Computer Algebra Independent Integration Tests

Summer 2023 edition

4-Trig-functions/4.2-Cosine/89-4.2.2.1-a+b-cos-^m-c+d-cos-^n

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Contents

CHAPTER 1

INTRODUCTION

This report gives the result of running the computer algebra independent integration test.The download section in on the main webpage contains links to download the problems in plain text format used for all CAS systems. The number of integrals in this report is [932]. This is test number [89].

1.1 Listing of CAS systems tested

The following are the CAS systems tested:

1. Mathematica 13.3.1 (August 16, 2023) on windows 10.
2. Rubi 4.16.1 (Dec 19, 2018) on Mathematica 13.3 on windows 10
3. Maple 2023.1 (July, 12, 2023) on windows 10.
4. Maxima 5.47 (June 1, 2023) using Lisp SBCL 2.3.0 on Linux via sagemath 10.1 (Aug 20, 2023).
5. FriCAS 1.3.9 (July 8, 2023) based on sbcl 2.3.0 on Linux via sagemath 10.1 (Aug 20, 2023).
6. Giac/Xcas 1.9.0-57 (June 26, 2023) on Linux via sagemath 10.1 (Aug 20, 2023).
7. Sympy 1.12 (May 10, 2023) Using Python 3.11.3 on Linux.
8. Mupad using Matlab 2021a with Symbolic Math Toolbox Version 8.7 on windows 10.

Maxima and Fricas and Giac are called using Sagemath. This was done using Sagemath `integrate` command by changing the name of the algorithm to use the different CAS systems.

Sympy was run directly in Python not via sagemath.

1.2 Results

Important note: A number of problems in this test suite have no antiderivative in closed form. This means the antiderivative of these integrals can not be expressed in terms of elementary, special functions or `Hypergeometric2F1` functions. `RootSum` and `RootOf` are not allowed. If a CAS returns the above integral unevaluated within the time limit, then the result is counted as passed and assigned an A grade.

However, if CAS times out, then it is assigned an F grade even if the integral is not integrable, as this implies CAS could not determine that the integral is not integrable in the time limit.

If a CAS returns an antiderivative to such an integral, it is assigned an A grade automatically and this special result is listed in the introduction section of each individual test report to make it easy to identify as this can be important result to investigate.

The results given in in the table below reflects the above.

System	% solved	% Failed
Rubi	100.00 (932)	0.00 (0)
Mathematica	99.68 (929)	0.32 (3)
Maple	91.63 (854)	8.37 (78)
Fricas	72.42 (675)	27.58 (257)
Maxima	34.87 (325)	65.13 (607)
Mupad	33.26 (310)	66.74 (622)
Giac	30.15 (281)	69.85 (651)
Sympy	10.84 (101)	89.16 (831)

Table 1.1: Percentage solved for each CAS

The table below gives additional break down of the grading of quality of the antiderivatives generated by each CAS. The grading is given using the letters A,B,C and F with A being the best quality. The grading is accomplished by comparing the antiderivative generated with the optimal antiderivatives included in the test suite. The following table describes the meaning of these grades.

grade	description
A	Integral was solved and antiderivative is optimal in quality and leaf size.
B	Integral was solved and antiderivative is optimal in quality but leaf size is larger than twice the optimal antiderivatives leaf size.
C	Integral was solved and antiderivative is non-optimal in quality. This can be due to one or more of the following reasons 1. antiderivative contains a hypergeometric function and the optimal antiderivative does not. 2. antiderivative contains a special function and the optimal antiderivative does not. 3. antiderivative contains the imaginary unit and the optimal antiderivative does not.
F	Integral was not solved. Either the integral was returned unevaluated within the time limit, or it timed out, or CAS hanged or crashed or an exception was raised.

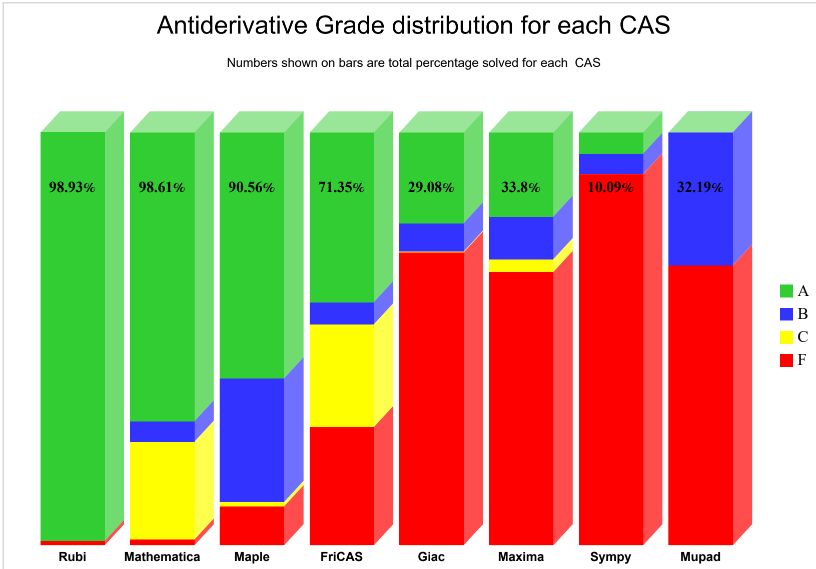
Table 1.2: Description of grading applied to integration result

Grading is implemented for all CAS systems. Based on the above, the following table summarizes the grading for this test suite.

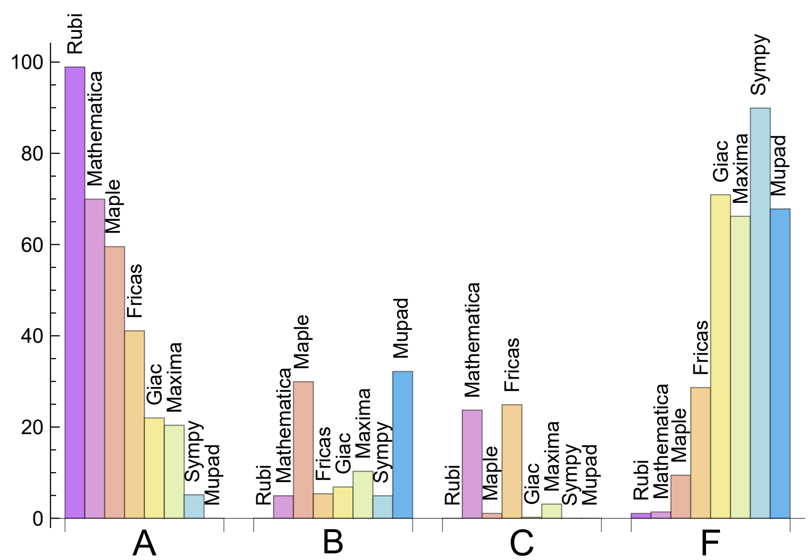
System	% A grade	% B grade	% C grade	% F grade
Rubi	98.927	0.000	0.000	1.073
Mathematica	69.957	4.936	23.712	1.395
Maple	59.549	29.936	1.073	9.442
Fricas	41.094	5.365	24.893	28.648
Giac	21.996	6.867	0.215	70.923
Maxima	20.386	10.300	3.112	66.202
Sympy	5.150	4.936	0.000	89.914
Mupad	0.000	32.189	0.000	67.811

Table 1.3: Antiderivative Grade distribution of each CAS

The following is a Bar chart illustration of the data in the above table.



The figure below compares the grades of the CAS systems.



The following table shows the distribution of the different types of failures for each CAS. There are 3 types failures. The first is when CAS returns the input within the time limit, which means it could not solve it. This is the typical failure and given as **F**.

The second failure is due to time out. CAS could not solve the integral within the 3 minutes time limit which is assigned. This is assigned **F(-1)**.

The third is due to an exception generated, indicated as **F(-2)**. This most likely indicates an interface problem between sagemath and the CAS (applicable only to FriCAS, Maxima and Giac) or it could be an indication of an internal error in the CAS itself. This type of error requires more investigation to determine the cause.

System	Number failed	Percentage normal failure	Percentage timeout failure	Percentage exception failure
Rubi	0	0.00	0.00	0.00
Mathematica	3	100.00	0.00	0.00
Maple	78	100.00	0.00	0.00
Fricas	257	76.26	23.74	0.00
Maxima	607	89.95	2.80	7.25
Mupad	622	0.00	100.00	0.00
Giac	651	89.09	9.52	1.38
Sympy	831	48.38	51.62	0.00

Table 1.4: Failure statistics for each CAS

1.3 Time and leaf size Performance

The table below summarizes the performance of each CAS system in terms of time used and leaf size of results.

Mean size is the average leaf size produced by the CAS (before any normalization). The Normalized mean is relative to the mean size of the optimal anti-derivative given in the input files.

For example, if CAS has **Normalized mean** of 3, then the mean size of its leaf size is 3 times as large as the mean size of the optimal leaf size.

Median size is value of leaf size where half the values are larger than this and half are smaller (before any normalization). i.e. The Middle value.

Similarly the **Normalized median** is relative to the median leaf size of the optimal.

For example, if a CAS has Normalized median of 1.2, then its median is 1.2 as large as the median leaf size of the optimal.

System	Mean time (sec)
Fricas	0.24
Rubi	0.32
Maxima	1.35
Mathematica	2.87
Giac	2.90
Sympy	6.37
Mupad	14.55
Maple	15.48

Table 1.5: Time performance for each CAS

System	Mean size	Normalized mean	Median size	Normalized median
Rubi	154.08	1.00	131.00	1.00
Fricas	205.82	1.63	161.00	1.33
Sympy	223.22	2.51	129.00	1.75
Mathematica	234.01	1.44	133.00	0.96
Mupad	402.21	2.47	102.00	1.07
Maple	430.47	2.17	194.00	1.63
Giac	820.91	5.71	116.00	1.23
Maxima	6483.49	48.36	127.00	1.47

Table 1.6: Leaf size performance for each CAS

1.4 Performance based on number of rules Rubi used

This section shows how each CAS performed based on the number of rules Rubi needed to solve the same integral. One diagram is given for each CAS.

On the y axis is the percentage solved which Rubi itself needed the number of rules given the x axis. These plots show that as more rules are needed then most CAS system percentage of solving decreases which indicates the integral is becoming more complicated to solve.

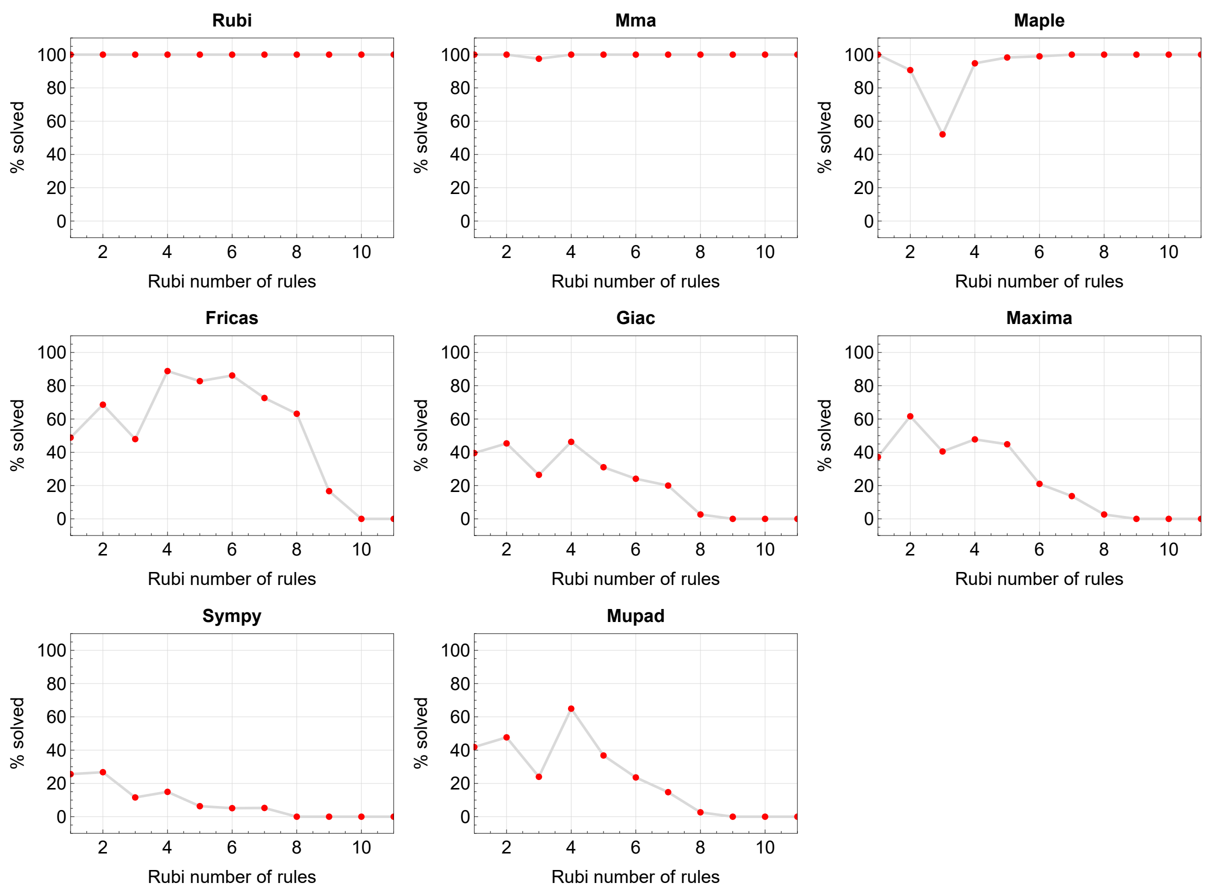


Figure 1.1: Solving statistics per number of Rubi rules used

1.5 Performance based on number of steps Rubi used

This section shows how each CAS performed based on the number of steps Rubi needed to solve the same integral. Note that the number of steps Rubi needed can be much higher than the number of rules, as the same rule could be used more than once.

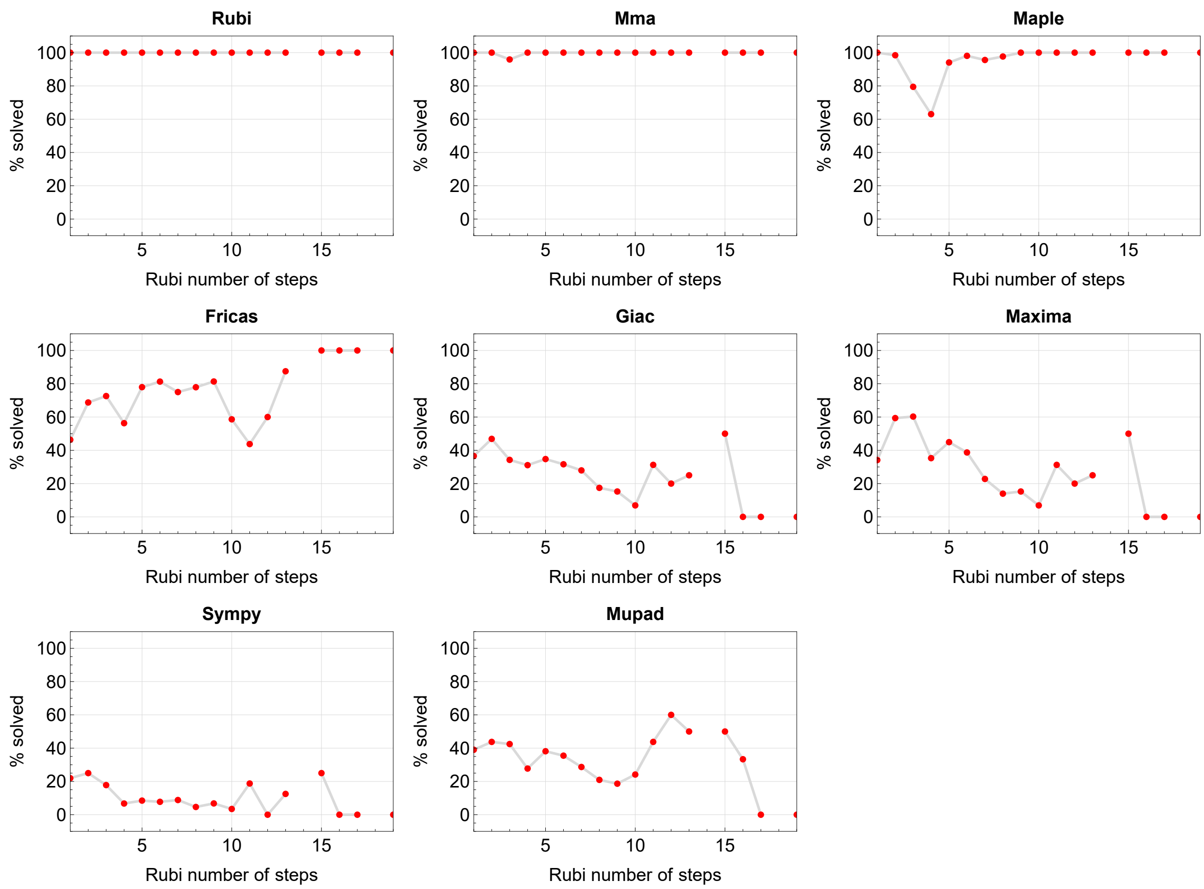


Figure 1.2: Solving statistics per number of Rubi steps used

The above diagram show that the precentage of solved intergals decreases for most CAS systems as the number of steps increases. As expected, for integrals that required less steps by Rubi, CAS systems had more success which indicates the integral was not as hard to solve. As Rubi needed more steps to solve the integral, the solved percentage decreased for most CAS systems which indicates the integral is becoming harder to solve.

1.6 Solved integrals histogram based on leaf size of result

The following shows the distribution of solved integrals for each CAS system based on leaf size of the antiderivatives produced by each CAS. It shows that most integrals solved produced leaf size less than about 100 to 150. The bin size used is 40.

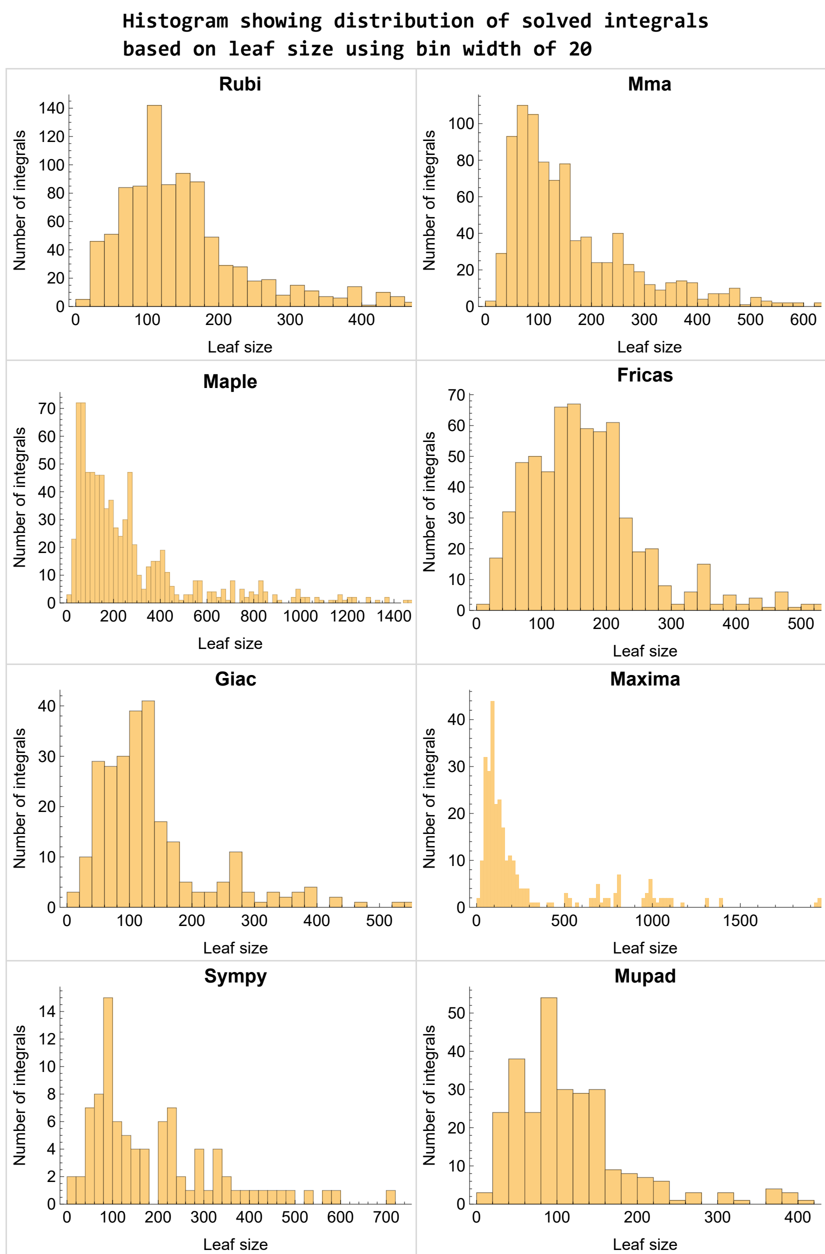


Figure 1.3: Solved integrals based on leaf size distribution

1.7 Solved integrals histogram based on CPU time used

The following shows the distribution of solved integrals for each CAS system based on CPU time used in seconds. The bin size used is 0.1 second.

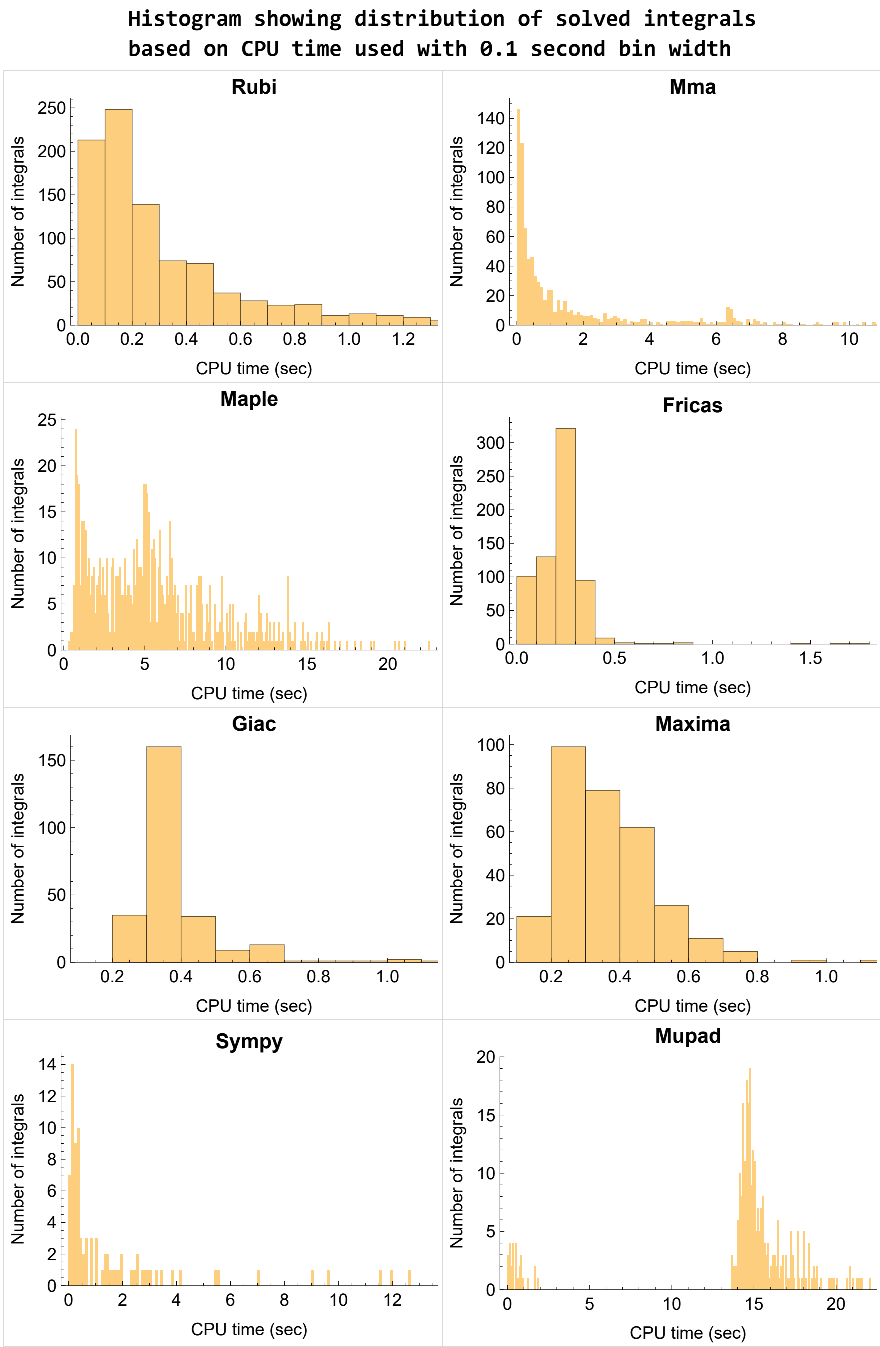


Figure 1.4: Solved integrals histogram based on CPU time used

1.8 Leaf size vs. CPU time used

The following shows the relation between the CPU time used to solve an integral and the leaf size of the antiderivative.

The result for Fricas, Maxima and Giac is shifted more to the right than the other CAS system due to the use of sagemath to call them, which causes an initial slight delay in the timing to start the integration due to overhead of starting a new process each time. This should also be taken into account when looking at the timing of these three CAS systems. Direct calls not using sagemath would result in faster timings, but current implementation uses sagemath as this makes testing much easier to do.

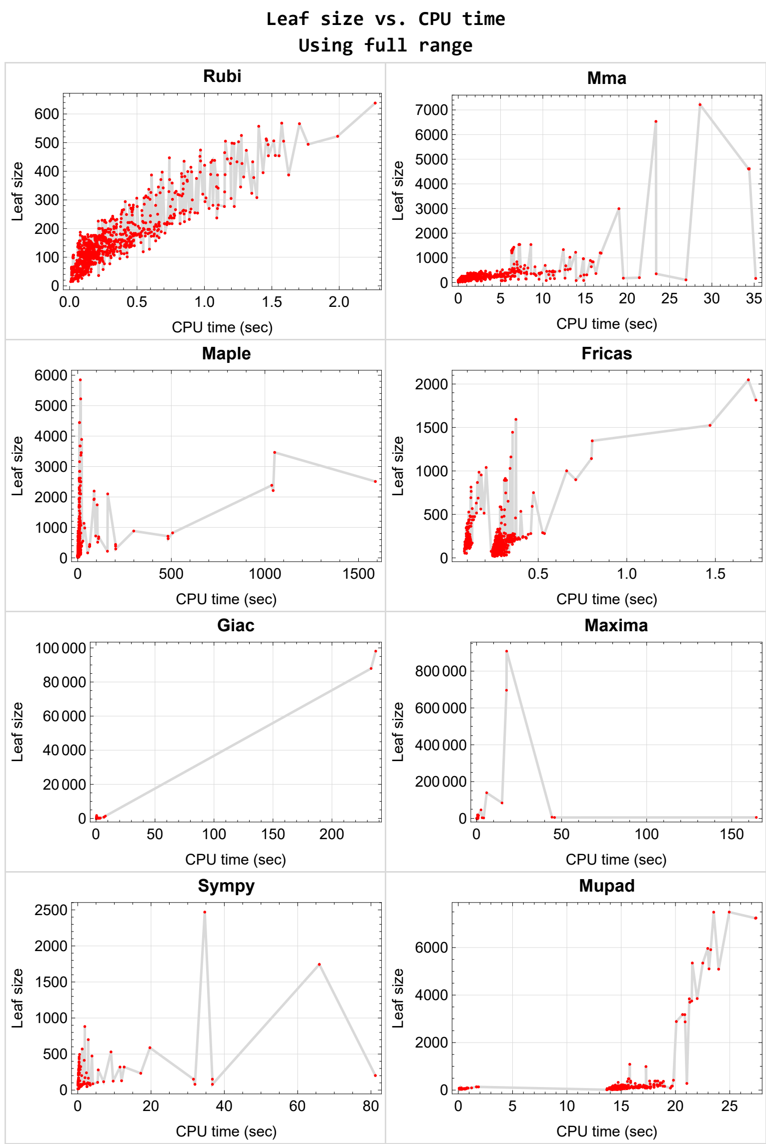


Figure 1.5: Leaf size vs. CPU time. Full range

1.9 list of integrals with no known antiderivative

{680, 681, 682, 683, 684, 685, 686, 687, 688, 689}

1.10 List of integrals solved by CAS but has no known antiderivative

Rubi {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

Mupad {}

1.11 list of integrals solved by CAS but failed verification

The following are integrals solved by CAS but the verification phase failed to verify the anti-derivative produced is correct. This does not necessarily mean that the anti-derivative is wrong as additional methods of verification might be needed, or more time is needed (3 minutes time limit was used). These integrals are listed here to make it possible to do further investigation to determine why the result could not be verified.

Rubi {}

Mathematica {117, 146, 147, 148, 150, 151, 152, 155, 156, 161, 162, 167, 169, 195, 213, 214, 215, 216, 217, 228, 229, 230, 232, 235, 236, 237, 242, 243, 249, 250, 253, 257, 258, 356, 357, 358, 359, 360, 361, 362, 363, 367, 368, 369, 373, 374, 379, 380, 386, 387, 610, 618, 638, 676, 677, 678, 679, 721, 724, 734, 735, 751, 755, 757, 763, 764, 765, 766, 773, 774}

Maple {126, 392, 631, 632, 638, 639, 732, 739, 746, 747, 752, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768}

Maxima Verification phase not currently implemented.

Fricas Verification phase not currently implemented.

Sympy Verification phase not currently implemented.

Giac Verification phase not currently implemented.

Mupad Verification phase not currently implemented.

1.12 Timing

The command `AbsoluteTiming[]` was used in Mathematica to obtain the elapsed time for each integrate call. In Maple, the command `Usage` was used as in the following example

```
cpu_time := Usage(assign ('result_of_int',int(expr,x)),output='realtime'
```

For all other CAS systems, the elapsed time to complete each integral was found by taking the difference between the time after the call completed from the time before the call was made. This was done using Python's `time.time()` call.

All elapsed times shown are in seconds. A time limit of 3 CPU minutes was used for each integral. If the integrate command did not complete within this time limit, the integral was aborted and considered to have failed and assigned an F grade. The time used by failed integrals due to time out was not counted in the final statistics.

1.13 Verification

A verification phase was applied on the result of integration for `Rubi` and `Mathematica`.

Future version of this report will implement verification for the other CAS systems. For the integrals whose result was not run through a verification phase, it is assumed that the antiderivative was correct.

Verification phase also had 3 minutes time out. An integral whose result was not verified could still be correct, but further investigation is needed on those integrals. These integrals were marked in the summary table below and also in each integral separate section so they are easy to identify and locate.

1.14 Important notes about some of the results

Important note about Maxima results

Since tests were run in a batch mode, and using an automated script, then any integral where Maxima needed an interactive response from the user to answer a question during the evaluation of the integral will fail.

The exception raised is `ValueError`. Therefore Maxima results is lower than what would result if Maxima was run directly and each question was answered correctly.

The percentage of such failures were not counted for each test file, but for an example, for the `Timofeev` test file, there were about 14 such integrals out of total 705, or about 2 percent. This percentage can be higher or lower depending on the specific input test file.

Such integrals can be identified by looking at the output of the integration in each section for Maxima. The exception message will indicate the cause of error.

Maxima integrate was run using SageMath with the following settings set by default

```
'besselexpand : true'
'display2d : false'
'domain : complex'
'keepfloat : true'
'load(to_poly_solve)'
'load(simplify_sum)'
'load(abs_integrate)' 'load(diag)'
```

SageMath automatic loading of Maxima `abs_integrate` was found to cause some problems. So the following code was added to disable this effect.

```
from sage.interfaces.maxima_lib import maxima_lib
maxima_lib.set('extra_definite_integration_methods', '[]')
maxima_lib.set('extra_integration_methods', '[]')
```

See `https://ask.sagemath.org/question/43088/integrate-results-that-are-different-from-using-maxima/` for reference.

Important note about FriCAS result

There were few integrals which failed due to SageMath interface and not because FriCAS system could not do the integration.

These will fail With error `Exception raised: NotImplementedError`.

The number of such cases seems to be very small. About 1 or 2 percent of all integrals. These can be identified by looking at the exception message given in the result.

Important note about finding leaf size of antiderivative

For Mathematica, Rubi, and Maple, the builtin system function `LeafSize` was used to find the leaf size of each antiderivative.

The other CAS systems (SageMath and Sympy) do not have special builtin function for this purpose at this time. Therefore the leaf size for Fricas and Sympy antiderivative was determined using the following function, thanks to user `slelievre` at `https://ask.sagemath.org/question/57123/could-we-have-a-leaf_count-function-in-base-sagemath/`

```
def tree_size(expr):
    r"""
```

```
    Return the tree size of this expression.
    """
    if expr not in SR:
        # deal with lists, tuples, vectors
        return 1 + sum(tree_size(a) for a in expr)
    expr = SR(expr)
    x, aa = expr.operator(), expr.operands()
    if x is None:
        return 1
    else:
        return 1 + sum(tree_size(a) for a in aa)
```

For Sympy, which was called directly from Python, the following code was used to obtain the leafsize of its result

```
try:
  # 1.7 is a fudge factor since it is low side from actual leaf count
  leafCount = round(1.7*count_ops(anti))

  except Exception as ee:
        leafCount =1
```

Important note about Mupad results

Matlab's symbolic toolbox does not have a leaf count function to measure the size of the antiderivative. Maple was used to determine the leaf size of Mupad output by post processing Mupad result.

Currently no grading of the antiderivative for Mupad is implemented. If it can integrate the problem, it was assigned a B grade automatically as a placeholder. In the future, when grading function is implemented for Mupad, the tests will be rerun again.

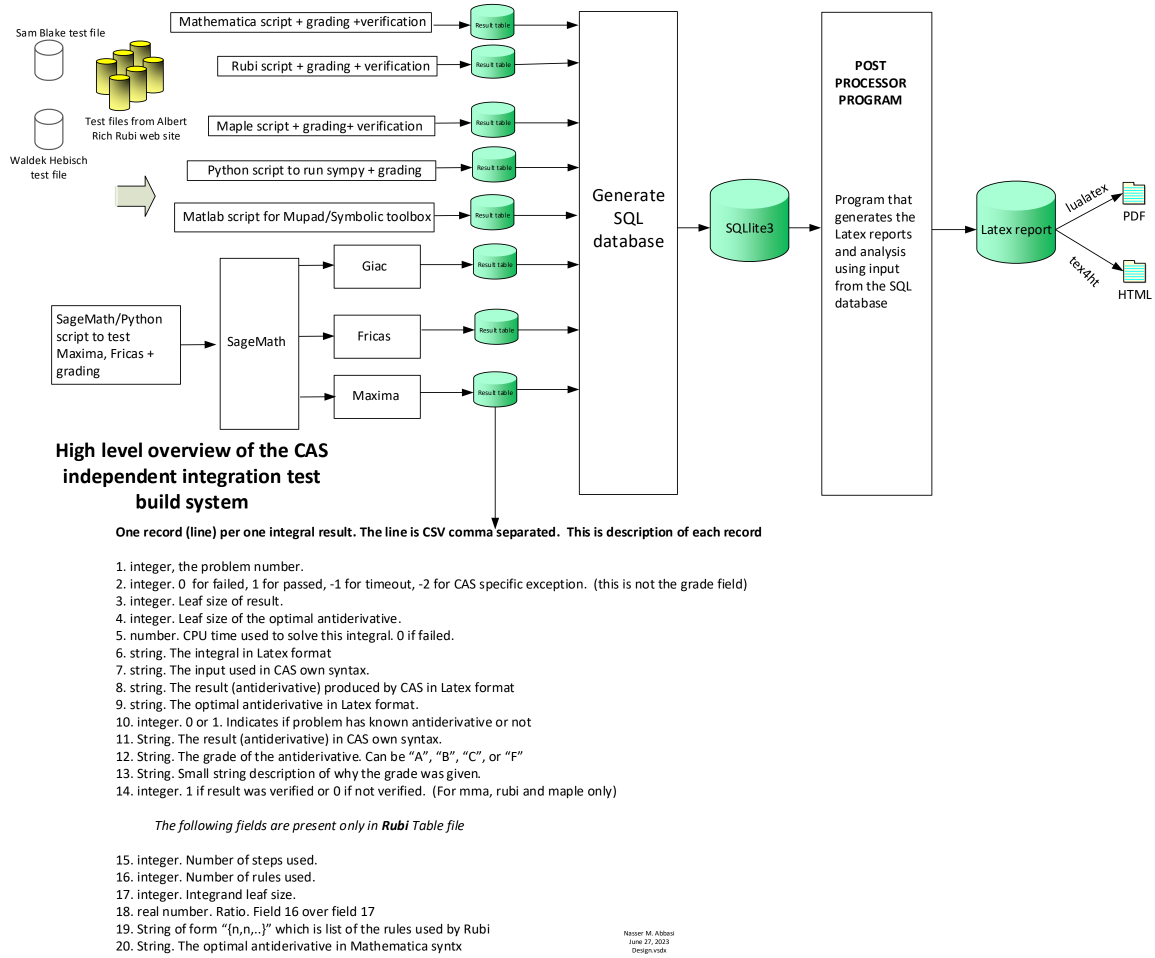
The following is an example of using Matlab's symbolic toolbox (Mupad) to solve an integral

```
integrand = evalin(symengine,'cos(x)*sin(x)')
the_variable = evalin(symengine,'x')
anti = int(integrand,the_variable)
```

Which gives `sin(x)^2/2`

1.15 Design of the test system

The following diagram gives a high level view of the current test build system.



CHAPTER 2

DETAILED SUMMARY TABLES OF RESULTS

2.1 List of integrals sorted by grade for each CAS

Rubi

A grade { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624,

625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644,
645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664,
665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 690, 691, 692, 693, 694,
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875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894,
895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914,
915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932 }

B grade { }

C grade { }

F normal fail { }

F(-1) timedout fail { }

F(-2) exception fail { }

Mma

A grade { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27,
29, 30, 31, 32, 33, 34, 35, 36, 39, 40, 41, 42, 43, 44, 45, 48, 53, 54, 55, 56, 57, 58, 63, 64, 65, 66,
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100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 121, 122, 123,
124, 125, 126, 127, 131, 132, 133, 134, 135, 137, 139, 140, 141, 142, 143, 198, 199, 200, 201, 202,
203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227,
231, 232, 233, 234, 238, 239, 240, 241, 244, 245, 246, 247, 248, 251, 252, 253, 254, 255, 256, 259,
260, 261, 262, 266, 267, 268, 272, 273, 274, 300, 313, 327, 339, 340, 341, 342, 343, 344, 345, 346,
347, 348, 349, 350, 351, 352, 353, 354, 355, 364, 370, 375, 376, 381, 382, 383, 388, 389, 390, 391,
394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413,
414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433,
434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453,
454, 455, 456, 457, 458, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474,
475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 493, 494, 495, 496,
497, 500, 501, 502, 503, 508, 509, 510, 511, 512, 513, 516, 517, 518, 519, 520, 523, 524, 525, 526,
527, 530, 531, 532, 533, 534, 538, 539, 540, 541, 542, 543, 546, 547, 548, 549, 550, 551, 554, 555,
556, 557, 558, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577,
578, 579, 580, 581, 582, 583, 584, 585, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598,
599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 611, 612, 613, 614, 615, 619, 620, 621, 622, 626,
627, 628, 629, 630, 632, 633, 634, 639, 647, 650, 651, 656, 657, 661, 663, 668, 669, 671, 690, 691,

692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 769, 770, 771, 772, 775, 776, 777, 779, 780, 781, 782, 783, 784, 785, 786, 787, 789, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932 }

B grade { 28, 37, 38, 46, 47, 49, 50, 51, 52, 59, 60, 61, 62, 69, 70, 71, 80, 81, 91, 92, 586, 644, 645, 646, 648, 649, 652, 653, 654, 655, 658, 659, 660, 662, 670, 676, 677, 678, 679, 721, 734, 768, 773, 774, 788, 790 }

C grade { 117, 118, 119, 120, 128, 129, 130, 136, 138, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 213, 214, 215, 216, 217, 228, 229, 230, 235, 236, 237, 242, 243, 249, 250, 257, 258, 263, 264, 265, 269, 270, 271, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 291, 292, 293, 294, 295, 296, 297, 298, 299, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 356, 357, 358, 359, 360, 361, 362, 363, 365, 366, 367, 368, 369, 371, 372, 373, 374, 377, 378, 379, 380, 384, 385, 386, 387, 392, 393, 459, 491, 492, 498, 499, 504, 505, 506, 507, 514, 515, 521, 522, 528, 529, 535, 536, 537, 544, 545, 552, 553, 559, 560, 609, 610, 616, 617, 618, 623, 624, 625, 631, 635, 636, 637, 638, 640, 641, 642, 643, 664, 665, 666, 667, 672, 673, 674, 675, 778 }

F normal fail { 288, 289, 290 }

F(-1) timedout fail { }

F(-2) exception fail { }

Maple

A grade { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 104, 105, 106, 107, 112, 113, 114, 115, 121, 122, 123, 124, 125, 131, 132, 133, 139, 140, 141, 142, 143, 146, 147, 149, 150, 153, 154, 155, 160, 161, 162, 163, 167, 168, 169, 170, 174, 175, 176, 177, 178, 179, 181, 182, 183, 184, 186, 189, 190, 191, 192, 193, 194, 195, 197, 198, 199, 200, 202, 203, 204, 205, 206, 207, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 224, 225, 226, 227, 228, 229, 230, 231, 232, 236, 237, 238, 239, 240, 242, 243, 244, 246, 247, 249, 250, 253, 254, 255, 256, 257, 258, 259, 260, 262, 263, 264, 265, 266, 267, 268, 269, 270, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 287, 293, 294, 295, 296, 297, 301, 302, 303, 307, 308, 309, 310, 314, 315, 316, 318, 319, 320, 321, 322, 323, 324, 325, 326, 328, 329, 330, 331, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 490, 497, 504, 509, 510, 511, 513, 516, 517, 518, 520, 525, 527, 528, 533, 534, 535, 543, 546, 547, 548, 549, 554, 555, 556, 561, 564, 565, 572, 578, 583, 584, 605, 627, 628, 648, 650, 651, 656, 657, 658, 660, 661, 662, 663, 664, 666, 667, 668, 669, 672, 673, 674, 692, 693, 694, 695, 696, 700, 701, 703, 704, 708, 710, 711, 712, 715, 716, 733, 753, 754, 755, 779, 780, 781, 782, 783, 784, 785, 786, 791, 792, 793, 799, 800, 801, 802, 803, 806, 807, 808, 809, 810, 813, 814, 815, 816, 817, 820, 821, 822, 823, 824, 827, 828, 829, 830, 831, 834, 835, 836, 837, 838, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886 }

B grade { 100, 101, 102, 103, 108, 109, 110, 111, 116, 117, 118, 119, 120, 127, 128, 129, 130, 134, 135, 136, 137, 138, 144, 145, 148, 151, 152, 156, 157, 158, 159, 164, 165, 166, 171, 172, 173, 180, 185, 187, 188, 196, 201, 208, 209, 222, 223, 233, 234, 235, 241, 245, 248, 251, 252, 261, 271, 285, 291, 292, 298, 299, 300, 304, 305, 306, 311, 312, 313, 317, 327, 332, 486, 487, 488, 489, 491, 492, 493, 494, 495, 496, 498, 499, 500, 501, 502, 503, 505, 506, 507, 508, 512, 514, 515, 519, 521, 522, 523, 524, 529, 530, 531, 532, 536, 537, 538, 539, 540, 541, 542, 544, 545, 551, 552, 553, 558, 559, 560, 562, 563, 566, 567, 568, 569, 570, 571, 574, 575, 576, 577, 580, 581, 582, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 649, 652, 653, 654, 655, 659, 665, 670, 671, 675, 690, 691, 697, 698, 699, 702, 705, 706, 707, 709, 713, 714, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 778, 794, 804, 805, 811, 812, 818, 819, 825, 826, 832, 833, 839, 840, 841 }

C grade { 32, 41, 42, 89, 126, 526, 550, 557, 573, 579 }

F normal fail { 221, 288, 289, 290, 396, 397, 398, 399, 400, 401, 402, 676, 677, 678, 679, 769, 770, 771, 772, 773, 774, 775, 776, 777, 787, 788, 789, 790, 795, 796, 797, 798, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932 }

F(-1) timedout fail { }

F(-2) exception fail { }

Fricas

A grade { 1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 102, 103, 104, 105, 106, 107, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 130, 131, 132, 133, 138, 139, 140, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 286, 287, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 403, 404, 405, 406, 407, 408, 409, 410, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 457, 458, 459, 460, 461, 463, 464, 468, 469, 472, 480, 778, 779, 780, 782, 784, 785, 791, 792, 793, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886 }

B grade { 7, 8, 19, 101, 108, 109, 127, 128, 129, 134, 135, 136, 137, 141, 142, 143, 144, 145, 234, 235, 261, 283, 284, 285, 411, 412, 423, 456, 462, 465, 466, 467, 470, 471, 473, 474, 475, 476, 477, 478, 479, 481, 482, 483, 484, 485, 781, 783, 786, 869 }

C grade { 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 486, 487, 488, 489, 493, 494, 495, 496, 500, 501, 502, 503, 508, 509, 510, 511, 512, 516, 517, 518, 519, 523, 524, 525, 526, 530, 531, 532, 533, 534, 538, 539, 540, 541, 542, 543, 546, 547, 548, 549, 550, 554, 555, 556, 557, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 794, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841 }

F normal fail { 288, 290, 397, 398, 399, 400, 401, 402, 497, 513, 514, 515, 520, 521, 522, 551, 552, 553, 558, 559, 560, 595, 596, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 730, 731, 732, 733, 734, 736, 737, 738, 739, 740, 741, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 787, 788, 789, 790, 795, 796, 797, 798, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932 }

F(-1) timedout fail { 289, 490, 491, 492, 498, 499, 504, 505, 506, 507, 527, 528, 529, 535, 536, 537, 544, 545, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 597, 598, 599, 600, 601, 602, 676, 677, 678, 679, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 735, 742 }

F(-2) exception fail { }

Maxima

A grade { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 41, 43, 44, 45, 47, 48, 49, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 104, 105, 106, 107, 112, 113, 114, 115, 121, 210, 212, 218, 219, 220, 346, 348, 353, 354, 355, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 780, 793, 842, 843, 844, 845, 846, 847, 850, 851, 852, 853, 854, 855, 858, 859, 860, 861, 862, 863, 866, 867, 868, 869, 873, 874, 875, 876, 880, 881, 882, 883 }

B grade { 40, 42, 46, 50, 51, 52, 101, 102, 103, 109, 110, 111, 117, 118, 119, 122, 123, 124, 125, 126, 128, 134, 135, 137, 143, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 211, 213, 214, 215, 216, 217, 221, 222, 223, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 339, 340, 341, 342, 343, 344, 345, 347, 349, 350, 351, 352, 356, 357, 358, 359, 360, 396, 781, 782, 783, 784, 785, 848, 849, 856, 857, 864, 865, 870, 871, 872, 877, 878, 879, 884, 885, 886 }

C grade { 226, 227, 228, 229, 230, 233, 234, 235, 236, 237, 261, 262, 278, 279, 280, 281, 285, 286, 287, 361, 362, 363, 364, 365, 367, 368, 369, 370, 371 }

F normal fail { 100, 108, 116, 127, 136, 144, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 197, 224, 225, 231, 232, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 259, 260, 275, 276, 277, 282, 283, 284, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 366, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 387, 388, 389, 390, 391, 392, 393, 394, 395, 397, 398, 399, 400, 401, 402, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 787, 788, 789, 790, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932 }

F(-1) timedout fail { 120, 129, 130, 131, 132, 133, 139, 140, 141, 142, 145, 258, 386, 602, 724, 725, 786 }

F(-2) exception fail { 138, 196, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 601, 778, 779, 791, 792 }

Giac

A grade { 1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 127, 131, 132, 133, 134, 135, 136, 139, 140, 141, 142, 143, 202, 203, 204, 205, 266, 267, 268, 272, 273, 274, 281, 339, 340, 341, 342, 403, 404, 405, 406, 407, 408, 409, 410, 416, 417, 418, 419, 420, 421, 428, 429, 430, 431, 433, 434, 438, 439, 440, 441, 443, 444, 450, 451, 452, 454, 457, 459, 460, 462, 463, 464, 465, 467, 468, 470, 471, 472, 476, 478, 480, 779, 780, 783, 785, 786, 793, 842, 843, 844, 850, 851, 858 }

B grade { 7, 8, 18, 19, 126, 223, 265, 271, 275, 276, 277, 278, 279, 280, 282, 283, 284, 285, 286, 287, 411, 412, 413, 414, 415, 422, 423, 424, 425, 426, 427, 432, 435, 436, 437, 442, 445, 446, 447, 448, 449, 453, 455, 456, 458, 461, 466, 469, 473, 474, 475, 477, 479, 481, 482, 483, 484, 485, 778, 781, 782, 784, 791, 792 }

C grade { 212, 219 }

F normal fail { 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 206, 207, 209, 213, 214, 222, 226, 227, 228, 229, 230, 233, 234, 235, 236, 237, 242, 243, 249, 250, 257, 258, 261, 262, 263, 264, 269, 270, 288, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 343, 344, 345, 349, 351, 352, 359, 360, 361, 362, 363, 364, 365, 367, 368, 369, 370, 371, 373, 374, 379, 380, 386, 387, 397, 398, 399, 400, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 787, 788, 789, 790, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 845, 846, 847, 848, 849, 852, 853, 854, 855, 856, 857, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932 }

F(-1) timedout fail { 208, 210, 211, 215, 216, 217, 218, 220, 221, 224, 225, 231, 232, 238, 239, 240, 241, 244, 245, 246, 247, 248, 251, 252, 253, 254, 255, 256, 259, 260, 289, 346, 347, 348, 350, 353, 354, 355, 356, 357, 358, 366, 372, 375, 376, 377, 378, 381, 382, 383, 384, 385, 388, 389, 390, 391, 392, 393, 394, 395, 396, 603 }

F(-2) exception fail { 128, 129, 130, 137, 138, 144, 145, 401, 402 }

Mupad

A grade { }

B grade { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 99, 124, 125, 126, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 202, 203, 204, 205, 210, 211, 212, 218, 219, 220, 221, 266, 267, 268, 272, 273, 274, 339, 340, 341, 342, 346, 347, 348, 353, 354, 355, 396, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 524, 525, 526, 548, 549, 550, 555, 556, 557, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 780, 781, 782, 783, 785, 786, 791, 792, 793, 794, 822, 823, 842, 843, 844, 845, 850, 851, 852, 853, 858, 859, 860, 861, 866, 867, 868, 873, 874, 875, 880, 881, 882 }

C grade { }

F normal fail { }

F(-1) timedout fail { 95, 96, 97, 98, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 206, 207, 208, 209, 213, 214, 215, 216, 217, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 269, 270, 271, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 343, 344, 345, 349, 350, 351, 352, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 397, 398, 399, 400, 401, 402, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 551, 552, 553, 554, 558, 559, 560, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 784, 787, 788, 789, 790, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 846, 847, 848, 849, 854, 855, 856, 857, 862, 863, 864, 865, 869, 870, 871, 872, 876, 877, 878, 879, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932 }

F(-2) exception fail { }

Sympy

A grade { 2, 4, 6, 7, 17, 47, 48, 56, 57, 58, 65, 66, 67, 68, 73, 74, 75, 76, 77, 78, 83, 84, 85, 86, 87, 88, 89, 93, 94, 404, 406, 408, 410, 420, 421, 429, 431, 440, 441, 793, 843, 844, 845, 852, 853, 867, 868, 875 }

B grade { 1, 3, 5, 13, 14, 15, 16, 23, 24, 25, 26, 33, 34, 35, 43, 44, 45, 46, 53, 54, 55, 63, 64, 72, 82, 403, 405, 407, 409, 411, 417, 418, 419, 428, 430, 438, 439, 452, 453, 454, 464, 780, 781, 782, 783, 791 }

C grade { }

F normal fail { 8, 9, 10, 11, 12, 18, 19, 20, 21, 22, 27, 28, 29, 30, 36, 37, 38, 39, 49, 50, 51, 52, 59, 60, 61, 62, 69, 70, 71, 79, 80, 81, 90, 91, 92, 97, 98, 99, 100, 101, 102, 103, 106, 107, 108, 115, 124, 125, 126, 127, 128, 129, 130, 133, 134, 135, 136, 137, 138, 142, 143, 144, 145, 148, 149, 150, 156, 176, 177, 178, 179, 180, 185, 186, 187, 188, 194, 195, 196, 197, 199, 200, 201, 202, 203, 207, 208, 209, 210, 221, 222, 223, 225, 226, 227, 228, 229, 232, 233, 234, 235, 236, 239, 240, 241, 242, 246, 247, 248, 261, 262, 263, 264, 265, 266, 267, 269, 270, 271, 272, 273, 276, 277, 278, 279, 280, 283, 284, 285, 286, 287, 293, 294, 295, 296, 297, 301, 302, 303, 308, 309, 310, 315, 316, 318, 319, 320, 321, 325, 326, 327, 328, 332, 333, 334, 343, 344, 345, 351, 352, 363, 364, 365, 366, 369, 370, 371, 372, 374, 375, 376, 399, 400, 401, 402, 412, 413, 414, 415, 416, 422, 423, 424, 425, 426, 432, 433, 434, 435, 442, 443, 444, 445, 455, 456, 457, 458, 465, 466, 467, 468, 475, 476, 477, 484, 485, 487, 488, 489, 490, 491, 492, 495, 496, 497, 503, 510, 511, 512, 513, 514, 515, 517, 518, 519, 520, 521, 522, 524, 525, 526, 527, 528, 529, 532, 533, 534, 535, 536, 537, 542, 543, 544, 545, 548, 549, 550, 551, 552, 553, 555, 556, 557, 558, 559, 560, 563, 564, 565, 571, 603, 604, 605, 606, 607, 611, 612, 613, 614, 626, 627, 628, 629, 630, 632, 633, 634, 635, 639, 640, 641, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 692, 693, 694, 695, 696, 701, 702, 703, 709, 710, 711, 713, 714, 715, 716, 719, 720, 721, 722, 725, 726, 727, 733, 734, 735, 741, 742, 752, 753, 754, 755, 758, 759, 760, 771, 772, 775, 776, 777, 778, 779, 784, 785, 786, 787, 788, 789, 790, 794, 795, 796, 797, 798, 801, 802, 803, 823, 824, 825, 826, 832, 833, 846, 869, 870, 876, 877, 889, 890, 901, 902, 903, 904, 908, 909, 910, 911, 913, 914, 915, 916, 921, 922, 923, 928, 929, 930, 931, 932 }

F(-1) timedout fail { 31, 32, 40, 41, 42, 95, 96, 104, 105, 109, 110, 111, 112, 113, 114, 116, 117, 118, 119, 120, 121, 122, 123, 131, 132, 139, 140, 141, 146, 147, 151, 152, 153, 154, 155, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 181, 182, 183, 184, 189, 190, 191, 192, 193, 198, 204, 205, 206, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 224, 230, 231, 237, 238, 243, 244, 245, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 268, 274, 275, 281, 282, 288, 289, 290, 291, 292, 298, 299, 300, 304, 305, 306, 307, 311, 312, 313, 314, 317, 322, 323, 324, 329, 330, 331, 335, 336, 337, 338, 339, 340, 341, 342, 346, 347, 348, 349, 350, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 367, 368, 373, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 427, 436, 437, 446, 447, 448, 449, 450, 451, 459, 460, 461, 462, 463, 469, 470, 471, 472, 473, 474, 478, 479, 480, 481, 482, 483, 486, 493, 494, 498, 499, 500, 501, 502, 504, 505, 506, 507, 508, 509, 516, 523, 530, 531, 538, 539, 540, 541, 546, 547, 554, 561, 562, 566, 567, 568, 569, 570, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 608, 609, 610, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 631, 636, 637, 638, 642, 643, 676, 677, 678, 679, 680, 681, 689, 690, 691, 697, 698, 699, 700, 704, 705, 706, 707, 708, 712, 717, 718, 723, 724, 728, 729, 730, 731, 732, 736, 737, 738, 739, 740, 743, 744, 745, 746, 747, 748, 749, 750, 751, 756, 757, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 773, 774, 792, 799, 800, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 827, 828, 829, 830, 831, 834, 835, 836, 837, 838, 839, 840, 841, 842, 847, 848, 849, 850, 851, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 871, 872, 873, 874, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 905, 906, 907, 912, 917, 918, 919, 920, 924, 925, 926, 927 }

F(-2) exception fail { }

2.2 Detailed conclusion table per each integral for all CAS systems

Detailed conclusion table per each integral is given by the table below. The elapsed time is in seconds. For failed result it is given as **F(-1)** if the failure was due to timeout. It is given as **F(-2)** if the failure was due to an exception being raised, which could indicate a bug in the system. If the failure was due to integral not being evaluated within the time limit, then it is given as **F**.

In this table, the column `N.S.` means **normalized size** and is defined as $\frac{\text{antiderivative leaf size}}{\text{optimal antiderivative leaf size}}$. To make the table fit the page, the name **`Mathematica`** was abbreviated to **`MMA`**.

Problem 1	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	114	114	75	73	84	75	216	92	107
N.S.	1	1.00	0.66	0.64	0.74	0.66	1.89	0.81	0.94
time (sec)	N/A	0.090	0.138	2.449	0.221	0.271	0.343	0.309	16.482

Problem 2	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	92	92	65	64	69	64	168	77	93
N.S.	1	1.00	0.71	0.70	0.75	0.70	1.83	0.84	1.01
time (sec)	N/A	0.073	0.101	2.254	0.242	0.335	0.228	0.331	16.631

Problem 3	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	76	76	73	53	57	53	144	62	79
N.S.	1	1.00	0.96	0.70	0.75	0.70	1.89	0.82	1.04
time (sec)	N/A	0.064	0.065	2.191	0.220	0.277	0.167	0.320	17.686

Problem 4	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	54	54	57	40	46	42	92	47	55
N.S.	1	1.00	1.06	0.74	0.85	0.78	1.70	0.87	1.02
time (sec)	N/A	0.056	0.071	1.662	0.225	0.261	0.120	0.308	14.560

Problem 5	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	38	38	32	29	34	29	66	31	50
N.S.	1	1.00	0.84	0.76	0.89	0.76	1.74	0.82	1.32
time (sec)	N/A	0.017	0.048	0.714	0.217	0.263	0.100	0.301	15.134

Problem 6	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	15	15	26	16	15	17	17	15	15
N.S.	1	1.00	1.73	1.07	1.00	1.13	1.13	1.00	1.00
time (sec)	N/A	0.010	0.003	0.333	0.243	0.256	0.059	0.304	13.686

Problem 7	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	B	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	16	16	16	29	28	36	49	43	20
N.S.	1	1.00	1.00	1.81	1.75	2.25	3.06	2.69	1.25
time (sec)	N/A	0.024	0.007	1.144	0.233	0.268	2.511	0.337	13.698

Problem 8	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	B	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	24	24	24	30	38	60	0	63	47
N.S.	1	1.00	1.00	1.25	1.58	2.50	0.00	2.62	1.96
time (sec)	N/A	0.042	0.008	1.781	0.220	0.277	0.000	0.324	13.797

Problem 9	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	47	47	47	47	58	74	0	80	75
N.S.	1	1.00	1.00	1.00	1.23	1.57	0.00	1.70	1.60
time (sec)	N/A	0.052	0.011	2.257	0.242	0.278	0.000	0.337	14.610

Problem 10	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	63	63	60	60	70	88	0	96	102
N.S.	1	1.00	0.95	0.95	1.11	1.40	0.00	1.52	1.62
time (sec)	N/A	0.058	0.103	2.284	0.212	0.271	0.000	0.341	16.521

Problem 11	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	85	85	56	73	95	99	0	110	130
N.S.	1	1.00	0.66	0.86	1.12	1.16	0.00	1.29	1.53
time (sec)	N/A	0.080	0.129	2.684	0.231	0.257	0.000	0.321	17.611

Problem 12	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	101	101	65	83	107	110	0	124	158
N.S.	1	1.00	0.64	0.82	1.06	1.09	0.00	1.23	1.56
time (sec)	N/A	0.086	0.199	2.496	0.232	0.261	0.000	0.307	19.005

Problem 13	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	129	129	73	75	121	89	343	106	121
N.S.	1	1.00	0.57	0.58	0.94	0.69	2.66	0.82	0.94
time (sec)	N/A	0.151	0.155	2.974	0.233	0.268	0.370	0.307	16.985

Problem 14	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	103	103	61	64	95	76	221	89	105
N.S.	1	1.00	0.59	0.62	0.92	0.74	2.15	0.86	1.02
time (sec)	N/A	0.137	0.075	2.761	0.217	0.264	0.254	0.342	17.331

Problem 15	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	87	87	53	55	83	63	211	72	89
N.S.	1	1.00	0.61	0.63	0.95	0.72	2.43	0.83	1.02
time (sec)	N/A	0.111	0.084	2.258	0.221	0.259	0.183	0.309	17.201

Problem 16	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	69	41	42	61	49	107	54	61
N.S.	1	1.21	0.72	0.74	1.07	0.86	1.88	0.95	1.07
time (sec)	N/A	0.043	0.055	1.422	0.225	0.254	0.126	0.306	13.706

Problem 17	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	45	45	34	31	45	36	78	38	57
N.S.	1	1.00	0.76	0.69	1.00	0.80	1.73	0.84	1.27
time (sec)	N/A	0.015	0.083	0.701	0.227	0.252	0.092	0.301	14.395

Problem 18	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	34	34	47	44	43	53	0	79	33
N.S.	1	1.00	1.38	1.29	1.26	1.56	0.00	2.32	0.97
time (sec)	N/A	0.068	0.026	1.226	0.213	0.254	0.000	0.330	14.234

Problem 19	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	B	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	34	34	28	44	49	76	0	79	56
N.S.	1	1.00	0.82	1.29	1.44	2.24	0.00	2.32	1.65
time (sec)	N/A	0.068	0.017	1.887	0.219	0.257	0.000	0.329	14.195

Problem 20	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	54	54	54	70	88	83	0	90	83
N.S.	1	1.00	1.00	1.30	1.63	1.54	0.00	1.67	1.54
time (sec)	N/A	0.086	0.011	2.236	0.210	0.256	0.000	0.340	14.145

Problem 21	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	66	66	66	75	85	96	0	106	112
N.S.	1	1.00	1.00	1.14	1.29	1.45	0.00	1.61	1.70
time (sec)	N/A	0.107	0.219	3.313	0.245	0.262	0.000	0.352	15.599

Problem 22	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	96	96	58	112	145	111	0	122	141
N.S.	1	1.00	0.60	1.17	1.51	1.16	0.00	1.27	1.47
time (sec)	N/A	0.126	0.297	2.931	0.217	0.263	0.000	0.354	16.990

Problem 23	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	129	129	73	75	143	89	379	106	121
N.S.	1	1.00	0.57	0.58	1.11	0.69	2.94	0.82	0.94
time (sec)	N/A	0.167	0.112	3.378	0.230	0.260	0.385	0.332	16.744

Problem 24	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	105	105	63	66	117	76	272	88	105
N.S.	1	1.00	0.60	0.63	1.11	0.72	2.59	0.84	1.00
time (sec)	N/A	0.130	0.086	2.467	0.204	0.254	0.271	0.319	17.432

Problem 25	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	85	88	51	53	94	63	224	71	89
N.S.	1	1.04	0.60	0.62	1.11	0.74	2.64	0.84	1.05
time (sec)	N/A	0.085	0.080	2.311	0.240	0.255	0.195	0.330	17.364

Problem 26	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	63	63	44	42	70	50	121	55	63
N.S.	1	1.00	0.70	0.67	1.11	0.79	1.92	0.87	1.00
time (sec)	N/A	0.062	0.102	1.619	0.218	0.280	0.126	0.328	14.110

Problem 27	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	59	59	81	59	67	65	0	100	88
N.S.	1	1.00	1.37	1.00	1.14	1.10	0.00	1.69	1.49
time (sec)	N/A	0.070	0.408	1.308	0.214	0.269	0.000	0.371	14.531

Problem 28	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	48	48	211	55	64	91	0	80	57
N.S.	1	1.00	4.40	1.15	1.33	1.90	0.00	1.67	1.19
time (sec)	N/A	0.080	1.078	2.257	0.224	0.301	0.000	0.447	14.895

Problem 29	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	59	59	50	80	99	98	0	100	88
N.S.	1	1.00	0.85	1.36	1.68	1.66	0.00	1.69	1.49
time (sec)	N/A	0.090	0.025	2.544	0.341	0.263	0.000	0.430	14.626

Problem 30	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	72	72	72	94	111	98	0	106	112
N.S.	1	1.00	1.00	1.31	1.54	1.36	0.00	1.47	1.56
time (sec)	N/A	0.109	0.228	3.446	0.238	0.254	0.000	0.367	16.088

Problem 31	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	93	93	93	123	156	111	0	122	141
N.S.	1	1.00	1.00	1.32	1.68	1.19	0.00	1.31	1.52
time (sec)	N/A	0.142	0.314	3.794	0.240	0.267	0.000	0.409	16.968

Problem 32	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	114	114	114	145	179	124	0	138	170
N.S.	1	1.00	1.00	1.27	1.57	1.09	0.00	1.21	1.49
time (sec)	N/A	0.156	0.433	4.074	0.242	0.252	0.000	0.355	18.351

Problem 33	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	127	127	73	75	165	89	434	106	121
N.S.	1	1.00	0.57	0.59	1.30	0.70	3.42	0.83	0.95
time (sec)	N/A	0.183	0.128	3.733	0.220	0.252	0.391	0.359	16.436

Problem 34	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	102	114	63	66	128	76	280	89	105
N.S.	1	1.12	0.62	0.65	1.25	0.75	2.75	0.87	1.03
time (sec)	N/A	0.139	0.091	2.794	0.316	0.243	0.277	0.349	17.628

Problem 35	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	87	87	56	55	106	63	224	72	89
N.S.	1	1.00	0.64	0.63	1.22	0.72	2.57	0.83	1.02
time (sec)	N/A	0.102	0.139	2.109	0.223	0.254	0.196	0.306	17.281

Problem 36	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	73	73	91	70	89	80	0	116	93
N.S.	1	1.00	1.25	0.96	1.22	1.10	0.00	1.59	1.27
time (sec)	N/A	0.096	0.750	2.447	0.270	0.255	0.000	0.370	13.996

Problem 37	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	73	73	241	82	85	105	0	129	117
N.S.	1	1.00	3.30	1.12	1.16	1.44	0.00	1.77	1.60
time (sec)	N/A	0.105	2.997	2.186	0.233	0.321	0.000	0.359	14.568

Problem 38	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	73	73	272	91	110	111	0	129	115
N.S.	1	1.00	3.73	1.25	1.51	1.52	0.00	1.77	1.58
time (sec)	N/A	0.105	3.459	2.970	0.251	0.264	0.000	0.379	14.792

Problem 39	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	73	73	61	96	120	110	0	116	117
N.S.	1	1.00	0.84	1.32	1.64	1.51	0.00	1.59	1.60
time (sec)	N/A	0.123	0.029	3.296	0.298	0.275	0.000	0.349	14.642

Problem 40	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	96	96	96	135	182	111	0	122	141
N.S.	1	1.00	1.00	1.41	1.90	1.16	0.00	1.27	1.47
time (sec)	N/A	0.163	1.276	3.954	0.273	0.298	0.000	0.377	17.745

Problem 41	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	111	111	111	156	190	124	0	138	170
N.S.	1	1.00	1.00	1.41	1.71	1.12	0.00	1.24	1.53
time (sec)	N/A	0.162	1.574	4.382	0.239	0.272	0.000	0.380	19.710

Problem 42	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	136	136	136	178	270	137	0	154	199
N.S.	1	1.00	1.00	1.31	1.99	1.01	0.00	1.13	1.46
time (sec)	N/A	0.239	3.760	4.540	0.264	0.278	0.000	0.381	18.603

Problem 43	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	118	118	173	67	217	79	882	101	98
N.S.	1	1.00	1.47	0.57	1.84	0.67	7.47	0.86	0.83
time (sec)	N/A	0.124	0.842	0.805	0.315	0.260	1.934	0.341	16.481

Problem 44	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	94	94	143	54	176	70	570	88	70
N.S.	1	1.00	1.52	0.57	1.87	0.74	6.06	0.94	0.74
time (sec)	N/A	0.127	0.743	0.780	0.490	0.321	1.225	0.329	14.751

Problem 45	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	76	76	117	43	133	57	325	73	89
N.S.	1	1.00	1.54	0.57	1.75	0.75	4.28	0.96	1.17
time (sec)	N/A	0.069	0.722	0.761	0.316	0.256	0.817	0.328	14.376

Problem 46	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	B	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	43	43	89	31	92	46	129	58	66
N.S.	1	1.00	2.07	0.72	2.14	1.07	3.00	1.35	1.53
time (sec)	N/A	0.093	0.474	0.735	0.309	0.259	0.560	0.381	14.916

Problem 47	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	29	29	69	23	49	37	27	28	23
N.S.	1	1.00	2.38	0.79	1.69	1.28	0.93	0.97	0.79
time (sec)	N/A	0.046	0.141	0.717	0.315	0.248	0.359	0.360	14.640

Problem 48	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	22	22	17	17	23	22	20	16	16
N.S.	1	1.00	0.77	0.77	1.05	1.00	0.91	0.73	0.73
time (sec)	N/A	0.015	0.012	0.699	0.214	0.243	0.297	0.356	14.196

Problem 49	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	38	38	103	46	75	65	0	54	31
N.S.	1	1.00	2.71	1.21	1.97	1.71	0.00	1.42	0.82
time (sec)	N/A	0.053	0.282	0.868	0.220	0.322	0.000	0.438	14.482

Problem 50	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	B	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	53	53	188	74	119	97	0	84	67
N.S.	1	1.00	3.55	1.40	2.25	1.83	0.00	1.58	1.26
time (sec)	N/A	0.092	0.783	0.933	0.231	0.254	0.000	0.319	14.798

Problem 51	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	B	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	83	83	244	105	162	112	0	101	95
N.S.	1	1.00	2.94	1.27	1.95	1.35	0.00	1.22	1.14
time (sec)	N/A	0.105	1.167	0.992	0.243	0.260	0.000	0.320	14.756

Problem 52	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	B	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	103	103	368	132	205	124	0	114	96
N.S.	1	1.00	3.57	1.28	1.99	1.20	0.00	1.11	0.93
time (sec)	N/A	0.119	3.134	1.044	0.208	0.270	0.000	0.314	14.585

Problem 53	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	124	124	115	77	207	108	700	108	135
N.S.	1	1.00	0.93	0.62	1.67	0.87	5.65	0.87	1.09
time (sec)	N/A	0.213	0.528	0.872	0.309	0.257	2.879	0.332	14.881

Problem 54	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	114	114	107	66	164	99	413	95	113
N.S.	1	1.00	0.94	0.58	1.44	0.87	3.62	0.83	0.99
time (sec)	N/A	0.176	0.423	0.789	0.353	0.306	1.774	0.454	14.579

Problem 55	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	80	80	97	55	118	90	201	79	91
N.S.	1	1.00	1.21	0.69	1.48	1.12	2.51	0.99	1.14
time (sec)	N/A	0.193	0.450	0.791	0.304	0.255	1.080	0.319	14.330

Problem 56	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	57	87	36	72	80	56	50	35
N.S.	1	1.00	1.53	0.63	1.26	1.40	0.98	0.88	0.61
time (sec)	N/A	0.096	0.256	0.703	0.313	0.256	0.650	0.303	14.215

Problem 57	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	55	55	36	31	47	51	48	31	30
N.S.	1	1.00	0.65	0.56	0.85	0.93	0.87	0.56	0.55
time (sec)	N/A	0.044	0.079	0.677	0.232	0.242	0.491	0.298	14.362

Problem 58	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	55	55	53	31	46	49	44	31	30
N.S.	1	1.00	0.96	0.56	0.84	0.89	0.80	0.56	0.55
time (sec)	N/A	0.032	0.036	0.629	0.238	0.245	0.427	0.304	14.060

Problem 59	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	66	66	152	62	98	114	0	77	43
N.S.	1	1.00	2.30	0.94	1.48	1.73	0.00	1.17	0.65
time (sec)	N/A	0.122	0.437	0.900	0.227	0.325	0.000	0.332	14.080

Problem 60	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	81	81	239	92	145	146	0	106	92
N.S.	1	1.00	2.95	1.14	1.79	1.80	0.00	1.31	1.14
time (sec)	N/A	0.187	1.073	0.839	0.250	0.297	0.000	0.312	14.369

Problem 61	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	119	119	292	120	190	162	0	122	122
N.S.	1	1.00	2.45	1.01	1.60	1.36	0.00	1.03	1.03
time (sec)	N/A	0.208	1.590	1.052	0.279	0.273	0.000	0.322	14.364

Problem 62	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	133	133	343	152	234	172	0	135	153
N.S.	1	1.00	2.58	1.14	1.76	1.29	0.00	1.02	1.15
time (sec)	N/A	0.216	2.911	1.261	0.240	0.262	0.000	0.329	14.297

Problem 63	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	153	153	127	77	184	135	473	113	137
N.S.	1	1.00	0.83	0.50	1.20	0.88	3.09	0.74	0.90
time (sec)	N/A	0.298	2.026	0.838	0.332	0.267	3.889	0.313	14.301

Problem 64	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	119	119	107	66	137	126	240	96	113
N.S.	1	1.00	0.90	0.55	1.15	1.06	2.02	0.81	0.95
time (sec)	N/A	0.329	0.488	0.785	0.308	0.252	2.377	0.315	14.279

Problem 65	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	96	96	108	51	92	116	75	68	81
N.S.	1	1.00	1.12	0.53	0.96	1.21	0.78	0.71	0.84
time (sec)	N/A	0.223	0.816	0.808	0.318	0.269	1.362	0.308	14.227

Problem 66	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	83	83	46	45	67	75	68	46	45
N.S.	1	1.00	0.55	0.54	0.81	0.90	0.82	0.55	0.54
time (sec)	N/A	0.105	0.130	0.707	0.232	0.245	1.035	0.307	14.536

Problem 67	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	83	83	44	31	47	73	48	31	30
N.S.	1	1.00	0.53	0.37	0.57	0.88	0.58	0.37	0.36
time (sec)	N/A	0.066	0.074	0.837	0.575	0.295	0.808	0.305	14.316

Problem 68	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	83	83	65	45	67	75	63	46	45
N.S.	1	1.00	0.78	0.54	0.81	0.90	0.76	0.55	0.54
time (sec)	N/A	0.057	0.056	0.659	0.229	0.234	0.687	0.293	14.604

Problem 69	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	97	97	201	75	119	158	0	94	58
N.S.	1	1.00	2.07	0.77	1.23	1.63	0.00	0.97	0.60
time (sec)	N/A	0.224	0.550	0.894	0.228	0.254	0.000	0.331	14.175

Problem 70	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	112	112	286	105	165	190	0	122	111
N.S.	1	1.00	2.55	0.94	1.47	1.70	0.00	1.09	0.99
time (sec)	N/A	0.323	1.129	1.025	0.344	0.259	0.000	0.322	14.306

Problem 71	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	156	156	343	135	211	206	0	139	141
N.S.	1	1.00	2.20	0.87	1.35	1.32	0.00	0.89	0.90
time (sec)	N/A	0.338	2.914	1.102	0.289	0.259	0.000	0.322	14.377

Problem 72	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	184	184	137	88	204	171	530	128	159
N.S.	1	1.00	0.74	0.48	1.11	0.93	2.88	0.70	0.86
time (sec)	N/A	0.412	6.175	0.934	0.356	0.266	9.079	0.321	14.851

Problem 73	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	150	135	77	158	162	280	112	137
N.S.	1	1.00	0.90	0.51	1.05	1.08	1.87	0.75	0.91
time (sec)	N/A	0.421	1.664	0.830	0.327	0.267	5.596	0.337	14.974

Problem 74	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	127	127	117	64	112	152	95	83	102
N.S.	1	1.00	0.92	0.50	0.88	1.20	0.75	0.65	0.80
time (sec)	N/A	0.308	3.187	0.650	0.330	0.269	3.261	0.343	14.835

Problem 75	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	114	114	56	57	87	99	88	59	58
N.S.	1	1.00	0.49	0.50	0.76	0.87	0.77	0.52	0.51
time (sec)	N/A	0.214	1.227	0.692	0.248	0.258	2.401	0.320	15.080

Problem 76	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	112	112	56	58	87	99	87	59	58
N.S.	1	1.00	0.50	0.52	0.78	0.88	0.78	0.53	0.52
time (sec)	N/A	0.126	0.877	0.777	0.258	0.252	1.890	0.317	14.941

Problem 77	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	112	112	56	57	87	99	85	59	58
N.S.	1	1.00	0.50	0.51	0.78	0.88	0.76	0.53	0.52
time (sec)	N/A	0.090	0.163	0.780	0.230	0.243	1.585	0.307	14.939

Problem 78	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	112	112	77	56	87	99	83	59	58
N.S.	1	1.00	0.69	0.50	0.78	0.88	0.74	0.53	0.52
time (sec)	N/A	0.071	0.120	0.630	0.228	0.283	1.431	0.297	15.283

Problem 79	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	120	120	185	88	139	202	0	110	83
N.S.	1	1.00	1.54	0.73	1.16	1.68	0.00	0.92	0.69
time (sec)	N/A	0.320	0.901	1.026	0.229	0.265	0.000	0.333	14.901

Problem 80	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	135	341	118	186	234	0	139	130
N.S.	1	1.00	2.53	0.87	1.38	1.73	0.00	1.03	0.96
time (sec)	N/A	0.417	3.376	1.065	0.249	0.260	0.000	0.326	14.974

Problem 81	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	185	185	455	148	231	250	0	155	160
N.S.	1	1.00	2.46	0.80	1.25	1.35	0.00	0.84	0.86
time (sec)	N/A	0.453	6.781	1.271	0.329	0.261	0.000	0.337	15.503

Problem 82	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	225	225	143	98	224	207	588	145	181
N.S.	1	1.00	0.64	0.44	1.00	0.92	2.61	0.64	0.80
time (sec)	N/A	0.543	8.033	0.997	0.339	0.257	19.695	0.346	15.425

Problem 83	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	191	191	149	88	178	198	320	129	159
N.S.	1	1.00	0.78	0.46	0.93	1.04	1.68	0.68	0.83
time (sec)	N/A	0.539	7.982	0.743	0.324	0.268	11.539	0.432	15.056

Problem 84	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	168	168	127	77	132	188	116	100	125
N.S.	1	1.00	0.76	0.46	0.79	1.12	0.69	0.60	0.74
time (sec)	N/A	0.449	7.118	0.713	0.309	0.258	7.073	0.420	14.852

Problem 85	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	155	155	66	71	107	123	107	72	127
N.S.	1	1.00	0.43	0.46	0.69	0.79	0.69	0.46	0.82
time (sec)	N/A	0.339	2.737	0.738	0.222	0.247	5.436	0.425	14.121

Problem 86	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	147	147	66	57	87	123	87	59	58
N.S.	1	1.00	0.45	0.39	0.59	0.84	0.59	0.40	0.39
time (sec)	N/A	0.239	2.694	0.843	0.221	0.300	4.125	0.434	14.414

Problem 87	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	139	139	66	45	67	123	68	46	45
N.S.	1	1.00	0.47	0.32	0.48	0.88	0.49	0.33	0.32
time (sec)	N/A	0.165	2.261	0.818	0.261	0.250	3.418	0.358	14.012

Problem 88	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	143	143	66	57	87	123	85	59	58
N.S.	1	1.00	0.46	0.40	0.61	0.86	0.59	0.41	0.41
time (sec)	N/A	0.126	0.224	0.767	0.263	0.253	3.037	0.438	14.056

Problem 89	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	143	143	89	69	107	123	102	72	127
N.S.	1	1.00	0.62	0.48	0.75	0.86	0.71	0.50	0.89
time (sec)	N/A	0.113	0.117	0.780	0.213	0.247	2.758	0.388	14.571

Problem 90	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	153	153	211	101	159	246	0	126	99
N.S.	1	1.00	1.38	0.66	1.04	1.61	0.00	0.82	0.65
time (sec)	N/A	0.451	1.622	1.112	0.246	0.269	0.000	0.437	14.541

Problem 91	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	168	168	393	131	206	278	0	155	149
N.S.	1	1.00	2.34	0.78	1.23	1.65	0.00	0.92	0.89
time (sec)	N/A	0.663	5.518	1.174	0.302	0.289	0.000	0.443	14.776

Problem 92	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	224	224	507	160	251	294	0	171	179
N.S.	1	1.00	2.26	0.71	1.12	1.31	0.00	0.76	0.80
time (sec)	N/A	0.852	7.091	1.223	0.257	0.266	0.000	0.415	14.231

Problem 93	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	184	184	76	83	127	147	129	85	75
N.S.	1	1.00	0.41	0.45	0.69	0.80	0.70	0.46	0.41
time (sec)	N/A	0.707	5.085	0.742	0.233	0.253	11.966	0.422	15.305

Problem 94	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	176	176	76	84	127	147	124	85	151
N.S.	1	1.00	0.43	0.48	0.72	0.84	0.70	0.48	0.86
time (sec)	N/A	0.422	5.085	0.869	0.227	0.250	9.672	0.414	14.791

Problem 95	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	158	158	92	97	79	72	0	117	0
N.S.	1	1.00	0.58	0.61	0.50	0.46	0.00	0.74	0.00
time (sec)	N/A	0.306	0.202	0.971	0.391	0.243	0.000	0.659	0.000

Problem 96	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	122	122	80	84	65	62	0	96	0
N.S.	1	1.00	0.66	0.69	0.53	0.51	0.00	0.79	0.00
time (sec)	N/A	0.212	0.096	0.797	0.365	0.243	0.000	0.619	0.000

Problem 97	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	86	86	68	71	51	52	0	75	0
N.S.	1	1.00	0.79	0.83	0.59	0.60	0.00	0.87	0.00
time (sec)	N/A	0.138	0.064	0.917	0.439	0.303	0.000	0.484	0.000

Problem 98	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	56	56	54	58	36	40	0	53	0
N.S.	1	1.00	0.96	1.04	0.64	0.71	0.00	0.95	0.00
time (sec)	N/A	0.057	0.046	0.776	0.388	0.261	0.000	0.547	0.000

Problem 99	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	26	26	29	43	20	32	0	30	33
N.S.	1	1.00	1.12	1.65	0.77	1.23	0.00	1.15	1.27
time (sec)	N/A	0.017	0.020	0.942	0.373	0.242	0.000	0.372	14.123

Problem 100	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	A	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	37	37	50	182	0	146	0	58	0
N.S.	1	1.00	1.35	4.92	0.00	3.95	0.00	1.57	0.00
time (sec)	N/A	0.060	0.035	1.415	0.000	0.270	0.000	0.381	0.000

Problem 101	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	B	B	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	62	62	79	383	1170	140	0	104	0
N.S.	1	1.00	1.27	6.18	18.87	2.26	0.00	1.68	0.00
time (sec)	N/A	0.140	0.071	1.221	0.402	0.263	0.000	0.422	0.000

Problem 102	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	B	A	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	102	102	94	551	2642	155	0	131	0
N.S.	1	1.00	0.92	5.40	25.90	1.52	0.00	1.28	0.00
time (sec)	N/A	0.194	0.122	1.560	4.163	0.265	0.000	0.438	0.000

Problem 103	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	B	A	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	138	138	109	717	5115	165	0	154	0
N.S.	1	1.00	0.79	5.20	37.07	1.20	0.00	1.12	0.00
time (sec)	N/A	0.265	0.224	1.779	45.833	0.264	0.000	0.425	0.000

Problem 104	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	162	162	93	99	84	78	0	122	0
N.S.	1	1.00	0.57	0.61	0.52	0.48	0.00	0.75	0.00
time (sec)	N/A	0.291	0.165	0.714	0.388	0.263	0.000	0.681	0.000

Problem 105	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	116	116	81	86	69	67	0	100	0
N.S.	1	1.00	0.70	0.74	0.59	0.58	0.00	0.86	0.00
time (sec)	N/A	0.162	0.106	0.867	0.385	0.254	0.000	0.428	0.000

Problem 106	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	86	86	67	71	53	55	0	77	0
N.S.	1	1.00	0.78	0.83	0.62	0.64	0.00	0.90	0.00
time (sec)	N/A	0.078	0.063	0.970	0.393	0.246	0.000	0.333	0.000

Problem 107	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	59	59	55	58	38	44	0	55	0
N.S.	1	1.00	0.93	0.98	0.64	0.75	0.00	0.93	0.00
time (sec)	N/A	0.032	0.041	0.772	0.408	0.309	0.000	0.308	0.000

Problem 108	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	B	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	66	66	65	209	0	127	0	89	0
N.S.	1	1.00	0.98	3.17	0.00	1.92	0.00	1.35	0.00
time (sec)	N/A	0.131	0.058	1.335	0.000	0.255	0.000	0.312	0.000

Problem 109	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	B	B	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	65	65	81	385	1314	146	0	107	0
N.S.	1	1.00	1.25	5.92	20.22	2.25	0.00	1.65	0.00
time (sec)	N/A	0.141	0.079	1.370	0.413	0.251	0.000	0.329	0.000

Problem 110	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	B	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	106	106	97	551	3216	162	0	134	0
N.S.	1	1.00	0.92	5.20	30.34	1.53	0.00	1.26	0.00
time (sec)	N/A	0.199	0.159	1.557	0.931	0.317	0.000	0.328	0.000

Problem 111	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	B	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	110	718	5542	173	0	158	0
N.S.	1	1.00	0.76	4.99	38.49	1.20	0.00	1.10	0.00
time (sec)	N/A	0.294	0.236	1.901	164.443	0.267	0.000	0.333	0.000

Problem 112	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	203	203	107	112	111	101	0	156	0
N.S.	1	1.00	0.53	0.55	0.55	0.50	0.00	0.77	0.00
time (sec)	N/A	0.432	0.314	5.543	0.356	0.264	0.000	1.757	0.000

Problem 113	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	146	146	95	99	94	88	0	132	0
N.S.	1	1.00	0.65	0.68	0.64	0.60	0.00	0.90	0.00
time (sec)	N/A	0.199	0.192	2.147	0.470	0.308	0.000	0.809	0.000

Problem 114	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	116	116	84	86	77	75	0	108	0
N.S.	1	1.00	0.72	0.74	0.66	0.65	0.00	0.93	0.00
time (sec)	N/A	0.100	0.146	1.163	0.372	0.265	0.000	0.442	0.000

Problem 115	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	89	89	71	73	60	62	0	84	0
N.S.	1	1.00	0.80	0.82	0.67	0.70	0.00	0.94	0.00
time (sec)	N/A	0.054	0.068	0.885	0.342	0.257	0.000	0.356	0.000

Problem 116	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	98	98	89	246	0	147	0	120	0
N.S.	1	1.00	0.91	2.51	0.00	1.50	0.00	1.22	0.00
time (sec)	N/A	0.242	0.279	1.973	0.000	0.276	0.000	0.386	0.000

Problem 117	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	B	A	F(-1)	A	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	92	92	217	432	10847	164	0	135	0
N.S.	1	1.00	2.36	4.70	117.90	1.78	0.00	1.47	0.00
time (sec)	N/A	0.243	5.580	6.561	0.673	0.270	0.000	0.375	0.000

Problem 118	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	B	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	106	106	267	551	3667	170	0	140	0
N.S.	1	1.00	2.52	5.20	34.59	1.60	0.00	1.32	0.00
time (sec)	N/A	0.283	6.367	27.530	3.255	0.280	0.000	0.526	0.000

Problem 119	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	B	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	284	717	6703	183	0	166	0
N.S.	1	1.00	1.97	4.98	46.55	1.27	0.00	1.15	0.00
time (sec)	N/A	0.419	6.465	96.056	44.297	0.270	0.000	0.416	0.000

Problem 120	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F(-1)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	182	182	388	882	0	196	0	192	0
N.S.	1	1.00	2.13	4.85	0.00	1.08	0.00	1.05	0.00
time (sec)	N/A	0.581	6.688	299.260	0.000	0.266	0.000	0.422	0.000

Problem 121	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	119	119	83	86	77	75	0	108	0
N.S.	1	1.00	0.70	0.72	0.65	0.63	0.00	0.91	0.00
time (sec)	N/A	0.117	0.161	0.983	0.371	0.250	0.000	0.443	0.000

Problem 122	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	174	174	112	194	696204	153	0	141	0
N.S.	1	1.00	0.64	1.11	4001.17	0.88	0.00	0.81	0.00
time (sec)	N/A	0.649	0.228	1.163	17.570	0.293	0.000	0.577	0.000

Problem 123	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	140	140	101	183	908518	143	0	139	0
N.S.	1	1.00	0.72	1.31	6489.41	1.02	0.00	0.99	0.00
time (sec)	N/A	0.461	0.170	1.293	17.657	0.257	0.000	0.415	0.000

Problem 124	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	104	104	84	132	19437	131	0	103	97
N.S.	1	1.00	0.81	1.27	186.89	1.26	0.00	0.99	0.93
time (sec)	N/A	0.158	0.095	1.414	0.662	0.265	0.000	0.360	14.229

Problem 125	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	73	73	53	120	18948	122	0	100	60
N.S.	1	1.00	0.73	1.64	259.56	1.67	0.00	1.37	0.82
time (sec)	N/A	0.069	0.032	1.223	0.575	0.312	0.000	0.341	0.128

Problem 126	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	B	A	F	B	B
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	46	46	40	56	90	126	0	93	45
N.S.	1	1.00	0.87	1.22	1.96	2.74	0.00	2.02	0.98
time (sec)	N/A	0.028	0.008	0.441	0.352	0.262	0.000	0.298	14.131

Problem 127	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	B	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	85	85	65	226	0	164	0	121	0
N.S.	1	1.00	0.76	2.66	0.00	1.93	0.00	1.42	0.00
time (sec)	N/A	0.158	0.040	1.639	0.000	0.271	0.000	0.343	0.000

Problem 128	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	B	B	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	108	108	192	466	18435	236	0	0	0
N.S.	1	1.00	1.78	4.31	170.69	2.19	0.00	0.00	0.00
time (sec)	N/A	0.277	0.855	1.746	0.548	0.267	0.000	0.000	0.000

Problem 129	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F(-1)	B	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	147	147	360	677	0	251	0	0	0
N.S.	1	1.00	2.45	4.61	0.00	1.71	0.00	0.00	0.00
time (sec)	N/A	0.460	1.261	1.802	0.000	0.278	0.000	0.000	0.000

Problem 130	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F(-1)	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	181	181	385	883	0	263	0	0	0
N.S.	1	1.00	2.13	4.88	0.00	1.45	0.00	0.00	0.00
time (sec)	N/A	0.629	1.416	2.039	0.000	0.281	0.000	0.000	0.000

Problem 131	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	183	118	265	0	184	0	167	0
N.S.	1	1.00	0.64	1.45	0.00	1.01	0.00	0.91	0.00
time (sec)	N/A	0.489	0.264	1.159	0.000	0.268	0.000	1.139	0.000

Problem 132	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	145	145	110	234	0	174	0	101	0
N.S.	1	1.00	0.76	1.61	0.00	1.20	0.00	0.70	0.00
time (sec)	N/A	0.334	0.193	1.264	0.000	0.261	0.000	0.689	0.000

Problem 133	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	A	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	105	105	100	173	0	164	0	145	0
N.S.	1	1.00	0.95	1.65	0.00	1.56	0.00	1.38	0.00
time (sec)	N/A	0.176	0.133	1.561	0.000	0.255	0.000	0.464	0.000

Problem 134	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	B	B	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	77	77	54	140	46532	154	0	116	0
N.S.	1	1.00	0.70	1.82	604.31	2.00	0.00	1.51	0.00
time (sec)	N/A	0.067	0.077	1.283	2.590	0.250	0.000	0.375	0.000

Problem 135	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	B	B	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	77	77	63	138	15721	153	0	112	0
N.S.	1	1.00	0.82	1.79	204.17	1.99	0.00	1.45	0.00
time (sec)	N/A	0.045	0.048	1.105	1.142	0.254	0.000	0.307	0.000

Problem 136	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	B	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	114	114	227	290	0	254	0	137	0
N.S.	1	1.00	1.99	2.54	0.00	2.23	0.00	1.20	0.00
time (sec)	N/A	0.274	1.266	1.948	0.000	0.265	0.000	0.359	0.000

Problem 137	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	B	B	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	103	567	139280	286	0	0	0
N.S.	1	1.00	0.72	3.94	967.22	1.99	0.00	0.00	0.00
time (sec)	N/A	0.445	0.338	1.684	5.926	0.308	0.000	0.000	0.000

Problem 138	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F(-2)	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	185	185	841	807	0	302	0	0	0
N.S.	1	1.00	4.55	4.36	0.00	1.63	0.00	0.00	0.00
time (sec)	N/A	0.594	6.928	1.809	0.000	0.281	0.000	0.000	0.000

Problem 139	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	183	123	242	0	208	0	122	0
N.S.	1	1.00	0.67	1.32	0.00	1.14	0.00	0.67	0.00
time (sec)	N/A	0.477	0.422	1.425	0.000	0.268	0.000	3.304	0.000

Problem 140	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	145	145	113	208	0	198	0	161	0
N.S.	1	1.00	0.78	1.43	0.00	1.37	0.00	1.11	0.00
time (sec)	N/A	0.319	0.306	1.398	0.000	0.256	0.000	2.120	0.000

Problem 141	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	B	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	107	107	104	174	0	188	0	138	0
N.S.	1	1.00	0.97	1.63	0.00	1.76	0.00	1.29	0.00
time (sec)	N/A	0.167	0.269	1.276	0.000	0.263	0.000	1.090	0.000

Problem 142	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	B	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	107	107	65	174	0	188	0	69	0
N.S.	1	1.00	0.61	1.63	0.00	1.76	0.00	0.64	0.00
time (sec)	N/A	0.097	0.170	1.289	0.000	0.262	0.000	0.643	0.000

Problem 143	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	B	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	107	107	65	174	84332	188	0	129	0
N.S.	1	1.00	0.61	1.63	788.15	1.76	0.00	1.21	0.00
time (sec)	N/A	0.074	0.106	1.308	14.940	0.259	0.000	0.340	0.000

Problem 144	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	B	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	279	325	0	298	0	0	0
N.S.	1	1.00	1.94	2.26	0.00	2.07	0.00	0.00	0.00
time (sec)	N/A	0.409	4.764	1.749	0.000	0.276	0.000	0.000	0.000

Problem 145	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F(-1)	B	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	174	174	731	601	0	330	0	0	0
N.S.	1	1.00	4.20	3.45	0.00	1.90	0.00	0.00	0.00
time (sec)	N/A	0.624	6.972	1.693	0.000	0.271	0.000	0.000	0.000

Problem 146	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	B
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	111	111	241	270	0	148	0	0	87
N.S.	1	1.00	2.17	2.43	0.00	1.33	0.00	0.00	0.78
time (sec)	N/A	0.087	4.640	8.852	0.000	0.093	0.000	0.000	15.493

Problem 147	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	B
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	87	87	232	219	0	137	0	0	80
N.S.	1	1.00	2.67	2.52	0.00	1.57	0.00	0.00	0.92
time (sec)	N/A	0.068	3.560	6.664	0.000	0.091	0.000	0.000	0.167

Problem 148	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F	F	B
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	61	61	222	225	0	125	0	0	53
N.S.	1	1.00	3.64	3.69	0.00	2.05	0.00	0.00	0.87
time (sec)	N/A	0.062	3.194	5.078	0.000	0.089	0.000	0.000	0.134

Problem 149	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	35	35	155	150	0	107	0	0	27
N.S.	1	1.00	4.43	4.29	0.00	3.06	0.00	0.00	0.77
time (sec)	N/A	0.048	1.333	2.605	0.000	0.084	0.000	0.000	14.942

Problem 150	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	B
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	57	57	209	148	0	156	0	0	60
N.S.	1	1.00	3.67	2.60	0.00	2.74	0.00	0.00	1.05
time (sec)	N/A	0.059	3.235	3.096	0.000	0.087	0.000	0.000	15.552

Problem 151	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	B
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	83	83	247	368	0	175	0	0	87
N.S.	1	1.00	2.98	4.43	0.00	2.11	0.00	0.00	1.05
time (sec)	N/A	0.070	4.506	4.266	0.000	0.093	0.000	0.000	15.316

Problem 152	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	B
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	111	111	477	384	0	188	0	0	87
N.S.	1	1.00	4.30	3.46	0.00	1.69	0.00	0.00	0.78
time (sec)	N/A	0.088	6.318	6.212	0.000	0.094	0.000	0.000	15.449

Problem 153	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	147	147	255	260	0	175	0	0	136
N.S.	1	1.00	1.73	1.77	0.00	1.19	0.00	0.00	0.93
time (sec)	N/A	0.170	5.277	12.147	0.000	0.100	0.000	0.000	15.070

Problem 154	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	121	245	272	0	162	0	0	129
N.S.	1	1.00	2.02	2.25	0.00	1.34	0.00	0.00	1.07
time (sec)	N/A	0.149	4.736	9.442	0.000	0.094	0.000	0.000	14.544

Problem 155	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	B
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	95	95	235	250	0	149	0	0	104
N.S.	1	1.00	2.47	2.63	0.00	1.57	0.00	0.00	1.09
time (sec)	N/A	0.128	3.865	7.076	0.000	0.092	0.000	0.000	14.623

Problem 156	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F	F	B
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	67	67	224	228	0	134	0	0	59
N.S.	1	1.00	3.34	3.40	0.00	2.00	0.00	0.00	0.88
time (sec)	N/A	0.100	3.856	3.940	0.000	0.089	0.000	0.000	14.886

Problem 157	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	44	44	112	185	0	97	0	0	82
N.S.	1	1.00	2.55	4.20	0.00	2.20	0.00	0.00	1.86
time (sec)	N/A	0.106	0.264	4.041	0.000	0.084	0.000	0.000	14.903

Problem 158	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	91	91	111	371	0	187	0	0	109
N.S.	1	1.00	1.22	4.08	0.00	2.05	0.00	0.00	1.20
time (sec)	N/A	0.118	0.218	4.827	0.000	0.092	0.000	0.000	14.961

Problem 159	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	121	114	386	0	202	0	0	114
N.S.	1	1.00	0.94	3.19	0.00	1.67	0.00	0.00	0.94
time (sec)	N/A	0.150	0.282	7.274	0.000	0.094	0.000	0.000	15.266

Problem 160	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	147	147	255	260	0	175	0	0	206
N.S.	1	1.00	1.73	1.77	0.00	1.19	0.00	0.00	1.40
time (sec)	N/A	0.190	6.712	12.954	0.000	0.100	0.000	0.000	15.005

Problem 161	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	B
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	121	121	245	272	0	162	0	0	143
N.S.	1	1.00	2.02	2.25	0.00	1.34	0.00	0.00	1.18
time (sec)	N/A	0.186	5.460	10.527	0.000	0.099	0.000	0.000	14.746

Problem 162	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	B
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	91	91	233	250	0	148	0	0	104
N.S.	1	1.00	2.56	2.75	0.00	1.63	0.00	0.00	1.14
time (sec)	N/A	0.136	5.014	5.943	0.000	0.096	0.000	0.000	13.916

Problem 163	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	91	91	146	172	0	180	0	0	104
N.S.	1	1.00	1.60	1.89	0.00	1.98	0.00	0.00	1.14
time (sec)	N/A	0.134	0.401	5.967	0.000	0.092	0.000	0.000	14.643

Problem 164	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	91	91	139	371	0	187	0	0	126
N.S.	1	1.00	1.53	4.08	0.00	2.05	0.00	0.00	1.38
time (sec)	N/A	0.128	0.323	6.454	0.000	0.097	0.000	0.000	14.487

Problem 165	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	117	117	138	386	0	200	0	0	154
N.S.	1	1.00	1.18	3.30	0.00	1.71	0.00	0.00	1.32
time (sec)	N/A	0.153	0.437	7.484	0.000	0.093	0.000	0.000	15.240

Problem 166	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	147	147	140	439	0	215	0	0	145
N.S.	1	1.00	0.95	2.99	0.00	1.46	0.00	0.00	0.99
time (sec)	N/A	0.198	0.644	10.407	0.000	0.117	0.000	0.000	15.566

Problem 167	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	B
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	173	173	271	273	0	188	0	0	221
N.S.	1	1.00	1.57	1.58	0.00	1.09	0.00	0.00	1.28
time (sec)	N/A	0.251	3.087	15.950	0.000	0.102	0.000	0.000	15.027

Problem 168	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	147	147	255	260	0	175	0	0	223
N.S.	1	1.00	1.73	1.77	0.00	1.19	0.00	0.00	1.52
time (sec)	N/A	0.204	5.935	12.700	0.000	0.113	0.000	0.000	15.160

Problem 169	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	B
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	121	121	245	272	0	162	0	0	146
N.S.	1	1.00	2.02	2.25	0.00	1.34	0.00	0.00	1.21
time (sec)	N/A	0.180	5.784	9.147	0.000	0.094	0.000	0.000	15.011

Problem 170	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	119	119	157	194	0	194	0	0	149
N.S.	1	1.00	1.32	1.63	0.00	1.63	0.00	0.00	1.25
time (sec)	N/A	0.156	0.936	8.785	0.000	0.106	0.000	0.000	15.017

Problem 171	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	98	98	186	292	0	125	0	0	145
N.S.	1	1.00	1.90	2.98	0.00	1.28	0.00	0.00	1.48
time (sec)	N/A	0.159	0.688	8.245	0.000	0.092	0.000	0.000	15.024

Problem 172	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	121	169	386	0	202	0	0	202
N.S.	1	1.00	1.40	3.19	0.00	1.67	0.00	0.00	1.67
time (sec)	N/A	0.173	0.663	8.786	0.000	0.101	0.000	0.000	15.642

Problem 173	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	147	147	171	439	0	215	0	0	199
N.S.	1	1.00	1.16	2.99	0.00	1.46	0.00	0.00	1.35
time (sec)	N/A	0.206	1.042	10.460	0.000	0.093	0.000	0.000	15.673

Problem 174	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	128	128	315	229	0	208	0	0	0
N.S.	1	1.00	2.46	1.79	0.00	1.62	0.00	0.00	0.00
time (sec)	N/A	0.130	1.859	5.279	0.000	0.100	0.000	0.000	0.000

Problem 175	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	100	100	289	215	0	198	0	0	0
N.S.	1	1.00	2.89	2.15	0.00	1.98	0.00	0.00	0.00
time (sec)	N/A	0.121	1.346	4.191	0.000	0.099	0.000	0.000	0.000

Problem 176	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	72	72	264	199	0	186	0	0	0
N.S.	1	1.00	3.67	2.76	0.00	2.58	0.00	0.00	0.00
time (sec)	N/A	0.101	2.196	3.261	0.000	0.104	0.000	0.000	0.000

Problem 177	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	70	70	256	198	0	184	0	0	0
N.S.	1	1.00	3.66	2.83	0.00	2.63	0.00	0.00	0.00
time (sec)	N/A	0.098	1.000	2.405	0.000	0.093	0.000	0.000	0.000

Problem 178	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	70	70	257	200	0	184	0	0	0
N.S.	1	1.00	3.67	2.86	0.00	2.63	0.00	0.00	0.00
time (sec)	N/A	0.103	1.070	1.704	0.000	0.086	0.000	0.000	0.000

Problem 179	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	96	96	297	253	0	236	0	0	0
N.S.	1	1.00	3.09	2.64	0.00	2.46	0.00	0.00	0.00
time (sec)	N/A	0.126	1.791	2.536	0.000	0.099	0.000	0.000	0.000

Problem 180	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	124	124	332	413	0	258	0	0	0
N.S.	1	1.00	2.68	3.33	0.00	2.08	0.00	0.00	0.00
time (sec)	N/A	0.130	2.910	3.731	0.000	0.095	0.000	0.000	0.000

Problem 181	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	160	160	148	283	0	288	0	0	0
N.S.	1	1.00	0.92	1.77	0.00	1.80	0.00	0.00	0.00
time (sec)	N/A	0.263	0.944	6.383	0.000	0.101	0.000	0.000	0.000

Problem 182	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	138	138	136	270	0	278	0	0	0
N.S.	1	1.00	0.99	1.96	0.00	2.01	0.00	0.00	0.00
time (sec)	N/A	0.251	0.614	6.199	0.000	0.101	0.000	0.000	0.000

Problem 183	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	112	112	128	257	0	268	0	0	0
N.S.	1	1.00	1.14	2.29	0.00	2.39	0.00	0.00	0.00
time (sec)	N/A	0.221	0.496	5.039	0.000	0.096	0.000	0.000	0.000

Problem 184	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	109	109	114	257	0	268	0	0	0
N.S.	1	1.00	1.05	2.36	0.00	2.46	0.00	0.00	0.00
time (sec)	N/A	0.209	0.384	3.260	0.000	0.101	0.000	0.000	0.000

Problem 185	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	57	71	188	0	150	0	0	0
N.S.	1	1.00	1.25	3.30	0.00	2.63	0.00	0.00	0.00
time (sec)	N/A	0.062	0.278	2.901	0.000	0.102	0.000	0.000	0.000

Problem 186	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	109	109	304	257	0	268	0	0	0
N.S.	1	1.00	2.79	2.36	0.00	2.46	0.00	0.00	0.00
time (sec)	N/A	0.206	2.415	1.870	0.000	0.113	0.000	0.000	0.000

Problem 187	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	136	136	334	405	0	318	0	0	0
N.S.	1	1.00	2.46	2.98	0.00	2.34	0.00	0.00	0.00
time (sec)	N/A	0.231	2.370	3.289	0.000	0.098	0.000	0.000	0.000

Problem 188	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	162	162	364	413	0	338	0	0	0
N.S.	1	1.00	2.25	2.55	0.00	2.09	0.00	0.00	0.00
time (sec)	N/A	0.255	4.964	4.549	0.000	0.105	0.000	0.000	0.000

Problem 189	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	207	207	175	296	0	364	0	0	0
N.S.	1	1.00	0.85	1.43	0.00	1.76	0.00	0.00	0.00
time (sec)	N/A	0.378	2.101	11.214	0.000	0.114	0.000	0.000	0.000

Problem 190	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	181	181	166	283	0	354	0	0	0
N.S.	1	1.00	0.92	1.56	0.00	1.96	0.00	0.00	0.00
time (sec)	N/A	0.376	1.338	10.449	0.000	0.108	0.000	0.000	0.000

Problem 191	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	155	155	157	270	0	344	0	0	0
N.S.	1	1.00	1.01	1.74	0.00	2.22	0.00	0.00	0.00
time (sec)	N/A	0.336	1.290	10.244	0.000	0.107	0.000	0.000	0.000

Problem 192	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	155	155	146	270	0	344	0	0	0
N.S.	1	1.00	0.94	1.74	0.00	2.22	0.00	0.00	0.00
time (sec)	N/A	0.346	1.021	9.678	0.000	0.097	0.000	0.000	0.000

Problem 193	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	155	155	146	270	0	344	0	0	0
N.S.	1	1.00	0.94	1.74	0.00	2.22	0.00	0.00	0.00
time (sec)	N/A	0.328	1.081	4.295	0.000	0.106	0.000	0.000	0.000

Problem 194	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	155	155	139	270	0	344	0	0	0
N.S.	1	1.00	0.90	1.74	0.00	2.22	0.00	0.00	0.00
time (sec)	N/A	0.356	2.240	4.188	0.000	0.093	0.000	0.000	0.000

Problem 195	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	155	155	304	268	0	344	0	0	0
N.S.	1	1.00	1.96	1.73	0.00	2.22	0.00	0.00	0.00
time (sec)	N/A	0.465	4.941	2.309	0.000	0.095	0.000	0.000	0.000

Problem 196	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F(-2)	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	181	181	364	555	0	394	0	0	0
N.S.	1	1.00	2.01	3.07	0.00	2.18	0.00	0.00	0.00
time (sec)	N/A	0.511	2.442	4.149	0.000	0.100	0.000	0.000	0.000

Problem 197	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	207	207	394	453	0	414	0	0	0
N.S.	1	1.00	1.90	2.19	0.00	2.00	0.00	0.00	0.00
time (sec)	N/A	0.649	2.834	5.208	0.000	0.107	0.000	0.000	0.000

Problem 198	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	154	154	105	180	1921	108	0	0	0
N.S.	1	1.00	0.68	1.17	12.47	0.70	0.00	0.00	0.00
time (sec)	N/A	0.287	0.230	11.510	0.581	0.265	0.000	0.000	0.000

Problem 199	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	116	116	91	145	1059	98	0	0	0
N.S.	1	1.00	0.78	1.25	9.13	0.84	0.00	0.00	0.00
time (sec)	N/A	0.216	0.137	11.604	0.465	0.263	0.000	0.000	0.000

Problem 200	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	72	72	77	108	791	88	0	0	0
N.S.	1	1.00	1.07	1.50	10.99	1.22	0.00	0.00	0.00
time (sec)	N/A	0.145	0.063	11.620	0.436	0.264	0.000	0.000	0.000

Problem 201	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	B	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	37	37	50	72	146	119	0	0	0
N.S.	1	1.00	1.35	1.95	3.95	3.22	0.00	0.00	0.00
time (sec)	N/A	0.076	0.034	4.028	0.409	0.287	0.000	0.000	0.000

Problem 202	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	36	36	39	42	98	49	0	58	41
N.S.	1	1.00	1.08	1.17	2.72	1.36	0.00	1.61	1.14
time (sec)	N/A	0.069	0.034	5.368	0.359	0.255	0.000	0.352	14.471

Problem 203	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	77	77	51	52	190	61	0	87	82
N.S.	1	1.00	0.66	0.68	2.47	0.79	0.00	1.13	1.06
time (sec)	N/A	0.137	0.060	4.066	0.369	0.259	0.000	0.475	14.767

Problem 204	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	115	115	61	62	237	71	0	116	132
N.S.	1	1.00	0.53	0.54	2.06	0.62	0.00	1.01	1.15
time (sec)	N/A	0.211	0.080	5.248	0.336	0.272	0.000	0.449	16.181

Problem 205	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	153	153	71	72	283	81	0	143	415
N.S.	1	1.00	0.46	0.47	1.85	0.53	0.00	0.93	2.71
time (sec)	N/A	0.274	0.118	4.549	0.366	0.246	0.000	0.548	19.816

Problem 206	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	160	160	106	181	1942	114	0	0	0
N.S.	1	1.00	0.66	1.13	12.14	0.71	0.00	0.00	0.00
time (sec)	N/A	0.306	0.245	11.908	0.594	0.267	0.000	0.000	0.000

Problem 207	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	120	120	92	146	1080	103	0	0	0
N.S.	1	1.00	0.77	1.22	9.00	0.86	0.00	0.00	0.00
time (sec)	N/A	0.245	0.147	11.744	0.470	0.265	0.000	0.000	0.000

Problem 208	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	B	A	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	75	75	79	152	803	90	0	0	0
N.S.	1	1.00	1.05	2.03	10.71	1.20	0.00	0.00	0.00
time (sec)	N/A	0.162	0.069	13.854	0.450	0.270	0.000	0.000	0.000

Problem 209	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	B	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	76	76	85	144	997	109	0	0	0
N.S.	1	1.00	1.12	1.89	13.12	1.43	0.00	0.00	0.00
time (sec)	N/A	0.163	0.102	5.444	0.468	0.291	0.000	0.000	0.000

Problem 210	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	F(-1)	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	81	81	52	53	125	62	0	0	89
N.S.	1	1.00	0.64	0.65	1.54	0.77	0.00	0.00	1.10
time (sec)	N/A	0.153	0.072	5.233	0.354	0.256	0.000	0.000	15.377

Problem 211	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	121	62	63	217	73	0	0	133
N.S.	1	1.00	0.51	0.52	1.79	0.60	0.00	0.00	1.10
time (sec)	N/A	0.238	0.097	4.949	0.354	0.265	0.000	0.000	16.402

Problem 212	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	C	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	161	161	72	73	263	86	0	87931	157
N.S.	1	1.00	0.45	0.45	1.63	0.53	0.00	546.16	0.98
time (sec)	N/A	0.344	0.146	5.291	0.331	0.262	0.000	233.170	19.641

Problem 213	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	200	200	182	218	7450	137	0	0	0
N.S.	1	1.00	0.91	1.09	37.25	0.68	0.00	0.00	0.00
time (sec)	N/A	0.548	2.992	12.294	0.758	0.271	0.000	0.000	0.000

Problem 214	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	160	160	182	183	1964	124	0	0	0
N.S.	1	1.00	1.14	1.14	12.28	0.78	0.00	0.00	0.00
time (sec)	N/A	0.475	2.869	12.504	0.561	0.302	0.000	0.000	0.000

Problem 215	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	B	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	120	120	182	172	1106	111	0	0	0
N.S.	1	1.00	1.52	1.43	9.22	0.92	0.00	0.00	0.00
time (sec)	N/A	0.354	2.802	13.842	0.471	0.277	0.000	0.000	0.000

Problem 216	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	B	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	114	114	182	162	973	127	0	0	0
N.S.	1	1.00	1.60	1.42	8.54	1.11	0.00	0.00	0.00
time (sec)	N/A	0.292	2.779	13.943	0.500	0.282	0.000	0.000	0.000

Problem 217	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	B	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	118	118	356	170	1395	131	0	0	0
N.S.	1	1.00	3.02	1.44	11.82	1.11	0.00	0.00	0.00
time (sec)	N/A	0.276	8.943	5.563	0.480	0.280	0.000	0.000	0.000

Problem 218	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	121	64	65	151	81	0	0	135
N.S.	1	1.00	0.53	0.54	1.25	0.67	0.00	0.00	1.12
time (sec)	N/A	0.306	0.140	5.093	0.335	0.272	0.000	0.000	16.351

Problem 219	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	C	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	161	161	74	75	243	94	0	98101	163
N.S.	1	1.00	0.46	0.47	1.51	0.58	0.00	609.32	1.01
time (sec)	N/A	0.367	5.183	5.492	0.336	0.291	0.000	237.097	18.395

Problem 220	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	201	201	84	85	289	107	0	0	279
N.S.	1	1.00	0.42	0.42	1.44	0.53	0.00	0.00	1.39
time (sec)	N/A	0.430	5.206	5.270	0.357	0.267	0.000	0.000	21.049

Problem 221	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	B	A	F	F(-1)	B
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	38	38	51	0	121	50	0	0	42
N.S.	1	1.00	1.34	0.00	3.18	1.32	0.00	0.00	1.11
time (sec)	N/A	0.077	0.067	0.000	0.329	0.271	0.000	0.000	0.627

Problem 222	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	B	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	37	37	50	72	146	119	0	0	0
N.S.	1	1.00	1.35	1.95	3.95	3.22	0.00	0.00	0.00
time (sec)	N/A	0.074	0.050	4.896	0.388	0.275	0.000	0.000	0.000

Problem 223	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	B	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	38	38	55	83	420	164	0	83	0
N.S.	1	1.00	1.45	2.18	11.05	4.32	0.00	2.18	0.00
time (sec)	N/A	0.088	0.124	3.370	0.410	0.291	0.000	0.501	0.000

Problem 224	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	171	171	151	178	0	155	0	0	0
N.S.	1	1.00	0.88	1.04	0.00	0.91	0.00	0.00	0.00
time (sec)	N/A	0.522	0.201	12.770	0.000	0.354	0.000	0.000	0.000

Problem 225	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	128	128	122	141	0	143	0	0	0
N.S.	1	1.00	0.95	1.10	0.00	1.12	0.00	0.00	0.00
time (sec)	N/A	0.339	0.119	12.043	0.000	0.330	0.000	0.000	0.000

Problem 226	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	C	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	95	95	89	108	698	89	0	0	0
N.S.	1	1.00	0.94	1.14	7.35	0.94	0.00	0.00	0.00
time (sec)	N/A	0.204	0.071	3.732	0.700	0.287	0.000	0.000	0.000

Problem 227	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	C	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	56	56	51	67	522	159	0	0	0
N.S.	1	1.00	0.91	1.20	9.32	2.84	0.00	0.00	0.00
time (sec)	N/A	0.077	0.036	4.497	0.706	0.287	0.000	0.000	0.000

Problem 228	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	C	A	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	93	93	180	130	665	132	0	0	0
N.S.	1	1.00	1.94	1.40	7.15	1.42	0.00	0.00	0.00
time (sec)	N/A	0.153	1.552	5.281	0.652	0.274	0.000	0.000	0.000

Problem 229	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	C	A	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	131	131	473	158	818	145	0	0	0
N.S.	1	1.00	3.61	1.21	6.24	1.11	0.00	0.00	0.00
time (sec)	N/A	0.303	7.163	5.850	0.650	0.274	0.000	0.000	0.000

Problem 230	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	C	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	169	169	1540	180	1006	157	0	0	0
N.S.	1	1.00	9.11	1.07	5.95	0.93	0.00	0.00	0.00
time (sec)	N/A	0.456	8.592	5.849	0.654	0.287	0.000	0.000	0.000

Problem 231	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	126	126	135	169	0	135	0	0	0
N.S.	1	1.00	1.07	1.34	0.00	1.07	0.00	0.00	0.00
time (sec)	N/A	0.327	0.169	12.564	0.000	0.276	0.000	0.000	0.000

Problem 232	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F	F(-1)	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	85	85	106	133	0	125	0	0	0
N.S.	1	1.00	1.25	1.56	0.00	1.47	0.00	0.00	0.00
time (sec)	N/A	0.225	0.120	12.858	0.000	0.286	0.000	0.000	0.000

Problem 233	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	C	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	54	54	101	108	689	70	0	0	0
N.S.	1	1.00	1.87	2.00	12.76	1.30	0.00	0.00	0.00
time (sec)	N/A	0.134	0.101	2.635	0.674	0.280	0.000	0.000	0.000

Problem 234	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	C	B	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	27	27	49	61	505	54	0	0	0
N.S.	1	1.00	1.81	2.26	18.70	2.00	0.00	0.00	0.00
time (sec)	N/A	0.048	0.035	4.221	0.663	0.286	0.000	0.000	0.000

Problem 235	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	C	B	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	62	62	178	132	648	121	0	0	0
N.S.	1	1.00	2.87	2.13	10.45	1.95	0.00	0.00	0.00
time (sec)	N/A	0.104	1.271	4.940	0.584	0.276	0.000	0.000	0.000

Problem 236	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	C	A	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	98	98	471	156	801	134	0	0	0
N.S.	1	1.00	4.81	1.59	8.17	1.37	0.00	0.00	0.00
time (sec)	N/A	0.203	6.446	4.826	0.574	0.313	0.000	0.000	0.000

Problem 237	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	C	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	134	134	1538	174	989	146	0	0	0
N.S.	1	1.00	11.48	1.30	7.38	1.09	0.00	0.00	0.00
time (sec)	N/A	0.286	7.169	5.379	0.586	0.288	0.000	0.000	0.000

Problem 238	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	174	174	212	240	0	192	0	0	0
N.S.	1	1.00	1.22	1.38	0.00	1.10	0.00	0.00	0.00
time (sec)	N/A	0.561	0.305	11.473	0.000	0.365	0.000	0.000	0.000

Problem 239	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	134	134	158	204	0	182	0	0	0
N.S.	1	1.00	1.18	1.52	0.00	1.36	0.00	0.00	0.00
time (sec)	N/A	0.369	0.332	3.315	0.000	0.353	0.000	0.000	0.000

Problem 240	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	97	97	118	131	0	145	0	0	0
N.S.	1	1.00	1.22	1.35	0.00	1.49	0.00	0.00	0.00
time (sec)	N/A	0.166	0.213	3.483	0.000	0.324	0.000	0.000	0.000

Problem 241	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	A	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	97	97	106	181	0	146	0	0	0
N.S.	1	1.00	1.09	1.87	0.00	1.51	0.00	0.00	0.00
time (sec)	N/A	0.166	0.386	4.203	0.000	0.292	0.000	0.000	0.000

Problem 242	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	137	137	247	196	0	171	0	0	0
N.S.	1	1.00	1.80	1.43	0.00	1.25	0.00	0.00	0.00
time (sec)	N/A	0.326	6.605	5.566	0.000	0.286	0.000	0.000	0.000

Problem 243	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	177	177	589	223	0	185	0	0	0
N.S.	1	1.00	3.33	1.26	0.00	1.05	0.00	0.00	0.00
time (sec)	N/A	0.490	8.234	4.680	0.000	0.296	0.000	0.000	0.000

Problem 244	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	214	214	217	344	0	236	0	0	0
N.S.	1	1.00	1.01	1.61	0.00	1.10	0.00	0.00	0.00
time (sec)	N/A	0.721	0.704	12.741	0.000	0.429	0.000	0.000	0.000

Problem 245	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	174	174	191	330	0	226	0	0	0
N.S.	1	1.00	1.10	1.90	0.00	1.30	0.00	0.00	0.00
time (sec)	N/A	0.533	0.535	3.850	0.000	0.433	0.000	0.000	0.000

Problem 246	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	137	137	149	196	0	180	0	0	0
N.S.	1	1.00	1.09	1.43	0.00	1.31	0.00	0.00	0.00
time (sec)	N/A	0.319	0.541	3.629	0.000	0.281	0.000	0.000	0.000

Problem 247	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	137	137	122	195	0	178	0	0	0
N.S.	1	1.00	0.89	1.42	0.00	1.30	0.00	0.00	0.00
time (sec)	N/A	0.310	0.741	3.357	0.000	0.295	0.000	0.000	0.000

Problem 248	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	A	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	137	137	134	229	0	180	0	0	0
N.S.	1	1.00	0.98	1.67	0.00	1.31	0.00	0.00	0.00
time (sec)	N/A	0.322	0.849	5.670	0.000	0.306	0.000	0.000	0.000

Problem 249	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	177	177	506	260	0	205	0	0	0
N.S.	1	1.00	2.86	1.47	0.00	1.16	0.00	0.00	0.00
time (sec)	N/A	0.480	7.206	5.649	0.000	0.279	0.000	0.000	0.000

Problem 250	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	217	217	639	287	0	219	0	0	0
N.S.	1	1.00	2.94	1.32	0.00	1.01	0.00	0.00	0.00
time (sec)	N/A	0.703	9.073	5.452	0.000	0.281	0.000	0.000	0.000

Problem 251	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	254	254	256	448	0	280	0	0	0
N.S.	1	1.00	1.01	1.76	0.00	1.10	0.00	0.00	0.00
time (sec)	N/A	0.949	1.104	12.472	0.000	0.535	0.000	0.000	0.000

Problem 252	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	214	214	230	378	0	270	0	0	0
N.S.	1	1.00	1.07	1.77	0.00	1.26	0.00	0.00	0.00
time (sec)	N/A	0.722	1.009	3.923	0.000	0.444	0.000	0.000	0.000

Problem 253	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	177	177	176	260	0	214	0	0	0
N.S.	1	1.00	0.99	1.47	0.00	1.21	0.00	0.00	0.00
time (sec)	N/A	0.482	1.791	3.605	0.000	0.293	0.000	0.000	0.000

Problem 254	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	177	177	148	260	0	214	0	0	0
N.S.	1	1.00	0.84	1.47	0.00	1.21	0.00	0.00	0.00
time (sec)	N/A	0.497	1.273	3.737	0.000	0.293	0.000	0.000	0.000

Problem 255	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	177	177	149	260	0	214	0	0	0
N.S.	1	1.00	0.84	1.47	0.00	1.21	0.00	0.00	0.00
time (sec)	N/A	0.500	1.819	3.240	0.000	0.283	0.000	0.000	0.000

Problem 256	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	177	177	148	277	0	214	0	0	0
N.S.	1	1.00	0.84	1.56	0.00	1.21	0.00	0.00	0.00
time (sec)	N/A	0.520	1.451	5.661	0.000	0.285	0.000	0.000	0.000

Problem 257	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	217	217	559	324	0	239	0	0	0
N.S.	1	1.00	2.58	1.49	0.00	1.10	0.00	0.00	0.00
time (sec)	N/A	0.707	7.760	5.442	0.000	0.294	0.000	0.000	0.000

Problem 258	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F(-1)	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	257	257	694	351	0	253	0	0	0
N.S.	1	1.00	2.70	1.37	0.00	0.98	0.00	0.00	0.00
time (sec)	N/A	0.894	10.280	5.859	0.000	0.298	0.000	0.000	0.000

Problem 259	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	217	217	190	350	0	248	0	0	0
N.S.	1	1.00	0.88	1.61	0.00	1.14	0.00	0.00	0.00
time (sec)	N/A	0.660	5.541	3.894	0.000	0.289	0.000	0.000	0.000

Problem 260	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	217	217	158	350	0	248	0	0	0
N.S.	1	1.00	0.73	1.61	0.00	1.14	0.00	0.00	0.00
time (sec)	N/A	0.820	1.438	3.502	0.000	0.308	0.000	0.000	0.000

Problem 261	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	C	B	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	16	16	30	34	306	31	0	0	0
N.S.	1	1.00	1.88	2.12	19.12	1.94	0.00	0.00	0.00
time (sec)	N/A	0.063	0.020	1.480	0.505	0.259	0.000	0.000	0.000

Problem 262	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	C	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	41	41	32	40	323	105	0	0	0
N.S.	1	1.00	0.78	0.98	7.88	2.56	0.00	0.00	0.00
time (sec)	N/A	0.117	0.014	1.464	0.566	0.273	0.000	0.000	0.000

Problem 263	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	B	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	129	129	186	152	1063	155	0	0	0
N.S.	1	1.00	1.44	1.18	8.24	1.20	0.00	0.00	0.00
time (sec)	N/A	0.327	0.762	12.560	0.426	0.306	0.000	0.000	0.000

Problem 264	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	B	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	85	85	152	120	795	142	0	0	0
N.S.	1	1.00	1.79	1.41	9.35	1.67	0.00	0.00	0.00
time (sec)	N/A	0.248	0.530	12.954	0.410	0.283	0.000	0.000	0.000

Problem 265	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	B	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	48	48	125	79	148	155	0	122	0
N.S.	1	1.00	2.60	1.65	3.08	3.23	0.00	2.54	0.00
time (sec)	N/A	0.130	0.418	4.548	0.363	0.303	0.000	0.454	0.000

Problem 266	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	37	37	40	40	82	42	0	62	42
N.S.	1	1.00	1.08	1.08	2.22	1.14	0.00	1.68	1.14
time (sec)	N/A	0.102	0.033	5.457	0.300	0.247	0.000	0.400	14.265

Problem 267	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	79	79	52	51	174	52	0	90	85
N.S.	1	1.00	0.66	0.65	2.20	0.66	0.00	1.14	1.08
time (sec)	N/A	0.175	0.330	5.577	0.307	0.252	0.000	0.442	14.732

Problem 268	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	118	118	62	63	221	64	0	120	158
N.S.	1	1.00	0.53	0.53	1.87	0.54	0.00	1.02	1.34
time (sec)	N/A	0.267	0.402	5.448	0.306	0.268	0.000	0.487	15.966

Problem 269	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	B	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	114	114	181	154	1305	124	0	0	0
N.S.	1	1.00	1.59	1.35	11.45	1.09	0.00	0.00	0.00
time (sec)	N/A	0.188	0.286	13.344	0.399	0.281	0.000	0.000	0.000

Problem 270	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	B	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	72	72	155	122	966	111	0	0	0
N.S.	1	1.00	2.15	1.69	13.42	1.54	0.00	0.00	0.00
time (sec)	N/A	0.107	0.334	13.254	0.400	0.299	0.000	0.000	0.000

Problem 271	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	B	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	37	37	124	81	221	64	0	119	0
N.S.	1	1.00	3.35	2.19	5.97	1.73	0.00	3.22	0.00
time (sec)	N/A	0.058	0.174	4.746	0.355	0.261	0.000	0.605	0.000

Problem 272	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	35	35	39	41	75	41	0	59	31
N.S.	1	1.00	1.11	1.17	2.14	1.17	0.00	1.69	0.89
time (sec)	N/A	0.056	0.026	5.497	0.301	0.255	0.000	0.608	14.709

Problem 273	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	75	75	51	53	164	51	0	87	84
N.S.	1	1.00	0.68	0.71	2.19	0.68	0.00	1.16	1.12
time (sec)	N/A	0.111	0.161	4.403	0.303	0.255	0.000	0.631	14.631

Problem 274	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	112	112	61	65	209	63	0	117	156
N.S.	1	1.00	0.54	0.58	1.87	0.56	0.00	1.04	1.39
time (sec)	N/A	0.174	0.188	5.573	0.307	0.260	0.000	0.663	15.422

Problem 275	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F(-1)	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	185	185	256	203	0	226	0	779	0
N.S.	1	1.00	1.38	1.10	0.00	1.22	0.00	4.21	0.00
time (sec)	N/A	0.563	1.112	12.350	0.000	0.272	0.000	6.911	0.000

Problem 276	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	141	141	228	169	0	212	0	581	0
N.S.	1	1.00	1.62	1.20	0.00	1.50	0.00	4.12	0.00
time (sec)	N/A	0.426	0.917	13.858	0.000	0.277	0.000	1.009	0.000

Problem 277	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	107	107	161	116	0	162	0	269	0
N.S.	1	1.00	1.50	1.08	0.00	1.51	0.00	2.51	0.00
time (sec)	N/A	0.331	0.518	2.077	0.000	0.261	0.000	0.670	0.000

Problem 278	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	C	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	58	58	118	80	209	144	0	162	0
N.S.	1	1.00	2.03	1.38	3.60	2.48	0.00	2.79	0.00
time (sec)	N/A	0.135	0.472	5.992	0.428	0.291	0.000	0.567	0.000

Problem 279	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	C	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	95	95	157	85	351	152	0	279	0
N.S.	1	1.00	1.65	0.89	3.69	1.60	0.00	2.94	0.00
time (sec)	N/A	0.240	0.531	5.449	0.405	0.291	0.000	0.696	0.000

Problem 280	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	C	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	135	171	102	504	165	0	235	0
N.S.	1	1.00	1.27	0.76	3.73	1.22	0.00	1.74	0.00
time (sec)	N/A	0.444	0.471	4.721	0.413	0.286	0.000	0.689	0.000

Problem 281	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	C	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	173	173	218	120	692	177	0	265	0
N.S.	1	1.00	1.26	0.69	4.00	1.02	0.00	1.53	0.00
time (sec)	N/A	0.606	0.745	6.346	0.437	0.285	0.000	0.787	0.000

Problem 282	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F(-1)	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	161	161	255	194	0	239	0	747	0
N.S.	1	1.00	1.58	1.20	0.00	1.48	0.00	4.64	0.00
time (sec)	N/A	0.379	0.441	13.829	0.000	0.261	0.000	6.634	0.000

Problem 283	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	B	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	118	118	227	159	0	225	0	560	0
N.S.	1	1.00	1.92	1.35	0.00	1.91	0.00	4.75	0.00
time (sec)	N/A	0.263	0.368	13.240	0.000	0.264	0.000	0.937	0.000

Problem 284	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	B	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	85	85	160	116	0	170	0	266	0
N.S.	1	1.00	1.88	1.36	0.00	2.00	0.00	3.13	0.00
time (sec)	N/A	0.155	0.170	2.118	0.000	0.278	0.000	0.583	0.000

Problem 285	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	C	B	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	47	47	110	84	248	84	0	159	0
N.S.	1	1.00	2.34	1.79	5.28	1.79	0.00	3.38	0.00
time (sec)	N/A	0.060	0.191	5.845	0.382	0.275	0.000	0.484	0.000

Problem 286	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	C	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	83	83	152	85	400	144	0	264	0
N.S.	1	1.00	1.83	1.02	4.82	1.73	0.00	3.18	0.00
time (sec)	N/A	0.109	0.272	5.570	0.384	0.301	0.000	0.559	0.000

Problem 287	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	C	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	122	122	170	100	563	157	0	232	0
N.S.	1	1.00	1.39	0.82	4.61	1.29	0.00	1.90	0.00
time (sec)	N/A	0.228	0.293	4.636	0.405	0.272	0.000	0.537	0.000

Problem 288	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	F	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	78	78	0	0	0	0	0	0	0
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.148	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Problem 289	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	F	F	F	F(-1)	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	79	79	0	0	0	0	0	0	0
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.154	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Problem 290	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	F	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	79	79	0	0	0	0	0	0	0
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.153	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Problem 291	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	151	151	268	384	0	188	0	0	0
N.S.	1	1.00	1.77	2.54	0.00	1.25	0.00	0.00	0.00
time (sec)	N/A	0.139	1.257	9.734	0.000	0.106	0.000	0.000	0.000

Problem 292	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	123	123	255	368	0	167	0	0	0
N.S.	1	1.00	2.07	2.99	0.00	1.36	0.00	0.00	0.00
time (sec)	N/A	0.130	0.864	8.435	0.000	0.092	0.000	0.000	0.000

Problem 293	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	97	97	124	148	0	124	0	0	0
N.S.	1	1.00	1.28	1.53	0.00	1.28	0.00	0.00	0.00
time (sec)	N/A	0.106	0.551	3.839	0.000	0.090	0.000	0.000	0.000

Problem 294	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	75	75	141	150	0	107	0	0	0
N.S.	1	1.00	1.88	2.00	0.00	1.43	0.00	0.00	0.00
time (sec)	N/A	0.098	0.586	3.627	0.000	0.092	0.000	0.000	0.000

Problem 295	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	101	101	140	225	0	125	0	0	0
N.S.	1	1.00	1.39	2.23	0.00	1.24	0.00	0.00	0.00
time (sec)	N/A	0.120	0.926	5.655	0.000	0.098	0.000	0.000	0.000

Problem 296	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	127	127	224	219	0	145	0	0	0
N.S.	1	1.00	1.76	1.72	0.00	1.14	0.00	0.00	0.00
time (sec)	N/A	0.143	0.739	6.652	0.000	0.094	0.000	0.000	0.000

Problem 297	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	151	151	198	270	0	156	0	0	0
N.S.	1	1.00	1.31	1.79	0.00	1.03	0.00	0.00	0.00
time (sec)	N/A	0.163	1.603	9.768	0.000	0.103	0.000	0.000	0.000

Problem 298	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	161	161	261	386	0	202	0	0	0
N.S.	1	1.00	1.62	2.40	0.00	1.25	0.00	0.00	0.00
time (sec)	N/A	0.196	1.472	20.620	0.000	0.098	0.000	0.000	0.000

Problem 299	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	131	131	250	371	0	179	0	0	0
N.S.	1	1.00	1.91	2.83	0.00	1.37	0.00	0.00	0.00
time (sec)	N/A	0.177	1.064	19.145	0.000	0.100	0.000	0.000	0.000

Problem 300	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	64	64	48	185	0	77	0	0	0
N.S.	1	1.00	0.75	2.89	0.00	1.20	0.00	0.00	0.00
time (sec)	N/A	0.135	0.708	5.010	0.000	0.083	0.000	0.000	0.000

Problem 301	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	107	107	127	228	0	134	0	0	0
N.S.	1	1.00	1.19	2.13	0.00	1.25	0.00	0.00	0.00
time (sec)	N/A	0.163	1.190	5.629	0.000	0.088	0.000	0.000	0.000

Problem 302	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	135	136	250	0	157	0	0	0
N.S.	1	1.00	1.01	1.85	0.00	1.16	0.00	0.00	0.00
time (sec)	N/A	0.172	1.465	8.363	0.000	0.093	0.000	0.000	0.000

Problem 303	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	161	161	149	272	0	170	0	0	0
N.S.	1	1.00	0.93	1.69	0.00	1.06	0.00	0.00	0.00
time (sec)	N/A	0.188	1.692	10.485	0.000	0.098	0.000	0.000	0.000

Problem 304	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	187	187	279	439	0	215	0	0	0
N.S.	1	1.00	1.49	2.35	0.00	1.15	0.00	0.00	0.00
time (sec)	N/A	0.289	2.126	64.021	0.000	0.094	0.000	0.000	0.000

Problem 305	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	157	157	259	386	0	200	0	0	0
N.S.	1	1.00	1.65	2.46	0.00	1.27	0.00	0.00	0.00
time (sec)	N/A	0.248	1.494	64.270	0.000	0.092	0.000	0.000	0.000

Problem 306	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	131	131	157	371	0	179	0	0	0
N.S.	1	1.00	1.20	2.83	0.00	1.37	0.00	0.00	0.00
time (sec)	N/A	0.222	1.387	62.794	0.000	0.094	0.000	0.000	0.000

Problem 307	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	131	131	135	172	0	148	0	0	0
N.S.	1	1.00	1.03	1.31	0.00	1.13	0.00	0.00	0.00
time (sec)	N/A	0.222	1.390	7.908	0.000	0.091	0.000	0.000	0.000

Problem 308	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	131	131	137	250	0	156	0	0	0
N.S.	1	1.00	1.05	1.91	0.00	1.19	0.00	0.00	0.00
time (sec)	N/A	0.224	1.306	6.865	0.000	0.092	0.000	0.000	0.000

Problem 309	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	161	161	146	272	0	170	0	0	0
N.S.	1	1.00	0.91	1.69	0.00	1.06	0.00	0.00	0.00
time (sec)	N/A	0.257	2.209	11.248	0.000	0.094	0.000	0.000	0.000

Problem 310	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	187	187	156	260	0	183	0	0	0
N.S.	1	1.00	0.83	1.39	0.00	0.98	0.00	0.00	0.00
time (sec)	N/A	0.299	2.622	12.571	0.000	0.100	0.000	0.000	0.000

Problem 311	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	187	187	271	439	0	215	0	0	0
N.S.	1	1.00	1.45	2.35	0.00	1.15	0.00	0.00	0.00
time (sec)	N/A	0.331	2.668	202.273	0.000	0.100	0.000	0.000	0.000

Problem 312	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	161	161	278	386	0	202	0	0	0
N.S.	1	1.00	1.73	2.40	0.00	1.25	0.00	0.00	0.00
time (sec)	N/A	0.291	3.663	202.294	0.000	0.101	0.000	0.000	0.000

Problem 313	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	118	118	70	292	0	121	0	0	0
N.S.	1	1.00	0.59	2.47	0.00	1.03	0.00	0.00	0.00
time (sec)	N/A	0.268	2.179	202.988	0.000	0.093	0.000	0.000	0.000

Problem 314	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	159	159	150	194	0	162	0	0	0
N.S.	1	1.00	0.94	1.22	0.00	1.02	0.00	0.00	0.00
time (sec)	N/A	0.273	3.027	10.709	0.000	0.099	0.000	0.000	0.000

Problem 315	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	161	161	146	272	0	170	0	0	0
N.S.	1	1.00	0.91	1.69	0.00	1.06	0.00	0.00	0.00
time (sec)	N/A	0.302	3.028	11.147	0.000	0.104	0.000	0.000	0.000

Problem 316	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	187	187	156	260	0	183	0	0	0
N.S.	1	1.00	0.83	1.39	0.00	0.98	0.00	0.00	0.00
time (sec)	N/A	0.326	3.238	16.315	0.000	0.102	0.000	0.000	0.000

Problem 317	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	164	164	285	413	0	248	0	0	0
N.S.	1	1.00	1.74	2.52	0.00	1.51	0.00	0.00	0.00
time (sec)	N/A	0.216	2.515	5.166	0.000	0.095	0.000	0.000	0.000

Problem 318	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	136	136	256	253	0	196	0	0	0
N.S.	1	1.00	1.88	1.86	0.00	1.44	0.00	0.00	0.00
time (sec)	N/A	0.203	1.597	3.144	0.000	0.093	0.000	0.000	0.000

Problem 319	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	110	110	180	200	0	184	0	0	0
N.S.	1	1.00	1.64	1.82	0.00	1.67	0.00	0.00	0.00
time (sec)	N/A	0.186	0.921	2.104	0.000	0.094	0.000	0.000	0.000

Problem 320	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	110	110	181	198	0	184	0	0	0
N.S.	1	1.00	1.65	1.80	0.00	1.67	0.00	0.00	0.00
time (sec)	N/A	0.187	0.912	2.932	0.000	0.094	0.000	0.000	0.000

Problem 321	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	112	112	311	199	0	186	0	0	0
N.S.	1	1.00	2.78	1.78	0.00	1.66	0.00	0.00	0.00
time (sec)	N/A	0.185	1.472	3.441	0.000	0.092	0.000	0.000	0.000

Problem 322	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	140	140	312	215	0	207	0	0	0
N.S.	1	1.00	2.23	1.54	0.00	1.48	0.00	0.00	0.00
time (sec)	N/A	0.203	3.073	4.520	0.000	0.097	0.000	0.000	0.000

Problem 323	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	168	168	341	229	0	217	0	0	0
N.S.	1	1.00	2.03	1.36	0.00	1.29	0.00	0.00	0.00
time (sec)	N/A	0.238	2.221	5.244	0.000	0.108	0.000	0.000	0.000

Problem 324	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	202	202	287	413	0	328	0	0	0
N.S.	1	1.00	1.42	2.04	0.00	1.62	0.00	0.00	0.00
time (sec)	N/A	0.345	2.010	9.834	0.000	0.100	0.000	0.000	0.000

Problem 325	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	176	176	252	405	0	278	0	0	0
N.S.	1	1.00	1.43	2.30	0.00	1.58	0.00	0.00	0.00
time (sec)	N/A	0.318	1.181	3.487	0.000	0.094	0.000	0.000	0.000

Problem 326	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	149	149	242	257	0	277	0	0	0
N.S.	1	1.00	1.62	1.72	0.00	1.86	0.00	0.00	0.00
time (sec)	N/A	0.276	1.084	2.584	0.000	0.098	0.000	0.000	0.000

Problem 327	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	77	77	98	188	0	150	0	0	0
N.S.	1	1.00	1.27	2.44	0.00	1.95	0.00	0.00	0.00
time (sec)	N/A	0.120	0.538	3.280	0.000	0.087	0.000	0.000	0.000

Problem 328	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	149	149	239	257	0	277	0	0	0
N.S.	1	1.00	1.60	1.72	0.00	1.86	0.00	0.00	0.00
time (sec)	N/A	0.285	1.262	3.717	0.000	0.094	0.000	0.000	0.000

Problem 329	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	152	152	259	257	0	277	0	0	0
N.S.	1	1.00	1.70	1.69	0.00	1.82	0.00	0.00	0.00
time (sec)	N/A	0.289	1.661	4.526	0.000	0.100	0.000	0.000	0.000

Problem 330	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	178	178	257	270	0	287	0	0	0
N.S.	1	1.00	1.44	1.52	0.00	1.61	0.00	0.00	0.00
time (sec)	N/A	0.306	1.634	5.271	0.000	0.103	0.000	0.000	0.000

Problem 331	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	200	200	271	283	0	297	0	0	0
N.S.	1	1.00	1.36	1.42	0.00	1.48	0.00	0.00	0.00
time (sec)	N/A	0.329	1.883	5.860	0.000	0.103	0.000	0.000	0.000

Problem 332	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	221	221	363	555	0	354	0	0	0
N.S.	1	1.00	1.64	2.51	0.00	1.60	0.00	0.00	0.00
time (sec)	N/A	0.433	1.853	4.375	0.000	0.105	0.000	0.000	0.000

Problem 333	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	195	195	274	268	0	353	0	0	0
N.S.	1	1.00	1.41	1.37	0.00	1.81	0.00	0.00	0.00
time (sec)	N/A	0.409	1.782	2.813	0.000	0.099	0.000	0.000	0.000

Problem 334	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	195	195	363	270	0	353	0	0	0
N.S.	1	1.00	1.86	1.38	0.00	1.81	0.00	0.00	0.00
time (sec)	N/A	0.405	1.619	4.513	0.000	0.096	0.000	0.000	0.000

Problem 335	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	195	195	363	270	0	353	0	0	0
N.S.	1	1.00	1.86	1.38	0.00	1.81	0.00	0.00	0.00
time (sec)	N/A	0.413	1.737	4.796	0.000	0.104	0.000	0.000	0.000

Problem 336	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	195	195	272	270	0	353	0	0	0
N.S.	1	1.00	1.39	1.38	0.00	1.81	0.00	0.00	0.00
time (sec)	N/A	0.437	2.304	5.168	0.000	0.100	0.000	0.000	0.000

Problem 337	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	195	195	378	270	0	353	0	0	0
N.S.	1	1.00	1.94	1.38	0.00	1.81	0.00	0.00	0.00
time (sec)	N/A	0.437	2.059	5.615	0.000	0.108	0.000	0.000	0.000

Problem 338	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	221	221	285	283	0	363	0	0	0
N.S.	1	1.00	1.29	1.28	0.00	1.64	0.00	0.00	0.00
time (sec)	N/A	0.446	2.353	5.571	0.000	0.120	0.000	0.000	0.000

Problem 339	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	153	153	71	72	283	81	0	143	163
N.S.	1	1.00	0.46	0.47	1.85	0.53	0.00	0.93	1.07
time (sec)	N/A	0.425	0.139	6.550	0.327	0.266	0.000	0.401	18.852

Problem 340	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	115	115	61	62	237	71	0	116	134
N.S.	1	1.00	0.53	0.54	2.06	0.62	0.00	1.01	1.17
time (sec)	N/A	0.425	0.087	6.084	0.314	0.269	0.000	0.397	1.859

Problem 341	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	77	77	51	52	190	59	0	87	84
N.S.	1	1.00	0.66	0.68	2.47	0.77	0.00	1.13	1.09
time (sec)	N/A	0.299	0.068	6.507	0.346	0.269	0.000	0.370	0.825

Problem 342	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	36	36	39	40	98	40	0	58	43
N.S.	1	1.00	1.08	1.11	2.72	1.11	0.00	1.61	1.19
time (sec)	N/A	0.215	0.045	5.780	0.316	0.258	0.000	0.388	0.301

Problem 343	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	57	70	88	146	119	0	0	0
N.S.	1	1.00	1.23	1.54	2.56	2.09	0.00	0.00	0.00
time (sec)	N/A	0.249	0.065	6.852	0.365	0.284	0.000	0.000	0.000

Problem 344	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	92	92	97	108	791	88	0	0	0
N.S.	1	1.00	1.05	1.17	8.60	0.96	0.00	0.00	0.00
time (sec)	N/A	0.236	0.093	14.159	0.407	0.260	0.000	0.000	0.000

Problem 345	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	136	136	111	145	1059	108	0	0	0
N.S.	1	1.00	0.82	1.07	7.79	0.79	0.00	0.00	0.00
time (sec)	N/A	0.302	0.178	14.202	0.433	0.278	0.000	0.000	0.000

Problem 346	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	161	161	72	73	263	86	0	0	221
N.S.	1	1.00	0.45	0.45	1.63	0.53	0.00	0.00	1.37
time (sec)	N/A	0.391	0.177	5.970	0.319	0.270	0.000	0.000	18.006

Problem 347	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	121	62	63	217	73	0	0	135
N.S.	1	1.00	0.51	0.52	1.79	0.60	0.00	0.00	1.12
time (sec)	N/A	0.298	0.117	6.283	0.316	0.285	0.000	0.000	1.695

Problem 348	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	81	81	52	53	125	60	0	0	91
N.S.	1	1.00	0.64	0.65	1.54	0.74	0.00	0.00	1.12
time (sec)	N/A	0.222	0.090	4.945	0.319	0.268	0.000	0.000	0.813

Problem 349	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	96	96	85	150	997	91	0	0	0
N.S.	1	1.00	0.89	1.56	10.39	0.95	0.00	0.00	0.00
time (sec)	N/A	0.231	0.130	6.610	0.434	0.286	0.000	0.000	0.000

Problem 350	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	95	95	99	117	803	90	0	0	0
N.S.	1	1.00	1.04	1.23	8.45	0.95	0.00	0.00	0.00
time (sec)	N/A	0.219	0.107	15.563	0.425	0.268	0.000	0.000	0.000

Problem 351	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	140	140	112	146	1080	112	0	0	0
N.S.	1	1.00	0.80	1.04	7.71	0.80	0.00	0.00	0.00
time (sec)	N/A	0.305	0.205	14.245	0.429	0.267	0.000	0.000	0.000

Problem 352	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	180	180	126	179	1942	123	0	0	0
N.S.	1	1.00	0.70	0.99	10.79	0.68	0.00	0.00	0.00
time (sec)	N/A	0.396	0.353	14.720	0.533	0.272	0.000	0.000	0.000

Problem 353	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	201	201	84	85	289	107	0	0	306
N.S.	1	1.00	0.42	0.42	1.44	0.53	0.00	0.00	1.52
time (sec)	N/A	0.519	5.580	1.563	0.322	0.273	0.000	0.000	18.609

Problem 354	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	161	161	74	75	243	94	0	0	227
N.S.	1	1.00	0.46	0.47	1.51	0.58	0.00	0.00	1.41
time (sec)	N/A	0.442	5.519	1.375	0.320	0.262	0.000	0.000	18.307

Problem 355	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	121	64	65	151	81	0	0	137
N.S.	1	1.00	0.53	0.54	1.25	0.67	0.00	0.00	1.13
time (sec)	N/A	0.377	0.199	1.156	0.312	0.264	0.000	0.000	1.667

Problem 356	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	B	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	138	138	404	181	1395	128	0	0	0
N.S.	1	1.00	2.93	1.31	10.11	0.93	0.00	0.00	0.00
time (sec)	N/A	0.405	6.194	1.310	0.445	0.271	0.000	0.000	0.000

Problem 357	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	B	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	134	134	202	168	973	111	0	0	0
N.S.	1	1.00	1.51	1.25	7.26	0.83	0.00	0.00	0.00
time (sec)	N/A	0.376	1.967	16.283	0.426	0.267	0.000	0.000	0.000

Problem 358	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	B	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	140	140	202	154	1106	120	0	0	0
N.S.	1	1.00	1.44	1.10	7.90	0.86	0.00	0.00	0.00
time (sec)	N/A	0.381	1.953	16.027	0.432	0.265	0.000	0.000	0.000

Problem 359	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	180	180	202	183	1964	133	0	0	0
N.S.	1	1.00	1.12	1.02	10.91	0.74	0.00	0.00	0.00
time (sec)	N/A	0.463	2.000	14.777	0.538	0.279	0.000	0.000	0.000

Problem 360	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	220	220	202	216	7450	146	0	0	0
N.S.	1	1.00	0.92	0.98	33.86	0.66	0.00	0.00	0.00
time (sec)	N/A	0.565	2.035	13.831	0.703	0.274	0.000	0.000	0.000

Problem 361	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	C	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	154	154	1540	182	989	130	0	0	0
N.S.	1	1.00	10.00	1.18	6.42	0.84	0.00	0.00	0.00
time (sec)	N/A	0.358	7.271	5.937	0.561	0.280	0.000	0.000	0.000

Problem 362	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	C	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	118	118	473	166	801	114	0	0	0
N.S.	1	1.00	4.01	1.41	6.79	0.97	0.00	0.00	0.00
time (sec)	N/A	0.252	6.451	6.408	0.559	0.289	0.000	0.000	0.000

Problem 363	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	C	A	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	82	82	178	138	648	86	0	0	0
N.S.	1	1.00	2.17	1.68	7.90	1.05	0.00	0.00	0.00
time (sec)	N/A	0.159	1.317	5.883	0.545	0.297	0.000	0.000	0.000

Problem 364	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	C	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	47	47	68	77	505	39	0	0	0
N.S.	1	1.00	1.45	1.64	10.74	0.83	0.00	0.00	0.00
time (sec)	N/A	0.095	0.082	5.918	0.580	0.271	0.000	0.000	0.000

Problem 365	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	C	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	94	94	171	108	689	70	0	0	0
N.S.	1	1.00	1.82	1.15	7.33	0.74	0.00	0.00	0.00
time (sec)	N/A	0.203	0.553	4.446	0.597	0.278	0.000	0.000	0.000

Problem 366	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	125	125	257	133	0	125	0	0	0
N.S.	1	1.00	2.06	1.06	0.00	1.00	0.00	0.00	0.00
time (sec)	N/A	0.281	0.656	13.543	0.000	0.278	0.000	0.000	0.000

Problem 367	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	C	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	189	189	1542	188	1006	141	0	0	0
N.S.	1	1.00	8.16	0.99	5.32	0.75	0.00	0.00	0.00
time (sec)	N/A	0.680	7.214	6.083	0.604	0.296	0.000	0.000	0.000

Problem 368	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	C	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	151	151	475	168	818	125	0	0	0
N.S.	1	1.00	3.15	1.11	5.42	0.83	0.00	0.00	0.00
time (sec)	N/A	0.529	6.456	6.797	0.595	0.285	0.000	0.000	0.000

Problem 369	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	C	A	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	113	113	180	136	665	98	0	0	0
N.S.	1	1.00	1.59	1.20	5.88	0.87	0.00	0.00	0.00
time (sec)	N/A	0.385	1.543	6.069	0.583	0.283	0.000	0.000	0.000

Problem 370	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	C	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	56	76	71	83	522	144	0	0	0
N.S.	1	1.36	1.27	1.48	9.32	2.57	0.00	0.00	0.00
time (sec)	N/A	0.190	0.070	6.867	0.630	0.286	0.000	0.000	0.000

Problem 371	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	C	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	105	135	173	108	698	89	0	0	0
N.S.	1	1.29	1.65	1.03	6.65	0.85	0.00	0.00	0.00
time (sec)	N/A	0.346	0.343	3.976	0.596	0.290	0.000	0.000	0.000

Problem 372	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	168	168	259	141	0	143	0	0	0
N.S.	1	1.00	1.54	0.84	0.00	0.85	0.00	0.00	0.00
time (sec)	N/A	0.444	0.425	13.815	0.000	0.293	0.000	0.000	0.000

Problem 373	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	197	197	591	233	0	161	0	0	0
N.S.	1	1.00	3.00	1.18	0.00	0.82	0.00	0.00	0.00
time (sec)	N/A	0.581	6.998	6.635	0.000	0.282	0.000	0.000	0.000

Problem 374	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	157	157	249	202	0	136	0	0	0
N.S.	1	1.00	1.59	1.29	0.00	0.87	0.00	0.00	0.00
time (sec)	N/A	0.400	6.310	6.533	0.000	0.280	0.000	0.000	0.000

Problem 375	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	117	117	99	139	0	126	0	0	0
N.S.	1	1.00	0.85	1.19	0.00	1.08	0.00	0.00	0.00
time (sec)	N/A	0.253	0.359	6.103	0.000	0.283	0.000	0.000	0.000

Problem 376	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	117	117	140	131	0	125	0	0	0
N.S.	1	1.00	1.20	1.12	0.00	1.07	0.00	0.00	0.00
time (sec)	N/A	0.252	0.294	4.331	0.000	0.291	0.000	0.000	0.000

Problem 377	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	174	174	248	203	0	182	0	0	0
N.S.	1	1.00	1.43	1.17	0.00	1.05	0.00	0.00	0.00
time (sec)	N/A	0.472	4.669	4.755	0.000	0.333	0.000	0.000	0.000

Problem 378	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	214	214	243	240	0	201	0	0	0
N.S.	1	1.00	1.14	1.12	0.00	0.94	0.00	0.00	0.00
time (sec)	N/A	0.663	4.705	15.046	0.000	0.349	0.000	0.000	0.000

Problem 379	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	237	237	641	297	0	195	0	0	0
N.S.	1	1.00	2.70	1.25	0.00	0.82	0.00	0.00	0.00
time (sec)	N/A	0.741	7.374	6.395	0.000	0.301	0.000	0.000	0.000

Problem 380	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	197	197	508	266	0	170	0	0	0
N.S.	1	1.00	2.58	1.35	0.00	0.86	0.00	0.00	0.00
time (sec)	N/A	0.553	6.535	6.128	0.000	0.294	0.000	0.000	0.000

Problem 381	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	157	157	131	202	0	169	0	0	0
N.S.	1	1.00	0.83	1.29	0.00	1.08	0.00	0.00	0.00
time (sec)	N/A	0.409	0.681	6.546	0.000	0.285	0.000	0.000	0.000

Problem 382	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	157	157	122	195	0	167	0	0	0
N.S.	1	1.00	0.78	1.24	0.00	1.06	0.00	0.00	0.00
time (sec)	N/A	0.390	0.477	4.358	0.000	0.282	0.000	0.000	0.000

Problem 383	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	157	157	164	188	0	169	0	0	0
N.S.	1	1.00	1.04	1.20	0.00	1.08	0.00	0.00	0.00
time (sec)	N/A	0.408	0.500	4.306	0.000	0.277	0.000	0.000	0.000

Problem 384	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	214	214	373	306	0	235	0	0	0
N.S.	1	1.00	1.74	1.43	0.00	1.10	0.00	0.00	0.00
time (sec)	N/A	0.639	1.867	4.557	0.000	0.412	0.000	0.000	0.000

Problem 385	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	254	254	412	344	0	245	0	0	0
N.S.	1	1.00	1.62	1.35	0.00	0.96	0.00	0.00	0.00
time (sec)	N/A	0.823	2.497	14.710	0.000	0.414	0.000	0.000	0.000

Problem 386	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F(-1)	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	277	277	696	361	0	229	0	0	0
N.S.	1	1.00	2.51	1.30	0.00	0.83	0.00	0.00	0.00
time (sec)	N/A	1.148	7.864	6.681	0.000	0.292	0.000	0.000	0.000

Problem 387	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	237	237	561	330	0	204	0	0	0
N.S.	1	1.00	2.37	1.39	0.00	0.86	0.00	0.00	0.00
time (sec)	N/A	1.092	6.639	6.649	0.000	0.280	0.000	0.000	0.000

Problem 388	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	197	197	153	266	0	203	0	0	0
N.S.	1	1.00	0.78	1.35	0.00	1.03	0.00	0.00	0.00
time (sec)	N/A	0.660	2.481	6.224	0.000	0.302	0.000	0.000	0.000

Problem 389	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	197	197	125	260	0	203	0	0	0
N.S.	1	1.00	0.63	1.32	0.00	1.03	0.00	0.00	0.00
time (sec)	N/A	0.628	0.796	4.577	0.000	0.300	0.000	0.000	0.000

Problem 390	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	197	197	153	250	0	203	0	0	0
N.S.	1	1.00	0.78	1.27	0.00	1.03	0.00	0.00	0.00
time (sec)	N/A	0.593	2.506	4.630	0.000	0.292	0.000	0.000	0.000

Problem 391	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	197	197	196	250	0	203	0	0	0
N.S.	1	1.00	0.99	1.27	0.00	1.03	0.00	0.00	0.00
time (sec)	N/A	0.582	2.854	3.997	0.000	0.290	0.000	0.000	0.000

Problem 392	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	254	254	454	401	0	279	0	0	0
N.S.	1	1.00	1.79	1.58	0.00	1.10	0.00	0.00	0.00
time (sec)	N/A	0.820	6.944	4.382	0.000	0.458	0.000	0.000	0.000

Problem 393	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	294	294	460	448	0	289	0	0	0
N.S.	1	1.00	1.56	1.52	0.00	0.98	0.00	0.00	0.00
time (sec)	N/A	1.004	2.683	15.022	0.000	0.525	0.000	0.000	0.000

Problem 394	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	237	237	163	312	0	237	0	0	0
N.S.	1	1.00	0.69	1.32	0.00	1.00	0.00	0.00	0.00
time (sec)	N/A	0.774	2.936	4.416	0.000	0.285	0.000	0.000	0.000

Problem 395	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	237	237	396	314	0	237	0	0	0
N.S.	1	1.00	1.67	1.32	0.00	1.00	0.00	0.00	0.00
time (sec)	N/A	0.759	6.061	4.173	0.000	0.286	0.000	0.000	0.000

Problem 396	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	B	A	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	38	38	51	0	121	41	0	0	44
N.S.	1	1.00	1.34	0.00	3.18	1.08	0.00	0.00	1.16
time (sec)	N/A	0.142	0.082	0.000	0.302	0.277	0.000	0.000	14.664

Problem 397	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	302	302	282	0	0	0	0	0	0
N.S.	1	1.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.596	1.636	0.000	0.000	0.000	0.000	0.000	0.000

Problem 398	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	232	232	167	0	0	0	0	0	0
N.S.	1	1.00	0.72	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.351	0.900	0.000	0.000	0.000	0.000	0.000	0.000

Problem 399	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	173	173	138	0	0	0	0	0	0
N.S.	1	1.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.158	0.352	0.000	0.000	0.000	0.000	0.000	0.000

Problem 400	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	131	131	111	0	0	0	0	0	0
N.S.	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.078	0.171	0.000	0.000	0.000	0.000	0.000	0.000

Problem 401	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	156	156	141	0	0	0	0	0	0
N.S.	1	1.00	0.90	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.155	0.409	0.000	0.000	0.000	0.000	0.000	0.000

Problem 402	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	229	229	188	0	0	0	0	0	0
N.S.	1	1.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.340	1.942	0.000	0.000	0.000	0.000	0.000	0.000

Problem 403	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	150	135	100	105	97	286	122	175
N.S.	1	1.00	0.90	0.67	0.70	0.65	1.91	0.81	1.17
time (sec)	N/A	0.106	0.196	3.052	0.194	0.274	0.671	0.313	17.245

Problem 404	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	128	128	89	90	94	86	238	107	154
N.S.	1	1.00	0.70	0.70	0.73	0.67	1.86	0.84	1.20
time (sec)	N/A	0.091	0.119	2.934	0.200	0.265	0.483	0.305	17.379

Problem 405	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	114	114	78	80	84	75	216	92	115
N.S.	1	1.00	0.68	0.70	0.74	0.66	1.89	0.81	1.01
time (sec)	N/A	0.085	0.087	2.571	0.206	0.261	0.344	0.297	14.309

Problem 406	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	92	92	89	69	69	64	168	77	115
N.S.	1	1.00	0.97	0.75	0.75	0.70	1.83	0.84	1.25
time (sec)	N/A	0.073	0.089	2.679	0.203	0.256	0.241	0.286	18.031

Problem 407	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	76	76	73	57	57	53	144	62	75
N.S.	1	1.00	0.96	0.75	0.75	0.70	1.89	0.82	0.99
time (sec)	N/A	0.062	0.084	2.678	0.208	0.254	0.182	0.278	14.194

Problem 408	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	54	54	57	44	46	42	92	47	55
N.S.	1	1.00	1.06	0.81	0.85	0.78	1.70	0.87	1.02
time (sec)	N/A	0.047	0.043	1.812	0.203	0.252	0.116	0.292	14.051

Problem 409	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	38	38	35	32	34	29	66	31	31
N.S.	1	1.00	0.92	0.84	0.89	0.76	1.74	0.82	0.82
time (sec)	N/A	0.016	0.066	0.802	0.197	0.249	0.087	0.288	14.373

Problem 410	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	15	15	26	16	15	17	17	15	17
N.S.	1	1.00	1.73	1.07	1.00	1.13	1.13	1.00	1.13
time (sec)	N/A	0.009	0.018	0.583	0.183	0.252	0.054	0.268	13.692

Problem 411	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	B	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	16	16	16	29	28	36	49	43	57
N.S.	1	1.00	1.00	1.81	1.75	2.25	3.06	2.69	3.56
time (sec)	N/A	0.024	0.004	1.315	0.189	0.274	2.525	0.287	13.888

Problem 412	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	B	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	24	24	24	30	38	60	0	63	47
N.S.	1	1.00	1.00	1.25	1.58	2.50	0.00	2.62	1.96
time (sec)	N/A	0.042	0.006	2.211	0.213	0.284	0.000	0.296	13.814

Problem 413	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	47	47	47	47	58	74	0	105	81
N.S.	1	1.00	1.00	1.00	1.23	1.57	0.00	2.23	1.72
time (sec)	N/A	0.052	0.008	2.986	0.199	0.271	0.000	0.295	14.658

Problem 414	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	63	63	60	60	70	88	0	122	111
N.S.	1	1.00	0.95	0.95	1.11	1.40	0.00	1.94	1.76
time (sec)	N/A	0.065	0.117	3.061	0.199	0.289	0.000	0.296	16.442

Problem 415	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	85	85	59	73	95	99	0	164	150
N.S.	1	1.00	0.69	0.86	1.12	1.16	0.00	1.93	1.76
time (sec)	N/A	0.077	0.151	3.071	0.201	0.286	0.000	0.291	16.755

Problem 416	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	101	101	94	83	107	110	0	178	180
N.S.	1	1.00	0.93	0.82	1.06	1.09	0.00	1.76	1.78
time (sec)	N/A	0.080	0.225	3.284	0.205	0.298	0.000	0.302	17.205

Problem 417	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	150	123	112	120	110	343	127	143
N.S.	1	1.00	0.82	0.75	0.80	0.73	2.29	0.85	0.95
time (sec)	N/A	0.121	0.275	3.465	0.289	0.268	0.370	0.287	14.390

Problem 418	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	111	111	85	95	94	86	221	102	117
N.S.	1	1.00	0.77	0.86	0.85	0.77	1.99	0.92	1.05
time (sec)	N/A	0.116	0.152	3.874	0.203	0.269	0.250	0.292	14.089

Problem 419	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	101	101	86	75	82	77	211	82	93
N.S.	1	1.00	0.85	0.74	0.81	0.76	2.09	0.81	0.92
time (sec)	N/A	0.103	0.170	2.718	0.207	0.259	0.182	0.293	14.965

Problem 420	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	71	71	59	61	60	52	107	60	72
N.S.	1	1.00	0.83	0.86	0.85	0.73	1.51	0.85	1.01
time (sec)	N/A	0.058	0.275	1.945	0.197	0.257	0.116	0.275	14.685

Problem 421	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	50	50	46	43	44	40	78	43	42
N.S.	1	1.00	0.92	0.86	0.88	0.80	1.56	0.86	0.84
time (sec)	N/A	0.017	0.114	0.954	0.197	0.249	0.090	0.273	14.409

Problem 422	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	33	33	46	43	42	52	0	78	73
N.S.	1	1.00	1.39	1.30	1.27	1.58	0.00	2.36	2.21
time (sec)	N/A	0.065	0.023	1.521	0.203	0.280	0.000	0.307	14.450

Problem 423	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	B	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	33	33	32	43	48	74	0	77	181
N.S.	1	1.00	0.97	1.30	1.45	2.24	0.00	2.33	5.48
time (sec)	N/A	0.081	0.063	2.367	0.195	0.260	0.000	0.295	14.686

Problem 424	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	59	59	67	69	87	93	0	127	99
N.S.	1	1.00	1.14	1.17	1.47	1.58	0.00	2.15	1.68
time (sec)	N/A	0.092	0.008	3.077	0.191	0.263	0.000	0.302	15.289

Problem 425	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	80	80	71	74	84	100	0	178	141
N.S.	1	1.00	0.89	0.92	1.05	1.25	0.00	2.22	1.76
time (sec)	N/A	0.110	0.156	4.016	0.190	0.274	0.000	0.305	17.132

Problem 426	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	110	110	82	111	144	133	0	258	184
N.S.	1	1.00	0.75	1.01	1.31	1.21	0.00	2.35	1.67
time (sec)	N/A	0.116	0.198	3.764	0.211	0.259	0.000	0.321	18.044

Problem 427	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	135	90	110	132	136	0	272	221
N.S.	1	1.00	0.67	0.81	0.98	1.01	0.00	2.01	1.64
time (sec)	N/A	0.135	0.394	4.334	0.201	0.281	0.000	0.330	18.544

Problem 428	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	170	193	159	135	145	132	393	150	380
N.S.	1	1.14	0.94	0.79	0.85	0.78	2.31	0.88	2.24
time (sec)	N/A	0.248	0.518	4.427	0.220	0.267	0.367	0.299	15.875

Problem 429	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	180	180	130	113	119	110	284	124	319
N.S.	1	1.00	0.72	0.63	0.66	0.61	1.58	0.69	1.77
time (sec)	N/A	0.243	0.426	3.545	0.208	0.264	0.260	0.312	15.867

Problem 430	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	121	100	102	95	84	233	96	279
N.S.	1	1.00	0.83	0.84	0.79	0.69	1.93	0.79	2.31
time (sec)	N/A	0.127	0.345	2.627	0.290	0.271	0.179	0.292	16.293

Problem 431	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	76	90	80	67	72	66	128	72	77
N.S.	1	1.18	1.05	0.88	0.95	0.87	1.68	0.95	1.01
time (sec)	N/A	0.078	0.185	2.005	0.199	0.273	0.126	0.291	14.439

Problem 432	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	73	73	105	73	69	72	0	137	123
N.S.	1	1.00	1.44	1.00	0.95	0.99	0.00	1.88	1.68
time (sec)	N/A	0.125	0.389	1.570	0.223	0.272	0.000	0.310	14.793

Problem 433	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	68	68	88	57	66	94	0	129	97
N.S.	1	1.00	1.29	0.84	0.97	1.38	0.00	1.90	1.43
time (sec)	N/A	0.144	0.533	2.686	0.203	0.272	0.000	0.305	14.828

Problem 434	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	79	79	55	82	101	112	0	143	136
N.S.	1	1.00	0.70	1.04	1.28	1.42	0.00	1.81	1.72
time (sec)	N/A	0.155	0.125	3.592	0.191	0.271	0.000	0.314	14.491

Problem 435	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	109	109	70	96	113	126	0	205	157
N.S.	1	1.00	0.64	0.88	1.04	1.16	0.00	1.88	1.44
time (sec)	N/A	0.210	0.182	4.371	0.227	0.266	0.000	0.310	16.338

Problem 436	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	133	133	90	125	158	140	0	330	224
N.S.	1	1.00	0.68	0.94	1.19	1.05	0.00	2.48	1.68
time (sec)	N/A	0.241	0.319	4.997	0.199	0.298	0.000	0.315	17.994

Problem 437	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	169	169	120	148	181	170	0	367	260
N.S.	1	1.00	0.71	0.88	1.07	1.01	0.00	2.17	1.54
time (sec)	N/A	0.264	0.570	4.909	0.249	0.278	0.000	0.355	17.674

Problem 438	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	247	247	181	176	192	171	495	197	476
N.S.	1	1.00	0.73	0.71	0.78	0.69	2.00	0.80	1.93
time (sec)	N/A	0.465	0.709	5.947	0.201	0.275	0.519	0.313	15.709

Problem 439	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	235	235	156	153	170	150	459	168	214
N.S.	1	1.00	0.66	0.65	0.72	0.64	1.95	0.71	0.91
time (sec)	N/A	0.384	0.623	4.313	0.186	0.264	0.391	0.318	14.464

Problem 440	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	170	170	133	125	133	121	301	134	363
N.S.	1	1.00	0.78	0.74	0.78	0.71	1.77	0.79	2.14
time (sec)	N/A	0.249	0.607	3.735	0.201	0.280	0.274	0.301	15.577

Problem 441	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	137	137	104	101	111	96	240	107	123
N.S.	1	1.00	0.76	0.74	0.81	0.70	1.75	0.78	0.90
time (sec)	N/A	0.174	0.353	2.433	0.195	0.266	0.195	0.285	14.748

Problem 442	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	107	107	128	98	95	98	0	212	158
N.S.	1	1.00	1.20	0.92	0.89	0.92	0.00	1.98	1.48
time (sec)	N/A	0.272	0.553	2.617	0.200	0.276	0.000	0.316	14.752

Problem 443	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	114	114	119	87	90	116	0	170	150
N.S.	1	1.00	1.04	0.76	0.79	1.02	0.00	1.49	1.32
time (sec)	N/A	0.278	0.889	2.476	0.192	0.263	0.000	0.308	14.551

Problem 444	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	108	108	174	96	115	130	0	177	152
N.S.	1	1.00	1.61	0.89	1.06	1.20	0.00	1.64	1.41
time (sec)	N/A	0.283	2.001	3.341	0.182	0.276	0.000	0.337	14.529

Problem 445	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	115	115	77	109	125	138	0	221	185
N.S.	1	1.00	0.67	0.95	1.09	1.20	0.00	1.92	1.61
time (sec)	N/A	0.298	0.231	4.248	0.191	0.269	0.000	0.337	14.883

Problem 446	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	154	154	101	147	187	163	0	360	245
N.S.	1	1.00	0.66	0.95	1.21	1.06	0.00	2.34	1.59
time (sec)	N/A	0.386	0.344	4.676	0.214	0.272	0.000	0.337	18.016

Problem 447	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	188	188	125	162	195	182	0	461	304
N.S.	1	1.00	0.66	0.86	1.04	0.97	0.00	2.45	1.62
time (sec)	N/A	0.414	0.503	6.155	0.209	0.261	0.000	0.327	18.752

Problem 448	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	222	222	154	209	275	217	0	592	370
N.S.	1	1.00	0.69	0.94	1.24	0.98	0.00	2.67	1.67
time (sec)	N/A	0.461	0.654	6.021	0.195	0.279	0.000	0.363	18.890

Problem 449	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	193	193	153	256	0	479	0	393	474
N.S.	1	1.00	0.79	1.33	0.00	2.48	0.00	2.04	2.46
time (sec)	N/A	0.652	0.633	1.319	0.000	0.307	0.000	0.292	15.665

Problem 450	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	148	148	122	179	0	400	0	249	203
N.S.	1	1.00	0.82	1.21	0.00	2.70	0.00	1.68	1.37
time (sec)	N/A	0.376	0.398	1.176	0.000	0.292	0.000	0.299	15.341

Problem 451	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	110	110	97	138	0	334	0	177	168
N.S.	1	1.00	0.88	1.25	0.00	3.04	0.00	1.61	1.53
time (sec)	N/A	0.281	0.302	1.179	0.000	0.284	0.000	0.297	15.565

Problem 452	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	76	76	72	97	0	269	1744	126	190
N.S.	1	1.00	0.95	1.28	0.00	3.54	22.95	1.66	2.50
time (sec)	N/A	0.160	0.204	0.980	0.000	0.281	65.916	0.283	14.407

Problem 453	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	59	59	58	65	0	223	320	240	99
N.S.	1	1.00	0.98	1.10	0.00	3.78	5.42	4.07	1.68
time (sec)	N/A	0.087	0.090	0.835	0.000	0.286	12.669	0.301	14.596

Problem 454	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	49	49	48	44	0	175	172	78	43
N.S.	1	1.00	0.98	0.90	0.00	3.57	3.51	1.59	0.88
time (sec)	N/A	0.040	0.024	0.891	0.000	0.282	1.983	0.309	14.513

Problem 455	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	68	68	102	83	0	278	0	119	99
N.S.	1	1.00	1.50	1.22	0.00	4.09	0.00	1.75	1.46
time (sec)	N/A	0.127	0.199	0.941	0.000	0.316	0.000	0.291	15.068

Problem 456	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	85	85	115	123	0	382	0	153	324
N.S.	1	1.00	1.35	1.45	0.00	4.49	0.00	1.80	3.81
time (sec)	N/A	0.225	0.455	1.231	0.000	0.312	0.000	0.317	14.723

Problem 457	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	119	119	238	192	0	459	0	211	1087
N.S.	1	1.00	2.00	1.61	0.00	3.86	0.00	1.77	9.13
time (sec)	N/A	0.546	0.942	1.579	0.000	0.372	0.000	0.315	15.792

Problem 458	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	157	157	258	252	0	535	0	286	991
N.S.	1	1.00	1.64	1.61	0.00	3.41	0.00	1.82	6.31
time (sec)	N/A	0.639	1.826	1.529	0.000	0.402	0.000	0.337	17.283

Problem 459	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F(-2)	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	266	266	176	257	0	747	0	333	3852
N.S.	1	1.00	0.66	0.97	0.00	2.81	0.00	1.25	14.48
time (sec)	N/A	0.786	0.907	1.523	0.000	0.316	0.000	0.311	22.001

Problem 460	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	166	213	144	218	0	651	0	262	3751
N.S.	1	1.28	0.87	1.31	0.00	3.92	0.00	1.58	22.60
time (sec)	N/A	0.487	0.721	1.565	0.000	0.330	0.000	0.310	21.497

Problem 461	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	155	155	113	178	0	554	0	847	3180
N.S.	1	1.00	0.73	1.15	0.00	3.57	0.00	5.46	20.52
time (sec)	N/A	0.306	0.637	1.199	0.000	0.310	0.000	0.372	20.653

Problem 462	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	108	108	103	143	0	470	0	175	2872
N.S.	1	1.00	0.95	1.32	0.00	4.35	0.00	1.62	26.59
time (sec)	N/A	0.181	0.403	0.999	0.000	0.295	0.000	0.315	20.892

Problem 463	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	85	85	83	114	0	321	0	135	99
N.S.	1	1.00	0.98	1.34	0.00	3.78	0.00	1.59	1.16
time (sec)	N/A	0.084	0.265	0.959	0.000	0.273	0.000	0.311	15.171

Problem 464	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	86	86	84	114	0	320	2470	135	99
N.S.	1	1.00	0.98	1.33	0.00	3.72	28.72	1.57	1.15
time (sec)	N/A	0.062	0.171	0.829	0.000	0.280	34.660	0.293	14.363

Problem 465	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	118	118	146	164	0	592	0	198	2886
N.S.	1	1.00	1.24	1.39	0.00	5.02	0.00	1.68	24.46
time (sec)	N/A	0.263	0.400	1.490	0.000	0.466	0.000	0.311	20.080

Problem 466	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	155	155	163	205	0	750	0	332	3176
N.S.	1	1.00	1.05	1.32	0.00	4.84	0.00	2.14	20.49
time (sec)	N/A	0.443	0.857	1.734	0.000	0.473	0.000	0.327	20.860

Problem 467	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	217	217	285	273	0	899	0	293	3699
N.S.	1	1.00	1.31	1.26	0.00	4.14	0.00	1.35	17.05
time (sec)	N/A	0.742	3.814	1.826	0.000	0.712	0.000	0.316	21.327

Problem 468	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	270	270	499	330	0	1001	0	368	3843
N.S.	1	1.00	1.85	1.22	0.00	3.71	0.00	1.36	14.23
time (sec)	N/A	1.097	6.481	2.063	0.000	0.660	0.000	0.341	21.276

Problem 469	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	300	300	199	306	0	1161	0	1735	5962
N.S.	1	1.00	0.66	1.02	0.00	3.87	0.00	5.78	19.87
time (sec)	N/A	0.911	1.613	1.881	0.000	0.346	0.000	0.500	22.974

Problem 470	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	221	221	177	266	0	1029	0	354	5350
N.S.	1	1.00	0.80	1.20	0.00	4.66	0.00	1.60	24.21
time (sec)	N/A	0.549	1.223	1.385	0.000	0.341	0.000	0.321	21.552

Problem 471	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	179	179	149	233	0	913	0	319	5102
N.S.	1	1.00	0.83	1.30	0.00	5.10	0.00	1.78	28.50
time (sec)	N/A	0.347	0.945	1.443	0.000	0.314	0.000	0.322	23.091

Problem 472	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	149	149	115	180	0	587	0	250	203
N.S.	1	1.00	0.77	1.21	0.00	3.94	0.00	1.68	1.36
time (sec)	N/A	0.203	0.546	1.157	0.000	0.285	0.000	0.317	17.064

Problem 473	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F(-1)	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	134	134	115	191	0	555	0	271	207
N.S.	1	1.00	0.86	1.43	0.00	4.14	0.00	2.02	1.54
time (sec)	N/A	0.148	0.347	1.081	0.000	0.293	0.000	0.317	16.757

Problem 474	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F(-1)	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	133	133	113	182	0	585	0	251	203
N.S.	1	1.00	0.85	1.37	0.00	4.40	0.00	1.89	1.53
time (sec)	N/A	0.141	0.305	1.168	0.000	0.289	0.000	0.296	16.627

Problem 475	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	182	182	192	251	0	1142	0	344	5090
N.S.	1	1.00	1.05	1.38	0.00	6.27	0.00	1.89	27.97
time (sec)	N/A	0.488	0.948	1.669	0.000	0.800	0.000	0.316	23.975

Problem 476	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	232	232	205	292	0	1346	0	380	5347
N.S.	1	1.00	0.88	1.26	0.00	5.80	0.00	1.64	23.05
time (sec)	N/A	0.888	3.014	2.045	0.000	0.805	0.000	0.335	22.513

Problem 477	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	305	305	427	360	0	1524	0	801	5910
N.S.	1	1.00	1.40	1.18	0.00	5.00	0.00	2.63	19.38
time (sec)	N/A	1.198	6.522	2.439	0.000	1.470	0.000	0.348	23.246

Problem 478	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	307	307	240	395	0	1593	0	563	7494
N.S.	1	1.00	0.78	1.29	0.00	5.19	0.00	1.83	24.41
time (sec)	N/A	1.012	4.081	2.253	0.000	0.374	0.000	0.377	24.952

Problem 479	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F(-1)	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	250	250	227	361	0	1445	0	531	7247
N.S.	1	1.00	0.91	1.44	0.00	5.78	0.00	2.12	28.99
time (sec)	N/A	0.653	2.034	1.749	0.000	0.355	0.000	0.354	27.411

Problem 480	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	222	222	158	281	0	893	0	399	378
N.S.	1	1.00	0.71	1.27	0.00	4.02	0.00	1.80	1.70
time (sec)	N/A	0.380	1.105	1.372	0.000	0.321	0.000	0.351	18.097

Problem 481	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F(-1)	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	206	206	162	290	0	893	0	427	381
N.S.	1	1.00	0.79	1.41	0.00	4.33	0.00	2.07	1.85
time (sec)	N/A	0.346	1.024	1.385	0.000	0.309	0.000	0.328	18.372

Problem 482	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F(-1)	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	192	192	164	293	0	891	0	427	382
N.S.	1	1.00	0.85	1.53	0.00	4.64	0.00	2.22	1.99
time (sec)	N/A	0.263	0.833	1.331	0.000	0.315	0.000	0.344	17.617

Problem 483	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F(-1)	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	184	184	159	280	0	895	0	399	378
N.S.	1	1.00	0.86	1.52	0.00	4.86	0.00	2.17	2.05
time (sec)	N/A	0.261	0.673	1.230	0.000	0.310	0.000	0.312	18.194

Problem 484	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	251	251	274	379	0	1815	0	554	7235
N.S.	1	1.00	1.09	1.51	0.00	7.23	0.00	2.21	28.82
time (sec)	N/A	0.849	2.106	2.319	0.000	1.729	0.000	0.348	27.374

Problem 485	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	308	308	416	421	0	2048	0	587	7490
N.S.	1	1.00	1.35	1.37	0.00	6.65	0.00	1.91	24.32
time (sec)	N/A	1.389	6.575	2.624	0.000	1.686	0.000	0.378	23.520

Problem 486	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	264	264	214	827	0	474	0	0	0
N.S.	1	1.00	0.81	3.13	0.00	1.80	0.00	0.00	0.00
time (sec)	N/A	0.465	0.904	7.526	0.000	0.121	0.000	0.000	0.000

Problem 487	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	207	207	180	665	0	436	0	0	0
N.S.	1	1.00	0.87	3.21	0.00	2.11	0.00	0.00	0.00
time (sec)	N/A	0.329	0.666	6.686	0.000	0.108	0.000	0.000	0.000

Problem 488	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	162	162	137	452	0	398	0	0	0
N.S.	1	1.00	0.85	2.79	0.00	2.46	0.00	0.00	0.00
time (sec)	N/A	0.215	0.453	5.452	0.000	0.106	0.000	0.000	0.000

Problem 489	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	57	57	170	0	355	0	0	0
N.S.	1	1.00	1.00	2.98	0.00	6.23	0.00	0.00	0.00
time (sec)	N/A	0.048	0.035	3.005	0.000	0.098	0.000	0.000	0.000

Problem 490	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	118	118	81	194	0	0	0	0	0
N.S.	1	1.00	0.69	1.64	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.277	13.944	3.468	0.000	0.000	0.000	0.000	0.000

Problem 491	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	197	197	307	622	0	0	0	0	0
N.S.	1	1.00	1.56	3.16	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.591	14.873	4.964	0.000	0.000	0.000	0.000	0.000

Problem 492	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	262	262	393	977	0	0	0	0	0
N.S.	1	1.00	1.50	3.73	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.862	5.681	5.456	0.000	0.000	0.000	0.000	0.000

Problem 493	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	314	314	262	995	0	516	0	0	0
N.S.	1	1.00	0.83	3.17	0.00	1.64	0.00	0.00	0.00
time (sec)	N/A	0.832	1.057	8.671	0.000	0.152	0.000	0.000	0.000

Problem 494	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	258	258	214	827	0	474	0	0	0
N.S.	1	1.00	0.83	3.21	0.00	1.84	0.00	0.00	0.00
time (sec)	N/A	0.463	0.883	7.814	0.000	0.141	0.000	0.000	0.000

Problem 495	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	199	199	174	663	0	438	0	0	0
N.S.	1	1.00	0.87	3.33	0.00	2.20	0.00	0.00	0.00
time (sec)	N/A	0.289	0.614	6.557	0.000	0.135	0.000	0.000	0.000

Problem 496	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	157	157	134	450	0	398	0	0	0
N.S.	1	1.00	0.85	2.87	0.00	2.54	0.00	0.00	0.00
time (sec)	N/A	0.192	0.359	4.679	0.000	0.100	0.000	0.000	0.000

Problem 497	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	179	179	107	249	0	0	0	0	0
N.S.	1	1.00	0.60	1.39	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.383	26.932	4.426	0.000	0.000	0.000	0.000	0.000

Problem 498	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	209	209	363	740	0	0	0	0	0
N.S.	1	1.00	1.74	3.54	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.666	16.283	5.118	0.000	0.000	0.000	0.000	0.000

Problem 499	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	255	255	386	980	0	0	0	0	0
N.S.	1	1.00	1.51	3.84	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.929	5.854	6.467	0.000	0.000	0.000	0.000	0.000

Problem 500	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	371	371	268	1140	0	561	0	0	0
N.S.	1	1.00	0.72	3.07	0.00	1.51	0.00	0.00	0.00
time (sec)	N/A	0.742	0.987	14.836	0.000	0.176	0.000	0.000	0.000

Problem 501	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	308	308	263	995	0	514	0	0	0
N.S.	1	1.00	0.85	3.23	0.00	1.67	0.00	0.00	0.00
time (sec)	N/A	0.582	1.027	10.019	0.000	0.194	0.000	0.000	0.000

Problem 502	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	249	249	214	827	0	474	0	0	0
N.S.	1	1.00	0.86	3.32	0.00	1.90	0.00	0.00	0.00
time (sec)	N/A	0.422	0.671	7.885	0.000	0.116	0.000	0.000	0.000

Problem 503	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	197	197	177	662	0	437	0	0	0
N.S.	1	1.00	0.90	3.36	0.00	2.22	0.00	0.00	0.00
time (sec)	N/A	0.305	0.498	6.553	0.000	0.127	0.000	0.000	0.000

Problem 504	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	222	222	379	528	0	0	0	0	0
N.S.	1	1.00	1.71	2.38	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.664	1.095	6.062	0.000	0.000	0.000	0.000	0.000

Problem 505	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	222	222	390	960	0	0	0	0	0
N.S.	1	1.00	1.76	4.32	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.725	1.465	10.753	0.000	0.000	0.000	0.000	0.000

Problem 506	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	270	270	395	1134	0	0	0	0	0
N.S.	1	1.00	1.46	4.20	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.035	1.843	33.461	0.000	0.000	0.000	0.000	0.000

Problem 507	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	323	323	434	1742	0	0	0	0	0
N.S.	1	1.00	1.34	5.39	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.351	2.666	103.948	0.000	0.000	0.000	0.000	0.000

Problem 508	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	246	246	211	824	0	474	0	0	0
N.S.	1	1.00	0.86	3.35	0.00	1.93	0.00	0.00	0.00
time (sec)	N/A	0.539	0.787	7.396	0.000	0.131	0.000	0.000	0.000

Problem 509	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	138	138	92	275	0	148	0	0	0
N.S.	1	1.00	0.67	1.99	0.00	1.07	0.00	0.00	0.00
time (sec)	N/A	0.294	0.282	5.999	0.000	0.101	0.000	0.000	0.000

Problem 510	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	105	105	81	253	0	138	0	0	0
N.S.	1	1.00	0.77	2.41	0.00	1.31	0.00	0.00	0.00
time (sec)	N/A	0.214	0.182	3.357	0.000	0.111	0.000	0.000	0.000

Problem 511	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	78	78	69	231	0	128	0	0	0
N.S.	1	1.00	0.88	2.96	0.00	1.64	0.00	0.00	0.00
time (sec)	N/A	0.128	0.096	2.727	0.000	0.101	0.000	0.000	0.000

Problem 512	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	23	23	23	137	0	108	0	0	0
N.S.	1	1.00	1.00	5.96	0.00	4.70	0.00	0.00	0.00
time (sec)	N/A	0.014	0.042	3.663	0.000	0.112	0.000	0.000	0.000

Problem 513	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	48	48	41	158	0	0	0	0	0
N.S.	1	1.00	0.85	3.29	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.137	0.101	2.309	0.000	0.000	0.000	0.000	0.000

Problem 514	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	95	95	157	350	0	0	0	0	0
N.S.	1	1.00	1.65	3.68	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.373	10.874	3.777	0.000	0.000	0.000	0.000	0.000

Problem 515	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	135	194	408	0	0	0	0	0
N.S.	1	1.00	1.44	3.02	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.418	0.901	4.085	0.000	0.000	0.000	0.000	0.000

Problem 516	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	140	140	114	276	0	148	0	0	0
N.S.	1	1.00	0.81	1.97	0.00	1.06	0.00	0.00	0.00
time (sec)	N/A	0.215	0.266	7.311	0.000	0.121	0.000	0.000	0.000

Problem 517	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	107	107	104	253	0	138	0	0	0
N.S.	1	1.00	0.97	2.36	0.00	1.29	0.00	0.00	0.00
time (sec)	N/A	0.159	0.231	5.154	0.000	0.100	0.000	0.000	0.000

Problem 518	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	80	80	94	231	0	128	0	0	0
N.S.	1	1.00	1.18	2.89	0.00	1.60	0.00	0.00	0.00
time (sec)	N/A	0.100	0.115	3.546	0.000	0.094	0.000	0.000	0.000

Problem 519	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	24	24	44	138	0	106	0	0	0
N.S.	1	1.00	1.83	5.75	0.00	4.42	0.00	0.00	0.00
time (sec)	N/A	0.015	0.050	3.814	0.000	0.088	0.000	0.000	0.000

Problem 520	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	50	50	61	159	0	0	0	0	0
N.S.	1	1.00	1.22	3.18	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.102	0.111	3.009	0.000	0.000	0.000	0.000	0.000

Problem 521	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	98	98	178	351	0	0	0	0	0
N.S.	1	1.00	1.82	3.58	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.308	0.970	4.613	0.000	0.000	0.000	0.000	0.000

Problem 522	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	138	138	237	408	0	0	0	0	0
N.S.	1	1.00	1.72	2.96	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.442	1.416	5.865	0.000	0.000	0.000	0.000	0.000

Problem 523	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	215	215	182	665	0	439	0	0	0
N.S.	1	1.00	0.85	3.09	0.00	2.04	0.00	0.00	0.00
time (sec)	N/A	0.349	0.753	5.593	0.000	0.111	0.000	0.000	0.000

Problem 524	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	165	165	137	453	0	398	0	0	116
N.S.	1	1.00	0.83	2.75	0.00	2.41	0.00	0.00	0.70
time (sec)	N/A	0.248	0.538	4.109	0.000	0.122	0.000	0.000	14.342

Problem 525	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	122	122	86	220	0	355	0	0	80
N.S.	1	1.00	0.70	1.80	0.00	2.91	0.00	0.00	0.66
time (sec)	N/A	0.142	2.301	3.405	0.000	0.102	0.000	0.000	14.600

Problem 526	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	C	F	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	57	57	78	0	146	0	0	52
N.S.	1	1.00	1.00	1.37	0.00	2.56	0.00	0.00	0.91
time (sec)	N/A	0.049	0.021	0.922	0.000	0.087	0.000	0.000	14.557

Problem 527	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	58	58	58	166	0	0	0	0	0
N.S.	1	1.00	1.00	2.86	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.160	0.169	2.073	0.000	0.000	0.000	0.000	0.000

Problem 528	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	206	206	310	532	0	0	0	0	0
N.S.	1	1.00	1.50	2.58	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.629	15.204	3.057	0.000	0.000	0.000	0.000	0.000

Problem 529	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	268	268	518	710	0	0	0	0	0
N.S.	1	1.00	1.93	2.65	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.901	6.374	3.667	0.000	0.000	0.000	0.000	0.000

Problem 530	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	326	326	242	1285	0	687	0	0	0
N.S.	1	1.00	0.74	3.94	0.00	2.11	0.00	0.00	0.00
time (sec)	N/A	0.603	1.028	6.158	0.000	0.161	0.000	0.000	0.000

Problem 531	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	257	257	197	743	0	630	0	0	0
N.S.	1	1.00	0.77	2.89	0.00	2.45	0.00	0.00	0.00
time (sec)	N/A	0.388	0.740	5.738	0.000	0.151	0.000	0.000	0.000

Problem 532	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	186	186	159	530	0	567	0	0	0
N.S.	1	1.00	0.85	2.85	0.00	3.05	0.00	0.00	0.00
time (sec)	N/A	0.252	0.594	5.251	0.000	0.128	0.000	0.000	0.000

Problem 533	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	170	170	137	373	0	527	0	0	0
N.S.	1	1.00	0.81	2.19	0.00	3.10	0.00	0.00	0.00
time (sec)	N/A	0.217	0.417	3.541	0.000	0.108	0.000	0.000	0.000

Problem 534	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	106	106	83	217	0	482	0	0	0
N.S.	1	1.00	0.78	2.05	0.00	4.55	0.00	0.00	0.00
time (sec)	N/A	0.088	0.131	3.013	0.000	0.115	0.000	0.000	0.000

Problem 535	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	176	176	402	376	0	0	0	0	0
N.S.	1	1.00	2.28	2.14	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.531	3.773	4.447	0.000	0.000	0.000	0.000	0.000

Problem 536	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	277	277	441	898	0	0	0	0	0
N.S.	1	1.00	1.59	3.24	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.221	2.700	6.441	0.000	0.000	0.000	0.000	0.000

Problem 537	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	345	345	466	1546	0	0	0	0	0
N.S.	1	1.00	1.35	4.48	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.269	4.585	8.819	0.000	0.000	0.000	0.000	0.000

Problem 538	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	436	436	272	1688	0	1040	0	0	0
N.S.	1	1.00	0.62	3.87	0.00	2.39	0.00	0.00	0.00
time (sec)	N/A	0.972	1.525	12.064	0.000	0.206	0.000	0.000	0.000

Problem 539	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	345	345	237	1295	0	954	0	0	0
N.S.	1	1.00	0.69	3.75	0.00	2.77	0.00	0.00	0.00
time (sec)	N/A	0.659	1.254	10.288	0.000	0.178	0.000	0.000	0.000

Problem 540	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	281	281	188	911	0	867	0	0	0
N.S.	1	1.00	0.67	3.24	0.00	3.09	0.00	0.00	0.00
time (sec)	N/A	0.638	1.003	9.852	0.000	0.157	0.000	0.000	0.000

Problem 541	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	263	263	175	850	0	814	0	0	0
N.S.	1	1.00	0.67	3.23	0.00	3.10	0.00	0.00	0.00
time (sec)	N/A	0.536	0.919	8.480	0.000	0.120	0.000	0.000	0.000

Problem 542	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	243	243	154	746	0	765	0	0	0
N.S.	1	1.00	0.63	3.07	0.00	3.15	0.00	0.00	0.00
time (sec)	N/A	0.320	0.770	7.803	0.000	0.122	0.000	0.000	0.000

Problem 543	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	221	221	158	489	0	692	0	0	0
N.S.	1	1.00	0.71	2.21	0.00	3.13	0.00	0.00	0.00
time (sec)	N/A	0.270	0.609	5.956	0.000	0.120	0.000	0.000	0.000

Problem 544	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	320	320	464	849	0	0	0	0	0
N.S.	1	1.00	1.45	2.65	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.988	3.231	9.017	0.000	0.000	0.000	0.000	0.000

Problem 545	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	380	380	517	1324	0	0	0	0	0
N.S.	1	1.00	1.36	3.48	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.291	5.220	12.070	0.000	0.000	0.000	0.000	0.000

Problem 546	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	282	282	189	616	0	985	0	0	0
N.S.	1	1.00	0.67	2.18	0.00	3.49	0.00	0.00	0.00
time (sec)	N/A	0.444	0.923	7.513	0.000	0.166	0.000	0.000	0.000

Problem 547	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	111	111	81	231	0	136	0	0	0
N.S.	1	1.00	0.73	2.08	0.00	1.23	0.00	0.00	0.00
time (sec)	N/A	0.247	0.254	3.845	0.000	0.099	0.000	0.000	0.000

Problem 548	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	78	78	70	231	0	128	0	0	78
N.S.	1	1.00	0.90	2.96	0.00	1.64	0.00	0.00	1.00
time (sec)	N/A	0.150	0.154	2.600	0.000	0.098	0.000	0.000	0.092

Problem 549	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	51	51	43	155	0	108	0	0	54
N.S.	1	1.00	0.84	3.04	0.00	2.12	0.00	0.00	1.06
time (sec)	N/A	0.075	0.101	2.286	0.000	0.097	0.000	0.000	14.495

Problem 550	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	C	F	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	23	23	23	23	0	54	0	0	39
N.S.	1	1.00	1.00	1.00	0.00	2.35	0.00	0.00	1.70
time (sec)	N/A	0.016	0.048	0.440	0.000	0.086	0.000	0.000	14.816

Problem 551	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	24	24	24	138	0	0	0	0	0
N.S.	1	1.00	1.00	5.75	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.061	0.107	1.839	0.000	0.000	0.000	0.000	0.000

Problem 552	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	101	101	158	350	0	0	0	0	0
N.S.	1	1.00	1.56	3.47	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.428	0.786	2.526	0.000	0.000	0.000	0.000	0.000

Problem 553	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	137	137	195	408	0	0	0	0	0
N.S.	1	1.00	1.42	2.98	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.455	0.890	3.092	0.000	0.000	0.000	0.000	0.000

Problem 554	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	113	113	102	254	0	136	0	0	0
N.S.	1	1.00	0.90	2.25	0.00	1.20	0.00	0.00	0.00
time (sec)	N/A	0.168	0.254	4.359	0.000	0.097	0.000	0.000	0.000

Problem 555	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	80	80	94	232	0	128	0	0	78
N.S.	1	1.00	1.18	2.90	0.00	1.60	0.00	0.00	0.98
time (sec)	N/A	0.114	0.191	2.926	0.000	0.096	0.000	0.000	0.086

Problem 556	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	53	53	60	158	0	106	0	0	52
N.S.	1	1.00	1.13	2.98	0.00	2.00	0.00	0.00	0.98
time (sec)	N/A	0.059	0.109	2.282	0.000	0.091	0.000	0.000	15.075

Problem 557	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	C	F	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	24	24	44	54	0	52	0	0	39
N.S.	1	1.00	1.83	2.25	0.00	2.17	0.00	0.00	1.62
time (sec)	N/A	0.015	0.051	0.524	0.000	0.095	0.000	0.000	0.097

Problem 558	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	25	25	45	139	0	0	0	0	0
N.S.	1	1.00	1.80	5.56	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.042	0.126	1.745	0.000	0.000	0.000	0.000	0.000

Problem 559	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	104	104	179	351	0	0	0	0	0
N.S.	1	1.00	1.72	3.38	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.305	1.030	2.894	0.000	0.000	0.000	0.000	0.000

Problem 560	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	140	140	236	408	0	0	0	0	0
N.S.	1	1.00	1.69	2.91	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.481	1.302	3.447	0.000	0.000	0.000	0.000	0.000

Problem 561	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	111	111	77	290	0	148	0	0	87
N.S.	1	1.00	0.69	2.61	0.00	1.33	0.00	0.00	0.78
time (sec)	N/A	0.095	0.400	9.743	0.000	0.102	0.000	0.000	15.231

Problem 562	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	87	87	66	262	0	137	0	0	80
N.S.	1	1.00	0.76	3.01	0.00	1.57	0.00	0.00	0.92
time (sec)	N/A	0.081	0.192	7.898	0.000	0.098	0.000	0.000	15.098

Problem 563	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	61	61	53	229	0	125	0	0	53
N.S.	1	1.00	0.87	3.75	0.00	2.05	0.00	0.00	0.87
time (sec)	N/A	0.064	0.104	6.597	0.000	0.094	0.000	0.000	0.178

Problem 564	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	35	35	35	152	0	107	0	0	33
N.S.	1	1.00	1.00	4.34	0.00	3.06	0.00	0.00	0.94
time (sec)	N/A	0.046	0.078	3.369	0.000	0.093	0.000	0.000	0.232

Problem 565	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	57	51	150	0	156	0	0	60
N.S.	1	1.00	0.89	2.63	0.00	2.74	0.00	0.00	1.05
time (sec)	N/A	0.060	0.136	4.349	0.000	0.092	0.000	0.000	15.478

Problem 566	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	83	83	65	397	0	175	0	0	87
N.S.	1	1.00	0.78	4.78	0.00	2.11	0.00	0.00	1.05
time (sec)	N/A	0.069	0.306	6.824	0.000	0.101	0.000	0.000	15.617

Problem 567	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	111	111	95	502	0	188	0	0	87
N.S.	1	1.00	0.86	4.52	0.00	1.69	0.00	0.00	0.78
time (sec)	N/A	0.089	0.248	9.332	0.000	0.106	0.000	0.000	15.756

Problem 568	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	160	160	113	398	0	195	0	0	135
N.S.	1	1.00	0.71	2.49	0.00	1.22	0.00	0.00	0.84
time (sec)	N/A	0.143	0.797	17.908	0.000	0.109	0.000	0.000	15.230

Problem 569	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	135	98	362	0	180	0	0	128
N.S.	1	1.00	0.73	2.68	0.00	1.33	0.00	0.00	0.95
time (sec)	N/A	0.137	0.639	10.986	0.000	0.103	0.000	0.000	15.164

Problem 570	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	101	101	79	357	0	162	0	0	102
N.S.	1	1.00	0.78	3.53	0.00	1.60	0.00	0.00	1.01
time (sec)	N/A	0.115	0.402	9.503	0.000	0.099	0.000	0.000	15.364

Problem 571	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	72	72	64	283	0	147	0	0	76
N.S.	1	1.00	0.89	3.93	0.00	2.04	0.00	0.00	1.06
time (sec)	N/A	0.099	0.577	7.045	0.000	0.098	0.000	0.000	14.717

Problem 572	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	68	68	62	202	0	178	0	0	81
N.S.	1	1.00	0.91	2.97	0.00	2.62	0.00	0.00	1.19
time (sec)	N/A	0.109	0.438	6.907	0.000	0.100	0.000	0.000	15.294

Problem 573	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	95	95	73	420	0	198	0	0	108
N.S.	1	1.00	0.77	4.42	0.00	2.08	0.00	0.00	1.14
time (sec)	N/A	0.126	0.664	8.408	0.000	0.112	0.000	0.000	15.576

Problem 574	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	135	124	633	0	223	0	0	113
N.S.	1	1.00	0.92	4.69	0.00	1.65	0.00	0.00	0.84
time (sec)	N/A	0.134	0.503	11.749	0.000	0.105	0.000	0.000	15.457

Problem 575	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	194	194	137	470	0	227	0	0	178
N.S.	1	1.00	0.71	2.42	0.00	1.17	0.00	0.00	0.92
time (sec)	N/A	0.262	1.002	13.529	0.000	0.115	0.000	0.000	14.771

Problem 576	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	159	159	110	421	0	205	0	0	146
N.S.	1	1.00	0.69	2.65	0.00	1.29	0.00	0.00	0.92
time (sec)	N/A	0.232	0.777	12.034	0.000	0.113	0.000	0.000	14.575

Problem 577	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	116	116	84	412	0	185	0	0	125
N.S.	1	1.00	0.72	3.55	0.00	1.59	0.00	0.00	1.08
time (sec)	N/A	0.199	0.571	9.484	0.000	0.115	0.000	0.000	14.750

Problem 578	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	124	124	86	303	0	214	0	0	124
N.S.	1	1.00	0.69	2.44	0.00	1.73	0.00	0.00	1.00
time (sec)	N/A	0.217	0.601	8.831	0.000	0.103	0.000	0.000	15.140

Problem 579	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	120	120	85	558	0	222	0	0	128
N.S.	1	1.00	0.71	4.65	0.00	1.85	0.00	0.00	1.07
time (sec)	N/A	0.220	1.093	9.727	0.000	0.111	0.000	0.000	15.466

Problem 580	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	149	149	125	711	0	244	0	0	156
N.S.	1	1.00	0.84	4.77	0.00	1.64	0.00	0.00	1.05
time (sec)	N/A	0.236	0.936	12.050	0.000	0.107	0.000	0.000	15.553

Problem 581	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	194	194	177	820	0	270	0	0	147
N.S.	1	1.00	0.91	4.23	0.00	1.39	0.00	0.00	0.76
time (sec)	N/A	0.270	0.905	14.691	0.000	0.114	0.000	0.000	16.465

Problem 582	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	112	112	158	552	0	0	0	0	0
N.S.	1	1.00	1.41	4.93	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.404	11.380	5.135	0.000	0.000	0.000	0.000	0.000

Problem 583	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	75	75	81	227	0	0	0	0	0
N.S.	1	1.00	1.08	3.03	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.177	10.404	4.180	0.000	0.000	0.000	0.000	0.000

Problem 584	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	53	53	48	188	0	0	0	0	0
N.S.	1	1.00	0.91	3.55	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.117	0.158	2.918	0.000	0.000	0.000	0.000	0.000

Problem 585	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	29	29	29	150	0	0	0	0	0
N.S.	1	1.00	1.00	5.17	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.048	0.150	2.174	0.000	0.000	0.000	0.000	0.000

Problem 586	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	77	77	195	354	0	0	0	0	0
N.S.	1	1.00	2.53	4.60	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.258	1.959	3.900	0.000	0.000	0.000	0.000	0.000

Problem 587	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	128	128	210	425	0	0	0	0	0
N.S.	1	1.00	1.64	3.32	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.592	2.818	5.968	0.000	0.000	0.000	0.000	0.000

Problem 588	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	245	245	266	1070	0	0	0	0	0
N.S.	1	1.00	1.09	4.37	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.779	1.251	17.418	0.000	0.000	0.000	0.000	0.000

Problem 589	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	185	185	251	815	0	0	0	0	0
N.S.	1	1.00	1.36	4.41	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.528	1.238	17.084	0.000	0.000	0.000	0.000	0.000

Problem 590	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	163	163	194	794	0	0	0	0	0
N.S.	1	1.00	1.19	4.87	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.431	2.208	5.815	0.000	0.000	0.000	0.000	0.000

Problem 591	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	148	148	229	713	0	0	0	0	0
N.S.	1	1.00	1.55	4.82	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.423	2.605	5.603	0.000	0.000	0.000	0.000	0.000

Problem 592	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	157	157	238	612	0	0	0	0	0
N.S.	1	1.00	1.52	3.90	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.474	2.334	4.747	0.000	0.000	0.000	0.000	0.000

Problem 593	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	217	217	278	847	0	0	0	0	0
N.S.	1	1.00	1.28	3.90	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.760	1.784	6.607	0.000	0.000	0.000	0.000	0.000

Problem 594	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	281	281	294	981	0	0	0	0	0
N.S.	1	1.00	1.05	3.49	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.063	2.273	9.053	0.000	0.000	0.000	0.000	0.000

Problem 595	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	346	346	354	2194	0	0	0	0	0
N.S.	1	1.00	1.02	6.34	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.090	2.160	87.674	0.000	0.000	0.000	0.000	0.000

Problem 596	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	282	282	309	1935	0	0	0	0	0
N.S.	1	1.00	1.10	6.86	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.103	1.922	88.056	0.000	0.000	0.000	0.000	0.000

Problem 597	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	264	264	284	1914	0	0	0	0	0
N.S.	1	1.00	1.08	7.25	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.846	1.435	86.514	0.000	0.000	0.000	0.000	0.000

Problem 598	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	244	244	272	1836	0	0	0	0	0
N.S.	1	1.00	1.11	7.52	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.749	1.352	9.605	0.000	0.000	0.000	0.000	0.000

Problem 599	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	250	250	291	1736	0	0	0	0	0
N.S.	1	1.00	1.16	6.94	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.775	1.880	8.228	0.000	0.000	0.000	0.000	0.000

Problem 600	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	261	261	301	1176	0	0	0	0	0
N.S.	1	1.00	1.15	4.51	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.839	1.812	6.320	0.000	0.000	0.000	0.000	0.000

Problem 601	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-2)	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	328	328	334	1965	0	0	0	0	0
N.S.	1	1.00	1.02	5.99	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.150	2.658	11.478	0.000	0.000	0.000	0.000	0.000

Problem 602	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-1)	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	395	395	349	2101	0	0	0	0	0
N.S.	1	1.00	0.88	5.32	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.435	3.732	15.663	0.000	0.000	0.000	0.000	0.000

Problem 603	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	438	438	429	1688	0	0	0	0	0
N.S.	1	1.00	0.98	3.85	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.076	7.175	7.062	0.000	0.000	0.000	0.000	0.000

Problem 604	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	371	371	314	1085	0	0	0	0	0
N.S.	1	1.00	0.85	2.92	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.677	5.867	6.418	0.000	0.000	0.000	0.000	0.000

Problem 605	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	135	137	181	0	0	0	0	0
N.S.	1	1.00	1.01	1.34	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.082	1.233	8.260	0.000	0.000	0.000	0.000	0.000

Problem 606	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	229	229	203	770	0	0	0	0	0
N.S.	1	1.00	0.89	3.36	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.305	2.221	10.104	0.000	0.000	0.000	0.000	0.000

Problem 607	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	271	271	247	1179	0	0	0	0	0
N.S.	1	1.00	0.91	4.35	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.454	5.472	12.654	0.000	0.000	0.000	0.000	0.000

Problem 608	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	329	329	453	2105	0	0	0	0	0
N.S.	1	1.00	1.38	6.40	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.737	10.464	12.110	0.000	0.000	0.000	0.000	0.000

Problem 609	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	389	389	1304	2499	0	0	0	0	0
N.S.	1	1.00	3.35	6.42	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.046	6.333	16.384	0.000	0.000	0.000	0.000	0.000

Problem 610	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	508	508	1189	2311	0	0	0	0	0
N.S.	1	1.00	2.34	4.55	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.462	16.899	8.065	0.000	0.000	0.000	0.000	0.000

Problem 611	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	433	433	437	1946	0	0	0	0	0
N.S.	1	1.00	1.01	4.49	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.358	7.427	7.200	0.000	0.000	0.000	0.000	0.000

Problem 612	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	375	375	339	1363	0	0	0	0	0
N.S.	1	1.00	0.90	3.63	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.941	5.196	9.362	0.000	0.000	0.000	0.000	0.000

Problem 613	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	337	337	357	1016	0	0	0	0	0
N.S.	1	1.00	1.06	3.01	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.588	8.605	10.740	0.000	0.000	0.000	0.000	0.000

Problem 614	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	277	277	256	1450	0	0	0	0	0
N.S.	1	1.00	0.92	5.23	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.502	3.255	12.161	0.000	0.000	0.000	0.000	0.000

Problem 615	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	325	325	399	2104	0	0	0	0	0
N.S.	1	1.00	1.23	6.47	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.782	9.805	13.863	0.000	0.000	0.000	0.000	0.000

Problem 616	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	387	387	1302	2499	0	0	0	0	0
N.S.	1	1.00	3.36	6.46	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.097	6.331	15.871	0.000	0.000	0.000	0.000	0.000

Problem 617	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	454	454	1368	3454	0	0	0	0	0
N.S.	1	1.00	3.01	7.61	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.474	6.431	18.996	0.000	0.000	0.000	0.000	0.000

Problem 618	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	506	506	1203	2568	0	0	0	0	0
N.S.	1	1.00	2.38	5.08	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.514	16.788	8.334	0.000	0.000	0.000	0.000	0.000

Problem 619	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	443	443	329	2232	0	0	0	0	0
N.S.	1	1.00	0.74	5.04	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.170	4.361	10.170	0.000	0.000	0.000	0.000	0.000

Problem 620	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	445	445	462	2508	0	0	0	0	0
N.S.	1	1.00	1.04	5.64	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.199	11.992	10.914	0.000	0.000	0.000	0.000	0.000

Problem 621	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	392	392	328	2211	0	0	0	0	0
N.S.	1	1.00	0.84	5.64	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.831	4.624	12.265	0.000	0.000	0.000	0.000	0.000

Problem 622	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	338	338	386	2373	0	0	0	0	0
N.S.	1	1.00	1.14	7.02	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.843	7.799	14.093	0.000	0.000	0.000	0.000	0.000

Problem 623	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	387	387	1302	2499	0	0	0	0	0
N.S.	1	1.00	3.36	6.46	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.625	6.365	16.335	0.000	0.000	0.000	0.000	0.000

Problem 624	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	454	454	1368	3454	0	0	0	0	0
N.S.	1	1.00	3.01	7.61	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.554	6.479	18.321	0.000	0.000	0.000	0.000	0.000

Problem 625	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	522	522	1431	3891	0	0	0	0	0
N.S.	1	1.00	2.74	7.45	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.988	6.572	21.011	0.000	0.000	0.000	0.000	0.000

Problem 626	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	379	414	224	834	0	0	0	0	0
N.S.	1	1.09	0.59	2.20	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.900	4.084	8.934	0.000	0.000	0.000	0.000	0.000

Problem 627	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	116	116	130	145	0	0	0	0	0
N.S.	1	1.00	1.12	1.25	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.078	0.918	7.706	0.000	0.000	0.000	0.000	0.000

Problem 628	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	109	109	170	111	0	0	0	0	0
N.S.	1	1.00	1.56	1.02	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.080	1.236	8.486	0.000	0.000	0.000	0.000	0.000

Problem 629	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	224	224	211	658	0	0	0	0	0
N.S.	1	1.00	0.94	2.94	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.260	3.953	11.278	0.000	0.000	0.000	0.000	0.000

Problem 630	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	274	274	339	1184	0	0	0	0	0
N.S.	1	1.00	1.24	4.32	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.471	9.646	13.138	0.000	0.000	0.000	0.000	0.000

Problem 631	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	465	465	1201	2526	0	0	0	0	0
N.S.	1	1.00	2.58	5.43	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.150	6.337	9.310	0.000	0.000	0.000	0.000	0.000

Problem 632	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	387	387	282	1036	0	0	0	0	0
N.S.	1	1.00	0.73	2.68	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.608	9.194	9.773	0.000	0.000	0.000	0.000	0.000

Problem 633	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	266	266	196	783	0	0	0	0	0
N.S.	1	1.00	0.74	2.94	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.401	3.647	6.676	0.000	0.000	0.000	0.000	0.000

Problem 634	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	267	267	202	750	0	0	0	0	0
N.S.	1	1.00	0.76	2.81	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.468	4.254	10.474	0.000	0.000	0.000	0.000	0.000

Problem 635	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	285	285	1233	1228	0	0	0	0	0
N.S.	1	1.00	4.33	4.31	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.554	6.355	12.915	0.000	0.000	0.000	0.000	0.000

Problem 636	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	357	357	1269	2618	0	0	0	0	0
N.S.	1	1.00	3.55	7.33	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.844	6.360	14.293	0.000	0.000	0.000	0.000	0.000

Problem 637	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	433	433	1314	3372	0	0	0	0	0
N.S.	1	1.00	3.03	7.79	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.241	6.418	16.783	0.000	0.000	0.000	0.000	0.000

Problem 638	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	No	No	TBD	TBD	TBD	TBD	TBD
size	497	497	1282	4445	0	0	0	0	0
N.S.	1	1.00	2.58	8.94	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.221	6.369	9.722	0.000	0.000	0.000	0.000	0.000

Problem 639	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	342	342	277	2129	0	0	0	0	0
N.S.	1	1.00	0.81	6.23	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.694	4.267	9.306	0.000	0.000	0.000	0.000	0.000

Problem 640	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	359	359	1273	2614	0	0	0	0	0
N.S.	1	1.00	3.55	7.28	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.761	6.330	8.029	0.000	0.000	0.000	0.000	0.000

Problem 641	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	381	381	1296	2841	0	0	0	0	0
N.S.	1	1.00	3.40	7.46	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.833	6.292	11.185	0.000	0.000	0.000	0.000	0.000

Problem 642	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	398	398	1321	3675	0	0	0	0	0
N.S.	1	1.00	3.32	9.23	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.905	6.404	13.490	0.000	0.000	0.000	0.000	0.000

Problem 643	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	473	473	1351	5224	0	0	0	0	0
N.S.	1	1.00	2.86	11.04	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.311	6.444	15.914	0.000	0.000	0.000	0.000	0.000

Problem 644	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	32	32	131	103	0	0	0	0	0
N.S.	1	1.00	4.09	3.22	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.064	9.556	7.877	0.000	0.000	0.000	0.000	0.000

Problem 645	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	25	25	156	95	0	0	0	0	0
N.S.	1	1.00	6.24	3.80	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.056	0.752	6.780	0.000	0.000	0.000	0.000	0.000

Problem 646	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	56	56	143	107	0	0	0	0	0
N.S.	1	1.00	2.55	1.91	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.128	1.714	7.702	0.000	0.000	0.000	0.000	0.000

Problem 647	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	49	49	72	121	0	0	0	0	0
N.S.	1	1.00	1.47	2.47	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.121	1.482	7.794	0.000	0.000	0.000	0.000	0.000

Problem 648	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	58	58	140	104	0	0	0	0	0
N.S.	1	1.00	2.41	1.79	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.062	1.164	7.247	0.000	0.000	0.000	0.000	0.000

Problem 649	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	60	60	144	113	0	0	0	0	0
N.S.	1	1.00	2.40	1.88	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.082	1.436	7.540	0.000	0.000	0.000	0.000	0.000

Problem 650	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	84	84	144	112	0	0	0	0	0
N.S.	1	1.00	1.71	1.33	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.149	1.039	7.300	0.000	0.000	0.000	0.000	0.000

Problem 651	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	82	82	153	126	0	0	0	0	0
N.S.	1	1.00	1.87	1.54	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.141	1.435	7.385	0.000	0.000	0.000	0.000	0.000

Problem 652	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	54	54	150	111	0	0	0	0	0
N.S.	1	1.00	2.78	2.06	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.120	0.459	7.248	0.000	0.000	0.000	0.000	0.000

Problem 653	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	47	47	158	97	0	0	0	0	0
N.S.	1	1.00	3.36	2.06	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.127	0.359	6.589	0.000	0.000	0.000	0.000	0.000

Problem 654	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	34	34	145	109	0	0	0	0	0
N.S.	1	1.00	4.26	3.21	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.070	0.517	6.040	0.000	0.000	0.000	0.000	0.000

Problem 655	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	27	27	74	117	0	0	0	0	0
N.S.	1	1.00	2.74	4.33	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.067	0.205	6.842	0.000	0.000	0.000	0.000	0.000

Problem 656	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	80	80	154	116	0	0	0	0	0
N.S.	1	1.00	1.92	1.45	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.120	0.537	7.545	0.000	0.000	0.000	0.000	0.000

Problem 657	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	82	82	146	106	0	0	0	0	0
N.S.	1	1.00	1.78	1.29	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.119	0.456	6.398	0.000	0.000	0.000	0.000	0.000

Problem 658	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	62	62	160	96	0	0	0	0	0
N.S.	1	1.00	2.58	1.55	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.061	0.565	4.673	0.000	0.000	0.000	0.000	0.000

Problem 659	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	60	60	155	118	0	0	0	0	0
N.S.	1	1.00	2.58	1.97	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.072	0.436	6.838	0.000	0.000	0.000	0.000	0.000

Problem 660	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	77	77	175	128	0	0	0	0	0
N.S.	1	1.00	2.27	1.66	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.054	12.626	6.267	0.000	0.000	0.000	0.000	0.000

Problem 661	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	75	75	140	118	0	0	0	0	0
N.S.	1	1.00	1.87	1.57	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.070	0.719	5.674	0.000	0.000	0.000	0.000	0.000

Problem 662	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	99	99	201	130	0	0	0	0	0
N.S.	1	1.00	2.03	1.31	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.135	1.623	6.706	0.000	0.000	0.000	0.000	0.000

Problem 663	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	101	101	155	149	0	0	0	0	0
N.S.	1	1.00	1.53	1.48	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.133	1.498	6.592	0.000	0.000	0.000	0.000	0.000

Problem 664	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	73	73	128	130	0	0	0	0	0
N.S.	1	1.00	1.75	1.78	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.056	1.070	6.726	0.000	0.000	0.000	0.000	0.000

Problem 665	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	75	75	128	140	0	0	0	0	0
N.S.	1	1.00	1.71	1.87	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.069	0.747	5.622	0.000	0.000	0.000	0.000	0.000

Problem 666	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	99	99	135	144	0	0	0	0	0
N.S.	1	1.00	1.36	1.45	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.147	0.825	7.061	0.000	0.000	0.000	0.000	0.000

Problem 667	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	97	97	126	158	0	0	0	0	0
N.S.	1	1.00	1.30	1.63	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.171	0.659	6.820	0.000	0.000	0.000	0.000	0.000

Problem 668	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	99	99	194	139	0	0	0	0	0
N.S.	1	1.00	1.96	1.40	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.186	0.624	6.914	0.000	0.000	0.000	0.000	0.000

Problem 669	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	97	97	142	120	0	0	0	0	0
N.S.	1	1.00	1.46	1.24	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.184	0.226	6.783	0.000	0.000	0.000	0.000	0.000

Problem 670	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	77	77	203	132	0	0	0	0	0
N.S.	1	1.00	2.64	1.71	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.103	0.737	5.402	0.000	0.000	0.000	0.000	0.000

Problem 671	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	79	79	156	142	0	0	0	0	0
N.S.	1	1.00	1.97	1.80	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.095	0.421	6.503	0.000	0.000	0.000	0.000	0.000

Problem 672	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	95	95	130	148	0	0	0	0	0
N.S.	1	1.00	1.37	1.56	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.178	0.386	6.620	0.000	0.000	0.000	0.000	0.000

Problem 673	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	97	97	130	160	0	0	0	0	0
N.S.	1	1.00	1.34	1.65	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.213	0.237	7.030	0.000	0.000	0.000	0.000	0.000

Problem 674	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	77	77	140	129	0	0	0	0	0
N.S.	1	1.00	1.82	1.68	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.077	0.180	6.322	0.000	0.000	0.000	0.000	0.000

Problem 675	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	75	75	128	144	0	0	0	0	0
N.S.	1	1.00	1.71	1.92	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.065	0.337	5.941	0.000	0.000	0.000	0.000	0.000

Problem 676	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD
size	176	176	4614	0	0	0	0	0	0
N.S.	1	1.00	26.22	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.247	34.420	0.000	0.000	0.000	0.000	0.000	0.000

Problem 677	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD
size	176	176	4613	0	0	0	0	0	0
N.S.	1	1.00	26.21	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.244	34.326	0.000	0.000	0.000	0.000	0.000	0.000

Problem 678	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD
size	176	176	4605	0	0	0	0	0	0
N.S.	1	1.00	26.16	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.245	34.377	0.000	0.000	0.000	0.000	0.000	0.000

Problem 679	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD
size	176	176	4608	0	0	0	0	0	0
N.S.	1	1.00	26.18	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.222	34.392	0.000	0.000	0.000	0.000	0.000	0.000

Problem 680	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	F(-1)	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	21	23	23	0	23	23
N.S.	1	1.00	1.08	0.84	0.92	0.92	0.00	0.92	0.92
time (sec)	N/A	0.064	122.063	0.694	1.341	0.805	0.000	22.414	16.167

Problem 681	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	F(-1)	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	21	23	23	0	23	23
N.S.	1	1.00	1.08	0.84	0.92	0.92	0.00	0.92	0.92
time (sec)	N/A	0.062	55.730	0.502	0.821	1.055	0.000	23.568	15.362

Problem 682	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	21	23	23	24	23	23
N.S.	1	1.00	1.08	0.84	0.92	0.92	0.96	0.92	0.92
time (sec)	N/A	0.064	33.042	0.579	0.790	0.768	102.892	20.086	15.245

Problem 683	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	21	23	23	24	23	23
N.S.	1	1.00	1.08	0.84	0.92	0.92	0.96	0.92	0.92
time (sec)	N/A	0.064	24.782	0.559	0.788	0.992	2.462	18.687	15.243

Problem 684	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	21	23	23	24	23	23
N.S.	1	1.00	1.08	0.84	0.92	0.92	0.96	0.92	0.92
time (sec)	N/A	0.062	15.107	0.620	0.775	0.505	1.003	18.064	15.896

Problem 685	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	21	23	44	26	23	23
N.S.	1	1.00	1.08	0.84	0.92	1.76	1.04	0.92	0.92
time (sec)	N/A	0.062	13.959	0.694	0.807	0.372	0.559	19.508	16.235

Problem 686	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	21	23	44	26	23	23
N.S.	1	1.00	1.08	0.84	0.92	1.76	1.04	0.92	0.92
time (sec)	N/A	0.066	0.320	0.578	0.804	0.348	1.263	19.047	14.698

Problem 687	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	21	23	46	26	23	23
N.S.	1	1.00	1.08	0.84	0.92	1.84	1.04	0.92	0.92
time (sec)	N/A	0.063	101.449	0.540	0.834	0.344	9.844	20.043	16.782

Problem 688	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	21	23	46	26	23	23
N.S.	1	1.00	1.08	0.84	0.92	1.84	1.04	0.92	0.92
time (sec)	N/A	0.065	83.833	0.573	0.822	0.321	23.652	19.521	14.684

Problem 689	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	F(-1)	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	21	23	46	0	23	23
N.S.	1	1.00	1.08	0.84	0.92	1.84	0.00	0.92	0.92
time (sec)	N/A	0.065	103.350	0.431	0.827	0.373	0.000	19.321	16.491

Problem 690	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	151	151	97	502	0	188	0	0	0
N.S.	1	1.00	0.64	3.32	0.00	1.25	0.00	0.00	0.00
time (sec)	N/A	0.136	0.397	22.510	0.000	0.098	0.000	0.000	0.000

Problem 691	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	123	123	85	397	0	167	0	0	0
N.S.	1	1.00	0.69	3.23	0.00	1.36	0.00	0.00	0.00
time (sec)	N/A	0.123	0.276	20.420	0.000	0.094	0.000	0.000	0.000

Problem 692	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	97	97	71	150	0	124	0	0	0
N.S.	1	1.00	0.73	1.55	0.00	1.28	0.00	0.00	0.00
time (sec)	N/A	0.111	0.201	5.717	0.000	0.088	0.000	0.000	0.000

Problem 693	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	75	75	52	152	0	107	0	0	0
N.S.	1	1.00	0.69	2.03	0.00	1.43	0.00	0.00	0.00
time (sec)	N/A	0.096	0.231	4.858	0.000	0.094	0.000	0.000	0.000

Problem 694	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	101	101	76	229	0	125	0	0	0
N.S.	1	1.00	0.75	2.27	0.00	1.24	0.00	0.00	0.00
time (sec)	N/A	0.108	0.246	7.762	0.000	0.099	0.000	0.000	0.000

Problem 695	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	127	127	88	262	0	145	0	0	0
N.S.	1	1.00	0.69	2.06	0.00	1.14	0.00	0.00	0.00
time (sec)	N/A	0.126	0.393	8.597	0.000	0.098	0.000	0.000	0.000

Problem 696	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	151	151	99	290	0	156	0	0	0
N.S.	1	1.00	0.66	1.92	0.00	1.03	0.00	0.00	0.00
time (sec)	N/A	0.153	0.561	9.770	0.000	0.105	0.000	0.000	0.000

Problem 697	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	200	200	139	689	0	235	0	0	0
N.S.	1	1.00	0.70	3.44	0.00	1.18	0.00	0.00	0.00
time (sec)	N/A	0.224	0.931	112.041	0.000	0.108	0.000	0.000	0.000

Problem 698	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	175	175	126	633	0	223	0	0	0
N.S.	1	1.00	0.72	3.62	0.00	1.27	0.00	0.00	0.00
time (sec)	N/A	0.219	1.185	111.078	0.000	0.098	0.000	0.000	0.000

Problem 699	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	135	93	513	0	190	0	0	0
N.S.	1	1.00	0.69	3.80	0.00	1.41	0.00	0.00	0.00
time (sec)	N/A	0.168	0.490	106.691	0.000	0.101	0.000	0.000	0.000

Problem 700	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	108	108	83	202	0	146	0	0	0
N.S.	1	1.00	0.77	1.87	0.00	1.35	0.00	0.00	0.00
time (sec)	N/A	0.161	0.747	8.490	0.000	0.094	0.000	0.000	0.000

Problem 701	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	112	112	87	283	0	147	0	0	0
N.S.	1	1.00	0.78	2.53	0.00	1.31	0.00	0.00	0.00
time (sec)	N/A	0.168	0.618	8.316	0.000	0.094	0.000	0.000	0.000

Problem 702	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	141	141	100	357	0	170	0	0	0
N.S.	1	1.00	0.71	2.53	0.00	1.21	0.00	0.00	0.00
time (sec)	N/A	0.186	0.852	10.214	0.000	0.096	0.000	0.000	0.000

Problem 703	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	175	175	120	362	0	191	0	0	0
N.S.	1	1.00	0.69	2.07	0.00	1.09	0.00	0.00	0.00
time (sec)	N/A	0.196	1.079	12.079	0.000	0.100	0.000	0.000	0.000

Problem 704	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	200	200	135	398	0	203	0	0	0
N.S.	1	1.00	0.68	1.99	0.00	1.02	0.00	0.00	0.00
time (sec)	N/A	0.216	1.437	13.890	0.000	0.105	0.000	0.000	0.000

Problem 705	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	234	234	191	820	0	270	0	0	0
N.S.	1	1.00	0.82	3.50	0.00	1.15	0.00	0.00	0.00
time (sec)	N/A	0.310	1.248	506.964	0.000	0.109	0.000	0.000	0.000

Problem 706	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	189	189	134	711	0	244	0	0	0
N.S.	1	1.00	0.71	3.76	0.00	1.29	0.00	0.00	0.00
time (sec)	N/A	0.272	1.377	482.095	0.000	0.115	0.000	0.000	0.000

Problem 707	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	160	160	106	630	0	214	0	0	0
N.S.	1	1.00	0.66	3.94	0.00	1.34	0.00	0.00	0.00
time (sec)	N/A	0.263	1.012	483.020	0.000	0.103	0.000	0.000	0.000

Problem 708	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	166	166	108	303	0	182	0	0	0
N.S.	1	1.00	0.65	1.83	0.00	1.10	0.00	0.00	0.00
time (sec)	N/A	0.268	0.906	8.457	0.000	0.104	0.000	0.000	0.000

Problem 709	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	156	156	106	412	0	193	0	0	0
N.S.	1	1.00	0.68	2.64	0.00	1.24	0.00	0.00	0.00
time (sec)	N/A	0.260	0.816	9.709	0.000	0.108	0.000	0.000	0.000

Problem 710	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	199	199	132	421	0	216	0	0	0
N.S.	1	1.00	0.66	2.12	0.00	1.09	0.00	0.00	0.00
time (sec)	N/A	0.286	1.228	11.241	0.000	0.113	0.000	0.000	0.000

Problem 711	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	234	234	159	470	0	238	0	0	0
N.S.	1	1.00	0.68	2.01	0.00	1.02	0.00	0.00	0.00
time (sec)	N/A	0.324	1.532	13.290	0.000	0.115	0.000	0.000	0.000

Problem 712	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	188	188	165	425	0	0	0	0	0
N.S.	1	1.00	0.88	2.26	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.607	35.183	11.163	0.000	0.000	0.000	0.000	0.000

Problem 713	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	117	117	83	354	0	0	0	0	0
N.S.	1	1.00	0.71	3.03	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.249	14.833	3.503	0.000	0.000	0.000	0.000	0.000

Problem 714	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	49	49	63	150	0	0	0	0	0
N.S.	1	1.00	1.29	3.06	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.158	0.277	1.816	0.000	0.000	0.000	0.000	0.000

Problem 715	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	93	93	47	188	0	0	0	0	0
N.S.	1	1.00	0.51	2.02	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.215	0.240	2.500	0.000	0.000	0.000	0.000	0.000

Problem 716	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	135	176	227	0	0	0	0	0
N.S.	1	1.00	1.30	1.68	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.286	19.526	3.782	0.000	0.000	0.000	0.000	0.000

Problem 717	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	172	172	196	552	0	0	0	0	0
N.S.	1	1.00	1.14	3.21	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.449	21.422	3.933	0.000	0.000	0.000	0.000	0.000

Problem 718	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	341	341	294	981	0	0	0	0	0
N.S.	1	1.00	0.86	2.88	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.102	4.854	37.465	0.000	0.000	0.000	0.000	0.000

Problem 719	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	277	277	351	847	0	0	0	0	0
N.S.	1	1.00	1.27	3.06	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.748	2.777	5.975	0.000	0.000	0.000	0.000	0.000

Problem 720	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	217	217	297	612	0	0	0	0	0
N.S.	1	1.00	1.37	2.82	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.473	5.340	4.028	0.000	0.000	0.000	0.000	0.000

Problem 721	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	208	208	574	713	0	0	0	0	0
N.S.	1	1.00	2.76	3.43	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.509	6.408	5.332	0.000	0.000	0.000	0.000	0.000

Problem 722	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	223	223	250	794	0	0	0	0	0
N.S.	1	1.00	1.12	3.56	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.599	3.403	5.528	0.000	0.000	0.000	0.000	0.000

Problem 723	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	245	245	319	815	0	0	0	0	0
N.S.	1	1.00	1.30	3.33	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.600	3.830	6.506	0.000	0.000	0.000	0.000	0.000

Problem 724	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-1)	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	455	455	747	2101	0	0	0	0	0
N.S.	1	1.00	1.64	4.62	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.526	6.599	160.230	0.000	0.000	0.000	0.000	0.000

Problem 725	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-1)	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	388	388	532	1965	0	0	0	0	0
N.S.	1	1.00	1.37	5.06	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.153	6.049	10.030	0.000	0.000	0.000	0.000	0.000

Problem 726	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	321	321	341	1176	0	0	0	0	0
N.S.	1	1.00	1.06	3.66	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.840	5.355	5.524	0.000	0.000	0.000	0.000	0.000

Problem 727	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	317	317	395	1736	0	0	0	0	0
N.S.	1	1.00	1.25	5.48	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.815	3.709	8.232	0.000	0.000	0.000	0.000	0.000

Problem 728	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	302	302	429	1836	0	0	0	0	0
N.S.	1	1.00	1.42	6.08	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.763	4.998	8.523	0.000	0.000	0.000	0.000	0.000

Problem 729	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	319	319	280	1914	0	0	0	0	0
N.S.	1	1.00	0.88	6.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.803	3.554	9.079	0.000	0.000	0.000	0.000	0.000

Problem 730	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	369	369	353	2115	0	0	0	0	0
N.S.	1	1.00	0.96	5.73	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.872	23.410	10.359	0.000	0.000	0.000	0.000	0.000

Problem 731	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	311	311	261	1201	0	0	0	0	0
N.S.	1	1.00	0.84	3.86	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.565	14.474	11.341	0.000	0.000	0.000	0.000	0.000

Problem 732	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	269	269	215	770	0	0	0	0	0
N.S.	1	1.00	0.80	2.86	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.458	4.531	9.088	0.000	0.000	0.000	0.000	0.000

Problem 733	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	155	155	146	181	0	0	0	0	0
N.S.	1	1.00	0.94	1.17	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.204	1.510	8.205	0.000	0.000	0.000	0.000	0.000

Problem 734	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	431	431	2995	1069	0	0	0	0	0
N.S.	1	1.00	6.95	2.48	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.048	19.003	6.164	0.000	0.000	0.000	0.000	0.000

Problem 735	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	498	498	837	1655	0	0	0	0	0
N.S.	1	1.00	1.68	3.32	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.205	15.953	7.518	0.000	0.000	0.000	0.000	0.000

Problem 736	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	427	427	441	2509	0	0	0	0	0
N.S.	1	1.00	1.03	5.88	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.193	11.054	15.277	0.000	0.000	0.000	0.000	0.000

Problem 737	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	365	365	345	2114	0	0	0	0	0
N.S.	1	1.00	0.95	5.79	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.874	8.106	13.080	0.000	0.000	0.000	0.000	0.000

Problem 738	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	317	317	291	1469	0	0	0	0	0
N.S.	1	1.00	0.92	4.63	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.642	4.896	11.981	0.000	0.000	0.000	0.000	0.000

Problem 739	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	397	397	639	1016	0	0	0	0	0
N.S.	1	1.00	1.61	2.56	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.687	15.736	10.266	0.000	0.000	0.000	0.000	0.000

Problem 740	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	435	435	322	1362	0	0	0	0	0
N.S.	1	1.00	0.74	3.13	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.849	9.097	8.994	0.000	0.000	0.000	0.000	0.000

Problem 741	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	493	493	845	1916	0	0	0	0	0
N.S.	1	1.00	1.71	3.89	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.472	15.845	7.583	0.000	0.000	0.000	0.000	0.000

Problem 742	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	568	568	961	2265	0	0	0	0	0
N.S.	1	1.00	1.69	3.99	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.573	14.804	8.304	0.000	0.000	0.000	0.000	0.000

Problem 743	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	494	494	521	3464	0	0	0	0	0
N.S.	1	1.00	1.05	7.01	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.769	12.638	1052.186	0.000	0.000	0.000	0.000	0.000

Problem 744	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	427	427	387	2509	0	0	0	0	0
N.S.	1	1.00	0.91	5.88	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.279	9.851	1590.088	0.000	0.000	0.000	0.000	0.000

Problem 745	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	378	378	376	2383	0	0	0	0	0
N.S.	1	1.00	0.99	6.30	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.366	9.551	1036.659	0.000	0.000	0.000	0.000	0.000

Problem 746	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	452	452	377	2211	0	0	0	0	0
N.S.	1	1.00	0.83	4.89	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.967	9.618	1044.133	0.000	0.000	0.000	0.000	0.000

Problem 747	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	505	505	421	2508	0	0	0	0	0
N.S.	1	1.00	0.83	4.97	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.587	11.190	10.072	0.000	0.000	0.000	0.000	0.000

Problem 748	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	503	503	421	2232	0	0	0	0	0
N.S.	1	1.00	0.84	4.44	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.253	8.072	9.309	0.000	0.000	0.000	0.000	0.000

Problem 749	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	566	566	970	2526	0	0	0	0	0
N.S.	1	1.00	1.71	4.46	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.705	14.793	9.098	0.000	0.000	0.000	0.000	0.000

Problem 750	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	638	638	1226	3159	0	0	0	0	0
N.S.	1	1.00	1.92	4.95	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	2.267	13.883	10.007	0.000	0.000	0.000	0.000	0.000

Problem 751	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	314	314	322	1202	0	0	0	0	0
N.S.	1	1.00	1.03	3.83	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.566	10.703	12.187	0.000	0.000	0.000	0.000	0.000

Problem 752	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	264	264	296	658	0	0	0	0	0
N.S.	1	1.00	1.12	2.49	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.391	11.238	10.203	0.000	0.000	0.000	0.000	0.000

Problem 753	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	129	129	103	111	0	0	0	0	0
N.S.	1	1.00	0.80	0.86	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.155	0.813	7.814	0.000	0.000	0.000	0.000	0.000

Problem 754	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	136	136	146	137	0	0	0	0	0
N.S.	1	1.00	1.07	1.01	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.170	1.714	7.100	0.000	0.000	0.000	0.000	0.000

Problem 755	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	474	474	235	820	0	0	0	0	0
N.S.	1	1.00	0.50	1.73	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.971	5.159	7.859	0.000	0.000	0.000	0.000	0.000

Problem 756	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	505	505	678	1689	0	0	0	0	0
N.S.	1	1.00	1.34	3.34	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.156	12.713	8.534	0.000	0.000	0.000	0.000	0.000

Problem 757	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	No	No	TBD	TBD	TBD	TBD	TBD
size	397	397	440	2618	0	0	0	0	0
N.S.	1	1.00	1.11	6.59	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.969	11.415	12.458	0.000	0.000	0.000	0.000	0.000

Problem 758	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	325	325	369	1228	0	0	0	0	0
N.S.	1	1.00	1.14	3.78	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.672	7.424	11.515	0.000	0.000	0.000	0.000	0.000

Problem 759	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	307	307	237	750	0	0	0	0	0
N.S.	1	1.00	0.77	2.44	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.552	6.229	9.047	0.000	0.000	0.000	0.000	0.000

Problem 760	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	306	306	235	783	0	0	0	0	0
N.S.	1	1.00	0.77	2.56	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.498	2.619	6.090	0.000	0.000	0.000	0.000	0.000

Problem 761	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	447	447	893	1036	0	0	0	0	0
N.S.	1	1.00	2.00	2.32	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.740	15.624	8.918	0.000	0.000	0.000	0.000	0.000

Problem 762	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	525	525	1025	2526	0	0	0	0	0
N.S.	1	1.00	1.95	4.81	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.275	13.206	8.872	0.000	0.000	0.000	0.000	0.000

Problem 763	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	No	No	TBD	TBD	TBD	TBD	TBD
size	513	513	546	5849	0	0	0	0	0
N.S.	1	1.00	1.06	11.40	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.458	13.243	13.994	0.000	0.000	0.000	0.000	0.000

Problem 764	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	No	No	TBD	TBD	TBD	TBD	TBD
size	438	438	525	3675	0	0	0	0	0
N.S.	1	1.00	1.20	8.39	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.059	12.965	11.878	0.000	0.000	0.000	0.000	0.000

Problem 765	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	No	No	TBD	TBD	TBD	TBD	TBD
size	421	421	471	2841	0	0	0	0	0
N.S.	1	1.00	1.12	6.75	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.002	11.201	9.684	0.000	0.000	0.000	0.000	0.000

Problem 766	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	No	No	TBD	TBD	TBD	TBD	TBD
size	399	399	455	2614	0	0	0	0	0
N.S.	1	1.00	1.14	6.55	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.877	10.780	7.944	0.000	0.000	0.000	0.000	0.000

Problem 767	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	382	382	359	2129	0	0	0	0	0
N.S.	1	1.00	0.94	5.57	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.855	5.653	8.396	0.000	0.000	0.000	0.000	0.000

Problem 768	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	557	557	1335	4445	0	0	0	0	0
N.S.	1	1.00	2.40	7.98	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.403	12.430	9.520	0.000	0.000	0.000	0.000	0.000

Problem 769	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	330	330	242	0	0	0	0	0	0
N.S.	1	1.00	0.73	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.790	1.099	0.000	0.000	0.000	0.000	0.000	0.000

Problem 770	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	250	250	197	0	0	0	0	0	0
N.S.	1	1.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.383	0.545	0.000	0.000	0.000	0.000	0.000	0.000

Problem 771	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	179	179	168	0	0	0	0	0	0
N.S.	1	1.00	0.94	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.135	0.222	0.000	0.000	0.000	0.000	0.000	0.000

Problem 772	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	131	131	112	0	0	0	0	0	0
N.S.	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.070	0.108	0.000	0.000	0.000	0.000	0.000	0.000

Problem 773	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD
size	190	190	6534	0	0	0	0	0	0
N.S.	1	1.00	34.39	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.255	23.382	0.000	0.000	0.000	0.000	0.000	0.000

Problem 774	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD
size	294	294	7214	0	0	0	0	0	0
N.S.	1	1.00	24.54	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.413	28.598	0.000	0.000	0.000	0.000	0.000	0.000

Problem 775	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	282	282	222	0	0	0	0	0	0
N.S.	1	1.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.473	0.537	0.000	0.000	0.000	0.000	0.000	0.000

Problem 776	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	200	200	159	0	0	0	0	0	0
N.S.	1	1.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.243	0.217	0.000	0.000	0.000	0.000	0.000	0.000

Problem 777	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	143	143	107	0	0	0	0	0	0
N.S.	1	1.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.136	0.129	0.000	0.000	0.000	0.000	0.000	0.000

Problem 778	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F(-2)	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	26	26	47	65	0	30	0	71	0
N.S.	1	1.00	1.81	2.50	0.00	1.15	0.00	2.73	0.00
time (sec)	N/A	0.091	0.101	2.118	0.000	0.307	0.000	0.343	0.000

Problem 779	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	65	65	64	63	0	32	0	46	0
N.S.	1	1.00	0.98	0.97	0.00	0.49	0.00	0.71	0.00
time (sec)	N/A	0.114	0.098	1.268	0.000	0.321	0.000	0.336	0.000

Problem 780	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	37	37	29	26	45	24	87	30	25
N.S.	1	1.00	0.78	0.70	1.22	0.65	2.35	0.81	0.68
time (sec)	N/A	0.022	0.088	0.795	0.214	0.292	0.097	0.297	14.611

Problem 781	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	26	26	27	34	144	70	333	88	29
N.S.	1	1.00	1.04	1.31	5.54	2.69	12.81	3.38	1.12
time (sec)	N/A	0.034	0.496	3.221	0.222	0.312	0.344	0.324	14.500

Problem 782	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	28	28	28	29	143	27	114	1370	28
N.S.	1	1.00	1.00	1.04	5.11	0.96	4.07	48.93	1.00
time (sec)	N/A	0.050	0.807	5.983	0.449	0.308	1.694	7.946	14.649

Problem 783	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	B	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	26	26	27	30	115	56	80	47	33
N.S.	1	1.00	1.04	1.15	4.42	2.15	3.08	1.81	1.27
time (sec)	N/A	0.041	0.503	0.951	0.224	0.275	0.818	0.303	14.141

Problem 784	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	28	28	45	48	92	36	0	80	0
N.S.	1	1.00	1.61	1.71	3.29	1.29	0.00	2.86	0.00
time (sec)	N/A	0.051	0.075	2.315	0.376	0.274	0.000	0.321	0.000

Problem 785	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	26	26	33	43	19040	36	0	33	37
N.S.	1	1.00	1.27	1.65	732.31	1.38	0.00	1.27	1.42
time (sec)	N/A	0.019	0.028	2.096	0.603	0.286	0.000	0.304	14.710

Problem 786	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	B	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	28	28	28	48	0	68	0	48	85
N.S.	1	1.00	1.00	1.71	0.00	2.43	0.00	1.71	3.04
time (sec)	N/A	0.054	0.056	3.460	0.000	0.285	0.000	0.700	19.538

Problem 787	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	104	104	164	0	0	0	0	0	0
N.S.	1	1.00	1.58	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.105	0.557	0.000	0.000	0.000	0.000	0.000	0.000

Problem 788	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	102	102	304	0	0	0	0	0	0
N.S.	1	1.00	2.98	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.098	3.487	0.000	0.000	0.000	0.000	0.000	0.000

Problem 789	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	101	101	133	0	0	0	0	0	0
N.S.	1	1.00	1.32	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.096	0.383	0.000	0.000	0.000	0.000	0.000	0.000

Problem 790	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	105	105	254	0	0	0	0	0	0
N.S.	1	1.00	2.42	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.111	1.988	0.000	0.000	0.000	0.000	0.000	0.000

Problem 791	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	63	63	64	77	0	194	233	281	93
N.S.	1	1.00	1.02	1.22	0.00	3.08	3.70	4.46	1.48
time (sec)	N/A	0.119	0.148	0.902	0.000	0.301	17.197	0.305	14.595

Problem 792	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	22	22	22	23	0	22	0	50	37
N.S.	1	1.00	1.00	1.05	0.00	1.00	0.00	2.27	1.68
time (sec)	N/A	0.032	0.225	0.846	0.000	0.269	0.000	0.295	14.610

Problem 793	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	47	47	31	37	52	43	56	72	74
N.S.	1	1.00	0.66	0.79	1.11	0.91	1.19	1.53	1.57
time (sec)	N/A	0.079	0.084	1.019	0.287	0.293	1.041	0.287	14.308

Problem 794	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	58	58	58	171	0	359	0	0	56
N.S.	1	1.00	1.00	2.95	0.00	6.19	0.00	0.00	0.97
time (sec)	N/A	0.051	0.042	5.168	0.000	0.109	0.000	0.000	14.542

Problem 795	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	229	229	259	0	0	0	0	0	0
N.S.	1	1.00	1.13	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.261	1.523	0.000	0.000	0.000	0.000	0.000	0.000

Problem 796	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	229	229	253	0	0	0	0	0	0
N.S.	1	1.00	1.10	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.241	1.413	0.000	0.000	0.000	0.000	0.000	0.000

Problem 797	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	226	226	189	0	0	0	0	0	0
N.S.	1	1.00	0.84	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.299	0.461	0.000	0.000	0.000	0.000	0.000	0.000

Problem 798	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	226	226	188	0	0	0	0	0	0
N.S.	1	1.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.213	0.469	0.000	0.000	0.000	0.000	0.000	0.000

Problem 799	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	168	168	100	299	0	162	0	0	0
N.S.	1	1.00	0.60	1.78	0.00	0.96	0.00	0.00	0.00
time (sec)	N/A	0.187	0.696	8.566	0.000	0.110	0.000	0.000	0.000

Problem 800	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	139	139	91	271	0	151	0	0	0
N.S.	1	1.00	0.65	1.95	0.00	1.09	0.00	0.00	0.00
time (sec)	N/A	0.148	0.285	6.955	0.000	0.106	0.000	0.000	0.000

Problem 801	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	108	108	75	238	0	139	0	0	0
N.S.	1	1.00	0.69	2.20	0.00	1.29	0.00	0.00	0.00
time (sec)	N/A	0.100	0.153	5.516	0.000	0.104	0.000	0.000	0.000

Problem 802	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	80	80	55	161	0	119	0	0	0
N.S.	1	1.00	0.69	2.01	0.00	1.49	0.00	0.00	0.00
time (sec)	N/A	0.094	0.136	4.773	0.000	0.110	0.000	0.000	0.000

Problem 803	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	105	105	73	215	0	170	0	0	0
N.S.	1	1.00	0.70	2.05	0.00	1.62	0.00	0.00	0.00
time (sec)	N/A	0.145	0.406	5.150	0.000	0.098	0.000	0.000	0.000

Problem 804	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	136	136	85	403	0	189	0	0	0
N.S.	1	1.00	0.62	2.96	0.00	1.39	0.00	0.00	0.00
time (sec)	N/A	0.186	0.413	6.514	0.000	0.108	0.000	0.000	0.000

Problem 805	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	169	169	107	576	0	202	0	0	0
N.S.	1	1.00	0.63	3.41	0.00	1.20	0.00	0.00	0.00
time (sec)	N/A	0.228	0.615	8.326	0.000	0.110	0.000	0.000	0.000

Problem 806	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	169	169	103	301	0	165	0	0	0
N.S.	1	1.00	0.61	1.78	0.00	0.98	0.00	0.00	0.00
time (sec)	N/A	0.261	0.457	8.392	0.000	0.111	0.000	0.000	0.000

Problem 807	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	140	140	88	273	0	153	0	0	0
N.S.	1	1.00	0.63	1.95	0.00	1.09	0.00	0.00	0.00
time (sec)	N/A	0.181	0.101	6.963	0.000	0.116	0.000	0.000	0.000

Problem 808	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	112	112	76	240	0	140	0	0	0
N.S.	1	1.00	0.68	2.14	0.00	1.25	0.00	0.00	0.00
time (sec)	N/A	0.157	0.054	5.895	0.000	0.112	0.000	0.000	0.000

Problem 809	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	83	83	57	163	0	119	0	0	0
N.S.	1	1.00	0.69	1.96	0.00	1.43	0.00	0.00	0.00
time (sec)	N/A	0.167	0.045	5.002	0.000	0.111	0.000	0.000	0.000

Problem 810	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	110	110	73	217	0	171	0	0	0
N.S.	1	1.00	0.66	1.97	0.00	1.55	0.00	0.00	0.00
time (sec)	N/A	0.250	0.461	5.147	0.000	0.122	0.000	0.000	0.000

Problem 811	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	141	141	87	404	0	192	0	0	0
N.S.	1	1.00	0.62	2.87	0.00	1.36	0.00	0.00	0.00
time (sec)	N/A	0.314	0.342	6.386	0.000	0.119	0.000	0.000	0.000

Problem 812	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	174	174	107	577	0	205	0	0	0
N.S.	1	1.00	0.61	3.32	0.00	1.18	0.00	0.00	0.00
time (sec)	N/A	0.237	0.550	8.298	0.000	0.108	0.000	0.000	0.000

Problem 813	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	171	171	100	301	0	171	0	0	0
N.S.	1	1.00	0.58	1.76	0.00	1.00	0.00	0.00	0.00
time (sec)	N/A	0.138	0.107	9.010	0.000	0.127	0.000	0.000	0.000

Problem 814	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	145	145	89	273	0	157	0	0	0
N.S.	1	1.00	0.61	1.88	0.00	1.08	0.00	0.00	0.00
time (sec)	N/A	0.152	0.146	8.884	0.000	0.117	0.000	0.000	0.000

Problem 815	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	116	116	78	240	0	142	0	0	0
N.S.	1	1.00	0.67	2.07	0.00	1.22	0.00	0.00	0.00
time (sec)	N/A	0.134	0.056	15.668	0.000	0.117	0.000	0.000	0.000

Problem 816	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	85	85	54	163	0	119	0	0	0
N.S.	1	1.00	0.64	1.92	0.00	1.40	0.00	0.00	0.00
time (sec)	N/A	0.117	0.391	53.232	0.000	0.111	0.000	0.000	0.000

Problem 817	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	112	112	73	217	0	173	0	0	0
N.S.	1	1.00	0.65	1.94	0.00	1.54	0.00	0.00	0.00
time (sec)	N/A	0.147	0.371	158.889	0.000	0.106	0.000	0.000	0.000

Problem 818	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	143	143	87	406	0	196	0	0	0
N.S.	1	1.00	0.61	2.84	0.00	1.37	0.00	0.00	0.00
time (sec)	N/A	0.165	0.376	2.429	0.000	0.117	0.000	0.000	0.000

Problem 819	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	176	176	102	579	0	211	0	0	0
N.S.	1	1.00	0.58	3.29	0.00	1.20	0.00	0.00	0.00
time (sec)	N/A	0.192	0.665	3.174	0.000	0.115	0.000	0.000	0.000

Problem 820	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	173	173	101	298	0	165	0	0	0
N.S.	1	1.00	0.58	1.72	0.00	0.95	0.00	0.00	0.00
time (sec)	N/A	0.164	0.667	7.524	0.000	0.120	0.000	0.000	0.000

Problem 821	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	88	270	0	154	0	0	0
N.S.	1	1.00	0.61	1.88	0.00	1.07	0.00	0.00	0.00
time (sec)	N/A	0.136	0.413	6.289	0.000	0.105	0.000	0.000	0.000

Problem 822	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	113	113	78	237	0	142	0	0	94
N.S.	1	1.00	0.69	2.10	0.00	1.26	0.00	0.00	0.83
time (sec)	N/A	0.116	0.067	5.129	0.000	0.110	0.000	0.000	0.290

Problem 823	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	82	82	54	160	0	122	0	0	48
N.S.	1	1.00	0.66	1.95	0.00	1.49	0.00	0.00	0.59
time (sec)	N/A	0.088	0.037	3.629	0.000	0.094	0.000	0.000	0.347

Problem 824	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	106	106	73	214	0	173	0	0	0
N.S.	1	1.00	0.69	2.02	0.00	1.63	0.00	0.00	0.00
time (sec)	N/A	0.141	0.286	5.145	0.000	0.115	0.000	0.000	0.000

Problem 825	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	135	84	406	0	192	0	0	0
N.S.	1	1.00	0.62	3.01	0.00	1.42	0.00	0.00	0.00
time (sec)	N/A	0.183	0.239	6.363	0.000	0.099	0.000	0.000	0.000

Problem 826	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	168	168	101	579	0	205	0	0	0
N.S.	1	1.00	0.60	3.45	0.00	1.22	0.00	0.00	0.00
time (sec)	N/A	0.207	0.409	8.488	0.000	0.105	0.000	0.000	0.000

Problem 827	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	176	176	104	301	0	165	0	0	0
N.S.	1	1.00	0.59	1.71	0.00	0.94	0.00	0.00	0.00
time (sec)	N/A	0.184	0.626	8.567	0.000	0.123	0.000	0.000	0.000

Problem 828	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	147	147	88	273	0	154	0	0	0
N.S.	1	1.00	0.60	1.86	0.00	1.05	0.00	0.00	0.00
time (sec)	N/A	0.154	0.639	6.761	0.000	0.109	0.000	0.000	0.000

Problem 829	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	116	116	75	240	0	142	0	0	0
N.S.	1	1.00	0.65	2.07	0.00	1.22	0.00	0.00	0.00
time (sec)	N/A	0.132	0.406	5.583	0.000	0.109	0.000	0.000	0.000

Problem 830	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	85	85	57	163	0	122	0	0	0
N.S.	1	1.00	0.67	1.92	0.00	1.44	0.00	0.00	0.00
time (sec)	N/A	0.101	0.040	4.540	0.000	0.102	0.000	0.000	0.000

Problem 831	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	112	112	76	217	0	173	0	0	0
N.S.	1	1.00	0.68	1.94	0.00	1.54	0.00	0.00	0.00
time (sec)	N/A	0.105	0.141	4.831	0.000	0.105	0.000	0.000	0.000

Problem 832	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	140	140	87	406	0	192	0	0	0
N.S.	1	1.00	0.62	2.90	0.00	1.37	0.00	0.00	0.00
time (sec)	N/A	0.155	0.117	6.595	0.000	0.101	0.000	0.000	0.000

Problem 833	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	171	171	104	579	0	205	0	0	0
N.S.	1	1.00	0.61	3.39	0.00	1.20	0.00	0.00	0.00
time (sec)	N/A	0.203	0.239	8.145	0.000	0.118	0.000	0.000	0.000

Problem 834	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	176	176	104	301	0	165	0	0	0
N.S.	1	1.00	0.59	1.71	0.00	0.94	0.00	0.00	0.00
time (sec)	N/A	0.175	0.884	8.294	0.000	0.119	0.000	0.000	0.000

Problem 835	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	147	147	91	273	0	154	0	0	0
N.S.	1	1.00	0.62	1.86	0.00	1.05	0.00	0.00	0.00
time (sec)	N/A	0.134	0.633	7.046	0.000	0.122	0.000	0.000	0.000

Problem 836	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	116	116	78	240	0	142	0	0	0
N.S.	1	1.00	0.67	2.07	0.00	1.22	0.00	0.00	0.00
time (sec)	N/A	0.113	0.465	5.699	0.000	0.107	0.000	0.000	0.000

Problem 837	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	85	85	57	163	0	122	0	0	0
N.S.	1	1.00	0.67	1.92	0.00	1.44	0.00	0.00	0.00
time (sec)	N/A	0.089	0.038	4.594	0.000	0.117	0.000	0.000	0.000

Problem 838	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	112	112	76	217	0	173	0	0	0
N.S.	1	1.00	0.68	1.94	0.00	1.54	0.00	0.00	0.00
time (sec)	N/A	0.118	0.059	4.664	0.000	0.103	0.000	0.000	0.000

Problem 839	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	143	143	87	406	0	192	0	0	0
N.S.	1	1.00	0.61	2.84	0.00	1.34	0.00	0.00	0.00
time (sec)	N/A	0.121	0.097	6.412	0.000	0.109	0.000	0.000	0.000

Problem 840	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	173	173	104	579	0	205	0	0	0
N.S.	1	1.00	0.60	3.35	0.00	1.18	0.00	0.00	0.00
time (sec)	N/A	0.193	0.098	8.424	0.000	0.116	0.000	0.000	0.000

Problem 841	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	176	176	104	579	0	205	0	0	0
N.S.	1	1.00	0.59	3.29	0.00	1.16	0.00	0.00	0.00
time (sec)	N/A	0.160	0.036	8.385	0.000	0.118	0.000	0.000	0.000

Problem 842	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	172	172	81	91	93	252	0	278	105
N.S.	1	1.00	0.47	0.53	0.54	1.47	0.00	1.62	0.61
time (sec)	N/A	0.096	0.404	5.223	0.481	0.363	0.000	3.404	16.238

Problem 843	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	136	136	69	74	68	230	202	194	92
N.S.	1	1.00	0.51	0.54	0.50	1.69	1.49	1.43	0.68
time (sec)	N/A	0.071	0.281	4.900	0.417	0.326	81.203	2.583	16.086

Problem 844	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	98	98	57	55	40	204	165	142	79
N.S.	1	1.00	0.58	0.56	0.41	2.08	1.68	1.45	0.81
time (sec)	N/A	0.028	0.224	5.025	0.410	0.343	2.901	1.878	14.954

Problem 845	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	59	59	42	39	40	181	80	0	35
N.S.	1	1.00	0.71	0.66	0.68	3.07	1.36	0.00	0.59
time (sec)	N/A	0.014	0.036	4.966	0.368	0.341	1.354	0.000	0.319

Problem 846	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	60	60	40	52	92	210	0	0	0
N.S.	1	1.00	0.67	0.87	1.53	3.50	0.00	0.00	0.00
time (sec)	N/A	0.027	0.026	4.677	0.375	0.357	0.000	0.000	0.000

Problem 847	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	68	68	50	57	120	205	0	0	0
N.S.	1	1.00	0.74	0.84	1.76	3.01	0.00	0.00	0.00
time (sec)	N/A	0.051	0.037	5.058	0.421	0.333	0.000	0.000	0.000

Problem 848	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	107	107	65	103	716	225	0	0	0
N.S.	1	1.00	0.61	0.96	6.69	2.10	0.00	0.00	0.00
time (sec)	N/A	0.064	0.084	5.139	0.617	0.339	0.000	0.000	0.000

Problem 849	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	145	145	76	122	957	253	0	0	0
N.S.	1	1.00	0.52	0.84	6.60	1.74	0.00	0.00	0.00
time (sec)	N/A	0.074	0.222	4.929	0.719	0.328	0.000	0.000	0.000

Problem 850	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	177	177	81	92	100	261	0	279	106
N.S.	1	1.00	0.46	0.52	0.56	1.47	0.00	1.58	0.60
time (sec)	N/A	0.080	0.365	5.076	0.466	0.351	0.000	3.459	16.238

Problem 851	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	140	140	69	75	74	237	0	195	93
N.S.	1	1.00	0.49	0.54	0.53	1.69	0.00	1.39	0.66
time (sec)	N/A	0.063	0.231	5.034	0.447	0.351	0.000	2.590	1.226

Problem 852	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	101	101	58	56	43	209	151	0	50
N.S.	1	1.00	0.57	0.55	0.43	2.07	1.50	0.00	0.50
time (sec)	N/A	0.025	0.033	4.899	0.443	0.320	31.582	0.000	0.549

Problem 853	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	61	61	42	40	40	184	80	0	36
N.S.	1	1.00	0.69	0.66	0.66	3.02	1.31	0.00	0.59
time (sec)	N/A	0.015	0.048	5.104	0.364	0.341	31.981	0.000	14.774

Problem 854	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	62	62	40	53	95	212	0	0	0
N.S.	1	1.00	0.65	0.85	1.53	3.42	0.00	0.00	0.00
time (sec)	N/A	0.029	0.031	4.959	0.439	0.383	0.000	0.000	0.000

Problem 855	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	70	70	50	58	123	208	0	0	0
N.S.	1	1.00	0.71	0.83	1.76	2.97	0.00	0.00	0.00
time (sec)	N/A	0.051	0.043	4.567	0.547	0.358	0.000	0.000	0.000

Problem 856	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	110	110	65	104	747	232	0	0	0
N.S.	1	1.00	0.59	0.95	6.79	2.11	0.00	0.00	0.00
time (sec)	N/A	0.073	0.079	4.993	0.548	0.371	0.000	0.000	0.000

Problem 857	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	149	149	77	123	992	260	0	0	0
N.S.	1	1.00	0.52	0.83	6.66	1.74	0.00	0.00	0.00
time (sec)	N/A	0.070	0.013	5.112	0.538	0.346	0.000	0.000	0.000

Problem 858	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	187	187	81	94	110	279	0	278	108
N.S.	1	1.00	0.43	0.50	0.59	1.49	0.00	1.49	0.58
time (sec)	N/A	0.079	0.396	5.095	0.510	0.357	0.000	3.702	15.839

Problem 859	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	148	148	69	77	82	251	0	0	64
N.S.	1	1.00	0.47	0.52	0.55	1.70	0.00	0.00	0.43
time (sec)	N/A	0.069	0.994	5.217	0.484	0.347	0.000	0.000	0.763

Problem 860	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	107	107	57	58	47	219	0	0	52
N.S.	1	1.00	0.53	0.54	0.44	2.05	0.00	0.00	0.49
time (sec)	N/A	0.030	0.268	5.108	0.471	0.343	0.000	0.000	14.910

Problem 861	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	65	65	42	42	40	190	0	0	38
N.S.	1	1.00	0.65	0.65	0.62	2.92	0.00	0.00	0.58
time (sec)	N/A	0.016	0.059	4.914	0.445	0.318	0.000	0.000	0.373

Problem 862	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	66	66	40	55	99	216	0	0	0
N.S.	1	1.00	0.61	0.83	1.50	3.27	0.00	0.00	0.00
time (sec)	N/A	0.030	0.049	4.920	0.402	0.360	0.000	0.000	0.000

Problem 863	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	74	74	50	60	127	214	0	0	0
N.S.	1	1.00	0.68	0.81	1.72	2.89	0.00	0.00	0.00
time (sec)	N/A	0.051	0.060	4.875	0.488	0.328	0.000	0.000	0.000

Problem 864	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	116	116	65	106	803	242	0	0	0
N.S.	1	1.00	0.56	0.91	6.92	2.09	0.00	0.00	0.00
time (sec)	N/A	0.064	0.109	4.719	0.440	0.340	0.000	0.000	0.000

Problem 865	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	157	157	76	125	1060	274	0	0	0
N.S.	1	1.00	0.48	0.80	6.75	1.75	0.00	0.00	0.00
time (sec)	N/A	0.073	0.222	5.031	0.443	0.367	0.000	0.000	0.000

Problem 866	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	136	136	69	74	68	236	0	0	95
N.S.	1	1.00	0.51	0.54	0.50	1.74	0.00	0.00	0.70
time (sec)	N/A	0.060	0.418	5.041	0.430	0.348	0.000	0.000	16.110

Problem 867	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	98	98	57	55	40	210	151	0	82
N.S.	1	1.00	0.58	0.56	0.41	2.14	1.54	0.00	0.84
time (sec)	N/A	0.025	0.350	4.762	0.415	0.313	36.742	0.000	0.902

Problem 868	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	59	59	42	39	40	187	80	0	61
N.S.	1	1.00	0.71	0.66	0.68	3.17	1.36	0.00	1.03
time (sec)	N/A	0.016	0.033	5.020	0.395	0.338	1.431	0.000	0.593

Problem 869	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	B	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	60	60	40	52	92	215	0	0	0
N.S.	1	1.00	0.67	0.87	1.53	3.58	0.00	0.00	0.00
time (sec)	N/A	0.031	0.027	4.914	0.413	0.368	0.000	0.000	0.000

Problem 870	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	68	68	50	57	125	211	0	0	0
N.S.	1	1.00	0.74	0.84	1.84	3.10	0.00	0.00	0.00
time (sec)	N/A	0.045	0.034	5.027	0.419	0.331	0.000	0.000	0.000

Problem 871	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	107	107	65	103	722	231	0	0	0
N.S.	1	1.00	0.61	0.96	6.75	2.16	0.00	0.00	0.00
time (sec)	N/A	0.063	0.060	5.033	0.421	0.344	0.000	0.000	0.000

Problem 872	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	145	145	76	122	957	259	0	0	0
N.S.	1	1.00	0.52	0.84	6.60	1.79	0.00	0.00	0.00
time (sec)	N/A	0.077	0.113	5.042	0.424	0.343	0.000	0.000	0.000

Problem 873	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	148	148	69	77	68	236	0	0	95
N.S.	1	1.00	0.47	0.52	0.46	1.59	0.00	0.00	0.64
time (sec)	N/A	0.061	0.505	5.014	0.417	0.368	0.000	0.000	15.809

Problem 874	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	107	107	57	58	40	210	0	0	82
N.S.	1	1.00	0.53	0.54	0.37	1.96	0.00	0.00	0.77
time (sec)	N/A	0.027	0.346	4.952	0.415	0.335	0.000	0.000	0.829

Problem 875	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	65	65	42	42	40	187	80	0	61
N.S.	1	1.00	0.65	0.65	0.62	2.88	1.23	0.00	0.94
time (sec)	N/A	0.015	0.043	4.902	0.371	0.346	36.756	0.000	0.510

Problem 876	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	66	66	40	55	92	215	0	0	0
N.S.	1	1.00	0.61	0.83	1.39	3.26	0.00	0.00	0.00
time (sec)	N/A	0.030	0.032	5.212	0.384	0.377	0.000	0.000	0.000

Problem 877	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	74	74	50	60	133	211	0	0	0
N.S.	1	1.00	0.68	0.81	1.80	2.85	0.00	0.00	0.00
time (sec)	N/A	0.046	0.042	5.048	0.409	0.333	0.000	0.000	0.000

Problem 878	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	116	116	65	106	739	231	0	0	0
N.S.	1	1.00	0.56	0.91	6.37	1.99	0.00	0.00	0.00
time (sec)	N/A	0.070	0.060	4.837	0.443	0.349	0.000	0.000	0.000

Problem 879	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	157	157	76	125	983	259	0	0	0
N.S.	1	1.00	0.48	0.80	6.26	1.65	0.00	0.00	0.00
time (sec)	N/A	0.076	0.118	5.118	0.439	0.330	0.000	0.000	0.000

Problem 880	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	148	148	72	77	68	236	0	0	95
N.S.	1	1.00	0.49	0.52	0.46	1.59	0.00	0.00	0.64
time (sec)	N/A	0.067	0.775	5.200	0.422	0.369	0.000	0.000	16.106

Problem 881	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	107	107	60	58	40	210	0	0	82
N.S.	1	1.00	0.56	0.54	0.37	1.96	0.00	0.00	0.77
time (sec)	N/A	0.028	0.463	4.760	0.411	0.370	0.000	0.000	0.742

Problem 882	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	65	65	45	42	40	187	0	0	61
N.S.	1	1.00	0.69	0.65	0.62	2.88	0.00	0.00	0.94
time (sec)	N/A	0.016	0.040	4.957	0.362	0.325	0.000	0.000	0.521

Problem 883	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	66	66	43	55	92	215	0	0	0
N.S.	1	1.00	0.65	0.83	1.39	3.26	0.00	0.00	0.00
time (sec)	N/A	0.034	0.034	4.964	0.386	0.396	0.000	0.000	0.000

Problem 884	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	74	74	50	60	133	211	0	0	0
N.S.	1	1.00	0.68	0.81	1.80	2.85	0.00	0.00	0.00
time (sec)	N/A	0.051	0.042	5.105	0.418	0.356	0.000	0.000	0.000

Problem 885	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	116	116	65	106	757	231	0	0	0
N.S.	1	1.00	0.56	0.91	6.53	1.99	0.00	0.00	0.00
time (sec)	N/A	0.063	0.069	5.110	0.444	0.389	0.000	0.000	0.000

Problem 886	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	157	157	76	125	1033	259	0	0	0
N.S.	1	1.00	0.48	0.80	6.58	1.65	0.00	0.00	0.00
time (sec)	N/A	0.079	0.141	5.222	0.434	0.338	0.000	0.000	0.000

Problem 887	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	119	119	94	0	0	0	0	0	0
N.S.	1	1.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.089	0.143	0.000	0.000	0.000	0.000	0.000	0.000

Problem 888	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	119	119	89	0	0	0	0	0	0
N.S.	1	1.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.090	0.097	0.000	0.000	0.000	0.000	0.000	0.000

Problem 889	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	119	119	86	0	0	0	0	0	0
N.S.	1	1.00	0.72	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.073	0.056	0.000	0.000	0.000	0.000	0.000	0.000

Problem 890	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	114	114	86	0	0	0	0	0	0
N.S.	1	1.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.098	0.068	0.000	0.000	0.000	0.000	0.000	0.000

Problem 891	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	112	112	86	0	0	0	0	0	0
N.S.	1	1.00	0.77	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.113	0.090	0.000	0.000	0.000	0.000	0.000	0.000

Problem 892	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	117	117	94	0	0	0	0	0	0
N.S.	1	1.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.110	0.065	0.000	0.000	0.000	0.000	0.000	0.000

Problem 893	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	119	119	94	0	0	0	0	0	0
N.S.	1	1.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.096	0.141	0.000	0.000	0.000	0.000	0.000	0.000

Problem 894	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	119	119	89	0	0	0	0	0	0
N.S.	1	1.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.093	0.126	0.000	0.000	0.000	0.000	0.000	0.000

Problem 895	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	119	119	86	0	0	0	0	0	0
N.S.	1	1.00	0.72	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.074	0.005	0.000	0.000	0.000	0.000	0.000	0.000

Problem 896	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	116	116	87	0	0	0	0	0	0
N.S.	1	1.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.109	0.005	0.000	0.000	0.000	0.000	0.000	0.000

Problem 897	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	112	112	88	0	0	0	0	0	0
N.S.	1	1.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.115	0.011	0.000	0.000	0.000	0.000	0.000	0.000

Problem 898	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	115	115	88	0	0	0	0	0	0
N.S.	1	1.00	0.77	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.123	0.080	0.000	0.000	0.000	0.000	0.000	0.000

Problem 899	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	119	119	94	0	0	0	0	0	0
N.S.	1	1.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.101	0.128	0.000	0.000	0.000	0.000	0.000	0.000

Problem 900	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	119	119	89	0	0	0	0	0	0
N.S.	1	1.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.091	0.009	0.000	0.000	0.000	0.000	0.000	0.000

Problem 901	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	117	117	85	0	0	0	0	0	0
N.S.	1	1.00	0.73	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.083	0.005	0.000	0.000	0.000	0.000	0.000	0.000

Problem 902	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	114	114	85	0	0	0	0	0	0
N.S.	1	1.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.111	0.048	0.000	0.000	0.000	0.000	0.000	0.000

Problem 903	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	114	114	89	0	0	0	0	0	0
N.S.	1	1.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.124	0.104	0.000	0.000	0.000	0.000	0.000	0.000

Problem 904	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	117	117	89	0	0	0	0	0	0
N.S.	1	1.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.112	0.104	0.000	0.000	0.000	0.000	0.000	0.000

Problem 905	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	119	119	94	0	0	0	0	0	0
N.S.	1	1.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.091	0.124	0.000	0.000	0.000	0.000	0.000	0.000

Problem 906	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	119	119	89	0	0	0	0	0	0
N.S.	1	1.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.082	0.067	0.000	0.000	0.000	0.000	0.000	0.000

Problem 907	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	117	117	85	0	0	0	0	0	0
N.S.	1	1.00	0.73	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.081	0.087	0.000	0.000	0.000	0.000	0.000	0.000

Problem 908	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	114	114	86	0	0	0	0	0	0
N.S.	1	1.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.103	0.107	0.000	0.000	0.000	0.000	0.000	0.000

Problem 909	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	114	114	89	0	0	0	0	0	0
N.S.	1	1.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.123	0.142	0.000	0.000	0.000	0.000	0.000	0.000

Problem 910	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	117	117	89	0	0	0	0	0	0
N.S.	1	1.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.128	0.145	0.000	0.000	0.000	0.000	0.000	0.000

Problem 911	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	157	157	130	0	0	0	0	0	0
N.S.	1	1.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.107	0.179	0.000	0.000	0.000	0.000	0.000	0.000

Problem 912	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	141	141	120	0	0	0	0	0	0
N.S.	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.138	0.204	0.000	0.000	0.000	0.000	0.000	0.000

Problem 913	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	141	141	118	0	0	0	0	0	0
N.S.	1	1.00	0.84	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.120	0.164	0.000	0.000	0.000	0.000	0.000	0.000

Problem 914	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	141	141	112	0	0	0	0	0	0
N.S.	1	1.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.096	0.118	0.000	0.000	0.000	0.000	0.000	0.000

Problem 915	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	132	132	109	0	0	0	0	0	0
N.S.	1	1.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.108	0.133	0.000	0.000	0.000	0.000	0.000	0.000

Problem 916	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	131	131	109	0	0	0	0	0	0
N.S.	1	1.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.155	0.128	0.000	0.000	0.000	0.000	0.000	0.000

Problem 917	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	139	139	118	0	0	0	0	0	0
N.S.	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.138	0.119	0.000	0.000	0.000	0.000	0.000	0.000

Problem 918	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	141	141	118	0	0	0	0	0	0
N.S.	1	1.00	0.84	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.150	0.120	0.000	0.000	0.000	0.000	0.000	0.000

Problem 919	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	163	163	138	0	0	0	0	0	0
N.S.	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.124	0.286	0.000	0.000	0.000	0.000	0.000	0.000

Problem 920	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	163	163	138	0	0	0	0	0	0
N.S.	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.118	0.233	0.000	0.000	0.000	0.000	0.000	0.000

Problem 921	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	163	163	138	0	0	0	0	0	0
N.S.	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.098	0.175	0.000	0.000	0.000	0.000	0.000	0.000

Problem 922	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	163	163	138	0	0	0	0	0	0
N.S.	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.112	0.171	0.000	0.000	0.000	0.000	0.000	0.000

Problem 923	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	163	163	133	0	0	0	0	0	0
N.S.	1	1.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.113	0.208	0.000	0.000	0.000	0.000	0.000	0.000

Problem 924	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	163	163	138	0	0	0	0	0	0
N.S.	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.109	0.177	0.000	0.000	0.000	0.000	0.000	0.000

Problem 925	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	163	163	138	0	0	0	0	0	0
N.S.	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.117	0.175	0.000	0.000	0.000	0.000	0.000	0.000

Problem 926	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	163	163	138	0	0	0	0	0	0
N.S.	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.107	0.165	0.000	0.000	0.000	0.000	0.000	0.000

Problem 927	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	169	169	140	0	0	0	0	0	0
N.S.	1	1.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.113	0.325	0.000	0.000	0.000	0.000	0.000	0.000

Problem 928	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	167	167	140	0	0	0	0	0	0
N.S.	1	1.00	0.84	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.111	0.199	0.000	0.000	0.000	0.000	0.000	0.000

Problem 929	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	167	167	140	0	0	0	0	0	0
N.S.	1	1.00	0.84	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.109	0.199	0.000	0.000	0.000	0.000	0.000	0.000

Problem 930	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	167	167	140	0	0	0	0	0	0
N.S.	1	1.00	0.84	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.100	0.207	0.000	0.000	0.000	0.000	0.000	0.000

Problem 931	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	167	167	140	0	0	0	0	0	0
N.S.	1	1.00	0.84	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.105	0.198	0.000	0.000	0.000	0.000	0.000	0.000

Problem 932	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	171	171	140	0	0	0	0	0	0
N.S.	1	1.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.114	0.222	0.000	0.000	0.000	0.000	0.000	0.000

2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi only. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is also given. The larger this ratio is, the harder the integral is to solve. In this test file, problem number [503] had the largest ratio of [.500000000000000000]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	7	4	1.00	19	0.210
2	A	6	4	1.00	19	0.210
3	A	6	4	1.00	19	0.210
4	A	5	4	1.00	19	0.210
5	A	1	1	1.00	17	0.059
6	A	2	1	1.00	10	0.100
7	A	2	2	1.00	17	0.118
8	A	4	4	1.00	19	0.210
9	A	5	5	1.00	19	0.263
10	A	5	4	1.00	19	0.210
11	A	6	4	1.00	19	0.210
12	A	6	4	1.00	19	0.210
13	A	11	4	1.00	21	0.190
14	A	9	4	1.00	21	0.190
15	A	9	4	1.00	21	0.190
16	A	2	2	1.21	19	0.105
17	A	1	1	1.00	12	0.083
18	A	3	3	1.00	19	0.158
19	A	5	4	1.00	21	0.190
20	A	7	5	1.00	21	0.238
21	A	8	5	1.00	21	0.238
22	A	9	4	1.00	21	0.190
23	A	13	4	1.00	21	0.190
24	A	11	4	1.00	21	0.190

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
25	A	8	6	1.04	19	0.316
26	A	7	5	1.00	12	0.417
27	A	6	5	1.00	19	0.263
28	A	6	5	1.00	21	0.238
29	A	7	5	1.00	21	0.238
30	A	9	5	1.00	21	0.238
31	A	11	5	1.00	21	0.238
32	A	11	4	1.00	21	0.190
33	A	15	4	1.00	21	0.190
34	A	11	6	1.12	19	0.316
35	A	10	5	1.00	12	0.417
36	A	8	6	1.00	19	0.316
37	A	8	6	1.00	21	0.286
38	A	8	6	1.00	21	0.286
39	A	9	5	1.00	21	0.238
40	A	12	5	1.00	21	0.238
41	A	13	5	1.00	21	0.238
42	A	15	4	1.00	21	0.190
43	A	7	5	1.00	21	0.238
44	A	6	5	1.00	21	0.238
45	A	2	2	1.00	21	0.095
46	A	4	4	1.00	21	0.190
47	A	2	2	1.00	19	0.105
48	A	1	1	1.00	12	0.083
49	A	3	3	1.00	19	0.158
50	A	5	5	1.00	21	0.238
51	A	6	6	1.00	21	0.286
52	A	6	5	1.00	21	0.238
53	A	7	6	1.00	21	0.286
54	A	3	3	1.00	21	0.143
55	A	6	6	1.00	21	0.286
56	A	3	3	1.00	21	0.143
57	A	2	2	1.00	19	0.105
58	A	2	2	1.00	12	0.167
59	A	4	4	1.00	19	0.210

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
60	A	6	6	1.00	21	0.286
61	A	7	7	1.00	21	0.333
62	A	7	6	1.00	21	0.286
63	A	4	3	1.00	21	0.143
64	A	7	7	1.00	21	0.333
65	A	5	5	1.00	21	0.238
66	A	3	3	1.00	21	0.143
67	A	3	3	1.00	19	0.158
68	A	3	2	1.00	12	0.167
69	A	5	4	1.00	19	0.210
70	A	7	6	1.00	21	0.286
71	A	8	7	1.00	21	0.333
72	A	5	3	1.00	21	0.143
73	A	8	7	1.00	21	0.333
74	A	6	6	1.00	21	0.286
75	A	5	5	1.00	21	0.238
76	A	4	4	1.00	21	0.190
77	A	4	3	1.00	19	0.158
78	A	4	2	1.00	12	0.167
79	A	6	4	1.00	19	0.210
80	A	8	6	1.00	21	0.286
81	A	9	7	1.00	21	0.333
82	A	6	3	1.00	21	0.143
83	A	9	7	1.00	21	0.333
84	A	7	6	1.00	21	0.286
85	A	6	6	1.00	21	0.286
86	A	6	6	1.00	21	0.286
87	A	5	4	1.00	21	0.190
88	A	5	3	1.00	19	0.158
89	A	5	2	1.00	12	0.167
90	A	7	4	1.00	19	0.210
91	A	9	6	1.00	21	0.286
92	A	10	7	1.00	21	0.333
93	A	7	6	1.00	21	0.286
94	A	7	7	1.00	21	0.333

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
95	A	5	4	1.00	23	0.174
96	A	4	4	1.00	23	0.174
97	A	3	3	1.00	23	0.130
98	A	2	2	1.00	21	0.095
99	A	1	1	1.00	14	0.071
100	A	2	2	1.00	21	0.095
101	A	3	3	1.00	23	0.130
102	A	4	3	1.00	23	0.130
103	A	5	3	1.00	23	0.130
104	A	6	6	1.00	23	0.261
105	A	4	4	1.00	23	0.174
106	A	3	3	1.00	21	0.143
107	A	2	2	1.00	14	0.143
108	A	4	4	1.00	21	0.190
109	A	4	4	1.00	23	0.174
110	A	5	5	1.00	23	0.217
111	A	6	5	1.00	23	0.217
112	A	6	6	1.00	23	0.261
113	A	5	4	1.00	23	0.174
114	A	4	3	1.00	21	0.143
115	A	3	2	1.00	14	0.143
116	A	4	4	1.00	21	0.190
117	A	4	4	1.00	23	0.174
118	A	4	4	1.00	23	0.174
119	A	5	5	1.00	23	0.217
120	A	6	5	1.00	23	0.217
121	A	4	2	1.00	14	0.143
122	A	7	7	1.00	23	0.304
123	A	6	6	1.00	23	0.261
124	A	4	4	1.00	23	0.174
125	A	3	3	1.00	21	0.143
126	A	2	2	1.00	14	0.143
127	A	5	4	1.00	21	0.190
128	A	6	5	1.00	23	0.217
129	A	7	6	1.00	23	0.261

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
130	A	8	6	1.00	23	0.261
131	A	7	7	1.00	23	0.304
132	A	6	6	1.00	23	0.261
133	A	4	4	1.00	23	0.174
134	A	3	3	1.00	21	0.143
135	A	3	3	1.00	14	0.214
136	A	6	5	1.00	21	0.238
137	A	7	6	1.00	23	0.261
138	A	8	6	1.00	23	0.261
139	A	7	7	1.00	23	0.304
140	A	6	6	1.00	23	0.261
141	A	4	4	1.00	23	0.174
142	A	4	4	1.00	21	0.190
143	A	4	3	1.00	14	0.214
144	A	7	6	1.00	21	0.286
145	A	8	7	1.00	23	0.304
146	A	6	4	1.00	21	0.190
147	A	5	4	1.00	21	0.190
148	A	4	4	1.00	21	0.190
149	A	3	3	1.00	21	0.143
150	A	4	4	1.00	21	0.190
151	A	5	4	1.00	21	0.190
152	A	6	4	1.00	21	0.190
153	A	10	4	1.00	23	0.174
154	A	9	4	1.00	23	0.174
155	A	7	4	1.00	23	0.174
156	A	6	4	1.00	23	0.174
157	A	6	4	1.00	23	0.174
158	A	7	4	1.00	23	0.174
159	A	9	4	1.00	23	0.174
160	A	12	4	1.00	23	0.174
161	A	10	4	1.00	23	0.174
162	A	8	4	1.00	23	0.174
163	A	8	5	1.00	23	0.217
164	A	8	4	1.00	23	0.174

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
165	A	10	4	1.00	23	0.174
166	A	12	4	1.00	23	0.174
167	A	16	4	1.00	23	0.174
168	A	13	4	1.00	23	0.174
169	A	11	4	1.00	23	0.174
170	A	10	5	1.00	23	0.217
171	A	10	5	1.00	23	0.217
172	A	11	4	1.00	23	0.174
173	A	13	4	1.00	23	0.174
174	A	6	5	1.00	23	0.217
175	A	5	5	1.00	23	0.217
176	A	4	4	1.00	23	0.174
177	A	4	4	1.00	23	0.174
178	A	4	4	1.00	23	0.174
179	A	5	5	1.00	23	0.217
180	A	6	5	1.00	23	0.217
181	A	7	6	1.00	23	0.261
182	A	6	6	1.00	23	0.261
183	A	5	5	1.00	23	0.217
184	A	5	5	1.00	23	0.217
185	A	3	3	1.00	23	0.130
186	A	5	5	1.00	23	0.217
187	A	6	6	1.00	23	0.261
188	A	7	6	1.00	23	0.261
189	A	8	6	1.00	23	0.261
190	A	7	6	1.00	23	0.261
191	A	6	5	1.00	23	0.217
192	A	6	6	1.00	23	0.261
193	A	6	5	1.00	23	0.217
194	A	6	5	1.00	23	0.217
195	A	6	5	1.00	23	0.217
196	A	7	6	1.00	23	0.261
197	A	8	6	1.00	23	0.261
198	A	5	3	1.00	25	0.120
199	A	4	3	1.00	25	0.120

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
200	A	3	3	1.00	25	0.120
201	A	2	2	1.00	25	0.080
202	A	1	1	1.00	25	0.040
203	A	2	2	1.00	25	0.080
204	A	3	2	1.00	25	0.080
205	A	4	2	1.00	25	0.080
206	A	6	5	1.00	25	0.200
207	A	5	5	1.00	25	0.200
208	A	4	4	1.00	25	0.160
209	A	4	4	1.00	25	0.160
210	A	3	3	1.00	25	0.120
211	A	4	4	1.00	25	0.160
212	A	5	4	1.00	25	0.160
213	A	6	5	1.00	25	0.200
214	A	5	5	1.00	25	0.200
215	A	4	4	1.00	25	0.160
216	A	4	4	1.00	25	0.160
217	A	4	4	1.00	25	0.160
218	A	3	3	1.00	25	0.120
219	A	4	4	1.00	25	0.160
220	A	5	4	1.00	25	0.160
221	A	2	2	1.00	25	0.080
222	A	2	2	1.00	25	0.080
223	A	2	2	1.00	28	0.071
224	A	7	7	1.00	25	0.280
225	A	6	6	1.00	25	0.240
226	A	5	5	1.00	25	0.200
227	A	2	2	1.00	25	0.080
228	A	4	4	1.00	25	0.160
229	A	5	5	1.00	25	0.200
230	A	6	5	1.00	25	0.200
231	A	7	6	1.00	23	0.261
232	A	6	5	1.00	23	0.217
233	A	5	4	1.00	23	0.174
234	A	2	2	1.00	23	0.087

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
235	A	3	3	1.00	23	0.130
236	A	5	5	1.00	23	0.217
237	A	6	5	1.00	23	0.217
238	A	7	7	1.00	25	0.280
239	A	6	6	1.00	25	0.240
240	A	4	4	1.00	25	0.160
241	A	4	4	1.00	25	0.160
242	A	5	5	1.00	25	0.200
243	A	6	5	1.00	25	0.200
244	A	8	8	1.00	25	0.320
245	A	7	7	1.00	25	0.280
246	A	5	5	1.00	25	0.200
247	A	5	5	1.00	25	0.200
248	A	5	5	1.00	25	0.200
249	A	6	6	1.00	25	0.240
250	A	7	6	1.00	25	0.240
251	A	9	8	1.00	25	0.320
252	A	8	7	1.00	25	0.280
253	A	6	6	1.00	25	0.240
254	A	6	5	1.00	25	0.200
255	A	6	5	1.00	25	0.200
256	A	6	5	1.00	25	0.200
257	A	7	6	1.00	25	0.240
258	A	8	6	1.00	25	0.240
259	A	7	6	1.00	25	0.240
260	A	7	6	1.00	25	0.240
261	A	2	2	1.00	15	0.133
262	A	2	2	1.00	17	0.118
263	A	4	3	1.00	26	0.115
264	A	3	3	1.00	26	0.115
265	A	2	2	1.00	26	0.077
266	A	1	1	1.00	26	0.038
267	A	2	2	1.00	26	0.077
268	A	3	2	1.00	26	0.077
269	A	4	3	1.00	25	0.120

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
270	A	3	3	1.00	25	0.120
271	A	2	2	1.00	25	0.080
272	A	1	1	1.00	25	0.040
273	A	2	2	1.00	25	0.080
274	A	3	2	1.00	25	0.080
275	A	7	7	1.00	26	0.269
276	A	6	6	1.00	26	0.231
277	A	5	5	1.00	26	0.192
278	A	2	2	1.00	26	0.077
279	A	4	4	1.00	26	0.154
280	A	5	5	1.00	26	0.192
281	A	6	5	1.00	26	0.192
282	A	7	7	1.00	25	0.280
283	A	6	6	1.00	25	0.240
284	A	5	5	1.00	25	0.200
285	A	2	2	1.00	25	0.080
286	A	3	3	1.00	25	0.120
287	A	5	5	1.00	25	0.200
288	A	3	3	1.00	25	0.120
289	A	3	3	1.00	25	0.120
290	A	3	3	1.00	25	0.120
291	A	9	6	1.00	21	0.286
292	A	8	6	1.00	21	0.286
293	A	7	6	1.00	21	0.286
294	A	6	5	1.00	21	0.238
295	A	7	6	1.00	21	0.286
296	A	8	6	1.00	21	0.286
297	A	9	6	1.00	21	0.286
298	A	9	7	1.00	23	0.304
299	A	8	7	1.00	23	0.304
300	A	5	5	1.00	23	0.217
301	A	7	6	1.00	23	0.261
302	A	8	7	1.00	23	0.304
303	A	9	7	1.00	23	0.304
304	A	17	6	1.00	23	0.261

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
305	A	15	6	1.00	23	0.261
306	A	13	6	1.00	23	0.261
307	A	13	7	1.00	23	0.304
308	A	13	6	1.00	23	0.261
309	A	15	6	1.00	23	0.261
310	A	17	6	1.00	23	0.261
311	A	19	6	1.00	23	0.261
312	A	17	6	1.00	23	0.261
313	A	16	7	1.00	23	0.304
314	A	16	7	1.00	23	0.304
315	A	17	6	1.00	23	0.261
316	A	19	6	1.00	23	0.261
317	A	9	7	1.00	23	0.304
318	A	8	7	1.00	23	0.304
319	A	7	6	1.00	23	0.261
320	A	7	6	1.00	23	0.261
321	A	7	6	1.00	23	0.261
322	A	8	7	1.00	23	0.304
323	A	9	7	1.00	23	0.304
324	A	10	8	1.00	23	0.348
325	A	9	8	1.00	23	0.348
326	A	8	7	1.00	23	0.304
327	A	5	5	1.00	23	0.217
328	A	8	7	1.00	23	0.304
329	A	8	7	1.00	23	0.304
330	A	9	8	1.00	23	0.348
331	A	10	8	1.00	23	0.348
332	A	10	8	1.00	23	0.348
333	A	9	7	1.00	23	0.304
334	A	9	8	1.00	23	0.348
335	A	9	8	1.00	23	0.348
336	A	9	8	1.00	23	0.348
337	A	9	7	1.00	23	0.304
338	A	10	8	1.00	23	0.348
339	A	5	3	1.00	25	0.120

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
340	A	4	3	1.00	25	0.120
341	A	3	3	1.00	25	0.120
342	A	2	2	1.00	25	0.080
343	A	3	3	1.00	25	0.120
344	A	4	4	1.00	25	0.160
345	A	5	4	1.00	25	0.160
346	A	6	5	1.00	25	0.200
347	A	5	5	1.00	25	0.200
348	A	4	4	1.00	25	0.160
349	A	5	5	1.00	25	0.200
350	A	5	5	1.00	25	0.200
351	A	6	6	1.00	25	0.240
352	A	7	6	1.00	25	0.240
353	A	6	5	1.00	25	0.200
354	A	5	5	1.00	25	0.200
355	A	4	4	1.00	25	0.160
356	A	5	5	1.00	25	0.200
357	A	5	5	1.00	25	0.200
358	A	5	5	1.00	25	0.200
359	A	6	6	1.00	25	0.240
360	A	7	6	1.00	25	0.240
361	A	7	6	1.00	23	0.261
362	A	6	6	1.00	23	0.261
363	A	4	4	1.00	23	0.174
364	A	3	3	1.00	23	0.130
365	A	6	5	1.00	23	0.217
366	A	7	6	1.00	23	0.261
367	A	7	6	1.00	25	0.240
368	A	6	6	1.00	25	0.240
369	A	5	5	1.00	25	0.200
370	A	3	3	1.36	25	0.120
371	A	6	6	1.29	25	0.240
372	A	7	7	1.00	25	0.280
373	A	7	6	1.00	25	0.240
374	A	6	6	1.00	25	0.240

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
375	A	5	5	1.00	25	0.200
376	A	5	5	1.00	25	0.200
377	A	7	7	1.00	25	0.280
378	A	8	8	1.00	25	0.320
379	A	8	7	1.00	25	0.280
380	A	7	7	1.00	25	0.280
381	A	6	6	1.00	25	0.240
382	A	6	6	1.00	25	0.240
383	A	6	6	1.00	25	0.240
384	A	8	8	1.00	25	0.320
385	A	9	9	1.00	25	0.360
386	A	9	7	1.00	25	0.280
387	A	8	7	1.00	25	0.280
388	A	7	6	1.00	25	0.240
389	A	7	6	1.00	25	0.240
390	A	7	6	1.00	25	0.240
391	A	7	7	1.00	25	0.280
392	A	9	8	1.00	25	0.320
393	A	10	9	1.00	25	0.360
394	A	8	7	1.00	25	0.280
395	A	8	7	1.00	25	0.280
396	A	3	3	1.00	25	0.120
397	A	7	6	1.00	21	0.286
398	A	6	5	1.00	21	0.238
399	A	4	3	1.00	21	0.143
400	A	3	2	1.00	19	0.105
401	A	4	3	1.00	21	0.143
402	A	5	4	1.00	21	0.190
403	A	8	4	1.00	19	0.210
404	A	7	4	1.00	19	0.210
405	A	7	4	1.00	19	0.210
406	A	6	4	1.00	19	0.210
407	A	6	4	1.00	19	0.210
408	A	5	4	1.00	19	0.210
409	A	1	1	1.00	17	0.059

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
410	A	2	1	1.00	10	0.100
411	A	2	2	1.00	17	0.118
412	A	4	4	1.00	19	0.210
413	A	5	5	1.00	19	0.263
414	A	5	4	1.00	19	0.210
415	A	6	4	1.00	19	0.210
416	A	6	4	1.00	19	0.210
417	A	7	5	1.00	21	0.238
418	A	7	5	1.00	21	0.238
419	A	6	5	1.00	21	0.238
420	A	2	2	1.00	19	0.105
421	A	1	1	1.00	12	0.083
422	A	3	3	1.00	19	0.158
423	A	4	4	1.00	21	0.190
424	A	5	5	1.00	21	0.238
425	A	6	6	1.00	21	0.286
426	A	6	5	1.00	21	0.238
427	A	7	5	1.00	21	0.238
428	A	8	6	1.14	21	0.286
429	A	4	3	1.00	21	0.143
430	A	3	2	1.00	19	0.105
431	A	2	2	1.18	12	0.167
432	A	4	4	1.00	19	0.210
433	A	4	4	1.00	21	0.190
434	A	4	4	1.00	21	0.190
435	A	6	6	1.00	21	0.286
436	A	7	7	1.00	21	0.333
437	A	7	6	1.00	21	0.286
438	A	9	7	1.00	21	0.333
439	A	5	3	1.00	21	0.143
440	A	4	2	1.00	19	0.105
441	A	3	3	1.00	12	0.250
442	A	5	5	1.00	19	0.263
443	A	5	5	1.00	21	0.238
444	A	5	5	1.00	21	0.238

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
445	A	5	5	1.00	21	0.238
446	A	7	7	1.00	21	0.333
447	A	8	8	1.00	21	0.381
448	A	8	7	1.00	21	0.333
449	A	7	6	1.00	21	0.286
450	A	6	6	1.00	21	0.286
451	A	5	5	1.00	21	0.238
452	A	5	5	1.00	21	0.238
453	A	3	3	1.00	19	0.158
454	A	2	2	1.00	12	0.167
455	A	4	4	1.00	19	0.210
456	A	6	6	1.00	21	0.286
457	A	6	6	1.00	21	0.286
458	A	7	6	1.00	21	0.286
459	A	7	6	1.00	21	0.286
460	A	6	6	1.28	21	0.286
461	A	5	5	1.00	21	0.238
462	A	4	4	1.00	21	0.190
463	A	4	4	1.00	19	0.210
464	A	4	4	1.00	12	0.333
465	A	5	5	1.00	19	0.263
466	A	6	6	1.00	21	0.286
467	A	7	6	1.00	21	0.286
468	A	8	6	1.00	21	0.286
469	A	7	7	1.00	21	0.333
470	A	6	6	1.00	21	0.286
471	A	5	5	1.00	21	0.238
472	A	5	5	1.00	21	0.238
473	A	5	4	1.00	19	0.210
474	A	5	5	1.00	12	0.417
475	A	6	6	1.00	19	0.316
476	A	7	6	1.00	21	0.286
477	A	8	6	1.00	21	0.286
478	A	7	7	1.00	21	0.333
479	A	6	6	1.00	21	0.286

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
480	A	6	6	1.00	21	0.286
481	A	6	5	1.00	21	0.238
482	A	6	4	1.00	19	0.210
483	A	6	5	1.00	12	0.417
484	A	7	6	1.00	19	0.316
485	A	8	6	1.00	21	0.286
486	A	8	8	1.00	23	0.348
487	A	7	7	1.00	23	0.304
488	A	6	6	1.00	21	0.286
489	A	2	2	1.00	14	0.143
490	A	5	5	1.00	21	0.238
491	A	9	9	1.00	23	0.391
492	A	10	10	1.00	23	0.435
493	A	9	8	1.00	23	0.348
494	A	8	7	1.00	23	0.304
495	A	7	6	1.00	21	0.286
496	A	6	6	1.00	14	0.429
497	A	8	8	1.00	21	0.381
498	A	9	9	1.00	23	0.391
499	A	10	10	1.00	23	0.435
500	A	10	8	1.00	23	0.348
501	A	9	7	1.00	23	0.304
502	A	8	6	1.00	21	0.286
503	A	7	7	1.00	14	0.500
504	A	9	9	1.00	21	0.429
505	A	9	9	1.00	23	0.391
506	A	10	10	1.00	23	0.435
507	A	11	10	1.00	23	0.435
508	A	8	7	1.00	14	0.500
509	A	6	6	1.00	23	0.261
510	A	5	5	1.00	23	0.217
511	A	4	4	1.00	21	0.190
512	A	1	1	1.00	14	0.071
513	A	3	3	1.00	21	0.143
514	A	6	6	1.00	23	0.261

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
515	A	7	7	1.00	23	0.304
516	A	6	6	1.00	23	0.261
517	A	5	5	1.00	23	0.217
518	A	4	4	1.00	21	0.190
519	A	1	1	1.00	14	0.071
520	A	3	3	1.00	21	0.143
521	A	6	6	1.00	23	0.261
522	A	7	7	1.00	23	0.304
523	A	7	7	1.00	23	0.304
524	A	6	6	1.00	23	0.261
525	A	5	5	1.00	21	0.238
526	A	2	2	1.00	14	0.143
527	A	2	2	1.00	21	0.095
528	A	9	9	1.00	23	0.391
529	A	10	10	1.00	23	0.435
530	A	8	8	1.00	23	0.348
531	A	7	7	1.00	23	0.304
532	A	6	6	1.00	23	0.261
533	A	6	6	1.00	21	0.286
534	A	4	4	1.00	14	0.286
535	A	7	7	1.00	21	0.333
536	A	10	10	1.00	23	0.435
537	A	11	10	1.00	23	0.435
538	A	9	9	1.00	23	0.391
539	A	8	8	1.00	23	0.348
540	A	7	7	1.00	23	0.304
541	A	7	7	1.00	23	0.304
542	A	7	6	1.00	21	0.286
543	A	7	7	1.00	14	0.500
544	A	10	10	1.00	21	0.476
545	A	11	11	1.00	23	0.478
546	A	8	7	1.00	14	0.500
547	A	5	5	1.00	23	0.217
548	A	4	4	1.00	23	0.174
549	A	3	3	1.00	21	0.143

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
550	A	1	1	1.00	14	0.071
551	A	1	1	1.00	21	0.048
552	A	6	6	1.00	23	0.261
553	A	7	7	1.00	23	0.304
554	A	5	5	1.00	23	0.217
555	A	4	4	1.00	23	0.174
556	A	3	3	1.00	21	0.143
557	A	1	1	1.00	14	0.071
558	A	1	1	1.00	21	0.048
559	A	6	6	1.00	23	0.261
560	A	7	7	1.00	23	0.304
561	A	6	4	1.00	21	0.190
562	A	5	4	1.00	21	0.190
563	A	4	4	1.00	21	0.190
564	A	3	3	1.00	21	0.143
565	A	4	4	1.00	21	0.190
566	A	5	4	1.00	21	0.190
567	A	6	4	1.00	21	0.190
568	A	7	5	1.00	23	0.217
569	A	6	5	1.00	23	0.217
570	A	5	5	1.00	23	0.217
571	A	4	4	1.00	23	0.174
572	A	4	4	1.00	23	0.174
573	A	5	5	1.00	23	0.217
574	A	6	5	1.00	23	0.217
575	A	7	6	1.00	23	0.261
576	A	6	6	1.00	23	0.261
577	A	5	5	1.00	23	0.217
578	A	5	5	1.00	23	0.217
579	A	5	5	1.00	23	0.217
580	A	6	6	1.00	23	0.261
581	A	7	6	1.00	23	0.261
582	A	6	6	1.00	23	0.261
583	A	5	5	1.00	23	0.217
584	A	3	3	1.00	23	0.130

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
585	A	1	1	1.00	23	0.043
586	A	5	5	1.00	23	0.217
587	A	7	7	1.00	23	0.304
588	A	7	7	1.00	23	0.304
589	A	6	6	1.00	23	0.261
590	A	6	6	1.00	23	0.261
591	A	6	6	1.00	23	0.261
592	A	6	6	1.00	23	0.261
593	A	7	7	1.00	23	0.304
594	A	8	7	1.00	23	0.304
595	A	8	8	1.00	23	0.348
596	A	7	7	1.00	23	0.304
597	A	7	7	1.00	23	0.304
598	A	7	7	1.00	23	0.304
599	A	7	7	1.00	23	0.304
600	A	7	7	1.00	23	0.304
601	A	8	7	1.00	23	0.304
602	A	9	7	1.00	23	0.304
603	A	7	7	1.00	25	0.280
604	A	7	7	1.00	25	0.280
605	A	1	1	1.00	25	0.040
606	A	3	3	1.00	25	0.120
607	A	4	4	1.00	25	0.160
608	A	5	5	1.00	25	0.200
609	A	6	5	1.00	25	0.200
610	A	8	8	1.00	25	0.320
611	A	8	8	1.00	25	0.320
612	A	6	6	1.00	25	0.240
613	A	5	5	1.00	25	0.200
614	A	4	4	1.00	25	0.160
615	A	5	5	1.00	25	0.200
616	A	6	5	1.00	25	0.200
617	A	7	5	1.00	25	0.200
618	A	8	8	1.00	25	0.320
619	A	7	7	1.00	25	0.280

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
620	A	7	7	1.00	25	0.280
621	A	6	6	1.00	25	0.240
622	A	5	5	1.00	25	0.200
623	A	6	5	1.00	25	0.200
624	A	7	5	1.00	25	0.200
625	A	8	5	1.00	25	0.200
626	A	8	8	1.09	25	0.320
627	A	1	1	1.00	25	0.040
628	A	1	1	1.00	25	0.040
629	A	3	3	1.00	25	0.120
630	A	4	4	1.00	25	0.160
631	A	7	7	1.00	25	0.280
632	A	6	6	1.00	25	0.240
633	A	4	4	1.00	25	0.160
634	A	4	4	1.00	25	0.160
635	A	4	4	1.00	25	0.160
636	A	5	5	1.00	25	0.200
637	A	6	5	1.00	25	0.200
638	A	7	7	1.00	25	0.280
639	A	5	5	1.00	25	0.200
640	A	5	5	1.00	25	0.200
641	A	5	5	1.00	25	0.200
642	A	5	5	1.00	25	0.200
643	A	6	5	1.00	25	0.200
644	A	1	1	1.00	25	0.040
645	A	1	1	1.00	25	0.040
646	A	2	2	1.00	25	0.080
647	A	2	2	1.00	25	0.080
648	A	1	1	1.00	25	0.040
649	A	1	1	1.00	25	0.040
650	A	2	2	1.00	25	0.080
651	A	2	2	1.00	25	0.080
652	A	2	2	1.00	27	0.074
653	A	2	2	1.00	27	0.074
654	A	1	1	1.00	27	0.037

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
655	A	1	1	1.00	27	0.037
656	A	2	2	1.00	27	0.074
657	A	2	2	1.00	27	0.074
658	A	1	1	1.00	27	0.037
659	A	1	1	1.00	27	0.037
660	A	1	1	1.00	25	0.040
661	A	1	1	1.00	25	0.040
662	A	2	2	1.00	25	0.080
663	A	2	2	1.00	25	0.080
664	A	1	1	1.00	25	0.040
665	A	1	1	1.00	25	0.040
666	A	2	2	1.00	25	0.080
667	A	2	2	1.00	25	0.080
668	A	2	2	1.00	27	0.074
669	A	2	2	1.00	27	0.074
670	A	1	1	1.00	27	0.037
671	A	1	1	1.00	27	0.037
672	A	2	2	1.00	27	0.074
673	A	2	2	1.00	27	0.074
674	A	1	1	1.00	27	0.037
675	A	1	1	1.00	27	0.037
676	A	5	3	1.00	23	0.130
677	A	5	3	1.00	23	0.130
678	A	5	3	1.00	23	0.130
679	A	5	3	1.00	23	0.130
680	N/A	0	0	1.00	25	0.000
681	N/A	0	0	1.00	25	0.000
682	N/A	0	0	1.00	25	0.000
683	N/A	0	0	1.00	25	0.000
684	N/A	0	0	1.00	25	0.000
685	N/A	0	0	1.00	25	0.000
686	N/A	0	0	1.00	25	0.000
687	N/A	0	0	1.00	25	0.000
688	N/A	0	0	1.00	25	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
689	N/A	0	0	1.00	25	0.000
690	A	9	6	1.00	21	0.286
691	A	8	6	1.00	21	0.286
692	A	7	6	1.00	21	0.286
693	A	6	5	1.00	21	0.238
694	A	7	6	1.00	21	0.286
695	A	8	6	1.00	21	0.286
696	A	9	6	1.00	21	0.286
697	A	10	7	1.00	23	0.304
698	A	9	7	1.00	23	0.304
699	A	8	7	1.00	23	0.304
700	A	7	6	1.00	23	0.261
701	A	7	6	1.00	23	0.261
702	A	8	7	1.00	23	0.304
703	A	9	7	1.00	23	0.304
704	A	10	7	1.00	23	0.304
705	A	10	8	1.00	23	0.348
706	A	9	8	1.00	23	0.348
707	A	8	7	1.00	23	0.304
708	A	8	7	1.00	23	0.304
709	A	8	7	1.00	23	0.304
710	A	9	8	1.00	23	0.348
711	A	10	8	1.00	23	0.348
712	A	11	10	1.00	23	0.435
713	A	7	7	1.00	23	0.304
714	A	3	3	1.00	23	0.130
715	A	5	5	1.00	23	0.217
716	A	9	8	1.00	23	0.348
717	A	10	9	1.00	23	0.391
718	A	12	10	1.00	23	0.435
719	A	11	10	1.00	23	0.435
720	A	10	9	1.00	23	0.391
721	A	10	9	1.00	23	0.391
722	A	10	9	1.00	23	0.391
723	A	10	9	1.00	23	0.391

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
724	A	13	11	1.00	23	0.478
725	A	12	11	1.00	23	0.478
726	A	11	10	1.00	23	0.435
727	A	11	10	1.00	23	0.435
728	A	11	10	1.00	23	0.435
729	A	11	10	1.00	23	0.435
730	A	6	6	1.00	25	0.240
731	A	5	5	1.00	25	0.200
732	A	4	4	1.00	25	0.160
733	A	2	2	1.00	25	0.080
734	A	8	8	1.00	25	0.320
735	A	8	8	1.00	25	0.320
736	A	7	6	1.00	25	0.240
737	A	6	6	1.00	25	0.240
738	A	5	5	1.00	25	0.200
739	A	6	6	1.00	25	0.240
740	A	7	7	1.00	25	0.280
741	A	9	9	1.00	25	0.360
742	A	9	9	1.00	25	0.360
743	A	8	6	1.00	25	0.240
744	A	7	6	1.00	25	0.240
745	A	6	6	1.00	25	0.240
746	A	7	7	1.00	25	0.280
747	A	8	8	1.00	25	0.320
748	A	8	8	1.00	25	0.320
749	A	9	9	1.00	25	0.360
750	A	10	9	1.00	25	0.360
751	A	5	5	1.00	25	0.200
752	A	4	4	1.00	25	0.160
753	A	2	2	1.00	25	0.080
754	A	2	2	1.00	25	0.080
755	A	9	9	1.00	25	0.360
756	A	8	8	1.00	25	0.320
757	A	6	6	1.00	25	0.240
758	A	5	5	1.00	25	0.200

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
759	A	5	5	1.00	25	0.200
760	A	5	5	1.00	25	0.200
761	A	7	7	1.00	25	0.280
762	A	8	8	1.00	25	0.320
763	A	7	6	1.00	25	0.240
764	A	6	6	1.00	25	0.240
765	A	6	6	1.00	25	0.240
766	A	6	6	1.00	25	0.240
767	A	6	6	1.00	25	0.240
768	A	8	8	1.00	25	0.320
769	A	6	5	1.00	21	0.238
770	A	5	4	1.00	21	0.190
771	A	4	3	1.00	21	0.143
772	A	3	2	1.00	19	0.105
773	A	5	3	1.00	21	0.143
774	A	8	3	1.00	21	0.143
775	A	8	6	1.00	21	0.286
776	A	7	5	1.00	21	0.238
777	A	6	4	1.00	19	0.210
778	A	2	2	1.00	21	0.095
779	A	3	3	1.00	19	0.158
780	A	1	1	1.00	25	0.040
781	A	1	1	1.00	27	0.037
782	A	1	1	1.00	31	0.032
783	A	1	1	1.00	27	0.037
784	A	1	1	1.00	29	0.034
785	A	2	2	1.00	25	0.080
786	A	1	1	1.00	29	0.034
787	A	3	3	1.00	25	0.120
788	A	3	3	1.00	25	0.120
789	A	3	3	1.00	25	0.120
790	A	3	3	1.00	25	0.120
791	A	3	3	1.00	28	0.107
792	A	2	2	1.00	23	0.087
793	A	2	2	1.00	21	0.095

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
794	A	3	3	1.00	28	0.107
795	A	7	4	1.00	25	0.160
796	A	7	4	1.00	25	0.160
797	A	7	4	1.00	25	0.160
798	A	7	4	1.00	25	0.160
799	A	9	6	1.00	31	0.194
800	A	8	6	1.00	29	0.207
801	A	6	5	1.00	23	0.217
802	A	6	5	1.00	29	0.172
803	A	7	6	1.00	31	0.194
804	A	8	6	1.00	31	0.194
805	A	9	6	1.00	31	0.194
806	A	9	6	1.00	29	0.207
807	A	7	5	1.00	23	0.217
808	A	7	6	1.00	29	0.207
809	A	6	5	1.00	31	0.161
810	A	7	6	1.00	31	0.194
811	A	8	6	1.00	31	0.194
812	A	9	6	1.00	31	0.194
813	A	8	5	1.00	23	0.217
814	A	8	6	1.00	29	0.207
815	A	7	6	1.00	31	0.194
816	A	6	5	1.00	31	0.161
817	A	7	6	1.00	31	0.194
818	A	8	6	1.00	31	0.194
819	A	9	6	1.00	31	0.194
820	A	9	6	1.00	31	0.194
821	A	8	6	1.00	31	0.194
822	A	7	6	1.00	29	0.207
823	A	5	4	1.00	23	0.174
824	A	7	6	1.00	29	0.207
825	A	8	6	1.00	31	0.194
826	A	9	6	1.00	31	0.194
827	A	9	6	1.00	31	0.194
828	A	8	6	1.00	31	0.194

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
829	A	7	6	1.00	31	0.194
830	A	6	5	1.00	29	0.172
831	A	6	5	1.00	23	0.217
832	A	8	6	1.00	29	0.207
833	A	9	6	1.00	31	0.194
834	A	9	6	1.00	31	0.194
835	A	8	6	1.00	31	0.194
836	A	7	6	1.00	31	0.194
837	A	6	5	1.00	31	0.161
838	A	7	6	1.00	29	0.207
839	A	7	5	1.00	23	0.217
840	A	9	6	1.00	29	0.207
841	A	8	5	1.00	23	0.217
842	A	7	5	1.00	33	0.152
843	A	6	5	1.00	33	0.152
844	A	2	2	1.00	33	0.061
845	A	3	2	1.00	33	0.061
846	A	3	3	1.00	33	0.091
847	A	5	5	1.00	33	0.152
848	A	6	6	1.00	33	0.182
849	A	6	5	1.00	33	0.152
850	A	7	5	1.00	33	0.152
851	A	6	5	1.00	33	0.152
852	A	2	2	1.00	33	0.061
853	A	3	2	1.00	33	0.061
854	A	3	3	1.00	33	0.091
855	A	5	5	1.00	33	0.152
856	A	6	6	1.00	33	0.182
857	A	6	5	1.00	33	0.152
858	A	7	5	1.00	33	0.152
859	A	6	5	1.00	33	0.152
860	A	2	2	1.00	33	0.061
861	A	3	2	1.00	33	0.061
862	A	3	3	1.00	33	0.091
863	A	5	5	1.00	33	0.152

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
864	A	6	6	1.00	33	0.182
865	A	6	5	1.00	33	0.152
866	A	6	5	1.00	33	0.152
867	A	2	2	1.00	33	0.061
868	A	3	2	1.00	33	0.061
869	A	3	3	1.00	33	0.091
870	A	5	5	1.00	33	0.152
871	A	6	6	1.00	33	0.182
872	A	6	5	1.00	33	0.152
873	A	6	5	1.00	33	0.152
874	A	2	2	1.00	33	0.061
875	A	3	2	1.00	33	0.061
876	A	3	3	1.00	33	0.091
877	A	5	5	1.00	33	0.152
878	A	6	6	1.00	33	0.182
879	A	6	5	1.00	33	0.152
880	A	6	5	1.00	33	0.152
881	A	2	2	1.00	33	0.061
882	A	3	2	1.00	33	0.061
883	A	3	3	1.00	33	0.091
884	A	5	5	1.00	33	0.152
885	A	6	6	1.00	33	0.182
886	A	6	5	1.00	33	0.152
887	A	4	3	1.00	31	0.097
888	A	4	3	1.00	29	0.103
889	A	3	2	1.00	23	0.087
890	A	4	3	1.00	29	0.103
891	A	4	3	1.00	31	0.097
892	A	4	3	1.00	31	0.097
893	A	4	3	1.00	31	0.097
894	A	4	3	1.00	29	0.103
895	A	3	2	1.00	23	0.087
896	A	4	3	1.00	29	0.103
897	A	4	3	1.00	31	0.097
898	A	4	3	1.00	31	0.097

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
899	A	4	3	1.00	31	0.097
900	A	4	3	1.00	29	0.103
901	A	3	2	1.00	23	0.087
902	A	4	3	1.00	29	0.103
903	A	4	3	1.00	31	0.097
904	A	4	3	1.00	31	0.097
905	A	4	3	1.00	31	0.097
906	A	4	3	1.00	29	0.103
907	A	3	2	1.00	23	0.087
908	A	4	3	1.00	29	0.103
909	A	4	3	1.00	31	0.097
910	A	4	3	1.00	31	0.097
911	A	4	3	1.00	29	0.103
912	A	4	3	1.00	29	0.103
913	A	4	3	1.00	27	0.111
914	A	3	2	1.00	21	0.095
915	A	4	3	1.00	27	0.111
916	A	4	3	1.00	29	0.103
917	A	4	3	1.00	29	0.103
918	A	4	3	1.00	29	0.103
919	A	4	3	1.00	31	0.097
920	A	4	3	1.00	31	0.097
921	A	4	3	1.00	31	0.097
922	A	4	3	1.00	31	0.097
923	A	4	3	1.00	31	0.097
924	A	4	3	1.00	31	0.097
925	A	4	3	1.00	31	0.097
926	A	4	3	1.00	31	0.097
927	A	4	3	1.00	31	0.097
928	A	4	3	1.00	31	0.097
929	A	4	3	1.00	31	0.097
930	A	4	3	1.00	31	0.097
931	A	4	3	1.00	31	0.097
932	A	4	3	1.00	31	0.097

CHAPTER 3

LISTING OF INTEGRALS

3.1 $\int \cos^5(c+dx)(a+a\cos(c+dx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 114

$$\int \cos^5(c+dx)(a+a\cos(c+dx))\,dx = \frac{5ax}{16}+\frac{a\sin(c+dx)}{d}+\frac{5a\cos(c+dx)\sin(c+dx)}{16d}+\frac{5a\cos^3(c+dx)\sin(c+dx)}{24d}+\frac{a\cos^5(c+dx)\sin(c+dx)}{6d}-\frac{2a\sin^3(c+dx)}{3d}+\frac{a\sin^5(c+dx)}{5d}$$

```
[Out] 5/16*a*x+a*sin(d*x+c)/d+5/16*a*cos(d*x+c)*sin(d*x+c)/d+5/24*a*cos(d*x+c)^3*
sin(d*x+c)/d+1/6*a*cos(d*x+c)^5*sin(d*x+c)/d-2/3*a*sin(d*x+c)^3/d+1/5*a*sin
(d*x+c)^5/d
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2827, 2713, 2715, 8}

$$\int \cos^5(c+dx)(a+a\cos(c+dx))\,dx = \frac{a\sin^5(c+dx)}{5d}-\frac{2a\sin^3(c+dx)}{3d}+\frac{a\sin(c+dx)}{d}+\frac{a\sin(c+dx)\cos^5(c+dx)}{6d}+\frac{5a\sin(c+dx)\cos^3(c+dx)}{24d}+\frac{5a\sin(c+dx)\cos(c+dx)}{16d}+\frac{5ax}{16}$$

```
[In] Int[Cos[c + d*x]^5*(a + a*Cos[c + d*x]),x]
```

```
[Out] (5*a*x)/16 + (a*Sin[c + d*x])/d + (5*a*Cos[c + d*x]*Sin[c + d*x])/(16*d) +
(5*a*Cos[c + d*x]^3*Sin[c + d*x])/(24*d) + (a*Cos[c + d*x]^5*Sin[c + d*x])/
(6*d) - (2*a*Sin[c + d*x]^3)/(3*d) + (a*Sin[c + d*x]^5)/(5*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= a\int \cos^5(c+dx)\,dx + a\int \cos^6(c+dx)\,dx \\
&= \frac{a\cos^5(c+dx)\sin(c+dx)}{6d} + \frac{1}{6}(5a)\int \cos^4(c+dx)\,dx \\
&\quad - \frac{a\text{Subst}\left(\int \left(1-2x^2+x^4\right)\,dx, x, -\sin(c+dx)\right)}{d} \\
&= \frac{a\sin(c+dx)}{d} + \frac{5a\cos^3(c+dx)\sin(c+dx)}{24d} + \frac{a\cos^5(c+dx)\sin(c+dx)}{6d} \\
&\quad - \frac{2a\sin^3(c+dx)}{3d} + \frac{a\sin^5(c+dx)}{5d} + \frac{1}{8}(5a)\int \cos^2(c+dx)\,dx \\
&= \frac{a\sin(c+dx)}{d} + \frac{5a\cos(c+dx)\sin(c+dx)}{16d} + \frac{5a\cos^3(c+dx)\sin(c+dx)}{24d} \\
&\quad + \frac{a\cos^5(c+dx)\sin(c+dx)}{6d} - \frac{2a\sin^3(c+dx)}{3d} + \frac{a\sin^5(c+dx)}{5d} + \frac{1}{16}(5a)\int 1\,dx
\end{aligned}$$

$$= \frac{5ax}{16} + \frac{a\sin(c+dx)}{d} + \frac{5a\cos(c+dx)\sin(c+dx)}{16d} + \frac{5a\cos^3(c+dx)\sin(c+dx)}{24d} + \frac{a\cos^5(c+dx)\sin(c+dx)}{6d} - \frac{2a\sin^3(c+dx)}{3d} + \frac{a\sin^5(c+dx)}{5d}$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.66

$$\int \cos^5(c+dx)(a+a\cos(c+dx))\,dx = \frac{a(960\sin(c+dx) - 640\sin^3(c+dx) + 192\sin^5(c+dx) + 5(60c+60dx+45\sin(2(c+dx)) + 9\sin(4(c+$$
$$960d$$

```
[In] Integrate[Cos[c + d*x]^5*(a + a*Cos[c + d*x]),x]
[Out] (a*(960*Sin[c + d*x] - 640*Sin[c + d*x]^3 + 192*Sin[c + d*x]^5 + 5*(60*c +
60*d*x + 45*Sin[2*(c + d*x)] + 9*Sin[4*(c + d*x)] + Sin[6*(c + d*x)])))/(96
0*d)
```

Maple [A] (verified)

Time = 2.45 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.64

method	result
parallelrisch	$\frac{\left(60dx+\sin(6dx+6c)+120\sin(dx+c)+45\sin(2dx+2c)+20\sin(3dx+3c)+9\sin(4dx+4c)+\frac{12\sin(5dx+5c)}{5}\right)a}{192d}$
derivativedivides	$\frac{a\left(\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{6}+\frac{5dx}{16}+\frac{5c}{16}\right)+\frac{a\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}}{d}$
default	$\frac{a\left(\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{6}+\frac{5dx}{16}+\frac{5c}{16}\right)+\frac{a\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}}{d}$
parts	$\frac{a\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5d}+\frac{a\left(\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{6}+\frac{5dx}{16}+\frac{5c}{16}\right)}{d}$
risch	$\frac{5ax}{16}+\frac{5a\sin(dx+c)}{8d}+\frac{a\sin(6dx+6c)}{192d}+\frac{a\sin(5dx+5c)}{80d}+\frac{3a\sin(4dx+4c)}{64d}+\frac{5a\sin(3dx+3c)}{48d}+\frac{15a\sin(2dx+2c}{64d}$
norman	$\frac{\frac{5ax}{16}+\frac{27a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8d}+\frac{107a\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{24d}+\frac{283a\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{20d}+\frac{133a\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{20d}+\frac{39a\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8d}+\frac{5a\left(\tan^{11}\left(\right.\right.}{8d}}{}$

```
[In] int(cos(d*x+c)^5*(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] 1/192*(60*d*x+sin(6*d*x+6*c)+120*sin(d*x+c)+45*sin(2*d*x+2*c)+20*sin(3*d*x+
3*c)+9*sin(4*d*x+4*c)+12/5*sin(5*d*x+5*c))*a/d
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.66

$$\int \cos^5(c+dx)(a+a\cos(c+dx))\,dx = \frac{75\,adx + \left(40\,a\cos\left(dx+c\right)^5 + 48\,a\cos\left(dx+c\right)^4 + 50\,a\cos\left(dx+c\right)^3 + 64\,a\cos\left(dx+c\right)^2 + 75\,a\cos\left(dx+c\right.}{240\,d}$$

```
[In] integrate(cos(d*x+c)^5*(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/240*(75*a*d*x + (40*a*cos(d*x + c)^5 + 48*a*cos(d*x + c)^4 + 50*a*cos(d*x
 + c)^3 + 64*a*cos(d*x + c)^2 + 75*a*cos(d*x + c) + 128*a)*sin(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 216 vs. 2(107) = 214.

Time = 0.34 (sec) , antiderivative size = 216, normalized size of antiderivative = 1.89

$$\int \cos^5(c+dx)(a+a\cos(c+dx))\,dx = \begin{cases} \frac{5ax\sin^6(c+dx)}{16} + \frac{15ax\sin^4(c+dx)\cos^2(c+dx)}{16} + \frac{15ax\sin^2(c+dx)\cos^4(c+dx)}{16} + \frac{5ax\cos^6(c+dx)}{16} + \frac{5a\sin^5(c+dx)\cos(c+dx)}{16d} + \frac{8a\,\mathrm{si}}{} \\ x(a\cos(c)+a)\cos^5(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)**5*(a+a*cos(d*x+c)),x)
```

```
[Out] Piecewise((5*a*x*sin(c + d*x)**6/16 + 15*a*x*sin(c + d*x)**4*cos(c + d*x)**
2/16 + 15*a*x*sin(c + d*x)**2*cos(c + d*x)**4/16 + 5*a*x*cos(c + d*x)**6/16
 + 5*a*sin(c + d*x)**5*cos(c + d*x)/(16*d) + 8*a*sin(c + d*x)**5/(15*d) + 5
*a*sin(c + d*x)**3*cos(c + d*x)**3/(6*d) + 4*a*sin(c + d*x)**3*cos(c + d*x)
**2/(3*d) + 11*a*sin(c + d*x)*cos(c + d*x)**5/(16*d) + a*sin(c + d*x)*cos(c
 + d*x)**4/d, Ne(d, 0)), (x*(a*cos(c) + a)*cos(c)**5, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.22 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.74

$$\int \cos^5(c+dx)(a+a\cos(c+dx))\,dx = \frac{64\left(3\sin(dx+c)^5-10\sin(dx+c)^3+15\sin(dx+c)\right)a-5\left(4\sin(2dx+2c)^3-60dx-60c-9\sin(4dx+4c)-48\sin(2dx+2c)\right)a}{960d}$$

```
[In] integrate(cos(d*x+c)^5*(a+a*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/960*(64*(3*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*sin(d*x + c))*a - 5*(4
*sin(2*d*x + 2*c)^3 - 60*d*x - 60*c - 9*sin(4*d*x + 4*c) - 48*sin(2*d*x + 2
*c))*a)/d
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 92, normalized size of antiderivative = 0.81

$$\int \cos^5(c+dx)(a+a\cos(c+dx))\,dx = \frac{5}{16}ax + \frac{a\sin(6dx+6c)}{192d} + \frac{a\sin(5dx+5c)}{80d} + \frac{3a\sin(4dx+4c)}{64d} + \frac{5a\sin(3dx+3c)}{48d} + \frac{15a\sin(2dx+2c)}{64d} + \frac{5a\sin(dx+c)}{8d}$$

```
[In] integrate(cos(d*x+c)^5*(a+a*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] 5/16*a*x + 1/192*a*sin(6*d*x + 6*c)/d + 1/80*a*sin(5*d*x + 5*c)/d + 3/64*a*
sin(4*d*x + 4*c)/d + 5/48*a*sin(3*d*x + 3*c)/d + 15/64*a*sin(2*d*x + 2*c)/d
 + 5/8*a*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 16.48 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.94

$$\int \cos^5(c+dx)(a+a\cos(c+dx))\,dx = \frac{5ax}{16} + \frac{\frac{5a\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{11}}{8}+\frac{39a\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{9}}{8}+\frac{133a\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{7}}{20}+\frac{283a\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{5}}{20}+\frac{107a\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{3}}{24}+\frac{27a\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{8}}{d\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2+1\right)^6}$$

```
[In] int(cos(c + d*x)^5*(a + a*cos(c + d*x)),x)

[Out] (5*a*x)/16 + ((27*a*tan(c/2 + (d*x)/2))/8 + (107*a*tan(c/2 + (d*x)/2)^3)/24
 + (283*a*tan(c/2 + (d*x)/2)^5)/20 + (133*a*tan(c/2 + (d*x)/2)^7)/20 + (39*
a*tan(c/2 + (d*x)/2)^9)/8 + (5*a*tan(c/2 + (d*x)/2)^11)/8)/(d*(tan(c/2 + (d
*x)/2)^2 + 1)^6)
```

3.2 $\int \cos^4(c+dx)(a+a\cos(c+dx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 92

$$\int \cos^4(c+dx)(a+a\cos(c+dx))\,dx = \frac{3ax}{8}+\frac{a\sin(c+dx)}{d}+\frac{3a\cos(c+dx)\sin(c+dx)}{8d} + \frac{a\cos^3(c+dx)\sin(c+dx)}{4d} - \frac{2a\sin^3(c+dx)}{3d}+\frac{a\sin^5(c+dx)}{5d}$$

```
[Out] 3/8*a*x+a*sin(d*x+c)/d+3/8*a*cos(d*x+c)*sin(d*x+c)/d+1/4*a*cos(d*x+c)^3*sin
(d*x+c)/d-2/3*a*sin(d*x+c)^3/d+1/5*a*sin(d*x+c)^5/d
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2827, 2715, 8, 2713}

$$\int \cos^4(c+dx)(a+a\cos(c+dx))\,dx = \frac{a\sin^5(c+dx)}{5d}-\frac{2a\sin^3(c+dx)}{3d} + \frac{a\sin(c+dx)}{d}+\frac{a\sin(c+dx)\cos^3(c+dx)}{4d} + \frac{3a\sin(c+dx)\cos(c+dx)}{8d}+\frac{3ax}{8}$$

```
[In] Int[Cos[c + d*x]^4*(a + a*Cos[c + d*x]),x]
```

```
[Out] (3*a*x)/8 + (a*Sin[c + d*x])/d + (3*a*Cos[c + d*x]*Sin[c + d*x])/(8*d) + (a
*Cos[c + d*x]^3*Sin[c + d*x])/(4*d) - (2*a*Sin[c + d*x]^3)/(3*d) + (a*Sin[c
 + d*x]^5)/(5*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= a\int \cos^4(c+dx)\,dx + a\int \cos^5(c+dx)\,dx\\
&= \frac{a\cos^3(c+dx)\sin(c+dx)}{4d} + \frac{1}{4}(3a)\int \cos^2(c+dx)\,dx\\
&\quad - \frac{a\text{Subst}\left(\int \left(1-2x^2+x^4\right)\,dx, x, -\sin(c+dx)\right)}{d}\\
&= \frac{a\sin(c+dx)}{d} + \frac{3a\cos(c+dx)\sin(c+dx)}{8d} + \frac{a\cos^3(c+dx)\sin(c+dx)}{4d}\\
&\quad - \frac{2a\sin^3(c+dx)}{3d} + \frac{a\sin^5(c+dx)}{5d} + \frac{1}{8}(3a)\int 1\,dx\\
&= \frac{3ax}{8} + \frac{a\sin(c+dx)}{d} + \frac{3a\cos(c+dx)\sin(c+dx)}{8d}\\
&\quad + \frac{a\cos^3(c+dx)\sin(c+dx)}{4d} - \frac{2a\sin^3(c+dx)}{3d} + \frac{a\sin^5(c+dx)}{5d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.71

$$\int \cos^4(c+dx)(a+a\cos(c+dx))\,dx$$
$$=\frac{a(480\sin(c+dx)-320\sin^3(c+dx)+96\sin^5(c+dx)+15(12(c+dx)+8\sin(2(c+dx))+\sin(4(c+dx\cdots}{480d}$$

```
[In] Integrate[Cos[c + d*x]^4*(a + a*Cos[c + d*x]),x]
```

```
[Out] (a*(480*Sin[c + d*x] - 320*Sin[c + d*x]^3 + 96*Sin[c + d*x]^5 + 15*(12*(c +
 d*x) + 8*Sin[2*(c + d*x)] + Sin[4*(c + d*x)])))/(480*d)
```

Maple [A] (verified)

Time = 2.25 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.70

method	result
parallelrisch	$\frac{a(180dx+300\sin(dx+c)+6\sin(5dx+5c)+15\sin(4dx+4c)+50\sin(3dx+3c)+120\sin(2dx+2c))}{480d}$
derivativedivides	$\frac{\frac{a\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}+a\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}$
default	$\frac{\frac{a\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}+a\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}$
parts	$\frac{a\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}+\frac{a\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5d}$
risch	$\frac{3ax}{8}+\frac{5a\sin(dx+c)}{8d}+\frac{a\sin(5dx+5c)}{80d}+\frac{a\sin(4dx+4c)}{32d}+\frac{5a\sin(3dx+3c)}{48d}+\frac{a\sin(2dx+2c)}{4d}$
norman	$\frac{\frac{3ax}{8}+\frac{13a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d}+\frac{19a\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{6d}+\frac{116a\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{15d}+\frac{13a\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{6d}+\frac{3a\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}+\frac{15ax\left(\tan^2\left(\frac{dx}{2}\cdots\right.\right.}{8}\cdots}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^5}$

```
[In] int(cos(d*x+c)^4*(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] 1/480*a*(180*d*x+300*sin(d*x+c)+6*sin(5*d*x+5*c)+15*sin(4*d*x+4*c)+50*sin(3
*d*x+3*c)+120*sin(2*d*x+2*c))/d
```

Fricas [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.70

$$\int \cos^4(c+dx)(a+a\cos(c+dx))\,dx = \frac{45\,adx+\left(24\,a\cos\left(dx+c\right)^4+30\,a\cos\left(dx+c\right)^3+32\,a\cos\left(dx+c\right)^2+45\,a\cos\left(dx+c\right)+64\,a\right)\sin\left(dx+c\right)}{120\,d}$$

```
[In] integrate(cos(d*x+c)^4*(a+a*cos(d*x+c)),x, algorithm="fricas")
[Out] 1/120*(45*a*d*x + (24*a*cos(d*x + c)^4 + 30*a*cos(d*x + c)^3 + 32*a*cos(d*x
 + c)^2 + 45*a*cos(d*x + c) + 64*a)*sin(d*x + c))/d
```

Sympy [A] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.83

$$\int \cos^4(c+dx)(a+a\cos(c+dx))\,dx = \begin{cases} \frac{3ax\sin^4(c+dx)}{8}+\frac{3ax\sin^2(c+dx)\cos^2(c+dx)}{4}+\frac{3ax\cos^4(c+dx)}{8}+\frac{8a\sin^5(c+dx)}{15d}+\frac{4a\sin^3(c+dx)\cos^2(c+dx)}{3d}+\frac{3a\sin^3(c+dx)\cos(c+dx)}{8d} \\ x(a\cos(c)+a)\cos^4(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)**4*(a+a*cos(d*x+c)),x)
[Out] Piecewise((3*a*x*sin(c + d*x)**4/8 + 3*a*x*sin(c + d*x)**2*cos(c + d*x)**2/
4 + 3*a*x*cos(c + d*x)**4/8 + 8*a*sin(c + d*x)**5/(15*d) + 4*a*sin(c + d*x)
**3*cos(c + d*x)**2/(3*d) + 3*a*sin(c + d*x)**3*cos(c + d*x)/(8*d) + a*sin(
c + d*x)*cos(c + d*x)**4/d + 5*a*sin(c + d*x)*cos(c + d*x)**3/(8*d), Ne(d,
0)), (x*(a*cos(c) + a)*cos(c)**4, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 69, normalized size of antiderivative = 0.75

$$\int \cos^4(c+dx)(a+a\cos(c+dx))\,dx = \frac{32\left(3\,\sin\left(dx+c\right)^5-10\,\sin\left(dx+c\right)^3+15\,\sin\left(dx+c\right)\right)a+15\left(12\,dx+12\,c+\sin\left(4\,dx+4\,c\right)+8\,\sin\left(2\,dx+2\,c\right)\right)a}{480\,d}$$

```
[In] integrate(cos(d*x+c)^4*(a+a*cos(d*x+c)),x, algorithm="maxima")
[Out] 1/480*(32*(3*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*sin(d*x + c))*a + 15*(
12*d*x + 12*c + sin(4*d*x + 4*c) + 8*sin(2*d*x + 2*c))*a)/d
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.84

$$\int \cos^4(c+dx)(a+a\cos(c+dx))\,dx = \frac{3}{8}\,ax + \frac{a\sin\left(5\,dx+5\,c\right)}{80\,d} + \frac{a\sin\left(4\,dx+4\,c\right)}{32\,d} + \frac{5\,a\sin\left(3\,dx+3\,c\right)}{48\,d} + \frac{a\sin\left(2\,dx+2\,c\right)}{4\,d} + \frac{5\,a\sin\left(dx+c\right)}{8\,d}$$

```
[In] integrate(cos(d*x+c)^4*(a+a*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] 3/8*a*x + 1/80*a*sin(5*d*x + 5*c)/d + 1/32*a*sin(4*d*x + 4*c)/d + 5/48*a*si
n(3*d*x + 3*c)/d + 1/4*a*sin(2*d*x + 2*c)/d + 5/8*a*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 16.63 (sec) , antiderivative size = 93, normalized size of antiderivative = 1.01

$$\int \cos^4(c+dx)(a+a\cos(c+dx))\,dx = \frac{3\,a\,x}{8} + \frac{\frac{3\,a\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9}{4} + \frac{13\,a\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{6} + \frac{116\,a\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{15} + \frac{19\,a\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{6} + \frac{13\,a\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{4}}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)^5}$$

```
[In] int(cos(c + d*x)^4*(a + a*cos(c + d*x)),x)
```

```
[Out] (3*a*x)/8 + ((13*a*tan(c/2 + (d*x)/2))/4 + (19*a*tan(c/2 + (d*x)/2)^3)/6 +
(116*a*tan(c/2 + (d*x)/2)^5)/15 + (13*a*tan(c/2 + (d*x)/2)^7)/6 + (3*a*tan(
c/2 + (d*x)/2)^9)/4)/(d*(tan(c/2 + (d*x)/2)^2 + 1)^5)
```

3.3 $\int \cos^3(c+dx)(a+a\cos(c+dx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 76

$$\int \cos^3(c+dx)(a+a\cos(c+dx))\,dx = \frac{3ax}{8}+\frac{a\sin(c+dx)}{d}+\frac{3a\cos(c+dx)\sin(c+dx)}{8d}+\frac{a\cos^3(c+dx)\sin(c+dx)}{4d}-\frac{a\sin^3(c+dx)}{3d}$$

```
[Out] 3/8*a*x+a*sin(d*x+c)/d+3/8*a*cos(d*x+c)*sin(d*x+c)/d+1/4*a*cos(d*x+c)^3*sin
(d*x+c)/d-1/3*a*sin(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 76, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2827, 2713, 2715, 8}

$$\int \cos^3(c+dx)(a+a\cos(c+dx))\,dx = -\frac{a\sin^3(c+dx)}{3d}+\frac{a\sin(c+dx)}{d}+\frac{a\sin(c+dx)\cos^3(c+dx)}{4d}+\frac{3a\sin(c+dx)\cos(c+dx)}{8d}+\frac{3ax}{8}$$

```
[In] Int[Cos[c + d*x]^3*(a + a*Cos[c + d*x]),x]
```

```
[Out] (3*a*x)/8 + (a*Sin[c + d*x])/d + (3*a*Cos[c + d*x]*Sin[c + d*x])/(8*d) + (a
*Cos[c + d*x]^3*Sin[c + d*x])/(4*d) - (a*Sin[c + d*x]^3)/(3*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= a\int \cos^3(c+dx)\,dx + a\int \cos^4(c+dx)\,dx\\
&= \frac{a\cos^3(c+dx)\sin(c+dx)}{4d} + \frac{1}{4}(3a)\int \cos^2(c+dx)\,dx\\
&\quad - \frac{a\text{Subst}\left(\int \left(1-x^2\right)\,dx, x, -\sin(c+dx)\right)}{d}\\
&= \frac{a\sin(c+dx)}{d} + \frac{3a\cos(c+dx)\sin(c+dx)}{8d}\\
&\quad + \frac{a\cos^3(c+dx)\sin(c+dx)}{4d} - \frac{a\sin^3(c+dx)}{3d} + \frac{1}{8}(3a)\int 1\,dx\\
&= \frac{3ax}{8} + \frac{a\sin(c+dx)}{d} + \frac{3a\cos(c+dx)\sin(c+dx)}{8d}\\
&\quad + \frac{a\cos^3(c+dx)\sin(c+dx)}{4d} - \frac{a\sin^3(c+dx)}{3d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.96

$$\int \cos^3(c+dx)(a+a\cos(c+dx))\,dx = \frac{3a(c+dx)}{8d}+\frac{a\sin(c+dx)}{d}-\frac{a\sin^3(c+dx)}{3d}+\frac{a\sin(2(c+dx))}{4d}+\frac{a\sin(4(c+dx))}{32d}$$

```
[In] Integrate[Cos[c + d*x]^3*(a + a*Cos[c + d*x]),x]
```

```
[Out] (3*a*(c + d*x))/(8*d) + (a*Sin[c + d*x])/d - (a*Sin[c + d*x]^3)/(3*d) + (a*
Sin[2*(c + d*x)])/(4*d) + (a*Sin[4*(c + d*x)])/(32*d)
```

Maple [A] (verified)

Time = 2.19 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.70

method	result
parallelrisch	$\frac{a(36dx+3\sin(4dx+4c)+8\sin(3dx+3c)+24\sin(2dx+2c)+72\sin(dx+c))}{96d}$
derivativedivides	$\frac{a\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{a\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}}{d}$
default	$\frac{a\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{a\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}}{d}$
parts	$\frac{a(2+\cos^2(dx+c))\sin(dx+c)}{3d}+\frac{a\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}$
risch	$\frac{3ax}{8}+\frac{3a\sin(dx+c)}{4d}+\frac{a\sin(4dx+4c)}{32d}+\frac{a\sin(3dx+3c)}{12d}+\frac{a\sin(2dx+2c)}{4d}$
norman	$\frac{\frac{3ax}{8}+\frac{13a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d}+\frac{31a\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12d}+\frac{49a\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12d}+\frac{3a\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}+\frac{3ax\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}+\frac{9ax\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^4}$

```
[In] int(cos(d*x+c)^3*(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] 1/96*a*(36*d*x+3*sin(4*d*x+4*c)+8*sin(3*d*x+3*c)+24*sin(2*d*x+2*c)+72*sin(d
*x+c))/d
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.70

$$\int \cos^3(c+dx)(a+a\cos(c+dx))\,dx = \frac{9\,adx + \left(6\,a\cos\left(dx+c\right)^3 + 8\,a\cos\left(dx+c\right)^2 + 9\,a\cos\left(dx+c\right) + 16\,a\right)\sin\left(dx+c\right)}{24\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+a*cos(d*x+c)),x, algorithm="fricas")
[Out] 1/24*(9*a*d*x + (6*a*cos(d*x + c)^3 + 8*a*cos(d*x + c)^2 + 9*a*cos(d*x + c)
 + 16*a)*sin(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 144 vs. $2(70) = 140$.

Time = 0.17 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.89

$$\int \cos^3(c+dx)(a+a\cos(c+dx))\,dx = \begin{cases} \frac{3ax\sin^4(c+dx)}{8} + \frac{3ax\sin^2(c+dx)\cos^2(c+dx)}{4} + \frac{3ax\cos^4(c+dx)}{8} + \frac{3a\sin^3(c+dx)\cos(c+dx)}{8d} + \frac{2a\sin^3(c+dx)}{3d} + \frac{5a\sin(c+dx)\cos^3}{8d} \\ x(a\cos(c)+a)\cos^3(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)**3*(a+a*cos(d*x+c)),x)
[Out] Piecewise((3*a*x*sin(c + d*x)**4/8 + 3*a*x*sin(c + d*x)**2*cos(c + d*x)**2/
4 + 3*a*x*cos(c + d*x)**4/8 + 3*a*sin(c + d*x)**3*cos(c + d*x)/(8*d) + 2*a*
sin(c + d*x)**3/(3*d) + 5*a*sin(c + d*x)*cos(c + d*x)**3/(8*d) + a*sin(c +
d*x)*cos(c + d*x)**2/d, Ne(d, 0)), (x*(a*cos(c) + a)*cos(c)**3, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.22 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.75

$$\int \cos^3(c+dx)(a+a\cos(c+dx))\,dx = -\frac{32\left(\sin\left(dx+c\right)^3 - 3\,\sin\left(dx+c\right)\right)a - 3\left(12\,dx + 12\,c + \sin\left(4\,dx+4\,c\right) + 8\,\sin\left(2\,dx+2\,c\right)\right)a}{96\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+a*cos(d*x+c)),x, algorithm="maxima")
[Out] -1/96*(32*(sin(d*x + c)^3 - 3*sin(d*x + c))*a - 3*(12*d*x + 12*c + sin(4*d*
x + 4*c) + 8*sin(2*d*x + 2*c))*a)/d
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 62, normalized size of antiderivative = 0.82

$$\int \cos^3(c+dx)(a+a\cos(c+dx))\,dx = \frac{3}{8}\,ax + \frac{a\sin\left(4\,dx+4\,c\right)}{32\,d} + \frac{a\sin\left(3\,dx+3\,c\right)}{12\,d} + \frac{a\sin\left(2\,dx+2\,c\right)}{4\,d} + \frac{3\,a\sin\left(dx+c\right)}{4\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+a*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] 3/8*a*x + 1/32*a*sin(4*d*x + 4*c)/d + 1/12*a*sin(3*d*x + 3*c)/d + 1/4*a*sin
(2*d*x + 2*c)/d + 3/4*a*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 17.69 (sec) , antiderivative size = 79, normalized size of antiderivative = 1.04

$$\int \cos^3(c+dx)(a+a\cos(c+dx))\,dx = \frac{3\,a\,x}{8} + \frac{\frac{3\,a\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{4} + \frac{49\,a\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{12} + \frac{31\,a\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{12} + \frac{13\,a\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{4}}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)^4}$$

```
[In] int(cos(c + d*x)^3*(a + a*cos(c + d*x)),x)
```

```
[Out] (3*a*x)/8 + ((13*a*tan(c/2 + (d*x)/2))/4 + (31*a*tan(c/2 + (d*x)/2)^3)/12 +
 (49*a*tan(c/2 + (d*x)/2)^5)/12 + (3*a*tan(c/2 + (d*x)/2)^7)/4)/(d*(tan(c/2
 + (d*x)/2)^2 + 1)^4)
```

3.4 $\int \cos^2(c+dx)(a+a\cos(c+dx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 54

$$\int \cos^2(c+dx)(a+a\cos(c+dx))\,dx = \frac{ax}{2}+\frac{a\sin(c+dx)}{d}+\frac{a\cos(c+dx)\sin(c+dx)}{2d}-\frac{a\sin^3(c+dx)}{3d}$$

```
[Out] 1/2*a*x+a*sin(d*x+c)/d+1/2*a*cos(d*x+c)*sin(d*x+c)/d-1/3*a*sin(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2827, 2715, 8, 2713}

$$\int \cos^2(c+dx)(a+a\cos(c+dx))\,dx = -\frac{a\sin^3(c+dx)}{3d}+\frac{a\sin(c+dx)}{d}+\frac{a\sin(c+dx)\cos(c+dx)}{2d}+\frac{ax}{2}$$

```
[In] Int[Cos[c + d*x]^2*(a + a*Cos[c + d*x]),x]
```

```
[Out] (a*x)/2 + (a*Sin[c + d*x])/d + (a*Cos[c + d*x]*Sin[c + d*x])/(2*d) - (a*Sin
[c + d*x]^3)/(3*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= a\int \cos^2(c+dx)\,dx + a\int \cos^3(c+dx)\,dx \\
&= \frac{a\cos(c+dx)\sin(c+dx)}{2d} + \frac{1}{2}a\int 1\,dx - \frac{a\text{Subst}\left(\int \left(1-x^2\right)\,dx, x, -\sin(c+dx)\right)}{d} \\
&= \frac{ax}{2} + \frac{a\sin(c+dx)}{d} + \frac{a\cos(c+dx)\sin(c+dx)}{2d} - \frac{a\sin^3(c+dx)}{3d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.06

$$
\int \cos^2(c+dx)(a+a\cos(c+dx))\,dx = \frac{a(c+dx)}{2d} + \frac{a\sin(c+dx)}{d} - \frac{a\sin^3(c+dx)}{3d} + \frac{a\sin(2(c+dx))}{4d}
$$

```
[In] Integrate[Cos[c + d*x]^2*(a + a*Cos[c + d*x]),x]
```

```
[Out] (a*(c + d*x))/(2*d) + (a*Sin[c + d*x])/d - (a*Sin[c + d*x]^3)/(3*d) + (a*Si
n[2*(c + d*x)])/(4*d)
```

Maple [A] (verified)

Time = 1.66 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.74

method	result
parallelrisch	$\frac{a(6dx+\sin(3dx+3c)+3\sin(2dx+2c)+9\sin(dx+c))}{12d}$
risch	$\frac{ax}{2}+\frac{3a\sin(dx+c)}{4d}+\frac{a\sin(3dx+3c)}{12d}+\frac{a\sin(2dx+2c)}{4d}$
derivativedivides	$\frac{\frac{a\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+a\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}$
default	$\frac{\frac{a\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+a\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}$
parts	$\frac{a\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{a(2+\cos^2(dx+c))\sin(dx+c)}{3d}$
norman	$\frac{\frac{a\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{ax}{2}+\frac{3a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{4a\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}+\frac{3ax\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}+\frac{3ax\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}+\frac{ax\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3}$

```
[In] int(cos(d*x+c)^2*(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
[Out] 1/12*a*(6*d*x+sin(3*d*x+3*c)+3*sin(2*d*x+2*c)+9*sin(d*x+c))/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.78

$$\int \cos^2(c+dx)(a+a\cos(c+dx))\,dx = \frac{3\,adx+\left(2\,a\cos\left(dx+c\right)^2+3\,a\cos\left(dx+c\right)+4\,a\right)\sin\left(dx+c\right)}{6\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c)),x, algorithm="fricas")
[Out] 1/6*(3*a*d*x + (2*a*cos(d*x + c)^2 + 3*a*cos(d*x + c) + 4*a)*sin(d*x + c))/
d
```

Sympy [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 92, normalized size of antiderivative = 1.70

$$\int \cos^2(c+dx)(a+a\cos(c+dx))\,dx$$
$$= \begin{cases} \frac{ax\sin^2(c+dx)}{2} + \frac{ax\cos^2(c+dx)}{2} + \frac{2a\sin^3(c+dx)}{3d} + \frac{a\sin(c+dx)\cos^2(c+dx)}{d} + \frac{a\sin(c+dx)\cos(c+dx)}{2d} & \text{for } d \neq 0 \\ x(a\cos(c)+a)\cos^2(c) & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)**2*(a+a*cos(d*x+c)),x)
```

```
[Out] Piecewise((a*x*sin(c + d*x)**2/2 + a*x*cos(c + d*x)**2/2 + 2*a*sin(c + d*x)
**3/(3*d) + a*sin(c + d*x)*cos(c + d*x)**2/d + a*sin(c + d*x)*cos(c + d*x)/
(2*d), Ne(d, 0)), (x*(a*cos(c) + a)*cos(c)**2, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 46, normalized size of antiderivative = 0.85

$$\int \cos^2(c+dx)(a+a\cos(c+dx))\,dx$$
$$= -\frac{4\left(\sin(dx+c)^3 - 3\sin(dx+c)\right)a - 3\left(2\,dx+2\,c+\sin(2\,dx+2\,c)\right)a}{12\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/12*(4*(sin(d*x + c)^3 - 3*sin(d*x + c))*a - 3*(2*d*x + 2*c + sin(2*d*x +
 2*c))*a)/d
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 47, normalized size of antiderivative = 0.87

$$\int \cos^2(c+dx)(a+a\cos(c+dx))\,dx = \frac{1}{2}\,ax + \frac{a\sin(3\,dx+3\,c)}{12\,d} + \frac{a\sin(2\,dx+2\,c)}{4\,d} + \frac{3\,a\sin(dx+c)}{4\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/2*a*x + 1/12*a*sin(3*d*x + 3*c)/d + 1/4*a*sin(2*d*x + 2*c)/d + 3/4*a*sin(
d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 14.56 (sec) , antiderivative size = 55, normalized size of antiderivative = 1.02

$$\int \cos^2(c+dx)(a+a\cos(c+dx))\,dx = \frac{a\,x}{2}+\frac{2\,a\,\sin\left(c+d\,x\right)}{3\,d}+\frac{a\,\cos\left(c+d\,x\right)\,\sin\left(c+d\,x\right)}{2\,d}+\frac{a\cos\left(c+d\,x\right)^2\,\sin\left(c+d\,x\right)}{3\,d}$$

```
[In] int(cos(c + d*x)^2*(a + a*cos(c + d*x)),x)
```

```
[Out] (a*x)/2 + (2*a*sin(c + d*x))/(3*d) + (a*cos(c + d*x)*sin(c + d*x))/(2*d) +
(a*cos(c + d*x)^2*sin(c + d*x))/(3*d)
```

3.5 $\int \cos(c+dx)(a+a\cos(c+dx))\,dx$

Optimal result

Integrand size = 17, antiderivative size = 38

$$\int \cos(c+dx)(a+a\cos(c+dx))\,dx = \frac{ax}{2}+\frac{a\sin(c+dx)}{d}+\frac{a\cos(c+dx)\sin(c+dx)}{2d}$$

```
[Out] 1/2*a*x+a*sin(d*x+c)/d+1/2*a*cos(d*x+c)*sin(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059, Rules used = {2813}

$$\int \cos(c+dx)(a+a\cos(c+dx))\,dx = \frac{a\sin(c+dx)}{d}+\frac{a\sin(c+dx)\cos(c+dx)}{2d}+\frac{ax}{2}$$

```
[In] Int[Cos[c + d*x]*(a + a*Cos[c + d*x]),x]
```

```
[Out] (a*x)/2 + (a*Sin[c + d*x])/d + (a*Cos[c + d*x]*Sin[c + d*x])/(2*d)
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rubi steps

$$\text{integral} = \frac{ax}{2}+\frac{a\sin(c+dx)}{d}+\frac{a\cos(c+dx)\sin(c+dx)}{2d}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 32, normalized size of antiderivative = 0.84

$$\int \cos(c+dx)(a+a\cos(c+dx))\,dx = \frac{a(2(c+dx)+4\sin(c+dx)+\sin(2(c+dx)))}{4d}$$

```
[In] Integrate[Cos[c + d*x]*(a + a*Cos[c + d*x]),x]
[Out] (a*(2*(c + d*x) + 4*Sin[c + d*x] + Sin[2*(c + d*x)]))/(4*d)
```

Maple [A] (verified)

Time = 0.71 (sec) , antiderivative size = 29, normalized size of antiderivative = 0.76

method	result	size
parallelrisch	$\frac{a(2dx+4\sin(dx+c)+\sin(2dx+2c))}{4d}$	29
risch	$\frac{ax}{2}+\frac{a\sin(dx+c)}{d}+\frac{a\sin(2dx+2c)}{4d}$	32
derivativedivides	$\frac{a\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+a\sin(dx+c)}{d}$	38
default	$\frac{a\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+a\sin(dx+c)}{d}$	38
parts	$\frac{a\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{a\sin(dx+c)}{d}$	40
norman	$\frac{\frac{a\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+ax\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\frac{ax}{2}+\frac{3a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{ax\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}$	82

```
[In] int(cos(d*x+c)*(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
[Out] 1/4*a*(2*d*x+4*sin(d*x+c)+sin(2*d*x+2*c))/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 29, normalized size of antiderivative = 0.76

$$\int \cos(c+dx)(a+a\cos(c+dx))\,dx = \frac{adx+(a\cos(dx+c)+2a)\sin(dx+c)}{2d}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c)),x, algorithm="fricas")
[Out] 1/2*(a*d*x + (a*cos(d*x + c) + 2*a)*sin(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 66 vs. $2(32) = 64$.

Time = 0.10 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.74

$$\int \cos(c+dx)(a+a\cos(c+dx))\,dx = \begin{cases} \frac{ax\sin^2(c+dx)}{2} + \frac{ax\cos^2(c+dx)}{2} + \frac{a\sin(c+dx)\cos(c+dx)}{2d} + \frac{a\sin(c+dx)}{d} & \text{for } d \neq 0 \\ x(a\cos(c)+a)\cos(c) & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c)),x)
```

```
[Out] Piecewise((a*x*sin(c + d*x)**2/2 + a*x*cos(c + d*x)**2/2 + a*sin(c + d*x)*c
os(c + d*x)/(2*d) + a*sin(c + d*x)/d, Ne(d, 0)), (x*(a*cos(c) + a)*cos(c),
True))
```

Maxima [A] (verification not implemented)

none

Time = 0.22 (sec) , antiderivative size = 34, normalized size of antiderivative = 0.89

$$\int \cos(c+dx)(a+a\cos(c+dx))\,dx = \frac{(2\,dx + 2\,c + \sin(2\,dx + 2\,c))a + 4\,a\sin(dx+c)}{4\,d}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/4*((2*d*x + 2*c + sin(2*d*x + 2*c))*a + 4*a*sin(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.82

$$\int \cos(c+dx)(a+a\cos(c+dx))\,dx = \frac{1}{2}\,ax + \frac{a\sin(2\,dx+2\,c)}{4\,d} + \frac{a\sin(dx+c)}{d}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/2*a*x + 1/4*a*sin(2*d*x + 2*c)/d + a*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 15.13 (sec) , antiderivative size = 50, normalized size of antiderivative = 1.32

$$\int \cos(c+dx)(a+a\cos(c+dx))\,dx=\frac{a\,x}{2}+\frac{a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3+3\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)^2}$$

```
[In] int(cos(c + d*x)*(a + a*cos(c + d*x)),x)
[Out] (a*x)/2 + (3*a*tan(c/2 + (d*x)/2) + a*tan(c/2 + (d*x)/2)^3)/(d*(tan(c/2 + (
d*x)/2)^2 + 1)^2)
```

3.6 $\int (a + a\cos(c + dx))\, dx$

Optimal result

Integrand size = 10, antiderivative size = 15

$$\int (a + a\cos(c + dx))\, dx = ax + \frac{a\sin(c + dx)}{d}$$

```
[Out] a*x+a*sin(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.01 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2717}

$$\int (a + a\cos(c + dx))\, dx = \frac{a\sin(c + dx)}{d} + ax$$

```
[In] Int[a + a*Cos[c + d*x],x]
```

```
[Out] a*x + (a*Sin[c + d*x])/d
```

Rule 2717

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned} \text{integral} &= ax + a\int \cos(c + dx)\, dx \\ &= ax + \frac{a\sin(c + dx)}{d} \end{aligned}$$

Mathematica [A] (verified)

Time = 0.00 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.73

$$\int (a+a\cos(c+dx))\,dx=ax+\frac{a\cos(dx)\sin(c)}{d}+\frac{a\cos(c)\sin(dx)}{d}$$

```
[In] Integrate[a + a*Cos[c + d*x],x]
[Out] a*x + (a*Cos[d*x]*Sin[c])/d + (a*Cos[c]*Sin[d*x])/d
```

Maple [A] (verified)

Time = 0.33 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.07

method	result	size
default	$ax+\frac{a\sin(dx+c)}{d}$	16
risch	$ax+\frac{a\sin(dx+c)}{d}$	16
parallelrisch	$ax+\frac{a\sin(dx+c)}{d}$	16
parts	$ax+\frac{a\sin(dx+c)}{d}$	16
derivativedivides	$\frac{a(dx+c)+a\sin(dx+c)}{d}$	21
norman	$\frac{ax+ax\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}$	50

```
[In] int(a+cos(d*x+c)*a,x,method=_RETURNVERBOSE)
[Out] a*x+a*sin(d*x+c)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 17, normalized size of antiderivative = 1.13

$$\int (a+a\cos(c+dx))\,dx=\frac{adx+a\sin(dx+c)}{d}$$

```
[In] integrate(a+a*cos(d*x+c),x, algorithm="fricas")
[Out] (a*d*x + a*sin(d*x + c))/d
```

Sympy [A] (verification not implemented)

Time = 0.06 (sec) , antiderivative size = 17, normalized size of antiderivative = 1.13

$$\int (a + a\cos(c + dx))\,dx = ax + a\left(\begin{cases} \frac{\sin(c+dx)}{d} & \text{for } d \neq 0 \\ x\cos(c) & \text{otherwise} \end{cases}\right)$$

```
[In] integrate(a+a*cos(d*x+c),x)
[Out] a*x + a*Piecewise((sin(c + d*x)/d, Ne(d, 0)), (x*cos(c), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.00

$$\int (a + a\cos(c + dx))\,dx = ax + \frac{a\sin(dx + c)}{d}$$

```
[In] integrate(a+a*cos(d*x+c),x, algorithm="maxima")
[Out] a*x + a*sin(d*x + c)/d
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.00

$$\int (a + a\cos(c + dx))\,dx = ax + \frac{a\sin(dx + c)}{d}$$

```
[In] integrate(a+a*cos(d*x+c),x, algorithm="giac")
[Out] a*x + a*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 13.69 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.00

$$\int (a + a\cos(c + dx))\,dx = a\,x + \frac{a\,\sin(c + d\,x)}{d}$$

```
[In] int(a + a*cos(c + d*x),x)
[Out] a*x + (a*sin(c + d*x))/d
```

3.7 $\int (a+a\cos(c+dx))\sec(c+dx)\,dx$

Optimal result

Integrand size = 17, antiderivative size = 16

$$\int (a+a\cos(c+dx))\sec(c+dx)\,dx=ax+\frac{a\text{arctanh}(\sin(c+dx))}{d}$$

```
[Out] a*x+a*arctanh(sin(d*x+c))/d
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2814, 3855}

$$\int (a+a\cos(c+dx))\sec(c+dx)\,dx=\frac{a\text{arctanh}(\sin(c+dx))}{d}+ax$$

```
[In] Int[(a + a*Cos[c + d*x])*Sec[c + d*x],x]
```

```
[Out] a*x + (a*ArcTanh[Sin[c + d*x]])/d
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= ax + a\int \sec(c+dx)\,dx\\ &= ax + \frac{a\text{arctanh}(\sin(c+dx))}{d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00

$$\int (a+a\cos(c+dx))\sec(c+dx)\,dx = ax + \frac{a\text{arctanh}(\sin(c+dx))}{d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])*Sec[c + d*x],x]
[Out] a*x + (a*ArcTanh[Sin[c + d*x]])/d
```

Maple [A] (verified)

Time = 1.14 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.81

method	result	size
derivativedivides	$\frac{a(dx+c)+a\ln(\sec(dx+c)+\tan(dx+c))}{d}$	29
default	$\frac{a(dx+c)+a\ln(\sec(dx+c)+\tan(dx+c))}{d}$	29
parts	$\frac{a\ln(\sec(dx+c)+\tan(dx+c))}{d}+\frac{a(dx+c)}{d}$	31
parallelrisch	$\frac{a\left(dx+\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\right)}{d}$	36
risch	$ax+\frac{a\ln\left(e^{i(dx+c)}+i\right)}{d}-\frac{a\ln\left(e^{i(dx+c)}-i\right)}{d}$	42
norman	$\frac{ax+ax\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}+\frac{a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{d}-\frac{a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{d}$	71

```
[In] int((a+cos(d*x+c)*a)*sec(d*x+c),x,method=_RETURNVERBOSE)
[Out] 1/d*(a*(d*x+c)+a*ln(sec(d*x+c)+tan(d*x+c)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 36 vs. $2(16) = 32$.

Time = 0.27 (sec) , antiderivative size = 36, normalized size of antiderivative = 2.25

$$\int (a + a\cos(c + dx))\sec(c + dx)\,dx = \frac{2\,adx + a\log(\sin(dx + c) + 1) - a\log(-\sin(dx + c) + 1)}{2\,d}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c),x, algorithm="fricas")
[Out] 1/2*(2*a*d*x + a*log(sin(d*x + c) + 1) - a*log(-sin(d*x + c) + 1))/d
```

Sympy [A] (verification not implemented)

Time = 2.51 (sec) , antiderivative size = 49, normalized size of antiderivative = 3.06

$$\int (a + a\cos(c + dx))\sec(c + dx)\,dx = ax + a\left(\begin{cases} \frac{x\tan(c)\sec(c)}{\tan(c)+\sec(c)} + \frac{x\sec^2(c)}{\tan(c)+\sec(c)} & \text{for } d = 0 \\ \frac{\log(\tan(c+dx)+\sec(c+dx))}{d} & \text{otherwise} \end{cases}\right)$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c),x)
[Out] a*x + a*Piecewise((x*tan(c)*sec(c)/(tan(c) + sec(c)) + x*sec(c)**2/(tan(c)
+ sec(c)), Eq(d, 0)), (log(tan(c + d*x) + sec(c + d*x))/d, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.75

$$\int (a + a\cos(c + dx))\sec(c + dx)\,dx = \frac{(dx + c)a + a\log(\sec(dx + c) + \tan(dx + c))}{d}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c),x, algorithm="maxima")
[Out] ((d*x + c)*a + a*log(sec(d*x + c) + tan(d*x + c)))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 43 vs. $2(16) = 32$.

Time = 0.34 (sec) , antiderivative size = 43, normalized size of antiderivative = 2.69

$$\int (a + a\cos(c + dx))\sec(c + dx)\,dx = \frac{(dx + c)a + a\log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) + 1\right|\right) - a\log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) - 1\right|\right)}{d}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c),x, algorithm="giac")
```

```
[Out] ((d*x + c)*a + a*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - a*log(abs(tan(1/2*d*x
 + 1/2*c) - 1)))/d
```

Mupad [B] (verification not implemented)

Time = 13.70 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.25

$$\int (a + a\cos(c + dx))\sec(c + dx)\,dx = a\,x + \frac{2\,a\,\mathrm{atanh}\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)\right)}{d}$$

```
[In] int((a + a*cos(c + d*x))/cos(c + d*x),x)
```

```
[Out] a*x + (2*a*atanh(tan(c/2 + (d*x)/2)))/d
```

3.8 $\int (a+a\cos(c+dx))\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 19, antiderivative size = 24

$$\int (a+a\cos(c+dx))\sec^2(c+dx)\,dx=\frac{a\text{arctanh}(\sin(c+dx))}{d}+\frac{a\tan(c+dx)}{d}$$

```
[Out] a*arctanh(sin(d*x+c))/d+a*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2827, 3852, 8, 3855}

$$\int (a+a\cos(c+dx))\sec^2(c+dx)\,dx=\frac{a\text{arctanh}(\sin(c+dx))}{d}+\frac{a\tan(c+dx)}{d}$$

```
[In] Int[(a + a*Cos[c + d*x])*Sec[c + d*x]^2,x]
```

```
[Out] (a*ArcTanh[Sin[c + d*x]])/d + (a*Tan[c + d*x])/d
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= a\int \sec(c+dx)\,dx + a\int \sec^2(c+dx)\,dx\\ &= \frac{a\text{arctanh}(\sin(c+dx))}{d} - \frac{a\text{Subst}(\int 1\,dx, x, -\tan(c+dx))}{d}\\ &= \frac{a\text{arctanh}(\sin(c+dx))}{d} + \frac{a\tan(c+dx)}{d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int (a+a\cos(c+dx))\sec^2(c+dx)\,dx = \frac{a\text{arctanh}(\sin(c+dx))}{d} + \frac{a\tan(c+dx)}{d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])*Sec[c + d*x]^2,x]
[Out] (a*ArcTanh[Sin[c + d*x]])/d + (a*Tan[c + d*x])/d
```

Maple [A] (verified)

Time = 1.78 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.25

method	result	size
derivativedivides	$\frac{a\ln(\sec(dx+c)+\tan(dx+c))+a\tan(dx+c)}{d}$	30
default	$\frac{a\ln(\sec(dx+c)+\tan(dx+c))+a\tan(dx+c)}{d}$	30
parts	$\frac{a\tan(dx+c)}{d}+\frac{a\ln(\sec(dx+c)+\tan(dx+c))}{d}$	32
risch	$\frac{2ia}{d(e^{2i(dx+c)}+1)}+\frac{a\ln(e^{i(dx+c)}+i)}{d}-\frac{a\ln(e^{i(dx+c)}-i)}{d}$	59
parallelrisch	$\frac{a\left(-\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(dx+c)+\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)\cos(dx+c)+\sin(dx+c)\right)}{d\cos(dx+c)}$	60
norman	$\frac{-\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}-\frac{2a\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{d}-\frac{a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{d}$	101

```
[In] int((a+cos(d*x+c)*a)*sec(d*x+c)^2,x,method=_RETURNVERBOSE)
[Out] 1/d*(a*ln(sec(d*x+c)+tan(d*x+c))+a*tan(d*x+c))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 60 vs. $2(24) = 48$.

Time = 0.28 (sec) , antiderivative size = 60, normalized size of antiderivative = 2.50

$$\int (a+a\cos(c+dx))\sec^2(c+dx)\,dx = \frac{a\cos(dx+c)\log(\sin(dx+c)+1)-a\cos(dx+c)\log(-\sin(dx+c)+1)+2a\sin(dx+c)}{2d\cos(dx+c)}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="fricas")
[Out] 1/2*(a*cos(d*x + c)*log(sin(d*x + c) + 1) - a*cos(d*x + c)*log(-sin(d*x + c
) + 1) + 2*a*sin(d*x + c))/(d*cos(d*x + c))
```

Sympy [F]

$$\int (a+a\cos(c+dx))\sec^2(c+dx)\,dx = a\left(\int\cos(c+dx)\sec^2(c+dx)\,dx+\int\sec^2(c+dx)\,dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)**2,x)
[Out] a*(Integral(cos(c + d*x)*sec(c + d*x)**2, x) + Integral(sec(c + d*x)**2, x)
)
```

Maxima [A] (verification not implemented)

none

Time = 0.22 (sec) , antiderivative size = 38, normalized size of antiderivative = 1.58

$$\int (a + a\cos(c + dx))\sec^2(c + dx)\,dx = \frac{a(\log(\sin(dx + c) + 1) - \log(\sin(dx + c) - 1)) + 2\,a\tan(dx + c)}{2\,d}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] 1/2*(a*(log(sin(d*x + c) + 1) - log(sin(d*x + c) - 1)) + 2*a*tan(d*x + c))/
d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 63 vs. 2(24) = 48.

Time = 0.32 (sec) , antiderivative size = 63, normalized size of antiderivative = 2.62

$$\int (a + a\cos(c + dx))\sec^2(c + dx)\,dx = \frac{a\log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) + 1\right|\right) - a\log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) - 1\right|\right) - \frac{2\,a\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)}{\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)^2 - 1}}{d}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="giac")
```

```
[Out] (a*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - a*log(abs(tan(1/2*d*x + 1/2*c) - 1)
) - 2*a*tan(1/2*d*x + 1/2*c)/(tan(1/2*d*x + 1/2*c)^2 - 1))/d
```

Mupad [B] (verification not implemented)

Time = 13.80 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.96

$$\int (a + a\cos(c + dx))\sec^2(c + dx)\,dx = \frac{2\,a\,\mathrm{atanh}\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)\right)}{d} - \frac{2\,a\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)}{d\,\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^2 - 1\right)}$$

```
[In] int((a + a*cos(c + d*x))/cos(c + d*x)^2,x)
```

```
[Out] (2*a*atanh(tan(c/2 + (d*x)/2)))/d - (2*a*tan(c/2 + (d*x)/2))/(d*(tan(c/2 +
(d*x)/2)^2 - 1))
```

3.9 $\int (a+a\cos(c+dx))\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 19, antiderivative size = 47

$$\int (a+a\cos(c+dx))\sec^3(c+dx)\,dx = \frac{a\text{arctanh}(\sin(c+dx))}{2d}+\frac{a\tan(c+dx)}{d}+\frac{a\sec(c+dx)\tan(c+dx)}{2d}$$

```
[Out] 1/2*a*arctanh(sin(d*x+c))/d+a*tan(d*x+c)/d+1/2*a*sec(d*x+c)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {2827, 3853, 3855, 3852, 8}

$$\int (a+a\cos(c+dx))\sec^3(c+dx)\,dx = \frac{a\text{arctanh}(\sin(c+dx))}{2d}+\frac{a\tan(c+dx)}{d}+\frac{a\tan(c+dx)\sec(c+dx)}{2d}$$

```
[In] Int[(a + a*Cos[c + d*x])*Sec[c + d*x]^3,x]
```

```
[Out] (a*ArcTanh[Sin[c + d*x]])/(2*d) + (a*Tan[c + d*x])/d + (a*Sec[c + d*x]*Tan[
c + d*x])/(2*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= a\int \sec^2(c+dx)\,dx + a\int \sec^3(c+dx)\,dx\\ &= \frac{a\sec(c+dx)\tan(c+dx)}{2d} + \frac{1}{2}a\int \sec(c+dx)\,dx - \frac{a\text{Subst}\left(\int 1\,dx, x, -\tan(c+dx)\right)}{d}\\ &= \frac{a\operatorname{arctanh}(\sin(c+dx))}{2d} + \frac{a\tan(c+dx)}{d} + \frac{a\sec(c+dx)\tan(c+dx)}{2d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00

$$\int (a+a\cos(c+dx))\sec^3(c+dx)\,dx = \frac{a\operatorname{arctanh}(\sin(c+dx))}{2d} + \frac{a\tan(c+dx)}{d} + \frac{a\sec(c+dx)\tan(c+dx)}{2d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])*Sec[c + d*x]^3,x]
```

```
[Out] (a*ArcTanh[Sin[c + d*x]])/(2*d) + (a*Tan[c + d*x])/d + (a*Sec[c + d*x]*Tan[
c + d*x])/(2*d)
```

Maple [A] (verified)

Time = 2.26 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00

method	result	s
derivativedivides	$\frac{a\tan(dx+c)+a\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}$	4
default	$\frac{a\tan(dx+c)+a\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}$	4
parts	$\frac{a\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}+\frac{a\tan(dx+c)}{d}$	4
parallelrisch	$\frac{\left((-1-\cos(2dx+2c))\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+(1+\cos(2dx+2c))\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)+2\sin(dx+c)+2\sin(2dx+2c)\right)a}{2d(1+\cos(2dx+2c))}$	9
risch	$-\frac{ia\left(e^{3i(dx+c)}-2\,e^{2i(dx+c)}-e^{i(dx+c)}-2\right)}{d\left(e^{2i(dx+c)}+1\right)^{2}}+\frac{a\ln\left(e^{i(dx+c)}+i\right)}{2d}-\frac{a\ln\left(e^{i(dx+c)}-i\right)}{2d}$	9
norman	$\frac{\frac{3a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{2a\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-\frac{a\left(\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}}{\left(1+\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\left(\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^{2}}-\frac{a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2d}+\frac{a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{2d}$	1

```
[In] int((a+cos(d*x+c)*a)*sec(d*x+c)^3,x,method=_RETURNVERBOSE)
[Out] 1/d*(a*tan(d*x+c)+a*(1/2*sec(d*x+c)*tan(d*x+c)+1/2*ln(sec(d*x+c)+tan(d*x+c)
)))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 74, normalized size of antiderivative = 1.57

$$\int (a+a\cos(c+dx))\sec^3(c+dx)\,dx$$
$$=\frac{a\cos(dx+c)^2\log(\sin(dx+c)+1)-a\cos(dx+c)^2\log(-\sin(dx+c)+1)+2\,(2\,a\cos(dx+c)+a)\sin}{4\,d\cos(dx+c)^2}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="fricas")
[Out] 1/4*(a*cos(d*x + c)^2*log(sin(d*x + c) + 1) - a*cos(d*x + c)^2*log(-sin(d*x
 + c) + 1) + 2*(2*a*cos(d*x + c) + a)*sin(d*x + c))/(d*cos(d*x + c)^2)
```

Sympy [F]

$$\int (a+a\cos(c+dx))\sec^3(c+dx)\,dx = a\left(\int \cos(c+dx)\sec^3(c+dx)\,dx + \int \sec^3(c+dx)\,dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)**3,x)
[Out] a*(Integral(cos(c + d*x)*sec(c + d*x)**3, x) + Integral(sec(c + d*x)**3, x)
)
```

Maxima [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 58, normalized size of antiderivative = 1.23

$$\int (a+a\cos(c+dx))\sec^3(c+dx)\,dx = -\frac{a\left(\frac{2\sin(dx+c)}{\sin(dx+c)^2-1} - \log(\sin(dx+c)+1) + \log(\sin(dx+c)-1)\right) - 4\,a\tan(dx+c)}{4\,d}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="maxima")
[Out] -1/4*(a*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(d*x + c) + 1) + log(
sin(d*x + c) - 1)) - 4*a*tan(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.70

$$\int (a+a\cos(c+dx))\sec^3(c+dx)\,dx = \frac{a\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right) - a\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right) - \frac{2\left(a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3 - 3\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)^2}}{2\,d}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="giac")
[Out] 1/2*(a*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - a*log(abs(tan(1/2*d*x + 1/2*c)
- 1)) - 2*(a*tan(1/2*d*x + 1/2*c)^3 - 3*a*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*
x + 1/2*c)^2 - 1)^2)/d
```

Mupad [B] (verification not implemented)

Time = 14.61 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.60

$$\int (a+a\cos(c+dx))\sec^3(c+dx)\,dx = \frac{3\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)} + \frac{a\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}$$

```
[In] int((a + a*cos(c + d*x))/cos(c + d*x)^3,x)
```

```
[Out] (3*a*tan(c/2 + (d*x)/2) - a*tan(c/2 + (d*x)/2)^3)/(d*(tan(c/2 + (d*x)/2)^4
- 2*tan(c/2 + (d*x)/2)^2 + 1)) + (a*atanh(tan(c/2 + (d*x)/2)))/d
```

3.10 $\int (a+a\cos(c+dx))\sec^4(c+dx)\,dx$

Optimal result

Integrand size = 19, antiderivative size = 63

$$\int (a+a\cos(c+dx))\sec^4(c+dx)\,dx=\frac{a\text{arctanh}(\sin(c+dx))}{2d}+\frac{a\tan(c+dx)}{d}+\frac{a\sec(c+dx)\tan(c+dx)}{2d}+\frac{a\tan^3(c+dx)}{3d}$$

```
[Out] 1/2*a*arctanh(sin(d*x+c))/d+a*tan(d*x+c)/d+1/2*a*sec(d*x+c)*tan(d*x+c)/d+1/
3*a*tan(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2827, 3852, 3853, 3855}

$$\int (a+a\cos(c+dx))\sec^4(c+dx)\,dx=\frac{a\text{arctanh}(\sin(c+dx))}{2d}+\frac{a\tan^3(c+dx)}{3d}+\frac{a\tan(c+dx)}{d}+\frac{a\tan(c+dx)\sec(c+dx)}{2d}$$

```
[In] Int[(a + a*Cos[c + d*x])*Sec[c + d*x]^4,x]
```

```
[Out] (a*ArcTanh[Sin[c + d*x]])/(2*d) + (a*Tan[c + d*x])/d + (a*Sec[c + d*x]*Tan[
c + d*x])/(2*d) + (a*Tan[c + d*x]^3)/(3*d)
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
```

```
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= a\int \sec^3(c+dx)\,dx + a\int \sec^4(c+dx)\,dx\\ &= \frac{a\sec(c+dx)\tan(c+dx)}{2d}+\frac{1}{2}a\int \sec(c+dx)\,dx-\frac{a\text{Subst}\left(\int (1+x^2)\ dx, x, -\tan(c+dx)\right)}{d}\\ &= \frac{a\text{arctanh}(\sin(c+dx))}{2d}+\frac{a\tan(c+dx)}{d}+\frac{a\sec(c+dx)\tan(c+dx)}{2d}+\frac{a\tan^3(c+dx)}{3d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.95

$$\int (a+a\cos(c+dx))\sec^4(c+dx)\,dx = \frac{a\text{arctanh}(\sin(c+dx))}{2d}+\frac{a\sec(c+dx)\tan(c+dx)}{2d}+\frac{a\left(\tan(c+dx)+\frac{1}{3}\tan^3(c+dx)\right)}{d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])*Sec[c + d*x]^4,x]
[Out] (a*ArcTanh[Sin[c + d*x]])/(2*d) + (a*Sec[c + d*x]*Tan[c + d*x])/(2*d) + (a*
(Tan[c + d*x] + Tan[c + d*x]^3/3))/d
```

Maple [A] (verified)

Time = 2.28 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.95

method	result
derivativedivides	$\frac{a\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-a\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)}{d}$
default	$\frac{a\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-a\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)}{d}$
parts	$-\frac{a\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)}{d}+\frac{a\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}$
risch	$-\frac{ia(3\,e^{5i(dx+c)}-12\,e^{2i(dx+c)}-3\,e^{i(dx+c)}-4)}{3d(e^{2i(dx+c)}+1)^3}+\frac{a\ln(e^{i(dx+c)}+i)}{2d}-\frac{a\ln(e^{i(dx+c)}-i)}{2d}$
norman	$\frac{-\frac{3a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}-\frac{5a\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}+\frac{a\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}-\frac{a\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^3}-\frac{a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2d}+\frac{a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right.\right.}{2d}$
parallelrisch	$-\frac{a\left(3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(3dx+3c)+9\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(dx+c)-3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)\cos(3dx+3c)-9\ln\left(\tan\right.\right.}{6d(\cos(3dx+3c)+3\cos(dx+c))}$

```
[In] int((a+cos(d*x+c)*a)*sec(d*x+c)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a*(1/2*sec(d*x+c)*tan(d*x+c)+1/2*ln(sec(d*x+c)+tan(d*x+c)))-a*(-2/3-1/
3*sec(d*x+c)^2)*tan(d*x+c))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.40

$$\int (a+a\cos(c+dx))\sec^4(c+dx)\,dx$$
$$=\frac{3\,a\cos(dx+c)^3\log(\sin(dx+c)+1)-3\,a\cos(dx+c)^3\log(-\sin(dx+c)+1)+2\left(4\,a\cos(dx+c)^2+3\right.}{12\,d\cos(dx+c)^3}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] 1/12*(3*a*cos(d*x + c)^3*log(sin(d*x + c) + 1) - 3*a*cos(d*x + c)^3*log(-si
n(d*x + c) + 1) + 2*(4*a*cos(d*x + c)^2 + 3*a*cos(d*x + c) + 2*a)*sin(d*x +
 c))/(d*cos(d*x + c)^3)
```

Sympy [F]

$$\int (a+a\cos(c+dx))\sec^4(c+dx)\,dx = a\left(\int \cos{(c+dx)}\sec^4{(c+dx)}\,dx + \int \sec^4{(c+dx)}\,dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)**4,x)
```

```
[Out] a*(Integral(cos(c + d*x)*sec(c + d*x)**4, x) + Integral(sec(c + d*x)**4, x)
)
```

Maxima [A] (verification not implemented)

none

Time = 0.21 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.11

$$\int (a+a\cos(c+dx))\sec^4(c+dx)\,dx = \frac{4\left(\tan{(dx+c)}^3 + 3\tan{(dx+c)}\right)a - 3a\left(\frac{2\sin(dx+c)}{\sin(dx+c)^2-1} - \log{(\sin{(dx+c)}+1)} + \log{(\sin{(dx+c)}-1)}\right)}{12\,d}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] 1/12*(4*(tan(d*x + c)^3 + 3*tan(d*x + c))*a - 3*a*(2*sin(d*x + c)/(sin(d*x
+ c)^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)))/d
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 96, normalized size of antiderivative = 1.52

$$\int (a+a\cos(c+dx))\sec^4(c+dx)\,dx = \frac{3a\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right) - 3a\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right) - \frac{2\left(3a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5 - 4a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3 + 9a\tan}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)^3}}{6\,d}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^4,x, algorithm="giac")
```

```
[Out] 1/6*(3*a*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 3*a*log(abs(tan(1/2*d*x + 1/2
*c) - 1)) - 2*(3*a*tan(1/2*d*x + 1/2*c)^5 - 4*a*tan(1/2*d*x + 1/2*c)^3 + 9*
a*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2 - 1)^3)/d
```

Mupad [B] (verification not implemented)

Time = 16.52 (sec) , antiderivative size = 102, normalized size of antiderivative = 1.62

$$\int (a + a\cos(c + dx))\sec^4(c + dx)\,dx$$
$$= \frac{a\,\mathrm{atanh}\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)\right)}{d} - \frac{a\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^5 - \frac{4\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{3} + 3\,a\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)}{d\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^6 - 3\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^4 + 3\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^2 - 1\right)}$$

```
[In] int((a + a*cos(c + d*x))/cos(c + d*x)^4,x)
```

```
[Out] (a*atanh(tan(c/2 + (d*x)/2)))/d - (3*a*tan(c/2 + (d*x)/2) - (4*a*tan(c/2 +
(d*x)/2)^3)/3 + a*tan(c/2 + (d*x)/2)^5)/(d*(3*tan(c/2 + (d*x)/2)^2 - 3*tan(
c/2 + (d*x)/2)^4 + tan(c/2 + (d*x)/2)^6 - 1))
```

3.11 $\int (a + a\cos(c + dx))\sec^5(c + dx)\,dx$

Optimal result

Integrand size = 19, antiderivative size = 85

$$\int (a+a\cos(c+dx))\sec^5(c+dx)\,dx = \frac{3a\text{arctanh}(\sin(c+dx))}{8d}+\frac{a\tan(c+dx)}{d}+\frac{3a\sec(c+dx)\tan(c+dx)}{8d}+\frac{a\sec^3(c+dx)\tan(c+dx)}{4d}+\frac{a\tan^3(c+dx)}{3d}$$

```
[Out] 3/8*a*arctanh(sin(d*x+c))/d+a*tan(d*x+c)/d+3/8*a*sec(d*x+c)*tan(d*x+c)/d+1/
4*a*sec(d*x+c)^3*tan(d*x+c)/d+1/3*a*tan(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2827, 3853, 3855, 3852}

$$\int (a+a\cos(c+dx))\sec^5(c+dx)\,dx = \frac{3a\text{arctanh}(\sin(c+dx))}{8d}+\frac{a\tan^3(c+dx)}{3d}+\frac{a\tan(c+dx)}{d}+\frac{a\tan(c+dx)\sec^3(c+dx)}{4d}+\frac{3a\tan(c+dx)\sec(c+dx)}{8d}$$

```
[In] Int[(a + a*Cos[c + d*x])*Sec[c + d*x]^5,x]
```

```
[Out] (3*a*ArcTanh[Sin[c + d*x]])/(8*d) + (a*Tan[c + d*x])/d + (3*a*Sec[c + d*x]*
Tan[c + d*x])/(8*d) + (a*Sec[c + d*x]^3*Tan[c + d*x])/(4*d) + (a*Tan[c + d*
x]^3)/(3*d)
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= a\int \sec^4(c+dx)\,dx + a\int \sec^5(c+dx)\,dx\\
&= \frac{a\sec^3(c+dx)\tan(c+dx)}{4d} + \frac{1}{4}(3a)\int \sec^3(c+dx)\,dx\\
&\quad - \frac{a\text{Subst}\left(\int \left(1+x^2\right)\,dx, x, -\tan(c+dx)\right)}{d}\\
&= \frac{a\tan(c+dx)}{d} + \frac{3a\sec(c+dx)\tan(c+dx)}{8d} + \frac{a\sec^3(c+dx)\tan(c+dx)}{4d}\\
&\quad + \frac{a\tan^3(c+dx)}{3d} + \frac{1}{8}(3a)\int \sec(c+dx)\,dx\\
&= \frac{3a\text{arctanh}(\sin(c+dx))}{8d} + \frac{a\tan(c+dx)}{d} + \frac{3a\sec(c+dx)\tan(c+dx)}{8d}\\
&\quad + \frac{a\sec^3(c+dx)\tan(c+dx)}{4d} + \frac{a\tan^3(c+dx)}{3d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 56, normalized size of antiderivative = 0.66

$$\int (a+a\cos(c+dx))\sec^5(c+dx)\,dx$$
$$=\frac{a(9\text{arctanh}(\sin(c+dx))+\tan(c+dx)\,(9\sec(c+dx)+6\sec^3(c+dx)+8(3+\tan^2(c+dx))))}{24d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])*Sec[c + d*x]^5,x]
```

```
[Out] (a*(9*ArcTanh[Sin[c + d*x]] + Tan[c + d*x]*(9*Sec[c + d*x] + 6*Sec[c + d*x]
^3 + 8*(3 + Tan[c + d*x]^2))))/(24*d)
```

Maple [A] (verified)

Time = 2.68 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.86

method	result
derivativedivides	$\frac{-a\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+a\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)}{d}$
default	$\frac{-a\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+a\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)}{d}$
parts	$\frac{a\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)}{d}-\frac{a\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)}{d}$
risch	$-\frac{ia\left(9\,\mathrm{e}^{7i(dx+c)}+33\,\mathrm{e}^{5i(dx+c)}-48\,\mathrm{e}^{4i(dx+c)}-33\,\mathrm{e}^{3i(dx+c)}-64\,\mathrm{e}^{2i(dx+c)}-9\,\mathrm{e}^{i(dx+c)}-16\right)}{12d\left(\mathrm{e}^{2i(dx+c)}+1\right)^4}-\frac{3a\ln\left(\mathrm{e}^{i(dx+c)}-i\right)}{8d}+ 3a$
parallelrisch	$\frac{a\left(9(-\cos(4dx+4c)-4\cos(2dx+2c)-3)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+9(\cos(4dx+4c)+4\cos(2dx+2c)+3)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)+\right.}{24d(\cos(4dx+4c)+4\cos(2dx+2c)+3)}$
norman	$\frac{\frac{13a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d}+\frac{2a\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}+\frac{3a\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2d}+\frac{10a\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}-\frac{3a\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^4}-\frac{3a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\right.}{8d}$

```
[In] int((a+cos(d*x+c)*a)*sec(d*x+c)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-a*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c)+a*(-(-1/4*sec(d*x+c)^3-3/8*sec(d
*x+c))*tan(d*x+c)+3/8*ln(sec(d*x+c)+tan(d*x+c))))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.16

$$\int (a + a\cos(c + dx))\sec^5(c + dx)\, dx = \frac{9\, a \cos\left(dx + c\right)^{4} \log\left(\sin\left(dx + c\right) + 1\right) - 9\, a \cos\left(dx + c\right)^{4} \log\left(-\sin\left(dx + c\right) + 1\right) + 2\left(16\, a \cos\left(dx + c\right)^{3} + 9\right.}{48\, d \cos\left(dx + c\right)^{4}}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^5,x, algorithm="fricas")
[Out] 1/48*(9*a*cos(d*x + c)^4*log(sin(d*x + c) + 1) - 9*a*cos(d*x + c)^4*log(-si
n(d*x + c) + 1) + 2*(16*a*cos(d*x + c)^3 + 9*a*cos(d*x + c)^2 + 8*a*cos(d*x
 + c) + 6*a)*sin(d*x + c))/(d*cos(d*x + c)^4)
```

Sympy [F]

$$\int (a+a\cos(c+dx))\sec^5(c+dx)\, dx = a\left(\int \cos\left(c + dx\right)\sec^{5}\left(c + dx\right) dx + \int \sec^{5}\left(c + dx\right) dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)**5,x)
[Out] a*(Integral(cos(c + d*x)*sec(c + d*x)**5, x) + Integral(sec(c + d*x)**5, x)
)
```

Maxima [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.12

$$\int (a + a\cos(c + dx))\sec^5(c + dx)\, dx = \frac{16\left(\tan\left(dx + c\right)^{3} + 3\, \tan\left(dx + c\right)\right)a - 3\, a\left(\frac{2\left(3\, \sin\left(dx+c\right)^{3} - 5\, \sin\left(dx+c\right)\right)}{\sin\left(dx+c\right)^{4} - 2\, \sin\left(dx+c\right)^{2} + 1} - 3\, \log\left(\sin\left(dx + c\right) + 1\right) + 3\, \log\left(\sin\left(\right.\right.\right.}{48\, d}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^5,x, algorithm="maxima")
[Out] 1/48*(16*(tan(d*x + c)^3 + 3*tan(d*x + c))*a - 3*a*(2*(3*sin(d*x + c)^3 - 5
*sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2 + 1) - 3*log(sin(d*x + c)
 + 1) + 3*log(sin(d*x + c) - 1)))/d
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.29

$$\int (a+a\cos(c+dx))\sec^5(c+dx)\,dx$$
$$= \frac{9\,a\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-9\,a\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)-\frac{2\left(9\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7-49\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5+31\,a\,\mathrm{t}}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-\right.}}{24\,d}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^5,x, algorithm="giac")
```

```
[Out] 1/24*(9*a*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 9*a*log(abs(tan(1/2*d*x + 1/
2*c) - 1)) - 2*(9*a*tan(1/2*d*x + 1/2*c)^7 - 49*a*tan(1/2*d*x + 1/2*c)^5 +
31*a*tan(1/2*d*x + 1/2*c)^3 - 39*a*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2
*c)^2 - 1)^4)/d
```

Mupad [B] (verification not implemented)

Time = 17.61 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.53

$$\int (a+a\cos(c+dx))\sec^5(c+dx)\,dx$$
$$= \frac{-\frac{3\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{4}+\frac{49\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{12}-\frac{31\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{12}+\frac{13\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{4}}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8-4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6+6\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)} + \frac{3\,a\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{4\,d}$$

```
[In] int((a + a*cos(c + d*x))/cos(c + d*x)^5,x)
```

```
[Out] ((13*a*tan(c/2 + (d*x)/2))/4 - (31*a*tan(c/2 + (d*x)/2)^3)/12 + (49*a*tan(c
/2 + (d*x)/2)^5)/12 - (3*a*tan(c/2 + (d*x)/2)^7)/4)/(d*(6*tan(c/2 + (d*x)/2
)^4 - 4*tan(c/2 + (d*x)/2)^2 - 4*tan(c/2 + (d*x)/2)^6 + tan(c/2 + (d*x)/2)^
8 + 1)) + (3*a*atanh(tan(c/2 + (d*x)/2)))/(4*d)
```

3.12 $\int (a+a\cos(c+dx))\sec^6(c+dx)\,dx$

Optimal result

Integrand size = 19, antiderivative size = 101

$$\int (a+a\cos(c+dx))\sec^6(c+dx)\,dx=\frac{3a\text{arctanh}(\sin(c+dx))}{8d}+\frac{a\tan(c+dx)}{d}+\frac{3a\sec(c+dx)\tan(c+dx)}{8d}+\frac{a\sec^3(c+dx)\tan(c+dx)}{4d}+\frac{2a\tan^3(c+dx)}{3d}+\frac{a\tan^5(c+dx)}{5d}$$

```
[Out] 3/8*a*arctanh(sin(d*x+c))/d+a*tan(d*x+c)/d+3/8*a*sec(d*x+c)*tan(d*x+c)/d+1/
4*a*sec(d*x+c)^3*tan(d*x+c)/d+2/3*a*tan(d*x+c)^3/d+1/5*a*tan(d*x+c)^5/d
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2827, 3852, 3853, 3855}

$$\int (a+a\cos(c+dx))\sec^6(c+dx)\,dx=\frac{3a\text{arctanh}(\sin(c+dx))}{8d}+\frac{a\tan^5(c+dx)}{5d}+\frac{2a\tan^3(c+dx)}{3d}+\frac{a\tan(c+dx)}{d}+\frac{a\tan(c+dx)\sec^3(c+dx)}{4d}+\frac{3a\tan(c+dx)\sec(c+dx)}{8d}$$

```
[In] Int[(a + a*Cos[c + d*x])*Sec[c + d*x]^6,x]
```

```
[Out] (3*a*ArcTanh[Sin[c + d*x]])/(8*d) + (a*Tan[c + d*x])/d + (3*a*Sec[c + d*x]*
Tan[c + d*x])/(8*d) + (a*Sec[c + d*x]^3*Tan[c + d*x])/(4*d) + (2*a*Tan[c +
d*x]^3)/(3*d) + (a*Tan[c + d*x]^5)/(5*d)
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= a\int \sec^5(c+dx)\,dx + a\int \sec^6(c+dx)\,dx\\
&= \frac{a\sec^3(c+dx)\tan(c+dx)}{4d} + \frac{1}{4}(3a)\int \sec^3(c+dx)\,dx\\
&\quad - \frac{a\text{Subst}\left(\int \left(1+2x^2+x^4\right)\,dx, x, -\tan(c+dx)\right)}{d}\\
&= \frac{a\tan(c+dx)}{d} + \frac{3a\sec(c+dx)\tan(c+dx)}{8d} + \frac{a\sec^3(c+dx)\tan(c+dx)}{4d}\\
&\quad + \frac{2a\tan^3(c+dx)}{3d} + \frac{a\tan^5(c+dx)}{5d} + \frac{1}{8}(3a)\int \sec(c+dx)\,dx\\
&= \frac{3a\text{arctanh}(\sin(c+dx))}{8d} + \frac{a\tan(c+dx)}{d} + \frac{3a\sec(c+dx)\tan(c+dx)}{8d}\\
&\quad + \frac{a\sec^3(c+dx)\tan(c+dx)}{4d} + \frac{2a\tan^3(c+dx)}{3d} + \frac{a\tan^5(c+dx)}{5d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.64

$$\int (a + a\cos(c + dx))\sec^6(c + dx)\,dx$$
$$= \frac{a(45\text{arctanh}(\sin(c+dx)) + \tan(c+dx)\,(120 + 45\sec(c+dx) + 30\sec^3(c+dx) + 80\tan^2(c+dx) + 24\tan}{120d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])*Sec[c + d*x]^6,x]
```

```
[Out] (a*(45*ArcTanh[Sin[c + d*x]] + Tan[c + d*x]*(120 + 45*Sec[c + d*x] + 30*Sec
[c + d*x]^3 + 80*Tan[c + d*x]^2 + 24*Tan[c + d*x]^4)))/(120*d)
```

Maple [A] (verified)

Time = 2.50 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.82

method	result
derivativedivides	$\frac{a\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)-a\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c)\right)}{5}-\frac{4\left(\sec^2(dx+c)\right)}{15}\right)\text{ta}}{d}$
default	$\frac{a\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)-a\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c)\right)}{5}-\frac{4\left(\sec^2(dx+c)\right)}{15}\right)\text{ta}}{d}$
parts	$-\frac{a\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c)\right)}{5}-\frac{4\left(\sec^2(dx+c)\right)}{15}\right)\tan(dx+c)}{d}+\frac{a\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)}{8}\right.}{d}$
risch	$-\frac{ia\left(45\,e^{9i(dx+c)}+210\,e^{7i(dx+c)}-640\,e^{4i(dx+c)}-210\,e^{3i(dx+c)}-320\,e^{2i(dx+c)}-45\,e^{i(dx+c)}-64\right)}{60d\left(e^{2i(dx+c)}+1\right)^5}+\frac{3a\ln\left(e^{i(dx+c)}+i\right)}{8d}-$
norman	$\frac{-\frac{13a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d}-\frac{a\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12d}-\frac{137a\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{30d}-\frac{167a\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{30d}+\frac{17a\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12d}-\frac{3a\left(\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^5}$
parallelrisch	$\frac{8\left(\left(-\frac{45\cos(dx+c)}{32}-\frac{45\cos(3dx+3c)}{64}-\frac{9\cos(5dx+5c)}{64}\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+\left(\frac{45\cos(dx+c)}{32}+\frac{45\cos(3dx+3c)}{64}+\frac{9\cos(5dx+5c)}{64}\right)\ln}{3d(\cos(5dx+5c)+5\cos(3dx+3c)+10\,\text{co}}$

```
[In] int((a+cos(d*x+c)*a)*sec(d*x+c)^6,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a*(-(-1/4*sec(d*x+c)^3-3/8*sec(d*x+c))*tan(d*x+c)+3/8*ln(sec(d*x+c)+ta
n(d*x+c)))-a*(-8/15-1/5*sec(d*x+c)^4-4/15*sec(d*x+c)^2)*tan(d*x+c))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.09

$$\int (a + a\cos(c + dx))\sec^6(c + dx)\,dx = \frac{45\,a\cos\left(dx + c\right)^5\log\left(\sin\left(dx + c\right) + 1\right) - 45\,a\cos\left(dx + c\right)^5\log\left(-\sin\left(dx + c\right) + 1\right) + 2\left(64\,a\cos\left(dx + c\right)^4\right.}{240\,d\cos\left(dx + c\right)^5}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^6,x, algorithm="fricas")
[Out] 1/240*(45*a*cos(d*x + c)^5*log(sin(d*x + c) + 1) - 45*a*cos(d*x + c)^5*log(
-sin(d*x + c) + 1) + 2*(64*a*cos(d*x + c)^4 + 45*a*cos(d*x + c)^3 + 32*a*co
s(d*x + c)^2 + 30*a*cos(d*x + c) + 24*a)*sin(d*x + c))/(d*cos(d*x + c)^5)
```

Sympy [F]

$$\int (a+a\cos(c+dx))\sec^6(c+dx)\,dx = a\left(\int\cos\left(c + dx\right)\sec^6\left(c + dx\right)dx + \int\sec^6\left(c + dx\right)dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)**6,x)
[Out] a*(Integral(cos(c + d*x)*sec(c + d*x)**6, x) + Integral(sec(c + d*x)**6, x)
)
```

Maxima [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.06

$$\int (a + a\cos(c + dx))\sec^6(c + dx)\,dx = \frac{16\left(3\tan\left(dx + c\right)^5 + 10\tan\left(dx + c\right)^3 + 15\tan\left(dx + c\right)\right)a - 15\,a\left(\frac{2\left(3\sin(dx+c)^3-5\sin(dx+c)\right)}{\sin(dx+c)^4-2\sin(dx+c)^2+1} - 3\log\left(\sin\left(\right.\right.\right.}{240\,d}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^6,x, algorithm="maxima")
[Out] 1/240*(16*(3*tan(d*x + c)^5 + 10*tan(d*x + c)^3 + 15*tan(d*x + c))*a - 15*a
*(2*(3*sin(d*x + c)^3 - 5*sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2
+ 1) - 3*log(sin(d*x + c) + 1) + 3*log(sin(d*x + c) - 1)))/d
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.23

$$\int (a + a\cos(c + dx))\sec^6(c + dx)\,dx$$

$$= \frac{45\,a\log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) + 1\right|\right) - 45\,a\log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) - 1\right|\right) - \frac{2\left(45\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^9 - 130\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7 + 46\cdots\right.}{\left(\mathrm{ta}\cdots\right.}}{120\,d}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^6,x, algorithm="giac")
```

```
[Out] 1/120*(45*a*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 45*a*log(abs(tan(1/2*d*x +
 1/2*c) - 1)) - 2*(45*a*tan(1/2*d*x + 1/2*c)^9 - 130*a*tan(1/2*d*x + 1/2*c)
^7 + 464*a*tan(1/2*d*x + 1/2*c)^5 - 190*a*tan(1/2*d*x + 1/2*c)^3 + 195*a*ta
n(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2 - 1)^5)/d
```

Mupad [B] (verification not implemented)

Time = 19.01 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.56

$$\int (a + a\cos(c + dx))\sec^6(c + dx)\,dx = \frac{3\,a\,\mathrm{atanh}\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)\right)}{4\,d} - \frac{\frac{3\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9}{4} - \frac{13\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{6} + \frac{116\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{15} - \frac{19\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{6} + \frac{13\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{4}}{d\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^{10} - 5\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^8 + 10\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^6 - 10\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^4 + 5\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^2 - 1\right)}$$

```
[In] int((a + a*cos(c + d*x))/cos(c + d*x)^6,x)
```

```
[Out] (3*a*atanh(tan(c/2 + (d*x)/2)))/(4*d) - ((13*a*tan(c/2 + (d*x)/2))/4 - (19*
a*tan(c/2 + (d*x)/2)^3)/6 + (116*a*tan(c/2 + (d*x)/2)^5)/15 - (13*a*tan(c/2
 + (d*x)/2)^7)/6 + (3*a*tan(c/2 + (d*x)/2)^9)/4)/(d*(5*tan(c/2 + (d*x)/2)^2
 - 10*tan(c/2 + (d*x)/2)^4 + 10*tan(c/2 + (d*x)/2)^6 - 5*tan(c/2 + (d*x)/2)
^8 + tan(c/2 + (d*x)/2)^10 - 1))
```

3.13 $\int \cos^4(c+dx)(a+a\cos(c+dx))^2\,dx$

Optimal result

Integrand size = 21, antiderivative size = 129

$$\int \cos^4(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{11a^2x}{16}+\frac{2a^2\sin(c+dx)}{d}+\frac{11a^2\cos(c+dx)\sin(c+dx)}{16d}+\frac{11a^2\cos^3(c+dx)\sin(c+dx)}{24d}+\frac{a^2\cos^5(c+dx)\sin(c+dx)}{6d}-\frac{4a^2\sin^3(c+dx)}{3d}+\frac{2a^2\sin^5(c+dx)}{5d}$$

```
[Out] 11/16*a^2*x+2*a^2*sin(d*x+c)/d+11/16*a^2*cos(d*x+c)*sin(d*x+c)/d+11/24*a^2*
cos(d*x+c)^3*sin(d*x+c)/d+1/6*a^2*cos(d*x+c)^5*sin(d*x+c)/d-4/3*a^2*sin(d*x
+c)^3/d+2/5*a^2*sin(d*x+c)^5/d
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 129, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2836, 2715, 8, 2713}

$$\int \cos^4(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{2a^2\sin^5(c+dx)}{5d}-\frac{4a^2\sin^3(c+dx)}{3d}+\frac{2a^2\sin(c+dx)}{d}+\frac{a^2\sin(c+dx)\cos^5(c+dx)}{6d}+\frac{11a^2\sin(c+dx)\cos^3(c+dx)}{24d}+\frac{11a^2\sin(c+dx)\cos(c+dx)}{16d}+\frac{11a^2x}{16}$$

```
[In] Int[Cos[c + d*x]^4*(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (11*a^2*x)/16 + (2*a^2*Sin[c + d*x])/d + (11*a^2*Cos[c + d*x]*Sin[c + d*x])
/(16*d) + (11*a^2*Cos[c + d*x]^3*Sin[c + d*x])/(24*d) + (a^2*Cos[c + d*x]^5
*Sin[c + d*x])/(6*d) - (4*a^2*Sin[c + d*x]^3)/(3*d) + (2*a^2*Sin[c + d*x]^5
)/(5*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(a^2\cos^4(c+dx)+2a^2\cos^5(c+dx)+a^2\cos^6(c+dx)\right)\,dx\\
&= a^2\int \cos^4(c+dx)\,dx + a^2\int \cos^6(c+dx)\,dx + \left(2a^2\right)\int \cos^5(c+dx)\,dx\\
&= \frac{a^2\cos^3(c+dx)\sin(c+dx)}{4d}+\frac{a^2\cos^5(c+dx)\sin(c+dx)}{6d}+\frac{1}{4}\left(3a^2\right)\int \cos^2(c+dx)\,dx\\
&\quad +\frac{1}{6}\left(5a^2\right)\int \cos^4(c+dx)\,dx-\frac{\left(2a^2\right)\operatorname{Subst}\left(\int \left(1-2x^2+x^4\right)\,dx,x,-\sin(c+dx)\right)}{d}\\
&= \frac{2a^2\sin(c+dx)}{d}+\frac{3a^2\cos(c+dx)\sin(c+dx)}{8d}+\frac{11a^2\cos^3(c+dx)\sin(c+dx)}{24d}\\
&\quad +\frac{a^2\cos^5(c+dx)\sin(c+dx)}{6d}-\frac{4a^2\sin^3(c+dx)}{3d}\\
&\quad +\frac{2a^2\sin^5(c+dx)}{5d}+\frac{1}{8}\left(3a^2\right)\int 1\,dx+\frac{1}{8}\left(5a^2\right)\int \cos^2(c+dx)\,dx
\end{aligned}$$

$$= \frac{3a^2x}{8} + \frac{2a^2\sin(c+dx)}{d} + \frac{11a^2\cos(c+dx)\sin(c+dx)}{16d} + \frac{11a^2\cos^3(c+dx)\sin(c+dx)}{24d} + \frac{a^2\cos^5(c+dx)\sin(c+dx)}{6d} - \frac{4a^2\sin^3(c+dx)}{3d} + \frac{2a^2\sin^5(c+dx)}{5d} + \frac{1}{16}(5a^2)\int 1\,dx$$

$$= \frac{11a^2x}{16} + \frac{2a^2\sin(c+dx)}{d} + \frac{11a^2\cos(c+dx)\sin(c+dx)}{16d} + \frac{11a^2\cos^3(c+dx)\sin(c+dx)}{24d} + \frac{a^2\cos^5(c+dx)\sin(c+dx)}{6d} - \frac{4a^2\sin^3(c+dx)}{3d} + \frac{2a^2\sin^5(c+dx)}{5d}$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.57

$$\int \cos^4(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{a^2(660dx + 1200\sin(c+dx) + 465\sin(2(c+dx)) + 200\sin(3(c+dx)) + 75\sin(4(c+dx)) + 24\sin(5(c+}{960d}$$

```
[In] Integrate[Cos[c + d*x]^4*(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (a^2*(660*d*x + 1200*Sin[c + d*x] + 465*Sin[2*(c + d*x)] + 200*Sin[3*(c + d
*x)] + 75*Sin[4*(c + d*x)] + 24*Sin[5*(c + d*x)] + 5*Sin[6*(c + d*x)]))/(96
0*d)
```

Maple [A] (verified)

Time = 2.97 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.58

method	result
parallelrisch	$\frac{\left(132 d x+\sin(6 d x+6 c)+240 \sin(d x+c)+93 \sin(2 d x+2 c)+40 \sin(3 d x+3 c)+15 \sin(4 d x+4 c)+\frac{24 \sin(5 d x+5 c)}{5}\right) a^{2}}{192 d}$
risch	$\frac{11 a^{2} x}{16}+\frac{5 a^{2} \sin(d x+c)}{4 d}+\frac{a^{2} \sin(6 d x+6 c)}{192 d}+\frac{a^{2} \sin(5 d x+5 c)}{40 d}+\frac{5 a^{2} \sin(4 d x+4 c)}{64 d}+\frac{5 a^{2} \sin(3 d x+3 c)}{24 d}+\frac{31 a^{2} \sin(2}{64}$
derivativedivides	$\frac{a^{2}\left(\frac{\left(\cos^{5}(d x+c)+\frac{5\left(\cos^{3}(d x+c)\right)}{4}+\frac{15 \cos(d x+c)}{8}\right) \sin(d x+c)}{6}+\frac{5 d x}{16}+\frac{5 c}{16}\right)+\frac{2 a^{2}\left(\frac{8}{3}+\cos^{4}(d x+c)+\frac{4\left(\cos^{2}(d x+c)\right)}{3}\right) \sin(d x+c)}{5}+a^{2}}{d}$
default	$\frac{a^{2}\left(\frac{\left(\cos^{5}(d x+c)+\frac{5\left(\cos^{3}(d x+c)\right)}{4}+\frac{15 \cos(d x+c)}{8}\right) \sin(d x+c)}{6}+\frac{5 d x}{16}+\frac{5 c}{16}\right)+\frac{2 a^{2}\left(\frac{8}{3}+\cos^{4}(d x+c)+\frac{4\left(\cos^{2}(d x+c)\right)}{3}\right) \sin(d x+c)}{5}+a^{2}}{d}$
parts	$\frac{a^{2}\left(\frac{\left(\cos^{3}(d x+c)+\frac{3 \cos(d x+c)}{2}\right) \sin(d x+c)}{4}+\frac{3 d x}{8}+\frac{3 c}{8}\right)}{d}+\frac{a^{2}\left(\frac{\left(\cos^{5}(d x+c)+\frac{5\left(\cos^{3}(d x+c)\right)}{4}+\frac{15 \cos(d x+c)}{8}\right) \sin(d x+c)}{6}+\frac{5 d x}{16}+\right.}{d}$
norman	$\frac{\frac{11 a^{2} x}{16}+\frac{53 a^{2} \tan\left(\frac{d x}{2}+\frac{c}{2}\right)}{8 d}+\frac{87 a^{2}\left(\tan^{3}\left(\frac{d x}{2}+\frac{c}{2}\right)\right)}{8 d}+\frac{501 a^{2}\left(\tan^{5}\left(\frac{d x}{2}+\frac{c}{2}\right)\right)}{20 d}+\frac{331 a^{2}\left(\tan^{7}\left(\frac{d x}{2}+\frac{c}{2}\right)\right)}{20 d}+\frac{187 a^{2}\left(\tan^{9}\left(\frac{d x}{2}+\frac{c}{2}\right)\right)}{24 d}+\frac{11 a^{2}}{}}{}$

```
[In] int(cos(d*x+c)^4*(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/192*(132*d*x+sin(6*d*x+6*c)+240*sin(d*x+c)+93*sin(2*d*x+2*c)+40*sin(3*d*x
+3*c)+15*sin(4*d*x+4*c)+24/5*sin(5*d*x+5*c))*a^2/d
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.69

$$\int \cos^4(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{165\,a^2dx+\left(40\,a^2\cos\left(dx+c\right)^5+96\,a^2\cos\left(dx+c\right)^4+110\,a^2\cos\left(dx+c\right)^3+128\,a^2\cos\left(dx+c\right)^2+165\,a^2\right.}{240\,d}$$

```
[In] integrate(cos(d*x+c)^4*(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/240*(165*a^2*d*x + (40*a^2*cos(d*x + c)^5 + 96*a^2*cos(d*x + c)^4 + 110*a
^2*cos(d*x + c)^3 + 128*a^2*cos(d*x + c)^2 + 165*a^2*cos(d*x + c) + 256*a^2
)*sin(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 343 vs. $2(122) = 244$.

Time = 0.37 (sec) , antiderivative size = 343, normalized size of antiderivative = 2.66

$$\int \cos^4(c+dx)(a+a\cos(c+dx))^2\,dx$$
$$= \begin{cases} \frac{5a^2x\sin^6(c+dx)}{16} + \frac{15a^2x\sin^4(c+dx)\cos^2(c+dx)}{16} + \frac{3a^2x\sin^4(c+dx)}{8} + \frac{15a^2x\sin^2(c+dx)\cos^4(c+dx)}{16} + \frac{3a^2x\sin^2(c+dx)\cos^2(c+dx)}{4} \\ x(a\cos(c)+a)^2\cos^4(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)**4*(a+a*cos(d*x+c))**2,x)
```

```
[Out] Piecewise((5*a**2*x*sin(c + d*x)**6/16 + 15*a**2*x*sin(c + d*x)**4*cos(c +
d*x)**2/16 + 3*a**2*x*sin(c + d*x)**4/8 + 15*a**2*x*sin(c + d*x)**2*cos(c +
 d*x)**4/16 + 3*a**2*x*sin(c + d*x)**2*cos(c + d*x)**2/4 + 5*a**2*x*cos(c +
 d*x)**6/16 + 3*a**2*x*cos(c + d*x)**4/8 + 5*a**2*sin(c + d*x)**5*cos(c + d
*x)/(16*d) + 16*a**2*sin(c + d*x)**5/(15*d) + 5*a**2*sin(c + d*x)**3*cos(c
+ d*x)**3/(6*d) + 8*a**2*sin(c + d*x)**3*cos(c + d*x)**2/(3*d) + 3*a**2*sin
(c + d*x)**3*cos(c + d*x)/(8*d) + 11*a**2*sin(c + d*x)*cos(c + d*x)**5/(16*
d) + 2*a**2*sin(c + d*x)*cos(c + d*x)**4/d + 5*a**2*sin(c + d*x)*cos(c + d*
x)**3/(8*d), Ne(d, 0)), (x*(a*cos(c) + a)**2*cos(c)**4, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 121, normalized size of antiderivative = 0.94

$$\int \cos^4(c+dx)(a+a\cos(c+dx))^2\,dx$$
$$= \frac{128\left(3\sin(dx+c)^5 - 10\sin(dx+c)^3 + 15\sin(dx+c)\right)a^2 - 5\left(4\sin(2dx+2c)^3 - 60dx - 60c - 9\sin\right.}{960\,d}$$

```
[In] integrate(cos(d*x+c)^4*(a+a*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/960*(128*(3*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*sin(d*x + c))*a^2 - 5
*(4*sin(2*d*x + 2*c)^3 - 60*d*x - 60*c - 9*sin(4*d*x + 4*c) - 48*sin(2*d*x
+ 2*c))*a^2 + 30*(12*d*x + 12*c + sin(4*d*x + 4*c) + 8*sin(2*d*x + 2*c))*a^
2)/d
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 106, normalized size of antiderivative = 0.82

$$\int \cos^4(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{11}{16}\,a^2x + \frac{a^2\sin(6\,dx+6\,c)}{192\,d} + \frac{a^2\sin(5\,dx+5\,c)}{40\,d} + \frac{5\,a^2\sin(4\,dx+4\,c)}{64\,d} + \frac{5\,a^2\sin(3\,dx+3\,c)}{24\,d} + \frac{31\,a^2\sin(2\,dx+2\,c)}{64\,d} + \frac{5\,a^2\sin(dx+c)}{4\,d}$$

```
[In] integrate(cos(d*x+c)^4*(a+a*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 11/16*a^2*x + 1/192*a^2*sin(6*d*x + 6*c)/d + 1/40*a^2*sin(5*d*x + 5*c)/d +
5/64*a^2*sin(4*d*x + 4*c)/d + 5/24*a^2*sin(3*d*x + 3*c)/d + 31/64*a^2*sin(2
*d*x + 2*c)/d + 5/4*a^2*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 16.98 (sec) , antiderivative size = 121, normalized size of antiderivative = 0.94

$$\int \cos^4(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{11\,a^2\,x}{16} + \frac{\frac{11\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{11}}{8} + \frac{187\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{9}}{24} + \frac{331\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{7}}{20} + \frac{501\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{5}}{20} + \frac{87\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{3}}{8} + \frac{53\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{8}}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)^6}$$

```
[In] int(cos(c + d*x)^4*(a + a*cos(c + d*x))^2,x)
```

```
[Out] (11*a^2*x)/16 + ((87*a^2*tan(c/2 + (d*x)/2)^3)/8 + (501*a^2*tan(c/2 + (d*x)
/2)^5)/20 + (331*a^2*tan(c/2 + (d*x)/2)^7)/20 + (187*a^2*tan(c/2 + (d*x)/2)
^9)/24 + (11*a^2*tan(c/2 + (d*x)/2)^11)/8 + (53*a^2*tan(c/2 + (d*x)/2))/8)/
(d*(tan(c/2 + (d*x)/2)^2 + 1)^6)
```

3.14 $\int \cos^3(c+dx)(a+a\cos(c+dx))^2\,dx$

Optimal result

Integrand size = 21, antiderivative size = 103

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{3a^2x}{4}+\frac{2a^2\sin(c+dx)}{d}+\frac{3a^2\cos(c+dx)\sin(c+dx)}{4d}+\frac{a^2\cos^3(c+dx)\sin(c+dx)}{2d}-\frac{a^2\sin^3(c+dx)}{d}+\frac{a^2\sin^5(c+dx)}{5d}$$

```
[Out] 3/4*a^2*x+2*a^2*sin(d*x+c)/d+3/4*a^2*cos(d*x+c)*sin(d*x+c)/d+1/2*a^2*cos(d*
x+c)^3*sin(d*x+c)/d-a^2*sin(d*x+c)^3/d+1/5*a^2*sin(d*x+c)^5/d
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 103, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2836, 2713, 2715, 8}

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{a^2\sin^5(c+dx)}{5d}-\frac{a^2\sin^3(c+dx)}{d}+\frac{2a^2\sin(c+dx)}{d}+\frac{a^2\sin(c+dx)\cos^3(c+dx)}{2d}+\frac{3a^2\sin(c+dx)\cos(c+dx)}{4d}+\frac{3a^2x}{4}$$

```
[In] Int[Cos[c + d*x]^3*(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (3*a^2*x)/4 + (2*a^2*Sin[c + d*x])/d + (3*a^2*Cos[c + d*x]*Sin[c + d*x])/(4
*d) + (a^2*Cos[c + d*x]^3*Sin[c + d*x])/(2*d) - (a^2*Sin[c + d*x]^3)/d + (a
^2*Sin[c + d*x]^5)/(5*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(a^2\cos^3(c+dx)+2a^2\cos^4(c+dx)+a^2\cos^5(c+dx)\right)\,dx\\
&= a^2\int \cos^3(c+dx)\,dx + a^2\int \cos^5(c+dx)\,dx + \left(2a^2\right)\int \cos^4(c+dx)\,dx\\
&= \frac{a^2\cos^3(c+dx)\sin(c+dx)}{2d} + \frac{1}{2}\left(3a^2\right)\int \cos^2(c+dx)\,dx\\
&\quad - \frac{a^2\text{Subst}\left(\int \left(1-x^2\right)\,dx, x, -\sin(c+dx)\right)}{d}\\
&\quad - \frac{a^2\text{Subst}\left(\int \left(1-2x^2+x^4\right)\,dx, x, -\sin(c+dx)\right)}{d}\\
&= \frac{2a^2\sin(c+dx)}{d} + \frac{3a^2\cos(c+dx)\sin(c+dx)}{4d} + \frac{a^2\cos^3(c+dx)\sin(c+dx)}{2d}\\
&\quad - \frac{a^2\sin^3(c+dx)}{d} + \frac{a^2\sin^5(c+dx)}{5d} + \frac{1}{4}\left(3a^2\right)\int 1\,dx
\end{aligned}$$

$$= \frac{3a^2x}{4} + \frac{2a^2\sin(c+dx)}{d} + \frac{3a^2\cos(c+dx)\sin(c+dx)}{4d} + \frac{a^2\cos^3(c+dx)\sin(c+dx)}{2d} - \frac{a^2\sin^3(c+dx)}{d} + \frac{a^2\sin^5(c+dx)}{5d}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.59

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{a^2(60dx+110\sin(c+dx)+40\sin(2(c+dx))+15\sin(3(c+dx))+5\sin(4(c+dx))+\sin(5(c+dx)))}{80d}$$

```
[In] Integrate[Cos[c + d*x]^3*(a + a*Cos[c + d*x])^2,x]
[Out] (a^2*(60*d*x + 110*Sin[c + d*x] + 40*Sin[2*(c + d*x)] + 15*Sin[3*(c + d*x)]
 + 5*Sin[4*(c + d*x)] + Sin[5*(c + d*x)]))/(80*d)
```

Maple [A] (verified)

Time = 2.76 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.62

method	result
parallelrisch	$\frac{a^2(60dx+110\sin(dx+c)+\sin(5dx+5c)+5\sin(4dx+4c)+15\sin(3dx+3c)+40\sin(2dx+2c))}{80d}$
risch	$\frac{3a^2x}{4}+\frac{11a^2\sin(dx+c)}{8d}+\frac{a^2\sin(5dx+5c)}{80d}+\frac{a^2\sin(4dx+4c)}{16d}+\frac{3a^2\sin(3dx+3c)}{16d}+\frac{a^2\sin(2dx+2c)}{2d}$
derivativedivides	$\frac{\frac{a^2\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}+2a^2\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{a^2\left(2+\cos^2(dx+c)\right)}{3}}{d}$
default	$\frac{\frac{a^2\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}+2a^2\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{a^2\left(2+\cos^2(dx+c)\right)}{3}}{d}$
parts	$\frac{a^2\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3d}+\frac{a^2\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5d}+\frac{2a^2\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)}{4}\right.}{d}$
norman	$\frac{\frac{3a^2x}{4}+\frac{13a^2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2d}+\frac{9a^2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{72a^2\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5d}+\frac{7a^2\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{3a^2\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2d}+\frac{15a^2x(\tan}{}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right.}$

```
[In] int(cos(d*x+c)^3*(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
[Out] 1/80*a^2*(60*d*x+110*sin(d*x+c)+sin(5*d*x+5*c)+5*sin(4*d*x+4*c)+15*sin(3*d*
x+3*c)+40*sin(2*d*x+2*c))/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.74

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^2\,dx$$
$$=\frac{15\,a^2dx+\left(4\,a^2\cos\left(dx+c\right)^4+10\,a^2\cos\left(dx+c\right)^3+12\,a^2\cos\left(dx+c\right)^2+15\,a^2\cos\left(dx+c\right)+24\,a^2\right)\sin\left(dx\right.}{20\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/20*(15*a^2*d*x + (4*a^2*cos(d*x + c)^4 + 10*a^2*cos(d*x + c)^3 + 12*a^2*c
os(d*x + c)^2 + 15*a^2*cos(d*x + c) + 24*a^2)*sin(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 221 vs. 2(94) = 188.

Time = 0.25 (sec) , antiderivative size = 221, normalized size of antiderivative = 2.15

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^2\,dx$$
$$=\begin{cases}\frac{3a^2x\sin^4(c+dx)}{4}+\frac{3a^2x\sin^2(c+dx)\cos^2(c+dx)}{2}+\frac{3a^2x\cos^4(c+dx)}{4}+\frac{8a^2\sin^5(c+dx)}{15d}+\frac{4a^2\sin^3(c+dx)\cos^2(c+dx)}{3d}+\frac{3a^2\sin^3(c+d}{4} \\ x\left(a\cos\left(c\right)+a\right)^2\cos^3\left(c\right)\end{cases}$$

```
[In] integrate(cos(d*x+c)**3*(a+a*cos(d*x+c))**2,x)
```

```
[Out] Piecewise((3*a**2*x*sin(c + d*x)**4/4 + 3*a**2*x*sin(c + d*x)**2*cos(c + d*
x)**2/2 + 3*a**2*x*cos(c + d*x)**4/4 + 8*a**2*sin(c + d*x)**5/(15*d) + 4*a*
*2*sin(c + d*x)**3*cos(c + d*x)**2/(3*d) + 3*a**2*sin(c + d*x)**3*cos(c + d
*x)/(4*d) + 2*a**2*sin(c + d*x)**3/(3*d) + a**2*sin(c + d*x)*cos(c + d*x)**
4/d + 5*a**2*sin(c + d*x)*cos(c + d*x)**3/(4*d) + a**2*sin(c + d*x)*cos(c +
 d*x)**2/d, Ne(d, 0)), (x*(a*cos(c) + a)**2*cos(c)**3, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.22 (sec) , antiderivative size = 95, normalized size of antiderivative = 0.92

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^2\,dx$$
$$=\frac{16\left(3\sin\left(dx+c\right)^5-10\sin\left(dx+c\right)^3+15\sin\left(dx+c\right)\right)a^2-80\left(\sin\left(dx+c\right)^3-3\sin\left(dx+c\right)\right)a^2+15\left(12\right.}{240\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+a*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/240*(16*(3*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*sin(d*x + c))*a^2 - 80
*(sin(d*x + c)^3 - 3*sin(d*x + c))*a^2 + 15*(12*d*x + 12*c + sin(4*d*x + 4*
c) + 8*sin(2*d*x + 2*c))*a^2)/d
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.86

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{3}{4}\,a^2x + \frac{a^2\sin(5\,dx+5\,c)}{80\,d} + \frac{a^2\sin(4\,dx+4\,c)}{16\,d} + \frac{3\,a^2\sin(3\,dx+3\,c)}{16\,d} + \frac{a^2\sin(2\,dx+2\,c)}{2\,d} + \frac{11\,a^2\sin(dx+c)}{8\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+a*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 3/4*a^2*x + 1/80*a^2*sin(5*d*x + 5*c)/d + 1/16*a^2*sin(4*d*x + 4*c)/d + 3/1
6*a^2*sin(3*d*x + 3*c)/d + 1/2*a^2*sin(2*d*x + 2*c)/d + 11/8*a^2*sin(d*x +
c)/d
```

Mupad [B] (verification not implemented)

Time = 17.33 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.02

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{3\,a^2\,x}{4} + \frac{\frac{3\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9}{2} + 7\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7 + \frac{72\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{5} + 9\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3 + \frac{13\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{2}}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)^5}$$

```
[In] int(cos(c + d*x)^3*(a + a*cos(c + d*x))^2,x)
```

```
[Out] (3*a^2*x)/4 + (9*a^2*tan(c/2 + (d*x)/2)^3 + (72*a^2*tan(c/2 + (d*x)/2)^5)/5
 + 7*a^2*tan(c/2 + (d*x)/2)^7 + (3*a^2*tan(c/2 + (d*x)/2)^9)/2 + (13*a^2*ta
n(c/2 + (d*x)/2))/2)/(d*(tan(c/2 + (d*x)/2)^2 + 1)^5)
```

3.15 $\int \cos^2(c+dx)(a+a\cos(c+dx))^2\,dx$

Optimal result

Integrand size = 21, antiderivative size = 87

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{7a^2x}{8}+\frac{2a^2\sin(c+dx)}{d}+\frac{7a^2\cos(c+dx)\sin(c+dx)}{8d}+\frac{a^2\cos^3(c+dx)\sin(c+dx)}{4d}-\frac{2a^2\sin^3(c+dx)}{3d}$$

```
[Out] 7/8*a^2*x+2*a^2*sin(d*x+c)/d+7/8*a^2*cos(d*x+c)*sin(d*x+c)/d+1/4*a^2*cos(d*
x+c)^3*sin(d*x+c)/d-2/3*a^2*sin(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2836, 2715, 8, 2713}

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^2\,dx = -\frac{2a^2\sin^3(c+dx)}{3d}+\frac{2a^2\sin(c+dx)}{d}+\frac{a^2\sin(c+dx)\cos^3(c+dx)}{4d}+\frac{7a^2\sin(c+dx)\cos(c+dx)}{8d}+\frac{7a^2x}{8}$$

```
[In] Int[Cos[c + d*x]^2*(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (7*a^2*x)/8 + (2*a^2*Sin[c + d*x])/d + (7*a^2*Cos[c + d*x]*Sin[c + d*x])/(8
*d) + (a^2*Cos[c + d*x]^3*Sin[c + d*x])/(4*d) - (2*a^2*Sin[c + d*x]^3)/(3*d
)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(a^2\cos^2(c+dx)+2a^2\cos^3(c+dx)+a^2\cos^4(c+dx)\right)\,dx \\
&= a^2\int \cos^2(c+dx)\,dx+a^2\int \cos^4(c+dx)\,dx+\left(2a^2\right)\int \cos^3(c+dx)\,dx \\
&= \frac{a^2\cos(c+dx)\sin(c+dx)}{2d}+\frac{a^2\cos^3(c+dx)\sin(c+dx)}{4d}+\frac{1}{2}a^2\int 1\,dx \\
&\quad+\frac{1}{4}\left(3a^2\right)\int \cos^2(c+dx)\,dx-\frac{\left(2a^2\right)\operatorname{Subst}\left(\int \left(1-x^2\right)\,dx,x,-\sin(c+dx)\right)}{d} \\
&= \frac{a^2x}{2}+\frac{2a^2\sin(c+dx)}{d}+\frac{7a^2\cos(c+dx)\sin(c+dx)}{8d} \\
&\quad+\frac{a^2\cos^3(c+dx)\sin(c+dx)}{4d}-\frac{2a^2\sin^3(c+dx)}{3d}+\frac{1}{8}\left(3a^2\right)\int 1\,dx \\
&= \frac{7a^2x}{8}+\frac{2a^2\sin(c+dx)}{d}+\frac{7a^2\cos(c+dx)\sin(c+dx)}{8d} \\
&\quad+\frac{a^2\cos^3(c+dx)\sin(c+dx)}{4d}-\frac{2a^2\sin^3(c+dx)}{3d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.61

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{a^2(84dx+144\sin(c+dx)+48\sin(2(c+dx))+16\sin(3(c+dx))+3\sin(4(c+dx)))}{96d}$$

```
[In] Integrate[Cos[c + d*x]^2*(a + a*Cos[c + d*x])^2,x]
[Out] (a^2*(84*d*x + 144*Sin[c + d*x] + 48*Sin[2*(c + d*x)] + 16*Sin[3*(c + d*x)]
 + 3*Sin[4*(c + d*x)]))/(96*d)
```

Maple [A] (verified)

Time = 2.26 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.63

method	result
parallelrisch	$\frac{a^2(84dx+144\sin(dx+c)+3\sin(4dx+4c)+16\sin(3dx+3c)+48\sin(2dx+2c))}{96d}$
risch	$\frac{7a^2x}{8}+\frac{3a^2\sin(dx+c)}{2d}+\frac{a^2\sin(4dx+4c)}{32d}+\frac{a^2\sin(3dx+3c)}{6d}+\frac{a^2\sin(2dx+2c)}{2d}$
derivativedivides	$\frac{a^2\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{2a^2\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+a^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}$
default	$\frac{a^2\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{2a^2\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+a^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}$
parts	$\frac{a^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{a^2\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}+\frac{2a^2\left(2+\cos^2(dx+c)\right)\sin(dx$
norman	$\frac{\frac{7a^2x}{8}+\frac{25a^2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d}+\frac{83a^2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12d}+\frac{77a^2\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12d}+\frac{7a^2\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}+\frac{7a^2x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}+\frac{21a^2x(\tan}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^4}$

```
[In] int(cos(d*x+c)^2*(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
[Out] 1/96*a^2*(84*d*x+144*sin(d*x+c)+3*sin(4*d*x+4*c)+16*sin(3*d*x+3*c)+48*sin(2
*d*x+2*c))/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.72

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^2\,dx$$
$$=\frac{21\,a^2dx+\left(6\,a^2\cos\left(dx+c\right)^3+16\,a^2\cos\left(dx+c\right)^2+21\,a^2\cos\left(dx+c\right)+32\,a^2\right)\sin\left(dx+c\right)}{24\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/24*(21*a^2*d*x + (6*a^2*cos(d*x + c)^3 + 16*a^2*cos(d*x + c)^2 + 21*a^2*c
os(d*x + c) + 32*a^2)*sin(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 211 vs. 2(82) = 164.

Time = 0.18 (sec) , antiderivative size = 211, normalized size of antiderivative = 2.43

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^2\,dx$$
$$=\begin{cases}\frac{3a^2x\sin^4(c+dx)}{8}+\frac{3a^2x\sin^2(c+dx)\cos^2(c+dx)}{4}+\frac{a^2x\sin^2(c+dx)}{2}+\frac{3a^2x\cos^4(c+dx)}{8}+\frac{a^2x\cos^2(c+dx)}{2}+\frac{3a^2\sin^3(c+dx)\cos(c+\\ x(a\cos(c)+a)^2\cos^2(c)\end{cases}$$

```
[In] integrate(cos(d*x+c)**2*(a+a*cos(d*x+c))**2,x)
```

```
[Out] Piecewise((3*a**2*x*sin(c + d*x)**4/8 + 3*a**2*x*sin(c + d*x)**2*cos(c + d*
x)**2/4 + a**2*x*sin(c + d*x)**2/2 + 3*a**2*x*cos(c + d*x)**4/8 + a**2*x*co
s(c + d*x)**2/2 + 3*a**2*sin(c + d*x)**3*cos(c + d*x)/(8*d) + 4*a**2*sin(c
+ d*x)**3/(3*d) + 5*a**2*sin(c + d*x)*cos(c + d*x)**3/(8*d) + 2*a**2*sin(c
+ d*x)*cos(c + d*x)**2/d + a**2*sin(c + d*x)*cos(c + d*x)/(2*d), Ne(d, 0)),
 (x*(a*cos(c) + a)**2*cos(c)**2, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.22 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.95

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^2\,dx =$$
$$-\frac{64\left(\sin\left(dx+c\right)^3-3\,\sin\left(dx+c\right)\right)a^2-3\left(12\,dx+12\,c+\sin\left(4\,dx+4\,c\right)+8\,\sin\left(2\,dx+2\,c\right)\right)a^2-24\,(2}{96\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/96*(64*(sin(d*x + c)^3 - 3*sin(d*x + c))*a^2 - 3*(12*d*x + 12*c + sin(4*
d*x + 4*c) + 8*sin(2*d*x + 2*c))*a^2 - 24*(2*d*x + 2*c + sin(2*d*x + 2*c))*
a^2)/d
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.83

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{7}{8}a^2x + \frac{a^2\sin(4\,dx+4\,c)}{32\,d} + \frac{a^2\sin(3\,dx+3\,c)}{6\,d} + \frac{a^2\sin(2\,dx+2\,c)}{2\,d} + \frac{3\,a^2\sin(dx+c)}{2\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 7/8*a^2*x + 1/32*a^2*sin(4*d*x + 4*c)/d + 1/6*a^2*sin(3*d*x + 3*c)/d + 1/2*
a^2*sin(2*d*x + 2*c)/d + 3/2*a^2*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 17.20 (sec) , antiderivative size = 89, normalized size of antiderivative = 1.02

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{7\,a^2\,x}{8} + \frac{\frac{7\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{4} + \frac{77\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{12} + \frac{83\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{12} + \frac{25\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{4}}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)^4}$$

```
[In] int(cos(c + d*x)^2*(a + a*cos(c + d*x))^2,x)
```

```
[Out] (7*a^2*x)/8 + ((83*a^2*tan(c/2 + (d*x)/2)^3)/12 + (77*a^2*tan(c/2 + (d*x)/2
)^5)/12 + (7*a^2*tan(c/2 + (d*x)/2)^7)/4 + (25*a^2*tan(c/2 + (d*x)/2))/4)/(
d*(tan(c/2 + (d*x)/2)^2 + 1)^4)
```

3.16 $\int \cos(c+dx)(a+a\cos(c+dx))^2\,dx$

Optimal result

Integrand size = 19, antiderivative size = 57

$$\int \cos(c+dx)(a+a\cos(c+dx))^2\,dx = a^2x + \frac{2a^2\sin(c+dx)}{d} + \frac{a^2\cos(c+dx)\sin(c+dx)}{d} - \frac{a^2\sin^3(c+dx)}{3d}$$

```
[Out] a^2*x+2*a^2*sin(d*x+c)/d+a^2*cos(d*x+c)*sin(d*x+c)/d-1/3*a^2*sin(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 69, normalized size of antiderivative = 1.21, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2830, 2723}

$$\int \cos(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{4a^2\sin(c+dx)}{3d} + \frac{a^2\sin(c+dx)\cos(c+dx)}{3d} + a^2x + \frac{\sin(c+dx)(a\cos(c+dx)+a)^2}{3d}$$

```
[In] Int[Cos[c + d*x]*(a + a*Cos[c + d*x])^2,x]
```

```
[Out] a^2*x + (4*a^2*Sin[c + d*x])/(3*d) + (a^2*Cos[c + d*x]*Sin[c + d*x])/(3*d)
+ ((a + a*Cos[c + d*x])^2*Sin[c + d*x])/(3*d)
```

Rule 2723

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^2, x_Symbol] :> Simp[(2*a^2 + b^
2)*(x/2), x] + (-Simp[2*a*b*(Cos[c + d*x]/d), x] - Simp[b^2*Cos[c + d*x]*(S
in[c + d*x]/(2*d)), x]) /; FreeQ[{a, b, c, d}, x]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rubi steps

$$\text{integral} = \frac{(a+a\cos(c+dx))^2\sin(c+dx)}{3d} + \frac{2}{3}\int (a+a\cos(c+dx))^2\,dx$$
$$= a^2x + \frac{4a^2\sin(c+dx)}{3d} + \frac{a^2\cos(c+dx)\sin(c+dx)}{3d} + \frac{(a+a\cos(c+dx))^2\sin(c+dx)}{3d}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 41, normalized size of antiderivative = 0.72

$$\int \cos(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{a^2(12dx+21\sin(c+dx)+6\sin(2(c+dx))+\sin(3(c+dx)))}{12d}$$

```
[In] Integrate[Cos[c + d*x]*(a + a*Cos[c + d*x])^2,x]
[Out] (a^2*(12*d*x + 21*Sin[c + d*x] + 6*Sin[2*(c + d*x)] + Sin[3*(c + d*x)]))/(1
2*d)
```

Maple [A] (verified)

Time = 1.42 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.74

method	result
parallelrisch	$\frac{a^{2}\left(12dx+21\sin\left(dx+c\right)+\sin\left(3dx+3c\right)+6\sin\left(2dx+2c\right)\right)}{12d}$
risch	$a^{2}x+\frac{7a^{2}\sin\left(dx+c\right)}{4d}+\frac{a^{2}\sin\left(3dx+3c\right)}{12d}+\frac{a^{2}\sin\left(2dx+2c\right)}{2d}$
derivativedivides	$\frac{\frac{a^{2}\left(2+\cos^{2}\left(dx+c\right)\right)\sin\left(dx+c\right)}{3}+2a^{2}\left(\frac{\cos\left(dx+c\right)\sin\left(dx+c\right)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+a^{2}\sin\left(dx+c\right)}{d}$
default	$\frac{\frac{a^{2}\left(2+\cos^{2}\left(dx+c\right)\right)\sin\left(dx+c\right)}{3}+2a^{2}\left(\frac{\cos\left(dx+c\right)\sin\left(dx+c\right)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+a^{2}\sin\left(dx+c\right)}{d}$
parts	$\frac{a^{2}\left(2+\cos^{2}\left(dx+c\right)\right)\sin\left(dx+c\right)}{3d}+\frac{a^{2}\sin\left(dx+c\right)}{d}+\frac{2a^{2}\left(\frac{\cos\left(dx+c\right)\sin\left(dx+c\right)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}$
norman	$\frac{a^{2}x+a^{2}x\left(\tan^{6}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\frac{6a^{2}\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{16a^{2}\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}+\frac{2a^{2}\left(\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+3a^{2}x\left(\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+3a^{2}x\left(\mathrm{ta}\right.}{\left(1+\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^{3}}$

```
[In] int(cos(d*x+c)*(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
[Out] 1/12*a^2*(12*d*x+21*sin(d*x+c)+sin(3*d*x+3*c)+6*sin(2*d*x+2*c))/d
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.86

$$\int \cos(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{3\,a^2dx+\left(a^2\cos\left(dx+c\right)^2+3\,a^2\cos\left(dx+c\right)+5\,a^2\right)\sin\left(dx+c\right)}{3\,d}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))^2,x, algorithm="fricas")
[Out] 1/3*(3*a^2*d*x + (a^2*cos(d*x + c)^2 + 3*a^2*cos(d*x + c) + 5*a^2)*sin(d*x
+ c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 107 vs. 2(51) = 102.

Time = 0.13 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.88

$$\int \cos(c+dx)(a+a\cos(c+dx))^2\,dx$$
$$= \begin{cases} a^2x\sin^2(c+dx) + a^2x\cos^2(c+dx) + \frac{2a^2\sin^3(c+dx)}{3d} + \frac{a^2\sin(c+dx)\cos^2(c+dx)}{d} + \frac{a^2\sin(c+dx)\cos(c+dx)}{d} + \frac{a^2\sin(c+\cdot}{d} \\ x(a\cos(c)+a)^2\cos(c) \end{cases}$$

[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))**2,x)

[Out] Piecewise((a**2*x*sin(c + d*x)**2 + a**2*x*cos(c + d*x)**2 + 2*a**2*sin(c + d*x)**3/(3*d) + a**2*sin(c + d*x)*cos(c + d*x)**2/d + a**2*sin(c + d*x)*cos(c + d*x)/d + a**2*sin(c + d*x)/d, Ne(d, 0)), (x*(a*cos(c) + a)**2*cos(c), True))

Maxima [A] (verification not implemented)

none

Time = 0.22 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.07

$$\int \cos(c+dx)(a+a\cos(c+dx))^2\,dx =$$
$$-\frac{2\left(\sin(dx+c)^3 - 3\sin(dx+c)\right)a^2 - 3\left(2\,dx + 2\,c + \sin(2\,dx + 2\,c)\right)a^2 - 6\,a^2\sin(dx+c)}{6\,d}$$

[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))^2,x, algorithm="maxima")

[Out] -1/6*(2*(sin(d*x + c)^3 - 3*sin(d*x + c))*a^2 - 3*(2*d*x + 2*c + sin(2*d*x + 2*c))*a^2 - 6*a^2*sin(d*x + c))/d

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 54, normalized size of antiderivative = 0.95

$$\int \cos(c+dx)(a+a\cos(c+dx))^2\,dx = a^2x + \frac{a^2\sin(3\,dx+3\,c)}{12\,d} + \frac{a^2\sin(2\,dx+2\,c)}{2\,d} + \frac{7\,a^2\sin(dx+c)}{4\,d}$$

[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))^2,x, algorithm="giac")

[Out] a^2*x + 1/12*a^2*sin(3*d*x + 3*c)/d + 1/2*a^2*sin(2*d*x + 2*c)/d + 7/4*a^2*sin(d*x + c)/d

Mupad [B] (verification not implemented)

Time = 13.71 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.07

$$\int \cos(c+dx)(a+a\cos(c+dx))^2\,dx = a^2\,x + \frac{5\,a^2\,\sin\left(c+d\,x\right)}{3\,d} + \frac{a^2\cos\left(c+d\,x\right)^2\,\sin\left(c+d\,x\right)}{3\,d} + \frac{a^2\,\cos\left(c+d\,x\right)\,\sin\left(c+d\,x\right)}{d}$$

```
[In] int(cos(c + d*x)*(a + a*cos(c + d*x))^2,x)
```

```
[Out] a^2*x + (5*a^2*sin(c + d*x))/(3*d) + (a^2*cos(c + d*x)^2*sin(c + d*x))/(3*d
) + (a^2*cos(c + d*x)*sin(c + d*x))/d
```

3.17 $\int (a+a\cos(c+dx))^2\,dx$

Optimal result

Integrand size = 12, antiderivative size = 45

$$\int (a+a\cos(c+dx))^2\,dx=\frac{3a^2x}{2}+\frac{2a^2\sin(c+dx)}{d}+\frac{a^2\cos(c+dx)\sin(c+dx)}{2d}$$

```
[Out] 3/2*a^2*x+2*a^2*sin(d*x+c)/d+1/2*a^2*cos(d*x+c)*sin(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {2723}

$$\int (a+a\cos(c+dx))^2\,dx=\frac{2a^2\sin(c+dx)}{d}+\frac{a^2\sin(c+dx)\cos(c+dx)}{2d}+\frac{3a^2x}{2}$$

```
[In] Int[(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (3*a^2*x)/2 + (2*a^2*Sin[c + d*x])/d + (a^2*Cos[c + d*x]*Sin[c + d*x])/(2*d
)
```

Rule 2723

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^2, x_Symbol] :> Simp[(2*a^2 + b^
2)*(x/2), x] + (-Simp[2*a*b*(Cos[c + d*x]/d), x] - Simp[b^2*Cos[c + d*x]*(S
in[c + d*x]/(2*d)), x]) /; FreeQ[{a, b, c, d}, x]
```

Rubi steps

$$\text{integral}=\frac{3a^2x}{2}+\frac{2a^2\sin(c+dx)}{d}+\frac{a^2\cos(c+dx)\sin(c+dx)}{2d}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 34, normalized size of antiderivative = 0.76

$$\int (a+a\cos(c+dx))^2\,dx=\frac{a^2(6(c+dx)+8\sin(c+dx)+\sin(2(c+dx)))}{4d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^2,x]
[Out] (a^2*(6*(c + d*x) + 8*Sin[c + d*x] + Sin[2*(c + d*x)]))/(4*d)
```

Maple [A] (verified)

Time = 0.70 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.69

method	result	size
parallelrisch	$\frac{a^2(6dx+8\sin(dx+c)+\sin(2dx+2c))}{4d}$	31
risch	$\frac{3a^2x}{2}+\frac{2a^2\sin(dx+c)}{d}+\frac{a^2\sin(2dx+2c)}{4d}$	39
parts	$a^2x+\frac{a^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{2a^2\sin(dx+c)}{d}$	50
derivativedivides	$\frac{a^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+2a^2\sin(dx+c)+a^2(dx+c)}{d}$	52
default	$\frac{a^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+2a^2\sin(dx+c)+a^2(dx+c)}{d}$	52
norman	$\frac{\frac{3a^2x}{2}+\frac{5a^2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{3a^2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+3a^2x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\frac{3a^2x\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}$	94

```
[In] int((a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
[Out] 1/4*a^2*(6*d*x+8*sin(d*x+c)+sin(2*d*x+2*c))/d
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.80

$$\int (a+a\cos(c+dx))^2\,dx=\frac{3\,a^2dx+(a^2\cos(dx+c)+4\,a^2)\sin(dx+c)}{2\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^2,x, algorithm="fricas")
[Out] 1/2*(3*a^2*d*x + (a^2*cos(d*x + c) + 4*a^2)*sin(d*x + c))/d
```

Sympy [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 78, normalized size of antiderivative = 1.73

$$\int (a + a\cos(c + dx))^2\, dx = \begin{cases} \frac{a^2x\sin^2(c+dx)}{2} + \frac{a^2x\cos^2(c+dx)}{2} + a^2x + \frac{a^2\sin(c+dx)\cos(c+dx)}{2d} + \frac{2a^2\sin(c+dx)}{d} & \text{for } d \neq 0 \\ x(a\cos(c) + a)^2 & \text{otherwise} \end{cases}$$

```
[In] integrate((a+a*cos(d*x+c))**2,x)
```

```
[Out] Piecewise((a**2*x*sin(c + d*x)**2/2 + a**2*x*cos(c + d*x)**2/2 + a**2*x + a
**2*sin(c + d*x)*cos(c + d*x)/(2*d) + 2*a**2*sin(c + d*x)/d, Ne(d, 0)), (x*
(a*cos(c) + a)**2, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.00

$$\int (a + a\cos(c + dx))^2\, dx = a^2x + \frac{(2\,dx + 2\,c + \sin(2\,dx + 2\,c))a^2}{4\,d} + \frac{2\,a^2\sin(dx + c)}{d}$$

```
[In] integrate((a+a*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] a^2*x + 1/4*(2*d*x + 2*c + sin(2*d*x + 2*c))*a^2/d + 2*a^2*sin(d*x + c)/d
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.84

$$\int (a + a\cos(c + dx))^2\, dx = \frac{3}{2}\,a^2x + \frac{a^2\sin(2\,dx + 2\,c)}{4\,d} + \frac{2\,a^2\sin(dx + c)}{d}$$

```
[In] integrate((a+a*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 3/2*a^2*x + 1/4*a^2*sin(2*d*x + 2*c)/d + 2*a^2*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 14.40 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.27

$$\int (a+a\cos(c+dx))^2\,dx=\frac{3\,a^2\,x}{2}+\frac{3\,a^2\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3+5\,a^2\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)^2}$$

```
[In] int((a + a*cos(c + d*x))^2,x)
```

```
[Out] (3*a^2*x)/2 + (3*a^2*tan(c/2 + (d*x)/2)^3 + 5*a^2*tan(c/2 + (d*x)/2))/(d*(t
an(c/2 + (d*x)/2)^2 + 1)^2)
```

3.18 $\int (a+a\cos(c+dx))^2\sec(c+dx)\,dx$

Optimal result

Integrand size = 19, antiderivative size = 34

$$\int (a+a\cos(c+dx))^2\sec(c+dx)\,dx=2a^2x+\frac{a^2\text{arctanh}(\sin(c+dx))}{d}+\frac{a^2\sin(c+dx)}{d}$$

```
[Out] 2*a^2*x+a^2*arctanh(sin(d*x+c))/d+a^2*sin(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2825, 2814, 3855}

$$\int (a+a\cos(c+dx))^2\sec(c+dx)\,dx=\frac{a^2\text{arctanh}(\sin(c+dx))}{d}+\frac{a^2\sin(c+dx)}{d}+2a^2x$$

```
[In] Int[(a + a*Cos[c + d*x])^2*Sec[c + d*x],x]
```

```
[Out] 2*a^2*x + (a^2*ArcTanh[Sin[c + d*x]])/d + (a^2*Sin[c + d*x])/d
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2825

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^2/((c_.) + (d_.)*sin[(e_.) + (f
_.)*(x_)]), x_Symbol] :> Simp[(-b^2)*(Cos[e + f*x]/(d*f)), x] + Dist[1/d, I
nt[Simp[a^2*d - b*(b*c - 2*a*d)*Sin[e + f*x], x]/(c + d*Sin[e + f*x]), x],
```

```
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{a^2\sin(c+dx)}{d}+\int\left(a^2+2a^2\cos(c+dx)\right)\sec(c+dx)\,dx\\ &= 2a^2x+\frac{a^2\sin(c+dx)}{d}+a^2\int\sec(c+dx)\,dx\\ &= 2a^2x+\frac{a^2\operatorname{arctanh}(\sin(c+dx))}{d}+\frac{a^2\sin(c+dx)}{d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.38

$$\int(a+a\cos(c+dx))^2\sec(c+dx)\,dx=2a^2x+\frac{a^2\operatorname{arctanh}(\sin(c+dx))}{d}+\frac{a^2\cos(dx)\sin(c)}{d}+\frac{a^2\cos(c)\sin(dx)}{d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^2*Sec[c + d*x],x]
[Out] 2*a^2*x + (a^2*ArcTanh[Sin[c + d*x]])/d + (a^2*Cos[d*x]*Sin[c])/d + (a^2*Co
s[c]*Sin[d*x])/d
```

Maple [A] (verified)

Time = 1.23 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.29

method	result
derivativedivides	$\frac{a^2\sin(dx+c)+2a^2(dx+c)+a^2\ln(\sec(dx+c)+\tan(dx+c))}{d}$
default	$\frac{a^2\sin(dx+c)+2a^2(dx+c)+a^2\ln(\sec(dx+c)+\tan(dx+c))}{d}$
parallelrisch	$\frac{a^2\left(2dx+\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+\sin(dx+c)\right)}{d}$
parts	$\frac{a^2\ln(\sec(dx+c)+\tan(dx+c))}{d}+\frac{a^2\sin(dx+c)}{d}+\frac{2a^2(dx+c)}{d}$
risch	$2a^2x-\frac{ia^2e^{i(dx+c)}}{2d}+\frac{ia^2e^{-i(dx+c)}}{2d}+\frac{a^2\ln(e^{i(dx+c)}+i)}{d}-\frac{a^2\ln(e^{i(dx+c)}-i)}{d}$
norman	$\frac{2a^2x+\frac{2a^2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{2a^2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+4a^2x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+2a^2x\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}+\frac{a^2\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{d}-$

```
[In] int((a+cos(d*x+c)*a)^2*sec(d*x+c),x,method=_RETURNVERBOSE)
[Out] 1/d*(a^2*sin(d*x+c)+2*a^2*(d*x+c)+a^2*ln(sec(d*x+c)+tan(d*x+c)))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 53, normalized size of antiderivative = 1.56

$$\int (a+a\cos(c+dx))^2\sec(c+dx)\,dx = \frac{4\,a^2dx+a^2\log\left(\sin\left(dx+c\right)+1\right)-a^2\log\left(-\sin\left(dx+c\right)+1\right)+2\,a^2\sin\left(dx+c\right)}{2\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c),x, algorithm="fricas")
[Out] 1/2*(4*a^2*d*x + a^2*log(sin(d*x + c) + 1) - a^2*log(-sin(d*x + c) + 1) + 2
*a^2*sin(d*x + c))/d
```

Sympy [F]

$$\int (a+a\cos(c+dx))^2\sec(c+dx)\,dx = a^2\left(\int 2\cos\left(c+dx\right)\sec\left(c+dx\right)dx + \int \cos^2\left(c+dx\right)\sec\left(c+dx\right)dx + \int \sec\left(c+dx\right)dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))**2*sec(d*x+c),x)
[Out] a**2*(Integral(2*cos(c + d*x)*sec(c + d*x), x) + Integral(cos(c + d*x)**2*s
ec(c + d*x), x) + Integral(sec(c + d*x), x))
```

Maxima [A] (verification not implemented)

none

Time = 0.21 (sec) , antiderivative size = 43, normalized size of antiderivative = 1.26

$$\int (a+a\cos(c+dx))^2\sec(c+dx)\,dx = \frac{2\,(dx+c)a^2 + a^2\log\left(\sec\left(dx+c\right)+\tan\left(dx+c\right)\right) + a^2\sin\left(dx+c\right)}{d}$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c),x, algorithm="maxima")
[Out] (2*(d*x + c)*a^2 + a^2*log(sec(d*x + c) + tan(d*x + c)) + a^2*sin(d*x + c))
/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 79 vs. 2(34) = 68.

Time = 0.33 (sec) , antiderivative size = 79, normalized size of antiderivative = 2.32

$$\int (a+a\cos(c+dx))^2\sec(c+dx)\,dx = \frac{2\,(dx+c)a^2 + a^2\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right) - a^2\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right) + \frac{2\,a^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+1}}{d}$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c),x, algorithm="giac")
[Out] (2*(d*x + c)*a^2 + a^2*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - a^2*log(abs(tan
(1/2*d*x + 1/2*c) - 1)) + 2*a^2*tan(1/2*d*x + 1/2*c)/(tan(1/2*d*x + 1/2*c)^
2 + 1))/d
```

Mupad [B] (verification not implemented)

Time = 14.23 (sec) , antiderivative size = 33, normalized size of antiderivative = 0.97

$$\int (a+a\cos(c+dx))^2\sec(c+dx)\,dx = 2\,a^2\,x + \frac{a^2\,\left(2\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)+\sin\left(c+d\,x\right)\right)}{d}$$

```
[In] int((a + a*cos(c + d*x))^2/cos(c + d*x),x)
[Out] 2*a^2*x + (a^2*(2*atanh(tan(c/2 + (d*x)/2)) + sin(c + d*x)))/d
```

3.19 $\int (a+a\cos(c+dx))^2\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 34

$$\int (a+a\cos(c+dx))^2\sec^2(c+dx)\,dx = a^2x+\frac{2a^2\text{arctanh}(\sin(c+dx))}{d}+\frac{a^2\tan(c+dx)}{d}$$

```
[Out] a^2*x+2*a^2*arctanh(sin(d*x+c))/d+a^2*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2836, 3855, 3852, 8}

$$\int (a+a\cos(c+dx))^2\sec^2(c+dx)\,dx = \frac{2a^2\text{arctanh}(\sin(c+dx))}{d}+\frac{a^2\tan(c+dx)}{d}+a^2x$$

```
[In] Int[(a + a*Cos[c + d*x])^2*Sec[c + d*x]^2,x]
```

```
[Out] a^2*x + (2*a^2*ArcTanh[Sin[c + d*x]])/d + (a^2*Tan[c + d*x])/d
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(a^2 + 2a^2 \sec(c+dx) + a^2 \sec^2(c+dx)\right) \, dx \\
&= a^2 x + a^2 \int \sec^2(c+dx) \, dx + \left(2a^2\right) \int \sec(c+dx) \, dx \\
&= a^2 x + \frac{2a^2 \text{arctanh}(\sin(c+dx))}{d} - \frac{a^2 \text{Subst}\left(\int 1 \, dx, x, -\tan(c+dx)\right)}{d} \\
&= a^2 x + \frac{2a^2 \text{arctanh}(\sin(c+dx))}{d} + \frac{a^2 \tan(c+dx)}{d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 28, normalized size of antiderivative = 0.82

$$\int (a + a\cos(c+dx))^2 \sec^2(c+dx) \, dx = a^2 \left(x + \frac{2\text{arctanh}(\sin(c+dx))}{d} + \frac{\tan(c+dx)}{d}\right)$$

```
[In] Integrate[(a + a*Cos[c + d*x])^2*Sec[c + d*x]^2,x]
[Out] a^2*(x + (2*ArcTanh[Sin[c + d*x]])/d + Tan[c + d*x]/d)
```

Maple [A] (verified)

Time = 1.89 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.29

method	result
derivativedivides	$\frac{a^2(dx+c)+2a^2\ln(\sec(dx+c)+\tan(dx+c))+a^2\tan(dx+c)}{d}$
default	$\frac{a^2(dx+c)+2a^2\ln(\sec(dx+c)+\tan(dx+c))+a^2\tan(dx+c)}{d}$
parts	$\frac{a^2\tan(dx+c)}{d}+\frac{a^2(dx+c)}{d}+\frac{2a^2\ln(\sec(dx+c)+\tan(dx+c))}{d}$
risch	$a^2x+\frac{2ia^2}{d(e^{2i(dx+c)}+1)}+\frac{2a^2\ln(e^{i(dx+c)}+i)}{d}-\frac{2a^2\ln(e^{i(dx+c)}-i)}{d}$
parallelrisch	$\frac{a^2\left(dx\cos(dx+c)-2\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(dx+c)+2\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)\cos(dx+c)+\sin(dx+c)\right)}{d\cos(dx+c)}$
norman	$\frac{a^2x\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a^2x\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-a^2x-\frac{2a^2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}-\frac{4a^2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-\frac{2a^2\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-a^2x\left(\tan^2\left(\frac{d}{}\right.\right.}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}$

```
[In] int((a+cos(d*x+c)*a)^2*sec(d*x+c)^2,x,method=_RETURNVERBOSE)
[Out] 1/d*(a^2*(d*x+c)+2*a^2*ln(sec(d*x+c)+tan(d*x+c))+a^2*tan(d*x+c))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 76 vs. $2(34) = 68$.

Time = 0.26 (sec) , antiderivative size = 76, normalized size of antiderivative = 2.24

$$\int (a+a\cos(c+dx))^2\sec^2(c+dx)\,dx$$
$$=\frac{a^2dx\cos(dx+c)+a^2\cos(dx+c)\log(\sin(dx+c)+1)-a^2\cos(dx+c)\log(-\sin(dx+c)+1)+a^2\sin(}{d\cos(dx+c)}$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^2,x, algorithm="fricas")
[Out] (a^2*d*x*cos(d*x + c) + a^2*cos(d*x + c)*log(sin(d*x + c) + 1) - a^2*cos(d*
x + c)*log(-sin(d*x + c) + 1) + a^2*sin(d*x + c))/(d*cos(d*x + c))
```

Sympy [F]

$$\int (a+a\cos(c+dx))^2\sec^2(c+dx)\,dx=a^2\left(\int 2\cos(c+dx)\sec^2(c+dx)\,dx+\int\cos^2(c+dx)\sec^2(c+dx)\,dx+\int\sec^2(c+dx)\,dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))**2*sec(d*x+c)**2,x)
[Out] a**2*(Integral(2*cos(c + d*x)*sec(c + d*x)**2, x) + Integral(cos(c + d*x)**
2*sec(c + d*x)**2, x) + Integral(sec(c + d*x)**2, x))
```

Maxima [A] (verification not implemented)

none

Time = 0.22 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.44

$$\int (a + a\cos(c + dx))^2 \sec^2(c + dx)\,dx = \frac{(dx + c)a^2 + a^2(\log(\sin(dx + c) + 1) - \log(\sin(dx + c) - 1)) + a^2\tan(dx + c)}{d}$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^2,x, algorithm="maxima")
[Out] ((d*x + c)*a^2 + a^2*(log(sin(d*x + c) + 1) - log(sin(d*x + c) - 1)) + a^2*
tan(d*x + c))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 79 vs. 2(34) = 68.

Time = 0.33 (sec) , antiderivative size = 79, normalized size of antiderivative = 2.32

$$\int (a + a\cos(c + dx))^2 \sec^2(c + dx)\,dx = \frac{(dx + c)a^2 + 2\,a^2\log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) + 1\right|\right) - 2\,a^2\log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) - 1\right|\right) - \frac{2\,a^2\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)}{\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)^2 - 1}}{d}$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^2,x, algorithm="giac")
[Out] ((d*x + c)*a^2 + 2*a^2*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 2*a^2*log(abs(t
an(1/2*d*x + 1/2*c) - 1)) - 2*a^2*tan(1/2*d*x + 1/2*c)/(tan(1/2*d*x + 1/2*c
)^2 - 1))/d
```

Mupad [B] (verification not implemented)

Time = 14.19 (sec) , antiderivative size = 56, normalized size of antiderivative = 1.65

$$\int (a + a\cos(c + dx))^2 \sec^2(c + dx)\,dx = a^2\,x + \frac{4\,a^2\,\mathrm{atanh}\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)\right)}{d} - \frac{2\,a^2\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)}{d\,\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^2 - 1\right)}$$

```
[In] int((a + a*cos(c + d*x))^2/cos(c + d*x)^2,x)
[Out] a^2*x + (4*a^2*atanh(tan(c/2 + (d*x)/2)))/d - (2*a^2*tan(c/2 + (d*x)/2))/(d
*(tan(c/2 + (d*x)/2)^2 - 1))
```

3.20 $\int (a+a\cos(c+dx))^2\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 54

$$\int (a+a\cos(c+dx))^2\sec^3(c+dx)\,dx=\frac{3a^2\operatorname{arctanh}(\sin(c+dx))}{2d}+\frac{2a^2\tan(c+dx)}{d}+\frac{a^2\sec(c+dx)\tan(c+dx)}{2d}$$

```
[Out] 3/2*a^2*arctanh(sin(d*x+c))/d+2*a^2*tan(d*x+c)/d+1/2*a^2*sec(d*x+c)*tan(d*x
+c)/d
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2836, 3855, 3852, 8, 3853}

$$\int (a+a\cos(c+dx))^2\sec^3(c+dx)\,dx=\frac{3a^2\operatorname{arctanh}(\sin(c+dx))}{2d}+\frac{2a^2\tan(c+dx)}{d}+\frac{a^2\tan(c+dx)\sec(c+dx)}{2d}$$

```
[In] Int[(a + a*Cos[c + d*x])^2*Sec[c + d*x]^3,x]
```

```
[Out] (3*a^2*ArcTanh[Sin[c + d*x]])/(2*d) + (2*a^2*Tan[c + d*x])/d + (a^2*Sec[c +
 d*x]*Tan[c + d*x])/(2*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(a^2 \sec(c+dx) + 2a^2 \sec^2(c+dx) + a^2 \sec^3(c+dx)\right)\,dx \\
&= a^2 \int \sec(c+dx)\,dx + a^2 \int \sec^3(c+dx)\,dx + \left(2a^2\right) \int \sec^2(c+dx)\,dx \\
&= \frac{a^2 \text{arctanh}(\sin(c+dx))}{d} + \frac{a^2 \sec(c+dx)\tan(c+dx)}{2d} \\
&\quad + \frac{1}{2}a^2 \int \sec(c+dx)\,dx - \frac{\left(2a^2\right)\text{Subst}\left(\int 1\,dx, x, -\tan(c+dx)\right)}{d} \\
&= \frac{3a^2 \text{arctanh}(\sin(c+dx))}{2d} + \frac{2a^2 \tan(c+dx)}{d} + \frac{a^2 \sec(c+dx)\tan(c+dx)}{2d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 54, normalized size of antiderivative = 1.00

$$\int (a+a\cos(c+dx))^2\sec^3(c+dx)\,dx=\frac{3a^2\text{arctanh}(\sin(c+dx))}{2d}+\frac{2a^2\tan(c+dx)}{d}+\frac{a^2\sec(c+dx)\tan(c+dx)}{2d}$$

[In] Integrate[(a + a*Cos[c + d*x])^2*Sec[c + d*x]^3,x]

[Out] (3*a^2*ArcTanh[Sin[c + d*x]])/(2*d) + (2*a^2*Tan[c + d*x])/d + (a^2*Sec[c + d*x]*Tan[c + d*x])/(2*d)

Maple [A] (verified)

Time = 2.24 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.30

method	result
derivativedivides	$\frac{a^2\ln(\sec(dx+c)+\tan(dx+c))+2a^2\tan(dx+c)+a^2\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}$
default	$\frac{a^2\ln(\sec(dx+c)+\tan(dx+c))+2a^2\tan(dx+c)+a^2\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}$
parts	$\frac{a^2\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}+\frac{a^2\ln(\sec(dx+c)+\tan(dx+c))}{d}+\frac{2a^2\tan(dx+c)}{d}$
risch	$-\frac{ia^2\left(e^{3i(dx+c)}-4\,e^{2i(dx+c)}-e^{i(dx+c)}-4\right)}{d\left(e^{2i(dx+c)}+1\right)^2}+\frac{3a^2\ln\left(e^{i(dx+c)}+i\right)}{2d}-\frac{3a^2\ln\left(e^{i(dx+c)}-i\right)}{2d}$
parallelrisch	$-\frac{a^2\left(3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(2dx+2c)-3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)\cos(2dx+2c)-2\sin(dx+c)+3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)-3\ln \cdots\right.}{2d(1+\cos(2dx+2c))}$
norman	$\frac{\frac{5a^2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{7a^2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-\frac{a^2\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-\frac{3a^2\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}-\frac{3a^2\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2d}+\frac{3a^2\ln\left(\tan \cdots\right.}{}$

[In] int((a+cos(d*x+c)*a)^2*sec(d*x+c)^3,x,method=_RETURNVERBOSE)

[Out] 1/d*(a^2*ln(sec(d*x+c)+tan(d*x+c))+2*a^2*tan(d*x+c)+a^2*(1/2*sec(d*x+c)*tan(d*x+c)+1/2*ln(sec(d*x+c)+tan(d*x+c))))

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.54

$$\int (a+a\cos(c+dx))^2\sec^3(c+dx)\,dx$$
$$=\frac{3\,a^2\cos\left(dx+c\right)^2\log\left(\sin\left(dx+c\right)+1\right)-3\,a^2\cos\left(dx+c\right)^2\log\left(-\sin\left(dx+c\right)+1\right)+2\left(4\,a^2\cos\left(dx+c\right)+\ldots\right.}{4\,d\cos\left(dx+c\right)^2}$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] 1/4*(3*a^2*cos(d*x + c)^2*log(sin(d*x + c) + 1) - 3*a^2*cos(d*x + c)^2*log(
-sin(d*x + c) + 1) + 2*(4*a^2*cos(d*x + c) + a^2)*sin(d*x + c))/(d*cos(d*x
+ c)^2)
```

Sympy [F]

$$\int (a+a\cos(c+dx))^2\sec^3(c+dx)\,dx=a^2\left(\int 2\cos\left(c+dx\right)\sec^3\left(c+dx\right)dx+\int\cos^2\left(c+dx\right)\sec^3\left(c+dx\right)dx+\int\sec^3\left(c+dx\right)dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))**2*sec(d*x+c)**3,x)
```

```
[Out] a**2*(Integral(2*cos(c + d*x)*sec(c + d*x)**3, x) + Integral(cos(c + d*x)**
2*sec(c + d*x)**3, x) + Integral(sec(c + d*x)**3, x))
```

Maxima [A] (verification not implemented)

none

Time = 0.21 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.63

$$\int (a+a\cos(c+dx))^2\sec^3(c+dx)\,dx=$$
$$-\frac{a^2\left(\frac{2\,\sin(dx+c)}{\sin(dx+c)^2-1}-\log\left(\sin\left(dx+c\right)+1\right)+\log\left(\sin\left(dx+c\right)-1\right)\right)-2\,a^2(\log\left(\sin\left(dx+c\right)+1\right)-\log\left(\sin\ldots\right.}{4\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] -1/4*(a^2*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(d*x + c) + 1) + lo
g(sin(d*x + c) - 1)) - 2*a^2*(log(sin(d*x + c) + 1) - log(sin(d*x + c) - 1)
) - 8*a^2*tan(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 90, normalized size of antiderivative = 1.67

$$\int (a + a\cos(c + dx))^2 \sec^3(c + dx)\, dx$$
$$= \frac{3\, a^2 \log\left(\left|\tan\left(\frac{1}{2}\, dx + \frac{1}{2}\, c\right) + 1\right|\right) - 3\, a^2 \log\left(\left|\tan\left(\frac{1}{2}\, dx + \frac{1}{2}\, c\right) - 1\right|\right) - \frac{2\left(3\, a^2 \tan\left(\frac{1}{2}\, dx + \frac{1}{2}\, c\right)^3 - 5\, a^2 \tan\left(\frac{1}{2}\, dx + \frac{1}{2}\, c\right)\right)}{\left(\tan\left(\frac{1}{2}\, dx + \frac{1}{2}\, c\right)^2 - 1\right)^2}}{2\, d}$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^3,x, algorithm="giac")
```

```
[Out] 1/2*(3*a^2*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 3*a^2*log(abs(tan(1/2*d*x +
 1/2*c) - 1)) - 2*(3*a^2*tan(1/2*d*x + 1/2*c)^3 - 5*a^2*tan(1/2*d*x + 1/2*c
))/(tan(1/2*d*x + 1/2*c)^2 - 1)^2)/d
```

Mupad [B] (verification not implemented)

Time = 14.14 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.54

$$\int (a + a\cos(c + dx))^2 \sec^3(c + dx)\, dx = \frac{3\, a^2\, \mathrm{atanh}\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)\right)}{d} - \frac{3\, a^2 \tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^3 - 5\, a^2 \tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)}{d\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^4 - 2\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^2 + 1\right)}$$

```
[In] int((a + a*cos(c + d*x))^2/cos(c + d*x)^3,x)
```

```
[Out] (3*a^2*atanh(tan(c/2 + (d*x)/2)))/d - (3*a^2*tan(c/2 + (d*x)/2)^3 - 5*a^2*t
an(c/2 + (d*x)/2))/(d*(tan(c/2 + (d*x)/2)^4 - 2*tan(c/2 + (d*x)/2)^2 + 1))
```

3.21 $\int (a+a\cos(c+dx))^2\sec^4(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 66

$$\int (a+a\cos(c+dx))^2\sec^4(c+dx)\,dx=\frac{a^2\text{arctanh}(\sin(c+dx))}{d}+\frac{2a^2\tan(c+dx)}{d}+\frac{a^2\sec(c+dx)\tan(c+dx)}{d}+\frac{a^2\tan^3(c+dx)}{3d}$$

```
[Out] a^2*arctanh(sin(d*x+c))/d+2*a^2*tan(d*x+c)/d+a^2*sec(d*x+c)*tan(d*x+c)/d+1/
3*a^2*tan(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2836, 3852, 8, 3853, 3855}

$$\int (a+a\cos(c+dx))^2\sec^4(c+dx)\,dx=\frac{a^2\text{arctanh}(\sin(c+dx))}{d}+\frac{a^2\tan^3(c+dx)}{3d}+\frac{2a^2\tan(c+dx)}{d}+\frac{a^2\tan(c+dx)\sec(c+dx)}{d}$$

```
[In] Int[(a + a*Cos[c + d*x])^2*Sec[c + d*x]^4,x]
```

```
[Out] (a^2*ArcTanh[Sin[c + d*x]])/d + (2*a^2*Tan[c + d*x])/d + (a^2*Sec[c + d*x]*
Tan[c + d*x])/d + (a^2*Tan[c + d*x]^3)/(3*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(a^2 \sec^2(c+dx)+2a^2 \sec^3(c+dx)+a^2 \sec^4(c+dx)\right)\,dx\\
&= a^2 \int \sec^2(c+dx)\,dx + a^2 \int \sec^4(c+dx)\,dx + \left(2a^2\right) \int \sec^3(c+dx)\,dx\\
&= \frac{a^2 \sec(c+dx)\tan(c+dx)}{d} + a^2 \int \sec(c+dx)\,dx\\
&\quad - \frac{a^2 \text{Subst}\left(\int 1\,dx, x, -\tan(c+dx)\right)}{d} - \frac{a^2 \text{Subst}\left(\int \left(1+x^2\right)\,dx, x, -\tan(c+dx)\right)}{d}\\
&= \frac{a^2 \text{arctanh}(\sin(c+dx))}{d} + \frac{2a^2 \tan(c+dx)}{d} + \frac{a^2 \sec(c+dx)\tan(c+dx)}{d} + \frac{a^2 \tan^3(c+dx)}{3d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.00

$$\int (a+a\cos(c+dx))^2\sec^4(c+dx)\,dx=\frac{a^2\text{arctanh}(\sin(c+dx))}{d}+\frac{2a^2\tan(c+dx)}{d}+\frac{a^2\sec(c+dx)\tan(c+dx)}{d}+\frac{a^2\tan^3(c+dx)}{3d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^2*Sec[c + d*x]^4,x]
```

```
[Out] (a^2*ArcTanh[Sin[c + d*x]])/d + (2*a^2*Tan[c + d*x])/d + (a^2*Sec[c + d*x]*
Tan[c + d*x])/d + (a^2*Tan[c + d*x]^3)/(3*d)
```

Maple [A] (verified)

Time = 3.31 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.14

method	result
derivativedivides	$\frac{a^2\tan(dx+c)+2a^2\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-a^2\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)}{d}$
default	$\frac{a^2\tan(dx+c)+2a^2\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-a^2\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)}{d}$
parts	$-\frac{a^2\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)}{d}+\frac{a^2\tan(dx+c)}{d}+\frac{a^2\sec(dx+c)\tan(dx+c)}{d}+\frac{a^2\ln(\sec(dx+c)+\tan(dx+c))}{d}$
risch	$-\frac{2ia^2\left(3\,\mathrm{e}^{5i(dx+c)}-3\,\mathrm{e}^{4i(dx+c)}-12\,\mathrm{e}^{2i(dx+c)}-3\,\mathrm{e}^{i(dx+c)}-5\right)}{3d\left(\mathrm{e}^{2i(dx+c)}+1\right)^3}+\frac{a^2\ln\left(\mathrm{e}^{i(dx+c)}+i\right)}{d}-\frac{a^2\ln\left(\mathrm{e}^{i(dx+c)}-i\right)}{d}$
parallelrisch	$-\frac{3\left(\left(\cos(dx+c)+\frac{\cos(3dx+3c)}{3}\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+\left(-\cos(dx+c)-\frac{\cos(3dx+3c)}{3}\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-\sin(dx+c)-\right)}{d(\cos(3dx+3c)+3\cos(dx+c))}$
norman	$\frac{-\frac{6a^2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}-\frac{20a^2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}+\frac{8a^2\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}+\frac{4a^2\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}-\frac{2a^2\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^3}+\frac{a^2\ln\left(\tan\left(\frac{dx}{2}\right)\right)}{d}$

```
[In] int((a+cos(d*x+c)*a)^2*sec(d*x+c)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a^2*tan(d*x+c)+2*a^2*(1/2*sec(d*x+c)*tan(d*x+c)+1/2*ln(sec(d*x+c)+tan(
d*x+c)))-a^2*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 96, normalized size of antiderivative = 1.45

$$\int (a + a\cos(c + dx))^2 \sec^4(c + dx)\, dx = \frac{3\,a^2\cos\left(dx + c\right)^3\log\left(\sin\left(dx + c\right) + 1\right) - 3\,a^2\cos\left(dx + c\right)^3\log\left(-\sin\left(dx + c\right) + 1\right) + 2\,\left(5\,a^2\cos\left(dx + c\right)^2 + \right.}{6\,d\cos\left(dx + c\right)^3}$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^4,x, algorithm="fricas")
[Out] 1/6*(3*a^2*cos(d*x + c)^3*log(sin(d*x + c) + 1) - 3*a^2*cos(d*x + c)^3*log(
-sin(d*x + c) + 1) + 2*(5*a^2*cos(d*x + c)^2 + 3*a^2*cos(d*x + c) + a^2)*si
n(d*x + c))/(d*cos(d*x + c)^3)
```

Sympy [F]

$$\int (a + a\cos(c + dx))^2 \sec^4(c + dx)\, dx = a^2\left(\int 2\cos\left(c + dx\right)\sec^4\left(c + dx\right) dx + \int \cos^2\left(c + dx\right)\sec^4\left(c + dx\right) dx + \int \sec^4\left(c + dx\right) dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))**2*sec(d*x+c)**4,x)
[Out] a**2*(Integral(2*cos(c + d*x)*sec(c + d*x)**4, x) + Integral(cos(c + d*x)**
2*sec(c + d*x)**4, x) + Integral(sec(c + d*x)**4, x))
```

Maxima [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.29

$$\int (a + a\cos(c + dx))^2 \sec^4(c + dx)\, dx = \frac{2\left(\tan\left(dx + c\right)^3 + 3\tan\left(dx + c\right)\right)a^2 - 3\,a^2\left(\frac{2\sin(dx+c)}{\sin(dx+c)^2-1} - \log\left(\sin\left(dx + c\right) + 1\right) + \log\left(\sin\left(dx + c\right) - 1\right)\right) + }{6\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^4,x, algorithm="maxima")
[Out] 1/6*(2*(tan(d*x + c)^3 + 3*tan(d*x + c))*a^2 - 3*a^2*(2*sin(d*x + c)/(sin(d
*x + c)^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)) + 6*a^2*tan
(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.61

$$\int (a+a\cos(c+dx))^2\sec^4(c+dx)\,dx$$
$$=\frac{3\,a^2\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-3\,a^2\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)-\frac{2\left(3\,a^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-8\,a^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+9}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)^3}}{3\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^4,x, algorithm="giac")
```

```
[Out] 1/3*(3*a^2*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 3*a^2*log(abs(tan(1/2*d*x +
 1/2*c) - 1)) - 2*(3*a^2*tan(1/2*d*x + 1/2*c)^5 - 8*a^2*tan(1/2*d*x + 1/2*c
)^3 + 9*a^2*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2 - 1)^3)/d
```

Mupad [B] (verification not implemented)

Time = 15.60 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.70

$$\int (a+a\cos(c+dx))^2\sec^4(c+dx)\,dx$$
$$=\frac{2\,a^2\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}-\frac{2\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5-\frac{16\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{3}+6\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6-3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-1\right)}$$

```
[In] int((a + a*cos(c + d*x))^2/cos(c + d*x)^4,x)
```

```
[Out] (2*a^2*atanh(tan(c/2 + (d*x)/2)))/d - (2*a^2*tan(c/2 + (d*x)/2)^5 - (16*a^2
*tan(c/2 + (d*x)/2)^3)/3 + 6*a^2*tan(c/2 + (d*x)/2))/(d*(3*tan(c/2 + (d*x)/
2)^2 - 3*tan(c/2 + (d*x)/2)^4 + tan(c/2 + (d*x)/2)^6 - 1))
```

3.22 $\int (a+a\cos(c+dx))^2\sec^5(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 96

$$\int (a+a\cos(c+dx))^2\sec^5(c+dx)\,dx=\frac{7a^2\operatorname{arctanh}(\sin(c+dx))}{8d}+\frac{2a^2\tan(c+dx)}{d}+\frac{7a^2\sec(c+dx)\tan(c+dx)}{8d}+\frac{a^2\sec^3(c+dx)\tan(c+dx)}{4d}+\frac{2a^2\tan^3(c+dx)}{3d}$$

```
[Out] 7/8*a^2*arctanh(sin(d*x+c))/d+2*a^2*tan(d*x+c)/d+7/8*a^2*sec(d*x+c)*tan(d*x
+c)/d+1/4*a^2*sec(d*x+c)^3*tan(d*x+c)/d+2/3*a^2*tan(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2836, 3853, 3855, 3852}

$$\int (a+a\cos(c+dx))^2\sec^5(c+dx)\,dx=\frac{7a^2\operatorname{arctanh}(\sin(c+dx))}{8d}+\frac{2a^2\tan^3(c+dx)}{3d}+\frac{2a^2\tan(c+dx)}{d}+\frac{a^2\tan(c+dx)\sec^3(c+dx)}{4d}+\frac{7a^2\tan(c+dx)\sec(c+dx)}{8d}$$

```
[In] Int[(a + a*Cos[c + d*x])^2*Sec[c + d*x]^5,x]
```

```
[Out] (7*a^2*ArcTanh[Sin[c + d*x]])/(8*d) + (2*a^2*Tan[c + d*x])/d + (7*a^2*Sec[c
 + d*x]*Tan[c + d*x])/(8*d) + (a^2*Sec[c + d*x]^3*Tan[c + d*x])/(4*d) + (2*
a^2*Tan[c + d*x]^3)/(3*d)
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(a^2\sec^3(c+dx)+2a^2\sec^4(c+dx)+a^2\sec^5(c+dx)\right)\,dx \\
&= a^2\int \sec^3(c+dx)\,dx+a^2\int \sec^5(c+dx)\,dx+\left(2a^2\right)\int \sec^4(c+dx)\,dx \\
&= \frac{a^2\sec(c+dx)\tan(c+dx)}{2d}+\frac{a^2\sec^3(c+dx)\tan(c+dx)}{4d}+\frac{1}{2}a^2\int \sec(c+dx)\,dx \\
&\quad +\frac{1}{4}\left(3a^2\right)\int \sec^3(c+dx)\,dx-\frac{\left(2a^2\right)\text{Subst}\left(\int \left(1+x^2\right)\,dx,x,-\tan(c+dx)\right)}{d} \\
&= \frac{a^2\text{arctanh}(\sin(c+dx))}{2d}+\frac{2a^2\tan(c+dx)}{d}+\frac{7a^2\sec(c+dx)\tan(c+dx)}{8d} \\
&\quad +\frac{a^2\sec^3(c+dx)\tan(c+dx)}{4d}+\frac{2a^2\tan^3(c+dx)}{3d}+\frac{1}{8}\left(3a^2\right)\int \sec(c+dx)\,dx \\
&= \frac{7a^2\text{arctanh}(\sin(c+dx))}{8d}+\frac{2a^2\tan(c+dx)}{d}+\frac{7a^2\sec(c+dx)\tan(c+dx)}{8d} \\
&\quad +\frac{a^2\sec^3(c+dx)\tan(c+dx)}{4d}+\frac{2a^2\tan^3(c+dx)}{3d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.30 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.60

$$\int (a+a\cos(c+dx))^2\sec^5(c+dx)\,dx = \frac{a^2(21\text{arctanh}(\sin(c+dx))+\tan(c+dx)\,(21\sec(c+dx)+6\sec^3(c+dx)+16(3+\tan^2(c+dx))))}{24d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^2*Sec[c + d*x]^5,x]
```

```
[Out] (a^2*(21*ArcTanh[Sin[c + d*x]] + Tan[c + d*x]*(21*Sec[c + d*x] + 6*Sec[c + 
d*x]^3 + 16*(3 + Tan[c + d*x]^2))))/(24*d)
```

Maple [A] (verified)

Time = 2.93 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.17

method	result
derivativedivides	$\frac{a^2\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-2a^2\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+a^2\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(\ldots}{8}\right.\right.}{d}$
default	$\frac{a^2\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-2a^2\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+a^2\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(\ldots}{8}\right.\right.}{d}$
parts	$\frac{a^2\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)}{d}+\frac{a^2\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\mathrm{t}\ldots}{2}\right.}{d}$
risch	$-\frac{ia^2\left(21\,\mathrm{e}^{7i(dx+c)}+45\,\mathrm{e}^{5i(dx+c)}-96\,\mathrm{e}^{4i(dx+c)}-45\,\mathrm{e}^{3i(dx+c)}-128\,\mathrm{e}^{2i(dx+c)}-21\,\mathrm{e}^{i(dx+c)}-32\right)}{12d\left(\mathrm{e}^{2i(dx+c)}+1\right)^4}+\frac{7a^2\ln\left(\mathrm{e}^{i(dx+c)}+i\right)}{8d}-\ldots$
parallelrisch	$\frac{a^2\left(21(-\cos(4dx+4c)-4\cos(2dx+2c)-3)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+21(\cos(4dx+4c)+4\cos(2dx+2c)+3)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)\ldots\right.}{24d(\cos(4dx+4c)+4\cos(2dx+2c)+3)}$
norman	$\frac{\frac{25a^2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d}+\frac{67a^2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12d}-\frac{7a^2\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{6d}+\frac{25a^2\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{6d}+\frac{35a^2\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12d}-\frac{7a^2\left(\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\ldots\right.\right.}{4d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^4}$

```
[In] int((a+cos(d*x+c)*a)^2*sec(d*x+c)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a^2*(1/2*sec(d*x+c)*tan(d*x+c)+1/2*ln(sec(d*x+c)+tan(d*x+c)))-2*a^2*(-
2/3-1/3*sec(d*x+c)^2)*tan(d*x+c)+a^2*(-(-1/4*sec(d*x+c)^3-3/8*sec(d*x+c))*t
an(d*x+c)+3/8*ln(sec(d*x+c)+tan(d*x+c))))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.16

$$\int (a + a\cos(c + dx))^2 \sec^5(c + dx)\, dx$$
$$= \frac{21\,a^2\cos\left(dx + c\right)^4\log\left(\sin\left(dx + c\right) + 1\right) - 21\,a^2\cos\left(dx + c\right)^4\log\left(-\sin\left(dx + c\right) + 1\right) + 2\,\left(32\,a^2\cos\left(dx + \right.\right.}{48\,d\cos\left(dx + c\right)^4}$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] 1/48*(21*a^2*cos(d*x + c)^4*log(sin(d*x + c) + 1) - 21*a^2*cos(d*x + c)^4*l
og(-sin(d*x + c) + 1) + 2*(32*a^2*cos(d*x + c)^3 + 21*a^2*cos(d*x + c)^2 +
16*a^2*cos(d*x + c) + 6*a^2)*sin(d*x + c))/(d*cos(d*x + c)^4)
```

Sympy [F]

$$\int (a + a\cos(c + dx))^2 \sec^5(c + dx)\, dx = a^2\left(\int 2\cos\left(c + dx\right)\sec^5\left(c + dx\right)\, dx + \int \cos^2\left(c + dx\right)\sec^5\left(c + dx\right)\, dx + \int \sec^5\left(c + dx\right)\, dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))**2*sec(d*x+c)**5,x)
```

```
[Out] a**2*(Integral(2*cos(c + d*x)*sec(c + d*x)**5, x) + Integral(cos(c + d*x)**
2*sec(c + d*x)**5, x) + Integral(sec(c + d*x)**5, x))
```

Maxima [A] (verification not implemented)

none

Time = 0.22 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.51

$$\int (a + a\cos(c + dx))^2 \sec^5(c + dx)\, dx$$
$$= \frac{32\,\left(\tan\left(dx + c\right)^3 + 3\,\tan\left(dx + c\right)\right)a^2 - 3\,a^2\left(\frac{2\,\left(3\,\sin\left(dx+c\right)^3 - 5\,\sin\left(dx+c\right)\right)}{\sin\left(dx+c\right)^4 - 2\,\sin\left(dx+c\right)^2 + 1} - 3\,\log\left(\sin\left(dx + c\right) + 1\right) + 3\,\log\left(\mathrm{s}\right.\right.}{48\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^5,x, algorithm="maxima")
```

```
[Out] 1/48*(32*(tan(d*x + c)^3 + 3*tan(d*x + c))*a^2 - 3*a^2*(2*(3*sin(d*x + c)^3
 - 5*sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2 + 1) - 3*log(sin(d*x
+ c) + 1) + 3*log(sin(d*x + c) - 1)) - 12*a^2*(2*sin(d*x + c)/(sin(d*x + c)
^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)))/d
```

Giac [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.27

$$\int (a+a\cos(c+dx))^2\sec^5(c+dx)\,dx = \frac{21\,a^2\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-21\,a^2\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)-\frac{2\left(21\,a^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7-77\,a^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5}{\left(\tan\left(\frac{1}{2}\,dx+\right.\right.}}{24\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^5,x, algorithm="giac")
```

```
[Out] 1/24*(21*a^2*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 21*a^2*log(abs(tan(1/2*d*
x + 1/2*c) - 1)) - 2*(21*a^2*tan(1/2*d*x + 1/2*c)^7 - 77*a^2*tan(1/2*d*x +
1/2*c)^5 + 83*a^2*tan(1/2*d*x + 1/2*c)^3 - 75*a^2*tan(1/2*d*x + 1/2*c))/(ta
n(1/2*d*x + 1/2*c)^2 - 1)^4)/d
```

Mupad [B] (verification not implemented)

Time = 16.99 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.47

$$\int (a+a\cos(c+dx))^2\sec^5(c+dx)\,dx = \frac{7\,a^2\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{4\,d} - \frac{\frac{7\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{4}-\frac{77\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{12}+\frac{83\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{12}-\frac{25\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{4}}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8-4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6+6\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)}$$

```
[In] int((a + a*cos(c + d*x))^2/cos(c + d*x)^5,x)
```

```
[Out] (7*a^2*atanh(tan(c/2 + (d*x)/2)))/(4*d) - ((83*a^2*tan(c/2 + (d*x)/2)^3)/12
 - (77*a^2*tan(c/2 + (d*x)/2)^5)/12 + (7*a^2*tan(c/2 + (d*x)/2)^7)/4 - (25*
a^2*tan(c/2 + (d*x)/2))/4)/(d*(6*tan(c/2 + (d*x)/2)^4 - 4*tan(c/2 + (d*x)/2
)^2 - 4*tan(c/2 + (d*x)/2)^6 + tan(c/2 + (d*x)/2)^8 + 1))
```

3.23 $\int \cos^3(c+dx)(a+a\cos(c+dx))^3\,dx$

Optimal result

Integrand size = 21, antiderivative size = 129

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^3\,dx = \frac{23a^3x}{16}+\frac{4a^3\sin(c+dx)}{d}+\frac{23a^3\cos(c+dx)\sin(c+dx)}{16d}+\frac{23a^3\cos^3(c+dx)\sin(c+dx)}{24d}+\frac{a^3\cos^5(c+dx)\sin(c+dx)}{6d}-\frac{7a^3\sin^3(c+dx)}{3d}+\frac{3a^3\sin^5(c+dx)}{5d}$$

```
[Out] 23/16*a^3*x+4*a^3*sin(d*x+c)/d+23/16*a^3*cos(d*x+c)*sin(d*x+c)/d+23/24*a^3*
cos(d*x+c)^3*sin(d*x+c)/d+1/6*a^3*cos(d*x+c)^5*sin(d*x+c)/d-7/3*a^3*sin(d*x
+c)^3/d+3/5*a^3*sin(d*x+c)^5/d
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 129, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2836, 2713, 2715, 8}

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^3\,dx = \frac{3a^3\sin^5(c+dx)}{5d}-\frac{7a^3\sin^3(c+dx)}{3d}+\frac{4a^3\sin(c+dx)}{d}+\frac{a^3\sin(c+dx)\cos^5(c+dx)}{6d}+\frac{23a^3\sin(c+dx)\cos^3(c+dx)}{24d}+\frac{23a^3\sin(c+dx)\cos(c+dx)}{16d}+\frac{23a^3x}{16}$$

```
[In] Int[Cos[c + d*x]^3*(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (23*a^3*x)/16 + (4*a^3*Sin[c + d*x])/d + (23*a^3*Cos[c + d*x]*Sin[c + d*x])
/(16*d) + (23*a^3*Cos[c + d*x]^3*Sin[c + d*x])/(24*d) + (a^3*Cos[c + d*x]^5
*Sin[c + d*x])/(6*d) - (7*a^3*Sin[c + d*x]^3)/(3*d) + (3*a^3*Sin[c + d*x]^5
)/(5*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(a^3\cos^3(c+dx)+3a^3\cos^4(c+dx)+3a^3\cos^5(c+dx)+a^3\cos^6(c+dx)\right)\,dx\\
&= a^3\int \cos^3(c+dx)\,dx+a^3\int \cos^6(c+dx)\,dx\\
&\quad+\left(3a^3\right)\int \cos^4(c+dx)\,dx+\left(3a^3\right)\int \cos^5(c+dx)\,dx\\
&= \frac{3a^3\cos^3(c+dx)\sin(c+dx)}{4d}+\frac{a^3\cos^5(c+dx)\sin(c+dx)}{6d}\\
&\quad+\frac{1}{6}\left(5a^3\right)\int \cos^4(c+dx)\,dx+\frac{1}{4}\left(9a^3\right)\int \cos^2(c+dx)\,dx\\
&\quad-\frac{a^3\text{Subst}\left(\int \left(1-x^2\right)\,dx,x,-\sin(c+dx)\right)}{d}\\
&\quad-\frac{\left(3a^3\right)\text{Subst}\left(\int \left(1-2x^2+x^4\right)\,dx,x,-\sin(c+dx)\right)}{d}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{4a^3\sin(c+dx)}{d} + \frac{9a^3\cos(c+dx)\sin(c+dx)}{8d} + \frac{23a^3\cos^3(c+dx)\sin(c+dx)}{24d} \\
&\quad + \frac{a^3\cos^5(c+dx)\sin(c+dx)}{6d} - \frac{7a^3\sin^3(c+dx)}{3d} \\
&\quad + \frac{3a^3\sin^5(c+dx)}{5d} + \frac{1}{8}(5a^3)\int \cos^2(c+dx)\,dx + \frac{1}{8}(9a^3)\int 1\,dx \\
&= \frac{9a^3x}{8} + \frac{4a^3\sin(c+dx)}{d} + \frac{23a^3\cos(c+dx)\sin(c+dx)}{16d} + \frac{23a^3\cos^3(c+dx)\sin(c+dx)}{24d} \\
&\quad + \frac{a^3\cos^5(c+dx)\sin(c+dx)}{6d} - \frac{7a^3\sin^3(c+dx)}{3d} + \frac{3a^3\sin^5(c+dx)}{5d} + \frac{1}{16}(5a^3)\int 1\,dx \\
&= \frac{23a^3x}{16} + \frac{4a^3\sin(c+dx)}{d} + \frac{23a^3\cos(c+dx)\sin(c+dx)}{16d} \\
&\quad + \frac{23a^3\cos^3(c+dx)\sin(c+dx)}{24d} + \frac{a^3\cos^5(c+dx)\sin(c+dx)}{6d} \\
&\quad - \frac{7a^3\sin^3(c+dx)}{3d} + \frac{3a^3\sin^5(c+dx)}{5d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.57

$$
\int \cos^3(c+dx)(a+a\cos(c+dx))^3\,dx
= \frac{a^3(1380dx + 2520\sin(c+dx) + 945\sin(2(c+dx)) + 380\sin(3(c+dx)) + 135\sin(4(c+dx)) + 36\sin(5(c}{960d}
$$

```
[In] Integrate[Cos[c + d*x]^3*(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (a^3*(1380*d*x + 2520*Sin[c + d*x] + 945*Sin[2*(c + d*x)] + 380*Sin[3*(c +
d*x)] + 135*Sin[4*(c + d*x)] + 36*Sin[5*(c + d*x)] + 5*Sin[6*(c + d*x)]))/(
960*d)
```

Maple [A] (verified)

Time = 3.38 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.58

method	result
parallelrisch	$\frac{\left(276dx+\sin(6dx+6c)+504\sin(dx+c)+189\sin(2dx+2c)+76\sin(3dx+3c)+27\sin(4dx+4c)+\frac{36\sin(5dx+5c)}{5}\right)a^3}{192d}$
risch	$\frac{23a^3x}{16}+\frac{21a^3\sin(dx+c)}{8d}+\frac{a^3\sin(6dx+6c)}{192d}+\frac{3a^3\sin(5dx+5c)}{80d}+\frac{9a^3\sin(4dx+4c)}{64d}+\frac{19a^3\sin(3dx+3c)}{48d}+\frac{63a^3 s}{}$
derivativedivides	$\frac{a^3\left(\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{6}+\frac{5dx}{16}+\frac{5c}{16}\right)+\frac{3a^3\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}+3a}{d}$
default	$\frac{a^3\left(\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{6}+\frac{5dx}{16}+\frac{5c}{16}\right)+\frac{3a^3\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}+3a}{d}$
parts	$\frac{a^3(2+\cos^2(dx+c))\sin(dx+c)}{3d}+\frac{a^3\left(\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{6}+\frac{5dx}{16}+\frac{5c}{16}\right)}{d}+\frac{3a^3\left(\left(\cos^3(\right.\right.}{}$
norman	$\frac{23a^3x}{16}+\frac{105a^3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8d}+\frac{211a^3\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8d}+\frac{969a^3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{20d}+\frac{759a^3\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{20d}+\frac{391a^3\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{24d}+\frac{23a}{}$

```
[In] int(cos(d*x+c)^3*(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/192*(276*d*x+sin(6*d*x+6*c)+504*sin(d*x+c)+189*sin(2*d*x+2*c)+76*sin(3*d*
x+3*c)+27*sin(4*d*x+4*c)+36/5*sin(5*d*x+5*c))*a^3/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.69

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^3\,dx$$
$$=\frac{345\,a^3dx+\left(40\,a^3\cos\left(dx+c\right)^5+144\,a^3\cos\left(dx+c\right)^4+230\,a^3\cos\left(dx+c\right)^3+272\,a^3\cos\left(dx+c\right)^2+345\,a^3\right.}{240\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/240*(345*a^3*d*x + (40*a^3*cos(d*x + c)^5 + 144*a^3*cos(d*x + c)^4 + 230*
a^3*cos(d*x + c)^3 + 272*a^3*cos(d*x + c)^2 + 345*a^3*cos(d*x + c) + 544*a^
3)*sin(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 379 vs. $2(122) = 244$.

Time = 0.39 (sec) , antiderivative size = 379, normalized size of antiderivative = 2.94

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^3\,dx = \begin{cases} \frac{5a^3x\sin^6(c+dx)}{16} + \frac{15a^3x\sin^4(c+dx)\cos^2(c+dx)}{16} + \frac{9a^3x\sin^4(c+dx)}{8} + \frac{15a^3x\sin^2(c+dx)\cos^4(c+dx)}{16} + \frac{9a^3x\sin^2(c+dx)\cos^2(c+dx)}{4} \\ x(a\cos(c)+a)^3\cos^3(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)**3*(a+a*cos(d*x+c))**3,x)
```

```
[Out] Piecewise((5*a**3*x*sin(c + d*x)**6/16 + 15*a**3*x*sin(c + d*x)**4*cos(c +
d*x)**2/16 + 9*a**3*x*sin(c + d*x)**4/8 + 15*a**3*x*sin(c + d*x)**2*cos(c +
 d*x)**4/16 + 9*a**3*x*sin(c + d*x)**2*cos(c + d*x)**2/4 + 5*a**3*x*cos(c +
 d*x)**6/16 + 9*a**3*x*cos(c + d*x)**4/8 + 5*a**3*sin(c + d*x)**5*cos(c + d
*x)/(16*d) + 8*a**3*sin(c + d*x)**5/(5*d) + 5*a**3*sin(c + d*x)**3*cos(c +
d*x)**3/(6*d) + 4*a**3*sin(c + d*x)**3*cos(c + d*x)**2/d + 9*a**3*sin(c + d
*x)**3*cos(c + d*x)/(8*d) + 2*a**3*sin(c + d*x)**3/(3*d) + 11*a**3*sin(c +
d*x)*cos(c + d*x)**5/(16*d) + 3*a**3*sin(c + d*x)*cos(c + d*x)**4/d + 15*a*
*3*sin(c + d*x)*cos(c + d*x)**3/(8*d) + a**3*sin(c + d*x)*cos(c + d*x)**2/d
, Ne(d, 0)), (x*(a*cos(c) + a)**3*cos(c)**3, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 143, normalized size of antiderivative = 1.11

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^3\,dx = \frac{192\left(3\sin(dx+c)^5 - 10\sin(dx+c)^3 + 15\sin(dx+c)\right)a^3 - 5\left(4\sin(2dx+2c)^3 - 60dx - 60c - 9\sin\right.}{}$$

```
[In] integrate(cos(d*x+c)^3*(a+a*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/960*(192*(3*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*sin(d*x + c))*a^3 - 5
*(4*sin(2*d*x + 2*c)^3 - 60*d*x - 60*c - 9*sin(4*d*x + 4*c) - 48*sin(2*d*x
+ 2*c))*a^3 - 320*(sin(d*x + c)^3 - 3*sin(d*x + c))*a^3 + 90*(12*d*x + 12*c
 + sin(4*d*x + 4*c) + 8*sin(2*d*x + 2*c))*a^3)/d
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 106, normalized size of antiderivative = 0.82

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^3\,dx = \frac{23}{16}\,a^3x + \frac{a^3\sin(6\,dx+6\,c)}{192\,d} + \frac{3\,a^3\sin(5\,dx+5\,c)}{80\,d} + \frac{9\,a^3\sin(4\,dx+4\,c)}{64\,d} + \frac{19\,a^3\sin(3\,dx+3\,c)}{48\,d} + \frac{63\,a^3\sin(2\,dx+2\,c)}{64\,d} + \frac{21\,a^3\sin(dx+c)}{8\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+a*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 23/16*a^3*x + 1/192*a^3*sin(6*d*x + 6*c)/d + 3/80*a^3*sin(5*d*x + 5*c)/d +
9/64*a^3*sin(4*d*x + 4*c)/d + 19/48*a^3*sin(3*d*x + 3*c)/d + 63/64*a^3*sin(
2*d*x + 2*c)/d + 21/8*a^3*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 16.74 (sec) , antiderivative size = 121, normalized size of antiderivative = 0.94

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^3\,dx = \frac{23\,a^3\,x}{16} + \frac{\frac{23\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{11}}{8} + \frac{391\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{9}}{24} + \frac{759\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{7}}{20} + \frac{969\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{5}}{20} + \frac{211\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{3}}{8} + \frac{105\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{8}}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)^6}$$

```
[In] int(cos(c + d*x)^3*(a + a*cos(c + d*x))^3,x)
```

```
[Out] (23*a^3*x)/16 + ((211*a^3*tan(c/2 + (d*x)/2)^3)/8 + (969*a^3*tan(c/2 + (d*x
)/2)^5)/20 + (759*a^3*tan(c/2 + (d*x)/2)^7)/20 + (391*a^3*tan(c/2 + (d*x)/2
)^9)/24 + (23*a^3*tan(c/2 + (d*x)/2)^11)/8 + (105*a^3*tan(c/2 + (d*x)/2))/8
)/(d*(tan(c/2 + (d*x)/2)^2 + 1)^6)
```

3.24 $\int \cos^2(c+dx)(a+a\cos(c+dx))^3\,dx$

Optimal result

Integrand size = 21, antiderivative size = 105

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^3\,dx=\frac{13a^3x}{8}+\frac{4a^3\sin(c+dx)}{d}+\frac{13a^3\cos(c+dx)\sin(c+dx)}{8d}+\frac{3a^3\cos^3(c+dx)\sin(c+dx)}{4d}-\frac{5a^3\sin^3(c+dx)}{3d}+\frac{a^3\sin^5(c+dx)}{5d}$$

```
[Out] 13/8*a^3*x+4*a^3*sin(d*x+c)/d+13/8*a^3*cos(d*x+c)*sin(d*x+c)/d+3/4*a^3*cos(
d*x+c)^3*sin(d*x+c)/d-5/3*a^3*sin(d*x+c)^3/d+1/5*a^3*sin(d*x+c)^5/d
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2836, 2715, 8, 2713}

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^3\,dx=\frac{a^3\sin^5(c+dx)}{5d}-\frac{5a^3\sin^3(c+dx)}{3d}+\frac{4a^3\sin(c+dx)}{d}+\frac{3a^3\sin(c+dx)\cos^3(c+dx)}{4d}+\frac{13a^3\sin(c+dx)\cos(c+dx)}{8d}+\frac{13a^3x}{8}$$

```
[In] Int[Cos[c + d*x]^2*(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (13*a^3*x)/8 + (4*a^3*Sin[c + d*x])/d + (13*a^3*Cos[c + d*x]*Sin[c + d*x])/
(8*d) + (3*a^3*Cos[c + d*x]^3*Sin[c + d*x])/(4*d) - (5*a^3*Sin[c + d*x]^3)/
(3*d) + (a^3*Sin[c + d*x]^5)/(5*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(a^3\cos^2(c+dx)+3a^3\cos^3(c+dx)+3a^3\cos^4(c+dx)+a^3\cos^5(c+dx)\right)\,dx\\
&= a^3\int \cos^2(c+dx)\,dx+a^3\int \cos^5(c+dx)\,dx\\
&\quad+\left(3a^3\right)\int \cos^3(c+dx)\,dx+\left(3a^3\right)\int \cos^4(c+dx)\,dx\\
&= \frac{a^3\cos(c+dx)\sin(c+dx)}{2d}+\frac{3a^3\cos^3(c+dx)\sin(c+dx)}{4d}+\frac{1}{2}a^3\int 1\,dx\\
&\quad+\frac{1}{4}\left(9a^3\right)\int \cos^2(c+dx)\,dx-\frac{a^3\text{Subst}\left(\int\left(1-2x^2+x^4\right)\,dx,x,-\sin(c+dx)\right)}{d}\\
&\quad-\frac{\left(3a^3\right)\text{Subst}\left(\int\left(1-x^2\right)\,dx,x,-\sin(c+dx)\right)}{d}\\
&= \frac{a^3x}{2}+\frac{4a^3\sin(c+dx)}{d}+\frac{13a^3\cos(c+dx)\sin(c+dx)}{8d}+\frac{3a^3\cos^3(c+dx)\sin(c+dx)}{4d}\\
&\quad-\frac{5a^3\sin^3(c+dx)}{3d}+\frac{a^3\sin^5(c+dx)}{5d}+\frac{1}{8}\left(9a^3\right)\int 1\,dx
\end{aligned}
$$

$$= \frac{13a^3x}{8} + \frac{4a^3\sin(c+dx)}{d} + \frac{13a^3\cos(c+dx)\sin(c+dx)}{8d} + \frac{3a^3\cos^3(c+dx)\sin(c+dx)}{4d} - \frac{5a^3\sin^3(c+dx)}{3d} + \frac{a^3\sin^5(c+dx)}{5d}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.60

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^3\,dx = \frac{a^3(780dx + 1380\sin(c+dx) + 480\sin(2(c+dx)) + 170\sin(3(c+dx)) + 45\sin(4(c+dx)) + 6\sin(5(c+ }{480d}$$

```
[In] Integrate[Cos[c + d*x]^2*(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (a^3*(780*d*x + 1380*Sin[c + d*x] + 480*Sin[2*(c + d*x)] + 170*Sin[3*(c + d
*x)] + 45*Sin[4*(c + d*x)] + 6*Sin[5*(c + d*x)]))/(480*d)
```

Maple [A] (verified)

Time = 2.47 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.63

method	result
parallelrisch	$\frac{a^3(780dx+1380\sin(dx+c)+6\sin(5dx+5c)+45\sin(4dx+4c)+170\sin(3dx+3c)+480\sin(2dx+2c))}{480d}$
risch	$\frac{13a^3x}{8}+\frac{23a^3\sin(dx+c)}{8d}+\frac{a^3\sin(5dx+5c)}{80d}+\frac{3a^3\sin(4dx+4c)}{32d}+\frac{17a^3\sin(3dx+3c)}{48d}+\frac{a^3\sin(2dx+2c)}{d}$
derivativedivides	$\frac{\frac{a^3\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}+3a^3\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+a^3(2+\cos^2(dx+c}{d}$
default	$\frac{\frac{a^3\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}+3a^3\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+a^3(2+\cos^2(dx+c}{d}$
parts	$\frac{a^3\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{a^3\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5d}+\frac{a^3(2+\cos^2(dx+c))\sin(dx+c)}{d}$
norman	$\frac{\frac{13a^3x}{8}+\frac{51a^3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d}+\frac{133a^3\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{6d}+\frac{416a^3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{15d}+\frac{91a^3\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{6d}+\frac{13a^3\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}+\frac{65a^3}{}}{\left(1+\tan^2\left(\frac{dx}{2}+\right.\right.}$

```
[In] int(cos(d*x+c)^2*(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/480*a^3*(780*d*x+1380*sin(d*x+c)+6*sin(5*d*x+5*c)+45*sin(4*d*x+4*c)+170*s
in(3*d*x+3*c)+480*sin(2*d*x+2*c))/d
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.72

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^3\,dx = \frac{195\,a^3dx + \left(24\,a^3\cos\left(dx+c\right)^4 + 90\,a^3\cos\left(dx+c\right)^3 + 152\,a^3\cos\left(dx+c\right)^2 + 195\,a^3\cos\left(dx+c\right) + 304\,a^3\right)\sin\left(dx+c\right)}{120\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/120*(195*a^3*d*x + (24*a^3*cos(d*x + c)^4 + 90*a^3*cos(d*x + c)^3 + 152*a
^3*cos(d*x + c)^2 + 195*a^3*cos(d*x + c) + 304*a^3)*sin(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 272 vs. $2(99) = 198$.

Time = 0.27 (sec) , antiderivative size = 272, normalized size of antiderivative = 2.59

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^3\,dx = \begin{cases} \frac{9a^3x\sin^4(c+dx)}{8} + \frac{9a^3x\sin^2(c+dx)\cos^2(c+dx)}{4} + \frac{a^3x\sin^2(c+dx)}{2} + \frac{9a^3x\cos^4(c+dx)}{8} + \frac{a^3x\cos^2(c+dx)}{2} + \frac{8a^3\sin^5(c+dx)}{15d} + \frac{4a^3\sin \ldots}{} \\ x(a\cos(c)+a)^3\cos^2(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)**2*(a+a*cos(d*x+c))**3,x)
```

```
[Out] Piecewise((9*a**3*x*sin(c + d*x)**4/8 + 9*a**3*x*sin(c + d*x)**2*cos(c + d*
x)**2/4 + a**3*x*sin(c + d*x)**2/2 + 9*a**3*x*cos(c + d*x)**4/8 + a**3*x*co
s(c + d*x)**2/2 + 8*a**3*sin(c + d*x)**5/(15*d) + 4*a**3*sin(c + d*x)**3*co
s(c + d*x)**2/(3*d) + 9*a**3*sin(c + d*x)**3*cos(c + d*x)/(8*d) + 2*a**3*si
n(c + d*x)**3/d + a**3*sin(c + d*x)*cos(c + d*x)**4/d + 15*a**3*sin(c + d*x
)*cos(c + d*x)**3/(8*d) + 3*a**3*sin(c + d*x)*cos(c + d*x)**2/d + a**3*sin(
c + d*x)*cos(c + d*x)/(2*d), Ne(d, 0)), (x*(a*cos(c) + a)**3*cos(c)**2, Tru
e))
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.11

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^3\,dx$$
$$=\frac{32\left(3\sin\left(dx+c\right)^5-10\sin\left(dx+c\right)^3+15\sin\left(dx+c\right)\right)a^3-480\left(\sin\left(dx+c\right)^3-3\sin\left(dx+c\right)\right)a^3+45\,(}{480\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/480*(32*(3*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*sin(d*x + c))*a^3 - 48
0*(sin(d*x + c)^3 - 3*sin(d*x + c))*a^3 + 45*(12*d*x + 12*c + sin(4*d*x + 4
*c) + 8*sin(2*d*x + 2*c))*a^3 + 120*(2*d*x + 2*c + sin(2*d*x + 2*c))*a^3)/d
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 88, normalized size of antiderivative = 0.84

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^3\,dx=\frac{13}{8}\,a^3x+\frac{a^3\sin\left(5\,dx+5\,c\right)}{80\,d}+\frac{3\,a^3\sin\left(4\,dx+4\,c\right)}{32\,d}+\frac{17\,a^3\sin\left(3\,dx+3\,c\right)}{48\,d}+\frac{a^3\sin\left(2\,dx+2\,c\right)}{d}+\frac{23\,a^3\sin\left(dx+c\right)}{8\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 13/8*a^3*x + 1/80*a^3*sin(5*d*x + 5*c)/d + 3/32*a^3*sin(4*d*x + 4*c)/d + 17
/48*a^3*sin(3*d*x + 3*c)/d + a^3*sin(2*d*x + 2*c)/d + 23/8*a^3*sin(d*x + c)
/d
```

Mupad [B] (verification not implemented)

Time = 17.43 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.00

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^3\,dx$$
$$=\frac{13\,a^3\,x}{8}+\frac{\frac{13\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9}{4}+\frac{91\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{6}+\frac{416\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{15}+\frac{133\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{6}+\frac{51\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{4}}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)^5}$$

```
[In] int(cos(c + d*x)^2*(a + a*cos(c + d*x))^3,x)
```

```
[Out] (13*a^3*x)/8 + ((133*a^3*tan(c/2 + (d*x)/2)^3)/6 + (416*a^3*tan(c/2 + (d*x)
/2)^5)/15 + (91*a^3*tan(c/2 + (d*x)/2)^7)/6 + (13*a^3*tan(c/2 + (d*x)/2)^9)
/4 + (51*a^3*tan(c/2 + (d*x)/2))/4)/(d*(tan(c/2 + (d*x)/2)^2 + 1)^5)
```

3.25 $\int \cos(c+dx)(a+a\cos(c+dx))^3\,dx$

Optimal result

Integrand size = 19, antiderivative size = 85

$$\int \cos(c+dx)(a+a\cos(c+dx))^3\,dx = \frac{15a^3x}{8}+\frac{4a^3\sin(c+dx)}{d}+\frac{15a^3\cos(c+dx)\sin(c+dx)}{8d}+\frac{a^3\cos^3(c+dx)\sin(c+dx)}{4d}-\frac{a^3\sin^3(c+dx)}{d}$$

```
[Out] 15/8*a^3*x+4*a^3*sin(d*x+c)/d+15/8*a^3*cos(d*x+c)*sin(d*x+c)/d+1/4*a^3*cos(
d*x+c)^3*sin(d*x+c)/d-a^3*sin(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.04, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {2830, 2724, 2717, 2715, 8, 2713}

$$\int \cos(c+dx)(a+a\cos(c+dx))^3\,dx = -\frac{a^3\sin^3(c+dx)}{4d}+\frac{3a^3\sin(c+dx)}{d}+\frac{9a^3\sin(c+dx)\cos(c+dx)}{8d}+\frac{15a^3x}{8}+\frac{\sin(c+dx)(a\cos(c+dx)+a)^3}{4d}$$

```
[In] Int[Cos[c + d*x]*(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (15*a^3*x)/8 + (3*a^3*Sin[c + d*x])/d + (9*a^3*Cos[c + d*x]*Sin[c + d*x])/(
8*d) + ((a + a*Cos[c + d*x])^3*Sin[c + d*x])/(4*d) - (a^3*Sin[c + d*x]^3)/(
4*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2717

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rule 2724

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Int[ExpandTri
g[(a + b*sin[c + d*x])^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && EqQ[a^2 -
b^2, 0] && IGtQ[n, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{(a+a\cos(c+dx))^3\sin(c+dx)}{4d}+\frac{3}{4}\int(a+a\cos(c+dx))^3\,dx\\ &= \frac{(a+a\cos(c+dx))^3\sin(c+dx)}{4d}\\ &\quad+\frac{3}{4}\int\left(a^3+3a^3\cos(c+dx)+3a^3\cos^2(c+dx)+a^3\cos^3(c+dx)\right)\,dx\end{aligned}$$

$$
\begin{aligned}
&= \frac{3a^3x}{4} + \frac{(a + a\cos(c+dx))^3\sin(c+dx)}{4d} + \frac{1}{4}(3a^3)\int \cos^3(c+dx)\,dx \\
&\quad + \frac{1}{4}(9a^3)\int \cos(c+dx)\,dx + \frac{1}{4}(9a^3)\int \cos^2(c+dx)\,dx \\
&= \frac{3a^3x}{4} + \frac{9a^3\sin(c+dx)}{4d} + \frac{9a^3\cos(c+dx)\sin(c+dx)}{8d} \\
&\quad + \frac{(a + a\cos(c+dx))^3\sin(c+dx)}{4d} + \frac{1}{8}(9a^3)\int 1\,dx \\
&\quad - \frac{(3a^3)\,\text{Subst}\left(\int (1-x^2)\,dx, x, -\sin(c+dx)\right)}{4d} \\
&= \frac{15a^3x}{8} + \frac{3a^3\sin(c+dx)}{d} + \frac{9a^3\cos(c+dx)\sin(c+dx)}{8d} \\
&\quad + \frac{(a + a\cos(c+dx))^3\sin(c+dx)}{4d} - \frac{a^3\sin^3(c+dx)}{4d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 51, normalized size of antiderivative = 0.60

$$
\int \cos(c+dx)(a + a\cos(c+dx))^3\,dx = \frac{a^3(60dx + 104\sin(c+dx) + 32\sin(2(c+dx)) + 8\sin(3(c+dx)) + \sin(4(c+dx)))}{32d}
$$

```
[In] Integrate[Cos[c + d*x]*(a + a*Cos[c + d*x])^3,x]
[Out] (a^3*(60*d*x + 104*Sin[c + d*x] + 32*Sin[2*(c + d*x)] + 8*Sin[3*(c + d*x)]
+ Sin[4*(c + d*x)]))/(32*d)
```

Maple [A] (verified)

Time = 2.31 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.62

method	result
parallelrisch	$\frac{a^3(60dx+\sin(4dx+4c)+8\sin(3dx+3c)+32\sin(2dx+2c)+104\sin(dx+c))}{32d}$
risch	$\frac{15a^3x}{8}+\frac{13a^3\sin(dx+c)}{4d}+\frac{a^3\sin(4dx+4c)}{32d}+\frac{a^3\sin(3dx+3c)}{4d}+\frac{a^3\sin(2dx+2c)}{d}$
derivativedivides	$\frac{a^3\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+a^3\left(2+\cos^2(dx+c)\right)\sin(dx+c)+3a^3\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+}{d}$
default	$\frac{a^3\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+a^3\left(2+\cos^2(dx+c)\right)\sin(dx+c)+3a^3\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+}{d}$
parts	$\frac{a^3\sin(dx+c)}{d}+\frac{a^3\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}+\frac{3a^3\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{a^3(2+\mathrm{co}}{}$
norman	$\frac{\frac{15a^3x}{8}+\frac{49a^3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d}+\frac{73a^3\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}+\frac{55a^3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}+\frac{15a^3\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}+\frac{15a^3x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}+\frac{45a^3x(}{}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^4}$

```
[In] int(cos(d*x+c)*(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/32*a^3*(60*d*x+sin(4*d*x+4*c)+8*sin(3*d*x+3*c)+32*sin(2*d*x+2*c)+104*sin(
d*x+c))/d
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.74

$$\int \cos(c+dx)(a+a\cos(c+dx))^3\,dx = \frac{15\,a^3dx+\left(2\,a^3\cos\left(dx+c\right)^3+8\,a^3\cos\left(dx+c\right)^2+15\,a^3\cos\left(dx+c\right)+24\,a^3\right)\sin\left(dx+c\right)}{8\,d}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/8*(15*a^3*d*x + (2*a^3*cos(d*x + c)^3 + 8*a^3*cos(d*x + c)^2 + 15*a^3*cos
(d*x + c) + 24*a^3)*sin(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 224 vs. 2(78) = 156.

Time = 0.20 (sec) , antiderivative size = 224, normalized size of antiderivative = 2.64

$$\int \cos(c+dx)(a+a\cos(c+dx))^3\,dx$$
$$= \begin{cases} \frac{3a^3x\sin^4(c+dx)}{8} + \frac{3a^3x\sin^2(c+dx)\cos^2(c+dx)}{4} + \frac{3a^3x\sin^2(c+dx)}{2} + \frac{3a^3x\cos^4(c+dx)}{8} + \frac{3a^3x\cos^2(c+dx)}{2} + \frac{3a^3\sin^3(c+dx)\cos(c}{8d} \\ x(a\cos(c)+a)^3\cos(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))**3,x)
```

```
[Out] Piecewise((3*a**3*x*sin(c + d*x)**4/8 + 3*a**3*x*sin(c + d*x)**2*cos(c + d*
x)**2/4 + 3*a**3*x*sin(c + d*x)**2/2 + 3*a**3*x*cos(c + d*x)**4/8 + 3*a**3*
x*cos(c + d*x)**2/2 + 3*a**3*sin(c + d*x)**3*cos(c + d*x)/(8*d) + 2*a**3*si
n(c + d*x)**3/d + 5*a**3*sin(c + d*x)*cos(c + d*x)**3/(8*d) + 3*a**3*sin(c
+ d*x)*cos(c + d*x)**2/d + 3*a**3*sin(c + d*x)*cos(c + d*x)/(2*d) + a**3*si
n(c + d*x)/d, Ne(d, 0)), (x*(a*cos(c) + a)**3*cos(c), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 94, normalized size of antiderivative = 1.11

$$\int \cos(c+dx)(a+a\cos(c+dx))^3\,dx =$$
$$-\frac{32\left(\sin\left(dx+c\right)^3-3\,\sin\left(dx+c\right)\right)a^3-\left(12\,dx+12\,c+\sin\left(4\,dx+4\,c\right)+8\,\sin\left(2\,dx+2\,c\right)\right)a^3-24\left(2\,d\right.}{32\,d}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/32*(32*(sin(d*x + c)^3 - 3*sin(d*x + c))*a^3 - (12*d*x + 12*c + sin(4*d*
x + 4*c) + 8*sin(2*d*x + 2*c))*a^3 - 24*(2*d*x + 2*c + sin(2*d*x + 2*c))*a^
3 - 32*a^3*sin(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.84

$$\int \cos(c+dx)(a+a\cos(c+dx))^3\,dx = \frac{15}{8}\,a^3x + \frac{a^3\sin\left(4\,dx+4\,c\right)}{32\,d} + \frac{a^3\sin\left(3\,dx+3\,c\right)}{4\,d} + \frac{a^3\sin\left(2\,dx+2\,c\right)}{d} + \frac{13\,a^3\sin\left(dx+c\right)}{4\,d}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 15/8*a^3*x + 1/32*a^3*sin(4*d*x + 4*c)/d + 1/4*a^3*sin(3*d*x + 3*c)/d + a^3
*sin(2*d*x + 2*c)/d + 13/4*a^3*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 17.36 (sec) , antiderivative size = 89, normalized size of antiderivative = 1.05

$$\int \cos(c+dx)(a+a\cos(c+dx))^3\,dx = \frac{15\,a^3\,x}{8} + \frac{\frac{15\,a^3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{4} + \frac{55\,a^3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{4} + \frac{73\,a^3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{4} + \frac{49\,a^3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{4}}{d\,\left({\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^2+1\right)^4}$$

```
[In] int(cos(c + d*x)*(a + a*cos(c + d*x))^3,x)
```

```
[Out] (15*a^3*x)/8 + ((73*a^3*tan(c/2 + (d*x)/2)^3)/4 + (55*a^3*tan(c/2 + (d*x)/2
)^5)/4 + (15*a^3*tan(c/2 + (d*x)/2)^7)/4 + (49*a^3*tan(c/2 + (d*x)/2))/4)/(
d*(tan(c/2 + (d*x)/2)^2 + 1)^4)
```

3.26 $\int (a+a\cos (c+dx))^3 \, dx$

Optimal result

Integrand size = 12, antiderivative size = 63

$$\int (a+a\cos (c+dx))^3 \, dx=\frac {5 a^3 x}{2}+\frac {4 a^3 \sin (c+dx)}{d}+\frac {3 a^3 \cos (c+dx) \sin (c+dx)}{2 d}-\frac {a^3 \sin ^3(c+dx)}{3 d}$$

```
[Out] 5/2*a^3*x+4*a^3*sin(d*x+c)/d+3/2*a^3*cos(d*x+c)*sin(d*x+c)/d-1/3*a^3*sin(d*
x+c)^3/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {2724, 2717, 2715, 8, 2713}

$$\int (a+a\cos (c+dx))^3 \, dx=-\frac {a^3 \sin ^3(c+dx)}{3 d}+\frac {4 a^3 \sin (c+dx)}{d}+\frac {3 a^3 \sin (c+dx) \cos (c+dx)}{2 d}+\frac {5 a^3 x}{2}$$

```
[In] Int[(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (5*a^3*x)/2 + (4*a^3*Sin[c + d*x])/d + (3*a^3*Cos[c + d*x]*Sin[c + d*x])/(2
*d) - (a^3*Sin[c + d*x]^3)/(3*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2717

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rule 2724

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Int[ExpandTri
g[(a + b*sin[c + d*x])^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && EqQ[a^2 -
b^2, 0] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(a^3+3a^3\cos(c+dx)+3a^3\cos^2(c+dx)+a^3\cos^3(c+dx)\right)\,dx \\
&= a^3x+a^3\int \cos^3(c+dx)\,dx+\left(3a^3\right)\int \cos(c+dx)\,dx+\left(3a^3\right)\int \cos^2(c+dx)\,dx \\
&= a^3x+\frac{3a^3\sin(c+dx)}{d}+\frac{3a^3\cos(c+dx)\sin(c+dx)}{2d} \\
&\quad +\frac{1}{2}\left(3a^3\right)\int 1\,dx-\frac{a^3\text{Subst}\left(\int \left(1-x^2\right)\,dx,x,-\sin(c+dx)\right)}{d} \\
&= \frac{5a^3x}{2}+\frac{4a^3\sin(c+dx)}{d}+\frac{3a^3\cos(c+dx)\sin(c+dx)}{2d}-\frac{a^3\sin^3(c+dx)}{3d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 44, normalized size of antiderivative = 0.70

$$\int (a + a\cos(c + dx))^3\, dx = \frac{a^3(30c + 30dx + 45\sin(c + dx) + 9\sin(2(c + dx)) + \sin(3(c + dx)))}{12d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (a^3*(30*c + 30*d*x + 45*Sin[c + d*x] + 9*Sin[2*(c + d*x)] + Sin[3*(c + d*x
)]))/(12*d)
```

Maple [A] (verified)

Time = 1.62 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.67

method	result
parallelrisch	$\frac{a^3(30dx+\sin(3dx+3c)+9\sin(2dx+2c)+45\sin(dx+c))}{12d}$
risch	$\frac{5a^3x}{2}+\frac{15a^3\sin(dx+c)}{4d}+\frac{a^3\sin(3dx+3c)}{12d}+\frac{3a^3\sin(2dx+2c)}{4d}$
derivativedivides	$\frac{\frac{a^3\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+3a^3\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+3a^3\sin(dx+c)+a^3(dx+c)}{d}$
default	$\frac{\frac{a^3\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+3a^3\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+3a^3\sin(dx+c)+a^3(dx+c)}{d}$
parts	$a^3x+\frac{a^3(2+\cos^2(dx+c))\sin(dx+c)}{3d}+\frac{3a^3\sin(dx+c)}{d}+\frac{3a^3\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}$
norman	$\frac{\frac{5a^3x}{2}+\frac{11a^3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{40a^3\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}+\frac{5a^3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{15a^3x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}+\frac{15a^3x\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}+\frac{5a^3x(}{}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3}$

```
[In] int((a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/12*a^3*(30*d*x+sin(3*d*x+3*c)+9*sin(2*d*x+2*c)+45*sin(d*x+c))/d
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.79

$$\int (a + a\cos(c + dx))^3 \, dx = \frac{15\,a^3 dx + \left(2\,a^3 \cos\left(dx + c\right)^2 + 9\,a^3 \cos\left(dx + c\right) + 22\,a^3\right) \sin\left(dx + c\right)}{6\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^3,x, algorithm="fricas")
[Out] 1/6*(15*a^3*d*x + (2*a^3*cos(d*x + c)^2 + 9*a^3*cos(d*x + c) + 22*a^3)*sin(
d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 121 vs. 2(58) = 116.

Time = 0.13 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.92

$$\int (a + a\cos(c + dx))^3 \, dx = \begin{cases} \frac{3a^3x\sin^2{(c+dx)}}{2} + \frac{3a^3x\cos^2{(c+dx)}}{2} + a^3x + \frac{2a^3\sin^3{(c+dx)}}{3d} + \frac{a^3\sin{(c+dx)}\cos^2{(c+dx)}}{d} + \frac{3a^3\sin{(c+dx)}\cos{(c+dx)}}{2d} + \frac{3a^3\sin{(c+}}{d} \\ x(a\cos{(c)} + a)^3 \end{cases}$$

```
[In] integrate((a+a*cos(d*x+c))**3,x)
[Out] Piecewise((3*a**3*x*sin(c + d*x)**2/2 + 3*a**3*x*cos(c + d*x)**2/2 + a**3*x
 + 2*a**3*sin(c + d*x)**3/(3*d) + a**3*sin(c + d*x)*cos(c + d*x)**2/d + 3*a
**3*sin(c + d*x)*cos(c + d*x)/(2*d) + 3*a**3*sin(c + d*x)/d, Ne(d, 0)), (x*
(a*cos(c) + a)**3, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.22 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.11

$$\int (a + a\cos(c + dx))^3 \, dx = a^3x - \frac{\left(\sin\left(dx + c\right)^3 - 3\,\sin\left(dx + c\right)\right)a^3}{3\,d} + \frac{3\,\left(2\,dx + 2\,c + \sin\left(2\,dx + 2\,c\right)\right)a^3}{4\,d} + \frac{3\,a^3 \sin\left(dx + c\right)}{d}$$

```
[In] integrate((a+a*cos(d*x+c))^3,x, algorithm="maxima")
[Out] a^3*x - 1/3*(sin(d*x + c)^3 - 3*sin(d*x + c))*a^3/d + 3/4*(2*d*x + 2*c + si
n(2*d*x + 2*c))*a^3/d + 3*a^3*sin(d*x + c)/d
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.87

$$\int (a+a\cos(c+dx))^3\,dx = \frac{5}{2}\,a^3x + \frac{a^3\sin\left(3\,dx+3\,c\right)}{12\,d} + \frac{3\,a^3\sin\left(2\,dx+2\,c\right)}{4\,d} + \frac{15\,a^3\sin\left(dx+c\right)}{4\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 5/2*a^3*x + 1/12*a^3*sin(3*d*x + 3*c)/d + 3/4*a^3*sin(2*d*x + 2*c)/d + 15/4
*a^3*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 14.11 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.00

$$\int (a+a\cos(c+dx))^3\,dx = \frac{5\,a^3\,x}{2} + \frac{11\,a^3\,\sin\left(c+d\,x\right)}{3\,d} + \frac{a^3\cos\left(c+d\,x\right)^2\,\sin\left(c+d\,x\right)}{3\,d} + \frac{3\,a^3\,\cos\left(c+d\,x\right)\,\sin\left(c+d\,x\right)}{2\,d}$$

```
[In] int((a + a*cos(c + d*x))^3,x)
```

```
[Out] (5*a^3*x)/2 + (11*a^3*sin(c + d*x))/(3*d) + (a^3*cos(c + d*x)^2*sin(c + d*x
))/(3*d) + (3*a^3*cos(c + d*x)*sin(c + d*x))/(2*d)
```

3.27 $\int (a+a\cos(c+dx))^3\sec(c+dx)\,dx$

Optimal result

Integrand size = 19, antiderivative size = 59

$$\int (a+a\cos(c+dx))^3\sec(c+dx)\,dx = \frac{7a^3x}{2}+\frac{a^3\text{arctanh}(\sin(c+dx))}{d} + \frac{3a^3\sin(c+dx)}{d}+\frac{a^3\cos(c+dx)\sin(c+dx)}{2d}$$

```
[Out] 7/2*a^3*x+a^3*arctanh(sin(d*x+c))/d+3*a^3*sin(d*x+c)/d+1/2*a^3*cos(d*x+c)*s
in(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {2836, 2717, 2715, 8, 3855}

$$\int (a+a\cos(c+dx))^3\sec(c+dx)\,dx = \frac{a^3\text{arctanh}(\sin(c+dx))}{d}+\frac{3a^3\sin(c+dx)}{d} + \frac{a^3\sin(c+dx)\cos(c+dx)}{2d}+\frac{7a^3x}{2}$$

```
[In] Int[(a + a*Cos[c + d*x])^3*Sec[c + d*x],x]
```

```
[Out] (7*a^3*x)/2 + (a^3*ArcTanh[Sin[c + d*x]])/d + (3*a^3*Sin[c + d*x])/d + (a^3
*Cos[c + d*x]*Sin[c + d*x])/(2*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2717

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(3a^3+3a^3\cos(c+dx)+a^3\cos^2(c+dx)+a^3\sec(c+dx)\right)\,dx \\
&= 3a^3x+a^3\int \cos^2(c+dx)\,dx+a^3\int \sec(c+dx)\,dx+\left(3a^3\right)\int \cos(c+dx)\,dx \\
&= 3a^3x+\frac{a^3\text{arctanh}(\sin(c+dx))}{d}+\frac{3a^3\sin(c+dx)}{d}+\frac{a^3\cos(c+dx)\sin(c+dx)}{2d}+\frac{1}{2}a^3\int 1\,dx \\
&= \frac{7a^3x}{2}+\frac{a^3\text{arctanh}(\sin(c+dx))}{d}+\frac{3a^3\sin(c+dx)}{d}+\frac{a^3\cos(c+dx)\sin(c+dx)}{2d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.41 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.37

$$\int (a+a\cos(c+dx))^3\sec(c+dx)\,dx$$
$$=\frac{a^3\left(14dx-4\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)+4\log\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)+12\sin(\right.}{4d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^3*Sec[c + d*x],x]
[Out] (a^3*(14*d*x - 4*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + 4*Log[Cos[(c +
d*x)/2] + Sin[(c + d*x)/2]] + 12*Sin[c + d*x] + Sin[2*(c + d*x)]))/(4*d)
```

Maple [A] (verified)

Time = 1.31 (sec) , antiderivative size = 59, normalized size of antiderivative = 1.00

method	result
parallelrisch	$\frac{a^{3}\left(14dx+\sin(2dx+2c)+12\sin(dx+c)+4\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-4\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\right)}{4d}$
derivativedivides	$\frac{a^{3}\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+3a^{3}\sin(dx+c)+3a^{3}(dx+c)+a^{3}\ln(\sec(dx+c)+\tan(dx+c))}{d}$
default	$\frac{a^{3}\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+3a^{3}\sin(dx+c)+3a^{3}(dx+c)+a^{3}\ln(\sec(dx+c)+\tan(dx+c))}{d}$
parts	$\frac{a^{3}\ln(\sec(dx+c)+\tan(dx+c))}{d}+\frac{a^{3}\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{3a^{3}(dx+c)}{d}+\frac{3a^{3}\sin(dx+c)}{d}$
risch	$\frac{7a^{3}x}{2}-\frac{3ia^{3}e^{i(dx+c)}}{2d}+\frac{3ia^{3}e^{-i(dx+c)}}{2d}+\frac{a^{3}\ln(e^{i(dx+c)}+i)}{d}-\frac{a^{3}\ln(e^{i(dx+c)}-i)}{d}+\frac{a^{3}\sin(2dx+2c)}{4d}$
norman	$\frac{\frac{7a^{3}x}{2}+\frac{7a^{3}\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{12a^{3}\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{5a^{3}\left(\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{21a^{3}x\left(\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}+\frac{21a^{3}x\left(\tan^{4}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}+\frac{7a^{3}x(\tan}{}}{\left(1+\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^{3}}$

[In] int((a+cos(d*x+c)*a)^3*sec(d*x+c),x,method=_RETURNVERBOSE)

[Out] 1/4*a^3*(14*d*x+sin(2*d*x+2*c)+12*sin(d*x+c)+4*ln(tan(1/2*d*x+1/2*c)+1)-4*l
n(tan(1/2*d*x+1/2*c)-1))/d

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.10

$$\int (a+a\cos(c+dx))^{3}\sec(c+dx)\,dx$$
$$=\frac{7\,a^{3}dx+a^{3}\log\left(\sin\left(dx+c\right)+1\right)-a^{3}\log\left(-\sin\left(dx+c\right)+1\right)+\left(a^{3}\cos\left(dx+c\right)+6\,a^{3}\right)\sin\left(dx+c\right)}{2\,d}$$

[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c),x, algorithm="fricas")

[Out] 1/2*(7*a^3*d*x + a^3*log(sin(d*x + c) + 1) - a^3*log(-sin(d*x + c) + 1) + (
a^3*cos(d*x + c) + 6*a^3)*sin(d*x + c))/d

Sympy [F]

$$\int (a+a\cos(c+dx))^3\sec(c+dx)\,dx = a^3\left(\int 3\cos(c+dx)\sec(c+dx)\,dx + \int 3\cos^2(c+dx)\sec(c+dx)\,dx + \int \cos^3(c+dx)\sec(c+dx)\,dx + \int \sec(c+dx)\,dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))**3*sec(d*x+c),x)
[Out] a**3*(Integral(3*cos(c + d*x)*sec(c + d*x), x) + Integral(3*cos(c + d*x)**2
*sec(c + d*x), x) + Integral(cos(c + d*x)**3*sec(c + d*x), x) + Integral(se
c(c + d*x), x))
```

Maxima [A] (verification not implemented)

none

Time = 0.21 (sec) , antiderivative size = 67, normalized size of antiderivative = 1.14

$$\int (a+a\cos(c+dx))^3\sec(c+dx)\,dx = \frac{(2\,dx+2\,c+\sin(2\,dx+2\,c))a^3+12\,(dx+c)a^3+4\,a^3\log(\sec(dx+c)+\tan(dx+c))+12\,a^3\sin(dx+}{4\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c),x, algorithm="maxima")
[Out] 1/4*((2*d*x + 2*c + sin(2*d*x + 2*c))*a^3 + 12*(d*x + c)*a^3 + 4*a^3*log(se
c(d*x + c) + tan(d*x + c)) + 12*a^3*sin(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 100, normalized size of antiderivative = 1.69

$$\int (a+a\cos(c+dx))^3\sec(c+dx)\,dx = \frac{7\,(dx+c)a^3+2\,a^3\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-2\,a^3\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)+\frac{2\left(5\,a^3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+7\,a^{}}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2}}{2\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c),x, algorithm="giac")
```

```
[Out] 1/2*(7*(d*x + c)*a^3 + 2*a^3*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 2*a^3*log
(abs(tan(1/2*d*x + 1/2*c) - 1)) + 2*(5*a^3*tan(1/2*d*x + 1/2*c)^3 + 7*a^3*t
an(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2 + 1)^2)/d
```

Mupad [B] (verification not implemented)

Time = 14.53 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.49

$$\int (a+a\cos(c+dx))^3\sec(c+dx)\,dx=\frac{7\,a^3\,x}{2}+\frac{2\,a^3\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}+\frac{5\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3+7\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)}$$

```
[In] int((a + a*cos(c + d*x))^3/cos(c + d*x),x)
```

```
[Out] (7*a^3*x)/2 + (2*a^3*atanh(tan(c/2 + (d*x)/2)))/d + (5*a^3*tan(c/2 + (d*x)/
2)^3 + 7*a^3*tan(c/2 + (d*x)/2))/(d*(2*tan(c/2 + (d*x)/2)^2 + tan(c/2 + (d*
x)/2)^4 + 1))
```

3.28 $\int (a+a\cos(c+dx))^3\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 48

$$\int (a+a\cos(c+dx))^3\sec^2(c+dx)\,dx=3a^3x+\frac{3a^3\text{arctanh}(\sin(c+dx))}{d}+\frac{a^3\sin(c+dx)}{d}+\frac{a^3\tan(c+dx)}{d}$$

```
[Out] 3*a^3*x+3*a^3*arctanh(sin(d*x+c))/d+a^3*sin(d*x+c)/d+a^3*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2836, 2717, 3855, 3852, 8}

$$\int (a+a\cos(c+dx))^3\sec^2(c+dx)\,dx=\frac{3a^3\text{arctanh}(\sin(c+dx))}{d}+\frac{a^3\sin(c+dx)}{d}+\frac{a^3\tan(c+dx)}{d}+3a^3x$$

```
[In] Int[(a + a*Cos[c + d*x])^3*Sec[c + d*x]^2,x]
```

```
[Out] 3*a^3*x + (3*a^3*ArcTanh[Sin[c + d*x]])/d + (a^3*Sin[c + d*x])/d + (a^3*Tan
[c + d*x])/d
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2717

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(3a^3 + a^3\cos(c+dx) + 3a^3\sec(c+dx) + a^3\sec^2(c+dx)\right)\,dx \\
&= 3a^3x + a^3\int \cos(c+dx)\,dx + a^3\int \sec^2(c+dx)\,dx + \left(3a^3\right)\int \sec(c+dx)\,dx \\
&= 3a^3x + \frac{3a^3\text{arctanh}(\sin(c+dx))}{d} + \frac{a^3\sin(c+dx)}{d} - \frac{a^3\text{Subst}\left(\int 1\,dx, x, -\tan(c+dx)\right)}{d} \\
&= 3a^3x + \frac{3a^3\text{arctanh}(\sin(c+dx))}{d} + \frac{a^3\sin(c+dx)}{d} + \frac{a^3\tan(c+dx)}{d}
\end{aligned}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 211 vs. $2(48) = 96$.

Time = 1.08 (sec) , antiderivative size = 211, normalized size of antiderivative = 4.40

$$\int (a+a\cos(c+dx))^3\sec^2(c+dx)\,dx$$
$$=\frac{1}{8}a^3(1+\cos(c+dx))^3\sec^6\left(\frac{1}{2}(c+dx)\right)\left(3x-\frac{3\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)}{d}+\frac{3\log\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)}{d}+\frac{\cos(dx)\sin(c)}{d}+\frac{\cos(c)\sin(dx)}{d}+\frac{\sin\left(\frac{dx}{2}\right)}{d\left(\cos\left(\frac{c}{2}\right)-\sin\left(\frac{c}{2}\right)\right)\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)}+\frac{\sin\left(\frac{dx}{2}\right)}{d\left(\cos\left(\frac{c}{2}\right)+\sin\left(\frac{c}{2}\right)\right)\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)}\right)$$

```
[In] Integrate[(a + a*Cos[c + d*x])^3*Sec[c + d*x]^2,x]
```

```
[Out] (a^3*(1 + Cos[c + d*x])^3*Sec[(c + d*x)/2]^6*(3*x - (3*Log[Cos[(c + d*x)/2]
 - Sin[(c + d*x)/2]])/d + (3*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]])/d +
(Cos[d*x]*Sin[c])/d + (Cos[c]*Sin[d*x])/d + Sin[(d*x)/2]/(d*(Cos[c/2] - Sin
[c/2])*(Cos[(c + d*x)/2] - Sin[(c + d*x)/2])) + Sin[(d*x)/2]/(d*(Cos[c/2] +
 Sin[c/2])*(Cos[(c + d*x)/2] + Sin[(c + d*x)/2]))))/8
```

Maple [A] (verified)

Time = 2.26 (sec) , antiderivative size = 55, normalized size of antiderivative = 1.15

method	result
derivativedivides	$\frac{a^3\sin(dx+c)+3a^3(dx+c)+3a^3\ln(\sec(dx+c)+\tan(dx+c))+a^3\tan(dx+c)}{d}$
default	$\frac{a^3\sin(dx+c)+3a^3(dx+c)+3a^3\ln(\sec(dx+c)+\tan(dx+c))+a^3\tan(dx+c)}{d}$
parts	$\frac{a^3\tan(dx+c)}{d}+\frac{a^3\sin(dx+c)}{d}+\frac{3a^3\ln(\sec(dx+c)+\tan(dx+c))}{d}+\frac{3a^3(dx+c)}{d}$
parallelrisch	$\frac{a^3\left(6dx\cos(dx+c)-6\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(dx+c)+6\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)\cos(dx+c)+2\sin(dx+c)+\sin(2dx+2c)\right)}{2d\cos(dx+c)}$
risch	$3a^3x-\frac{ia^3e^{i(dx+c)}}{2d}+\frac{ia^3e^{-i(dx+c)}}{2d}+\frac{2ia^3}{d(e^{2i(dx+c)}+1)}-\frac{3a^3\ln(e^{i(dx+c)}-i)}{d}+\frac{3a^3\ln(e^{i(dx+c)}+i)}{d}$
norman	$\frac{-3a^3x-\frac{4a^3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}-\frac{8a^3\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-\frac{4a^3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-6a^3x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+6a^3x\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+3a^3x}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}$

```
[In] int((a+cos(d*x+c)*a)^3*sec(d*x+c)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a^3*sin(d*x+c)+3*a^3*(d*x+c)+3*a^3*ln(sec(d*x+c)+tan(d*x+c))+a^3*tan(d
*x+c))
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.90

$$\int (a+a\cos(c+dx))^3\sec^2(c+dx)\,dx$$
$$=\frac{6\,a^3dx\cos\left(dx+c\right)+3\,a^3\cos\left(dx+c\right)\log\left(\sin\left(dx+c\right)+1\right)-3\,a^3\cos\left(dx+c\right)\log\left(-\sin\left(dx+c\right)+1\right)+2}{2\,d\cos\left(dx+c\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] 1/2*(6*a^3*d*x*cos(d*x + c) + 3*a^3*cos(d*x + c)*log(sin(d*x + c) + 1) - 3*
a^3*cos(d*x + c)*log(-sin(d*x + c) + 1) + 2*(a^3*cos(d*x + c) + a^3)*sin(d*
x + c))/(d*cos(d*x + c))
```

Sympy [F]

$$\int (a+a\cos(c+dx))^3\sec^2(c+dx)\,dx=a^3\left(\int 3\cos\left(c+dx\right)\sec^2\left(c+dx\right)dx+\int 3\cos^2\left(c+dx\right)\sec^2\left(c+dx\right)dx+\int \cos^3\left(c+dx\right)\sec^2\left(c+dx\right)dx+\int \sec^2\left(c+dx\right)dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))**3*sec(d*x+c)**2,x)
```

```
[Out] a**3*(Integral(3*cos(c + d*x)*sec(c + d*x)**2, x) + Integral(3*cos(c + d*x)
**2*sec(c + d*x)**2, x) + Integral(cos(c + d*x)**3*sec(c + d*x)**2, x) + In
tegral(sec(c + d*x)**2, x))
```

Maxima [A] (verification not implemented)

none

Time = 0.22 (sec) , antiderivative size = 64, normalized size of antiderivative = 1.33

$$\int (a+a\cos(c+dx))^3\sec^2(c+dx)\,dx$$
$$=\frac{6\left(dx+c\right)a^3+3\,a^3\left(\log\left(\sin\left(dx+c\right)+1\right)-\log\left(\sin\left(dx+c\right)-1\right)\right)+2\,a^3\sin\left(dx+c\right)+2\,a^3\tan\left(dx+c\right)}{2\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] 1/2*(6*(d*x + c)*a^3 + 3*a^3*(log(sin(d*x + c) + 1) - log(sin(d*x + c) - 1)
) + 2*a^3*sin(d*x + c) + 2*a^3*tan(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.45 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.67

$$\int (a+a\cos(c+dx))^3\sec^2(c+dx)\,dx$$
$$= \frac{3\,(dx+c)a^3+3\,a^3\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-3\,a^3\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)-\frac{4\,a^3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^4-1}}{d}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^2,x, algorithm="giac")
```

```
[Out] (3*(d*x + c)*a^3 + 3*a^3*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 3*a^3*log(abs
(tan(1/2*d*x + 1/2*c) - 1)) - 4*a^3*tan(1/2*d*x + 1/2*c)/(tan(1/2*d*x + 1/2
*c)^4 - 1))/d
```

Mupad [B] (verification not implemented)

Time = 14.89 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.19

$$\int (a+a\cos(c+dx))^3\sec^2(c+dx)\,dx = 3\,a^3\,x+\frac{6\,a^3\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d} - \frac{4\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-1\right)}$$

```
[In] int((a + a*cos(c + d*x))^3/cos(c + d*x)^2,x)
```

```
[Out] 3*a^3*x + (6*a^3*atanh(tan(c/2 + (d*x)/2)))/d - (4*a^3*tan(c/2 + (d*x)/2))/
(d*(tan(c/2 + (d*x)/2)^4 - 1))
```

3.29 $\int (a+a\cos(c+dx))^3\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 59

$$\int (a+a\cos(c+dx))^3\sec^3(c+dx)\,dx=a^3x+\frac{7a^3\text{arctanh}(\sin(c+dx))}{2d}+\frac{3a^3\tan(c+dx)}{d}+\frac{a^3\sec(c+dx)\tan(c+dx)}{2d}$$

```
[Out] a^3*x+7/2*a^3*arctanh(sin(d*x+c))/d+3*a^3*tan(d*x+c)/d+1/2*a^3*sec(d*x+c)*t
an(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2836, 3855, 3852, 8, 3853}

$$\int (a+a\cos(c+dx))^3\sec^3(c+dx)\,dx=\frac{7a^3\text{arctanh}(\sin(c+dx))}{2d}+\frac{3a^3\tan(c+dx)}{d}+\frac{a^3\tan(c+dx)\sec(c+dx)}{2d}+a^3x$$

```
[In] Int[(a + a*Cos[c + d*x])^3*Sec[c + d*x]^3,x]
```

```
[Out] a^3*x + (7*a^3*ArcTanh[Sin[c + d*x]])/(2*d) + (3*a^3*Tan[c + d*x])/d + (a^3
*Sec[c + d*x]*Tan[c + d*x])/(2*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = \int \left(a^3+3a^3\sec(c+dx)+3a^3\sec^2(c+dx)+a^3\sec^3(c+dx)\right)\,dx$$

$$= a^3x+a^3\int \sec^3(c+dx)\,dx+\left(3a^3\right)\int \sec(c+dx)\,dx+\left(3a^3\right)\int \sec^2(c+dx)\,dx$$

$$= a^3x+\frac{3a^3\text{arctanh}(\sin(c+dx))}{d}+\frac{a^3\sec(c+dx)\tan(c+dx)}{2d}+\frac{1}{2}a^3\int \sec(c+dx)\,dx-\frac{\left(3a^3\right)\text{Subst}\left(\int 1\,dx,x,-\tan(c+dx)\right)}{d}$$

$$= a^3x+\frac{7a^3\text{arctanh}(\sin(c+dx))}{2d}+\frac{3a^3\tan(c+dx)}{d}+\frac{a^3\sec(c+dx)\tan(c+dx)}{2d}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.85

$$\int (a+a\cos(c+dx))^3\sec^3(c+dx)\,dx = a^3\left(x+\frac{7\text{arctanh}(\sin(c+dx))}{2d}+\frac{3\tan(c+dx)}{d}+\frac{\sec(c+dx)\tan(c+dx)}{2d}\right)$$

```
[In] Integrate[(a + a*Cos[c + d*x])^3*Sec[c + d*x]^3,x]
```

```
[Out] a^3*(x + (7*ArcTanh[Sin[c + d*x]])/(2*d) + (3*Tan[c + d*x])/d + (Sec[c + d*
x]*Tan[c + d*x])/(2*d))
```

Maple [A] (verified)

Time = 2.54 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.36

method	result
derivativedivides	$\frac{a^3(dx+c)+3a^3\ln(\sec(dx+c)+\tan(dx+c))+3a^3\tan(dx+c)+a^3\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}$
default	$\frac{a^3(dx+c)+3a^3\ln(\sec(dx+c)+\tan(dx+c))+3a^3\tan(dx+c)+a^3\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}$
parts	$\frac{a^3\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}+\frac{a^3(dx+c)}{d}+\frac{3a^3\tan(dx+c)}{d}+\frac{3a^3\ln(\sec(dx+c)+\tan(dx+c))}{d}$
risch	$a^3x-\frac{ia^3(e^{3i(dx+c)}-6e^{2i(dx+c)}-e^{i(dx+c)}-6)}{d(e^{2i(dx+c)}+1)^2}-\frac{7a^3\ln(e^{i(dx+c)}-i)}{2d}+\frac{7a^3\ln(e^{i(dx+c)}+i)}{2d}$
parallelrisch	$\frac{a^3\Big(2dx\cos(2dx+2c)+7\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)\cos(2dx+2c)-7\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(2dx+2c)+2dx+2\sin(dx+c)+7\ln\Big(\mathrm{t}}{2d(1+\cos(2dx+2c))}$
norman	$\frac{a^3x+a^3x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a^3x\left(\tan^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a^3x\left(\tan^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\frac{7a^3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{16a^3\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{6a^3\Big(\tan^5}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3\Big(\tan^2\Big(\frac{dx}{2}+}$

```
[In] int((a+cos(d*x+c)*a)^3*sec(d*x+c)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a^3*(d*x+c)+3*a^3*ln(sec(d*x+c)+tan(d*x+c))+3*a^3*tan(d*x+c)+a^3*(1/2*
sec(d*x+c)*tan(d*x+c)+1/2*ln(sec(d*x+c)+tan(d*x+c))))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.66

$$\int (a + a\cos(c + dx))^3 \sec^3(c + dx)\, dx$$
$$= \frac{4\,a^3 dx\cos(dx + c)^2 + 7\,a^3\cos(dx + c)^2\log(\sin(dx + c) + 1) - 7\,a^3\cos(dx + c)^2\log(-\sin(dx + c) + 1)}{4\,d\cos(dx + c)^2}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] 1/4*(4*a^3*d*x*cos(d*x + c)^2 + 7*a^3*cos(d*x + c)^2*log(sin(d*x + c) + 1)
- 7*a^3*cos(d*x + c)^2*log(-sin(d*x + c) + 1) + 2*(6*a^3*cos(d*x + c) + a^3
)*sin(d*x + c))/(d*cos(d*x + c)^2)
```

Sympy [F]

$$\int (a + a\cos(c + dx))^3 \sec^3(c + dx)\, dx = a^3 \left(\int 3\cos(c + dx)\sec^3(c + dx)\, dx + \int 3\cos^2(c + dx)\sec^3(c + dx)\, dx + \int \cos^3(c + dx)\sec^3(c + dx)\, dx + \int \sec^3(c + dx)\, dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))**3*sec(d*x+c)**3,x)
```

```
[Out] a**3*(Integral(3*cos(c + d*x)*sec(c + d*x)**3, x) + Integral(3*cos(c + d*x)
**2*sec(c + d*x)**3, x) + Integral(cos(c + d*x)**3*sec(c + d*x)**3, x) + In
tegral(sec(c + d*x)**3, x))
```

Maxima [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.68

$$\int (a + a\cos(c + dx))^3 \sec^3(c + dx)\, dx$$
$$= \frac{4\,(dx + c)a^3 - a^3\left(\frac{2\,\sin(dx+c)}{\sin(dx+c)^2-1} - \log(\sin(dx + c) + 1) + \log(\sin(dx + c) - 1)\right) + 6\,a^3(\log(\sin(dx + c) +}{4\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] 1/4*(4*(d*x + c)*a^3 - a^3*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(d
*x + c) + 1) + log(sin(d*x + c) - 1)) + 6*a^3*(log(sin(d*x + c) + 1) - log(
sin(d*x + c) - 1)) + 12*a^3*tan(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.43 (sec) , antiderivative size = 100, normalized size of antiderivative = 1.69

$$\int (a + a\cos(c+dx))^3 \sec^3(c+dx)\,dx$$
$$= \frac{2\,(dx+c)a^3 + 7\,a^3 \log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) + 1\right|\right) - 7\,a^3 \log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) - 1\right|\right) - \frac{2\left(5\,a^3 \tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3 - 7\,a^3 \mathrm{t}}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2 -\right.}}{2\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^3,x, algorithm="giac")
```

```
[Out] 1/2*(2*(d*x + c)*a^3 + 7*a^3*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 7*a^3*log
(abs(tan(1/2*d*x + 1/2*c) - 1)) - 2*(5*a^3*tan(1/2*d*x + 1/2*c)^3 - 7*a^3*t
an(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2 - 1)^2)/d
```

Mupad [B] (verification not implemented)

Time = 14.63 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.49

$$\int (a + a\cos(c+dx))^3 \sec^3(c+dx)\,dx = a^3\,x + \frac{7\,a^3\,\mathrm{atanh}\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)\right)}{d} - \frac{5\,a^3 \tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^3 - 7\,a^3 \tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)}{d\,\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^4 - 2\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^2 + 1\right)}$$

```
[In] int((a + a*cos(c + d*x))^3/cos(c + d*x)^3,x)
```

```
[Out] a^3*x + (7*a^3*atanh(tan(c/2 + (d*x)/2)))/d - (5*a^3*tan(c/2 + (d*x)/2)^3 -
 7*a^3*tan(c/2 + (d*x)/2))/(d*(tan(c/2 + (d*x)/2)^4 - 2*tan(c/2 + (d*x)/2)^
2 + 1))
```

3.30 $\int (a+a\cos(c+dx))^3\sec^4(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 72

$$\int (a+a\cos(c+dx))^3\sec^4(c+dx)\,dx=\frac{5a^3\operatorname{arctanh}(\sin(c+dx))}{2d}+\frac{4a^3\tan(c+dx)}{d}+\frac{3a^3\sec(c+dx)\tan(c+dx)}{2d}+\frac{a^3\tan^3(c+dx)}{3d}$$

```
[Out] 5/2*a^3*arctanh(sin(d*x+c))/d+4*a^3*tan(d*x+c)/d+3/2*a^3*sec(d*x+c)*tan(d*x
+c)/d+1/3*a^3*tan(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2836, 3855, 3852, 8, 3853}

$$\int (a+a\cos(c+dx))^3\sec^4(c+dx)\,dx=\frac{5a^3\operatorname{arctanh}(\sin(c+dx))}{2d}+\frac{a^3\tan^3(c+dx)}{3d}+\frac{4a^3\tan(c+dx)}{d}+\frac{3a^3\tan(c+dx)\sec(c+dx)}{2d}$$

```
[In] Int[(a + a*Cos[c + d*x])^3*Sec[c + d*x]^4,x]
```

```
[Out] (5*a^3*ArcTanh[Sin[c + d*x]])/(2*d) + (4*a^3*Tan[c + d*x])/d + (3*a^3*Sec[c
 + d*x]*Tan[c + d*x])/(2*d) + (a^3*Tan[c + d*x]^3)/(3*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(a^3 \sec(c+dx) + 3a^3 \sec^2(c+dx) + 3a^3 \sec^3(c+dx) + a^3 \sec^4(c+dx)\right) dx \\
&= a^3 \int \sec(c+dx)\,dx + a^3 \int \sec^4(c+dx)\,dx + \left(3a^3\right) \int \sec^2(c+dx)\,dx + \left(3a^3\right) \int \sec^3(c+dx)\,dx \\
&= \frac{a^3 \operatorname{arctanh}(\sin(c+dx))}{d} + \frac{3a^3 \sec(c+dx)\tan(c+dx)}{2d} + \frac{1}{2}\left(3a^3\right) \int \sec(c+dx)\,dx \\
&\quad - \frac{a^3 \operatorname{Subst}\left(\int \left(1+x^2\right) dx, x, -\tan(c+dx)\right)}{d} - \frac{\left(3a^3\right) \operatorname{Subst}\left(\int 1\,dx, x, -\tan(c+dx)\right)}{d} \\
&= \frac{5a^3 \operatorname{arctanh}(\sin(c+dx))}{2d} + \frac{4a^3 \tan(c+dx)}{d} + \frac{3a^3 \sec(c+dx)\tan(c+dx)}{2d} + \frac{a^3 \tan^3(c+dx)}{3d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.23 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.00

$$\int (a + a\cos(c+dx))^3 \sec^4(c+dx)\,dx = \frac{5a^3\operatorname{arctanh}(\sin(c+dx))}{2d} + \frac{4a^3\tan(c+dx)}{d} + \frac{3a^3\sec(c+dx)\tan(c+dx)}{2d} + \frac{a^3\tan^3(c+dx)}{3d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^3*Sec[c + d*x]^4,x]
```

```
[Out] (5*a^3*ArcTanh[Sin[c + d*x]])/(2*d) + (4*a^3*Tan[c + d*x])/d + (3*a^3*Sec[c
 + d*x]*Tan[c + d*x])/(2*d) + (a^3*Tan[c + d*x]^3)/(3*d)
```

Maple [A] (verified)

Time = 3.45 (sec) , antiderivative size = 94, normalized size of antiderivative = 1.31

method	result
derivativedivides	$\frac{a^3\ln(\sec(dx+c)+\tan(dx+c))+3a^3\tan(dx+c)+3a^3\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-a^3\left(-\frac{2}{3}-\frac{\left(\sec^2(dx\right.}{3}\right.}{d}$
default	$\frac{a^3\ln(\sec(dx+c)+\tan(dx+c))+3a^3\tan(dx+c)+3a^3\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-a^3\left(-\frac{2}{3}-\frac{\left(\sec^2(dx\right.}{3}\right.}{d}$
parts	$-\frac{a^3\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)}{d}+\frac{a^3\ln(\sec(dx+c)+\tan(dx+c))}{d}+\frac{3a^3\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan}{2}\right.}{d}$
risch	$-\frac{ia^3\left(9\,\mathrm{e}^{5i(dx+c)}-18\,\mathrm{e}^{4i(dx+c)}-48\,\mathrm{e}^{2i(dx+c)}-9\,\mathrm{e}^{i(dx+c)}-22\right)}{3d\left(\mathrm{e}^{2i(dx+c)}+1\right)^3}+\frac{5a^3\ln\left(\mathrm{e}^{i(dx+c)}+i\right)}{2d}-\frac{5a^3\ln\left(\mathrm{e}^{i(dx+c)}-i\right)}{2d}$
parallelrisch	$-\frac{a^3\left(15\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(3dx+3c)-15\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)\cos(3dx+3c)+45\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(dx+c)-4\right.}{6d(\cos(3dx+3c)+3\cos(dx+c))}$
norman	$\frac{-\frac{11a^3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}-\frac{59a^3\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}+\frac{2a^3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{14a^3\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-\frac{5a^3\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}-\frac{5a^3\left(\tan^{11}\left(\frac{dx}{2}\right.\right.}{d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^3}$

```
[In] int((a+cos(d*x+c)*a)^3*sec(d*x+c)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a^3*ln(sec(d*x+c)+tan(d*x+c))+3*a^3*tan(d*x+c)+3*a^3*(1/2*sec(d*x+c)*t
an(d*x+c)+1/2*ln(sec(d*x+c)+tan(d*x+c)))-a^3*(-2/3-1/3*sec(d*x+c)^2)*tan(d*
x+c))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.36

$$\int (a + a\cos(c + dx))^3 \sec^4(c + dx)\, dx$$
$$= \frac{15\, a^3 \cos(dx + c)^3 \log(\sin(dx + c) + 1) - 15\, a^3 \cos(dx + c)^3 \log(-\sin(dx + c) + 1) + 2\left(22\, a^3 \cos(dx + c\right.}{12\, d \cos(dx + c)^3}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] 1/12*(15*a^3*cos(d*x + c)^3*log(sin(d*x + c) + 1) - 15*a^3*cos(d*x + c)^3*l
og(-sin(d*x + c) + 1) + 2*(22*a^3*cos(d*x + c)^2 + 9*a^3*cos(d*x + c) + 2*a
^3)*sin(d*x + c))/(d*cos(d*x + c)^3)
```

Sympy [F]

$$\int (a + a\cos(c + dx))^3 \sec^4(c + dx)\, dx = a^3 \left(\int 3\cos(c + dx) \sec^4(c + dx)\, dx + \int 3\cos^2(c + dx) \sec^4(c + dx)\, dx + \int \cos^3(c + dx) \sec^4(c + dx)\, dx + \int \sec^4(c + dx)\, dx \right)$$

```
[In] integrate((a+a*cos(d*x+c))**3*sec(d*x+c)**4,x)
```

```
[Out] a**3*(Integral(3*cos(c + d*x)*sec(c + d*x)**4, x) + Integral(3*cos(c + d*x)
**2*sec(c + d*x)**4, x) + Integral(cos(c + d*x)**3*sec(c + d*x)**4, x) + In
tegral(sec(c + d*x)**4, x))
```

Maxima [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.54

$$\int (a + a\cos(c + dx))^3 \sec^4(c + dx)\, dx$$
$$= \frac{4\left(\tan(dx + c)^3 + 3\tan(dx + c)\right)a^3 - 9\, a^3 \left(\frac{2\sin(dx+c)}{\sin(dx+c)^2 - 1} - \log(\sin(dx + c) + 1) + \log(\sin(dx + c) - 1)\right) +}{12\, d}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] 1/12*(4*(tan(d*x + c)^3 + 3*tan(d*x + c))*a^3 - 9*a^3*(2*sin(d*x + c)/(sin(
d*x + c)^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)) + 6*a^3*(l
og(sin(d*x + c) + 1) - log(sin(d*x + c) - 1)) + 36*a^3*tan(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.47

$$\int (a+a\cos(c+dx))^3\sec^4(c+dx)\,dx$$
$$=\frac{15\,a^3\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-15\,a^3\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)-\frac{2\left(15\,a^3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-40\,a^3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right.\right.}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)}}{6\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^4,x, algorithm="giac")
```

```
[Out] 1/6*(15*a^3*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 15*a^3*log(abs(tan(1/2*d*x
 + 1/2*c) - 1)) - 2*(15*a^3*tan(1/2*d*x + 1/2*c)^5 - 40*a^3*tan(1/2*d*x + 1
/2*c)^3 + 33*a^3*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2 - 1)^3)/d
```

Mupad [B] (verification not implemented)

Time = 16.09 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.56

$$\int (a+a\cos(c+dx))^3\sec^4(c+dx)\,dx$$
$$=\frac{5\,a^3\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}-\frac{5\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5-\frac{40\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{3}+11\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6-3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-1\right)}$$

```
[In] int((a + a*cos(c + d*x))^3/cos(c + d*x)^4,x)
```

```
[Out] (5*a^3*atanh(tan(c/2 + (d*x)/2)))/d - (5*a^3*tan(c/2 + (d*x)/2)^5 - (40*a^3
*tan(c/2 + (d*x)/2)^3)/3 + 11*a^3*tan(c/2 + (d*x)/2))/(d*(3*tan(c/2 + (d*x)
/2)^2 - 3*tan(c/2 + (d*x)/2)^4 + tan(c/2 + (d*x)/2)^6 - 1))
```

3.31 $\int (a + a\cos(c + dx))^3 \sec^5(c + dx)\, dx$

Optimal result

Integrand size = 21, antiderivative size = 93

$$\int (a + a\cos(c + dx))^3 \sec^5(c + dx)\, dx = \frac{15a^3 \operatorname{arctanh}(\sin(c + dx))}{8d} + \frac{4a^3 \tan(c + dx)}{d} + \frac{15a^3 \sec(c + dx)\tan(c + dx)}{8d} + \frac{a^3 \sec^3(c + dx)\tan(c + dx)}{4d} + \frac{a^3 \tan^3(c + dx)}{d}$$

```
[Out] 15/8*a^3*arctanh(sin(d*x+c))/d+4*a^3*tan(d*x+c)/d+15/8*a^3*sec(d*x+c)*tan(d
*x+c)/d+1/4*a^3*sec(d*x+c)^3*tan(d*x+c)/d+a^3*tan(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 93, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2836, 3852, 8, 3853, 3855}

$$\int (a + a\cos(c + dx))^3 \sec^5(c + dx)\, dx = \frac{15a^3 \operatorname{arctanh}(\sin(c + dx))}{8d} + \frac{a^3 \tan^3(c + dx)}{d} + \frac{4a^3 \tan(c + dx)}{d} + \frac{a^3 \tan(c + dx)\sec^3(c + dx)}{4d} + \frac{15a^3 \tan(c + dx)\sec(c + dx)}{8d}$$

```
[In] Int[(a + a*Cos[c + d*x])^3*Sec[c + d*x]^5,x]
```

```
[Out] (15*a^3*ArcTanh[Sin[c + d*x]])/(8*d) + (4*a^3*Tan[c + d*x])/d + (15*a^3*Sec
[c + d*x]*Tan[c + d*x])/(8*d) + (a^3*Sec[c + d*x]^3*Tan[c + d*x])/(4*d) + (
a^3*Tan[c + d*x]^3)/d
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(a^3 \sec^2(c+dx) + 3a^3 \sec^3(c+dx) + 3a^3 \sec^4(c+dx) + a^3 \sec^5(c+dx)\right)\, dx \\
&= a^3 \int \sec^2(c+dx)\, dx + a^3 \int \sec^5(c+dx)\, dx \\
&\quad + \left(3a^3\right) \int \sec^3(c+dx)\, dx + \left(3a^3\right) \int \sec^4(c+dx)\, dx \\
&= \frac{3a^3 \sec(c+dx)\tan(c+dx)}{2d} + \frac{a^3 \sec^3(c+dx)\tan(c+dx)}{4d} \\
&\quad + \frac{1}{4}\left(3a^3\right) \int \sec^3(c+dx)\, dx + \frac{1}{2}\left(3a^3\right) \int \sec(c+dx)\, dx \\
&\quad - \frac{a^3 \text{Subst}\left(\int 1\, dx, x, -\tan(c+dx)\right)}{d} \\
&\quad - \frac{\left(3a^3\right) \text{Subst}\left(\int \left(1+x^2\right)\, dx, x, -\tan(c+dx)\right)}{d}
\end{aligned}$$

$$= \frac{3a^3\text{arctanh}(\sin(c+dx))}{2d} + \frac{4a^3\tan(c+dx)}{d} + \frac{15a^3\sec(c+dx)\tan(c+dx)}{8d} + \frac{a^3\sec^3(c+dx)\tan(c+dx)}{4d} + \frac{a^3\tan^3(c+dx)}{d} + \frac{1}{8}(3a^3)\int \sec(c+dx)\,dx$$

$$= \frac{15a^3\text{arctanh}(\sin(c+dx))}{8d} + \frac{4a^3\tan(c+dx)}{d} + \frac{15a^3\sec(c+dx)\tan(c+dx)}{8d} + \frac{a^3\sec^3(c+dx)\tan(c+dx)}{4d} + \frac{a^3\tan^3(c+dx)}{d}$$

Mathematica [A] (verified)

Time = 0.31 (sec) , antiderivative size = 93, normalized size of antiderivative = 1.00

$$\int (a+a\cos(c+dx))^3\sec^5(c+dx)\,dx = \frac{15a^3\text{arctanh}(\sin(c+dx))}{8d} + \frac{4a^3\tan(c+dx)}{d} + \frac{15a^3\sec(c+dx)\tan(c+dx)}{8d} + \frac{a^3\sec^3(c+dx)\tan(c+dx)}{4d} + \frac{a^3\tan^3(c+dx)}{d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^3*Sec[c + d*x]^5,x]
```

```
[Out] (15*a^3*ArcTanh[Sin[c + d*x]])/(8*d) + (4*a^3*Tan[c + d*x])/d + (15*a^3*Sec
[c + d*x]*Tan[c + d*x])/(8*d) + (a^3*Sec[c + d*x]^3*Tan[c + d*x])/(4*d) + (
a^3*Tan[c + d*x]^3)/d
```

Maple [A] (verified)

Time = 3.79 (sec) , antiderivative size = 123, normalized size of antiderivative = 1.32

method	result
derivativedivides	$\frac{a^3\tan(dx+c)+3a^3\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-3a^3\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+a^3\left(-\left(-\frac{(\mathrm{s}}{}\right.\right.}{d}$
default	$\frac{a^3\tan(dx+c)+3a^3\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-3a^3\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+a^3\left(-\left(-\frac{(\mathrm{s}}{}\right.\right.}{d}$
parts	$\frac{a^3\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)}{d}+\frac{a^3\tan(dx+c)}{d}-\frac{3a^3\left(-\frac{2}{3}-\frac{\left(\sec^2(dx\right.}{3}\right.}{d}$
risch	$-\frac{ia^3\left(15\,\mathrm{e}^{7i(dx+c)}-8\,\mathrm{e}^{6i(dx+c)}+23\,\mathrm{e}^{5i(dx+c)}-72\,\mathrm{e}^{4i(dx+c)}-23\,\mathrm{e}^{3i(dx+c)}-88\,\mathrm{e}^{2i(dx+c)}-15\,\mathrm{e}^{i(dx+c)}-24\right)}{4d\left(\mathrm{e}^{2i(dx+c)}+1\right)^4}-\frac{15a^3\ln(\mathrm{e}}{8}$
parallelrisch	$\frac{a^3\left(15(-\cos(4dx+4c)-4\cos(2dx+2c)-3)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+15(\cos(4dx+4c)+4\cos(2dx+2c)+3)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\right.\right.}{8d(\cos(4dx+4c)+4\cos(2dx+2c)+3)}$
norman	$\frac{\frac{49a^3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d}+\frac{37a^3\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2d}-\frac{17a^3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}-\frac{5a^3\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{47a^3\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}+\frac{5a^3\left(\tan^{11}\left(\frac{dx}{2}+\right.\right.}{2d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^4}$

```
[In] int((a+cos(d*x+c)*a)^3*sec(d*x+c)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a^3*tan(d*x+c)+3*a^3*(1/2*sec(d*x+c)*tan(d*x+c)+1/2*ln(sec(d*x+c)+tan(
d*x+c)))-3*a^3*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c)+a^3*(-(-1/4*sec(d*x+c)^3-
3/8*sec(d*x+c))*tan(d*x+c)+3/8*ln(sec(d*x+c)+tan(d*x+c))))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.19

$$\int (a+a\cos(c+dx))^3\sec^5(c+dx)\,dx$$
$$=\frac{15\,a^3\cos\left(dx+c\right)^4\log\left(\sin\left(dx+c\right)+1\right)-15\,a^3\cos\left(dx+c\right)^4\log\left(-\sin\left(dx+c\right)+1\right)+2\left(24\,a^3\cos\left(dx+\right.\right.}{16\,d\cos\left(dx+c\right)^4}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] 1/16*(15*a^3*cos(d*x + c)^4*log(sin(d*x + c) + 1) - 15*a^3*cos(d*x + c)^4*l
og(-sin(d*x + c) + 1) + 2*(24*a^3*cos(d*x + c)^3 + 15*a^3*cos(d*x + c)^2 +
8*a^3*cos(d*x + c) + 2*a^3)*sin(d*x + c))/(d*cos(d*x + c)^4)
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^3\sec^5(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**3*sec(d*x+c)**5,x)
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.68

$$\int (a+a\cos(c+dx))^3\sec^5(c+dx)\,dx$$
$$= \frac{16\left(\tan(dx+c)^3+3\tan(dx+c)\right)a^3 - a^3\left(\frac{2\left(3\sin(dx+c)^3-5\sin(dx+c)\right)}{\sin(dx+c)^4-2\sin(dx+c)^2+1} - 3\log(\sin(dx+c)+1) + 3\log(\sin(\ldots}{16\ldots}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^5,x, algorithm="maxima")
[Out] 1/16*(16*(tan(d*x + c)^3 + 3*tan(d*x + c))*a^3 - a^3*(2*(3*sin(d*x + c)^3 -
 5*sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2 + 1) - 3*log(sin(d*x +
c) + 1) + 3*log(sin(d*x + c) - 1)) - 12*a^3*(2*sin(d*x + c)/(sin(d*x + c)^2
 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)) + 16*a^3*tan(d*x + c
))/d
```

Giac [A] (verification not implemented)

none

Time = 0.41 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.31

$$\int (a+a\cos(c+dx))^3\sec^5(c+dx)\,dx$$
$$= \frac{15a^3\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right) - 15a^3\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right) - \frac{2\left(15a^3\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^7-55a^3\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5\ldots\right.}{\left(\tan\left(\frac{1}{2}dx+\ldots\right.\right.}}{8d}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^5,x, algorithm="giac")
[Out] 1/8*(15*a^3*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 15*a^3*log(abs(tan(1/2*d*x
 + 1/2*c) - 1)) - 2*(15*a^3*tan(1/2*d*x + 1/2*c)^7 - 55*a^3*tan(1/2*d*x + 1
/2*c)^5 + 73*a^3*tan(1/2*d*x + 1/2*c)^3 - 49*a^3*tan(1/2*d*x + 1/2*c))/(tan
(1/2*d*x + 1/2*c)^2 - 1)^4)/d
```

Mupad [B] (verification not implemented)

Time = 16.97 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.52

$$\int (a+a\cos(c+dx))^3\sec^5(c+dx)\,dx$$
$$=\frac{15\,a^3\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{4\,d}-\frac{\frac{15\,a^3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{4}-\frac{55\,a^3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{4}+\frac{73\,a^3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{4}-\frac{49\,a^3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{4}}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8-4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6+6\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)}$$

```
[In] int((a + a*cos(c + d*x))^3/cos(c + d*x)^5,x)
```

```
[Out] (15*a^3*atanh(tan(c/2 + (d*x)/2)))/(4*d) - ((73*a^3*tan(c/2 + (d*x)/2)^3)/4
 - (55*a^3*tan(c/2 + (d*x)/2)^5)/4 + (15*a^3*tan(c/2 + (d*x)/2)^7)/4 - (49*
a^3*tan(c/2 + (d*x)/2))/4)/(d*(6*tan(c/2 + (d*x)/2)^4 - 4*tan(c/2 + (d*x)/2
)^2 - 4*tan(c/2 + (d*x)/2)^6 + tan(c/2 + (d*x)/2)^8 + 1))
```

3.32 $\int (a+a\cos(c+dx))^3\sec^6(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 114

$$\int (a+a\cos(c+dx))^3\sec^6(c+dx)\,dx = \frac{13a^3\text{arctanh}(\sin(c+dx))}{8d}+\frac{4a^3\tan(c+dx)}{d}+\frac{13a^3\sec(c+dx)\tan(c+dx)}{8d}+\frac{3a^3\sec^3(c+dx)\tan(c+dx)}{4d}+\frac{5a^3\tan^3(c+dx)}{3d}+\frac{a^3\tan^5(c+dx)}{5d}$$

```
[Out] 13/8*a^3*arctanh(sin(d*x+c))/d+4*a^3*tan(d*x+c)/d+13/8*a^3*sec(d*x+c)*tan(d
*x+c)/d+3/4*a^3*sec(d*x+c)^3*tan(d*x+c)/d+5/3*a^3*tan(d*x+c)^3/d+1/5*a^3*ta
n(d*x+c)^5/d
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2836, 3853, 3855, 3852}

$$\int (a+a\cos(c+dx))^3\sec^6(c+dx)\,dx = \frac{13a^3\text{arctanh}(\sin(c+dx))}{8d}+\frac{a^3\tan^5(c+dx)}{5d}+\frac{5a^3\tan^3(c+dx)}{3d}+\frac{4a^3\tan(c+dx)}{d}+\frac{3a^3\tan(c+dx)\sec^3(c+dx)}{4d}+\frac{13a^3\tan(c+dx)\sec(c+dx)}{8d}$$

```
[In] Int[(a + a*Cos[c + d*x])^3*Sec[c + d*x]^6,x]
```

```
[Out] (13*a^3*ArcTanh[Sin[c + d*x]])/(8*d) + (4*a^3*Tan[c + d*x])/d + (13*a^3*Sec
[c + d*x]*Tan[c + d*x])/(8*d) + (3*a^3*Sec[c + d*x]^3*Tan[c + d*x])/(4*d) +
 (5*a^3*Tan[c + d*x]^3)/(3*d) + (a^3*Tan[c + d*x]^5)/(5*d)
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(a^3\sec^3(c+dx)+3a^3\sec^4(c+dx)+3a^3\sec^5(c+dx)+a^3\sec^6(c+dx)\right)\,dx \\
&= a^3\int \sec^3(c+dx)\,dx+a^3\int \sec^6(c+dx)\,dx \\
&\quad +\left(3a^3\right)\int \sec^4(c+dx)\,dx+\left(3a^3\right)\int \sec^5(c+dx)\,dx \\
&= \frac{a^3\sec(c+dx)\tan(c+dx)}{2d}+\frac{3a^3\sec^3(c+dx)\tan(c+dx)}{4d}+\frac{1}{2}a^3\int \sec(c+dx)\,dx \\
&\quad +\frac{1}{4}\left(9a^3\right)\int \sec^3(c+dx)\,dx-\frac{a^3\text{Subst}\left(\int \left(1+2x^2+x^4\right)\,dx,x,-\tan(c+dx)\right)}{d} \\
&\quad -\frac{\left(3a^3\right)\text{Subst}\left(\int \left(1+x^2\right)\,dx,x,-\tan(c+dx)\right)}{d}
\end{aligned}$$

$$
\begin{aligned}
&= \frac{a^3\text{arctanh}(\sin(c+dx))}{2d} + \frac{4a^3\tan(c+dx)}{d} + \frac{13a^3\sec(c+dx)\tan(c+dx)}{8d} \\
&\quad + \frac{3a^3\sec^3(c+dx)\tan(c+dx)}{4d} + \frac{5a^3\tan^3(c+dx)}{3d} \\
&\quad + \frac{a^3\tan^5(c+dx)}{5d} + \frac{1}{8}(9a^3)\int \sec(c+dx)\,dx \\
&= \frac{13a^3\text{arctanh}(\sin(c+dx))}{8d} + \frac{4a^3\tan(c+dx)}{d} + \frac{13a^3\sec(c+dx)\tan(c+dx)}{8d} \\
&\quad + \frac{3a^3\sec^3(c+dx)\tan(c+dx)}{4d} + \frac{5a^3\tan^3(c+dx)}{3d} + \frac{a^3\tan^5(c+dx)}{5d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.43 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.00

$$
\begin{aligned}
\int (a+a\cos(c+dx))^3\sec^6(c+dx)\,dx &= \frac{13a^3\text{arctanh}(\sin(c+dx))}{8d} + \frac{4a^3\tan(c+dx)}{d} \\
&\quad + \frac{13a^3\sec(c+dx)\tan(c+dx)}{8d} \\
&\quad + \frac{3a^3\sec^3(c+dx)\tan(c+dx)}{4d} \\
&\quad + \frac{5a^3\tan^3(c+dx)}{3d} + \frac{a^3\tan^5(c+dx)}{5d}
\end{aligned}
$$

```
[In] Integrate[(a + a*Cos[c + d*x])^3*Sec[c + d*x]^6,x]
```

```
[Out] (13*a^3*ArcTanh[Sin[c + d*x]])/(8*d) + (4*a^3*Tan[c + d*x])/d + (13*a^3*Sec
[c + d*x]*Tan[c + d*x])/(8*d) + (3*a^3*Sec[c + d*x]^3*Tan[c + d*x])/(4*d) +
 (5*a^3*Tan[c + d*x]^3)/(3*d) + (a^3*Tan[c + d*x]^5)/(5*d)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 4.07 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.27

method	result
risch	$-\frac{i a^3 \left(195 \,{\rm e}^{9 i (d x +c)}+750 \,{\rm e}^{7 i (d x +c)}-720 \,{\rm e}^{6 i (d x +c)}-2320 \,{\rm e}^{4 i (d x +c)}-750 \,{\rm e}^{3 i (d x +c)}-1520 \,{\rm e}^{2 i (d x +c)}-195 \,{\rm e}^{i (d x +c)}-304\right)}{60 d \left({\rm e}^{2 i (d x +c)}+1\right)^{5}}$
derivativedivides	$\frac{a^3 \left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-3a^3\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+3a^3\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3 \sec}{}\right.\right.}{d}$
default	$\frac{a^3 \left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-3a^3\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+3a^3\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3 \sec}{}\right.\right.}{d}$
parts	$-\frac{a^3\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c)\right)}{5}-\frac{4\left(\sec^2(dx+c)\right)}{15}\right)\tan(dx+c)}{d}+\frac{a^3\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}+\frac{3a^3\left(\right.}{}$
norman	$\frac{-\frac{51a^3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d}-\frac{193a^3\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12d}+\frac{31a^3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{60d}-\frac{857a^3\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{60d}-\frac{1127a^3\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{60d}+\frac{481a^3\left(\tan\right.}{}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^5}$
parallelrisch	$-\frac{a^3\left(975\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(3dx+3c)-975\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)\cos(3dx+3c)+1950\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(dx+\right.}{}$

```
[In] int((a+cos(d*x+c)*a)^3*sec(d*x+c)^6,x,method=_RETURNVERBOSE)
```

```
[Out] -1/60*I*a^3*(195*exp(9*I*(d*x+c))+750*exp(7*I*(d*x+c))-720*exp(6*I*(d*x+c))
-2320*exp(4*I*(d*x+c))-750*exp(3*I*(d*x+c))-1520*exp(2*I*(d*x+c))-195*exp(I
*(d*x+c))-304)/d/(exp(2*I*(d*x+c))+1)^5+13/8*a^3/d*ln(exp(I*(d*x+c))+I)-13/
8*a^3/d*ln(exp(I*(d*x+c))-I)
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.09

$$\int (a+a\cos(c+dx))^3\sec^6(c+dx)\,dx$$
$$=\frac{195\,a^3\cos(dx+c)^5\log(\sin(dx+c)+1)-195\,a^3\cos(dx+c)^5\log(-\sin(dx+c)+1)+2\,(304\,a^3\cos(d}{240\,d\cos(dx+}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^6,x, algorithm="fricas")
```

```
[Out] 1/240*(195*a^3*cos(d*x + c)^5*log(sin(d*x + c) + 1) - 195*a^3*cos(d*x + c)^
5*log(-sin(d*x + c) + 1) + 2*(304*a^3*cos(d*x + c)^4 + 195*a^3*cos(d*x + c)
^3 + 152*a^3*cos(d*x + c)^2 + 90*a^3*cos(d*x + c) + 24*a^3)*sin(d*x + c))/(
d*cos(d*x + c)^5)
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^3\sec^6(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**3*sec(d*x+c)**6,x)
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 179, normalized size of antiderivative = 1.57

$$\int (a+a\cos(c+dx))^3\sec^6(c+dx)\,dx$$

$$= \frac{16\left(3\tan(dx+c)^5+10\tan(dx+c)^3+15\tan(dx+c)\right)a^3+240\left(\tan(dx+c)^3+3\tan(dx+c)\right)a^3-45$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^6,x, algorithm="maxima")
[Out] 1/240*(16*(3*tan(d*x + c)^5 + 10*tan(d*x + c)^3 + 15*tan(d*x + c))*a^3 + 24
0*(tan(d*x + c)^3 + 3*tan(d*x + c))*a^3 - 45*a^3*(2*(3*sin(d*x + c)^3 - 5*s
in(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2 + 1) - 3*log(sin(d*x + c) +
 1) + 3*log(sin(d*x + c) - 1)) - 60*a^3*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1
) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)))/d
```

Giac [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.21

$$\int (a+a\cos(c+dx))^3\sec^6(c+dx)\,dx$$

$$= \frac{195a^3\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)-195a^3\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right)-\frac{2\left(195a^3\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^9-910a^3\tan\left(\frac{1}{2}dx+\right.\right.}{}}{120\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^6,x, algorithm="giac")
[Out] 1/120*(195*a^3*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 195*a^3*log(abs(tan(1/2
*d*x + 1/2*c) - 1)) - 2*(195*a^3*tan(1/2*d*x + 1/2*c)^9 - 910*a^3*tan(1/2*d
*x + 1/2*c)^7 + 1664*a^3*tan(1/2*d*x + 1/2*c)^5 - 1330*a^3*tan(1/2*d*x + 1/
2*c)^3 + 765*a^3*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2 - 1)^5)/d
```

Mupad [B] (verification not implemented)

Time = 18.35 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.49

$$\int (a+a\cos(c+dx))^3\sec^6(c+dx)\,dx=\frac{13\,a^3\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{4\,d}-\frac{\frac{13\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9}{4}-\frac{91\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{6}+\frac{416\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{15}-\frac{133\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{6}+\frac{51\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{4}}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}-5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8+10\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6-10\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-1\right)}$$

```
[In] int((a + a*cos(c + d*x))^3/cos(c + d*x)^6,x)
```

```
[Out] (13*a^3*atanh(tan(c/2 + (d*x)/2)))/(4*d) - ((416*a^3*tan(c/2 + (d*x)/2)^5)/
15 - (133*a^3*tan(c/2 + (d*x)/2)^3)/6 - (91*a^3*tan(c/2 + (d*x)/2)^7)/6 + (
13*a^3*tan(c/2 + (d*x)/2)^9)/4 + (51*a^3*tan(c/2 + (d*x)/2))/4)/(d*(5*tan(c
/2 + (d*x)/2)^2 - 10*tan(c/2 + (d*x)/2)^4 + 10*tan(c/2 + (d*x)/2)^6 - 5*tan
(c/2 + (d*x)/2)^8 + tan(c/2 + (d*x)/2)^10 - 1))
```

3.33 $\int \cos^2(c+dx)(a+a\cos(c+dx))^4\,dx$

Optimal result

Integrand size = 21, antiderivative size = 127

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^4\,dx = \frac{49a^4x}{16}+\frac{8a^4\sin(c+dx)}{d}+\frac{49a^4\cos(c+dx)\sin(c+dx)}{16d}+\frac{41a^4\cos^3(c+dx)\sin(c+dx)}{24d}+\frac{a^4\cos^5(c+dx)\sin(c+dx)}{6d}-\frac{4a^4\sin^3(c+dx)}{d}+\frac{4a^4\sin^5(c+dx)}{5d}$$

```
[Out] 49/16*a^4*x+8*a^4*sin(d*x+c)/d+49/16*a^4*cos(d*x+c)*sin(d*x+c)/d+41/24*a^4*
cos(d*x+c)^3*sin(d*x+c)/d+1/6*a^4*cos(d*x+c)^5*sin(d*x+c)/d-4*a^4*sin(d*x+c
)^3/d+4/5*a^4*sin(d*x+c)^5/d
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 127, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2836, 2715, 8, 2713}

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^4\,dx = \frac{4a^4\sin^5(c+dx)}{5d}-\frac{4a^4\sin^3(c+dx)}{d}+\frac{8a^4\sin(c+dx)}{d}+\frac{a^4\sin(c+dx)\cos^5(c+dx)}{6d}+\frac{41a^4\sin(c+dx)\cos^3(c+dx)}{24d}+\frac{49a^4\sin(c+dx)\cos(c+dx)}{16d}+\frac{49a^4x}{16}$$

```
[In] Int[Cos[c + d*x]^2*(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (49*a^4*x)/16 + (8*a^4*Sin[c + d*x])/d + (49*a^4*Cos[c + d*x]*Sin[c + d*x])
/(16*d) + (41*a^4*Cos[c + d*x]^3*Sin[c + d*x])/(24*d) + (a^4*Cos[c + d*x]^5
*Sin[c + d*x])/(6*d) - (4*a^4*Sin[c + d*x]^3)/d + (4*a^4*Sin[c + d*x]^5)/(5
*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$\text{integral} = \int \left(a^4 \cos^2(c+dx) + 4a^4 \cos^3(c+dx) + 6a^4 \cos^4(c+dx) + 4a^4 \cos^5(c+dx) + a^4 \cos^6(c+dx)\right)\, dx$$

$$= a^4 \int \cos^2(c+dx)\, dx + a^4 \int \cos^6(c+dx)\, dx + \left(4a^4\right) \int \cos^3(c+dx)\, dx + \left(4a^4\right) \int \cos^5(c+dx)\, dx + \left(6a^4\right) \int \cos^4(c+dx)\, dx$$

$$
\begin{aligned}
&= \frac{a^4\cos(c+dx)\sin(c+dx)}{2d} + \frac{3a^4\cos^3(c+dx)\sin(c+dx)}{2d} \\
&\quad + \frac{a^4\cos^5(c+dx)\sin(c+dx)}{6d} + \frac{1}{2}a^4\int 1\,dx + \frac{1}{6}(5a^4)\int \cos^4(c+dx)\,dx \\
&\quad + \frac{1}{2}(9a^4)\int \cos^2(c+dx)\,dx - \frac{(4a^4)\,\mathrm{Subst}\left(\int (1-x^2)\,dx, x, -\sin(c+dx)\right)}{d} \\
&\quad - \frac{(4a^4)\,\mathrm{Subst}\left(\int (1-2x^2+x^4)\,dx, x, -\sin(c+dx)\right)}{d} \\
&= \frac{a^4x}{2} + \frac{8a^4\sin(c+dx)}{d} + \frac{11a^4\cos(c+dx)\sin(c+dx)}{4d} \\
&\quad + \frac{41a^4\cos^3(c+dx)\sin(c+dx)}{24d} + \frac{a^4\cos^5(c+dx)\sin(c+dx)}{6d} - \frac{4a^4\sin^3(c+dx)}{d} \\
&\quad + \frac{4a^4\sin^5(c+dx)}{5d} + \frac{1}{8}(5a^4)\int \cos^2(c+dx)\,dx + \frac{1}{4}(9a^4)\int 1\,dx \\
&= \frac{11a^4x}{4} + \frac{8a^4\sin(c+dx)}{d} + \frac{49a^4\cos(c+dx)\sin(c+dx)}{16d} + \frac{41a^4\cos^3(c+dx)\sin(c+dx)}{24d} \\
&\quad + \frac{a^4\cos^5(c+dx)\sin(c+dx)}{6d} - \frac{4a^4\sin^3(c+dx)}{d} + \frac{4a^4\sin^5(c+dx)}{5d} + \frac{1}{16}(5a^4)\int 1\,dx \\
&= \frac{49a^4x}{16} + \frac{8a^4\sin(c+dx)}{d} + \frac{49a^4\cos(c+dx)\sin(c+dx)}{16d} \\
&\quad + \frac{41a^4\cos^3(c+dx)\sin(c+dx)}{24d} + \frac{a^4\cos^5(c+dx)\sin(c+dx)}{6d} \\
&\quad - \frac{4a^4\sin^3(c+dx)}{d} + \frac{4a^4\sin^5(c+dx)}{5d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.57

$$
\int \cos^2(c+dx)(a+a\cos(c+dx))^4\,dx
$$

$$
= \frac{a^4(2940dx + 5280\sin(c+dx) + 1905\sin(2(c+dx)) + 720\sin(3(c+dx)) + 225\sin(4(c+dx)) + 48\sin(5(c
}{960d}
$$

```
[In] Integrate[Cos[c + d*x]^2*(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (a^4*(2940*d*x + 5280*Sin[c + d*x] + 1905*Sin[2*(c + d*x)] + 720*Sin[3*(c +
 d*x)] + 225*Sin[4*(c + d*x)] + 48*Sin[5*(c + d*x)] + 5*Sin[6*(c + d*x)]))/
(960*d)
```

Maple [A] (verified)

Time = 3.73 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.59

method	result
parallelrisch	$\frac{\left(588dx+\sin(6dx+6c)+1056\sin(dx+c)+381\sin(2dx+2c)+144\sin(3dx+3c)+45\sin(4dx+4c)+\frac{48\sin(5dx+5c)}{5}\right)a^4}{192d}$
risch	$\frac{49a^4x}{16}+\frac{11a^4\sin(dx+c)}{2d}+\frac{a^4\sin(6dx+6c)}{192d}+\frac{a^4\sin(5dx+5c)}{20d}+\frac{15a^4\sin(4dx+4c)}{64d}+\frac{3a^4\sin(3dx+3c)}{4d}+\frac{127a}{}$
derivativedivides	$\frac{a^4\left(\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{6}+\frac{5dx}{16}+\frac{5c}{16}\right)+\frac{4a^4\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}+}{d}$
default	$\frac{a^4\left(\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{6}+\frac{5dx}{16}+\frac{5c}{16}\right)+\frac{4a^4\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}+}{d}$
parts	$\frac{a^4\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{a^4\left(\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{6}+\frac{5dx}{16}+\frac{5c}{16}\right)}{d}+\frac{4a^4(2+}{}$
norman	$\frac{\frac{49a^4x}{16}+\frac{207a^4\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8d}+\frac{1471a^4\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{24d}+\frac{1967a^4\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{20d}+\frac{1617a^4\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{20d}+\frac{833a^4\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{24d}}{}$

```
[In] int(cos(d*x+c)^2*(a+cos(d*x+c)*a)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/192*(588*d*x+sin(6*d*x+6*c)+1056*sin(d*x+c)+381*sin(2*d*x+2*c)+144*sin(3*
d*x+3*c)+45*sin(4*d*x+4*c)+48/5*sin(5*d*x+5*c))*a^4/d
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.70

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^4\,dx$$
$$=\frac{735\,a^4dx+\left(40\,a^4\cos\left(dx+c\right)^5+192\,a^4\cos\left(dx+c\right)^4+410\,a^4\cos\left(dx+c\right)^3+576\,a^4\cos\left(dx+c\right)^2+735\,a\right.}{240\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/240*(735*a^4*d*x + (40*a^4*cos(d*x + c)^5 + 192*a^4*cos(d*x + c)^4 + 410*
a^4*cos(d*x + c)^3 + 576*a^4*cos(d*x + c)^2 + 735*a^4*cos(d*x + c) + 1152*a
^4)*sin(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 434 vs. 2(121) = 242.

Time = 0.39 (sec) , antiderivative size = 434, normalized size of antiderivative = 3.42

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^4\,dx$$
$$= \begin{cases} \frac{5a^4x\sin^6(c+dx)}{16} + \frac{15a^4x\sin^4(c+dx)\cos^2(c+dx)}{16} + \frac{9a^4x\sin^4(c+dx)}{4} + \frac{15a^4x\sin^2(c+dx)\cos^4(c+dx)}{16} + \frac{9a^4x\sin^2(c+dx)\cos^2(c+dx)}{2} \\ x(a\cos(c)+a)^4\cos^2(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)**2*(a+a*cos(d*x+c))**4,x)
```

```
[Out] Piecewise((5*a**4*x*sin(c + d*x)**6/16 + 15*a**4*x*sin(c + d*x)**4*cos(c +
d*x)**2/16 + 9*a**4*x*sin(c + d*x)**4/4 + 15*a**4*x*sin(c + d*x)**2*cos(c +
 d*x)**4/16 + 9*a**4*x*sin(c + d*x)**2*cos(c + d*x)**2/2 + a**4*x*sin(c + d
*x)**2/2 + 5*a**4*x*cos(c + d*x)**6/16 + 9*a**4*x*cos(c + d*x)**4/4 + a**4*
x*cos(c + d*x)**2/2 + 5*a**4*sin(c + d*x)**5*cos(c + d*x)/(16*d) + 32*a**4*
sin(c + d*x)**5/(15*d) + 5*a**4*sin(c + d*x)**3*cos(c + d*x)**3/(6*d) + 16*
a**4*sin(c + d*x)**3*cos(c + d*x)**2/(3*d) + 9*a**4*sin(c + d*x)**3*cos(c +
 d*x)/(4*d) + 8*a**4*sin(c + d*x)**3/(3*d) + 11*a**4*sin(c + d*x)*cos(c + d
*x)**5/(16*d) + 4*a**4*sin(c + d*x)*cos(c + d*x)**4/d + 15*a**4*sin(c + d*x
)*cos(c + d*x)**3/(4*d) + 4*a**4*sin(c + d*x)*cos(c + d*x)**2/d + a**4*sin(
c + d*x)*cos(c + d*x)/(2*d), Ne(d, 0)), (x*(a*cos(c) + a)**4*cos(c)**2, Tru
e))
```

Maxima [A] (verification not implemented)

none

Time = 0.22 (sec) , antiderivative size = 165, normalized size of antiderivative = 1.30

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^4\,dx$$
$$= \frac{256\left(3\sin(dx+c)^5 - 10\sin(dx+c)^3 + 15\sin(dx+c)\right)a^4 - 5\left(4\sin(2dx+2c)^3 - 60dx - 60c - 9\sin(\right.}{}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/960*(256*(3*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*sin(d*x + c))*a^4 - 5
*(4*sin(2*d*x + 2*c)^3 - 60*d*x - 60*c - 9*sin(4*d*x + 4*c) - 48*sin(2*d*x
+ 2*c))*a^4 - 1280*(sin(d*x + c)^3 - 3*sin(d*x + c))*a^4 + 180*(12*d*x + 12
*c + sin(4*d*x + 4*c) + 8*sin(2*d*x + 2*c))*a^4 + 240*(2*d*x + 2*c + sin(2*
d*x + 2*c))*a^4)/d
```

Giac [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 106, normalized size of antiderivative = 0.83

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^4\,dx = \frac{49}{16}\,a^4x + \frac{a^4\sin\left(6\,dx+6\,c\right)}{192\,d} + \frac{a^4\sin\left(5\,dx+5\,c\right)}{20\,d} + \frac{15\,a^4\sin\left(4\,dx+4\,c\right)}{64\,d} + \frac{3\,a^4\sin\left(3\,dx+3\,c\right)}{4\,d} + \frac{127\,a^4\sin\left(2\,dx+2\,c\right)}{64\,d} + \frac{11\,a^4\sin\left(dx+c\right)}{2\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 49/16*a^4*x + 1/192*a^4*sin(6*d*x + 6*c)/d + 1/20*a^4*sin(5*d*x + 5*c)/d +
15/64*a^4*sin(4*d*x + 4*c)/d + 3/4*a^4*sin(3*d*x + 3*c)/d + 127/64*a^4*sin(
2*d*x + 2*c)/d + 11/2*a^4*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 16.44 (sec) , antiderivative size = 121, normalized size of antiderivative = 0.95

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^4\,dx = \frac{49\,a^4\,x}{16} + \frac{\frac{49\,a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{11}}{8} + \frac{833\,a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{9}}{24} + \frac{1617\,a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{7}}{20} + \frac{1967\,a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{5}}{20} + \frac{1471\,a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{3}}{24} + \frac{207\,a^4\,\tan}{8}}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)^6}$$

```
[In] int(cos(c + d*x)^2*(a + a*cos(c + d*x))^4,x)
```

```
[Out] (49*a^4*x)/16 + ((1471*a^4*tan(c/2 + (d*x)/2)^3)/24 + (1967*a^4*tan(c/2 + (
d*x)/2)^5)/20 + (1617*a^4*tan(c/2 + (d*x)/2)^7)/20 + (833*a^4*tan(c/2 + (d*
x)/2)^9)/24 + (49*a^4*tan(c/2 + (d*x)/2)^11)/8 + (207*a^4*tan(c/2 + (d*x)/2
))/8)/(d*(tan(c/2 + (d*x)/2)^2 + 1)^6)
```

3.34 $\int \cos(c+dx)(a+a\cos(c+dx))^4\,dx$

Optimal result

Integrand size = 19, antiderivative size = 102

$$\int \cos(c+dx)(a+a\cos(c+dx))^4\,dx = \frac{7a^4x}{2}+\frac{8a^4\sin(c+dx)}{d}+\frac{7a^4\cos(c+dx)\sin(c+dx)}{2d}+\frac{a^4\cos^3(c+dx)\sin(c+dx)}{d}-\frac{8a^4\sin^3(c+dx)}{3d}+\frac{a^4\sin^5(c+dx)}{5d}$$

```
[Out] 7/2*a^4*x+8*a^4*sin(d*x+c)/d+7/2*a^4*cos(d*x+c)*sin(d*x+c)/d+a^4*cos(d*x+c)
^3*sin(d*x+c)/d-8/3*a^4*sin(d*x+c)^3/d+1/5*a^4*sin(d*x+c)^5/d
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.12, number of steps used = 11, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {2830, 2724, 2717, 2715, 8, 2713}

$$\int \cos(c+dx)(a+a\cos(c+dx))^4\,dx = -\frac{16a^4\sin^3(c+dx)}{15d}+\frac{32a^4\sin(c+dx)}{5d}+\frac{a^4\sin(c+dx)\cos^3(c+dx)}{5d}+\frac{27a^4\sin(c+dx)\cos(c+dx)}{10d}+\frac{7a^4x}{2}+\frac{\sin(c+dx)(a\cos(c+dx)+a)^4}{5d}$$

```
[In] Int[Cos[c + d*x]*(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (7*a^4*x)/2 + (32*a^4*Sin[c + d*x])/(5*d) + (27*a^4*Cos[c + d*x]*Sin[c + d*
x])/(10*d) + (a^4*Cos[c + d*x]^3*Sin[c + d*x])/(5*d) + ((a + a*Cos[c + d*x]
)^4*Sin[c + d*x])/(5*d) - (16*a^4*Sin[c + d*x]^3)/(15*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2717

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rule 2724

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Int[ExpandTri
g[(a + b*sin[c + d*x])^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && EqQ[a^2 -
b^2, 0] && IGtQ[n, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{(a+a\cos(c+dx))^4\sin(c+dx)}{5d}+\frac{4}{5}\int(a+a\cos(c+dx))^4\,dx\\ &= \frac{(a+a\cos(c+dx))^4\sin(c+dx)}{5d}\\ &\quad+\frac{4}{5}\int\left(a^4+4a^4\cos(c+dx)+6a^4\cos^2(c+dx)+4a^4\cos^3(c+dx)+a^4\cos^4(c+dx)\right)dx\end{aligned}$$

$$
\begin{aligned}
&= \frac{4a^4x}{5} + \frac{(a+a\cos(c+dx))^4\sin(c+dx)}{5d} \\
&\quad + \frac{1}{5}(4a^4)\int\cos^4(c+dx)\,dx + \frac{1}{5}(16a^4)\int\cos(c+dx)\,dx \\
&\quad + \frac{1}{5}(16a^4)\int\cos^3(c+dx)\,dx + \frac{1}{5}(24a^4)\int\cos^2(c+dx)\,dx \\
&= \frac{4a^4x}{5} + \frac{16a^4\sin(c+dx)}{5d} + \frac{12a^4\cos(c+dx)\sin(c+dx)}{5d} \\
&\quad + \frac{a^4\cos^3(c+dx)\sin(c+dx)}{5d} + \frac{(a+a\cos(c+dx))^4\sin(c+dx)}{5d} \\
&\quad + \frac{1}{5}(3a^4)\int\cos^2(c+dx)\,dx + \frac{1}{5}(12a^4)\int 1\,dx \\
&\quad - \frac{(16a^4)\,\text{Subst}\left(\int(1-x^2)\,dx, x, -\sin(c+dx)\right)}{5d} \\
&= \frac{16a^4x}{5} + \frac{32a^4\sin(c+dx)}{5d} + \frac{27a^4\cos(c+dx)\sin(c+dx)}{10d} \\
&\quad + \frac{a^4\cos^3(c+dx)\sin(c+dx)}{5d} + \frac{(a+a\cos(c+dx))^4\sin(c+dx)}{5d} \\
&\quad - \frac{16a^4\sin^3(c+dx)}{15d} + \frac{1}{10}(3a^4)\int 1\,dx \\
&= \frac{7a^4x}{2} + \frac{32a^4\sin(c+dx)}{5d} + \frac{27a^4\cos(c+dx)\sin(c+dx)}{10d} \\
&\quad + \frac{a^4\cos^3(c+dx)\sin(c+dx)}{5d} \\
&\quad + \frac{(a+a\cos(c+dx))^4\sin(c+dx)}{5d} - \frac{16a^4\sin^3(c+dx)}{15d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.62

$$
\int\cos(c+dx)(a+a\cos(c+dx))^4\,dx
$$

$$
= \frac{a^4(840dx+1470\sin(c+dx)+480\sin(2(c+dx))+145\sin(3(c+dx))+30\sin(4(c+dx))+3\sin(5(c+d}{240d}
$$

```
[In] Integrate[Cos[c + d*x]*(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (a^4*(840*d*x + 1470*Sin[c + d*x] + 480*Sin[2*(c + d*x)] + 145*Sin[3*(c + d
*x)] + 30*Sin[4*(c + d*x)] + 3*Sin[5*(c + d*x)]))/(240*d)
```

Maple [A] (verified)

Time = 2.79 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.65

method	result
parallelrisch	$\frac{a^4(840dx+3\sin(5dx+5c)+30\sin(4dx+4c)+145\sin(3dx+3c)+480\sin(2dx+2c)+1470\sin(dx+c))}{240d}$
risch	$\frac{7a^4x}{2}+\frac{49a^4\sin(dx+c)}{8d}+\frac{a^4\sin(5dx+5c)}{80d}+\frac{a^4\sin(4dx+4c)}{8d}+\frac{29a^4\sin(3dx+3c)}{48d}+\frac{2a^4\sin(2dx+2c)}{d}$
derivativedivides	$\frac{\frac{a^4\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}+4a^4\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+2a^4(2+\cos^2(dx+}{d}$
default	$\frac{\frac{a^4\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}+4a^4\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+2a^4(2+\cos^2(dx+}{d}$
parts	$\frac{a^4\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5d}+\frac{a^4\sin(dx+c)}{d}+\frac{4a^4\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{2a^4(2+\cos}{}$
norman	$\frac{\frac{7a^4x}{2}+\frac{25a^4\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{158a^4\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}+\frac{896a^4\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{15d}+\frac{98a^4\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}+\frac{7a^4\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{35a^4x}{}}{\left(1+\tan^2\left(\frac{dx}{2}+\right.\right.}$

[In] int(cos(d*x+c)*(a+cos(d*x+c)*a)^4,x,method=_RETURNVERBOSE)

[Out] 1/240*a^4*(840*d*x+3*sin(5*d*x+5*c)+30*sin(4*d*x+4*c)+145*sin(3*d*x+3*c)+48 0*sin(2*d*x+2*c)+1470*sin(d*x+c))/d

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.75

$$\int \cos(c+dx)(a+a\cos(c+dx))^4\,dx$$
$$=\frac{105\,a^4dx+\left(6\,a^4\cos\left(dx+c\right)^4+30\,a^4\cos\left(dx+c\right)^3+68\,a^4\cos\left(dx+c\right)^2+105\,a^4\cos\left(dx+c\right)+166\,a^4\right)\mathrm{si}}{30\,d}$$

[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))^4,x, algorithm="fricas")

[Out] 1/30*(105*a^4*d*x + (6*a^4*cos(d*x + c)^4 + 30*a^4*cos(d*x + c)^3 + 68*a^4* cos(d*x + c)^2 + 105*a^4*cos(d*x + c) + 166*a^4)*sin(d*x + c))/d

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 280 vs. 2(95) = 190.

Time = 0.28 (sec) , antiderivative size = 280, normalized size of antiderivative = 2.75

$$\int \cos(c+dx)(a+a\cos(c+dx))^4\,dx$$
$$= \begin{cases} \frac{3a^4x\sin^4(c+dx)}{2} + 3a^4x\sin^2(c+dx)\cos^2(c+dx) + 2a^4x\sin^2(c+dx) + \frac{3a^4x\cos^4(c+dx)}{2} + 2a^4x\cos^2(c+dx) \\ x(a\cos(c)+a)^4\cos(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))**4,x)
```

```
[Out] Piecewise((3*a**4*x*sin(c + d*x)**4/2 + 3*a**4*x*sin(c + d*x)**2*cos(c + d*
x)**2 + 2*a**4*x*sin(c + d*x)**2 + 3*a**4*x*cos(c + d*x)**4/2 + 2*a**4*x*co
s(c + d*x)**2 + 8*a**4*sin(c + d*x)**5/(15*d) + 4*a**4*sin(c + d*x)**3*cos(
c + d*x)**2/(3*d) + 3*a**4*sin(c + d*x)**3*cos(c + d*x)/(2*d) + 4*a**4*sin(
c + d*x)**3/d + a**4*sin(c + d*x)*cos(c + d*x)**4/d + 5*a**4*sin(c + d*x)*c
os(c + d*x)**3/(2*d) + 6*a**4*sin(c + d*x)*cos(c + d*x)**2/d + 2*a**4*sin(c
 + d*x)*cos(c + d*x)/d + a**4*sin(c + d*x)/d, Ne(d, 0)), (x*(a*cos(c) + a)*
*4*cos(c), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.25

$$\int \cos(c+dx)(a+a\cos(c+dx))^4\,dx$$
$$= \frac{8\left(3\sin(dx+c)^5 - 10\sin(dx+c)^3 + 15\sin(dx+c)\right)a^4 - 240\left(\sin(dx+c)^3 - 3\sin(dx+c)\right)a^4 + 15(12}{1}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/120*(8*(3*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*sin(d*x + c))*a^4 - 240
*(sin(d*x + c)^3 - 3*sin(d*x + c))*a^4 + 15*(12*d*x + 12*c + sin(4*d*x + 4*
c) + 8*sin(2*d*x + 2*c))*a^4 + 120*(2*d*x + 2*c + sin(2*d*x + 2*c))*a^4 + 1
20*a^4*sin(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.87

$$\int \cos(c+dx)(a+a\cos(c+dx))^4\,dx = \frac{7}{2}\,a^4x + \frac{a^4\sin\left(5\,dx+5\,c\right)}{80\,d} + \frac{a^4\sin\left(4\,dx+4\,c\right)}{8\,d} + \frac{29\,a^4\sin\left(3\,dx+3\,c\right)}{48\,d} + \frac{2\,a^4\sin\left(2\,dx+2\,c\right)}{d} + \frac{49\,a^4\sin\left(dx+c\right)}{8\,d}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 7/2*a^4*x + 1/80*a^4*sin(5*d*x + 5*c)/d + 1/8*a^4*sin(4*d*x + 4*c)/d + 29/4
8*a^4*sin(3*d*x + 3*c)/d + 2*a^4*sin(2*d*x + 2*c)/d + 49/8*a^4*sin(d*x + c)
/d
```

Mupad [B] (verification not implemented)

Time = 17.63 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.03

$$\int \cos(c+dx)(a+a\cos(c+dx))^4\,dx = \frac{7\,a^4\,x}{2} + \frac{7\,a^4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9 + \frac{98\,a^4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{3} + \frac{896\,a^4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{15} + \frac{158\,a^4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{3} + 25\,a^4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)^5}$$

```
[In] int(cos(c + d*x)*(a + a*cos(c + d*x))^4,x)
```

```
[Out] (7*a^4*x)/2 + ((158*a^4*tan(c/2 + (d*x)/2)^3)/3 + (896*a^4*tan(c/2 + (d*x)/
2)^5)/15 + (98*a^4*tan(c/2 + (d*x)/2)^7)/3 + 7*a^4*tan(c/2 + (d*x)/2)^9 + 2
5*a^4*tan(c/2 + (d*x)/2))/(d*(tan(c/2 + (d*x)/2)^2 + 1)^5)
```

3.35 $\int (a+a\cos(c+dx))^4\,dx$

Optimal result

Integrand size = 12, antiderivative size = 87

$$\int (a+a\cos(c+dx))^4\,dx=\frac{35a^4x}{8}+\frac{8a^4\sin(c+dx)}{d}+\frac{27a^4\cos(c+dx)\sin(c+dx)}{8d}+\frac{a^4\cos^3(c+dx)\sin(c+dx)}{4d}-\frac{4a^4\sin^3(c+dx)}{3d}$$

```
[Out] 35/8*a^4*x+8*a^4*sin(d*x+c)/d+27/8*a^4*cos(d*x+c)*sin(d*x+c)/d+1/4*a^4*cos(
d*x+c)^3*sin(d*x+c)/d-4/3*a^4*sin(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {2724, 2717, 2715, 8, 2713}

$$\int (a+a\cos(c+dx))^4\,dx=-\frac{4a^4\sin^3(c+dx)}{3d}+\frac{8a^4\sin(c+dx)}{d}+\frac{a^4\sin(c+dx)\cos^3(c+dx)}{4d}+\frac{27a^4\sin(c+dx)\cos(c+dx)}{8d}+\frac{35a^4x}{8}$$

```
[In] Int[(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (35*a^4*x)/8 + (8*a^4*Sin[c + d*x])/d + (27*a^4*Cos[c + d*x]*Sin[c + d*x])/
(8*d) + (a^4*Cos[c + d*x]^3*Sin[c + d*x])/(4*d) - (4*a^4*Sin[c + d*x]^3)/(3
*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2717

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rule 2724

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Int[ExpandTri
g[(a + b*sin[c + d*x])^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && EqQ[a^2 -
b^2, 0] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(a^4+4a^4\cos(c+dx)+6a^4\cos^2(c+dx)+4a^4\cos^3(c+dx)+a^4\cos^4(c+dx)\right)\,dx\\
&= a^4x+a^4\int \cos^4(c+dx)\,dx+\left(4a^4\right)\int \cos(c+dx)\,dx\\
&\quad+\left(4a^4\right)\int \cos^3(c+dx)\,dx+\left(6a^4\right)\int \cos^2(c+dx)\,dx\\
&= a^4x+\frac{4a^4\sin(c+dx)}{d}+\frac{3a^4\cos(c+dx)\sin(c+dx)}{d}+\frac{a^4\cos^3(c+dx)\sin(c+dx)}{4d}\\
&\quad+\frac{1}{4}\left(3a^4\right)\int \cos^2(c+dx)\,dx+\left(3a^4\right)\int 1\,dx-\frac{\left(4a^4\right)\text{Subst}\left(\int \left(1-x^2\right)\,dx,x,-\sin(c+dx)\right)}{d}\\
&= 4a^4x+\frac{8a^4\sin(c+dx)}{d}+\frac{27a^4\cos(c+dx)\sin(c+dx)}{8d}\\
&\quad+\frac{a^4\cos^3(c+dx)\sin(c+dx)}{4d}-\frac{4a^4\sin^3(c+dx)}{3d}+\frac{1}{8}\left(3a^4\right)\int 1\,dx
\end{aligned}$$

$$= \frac{35a^4x}{8} + \frac{8a^4\sin(c+dx)}{d} + \frac{27a^4\cos(c+dx)\sin(c+dx)}{8d} + \frac{a^4\cos^3(c+dx)\sin(c+dx)}{4d} - \frac{4a^4\sin^3(c+dx)}{3d}$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 56, normalized size of antiderivative = 0.64

$$\int (a+a\cos(c+dx))^4\,dx = \frac{a^4(420c+420dx+672\sin(c+dx)+168\sin(2(c+dx))+32\sin(3(c+dx))+3\sin(4(c+dx)))}{96d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^4,x]
[Out] (a^4*(420*c + 420*d*x + 672*Sin[c + d*x] + 168*Sin[2*(c + d*x)] + 32*Sin[3*
(c + d*x)] + 3*Sin[4*(c + d*x)]))/(96*d)
```

Maple [A] (verified)

Time = 2.11 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.63

method	result
parallelrisch	$\frac{a^4(420dx+672\sin(dx+c)+3\sin(4dx+4c)+32\sin(3dx+3c)+168\sin(2dx+2c))}{96d}$
risch	$\frac{35a^4x}{8}+\frac{7a^4\sin(dx+c)}{d}+\frac{a^4\sin(4dx+4c)}{32d}+\frac{a^4\sin(3dx+3c)}{3d}+\frac{7a^4\sin(2dx+2c)}{4d}$
derivativedivides	$\frac{a^4\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{4a^4\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+6a^4\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+4c}{d}$
default	$\frac{a^4\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{4a^4\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+6a^4\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+4c}{d}$
parts	$a^4x+\frac{a^4\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}+\frac{6a^4\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{4a^4(2+\cos^2(dx+}{3d}$
norman	$\frac{\frac{35a^4x}{8}+\frac{93a^4\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d}+\frac{511a^4\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12d}+\frac{385a^4\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12d}+\frac{35a^4\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}+\frac{35a^4x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}+\frac{105a}{}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^4}$

```
[In] int((a+cos(d*x+c)*a)^4,x,method=_RETURNVERBOSE)
[Out] 1/96*a^4*(420*d*x+672*sin(d*x+c)+3*sin(4*d*x+4*c)+32*sin(3*d*x+3*c)+168*sin
(2*d*x+2*c))/d
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.72

$$\int (a + a\cos(c + dx))^4 \, dx = \frac{105\, a^4 dx + \left(6\, a^4 \cos\left(dx + c\right)^3 + 32\, a^4 \cos\left(dx + c\right)^2 + 81\, a^4 \cos\left(dx + c\right) + 160\, a^4\right) \sin\left(dx + c\right)}{24\, d}$$

```
[In] integrate((a+a*cos(d*x+c))^4,x, algorithm="fricas")
[Out] 1/24*(105*a^4*d*x + (6*a^4*cos(d*x + c)^3 + 32*a^4*cos(d*x + c)^2 + 81*a^4*
cos(d*x + c) + 160*a^4)*sin(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 224 vs. 2(82) = 164.

Time = 0.20 (sec) , antiderivative size = 224, normalized size of antiderivative = 2.57

$$\int (a + a\cos(c + dx))^4 \, dx = \begin{cases} \frac{3a^4 x \sin^4{(c+dx)}}{8} + \frac{3a^4 x \sin^2{(c+dx)} \cos^2{(c+dx)}}{4} + 3a^4 x \sin^2{(c + dx)} + \frac{3a^4 x \cos^4{(c+dx)}}{8} + 3a^4 x \cos^2{(c + dx)} + a^4 x + \\ x(a \cos{(c)} + a)^4 \end{cases}$$

```
[In] integrate((a+a*cos(d*x+c))**4,x)
[Out] Piecewise((3*a**4*x*sin(c + d*x)**4/8 + 3*a**4*x*sin(c + d*x)**2*cos(c + d*
x)**2/4 + 3*a**4*x*sin(c + d*x)**2 + 3*a**4*x*cos(c + d*x)**4/8 + 3*a**4*x*
cos(c + d*x)**2 + a**4*x + 3*a**4*sin(c + d*x)**3*cos(c + d*x)/(8*d) + 8*a*
*4*sin(c + d*x)**3/(3*d) + 5*a**4*sin(c + d*x)*cos(c + d*x)**3/(8*d) + 4*a*
*4*sin(c + d*x)*cos(c + d*x)**2/d + 3*a**4*sin(c + d*x)*cos(c + d*x)/d + 4*
a**4*sin(c + d*x)/d, Ne(d, 0)), (x*(a*cos(c) + a)**4, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.22 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.22

$$\int (a + a\cos(c + dx))^4 \, dx = a^4 x - \frac{4\left(\sin\left(dx + c\right)^3 - 3\,\sin\left(dx + c\right)\right) a^4}{3\, d} + \frac{\left(12\, dx + 12\, c + \sin\left(4\, dx + 4\, c\right) + 8\,\sin\left(2\, dx + 2\, c\right)\right) a^4}{32\, d} + \frac{3\left(2\, dx + 2\, c + \sin\left(2\, dx + 2\, c\right)\right) a^4}{2\, d} + \frac{4\, a^4 \sin\left(dx + c\right)}{d}$$

```
[In] integrate((a+a*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] a^4*x - 4/3*(sin(d*x + c)^3 - 3*sin(d*x + c))*a^4/d + 1/32*(12*d*x + 12*c +
 sin(4*d*x + 4*c) + 8*sin(2*d*x + 2*c))*a^4/d + 3/2*(2*d*x + 2*c + sin(2*d*
x + 2*c))*a^4/d + 4*a^4*sin(d*x + c)/d
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.83

$$\int (a + a\cos(c + dx))^4 \, dx = \frac{35}{8} a^4 x + \frac{a^4 \sin(4\,dx + 4\,c)}{32\,d} + \frac{a^4 \sin(3\,dx + 3\,c)}{3\,d} + \frac{7\,a^4 \sin(2\,dx + 2\,c)}{4\,d} + \frac{7\,a^4 \sin(dx + c)}{d}$$

```
[In] integrate((a+a*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 35/8*a^4*x + 1/32*a^4*sin(4*d*x + 4*c)/d + 1/3*a^4*sin(3*d*x + 3*c)/d + 7/4
*a^4*sin(2*d*x + 2*c)/d + 7*a^4*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 17.28 (sec) , antiderivative size = 89, normalized size of antiderivative = 1.02

$$\int (a + a\cos(c + dx))^4 \, dx = \frac{35\,a^4\,x}{8} + \frac{\frac{35\,a^4 \tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^7}{4} + \frac{385\,a^4 \tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^5}{12} + \frac{511\,a^4 \tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^3}{12} + \frac{93\,a^4 \tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)}{4}}{d\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^2 + 1\right)^4}$$

```
[In] int((a + a*cos(c + d*x))^4,x)
```

```
[Out] (35*a^4*x)/8 + ((511*a^4*tan(c/2 + (d*x)/2)^3)/12 + (385*a^4*tan(c/2 + (d*x
)/2)^5)/12 + (35*a^4*tan(c/2 + (d*x)/2)^7)/4 + (93*a^4*tan(c/2 + (d*x)/2))/
4)/(d*(tan(c/2 + (d*x)/2)^2 + 1)^4)
```

3.36 $\int (a+a\cos(c+dx))^4\sec(c+dx)\,dx$

Optimal result

Integrand size = 19, antiderivative size = 73

$$\int (a+a\cos(c+dx))^4\sec(c+dx)\,dx=6a^4x+\frac{a^4\operatorname{arctanh}(\sin(c+dx))}{d}+\frac{7a^4\sin(c+dx)}{d}+\frac{2a^4\cos(c+dx)\sin(c+dx)}{d}-\frac{a^4\sin^3(c+dx)}{3d}$$

```
[Out] 6*a^4*x+a^4*arctanh(sin(d*x+c))/d+7*a^4*sin(d*x+c)/d+2*a^4*cos(d*x+c)*sin(d
*x+c)/d-1/3*a^4*sin(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {2836, 2717, 2715, 8, 2713, 3855}

$$\int (a+a\cos(c+dx))^4\sec(c+dx)\,dx=\frac{a^4\operatorname{arctanh}(\sin(c+dx))}{d}-\frac{a^4\sin^3(c+dx)}{3d}+\frac{7a^4\sin(c+dx)}{d}+\frac{2a^4\sin(c+dx)\cos(c+dx)}{d}+6a^4x$$

```
[In] Int[(a + a*Cos[c + d*x])^4*Sec[c + d*x],x]
```

```
[Out] 6*a^4*x + (a^4*ArcTanh[Sin[c + d*x]])/d + (7*a^4*Sin[c + d*x])/d + (2*a^4*C
os[c + d*x]*Sin[c + d*x])/d - (a^4*Sin[c + d*x]^3)/(3*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2717

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(4a^4+6a^4\cos(c+dx)+4a^4\cos^2(c+dx)+a^4\cos^3(c+dx)+a^4\sec(c+dx)\right)\,dx \\
&= 4a^4x+a^4\int\cos^3(c+dx)\,dx+a^4\int\sec(c+dx)\,dx \\
&\quad+\left(4a^4\right)\int\cos^2(c+dx)\,dx+\left(6a^4\right)\int\cos(c+dx)\,dx \\
&= 4a^4x+\frac{a^4\text{arctanh}(\sin(c+dx))}{d}+\frac{6a^4\sin(c+dx)}{d}+\frac{2a^4\cos(c+dx)\sin(c+dx)}{d} \\
&\quad+\left(2a^4\right)\int 1\,dx-\frac{a^4\text{Subst}\left(\int\left(1-x^2\right)\,dx,x,-\sin(c+dx)\right)}{d}
\end{aligned}$$

$$= 6a^4x + \frac{a^4\text{arctanh}(\sin(c+dx))}{d} + \frac{7a^4\sin(c+dx)}{d} + \frac{2a^4\cos(c+dx)\sin(c+dx)}{d} - \frac{a^4\sin^3(c+dx)}{3d}$$

Mathematica [A] (verified)

Time = 0.75 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.25

$$\int (a+a\cos(c+dx))^4\sec(c+dx)\,dx = \frac{a^4\left(72dx - 12\log\left(\cos\left(\frac{1}{2}(c+dx)\right) - \sin\left(\frac{1}{2}(c+dx)\right)\right) + 12\log\left(\cos\left(\frac{1}{2}(c+dx)\right) + \sin\left(\frac{1}{2}(c+dx)\right)\right) + 81\sin\right.}{12d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^4*Sec[c + d*x],x]
```

```
[Out] (a^4*(72*d*x - 12*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + 12*Log[Cos[(c
+ d*x)/2] + Sin[(c + d*x)/2]] + 81*Sin[c + d*x] + 12*Sin[2*(c + d*x)] + Sin
[3*(c + d*x)]))/(12*d)
```

Maple [A] (verified)

Time = 2.45 (sec) , antiderivative size = 70, normalized size of antiderivative = 0.96

method	result
parallelrisch	$\frac{a^4\left(72dx+\sin(3dx+3c)+12\sin(2dx+2c)+81\sin(dx+c)+12\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-12\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\right)}{12d}$
derivativedivides	$\frac{\frac{a^4\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+4a^4\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+6a^4\sin(dx+c)+4a^4(dx+c)+a^4\ln(\sec(dx+c)+\tan(dx+}{d}$
default	$\frac{\frac{a^4\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+4a^4\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+6a^4\sin(dx+c)+4a^4(dx+c)+a^4\ln(\sec(dx+c)+\tan(dx+}{d}$
parts	$\frac{a^4\ln(\sec(dx+c)+\tan(dx+c))}{d}+\frac{a^4(2+\cos^2(dx+c))\sin(dx+c)}{3d}+\frac{4a^4(dx+c)}{d}+\frac{6a^4\sin(dx+c)}{d}+\frac{4a^4\left(\frac{\cos(dx+c)\sin}{2}\right.}{}$
risch	$6a^4x-\frac{27ia^4e^{i(dx+c)}}{8d}+\frac{27ia^4e^{-i(dx+c)}}{8d}+\frac{a^4\ln(e^{i(dx+c)}+i)}{d}-\frac{a^4\ln(e^{i(dx+c)}-i)}{d}+\frac{a^4\sin(3dx+3c)}{12d}+\frac{a^4\sin}{}$
norman	$\frac{6a^4x+\frac{18a^4\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{130a^4\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}+\frac{106a^4\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}+\frac{10a^4\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+24a^4x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+36}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^4}$

```
[In] int((a+cos(d*x+c)*a)^4*sec(d*x+c),x,method=_RETURNVERBOSE)
```

```
[Out] 1/12*a^4*(72*d*x+sin(3*d*x+3*c)+12*sin(2*d*x+2*c)+81*sin(d*x+c)+12*ln(tan(1
/2*d*x+1/2*c)+1)-12*ln(tan(1/2*d*x+1/2*c)-1))/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.10

$$\int (a+a\cos(c+dx))^4\sec(c+dx)\,dx = \frac{36\,a^4dx+3\,a^4\log\left(\sin\left(dx+c\right)+1\right)-3\,a^4\log\left(-\sin\left(dx+c\right)+1\right)+2\,\left(a^4\cos\left(dx+c\right)^2+6\,a^4\cos\left(dx+c\right)\right.}{6\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c),x, algorithm="fricas")
[Out] 1/6*(36*a^4*d*x + 3*a^4*log(sin(d*x + c) + 1) - 3*a^4*log(-sin(d*x + c) + 1
) + 2*(a^4*cos(d*x + c)^2 + 6*a^4*cos(d*x + c) + 20*a^4)*sin(d*x + c))/d
```

Sympy [F]

$$\int (a+a\cos(c+dx))^4\sec(c+dx)\,dx = a^4\left(\int 4\cos\left(c+dx\right)\sec\left(c+dx\right)dx + \int 6\cos^2\left(c+dx\right)\sec\left(c+dx\right)dx + \int 4\cos^3\left(c+dx\right)\sec\left(c+dx\right)dx + \int \cos^4\left(c+dx\right)\sec\left(c+dx\right)dx + \int \sec\left(c+dx\right)dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))**4*sec(d*x+c),x)
[Out] a**4*(Integral(4*cos(c + d*x)*sec(c + d*x), x) + Integral(6*cos(c + d*x)**2
*sec(c + d*x), x) + Integral(4*cos(c + d*x)**3*sec(c + d*x), x) + Integral(
cos(c + d*x)**4*sec(c + d*x), x) + Integral(sec(c + d*x), x))
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 89, normalized size of antiderivative = 1.22

$$\int (a+a\cos(c+dx))^4\sec(c+dx)\,dx = -\frac{\left(\sin\left(dx+c\right)^3-3\,\sin\left(dx+c\right)\right)a^4-3\left(2\,dx+2\,c+\sin\left(2\,dx+2\,c\right)\right)a^4-12\left(dx+c\right)a^4-3\,a^4\log\left(\sec\left(dx\right.\right.}{3\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c),x, algorithm="maxima")
```

```
[Out] -1/3*((sin(d*x + c)^3 - 3*sin(d*x + c))*a^4 - 3*(2*d*x + 2*c + sin(2*d*x +
2*c))*a^4 - 12*(d*x + c)*a^4 - 3*a^4*log(sec(d*x + c) + tan(d*x + c)) - 18*
a^4*sin(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.59

$$\int (a+a\cos(c+dx))^4\sec(c+dx)\,dx$$
$$=\frac{18\,(dx+c)a^4+3\,a^4\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-3\,a^4\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)+\frac{2\left(15\,a^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5+\cdots\right.}{\left(\cdots\right.}}{3\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c),x, algorithm="giac")
```

```
[Out] 1/3*(18*(d*x + c)*a^4 + 3*a^4*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 3*a^4*lo
g(abs(tan(1/2*d*x + 1/2*c) - 1)) + 2*(15*a^4*tan(1/2*d*x + 1/2*c)^5 + 38*a^
4*tan(1/2*d*x + 1/2*c)^3 + 27*a^4*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*
c)^2 + 1)^3)/d
```

Mupad [B] (verification not implemented)

Time = 14.00 (sec) , antiderivative size = 93, normalized size of antiderivative = 1.27

$$\int (a+a\cos(c+dx))^4\sec(c+dx)\,dx=6\,a^4\,x+\frac{20\,a^4\,\sin\left(c+d\,x\right)}{3\,d}+\frac{2\,a^4\,\mathrm{atanh}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d}$$
$$+\frac{a^4\cos\left(c+d\,x\right)^2\,\sin\left(c+d\,x\right)}{3\,d}$$
$$+\frac{2\,a^4\,\cos\left(c+d\,x\right)\,\sin\left(c+d\,x\right)}{d}$$

```
[In] int((a + a*cos(c + d*x))^4/cos(c + d*x),x)
```

```
[Out] 6*a^4*x + (20*a^4*sin(c + d*x))/(3*d) + (2*a^4*atanh(sin(c/2 + (d*x)/2)/cos
(c/2 + (d*x)/2)))/d + (a^4*cos(c + d*x)^2*sin(c + d*x))/(3*d) + (2*a^4*cos(
c + d*x)*sin(c + d*x))/d
```

3.37 $\int (a+a\cos(c+dx))^4\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 73

$$\int (a+a\cos(c+dx))^4\sec^2(c+dx)\,dx=\frac{13a^4x}{2}+\frac{4a^4\text{arctanh}(\sin(c+dx))}{d}+\frac{4a^4\sin(c+dx)}{d}+\frac{a^4\cos(c+dx)\sin(c+dx)}{2d}+\frac{a^4\tan(c+dx)}{d}$$

```
[Out] 13/2*a^4*x+4*a^4*arctanh(sin(d*x+c))/d+4*a^4*sin(d*x+c)/d+1/2*a^4*cos(d*x+c
)*sin(d*x+c)/d+a^4*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2836, 2717, 2715, 8, 3855, 3852}

$$\int (a+a\cos(c+dx))^4\sec^2(c+dx)\,dx=\frac{4a^4\text{arctanh}(\sin(c+dx))}{d}+\frac{4a^4\sin(c+dx)}{d}+\frac{a^4\tan(c+dx)}{d}+\frac{a^4\sin(c+dx)\cos(c+dx)}{2d}+\frac{13a^4x}{2}$$

```
[In] Int[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^2,x]
```

```
[Out] (13*a^4*x)/2 + (4*a^4*ArcTanh[Sin[c + d*x]])/d + (4*a^4*Sin[c + d*x])/d + (
a^4*Cos[c + d*x]*Sin[c + d*x])/(2*d) + (a^4*Tan[c + d*x])/d
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2717

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = \int \left(6a^4 + 4a^4\cos(c+dx) + a^4\cos^2(c+dx) + 4a^4\sec(c+dx) + a^4\sec^2(c+dx)\right)\,dx$$

$$\begin{aligned}
&= 6a^4x + a^4\int \cos^2(c+dx)\,dx + a^4\int \sec^2(c+dx)\,dx \\
&\quad + \left(4a^4\right)\int \cos(c+dx)\,dx + \left(4a^4\right)\int \sec(c+dx)\,dx \\
&= 6a^4x + \frac{4a^4\text{arctanh}(\sin(c+dx))}{d} + \frac{4a^4\sin(c+dx)}{d} + \frac{a^4\cos(c+dx)\sin(c+dx)}{2d} \\
&\quad + \frac{1}{2}a^4\int 1\,dx - \frac{a^4\text{Subst}\left(\int 1\,dx, x, -\tan(c+dx)\right)}{d}
\end{aligned}$$

$$= \frac{13a^4x}{2} + \frac{4a^4\text{arctanh}(\sin(c+dx))}{d} + \frac{4a^4\sin(c+dx)}{d} + \frac{a^4\cos(c+dx)\sin(c+dx)}{2d} + \frac{a^4\tan(c+dx)}{d}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 241 vs. $2(73) = 146$.

Time = 3.00 (sec) , antiderivative size = 241, normalized size of antiderivative = 3.30

$$\int (a+a\cos(c+dx))^4\sec^2(c+dx)\,dx$$
$$= \frac{1}{64}a^4(1+\cos(c+dx))^4\sec^8\left(\frac{1}{2}(c+dx)\right)\left(26x - \frac{16\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)}{d} + \frac{16\log\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)}{d} + \frac{16\cos(dx)\sin(c)}{d} + \frac{\cos(2dx)\sin(2c)}{d} + \frac{16\cos(c)\sin(dx)}{d} + \frac{\cos(2c)\sin(2dx)}{d} + \frac{4\sin\left(\frac{dx}{2}\right)}{d\left(\cos\left(\frac{c}{2}\right)-\sin\left(\frac{c}{2}\right)\right)\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)} + \frac{4\sin\left(\frac{dx}{2}\right)}{d\left(\cos\left(\frac{c}{2}\right)+\sin\left(\frac{c}{2}\right)\right)\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)}\right)$$

```
[In] Integrate[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^2,x]
```

```
[Out] (a^4*(1 + Cos[c + d*x])^4*Sec[(c + d*x)/2]^8*(26*x - (16*Log[Cos[(c + d*x)/
2] - Sin[(c + d*x)/2]])/d + (16*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]])/d
 + (16*Cos[d*x]*Sin[c])/d + (Cos[2*d*x]*Sin[2*c])/d + (16*Cos[c]*Sin[d*x])/
d + (Cos[2*c]*Sin[2*d*x])/d + (4*Sin[(d*x)/2])/(d*(Cos[c/2] - Sin[c/2])*(Co
s[(c + d*x)/2] - Sin[(c + d*x)/2])) + (4*Sin[(d*x)/2])/(d*(Cos[c/2] + Sin[c
/2])*(Cos[(c + d*x)/2] + Sin[(c + d*x)/2]))))/64
```

Maple [A] (verified)

Time = 2.19 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.12

method	result
derivativedivides	$\frac{a^{4}\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+4a^{4}\sin(dx+c)+6a^{4}(dx+c)+4a^{4}\ln(\sec(dx+c)+\tan(dx+c))+a^{4}\tan(dx+c)}{d}$
default	$\frac{a^{4}\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+4a^{4}\sin(dx+c)+6a^{4}(dx+c)+4a^{4}\ln(\sec(dx+c)+\tan(dx+c))+a^{4}\tan(dx+c)}{d}$
parts	$\frac{a^{4}\tan(dx+c)}{d}+\frac{a^{4}\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{4a^{4}\ln(\sec(dx+c)+\tan(dx+c))}{d}+\frac{6a^{4}(dx+c)}{d}+\frac{4a^{4}\sin(dx+c}{d}$
parallelrisch	$\frac{a^{4}\left(52dx\cos(dx+c)-32\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(dx+c)+32\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)\cos(dx+c)+9\sin(dx+c)+\sin(3dx+3c)\right.}{8d\cos(dx+c)}$
risch	$\frac{13a^{4}x}{2}-\frac{ia^{4}e^{2i(dx+c)}}{8d}-\frac{2ia^{4}e^{i(dx+c)}}{d}+\frac{2ia^{4}e^{-i(dx+c)}}{d}+\frac{ia^{4}e^{-2i(dx+c)}}{8d}+\frac{2ia^{4}}{d(e^{2i(dx+c)}+1)}+\frac{4a^{4}\ln(e^{i(dx+c)}}{d}$
norman	$\frac{-\frac{13a^{4}x}{2}-\frac{11a^{4}\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}-\frac{24a^{4}\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-\frac{10a^{4}\left(\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{8a^{4}\left(\tan^{7}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{5a^{4}\left(\tan^{9}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-\frac{39a^{4}x}{}}{\left(1+\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^{4}(\text{ta}}$

```
[In] int((a+cos(d*x+c)*a)^4*sec(d*x+c)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a^4*(1/2*cos(d*x+c)*sin(d*x+c)+1/2*d*x+1/2*c)+4*a^4*sin(d*x+c)+6*a^4*(
d*x+c)+4*a^4*ln(sec(d*x+c)+tan(d*x+c))+a^4*tan(d*x+c))
```

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.44

$$\int (a+a\cos(c+dx))^4\sec^2(c+dx)\,dx$$
$$=\frac{13\,a^4dx\cos(dx+c)+4\,a^4\cos(dx+c)\log(\sin(dx+c)+1)-4\,a^4\cos(dx+c)\log(-\sin(dx+c)+1)+}{2\,d\cos(dx+c)}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] 1/2*(13*a^4*d*x*cos(d*x + c) + 4*a^4*cos(d*x + c)*log(sin(d*x + c) + 1) - 4
*a^4*cos(d*x + c)*log(-sin(d*x + c) + 1) + (a^4*cos(d*x + c)^2 + 8*a^4*cos(
d*x + c) + 2*a^4)*sin(d*x + c))/(d*cos(d*x + c))
```

Sympy [F]

$$\int (a + a\cos(c + dx))^4 \sec^2(c + dx)\, dx = a^4 \left(\int 4\cos(c + dx)\sec^2(c + dx)\, dx + \int 6\cos^2(c + dx)\sec^2(c + dx)\, dx + \int 4\cos^3(c + dx)\sec^2(c + dx)\, dx + \int \cos^4(c + dx)\sec^2(c + dx)\, dx + \int \sec^2(c + dx)\, dx \right)$$

```
[In] integrate((a+a*cos(d*x+c))**4*sec(d*x+c)**2,x)
```

```
[Out] a**4*(Integral(4*cos(c + d*x)*sec(c + d*x)**2, x) + Integral(6*cos(c + d*x)
**2*sec(c + d*x)**2, x) + Integral(4*cos(c + d*x)**3*sec(c + d*x)**2, x) +
Integral(cos(c + d*x)**4*sec(c + d*x)**2, x) + Integral(sec(c + d*x)**2, x)
)
```

Maxima [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.16

$$\int (a + a\cos(c + dx))^4 \sec^2(c + dx)\, dx = \frac{(2\,dx + 2\,c + \sin(2\,dx + 2\,c))a^4 + 24\,(dx + c)a^4 + 8\,a^4(\log(\sin(dx + c) + 1) - \log(\sin(dx + c) - 1)) + 16}{4\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] 1/4*((2*d*x + 2*c + sin(2*d*x + 2*c))*a^4 + 24*(d*x + c)*a^4 + 8*a^4*(log(s
in(d*x + c) + 1) - log(sin(d*x + c) - 1)) + 16*a^4*sin(d*x + c) + 4*a^4*tan
(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 129, normalized size of antiderivative = 1.77

$$\int (a + a\cos(c + dx))^4 \sec^2(c + dx)\, dx$$
$$= \frac{13\,(dx + c)a^4 + 8\,a^4 \log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) + 1\right|\right) - 8\,a^4 \log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) - 1\right|\right) - \frac{4\,a^4 \tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)}{\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)^2 - 1} + \frac{2\left(\right.}{}}{2\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^2,x, algorithm="giac")
```

```
[Out] 1/2*(13*(d*x + c)*a^4 + 8*a^4*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 8*a^4*lo
g(abs(tan(1/2*d*x + 1/2*c) - 1)) - 4*a^4*tan(1/2*d*x + 1/2*c)/(tan(1/2*d*x
+ 1/2*c)^2 - 1) + 2*(7*a^4*tan(1/2*d*x + 1/2*c)^3 + 9*a^4*tan(1/2*d*x + 1/2
*c))/(tan(1/2*d*x + 1/2*c)^2 + 1)^2)/d
```

Mupad [B] (verification not implemented)

Time = 14.57 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.60

$$\int (a + a\cos(c + dx))^4 \sec^2(c + dx)\, dx$$
$$= \frac{13\,a^4\,x}{2} + \frac{8\,a^4 \operatorname{atanh}\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)\right)}{d}$$
$$+ \frac{-5\,a^4 \tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^5 + 2\,a^4 \tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^3 + 11\,a^4 \tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)}{d\left(-\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^6 - \tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^4 + \tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^2 + 1\right)}$$

```
[In] int((a + a*cos(c + d*x))^4/cos(c + d*x)^2,x)
```

```
[Out] (13*a^4*x)/2 + (8*a^4*atanh(tan(c/2 + (d*x)/2)))/d + (2*a^4*tan(c/2 + (d*x)
/2)^3 - 5*a^4*tan(c/2 + (d*x)/2)^5 + 11*a^4*tan(c/2 + (d*x)/2))/(d*(tan(c/2
 + (d*x)/2)^2 - tan(c/2 + (d*x)/2)^4 - tan(c/2 + (d*x)/2)^6 + 1))
```

3.38 $\int (a+a\cos(c+dx))^4 \sec^3(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 73

$$\int (a+a\cos(c+dx))^4 \sec^3(c+dx)\,dx = 4a^4x+\frac{13a^4\text{arctanh}(\sin(c+dx))}{2d}+\frac{a^4\sin(c+dx)}{d}+\frac{4a^4\tan(c+dx)}{d}+\frac{a^4\sec(c+dx)\tan(c+dx)}{2d}$$

```
[Out] 4*a^4*x+13/2*a^4*arctanh(sin(d*x+c))/d+a^4*sin(d*x+c)/d+4*a^4*tan(d*x+c)/d+
1/2*a^4*sec(d*x+c)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2836, 2717, 3855, 3852, 8, 3853}

$$\int (a+a\cos(c+dx))^4 \sec^3(c+dx)\,dx = \frac{13a^4\text{arctanh}(\sin(c+dx))}{2d}+\frac{a^4\sin(c+dx)}{d}+\frac{4a^4\tan(c+dx)}{d}+\frac{a^4\tan(c+dx)\sec(c+dx)}{2d}+4a^4x$$

```
[In] Int[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^3,x]
```

```
[Out] 4*a^4*x + (13*a^4*ArcTanh[Sin[c + d*x]])/(2*d) + (a^4*Sin[c + d*x])/d + (4*
a^4*Tan[c + d*x])/d + (a^4*Sec[c + d*x]*Tan[c + d*x])/(2*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2717

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(4a^4+a^4\cos(c+dx)+6a^4\sec(c+dx)+4a^4\sec^2(c+dx)+a^4\sec^3(c+dx)\right)\,dx \\
&= 4a^4x+a^4\int\cos(c+dx)\,dx+a^4\int\sec^3(c+dx)\,dx \\
&\quad+\left(4a^4\right)\int\sec^2(c+dx)\,dx+\left(6a^4\right)\int\sec(c+dx)\,dx \\
&= 4a^4x+\frac{6a^4\operatorname{arctanh}(\sin(c+dx))}{d}+\frac{a^4\sin(c+dx)}{d}+\frac{a^4\sec(c+dx)\tan(c+dx)}{2d} \\
&\quad+\frac{1}{2}a^4\int\sec(c+dx)\,dx-\frac{\left(4a^4\right)\operatorname{Subst}\left(\int 1\,dx,x,-\tan(c+dx)\right)}{d}
\end{aligned}
$$

$$= 4a^4x + \frac{13a^4\text{arctanh}(\sin(c+dx))}{2d} + \frac{a^4\sin(c+dx)}{d} + \frac{4a^4\tan(c+dx)}{d} + \frac{a^4\sec(c+dx)\tan(c+dx)}{2d}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 272 vs. $2(73) = 146$.

Time = 3.46 (sec) , antiderivative size = 272, normalized size of antiderivative = 3.73

$$\int (a + a\cos(c+dx))^4 \sec^3(c+dx)\,dx$$
$$= \frac{1}{64}a^4(1+\cos(c+dx))^4\sec^8\left(\frac{1}{2}(c+dx)\right)\left(16x - \frac{26\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)}{d} + \frac{26\log\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)}{d} + \frac{4\cos(dx)\sin(c)}{d} + \frac{4\cos(c)\sin(dx)}{d} + \frac{1}{d\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)^2} + \frac{16\sin\left(\frac{dx}{2}\right)}{d\left(\cos\left(\frac{c}{2}\right)-\sin\left(\frac{c}{2}\right)\right)\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)} - \frac{1}{d\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)^2} + \frac{16\sin\left(\frac{dx}{2}\right)}{d\left(\cos\left(\frac{c}{2}\right)+\sin\left(\frac{c}{2}\right)\right)\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)}\right)$$

```
[In] Integrate[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^3,x]
```

```
[Out] (a^4*(1 + Cos[c + d*x])^4*Sec[(c + d*x)/2]^8*(16*x - (26*Log[Cos[(c + d*x)/
2] - Sin[(c + d*x)/2]])/d + (26*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]])/d
 + (4*Cos[d*x]*Sin[c])/d + (4*Cos[c]*Sin[d*x])/d + 1/(d*(Cos[(c + d*x)/2] -
 Sin[(c + d*x)/2])^2) + (16*Sin[(d*x)/2])/(d*(Cos[c/2] - Sin[c/2])*(Cos[(c
+ d*x)/2] - Sin[(c + d*x)/2])) - 1/(d*(Cos[(c + d*x)/2] + Sin[(c + d*x)/2])
^2) + (16*Sin[(d*x)/2])/(d*(Cos[c/2] + Sin[c/2])*(Cos[(c + d*x)/2] + Sin[(c
 + d*x)/2]))))/64
```

Maple [A] (verified)

Time = 2.97 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.25

method	result
derivativedivides	$\frac{a^4\sin(dx+c)+4a^4(dx+c)+6a^4\ln(\sec(dx+c)+\tan(dx+c))+4a^4\tan(dx+c)+a^4\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(d}{2}\right.}{d}$
default	$\frac{a^4\sin(dx+c)+4a^4(dx+c)+6a^4\ln(\sec(dx+c)+\tan(dx+c))+4a^4\tan(dx+c)+a^4\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(d}{2}\right.}{d}$
parts	$\frac{a^4\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}+\frac{a^4\sin(dx+c)}{d}+\frac{4a^4\tan(dx+c)}{d}+\frac{6a^4\ln(\sec(dx+c)+\tan(dx+}{d}$
parallelrisch	$\frac{a^4\left(-13(1+\cos(2dx+2c))\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+8dx\cos(2dx+2c)+13\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)\cos(2dx+2c)+8dx+13\ln\left(\tan\right.\right.}{2d(1+\cos(2dx+2c))}$
risch	$4a^4x-\frac{ia^4e^{i(dx+c)}}{2d}+\frac{ia^4e^{-i(dx+c)}}{2d}-\frac{ia^4\left(e^{3i(dx+c)}-8e^{2i(dx+c)}-e^{i(dx+c)}-8\right)}{d\left(e^{2i(dx+c)}+1\right)^2}-\frac{13a^4\ln\left(e^{i(dx+c)}-i\right)}{2d}+\frac{13a^4}{}$
norman	$\frac{4a^4x+\frac{11a^4\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{31a^4\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{22a^4\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-\frac{10a^4\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-\frac{17a^4\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-\frac{5a^4\left(\tan\right.}{}}{\left(1\right.}$

```
[In] int((a+cos(d*x+c)*a)^4*sec(d*x+c)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a^4*sin(d*x+c)+4*a^4*(d*x+c)+6*a^4*ln(sec(d*x+c)+tan(d*x+c))+4*a^4*tan
(d*x+c)+a^4*(1/2*sec(d*x+c)*tan(d*x+c)+1/2*ln(sec(d*x+c)+tan(d*x+c))))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.52

$$\int (a+a\cos(c+dx))^4\sec^3(c+dx)\,dx$$
$$=\frac{16\,a^4dx\cos(dx+c)^2+13\,a^4\cos(dx+c)^2\log(\sin(dx+c)+1)-13\,a^4\cos(dx+c)^2\log(-\sin(dx+c)+}{4\,d\cos(dx+c)^2}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] 1/4*(16*a^4*d*x*cos(d*x + c)^2 + 13*a^4*cos(d*x + c)^2*log(sin(d*x + c) + 1
) - 13*a^4*cos(d*x + c)^2*log(-sin(d*x + c) + 1) + 2*(2*a^4*cos(d*x + c)^2
+ 8*a^4*cos(d*x + c) + a^4)*sin(d*x + c))/(d*cos(d*x + c)^2)
```

Sympy [F]

$$\int (a+a\cos(c+dx))^4\sec^3(c+dx)\,dx = a^4\left(\int 4\cos(c+dx)\sec^3(c+dx)\,dx + \int 6\cos^2(c+dx)\sec^3(c+dx)\,dx + \int 4\cos^3(c+dx)\sec^3(c+dx)\,dx + \int \cos^4(c+dx)\sec^3(c+dx)\,dx + \int \sec^3(c+dx)\,dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))**4*sec(d*x+c)**3,x)
```

```
[Out] a**4*(Integral(4*cos(c + d*x)*sec(c + d*x)**3, x) + Integral(6*cos(c + d*x)
**2*sec(c + d*x)**3, x) + Integral(4*cos(c + d*x)**3*sec(c + d*x)**3, x) +
Integral(cos(c + d*x)**4*sec(c + d*x)**3, x) + Integral(sec(c + d*x)**3, x)
)
```

Maxima [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.51

$$\int (a+a\cos(c+dx))^4\sec^3(c+dx)\,dx = \frac{16\,(dx+c)a^4 - a^4\left(\frac{2\,\sin(dx+c)}{\sin(dx+c)^2-1} - \log(\sin(dx+c)+1) + \log(\sin(dx+c)-1)\right) + 12\,a^4(\log(\sin(dx+c)+}{4\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] 1/4*(16*(d*x + c)*a^4 - a^4*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(
d*x + c) + 1) + log(sin(d*x + c) - 1)) + 12*a^4*(log(sin(d*x + c) + 1) - lo
g(sin(d*x + c) - 1)) + 4*a^4*sin(d*x + c) + 16*a^4*tan(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.38 (sec) , antiderivative size = 129, normalized size of antiderivative = 1.77

$$\int (a + a\cos(c + dx))^4 \sec^3(c + dx)\, dx$$
$$= \frac{8\,(dx + c)a^4 + 13\,a^4 \log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) + 1\right|\right) - 13\,a^4 \log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) - 1\right|\right) + \frac{4\,a^4 \tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)}{\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)^2 + 1} - \frac{2}{}}{2\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^3,x, algorithm="giac")
```

```
[Out] 1/2*(8*(d*x + c)*a^4 + 13*a^4*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 13*a^4*l
og(abs(tan(1/2*d*x + 1/2*c) - 1)) + 4*a^4*tan(1/2*d*x + 1/2*c)/(tan(1/2*d*x
 + 1/2*c)^2 + 1) - 2*(7*a^4*tan(1/2*d*x + 1/2*c)^3 - 9*a^4*tan(1/2*d*x + 1/
2*c))/(tan(1/2*d*x + 1/2*c)^2 - 1)^2)/d
```

Mupad [B] (verification not implemented)

Time = 14.79 (sec) , antiderivative size = 115, normalized size of antiderivative = 1.58

$$\int (a + a\cos(c + dx))^4 \sec^3(c + dx)\, dx$$
$$= 4\,a^4\,x + \frac{13\,a^4\,\mathrm{atanh}\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)\right)}{d} + \frac{5\,a^4\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^5 + 2\,a^4\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^3 - 11\,a^4\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)}{d\left(-\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^6 + \tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^4 + \tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^2 - 1\right)}$$

```
[In] int((a + a*cos(c + d*x))^4/cos(c + d*x)^3,x)
```

```
[Out] 4*a^4*x + (13*a^4*atanh(tan(c/2 + (d*x)/2)))/d + (2*a^4*tan(c/2 + (d*x)/2)^
3 + 5*a^4*tan(c/2 + (d*x)/2)^5 - 11*a^4*tan(c/2 + (d*x)/2))/(d*(tan(c/2 + (
d*x)/2)^2 + tan(c/2 + (d*x)/2)^4 - tan(c/2 + (d*x)/2)^6 - 1))
```

3.39 $\int (a+a\cos(c+dx))^4\sec^4(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 73

$$\int (a+a\cos(c+dx))^4\sec^4(c+dx)\,dx=a^4x+\frac{6a^4\operatorname{arctanh}(\sin(c+dx))}{d}+\frac{7a^4\tan(c+dx)}{d}+\frac{2a^4\sec(c+dx)\tan(c+dx)}{d}+\frac{a^4\tan^3(c+dx)}{3d}$$

```
[Out] a^4*x+6*a^4*arctanh(sin(d*x+c))/d+7*a^4*tan(d*x+c)/d+2*a^4*sec(d*x+c)*tan(d
*x+c)/d+1/3*a^4*tan(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2836, 3855, 3852, 8, 3853}

$$\int (a+a\cos(c+dx))^4\sec^4(c+dx)\,dx=\frac{6a^4\operatorname{arctanh}(\sin(c+dx))}{d}+\frac{a^4\tan^3(c+dx)}{3d}+\frac{7a^4\tan(c+dx)}{d}+\frac{2a^4\tan(c+dx)\sec(c+dx)}{d}+a^4x$$

```
[In] Int[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^4,x]
```

```
[Out] a^4*x + (6*a^4*ArcTanh[Sin[c + d*x]])/d + (7*a^4*Tan[c + d*x])/d + (2*a^4*S
ec[c + d*x]*Tan[c + d*x])/d + (a^4*Tan[c + d*x]^3)/(3*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(a^4+4a^4\sec(c+dx)+6a^4\sec^2(c+dx)+4a^4\sec^3(c+dx)+a^4\sec^4(c+dx)\right)\,dx\\
&= a^4x+a^4\int \sec^4(c+dx)\,dx+\left(4a^4\right)\int \sec(c+dx)\,dx\\
&\quad+\left(4a^4\right)\int \sec^3(c+dx)\,dx+\left(6a^4\right)\int \sec^2(c+dx)\,dx\\
&= a^4x+\frac{4a^4\text{arctanh}(\sin(c+dx))}{d}+\frac{2a^4\sec(c+dx)\tan(c+dx)}{d}+\left(2a^4\right)\int \sec(c+dx)\,dx\\
&\quad-\frac{a^4\text{Subst}\left(\int \left(1+x^2\right)\,dx,x,-\tan(c+dx)\right)}{d}-\frac{\left(6a^4\right)\text{Subst}\left(\int 1\,dx,x,-\tan(c+dx)\right)}{d}\\
&= a^4x+\frac{6a^4\text{arctanh}(\sin(c+dx))}{d}+\frac{7a^4\tan(c+dx)}{d}\\
&\quad+\frac{2a^4\sec(c+dx)\tan(c+dx)}{d}+\frac{a^4\tan^3(c+dx)}{3d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.84

$$\int (a+a\cos(c+dx))^4\sec^4(c+dx)\,dx = a^4\left(x+\frac{6\text{arctanh}(\sin(c+dx))}{d}+\frac{7\tan(c+dx)}{d}+\frac{2\sec(c+dx)\tan(c+dx)}{d}+\frac{\tan^3(c+dx)}{3d}\right)$$

```
[In] Integrate[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^4,x]
```

```
[Out] a^4*(x + (6*ArcTanh[Sin[c + d*x]])/d + (7*Tan[c + d*x])/d + (2*Sec[c + d*x]
*Tan[c + d*x])/d + Tan[c + d*x]^3/(3*d))
```

Maple [A] (verified)

Time = 3.30 (sec) , antiderivative size = 96, normalized size of antiderivative = 1.32

method	result
parts	$-\frac{a^4\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)}{d}+\frac{a^4(dx+c)}{d}+\frac{2a^4\sec(dx+c)\tan(dx+c)}{d}+\frac{6a^4\ln(\sec(dx+c)+\tan(dx+c))}{d}+$
derivativedivides	$\frac{a^4(dx+c)+4a^4\ln(\sec(dx+c)+\tan(dx+c))+6a^4\tan(dx+c)+4a^4\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-a^4 (-\frac{2}{3}}{d}$
default	$\frac{a^4(dx+c)+4a^4\ln(\sec(dx+c)+\tan(dx+c))+6a^4\tan(dx+c)+4a^4\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-a^4 (-\frac{2}{3}}{d}$
risch	$a^4x-\frac{4ia^4\left(3\,\mathrm{e}^{5i(dx+c)}-9\,\mathrm{e}^{4i(dx+c)}-21\,\mathrm{e}^{2i(dx+c)}-3\,\mathrm{e}^{i(dx+c)}-10\right)}{3d\left(\mathrm{e}^{2i(dx+c)}+1\right)^3}+\frac{6a^4\ln\left(\mathrm{e}^{i(dx+c)}+i\right)}{d}-\frac{6a^4\ln\left(\mathrm{e}^{i(dx+c)}-i\right)}{d}$
parallelrisch	$-\frac{18\left(\left(\cos(dx+c)+\frac{\cos(3dx+3c)}{3}\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+\left(-\cos(dx+c)-\frac{\cos(3dx+3c)}{3}\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-\frac{dx\cos(dx+c)}{6}-}{d(\cos(3dx+3c)+3\cos(dx+c))}$
norman	$\frac{a^4x\left(\tan^{12}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a^4x\left(\tan^{14}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-a^4x-\frac{18a^4\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}-\frac{140a^4\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}-\frac{50a^4\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}+\frac{40a^4 (}{}}{}$

```
[In] int((a+cos(d*x+c)*a)^4*sec(d*x+c)^4,x,method=_RETURNVERBOSE)
```

```
[Out] -a^4/d*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c)+a^4/d*(d*x+c)+2*a^4*sec(d*x+c)*ta
n(d*x+c)/d+6*a^4/d*ln(sec(d*x+c)+tan(d*x+c))+6*a^4*tan(d*x+c)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.51

$$\int (a + a\cos(c + dx))^4 \sec^4(c + dx)\, dx$$
$$= \frac{3\, a^4 dx \cos\left(dx + c\right)^3 + 9\, a^4 \cos\left(dx + c\right)^3 \log\left(\sin\left(dx + c\right) + 1\right) - 9\, a^4 \cos\left(dx + c\right)^3 \log\left(-\sin\left(dx + c\right) + 1\right)}{3\, d \cos\left(dx + c\right)^3}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] 1/3*(3*a^4*d*x*cos(d*x + c)^3 + 9*a^4*cos(d*x + c)^3*log(sin(d*x + c) + 1)
- 9*a^4*cos(d*x + c)^3*log(-sin(d*x + c) + 1) + (20*a^4*cos(d*x + c)^2 + 6*
a^4*cos(d*x + c) + a^4)*sin(d*x + c))/(d*cos(d*x + c)^3)
```

Sympy [F]

$$\int (a + a\cos(c + dx))^4 \sec^4(c + dx)\, dx = a^4 \left(\int 4 \cos\left(c + dx\right) \sec^4\left(c + dx\right) dx + \int 6 \cos^2\left(c + dx\right) \sec^4\left(c + dx\right) dx + \int 4 \cos^3\left(c + dx\right) \sec^4\left(c + dx\right) dx + \int \cos^4\left(c + dx\right) \sec^4\left(c + dx\right) dx + \int \sec^4\left(c + dx\right) dx \right)$$

```
[In] integrate((a+a*cos(d*x+c))**4*sec(d*x+c)**4,x)
```

```
[Out] a**4*(Integral(4*cos(c + d*x)*sec(c + d*x)**4, x) + Integral(6*cos(c + d*x)
**2*sec(c + d*x)**4, x) + Integral(4*cos(c + d*x)**3*sec(c + d*x)**4, x) +
Integral(cos(c + d*x)**4*sec(c + d*x)**4, x) + Integral(sec(c + d*x)**4, x)
)
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 120, normalized size of antiderivative = 1.64

$$\int (a+a\cos(c+dx))^4\sec^4(c+dx)\,dx$$
$$=\frac{\left(\tan\left(dx+c\right)^3+3\,\tan\left(dx+c\right)\right)a^4+3\left(dx+c\right)a^4-3\,a^4\left(\frac{2\,\sin(dx+c)}{\sin(dx+c)^2-1}-\log\left(\sin\left(dx+c\right)+1\right)+\log\left(\sin\left(dx\right.\right.\right.}{3\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] 1/3*((tan(d*x + c)^3 + 3*tan(d*x + c))*a^4 + 3*(d*x + c)*a^4 - 3*a^4*(2*sin
(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) -
 1)) + 6*a^4*(log(sin(d*x + c) + 1) - log(sin(d*x + c) - 1)) + 18*a^4*tan(d
*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.59

$$\int (a+a\cos(c+dx))^4\sec^4(c+dx)\,dx$$
$$=\frac{3\left(dx+c\right)a^4+18\,a^4\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-18\,a^4\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)-\frac{2\left(15\,a^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-3\right.}{\left(\mathrm{ta}\right.}}{3\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^4,x, algorithm="giac")
```

```
[Out] 1/3*(3*(d*x + c)*a^4 + 18*a^4*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 18*a^4*l
og(abs(tan(1/2*d*x + 1/2*c) - 1)) - 2*(15*a^4*tan(1/2*d*x + 1/2*c)^5 - 38*a
^4*tan(1/2*d*x + 1/2*c)^3 + 27*a^4*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2
*c)^2 - 1)^3)/d
```

Mupad [B] (verification not implemented)

Time = 14.64 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.60

$$\int (a+a\cos(c+dx))^4\sec^4(c+dx)\,dx$$
$$=a^4\,x+\frac{12\,a^4\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}$$
$$-\frac{10\,a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5-\frac{76\,a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{3}+18\,a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6-3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-1\right)}$$

```
[In] int((a + a*cos(c + d*x))^4/cos(c + d*x)^4,x)
```

```
[Out] a^4*x + (12*a^4*atanh(tan(c/2 + (d*x)/2)))/d - (10*a^4*tan(c/2 + (d*x)/2)^5
 - (76*a^4*tan(c/2 + (d*x)/2)^3)/3 + 18*a^4*tan(c/2 + (d*x)/2))/(d*(3*tan(c
/2 + (d*x)/2)^2 - 3*tan(c/2 + (d*x)/2)^4 + tan(c/2 + (d*x)/2)^6 - 1))
```

3.40 $\int (a + a\cos(c + dx))^4 \sec^5(c + dx)\, dx$

Optimal result

Integrand size = 21, antiderivative size = 96

$$\int (a + a\cos(c + dx))^4 \sec^5(c + dx)\, dx = \frac{35a^4 \operatorname{arctanh}(\sin(c + dx))}{8d} + \frac{8a^4 \tan(c + dx)}{d} + \frac{27a^4 \sec(c + dx)\tan(c + dx)}{8d} + \frac{a^4 \sec^3(c + dx)\tan(c + dx)}{4d} + \frac{4a^4 \tan^3(c + dx)}{3d}$$

```
[Out] 35/8*a^4*arctanh(sin(d*x+c))/d+8*a^4*tan(d*x+c)/d+27/8*a^4*sec(d*x+c)*tan(d
*x+c)/d+1/4*a^4*sec(d*x+c)^3*tan(d*x+c)/d+4/3*a^4*tan(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2836, 3855, 3852, 8, 3853}

$$\int (a + a\cos(c + dx))^4 \sec^5(c + dx)\, dx = \frac{35a^4 \operatorname{arctanh}(\sin(c + dx))}{8d} + \frac{4a^4 \tan^3(c + dx)}{3d} + \frac{8a^4 \tan(c + dx)}{d} + \frac{a^4 \tan(c + dx)\sec^3(c + dx)}{4d} + \frac{27a^4 \tan(c + dx)\sec(c + dx)}{8d}$$

```
[In] Int[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^5,x]
```

```
[Out] (35*a^4*ArcTanh[Sin[c + d*x]])/(8*d) + (8*a^4*Tan[c + d*x])/d + (27*a^4*Sec
[c + d*x]*Tan[c + d*x])/(8*d) + (a^4*Sec[c + d*x]^3*Tan[c + d*x])/(4*d) + (
4*a^4*Tan[c + d*x]^3)/(3*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = \int \left(a^4\sec(c+dx) + 4a^4\sec^2(c+dx) + 6a^4\sec^3(c+dx) + 4a^4\sec^4(c+dx) + a^4\sec^5(c+dx)\right)\,dx$$

$$= a^4\int \sec(c+dx)\,dx + a^4\int \sec^5(c+dx)\,dx + \left(4a^4\right)\int \sec^2(c+dx)\,dx + \left(4a^4\right)\int \sec^4(c+dx)\,dx + \left(6a^4\right)\int \sec^3(c+dx)\,dx$$

$$= \frac{a^4\text{arctanh}(\sin(c+dx))}{d} + \frac{3a^4\sec(c+dx)\tan(c+dx)}{d} + \frac{a^4\sec^3(c+dx)\tan(c+dx)}{4d} + \frac{1}{4}\left(3a^4\right)\int \sec^3(c+dx)\,dx + \left(3a^4\right)\int \sec(c+dx)\,dx - \frac{\left(4a^4\right)\text{Subst}\left(\int 1\,dx, x, -\tan(c+dx)\right)}{d} - \frac{\left(4a^4\right)\text{Subst}\left(\int \left(1+x^2\right)\,dx, x, -\tan(c+dx)\right)}{d}$$

$$= \frac{4a^4 \text{arctanh}(\sin(c+dx))}{d} + \frac{8a^4 \tan(c+dx)}{d} + \frac{27a^4 \sec(c+dx)\tan(c+dx)}{8d} + \frac{a^4 \sec^3(c+dx)\tan(c+dx)}{4d} + \frac{4a^4 \tan^3(c+dx)}{3d} + \frac{1}{8}(3a^4)\int \sec(c+dx)\,dx$$

$$= \frac{35a^4 \text{arctanh}(\sin(c+dx))}{8d} + \frac{8a^4 \tan(c+dx)}{d} + \frac{27a^4 \sec(c+dx)\tan(c+dx)}{8d} + \frac{a^4 \sec^3(c+dx)\tan(c+dx)}{4d} + \frac{4a^4 \tan^3(c+dx)}{3d}$$

Mathematica [A] (verified)

Time = 1.28 (sec) , antiderivative size = 96, normalized size of antiderivative = 1.00

$$\int (a+a\cos(c+dx))^4 \sec^5(c+dx)\,dx = \frac{35a^4 \text{arctanh}(\sin(c+dx))}{8d} + \frac{8a^4 \tan(c+dx)}{d} + \frac{27a^4 \sec(c+dx)\tan(c+dx)}{8d} + \frac{a^4 \sec^3(c+dx)\tan(c+dx)}{4d} + \frac{4a^4 \tan^3(c+dx)}{3d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^5,x]
```

```
[Out] (35*a^4*ArcTanh[Sin[c + d*x]])/(8*d) + (8*a^4*Tan[c + d*x])/d + (27*a^4*Sec
[c + d*x]*Tan[c + d*x])/(8*d) + (a^4*Sec[c + d*x]^3*Tan[c + d*x])/(4*d) + (
4*a^4*Tan[c + d*x]^3)/(3*d)
```

Maple [A] (verified)

Time = 3.95 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.41

method	result
parts	$\frac{a^4\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)}{d}+\frac{4a^4\ln(\sec(dx+c)+\tan(dx+c))}{d}-\frac{4a ...}{}$
derivativedivides	$\frac{a^4\ln(\sec(dx+c)+\tan(dx+c))+4a^4\tan(dx+c)+6a^4\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-4a^4\left(-\frac{2}{3}-\frac{\left(\sec^2(d ...}{3}\right.}{d}$
default	$\frac{a^4\ln(\sec(dx+c)+\tan(dx+c))+4a^4\tan(dx+c)+6a^4\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-4a^4\left(-\frac{2}{3}-\frac{\left(\sec^2(d ...}{3}\right.}{d}$
risch	$-\frac{ia^4\left(81\,e^{7i(dx+c)}-96\,e^{6i(dx+c)}+105\,e^{5i(dx+c)}-480\,e^{4i(dx+c)}-105\,e^{3i(dx+c)}-544\,e^{2i(dx+c)}-81\,e^{i(dx+c)}-160\right)}{12d\left(e^{2i(dx+c)}+1\right)^4}+\frac{35 ...}{}$
parallelrisch	$\frac{a^4\left(105(-\cos(4dx+4c)-4\cos(2dx+2c)-3)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+105(\cos(4dx+4c)+4\cos(2dx+2c)+3)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right) ...\right.\right.}{24d(\cos(4dx+4c)+4\cos(2dx+2c)+3)}$
norman	$\frac{\frac{93a^4\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d}+\frac{605a^4\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12d}+\frac{5a^4\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}-\frac{515a^4\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12d}+\frac{125a^4\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12d}+\frac{133a^4\left(\tan^{11} ...\right.}{4d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^4\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^4}$

```
[In] int((a+cos(d*x+c)*a)^4*sec(d*x+c)^5,x,method=_RETURNVERBOSE)
```

```
[Out] a^4/d*(-(-1/4*sec(d*x+c)^3-3/8*sec(d*x+c))*tan(d*x+c)+3/8*ln(sec(d*x+c)+tan
(d*x+c)))+4*a^4/d*ln(sec(d*x+c)+tan(d*x+c))-4*a^4/d*(-2/3-1/3*sec(d*x+c)^2)
*tan(d*x+c)+3*a^4*sec(d*x+c)*tan(d*x+c)/d+4*a^4*tan(d*x+c)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.16

$$\int (a+a\cos(c+dx))^4\sec^5(c+dx)\,dx$$
$$=\frac{105\,a^4\cos(dx+c)^4\log(\sin(dx+c)+1)-105\,a^4\cos(dx+c)^4\log(-\sin(dx+c)+1)+2\,(160\,a^4\cos(d ...}{48\,d\cos(dx+c)^4}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] 1/48*(105*a^4*cos(d*x + c)^4*log(sin(d*x + c) + 1) - 105*a^4*cos(d*x + c)^4
*log(-sin(d*x + c) + 1) + 2*(160*a^4*cos(d*x + c)^3 + 81*a^4*cos(d*x + c)^2
 + 32*a^4*cos(d*x + c) + 6*a^4)*sin(d*x + c))/(d*cos(d*x + c)^4)
```

Sympy [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^4 \sec^5(c + dx)\, dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**4*sec(d*x+c)**5,x)
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 182 vs. 2(88) = 176.

Time = 0.27 (sec) , antiderivative size = 182, normalized size of antiderivative = 1.90

$$\int (a + a\cos(c + dx))^4 \sec^5(c + dx)\, dx$$
$$= \frac{64\left(\tan(dx+c)^3 + 3\tan(dx+c)\right)a^4 - 3a^4\left(\frac{2\left(3\sin(dx+c)^3 - 5\sin(dx+c)\right)}{\sin(dx+c)^4 - 2\sin(dx+c)^2 + 1} - 3\log(\sin(dx+c)+1) + 3\log(\sin\ldots\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^5,x, algorithm="maxima")
[Out] 1/48*(64*(tan(d*x + c)^3 + 3*tan(d*x + c))*a^4 - 3*a^4*(2*(3*sin(d*x + c)^3
 - 5*sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2 + 1) - 3*log(sin(d*x
+ c) + 1) + 3*log(sin(d*x + c) - 1)) - 72*a^4*(2*sin(d*x + c)/(sin(d*x + c)
^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)) + 24*a^4*(log(sin(
d*x + c) + 1) - log(sin(d*x + c) - 1)) + 192*a^4*tan(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.38 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.27

$$\int (a + a\cos(c + dx))^4 \sec^5(c + dx)\, dx$$
$$= \frac{105a^4\log\left(\left|\tan\left(\frac{1}{2}dx + \frac{1}{2}c\right) + 1\right|\right) - 105a^4\log\left(\left|\tan\left(\frac{1}{2}dx + \frac{1}{2}c\right) - 1\right|\right) - \frac{2\left(105a^4\tan\left(\frac{1}{2}dx + \frac{1}{2}c\right)^7 - 385a^4\tan\left(\frac{1}{2}dx + \ldots\right.\right.}{\left(\tan\left(\ldots\right.\right.}}{24d}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^5,x, algorithm="giac")
[Out] 1/24*(105*a^4*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 105*a^4*log(abs(tan(1/2*
d*x + 1/2*c) - 1)) - 2*(105*a^4*tan(1/2*d*x + 1/2*c)^7 - 385*a^4*tan(1/2*d*
x + 1/2*c)^5 + 511*a^4*tan(1/2*d*x + 1/2*c)^3 - 279*a^4*tan(1/2*d*x + 1/2*c
))/(tan(1/2*d*x + 1/2*c)^2 - 1)^4)/d
```

Mupad [B] (verification not implemented)

Time = 17.75 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.47

$$\int (a+a\cos(c+dx))^4\sec^5(c+dx)\,dx$$
$$=\frac{35\,a^4\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{4\,d}-\frac{\frac{35\,a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{4}-\frac{385\,a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{12}+\frac{511\,a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{12}-\frac{93\,a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{4}}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8-4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6+6\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)}$$

```
[In] int((a + a*cos(c + d*x))^4/cos(c + d*x)^5,x)
```

```
[Out] (35*a^4*atanh(tan(c/2 + (d*x)/2)))/(4*d) - ((511*a^4*tan(c/2 + (d*x)/2)^3)/
12 - (385*a^4*tan(c/2 + (d*x)/2)^5)/12 + (35*a^4*tan(c/2 + (d*x)/2)^7)/4 -
(93*a^4*tan(c/2 + (d*x)/2))/4)/(d*(6*tan(c/2 + (d*x)/2)^4 - 4*tan(c/2 + (d*
x)/2)^2 - 4*tan(c/2 + (d*x)/2)^6 + tan(c/2 + (d*x)/2)^8 + 1))
```

3.41 $\int (a+a\cos(c+dx))^4\sec^6(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 111

$$\int (a+a\cos(c+dx))^4\sec^6(c+dx)\,dx=\frac{7a^4\text{arctanh}(\sin(c+dx))}{2d}+\frac{8a^4\tan(c+dx)}{d}+\frac{7a^4\sec(c+dx)\tan(c+dx)}{2d}+\frac{a^4\sec^3(c+dx)\tan(c+dx)}{d}+\frac{8a^4\tan^3(c+dx)}{3d}+\frac{a^4\tan^5(c+dx)}{5d}$$

```
[Out] 7/2*a^4*arctanh(sin(d*x+c))/d+8*a^4*tan(d*x+c)/d+7/2*a^4*sec(d*x+c)*tan(d*x
+c)/d+a^4*sec(d*x+c)^3*tan(d*x+c)/d+8/3*a^4*tan(d*x+c)^3/d+1/5*a^4*tan(d*x+
c)^5/d
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2836, 3852, 8, 3853, 3855}

$$\int (a+a\cos(c+dx))^4\sec^6(c+dx)\,dx=\frac{7a^4\text{arctanh}(\sin(c+dx))}{2d}+\frac{a^4\tan^5(c+dx)}{5d}+\frac{8a^4\tan^3(c+dx)}{3d}+\frac{8a^4\tan(c+dx)}{d}+\frac{a^4\tan(c+dx)\sec^3(c+dx)}{d}+\frac{7a^4\tan(c+dx)\sec(c+dx)}{2d}$$

```
[In] Int[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^6,x]
```

```
[Out] (7*a^4*ArcTanh[Sin[c + d*x]])/(2*d) + (8*a^4*Tan[c + d*x])/d + (7*a^4*Sec[c
 + d*x]*Tan[c + d*x])/(2*d) + (a^4*Sec[c + d*x]^3*Tan[c + d*x])/d + (8*a^4*
Tan[c + d*x]^3)/(3*d) + (a^4*Tan[c + d*x]^5)/(5*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(a^4 \sec^2(c+dx) + 4a^4 \sec^3(c+dx) + 6a^4 \sec^4(c+dx) + 4a^4 \sec^5(c+dx) + a^4 \sec^6(c+dx)\right) dx \\
&= a^4 \int \sec^2(c+dx)\,dx + a^4 \int \sec^6(c+dx)\,dx + \left(4a^4\right) \int \sec^3(c+dx)\,dx \\
&\quad + \left(4a^4\right) \int \sec^5(c+dx)\,dx + \left(6a^4\right) \int \sec^4(c+dx)\,dx
\end{aligned}$$

$$= \frac{2a^4 \sec(c+dx)\tan(c+dx)}{d} + \frac{a^4 \sec^3(c+dx)\tan(c+dx)}{d} + (2a^4)\int \sec(c+dx)\,dx$$
$$+ (3a^4)\int \sec^3(c+dx)\,dx - \frac{a^4\text{Subst}(\int 1\,dx, x, -\tan(c+dx))}{d}$$
$$- \frac{a^4\text{Subst}\left(\int (1+2x^2+x^4)\,dx, x, -\tan(c+dx)\right)}{d}$$
$$- \frac{(6a^4)\,\text{Subst}\left(\int (1+x^2)\,dx, x, -\tan(c+dx)\right)}{d}$$
$$= \frac{2a^4\text{arctanh}(\sin(c+dx))}{d} + \frac{8a^4\tan(c+dx)}{d} + \frac{7a^4\sec(c+dx)\tan(c+dx)}{2d}$$
$$+ \frac{a^4\sec^3(c+dx)\tan(c+dx)}{d} + \frac{8a^4\tan^3(c+dx)}{3d}$$
$$+ \frac{a^4\tan^5(c+dx)}{5d} + \frac{1}{2}(3a^4)\int \sec(c+dx)\,dx$$
$$= \frac{7a^4\text{arctanh}(\sin(c+dx))}{2d} + \frac{8a^4\tan(c+dx)}{d} + \frac{7a^4\sec(c+dx)\tan(c+dx)}{2d}$$
$$+ \frac{a^4\sec^3(c+dx)\tan(c+dx)}{d} + \frac{8a^4\tan^3(c+dx)}{3d} + \frac{a^4\tan^5(c+dx)}{5d}$$

Mathematica [A] (verified)

Time = 1.57 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.00

$$\int (a+a\cos(c+dx))^4\sec^6(c+dx)\,dx = \frac{7a^4\text{arctanh}(\sin(c+dx))}{2d} + \frac{8a^4\tan(c+dx)}{d} + \frac{7a^4\sec(c+dx)\tan(c+dx)}{2d} + \frac{a^4\sec^3(c+dx)\tan(c+dx)}{d} + \frac{8a^4\tan^3(c+dx)}{3d} + \frac{a^4\tan^5(c+dx)}{5d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^6,x]
```

```
[Out] (7*a^4*ArcTanh[Sin[c + d*x]])/(2*d) + (8*a^4*Tan[c + d*x])/d + (7*a^4*Sec[c
 + d*x]*Tan[c + d*x])/(2*d) + (a^4*Sec[c + d*x]^3*Tan[c + d*x])/d + (8*a^4*
Tan[c + d*x]^3)/(3*d) + (a^4*Tan[c + d*x]^5)/(5*d)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 4.38 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.41

method	result
risch	$-\frac{i a^{4}\left(105\,\mathrm{e}^{9 i (d x+c)}-30\,\mathrm{e}^{8 i (d x+c)}+330\,\mathrm{e}^{7 i (d x+c)}-480\,\mathrm{e}^{6 i (d x+c)}-1180\,\mathrm{e}^{4 i (d x+c)}-330\,\mathrm{e}^{3 i (d x+c)}-800\,\mathrm{e}^{2 i (d x+c)}-105\,\mathrm{e}^{i (d}\right.}{15 d\left(\mathrm{e}^{2 i (d x+c)}+1\right)^{5}}$
derivativedivides	$\frac{a^{4}\tan(dx+c)+4a^{4}\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-6a^{4}\left(-\frac{2}{3}-\frac{\left(\sec^{2}(dx+c)\right)}{3}\right)\tan(dx+c)+4a^{4}\left(-\left(-\left(\right.\right.\right.}{}$
default	$\frac{a^{4}\tan(dx+c)+4a^{4}\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-6a^{4}\left(-\frac{2}{3}-\frac{\left(\sec^{2}(dx+c)\right)}{3}\right)\tan(dx+c)+4a^{4}\left(-\left(-\left(\right.\right.\right.}{}$
parts	$-\frac{a^{4}\left(-\frac{8}{15}-\frac{\left(\sec^{4}(dx+c)\right)}{5}-\frac{4\left(\sec^{2}(dx+c)\right)}{15}\right)\tan(dx+c)}{d}+\frac{a^{4}\tan(dx+c)}{d}+\frac{4a^{4}\left(-\left(-\frac{\left(\sec^{3}(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\mathrm{ta}\right.}{d}$
parallelrisch	$\frac{77\left(\left(-\frac{15\cos(dx+c)}{11}-\frac{15\cos(3dx+3c)}{22}-\frac{3\cos(5dx+5c)}{22}\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+\left(\frac{15\cos(dx+c)}{11}+\frac{15\cos(3dx+3c)}{22}+\frac{3\cos(5dx+5c)}{22}\right.\right.}{3d(\cos(5dx+5c)+5\cos(3dx+3c)+}$

```
[In] int((a+cos(d*x+c)*a)^4*sec(d*x+c)^6,x,method=_RETURNVERBOSE)
```

```
[Out] -1/15*I*a^4*(105*exp(9*I*(d*x+c))-30*exp(8*I*(d*x+c))+330*exp(7*I*(d*x+c))-
480*exp(6*I*(d*x+c))-1180*exp(4*I*(d*x+c))-330*exp(3*I*(d*x+c))-800*exp(2*I
*(d*x+c))-105*exp(I*(d*x+c))-166)/d/(exp(2*I*(d*x+c))+1)^5+7/2*a^4/d*ln(exp
(I*(d*x+c))+I)-7/2*a^4/d*ln(exp(I*(d*x+c))-I)
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.12

$$\int (a+a\cos(c+dx))^4\sec^6(c+dx)\,dx$$
$$=\frac{105\,a^4\cos\left(dx+c\right)^5\log\left(\sin\left(dx+c\right)+1\right)-105\,a^4\cos\left(dx+c\right)^5\log\left(-\sin\left(dx+c\right)+1\right)+2\left(166\,a^4\cos\left(d\right.\right.}{60\,d\cos\left(dx+c\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^6,x, algorithm="fricas")
```

```
[Out] 1/60*(105*a^4*cos(d*x + c)^5*log(sin(d*x + c) + 1) - 105*a^4*cos(d*x + c)^5
*log(-sin(d*x + c) + 1) + 2*(166*a^4*cos(d*x + c)^4 + 105*a^4*cos(d*x + c)^
3 + 68*a^4*cos(d*x + c)^2 + 30*a^4*cos(d*x + c) + 6*a^4)*sin(d*x + c))/(d*c
os(d*x + c)^5)
```

Sympy [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^4 \sec^6(c + dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**4*sec(d*x+c)**6,x)
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 190, normalized size of antiderivative = 1.71

$$\int (a + a\cos(c + dx))^4 \sec^6(c + dx)\,dx$$
$$= \frac{4\left(3\tan(dx+c)^5 + 10\tan(dx+c)^3 + 15\tan(dx+c)\right)a^4 + 120\left(\tan(dx+c)^3 + 3\tan(dx+c)\right)a^4 - 15a}{}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^6,x, algorithm="maxima")
[Out] 1/60*(4*(3*tan(d*x + c)^5 + 10*tan(d*x + c)^3 + 15*tan(d*x + c))*a^4 + 120*
(tan(d*x + c)^3 + 3*tan(d*x + c))*a^4 - 15*a^4*(2*(3*sin(d*x + c)^3 - 5*sin
(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2 + 1) - 3*log(sin(d*x + c) + 1
) + 3*log(sin(d*x + c) - 1)) - 60*a^4*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1)
- log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)) + 60*a^4*tan(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.38 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.24

$$\int (a + a\cos(c + dx))^4 \sec^6(c + dx)\,dx$$
$$= \frac{105\,a^4 \log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) + 1\right|\right) - 105\,a^4 \log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) - 1\right|\right) - \frac{2\left(105\,a^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^9 - 490\,a^4\tan\left(\frac{1}{2}\,dx+\right.\right.}{}}{30\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^6,x, algorithm="giac")
[Out] 1/30*(105*a^4*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 105*a^4*log(abs(tan(1/2*
d*x + 1/2*c) - 1)) - 2*(105*a^4*tan(1/2*d*x + 1/2*c)^9 - 490*a^4*tan(1/2*d*
x + 1/2*c)^7 + 896*a^4*tan(1/2*d*x + 1/2*c)^5 - 790*a^4*tan(1/2*d*x + 1/2*c
)^3 + 375*a^4*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2 - 1)^5)/d
```

Mupad [B] (verification not implemented)

Time = 19.71 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.53

$$\int (a+a\cos(c+dx))^4\sec^6(c+dx)\,dx=\frac{7\,a^4\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}-\frac{7\,a^4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9-\frac{98\,a^4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{3}+\frac{896\,a^4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{15}-\frac{158\,a^4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{3}+25\,a^4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{d\,\left({\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^{10}-5\,{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^8+10\,{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^6-10\,{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^4+5\,{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^2-1\right)}$$

```
[In] int((a + a*cos(c + d*x))^4/cos(c + d*x)^6,x)
```

```
[Out] (7*a^4*atanh(tan(c/2 + (d*x)/2)))/d - ((896*a^4*tan(c/2 + (d*x)/2)^5)/15 -
(158*a^4*tan(c/2 + (d*x)/2)^3)/3 - (98*a^4*tan(c/2 + (d*x)/2)^7)/3 + 7*a^4*
tan(c/2 + (d*x)/2)^9 + 25*a^4*tan(c/2 + (d*x)/2))/(d*(5*tan(c/2 + (d*x)/2)^
2 - 10*tan(c/2 + (d*x)/2)^4 + 10*tan(c/2 + (d*x)/2)^6 - 5*tan(c/2 + (d*x)/2
)^8 + tan(c/2 + (d*x)/2)^10 - 1))
```

3.42 $\int (a+a\cos(c+dx))^4\sec^7(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 136

$$\int (a+a\cos(c+dx))^4\sec^7(c+dx)\,dx=\frac{49a^4\text{arctanh}(\sin(c+dx))}{16d}+\frac{8a^4\tan(c+dx)}{d}+\frac{49a^4\sec(c+dx)\tan(c+dx)}{16d}+\frac{41a^4\sec^3(c+dx)\tan(c+dx)}{24d}+\frac{a^4\sec^5(c+dx)\tan(c+dx)}{6d}+\frac{4a^4\tan^3(c+dx)}{d}+\frac{4a^4\tan^5(c+dx)}{5d}$$

```
[Out] 49/16*a^4*arctanh(sin(d*x+c))/d+8*a^4*tan(d*x+c)/d+49/16*a^4*sec(d*x+c)*tan
(d*x+c)/d+41/24*a^4*sec(d*x+c)^3*tan(d*x+c)/d+1/6*a^4*sec(d*x+c)^5*tan(d*x+
c)/d+4*a^4*tan(d*x+c)^3/d+4/5*a^4*tan(d*x+c)^5/d
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used

= {2836, 3853, 3855, 3852}

$$\int (a+a\cos(c+dx))^4\sec^7(c+dx)\,dx = \frac{49a^4\text{arctanh}(\sin(c+dx))}{16d}+\frac{4a^4\tan^5(c+dx)}{5d}+\frac{4a^4\tan^3(c+dx)}{d}+\frac{8a^4\tan(c+dx)}{d}+\frac{a^4\tan(c+dx)\sec^5(c+dx)}{6d}+\frac{41a^4\tan(c+dx)\sec^3(c+dx)}{24d}+\frac{49a^4\tan(c+dx)\sec(c+dx)}{16d}$$

```
[In] Int[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^7,x]
```

```
[Out] (49*a^4*ArcTanh[Sin[c + d*x]])/(16*d) + (8*a^4*Tan[c + d*x])/d + (49*a^4*Se
c[c + d*x]*Tan[c + d*x])/(16*d) + (41*a^4*Sec[c + d*x]^3*Tan[c + d*x])/(24*
d) + (a^4*Sec[c + d*x]^5*Tan[c + d*x])/(6*d) + (4*a^4*Tan[c + d*x]^3)/d + (
4*a^4*Tan[c + d*x]^5)/(5*d)
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(a^4\sec^3(c+dx)+4a^4\sec^4(c+dx)+6a^4\sec^5(c+dx)+4a^4\sec^6(c+dx)\right.\\
&\qquad \left.+a^4\sec^7(c+dx)\right)\,dx\\
&= a^4\int \sec^3(c+dx)\,dx+a^4\int \sec^7(c+dx)\,dx+\left(4a^4\right)\int \sec^4(c+dx)\,dx\\
&\quad+\left(4a^4\right)\int \sec^6(c+dx)\,dx+\left(6a^4\right)\int \sec^5(c+dx)\,dx\\
&= \frac{a^4\sec(c+dx)\tan(c+dx)}{2d}+\frac{3a^4\sec^3(c+dx)\tan(c+dx)}{2d}\\
&\quad+\frac{a^4\sec^5(c+dx)\tan(c+dx)}{6d}+\frac{1}{2}a^4\int \sec(c+dx)\,dx+\frac{1}{6}\left(5a^4\right)\int \sec^5(c+dx)\,dx\\
&\quad+\frac{1}{2}\left(9a^4\right)\int \sec^3(c+dx)\,dx-\frac{\left(4a^4\right)\operatorname{Subst}\left(\int \left(1+x^2\right)\,dx,x,-\tan(c+dx)\right)}{d}\\
&\quad-\frac{\left(4a^4\right)\operatorname{Subst}\left(\int \left(1+2x^2+x^4\right)\,dx,x,-\tan(c+dx)\right)}{d}\\
&= \frac{a^4\operatorname{arctanh}(\sin(c+dx))}{2d}+\frac{8a^4\tan(c+dx)}{d}+\frac{11a^4\sec(c+dx)\tan(c+dx)}{4d}\\
&\quad+\frac{41a^4\sec^3(c+dx)\tan(c+dx)}{24d}+\frac{a^4\sec^5(c+dx)\tan(c+dx)}{6d}+\frac{4a^4\tan^3(c+dx)}{d}\\
&\quad+\frac{4a^4\tan^5(c+dx)}{5d}+\frac{1}{8}\left(5a^4\right)\int \sec^3(c+dx)\,dx+\frac{1}{4}\left(9a^4\right)\int \sec(c+dx)\,dx\\
&= \frac{11a^4\operatorname{arctanh}(\sin(c+dx))}{4d}+\frac{8a^4\tan(c+dx)}{d}+\frac{49a^4\sec(c+dx)\tan(c+dx)}{16d}\\
&\quad+\frac{41a^4\sec^3(c+dx)\tan(c+dx)}{24d}+\frac{a^4\sec^5(c+dx)\tan(c+dx)}{6d}\\
&\quad+\frac{4a^4\tan^3(c+dx)}{d}+\frac{4a^4\tan^5(c+dx)}{5d}+\frac{1}{16}\left(5a^4\right)\int \sec(c+dx)\,dx\\
&= \frac{49a^4\operatorname{arctanh}(\sin(c+dx))}{16d}+\frac{8a^4\tan(c+dx)}{d}\\
&\quad+\frac{49a^4\sec(c+dx)\tan(c+dx)}{16d}+\frac{41a^4\sec^3(c+dx)\tan(c+dx)}{24d}\\
&\quad+\frac{a^4\sec^5(c+dx)\tan(c+dx)}{6d}+\frac{4a^4\tan^3(c+dx)}{d}+\frac{4a^4\tan^5(c+dx)}{5d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 3.76 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.00

$$
\begin{aligned}
\int (a+a\cos(c+dx))^4\sec^7(c+dx)\,dx = {} & \frac{49a^4\operatorname{arctanh}(\sin(c+dx))}{16d}+\frac{8a^4\tan(c+dx)}{d} \\
& +\frac{49a^4\sec(c+dx)\tan(c+dx)}{16d} \\
& +\frac{41a^4\sec^3(c+dx)\tan(c+dx)}{24d} \\
& +\frac{a^4\sec^5(c+dx)\tan(c+dx)}{6d} \\
& +\frac{4a^4\tan^3(c+dx)}{d}+\frac{4a^4\tan^5(c+dx)}{5d}
\end{aligned}
$$

```
[In] Integrate[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^7,x]

[Out] (49*a^4*ArcTanh[Sin[c + d*x]])/(16*d) + (8*a^4*Tan[c + d*x])/d + (49*a^4*Se
c[c + d*x]*Tan[c + d*x])/(16*d) + (41*a^4*Sec[c + d*x]^3*Tan[c + d*x])/(24*
d) + (a^4*Sec[c + d*x]^5*Tan[c + d*x])/(6*d) + (4*a^4*Tan[c + d*x]^3)/d + (
4*a^4*Tan[c + d*x]^5)/(5*d)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 4.54 (sec) , antiderivative size = 178, normalized size of antiderivative = 1.31

method	result
risch	$-\frac{ia^4(735\,e^{11i(dx+c)}+3845\,e^{9i(dx+c)}-1920\,e^{8i(dx+c)}+3750\,e^{7i(dx+c)}-11520\,e^{6i(dx+c)}-3750\,e^{5i(dx+c)}-15360\,e^{4i(dx+}}{120d(e^{2i(dx+c)}+1)^6}$
derivativedivides	$a^4\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-4a^4\left(-\frac{2}{3}-\frac{(\sec^2(dx+c))}{3}\right)\tan(dx+c)+6a^4\left(-\left(-\frac{(\sec^3(dx+c))}{4}-\frac{3\,\mathrm{se}}{}\right.\right.$
default	$a^4\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)-4a^4\left(-\frac{2}{3}-\frac{(\sec^2(dx+c))}{3}\right)\tan(dx+c)+6a^4\left(-\left(-\frac{(\sec^3(dx+c))}{4}-\frac{3\,\mathrm{se}}{}\right.\right.$
parallelrisch	$\frac{a^4(735(-\cos(6dx+6c)-6\cos(4dx+4c)-15\cos(2dx+2c)-10)\ln(\tan(\frac{dx}{2}+\frac{c}{2})-1)+735(\cos(6dx+6c)+6\cos(4dx+4c)+}{240d(\cos}$
parts	$\frac{a^4\left(-\left(-\frac{(\sec^5(dx+c))}{6}-\frac{5(\sec^3(dx+c))}{24}-\frac{5\sec(dx+c)}{16}\right)\tan(dx+c)+\frac{5\ln(\sec(dx+c)+\tan(dx+c))}{16}\right)}{d}+\frac{a^4\left(\frac{\sec(dx+c)\tan(dx+}{2}\right.}{}$

```
[In] int((a+cos(d*x+c)*a)^4*sec(d*x+c)^7,x,method=_RETURNVERBOSE)

[Out] -1/120*I*a^4*(735*exp(11*I*(d*x+c))+3845*exp(9*I*(d*x+c))-1920*exp(8*I*(d*x
+c))+3750*exp(7*I*(d*x+c))-11520*exp(6*I*(d*x+c))-3750*exp(5*I*(d*x+c))-153
```

```
60*exp(4*I*(d*x+c))-3845*exp(3*I*(d*x+c))-6912*exp(2*I*(d*x+c))-735*exp(I*(
d*x+c))-1152)/d/(exp(2*I*(d*x+c))+1)^6+49/16*a^4/d*ln(exp(I*(d*x+c))+I)-49/
16*a^4/d*ln(exp(I*(d*x+c))-I)
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.01

$$\int (a+a\cos(c+dx))^4\sec^7(c+dx)\,dx$$
$$= \frac{735\,a^4\cos(dx+c)^6\log(\sin(dx+c)+1) - 735\,a^4\cos(dx+c)^6\log(-\sin(dx+c)+1) + 2\,(1152\,a^4\cos(dx}{480\,a}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^7,x, algorithm="fricas")
```

```
[Out] 1/480*(735*a^4*cos(d*x + c)^6*log(sin(d*x + c) + 1) - 735*a^4*cos(d*x + c)^
6*log(-sin(d*x + c) + 1) + 2*(1152*a^4*cos(d*x + c)^5 + 735*a^4*cos(d*x + c
)^4 + 576*a^4*cos(d*x + c)^3 + 410*a^4*cos(d*x + c)^2 + 192*a^4*cos(d*x + c
) + 40*a^4)*sin(d*x + c))/(d*cos(d*x + c)^6)
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^4\sec^7(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**4*sec(d*x+c)**7,x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 270 vs. 2(126) = 252.

Time = 0.26 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.99

$$\int (a+a\cos(c+dx))^4\sec^7(c+dx)\,dx$$
$$= \frac{128\left(3\tan(dx+c)^5 + 10\tan(dx+c)^3 + 15\tan(dx+c)\right)a^4 + 640\left(\tan(dx+c)^3 + 3\tan(dx+c)\right)a^4 - 5}{}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^7,x, algorithm="maxima")
```

```
[Out] 1/480*(128*(3*tan(d*x + c)^5 + 10*tan(d*x + c)^3 + 15*tan(d*x + c))*a^4 + 6
40*(tan(d*x + c)^3 + 3*tan(d*x + c))*a^4 - 5*a^4*(2*(15*sin(d*x + c)^5 - 40
*sin(d*x + c)^3 + 33*sin(d*x + c))/(sin(d*x + c)^6 - 3*sin(d*x + c)^4 + 3*s
in(d*x + c)^2 - 1) - 15*log(sin(d*x + c) + 1) + 15*log(sin(d*x + c) - 1)) -
 180*a^4*(2*(3*sin(d*x + c)^3 - 5*sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x
 + c)^2 + 1) - 3*log(sin(d*x + c) + 1) + 3*log(sin(d*x + c) - 1)) - 120*a^4
*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x
 + c) - 1)))/d
```

Giac [A] (verification not implemented)

none

Time = 0.38 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.13

$$\int (a + a\cos(c+dx))^4 \sec^7(c+dx)\,dx$$
$$= \frac{735\,a^4 \log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) + 1\right|\right) - 735\,a^4 \log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) - 1\right|\right) - \frac{2\left(735\,a^4 \tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)^{11} - 4165\,a^4 \tan\left(\frac{1}{2}\right.\right.}{}}{240\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^7,x, algorithm="giac")
```

```
[Out] 1/240*(735*a^4*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 735*a^4*log(abs(tan(1/2
*d*x + 1/2*c) - 1)) - 2*(735*a^4*tan(1/2*d*x + 1/2*c)^11 - 4165*a^4*tan(1/2
*d*x + 1/2*c)^9 + 9702*a^4*tan(1/2*d*x + 1/2*c)^7 - 11802*a^4*tan(1/2*d*x +
 1/2*c)^5 + 7355*a^4*tan(1/2*d*x + 1/2*c)^3 - 3105*a^4*tan(1/2*d*x + 1/2*c)
)/(tan(1/2*d*x + 1/2*c)^2 - 1)^6)/d
```

Mupad [B] (verification not implemented)

Time = 18.60 (sec) , antiderivative size = 199, normalized size of antiderivative = 1.46

$$\int (a + a\cos(c+dx))^4 \sec^7(c+dx)\,dx = \frac{49\,a^4\,\mathrm{atanh}\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)\right)}{8\,d}$$
$$- \frac{\frac{49\,a^4 \tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{11}}{8} - \frac{833\,a^4 \tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{9}}{24} + \frac{1617\,a^4 \tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{7}}{20} - \frac{1967\,a^4 \tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{5}}{20} + \frac{1471\,a^4 \tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{3}}{24} - \frac{207}{}}{d\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^{12} - 6\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^{10} + 15\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^{8} - 20\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^{6} + 15\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^{4} - 6\,\mathrm{ta}\right.}$$

```
[In] int((a + a*cos(c + d*x))^4/cos(c + d*x)^7,x)
```

```
[Out] (49*a^4*atanh(tan(c/2 + (d*x)/2)))/(8*d) - ((1471*a^4*tan(c/2 + (d*x)/2)^3)
/24 - (1967*a^4*tan(c/2 + (d*x)/2)^5)/20 + (1617*a^4*tan(c/2 + (d*x)/2)^7)/
20 - (833*a^4*tan(c/2 + (d*x)/2)^9)/24 + (49*a^4*tan(c/2 + (d*x)/2)^11)/8 -
 (207*a^4*tan(c/2 + (d*x)/2))/8)/(d*(15*tan(c/2 + (d*x)/2)^4 - 6*tan(c/2 +
(d*x)/2)^2 - 20*tan(c/2 + (d*x)/2)^6 + 15*tan(c/2 + (d*x)/2)^8 - 6*tan(c/2
+ (d*x)/2)^10 + tan(c/2 + (d*x)/2)^12 + 1))
```

3.43 $\int \frac{\cos^5(c+dx)}{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 118

$$\int \frac{\cos^5(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{15x}{8a} - \frac{4\sin(c+dx)}{ad} + \frac{15\cos(c+dx)\sin(c+dx)}{8ad} + \frac{5\cos^3(c+dx)\sin(c+dx)}{4ad} - \frac{\cos^4(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} + \frac{4\sin^3(c+dx)}{3ad}$$

```
[Out] 15/8*x/a-4*sin(d*x+c)/a/d+15/8*cos(d*x+c)*sin(d*x+c)/a/d+5/4*cos(d*x+c)^3*s
in(d*x+c)/a/d-cos(d*x+c)^4*sin(d*x+c)/d/(a+a*cos(d*x+c))+4/3*sin(d*x+c)^3/a
/d
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2846, 2827, 2713, 2715, 8}

$$\int \frac{\cos^5(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{4\sin^3(c+dx)}{3ad} - \frac{4\sin(c+dx)}{ad} - \frac{\sin(c+dx)\cos^4(c+dx)}{d(a\cos(c+dx)+a)} + \frac{5\sin(c+dx)\cos^3(c+dx)}{4ad} + \frac{15\sin(c+dx)\cos(c+dx)}{8ad} + \frac{15x}{8a}$$

```
[In] Int[Cos[c + d*x]^5/(a + a*Cos[c + d*x]),x]
```

```
[Out] (15*x)/(8*a) - (4*Sin[c + d*x])/(a*d) + (15*Cos[c + d*x]*Sin[c + d*x])/(8*a
*d) + (5*Cos[c + d*x]^3*Sin[c + d*x])/(4*a*d) - (Cos[c + d*x]^4*Sin[c + d*x
])/(d*(a + a*Cos[c + d*x])) + (4*Sin[c + d*x]^3)/(3*a*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2846

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/((a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((c + d*Sin[e +
 f*x])^(n - 1)/(a*f*(a + b*Sin[e + f*x]))), x] - Dist[d/(a*b), Int[(c + d*S
in[e + f*x])^(n - 2)*Simp[b*d*(n - 1) - a*c*n + (b*c*(n - 1) - a*d*n)*Sin[e
 + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[n, 1] && (IntegerQ[2*n] || E
qQ[c, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^4(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} - \frac{\int \cos^3(c+dx)(4a-5a\cos(c+dx))\,dx}{a^2} \\
&= -\frac{\cos^4(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} - \frac{4\int \cos^3(c+dx)\,dx}{a} + \frac{5\int \cos^4(c+dx)\,dx}{a} \\
&= \frac{5\cos^3(c+dx)\sin(c+dx)}{4ad} - \frac{\cos^4(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} \\
&\quad + \frac{15\int \cos^2(c+dx)\,dx}{4a} + \frac{4\text{Subst}\left(\int (1-x^2)\,dx, x, -\sin(c+dx)\right)}{ad}
\end{aligned}$$

$$= -\frac{4\sin(c+dx)}{ad} + \frac{15\cos(c+dx)\sin(c+dx)}{8ad} + \frac{5\cos^3(c+dx)\sin(c+dx)}{4ad} - \frac{\cos^4(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} + \frac{4\sin^3(c+dx)}{3ad} + \frac{15\int 1\,dx}{8a}$$

$$= \frac{15x}{8a} - \frac{4\sin(c+dx)}{ad} + \frac{15\cos(c+dx)\sin(c+dx)}{8ad} + \frac{5\cos^3(c+dx)\sin(c+dx)}{4ad} - \frac{\cos^4(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} + \frac{4\sin^3(c+dx)}{3ad}$$

Mathematica [A] (verified)

Time = 0.84 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.47

$$\int \frac{\cos^5(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\sec\left(\frac{c}{2}\right)\sec\left(\frac{1}{2}(c+dx)\right)\left(360dx\cos\left(\frac{dx}{2}\right)+360dx\cos\left(c+\frac{dx}{2}\right)-552\sin\left(\frac{dx}{2}\right)-168\sin\left(c+\frac{dx}{2}\right)-120\sin\left(c\right.\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^5/(a + a*Cos[c + d*x]),x]
```

```
[Out] (Sec[c/2]*Sec[(c + d*x)/2]*(360*d*x*Cos[(d*x)/2] + 360*d*x*Cos[c + (d*x)/2]
 - 552*Sin[(d*x)/2] - 168*Sin[c + (d*x)/2] - 120*Sin[c + (3*d*x)/2] - 120*S
in[2*c + (3*d*x)/2] + 40*Sin[2*c + (5*d*x)/2] + 40*Sin[3*c + (5*d*x)/2] - 5
*Sin[3*c + (7*d*x)/2] - 5*Sin[4*c + (7*d*x)/2] + 3*Sin[4*c + (9*d*x)/2] + 3
*Sin[5*c + (9*d*x)/2]))/(384*a*d)
```

Maple [A] (verified)

Time = 0.80 (sec) , antiderivative size = 67, normalized size of antiderivative = 0.57

method	result
parallelrisch	$\frac{180dx+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\left(-221+3\cos(4dx+4c)-2\cos(3dx+3c)+38\cos(2dx+2c)-82\cos(dx+c)\right)}{96ad}$
derivativedivides	$\frac{-\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{-\frac{25\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4}-\frac{115\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12}-\frac{109\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12}-\frac{7\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^4}+\frac{15\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4}}{da}$
default	$\frac{-\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{-\frac{25\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4}-\frac{115\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12}-\frac{109\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12}-\frac{7\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^4}+\frac{15\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4}}{da}$
risch	$\frac{15x}{8a}+\frac{7ie^{i(dx+c)}}{8ad}-\frac{7ie^{-i(dx+c)}}{8ad}-\frac{2i}{da\left(e^{i(dx+c)}+1\right)}+\frac{\sin(4dx+4c)}{32ad}-\frac{\sin(3dx+3c)}{12ad}+\frac{\sin(2dx+2c)}{2ad}$
norman	$\frac{\frac{15x}{8a}-\frac{11\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4da}-\frac{95\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{6da}-\frac{86\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3da}-\frac{155\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{6da}-\frac{45\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4da}-\frac{\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}+\frac{75x(\cdots}{}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^5}$

```
[In] int(cos(d*x+c)^5/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] 1/96*(180*d*x+tan(1/2*d*x+1/2*c)*(-221+3*cos(4*d*x+4*c)-2*cos(3*d*x+3*c)+38
*cos(2*d*x+2*c)-82*cos(d*x+c)))/a/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 79, normalized size of antiderivative = 0.67

$$\int \frac{\cos^5(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{45\,dx\cos(dx+c)+45\,dx+\left(6\,\cos(dx+c)^4-2\,\cos(dx+c)^3+13\,\cos(dx+c)^2-19\,\cos(dx+c)-64\right)}{24\,(ad\cos(dx+c)+ad)}$$

```
[In] integrate(cos(d*x+c)^5/(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/24*(45*d*x*cos(d*x + c) + 45*d*x + (6*cos(d*x + c)^4 - 2*cos(d*x + c)^3 +
 13*cos(d*x + c)^2 - 19*cos(d*x + c) - 64)*sin(d*x + c))/(a*d*cos(d*x + c)
+ a*d)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 882 vs. 2(102) = 204.

Time = 1.93 (sec) , antiderivative size = 882, normalized size of antiderivative = 7.47

$$\int \frac{\cos^5(c+dx)}{a+a\cos(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)**5/(a+a*cos(d*x+c)),x)
```

```
[Out] Piecewise((45*d*x*tan(c/2 + d*x/2)**8/(24*a*d*tan(c/2 + d*x/2)**8 + 96*a*d*
tan(c/2 + d*x/2)**6 + 144*a*d*tan(c/2 + d*x/2)**4 + 96*a*d*tan(c/2 + d*x/2)
**2 + 24*a*d) + 180*d*x*tan(c/2 + d*x/2)**6/(24*a*d*tan(c/2 + d*x/2)**8 + 9
6*a*d*tan(c/2 + d*x/2)**6 + 144*a*d*tan(c/2 + d*x/2)**4 + 96*a*d*tan(c/2 +
d*x/2)**2 + 24*a*d) + 270*d*x*tan(c/2 + d*x/2)**4/(24*a*d*tan(c/2 + d*x/2)*
*8 + 96*a*d*tan(c/2 + d*x/2)**6 + 144*a*d*tan(c/2 + d*x/2)**4 + 96*a*d*tan(
c/2 + d*x/2)**2 + 24*a*d) + 180*d*x*tan(c/2 + d*x/2)**2/(24*a*d*tan(c/2 + d
*x/2)**8 + 96*a*d*tan(c/2 + d*x/2)**6 + 144*a*d*tan(c/2 + d*x/2)**4 + 96*a*
d*tan(c/2 + d*x/2)**2 + 24*a*d) + 45*d*x/(24*a*d*tan(c/2 + d*x/2)**8 + 96*a
*d*tan(c/2 + d*x/2)**6 + 144*a*d*tan(c/2 + d*x/2)**4 + 96*a*d*tan(c/2 + d*x
/2)**2 + 24*a*d) - 24*tan(c/2 + d*x/2)**9/(24*a*d*tan(c/2 + d*x/2)**8 + 96*
a*d*tan(c/2 + d*x/2)**6 + 144*a*d*tan(c/2 + d*x/2)**4 + 96*a*d*tan(c/2 + d*
x/2)**2 + 24*a*d) - 246*tan(c/2 + d*x/2)**7/(24*a*d*tan(c/2 + d*x/2)**8 + 9
```

6*a*d*tan(c/2 + d*x/2)**6 + 144*a*d*tan(c/2 + d*x/2)**4 + 96*a*d*tan(c/2 + d*x/2)**2 + 24*a*d) - 374*tan(c/2 + d*x/2)**5/(24*a*d*tan(c/2 + d*x/2)**8 + 96*a*d*tan(c/2 + d*x/2)**6 + 144*a*d*tan(c/2 + d*x/2)**4 + 96*a*d*tan(c/2 + d*x/2)**2 + 24*a*d) - 314*tan(c/2 + d*x/2)**3/(24*a*d*tan(c/2 + d*x/2)**8 + 96*a*d*tan(c/2 + d*x/2)**6 + 144*a*d*tan(c/2 + d*x/2)**4 + 96*a*d*tan(c/2 + d*x/2)**2 + 24*a*d) - 66*tan(c/2 + d*x/2)/(24*a*d*tan(c/2 + d*x/2)**8 + 96*a*d*tan(c/2 + d*x/2)**6 + 144*a*d*tan(c/2 + d*x/2)**4 + 96*a*d*tan(c/2 + d*x/2)**2 + 24*a*d), Ne(d, 0)), (x*cos(c)**5/(a*cos(c) + a), True))

Maxima [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.84

$$\int \frac{\cos^5(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{\frac{\frac{21\sin(dx+c)}{\cos(dx+c)+1}+\frac{109\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{115\sin(dx+c)^5}{(\cos(dx+c)+1)^5}+\frac{75\sin(dx+c)^7}{(\cos(dx+c)+1)^7}}{a+\frac{4a\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{6a\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+\frac{4a\sin(dx+c)^6}{(\cos(dx+c)+1)^6}+\frac{a\sin(dx+c)^8}{(\cos(dx+c)+1)^8}}-\frac{45\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{a}+\frac{12\sin(dx+c)}{a(\cos(dx+c)+1)}}{12\,d}$$

```
[In] integrate(cos(d*x+c)^5/(a+a*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/12*((21*sin(d*x + c)/(cos(d*x + c) + 1) + 109*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 115*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 + 75*sin(d*x + c)^7/(cos(d*x + c) + 1)^7)/(a + 4*a*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 6*a*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + 4*a*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 + a*sin(d*x + c)^8/(cos(d*x + c) + 1)^8) - 45*arctan(sin(d*x + c)/(cos(d*x + c) + 1))/a + 12*sin(d*x + c)/(a*(cos(d*x + c) + 1)))/d
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 101, normalized size of antiderivative = 0.86

$$\int \frac{\cos^5(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\frac{45(dx+c)}{a}-\frac{24\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{a}-\frac{2\left(75\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^7+115\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5+109\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3+21\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2+1\right)^4a}}{24\,d}$$

```
[In] integrate(cos(d*x+c)^5/(a+a*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/24*(45*(d*x + c)/a - 24*tan(1/2*d*x + 1/2*c)/a - 2*(75*tan(1/2*d*x + 1/2*c)^7 + 115*tan(1/2*d*x + 1/2*c)^5 + 109*tan(1/2*d*x + 1/2*c)^3 + 21*tan(1/2*d*x + 1/2*c))/((tan(1/2*d*x + 1/2*c)^2 + 1)^4*a))/d
```

Mupad [B] (verification not implemented)

Time = 16.48 (sec) , antiderivative size = 98, normalized size of antiderivative = 0.83

$$\int \frac{\cos^5(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{15\,x}{8\,a} - \frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{a\,d} - \frac{\frac{25\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{4}+\frac{115\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{12}+\frac{109\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{12}+\frac{7\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{4}}{a\,d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)^4}$$

```
[In] int(cos(c + d*x)^5/(a + a*cos(c + d*x)),x)
[Out] (15*x)/(8*a) - tan(c/2 + (d*x)/2)/(a*d) - ((7*tan(c/2 + (d*x)/2))/4 + (109*
tan(c/2 + (d*x)/2)^3)/12 + (115*tan(c/2 + (d*x)/2)^5)/12 + (25*tan(c/2 + (d
*x)/2)^7)/4)/(a*d*(tan(c/2 + (d*x)/2)^2 + 1)^4)
```

3.44 $\int \frac{\cos^4(c+dx)}{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 94

$$\int \frac{\cos^4(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{3x}{2a}+\frac{4\sin(c+dx)}{ad}-\frac{3\cos(c+dx)\sin(c+dx)}{2ad}-\frac{\cos^3(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))}-\frac{4\sin^3(c+dx)}{3ad}$$

```
[Out] -3/2*x/a+4*sin(d*x+c)/a/d-3/2*cos(d*x+c)*sin(d*x+c)/a/d-cos(d*x+c)^3*sin(d*
x+c)/d/(a+a*cos(d*x+c))-4/3*sin(d*x+c)^3/a/d
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2846, 2827, 2715, 8, 2713}

$$\int \frac{\cos^4(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{4\sin^3(c+dx)}{3ad}+\frac{4\sin(c+dx)}{ad}-\frac{\sin(c+dx)\cos^3(c+dx)}{d(a\cos(c+dx)+a)}-\frac{3\sin(c+dx)\cos(c+dx)}{2ad}-\frac{3x}{2a}$$

```
[In] Int[Cos[c + d*x]^4/(a + a*Cos[c + d*x]),x]
```

```
[Out] (-3*x)/(2*a) + (4*Sin[c + d*x])/(a*d) - (3*Cos[c + d*x]*Sin[c + d*x])/(2*a*
d) - (Cos[c + d*x]^3*Sin[c + d*x])/(d*(a + a*Cos[c + d*x])) - (4*Sin[c + d*
x]^3)/(3*a*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2846

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/((a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((c + d*Sin[e +
 f*x])^(n - 1)/(a*f*(a + b*Sin[e + f*x]))), x] - Dist[d/(a*b), Int[(c + d*S
in[e + f*x])^(n - 2)*Simp[b*d*(n - 1) - a*c*n + (b*c*(n - 1) - a*d*n)*Sin[e
 + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[n, 1] && (IntegerQ[2*n] || E
qQ[c, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^3(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} - \frac{\int \cos^2(c+dx)(3a-4a\cos(c+dx))\,dx}{a^2} \\
&= -\frac{\cos^3(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} - \frac{3\int \cos^2(c+dx)\,dx}{a} + \frac{4\int \cos^3(c+dx)\,dx}{a} \\
&= -\frac{3\cos(c+dx)\sin(c+dx)}{2ad} - \frac{\cos^3(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} \\
&\quad - \frac{3\int 1\,dx}{2a} - \frac{4\text{Subst}\left(\int \left(1-x^2\right)\,dx, x, -\sin(c+dx)\right)}{ad} \\
&= -\frac{3x}{2a} + \frac{4\sin(c+dx)}{ad} - \frac{3\cos(c+dx)\sin(c+dx)}{2ad} - \frac{\cos^3(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} - \frac{4\sin^3(c+dx)}{3ad}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.74 (sec) , antiderivative size = 143, normalized size of antiderivative = 1.52

$$\int \frac{\cos^4(c+dx)}{a+a\cos(c+dx)}\,dx$$
$$= \frac{\sec\left(\frac{c}{2}\right)\sec\left(\frac{1}{2}(c+dx)\right)\left(-36dx\cos\left(\frac{dx}{2}\right)-36dx\cos\left(c+\frac{dx}{2}\right)+69\sin\left(\frac{dx}{2}\right)+21\sin\left(c+\frac{dx}{2}\right)+18\sin\left(c+\frac{3d}{2}\right.\right.}{48ad}$$

```
[In] Integrate[Cos[c + d*x]^4/(a + a*Cos[c + d*x]),x]
```

```
[Out] (Sec[c/2]*Sec[(c + d*x)/2]*(-36*d*x*Cos[(d*x)/2] - 36*d*x*Cos[c + (d*x)/2]
+ 69*Sin[(d*x)/2] + 21*Sin[c + (d*x)/2] + 18*Sin[c + (3*d*x)/2] + 18*Sin[2*
c + (3*d*x)/2] - 2*Sin[2*c + (5*d*x)/2] - 2*Sin[3*c + (5*d*x)/2] + Sin[3*c
+ (7*d*x)/2] + Sin[4*c + (7*d*x)/2]))/(48*a*d)
```

Maple [A] (verified)

Time = 0.78 (sec) , antiderivative size = 54, normalized size of antiderivative = 0.57

method	result
parallelrisch	$\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)(31+\cos(3dx+3c)-\cos(2dx+2c)+17\cos(dx+c))-18dx}{12ad}$
derivativedivides	$\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{8\left(-\frac{5\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8}-\frac{2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-\frac{3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8}\right)}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3}-3\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{da}$
default	$\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{8\left(-\frac{5\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8}-\frac{2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-\frac{3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8}\right)}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3}-3\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{da}$
risch	$-\frac{3x}{2a}-\frac{7i\,\mathrm{e}^{i(dx+c)}}{8ad}+\frac{7i\,\mathrm{e}^{-i(dx+c)}}{8ad}+\frac{2i}{da\left(\mathrm{e}^{i(dx+c)}+1\right)}+\frac{\sin(3dx+3c)}{12ad}-\frac{\sin(2dx+2c)}{4ad}$
norman	$\frac{\frac{\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}-\frac{3x}{2a}+\frac{4\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}+\frac{37\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3da}+\frac{49\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3da}+\frac{9\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{da}-\frac{6x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{a}-\frac{9x\left(\tan^4\left(\right.\right.}{a}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^4}$

```
[In] int(cos(d*x+c)^4/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] 1/12*(tan(1/2*d*x+1/2*c)*(31+cos(3*d*x+3*c)-cos(2*d*x+2*c)+17*cos(d*x+c))-1
8*d*x)/a/d
```

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 70, normalized size of antiderivative = 0.74

$$\int \frac{\cos^4(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{9\,dx\cos(dx+c)+9\,dx-\left(2\,\cos(dx+c)^3-\cos(dx+c)^2+7\,\cos(dx+c)+16\right)\sin(dx+c)}{6\,(ad\cos(dx+c)+ad)}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] -1/6*(9*d*x*cos(d*x + c) + 9*d*x - (2*cos(d*x + c)^3 - cos(d*x + c)^2 + 7*c
os(d*x + c) + 16)*sin(d*x + c))/(a*d*cos(d*x + c) + a*d)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 570 vs. 2(80) = 160.

Time = 1.22 (sec) , antiderivative size = 570, normalized size of antiderivative = 6.06

$$\int \frac{\cos^4(c+dx)}{a+a\cos(c+dx)}\,dx = \begin{cases} -\frac{9dx\tan^6\left(\frac{c}{2}+\frac{dx}{2}\right)}{6ad\tan^6\left(\frac{c}{2}+\frac{dx}{2}\right)+18ad\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)+18ad\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+6ad} - \frac{27dx\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)}{6ad\tan^6\left(\frac{c}{2}+\frac{dx}{2}\right)+18ad\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)+18ad\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+6ad} - \\ \frac{x\cos^4(c)}{a\cos(c)+a} \end{cases}$$

```
[In] integrate(cos(d*x+c)**4/(a+a*cos(d*x+c)),x)
```

```
[Out] Piecewise((-9*d*x*tan(c/2 + d*x/2)**6/(6*a*d*tan(c/2 + d*x/2)**6 + 18*a*d*t
an(c/2 + d*x/2)**4 + 18*a*d*tan(c/2 + d*x/2)**2 + 6*a*d) - 27*d*x*tan(c/2 +
 d*x/2)**4/(6*a*d*tan(c/2 + d*x/2)**6 + 18*a*d*tan(c/2 + d*x/2)**4 + 18*a*d
*tan(c/2 + d*x/2)**2 + 6*a*d) - 27*d*x*tan(c/2 + d*x/2)**2/(6*a*d*tan(c/2 +
 d*x/2)**6 + 18*a*d*tan(c/2 + d*x/2)**4 + 18*a*d*tan(c/2 + d*x/2)**2 + 6*a*
d) - 9*d*x/(6*a*d*tan(c/2 + d*x/2)**6 + 18*a*d*tan(c/2 + d*x/2)**4 + 18*a*d
*tan(c/2 + d*x/2)**2 + 6*a*d) + 6*tan(c/2 + d*x/2)**7/(6*a*d*tan(c/2 + d*x/
2)**6 + 18*a*d*tan(c/2 + d*x/2)**4 + 18*a*d*tan(c/2 + d*x/2)**2 + 6*a*d) +
48*tan(c/2 + d*x/2)**5/(6*a*d*tan(c/2 + d*x/2)**6 + 18*a*d*tan(c/2 + d*x/2)
**4 + 18*a*d*tan(c/2 + d*x/2)**2 + 6*a*d) + 50*tan(c/2 + d*x/2)**3/(6*a*d*t
an(c/2 + d*x/2)**6 + 18*a*d*tan(c/2 + d*x/2)**4 + 18*a*d*tan(c/2 + d*x/2)**
2 + 6*a*d) + 24*tan(c/2 + d*x/2)/(6*a*d*tan(c/2 + d*x/2)**6 + 18*a*d*tan(c/
2 + d*x/2)**4 + 18*a*d*tan(c/2 + d*x/2)**2 + 6*a*d), Ne(d, 0)), (x*cos(c)**
4/(a*cos(c) + a), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.49 (sec) , antiderivative size = 176, normalized size of antiderivative = 1.87

$$\int \frac{\cos^4(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\frac{\frac{9\sin(dx+c)}{\cos(dx+c)+1}+\frac{16\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{15\sin(dx+c)^5}{(\cos(dx+c)+1)^5}}{a+\frac{3a\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{3a\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+\frac{a\sin(dx+c)^6}{(\cos(dx+c)+1)^6}}-\frac{9\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{a}+\frac{3\sin(dx+c)}{a(\cos(dx+c)+1)}}{3d}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/3*((9*sin(d*x + c)/(cos(d*x + c) + 1) + 16*sin(d*x + c)^3/(cos(d*x + c) +
 1)^3 + 15*sin(d*x + c)^5/(cos(d*x + c) + 1)^5)/(a + 3*a*sin(d*x + c)^2/(co
s(d*x + c) + 1)^2 + 3*a*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + a*sin(d*x + c
)^6/(cos(d*x + c) + 1)^6) - 9*arctan(sin(d*x + c)/(cos(d*x + c) + 1))/a + 3
*sin(d*x + c)/(a*(cos(d*x + c) + 1)))/d
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 88, normalized size of antiderivative = 0.94

$$\int \frac{\cos^4(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{\frac{9(dx+c)}{a}-\frac{6\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{a}-\frac{2\left(15\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5+16\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3+9\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2+1\right)^3a}}{6d}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/6*(9*(d*x + c)/a - 6*tan(1/2*d*x + 1/2*c)/a - 2*(15*tan(1/2*d*x + 1/2*c)
^5 + 16*tan(1/2*d*x + 1/2*c)^3 + 9*tan(1/2*d*x + 1/2*c))/((tan(1/2*d*x + 1/
2*c)^2 + 1)^3*a))/d
```

Mupad [B] (verification not implemented)

Time = 14.75 (sec) , antiderivative size = 70, normalized size of antiderivative = 0.74

$$\int \frac{\cos^4(c+dx)}{a+a\cos(c+dx)}\,dx=\frac{\frac{15\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{8}+\frac{3\,\sin\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)}{4}-\frac{\sin\left(\frac{5\,c}{2}+\frac{5\,d\,x}{2}\right)}{12}+\frac{\sin\left(\frac{7\,c}{2}+\frac{7\,d\,x}{2}\right)}{24}}{a\,d\,\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}-\frac{3\,x}{2\,a}$$

```
[In] int(cos(c + d*x)^4/(a + a*cos(c + d*x)),x)
```

```
[Out] ((15*sin(c/2 + (d*x)/2))/8 + (3*sin((3*c)/2 + (3*d*x)/2))/4 - sin((5*c)/2 +
 (5*d*x)/2)/12 + sin((7*c)/2 + (7*d*x)/2)/24)/(a*d*cos(c/2 + (d*x)/2)) - (3
*x)/(2*a)
```

3.45 $\int \frac{\cos^3(c+dx)}{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 76

$$\int \frac{\cos^3(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{3x}{2a}-\frac{2\sin(c+dx)}{ad}+\frac{3\cos(c+dx)\sin(c+dx)}{2ad} - \frac{\cos^2(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))}$$

```
[Out] 3/2*x/a-2*sin(d*x+c)/a/d+3/2*cos(d*x+c)*sin(d*x+c)/a/d-cos(d*x+c)^2*sin(d*x
+c)/d/(a+a*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 76, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2846, 2813}

$$\int \frac{\cos^3(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{2\sin(c+dx)}{ad}-\frac{\sin(c+dx)\cos^2(c+dx)}{d(a\cos(c+dx)+a)} + \frac{3\sin(c+dx)\cos(c+dx)}{2ad}+\frac{3x}{2a}$$

```
[In] Int[Cos[c + d*x]^3/(a + a*Cos[c + d*x]),x]
```

```
[Out] (3*x)/(2*a) - (2*Sin[c + d*x])/(a*d) + (3*Cos[c + d*x]*Sin[c + d*x])/(2*a*d
) - (Cos[c + d*x]^2*Sin[c + d*x])/(d*(a + a*Cos[c + d*x]))
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
```

```
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2846

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/((a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((c + d*Sin[e +
 f*x])^(n - 1)/(a*f*(a + b*Sin[e + f*x]))), x] - Dist[d/(a*b), Int[(c + d*S
in[e + f*x])^(n - 2)*Simp[b*d*(n - 1) - a*c*n + (b*c*(n - 1) - a*d*n)*Sin[e
 + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[n, 1] && (IntegerQ[2*n] || E
qQ[c, 0])
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{\cos^2(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} - \frac{\int \cos(c+dx)(2a-3a\cos(c+dx))\,dx}{a^2}\\ &= \frac{3x}{2a} - \frac{2\sin(c+dx)}{ad} + \frac{3\cos(c+dx)\sin(c+dx)}{2ad} - \frac{\cos^2(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.72 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.54

$$\int \frac{\cos^3(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\sec\left(\frac{c}{2}\right)\sec\left(\frac{1}{2}(c+dx)\right)\left(12dx\cos\left(\frac{dx}{2}\right)+12dx\cos\left(c+\frac{dx}{2}\right)-20\sin\left(\frac{dx}{2}\right)-4\sin\left(c+\frac{dx}{2}\right)-3\sin\left(c+\frac{3dx}{2}\right)}{16ad}$$

```
[In] Integrate[Cos[c + d*x]^3/(a + a*Cos[c + d*x]),x]
```

```
[Out] (Sec[c/2]*Sec[(c + d*x)/2]*(12*d*x*Cos[(d*x)/2] + 12*d*x*Cos[c + (d*x)/2] -
 20*Sin[(d*x)/2] - 4*Sin[c + (d*x)/2] - 3*Sin[c + (3*d*x)/2] - 3*Sin[2*c +
(3*d*x)/2] + Sin[2*c + (5*d*x)/2] + Sin[3*c + (5*d*x)/2]))/(16*a*d)
```

Maple [A] (verified)

Time = 0.76 (sec) , antiderivative size = 43, normalized size of antiderivative = 0.57

method	result
parallelrisch	$\frac{6dx+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)(-7+\cos(2dx+2c)-2\cos(dx+c))}{4ad}$
derivativedivides	$\frac{-\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{-3\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}+3\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{da}$
default	$\frac{-\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{-3\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}+3\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{da}$
risch	$\frac{3x}{2a}+\frac{i e^{i(dx+c)}}{2ad}-\frac{i e^{-i(dx+c)}}{2ad}-\frac{2i}{da\left(e^{i(dx+c)}+1\right)}+\frac{\sin(2dx+2c)}{4ad}$
norman	$\frac{\frac{3x}{2a}-\frac{2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}-\frac{7\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{da}-\frac{6\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{da}-\frac{\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}+\frac{9x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2a}+\frac{9x\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2a}+\frac{3x\left(\tan^6\left(\frac{d}{}\right.\right.}{2a}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3}$

```
[In] int(cos(d*x+c)^3/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
[Out] 1/4*(6*d*x+tan(1/2*d*x+1/2*c)*(-7+cos(2*d*x+2*c)-2*cos(d*x+c)))/a/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.75

$$\int \frac{\cos^3(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{3\,dx\cos(dx+c)+3\,dx+\left(\cos(dx+c)^2-\cos(dx+c)-4\right)\sin(dx+c)}{2\left(ad\cos(dx+c)+ad\right)}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c)),x, algorithm="fricas")
[Out] 1/2*(3*d*x*cos(d*x + c) + 3*d*x + (cos(d*x + c)^2 - cos(d*x + c) - 4)*sin(d
*x + c))/(a*d*cos(d*x + c) + a*d)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 325 vs. 2(65) = 130.

Time = 0.82 (sec) , antiderivative size = 325, normalized size of antiderivative = 4.28

$$\int \frac{\cos^3(c+dx)}{a+a\cos(c+dx)}\,dx = \begin{cases} \frac{3dx\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)}{2ad\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)+4ad\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+2ad}+\frac{6dx\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)}{2ad\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)+4ad\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+2ad}+\frac{3dx}{2ad\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)+4ad\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+2ad}- \\ \frac{x\cos^3(c)}{a\cos(c)+a} \end{cases}$$

```
[In] integrate(cos(d*x+c)**3/(a+a*cos(d*x+c)),x)
```

```
[Out] Piecewise((3*d*x*tan(c/2 + d*x/2)**4/(2*a*d*tan(c/2 + d*x/2)**4 + 4*a*d*tan
(c/2 + d*x/2)**2 + 2*a*d) + 6*d*x*tan(c/2 + d*x/2)**2/(2*a*d*tan(c/2 + d*x/
2)**4 + 4*a*d*tan(c/2 + d*x/2)**2 + 2*a*d) + 3*d*x/(2*a*d*tan(c/2 + d*x/2)*
*4 + 4*a*d*tan(c/2 + d*x/2)**2 + 2*a*d) - 2*tan(c/2 + d*x/2)**5/(2*a*d*tan(
c/2 + d*x/2)**4 + 4*a*d*tan(c/2 + d*x/2)**2 + 2*a*d) - 10*tan(c/2 + d*x/2)*
*3/(2*a*d*tan(c/2 + d*x/2)**4 + 4*a*d*tan(c/2 + d*x/2)**2 + 2*a*d) - 4*tan(
c/2 + d*x/2)/(2*a*d*tan(c/2 + d*x/2)**4 + 4*a*d*tan(c/2 + d*x/2)**2 + 2*a*d
), Ne(d, 0)), (x*cos(c)**3/(a*cos(c) + a), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 133, normalized size of antiderivative = 1.75

$$\int \frac{\cos^3(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{\frac{\frac{\sin(dx+c)}{\cos(dx+c)+1}+\frac{3\sin(dx+c)^3}{(\cos(dx+c)+1)^3}}{a+\frac{2a\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{a\sin(dx+c)^4}{(\cos(dx+c)+1)^4}} - \frac{3\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{a} + \frac{\sin(dx+c)}{a(\cos(dx+c)+1)}}{d}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] -((sin(d*x + c)/(cos(d*x + c) + 1) + 3*sin(d*x + c)^3/(cos(d*x + c) + 1)^3)
/(a + 2*a*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + a*sin(d*x + c)^4/(cos(d*x +
 c) + 1)^4) - 3*arctan(sin(d*x + c)/(cos(d*x + c) + 1))/a + sin(d*x + c)/(a
*(cos(d*x + c) + 1)))/d
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.96

$$\int \frac{\cos^3(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\frac{3(dx+c)}{a} - \frac{2\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{a} - \frac{2\left(3\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3+\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2+1\right)^2 a}}{2d}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/2*(3*(d*x + c)/a - 2*tan(1/2*d*x + 1/2*c)/a - 2*(3*tan(1/2*d*x + 1/2*c)^3
 + tan(1/2*d*x + 1/2*c))/((tan(1/2*d*x + 1/2*c)^2 + 1)^2*a))/d
```

Mupad [B] (verification not implemented)

Time = 14.38 (sec) , antiderivative size = 89, normalized size of antiderivative = 1.17

$$\int \frac{\cos^3(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{\sin\left(\frac{c}{2}+\frac{dx}{2}\right)-\frac{3\cos\left(\frac{c}{2}+\frac{dx}{2}\right)(c+dx)}{2}+3\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^2\sin\left(\frac{c}{2}+\frac{dx}{2}\right)-2\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^4\sin\left(\frac{c}{2}+\frac{dx}{2}\right)}{a\,d\,\cos\left(\frac{c}{2}+\frac{dx}{2}\right)}$$

```
[In] int(cos(c + d*x)^3/(a + a*cos(c + d*x)),x)
```

```
[Out] -(sin(c/2 + (d*x)/2) - (3*cos(c/2 + (d*x)/2)*(c + d*x))/2 + 3*cos(c/2 + (d*
x)/2)^2*sin(c/2 + (d*x)/2) - 2*cos(c/2 + (d*x)/2)^4*sin(c/2 + (d*x)/2))/(a*
d*cos(c/2 + (d*x)/2))
```

3.46 $\int \frac{\cos^2(c+dx)}{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 43

$$\int \frac{\cos^2(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{x}{a}+\frac{\sin(c+dx)}{ad}+\frac{\sin(c+dx)}{ad(1+\cos(c+dx))}$$

```
[Out] -x/a+sin(d*x+c)/a/d+sin(d*x+c)/a/d/(1+cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2825, 12, 2814, 2727}

$$\int \frac{\cos^2(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\sin(c+dx)}{ad}+\frac{\sin(c+dx)}{ad(\cos(c+dx)+1)}-\frac{x}{a}$$

```
[In] Int[Cos[c + d*x]^2/(a + a*Cos[c + d*x]),x]
```

```
[Out] -(x/a) + Sin[c + d*x]/(a*d) + Sin[c + d*x]/(a*d*(1 + Cos[c + d*x]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2825

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^2/((c_.) + (d_.)*sin[(e_.) + (f
_.)*(x_)]), x_Symbol] :> Simp[(-b^2)*(Cos[e + f*x]/(d*f)), x] + Dist[1/d, I
nt[Simp[a^2*d - b*(b*c - 2*a*d)*Sin[e + f*x], x]/(c + d*Sin[e + f*x]), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sin(c+dx)}{ad} - \frac{\int \frac{a\cos(c+dx)}{a+a\cos(c+dx)}\,dx}{a} \\
&= \frac{\sin(c+dx)}{ad} - \int \frac{\cos(c+dx)}{a+a\cos(c+dx)}\,dx \\
&= -\frac{x}{a} + \frac{\sin(c+dx)}{ad} + \int \frac{1}{a+a\cos(c+dx)}\,dx \\
&= -\frac{x}{a} + \frac{\sin(c+dx)}{ad} + \frac{\sin(c+dx)}{d(a+a\cos(c+dx))}
\end{aligned}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 89 vs. $2(43) = 86$.

Time = 0.47 (sec) , antiderivative size = 89, normalized size of antiderivative = 2.07

$$\int \frac{\cos^2(c+dx)}{a+a\cos(c+dx)}\,dx$$
$$= \frac{\sec\left(\frac{c}{2}\right)\sec\left(\frac{1}{2}(c+dx)\right)\left(-2dx\cos\left(\frac{dx}{2}\right)-2dx\cos\left(c+\frac{dx}{2}\right)+5\sin\left(\frac{dx}{2}\right)+\sin\left(c+\frac{dx}{2}\right)+\sin\left(c+\frac{3dx}{2}\right)+\sin}{4ad}$$

```
[In] Integrate[Cos[c + d*x]^2/(a + a*Cos[c + d*x]),x]
```

```
[Out] (Sec[c/2]*Sec[(c + d*x)/2]*(-2*d*x*Cos[(d*x)/2] - 2*d*x*Cos[c + (d*x)/2] +
5*Sin[(d*x)/2] + Sin[c + (d*x)/2] + Sin[c + (3*d*x)/2] + Sin[2*c + (3*d*x)/
2]))/(4*a*d)
```

Maple [A] (verified)

Time = 0.74 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.72

method	result	size
parallelrisch	$\frac{-dx+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)(\cos(dx+c)+2)}{ad}$	31
derivativedivides	$\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}-2\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{da}$	56
default	$\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}-2\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{da}$	56
risch	$-\frac{x}{a}-\frac{i\,\mathrm{e}^{i(dx+c)}}{2ad}+\frac{i\,\mathrm{e}^{-i(dx+c)}}{2ad}+\frac{2i}{da\left(\mathrm{e}^{i(dx+c)}+1\right)}$	66
norman	$\frac{\frac{\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}-\frac{x}{a}+\frac{3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}+\frac{4\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{da}-\frac{2x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{a}-\frac{x\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{a}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}$	112

```
[In] int(cos(d*x+c)^2/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
[Out] (-d*x+tan(1/2*d*x+1/2*c)*(cos(d*x+c)+2))/a/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.07

$$\int \frac{\cos^2(c+dx)}{a+a\cos(c+dx)}\,dx=-\frac{dx\cos(dx+c)+dx-(\cos(dx+c)+2)\sin(dx+c)}{ad\cos(dx+c)+ad}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c)),x, algorithm="fricas")
[Out] -(d*x*cos(d*x + c) + d*x - (cos(d*x + c) + 2)*sin(d*x + c))/(a*d*cos(d*x +
c) + a*d)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 129 vs. 2(31) = 62.

Time = 0.56 (sec) , antiderivative size = 129, normalized size of antiderivative = 3.00

$$\int \frac{\cos^2(c+dx)}{a+a\cos(c+dx)}\,dx = \begin{cases} -\frac{dx\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)}{ad\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+ad}-\frac{dx}{ad\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+ad}+\frac{\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{ad\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+ad}+\frac{3\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{ad\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+ad} & \text{for } d\neq 0 \\ \frac{x\cos^2(c)}{a\cos(c)+a} & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)**2/(a+a*cos(d*x+c)),x)
```

```
[Out] Piecewise((-d*x*tan(c/2 + d*x/2)**2/(a*d*tan(c/2 + d*x/2)**2 + a*d) - d*x/(
a*d*tan(c/2 + d*x/2)**2 + a*d) + tan(c/2 + d*x/2)**3/(a*d*tan(c/2 + d*x/2)*
*2 + a*d) + 3*tan(c/2 + d*x/2)/(a*d*tan(c/2 + d*x/2)**2 + a*d), Ne(d, 0)),
(x*cos(c)**2/(a*cos(c) + a), True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 92 vs. $2(43) = 86$.

Time = 0.31 (sec) , antiderivative size = 92, normalized size of antiderivative = 2.14

$$\int \frac{\cos^2(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{\frac{2\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{a} - \frac{2\sin(dx+c)}{\left(a+\frac{a\sin(dx+c)^2}{(\cos(dx+c)+1)^2}\right)(\cos(dx+c)+1)} - \frac{\sin(dx+c)}{a(\cos(dx+c)+1)}}{d}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] -(2*arctan(sin(d*x + c)/(cos(d*x + c) + 1))/a - 2*sin(d*x + c)/((a + a*sin(
d*x + c)^2/(cos(d*x + c) + 1)^2)*(cos(d*x + c) + 1)) - sin(d*x + c)/(a*(cos
(d*x + c) + 1)))/d
```

Giac [A] (verification not implemented)

none

Time = 0.38 (sec) , antiderivative size = 58, normalized size of antiderivative = 1.35

$$\int \frac{\cos^2(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{\frac{dx+c}{a} - \frac{\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{a} - \frac{2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+1\right)a}}{d}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] -((d*x + c)/a - tan(1/2*d*x + 1/2*c)/a - 2*tan(1/2*d*x + 1/2*c)/((tan(1/2*d
*x + 1/2*c)^2 + 1)*a))/d
```

Mupad [B] (verification not implemented)

Time = 14.92 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.53

$$\int \frac{\cos^2(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{2\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^2+\left(-c-d\,x\right)\,\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)+\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{a\,d\,\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}$$

```
[In] int(cos(c + d*x)^2/(a + a*cos(c + d*x)),x)
```

```
[Out] (sin(c/2 + (d*x)/2) - cos(c/2 + (d*x)/2)*(c + d*x) + 2*cos(c/2 + (d*x)/2)^2
*sin(c/2 + (d*x)/2))/(a*d*cos(c/2 + (d*x)/2))
```

3.47 $\int \frac{\cos(c+dx)}{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 29

$$\int \frac{\cos(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{x}{a} - \frac{\sin(c+dx)}{d(a+a\cos(c+dx))}$$

```
[Out] x/a-sin(d*x+c)/d/(a+a*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.105$, Rules used = {2814, 2727}

$$\int \frac{\cos(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{x}{a} - \frac{\sin(c+dx)}{d(a\cos(c+dx)+a)}$$

```
[In] Int[Cos[c + d*x]/(a + a*Cos[c + d*x]),x]
```

```
[Out] x/a - Sin[c + d*x]/(d*(a + a*Cos[c + d*x]))
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rubi steps

$$\begin{aligned}\text{integral}&=\frac{x}{a}-\int\frac{1}{a+a\cos(c+dx)}\,dx\\&=\frac{x}{a}-\frac{\sin(c+dx)}{d(a+a\cos(c+dx))}\end{aligned}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 69 vs. $2(29) = 58$.

Time = 0.14 (sec) , antiderivative size = 69, normalized size of antiderivative = 2.38

$$\int\frac{\cos(c+dx)}{a+a\cos(c+dx)}\,dx$$
$$=-\frac{\sin(c+dx)\left(\arcsin(\cos(c+dx))(1+\cos(c+dx))+\sqrt{\sin^2(c+dx)}\right)}{ad\sqrt{1-\cos(c+dx)}(1+\cos(c+dx))^{3/2}}$$

```
[In] Integrate[Cos[c + d*x]/(a + a*Cos[c + d*x]),x]
```

```
[Out] -((Sin[c + d*x]*(ArcSin[Cos[c + d*x]]*(1 + Cos[c + d*x]) + Sqrt[Sin[c + d*x
]^2]))/(a*d*Sqrt[1 - Cos[c + d*x]]*(1 + Cos[c + d*x])^(3/2)))
```

Maple [A] (verified)

Time = 0.72 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.79

method	result	size
parallelrisch	$\frac{dx-\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{ad}$	23
risch	$\frac{x}{a}-\frac{2i}{da\left(e^{i(dx+c)}+1\right)}$	29
derivativedivides	$\frac{-\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+2\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{da}$	32
default	$\frac{-\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+2\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{da}$	32
norman	$\frac{\frac{x}{a}+\frac{x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{a}-\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}-\frac{\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}$	75

```
[In] int(cos(d*x+c)/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] (d*x-tan(1/2*d*x+1/2*c))/a/d
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.28

$$\int \frac{\cos(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{dx\cos(dx+c)+dx-\sin(dx+c)}{ad\cos(dx+c)+ad}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] (d*x*cos(d*x + c) + d*x - sin(d*x + c))/(a*d*cos(d*x + c) + a*d)
```

Sympy [A] (verification not implemented)

Time = 0.36 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.93

$$\int \frac{\cos(c+dx)}{a+a\cos(c+dx)}\,dx = \begin{cases} \frac{x}{a} - \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{ad} & \text{for } d \neq 0 \\ \frac{x\cos(c)}{a\cos(c)+a} & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c)),x)
```

```
[Out] Piecewise((x/a - tan(c/2 + d*x/2)/(a*d), Ne(d, 0)), (x*cos(c)/(a*cos(c) + a
), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.69

$$\int \frac{\cos(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\frac{2\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{a} - \frac{\sin(dx+c)}{a(\cos(dx+c)+1)}}{d}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] (2*arctan(sin(d*x + c)/(cos(d*x + c) + 1))/a - sin(d*x + c)/(a*(cos(d*x + c
) + 1)))/d
```

Giac [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 28, normalized size of antiderivative = 0.97

$$\int \frac{\cos(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\frac{dx+c}{a} - \frac{\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{a}}{d}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c)),x, algorithm="giac")
[Out] ((d*x + c)/a - tan(1/2*d*x + 1/2*c)/a)/d
```

Mupad [B] (verification not implemented)

Time = 14.64 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.79

$$\int \frac{\cos(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{x}{a} - \frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{a\,d}$$

```
[In] int(cos(c + d*x)/(a + a*cos(c + d*x)),x)
[Out] x/a - tan(c/2 + (d*x)/2)/(a*d)
```

3.48 $\int \frac{1}{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 22

$$\int \frac{1}{a+a\cos(c+dx)}\,dx=\frac{\sin(c+dx)}{d(a+a\cos(c+dx))}$$

```
[Out] sin(d*x+c)/d/(a+a*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.01 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {2727}

$$\int \frac{1}{a+a\cos(c+dx)}\,dx=\frac{\sin(c+dx)}{d(a\cos(c+dx)+a)}$$

```
[In] Int[(a + a*Cos[c + d*x])^(-1),x]
```

```
[Out] Sin[c + d*x]/(d*(a + a*Cos[c + d*x]))
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rubi steps

$$\text{integral}=\frac{\sin(c+dx)}{d(a+a\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.77

$$\int \frac{1}{a+a\cos(c+dx)}\,dx=\frac{\tan\left(\frac{1}{2}(c+dx)\right)}{ad}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(-1),x]
[Out] Tan[(c + d*x)/2]/(a*d)
```

Maple [A] (verified)

Time = 0.70 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.77

method	result	size
derivativedivides	$\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}$	17
default	$\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}$	17
norman	$\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}$	17
parallelrisch	$\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}$	17
risch	$\frac{2i}{da\left(e^{i(dx+c)}+1\right)}$	23

```
[In] int(1/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
[Out] 1/d/a*tan(1/2*d*x+1/2*c)
```

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{a+a\cos(c+dx)}\,dx=\frac{\sin\left(dx+c\right)}{ad\cos\left(dx+c\right)+ad}$$

```
[In] integrate(1/(a+a*cos(d*x+c)),x, algorithm="fricas")
[Out] sin(d*x + c)/(a*d*cos(d*x + c) + a*d)
```

Sympy [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{1}{a+a\cos(c+dx)}\,dx = \begin{cases} \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{ad} & \text{for } d \neq 0 \\ \frac{x}{a\cos(c)+a} & \text{otherwise} \end{cases}$$

```
[In] integrate(1/(a+a*cos(d*x+c)),x)
[Out] Piecewise((tan(c/2 + d*x/2)/(a*d), Ne(d, 0)), (x/(a*cos(c) + a), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.21 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.05

$$\int \frac{1}{a+a\cos(c+dx)}\,dx = \frac{\sin(dx+c)}{ad(\cos(dx+c)+1)}$$

```
[In] integrate(1/(a+a*cos(d*x+c)),x, algorithm="maxima")
[Out] sin(d*x + c)/(a*d*(cos(d*x + c) + 1))
```

Giac [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 16, normalized size of antiderivative = 0.73

$$\int \frac{1}{a+a\cos(c+dx)}\,dx = \frac{\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{ad}$$

```
[In] integrate(1/(a+a*cos(d*x+c)),x, algorithm="giac")
[Out] tan(1/2*d*x + 1/2*c)/(a*d)
```

Mupad [B] (verification not implemented)

Time = 14.20 (sec) , antiderivative size = 16, normalized size of antiderivative = 0.73

$$\int \frac{1}{a+a\cos(c+dx)}\,dx=\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{a\,d}$$

```
[In] int(1/(a + a*cos(c + d*x)),x)
[Out] tan(c/2 + (d*x)/2)/(a*d)
```

3.49 $\int \frac{\sec(c+dx)}{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 38

$$\int \frac{\sec(c+dx)}{a+a\cos(c+dx)}\,dx=\frac{\operatorname{arctanh}(\sin(c+dx))}{ad}-\frac{\sin(c+dx)}{d(a+a\cos(c+dx))}$$

```
[Out] arctanh(sin(d*x+c))/a/d-sin(d*x+c)/d/(a+a*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2826, 3855, 2727}

$$\int \frac{\sec(c+dx)}{a+a\cos(c+dx)}\,dx=\frac{\operatorname{arctanh}(\sin(c+dx))}{ad}-\frac{\sin(c+dx)}{d(a\cos(c+dx)+a)}$$

```
[In] Int[Sec[c + d*x]/(a + a*Cos[c + d*x]),x]
```

```
[Out] ArcTanh[Sin[c + d*x]]/(a*d) - Sin[c + d*x]/(d*(a + a*Cos[c + d*x]))
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2826

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])), x_Symbol] :> Dist[b/(b*c - a*d), Int[1/(a + b*Sin[e + f*x]),
```

```
x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a
, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\int \sec(c+dx)\,dx}{a} - \int \frac{1}{a+a\cos(c+dx)}\,dx\\ &= \frac{\operatorname{arctanh}(\sin(c+dx))}{ad} - \frac{\sin(c+dx)}{d(a+a\cos(c+dx))}\end{aligned}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 103 vs. $2(38) = 76$.

Time = 0.28 (sec) , antiderivative size = 103, normalized size of antiderivative = 2.71

$$\int \frac{\sec(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{2\cos\left(\frac{1}{2}(c+dx)\right)\left(\cos\left(\frac{1}{2}(c+dx)\right)\left(\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)-\log\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\right.\right.\right.}{ad(1+\cos(c+dx))}$$

```
[In] Integrate[Sec[c + d*x]/(a + a*Cos[c + d*x]),x]
```

```
[Out] (-2*Cos[(c + d*x)/2]*(Cos[(c + d*x)/2]*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x
)/2]] - Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) + Sec[c/2]*Sin[(d*x)/2]))
/(a*d*(1 + Cos[c + d*x]))
```

Maple [A] (verified)

Time = 0.87 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.21

method	result	size
derivativedivides	$\frac{-\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{da}$	46
default	$\frac{-\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{da}$	46
parallelrisch	$\frac{-\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{da}$	46
norman	$-\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}+\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{ad}-\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{ad}$	58
risch	$-\frac{2i}{da\left(e^{i(dx+c)}+1\right)}-\frac{\ln\left(e^{i(dx+c)}-i\right)}{da}+\frac{\ln\left(e^{i(dx+c)}+i\right)}{ad}$	65

```
[In] int(sec(d*x+c)/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d/a*(-tan(1/2*d*x+1/2*c)-ln(tan(1/2*d*x+1/2*c)-1)+ln(tan(1/2*d*x+1/2*c)+1
))
```

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.71

$$\int \frac{\sec(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{(\cos(dx+c)+1)\log(\sin(dx+c)+1)-(\cos(dx+c)+1)\log(-\sin(dx+c)+1)-2\sin(dx+c)}{2\left(ad\cos(dx+c)+ad\right)}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/2*((cos(d*x + c) + 1)*log(sin(d*x + c) + 1) - (cos(d*x + c) + 1)*log(-sin
(d*x + c) + 1) - 2*sin(d*x + c))/(a*d*cos(d*x + c) + a*d)
```

Sympy [F]

$$\int \frac{\sec(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\int \frac{\sec(c+dx)}{\cos(c+dx)+1}\,dx}{a}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c)),x)
```

```
[Out] Integral(sec(c + d*x)/(cos(c + d*x) + 1), x)/a
```

Maxima [A] (verification not implemented)

none

Time = 0.22 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.97

$$\int \frac{\sec(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\frac{\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a} - \frac{\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)}{a} - \frac{\sin(dx+c)}{a(\cos(dx+c)+1)}}{d}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c)),x, algorithm="maxima")
[Out] (log(sin(d*x + c)/(cos(d*x + c) + 1) + 1)/a - log(sin(d*x + c)/(cos(d*x + c
) + 1) - 1)/a - sin(d*x + c)/(a*(cos(d*x + c) + 1)))/d
```

Giac [A] (verification not implemented)

none

Time = 0.44 (sec) , antiderivative size = 54, normalized size of antiderivative = 1.42

$$\int \frac{\sec(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\frac{\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)}{a} - \frac{\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)}{a} - \frac{\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{a}}{d}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c)),x, algorithm="giac")
[Out] (log(abs(tan(1/2*d*x + 1/2*c) + 1))/a - log(abs(tan(1/2*d*x + 1/2*c) - 1))/
a - tan(1/2*d*x + 1/2*c)/a)/d
```

Mupad [B] (verification not implemented)

Time = 14.48 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.82

$$\int \frac{\sec(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{2\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{a\,d}$$

```
[In] int(1/(cos(c + d*x)*(a + a*cos(c + d*x))),x)
[Out] (2*atanh(tan(c/2 + (d*x)/2)) - tan(c/2 + (d*x)/2))/(a*d)
```

3.50 $\int \frac{\sec^2(c+dx)}{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 53

$$\int \frac{\sec^2(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{\operatorname{arctanh}(\sin(c+dx))}{ad}+\frac{2\tan(c+dx)}{ad}-\frac{\tan(c+dx)}{d(a+a\cos(c+dx))}$$

```
[Out] -arctanh(sin(d*x+c))/a/d+2*tan(d*x+c)/a/d-tan(d*x+c)/d/(a+a*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2847, 2827, 3852, 8, 3855}

$$\int \frac{\sec^2(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{\operatorname{arctanh}(\sin(c+dx))}{ad}+\frac{2\tan(c+dx)}{ad}-\frac{\tan(c+dx)}{d(a\cos(c+dx)+a)}$$

```
[In] Int[Sec[c + d*x]^2/(a + a*Cos[c + d*x]),x]
```

```
[Out] -(ArcTanh[Sin[c + d*x]]/(a*d)) + (2*Tan[c + d*x])/(a*d) - Tan[c + d*x]/(d*(
a + a*Cos[c + d*x]))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2847

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/((a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(b*c - a*d)*(a + b*Sin[e + f*x]))), x] + Dist[d/(a*(b*c - a*d))
, Int[(c + d*Sin[e + f*x])^n*(a*n - b*(n + 1)*Sin[e + f*x]), x], x] /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c
^2 - d^2, 0] && LtQ[n, 0] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\tan(c+dx)}{d(a+a\cos(c+dx))} - \frac{\int(-2a+a\cos(c+dx))\sec^2(c+dx)\,dx}{a^2} \\
&= -\frac{\tan(c+dx)}{d(a+a\cos(c+dx))} - \frac{\int\sec(c+dx)\,dx}{a} + \frac{2\int\sec^2(c+dx)\,dx}{a} \\
&= -\frac{\operatorname{arctanh}(\sin(c+dx))}{ad} - \frac{\tan(c+dx)}{d(a+a\cos(c+dx))} - \frac{2\text{Subst}(\int 1\,dx, x, -\tan(c+dx))}{ad} \\
&= -\frac{\operatorname{arctanh}(\sin(c+dx))}{ad} + \frac{2\tan(c+dx)}{ad} - \frac{\tan(c+dx)}{d(a+a\cos(c+dx))}
\end{aligned}
$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 188 vs. $2(53) = 106$.

Time = 0.78 (sec) , antiderivative size = 188, normalized size of antiderivative = 3.55

$$
\int \frac{\sec^2(c+dx)}{a+a\cos(c+dx)}\,dx
= \frac{2\cos\left(\frac{1}{2}(c+dx)\right)\left(\sec\left(\frac{c}{2}\right)\sin\left(\frac{dx}{2}\right)+\cos\left(\frac{1}{2}(c+dx)\right)\left(\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)-\log\left(\cos\right.\right.\right.}{ad(1+\ldots}
$$

```
[In] Integrate[Sec[c + d*x]^2/(a + a*Cos[c + d*x]),x]
```

```
[Out] (2*Cos[(c + d*x)/2]*(Sec[c/2]*Sin[(d*x)/2] + Cos[(c + d*x)/2]*(Log[Cos[(c +
 d*x)/2] - Sin[(c + d*x)/2]] - Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] + S
in[d*x]/((Cos[c/2] - Sin[c/2])*(Cos[c/2] + Sin[c/2])*(Cos[(c + d*x)/2] - Si
n[(c + d*x)/2])*(Cos[(c + d*x)/2] + Sin[(c + d*x)/2])))))/(a*d*(1 + Cos[c +
 d*x]))
```

Maple [A] (verified)

Time = 0.93 (sec) , antiderivative size = 74, normalized size of antiderivative = 1.40

method	result	size
derivativedivides	$\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{1}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1}+\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)-\frac{1}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1}-\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{da}$	74
default	$\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{1}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1}+\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)-\frac{1}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1}-\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{da}$	74
parallelrisch	$\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(dx+c)-\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)\cos(dx+c)+2\cos(dx+c)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{ad\cos(dx+c)}$	82
norman	$\frac{\frac{\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}-\frac{3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}}{\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1}+\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{ad}-\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{ad}$	93
risch	$\frac{2i\left(e^{2i(dx+c)}+e^{i(dx+c)}+2\right)}{da\left(e^{i(dx+c)}+1\right)\left(e^{2i(dx+c)}+1\right)}+\frac{\ln\left(e^{i(dx+c)}-i\right)}{da}-\frac{\ln\left(e^{i(dx+c)}+i\right)}{ad}$	98

```
[In] int(sec(d*x+c)^2/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d/a*(tan(1/2*d*x+1/2*c)-1/(tan(1/2*d*x+1/2*c)-1)+ln(tan(1/2*d*x+1/2*c)-1)
-1/(tan(1/2*d*x+1/2*c)+1)-ln(tan(1/2*d*x+1/2*c)+1))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.83

$$\int \frac{\sec^2(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{\left(\cos\left(dx+c\right)^2+\cos\left(dx+c\right)\right)\log\left(\sin\left(dx+c\right)+1\right)-\left(\cos\left(dx+c\right)^2+\cos\left(dx+c\right)\right)\log\left(-\sin\left(dx+c\right)-\right.}{2\left(ad\cos\left(dx+c\right)^2+ad\cos\left(dx+c\right)\right)}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] -1/2*((cos(d*x + c)^2 + cos(d*x + c))*log(sin(d*x + c) + 1) - (cos(d*x + c)
^2 + cos(d*x + c))*log(-sin(d*x + c) + 1) - 2*(2*cos(d*x + c) + 1)*sin(d*x
+ c))/(a*d*cos(d*x + c)^2 + a*d*cos(d*x + c))
```

Sympy [F]

$$\int \frac{\sec^2(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\int \frac{\sec^2(c+dx)}{\cos(c+dx)+1}\,dx}{a}$$

```
[In] integrate(sec(d*x+c)**2/(a+a*cos(d*x+c)),x)
[Out] Integral(sec(c + d*x)**2/(cos(c + d*x) + 1), x)/a
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 119 vs. 2(53) = 106.

Time = 0.23 (sec) , antiderivative size = 119, normalized size of antiderivative = 2.25

$$\int \frac{\sec^2(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{\frac{\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a} - \frac{\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)}{a} - \frac{2\sin(dx+c)}{\left(a-\frac{a\sin(dx+c)^2}{(\cos(dx+c)+1)^2}\right)(\cos(dx+c)+1)} - \frac{\sin(dx+c)}{a(\cos(dx+c)+1)}}{d}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c)),x, algorithm="maxima")
[Out] -(log(sin(d*x + c)/(cos(d*x + c) + 1) + 1)/a - log(sin(d*x + c)/(cos(d*x +
c) + 1) - 1)/a - 2*sin(d*x + c)/((a - a*sin(d*x + c)^2/(cos(d*x + c) + 1)^2
)*(cos(d*x + c) + 1)) - sin(d*x + c)/(a*(cos(d*x + c) + 1)))/d
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 84, normalized size of antiderivative = 1.58

$$\int \frac{\sec^2(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{\frac{\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)}{a} - \frac{\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)}{a} - \frac{\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{a} + \frac{2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)a}}{d}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c)),x, algorithm="giac")
[Out] -(log(abs(tan(1/2*d*x + 1/2*c) + 1))/a - log(abs(tan(1/2*d*x + 1/2*c) - 1))
/a - tan(1/2*d*x + 1/2*c)/a + 2*tan(1/2*d*x + 1/2*c)/((tan(1/2*d*x + 1/2*c)
^2 - 1)*a))/d
```

Mupad [B] (verification not implemented)

Time = 14.80 (sec) , antiderivative size = 67, normalized size of antiderivative = 1.26

$$\int \frac{\sec^2(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{2\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{d\left(a-a\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2\right)} - \frac{2\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}{a\,d} + \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{a\,d}$$

```
[In] int(1/(cos(c + d*x)^2*(a + a*cos(c + d*x))),x)
```

```
[Out] (2*tan(c/2 + (d*x)/2))/(d*(a - a*tan(c/2 + (d*x)/2)^2)) - (2*atanh(tan(c/2
+ (d*x)/2)))/(a*d) + tan(c/2 + (d*x)/2)/(a*d)
```

3.51 $\int \frac{\sec^3(c+dx)}{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 83

$$\int \frac{\sec^3(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{3\text{arctanh}(\sin(c+dx))}{2ad} - \frac{2\tan(c+dx)}{ad} + \frac{3\sec(c+dx)\tan(c+dx)}{2ad} - \frac{\sec(c+dx)\tan(c+dx)}{d(a+a\cos(c+dx))}$$

```
[Out] 3/2*arctanh(sin(d*x+c))/a/d-2*tan(d*x+c)/a/d+3/2*sec(d*x+c)*tan(d*x+c)/a/d-
sec(d*x+c)*tan(d*x+c)/d/(a+a*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2847, 2827, 3853, 3855, 3852, 8}

$$\int \frac{\sec^3(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{3\text{arctanh}(\sin(c+dx))}{2ad} - \frac{2\tan(c+dx)}{ad} + \frac{3\tan(c+dx)\sec(c+dx)}{2ad} - \frac{\tan(c+dx)\sec(c+dx)}{d(a\cos(c+dx)+a)}$$

```
[In] Int[Sec[c + d*x]^3/(a + a*Cos[c + d*x]),x]
```

```
[Out] (3*ArcTanh[Sin[c + d*x]])/(2*a*d) - (2*Tan[c + d*x])/(a*d) + (3*Sec[c + d*x
]*Tan[c + d*x])/(2*a*d) - (Sec[c + d*x]*Tan[c + d*x])/(d*(a + a*Cos[c + d*x
]))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2847

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/((a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(b*c - a*d)*(a + b*Sin[e + f*x]))), x] + Dist[d/(a*(b*c - a*d))
, Int[(c + d*Sin[e + f*x])^n*(a*n - b*(n + 1)*Sin[e + f*x]), x], x] /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c
^2 - d^2, 0] && LtQ[n, 0] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sec(c+dx)\tan(c+dx)}{d(a+a\cos(c+dx))} - \frac{\int(-3a+2a\cos(c+dx))\sec^3(c+dx)\,dx}{a^2} \\
&= -\frac{\sec(c+dx)\tan(c+dx)}{d(a+a\cos(c+dx))} - \frac{2\int\sec^2(c+dx)\,dx}{a} + \frac{3\int\sec^3(c+dx)\,dx}{a} \\
&= \frac{3\sec(c+dx)\tan(c+dx)}{2ad} - \frac{\sec(c+dx)\tan(c+dx)}{d(a+a\cos(c+dx))} \\
&\quad + \frac{3\int\sec(c+dx)\,dx}{2a} + \frac{2\text{Subst}(\int 1\,dx, x, -\tan(c+dx))}{ad}
\end{aligned}$$

$$= \frac{3\operatorname{arctanh}(\sin(c+dx))}{2ad} - \frac{2\tan(c+dx)}{ad} + \frac{3\sec(c+dx)\tan(c+dx)}{2ad} - \frac{\sec(c+dx)\tan(c+dx)}{d(a+a\cos(c+dx))}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 244 vs. $2(83) = 166$.

Time = 1.17 (sec) , antiderivative size = 244, normalized size of antiderivative = 2.94

$$\int \frac{\sec^3(c+dx)}{a+a\cos(c+dx)}\,dx$$

$$= \frac{\cos\left(\frac{1}{2}(c+dx)\right)\left(-4\sec\left(\frac{c}{2}\right)\sin\left(\frac{dx}{2}\right)+\cos\left(\frac{1}{2}(c+dx)\right)\left(-6\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)+6\,\mathrm{lo}\right.\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^3/(a + a*Cos[c + d*x]),x]
```

```
[Out] (Cos[(c + d*x)/2]*(-4*Sec[c/2]*Sin[(d*x)/2] + Cos[(c + d*x)/2]*(-6*Log[Cos[
(c + d*x)/2] - Sin[(c + d*x)/2]] + 6*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2
]] + (Cos[(c + d*x)/2] - Sin[(c + d*x)/2])^(-2) - (Cos[(c + d*x)/2] + Sin[(
c + d*x)/2])^(-2) - (4*Sin[d*x])/((Cos[c/2] - Sin[c/2])*(Cos[c/2] + Sin[c/2
])*(Cos[(c + d*x)/2] - Sin[(c + d*x)/2])*(Cos[(c + d*x)/2] + Sin[(c + d*x)/
2])))))/(2*a*d*(1 + Cos[c + d*x]))
```

Maple [A] (verified)

Time = 0.99 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.27

method	result
parallelrisch	$\frac{(-3\cos(2dx+2c)-3)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+(3\cos(2dx+2c)+3)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)(1+2\cos(2dx+2c)+}{2ad(1+\cos(2dx+2c))}$
derivativedivides	$\frac{-\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{1}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}+\frac{3}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}-\frac{3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2}-\frac{1}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^2}+\frac{3}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}-}{da}$
default	$\frac{-\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{1}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}+\frac{3}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}-\frac{3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2}-\frac{1}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^2}+\frac{3}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}-}{da}$
norman	$\frac{-\frac{2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}+\frac{5\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{da}-\frac{\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}}{\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}-\frac{3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2ad}+\frac{3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{2ad}$
risch	$-\frac{i\left(3\,\mathrm{e}^{4i(dx+c)}+3\,\mathrm{e}^{3i(dx+c)}+5\,\mathrm{e}^{2i(dx+c)}+\mathrm{e}^{i(dx+c)}+4\right)}{da\left(\mathrm{e}^{2i(dx+c)}+1\right)^2\left(\mathrm{e}^{i(dx+c)}+1\right)}+\frac{3\ln\left(\mathrm{e}^{i(dx+c)}+i\right)}{2ad}-\frac{3\ln\left(\mathrm{e}^{i(dx+c)}-i\right)}{2da}$

```
[In] int(sec(d*x+c)^3/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*((-3*cos(2*d*x+2*c)-3)*ln(tan(1/2*d*x+1/2*c)-1)+(3*cos(2*d*x+2*c)+3)*ln
(tan(1/2*d*x+1/2*c)+1)-2*tan(1/2*d*x+1/2*c)*(1+2*cos(2*d*x+2*c)+cos(d*x+c))
)/a/d/(1+cos(2*d*x+2*c))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.35

$$\int \frac{\sec^3(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{3\left(\cos\left(dx+c\right)^3+\cos\left(dx+c\right)^2\right)\log\left(\sin\left(dx+c\right)+1\right)-3\left(\cos\left(dx+c\right)^3+\cos\left(dx+c\right)^2\right)\log\left(-\sin\left(dx+c\right.\right.}{4\left(ad\cos\left(dx+c\right)^3+ad\cos\left(dx+c\right)^2\right)}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/4*(3*(cos(d*x + c)^3 + cos(d*x + c)^2)*log(sin(d*x + c) + 1) - 3*(cos(d*x
 + c)^3 + cos(d*x + c)^2)*log(-sin(d*x + c) + 1) - 2*(4*cos(d*x + c)^2 + co
s(d*x + c) - 1)*sin(d*x + c))/(a*d*cos(d*x + c)^3 + a*d*cos(d*x + c)^2)
```

Sympy [F]

$$\int \frac{\sec^3(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\int \frac{\sec^3\left(c+dx\right)}{\cos\left(c+dx\right)+1}\,dx}{a}$$

```
[In] integrate(sec(d*x+c)**3/(a+a*cos(d*x+c)),x)
```

```
[Out] Integral(sec(c + d*x)**3/(cos(c + d*x) + 1), x)/a
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 162 vs. 2(79) = 158.

Time = 0.24 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.95

$$\int \frac{\sec^3(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{\frac{2\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-\frac{3\sin(dx+c)^3}{(\cos(dx+c)+1)^3}\right)}{a-\frac{2a\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{a\sin(dx+c)^4}{(\cos(dx+c)+1)^4}}-\frac{3\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a}+\frac{3\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)}{a}+\frac{2\sin(dx+c)}{a(\cos(dx+c)+1)}}{2d}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/2*(2*(sin(d*x + c)/(cos(d*x + c) + 1) - 3*sin(d*x + c)^3/(cos(d*x + c) +
 1)^3)/(a - 2*a*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + a*sin(d*x + c)^4/(cos
(d*x + c) + 1)^4) - 3*log(sin(d*x + c)/(cos(d*x + c) + 1) + 1)/a + 3*log(si
n(d*x + c)/(cos(d*x + c) + 1) - 1)/a + 2*sin(d*x + c)/(a*(cos(d*x + c) + 1)
))/d
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.22

$$\int \frac{\sec^3(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\frac{3\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)}{a} - \frac{3\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right)}{a} - \frac{2\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{a} + \frac{2\left(3\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)^2a}}{2d}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/2*(3*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a - 3*log(abs(tan(1/2*d*x + 1/2*c
) - 1))/a - 2*tan(1/2*d*x + 1/2*c)/a + 2*(3*tan(1/2*d*x + 1/2*c)^3 - tan(1/
2*d*x + 1/2*c))/((tan(1/2*d*x + 1/2*c)^2 - 1)^2*a))/d
```

Mupad [B] (verification not implemented)

Time = 14.76 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.14

$$\int \frac{\sec^3(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{3\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{a\,d} - \frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{a\,d} - \frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{d\,\left(a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-2\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+a\right)}$$

```
[In] int(1/(cos(c + d*x)^3*(a + a*cos(c + d*x))),x)
```

```
[Out] (3*atanh(tan(c/2 + (d*x)/2)))/(a*d) - tan(c/2 + (d*x)/2)/(a*d) - (tan(c/2 +
 (d*x)/2) - 3*tan(c/2 + (d*x)/2)^3)/(d*(a - 2*a*tan(c/2 + (d*x)/2)^2 + a*ta
n(c/2 + (d*x)/2)^4))
```

3.52 $\int \frac{\sec^4(c+dx)}{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 103

$$\int \frac{\sec^4(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{3\text{arctanh}(\sin(c+dx))}{2ad}+\frac{4\tan(c+dx)}{ad}-\frac{3\sec(c+dx)\tan(c+dx)}{2ad}-\frac{\sec^2(c+dx)\tan(c+dx)}{d(a+a\cos(c+dx))}+\frac{4\tan^3(c+dx)}{3ad}$$

```
[Out] -3/2*arctanh(sin(d*x+c))/a/d+4*tan(d*x+c)/a/d-3/2*sec(d*x+c)*tan(d*x+c)/a/d
-sec(d*x+c)^2*tan(d*x+c)/d/(a+a*cos(d*x+c))+4/3*tan(d*x+c)^3/a/d
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 103, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2847, 2827, 3852, 3853, 3855}

$$\int \frac{\sec^4(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{3\text{arctanh}(\sin(c+dx))}{2ad}+\frac{4\tan^3(c+dx)}{3ad}+\frac{4\tan(c+dx)}{ad}-\frac{3\tan(c+dx)\sec(c+dx)}{2ad}-\frac{\tan(c+dx)\sec^2(c+dx)}{d(a\cos(c+dx)+a)}$$

```
[In] Int[Sec[c + d*x]^4/(a + a*Cos[c + d*x]),x]
```

```
[Out] (-3*ArcTanh[Sin[c + d*x]])/(2*a*d) + (4*Tan[c + d*x])/(a*d) - (3*Sec[c + d*
x]*Tan[c + d*x])/(2*a*d) - (Sec[c + d*x]^2*Tan[c + d*x])/(d*(a + a*Cos[c +
d*x])) + (4*Tan[c + d*x]^3)/(3*a*d)
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2847

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/((a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(b*c - a*d)*(a + b*Sin[e + f*x]))), x] + Dist[d/(a*(b*c - a*d))
, Int[(c + d*Sin[e + f*x])^n*(a*n - b*(n + 1)*Sin[e + f*x]), x], x] /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c
^2 - d^2, 0] && LtQ[n, 0] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sec^2(c+dx)\tan(c+dx)}{d(a+a\cos(c+dx))} - \frac{\int(-4a+3a\cos(c+dx))\sec^4(c+dx)\,dx}{a^2} \\
&= -\frac{\sec^2(c+dx)\tan(c+dx)}{d(a+a\cos(c+dx))} - \frac{3\int\sec^3(c+dx)\,dx}{a} + \frac{4\int\sec^4(c+dx)\,dx}{a} \\
&= -\frac{3\sec(c+dx)\tan(c+dx)}{2ad} - \frac{\sec^2(c+dx)\tan(c+dx)}{d(a+a\cos(c+dx))} \\
&\quad - \frac{3\int\sec(c+dx)\,dx}{2a} - \frac{4\text{Subst}\left(\int\left(1+x^2\right)\,dx,x,-\tan(c+dx)\right)}{ad}
\end{aligned}$$

$$= -\frac{3\text{arctanh}(\sin(c+dx))}{2ad} + \frac{4\tan(c+dx)}{ad} - \frac{3\sec(c+dx)\tan(c+dx)}{2ad} - \frac{\sec^2(c+dx)\tan(c+dx)}{d(a+a\cos(c+dx))} + \frac{4\tan^3(c+dx)}{3ad}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 368 vs. $2(103) = 206$.

Time = 3.13 (sec) , antiderivative size = 368, normalized size of antiderivative = 3.57

$$\int \frac{\sec^4(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\cos\left(\frac{1}{2}(c+dx)\right)\left(6\sec\left(\frac{c}{2}\right)\sin\left(\frac{dx}{2}\right)+\frac{1}{8}\cos\left(\frac{1}{2}(c+dx)\right)\sec(c)\sec^3(c+dx)\left(9\cos(2c+3dx)\log\left(\cos\left(\frac{1}{2}(c+a\right.\right.\right.\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^4/(a + a*Cos[c + d*x]),x]
```

```
[Out] (Cos[(c + d*x)/2]*(6*Sec[c/2]*Sin[(d*x)/2] + (Cos[(c + d*x)/2]*Sec[c]*Sec[c
 + d*x]^3*(9*Cos[2*c + 3*d*x]*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + 9*
Cos[4*c + 3*d*x]*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + 27*Cos[d*x]*(Lo
g[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - Log[Cos[(c + d*x)/2] + Sin[(c + d*
x)/2]]) + 27*Cos[2*c + d*x]*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - Log
[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) - 9*Cos[2*c + 3*d*x]*Log[Cos[(c + d*
x)/2] + Sin[(c + d*x)/2]] - 9*Cos[4*c + 3*d*x]*Log[Cos[(c + d*x)/2] + Sin[(
c + d*x)/2]] + 48*Sin[d*x] - 12*Sin[2*c + d*x] - 6*Sin[c + 2*d*x] - 6*Sin[3
*c + 2*d*x] + 20*Sin[2*c + 3*d*x]))/8))/(3*a*d*(1 + Cos[c + d*x]))
```

Maple [A] (verified)

Time = 1.04 (sec) , antiderivative size = 132, normalized size of antiderivative = 1.28

method	result
norman	$\frac{\frac{\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}-\frac{4\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{da}+\frac{25\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3da}-\frac{8\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{da}}{\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^3}+\frac{3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2ad}-\frac{3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{2ad}$
derivativedivides	$\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{1}{3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^3}+\frac{1}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^2}-\frac{5}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}-\frac{3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{2}-\frac{1}{3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^3}-\frac{}{(\text{ta}}}{da}$
default	$\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{1}{3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^3}+\frac{1}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^2}-\frac{5}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}-\frac{3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{2}-\frac{1}{3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^3}-\frac{}{(\text{ta}}}{da}$
parallelrisch	$\frac{(27\cos(dx+c)+9\cos(3dx+3c))\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+(-27\cos(dx+c)-9\cos(3dx+3c))\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)+44\tan\left(\frac{dx}{2}+\right.}{6ad(\cos(3dx+3c)+3\cos(dx+c))}$
risch	$\frac{i(9\,\mathrm{e}^{6i(dx+c)}+9\,\mathrm{e}^{5i(dx+c)}+24\,\mathrm{e}^{4i(dx+c)}+24\,\mathrm{e}^{3i(dx+c)}+39\,\mathrm{e}^{2i(dx+c)}+7\,\mathrm{e}^{i(dx+c)}+16)}{3da\left(\mathrm{e}^{2i(dx+c)}+1\right)^3\left(\mathrm{e}^{i(dx+c)}+1\right)}-\frac{3\ln\left(\mathrm{e}^{i(dx+c)}+i\right)}{2ad}+\frac{3\ln\left(\mathrm{e}^{i(dx+c)}\right.}{2da}$

```
[In] int(sec(d*x+c)^4/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] (1/d/a*tan(1/2*d*x+1/2*c)^7-4/d/a*tan(1/2*d*x+1/2*c)+25/3/d/a*tan(1/2*d*x+1
/2*c)^3-8/d/a*tan(1/2*d*x+1/2*c)^5)/(tan(1/2*d*x+1/2*c)^2-1)^3+3/2/a/d*ln(t
an(1/2*d*x+1/2*c)-1)-3/2/a/d*ln(tan(1/2*d*x+1/2*c)+1)
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.20

$$\int \frac{\sec^4(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{9\left(\cos\left(dx+c\right)^4+\cos\left(dx+c\right)^3\right)\log\left(\sin\left(dx+c\right)+1\right)-9\left(\cos\left(dx+c\right)^4+\cos\left(dx+c\right)^3\right)\log\left(-\sin\left(dx\right.\right.}{12\left(ad\cos\left(dx+c\right)^4+ad\cos\left(\right.\right.}$$

```
[In] integrate(sec(d*x+c)^4/(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] -1/12*(9*(cos(d*x + c)^4 + cos(d*x + c)^3)*log(sin(d*x + c) + 1) - 9*(cos(d
*x + c)^4 + cos(d*x + c)^3)*log(-sin(d*x + c) + 1) - 2*(16*cos(d*x + c)^3 +
 7*cos(d*x + c)^2 - cos(d*x + c) + 2)*sin(d*x + c))/(a*d*cos(d*x + c)^4 + a
*d*cos(d*x + c)^3)
```

Sympy [F]

$$\int \frac{\sec^4(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\int \frac{\sec^4(c+dx)}{\cos(c+dx)+1}\,dx}{a}$$

```
[In] integrate(sec(d*x+c)**4/(a+a*cos(d*x+c)),x)
```

```
[Out] Integral(sec(c + d*x)**4/(cos(c + d*x) + 1), x)/a
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 205 vs. 2(97) = 194.

Time = 0.21 (sec) , antiderivative size = 205, normalized size of antiderivative = 1.99

$$\int \frac{\sec^4(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\frac{2\left(\frac{9\sin(dx+c)}{\cos(dx+c)+1}-\frac{16\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{15\sin(dx+c)^5}{(\cos(dx+c)+1)^5}\right)}{a-\frac{3a\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{3a\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{a\sin(dx+c)^6}{(\cos(dx+c)+1)^6}}-\frac{9\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a}+\frac{9\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)}{a}+\frac{6\sin(dx+c)}{a(\cos(dx+c)+1)}}{6d}$$

```
[In] integrate(sec(d*x+c)^4/(a+a*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/6*(2*(9*sin(d*x + c)/(cos(d*x + c) + 1) - 16*sin(d*x + c)^3/(cos(d*x + c)
 + 1)^3 + 15*sin(d*x + c)^5/(cos(d*x + c) + 1)^5)/(a - 3*a*sin(d*x + c)^2/(
cos(d*x + c) + 1)^2 + 3*a*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - a*sin(d*x +
 c)^6/(cos(d*x + c) + 1)^6) - 9*log(sin(d*x + c)/(cos(d*x + c) + 1) + 1)/a
+ 9*log(sin(d*x + c)/(cos(d*x + c) + 1) - 1)/a + 6*sin(d*x + c)/(a*(cos(d*x
 + c) + 1)))/d
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.11

$$\int \frac{\sec^4(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{\frac{9\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)}{a} - \frac{9\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)}{a} - \frac{6\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{a} + \frac{2\left(15\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-16\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+9\tan\left(\frac{1}{2}\,dx+\right.}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)^3 a}}{6\,d}$$

```
[In] integrate(sec(d*x+c)^4/(a+a*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/6*(9*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a - 9*log(abs(tan(1/2*d*x + 1/2*
c) - 1))/a - 6*tan(1/2*d*x + 1/2*c)/a + 2*(15*tan(1/2*d*x + 1/2*c)^5 - 16*t
an(1/2*d*x + 1/2*c)^3 + 9*tan(1/2*d*x + 1/2*c))/((tan(1/2*d*x + 1/2*c)^2 -
1)^3*a))/d
```

Mupad [B] (verification not implemented)

Time = 14.58 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.93

$$\int \frac{\sec^4(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{a\,d} - \frac{3\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{a\,d} - \frac{5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5-\frac{16\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{3}+3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{a\,d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-1\right)^3}$$

```
[In] int(1/(cos(c + d*x)^4*(a + a*cos(c + d*x))),x)
```

```
[Out] tan(c/2 + (d*x)/2)/(a*d) - (3*atanh(tan(c/2 + (d*x)/2)))/(a*d) - (3*tan(c/2
 + (d*x)/2) - (16*tan(c/2 + (d*x)/2)^3)/3 + 5*tan(c/2 + (d*x)/2)^5)/(a*d*(t
an(c/2 + (d*x)/2)^2 - 1)^3)
```

3.53 $\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^2} dx$

Optimal result

Integrand size = 21, antiderivative size = 124

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^2} dx = -\frac{5x}{a^2} + \frac{12\sin(c+dx)}{a^2d} - \frac{5\cos(c+dx)\sin(c+dx)}{a^2d} - \frac{10\cos^3(c+dx)\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^4(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{4\sin^3(c+dx)}{a^2d}$$

```
[Out] -5*x/a^2+12*sin(d*x+c)/a^2/d-5*cos(d*x+c)*sin(d*x+c)/a^2/d-10/3*cos(d*x+c)^
3*sin(d*x+c)/a^2/d/(1+cos(d*x+c))-1/3*cos(d*x+c)^4*sin(d*x+c)/d/(a+a*cos(d*
x+c))^2-4*sin(d*x+c)^3/a^2/d
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {2844, 3056, 2827, 2715, 8, 2713}

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^2} dx = -\frac{4\sin^3(c+dx)}{a^2d} + \frac{12\sin(c+dx)}{a^2d} - \frac{10\sin(c+dx)\cos^3(c+dx)}{3a^2d(\cos(c+dx)+1)} - \frac{5\sin(c+dx)\cos(c+dx)}{a^2d} - \frac{5x}{a^2} - \frac{\sin(c+dx)\cos^4(c+dx)}{3d(a\cos(c+dx)+a)^2}$$

```
[In] Int[Cos[c + d*x]^5/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (-5*x)/a^2 + (12*Sin[c + d*x])/(a^2*d) - (5*Cos[c + d*x]*Sin[c + d*x])/(a^2
*d) - (10*Cos[c + d*x]^3*Sin[c + d*x])/(3*a^2*d*(1 + Cos[c + d*x])) - (Cos[
```

```
c + d*x]^4*Sin[c + d*x])/(3*d*(a + a*Cos[c + d*x])^2) - (4*Sin[c + d*x]^3)/
(a^2*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
```

```
egerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\text{integral} = -\frac{\cos^4(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{\int \frac{\cos^3(c+dx)(4a-6a\cos(c+dx))}{a+a\cos(c+dx)}\,dx}{3a^2}$$

$$= -\frac{10\cos^3(c+dx)\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^4(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{\int \cos^2(c+dx)\left(30a^2-36a^2\cos(c+dx)\right)\,dx}{3a^4}$$

$$= -\frac{10\cos^3(c+dx)\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^4(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{10\int \cos^2(c+dx)\,dx}{a^2} + \frac{12\int \cos^3(c+dx)\,dx}{a^2}$$

$$= -\frac{5\cos(c+dx)\sin(c+dx)}{a^2d} - \frac{10\cos^3(c+dx)\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^4(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{5\int 1\,dx}{a^2} - \frac{12\text{Subst}\left(\int \left(1-x^2\right)\,dx, x, -\sin(c+dx)\right)}{a^2d}$$

$$= -\frac{5x}{a^2} + \frac{12\sin(c+dx)}{a^2d} - \frac{5\cos(c+dx)\sin(c+dx)}{a^2d} - \frac{10\cos^3(c+dx)\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^4(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{4\sin^3(c+dx)}{a^2d}$$

Mathematica [A] (verified)

Time = 0.53 (sec) , antiderivative size = 115, normalized size of antiderivative = 0.93

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\sin(c+dx)\left(60\arcsin(\cos(c+dx))\cos^4\left(\frac{1}{2}(c+dx)\right) + (24+33\cos(c+dx)+6\cos^2(c+dx)-\cos^3(c+a$$
$$3a^2d\sqrt{1-\cos(c+dx)}(1+\cos(c+dx))^{5/2}$$

```
[In] Integrate[Cos[c + d*x]^5/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (Sin[c + d*x]*(60*ArcSin[Cos[c + d*x]]*Cos[(c + d*x)/2]^4 + (24 + 33*Cos[c
+ d*x] + 6*Cos[c + d*x]^2 - Cos[c + d*x]^3 + Cos[c + d*x]^4)*Sqrt[Sin[c + d
*x]^2]))/(3*a^2*d*Sqrt[1 - Cos[c + d*x]]*(1 + Cos[c + d*x])^(5/2))
```

Maple [A] (verified)

Time = 0.87 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.62

method	result
parallelrisch	$\frac{43\left(\cos(dx+c)+\frac{14\cos(2dx+2c)}{129}-\frac{\cos(3dx+3c)}{129}+\frac{\cos(4dx+4c)}{258}+\frac{73}{86}\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sec^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-40dx}{8a^2d}$
derivativedivides	$\frac{-\frac{\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+9\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{8\left(-\frac{5\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}-\frac{10\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-\frac{3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2}\right)}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3}-20\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2d\,a^2}$
default	$\frac{-\frac{\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+9\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{8\left(-\frac{5\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}-\frac{10\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-\frac{3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2}\right)}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3}-20\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2d\,a^2}$
risch	$-\frac{5x}{a^2}+\frac{i e^{2i(dx+c)}}{4d\,a^2}-\frac{15i e^{i(dx+c)}}{8a^2d}+\frac{15i e^{-i(dx+c)}}{8a^2d}-\frac{i e^{-2i(dx+c)}}{4d\,a^2}+\frac{2i\left(15\,e^{2i(dx+c)}+27\,e^{i(dx+c)}+14\right)}{3d\,a^2\left(e^{i(dx+c)}+1\right)^3}+\frac{\sin(3dx+}{12a^2}$
norman	$\frac{-\frac{5x}{a}+\frac{21\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2da}+\frac{143\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3da}+\frac{521\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{6da}+\frac{230\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3da}+\frac{185\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{6da}+\frac{11\left(\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3da}}{\left(1+\tan^2\left(\right.\right.}$

[In] int(cos(d*x+c)^5/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)

[Out] 1/8*(43*(cos(d*x+c)+14/129*cos(2*d*x+2*c)-1/129*cos(3*d*x+3*c)+1/258*cos(4*d*x+4*c)+73/86)*tan(1/2*d*x+1/2*c)*sec(1/2*d*x+1/2*c)^2-40*d*x)/a^2/d

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 108, normalized size of antiderivative = 0.87

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{15\,dx\cos\left(dx+c\right)^2+30\,dx\cos\left(dx+c\right)+15\,dx-\left(\cos\left(dx+c\right)^4-\cos\left(dx+c\right)^3+6\,\cos\left(dx+c\right)^2+33\right.}{3\left(a^2d\cos\left(dx+c\right)^2+2\,a^2d\cos\left(dx+c\right)+a^2d\right)}$$

[In] integrate(cos(d*x+c)^5/(a+a*cos(d*x+c))^2,x, algorithm="fricas")

[Out] -1/3*(15*d*x*cos(d*x + c)^2 + 30*d*x*cos(d*x + c) + 15*d*x - (cos(d*x + c)^4 - cos(d*x + c)^3 + 6*cos(d*x + c)^2 + 33*cos(d*x + c) + 24)*sin(d*x + c))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 700 vs. $2(117) = 234$.

Time = 2.88 (sec) , antiderivative size = 700, normalized size of antiderivative = 5.65

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^2}\,dx$$
$$= \begin{cases} -\frac{30dx\tan^6\left(\frac{c}{2}+\frac{dx}{2}\right)}{6a^2d\tan^6\left(\frac{c}{2}+\frac{dx}{2}\right)+18a^2d\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)+18a^2d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+6a^2d} - \frac{90dx\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)}{6a^2d\tan^6\left(\frac{c}{2}+\frac{dx}{2}\right)+18a^2d\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)+18a^2d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)} \\ \frac{x\cos^5(c)}{(a\cos(c)+a)^2} \end{cases}$$

```
[In] integrate(cos(d*x+c)**5/(a+a*cos(d*x+c))**2,x)
```

```
[Out] Piecewise((-30*d*x*tan(c/2 + d*x/2)**6/(6*a**2*d*tan(c/2 + d*x/2)**6 + 18*a
**2*d*tan(c/2 + d*x/2)**4 + 18*a**2*d*tan(c/2 + d*x/2)**2 + 6*a**2*d) - 90*
d*x*tan(c/2 + d*x/2)**4/(6*a**2*d*tan(c/2 + d*x/2)**6 + 18*a**2*d*tan(c/2 +
 d*x/2)**4 + 18*a**2*d*tan(c/2 + d*x/2)**2 + 6*a**2*d) - 90*d*x*tan(c/2 + d
*x/2)**2/(6*a**2*d*tan(c/2 + d*x/2)**6 + 18*a**2*d*tan(c/2 + d*x/2)**4 + 18
*a**2*d*tan(c/2 + d*x/2)**2 + 6*a**2*d) - 30*d*x/(6*a**2*d*tan(c/2 + d*x/2)
**6 + 18*a**2*d*tan(c/2 + d*x/2)**4 + 18*a**2*d*tan(c/2 + d*x/2)**2 + 6*a**
2*d) - tan(c/2 + d*x/2)**9/(6*a**2*d*tan(c/2 + d*x/2)**6 + 18*a**2*d*tan(c/
2 + d*x/2)**4 + 18*a**2*d*tan(c/2 + d*x/2)**2 + 6*a**2*d) + 24*tan(c/2 + d*
x/2)**7/(6*a**2*d*tan(c/2 + d*x/2)**6 + 18*a**2*d*tan(c/2 + d*x/2)**4 + 18*
a**2*d*tan(c/2 + d*x/2)**2 + 6*a**2*d) + 138*tan(c/2 + d*x/2)**5/(6*a**2*d*
tan(c/2 + d*x/2)**6 + 18*a**2*d*tan(c/2 + d*x/2)**4 + 18*a**2*d*tan(c/2 + d
*x/2)**2 + 6*a**2*d) + 160*tan(c/2 + d*x/2)**3/(6*a**2*d*tan(c/2 + d*x/2)**
6 + 18*a**2*d*tan(c/2 + d*x/2)**4 + 18*a**2*d*tan(c/2 + d*x/2)**2 + 6*a**2*
d) + 63*tan(c/2 + d*x/2)/(6*a**2*d*tan(c/2 + d*x/2)**6 + 18*a**2*d*tan(c/2
+ d*x/2)**4 + 18*a**2*d*tan(c/2 + d*x/2)**2 + 6*a**2*d), Ne(d, 0)), (x*cos(
c)**5/(a*cos(c) + a)**2, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.67

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^2}\,dx$$
$$= \frac{\frac{4\left(\frac{9\sin(dx+c)}{\cos(dx+c)+1}+\frac{20\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{15\sin(dx+c)^5}{(\cos(dx+c)+1)^5}\right)}{a^2+\frac{3a^2\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{3a^2\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+\frac{a^2\sin(dx+c)^6}{(\cos(dx+c)+1)^6}} + \frac{\frac{27\sin(dx+c)}{\cos(dx+c)+1}-\frac{\sin(dx+c)^3}{(\cos(dx+c)+1)^3}}{a^2} - \frac{60\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{a^2}}{6d}$$

```
[In] integrate(cos(d*x+c)^5/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/6*(4*(9*sin(d*x + c)/(cos(d*x + c) + 1) + 20*sin(d*x + c)^3/(cos(d*x + c)
 + 1)^3 + 15*sin(d*x + c)^5/(cos(d*x + c) + 1)^5)/(a^2 + 3*a^2*sin(d*x + c)
^2/(cos(d*x + c) + 1)^2 + 3*a^2*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + a^2*s
in(d*x + c)^6/(cos(d*x + c) + 1)^6) + (27*sin(d*x + c)/(cos(d*x + c) + 1) -
 sin(d*x + c)^3/(cos(d*x + c) + 1)^3)/a^2 - 60*arctan(sin(d*x + c)/(cos(d*x
 + c) + 1))/a^2)/d
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 108, normalized size of antiderivative = 0.87

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{\frac{30\,(dx+c)}{a^2} - \frac{4\left(15\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5+20\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+9\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+1\right)^3 a^2} + \frac{a^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-27\,a^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{a^6}}{6\,d}$$

```
[In] integrate(cos(d*x+c)^5/(a+a*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/6*(30*(d*x + c)/a^2 - 4*(15*tan(1/2*d*x + 1/2*c)^5 + 20*tan(1/2*d*x + 1/
2*c)^3 + 9*tan(1/2*d*x + 1/2*c))/((tan(1/2*d*x + 1/2*c)^2 + 1)^3*a^2) + (a^
4*tan(1/2*d*x + 1/2*c)^3 - 27*a^4*tan(1/2*d*x + 1/2*c))/a^6)/d
```

Mupad [B] (verification not implemented)

Time = 14.88 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.09

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{\sin\left(\frac{c}{2}+\frac{dx}{2}\right) - 28\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^2\sin\left(\frac{c}{2}+\frac{dx}{2}\right) - 60\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^4\sin\left(\frac{c}{2}+\frac{dx}{2}\right) + 40\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^6\sin\left(\frac{c}{2}+\right.}{6\,a^2\,d\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^3}$$

```
[In] int(cos(c + d*x)^5/(a + a*cos(c + d*x))^2,x)
```

```
[Out] -(sin(c/2 + (d*x)/2) - 28*cos(c/2 + (d*x)/2)^2*sin(c/2 + (d*x)/2) - 60*cos(
c/2 + (d*x)/2)^4*sin(c/2 + (d*x)/2) + 40*cos(c/2 + (d*x)/2)^6*sin(c/2 + (d*
x)/2) - 16*cos(c/2 + (d*x)/2)^8*sin(c/2 + (d*x)/2) + 30*cos(c/2 + (d*x)/2)^
3*(c + d*x))/(6*a^2*d*cos(c/2 + (d*x)/2)^3)
```

3.54 $\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^2} \, dx$

Optimal result

Integrand size = 21, antiderivative size = 114

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^2} \, dx = \frac{7x}{2a^2} - \frac{16\sin(c+dx)}{3a^2d} + \frac{7\cos(c+dx)\sin(c+dx)}{2a^2d} - \frac{8\cos^2(c+dx)\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^3(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2}$$

```
[Out] 7/2*x/a^2-16/3*sin(d*x+c)/a^2/d+7/2*cos(d*x+c)*sin(d*x+c)/a^2/d-8/3*cos(d*x
+c)^2*sin(d*x+c)/a^2/d/(1+cos(d*x+c))-1/3*cos(d*x+c)^3*sin(d*x+c)/d/(a+a*co
s(d*x+c))^2
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2844, 3056, 2813}

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^2} \, dx = -\frac{16\sin(c+dx)}{3a^2d} - \frac{8\sin(c+dx)\cos^2(c+dx)}{3a^2d(\cos(c+dx)+1)} + \frac{7\sin(c+dx)\cos(c+dx)}{2a^2d} + \frac{7x}{2a^2} - \frac{\sin(c+dx)\cos^3(c+dx)}{3d(a\cos(c+dx)+a)^2}$$

```
[In] Int[Cos[c + d*x]^4/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (7*x)/(2*a^2) - (16*Sin[c + d*x])/(3*a^2*d) + (7*Cos[c + d*x]*Sin[c + d*x])
/(2*a^2*d) - (8*Cos[c + d*x]^2*Sin[c + d*x])/(3*a^2*d*(1 + Cos[c + d*x])) -
 (Cos[c + d*x]^3*Sin[c + d*x])/(3*d*(a + a*Cos[c + d*x])^2)
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^3(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{\int \frac{\cos^2(c+dx)(3a-5a\cos(c+dx))}{a+a\cos(c+dx)}\,dx}{3a^2} \\
&= -\frac{8\cos^2(c+dx)\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^3(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} \\
&\quad - \frac{\int \cos(c+dx)\left(16a^2-21a^2\cos(c+dx)\right)\,dx}{3a^4} \\
&= \frac{7x}{2a^2} - \frac{16\sin(c+dx)}{3a^2d} + \frac{7\cos(c+dx)\sin(c+dx)}{2a^2d} \\
&\quad - \frac{8\cos^2(c+dx)\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^3(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.42 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.94

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^2}\,dx$$
$$= \frac{\sin(c+dx)\left(-84\arcsin(\cos(c+dx))\cos^4\left(\frac{1}{2}(c+dx)\right)+(-32-43\cos(c+dx)-6\cos^2(c+dx)+3\cos^3(\ldots\right.}{6a^2d\sqrt{1-\cos(c+dx)}(1+\cos(c+dx))^{5/2}}$$

```
[In] Integrate[Cos[c + d*x]^4/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (Sin[c + d*x]*(-84*ArcSin[Cos[c + d*x]]*Cos[(c + d*x)/2]^4 + (-32 - 43*Cos[
c + d*x] - 6*Cos[c + d*x]^2 + 3*Cos[c + d*x]^3)*Sqrt[Sin[c + d*x]^2]))/(6*a
^2*d*Sqrt[1 - Cos[c + d*x]]*(1 + Cos[c + d*x])^(5/2))
```

Maple [A] (verified)

Time = 0.79 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.58

method	result
parallelrisch	$\frac{-163\left(\cos(dx+c)+\frac{12\cos(2dx+2c)}{163}-\frac{3\cos(3dx+3c)}{163}+\frac{140}{163}\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sec^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+168dx}{48a^2d}$
derivativedivides	$\frac{\frac{\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-7\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{-10\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-6\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}+14\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2d\,a^2}$
default	$\frac{\frac{\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-7\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{-10\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-6\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}+14\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2d\,a^2}$
risch	$\frac{7x}{2a^2}-\frac{i\mathrm{e}^{2i(dx+c)}}{8d\,a^2}+\frac{i\mathrm{e}^{i(dx+c)}}{a^2d}-\frac{i\mathrm{e}^{-i(dx+c)}}{a^2d}+\frac{i\mathrm{e}^{-2i(dx+c)}}{8d\,a^2}-\frac{2i\left(12\,\mathrm{e}^{2i(dx+c)}+21\,\mathrm{e}^{i(dx+c)}+11\right)}{3d\,a^2\left(\mathrm{e}^{i(dx+c)}+1\right)^3}$
norman	$\frac{\frac{7x}{2a}-\frac{13\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2da}-\frac{149\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{6da}-\frac{100\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3da}-\frac{18\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{da}-\frac{17\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{6da}+\frac{\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)}{6da}+\frac{14\ldots}{\ldots}}{a\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^4}$

```
[In] int(cos(d*x+c)^4/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/48*(-163*(cos(d*x+c)+12/163*cos(2*d*x+2*c)-3/163*cos(3*d*x+3*c)+140/163)*
tan(1/2*d*x+1/2*c)*sec(1/2*d*x+1/2*c)^2+168*d*x)/a^2/d
```

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 99, normalized size of antiderivative = 0.87

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^2}\,dx$$
$$= \frac{21\,dx\cos{(dx+c)}^2 + 42\,dx\cos{(dx+c)} + 21\,dx + \left(3\,\cos{(dx+c)}^3 - 6\,\cos{(dx+c)}^2 - 43\,\cos{(dx+c)} - 3}{6\,\left(a^2d\cos{(dx+c)}^2 + 2\,a^2d\cos{(dx+c)} + a^2d\right)}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/6*(21*d*x*cos(d*x + c)^2 + 42*d*x*cos(d*x + c) + 21*d*x + (3*cos(d*x + c)
^3 - 6*cos(d*x + c)^2 - 43*cos(d*x + c) - 32)*sin(d*x + c))/(a^2*d*cos(d*x
+ c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 413 vs. 2(107) = 214.

Time = 1.77 (sec) , antiderivative size = 413, normalized size of antiderivative = 3.62

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^2}\,dx$$
$$= \begin{cases} \frac{21dx\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)}{6a^2d\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)+12a^2d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+6a^2d} + \frac{42dx\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)}{6a^2d\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)+12a^2d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+6a^2d} + \frac{21dx}{6a^2d\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)+12a^2d\tan^2\left(\frac{c}{2}+\right.} \\ \frac{x\cos^4{(c)}}{(a\cos{(c)}+a)^2} \end{cases}$$

```
[In] integrate(cos(d*x+c)**4/(a+a*cos(d*x+c))**2,x)
```

```
[Out] Piecewise((21*d*x*tan(c/2 + d*x/2)**4/(6*a**2*d*tan(c/2 + d*x/2)**4 + 12*a*
*2*d*tan(c/2 + d*x/2)**2 + 6*a**2*d) + 42*d*x*tan(c/2 + d*x/2)**2/(6*a**2*d
*tan(c/2 + d*x/2)**4 + 12*a**2*d*tan(c/2 + d*x/2)**2 + 6*a**2*d) + 21*d*x/(
6*a**2*d*tan(c/2 + d*x/2)**4 + 12*a**2*d*tan(c/2 + d*x/2)**2 + 6*a**2*d) +
tan(c/2 + d*x/2)**7/(6*a**2*d*tan(c/2 + d*x/2)**4 + 12*a**2*d*tan(c/2 + d*x
/2)**2 + 6*a**2*d) - 19*tan(c/2 + d*x/2)**5/(6*a**2*d*tan(c/2 + d*x/2)**4 +
 12*a**2*d*tan(c/2 + d*x/2)**2 + 6*a**2*d) - 71*tan(c/2 + d*x/2)**3/(6*a**2
*d*tan(c/2 + d*x/2)**4 + 12*a**2*d*tan(c/2 + d*x/2)**2 + 6*a**2*d) - 39*tan
(c/2 + d*x/2)/(6*a**2*d*tan(c/2 + d*x/2)**4 + 12*a**2*d*tan(c/2 + d*x/2)**2
 + 6*a**2*d), Ne(d, 0)), (x*cos(c)**4/(a*cos(c) + a)**2, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 164, normalized size of antiderivative = 1.44

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{\frac{6\left(\frac{3\sin(dx+c)}{\cos(dx+c)+1}+\frac{5\sin(dx+c)^3}{(\cos(dx+c)+1)^3}\right)}{a^2+\frac{2a^2\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{a^2\sin(dx+c)^4}{(\cos(dx+c)+1)^4}}+\frac{\frac{21\sin(dx+c)}{\cos(dx+c)+1}-\frac{\sin(dx+c)^3}{(\cos(dx+c)+1)^3}}{a^2}-\frac{42\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{a^2}}{6\,d}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/6*(6*(3*sin(d*x + c)/(cos(d*x + c) + 1) + 5*sin(d*x + c)^3/(cos(d*x + c)
 + 1)^3)/(a^2 + 2*a^2*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + a^2*sin(d*x + c
)^4/(cos(d*x + c) + 1)^4) + (21*sin(d*x + c)/(cos(d*x + c) + 1) - sin(d*x +
 c)^3/(cos(d*x + c) + 1)^3)/a^2 - 42*arctan(sin(d*x + c)/(cos(d*x + c) + 1)
)/a^2)/d
```

Giac [A] (verification not implemented)

none

Time = 0.45 (sec) , antiderivative size = 95, normalized size of antiderivative = 0.83

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\frac{21\,(dx+c)}{a^2}-\frac{6\left(5\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+1\right)^2a^2}+\frac{a^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-21\,a^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{a^6}}{6\,d}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/6*(21*(d*x + c)/a^2 - 6*(5*tan(1/2*d*x + 1/2*c)^3 + 3*tan(1/2*d*x + 1/2*c
))/((tan(1/2*d*x + 1/2*c)^2 + 1)^2*a^2) + (a^4*tan(1/2*d*x + 1/2*c)^3 - 21*
a^4*tan(1/2*d*x + 1/2*c))/a^6)/d
```

Mupad [B] (verification not implemented)

Time = 14.58 (sec) , antiderivative size = 113, normalized size of antiderivative = 0.99

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^2}\,dx$$
$$= \frac{\sin\left(\frac{c}{2}+\frac{dx}{2}\right)-22\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^2\sin\left(\frac{c}{2}+\frac{dx}{2}\right)-30\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^4\sin\left(\frac{c}{2}+\frac{dx}{2}\right)+12\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^6\sin\left(\frac{c}{2}+\right.}{6\,a^2\,d\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^3}$$

```
[In] int(cos(c + d*x)^4/(a + a*cos(c + d*x))^2,x)
```

```
[Out] (sin(c/2 + (d*x)/2) - 22*cos(c/2 + (d*x)/2)^2*sin(c/2 + (d*x)/2) - 30*cos(c
/2 + (d*x)/2)^4*sin(c/2 + (d*x)/2) + 12*cos(c/2 + (d*x)/2)^6*sin(c/2 + (d*x
)/2) + 21*cos(c/2 + (d*x)/2)^3*(c + d*x))/(6*a^2*d*cos(c/2 + (d*x)/2)^3)
```

3.55 $\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 80

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{2x}{a^2}+\frac{4\sin(c+dx)}{3a^2d}+\frac{2\sin(c+dx)}{a^2d(1+\cos(c+dx))} - \frac{\cos^2(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2}$$

```
[Out] -2*x/a^2+4/3*sin(d*x+c)/a^2/d+2*sin(d*x+c)/a^2/d/(1+cos(d*x+c))-1/3*cos(d*x
+c)^2*sin(d*x+c)/d/(a+a*cos(d*x+c))^2
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2844, 3047, 3102, 12, 2814, 2727}

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{4\sin(c+dx)}{3a^2d}+\frac{2\sin(c+dx)}{a^2d(\cos(c+dx)+1)} - \frac{2x}{a^2}-\frac{\sin(c+dx)\cos^2(c+dx)}{3d(a\cos(c+dx)+a)^2}$$

```
[In] Int[Cos[c + d*x]^3/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (-2*x)/a^2 + (4*Sin[c + d*x])/(3*a^2*d) + (2*Sin[c + d*x])/(a^2*d*(1 + Cos[
c + d*x])) - (Cos[c + d*x]^2*Sin[c + d*x])/(3*d*(a + a*Cos[c + d*x])^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{\cos^2(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{\int \frac{\cos(c+dx)(2a-4a\cos(c+dx))}{a+a\cos(c+dx)}\,dx}{3a^2}\\ &= -\frac{\cos^2(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{\int \frac{2a\cos(c+dx)-4a\cos^2(c+dx)}{a+a\cos(c+dx)}\,dx}{3a^2}\end{aligned}$$

$$= \frac{4\sin(c+dx)}{3a^2d} - \frac{\cos^2(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{\int \frac{6a^2\cos(c+dx)}{a+a\cos(c+dx)}dx}{3a^3}$$

$$= \frac{4\sin(c+dx)}{3a^2d} - \frac{\cos^2(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{2\int \frac{\cos(c+dx)}{a+a\cos(c+dx)}dx}{a}$$

$$= -\frac{2x}{a^2} + \frac{4\sin(c+dx)}{3a^2d} - \frac{\cos^2(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} + \frac{2\int \frac{1}{a+a\cos(c+dx)}dx}{a}$$

$$= -\frac{2x}{a^2} + \frac{4\sin(c+dx)}{3a^2d} - \frac{\cos^2(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} + \frac{2\sin(c+dx)}{d(a^2+a^2\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 0.45 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.21

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx$$
$$= \frac{\sin(c+dx)\left(48\arcsin(\cos(c+dx))\cos^4\left(\frac{1}{2}(c+dx)\right) + (23+28\cos(c+dx)+3\cos(2(c+dx)))\sqrt{\sin^2(c+\right.}{6a^2d\sqrt{1-\cos(c+dx)}(1+\cos(c+dx))^{5/2}}$$

```
[In] Integrate[Cos[c + d*x]^3/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (Sin[c + d*x]*(48*ArcSin[Cos[c + d*x]]*Cos[(c + d*x)/2]^4 + (23 + 28*Cos[c
+ d*x] + 3*Cos[2*(c + d*x)])*Sqrt[Sin[c + d*x]^2]))/(6*a^2*d*Sqrt[1 - Cos[c
 + d*x]]*(1 + Cos[c + d*x])^(5/2))
```

Maple [A] (verified)

Time = 0.79 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.69

method	result
parallelrisch	$\frac{7\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\cos(dx+c)+\frac{3\cos(2dx+2c)}{28}+\frac{23}{28}\right)\left(\sec^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-6dx}{3a^2d}$
derivativedivides	$\frac{-\frac{\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+5\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{4\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}-8\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2d\,a^2}$
default	$\frac{-\frac{\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+5\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{4\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}-8\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2d\,a^2}$
risch	$-\frac{2x}{a^2}-\frac{i\,e^{i(dx+c)}}{2a^2d}+\frac{i\,e^{-i(dx+c)}}{2a^2d}+\frac{2i\left(9\,e^{2i(dx+c)}+15\,e^{i(dx+c)}+8\right)}{3d\,a^2\left(e^{i(dx+c)}+1\right)^3}$
norman	$\frac{-\frac{2x}{a}+\frac{9\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2da}+\frac{34\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3da}+\frac{9\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{da}+\frac{2\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{da}-\frac{\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)}{6da}-\frac{6x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{a}-\frac{6x\left(\tan\right.}{}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3a}$

```
[In] int(cos(d*x+c)^3/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*(7*tan(1/2*d*x+1/2*c)*(cos(d*x+c)+3/28*cos(2*d*x+2*c)+23/28)*sec(1/2*d*
x+1/2*c)^2-6*d*x)/a^2/d
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 90, normalized size of antiderivative = 1.12

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{6\,dx\cos\left(dx+c\right)^2+12\,dx\cos\left(dx+c\right)+6\,dx-\left(3\,\cos\left(dx+c\right)^2+14\,\cos\left(dx+c\right)+10\right)\sin\left(dx+c\right)}{3\left(a^2d\cos\left(dx+c\right)^2+2\,a^2d\cos\left(dx+c\right)+a^2d\right)}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -1/3*(6*d*x*cos(d*x + c)^2 + 12*d*x*cos(d*x + c) + 6*d*x - (3*cos(d*x + c)^
2 + 14*cos(d*x + c) + 10)*sin(d*x + c))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos
(d*x + c) + a^2*d)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 201 vs. $2(73) = 146$.

Time = 1.08 (sec) , antiderivative size = 201, normalized size of antiderivative = 2.51

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \begin{cases} -\frac{12dx\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)}{6a^2d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+6a^2d} - \frac{12dx}{6a^2d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+6a^2d} - \frac{\tan^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{6a^2d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+6a^2d} + \frac{14\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{6a^2d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+6a^2d} + \frac{27\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{6a^2d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+6a^2d} \\ \frac{x\cos^3\left(c\right)}{\left(a\cos\left(c\right)+a\right)^2} \end{cases}$$

```
[In] integrate(cos(d*x+c)**3/(a+a*cos(d*x+c))**2,x)
```

```
[Out] Piecewise((-12*d*x*tan(c/2 + d*x/2)**2/(6*a**2*d*tan(c/2 + d*x/2)**2 + 6*a*
*2*d) - 12*d*x/(6*a**2*d*tan(c/2 + d*x/2)**2 + 6*a**2*d) - tan(c/2 + d*x/2)
**5/(6*a**2*d*tan(c/2 + d*x/2)**2 + 6*a**2*d) + 14*tan(c/2 + d*x/2)**3/(6*a
**2*d*tan(c/2 + d*x/2)**2 + 6*a**2*d) + 27*tan(c/2 + d*x/2)/(6*a**2*d*tan(c
/2 + d*x/2)**2 + 6*a**2*d), Ne(d, 0)), (x*cos(c)**3/(a*cos(c) + a)**2, True
))
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.48

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\frac{\frac{15\sin(dx+c)}{\cos(dx+c)+1}-\frac{\sin(dx+c)^3}{(\cos(dx+c)+1)^3}}{a^2}-\frac{24\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{a^2}+\frac{12\sin(dx+c)}{\left(a^2+\frac{a^2\sin(dx+c)^2}{(\cos(dx+c)+1)^2}\right)(\cos(dx+c)+1)}}{6\,d}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/6*((15*sin(d*x + c)/(cos(d*x + c) + 1) - sin(d*x + c)^3/(cos(d*x + c) + 1
)^3)/a^2 - 24*arctan(sin(d*x + c)/(cos(d*x + c) + 1))/a^2 + 12*sin(d*x + c)
/((a^2 + a^2*sin(d*x + c)^2/(cos(d*x + c) + 1)^2)*(cos(d*x + c) + 1)))/d
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 79, normalized size of antiderivative = 0.99

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{\frac{12(dx+c)}{a^2}-\frac{12\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2+1\right)a^2}+\frac{a^4\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-15a^4\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{a^6}}{6\,d}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/6*(12*(d*x + c)/a^2 - 12*tan(1/2*d*x + 1/2*c)/((tan(1/2*d*x + 1/2*c)^2 +
 1)*a^2) + (a^4*tan(1/2*d*x + 1/2*c)^3 - 15*a^4*tan(1/2*d*x + 1/2*c))/a^6)/
d
```

Mupad [B] (verification not implemented)

Time = 14.33 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.14

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{\sin\left(\frac{c}{2}+\frac{dx}{2}\right)-16\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^2\sin\left(\frac{c}{2}+\frac{dx}{2}\right)-12\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^4\sin\left(\frac{c}{2}+\frac{dx}{2}\right)+12\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^3(c+}{6\,a^2\,d\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^3}$$

```
[In] int(cos(c + d*x)^3/(a + a*cos(c + d*x))^2,x)
```

```
[Out] -(sin(c/2 + (d*x)/2) - 16*cos(c/2 + (d*x)/2)^2*sin(c/2 + (d*x)/2) - 12*cos(
c/2 + (d*x)/2)^4*sin(c/2 + (d*x)/2) + 12*cos(c/2 + (d*x)/2)^3*(c + d*x))/(6
*a^2*d*cos(c/2 + (d*x)/2)^3)
```

3.56 $\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^2} \, dx$

Optimal result

Integrand size = 21, antiderivative size = 57

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^2} \, dx = \frac{x}{a^2} - \frac{5\sin(c+dx)}{3a^2d(1+\cos(c+dx))} + \frac{\sin(c+dx)}{3d(a+a\cos(c+dx))^2}$$

```
[Out] x/a^2-5/3*sin(d*x+c)/a^2/d/(1+cos(d*x+c))+1/3*sin(d*x+c)/d/(a+a*cos(d*x+c))
^2
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2837, 2814, 2727}

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^2} \, dx = -\frac{5\sin(c+dx)}{3a^2d(\cos(c+dx)+1)} + \frac{x}{a^2} + \frac{\sin(c+dx)}{3d(a\cos(c+dx)+a)^2}$$

```
[In] Int[Cos[c + d*x]^2/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] x/a^2 - (5*Sin[c + d*x])/(3*a^2*d*(1 + Cos[c + d*x])) + Sin[c + d*x]/(3*d*(
a + a*Cos[c + d*x])^2)
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2837

```
Int[sin[(e_.) + (f_.)*(x_)]^2*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_),
x_Symbol] :> Simp[b*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(a*f*(2*m + 1))),
x] - Dist[1/(a^2*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(a*m - b*(2*m
 + 1)*Sin[e + f*x]), x], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 - b^2, 0]
&& LtQ[m, -2^(-1)]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sin(c+dx)}{3d(a+a\cos(c+dx))^2}+\frac{\int \frac{-2a+3a\cos(c+dx)}{a+a\cos(c+dx)}\,dx}{3a^2}\\ &= \frac{x}{a^2}+\frac{\sin(c+dx)}{3d(a+a\cos(c+dx))^2}-\frac{5\int \frac{1}{a+a\cos(c+dx)}\,dx}{3a}\\ &= \frac{x}{a^2}+\frac{\sin(c+dx)}{3d(a+a\cos(c+dx))^2}-\frac{5\sin(c+dx)}{3d\left(a^2+a^2\cos(c+dx)\right)}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.26 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.53

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{\sin(c+dx)\left(12\arcsin(\cos(c+dx))\cos^4\left(\frac{1}{2}(c+dx)\right)+(4+5\cos(c+dx))\sqrt{\sin^2(c+dx)}\right)}{3a^2d\sqrt{1-\cos(c+dx)}(1+\cos(c+dx))^{5/2}}$$

```
[In] Integrate[Cos[c + d*x]^2/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] -1/3*(Sin[c + d*x]*(12*ArcSin[Cos[c + d*x]]*Cos[(c + d*x)/2]^4 + (4 + 5*Cos
[c + d*x])*Sqrt[Sin[c + d*x]^2]))/(a^2*d*Sqrt[1 - Cos[c + d*x]]*(1 + Cos[c
+ d*x])^(5/2))
```

Maple [A] (verified)

Time = 0.70 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.63

method	result	size
parallelrisch	$\frac{\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)+6dx-9\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{6a^{2}d}$	36
derivativedivides	$\frac{\frac{\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+4\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2d\,a^{2}}$	46
default	$\frac{\frac{\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+4\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2d\,a^{2}}$	46
risch	$\frac{x}{a^{2}}-\frac{2i\left(6\,\mathrm{e}^{2i(dx+c)}+9\,\mathrm{e}^{i(dx+c)}+5\right)}{3d\,a^{2}\left(\mathrm{e}^{i(dx+c)}+1\right)^{3}}$	53
norman	$\frac{\frac{x}{a}+\frac{x\left(\tan^{4}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{a}-\frac{3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2da}-\frac{17\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{6da}-\frac{7\left(\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{6da}+\frac{\tan^{7}\left(\frac{dx}{2}+\frac{c}{2}\right)}{6da}+\frac{2x\left(\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{a}}{a\left(1+\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^{2}}$	133

```
[In] int(cos(d*x+c)^2/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*(tan(1/2*d*x+1/2*c)^3+6*d*x-9*tan(1/2*d*x+1/2*c))/a^2/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.40

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{3\,dx\cos\left(dx+c\right)^2+6\,dx\cos\left(dx+c\right)+3\,dx-\left(5\,\cos\left(dx+c\right)+4\right)\sin\left(dx+c\right)}{3\,\left(a^2d\cos\left(dx+c\right)^2+2\,a^2d\cos\left(dx+c\right)+a^2d\right)}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/3*(3*d*x*cos(d*x + c)^2 + 6*d*x*cos(d*x + c) + 3*d*x - (5*cos(d*x + c) +
4)*sin(d*x + c))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)
```

Sympy [A] (verification not implemented)

Time = 0.65 (sec) , antiderivative size = 56, normalized size of antiderivative = 0.98

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \begin{cases} \frac{x}{a^2} + \frac{\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{6a^2d} - \frac{3\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{2a^2d} & \text{for } d \neq 0 \\ \frac{x\cos^2(c)}{(a\cos(c)+a)^2} & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)**2/(a+a*cos(d*x+c))**2,x)
```

```
[Out] Piecewise((x/a**2 + tan(c/2 + d*x/2)**3/(6*a**2*d) - 3*tan(c/2 + d*x/2)/(2*
a**2*d), Ne(d, 0)), (x*cos(c)**2/(a*cos(c) + a)**2, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.26

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{\frac{\frac{9\sin(dx+c)}{\cos(dx+c)+1}-\frac{\sin(dx+c)^3}{(\cos(dx+c)+1)^3}}{a^2} - \frac{12\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{a^2}}{6\,d}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/6*((9*sin(d*x + c)/(cos(d*x + c) + 1) - sin(d*x + c)^3/(cos(d*x + c) + 1
)^3)/a^2 - 12*arctan(sin(d*x + c)/(cos(d*x + c) + 1))/a^2)/d
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.88

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\frac{6\,(dx+c)}{a^2} + \frac{a^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3 - 9\,a^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{a^6}}{6\,d}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/6*(6*(d*x + c)/a^2 + (a^4*tan(1/2*d*x + 1/2*c)^3 - 9*a^4*tan(1/2*d*x + 1/
2*c))/a^6)/d
```

Mupad [B] (verification not implemented)

Time = 14.21 (sec) , antiderivative size = 35, normalized size of antiderivative = 0.61

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3-9\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+6\,d\,x}{6\,a^2\,d}$$

```
[In] int(cos(c + d*x)^2/(a + a*cos(c + d*x))^2,x)
[Out] (tan(c/2 + (d*x)/2)^3 - 9*tan(c/2 + (d*x)/2) + 6*d*x)/(6*a^2*d)
```

3.57 $\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 55

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^2}\,dx=-\frac{\sin(c+dx)}{3d(a+a\cos(c+dx))^2}+\frac{2\sin(c+dx)}{3d\,(a^2+a^2\cos(c+dx))}$$

```
[Out] -1/3*sin(d*x+c)/d/(a+a*cos(d*x+c))^2+2/3*sin(d*x+c)/d/(a^2+a^2*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2829, 2727}

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^2}\,dx=\frac{2\sin(c+dx)}{3d\,(a^2\cos(c+dx)+a^2)}-\frac{\sin(c+dx)}{3d(a\cos(c+dx)+a)^2}$$

```
[In] Int[Cos[c + d*x]/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] -1/3*Sin[c + d*x]/(d*(a + a*Cos[c + d*x])^2) + (2*Sin[c + d*x])/(3*d*(a^2 +
 a^2*Cos[c + d*x]))
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2829

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((a + b*Sin[e + f*
```

```
x])^m/(a*f*(2*m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(a*b*(2*m + 1)), In
t[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && N
eQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{\sin(c+dx)}{3d(a+a\cos(c+dx))^2}+\frac{2\int \frac{1}{a+a\cos(c+dx)}\,dx}{3a}\\ &= -\frac{\sin(c+dx)}{3d(a+a\cos(c+dx))^2}+\frac{2\sin(c+dx)}{3d\,(a^2+a^2\cos(c+dx))}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.65

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^2}\,dx=\frac{(1+2\cos(c+dx))\sin(c+dx)}{3a^2d(1+\cos(c+dx))^2}$$

```
[In] Integrate[Cos[c + d*x]/(a + a*Cos[c + d*x])^2,x]
[Out] ((1 + 2*Cos[c + d*x])*Sin[c + d*x])/(3*a^2*d*(1 + Cos[c + d*x])^2)
```

Maple [A] (verified)

Time = 0.68 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.56

method	result	size
parallelrisch	$-\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-3\right)}{6a^2d}$	31
derivativedivides	$\frac{-\frac{\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2d\,a^2}$	32
default	$\frac{-\frac{\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2d\,a^2}$	32
risch	$\frac{2i\left(3\,\mathrm{e}^{2i(dx+c)}+3\,\mathrm{e}^{i(dx+c)}+2\right)}{3d\,a^2\left(\mathrm{e}^{i(dx+c)}+1\right)^3}$	47
norman	$\frac{\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2da}+\frac{\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)}{3da}-\frac{\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)}{6da}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a}$	76

```
[In] int(cos(d*x+c)/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
[Out] -1/6*tan(1/2*d*x+1/2*c)*(tan(1/2*d*x+1/2*c)^2-3)/a^2/d
```

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 51, normalized size of antiderivative = 0.93

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{(2\cos(dx+c)+1)\sin(dx+c)}{3\left(a^2d\cos(dx+c)^2+2a^2d\cos(dx+c)+a^2d\right)}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^2,x, algorithm="fricas")
[Out] 1/3*(2*cos(d*x + c) + 1)*sin(d*x + c)/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(d
*x + c) + a^2*d)
```

Sympy [A] (verification not implemented)

Time = 0.49 (sec) , antiderivative size = 48, normalized size of antiderivative = 0.87

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \begin{cases} -\frac{\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{6a^2d}+\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{2a^2d} & \text{for } d\neq 0\\ \frac{x\cos(c)}{(a\cos(c)+a)^2} & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))**2,x)
[Out] Piecewise((-tan(c/2 + d*x/2)**3/(6*a**2*d) + tan(c/2 + d*x/2)/(2*a**2*d), N
e(d, 0)), (x*cos(c)/(a*cos(c) + a)**2, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 47, normalized size of antiderivative = 0.85

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\frac{3\sin(dx+c)}{\cos(dx+c)+1}-\frac{\sin(dx+c)^3}{(\cos(dx+c)+1)^3}}{6a^2d}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
[Out] 1/6*(3*sin(d*x + c)/(cos(d*x + c) + 1) - sin(d*x + c)^3/(cos(d*x + c) + 1)^
3)/(a^2*d)
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.56

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-3\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{6\,a^2d}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^2,x, algorithm="giac")
[Out] -1/6*(tan(1/2*d*x + 1/2*c)^3 - 3*tan(1/2*d*x + 1/2*c))/(a^2*d)
```

Mupad [B] (verification not implemented)

Time = 14.36 (sec) , antiderivative size = 30, normalized size of antiderivative = 0.55

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-3\right)}{6\,a^2\,d}$$

```
[In] int(cos(c + d*x)/(a + a*cos(c + d*x))^2,x)
[Out] -(tan(c/2 + (d*x)/2)*(tan(c/2 + (d*x)/2)^2 - 3))/(6*a^2*d)
```

3.58 $\int \frac{1}{(a+a\cos(c+dx))^2} dx$

Optimal result

Integrand size = 12, antiderivative size = 55

$$\int \frac{1}{(a+a\cos(c+dx))^2} dx = \frac{\sin(c+dx)}{3d(a+a\cos(c+dx))^2} + \frac{\sin(c+dx)}{3d(a^2+a^2\cos(c+dx))}$$

```
[Out] 1/3*sin(d*x+c)/d/(a+a*cos(d*x+c))^2+1/3*sin(d*x+c)/d/(a^2+a^2*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {2729, 2727}

$$\int \frac{1}{(a+a\cos(c+dx))^2} dx = \frac{\sin(c+dx)}{3d(a^2\cos(c+dx)+a^2)} + \frac{\sin(c+dx)}{3d(a\cos(c+dx)+a)^2}$$

```
[In] Int[(a + a*Cos[c + d*x])^(-2),x]
```

```
[Out] Sin[c + d*x]/(3*d*(a + a*Cos[c + d*x])^2) + Sin[c + d*x]/(3*d*(a^2 + a^2*Co
s[c + d*x]))
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2729

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[c
+ d*x]*((a + b*Sin[c + d*x])^n/(a*d*(2*n + 1))), x] + Dist[(n + 1)/(a*(2*n
```

```
+ 1)), Int[(a + b*Sin[c + d*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d}, x] &
& EqQ[a^2 - b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sin(c+dx)}{3d(a+a\cos(c+dx))^2}+\frac{\int \frac{1}{a+a\cos(c+dx)}\,dx}{3a}\\ &= \frac{\sin(c+dx)}{3d(a+a\cos(c+dx))^2}+\frac{\sin(c+dx)}{3d\left(a^2+a^2\cos(c+dx)\right)}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.96

$$\int \frac{1}{(a+a\cos(c+dx))^2}\,dx=\frac{\cos\left(\frac{1}{2}(c+dx)\right)\left(3\sin\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{3}{2}(c+dx)\right)\right)}{3a^2d(1+\cos(c+dx))^2}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(-2),x]
[Out] (Cos[(c + d*x)/2]*(3*Sin[(c + d*x)/2] + Sin[(3*(c + d*x))/2]))/(3*a^2*d*(1
+ Cos[c + d*x])^2)
```

Maple [A] (verified)

Time = 0.63 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.56

method	result	size
parallelrisch	$\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)+3\right)}{6a^2d}$	31
derivativedivides	$\frac{\frac{\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2d\,a^2}$	32
default	$\frac{\frac{\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2d\,a^2}$	32
risch	$\frac{2i\left(3\,\mathrm{e}^{i(dx+c)}+1\right)}{3d\,a^2\left(\mathrm{e}^{i(dx+c)}+1\right)^3}$	36
norman	$\frac{\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2da}+\frac{\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)}{6da}}{a}$	42

```
[In] int(1/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
[Out] 1/6*tan(1/2*d*x+1/2*c)*(tan(1/2*d*x+1/2*c)^2+3)/a^2/d
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.89

$$\int \frac{1}{(a+a\cos(c+dx))^2}\,dx = \frac{(\cos(dx+c)+2)\sin(dx+c)}{3\left(a^2d\cos(dx+c)^2+2\,a^2d\cos(dx+c)+a^2d\right)}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^2,x, algorithm="fricas")
[Out] 1/3*(cos(d*x + c) + 2)*sin(d*x + c)/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(d*x
 + c) + a^2*d)
```

Sympy [A] (verification not implemented)

Time = 0.43 (sec) , antiderivative size = 44, normalized size of antiderivative = 0.80

$$\int \frac{1}{(a+a\cos(c+dx))^2}\,dx = \begin{cases} \frac{\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{6a^2d}+\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{2a^2d} & \text{for } d\neq 0 \\ \frac{x}{(a\cos(c)+a)^2} & \text{otherwise} \end{cases}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**2,x)
[Out] Piecewise((tan(c/2 + d*x/2)**3/(6*a**2*d) + tan(c/2 + d*x/2)/(2*a**2*d), Ne
(d, 0)), (x/(a*cos(c) + a)**2, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 46, normalized size of antiderivative = 0.84

$$\int \frac{1}{(a+a\cos(c+dx))^2}\,dx = \frac{\frac{3\sin(dx+c)}{\cos(dx+c)+1}+\frac{\sin(dx+c)^3}{(\cos(dx+c)+1)^3}}{6\,a^2d}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
[Out] 1/6*(3*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d*x + c)^3/(cos(d*x + c) + 1)^
3)/(a^2*d)
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.56

$$\int \frac{1}{(a+a\cos(c+dx))^2}\,dx = \frac{\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+3\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{6\,a^2d}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^2,x, algorithm="giac")
[Out] 1/6*(tan(1/2*d*x + 1/2*c)^3 + 3*tan(1/2*d*x + 1/2*c))/(a^2*d)
```

Mupad [B] (verification not implemented)

Time = 14.06 (sec) , antiderivative size = 30, normalized size of antiderivative = 0.55

$$\int \frac{1}{(a+a\cos(c+dx))^2}\,dx = \frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+3\right)}{6\,a^2\,d}$$

```
[In] int(1/(a + a*cos(c + d*x))^2,x)
[Out] (tan(c/2 + (d*x)/2)*(tan(c/2 + (d*x)/2)^2 + 3))/(6*a^2*d)
```

3.59 $\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 66

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\operatorname{arctanh}(\sin(c+dx))}{a^2d} - \frac{4\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\sin(c+dx)}{3d(a+a\cos(c+dx))^2}$$

```
[Out] arctanh(sin(d*x+c))/a^2/d-4/3*sin(d*x+c)/a^2/d/(1+cos(d*x+c))-1/3*sin(d*x+c
)/d/(a+a*cos(d*x+c))^2
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2845, 3057, 12, 3855}

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\operatorname{arctanh}(\sin(c+dx))}{a^2d} - \frac{4\sin(c+dx)}{3a^2d(\cos(c+dx)+1)} - \frac{\sin(c+dx)}{3d(a\cos(c+dx)+a)^2}$$

```
[In] Int[Sec[c + d*x]/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] ArcTanh[Sin[c + d*x]]/(a^2*d) - (4*Sin[c + d*x])/(3*a^2*d*(1 + Cos[c + d*x]
)) - Sin[c + d*x]/(3*d*(a + a*Cos[c + d*x])^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\sin(c+dx)}{3d(a+a\cos(c+dx))^2}+\frac{\int \frac{(3a-a\cos(c+dx))\sec(c+dx)}{a+a\cos(c+dx)}\,dx}{3a^2}\\
&= -\frac{4\sin(c+dx)}{3a^2d(1+\cos(c+dx))}-\frac{\sin(c+dx)}{3d(a+a\cos(c+dx))^2}+\frac{\int 3a^2\sec(c+dx)\,dx}{3a^4}\\
&= -\frac{4\sin(c+dx)}{3a^2d(1+\cos(c+dx))}-\frac{\sin(c+dx)}{3d(a+a\cos(c+dx))^2}+\frac{\int \sec(c+dx)\,dx}{a^2}\\
&= \frac{\operatorname{arctanh}(\sin(c+dx))}{a^2d}-\frac{4\sin(c+dx)}{3a^2d(1+\cos(c+dx))}-\frac{\sin(c+dx)}{3d(a+a\cos(c+dx))^2}
\end{aligned}
$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 152 vs. 2(66) = 132.

Time = 0.44 (sec) , antiderivative size = 152, normalized size of antiderivative = 2.30

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{2\cos\left(\frac{1}{2}(c+dx)\right)\left(6\cos^3\left(\frac{1}{2}(c+dx)\right)\left(\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)-\log\left(\cos\left(\frac{1}{2}(c+dx)\right)+\right.\right.\right.}{3a^2d(1+\cos}$$

```
[In] Integrate[Sec[c + d*x]/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (-2*Cos[(c + d*x)/2]*(6*Cos[(c + d*x)/2]^3*(Log[Cos[(c + d*x)/2] - Sin[(c +
 d*x)/2]] - Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) + Sec[c/2]*Sin[(d*x)/
2] + 8*Cos[(c + d*x)/2]^2*Sec[c/2]*Sin[(d*x)/2] + Cos[(c + d*x)/2]*Tan[c/2]
))/(3*a^2*d*(1 + Cos[c + d*x])^2)
```

Maple [A] (verified)

Time = 0.90 (sec) , antiderivative size = 62, normalized size of antiderivative = 0.94

method	result	size
derivativedivides	$\frac{-\frac{\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-2\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+2\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{2d\,a^2}$	62
default	$\frac{-\frac{\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-2\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+2\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{2d\,a^2}$	62
parallelrisch	$\frac{-\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-9\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-6\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+6\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{6a^2d}$	62
norman	$\frac{-\frac{3\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2da}-\frac{\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)}{6da}}{a}+\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{d\,a^2}-\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^2d}$	82
risch	$-\frac{2i\left(3\,e^{2i(dx+c)}+9\,e^{i(dx+c)}+4\right)}{3d\,a^2\left(e^{i(dx+c)}+1\right)^3}+\frac{\ln\left(e^{i(dx+c)}+i\right)}{d\,a^2}-\frac{\ln\left(e^{i(dx+c)}-i\right)}{a^2d}$	89

```
[In] int(sec(d*x+c)/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/d/a^2*(-1/3*tan(1/2*d*x+1/2*c)^3-3*tan(1/2*d*x+1/2*c)-2*ln(tan(1/2*d*x+
1/2*c)-1)+2*ln(tan(1/2*d*x+1/2*c)+1))
```

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.73

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{3\left(\cos\left(dx+c\right)^2+2\cos\left(dx+c\right)+1\right)\log\left(\sin\left(dx+c\right)+1\right)-3\left(\cos\left(dx+c\right)^2+2\cos\left(dx+c\right)+1\right)\log\left(-\right.}{6\left(a^2d\cos\left(dx+c\right)^2+2\,a^2d\cos\left(dx+c\right)+a^2d\right)}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/6*(3*(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*log(sin(d*x + c) + 1) - 3*(cos
(d*x + c)^2 + 2*cos(d*x + c) + 1)*log(-sin(d*x + c) + 1) - 2*(4*cos(d*x + c
) + 5)*sin(d*x + c))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)
```

Sympy [F]

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\int \frac{\sec\left(c+dx\right)}{\cos^2\left(c+dx\right)+2\cos\left(c+dx\right)+1}\,dx}{a^2}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))**2,x)
```

```
[Out] Integral(sec(c + d*x)/(cos(c + d*x)**2 + 2*cos(c + d*x) + 1), x)/a**2
```

Maxima [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.48

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{\frac{\frac{9\sin\left(dx+c\right)}{\cos\left(dx+c\right)+1}+\frac{\sin\left(dx+c\right)^3}{\left(\cos\left(dx+c\right)+1\right)^3}}{a^2}-\frac{6\log\left(\frac{\sin\left(dx+c\right)}{\cos\left(dx+c\right)+1}+1\right)}{a^2}+\frac{6\log\left(\frac{\sin\left(dx+c\right)}{\cos\left(dx+c\right)+1}-1\right)}{a^2}}{6\,d}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/6*((9*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d*x + c)^3/(cos(d*x + c) + 1
)^3)/a^2 - 6*log(sin(d*x + c)/(cos(d*x + c) + 1) + 1)/a^2 + 6*log(sin(d*x +
 c)/(cos(d*x + c) + 1) - 1)/a^2)/d
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 77, normalized size of antiderivative = 1.17

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\frac{6\,\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)}{a^2} - \frac{6\,\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)}{a^2} - \frac{a^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+9\,a^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{a^6}}{6\,d}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/6*(6*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^2 - 6*log(abs(tan(1/2*d*x + 1/2
*c) - 1))/a^2 - (a^4*tan(1/2*d*x + 1/2*c)^3 + 9*a^4*tan(1/2*d*x + 1/2*c))/a
^6)/d
```

Mupad [B] (verification not implemented)

Time = 14.08 (sec) , antiderivative size = 43, normalized size of antiderivative = 0.65

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{9\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-12\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{6\,a^2\,d}$$

```
[In] int(1/(cos(c + d*x)*(a + a*cos(c + d*x))^2),x)
```

```
[Out] -(9*tan(c/2 + (d*x)/2) - 12*atanh(tan(c/2 + (d*x)/2)) + tan(c/2 + (d*x)/2)^
3)/(6*a^2*d)
```

3.60 $\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 81

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{2\text{arctanh}(\sin(c+dx))}{a^2d}+\frac{10\tan(c+dx)}{3a^2d} - \frac{2\tan(c+dx)}{a^2d(1+\cos(c+dx))}-\frac{\tan(c+dx)}{3d(a+a\cos(c+dx))^2}$$

```
[Out] -2*arctanh(sin(d*x+c))/a^2/d+10/3*tan(d*x+c)/a^2/d-2*tan(d*x+c)/a^2/d/(1+co
s(d*x+c))-1/3*tan(d*x+c)/d/(a+a*cos(d*x+c))^2
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2845, 3057, 2827, 3852, 8, 3855}

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{2\text{arctanh}(\sin(c+dx))}{a^2d}+\frac{10\tan(c+dx)}{3a^2d} - \frac{2\tan(c+dx)}{a^2d(\cos(c+dx)+1)}-\frac{\tan(c+dx)}{3d(a\cos(c+dx)+a)^2}$$

```
[In] Int[Sec[c + d*x]^2/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (-2*ArcTanh[Sin[c + d*x]])/(a^2*d) + (10*Tan[c + d*x])/(3*a^2*d) - (2*Tan[c
 + d*x])/(a^2*d*(1 + Cos[c + d*x])) - Tan[c + d*x]/(3*d*(a + a*Cos[c + d*x]
)^2)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = -\frac{\tan(c+dx)}{3d(a+a\cos(c+dx))^2} + \frac{\int \frac{(4a-2a\cos(c+dx))\sec^2(c+dx)}{a+a\cos(c+dx)}\,dx}{3a^2}$$

$$= -\frac{2\tan(c+dx)}{a^2d(1+\cos(c+dx))} - \frac{\tan(c+dx)}{3d(a+a\cos(c+dx))^2} + \frac{\int (10a^2-6a^2\cos(c+dx))\sec^2(c+dx)\,dx}{3a^4}$$

$$= -\frac{2\tan(c+dx)}{a^2d(1+\cos(c+dx))} - \frac{\tan(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{2\int \sec(c+dx)\,dx}{a^2} + \frac{10\int \sec^2(c+dx)\,dx}{3a^2}$$

$$= -\frac{2\text{arctanh}(\sin(c+dx))}{a^2d} - \frac{2\tan(c+dx)}{a^2d(1+\cos(c+dx))} - \frac{\tan(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{10\text{Subst}(\int 1\,dx, x, -\tan(c+dx))}{3a^2d}$$

$$= -\frac{2\text{arctanh}(\sin(c+dx))}{a^2d} + \frac{10\tan(c+dx)}{3a^2d} - \frac{2\tan(c+dx)}{a^2d(1+\cos(c+dx))} - \frac{\tan(c+dx)}{3d(a+a\cos(c+dx))^2}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 239 vs. $2(81) = 162$.

Time = 1.07 (sec) , antiderivative size = 239, normalized size of antiderivative = 2.95

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{2\cos\left(\frac{1}{2}(c+dx)\right)\left(\sec\left(\frac{c}{2}\right)\sin\left(\frac{dx}{2}\right)+14\cos^2\left(\frac{1}{2}(c+dx)\right)\sec\left(\frac{c}{2}\right)\sin\left(\frac{dx}{2}\right)+6\cos^3\left(\frac{1}{2}(c+dx)\right)\left(2\log\left(\cos\left(\frac{1}{2}\right.\right.\right.\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^2/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (2*Cos[(c + d*x)/2]*(Sec[c/2]*Sin[(d*x)/2] + 14*Cos[(c + d*x)/2]^2*Sec[c/2]
*Sin[(d*x)/2] + 6*Cos[(c + d*x)/2]^3*(2*Log[Cos[(c + d*x)/2] - Sin[(c + d*x
)/2]] - 2*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] + Sin[d*x]/((Cos[c/2] -
Sin[c/2])*(Cos[c/2] + Sin[c/2])*(Cos[(c + d*x)/2] - Sin[(c + d*x)/2])*(Cos[
(c + d*x)/2] + Sin[(c + d*x)/2]))) + Cos[(c + d*x)/2]*Tan[c/2]))/(3*a^2*d*(
1 + Cos[c + d*x])^2)
```

Maple [A] (verified)

Time = 0.84 (sec) , antiderivative size = 92, normalized size of antiderivative = 1.14

method	result
derivativedivides	$\frac{\frac{\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+5\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{2}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1}-4\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-\frac{2}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1}+4\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2d\,a^2}$
default	$\frac{\frac{\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+5\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{2}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1}-4\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-\frac{2}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1}+4\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2d\,a^2}$
parallelrisch	$\frac{6\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(dx+c)-6\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)\cos(dx+c)+7\left(\sec^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\cos(dx+c)+\frac{5\cos(2}{}\right.}{3a^2d\cos(dx+c)}$
norman	$\frac{-\frac{9\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2da}+\frac{7\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3da}+\frac{\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)}{6da}}{\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)a}+\frac{2\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^2d}-\frac{2\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{d\,a^2}$
risch	$\frac{4i\left(3\,e^{4i(dx+c)}+9\,e^{3i(dx+c)}+11\,e^{2i(dx+c)}+12\,e^{i(dx+c)}+5\right)}{3d\,a^2\left(e^{i(dx+c)}+1\right)^3\left(e^{2i(dx+c)}+1\right)}+\frac{2\ln\left(e^{i(dx+c)}-i\right)}{a^2d}-\frac{2\ln\left(e^{i(dx+c)}+i\right)}{d\,a^2}$

```
[In] int(sec(d*x+c)^2/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/d/a^2*(1/3*tan(1/2*d*x+1/2*c)^3+5*tan(1/2*d*x+1/2*c)-2/(tan(1/2*d*x+1/2
*c)+1)-4*ln(tan(1/2*d*x+1/2*c)+1)-2/(tan(1/2*d*x+1/2*c)-1)+4*ln(tan(1/2*d*x
+1/2*c)-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.80

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{3\left(\cos\left(dx+c\right)^3+2\,\cos\left(dx+c\right)^2+\cos\left(dx+c\right)\right)\log\left(\sin\left(dx+c\right)+1\right)-3\left(\cos\left(dx+c\right)^3+2\,\cos\left(dx+\right.\right.}{3\left(a^2d\cos\left(dx+c\right)^3+2\,a^2d\cos\left(\right.\right.}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -1/3*(3*(cos(d*x + c)^3 + 2*cos(d*x + c)^2 + cos(d*x + c))*log(sin(d*x + c)
 + 1) - 3*(cos(d*x + c)^3 + 2*cos(d*x + c)^2 + cos(d*x + c))*log(-sin(d*x +
 c) + 1) - (10*cos(d*x + c)^2 + 14*cos(d*x + c) + 3)*sin(d*x + c))/(a^2*d*c
os(d*x + c)^3 + 2*a^2*d*cos(d*x + c)^2 + a^2*d*cos(d*x + c))
```

Sympy [F]

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\int \frac{\sec^2(c+dx)}{\cos^2(c+dx)+2\cos(c+dx)+1}\,dx}{a^2}$$

```
[In] integrate(sec(d*x+c)**2/(a+a*cos(d*x+c))**2,x)
[Out] Integral(sec(c + d*x)**2/(cos(c + d*x)**2 + 2*cos(c + d*x) + 1), x)/a**2
```

Maxima [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.79

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\frac{\frac{15\sin(dx+c)}{\cos(dx+c)+1}+\frac{\sin(dx+c)^3}{(\cos(dx+c)+1)^3}}{a^2} - \frac{12\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a^2} + \frac{12\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)}{a^2} + \frac{12\sin(dx+c)}{\left(a^2-\frac{a^2\sin(dx+c)^2}{(\cos(dx+c)+1)^2}\right)(\cos(dx+c)+1)}}{6\,d}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
[Out] 1/6*((15*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d*x + c)^3/(cos(d*x + c) + 1
)^3)/a^2 - 12*log(sin(d*x + c)/(cos(d*x + c) + 1) + 1)/a^2 + 12*log(sin(d*x
 + c)/(cos(d*x + c) + 1) - 1)/a^2 + 12*sin(d*x + c)/((a^2 - a^2*sin(d*x + c
)^2/(cos(d*x + c) + 1)^2)*(cos(d*x + c) + 1)))/d
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.31

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{\frac{12\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)}{a^2} - \frac{12\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right)}{a^2} + \frac{12\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)a^2} - \frac{a^4\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3+15a^4\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{a^6}}{6\,d}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^2,x, algorithm="giac")
[Out] -1/6*(12*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^2 - 12*log(abs(tan(1/2*d*x +
1/2*c) - 1))/a^2 + 12*tan(1/2*d*x + 1/2*c)/((tan(1/2*d*x + 1/2*c)^2 - 1)*a^
2) - (a^4*tan(1/2*d*x + 1/2*c)^3 + 15*a^4*tan(1/2*d*x + 1/2*c))/a^6)/d
```

Mupad [B] (verification not implemented)

Time = 14.37 (sec) , antiderivative size = 92, normalized size of antiderivative = 1.14

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{6\,a^2\,d}-\frac{4\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{a^2\,d} -\frac{2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{d\,\left(a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-a^2\right)}+\frac{5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{2\,a^2\,d}$$

```
[In] int(1/(cos(c + d*x)^2*(a + a*cos(c + d*x))^2),x)
```

```
[Out] tan(c/2 + (d*x)/2)^3/(6*a^2*d) - (4*atanh(tan(c/2 + (d*x)/2)))/(a^2*d) - (2
*tan(c/2 + (d*x)/2))/(d*(a^2*tan(c/2 + (d*x)/2)^2 - a^2)) + (5*tan(c/2 + (d
*x)/2))/(2*a^2*d)
```

3.61 $\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 119

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{7\text{arctanh}(\sin(c+dx))}{2a^2d} - \frac{16\tan(c+dx)}{3a^2d} + \frac{7\sec(c+dx)\tan(c+dx)}{2a^2d} - \frac{8\sec(c+dx)\tan(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\sec(c+dx)\tan(c+dx)}{3d(a+a\cos(c+dx))^2}$$

```
[Out] 7/2*arctanh(sin(d*x+c))/a^2/d-16/3*tan(d*x+c)/a^2/d+7/2*sec(d*x+c)*tan(d*x+
c)/a^2/d-8/3*sec(d*x+c)*tan(d*x+c)/a^2/d/(1+cos(d*x+c))-1/3*sec(d*x+c)*tan(
d*x+c)/d/(a+a*cos(d*x+c))^2
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2845, 3057, 2827, 3853, 3855, 3852, 8}

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{7\text{arctanh}(\sin(c+dx))}{2a^2d} - \frac{16\tan(c+dx)}{3a^2d} + \frac{7\tan(c+dx)\sec(c+dx)}{2a^2d} - \frac{8\tan(c+dx)\sec(c+dx)}{3a^2d(\cos(c+dx)+1)} - \frac{\tan(c+dx)\sec(c+dx)}{3d(a\cos(c+dx)+a)^2}$$

```
[In] Int[Sec[c + d*x]^3/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (7*ArcTanh[Sin[c + d*x]])/(2*a^2*d) - (16*Tan[c + d*x])/(3*a^2*d) + (7*Sec[
c + d*x]*Tan[c + d*x])/(2*a^2*d) - (8*Sec[c + d*x]*Tan[c + d*x])/(3*a^2*d*(
1 + Cos[c + d*x])) - (Sec[c + d*x]*Tan[c + d*x])/(3*d*(a + a*Cos[c + d*x])^
2)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
```

```
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sec(c+dx)\tan(c+dx)}{3d(a+a\cos(c+dx))^2} + \frac{\int \frac{(5a-3a\cos(c+dx))\sec^3(c+dx)}{a+a\cos(c+dx)}\,dx}{3a^2} \\
&= -\frac{8\sec(c+dx)\tan(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\sec(c+dx)\tan(c+dx)}{3d(a+a\cos(c+dx))^2} \\
&\quad + \frac{\int (21a^2-16a^2\cos(c+dx))\sec^3(c+dx)\,dx}{3a^4} \\
&= -\frac{8\sec(c+dx)\tan(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\sec(c+dx)\tan(c+dx)}{3d(a+a\cos(c+dx))^2} \\
&\quad - \frac{16\int \sec^2(c+dx)\,dx}{3a^2} + \frac{7\int \sec^3(c+dx)\,dx}{a^2} \\
&= \frac{7\sec(c+dx)\tan(c+dx)}{2a^2d} - \frac{8\sec(c+dx)\tan(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\sec(c+dx)\tan(c+dx)}{3d(a+a\cos(c+dx))^2} \\
&\quad + \frac{7\int \sec(c+dx)\,dx}{2a^2} + \frac{16\text{Subst}(\int 1\,dx, x, -\tan(c+dx))}{3a^2d} \\
&= \frac{7\text{arctanh}(\sin(c+dx))}{2a^2d} - \frac{16\tan(c+dx)}{3a^2d} + \frac{7\sec(c+dx)\tan(c+dx)}{2a^2d} \\
&\quad - \frac{8\sec(c+dx)\tan(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\sec(c+dx)\tan(c+dx)}{3d(a+a\cos(c+dx))^2}
\end{aligned}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 292 vs. $2(119) = 238$.

Time = 1.59 (sec) , antiderivative size = 292, normalized size of antiderivative = 2.45

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx$$
$$= \frac{\cos\left(\frac{1}{2}(c+dx)\right)\left(-2\sec\left(\frac{c}{2}\right)\sin\left(\frac{dx}{2}\right) - 40\cos^2\left(\frac{1}{2}(c+dx)\right)\sec\left(\frac{c}{2}\right)\sin\left(\frac{dx}{2}\right) + 3\cos^3\left(\frac{1}{2}(c+dx)\right)\left(-14\log\left(\right.\right.\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^3/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (Cos[(c + d*x)/2]*(-2*Sec[c/2]*Sin[(d*x)/2] - 40*Cos[(c + d*x)/2]^2*Sec[c/2
]*Sin[(d*x)/2] + 3*Cos[(c + d*x)/2]^3*(-14*Log[Cos[(c + d*x)/2] - Sin[(c +
d*x)/2]] + 14*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] + (Cos[(c + d*x)/2]
- Sin[(c + d*x)/2])^(-2) - (Cos[(c + d*x)/2] + Sin[(c + d*x)/2])^(-2) - (8*
Sin[d*x])/((Cos[c/2] - Sin[c/2])*(Cos[c/2] + Sin[c/2])*(Cos[(c + d*x)/2] -
Sin[(c + d*x)/2])*(Cos[(c + d*x)/2] + Sin[(c + d*x)/2]))) - 2*Cos[(c + d*x)
/2]*Tan[c/2]))/(3*a^2*d*(1 + Cos[c + d*x])^2)
```

Maple [A] (verified)

Time = 1.05 (sec) , antiderivative size = 120, normalized size of antiderivative = 1.01

method	result
derivativedivides	$\frac{-\frac{1}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^{2}}+\frac{5}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1}+7\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-\frac{\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-7\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{1}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^{2}}+\frac{}{\tan}}{2d\,a^{2}}$
default	$\frac{-\frac{1}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^{2}}+\frac{5}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1}+7\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-\frac{\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-7\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{1}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^{2}}+\frac{}{\tan}}{2d\,a^{2}}$
parallelrisch	$\frac{(-42\cos(2dx+2c)-42)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+(42\cos(2dx+2c)+42)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-60\left(\sec^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\left(\cos(dx+c\right.}{12a^{2}d(1+\cos(2dx+2c))}$
norman	$\frac{-\frac{13\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2da}+\frac{71\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{6da}-\frac{19\left(\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{6da}-\frac{\tan^{7}\left(\frac{dx}{2}+\frac{c}{2}\right)}{6da}}{\left(\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^{2}a}-\frac{7\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2a^{2}d}+\frac{7\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right.}{2d\,a^{2}}$
risch	$-\frac{i\left(21\,e^{6i(dx+c)}+63\,e^{5i(dx+c)}+98\,e^{4i(dx+c)}+126\,e^{3i(dx+c)}+97\,e^{2i(dx+c)}+75\,e^{i(dx+c)}+32\right)}{3d\,a^{2}\left(e^{2i(dx+c)}+1\right)^{2}\left(e^{i(dx+c)}+1\right)^{3}}+\frac{7\ln\left(e^{i(dx+c)}+i\right)}{2d\,a^{2}}-\frac{7\ln}{}$

```
[In] int(sec(d*x+c)^3/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/d/a^2*(-1/(tan(1/2*d*x+1/2*c)+1)^2+5/(tan(1/2*d*x+1/2*c)+1)+7*ln(tan(1/
2*d*x+1/2*c)+1)-1/3*tan(1/2*d*x+1/2*c)^3-7*tan(1/2*d*x+1/2*c)+1/(tan(1/2*d*
x+1/2*c)-1)^2+5/(tan(1/2*d*x+1/2*c)-1)-7*ln(tan(1/2*d*x+1/2*c)-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.36

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{21\left(\cos(dx+c)^4+2\cos(dx+c)^3+\cos(dx+c)^2\right)\log(\sin(dx+c)+1)-21\left(\cos(dx+c)^4+2\cos(dx\right.}{12\left(a^2d\cos(dx+c)^4+\right.}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/12*(21*(cos(d*x + c)^4 + 2*cos(d*x + c)^3 + cos(d*x + c)^2)*log(sin(d*x +
 c) + 1) - 21*(cos(d*x + c)^4 + 2*cos(d*x + c)^3 + cos(d*x + c)^2)*log(-sin
(d*x + c) + 1) - 2*(32*cos(d*x + c)^3 + 43*cos(d*x + c)^2 + 6*cos(d*x + c)
- 3)*sin(d*x + c))/(a^2*d*cos(d*x + c)^4 + 2*a^2*d*cos(d*x + c)^3 + a^2*d*c
os(d*x + c)^2)
```

Sympy [F]

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\int \frac{\sec^3(c+dx)}{\cos^2(c+dx)+2\cos(c+dx)+1}\,dx}{a^2}$$

```
[In] integrate(sec(d*x+c)**3/(a+a*cos(d*x+c))**2,x)
```

```
[Out] Integral(sec(c + d*x)**3/(cos(c + d*x)**2 + 2*cos(c + d*x) + 1), x)/a**2
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 190, normalized size of antiderivative = 1.60

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{\frac{6\left(\frac{3\sin(dx+c)}{\cos(dx+c)+1}-\frac{5\sin(dx+c)^3}{(\cos(dx+c)+1)^3}\right)}{a^2-\frac{2a^2\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{a^2\sin(dx+c)^4}{(\cos(dx+c)+1)^4}}+\frac{\frac{21\sin(dx+c)}{\cos(dx+c)+1}+\frac{\sin(dx+c)^3}{(\cos(dx+c)+1)^3}}{a^2}-\frac{21\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a^2}+\frac{21\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)}{a^2}}{6d}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/6*(6*(3*sin(d*x + c)/(cos(d*x + c) + 1) - 5*sin(d*x + c)^3/(cos(d*x + c)
 + 1)^3)/(a^2 - 2*a^2*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + a^2*sin(d*x + c
)^4/(cos(d*x + c) + 1)^4) + (21*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d*x +
 c)^3/(cos(d*x + c) + 1)^3)/a^2 - 21*log(sin(d*x + c)/(cos(d*x + c) + 1) +
1)/a^2 + 21*log(sin(d*x + c)/(cos(d*x + c) + 1) - 1)/a^2)/d
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.03

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\frac{21\,\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)}{a^2}-\frac{21\,\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)}{a^2}+\frac{6\left(5\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-3\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)^2a^2}-\frac{a^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+21\,a^4\tan\left(\frac{1}{2}\right.}{a^6}}{6\,d}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/6*(21*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^2 - 21*log(abs(tan(1/2*d*x + 1
/2*c) - 1))/a^2 + 6*(5*tan(1/2*d*x + 1/2*c)^3 - 3*tan(1/2*d*x + 1/2*c))/((t
an(1/2*d*x + 1/2*c)^2 - 1)^2*a^2) - (a^4*tan(1/2*d*x + 1/2*c)^3 + 21*a^4*ta
n(1/2*d*x + 1/2*c))/a^6)/d
```

Mupad [B] (verification not implemented)

Time = 14.36 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.03

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{7\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{a^2\,d}-\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{6\,a^2\,d} - \frac{3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{d\,\left(a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-2\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+a^2\right)} - \frac{7\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{2\,a^2\,d}$$

```
[In] int(1/(cos(c + d*x)^3*(a + a*cos(c + d*x))^2),x)
```

```
[Out] (7*atanh(tan(c/2 + (d*x)/2)))/(a^2*d) - tan(c/2 + (d*x)/2)^3/(6*a^2*d) - (3
*tan(c/2 + (d*x)/2) - 5*tan(c/2 + (d*x)/2)^3)/(d*(a^2*tan(c/2 + (d*x)/2)^4
- 2*a^2*tan(c/2 + (d*x)/2)^2 + a^2)) - (7*tan(c/2 + (d*x)/2))/(2*a^2*d)
```

3.62 $\int \frac{\sec^4(c+dx)}{(a+a\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 133

$$\int \frac{\sec^4(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{5\text{arctanh}(\sin(c+dx))}{a^2d}+\frac{12\tan(c+dx)}{a^2d} -\frac{5\sec(c+dx)\tan(c+dx)}{a^2d}-\frac{10\sec^2(c+dx)\tan(c+dx)}{3a^2d(1+\cos(c+dx))} -\frac{\sec^2(c+dx)\tan(c+dx)}{3d(a+a\cos(c+dx))^2}+\frac{4\tan^3(c+dx)}{a^2d}$$

```
[Out] -5*arctanh(sin(d*x+c))/a^2/d+12*tan(d*x+c)/a^2/d-5*sec(d*x+c)*tan(d*x+c)/a^
2/d-10/3*sec(d*x+c)^2*tan(d*x+c)/a^2/d/(1+cos(d*x+c))-1/3*sec(d*x+c)^2*tan(
d*x+c)/d/(a+a*cos(d*x+c))^2+4*tan(d*x+c)^3/a^2/d
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 133, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2845, 3057, 2827, 3852, 3853, 3855}

$$\int \frac{\sec^4(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{5\text{arctanh}(\sin(c+dx))}{a^2d}+\frac{4\tan^3(c+dx)}{a^2d} +\frac{12\tan(c+dx)}{a^2d}-\frac{5\tan(c+dx)\sec(c+dx)}{a^2d} -\frac{10\tan(c+dx)\sec^2(c+dx)}{3a^2d(\cos(c+dx)+1)}-\frac{\tan(c+dx)\sec^2(c+dx)}{3d(a\cos(c+dx)+a)^2}$$

```
[In] Int[Sec[c + d*x]^4/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (-5*ArcTanh[Sin[c + d*x]])/(a^2*d) + (12*Tan[c + d*x])/(a^2*d) - (5*Sec[c +
 d*x]*Tan[c + d*x])/(a^2*d) - (10*Sec[c + d*x]^2*Tan[c + d*x])/(3*a^2*d*(1
+ Cos[c + d*x])) - (Sec[c + d*x]^2*Tan[c + d*x])/(3*d*(a + a*Cos[c + d*x])^
2) + (4*Tan[c + d*x]^3)/(a^2*d)
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sec^2(c+dx)\tan(c+dx)}{3d(a+a\cos(c+dx))^2} + \frac{\int \frac{(6a-4a\cos(c+dx))\sec^4(c+dx)}{a+a\cos(c+dx)}\,dx}{3a^2} \\
&= -\frac{10\sec^2(c+dx)\tan(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\sec^2(c+dx)\tan(c+dx)}{3d(a+a\cos(c+dx))^2} \\
&\quad + \frac{\int (36a^2-30a^2\cos(c+dx))\sec^4(c+dx)\,dx}{3a^4} \\
&= -\frac{10\sec^2(c+dx)\tan(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\sec^2(c+dx)\tan(c+dx)}{3d(a+a\cos(c+dx))^2} \\
&\quad - \frac{10\int \sec^3(c+dx)\,dx}{a^2} + \frac{12\int \sec^4(c+dx)\,dx}{a^2} \\
&= -\frac{5\sec(c+dx)\tan(c+dx)}{a^2d} - \frac{10\sec^2(c+dx)\tan(c+dx)}{3a^2d(1+\cos(c+dx))} \\
&\quad - \frac{\sec^2(c+dx)\tan(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{5\int \sec(c+dx)\,dx}{a^2} \\
&\quad - \frac{12\text{Subst}\left(\int (1+x^2)\,dx, x, -\tan(c+dx)\right)}{a^2d} \\
&= -\frac{5\text{arctanh}(\sin(c+dx))}{a^2d} + \frac{12\tan(c+dx)}{a^2d} - \frac{5\sec(c+dx)\tan(c+dx)}{a^2d} \\
&\quad - \frac{10\sec^2(c+dx)\tan(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\sec^2(c+dx)\tan(c+dx)}{3d(a+a\cos(c+dx))^2} + \frac{4\tan^3(c+dx)}{a^2d}
\end{aligned}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 343 vs. $2(133) = 266$.

Time = 2.91 (sec) , antiderivative size = 343, normalized size of antiderivative = 2.58

$$\int \frac{\sec^4(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{960\cos^4\left(\frac{1}{2}(c+dx)\right)\left(\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)-\log\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)\right)+}{}$$

```
[In] Integrate[Sec[c + d*x]^4/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (960*Cos[(c + d*x)/2]^4*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - Log[Cos
[(c + d*x)/2] + Sin[(c + d*x)/2]]) + Cos[(c + d*x)/2]*Sec[c/2]*Sec[c]*Sec[c
```

```
 + d*x]^3*(-3*Sin[(d*x)/2] + 155*Sin[(3*d*x)/2] - 153*Sin[c - (d*x)/2] + 21
*Sin[c + (d*x)/2] - 135*Sin[2*c + (d*x)/2] + 25*Sin[c + (3*d*x)/2] + 45*Sin
[2*c + (3*d*x)/2] - 85*Sin[3*c + (3*d*x)/2] + 99*Sin[c + (5*d*x)/2] + 21*Si
n[2*c + (5*d*x)/2] + 33*Sin[3*c + (5*d*x)/2] - 45*Sin[4*c + (5*d*x)/2] + 57
*Sin[2*c + (7*d*x)/2] + 18*Sin[3*c + (7*d*x)/2] + 24*Sin[4*c + (7*d*x)/2] -
 15*Sin[5*c + (7*d*x)/2] + 24*Sin[3*c + (9*d*x)/2] + 11*Sin[4*c + (9*d*x)/2
] + 13*Sin[5*c + (9*d*x)/2]))/(48*a^2*d*(1 + Cos[c + d*x])^2)
```

Maple [A] (verified)

Time = 1.26 (sec) , antiderivative size = 152, normalized size of antiderivative = 1.14

method	result
derivativedivides	$\frac{\frac{\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+9\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{2}{3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^3}+\frac{3}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^2}-\frac{10}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1}-10\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-\frac{}{3(\mathrm{t}}}{2d\,a^2}$
default	$\frac{\frac{\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+9\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{2}{3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^3}+\frac{3}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^2}-\frac{10}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1}-10\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-\frac{}{3(\mathrm{t}}}{2d\,a^2}$
norman	$\frac{-\frac{21\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2da}+\frac{80\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3da}-\frac{23\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{da}+\frac{4\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{da}+\frac{\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)}{6da}}{\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^3 a}+\frac{5\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^2d}-$
parallelrisch	$\frac{(90\cos(dx+c)+30\cos(3dx+3c))\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+(-90\cos(dx+c)-30\cos(3dx+3c))\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)+95\left(\cos\right.}{6a^2d(\cos(3dx+3c)+3\cos(dx+c}$
risch	$\frac{2i\left(15\,\mathrm{e}^{8i(dx+c)}+45\,\mathrm{e}^{7i(dx+c)}+85\,\mathrm{e}^{6i(dx+c)}+135\,\mathrm{e}^{5i(dx+c)}+153\,\mathrm{e}^{4i(dx+c)}+155\,\mathrm{e}^{3i(dx+c)}+99\,\mathrm{e}^{2i(dx+c)}+57\,\mathrm{e}^{i(dx+c)}+24\right.}{3a^2d\left(\mathrm{e}^{2i(dx+c)}+1\right)^3\left(\mathrm{e}^{i(dx+c)}+1\right)^3}$

```
[In] int(sec(d*x+c)^4/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/d/a^2*(1/3*tan(1/2*d*x+1/2*c)^3+9*tan(1/2*d*x+1/2*c)-2/3/(tan(1/2*d*x+1
/2*c)+1)^3+3/(tan(1/2*d*x+1/2*c)+1)^2-10/(tan(1/2*d*x+1/2*c)+1)-10*ln(tan(1
/2*d*x+1/2*c)+1)-2/3/(tan(1/2*d*x+1/2*c)-1)^3-3/(tan(1/2*d*x+1/2*c)-1)^2-10
/(tan(1/2*d*x+1/2*c)-1)+10*ln(tan(1/2*d*x+1/2*c)-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.29

$$\int \frac{\sec^4(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{15\left(\cos\left(dx+c\right)^5+2\,\cos\left(dx+c\right)^4+\cos\left(dx+c\right)^3\right)\log\left(\sin\left(dx+c\right)+1\right)-15\left(\cos\left(dx+c\right)^5+2\,\cos\left(d\right.\right.}{6\left(a^2d\cos\left(d\right.\right.}$$

```
[In] integrate(sec(d*x+c)^4/(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -1/6*(15*(cos(d*x + c)^5 + 2*cos(d*x + c)^4 + cos(d*x + c)^3)*log(sin(d*x +
 c) + 1) - 15*(cos(d*x + c)^5 + 2*cos(d*x + c)^4 + cos(d*x + c)^3)*log(-sin
(d*x + c) + 1) - 2*(24*cos(d*x + c)^4 + 33*cos(d*x + c)^3 + 6*cos(d*x + c)^
2 - cos(d*x + c) + 1)*sin(d*x + c))/(a^2*d*cos(d*x + c)^5 + 2*a^2*d*cos(d*x
 + c)^4 + a^2*d*cos(d*x + c)^3)
```

Sympy [F]

$$\int \frac{\sec^4(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\int \frac{\sec^4(c+dx)}{\cos^2(c+dx)+2\cos(c+dx)+1}\,dx}{a^2}$$

```
[In] integrate(sec(d*x+c)**4/(a+a*cos(d*x+c))**2,x)
```

```
[Out] Integral(sec(c + d*x)**4/(cos(c + d*x)**2 + 2*cos(c + d*x) + 1), x)/a**2
```

Maxima [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 234, normalized size of antiderivative = 1.76

$$\int \frac{\sec^4(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\frac{4\left(\frac{9\sin(dx+c)}{\cos(dx+c)+1}-\frac{20\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{15\sin(dx+c)^5}{(\cos(dx+c)+1)^5}\right)}{a^2-\frac{3a^2\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{3a^2\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{a^2\sin(dx+c)^6}{(\cos(dx+c)+1)^6}}+\frac{\frac{27\sin(dx+c)}{\cos(dx+c)+1}+\frac{\sin(dx+c)^3}{(\cos(dx+c)+1)^3}}{a^2}-\frac{30\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a^2}+\frac{30\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)}{a^2}}{6d}$$

```
[In] integrate(sec(d*x+c)^4/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/6*(4*(9*sin(d*x + c)/(cos(d*x + c) + 1) - 20*sin(d*x + c)^3/(cos(d*x + c)
 + 1)^3 + 15*sin(d*x + c)^5/(cos(d*x + c) + 1)^5)/(a^2 - 3*a^2*sin(d*x + c)
^2/(cos(d*x + c) + 1)^2 + 3*a^2*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - a^2*s
in(d*x + c)^6/(cos(d*x + c) + 1)^6) + (27*sin(d*x + c)/(cos(d*x + c) + 1) +
 sin(d*x + c)^3/(cos(d*x + c) + 1)^3)/a^2 - 30*log(sin(d*x + c)/(cos(d*x +
c) + 1) + 1)/a^2 + 30*log(sin(d*x + c)/(cos(d*x + c) + 1) - 1)/a^2)/d
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.02

$$\int \frac{\sec^4(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{\frac{30\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)}{a^2}-\frac{30\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right)}{a^2}+\frac{4\left(15\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5-20\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3+9\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)^3a^2}-\frac{a^4\tan(}{}}{6d}$$

```
[In] integrate(sec(d*x+c)^4/(a+a*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/6*(30*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^2 - 30*log(abs(tan(1/2*d*x +
1/2*c) - 1))/a^2 + 4*(15*tan(1/2*d*x + 1/2*c)^5 - 20*tan(1/2*d*x + 1/2*c)^3
 + 9*tan(1/2*d*x + 1/2*c))/((tan(1/2*d*x + 1/2*c)^2 - 1)^3*a^2) - (a^4*tan(
1/2*d*x + 1/2*c)^3 + 27*a^4*tan(1/2*d*x + 1/2*c))/a^6)/d
```

Mupad [B] (verification not implemented)

Time = 14.30 (sec) , antiderivative size = 153, normalized size of antiderivative = 1.15

$$\int \frac{\sec^4(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^3}{6a^2d}-\frac{10\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}{a^2d} - \frac{10\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^5-\frac{40\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^3}{3}+6\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{d\left(a^2\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^6-3a^2\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^4+3a^2\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2-a^2\right)}+\frac{9\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{2a^2d}$$

```
[In] int(1/(cos(c + d*x)^4*(a + a*cos(c + d*x))^2),x)
```

```
[Out] tan(c/2 + (d*x)/2)^3/(6*a^2*d) - (10*atanh(tan(c/2 + (d*x)/2)))/(a^2*d) - (
6*tan(c/2 + (d*x)/2) - (40*tan(c/2 + (d*x)/2)^3)/3 + 10*tan(c/2 + (d*x)/2)^
5)/(d*(3*a^2*tan(c/2 + (d*x)/2)^2 - 3*a^2*tan(c/2 + (d*x)/2)^4 + a^2*tan(c/
2 + (d*x)/2)^6 - a^2)) + (9*tan(c/2 + (d*x)/2))/(2*a^2*d)
```

3.63 $\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^3} dx$

Optimal result

Integrand size = 21, antiderivative size = 153

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^3} dx = \frac{13x}{2a^3} - \frac{152\sin(c+dx)}{15a^3d} + \frac{13\cos(c+dx)\sin(c+dx)}{2a^3d} - \frac{\cos^4(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{11\cos^3(c+dx)\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{76\cos^2(c+dx)\sin(c+dx)}{15d\left(a^3+a^3\cos(c+dx)\right)}$$

```
[Out] 13/2*x/a^3-152/15*sin(d*x+c)/a^3/d+13/2*cos(d*x+c)*sin(d*x+c)/a^3/d-1/5*cos
(d*x+c)^4*sin(d*x+c)/d/(a+a*cos(d*x+c))^3-11/15*cos(d*x+c)^3*sin(d*x+c)/a/d
/(a+a*cos(d*x+c))^2-76/15*cos(d*x+c)^2*sin(d*x+c)/d/(a^3+a^3*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 153, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2844, 3056, 2813}

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^3} dx = -\frac{152\sin(c+dx)}{15a^3d} - \frac{76\sin(c+dx)\cos^2(c+dx)}{15d\left(a^3\cos(c+dx)+a^3\right)} + \frac{13\sin(c+dx)\cos(c+dx)}{2a^3d} + \frac{13x}{2a^3} - \frac{\sin(c+dx)\cos^4(c+dx)}{5d(a\cos(c+dx)+a)^3} - \frac{11\sin(c+dx)\cos^3(c+dx)}{15ad(a\cos(c+dx)+a)^2}$$

```
[In] Int[Cos[c + d*x]^5/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (13*x)/(2*a^3) - (152*Sin[c + d*x])/(15*a^3*d) + (13*Cos[c + d*x]*Sin[c + d
*x])/(2*a^3*d) - (Cos[c + d*x]^4*Sin[c + d*x])/(5*d*(a + a*Cos[c + d*x])^3)
 - (11*Cos[c + d*x]^3*Sin[c + d*x])/(15*a*d*(a + a*Cos[c + d*x])^2) - (76*C
os[c + d*x]^2*Sin[c + d*x])/(15*d*(a^3 + a^3*Cos[c + d*x]))
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\text{integral} = -\frac{\cos^4(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{\int \frac{\cos^3(c+dx)(4a-7a\cos(c+dx))}{(a+a\cos(c+dx))^2}\,dx}{5a^2}$$

$$= -\frac{\cos^4(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{11\cos^3(c+dx)\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{\int \frac{\cos^2(c+dx)(33a^2-43a^2\cos(c+dx))}{a+a\cos(c+dx)}\,dx}{15a^4}$$

$$= -\frac{\cos^4(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{11\cos^3(c+dx)\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{76\cos^2(c+dx)\sin(c+dx)}{15d(a^3+a^3\cos(c+dx))} - \frac{\int \cos(c+dx)\left(152a^3-195a^3\cos(c+dx)\right)\,dx}{15a^6}$$

$$= \frac{13x}{2a^3} - \frac{152\sin(c+dx)}{15a^3d} + \frac{13\cos(c+dx)\sin(c+dx)}{2a^3d} - \frac{\cos^4(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{11\cos^3(c+dx)\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{76\cos^2(c+dx)\sin(c+dx)}{15d(a^3+a^3\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 2.03 (sec) , antiderivative size = 127, normalized size of antiderivative = 0.83

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{\cos\left(\frac{1}{2}(c+dx)\right)\csc^6(c+dx)\sin^7\left(\frac{1}{2}(c+dx)\right)\left(12480\arcsin(\cos(c+dx))\cos^6\left(\frac{1}{2}(c+dx)\right)+(4303+600\right.}{15a^3d\sqrt{\sin^2(c+}}$$

```
[In] Integrate[Cos[c + d*x]^5/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] -1/15*(Cos[(c + d*x)/2]*Csc[c + d*x]^6*Sin[(c + d*x)/2]^7*(12480*ArcSin[Cos
[c + d*x]]*Cos[(c + d*x)/2]^6 + (4303 + 6006*Cos[c + d*x] + 1856*Cos[2*(c +
 d*x)] + 90*Cos[3*(c + d*x)] - 15*Cos[4*(c + d*x)])*Sqrt[Sin[c + d*x]^2]))/
(a^3*d*Sqrt[Sin[c + d*x]^2])
```

Maple [A] (verified)

Time = 0.84 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.50

method	result
parallelrisch	$\frac{-\frac{1001\left(\cos(dx+c)+\frac{928\cos(2dx+2c)}{3003}+\frac{15\cos(3dx+3c)}{1001}-\frac{5\cos(4dx+4c)}{2002}+\frac{331}{462}\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sec^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{160}+\frac{13dx}{2}}{a^3d}$
derivativedivides	$\frac{-\frac{\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\frac{8\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-31\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{-28\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-20\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}+52\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d\,a^3}$
default	$\frac{-\frac{\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\frac{8\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-31\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{-28\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-20\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}+52\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d\,a^3}$
risch	$\frac{13x}{2a^3}-\frac{ie^{2i(dx+c)}}{8d\,a^3}+\frac{3ie^{i(dx+c)}}{2d\,a^3}-\frac{3ie^{-i(dx+c)}}{2d\,a^3}+\frac{ie^{-2i(dx+c)}}{8d\,a^3}-\frac{2i\left(150\,e^{4i(dx+c)}+525\,e^{3i(dx+c)}+745\,e^{2i(dx+c)}+48\right.}{15d\,a^3\left(e^{i(dx+c)}+1\right)^5}$
norman	$\frac{\frac{13x}{2a}-\frac{51\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4da}-\frac{721\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12da}-\frac{6613\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{60da}-\frac{1165\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12da}-\frac{475\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12da}-\frac{59\left(\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right.}{12da}}{(}$

```
[In] int(cos(d*x+c)^5/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 13/160*(-77*(cos(d*x+c)+928/3003*cos(2*d*x+2*c)+15/1001*cos(3*d*x+3*c)-5/20
02*cos(4*d*x+4*c)+331/462)*tan(1/2*d*x+1/2*c)*sec(1/2*d*x+1/2*c)^4+80*d*x)/
a^3/d
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 135, normalized size of antiderivative = 0.88

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^3}\,dx$$
$$= \frac{195\,dx\cos{(dx+c)}^3 + 585\,dx\cos{(dx+c)}^2 + 585\,dx\cos{(dx+c)} + 195\,dx + \left(15\,\cos{(dx+c)}^4 - 45\,\cos{(d}}{30\,\left(a^3d\cos{(dx+c)}^3 + 3\,a^3d\cos{(dx+c)}^2 + 3\,a^3d\cos{(}}$$

```
[In] integrate(cos(d*x+c)^5/(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/30*(195*d*x*cos(d*x + c)^3 + 585*d*x*cos(d*x + c)^2 + 585*d*x*cos(d*x + c
) + 195*d*x + (15*cos(d*x + c)^4 - 45*cos(d*x + c)^3 - 479*cos(d*x + c)^2 -
 717*cos(d*x + c) - 304)*sin(d*x + c))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(
d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 473 vs. 2(143) = 286.

Time = 3.89 (sec) , antiderivative size = 473, normalized size of antiderivative = 3.09

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^3}\,dx$$
$$= \begin{cases} \frac{390dx\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)}{60a^3d\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)+120a^3d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+60a^3d} + \frac{780dx\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)}{60a^3d\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)+120a^3d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+60a^3d} + \frac{390dx}{60a^3d\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)+120a^3} \\ \frac{x\cos^5{(c)}}{(a\cos{(c)}+a)^3} \end{cases}$$

```
[In] integrate(cos(d*x+c)**5/(a+a*cos(d*x+c))**3,x)
```

```
[Out] Piecewise((390*d*x*tan(c/2 + d*x/2)**4/(60*a**3*d*tan(c/2 + d*x/2)**4 + 120
*a**3*d*tan(c/2 + d*x/2)**2 + 60*a**3*d) + 780*d*x*tan(c/2 + d*x/2)**2/(60*
a**3*d*tan(c/2 + d*x/2)**4 + 120*a**3*d*tan(c/2 + d*x/2)**2 + 60*a**3*d) +
390*d*x/(60*a**3*d*tan(c/2 + d*x/2)**4 + 120*a**3*d*tan(c/2 + d*x/2)**2 + 6
0*a**3*d) - 3*tan(c/2 + d*x/2)**9/(60*a**3*d*tan(c/2 + d*x/2)**4 + 120*a**3
*d*tan(c/2 + d*x/2)**2 + 60*a**3*d) + 34*tan(c/2 + d*x/2)**7/(60*a**3*d*tan
(c/2 + d*x/2)**4 + 120*a**3*d*tan(c/2 + d*x/2)**2 + 60*a**3*d) - 388*tan(c/
2 + d*x/2)**5/(60*a**3*d*tan(c/2 + d*x/2)**4 + 120*a**3*d*tan(c/2 + d*x/2)*
*2 + 60*a**3*d) - 1310*tan(c/2 + d*x/2)**3/(60*a**3*d*tan(c/2 + d*x/2)**4 +
 120*a**3*d*tan(c/2 + d*x/2)**2 + 60*a**3*d) - 765*tan(c/2 + d*x/2)/(60*a**
3*d*tan(c/2 + d*x/2)**4 + 120*a**3*d*tan(c/2 + d*x/2)**2 + 60*a**3*d), Ne(d
, 0)), (x*cos(c)**5/(a*cos(c) + a)**3, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 184, normalized size of antiderivative = 1.20

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{\frac{60\left(\frac{5\sin(dx+c)}{\cos(dx+c)+1}+\frac{7\sin(dx+c)^3}{(\cos(dx+c)+1)^3}\right)}{a^3+\frac{2a^3\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{a^3\sin(dx+c)^4}{(\cos(dx+c)+1)^4}}+\frac{\frac{465\sin(dx+c)}{\cos(dx+c)+1}-\frac{40\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{3\sin(dx+c)^5}{(\cos(dx+c)+1)^5}}{a^3}-\frac{780\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{a^3}}{60\,d}$$

```
[In] integrate(cos(d*x+c)^5/(a+a*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/60*(60*(5*sin(d*x + c)/(cos(d*x + c) + 1) + 7*sin(d*x + c)^3/(cos(d*x +
c) + 1)^3)/(a^3 + 2*a^3*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + a^3*sin(d*x +
 c)^4/(cos(d*x + c) + 1)^4) + (465*sin(d*x + c)/(cos(d*x + c) + 1) - 40*sin
(d*x + c)^3/(cos(d*x + c) + 1)^3 + 3*sin(d*x + c)^5/(cos(d*x + c) + 1)^5)/a
^3 - 780*arctan(sin(d*x + c)/(cos(d*x + c) + 1))/a^3)/d
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 113, normalized size of antiderivative = 0.74

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\frac{390\,(dx+c)}{a^3}-\frac{60\left(7\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+5\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+1\right)^2a^3}-\frac{3\,a^{12}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-40\,a^{12}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+465\,a^{12}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{a^{15}}}{60\,d}$$

```
[In] integrate(cos(d*x+c)^5/(a+a*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/60*(390*(d*x + c)/a^3 - 60*(7*tan(1/2*d*x + 1/2*c)^3 + 5*tan(1/2*d*x + 1/
2*c))/((tan(1/2*d*x + 1/2*c)^2 + 1)^2*a^3) - (3*a^12*tan(1/2*d*x + 1/2*c)^5
 - 40*a^12*tan(1/2*d*x + 1/2*c)^3 + 465*a^12*tan(1/2*d*x + 1/2*c))/a^15)/d
```

Mupad [B] (verification not implemented)

Time = 14.30 (sec) , antiderivative size = 137, normalized size of antiderivative = 0.90

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{3\sin\left(\frac{c}{2}+\frac{dx}{2}\right)-46\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^2\sin\left(\frac{c}{2}+\frac{dx}{2}\right)+508\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^4\sin\left(\frac{c}{2}+\frac{dx}{2}\right)+420\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^6 \mathrm{s}}{60\,a^3\,d\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^5}$$

```
[In] int(cos(c + d*x)^5/(a + a*cos(c + d*x))^3,x)
```

```
[Out] -(3*sin(c/2 + (d*x)/2) - 46*cos(c/2 + (d*x)/2)^2*sin(c/2 + (d*x)/2) + 508*c
os(c/2 + (d*x)/2)^4*sin(c/2 + (d*x)/2) + 420*cos(c/2 + (d*x)/2)^6*sin(c/2 +
 (d*x)/2) - 120*cos(c/2 + (d*x)/2)^8*sin(c/2 + (d*x)/2) - 390*cos(c/2 + (d*
x)/2)^5*(c + d*x))/(60*a^3*d*cos(c/2 + (d*x)/2)^5)
```

3.64 $\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 119

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{3x}{a^3}+\frac{9\sin(c+dx)}{5a^3d}-\frac{\cos^3(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{3\cos^2(c+dx)\sin(c+dx)}{5ad(a+a\cos(c+dx))^2}+\frac{3\sin(c+dx)}{d\,(a^3+a^3\cos(c+dx))}$$

```
[Out] -3*x/a^3+9/5*sin(d*x+c)/a^3/d-1/5*cos(d*x+c)^3*sin(d*x+c)/d/(a+a*cos(d*x+c)
)^3-3/5*cos(d*x+c)^2*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^2+3*sin(d*x+c)/d/(a^3+
a^3*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2844, 3056, 3047, 3102, 12, 2814, 2727}

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{9\sin(c+dx)}{5a^3d}+\frac{3\sin(c+dx)}{d\,(a^3\cos(c+dx)+a^3)}-\frac{3x}{a^3} - \frac{\sin(c+dx)\cos^3(c+dx)}{5d(a\cos(c+dx)+a)^3}-\frac{3\sin(c+dx)\cos^2(c+dx)}{5ad(a\cos(c+dx)+a)^2}$$

```
[In] Int[Cos[c + d*x]^4/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (-3*x)/a^3 + (9*Sin[c + d*x])/(5*a^3*d) - (Cos[c + d*x]^3*Sin[c + d*x])/(5*
d*(a + a*Cos[c + d*x])^3) - (3*Cos[c + d*x]^2*Sin[c + d*x])/(5*a*d*(a + a*C
os[c + d*x])^2) + (3*Sin[c + d*x])/(d*(a^3 + a^3*Cos[c + d*x]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\text{integral} = -\frac{\cos^3(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{\int \frac{\cos^2(c+dx)(3a-6a\cos(c+dx))}{(a+a\cos(c+dx))^2}\,dx}{5a^2}$$

$$= -\frac{\cos^3(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{3\cos^2(c+dx)\sin(c+dx)}{5ad(a+a\cos(c+dx))^2} - \frac{\int \frac{\cos(c+dx)(18a^2-27a^2\cos(c+dx))}{a+a\cos(c+dx)}\,dx}{15a^4}$$

$$= -\frac{\cos^3(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{3\cos^2(c+dx)\sin(c+dx)}{5ad(a+a\cos(c+dx))^2} - \frac{\int \frac{18a^2\cos(c+dx)-27a^2\cos^2(c+dx)}{a+a\cos(c+dx)}\,dx}{15a^4}$$

$$= \frac{9\sin(c+dx)}{5a^3d} - \frac{\cos^3(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{3\cos^2(c+dx)\sin(c+dx)}{5ad(a+a\cos(c+dx))^2} - \frac{\int \frac{45a^3\cos(c+dx)}{a+a\cos(c+dx)}\,dx}{15a^5}$$

$$= \frac{9\sin(c+dx)}{5a^3d} - \frac{\cos^3(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{3\cos^2(c+dx)\sin(c+dx)}{5ad(a+a\cos(c+dx))^2} - \frac{3\int \frac{\cos(c+dx)}{a+a\cos(c+dx)}\,dx}{a^2}$$

$$= -\frac{3x}{a^3} + \frac{9\sin(c+dx)}{5a^3d} - \frac{\cos^3(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{3\cos^2(c+dx)\sin(c+dx)}{5ad(a+a\cos(c+dx))^2} + \frac{3\int \frac{1}{a+a\cos(c+dx)}\,dx}{a^2}$$

$$= -\frac{3x}{a^3} + \frac{9\sin(c+dx)}{5a^3d} - \frac{\cos^3(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{3\cos^2(c+dx)\sin(c+dx)}{5ad(a+a\cos(c+dx))^2} + \frac{3\sin(c+dx)}{d(a^3+a^3\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 0.49 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.90

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^3}\,dx$$

$$= \frac{\sin(c+dx)\left(120\arcsin(\cos(c+dx))\cos^6\left(\frac{1}{2}(c+dx)\right) + (24+57\cos(c+dx)+39\cos^2(c+dx)+5\cos^3(c-\right.}{5a^3d\sqrt{1-\cos(c+dx)}(1+\cos(c+dx))^{7/2}}$$

```
[In] Integrate[Cos[c + d*x]^4/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (Sin[c + d*x]*(120*ArcSin[Cos[c + d*x]]*Cos[(c + d*x)/2]^6 + (24 + 57*Cos[c
 + d*x] + 39*Cos[c + d*x]^2 + 5*Cos[c + d*x]^3)*Sqrt[Sin[c + d*x]^2]))/(5*a
^3*d*Sqrt[1 - Cos[c + d*x]]*(1 + Cos[c + d*x])^(7/2))
```

Maple [A] (verified)

Time = 0.78 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.55

method	result
parallelrisch	$\frac{\frac{243\left(\cos(dx+c)+\frac{26\cos(2dx+2c)}{81}+\frac{5\cos(3dx+3c)}{243}+\frac{58}{81}\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sec^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{80}-3dx}{a^3 d}$
derivativedivides	$\frac{\frac{\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+17\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{8\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}-24\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d\,a^3}$
default	$\frac{\frac{\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+17\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{8\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}-24\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d\,a^3}$
risch	$-\frac{3x}{a^3}-\frac{i\mathrm{e}^{i(dx+c)}}{2d\,a^3}+\frac{i\mathrm{e}^{-i(dx+c)}}{2d\,a^3}+\frac{4i\left(15\,\mathrm{e}^{4i(dx+c)}+50\,\mathrm{e}^{3i(dx+c)}+70\,\mathrm{e}^{2i(dx+c)}+45\,\mathrm{e}^{i(dx+c)}+12\right)}{5d\,a^3\left(\mathrm{e}^{i(dx+c)}+1\right)^5}$
norman	$\frac{-\frac{3x}{a}+\frac{25\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4da}+\frac{45\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2da}+\frac{591\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{20da}+\frac{81\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5da}+\frac{51\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{20da}-\frac{3\left(\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{10da}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^4 a^2}$

```
[In] int(cos(d*x+c)^4/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 3/80*(81*(cos(d*x+c)+26/81*cos(2*d*x+2*c)+5/243*cos(3*d*x+3*c)+58/81)*tan(1
/2*d*x+1/2*c)*sec(1/2*d*x+1/2*c)^4-80*d*x)/a^3/d
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.06

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{15\,dx\cos\left(dx+c\right)^3+45\,dx\cos\left(dx+c\right)^2+45\,dx\cos\left(dx+c\right)+15\,dx-\left(5\,\cos\left(dx+c\right)^3+39\,\cos\left(dx+\right.\right.}{5\left(a^3d\cos\left(dx+c\right)^3+3\,a^3d\cos\left(dx+c\right)^2+3\,a^3d\cos\left(dx+c\right)+a\right.}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] -1/5*(15*d*x*cos(d*x + c)^3 + 45*d*x*cos(d*x + c)^2 + 45*d*x*cos(d*x + c) +
 15*d*x - (5*cos(d*x + c)^3 + 39*cos(d*x + c)^2 + 57*cos(d*x + c) + 24)*sin
(d*x + c))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x
 + c) + a^3*d)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 240 vs. $2(109) = 218$.

Time = 2.38 (sec) , antiderivative size = 240, normalized size of antiderivative = 2.02

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^3}\,dx$$
$$= \begin{cases} -\frac{60dx\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)}{20a^3d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+20a^3d} - \frac{60dx}{20a^3d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+20a^3d} + \frac{\tan^7\left(\frac{c}{2}+\frac{dx}{2}\right)}{20a^3d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+20a^3d} - \frac{9\tan^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{20a^3d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+20a^3d} + \frac{75\,\mathrm{t}}{20a^3d\,\mathrm{tan}} \\ \frac{x\cos^4(c)}{(a\cos(c)+a)^3} \end{cases}$$

```
[In] integrate(cos(d*x+c)**4/(a+a*cos(d*x+c))**3,x)
```

```
[Out] Piecewise((-60*d*x*tan(c/2 + d*x/2)**2/(20*a**3*d*tan(c/2 + d*x/2)**2 + 20*
a**3*d) - 60*d*x/(20*a**3*d*tan(c/2 + d*x/2)**2 + 20*a**3*d) + tan(c/2 + d*
x/2)**7/(20*a**3*d*tan(c/2 + d*x/2)**2 + 20*a**3*d) - 9*tan(c/2 + d*x/2)**5
/(20*a**3*d*tan(c/2 + d*x/2)**2 + 20*a**3*d) + 75*tan(c/2 + d*x/2)**3/(20*a
**3*d*tan(c/2 + d*x/2)**2 + 20*a**3*d) + 125*tan(c/2 + d*x/2)/(20*a**3*d*ta
n(c/2 + d*x/2)**2 + 20*a**3*d), Ne(d, 0)), (x*cos(c)**4/(a*cos(c) + a)**3,
True))
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.15

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^3}\,dx$$
$$= \frac{\frac{40\sin(dx+c)}{\left(a^3+\frac{a^3\sin(dx+c)^2}{(\cos(dx+c)+1)^2}\right)(\cos(dx+c)+1)} + \frac{\frac{85\sin(dx+c)}{\cos(dx+c)+1} - \frac{10\sin(dx+c)^3}{(\cos(dx+c)+1)^3} + \frac{\sin(dx+c)^5}{(\cos(dx+c)+1)^5}}{a^3} - \frac{120\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{a^3}}{20\,d}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/20*(40*sin(d*x + c)/((a^3 + a^3*sin(d*x + c)^2/(cos(d*x + c) + 1)^2)*(cos
(d*x + c) + 1)) + (85*sin(d*x + c)/(cos(d*x + c) + 1) - 10*sin(d*x + c)^3/(
cos(d*x + c) + 1)^3 + sin(d*x + c)^5/(cos(d*x + c) + 1)^5)/a^3 - 120*arctan
(sin(d*x + c)/(cos(d*x + c) + 1))/a^3)/d
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.81

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^3}\,dx$$
$$= -\frac{\frac{60\,(dx+c)}{a^3} - \frac{40\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+1\right)a^3} - \frac{a^{12}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-10\,a^{12}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+85\,a^{12}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{a^{15}}}{20\,d}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/20*(60*(d*x + c)/a^3 - 40*tan(1/2*d*x + 1/2*c)/((tan(1/2*d*x + 1/2*c)^2
+ 1)*a^3) - (a^12*tan(1/2*d*x + 1/2*c)^5 - 10*a^12*tan(1/2*d*x + 1/2*c)^3 +
 85*a^12*tan(1/2*d*x + 1/2*c))/a^15)/d
```

Mupad [B] (verification not implemented)

Time = 14.28 (sec) , antiderivative size = 113, normalized size of antiderivative = 0.95

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^3}\,dx$$
$$= \frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right) - 12\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right) + 96\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right) + 40\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6\sin\left(\frac{c}{2}+\right.}{20\,a^3\,d\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}$$

```
[In] int(cos(c + d*x)^4/(a + a*cos(c + d*x))^3,x)
```

```
[Out] (sin(c/2 + (d*x)/2) - 12*cos(c/2 + (d*x)/2)^2*sin(c/2 + (d*x)/2) + 96*cos(c
/2 + (d*x)/2)^4*sin(c/2 + (d*x)/2) + 40*cos(c/2 + (d*x)/2)^6*sin(c/2 + (d*x
)/2) - 60*cos(c/2 + (d*x)/2)^5*(c + d*x))/(20*a^3*d*cos(c/2 + (d*x)/2)^5)
```

3.65 $\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 96

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{x}{a^3} - \frac{\cos^2(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} + \frac{7\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{29\sin(c+dx)}{15d\,(a^3+a^3\cos(c+dx))}$$

```
[Out] x/a^3-1/5*cos(d*x+c)^2*sin(d*x+c)/d/(a+a*cos(d*x+c))^3+7/15*sin(d*x+c)/a/d/
(a+a*cos(d*x+c))^2-29/15*sin(d*x+c)/d/(a^3+a^3*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2844, 3047, 3098, 2814, 2727}

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{29\sin(c+dx)}{15d\,(a^3\cos(c+dx)+a^3)} + \frac{x}{a^3} - \frac{\sin(c+dx)\cos^2(c+dx)}{5d(a\cos(c+dx)+a)^3} + \frac{7\sin(c+dx)}{15ad(a\cos(c+dx)+a)^2}$$

```
[In] Int[Cos[c + d*x]^3/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] x/a^3 - (Cos[c + d*x]^2*Sin[c + d*x])/(5*d*(a + a*Cos[c + d*x])^3) + (7*Sin
[c + d*x])/(15*a*d*(a + a*Cos[c + d*x])^2) - (29*Sin[c + d*x])/(15*d*(a^3 +
 a^3*Cos[c + d*x]))
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3098

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(A*b - a*
B + b*C)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(a*f*(2*m + 1))), x] + Dist[1
/(a^2*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[a*A*(m + 1) + m*(b*
B - a*C) + b*C*(2*m + 1)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A,
B, C}, x] && LtQ[m, -1] && EqQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = -\frac{\cos^2(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{\int \frac{\cos(c+dx)(2a-5a\cos(c+dx))}{(a+a\cos(c+dx))^2}\,dx}{5a^2}$$

$$= -\frac{\cos^2(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{\int \frac{2a\cos(c+dx)-5a\cos^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx}{5a^2}$$

$$= -\frac{\cos^2(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} + \frac{7\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} + \frac{\int \frac{-14a^2+15a^2\cos(c+dx)}{a+a\cos(c+dx)}\,dx}{15a^4}$$

$$= \frac{x}{a^3} - \frac{\cos^2(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} + \frac{7\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{29\int \frac{1}{a+a\cos(c+dx)}\,dx}{15a^2}$$

$$= \frac{x}{a^3} - \frac{\cos^2(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} + \frac{7\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{29\sin(c+dx)}{15d\,(a^3+a^3\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 0.82 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.12

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^3}\,dx =$$

$$-\frac{4\cos\left(\frac{1}{2}(c+dx)\right)\csc^6(c+dx)\sin^7\left(\frac{1}{2}(c+dx)\right)\left(480\arcsin(\cos(c+dx))\cos^6\left(\frac{1}{2}(c+dx)\right)+4(38+51\cos\right.}{15a^3d\sqrt{\sin^2(c+dx)}}$$

```
[In] Integrate[Cos[c + d*x]^3/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (-4*Cos[(c + d*x)/2]*Csc[c + d*x]^6*Sin[(c + d*x)/2]^7*(480*ArcSin[Cos[c +
d*x]]*Cos[(c + d*x)/2]^6 + 4*(38 + 51*Cos[c + d*x] + 16*Cos[2*(c + d*x)])*S
qrt[Sin[c + d*x]^2]))/(15*a^3*d*Sqrt[Sin[c + d*x]^2])
```

Maple [A] (verified)

Time = 0.81 (sec) , antiderivative size = 51, normalized size of antiderivative = 0.53

method	result
parallelrisch	$\frac{-3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+20\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+60dx-105\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{60a^3d}$
derivativedivides	$\frac{-\frac{\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\frac{4\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-7\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+8\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d\,a^3}$
default	$\frac{-\frac{\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\frac{4\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-7\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+8\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d\,a^3}$
risch	$\frac{x}{a^3}-\frac{2i\left(45\,e^{4i(dx+c)}+135\,e^{3i(dx+c)}+185\,e^{2i(dx+c)}+115\,e^{i(dx+c)}+32\right)}{15d\,a^3\left(e^{i(dx+c)}+1\right)^5}$
norman	$\frac{\frac{x}{a}+\frac{x\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{a}-\frac{7\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4da}-\frac{59\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12da}-\frac{43\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{10da}-\frac{9\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{10da}+\frac{11\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{60da}-\frac{\tan^{11}(}{20}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3a^2}$

```
[In] int(cos(d*x+c)^3/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

[Out] 1/60*(-3*tan(1/2*d*x+1/2*c)^5+20*tan(1/2*d*x+1/2*c)^3+60*d*x-105*tan(1/2*d*x+1/2*c))/a^3/d

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.21

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^3} dx = \frac{15\,dx\cos(dx+c)^3+45\,dx\cos(dx+c)^2+45\,dx\cos(dx+c)+15\,dx-\left(32\,\cos(dx+c)^2+51\,\cos(dx+ \right.}{15\left(a^3d\cos(dx+c)^3+3\,a^3d\cos(dx+c)^2+3\,a^3d\cos(dx+c)+a^3d\right)}$$

[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^3,x, algorithm="fricas")

[Out] 1/15*(15*d*x*cos(d*x + c)^3 + 45*d*x*cos(d*x + c)^2 + 45*d*x*cos(d*x + c) + 15*d*x - (32*cos(d*x + c)^2 + 51*cos(d*x + c) + 22)*sin(d*x + c))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)

Sympy [A] (verification not implemented)

Time = 1.36 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.78

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^3} dx = \begin{cases} \frac{x}{a^3}-\frac{\tan^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{20a^3d}+\frac{\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{3a^3d}-\frac{7\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{4a^3d} & \text{for } d\neq 0 \\ \frac{x\cos^3(c)}{(a\cos(c)+a)^3} & \text{otherwise} \end{cases}$$

[In] integrate(cos(d*x+c)**3/(a+a*cos(d*x+c))**3,x)

[Out] Piecewise((x/a**3 - tan(c/2 + d*x/2)**5/(20*a**3*d) + tan(c/2 + d*x/2)**3/(3*a**3*d) - 7*tan(c/2 + d*x/2)/(4*a**3*d), Ne(d, 0)), (x*cos(c)**3/(a*cos(c) + a)**3, True))

Maxima [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 92, normalized size of antiderivative = 0.96

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^3} dx = -\frac{\frac{\frac{105\,\sin(dx+c)}{\cos(dx+c)+1}-\frac{20\,\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{3\,\sin(dx+c)^5}{(\cos(dx+c)+1)^5}}{a^3}-\frac{120\,\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{a^3}}{60\,d}$$

[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^3,x, algorithm="maxima")

[Out] -1/60*((105*sin(d*x + c)/(cos(d*x + c) + 1) - 20*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 3*sin(d*x + c)^5/(cos(d*x + c) + 1)^5)/a^3 - 120*arctan(sin(d*x + c)/(cos(d*x + c) + 1))/a^3)/d

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 68, normalized size of antiderivative = 0.71

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\frac{60\,(dx+c)}{a^3} - \frac{3\,a^{12}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5 - 20\,a^{12}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3 + 105\,a^{12}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{a^{15}}}{60\,d}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/60*(60*(d*x + c)/a^3 - (3*a^12*tan(1/2*d*x + 1/2*c)^5 - 20*a^12*tan(1/2*d
*x + 1/2*c)^3 + 105*a^12*tan(1/2*d*x + 1/2*c))/a^15)/d
```

Mupad [B] (verification not implemented)

Time = 14.23 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.84

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{x}{a^3} - \frac{\frac{32\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4}{15} - \frac{13\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2}{30} + \frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{20}}{a^3\,d\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}$$

```
[In] int(cos(c + d*x)^3/(a + a*cos(c + d*x))^3,x)
```

```
[Out] x/a^3 - (sin(c/2 + (d*x)/2)/20 - (13*cos(c/2 + (d*x)/2)^2*sin(c/2 + (d*x)/2
))/30 + (32*cos(c/2 + (d*x)/2)^4*sin(c/2 + (d*x)/2))/15)/(a^3*d*cos(c/2 + (
d*x)/2)^5)
```

3.66 $\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^3} dx$

Optimal result

Integrand size = 21, antiderivative size = 83

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^3} dx = \frac{\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{8\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} + \frac{7\sin(c+dx)}{15d(a^3+a^3\cos(c+dx))}$$

```
[Out] 1/5*sin(d*x+c)/d/(a+a*cos(d*x+c))^3-8/15*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^2+
7/15*sin(d*x+c)/d/(a^3+a^3*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2837, 2829, 2727}

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^3} dx = \frac{7\sin(c+dx)}{15d(a^3\cos(c+dx)+a^3)} - \frac{8\sin(c+dx)}{15ad(a\cos(c+dx)+a)^2} + \frac{\sin(c+dx)}{5d(a\cos(c+dx)+a)^3}$$

```
[In] Int[Cos[c + d*x]^2/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] Sin[c + d*x]/(5*d*(a + a*Cos[c + d*x])^3) - (8*Sin[c + d*x])/(15*a*d*(a + a
*Cos[c + d*x])^2) + (7*Sin[c + d*x])/(15*d*(a^3 + a^3*Cos[c + d*x]))
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
```

```
^2, 0]
```

Rule 2829

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((a + b*Sin[e + f*
x])^m/(a*f*(2*m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(a*b*(2*m + 1)), In
t[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && N
eQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)]
```

Rule 2837

```
Int[sin[(e_.) + (f_.)*(x_)]^2*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_),
x_Symbol] :> Simp[b*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(a*f*(2*m + 1))),
x] - Dist[1/(a^2*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(a*m - b*(2*m
 + 1)*Sin[e + f*x]), x], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 - b^2, 0]
&& LtQ[m, -2^(-1)]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sin(c+dx)}{5d(a+a\cos(c+dx))^3} + \frac{\int \frac{-3a+5a\cos(c+dx)}{(a+a\cos(c+dx))^2}\,dx}{5a^2} \\
&= \frac{\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{8\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} + \frac{7\int \frac{1}{a+a\cos(c+dx)}\,dx}{15a^2} \\
&= \frac{\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{8\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} + \frac{7\sin(c+dx)}{15d\,(a^3+a^3\cos(c+dx))}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 46, normalized size of antiderivative = 0.55

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{(2+6\cos(c+dx)+7\cos^2(c+dx))\sin(c+dx)}{15a^3d(1+\cos(c+dx))^3}$$

```
[In] Integrate[Cos[c + d*x]^2/(a + a*Cos[c + d*x])^3,x]
[Out] ((2 + 6*Cos[c + d*x] + 7*Cos[c + d*x]^2)*Sin[c + d*x])/(15*a^3*d*(1 + Cos[c
 + d*x])^3)
```

Maple [A] (verified)

Time = 0.71 (sec) , antiderivative size = 45, normalized size of antiderivative = 0.54

method	result	size
derivativedivides	$\frac{\frac{\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-\frac{2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d\,a^3}$	45
default	$\frac{\frac{\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-\frac{2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d\,a^3}$	45
parallelrisch	$\frac{3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-10\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+15\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{60a^3d}$	47
risch	$\frac{2i\left(15\,\mathrm{e}^{4i(dx+c)}+30\,\mathrm{e}^{3i(dx+c)}+40\,\mathrm{e}^{2i(dx+c)}+20\,\mathrm{e}^{i(dx+c)}+7\right)}{15d\,a^3\left(\mathrm{e}^{i(dx+c)}+1\right)^5}$	69
norman	$\frac{\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4da}+\frac{\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)}{3da}-\frac{\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)}{30da}-\frac{\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)}{15da}+\frac{\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)}{20da}}{a^2\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}$	114

```
[In] int(cos(d*x+c)^2/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
[Out] 1/4/d/a^3*(1/5*tan(1/2*d*x+1/2*c)^5-2/3*tan(1/2*d*x+1/2*c)^3+tan(1/2*d*x+1/
2*c))
```

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.90

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\left(7\,\cos\left(dx+c\right)^2+6\,\cos\left(dx+c\right)+2\right)\sin\left(dx+c\right)}{15\,\left(a^3d\cos\left(dx+c\right)^3+3\,a^3d\cos\left(dx+c\right)^2+3\,a^3d\cos\left(dx+c\right)+a^3d\right)}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^3,x, algorithm="fricas")
[Out] 1/15*(7*cos(d*x + c)^2 + 6*cos(d*x + c) + 2)*sin(d*x + c)/(a^3*d*cos(d*x +
c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [A] (verification not implemented)

Time = 1.04 (sec) , antiderivative size = 68, normalized size of antiderivative = 0.82

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \begin{cases} \frac{\tan^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{20a^3d} - \frac{\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{6a^3d} + \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{4a^3d} & \text{for } d \neq 0 \\ \frac{x\cos^2(c)}{(a\cos(c)+a)^3} & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)**2/(a+a*cos(d*x+c))**3,x)
```

```
[Out] Piecewise((tan(c/2 + d*x/2)**5/(20*a**3*d) - tan(c/2 + d*x/2)**3/(6*a**3*d)
 + tan(c/2 + d*x/2)/(4*a**3*d), Ne(d, 0)), (x*cos(c)**2/(a*cos(c) + a)**3,
True))
```

Maxima [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 67, normalized size of antiderivative = 0.81

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\frac{15\sin(dx+c)}{\cos(dx+c)+1} - \frac{10\sin(dx+c)^3}{(\cos(dx+c)+1)^3} + \frac{3\sin(dx+c)^5}{(\cos(dx+c)+1)^5}}{60\,a^3d}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/60*(15*sin(d*x + c)/(cos(d*x + c) + 1) - 10*sin(d*x + c)^3/(cos(d*x + c)
+ 1)^3 + 3*sin(d*x + c)^5/(cos(d*x + c) + 1)^5)/(a^3*d)
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 46, normalized size of antiderivative = 0.55

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5 - 10\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3 + 15\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{60\,a^3d}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/60*(3*tan(1/2*d*x + 1/2*c)^5 - 10*tan(1/2*d*x + 1/2*c)^3 + 15*tan(1/2*d*x
 + 1/2*c))/(a^3*d)
```

Mupad [B] (verification not implemented)

Time = 14.54 (sec) , antiderivative size = 45, normalized size of antiderivative = 0.54

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\left(3\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^4-10\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2+15\right)}{60\,a^3\,d}$$

```
[In] int(cos(c + d*x)^2/(a + a*cos(c + d*x))^3,x)
```

```
[Out] (tan(c/2 + (d*x)/2)*(3*tan(c/2 + (d*x)/2)^4 - 10*tan(c/2 + (d*x)/2)^2 + 15)
)/(60*a^3*d)
```

3.67 $\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^3} dx$

Optimal result

Integrand size = 19, antiderivative size = 83

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^3} dx = -\frac{\sin(c+dx)}{5d(a+a\cos(c+dx))^3} + \frac{\sin(c+dx)}{5ad(a+a\cos(c+dx))^2} + \frac{\sin(c+dx)}{5d(a^3+a^3\cos(c+dx))}$$

```
[Out] -1/5*sin(d*x+c)/d/(a+a*cos(d*x+c))^3+1/5*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^2+
1/5*sin(d*x+c)/d/(a^3+a^3*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.158$, Rules used = {2829, 2729, 2727}

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^3} dx = \frac{\sin(c+dx)}{5d(a^3\cos(c+dx)+a^3)} + \frac{\sin(c+dx)}{5ad(a\cos(c+dx)+a)^2} - \frac{\sin(c+dx)}{5d(a\cos(c+dx)+a)^3}$$

```
[In] Int[Cos[c + d*x]/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] -1/5*Sin[c + d*x]/(d*(a + a*Cos[c + d*x])^3) + Sin[c + d*x]/(5*a*d*(a + a*C
os[c + d*x])^2) + Sin[c + d*x]/(5*d*(a^3 + a^3*Cos[c + d*x]))
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
```

```
^2, 0]
```

Rule 2729

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[c
+ d*x]*((a + b*Sin[c + d*x])^n/(a*d*(2*n + 1))), x] + Dist[(n + 1)/(a*(2*n
+ 1)), Int[(a + b*Sin[c + d*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d}, x] &
& EqQ[a^2 - b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2829

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((a + b*Sin[e + f*
x])^m/(a*f*(2*m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(a*b*(2*m + 1)), In
t[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && N
eQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sin(c+dx)}{5d(a+a\cos(c+dx))^3}+\frac{3\int \frac{1}{(a+a\cos(c+dx))^2}\,dx}{5a}\\
&= -\frac{\sin(c+dx)}{5d(a+a\cos(c+dx))^3}+\frac{\sin(c+dx)}{5ad(a+a\cos(c+dx))^2}+\frac{\int \frac{1}{a+a\cos(c+dx)}\,dx}{5a^2}\\
&= -\frac{\sin(c+dx)}{5d(a+a\cos(c+dx))^3}+\frac{\sin(c+dx)}{5ad(a+a\cos(c+dx))^2}+\frac{\sin(c+dx)}{5d\,(a^3+a^3\cos(c+dx))}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 44, normalized size of antiderivative = 0.53

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^3}\,dx=\frac{(1+3\cos(c+dx)+\cos^2(c+dx))\sin(c+dx)}{5a^3d(1+\cos(c+dx))^3}$$

```
[In] Integrate[Cos[c + d*x]/(a + a*Cos[c + d*x])^3,x]
[Out] ((1 + 3*Cos[c + d*x] + Cos[c + d*x]^2)*Sin[c + d*x])/(5*a^3*d*(1 + Cos[c +
d*x])^3)
```

Maple [A] (verified)

Time = 0.84 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.37

method	result	size
parallelrisch	$-\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)-5\right)}{20a^3d}$	31
derivativedivides	$\frac{-\frac{\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d\,a^3}$	32
default	$\frac{-\frac{\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d\,a^3}$	32
risch	$\frac{2i\left(5\,\mathrm{e}^{3i(dx+c)}+5\,\mathrm{e}^{2i(dx+c)}+5\,\mathrm{e}^{i(dx+c)}+1\right)}{5d\,a^3\left(\mathrm{e}^{i(dx+c)}+1\right)^5}$	58
norman	$\frac{\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4da}+\frac{\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)}{4da}-\frac{\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)}{20da}-\frac{\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)}{20da}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a^2}$	95

```
[In] int(cos(d*x+c)/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
[Out] -1/20*tan(1/2*d*x+1/2*c)*(tan(1/2*d*x+1/2*c)^4-5)/a^3/d
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.88

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\left(\cos\left(dx+c\right)^2+3\,\cos\left(dx+c\right)+1\right)\sin\left(dx+c\right)}{5\left(a^3d\cos\left(dx+c\right)^3+3\,a^3d\cos\left(dx+c\right)^2+3\,a^3d\cos\left(dx+c\right)+a^3d\right)}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^3,x, algorithm="fricas")
[Out] 1/5*(cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*sin(d*x + c)/(a^3*d*cos(d*x + c)^
3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [A] (verification not implemented)

Time = 0.81 (sec) , antiderivative size = 48, normalized size of antiderivative = 0.58

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \begin{cases} -\frac{\tan^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{20a^3d} + \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{4a^3d} & \text{for } d \neq 0 \\ \frac{x\cos(c)}{(a\cos(c)+a)^3} & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))**3,x)
[Out] Piecewise((-tan(c/2 + d*x/2)**5/(20*a**3*d) + tan(c/2 + d*x/2)/(4*a**3*d),
Ne(d, 0)), (x*cos(c)/(a*cos(c) + a)**3, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.57 (sec) , antiderivative size = 47, normalized size of antiderivative = 0.57

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\frac{5\sin(dx+c)}{\cos(dx+c)+1} - \frac{\sin(dx+c)^5}{(\cos(dx+c)+1)^5}}{20\,a^3d}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^3,x, algorithm="maxima")
[Out] 1/20*(5*sin(d*x + c)/(cos(d*x + c) + 1) - sin(d*x + c)^5/(cos(d*x + c) + 1)
^5)/(a^3*d)
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.37

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5 - 5\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{20\,a^3d}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^3,x, algorithm="giac")
[Out] -1/20*(tan(1/2*d*x + 1/2*c)^5 - 5*tan(1/2*d*x + 1/2*c))/(a^3*d)
```

Mupad [B] (verification not implemented)

Time = 14.32 (sec) , antiderivative size = 30, normalized size of antiderivative = 0.36

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\,\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^4-5\right)}{20\,a^3\,d}$$

```
[In] int(cos(c + d*x)/(a + a*cos(c + d*x))^3,x)
[Out] -(tan(c/2 + (d*x)/2)*(tan(c/2 + (d*x)/2)^4 - 5))/(20*a^3*d)
```

3.68 $\int \frac{1}{(a+a\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 83

$$\int \frac{1}{(a+a\cos(c+dx))^3}\,dx=\frac{\sin(c+dx)}{5d(a+a\cos(c+dx))^3}+\frac{2\sin(c+dx)}{15ad(a+a\cos(c+dx))^2}+\frac{2\sin(c+dx)}{15d\,(a^3+a^3\cos(c+dx))}$$

```
[Out] 1/5*sin(d*x+c)/d/(a+a*cos(d*x+c))^3+2/15*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^2+
2/15*sin(d*x+c)/d/(a^3+a^3*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {2729, 2727}

$$\int \frac{1}{(a+a\cos(c+dx))^3}\,dx=\frac{2\sin(c+dx)}{15d\,(a^3\cos(c+dx)+a^3)}+\frac{2\sin(c+dx)}{15ad(a\cos(c+dx)+a)^2}+\frac{\sin(c+dx)}{5d(a\cos(c+dx)+a)^3}$$

```
[In] Int[(a + a*Cos[c + d*x])^(-3),x]
```

```
[Out] Sin[c + d*x]/(5*d*(a + a*Cos[c + d*x])^3) + (2*Sin[c + d*x])/(15*a*d*(a + a
*Cos[c + d*x])^2) + (2*Sin[c + d*x])/(15*d*(a^3 + a^3*Cos[c + d*x]))
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
```

```
^2, 0]
```

Rule 2729

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[c
+ d*x]*((a + b*Sin[c + d*x])^n/(a*d*(2*n + 1))), x] + Dist[(n + 1)/(a*(2*n
+ 1)), Int[(a + b*Sin[c + d*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d}, x] &
& EqQ[a^2 - b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sin(c+dx)}{5d(a+a\cos(c+dx))^3}+\frac{2\int\frac{1}{(a+a\cos(c+dx))^2}\,dx}{5a}\\ &= \frac{\sin(c+dx)}{5d(a+a\cos(c+dx))^3}+\frac{2\sin(c+dx)}{15ad(a+a\cos(c+dx))^2}+\frac{2\int\frac{1}{a+a\cos(c+dx)}\,dx}{15a^2}\\ &= \frac{\sin(c+dx)}{5d(a+a\cos(c+dx))^3}+\frac{2\sin(c+dx)}{15ad(a+a\cos(c+dx))^2}+\frac{2\sin(c+dx)}{15d\left(a^3+a^3\cos(c+dx)\right)}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.78

$$\int\frac{1}{(a+a\cos(c+dx))^3}\,dx = \frac{\cos\left(\frac{1}{2}(c+dx)\right)\left(10\sin\left(\frac{1}{2}(c+dx)\right)+5\sin\left(\frac{3}{2}(c+dx)\right)+\sin\left(\frac{5}{2}(c+dx)\right)\right)}{15a^3d(1+\cos(c+dx))^3}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(-3),x]
[Out] (Cos[(c + d*x)/2]*(10*Sin[(c + d*x)/2] + 5*Sin[(3*(c + d*x))/2] + Sin[(5*(c
 + d*x))/2]))/(15*a^3*d*(1 + Cos[c + d*x])^3)
```

Maple [A] (verified)

Time = 0.66 (sec) , antiderivative size = 45, normalized size of antiderivative = 0.54

method	result	size
derivativedivides	$\frac{\frac{\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\frac{2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d\,a^3}$	45
default	$\frac{\frac{\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\frac{2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d\,a^3}$	45
risch	$\frac{4i\left(10\,e^{2i(dx+c)}+5\,e^{i(dx+c)}+1\right)}{15d\,a^3\left(e^{i(dx+c)}+1\right)^5}$	47
parallelrisch	$\frac{3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+10\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+15\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{60a^3d}$	47
norman	$\frac{\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4da}+\frac{\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)}{6da}+\frac{\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)}{20da}}{a^2}$	61

```
[In] int(1/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/d/a^3*(1/5*tan(1/2*d*x+1/2*c)^5+2/3*tan(1/2*d*x+1/2*c)^3+tan(1/2*d*x+1/
2*c))
```

Fricas [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.90

$$\int \frac{1}{(a+a\cos(c+dx))^3}\,dx = \frac{\left(2\,\cos\left(dx+c\right)^2+6\,\cos\left(dx+c\right)+7\right)\sin\left(dx+c\right)}{15\,\left(a^3d\cos\left(dx+c\right)^3+3\,a^3d\cos\left(dx+c\right)^2+3\,a^3d\cos\left(dx+c\right)+a^3d\right)}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/15*(2*cos(d*x + c)^2 + 6*cos(d*x + c) + 7)*sin(d*x + c)/(a^3*d*cos(d*x +
c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [A] (verification not implemented)

Time = 0.69 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.76

$$\int \frac{1}{(a+a\cos(c+dx))^3}\,dx = \begin{cases} \frac{\tan^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{20a^3d}+\frac{\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{6a^3d}+\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{4a^3d} & \text{for } d\neq 0 \\ \frac{x}{(a\cos(c)+a)^3} & \text{otherwise} \end{cases}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**3,x)
```

```
[Out] Piecewise((tan(c/2 + d*x/2)**5/(20*a**3*d) + tan(c/2 + d*x/2)**3/(6*a**3*d)
 + tan(c/2 + d*x/2)/(4*a**3*d), Ne(d, 0)), (x/(a*cos(c) + a)**3, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 67, normalized size of antiderivative = 0.81

$$\int \frac{1}{(a + a\cos(c + dx))^3}\,dx = \frac{\frac{15\sin(dx+c)}{\cos(dx+c)+1} + \frac{10\sin(dx+c)^3}{(\cos(dx+c)+1)^3} + \frac{3\sin(dx+c)^5}{(\cos(dx+c)+1)^5}}{60\,a^3d}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/60*(15*sin(d*x + c)/(cos(d*x + c) + 1) + 10*sin(d*x + c)^3/(cos(d*x + c)
+ 1)^3 + 3*sin(d*x + c)^5/(cos(d*x + c) + 1)^5)/(a^3*d)
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 46, normalized size of antiderivative = 0.55

$$\int \frac{1}{(a + a\cos(c + dx))^3}\,dx = \frac{3\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)^5 + 10\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)^3 + 15\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)}{60\,a^3d}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/60*(3*tan(1/2*d*x + 1/2*c)^5 + 10*tan(1/2*d*x + 1/2*c)^3 + 15*tan(1/2*d*x
 + 1/2*c))/(a^3*d)
```

Mupad [B] (verification not implemented)

Time = 14.60 (sec) , antiderivative size = 45, normalized size of antiderivative = 0.54

$$\int \frac{1}{(a + a\cos(c + dx))^3}\,dx = \frac{\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)\,\left(3\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^4 + 10\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^2 + 15\right)}{60\,a^3\,d}$$

```
[In] int(1/(a + a*cos(c + d*x))^3,x)
```

```
[Out] (tan(c/2 + (d*x)/2)*(10*tan(c/2 + (d*x)/2)^2 + 3*tan(c/2 + (d*x)/2)^4 + 15)
)/(60*a^3*d)
```

3.69 $\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 97

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\operatorname{arctanh}(\sin(c+dx))}{a^3d} - \frac{\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{7\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{22\sin(c+dx)}{15d\,(a^3+a^3\cos(c+dx))}$$

```
[Out] arctanh(sin(d*x+c))/a^3/d-1/5*sin(d*x+c)/d/(a+a*cos(d*x+c))^3-7/15*sin(d*x+
c)/a/d/(a+a*cos(d*x+c))^2-22/15*sin(d*x+c)/d/(a^3+a^3*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2845, 3057, 12, 3855}

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\operatorname{arctanh}(\sin(c+dx))}{a^3d} - \frac{22\sin(c+dx)}{15d\,(a^3\cos(c+dx)+a^3)} - \frac{7\sin(c+dx)}{15ad(a\cos(c+dx)+a)^2} - \frac{\sin(c+dx)}{5d(a\cos(c+dx)+a)^3}$$

```
[In] Int[Sec[c + d*x]/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] ArcTanh[Sin[c + d*x]]/(a^3*d) - Sin[c + d*x]/(5*d*(a + a*Cos[c + d*x])^3) -
 (7*Sin[c + d*x])/(15*a*d*(a + a*Cos[c + d*x])^2) - (22*Sin[c + d*x])/(15*d
*(a^3 + a^3*Cos[c + d*x]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\sin(c+dx)}{5d(a+a\cos(c+dx))^3}+\frac{\int \frac{(5a-2a\cos(c+dx))\sec(c+dx)}{(a+a\cos(c+dx))^2}\,dx}{5a^2}\\
&= -\frac{\sin(c+dx)}{5d(a+a\cos(c+dx))^3}-\frac{7\sin(c+dx)}{15ad(a+a\cos(c+dx))^2}+\frac{\int \frac{(15a^2-7a^2\cos(c+dx))\sec(c+dx)}{a+a\cos(c+dx)}\,dx}{15a^4}\\
&= -\frac{\sin(c+dx)}{5d(a+a\cos(c+dx))^3}-\frac{7\sin(c+dx)}{15ad(a+a\cos(c+dx))^2}\\
&\quad -\frac{22\sin(c+dx)}{15d\,(a^3+a^3\cos(c+dx))}+\frac{\int 15a^3\sec(c+dx)\,dx}{15a^6}
\end{aligned}
$$

$$= -\frac{\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{7\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{22\sin(c+dx)}{15d\left(a^3+a^3\cos(c+dx)\right)} + \frac{\int \sec(c+dx)\,dx}{a^3}$$

$$= \frac{\operatorname{arctanh}(\sin(c+dx))}{a^3d} - \frac{\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{7\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{22\sin(c+dx)}{15d\left(a^3+a^3\cos(c+dx)\right)}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 201 vs. $2(97) = 194$.

Time = 0.55 (sec) , antiderivative size = 201, normalized size of antiderivative = 2.07

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{2\cos\left(\frac{1}{2}(c+dx)\right)\left(60\cos^5\left(\frac{1}{2}(c+dx)\right)\left(\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)-\log\left(\cos\left(\frac{1}{2}(c+dx)\right)\right.\right.\right.}{}$$

```
[In] Integrate[Sec[c + d*x]/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (-2*Cos[(c + d*x)/2]*(60*Cos[(c + d*x)/2]^5*(Log[Cos[(c + d*x)/2] - Sin[(c
+ d*x)/2]] - Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) + 3*Sec[c/2]*Sin[(d*
x)/2] + 14*Cos[(c + d*x)/2]^2*Sec[c/2]*Sin[(d*x)/2] + 88*Cos[(c + d*x)/2]^4
*Sec[c/2]*Sin[(d*x)/2] + 3*Cos[(c + d*x)/2]*Tan[c/2] + 14*Cos[(c + d*x)/2]^
3*Tan[c/2]))/(15*a^3*d*(1 + Cos[c + d*x])^3)
```

Maple [A] (verified)

Time = 0.89 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.77

method	result	size
derivativedivides	$\frac{-\frac{\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-\frac{4\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-7\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-4\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+4\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{4d\,a^3}$	75
default	$\frac{-\frac{\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-\frac{4\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-7\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-4\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+4\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{4d\,a^3}$	75
parallelrisch	$\frac{-3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-20\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-60\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+60\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-105\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{60a^3d}$	75
norman	$\frac{-\frac{7\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4da}-\frac{\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)}{3da}-\frac{\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)}{20da}}{a^2}+\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{a^3d}-\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^3d}$	101
risch	$-\frac{2i\left(15\,e^{4i(dx+c)}+75\,e^{3i(dx+c)}+145\,e^{2i(dx+c)}+95\,e^{i(dx+c)}+22\right)}{15d\,a^3\left(e^{i(dx+c)}+1\right)^5}-\frac{\ln\left(e^{i(dx+c)}-i\right)}{a^3d}+\frac{\ln\left(e^{i(dx+c)}+i\right)}{d\,a^3}$	111

```
[In] int(sec(d*x+c)/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/d/a^3*(-1/5*tan(1/2*d*x+1/2*c)^5-4/3*tan(1/2*d*x+1/2*c)^3-7*tan(1/2*d*x
+1/2*c)-4*ln(tan(1/2*d*x+1/2*c)-1)+4*ln(tan(1/2*d*x+1/2*c)+1))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.63

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{15\left(\cos\left(dx+c\right)^3+3\,\cos\left(dx+c\right)^2+3\,\cos\left(dx+c\right)+1\right)\log\left(\sin\left(dx+c\right)+1\right)-15\left(\cos\left(dx+c\right)^3+3\,\cos\left(\right.\right.}{30\left(a^3d\cos\left(dx+c\right)^3+3\,a^3d\cos\right.}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/30*(15*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*log(sin(d
*x + c) + 1) - 15*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*
log(-sin(d*x + c) + 1) - 2*(22*cos(d*x + c)^2 + 51*cos(d*x + c) + 32)*sin(d
*x + c))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x +
 c) + a^3*d)
```

Sympy [F]

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\int \frac{\sec\left(c+dx\right)}{\cos^3\left(c+dx\right)+3\cos^2\left(c+dx\right)+3\cos\left(c+dx\right)+1}\,dx}{a^3}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))**3,x)
```

```
[Out] Integral(sec(c + d*x)/(cos(c + d*x)**3 + 3*cos(c + d*x)**2 + 3*cos(c + d*x)
 + 1), x)/a**3
```

Maxima [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.23

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{\frac{\frac{105\,\sin(dx+c)}{\cos(dx+c)+1}+\frac{20\,\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{3\,\sin(dx+c)^5}{(\cos(dx+c)+1)^5}}{a^3}-\frac{60\,\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a^3}+\frac{60\,\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)}{a^3}}{60\,d}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/60*((105*sin(d*x + c)/(cos(d*x + c) + 1) + 20*sin(d*x + c)^3/(cos(d*x +
c) + 1)^3 + 3*sin(d*x + c)^5/(cos(d*x + c) + 1)^5)/a^3 - 60*log(sin(d*x + c
)/(cos(d*x + c) + 1) + 1)/a^3 + 60*log(sin(d*x + c)/(cos(d*x + c) + 1) - 1)
/a^3)/d
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.97

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\frac{60\,\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)}{a^3}-\frac{60\,\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)}{a^3}-\frac{3\,a^{12}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5+20\,a^{12}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+105\,a^{12}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{a^{15}}}{60\,d}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/60*(60*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^3 - 60*log(abs(tan(1/2*d*x +
1/2*c) - 1))/a^3 - (3*a^12*tan(1/2*d*x + 1/2*c)^5 + 20*a^12*tan(1/2*d*x + 1
/2*c)^3 + 105*a^12*tan(1/2*d*x + 1/2*c))/a^15)/d
```

Mupad [B] (verification not implemented)

Time = 14.18 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.60

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{105\tan\left(\frac{c}{2}+\frac{dx}{2}\right)-120\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)+20\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^3+3\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^5}{60\,a^3\,d}$$

```
[In] int(1/(cos(c + d*x)*(a + a*cos(c + d*x))^3),x)
```

```
[Out] -(105*tan(c/2 + (d*x)/2) - 120*atanh(tan(c/2 + (d*x)/2)) + 20*tan(c/2 + (d*
x)/2)^3 + 3*tan(c/2 + (d*x)/2)^5)/(60*a^3*d)
```

3.70 $\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 112

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{3\text{arctanh}(\sin(c+dx))}{a^3d}+\frac{24\tan(c+dx)}{5a^3d} - \frac{\tan(c+dx)}{5d(a+a\cos(c+dx))^3}-\frac{3\tan(c+dx)}{5ad(a+a\cos(c+dx))^2} - \frac{3\tan(c+dx)}{d\left(a^3+a^3\cos(c+dx)\right)}$$

```
[Out] -3*arctanh(sin(d*x+c))/a^3/d+24/5*tan(d*x+c)/a^3/d-1/5*tan(d*x+c)/d/(a+a*co
s(d*x+c))^3-3/5*tan(d*x+c)/a/d/(a+a*cos(d*x+c))^2-3*tan(d*x+c)/d/(a^3+a^3*c
os(d*x+c))
```

Rubi [A] (verified)

Time = 0.32 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2845, 3057, 2827, 3852, 8, 3855}

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{3\text{arctanh}(\sin(c+dx))}{a^3d}+\frac{24\tan(c+dx)}{5a^3d} - \frac{3\tan(c+dx)}{d\left(a^3\cos(c+dx)+a^3\right)} - \frac{3\tan(c+dx)}{5ad(a\cos(c+dx)+a)^2}-\frac{\tan(c+dx)}{5d(a\cos(c+dx)+a)^3}$$

```
[In] Int[Sec[c + d*x]^2/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (-3*ArcTanh[Sin[c + d*x]])/(a^3*d) + (24*Tan[c + d*x])/(5*a^3*d) - Tan[c +
d*x]/(5*d*(a + a*Cos[c + d*x])^3) - (3*Tan[c + d*x])/(5*a*d*(a + a*Cos[c +
d*x])^2) - (3*Tan[c + d*x])/(d*(a^3 + a^3*Cos[c + d*x]))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = -\frac{\tan(c+dx)}{5d(a+a\cos(c+dx))^3} + \frac{\int \frac{(6a-3a\cos(c+dx))\sec^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx}{5a^2}$$

$$= -\frac{\tan(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{3\tan(c+dx)}{5ad(a+a\cos(c+dx))^2} + \frac{\int \frac{(27a^2-18a^2\cos(c+dx))\sec^2(c+dx)}{a+a\cos(c+dx)}\,dx}{15a^4}$$

$$= -\frac{\tan(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{3\tan(c+dx)}{5ad(a+a\cos(c+dx))^2} - \frac{3\tan(c+dx)}{d(a^3+a^3\cos(c+dx))} + \frac{\int (72a^3-45a^3\cos(c+dx))\sec^2(c+dx)\,dx}{15a^6}$$

$$= -\frac{\tan(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{3\tan(c+dx)}{5ad(a+a\cos(c+dx))^2} - \frac{3\tan(c+dx)}{d(a^3+a^3\cos(c+dx))} - \frac{3\int \sec(c+dx)\,dx}{a^3} + \frac{24\int \sec^2(c+dx)\,dx}{5a^3}$$

$$= -\frac{3\text{arctanh}(\sin(c+dx))}{a^3d} - \frac{\tan(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{3\tan(c+dx)}{5ad(a+a\cos(c+dx))^2} - \frac{3\tan(c+dx)}{d(a^3+a^3\cos(c+dx))} - \frac{24\text{Subst}(\int 1\,dx, x, -\tan(c+dx))}{5a^3d}$$

$$= -\frac{3\text{arctanh}(\sin(c+dx))}{a^3d} + \frac{24\tan(c+dx)}{5a^3d} - \frac{\tan(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{3\tan(c+dx)}{5ad(a+a\cos(c+dx))^2} - \frac{3\tan(c+dx)}{d(a^3+a^3\cos(c+dx))}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 286 vs. 2(112) = 224.

Time = 1.13 (sec) , antiderivative size = 286, normalized size of antiderivative = 2.55

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{2\cos\left(\frac{1}{2}(c+dx)\right)\left(\sec\left(\frac{c}{2}\right)\sin\left(\frac{dx}{2}\right)+8\cos^2\left(\frac{1}{2}(c+dx)\right)\sec\left(\frac{c}{2}\right)\sin\left(\frac{dx}{2}\right)+76\cos^4\left(\frac{1}{2}(c+dx)\right)\sec\left(\frac{c}{2}\right)\sin\left(\frac{dx}{2}\right)\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^2/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (2*Cos[(c + d*x)/2]*(Sec[c/2]*Sin[(d*x)/2] + 8*Cos[(c + d*x)/2]^2*Sec[c/2]*
Sin[(d*x)/2] + 76*Cos[(c + d*x)/2]^4*Sec[c/2]*Sin[(d*x)/2] + 20*Cos[(c + d*
x)/2]^5*(3*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - 3*Log[Cos[(c + d*x)/2
] + Sin[(c + d*x)/2]] + Sin[d*x]/((Cos[c/2] - Sin[c/2])*(Cos[c/2] + Sin[c/2
])*(Cos[(c + d*x)/2] - Sin[(c + d*x)/2])*(Cos[(c + d*x)/2] + Sin[(c + d*x)/
2]))) + Cos[(c + d*x)/2]*Tan[c/2] + 8*Cos[(c + d*x)/2]^3*Tan[c/2]))/(5*a^3*
d*(1 + Cos[c + d*x])^3)
```

Maple [A] (verified)

Time = 1.02 (sec) , antiderivative size = 105, normalized size of antiderivative = 0.94

method	result
derivativedivides	$\frac{\frac{\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+17\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{4}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1}-12\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-\frac{4}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1}+12\ln\left(\mathrm{t}\right.}{4d\,a^3}$
default	$\frac{\frac{\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+17\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{4}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1}-12\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-\frac{4}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1}+12\ln\left(\mathrm{t}\right.}{4d\,a^3}$
parallelrisch	$\frac{3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(dx+c)-3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)\cos(dx+c)+\frac{57\left(\cos(dx+c)+\frac{\cos(2dx+2c)}{2}+\frac{2\cos(3dx+3c)}{19}+\frac{67}{114}\right)\left(\mathrm{se}\right.}{20}}{a^3d\cos(dx+c)}$
norman	$\frac{-\frac{25\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4da}+\frac{15\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4da}+\frac{9\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{20da}+\frac{\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)}{20da}}{\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)a^2}+\frac{3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^3d}-\frac{3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\right.}{a^3d}$
risch	$\frac{2i\left(15\,\mathrm{e}^{6i(dx+c)}+75\,\mathrm{e}^{5i(dx+c)}+160\,\mathrm{e}^{4i(dx+c)}+200\,\mathrm{e}^{3i(dx+c)}+189\,\mathrm{e}^{2i(dx+c)}+105\,\mathrm{e}^{i(dx+c)}+24\right)}{5d\,a^3\left(\mathrm{e}^{i(dx+c)}+1\right)^5\left(\mathrm{e}^{2i(dx+c)}+1\right)}+\frac{3\ln\left(\mathrm{e}^{i(dx+c)}-i\right)}{a^3d}-$

```
[In] int(sec(d*x+c)^2/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/d/a^3*(1/5*tan(1/2*d*x+1/2*c)^5+2*tan(1/2*d*x+1/2*c)^3+17*tan(1/2*d*x+1
/2*c)-4/(tan(1/2*d*x+1/2*c)+1)-12*ln(tan(1/2*d*x+1/2*c)+1)-4/(tan(1/2*d*x+1
/2*c)-1)+12*ln(tan(1/2*d*x+1/2*c)-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 190, normalized size of antiderivative = 1.70

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{15\left(\cos\left(dx+c\right)^4+3\cos\left(dx+c\right)^3+3\cos\left(dx+c\right)^2+\cos\left(dx+c\right)\right)\log\left(\sin\left(dx+c\right)+1\right)-15\left(\cos\left(dx\right.\right.}{10\left(a^3d\cos\left(dx\right.\right.}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] -1/10*(15*(cos(d*x + c)^4 + 3*cos(d*x + c)^3 + 3*cos(d*x + c)^2 + cos(d*x +
 c))*log(sin(d*x + c) + 1) - 15*(cos(d*x + c)^4 + 3*cos(d*x + c)^3 + 3*cos(
d*x + c)^2 + cos(d*x + c))*log(-sin(d*x + c) + 1) - 2*(24*cos(d*x + c)^3 +
57*cos(d*x + c)^2 + 39*cos(d*x + c) + 5)*sin(d*x + c))/(a^3*d*cos(d*x + c)^
4 + 3*a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + a^3*d*cos(d*x + c))
```

Sympy [F]

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\int \frac{\sec^2(c+dx)}{\cos^3(c+dx)+3\cos^2(c+dx)+3\cos(c+dx)+1}\,dx}{a^3}$$

[In] integrate(sec(d*x+c)**2/(a+a*cos(d*x+c))**3,x)

[Out] Integral(sec(c + d*x)**2/(cos(c + d*x)**3 + 3*cos(c + d*x)**2 + 3*cos(c + d*x) + 1), x)/a**3

Maxima [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 165, normalized size of antiderivative = 1.47

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\frac{40\sin(dx+c)}{\left(a^3-\frac{a^3\sin(dx+c)^2}{(\cos(dx+c)+1)^2}\right)(\cos(dx+c)+1)} + \frac{\frac{85\sin(dx+c)}{\cos(dx+c)+1}+\frac{10\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{\sin(dx+c)^5}{(\cos(dx+c)+1)^5}}{a^3} - \frac{60\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a^3} + \frac{60\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)}{a^3}}{20\,d}$$

[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^3,x, algorithm="maxima")

[Out] 1/20*(40*sin(d*x + c)/((a^3 - a^3*sin(d*x + c)^2/(cos(d*x + c) + 1)^2)*(cos(d*x + c) + 1)) + (85*sin(d*x + c)/(cos(d*x + c) + 1) + 10*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + sin(d*x + c)^5/(cos(d*x + c) + 1)^5)/a^3 - 60*log(sin(d*x + c)/(cos(d*x + c) + 1) + 1)/a^3 + 60*log(sin(d*x + c)/(cos(d*x + c) + 1) - 1)/a^3)/d

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.09

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{\frac{60\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)}{a^3} - \frac{60\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right)}{a^3} + \frac{40\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)a^3} - \frac{a^{12}\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5+10a^{12}\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3+85}{a^{15}}}{20\,d}$$

[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^3,x, algorithm="giac")

[Out] -1/20*(60*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^3 - 60*log(abs(tan(1/2*d*x + 1/2*c) - 1))/a^3 + 40*tan(1/2*d*x + 1/2*c)/((tan(1/2*d*x + 1/2*c)^2 - 1)*a^3) - (a^12*tan(1/2*d*x + 1/2*c)^5 + 10*a^12*tan(1/2*d*x + 1/2*c)^3 + 85*a^12*tan(1/2*d*x + 1/2*c))/a^15)/d

Mupad [B] (verification not implemented)

Time = 14.31 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.99

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^3}{2\,a^3\,d}+\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^5}{20\,a^3\,d}-\frac{6\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}{a^3\,d}-\frac{2\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{d\,\left(a^3\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2-a^3\right)}+\frac{17\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{4\,a^3\,d}$$

```
[In] int(1/(cos(c + d*x)^2*(a + a*cos(c + d*x))^3),x)
```

```
[Out] tan(c/2 + (d*x)/2)^3/(2*a^3*d) + tan(c/2 + (d*x)/2)^5/(20*a^3*d) - (6*atanh
(tan(c/2 + (d*x)/2)))/(a^3*d) - (2*tan(c/2 + (d*x)/2))/(d*(a^3*tan(c/2 + (d
*x)/2)^2 - a^3)) + (17*tan(c/2 + (d*x)/2))/(4*a^3*d)
```

3.71 $\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 156

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{13\text{arctanh}(\sin(c+dx))}{2a^3d} - \frac{152\tan(c+dx)}{15a^3d} + \frac{13\sec(c+dx)\tan(c+dx)}{2a^3d} - \frac{\sec(c+dx)\tan(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{11\sec(c+dx)\tan(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{76\sec(c+dx)\tan(c+dx)}{15d\,(a^3+a^3\cos(c+dx))}$$

```
[Out] 13/2*arctanh(sin(d*x+c))/a^3/d-152/15*tan(d*x+c)/a^3/d+13/2*sec(d*x+c)*tan(
d*x+c)/a^3/d-1/5*sec(d*x+c)*tan(d*x+c)/d/(a+a*cos(d*x+c))^3-11/15*sec(d*x+c
)*tan(d*x+c)/a/d/(a+a*cos(d*x+c))^2-76/15*sec(d*x+c)*tan(d*x+c)/d/(a^3+a^3*
cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2845, 3057, 2827, 3853, 3855, 3852, 8}

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{13\text{arctanh}(\sin(c+dx))}{2a^3d} - \frac{152\tan(c+dx)}{15a^3d} + \frac{13\tan(c+dx)\sec(c+dx)}{2a^3d} - \frac{76\tan(c+dx)\sec(c+dx)}{15d\,(a^3\cos(c+dx)+a^3)} - \frac{11\tan(c+dx)\sec(c+dx)}{15ad(a\cos(c+dx)+a)^2} - \frac{\tan(c+dx)\sec(c+dx)}{5d(a\cos(c+dx)+a)^3}$$

```
[In] Int[Sec[c + d*x]^3/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (13*ArcTanh[Sin[c + d*x]])/(2*a^3*d) - (152*Tan[c + d*x])/(15*a^3*d) + (13*
Sec[c + d*x]*Tan[c + d*x])/(2*a^3*d) - (Sec[c + d*x]*Tan[c + d*x])/(5*d*(a
+ a*Cos[c + d*x])^3) - (11*Sec[c + d*x]*Tan[c + d*x])/(15*a*d*(a + a*Cos[c
+ d*x])^2) - (76*Sec[c + d*x]*Tan[c + d*x])/(15*d*(a^3 + a^3*Cos[c + d*x]))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
```

```
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = -\frac{\sec(c+dx)\tan(c+dx)}{5d(a+a\cos(c+dx))^3} + \frac{\int \frac{(7a-4a\cos(c+dx))\sec^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx}{5a^2}$$

$$= -\frac{\sec(c+dx)\tan(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{11\sec(c+dx)\tan(c+dx)}{15ad(a+a\cos(c+dx))^2} + \frac{\int \frac{(43a^2-33a^2\cos(c+dx))\sec^3(c+dx)}{a+a\cos(c+dx)}\,dx}{15a^4}$$

$$= -\frac{\sec(c+dx)\tan(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{11\sec(c+dx)\tan(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{76\sec(c+dx)\tan(c+dx)}{15d\left(a^3+a^3\cos(c+dx)\right)} + \frac{\int (195a^3-152a^3\cos(c+dx))\sec^3(c+dx)\,dx}{15a^6}$$

$$= -\frac{\sec(c+dx)\tan(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{11\sec(c+dx)\tan(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{76\sec(c+dx)\tan(c+dx)}{15d\left(a^3+a^3\cos(c+dx)\right)} - \frac{152\int \sec^2(c+dx)\,dx}{15a^3} + \frac{13\int \sec^3(c+dx)\,dx}{a^3}$$

$$= \frac{13\sec(c+dx)\tan(c+dx)}{2a^3d} - \frac{\sec(c+dx)\tan(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{11\sec(c+dx)\tan(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{76\sec(c+dx)\tan(c+dx)}{15d\left(a^3+a^3\cos(c+dx)\right)} + \frac{13\int \sec(c+dx)\,dx}{2a^3} + \frac{152\text{Subst}(\int 1\,dx, x, -\tan(c+dx))}{15a^3d}$$

$$= \frac{13\text{arctanh}(\sin(c+dx))}{2a^3d} - \frac{152\tan(c+dx)}{15a^3d} + \frac{13\sec(c+dx)\tan(c+dx)}{2a^3d} - \frac{\sec(c+dx)\tan(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{11\sec(c+dx)\tan(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{76\sec(c+dx)\tan(c+dx)}{15d\left(a^3+a^3\cos(c+dx)\right)}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 343 vs. 2(156) = 312.

Time = 2.91 (sec) , antiderivative size = 343, normalized size of antiderivative = 2.20

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{24960\cos^6\left(\frac{1}{2}(c+dx)\right)\left(\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)-\log\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx\right.\right.\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^3/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] -1/480*(24960*Cos[(c + d*x)/2]^6*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]]
- Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) + Cos[(c + d*x)/2]*Sec[c/2]*Sec
[c]*Sec[c + d*x]^2*(-1235*Sin[(d*x)/2] + 3805*Sin[(3*d*x)/2] - 4329*Sin[c -
 (d*x)/2] + 1989*Sin[c + (d*x)/2] - 3575*Sin[2*c + (d*x)/2] - 475*Sin[c + (
3*d*x)/2] + 2005*Sin[2*c + (3*d*x)/2] - 2275*Sin[3*c + (3*d*x)/2] + 2673*Si
n[c + (5*d*x)/2] + 105*Sin[2*c + (5*d*x)/2] + 1593*Sin[3*c + (5*d*x)/2] - 9
75*Sin[4*c + (5*d*x)/2] + 1325*Sin[2*c + (7*d*x)/2] + 255*Sin[3*c + (7*d*x)
/2] + 875*Sin[4*c + (7*d*x)/2] - 195*Sin[5*c + (7*d*x)/2] + 304*Sin[3*c + (
9*d*x)/2] + 90*Sin[4*c + (9*d*x)/2] + 214*Sin[5*c + (9*d*x)/2]))/(a^3*d*(1
+ Cos[c + d*x])^3)
```

Maple [A] (verified)

Time = 1.10 (sec) , antiderivative size = 135, normalized size of antiderivative = 0.87

method	result
derivativedivides	$\frac{-\frac{\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)}{5}-\frac{8\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-31\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{2}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^2}+\frac{14}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1}+26\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)+\cdots}{4d\,a^3}$
default	$\frac{-\frac{\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)}{5}-\frac{8\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-31\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{2}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^2}+\frac{14}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1}+26\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)+\cdots}{4d\,a^3}$
parallelrisch	$\frac{(-1560\cos(2dx+2c)-1560)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+(1560\cos(2dx+2c)+1560)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-2331\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\cdots}{240a^3d(1+\cos(2dx+2c))}$
norman	$\frac{-\frac{51\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4da}+\frac{131\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{6da}-\frac{97\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{15da}-\frac{17\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{30da}-\frac{\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)}{20da}}{\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2a^2}-\frac{13\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2a^3d}\cdots$
risch	$-\frac{i\left(195\,e^{8i(dx+c)}+975\,e^{7i(dx+c)}+2275\,e^{6i(dx+c)}+3575\,e^{5i(dx+c)}+4329\,e^{4i(dx+c)}+3805\,e^{3i(dx+c)}+2673\,e^{2i(dx+c)}+132\cdots\right.}{15d\,a^3\left(e^{2i(dx+c)}+1\right)^2\left(e^{i(dx+c)}+1\right)^5}$

```
[In] int(sec(d*x+c)^3/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/d/a^3*(-1/5*tan(1/2*d*x+1/2*c)^5-8/3*tan(1/2*d*x+1/2*c)^3-31*tan(1/2*d*
x+1/2*c)-2/(tan(1/2*d*x+1/2*c)+1)^2+14/(tan(1/2*d*x+1/2*c)+1)+26*ln(tan(1/2
```

```
*d*x+1/2*c)+1)+2/(tan(1/2*d*x+1/2*c)-1)^2+14/(tan(1/2*d*x+1/2*c)-1)-26*ln(t
an(1/2*d*x+1/2*c)-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 206, normalized size of antiderivative = 1.32

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{195\left(\cos(dx+c)^5+3\cos(dx+c)^4+3\cos(dx+c)^3+\cos(dx+c)^2\right)\log(\sin(dx+c)+1)-195\left(\cos(dx\ldots\right.}{60\,(\ldots}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/60*(195*(cos(d*x + c)^5 + 3*cos(d*x + c)^4 + 3*cos(d*x + c)^3 + cos(d*x +
 c)^2)*log(sin(d*x + c) + 1) - 195*(cos(d*x + c)^5 + 3*cos(d*x + c)^4 + 3*c
os(d*x + c)^3 + cos(d*x + c)^2)*log(-sin(d*x + c) + 1) - 2*(304*cos(d*x + c
)^4 + 717*cos(d*x + c)^3 + 479*cos(d*x + c)^2 + 45*cos(d*x + c) - 15)*sin(d
*x + c))/(a^3*d*cos(d*x + c)^5 + 3*a^3*d*cos(d*x + c)^4 + 3*a^3*d*cos(d*x +
 c)^3 + a^3*d*cos(d*x + c)^2)
```

Sympy [F]

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\int \frac{\sec^3(c+dx)}{\cos^3(c+dx)+3\cos^2(c+dx)+3\cos(c+dx)+1}\,dx}{a^3}$$

```
[In] integrate(sec(d*x+c)**3/(a+a*cos(d*x+c))**3,x)
```

```
[Out] Integral(sec(c + d*x)**3/(cos(c + d*x)**3 + 3*cos(c + d*x)**2 + 3*cos(c + d
*x) + 1), x)/a**3
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 211, normalized size of antiderivative = 1.35

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{\frac{60\left(\frac{5\sin(dx+c)}{\cos(dx+c)+1}-\frac{7\sin(dx+c)^3}{(\cos(dx+c)+1)^3}\right)}{a^3-\frac{2a^3\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{a^3\sin(dx+c)^4}{(\cos(dx+c)+1)^4}}+\frac{\frac{465\sin(dx+c)}{\cos(dx+c)+1}+\frac{40\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{3\sin(dx+c)^5}{(\cos(dx+c)+1)^5}}{a^3}-\frac{390\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a^3}+\frac{390\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\ldots\right.}{a^3}}{60\,d}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/60*(60*(5*sin(d*x + c)/(cos(d*x + c) + 1) - 7*sin(d*x + c)^3/(cos(d*x +
c) + 1)^3)/(a^3 - 2*a^3*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + a^3*sin(d*x +
 c)^4/(cos(d*x + c) + 1)^4) + (465*sin(d*x + c)/(cos(d*x + c) + 1) + 40*sin
(d*x + c)^3/(cos(d*x + c) + 1)^3 + 3*sin(d*x + c)^5/(cos(d*x + c) + 1)^5)/a
^3 - 390*log(sin(d*x + c)/(cos(d*x + c) + 1) + 1)/a^3 + 390*log(sin(d*x + c
)/(cos(d*x + c) + 1) - 1)/a^3)/d
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 139, normalized size of antiderivative = 0.89

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\frac{390\,\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)}{a^3} - \frac{390\,\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)}{a^3} + \frac{60\left(7\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-5\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)^2a^3} - \frac{3\,a^{12}\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5+40\,a^{12}\cdots}{\cdots}}{60\,d}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/60*(390*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^3 - 390*log(abs(tan(1/2*d*x
+ 1/2*c) - 1))/a^3 + 60*(7*tan(1/2*d*x + 1/2*c)^3 - 5*tan(1/2*d*x + 1/2*c))
/((tan(1/2*d*x + 1/2*c)^2 - 1)^2*a^3) - (3*a^12*tan(1/2*d*x + 1/2*c)^5 + 40
*a^12*tan(1/2*d*x + 1/2*c)^3 + 465*a^12*tan(1/2*d*x + 1/2*c))/a^15)/d
```

Mupad [B] (verification not implemented)

Time = 14.38 (sec) , antiderivative size = 141, normalized size of antiderivative = 0.90

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{13\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{a^3\,d} - \frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{20\,a^3\,d} - \frac{2\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{3\,a^3\,d} - \frac{5\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-7\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{d\,\left(a^3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-2\,a^3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+a^3\right)} - \frac{31\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{4\,a^3\,d}$$

```
[In] int(1/(cos(c + d*x)^3*(a + a*cos(c + d*x))^3),x)
```

```
[Out] (13*atanh(tan(c/2 + (d*x)/2)))/(a^3*d) - tan(c/2 + (d*x)/2)^5/(20*a^3*d) -
(2*tan(c/2 + (d*x)/2)^3)/(3*a^3*d) - (5*tan(c/2 + (d*x)/2) - 7*tan(c/2 + (d
*x)/2)^3)/(d*(a^3*tan(c/2 + (d*x)/2)^4 - 2*a^3*tan(c/2 + (d*x)/2)^2 + a^3))
 - (31*tan(c/2 + (d*x)/2))/(4*a^3*d)
```

3.72 $\int \frac{\cos^6(c+dx)}{(a+a\cos(c+dx))^4}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 184

$$\int \frac{\cos^6(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{21x}{2a^4} - \frac{576\sin(c+dx)}{35a^4d} + \frac{21\cos(c+dx)\sin(c+dx)}{2a^4d} - \frac{43\cos^3(c+dx)\sin(c+dx)}{35a^4d(1+\cos(c+dx))^2} - \frac{288\cos^2(c+dx)\sin(c+dx)}{35a^4d(1+\cos(c+dx))} - \frac{\cos^5(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{2\cos^4(c+dx)\sin(c+dx)}{5ad(a+a\cos(c+dx))^3}$$

```
[Out] 21/2*x/a^4-576/35*sin(d*x+c)/a^4/d+21/2*cos(d*x+c)*sin(d*x+c)/a^4/d-43/35*c
os(d*x+c)^3*sin(d*x+c)/a^4/d/(1+cos(d*x+c))^2-288/35*cos(d*x+c)^2*sin(d*x+c
)/a^4/d/(1+cos(d*x+c))-1/7*cos(d*x+c)^5*sin(d*x+c)/d/(a+a*cos(d*x+c))^4-2/5
*cos(d*x+c)^4*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^3
```

Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 184, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {2844, 3056, 2813}

$$\int \frac{\cos^6(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{576\sin(c+dx)}{35a^4d} - \frac{43\sin(c+dx)\cos^3(c+dx)}{35a^4d(\cos(c+dx)+1)^2} - \frac{288\sin(c+dx)\cos^2(c+dx)}{35a^4d(\cos(c+dx)+1)} + \frac{21\sin(c+dx)\cos(c+dx)}{2a^4d} + \frac{21x}{2a^4} - \frac{\sin(c+dx)\cos^5(c+dx)}{7d(a\cos(c+dx)+a)^4} - \frac{2\sin(c+dx)\cos^4(c+dx)}{5ad(a\cos(c+dx)+a)^3}$$

```
[In] Int[Cos[c + d*x]^6/(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (21*x)/(2*a^4) - (576*Sin[c + d*x])/(35*a^4*d) + (21*Cos[c + d*x]*Sin[c + d
*x])/(2*a^4*d) - (43*Cos[c + d*x]^3*Sin[c + d*x])/(35*a^4*d*(1 + Cos[c + d*
x])^2) - (288*Cos[c + d*x]^2*Sin[c + d*x])/(35*a^4*d*(1 + Cos[c + d*x])) -
(Cos[c + d*x]^5*Sin[c + d*x])/(7*d*(a + a*Cos[c + d*x])^4) - (2*Cos[c + d*x
]^4*Sin[c + d*x])/(5*a*d*(a + a*Cos[c + d*x])^3)
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\text{integral} = -\frac{\cos^5(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{\int \frac{\cos^4(c+dx)(5a-9a\cos(c+dx))}{(a+a\cos(c+dx))^3}\,dx}{7a^2}$$

$$= -\frac{\cos^5(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{2\cos^4(c+dx)\sin(c+dx)}{5ad(a+a\cos(c+dx))^3} - \frac{\int \frac{\cos^3(c+dx)(56a^2-73a^2\cos(c+dx))}{(a+a\cos(c+dx))^2}\,dx}{35a^4}$$

$$= -\frac{43\cos^3(c+dx)\sin(c+dx)}{35a^4d(1+\cos(c+dx))^2} - \frac{\cos^5(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{2\cos^4(c+dx)\sin(c+dx)}{5ad(a+a\cos(c+dx))^3} - \frac{\int \frac{\cos^2(c+dx)(387a^3-477a^3\cos(c+dx))}{a+a\cos(c+dx)}\,dx}{105a^6}$$

$$= -\frac{43\cos^3(c+dx)\sin(c+dx)}{35a^4d(1+\cos(c+dx))^2} - \frac{\cos^5(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{2\cos^4(c+dx)\sin(c+dx)}{5ad(a+a\cos(c+dx))^3} - \frac{288\cos^2(c+dx)\sin(c+dx)}{35d\left(a^4+a^4\cos(c+dx)\right)} - \frac{\int \cos(c+dx)\left(1728a^4-2205a^4\cos(c+dx)\right)\,dx}{105a^8}$$

$$= \frac{21x}{2a^4} - \frac{576\sin(c+dx)}{35a^4d} + \frac{21\cos(c+dx)\sin(c+dx)}{2a^4d} - \frac{43\cos^3(c+dx)\sin(c+dx)}{35a^4d(1+\cos(c+dx))^2} - \frac{\cos^5(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{2\cos^4(c+dx)\sin(c+dx)}{5ad(a+a\cos(c+dx))^3} - \frac{288\cos^2(c+dx)\sin(c+dx)}{35d\left(a^4+a^4\cos(c+dx)\right)}$$

Mathematica [A] (verified)

Time = 6.17 (sec) , antiderivative size = 137, normalized size of antiderivative = 0.74

$$\int \frac{\cos^6(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{\cos\left(\frac{1}{2}(c+dx)\right)\csc^8(c+dx)\sin^9\left(\frac{1}{2}(c+dx)\right)\left(188160\arcsin(\cos(c+dx))\cos^8\left(\frac{1}{2}(c+dx)\right)+(55656+8\right.}{35}$$

```
[In] Integrate[Cos[c + d*x]^6/(a + a*Cos[c + d*x])^4,x]
```

```
[Out] -1/35*(Cos[(c + d*x)/2]*Csc[c + d*x]^8*Sin[(c + d*x)/2]^9*(188160*ArcSin[Co
s[c + d*x]]*Cos[(c + d*x)/2]^8 + (55656 + 85762*Cos[c + d*x] + 37504*Cos[2*
(c + d*x)] + 7873*Cos[3*(c + d*x)] + 280*Cos[4*(c + d*x)] - 35*Cos[5*(c + d
*x)])*Sqrt[Sin[c + d*x]^2]))/(a^4*d*Sqrt[Sin[c + d*x]^2])
```

Maple [A] (verified)

Time = 0.93 (sec) , antiderivative size = 88, normalized size of antiderivative = 0.48

method	result
parallelrisch	$\frac{-85762\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\cos(dx+c)+\frac{18752\cos(2dx+2c)}{42881}+\frac{7873\cos(3dx+3c)}{85762}+\frac{140\cos(4dx+4c)}{42881}-\frac{35\cos(5dx+5c)}{85762}+\frac{27828}{42881}\right)\left(\sec^6\left(\right.\right.}{8960a^4d}$
derivativedivides	$\frac{\frac{\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{9\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+13\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-111\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{-72\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-56\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}+168\,\mathrm{arct}}{8d\,a^4}$
default	$\frac{\frac{\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{9\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+13\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-111\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{-72\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-56\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}+168\,\mathrm{arct}}{8d\,a^4}$
risch	$\frac{21x}{2a^4}-\frac{i\mathrm{e}^{2i(dx+c)}}{8a^4d}+\frac{2i\mathrm{e}^{i(dx+c)}}{d\,a^4}-\frac{2i\mathrm{e}^{-i(dx+c)}}{d\,a^4}+\frac{i\mathrm{e}^{-2i(dx+c)}}{8a^4d}-\frac{2i\left(700\,\mathrm{e}^{6i(dx+c)}+3675\,\mathrm{e}^{5i(dx+c)}+8505\,\mathrm{e}^{4i(dx+c)}\right.}{35d\,a^4}$

```
[In] int(cos(d*x+c)^6/(a+cos(d*x+c)*a)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/8960*(-85762*tan(1/2*d*x+1/2*c)*(cos(d*x+c)+18752/42881*cos(2*d*x+2*c)+78
73/85762*cos(3*d*x+3*c)+140/42881*cos(4*d*x+4*c)-35/85762*cos(5*d*x+5*c)+27
828/42881)*sec(1/2*d*x+1/2*c)^6+94080*d*x)/a^4/d
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 171, normalized size of antiderivative = 0.93

$$\int \frac{\cos^6(c+dx)}{(a+a\cos(c+dx))^4}\,dx$$
$$=\frac{735\,dx\cos\left(dx+c\right)^4+2940\,dx\cos\left(dx+c\right)^3+4410\,dx\cos\left(dx+c\right)^2+2940\,dx\cos\left(dx+c\right)+735\,dx+\left(3\right.}{70\left(a^4d\cos\left(dx+c\right)^4+4\,a^4d\cos\left(dx+\right.\right.}$$

```
[In] integrate(cos(d*x+c)^6/(a+a*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/70*(735*d*x*cos(d*x + c)^4 + 2940*d*x*cos(d*x + c)^3 + 4410*d*x*cos(d*x +
 c)^2 + 2940*d*x*cos(d*x + c) + 735*d*x + (35*cos(d*x + c)^5 - 140*cos(d*x
+ c)^4 - 2012*cos(d*x + c)^3 - 4548*cos(d*x + c)^2 - 3873*cos(d*x + c) - 11
52)*sin(d*x + c))/(a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(d*x + c)^3 + 6*a^4*d*
cos(d*x + c)^2 + 4*a^4*d*cos(d*x + c) + a^4*d)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 530 vs. 2(175) = 350.

Time = 9.08 (sec) , antiderivative size = 530, normalized size of antiderivative = 2.88

$$\int \frac{\cos^6(c+dx)}{(a+a\cos(c+dx))^4}\,dx$$
$$= \begin{cases} \frac{2940dx\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)}{280a^4d\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)+560a^4d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+280a^4d} + \frac{5880dx\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)}{280a^4d\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)+560a^4d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+280a^4d} + \frac{29\ldots}{280a^4d\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)+56\ldots} \\ \frac{x\cos^6(c)}{(a\cos(c)+a)^4} \end{cases}$$

```
[In] integrate(cos(d*x+c)**6/(a+a*cos(d*x+c))**4,x)
```

```
[Out] Piecewise((2940*d*x*tan(c/2 + d*x/2)**4/(280*a**4*d*tan(c/2 + d*x/2)**4 + 5
60*a**4*d*tan(c/2 + d*x/2)**2 + 280*a**4*d) + 5880*d*x*tan(c/2 + d*x/2)**2/
(280*a**4*d*tan(c/2 + d*x/2)**4 + 560*a**4*d*tan(c/2 + d*x/2)**2 + 280*a**4
*d) + 2940*d*x/(280*a**4*d*tan(c/2 + d*x/2)**4 + 560*a**4*d*tan(c/2 + d*x/2
)**2 + 280*a**4*d) + 5*tan(c/2 + d*x/2)**11/(280*a**4*d*tan(c/2 + d*x/2)**4
 + 560*a**4*d*tan(c/2 + d*x/2)**2 + 280*a**4*d) - 53*tan(c/2 + d*x/2)**9/(2
80*a**4*d*tan(c/2 + d*x/2)**4 + 560*a**4*d*tan(c/2 + d*x/2)**2 + 280*a**4*d
) + 334*tan(c/2 + d*x/2)**7/(280*a**4*d*tan(c/2 + d*x/2)**4 + 560*a**4*d*ta
n(c/2 + d*x/2)**2 + 280*a**4*d) - 3038*tan(c/2 + d*x/2)**5/(280*a**4*d*tan(
c/2 + d*x/2)**4 + 560*a**4*d*tan(c/2 + d*x/2)**2 + 280*a**4*d) - 9835*tan(c
/2 + d*x/2)**3/(280*a**4*d*tan(c/2 + d*x/2)**4 + 560*a**4*d*tan(c/2 + d*x/2
)**2 + 280*a**4*d) - 5845*tan(c/2 + d*x/2)/(280*a**4*d*tan(c/2 + d*x/2)**4
+ 560*a**4*d*tan(c/2 + d*x/2)**2 + 280*a**4*d), Ne(d, 0)), (x*cos(c)**6/(a*
cos(c) + a)**4, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 204, normalized size of antiderivative = 1.11

$$\int \frac{\cos^6(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{\frac{280\left(\frac{7\sin(dx+c)}{\cos(dx+c)+1}+\frac{9\sin(dx+c)^3}{(\cos(dx+c)+1)^3}\right)}{a^4+\frac{2a^4\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{a^4\sin(dx+c)^4}{(\cos(dx+c)+1)^4}} + \frac{\frac{3885\sin(dx+c)}{\cos(dx+c)+1}-\frac{455\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{63\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{5\sin(dx+c)^7}{(\cos(dx+c)+1)^7}}{a^4} - \frac{5880\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{a^4}}{280\,d}$$

```
[In] integrate(cos(d*x+c)^6/(a+a*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] -1/280*(280*(7*sin(d*x + c)/(cos(d*x + c) + 1) + 9*sin(d*x + c)^3/(cos(d*x
+ c) + 1)^3)/(a^4 + 2*a^4*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + a^4*sin(d*x
```

```
 + c)^4/(cos(d*x + c) + 1)^4) + (3885*sin(d*x + c)/(cos(d*x + c) + 1) - 455
*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 63*sin(d*x + c)^5/(cos(d*x + c) + 1)
^5 - 5*sin(d*x + c)^7/(cos(d*x + c) + 1)^7)/a^4 - 5880*arctan(sin(d*x + c)/
(cos(d*x + c) + 1))/a^4)/d
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 128, normalized size of antiderivative = 0.70

$$\int \frac{\cos^6(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{\frac{2940\,(dx+c)}{a^4} - \frac{280\left(9\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+7\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+1\right)^2 a^4} + \frac{5\,a^{24}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7-63\,a^{24}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5+455\,a^{24}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-3885}{a^{28}}}{280\,d}$$

```
[In] integrate(cos(d*x+c)^6/(a+a*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/280*(2940*(d*x + c)/a^4 - 280*(9*tan(1/2*d*x + 1/2*c)^3 + 7*tan(1/2*d*x +
 1/2*c))/((tan(1/2*d*x + 1/2*c)^2 + 1)^2*a^4) + (5*a^24*tan(1/2*d*x + 1/2*c
)^7 - 63*a^24*tan(1/2*d*x + 1/2*c)^5 + 455*a^24*tan(1/2*d*x + 1/2*c)^3 - 38
85*a^24*tan(1/2*d*x + 1/2*c))/a^28)/d
```

Mupad [B] (verification not implemented)

Time = 14.85 (sec) , antiderivative size = 159, normalized size of antiderivative = 0.86

$$\int \frac{\cos^6(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{5\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)-78\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)+596\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)-4408\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6 \sin}{280\,a^4\,d}$$

```
[In] int(cos(c + d*x)^6/(a + a*cos(c + d*x))^4,x)
```

```
[Out] (5*sin(c/2 + (d*x)/2) - 78*cos(c/2 + (d*x)/2)^2*sin(c/2 + (d*x)/2) + 596*co
s(c/2 + (d*x)/2)^4*sin(c/2 + (d*x)/2) - 4408*cos(c/2 + (d*x)/2)^6*sin(c/2 +
 (d*x)/2) - 2520*cos(c/2 + (d*x)/2)^8*sin(c/2 + (d*x)/2) + 560*cos(c/2 + (d
*x)/2)^10*sin(c/2 + (d*x)/2) + 2940*cos(c/2 + (d*x)/2)^7*(c + d*x))/(280*a^
4*d*cos(c/2 + (d*x)/2)^7)
```

3.73 $\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^4} dx$

Optimal result

Integrand size = 21, antiderivative size = 150

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^4} dx = -\frac{4x}{a^4} + \frac{244\sin(c+dx)}{105a^4d} - \frac{88\cos^2(c+dx)\sin(c+dx)}{105a^4d(1+\cos(c+dx))^2} + \frac{4\sin(c+dx)}{a^4d(1+\cos(c+dx))} - \frac{\cos^4(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{12\cos^3(c+dx)\sin(c+dx)}{35ad(a+a\cos(c+dx))^3}$$

```
[Out] -4*x/a^4+244/105*sin(d*x+c)/a^4/d-88/105*cos(d*x+c)^2*sin(d*x+c)/a^4/d/(1+c
os(d*x+c))^2+4*sin(d*x+c)/a^4/d/(1+cos(d*x+c))-1/7*cos(d*x+c)^4*sin(d*x+c)/
d/(a+a*cos(d*x+c))^4-12/35*cos(d*x+c)^3*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^3
```

Rubi [A] (verified)

Time = 0.42 (sec) , antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {2844, 3056, 3047, 3102, 12, 2814, 2727}

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^4} dx = \frac{244\sin(c+dx)}{105a^4d} - \frac{88\sin(c+dx)\cos^2(c+dx)}{105a^4d(\cos(c+dx)+1)^2} + \frac{4\sin(c+dx)}{a^4d(\cos(c+dx)+1)} - \frac{4x}{a^4} - \frac{\sin(c+dx)\cos^4(c+dx)}{7d(a\cos(c+dx)+a)^4} - \frac{12\sin(c+dx)\cos^3(c+dx)}{35ad(a\cos(c+dx)+a)^3}$$

```
[In] Int[Cos[c + d*x]^5/(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (-4*x)/a^4 + (244*Sin[c + d*x])/(105*a^4*d) - (88*Cos[c + d*x]^2*Sin[c + d*
x])/(105*a^4*d*(1 + Cos[c + d*x])^2) + (4*Sin[c + d*x])/(a^4*d*(1 + Cos[c +
 d*x])) - (Cos[c + d*x]^4*Sin[c + d*x])/(7*d*(a + a*Cos[c + d*x])^4) - (12*
Cos[c + d*x]^3*Sin[c + d*x])/(35*a*d*(a + a*Cos[c + d*x])^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
```

```
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^4(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{\int \frac{\cos^3(c+dx)(4a-8a\cos(c+dx))}{(a+a\cos(c+dx))^3}\,dx}{7a^2} \\
&= -\frac{\cos^4(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{12\cos^3(c+dx)\sin(c+dx)}{35ad(a+a\cos(c+dx))^3} - \frac{\int \frac{\cos^2(c+dx)(36a^2-52a^2\cos(c+dx))}{(a+a\cos(c+dx))^2}\,dx}{35a^4} \\
&= -\frac{88\cos^2(c+dx)\sin(c+dx)}{105a^4d(1+\cos(c+dx))^2} - \frac{\cos^4(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} \\
&\quad - \frac{12\cos^3(c+dx)\sin(c+dx)}{35ad(a+a\cos(c+dx))^3} - \frac{\int \frac{\cos(c+dx)(176a^3-244a^3\cos(c+dx))}{a+a\cos(c+dx)}\,dx}{105a^6} \\
&= -\frac{88\cos^2(c+dx)\sin(c+dx)}{105a^4d(1+\cos(c+dx))^2} - \frac{\cos^4(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} \\
&\quad - \frac{12\cos^3(c+dx)\sin(c+dx)}{35ad(a+a\cos(c+dx))^3} - \frac{\int \frac{176a^3\cos(c+dx)-244a^3\cos^2(c+dx)}{a+a\cos(c+dx)}\,dx}{105a^6} \\
&= \frac{244\sin(c+dx)}{105a^4d} - \frac{88\cos^2(c+dx)\sin(c+dx)}{105a^4d(1+\cos(c+dx))^2} - \frac{\cos^4(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} \\
&\quad - \frac{12\cos^3(c+dx)\sin(c+dx)}{35ad(a+a\cos(c+dx))^3} - \frac{\int \frac{420a^4\cos(c+dx)}{a+a\cos(c+dx)}\,dx}{105a^7} \\
&= \frac{244\sin(c+dx)}{105a^4d} - \frac{88\cos^2(c+dx)\sin(c+dx)}{105a^4d(1+\cos(c+dx))^2} - \frac{\cos^4(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} \\
&\quad - \frac{12\cos^3(c+dx)\sin(c+dx)}{35ad(a+a\cos(c+dx))^3} - \frac{4\int \frac{\cos(c+dx)}{a+a\cos(c+dx)}\,dx}{a^3}
\end{aligned}$$

$$= -\frac{4x}{a^4} + \frac{244\sin(c+dx)}{105a^4d} - \frac{88\cos^2(c+dx)\sin(c+dx)}{105a^4d(1+\cos(c+dx))^2} - \frac{\cos^4(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{12\cos^3(c+dx)\sin(c+dx)}{35ad(a+a\cos(c+dx))^3} + \frac{4\int \frac{1}{a+a\cos(c+dx)}\,dx}{a^3}$$

$$= -\frac{4x}{a^4} + \frac{244\sin(c+dx)}{105a^4d} - \frac{88\cos^2(c+dx)\sin(c+dx)}{105a^4d(1+\cos(c+dx))^2} - \frac{\cos^4(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{12\cos^3(c+dx)\sin(c+dx)}{35ad(a+a\cos(c+dx))^3} + \frac{4\sin(c+dx)}{d(a^4+a^4\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 1.66 (sec) , antiderivative size = 135, normalized size of antiderivative = 0.90

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{\cos\left(\frac{1}{2}(c+dx)\right)\sin^5\left(\frac{1}{2}(c+dx)\right)\left(7350+6678\cos(c+dx)-5432\cos(2(c+dx))-6333\cos(3(c+dx)\right)}{210a^4d(-1+\cos(c+}$$

```
[In] Integrate[Cos[c + d*x]^5/(a + a*Cos[c + d*x])^4,x]
```

```
[Out] -1/210*(Cos[(c + d*x)/2]*Sin[(c + d*x)/2]^5*(7350 + 6678*Cos[c + d*x] - 543
2*Cos[2*(c + d*x)] - 6333*Cos[3*(c + d*x)] - 2158*Cos[4*(c + d*x)] - 105*Co
s[5*(c + d*x)] + 53760*ArcSin[Cos[c + d*x]]*Cos[(c + d*x)/2]^6*Sqrt[Sin[c +
 d*x]^2]))/(a^4*d*(-1 + Cos[c + d*x])^3*(1 + Cos[c + d*x])^4)
```

Maple [A] (verified)

Time = 0.83 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.51

method	result
parallelrisch	$\frac{781\left(\cos(dx+c)+\frac{2741\cos(2dx+2c)}{6248}+\frac{74\cos(3dx+3c)}{781}+\frac{105\cos(4dx+4c)}{24992}+\frac{16171}{24992}\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sec^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-840dx}{210a^4d}$
derivativedivides	$\frac{-\frac{\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+\frac{7\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-\frac{23\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+49\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{16\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}-64\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8d\,a^4}$
default	$\frac{-\frac{\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+\frac{7\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-\frac{23\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+49\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{16\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}-64\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8d\,a^4}$
risch	$-\frac{4x}{a^4}-\frac{i e^{i(dx+c)}}{2d\,a^4}+\frac{i e^{-i(dx+c)}}{2d\,a^4}+\frac{4i\left(525\,e^{6i(dx+c)}+2625\,e^{5i(dx+c)}+5950\,e^{4i(dx+c)}+7420\,e^{3i(dx+c)}+5397\,e^{2i(dx+c}\right.}{105d\,a^4\left(e^{i(dx+c)}+1\right)^7}$
norman	$\frac{-\frac{4x}{a}-\frac{\tan^{17}\left(\frac{dx}{2}+\frac{c}{2}\right)}{56ad}+\frac{65\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8da}+\frac{113\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3da}+\frac{2059\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{30da}+\frac{1271\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{21da}+\frac{2075\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right.}{84da}}{}$

```
[In] int(cos(d*x+c)^5/(a+cos(d*x+c)*a)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/210*(781*(cos(d*x+c)+2741/6248*cos(2*d*x+2*c)+74/781*cos(3*d*x+3*c)+105/2
4992*cos(4*d*x+4*c)+16171/24992)*tan(1/2*d*x+1/2*c)*sec(1/2*d*x+1/2*c)^6-84
0*d*x)/a^4/d
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.08

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{420\,dx\cos{(dx+c)}^4 + 1680\,dx\cos{(dx+c)}^3 + 2520\,dx\cos{(dx+c)}^2 + 1680\,dx\cos{(dx+c)} + 420\,dx - (}{105\,\left(a^4d\cos{(dx+c)}^4 + 4\,a^4d\cos{(dx+c)}^3 + 6\,a\right.}$$

```
[In] integrate(cos(d*x+c)^5/(a+a*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] -1/105*(420*d*x*cos(d*x + c)^4 + 1680*d*x*cos(d*x + c)^3 + 2520*d*x*cos(d*x
 + c)^2 + 1680*d*x*cos(d*x + c) + 420*d*x - (105*cos(d*x + c)^4 + 1184*cos(
d*x + c)^3 + 2636*cos(d*x + c)^2 + 2236*cos(d*x + c) + 664)*sin(d*x + c))/(
a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(d*x + c)^3 + 6*a^4*d*cos(d*x + c)^2 + 4*
a^4*d*cos(d*x + c) + a^4*d)
```

Sympy [A] (verification not implemented)

Time = 5.60 (sec) , antiderivative size = 280, normalized size of antiderivative = 1.87

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \begin{cases} -\frac{3360dx\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)}{840a^4d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+840a^4d} - \frac{3360dx}{840a^4d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+840a^4d} - \frac{15\tan^9\left(\frac{c}{2}+\frac{dx}{2}\right)}{840a^4d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+840a^4d} + \frac{132\tan^7\left(\frac{c}{2}+\frac{dx}{2}\right)}{840a^4d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+840a^4d} - \\ \frac{x\cos^5{(c)}}{(a\cos{(c)}+a)^4} \end{cases}$$

```
[In] integrate(cos(d*x+c)**5/(a+a*cos(d*x+c))**4,x)
```

```
[Out] Piecewise((-3360*d*x*tan(c/2 + d*x/2)**2/(840*a**4*d*tan(c/2 + d*x/2)**2 +
840*a**4*d) - 3360*d*x/(840*a**4*d*tan(c/2 + d*x/2)**2 + 840*a**4*d) - 15*t
an(c/2 + d*x/2)**9/(840*a**4*d*tan(c/2 + d*x/2)**2 + 840*a**4*d) + 132*tan(
c/2 + d*x/2)**7/(840*a**4*d*tan(c/2 + d*x/2)**2 + 840*a**4*d) - 658*tan(c/2
 + d*x/2)**5/(840*a**4*d*tan(c/2 + d*x/2)**2 + 840*a**4*d) + 4340*tan(c/2 +
 d*x/2)**3/(840*a**4*d*tan(c/2 + d*x/2)**2 + 840*a**4*d) + 6825*tan(c/2 + d
*x/2)/(840*a**4*d*tan(c/2 + d*x/2)**2 + 840*a**4*d), Ne(d, 0)), (x*cos(c)**
5/(a*cos(c) + a)**4, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.05

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{\frac{1680\sin(dx+c)}{\left(a^4+\frac{a^4\sin(dx+c)^2}{(\cos(dx+c)+1)^2}\right)(\cos(dx+c)+1)} + \frac{\frac{5145\sin(dx+c)}{\cos(dx+c)+1}-\frac{805\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{147\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{15\sin(dx+c)^7}{(\cos(dx+c)+1)^7}}{a^4} - \frac{6720\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{a^4}}{840\,d}$$

```
[In] integrate(cos(d*x+c)^5/(a+a*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/840*(1680*sin(d*x + c)/((a^4 + a^4*sin(d*x + c)^2/(cos(d*x + c) + 1)^2)*(
cos(d*x + c) + 1)) + (5145*sin(d*x + c)/(cos(d*x + c) + 1) - 805*sin(d*x +
c)^3/(cos(d*x + c) + 1)^3 + 147*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 15*si
n(d*x + c)^7/(cos(d*x + c) + 1)^7)/a^4 - 6720*arctan(sin(d*x + c)/(cos(d*x
+ c) + 1))/a^4)/d
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 112, normalized size of antiderivative = 0.75

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{\frac{3360\,(dx+c)}{a^4} - \frac{1680\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2+1\right)a^4} + \frac{15\,a^{24}\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^7-147\,a^{24}\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5+805\,a^{24}\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-5145\,a^{24}\tan\left(\frac{1}{2}dx\right.}{a^{28}}}{840\,d}$$

```
[In] integrate(cos(d*x+c)^5/(a+a*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] -1/840*(3360*(d*x + c)/a^4 - 1680*tan(1/2*d*x + 1/2*c)/((tan(1/2*d*x + 1/2*
c)^2 + 1)*a^4) + (15*a^24*tan(1/2*d*x + 1/2*c)^7 - 147*a^24*tan(1/2*d*x + 1
/2*c)^5 + 805*a^24*tan(1/2*d*x + 1/2*c)^3 - 5145*a^24*tan(1/2*d*x + 1/2*c))
/a^28)/d
```

Mupad [B] (verification not implemented)

Time = 14.97 (sec) , antiderivative size = 137, normalized size of antiderivative = 0.91

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{15\,\sin\left(\frac{c}{2}+\frac{dx}{2}\right)-192\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^2\,\sin\left(\frac{c}{2}+\frac{dx}{2}\right)+1144\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^4\,\sin\left(\frac{c}{2}+\frac{dx}{2}\right)-6112\cos\left(\frac{c}{2}+\frac{dx}{2}\right)}{840\,a^4\,d\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^7}$$

```
[In] int(cos(c + d*x)^5/(a + a*cos(c + d*x))^4,x)
```

```
[Out] -(15*sin(c/2 + (d*x)/2) - 192*cos(c/2 + (d*x)/2)^2*sin(c/2 + (d*x)/2) + 114
4*cos(c/2 + (d*x)/2)^4*sin(c/2 + (d*x)/2) - 6112*cos(c/2 + (d*x)/2)^6*sin(c
/2 + (d*x)/2) - 1680*cos(c/2 + (d*x)/2)^8*sin(c/2 + (d*x)/2) + 3360*cos(c/2
 + (d*x)/2)^7*(c + d*x))/(840*a^4*d*cos(c/2 + (d*x)/2)^7)
```

3.74 $\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^4} dx$

Optimal result

Integrand size = 21, antiderivative size = 127

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^4} dx = \frac{x}{a^4} + \frac{11\sin(c+dx)}{21a^4d(1+\cos(c+dx))^2} - \frac{43\sin(c+dx)}{21a^4d(1+\cos(c+dx))} - \frac{\cos^3(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{2\cos^2(c+dx)\sin(c+dx)}{7ad(a+a\cos(c+dx))^3}$$

```
[Out] x/a^4+11/21*sin(d*x+c)/a^4/d/(1+cos(d*x+c))^2-43/21*sin(d*x+c)/a^4/d/(1+cos
(d*x+c))-1/7*cos(d*x+c)^3*sin(d*x+c)/d/(a+a*cos(d*x+c))^4-2/7*cos(d*x+c)^2*
sin(d*x+c)/a/d/(a+a*cos(d*x+c))^3
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 127, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {2844, 3056, 3047, 3098, 2814, 2727}

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^4} dx = -\frac{43\sin(c+dx)}{21a^4d(\cos(c+dx)+1)} + \frac{11\sin(c+dx)}{21a^4d(\cos(c+dx)+1)^2} + \frac{x}{a^4} - \frac{\sin(c+dx)\cos^3(c+dx)}{7d(a\cos(c+dx)+a)^4} - \frac{2\sin(c+dx)\cos^2(c+dx)}{7ad(a\cos(c+dx)+a)^3}$$

```
[In] Int[Cos[c + d*x]^4/(a + a*Cos[c + d*x])^4,x]
```

```
[Out] x/a^4 + (11*Sin[c + d*x])/(21*a^4*d*(1 + Cos[c + d*x])^2) - (43*Sin[c + d*x
])/(21*a^4*d*(1 + Cos[c + d*x])) - (Cos[c + d*x]^3*Sin[c + d*x])/(7*d*(a +
a*Cos[c + d*x])^4) - (2*Cos[c + d*x]^2*Sin[c + d*x])/(7*a*d*(a + a*Cos[c +
d*x])^3)
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3098

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(A*b - a*
```

```
B + b*C)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(a*f*(2*m + 1))), x] + Dist[1
/(a^2*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[a*A*(m + 1) + m*(b*
B - a*C) + b*C*(2*m + 1)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A,
B, C}, x] && LtQ[m, -1] && EqQ[a^2 - b^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^3(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{\int \frac{\cos^2(c+dx)(3a-7a\cos(c+dx))}{(a+a\cos(c+dx))^3}\,dx}{7a^2} \\
&= -\frac{\cos^3(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{2\cos^2(c+dx)\sin(c+dx)}{7ad(a+a\cos(c+dx))^3} - \frac{\int \frac{\cos(c+dx)(20a^2-35a^2\cos(c+dx))}{(a+a\cos(c+dx))^2}\,dx}{35a^4} \\
&= -\frac{\cos^3(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{2\cos^2(c+dx)\sin(c+dx)}{7ad(a+a\cos(c+dx))^3} - \frac{\int \frac{20a^2\cos(c+dx)-35a^2\cos^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx}{35a^4} \\
&= \frac{11\sin(c+dx)}{21a^4d(1+\cos(c+dx))^2} - \frac{\cos^3(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} \\
&\quad - \frac{2\cos^2(c+dx)\sin(c+dx)}{7ad(a+a\cos(c+dx))^3} + \frac{\int \frac{-110a^3+105a^3\cos(c+dx)}{a+a\cos(c+dx)}\,dx}{105a^6} \\
&= \frac{x}{a^4} + \frac{11\sin(c+dx)}{21a^4d(1+\cos(c+dx))^2} - \frac{\cos^3(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} \\
&\quad - \frac{2\cos^2(c+dx)\sin(c+dx)}{7ad(a+a\cos(c+dx))^3} - \frac{43\int \frac{1}{a+a\cos(c+dx)}\,dx}{21a^3} \\
&= \frac{x}{a^4} + \frac{11\sin(c+dx)}{21a^4d(1+\cos(c+dx))^2} - \frac{\cos^3(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} \\
&\quad - \frac{2\cos^2(c+dx)\sin(c+dx)}{7ad(a+a\cos(c+dx))^3} - \frac{43\sin(c+dx)}{21d\,(a^4+a^4\cos(c+dx))}
\end{aligned}$$

Mathematica [A] (verified)

Time = 3.19 (sec) , antiderivative size = 117, normalized size of antiderivative = 0.92

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^4}\,dx =$$
$$-\frac{32\cos\left(\frac{1}{2}(c+dx)\right)\csc^8(c+dx)\sin^9\left(\frac{1}{2}(c+dx)\right)\left(336\arcsin(\cos(c+dx))\cos^8\left(\frac{1}{2}(c+dx)\right)+(94+146\right.}{21a^4d\sqrt{\sin^2(c+dx)}}$$

```
[In] Integrate[Cos[c + d*x]^4/(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (-32*Cos[(c + d*x)/2]*Csc[c + d*x]^8*Sin[(c + d*x)/2]^9*(336*ArcSin[Cos[c +
 d*x]]*Cos[(c + d*x)/2]^8 + (94 + 146*Cos[c + d*x] + 62*Cos[2*(c + d*x)] +
13*Cos[3*(c + d*x)])*Sqrt[Sin[c + d*x]^2]))/(21*a^4*d*Sqrt[Sin[c + d*x]^2])
```

Maple [A] (verified)

Time = 0.65 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.50

method	result
parallelrisch	$\frac{3\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-21\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+77\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+168dx-315\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{168a^4d}$
derivativedivides	$\frac{\frac{\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\frac{11\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-15\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+16\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8d\,a^4}$
default	$\frac{\frac{\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\frac{11\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-15\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+16\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8d\,a^4}$
risch	$\frac{x}{a^4}-\frac{4i\left(42\,\mathrm{e}^{6i(dx+c)}+189\,\mathrm{e}^{5i(dx+c)}+413\,\mathrm{e}^{4i(dx+c)}+497\,\mathrm{e}^{3i(dx+c)}+357\,\mathrm{e}^{2i(dx+c)}+140\,\mathrm{e}^{i(dx+c)}+26\right)}{21d\,a^4\left(\mathrm{e}^{i(dx+c)}+1\right)^7}$
norman	$\frac{\frac{x}{a}+\frac{x\left(\tan^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{a}-\frac{15\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8da}-\frac{169\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{24da}-\frac{229\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{24da}-\frac{293\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{56da}-\frac{121\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{168da}+\cdots}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right.\cdots\right.}$

```
[In] int(cos(d*x+c)^4/(a+cos(d*x+c)*a)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/168*(3*tan(1/2*d*x+1/2*c)^7-21*tan(1/2*d*x+1/2*c)^5+77*tan(1/2*d*x+1/2*c)
^3+168*d*x-315*tan(1/2*d*x+1/2*c))/a^4/d
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 152, normalized size of antiderivative = 1.20

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^4}\,dx$$
$$=\frac{21\,dx\cos\left(dx+c\right)^4+84\,dx\cos\left(dx+c\right)^3+126\,dx\cos\left(dx+c\right)^2+84\,dx\cos\left(dx+c\right)+21\,dx-\left(52\,\cos\left(dx\cdots\right.\right.}{21\left(a^4d\cos\left(dx+c\right)^4+4\,a^4d\cos\left(dx+c\right)^3+6\,a^4d\cos\left(dx+c\right)^2+4\cdots\right.}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/21*(21*d*x*cos(d*x + c)^4 + 84*d*x*cos(d*x + c)^3 + 126*d*x*cos(d*x + c)^
2 + 84*d*x*cos(d*x + c) + 21*d*x - (52*cos(d*x + c)^3 + 124*cos(d*x + c)^2
+ 107*cos(d*x + c) + 32)*sin(d*x + c))/(a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(
d*x + c)^3 + 6*a^4*d*cos(d*x + c)^2 + 4*a^4*d*cos(d*x + c) + a^4*d)
```

Sympy [A] (verification not implemented)

Time = 3.26 (sec) , antiderivative size = 95, normalized size of antiderivative = 0.75

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \begin{cases} \frac{x}{a^4} + \frac{\tan^7\left(\frac{c}{2}+\frac{dx}{2}\right)}{56a^4d} - \frac{\tan^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{8a^4d} + \frac{11\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{24a^4d} - \frac{15\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{8a^4d} & \text{for } d \neq 0 \\ \frac{x\cos^4(c)}{(a\cos(c)+a)^4} & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)**4/(a+a*cos(d*x+c))**4,x)
```

```
[Out] Piecewise((x/a**4 + tan(c/2 + d*x/2)**7/(56*a**4*d) - tan(c/2 + d*x/2)**5/(
8*a**4*d) + 11*tan(c/2 + d*x/2)**3/(24*a**4*d) - 15*tan(c/2 + d*x/2)/(8*a**
4*d), Ne(d, 0)), (x*cos(c)**4/(a*cos(c) + a)**4, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 112, normalized size of antiderivative = 0.88

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{\frac{\frac{315\sin(dx+c)}{\cos(dx+c)+1} - \frac{77\sin(dx+c)^3}{(\cos(dx+c)+1)^3} + \frac{21\sin(dx+c)^5}{(\cos(dx+c)+1)^5} - \frac{3\sin(dx+c)^7}{(\cos(dx+c)+1)^7}}{a^4} - \frac{336\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{a^4}}{168\,d}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] -1/168*((315*sin(d*x + c)/(cos(d*x + c) + 1) - 77*sin(d*x + c)^3/(cos(d*x +
 c) + 1)^3 + 21*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 3*sin(d*x + c)^7/(cos
(d*x + c) + 1)^7)/a^4 - 336*arctan(sin(d*x + c)/(cos(d*x + c) + 1))/a^4)/d
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.65

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{\frac{168\,(dx+c)}{a^4} + \frac{3\,a^{24}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7 - 21\,a^{24}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5 + 77\,a^{24}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3 - 315\,a^{24}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{a^{28}}}{168\,d}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/168*(168*(d*x + c)/a^4 + (3*a^24*tan(1/2*d*x + 1/2*c)^7 - 21*a^24*tan(1/2
*d*x + 1/2*c)^5 + 77*a^24*tan(1/2*d*x + 1/2*c)^3 - 315*a^24*tan(1/2*d*x + 1
/2*c))/a^28)/d
```

Mupad [B] (verification not implemented)

Time = 14.84 (sec) , antiderivative size = 102, normalized size of antiderivative = 0.80

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{x}{a^4} + \frac{-\frac{52\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6}{21}+\frac{16\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4}{21}-\frac{5\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2}{28}+\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{56}}{a^4\,d\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}$$

```
[In] int(cos(c + d*x)^4/(a + a*cos(c + d*x))^4,x)
```

```
[Out] x/a^4 + (sin(c/2 + (d*x)/2)/56 - (5*cos(c/2 + (d*x)/2)^2*sin(c/2 + (d*x)/2)
)/28 + (16*cos(c/2 + (d*x)/2)^4*sin(c/2 + (d*x)/2))/21 - (52*cos(c/2 + (d*x
)/2)^6*sin(c/2 + (d*x)/2))/21)/(a^4*d*cos(c/2 + (d*x)/2)^7)
```

3.75 $\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^4} dx$

Optimal result

Integrand size = 21, antiderivative size = 114

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^4} dx = -\frac{18\sin(c+dx)}{35a^4d(1+\cos(c+dx))^2} + \frac{12\sin(c+dx)}{35a^4d(1+\cos(c+dx))} - \frac{\cos^2(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} + \frac{8\sin(c+dx)}{35ad(a+a\cos(c+dx))^3}$$

```
[Out] -18/35*sin(d*x+c)/a^4/d/(1+cos(d*x+c))^2+12/35*sin(d*x+c)/a^4/d/(1+cos(d*x+
c))-1/7*cos(d*x+c)^2*sin(d*x+c)/d/(a+a*cos(d*x+c))^4+8/35*sin(d*x+c)/a/d/(a
+a*cos(d*x+c))^3
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$, Rules used = {2844, 3047, 3098, 2829, 2727}

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^4} dx = \frac{12\sin(c+dx)}{35a^4d(\cos(c+dx)+1)} - \frac{18\sin(c+dx)}{35a^4d(\cos(c+dx)+1)^2} - \frac{\sin(c+dx)\cos^2(c+dx)}{7d(a\cos(c+dx)+a)^4} + \frac{8\sin(c+dx)}{35ad(a\cos(c+dx)+a)^3}$$

```
[In] Int[Cos[c + d*x]^3/(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (-18*Sin[c + d*x])/(35*a^4*d*(1 + Cos[c + d*x])^2) + (12*Sin[c + d*x])/(35*
a^4*d*(1 + Cos[c + d*x])) - (Cos[c + d*x]^2*Sin[c + d*x])/(7*d*(a + a*Cos[c
 + d*x])^4) + (8*Sin[c + d*x])/(35*a*d*(a + a*Cos[c + d*x])^3)
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2829

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((a + b*Sin[e + f*
x])^m/(a*f*(2*m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(a*b*(2*m + 1)), In
t[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && N
eQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3098

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(A*b - a*
B + b*C)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(a*f*(2*m + 1))), x] + Dist[1
/(a^2*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[a*A*(m + 1) + m*(b*
B - a*C) + b*C*(2*m + 1)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A,
B, C}, x] && LtQ[m, -1] && EqQ[a^2 - b^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^2(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{\int \frac{\cos(c+dx)(2a-6a\cos(c+dx))}{(a+a\cos(c+dx))^3}\,dx}{7a^2} \\
&= -\frac{\cos^2(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{\int \frac{2a\cos(c+dx)-6a\cos^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx}{7a^2}
\end{aligned}$$

$$= -\frac{\cos^2(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} + \frac{8\sin(c+dx)}{35ad(a+a\cos(c+dx))^3} + \frac{\int \frac{-24a^2+30a^2\cos(c+dx)}{(a+a\cos(c+dx))^2}\,dx}{35a^4}$$

$$= -\frac{18\sin(c+dx)}{35a^4d(1+\cos(c+dx))^2} - \frac{\cos^2(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} + \frac{8\sin(c+dx)}{35ad(a+a\cos(c+dx))^3} + \frac{12\int \frac{1}{a+a\cos(c+dx)}\,dx}{35a^3}$$

$$= -\frac{18\sin(c+dx)}{35a^4d(1+\cos(c+dx))^2} - \frac{\cos^2(c+dx)\sin(c+dx)}{7d(a+a\cos(c+dx))^4} + \frac{8\sin(c+dx)}{35ad(a+a\cos(c+dx))^3} + \frac{12\sin(c+dx)}{35d\,(a^4+a^4\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 1.23 (sec) , antiderivative size = 56, normalized size of antiderivative = 0.49

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{(2+8\cos(c+dx)+13\cos^2(c+dx)+12\cos^3(c+dx))\sin(c+dx)}{35a^4d(1+\cos(c+dx))^4}$$

```
[In] Integrate[Cos[c + d*x]^3/(a + a*Cos[c + d*x])^4,x]
[Out] ((2 + 8*Cos[c + d*x] + 13*Cos[c + d*x]^2 + 12*Cos[c + d*x]^3)*Sin[c + d*x])
/(35*a^4*d*(1 + Cos[c + d*x])^4)
```

Maple [A] (verified)

Time = 0.69 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.50

method	result
parallelrisch	$-\frac{\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{21\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+7\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-7\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{56a^4d}$
derivativedivides	$\frac{-\frac{\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+\frac{3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8d\,a^4}$
default	$\frac{-\frac{\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+\frac{3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8d\,a^4}$
risch	$\frac{2i\left(35\,e^{6i(dx+c)}+105\,e^{5i(dx+c)}+210\,e^{4i(dx+c)}+210\,e^{3i(dx+c)}+147\,e^{2i(dx+c)}+49\,e^{i(dx+c)}+12\right)}{35d\,a^4\left(e^{i(dx+c)}+1\right)^7}$
norman	$\frac{\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8da}+\frac{\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)}{4da}+\frac{3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{40da}-\frac{3\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{70da}+\frac{13\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{280da}+\frac{3\left(\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{140da}-\frac{\tan^{13}\left(\frac{dx}{2}+\frac{c}{2}\right)}{56da}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3 a^3}$

```
[In] int(cos(d*x+c)^3/(a+cos(d*x+c)*a)^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/56*(tan(1/2*d*x+1/2*c)^6-21/5*tan(1/2*d*x+1/2*c)^4+7*tan(1/2*d*x+1/2*c)^
2-7)*tan(1/2*d*x+1/2*c)/a^4/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 99, normalized size of antiderivative = 0.87

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{(12\cos(dx+c)^3+13\cos(dx+c)^2+8\cos(dx+c)+2)\sin(dx+c)}{35\left(a^4d\cos(dx+c)^4+4\,a^4d\cos(dx+c)^3+6\,a^4d\cos(dx+c)^2+4\,a^4d\cos(dx+c)+a^4d\right)}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/35*(12*cos(d*x + c)^3 + 13*cos(d*x + c)^2 + 8*cos(d*x + c) + 2)*sin(d*x +
 c)/(a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(d*x + c)^3 + 6*a^4*d*cos(d*x + c)^2
 + 4*a^4*d*cos(d*x + c) + a^4*d)
```

Sympy [A] (verification not implemented)

Time = 2.40 (sec) , antiderivative size = 88, normalized size of antiderivative = 0.77

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \begin{cases} -\frac{\tan^7\left(\frac{c}{2}+\frac{dx}{2}\right)}{56a^4d}+\frac{3\tan^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{40a^4d}-\frac{\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{8a^4d}+\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{8a^4d} & \text{for } d\neq 0 \\ \frac{x\cos^3(c)}{(a\cos(c)+a)^4} & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)**3/(a+a*cos(d*x+c))**4,x)
```

```
[Out] Piecewise((-tan(c/2 + d*x/2)**7/(56*a**4*d) + 3*tan(c/2 + d*x/2)**5/(40*a**
4*d) - tan(c/2 + d*x/2)**3/(8*a**4*d) + tan(c/2 + d*x/2)/(8*a**4*d), Ne(d,
0)), (x*cos(c)**3/(a*cos(c) + a)**4, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.76

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{\frac{35\sin(dx+c)}{\cos(dx+c)+1} - \frac{35\sin(dx+c)^3}{(\cos(dx+c)+1)^3} + \frac{21\sin(dx+c)^5}{(\cos(dx+c)+1)^5} - \frac{5\sin(dx+c)^7}{(\cos(dx+c)+1)^7}}{280\,a^4d}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/280*(35*sin(d*x + c)/(cos(d*x + c) + 1) - 35*sin(d*x + c)^3/(cos(d*x + c)
 + 1)^3 + 21*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 5*sin(d*x + c)^7/(cos(d*
x + c) + 1)^7)/(a^4*d)
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.52

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{5\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7 - 21\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5 + 35\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3 - 35\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{280\,a^4d}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] -1/280*(5*tan(1/2*d*x + 1/2*c)^7 - 21*tan(1/2*d*x + 1/2*c)^5 + 35*tan(1/2*d
*x + 1/2*c)^3 - 35*tan(1/2*d*x + 1/2*c))/(a^4*d)
```

Mupad [B] (verification not implemented)

Time = 15.08 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.51

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6 - 21\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4 + 35\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2 - 35\right)}{280\,a^4\,d}$$

```
[In] int(cos(c + d*x)^3/(a + a*cos(c + d*x))^4,x)
```

```
[Out] -(tan(c/2 + (d*x)/2)*(35*tan(c/2 + (d*x)/2)^2 - 21*tan(c/2 + (d*x)/2)^4 + 5
*tan(c/2 + (d*x)/2)^6 - 35))/(280*a^4*d)
```

3.76 $\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 112

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{11\sin(c+dx)}{35ad(a+a\cos(c+dx))^3} + \frac{13\sin(c+dx)}{105d\,(a^2+a^2\cos(c+dx))^2} + \frac{13\sin(c+dx)}{105d\,(a^4+a^4\cos(c+dx))}$$

```
[Out] 1/7*sin(d*x+c)/d/(a+a*cos(d*x+c))^4-11/35*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^3
+13/105*sin(d*x+c)/d/(a^2+a^2*cos(d*x+c))^2+13/105*sin(d*x+c)/d/(a^4+a^4*co
s(d*x+c))
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2837, 2829, 2729, 2727}

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{13\sin(c+dx)}{105d\,(a^4\cos(c+dx)+a^4)} + \frac{13\sin(c+dx)}{105d\,(a^2\cos(c+dx)+a^2)^2} - \frac{11\sin(c+dx)}{35ad(a\cos(c+dx)+a)^3} + \frac{\sin(c+dx)}{7d(a\cos(c+dx)+a)^4}$$

```
[In] Int[Cos[c + d*x]^2/(a + a*Cos[c + d*x])^4,x]
```

```
[Out] Sin[c + d*x]/(7*d*(a + a*Cos[c + d*x])^4) - (11*Sin[c + d*x])/(35*a*d*(a +
a*Cos[c + d*x])^3) + (13*Sin[c + d*x])/(105*d*(a^2 + a^2*Cos[c + d*x])^2) +
 (13*Sin[c + d*x])/(105*d*(a^4 + a^4*Cos[c + d*x]))
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2729

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[c
+ d*x]*((a + b*Sin[c + d*x])^n/(a*d*(2*n + 1))), x] + Dist[(n + 1)/(a*(2*n
+ 1)), Int[(a + b*Sin[c + d*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d}, x] &
& EqQ[a^2 - b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2829

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((a + b*Sin[e + f*
x])^m/(a*f*(2*m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(a*b*(2*m + 1)), In
t[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && N
eQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)]
```

Rule 2837

```
Int[sin[(e_.) + (f_.)*(x_)]^2*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_),
x_Symbol] :> Simp[b*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(a*f*(2*m + 1))),
x] - Dist[1/(a^2*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(a*m - b*(2*m
 + 1)*Sin[e + f*x]), x], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 - b^2, 0]
&& LtQ[m, -2^(-1)]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4} + \frac{\int \frac{-4a+7a\cos(c+dx)}{(a+a\cos(c+dx))^3}\,dx}{7a^2} \\
&= \frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{11\sin(c+dx)}{35ad(a+a\cos(c+dx))^3} + \frac{13\int \frac{1}{(a+a\cos(c+dx))^2}\,dx}{35a^2} \\
&= \frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{11\sin(c+dx)}{35ad(a+a\cos(c+dx))^3} \\
&\quad + \frac{13\sin(c+dx)}{105d\left(a^2+a^2\cos(c+dx)\right)^2} + \frac{13\int \frac{1}{a+a\cos(c+dx)}\,dx}{105a^3} \\
&= \frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{11\sin(c+dx)}{35ad(a+a\cos(c+dx))^3} \\
&\quad + \frac{13\sin(c+dx)}{105d\left(a^2+a^2\cos(c+dx)\right)^2} + \frac{13\sin(c+dx)}{105d\left(a^4+a^4\cos(c+dx)\right)}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.88 (sec) , antiderivative size = 56, normalized size of antiderivative = 0.50

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{(8+32\cos(c+dx)+52\cos^2(c+dx)+13\cos^3(c+dx))\sin(c+dx)}{105a^4d(1+\cos(c+dx))^4}$$

```
[In] Integrate[Cos[c + d*x]^2/(a + a*Cos[c + d*x])^4,x]
```

```
[Out] ((8 + 32*Cos[c + d*x] + 52*Cos[c + d*x]^2 + 13*Cos[c + d*x]^3)*Sin[c + d*x]
)/(105*a^4*d*(1 + Cos[c + d*x])^4)
```

Maple [A] (verified)

Time = 0.78 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.52

method	result	size
derivativedivides	$\frac{\frac{\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-\frac{\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8d\,a^4}$	58
default	$\frac{\frac{\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-\frac{\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8d\,a^4}$	58
parallelrisch	$\frac{15\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-21\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-35\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+105\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{840a^4d}$	60
risch	$\frac{2i\left(105\,\mathrm{e}^{5i(dx+c)}+175\,\mathrm{e}^{4i(dx+c)}+280\,\mathrm{e}^{3i(dx+c)}+168\,\mathrm{e}^{2i(dx+c)}+91\,\mathrm{e}^{i(dx+c)}+13\right)}{105d\,a^4\left(\mathrm{e}^{i(dx+c)}+1\right)^7}$	80
norman	$\frac{\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8da}+\frac{5\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{24da}+\frac{\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)}{60da}-\frac{31\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{420da}+\frac{3\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{280da}+\frac{\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)}{56da}}{a^3\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}$	133

```
[In] int(cos(d*x+c)^2/(a+cos(d*x+c)*a)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/8/d/a^4*(1/7*tan(1/2*d*x+1/2*c)^7-1/5*tan(1/2*d*x+1/2*c)^5-1/3*tan(1/2*d*
x+1/2*c)^3+tan(1/2*d*x+1/2*c))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 99, normalized size of antiderivative = 0.88

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx$$
$$= \frac{\left(13\cos(dx+c)^3+52\cos(dx+c)^2+32\cos(dx+c)+8\right)\sin(dx+c)}{105\left(a^4d\cos(dx+c)^4+4\,a^4d\cos(dx+c)^3+6\,a^4d\cos(dx+c)^2+4\,a^4d\cos(dx+c)+a^4d\right)}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/105*(13*cos(d*x + c)^3 + 52*cos(d*x + c)^2 + 32*cos(d*x + c) + 8)*sin(d*x
 + c)/(a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(d*x + c)^3 + 6*a^4*d*cos(d*x + c)
^2 + 4*a^4*d*cos(d*x + c) + a^4*d)
```

Sympy [A] (verification not implemented)

Time = 1.89 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.78

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx$$
$$= \begin{cases} \frac{\tan^7\left(\frac{c}{2}+\frac{dx}{2}\right)}{56a^4d} - \frac{\tan^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{40a^4d} - \frac{\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{24a^4d} + \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{8a^4d} & \text{for } d \neq 0 \\ \frac{x\cos^2(c)}{(a\cos(c)+a)^4} & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)**2/(a+a*cos(d*x+c))**4,x)
```

```
[Out] Piecewise((tan(c/2 + d*x/2)**7/(56*a**4*d) - tan(c/2 + d*x/2)**5/(40*a**4*d
) - tan(c/2 + d*x/2)**3/(24*a**4*d) + tan(c/2 + d*x/2)/(8*a**4*d), Ne(d, 0)
), (x*cos(c)**2/(a*cos(c) + a)**4, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.78

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{\frac{105\sin(dx+c)}{\cos(dx+c)+1} - \frac{35\sin(dx+c)^3}{(\cos(dx+c)+1)^3} - \frac{21\sin(dx+c)^5}{(\cos(dx+c)+1)^5} + \frac{15\sin(dx+c)^7}{(\cos(dx+c)+1)^7}}{840\,a^4d}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/840*(105*sin(d*x + c)/(cos(d*x + c) + 1) - 35*sin(d*x + c)^3/(cos(d*x + c
) + 1)^3 - 21*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 + 15*sin(d*x + c)^7/(cos(
d*x + c) + 1)^7)/(a^4*d)
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.53

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{15\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7-21\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-35\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+105\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{840\,a^4d}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^4,x, algorithm="giac")
[Out] 1/840*(15*tan(1/2*d*x + 1/2*c)^7 - 21*tan(1/2*d*x + 1/2*c)^5 - 35*tan(1/2*d
*x + 1/2*c)^3 + 105*tan(1/2*d*x + 1/2*c))/(a^4*d)
```

Mupad [B] (verification not implemented)

Time = 14.94 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.52

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(-15\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6+21\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+35\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-105\right)}{840\,a^4\,d}$$

```
[In] int(cos(c + d*x)^2/(a + a*cos(c + d*x))^4,x)
[Out] -(tan(c/2 + (d*x)/2)*(35*tan(c/2 + (d*x)/2)^2 + 21*tan(c/2 + (d*x)/2)^4 - 1
5*tan(c/2 + (d*x)/2)^6 - 105))/(840*a^4*d)
```

3.77 $\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^4} dx$

Optimal result

Integrand size = 19, antiderivative size = 112

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^4} dx = -\frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4} + \frac{4\sin(c+dx)}{35ad(a+a\cos(c+dx))^3} + \frac{8\sin(c+dx)}{105d\,(a^2+a^2\cos(c+dx))^2} + \frac{8\sin(c+dx)}{105d\,(a^4+a^4\cos(c+dx))}$$

```
[Out] -1/7*sin(d*x+c)/d/(a+a*cos(d*x+c))^4+4/35*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^3
+8/105*sin(d*x+c)/d/(a^2+a^2*cos(d*x+c))^2+8/105*sin(d*x+c)/d/(a^4+a^4*cos(
d*x+c))
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2829, 2729, 2727}

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^4} dx = \frac{8\sin(c+dx)}{105d\,(a^4\cos(c+dx)+a^4)} + \frac{8\sin(c+dx)}{105d\,(a^2\cos(c+dx)+a^2)^2} + \frac{4\sin(c+dx)}{35ad(a\cos(c+dx)+a)^3} - \frac{\sin(c+dx)}{7d(a\cos(c+dx)+a)^4}$$

```
[In] Int[Cos[c + d*x]/(a + a*Cos[c + d*x])^4,x]
```

```
[Out] -1/7*Sin[c + d*x]/(d*(a + a*Cos[c + d*x])^4) + (4*Sin[c + d*x])/(35*a*d*(a
+ a*Cos[c + d*x])^3) + (8*Sin[c + d*x])/(105*d*(a^2 + a^2*Cos[c + d*x])^2)
+ (8*Sin[c + d*x])/(105*d*(a^4 + a^4*Cos[c + d*x]))
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2729

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[c
+ d*x]*((a + b*Sin[c + d*x])^n/(a*d*(2*n + 1))), x] + Dist[(n + 1)/(a*(2*n
+ 1)), Int[(a + b*Sin[c + d*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d}, x] &
& EqQ[a^2 - b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2829

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((a + b*Sin[e + f*
x])^m/(a*f*(2*m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(a*b*(2*m + 1)), In
t[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && N
eQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4}+\frac{4\int\frac{1}{(a+a\cos(c+dx))^3}\,dx}{7a}\\
&= -\frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4}+\frac{4\sin(c+dx)}{35ad(a+a\cos(c+dx))^3}+\frac{8\int\frac{1}{(a+a\cos(c+dx))^2}\,dx}{35a^2}\\
&= -\frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4}+\frac{4\sin(c+dx)}{35ad(a+a\cos(c+dx))^3}\\
&\quad+\frac{8\sin(c+dx)}{105d\left(a^2+a^2\cos(c+dx)\right)^2}+\frac{8\int\frac{1}{a+a\cos(c+dx)}\,dx}{105a^3}\\
&= -\frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4}+\frac{4\sin(c+dx)}{35ad(a+a\cos(c+dx))^3}\\
&\quad+\frac{8\sin(c+dx)}{105d\left(a^2+a^2\cos(c+dx)\right)^2}+\frac{8\sin(c+dx)}{105d\left(a^4+a^4\cos(c+dx)\right)}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 56, normalized size of antiderivative = 0.50

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{(13+52\cos(c+dx)+32\cos^2(c+dx)+8\cos^3(c+dx))\sin(c+dx)}{105a^4d(1+\cos(c+dx))^4}$$

```
[In] Integrate[Cos[c + d*x]/(a + a*Cos[c + d*x])^4,x]
[Out] ((13 + 52*Cos[c + d*x] + 32*Cos[c + d*x]^2 + 8*Cos[c + d*x]^3)*Sin[c + d*x]
)/(105*a^4*d*(1 + Cos[c + d*x])^4)
```

Maple [A] (verified)

Time = 0.78 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.51

method	result	size
parallelrisch	$-\frac{\left(\tan^{6}\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{7\left(\tan^{4}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-\frac{7\left(\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-7\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{56a^{4}d}$	57
derivativedivides	$\frac{-\frac{\left(\tan^{7}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{\left(\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\frac{\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8d\,a^{4}}$	58
default	$\frac{-\frac{\left(\tan^{7}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{\left(\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\frac{\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8d\,a^{4}}$	58
risch	$\frac{8i\left(35\,e^{4i(dx+c)}+35\,e^{3i(dx+c)}+42\,e^{2i(dx+c)}+14\,e^{i(dx+c)}+2\right)}{105d\,a^{4}\left(e^{i(dx+c)}+1\right)^{7}}$	69
norman	$\frac{\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8da}+\frac{\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)}{6da}+\frac{\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)}{60da}-\frac{3\left(\tan^{7}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{70da}-\frac{\tan^{9}\left(\frac{dx}{2}+\frac{c}{2}\right)}{56da}}{a^{3}\left(1+\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}$	114

```
[In] int(cos(d*x+c)/(a+cos(d*x+c)*a)^4,x,method=_RETURNVERBOSE)
[Out] -1/56*(tan(1/2*d*x+1/2*c)^6+7/5*tan(1/2*d*x+1/2*c)^4-7/3*tan(1/2*d*x+1/2*c)
^2-7)*tan(1/2*d*x+1/2*c)/a^4/d
```

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 99, normalized size of antiderivative = 0.88

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{(8\cos(dx+c)^3+32\cos(dx+c)^2+52\cos(dx+c)+13)\sin(dx+c)}{105\,(a^4d\cos(dx+c)^4+4\,a^4d\cos(dx+c)^3+6\,a^4d\cos(dx+c)^2+4\,a^4d\cos(dx+c)+a^4d)}$$

[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^4,x, algorithm="fricas")

[Out] 1/105*(8*cos(d*x + c)^3 + 32*cos(d*x + c)^2 + 52*cos(d*x + c) + 13)*sin(d*x + c)/(a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(d*x + c)^3 + 6*a^4*d*cos(d*x + c)^2 + 4*a^4*d*cos(d*x + c) + a^4*d)

Sympy [A] (verification not implemented)

Time = 1.58 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.76

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \begin{cases} -\frac{\tan^7\left(\frac{c}{2}+\frac{dx}{2}\right)}{56a^4d} - \frac{\tan^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{40a^4d} + \frac{\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{24a^4d} + \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{8a^4d} & \text{for } d \neq 0 \\ \frac{x\cos(c)}{(a\cos(c)+a)^4} & \text{otherwise} \end{cases}$$

[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))**4,x)

[Out] Piecewise((-tan(c/2 + d*x/2)**7/(56*a**4*d) - tan(c/2 + d*x/2)**5/(40*a**4*d) + tan(c/2 + d*x/2)**3/(24*a**4*d) + tan(c/2 + d*x/2)/(8*a**4*d), Ne(d, 0)), (x*cos(c)/(a*cos(c) + a)**4, True))

Maxima [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.78

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{\frac{105\sin(dx+c)}{\cos(dx+c)+1} + \frac{35\sin(dx+c)^3}{(\cos(dx+c)+1)^3} - \frac{21\sin(dx+c)^5}{(\cos(dx+c)+1)^5} - \frac{15\sin(dx+c)^7}{(\cos(dx+c)+1)^7}}{840\,a^4d}$$

[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^4,x, algorithm="maxima")

[Out] 1/840*(105*sin(d*x + c)/(cos(d*x + c) + 1) + 35*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 - 21*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 15*sin(d*x + c)^7/(cos(d*x + c) + 1)^7)/(a^4*d)

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.53

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{15\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7+21\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-35\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-105\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{840\,a^4d}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] -1/840*(15*tan(1/2*d*x + 1/2*c)^7 + 21*tan(1/2*d*x + 1/2*c)^5 - 35*tan(1/2*
d*x + 1/2*c)^3 - 105*tan(1/2*d*x + 1/2*c))/(a^4*d)
```

Mupad [B] (verification not implemented)

Time = 14.94 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.52

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(-15\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6-21\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+35\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+105\right)}{840\,a^4\,d}$$

```
[In] int(cos(c + d*x)/(a + a*cos(c + d*x))^4,x)
```

```
[Out] (tan(c/2 + (d*x)/2)*(35*tan(c/2 + (d*x)/2)^2 - 21*tan(c/2 + (d*x)/2)^4 - 15
*tan(c/2 + (d*x)/2)^6 + 105))/(840*a^4*d)
```

3.78 $\int \frac{1}{(a+a\cos(c+dx))^4}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 112

$$\int \frac{1}{(a+a\cos(c+dx))^4}\,dx=\frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4}+\frac{3\sin(c+dx)}{35ad(a+a\cos(c+dx))^3}+\frac{2\sin(c+dx)}{35d\left(a^2+a^2\cos(c+dx)\right)^2}+\frac{2\sin(c+dx)}{35d\left(a^4+a^4\cos(c+dx)\right)}$$

```
[Out] 1/7*sin(d*x+c)/d/(a+a*cos(d*x+c))^4+3/35*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^3+
2/35*sin(d*x+c)/d/(a^2+a^2*cos(d*x+c))^2+2/35*sin(d*x+c)/d/(a^4+a^4*cos(d*x
+c))
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {2729, 2727}

$$\int \frac{1}{(a+a\cos(c+dx))^4}\,dx=\frac{2\sin(c+dx)}{35d\left(a^4\cos(c+dx)+a^4\right)}+\frac{2\sin(c+dx)}{35d\left(a^2\cos(c+dx)+a^2\right)^2}+\frac{3\sin(c+dx)}{35ad(a\cos(c+dx)+a)^3}+\frac{\sin(c+dx)}{7d(a\cos(c+dx)+a)^4}$$

```
[In] Int[(a + a*Cos[c + d*x])^(-4),x]
```

```
[Out] Sin[c + d*x]/(7*d*(a + a*Cos[c + d*x])^4) + (3*Sin[c + d*x])/(35*a*d*(a + a
*Cos[c + d*x])^3) + (2*Sin[c + d*x])/(35*d*(a^2 + a^2*Cos[c + d*x])^2) + (2
*Sin[c + d*x])/(35*d*(a^4 + a^4*Cos[c + d*x]))
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2729

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[c
+ d*x]*((a + b*Sin[c + d*x])^n/(a*d*(2*n + 1))), x] + Dist[(n + 1)/(a*(2*n
+ 1)), Int[(a + b*Sin[c + d*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d}, x] &
& EqQ[a^2 - b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4}+\frac{3\int \frac{1}{(a+a\cos(c+dx))^3}\,dx}{7a}\\
&= \frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4}+\frac{3\sin(c+dx)}{35ad(a+a\cos(c+dx))^3}+\frac{6\int \frac{1}{(a+a\cos(c+dx))^2}\,dx}{35a^2}\\
&= \frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4}+\frac{3\sin(c+dx)}{35ad(a+a\cos(c+dx))^3}\\
&\quad+\frac{2\sin(c+dx)}{35d\left(a^2+a^2\cos(c+dx)\right)^2}+\frac{2\int \frac{1}{a+a\cos(c+dx)}\,dx}{35a^3}\\
&= \frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4}+\frac{3\sin(c+dx)}{35ad(a+a\cos(c+dx))^3}\\
&\quad+\frac{2\sin(c+dx)}{35d\left(a^2+a^2\cos(c+dx)\right)^2}+\frac{2\sin(c+dx)}{35d\left(a^4+a^4\cos(c+dx)\right)}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.69

$$\int \frac{1}{(a+a\cos(c+dx))^4}\,dx = \frac{\cos\left(\frac{1}{2}(c+dx)\right)\left(35\sin\left(\frac{1}{2}(c+dx)\right)+21\sin\left(\frac{3}{2}(c+dx)\right)+7\sin\left(\frac{5}{2}(c+dx)\right)+\sin\left(\frac{7}{2}(c+dx)\right)\right)}{70a^4d(1+\cos(c+dx))^4}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(-4),x]
[Out] (Cos[(c + d*x)/2]*(35*Sin[(c + d*x)/2] + 21*Sin[(3*(c + d*x))/2] + 7*Sin[(5
*(c + d*x))/2] + Sin[(7*(c + d*x))/2]))/(70*a^4*d*(1 + Cos[c + d*x])^4)
```

Maple [A] (verified)

Time = 0.63 (sec) , antiderivative size = 56, normalized size of antiderivative = 0.50

method	result	size
derivativedivides	$\frac{\frac{\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+\frac{3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8d\,a^4}$	56
default	$\frac{\frac{\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+\frac{3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8d\,a^4}$	56
risch	$\frac{4i\left(35\,\mathrm{e}^{3i(dx+c)}+21\,\mathrm{e}^{2i(dx+c)}+7\,\mathrm{e}^{i(dx+c)}+1\right)}{35d\,a^4\left(\mathrm{e}^{i(dx+c)}+1\right)^7}$	58
parallelrisch	$\frac{5\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+21\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+35\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+35\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{280a^4d}$	60
norman	$\frac{\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8da}+\frac{\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)}{8da}+\frac{3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{40da}+\frac{\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)}{56da}}{a^3}$	80

```
[In] int(1/(a+cos(d*x+c)*a)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/8/d/a^4*(1/7*tan(1/2*d*x+1/2*c)^7+3/5*tan(1/2*d*x+1/2*c)^5+tan(1/2*d*x+1/
2*c)^3+tan(1/2*d*x+1/2*c))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 99, normalized size of antiderivative = 0.88

$$\int \frac{1}{(a+a\cos(c+dx))^4}\,dx = \frac{\left(2\,\cos\left(dx+c\right)^3+8\,\cos\left(dx+c\right)^2+13\,\cos\left(dx+c\right)+12\right)\sin\left(dx+c\right)}{35\left(a^4d\cos\left(dx+c\right)^4+4\,a^4d\cos\left(dx+c\right)^3+6\,a^4d\cos\left(dx+c\right)^2+4\,a^4d\cos\left(dx+c\right)+a^4d\right)}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/35*(2*cos(d*x + c)^3 + 8*cos(d*x + c)^2 + 13*cos(d*x + c) + 12)*sin(d*x +
 c)/(a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(d*x + c)^3 + 6*a^4*d*cos(d*x + c)^2
 + 4*a^4*d*cos(d*x + c) + a^4*d)
```

Sympy [A] (verification not implemented)

Time = 1.43 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.74

$$\int \frac{1}{(a+a\cos(c+dx))^4}\,dx = \begin{cases} \frac{\tan^7\left(\frac{c}{2}+\frac{dx}{2}\right)}{56a^4d} + \frac{3\tan^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{40a^4d} + \frac{\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{8a^4d} + \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{8a^4d} & \text{for } d \neq 0 \\ \frac{x}{(a\cos(c)+a)^4} & \text{otherwise} \end{cases}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**4,x)
```

```
[Out] Piecewise((tan(c/2 + d*x/2)**7/(56*a**4*d) + 3*tan(c/2 + d*x/2)**5/(40*a**4
*d) + tan(c/2 + d*x/2)**3/(8*a**4*d) + tan(c/2 + d*x/2)/(8*a**4*d), Ne(d, 0
)), (x/(a*cos(c) + a)**4, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.78

$$\int \frac{1}{(a+a\cos(c+dx))^4}\,dx = \frac{\frac{35\sin(dx+c)}{\cos(dx+c)+1} + \frac{35\sin(dx+c)^3}{(\cos(dx+c)+1)^3} + \frac{21\sin(dx+c)^5}{(\cos(dx+c)+1)^5} + \frac{5\sin(dx+c)^7}{(\cos(dx+c)+1)^7}}{280\,a^4d}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/280*(35*sin(d*x + c)/(cos(d*x + c) + 1) + 35*sin(d*x + c)^3/(cos(d*x + c)
 + 1)^3 + 21*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 + 5*sin(d*x + c)^7/(cos(d*
x + c) + 1)^7)/(a^4*d)
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.53

$$\int \frac{1}{(a+a\cos(c+dx))^4}\,dx = \frac{5\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^7 + 21\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5 + 35\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3 + 35\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{280\,a^4d}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/280*(5*tan(1/2*d*x + 1/2*c)^7 + 21*tan(1/2*d*x + 1/2*c)^5 + 35*tan(1/2*d*
x + 1/2*c)^3 + 35*tan(1/2*d*x + 1/2*c))/(a^4*d)
```

Mupad [B] (verification not implemented)

Time = 15.28 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.52

$$\int \frac{1}{(a+a\cos(c+dx))^4}\,dx = \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\,\left(5\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^6+21\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^4+35\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2+35\right)}{280\,a^4\,d}$$

```
[In] int(1/(a + a*cos(c + d*x))^4,x)
```

```
[Out] (tan(c/2 + (d*x)/2)*(35*tan(c/2 + (d*x)/2)^2 + 21*tan(c/2 + (d*x)/2)^4 + 5*
tan(c/2 + (d*x)/2)^6 + 35))/(280*a^4*d)
```

3.79 $\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^4}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 120

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{\operatorname{arctanh}(\sin(c+dx))}{a^4d} - \frac{11\sin(c+dx)}{21a^4d(1+\cos(c+dx))^2} - \frac{32\sin(c+dx)}{21a^4d(1+\cos(c+dx))} - \frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{2\sin(c+dx)}{7ad(a+a\cos(c+dx))^3}$$

```
[Out] arctanh(sin(d*x+c))/a^4/d-11/21*sin(d*x+c)/a^4/d/(1+cos(d*x+c))^2-32/21*sin
(d*x+c)/a^4/d/(1+cos(d*x+c))-1/7*sin(d*x+c)/d/(a+a*cos(d*x+c))^4-2/7*sin(d*
x+c)/a/d/(a+a*cos(d*x+c))^3
```

Rubi [A] (verified)

Time = 0.32 (sec) , antiderivative size = 120, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2845, 3057, 12, 3855}

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{\operatorname{arctanh}(\sin(c+dx))}{a^4d} - \frac{32\sin(c+dx)}{21a^4d(\cos(c+dx)+1)} - \frac{11\sin(c+dx)}{21a^4d(\cos(c+dx)+1)^2} - \frac{2\sin(c+dx)}{7ad(a\cos(c+dx)+a)^3} - \frac{\sin(c+dx)}{7d(a\cos(c+dx)+a)^4}$$

```
[In] Int[Sec[c + d*x]/(a + a*Cos[c + d*x])^4,x]
```

```
[Out] ArcTanh[Sin[c + d*x]]/(a^4*d) - (11*Sin[c + d*x])/(21*a^4*d*(1 + Cos[c + d*
x])^2) - (32*Sin[c + d*x])/(21*a^4*d*(1 + Cos[c + d*x])) - Sin[c + d*x]/(7*
d*(a + a*Cos[c + d*x])^4) - (2*Sin[c + d*x])/(7*a*d*(a + a*Cos[c + d*x])^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = -\frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4}+\frac{\int \frac{(7a-3a\cos(c+dx))\sec(c+dx)}{(a+a\cos(c+dx))^3}\,dx}{7a^2}$$

$$=-\frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4}-\frac{2\sin(c+dx)}{7ad(a+a\cos(c+dx))^3}+\frac{\int \frac{(35a^2-20a^2\cos(c+dx))\sec(c+dx)}{(a+a\cos(c+dx))^2}\,dx}{35a^4}$$

$$
\begin{aligned}
&= -\frac{11\sin(c+dx)}{21a^4d(1+\cos(c+dx))^2} - \frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4} \\
&\quad - \frac{2\sin(c+dx)}{7ad(a+a\cos(c+dx))^3} + \frac{\int \frac{(105a^3-55a^3\cos(c+dx))\sec(c+dx)}{a+a\cos(c+dx)}\,dx}{105a^6} \\
&= -\frac{11\sin(c+dx)}{21a^4d(1+\cos(c+dx))^2} - \frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{2\sin(c+dx)}{7ad(a+a\cos(c+dx))^3} \\
&\quad - \frac{32\sin(c+dx)}{21d\,(a^4+a^4\cos(c+dx))} + \frac{\int 105a^4\sec(c+dx)\,dx}{105a^8} \\
&= -\frac{11\sin(c+dx)}{21a^4d(1+\cos(c+dx))^2} - \frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4} \\
&\quad - \frac{2\sin(c+dx)}{7ad(a+a\cos(c+dx))^3} - \frac{32\sin(c+dx)}{21d\,(a^4+a^4\cos(c+dx))} + \frac{\int \sec(c+dx)\,dx}{a^4} \\
&= \frac{\operatorname{arctanh}(\sin(c+dx))}{a^4d} - \frac{11\sin(c+dx)}{21a^4d(1+\cos(c+dx))^2} - \frac{\sin(c+dx)}{7d(a+a\cos(c+dx))^4} \\
&\quad - \frac{2\sin(c+dx)}{7ad(a+a\cos(c+dx))^3} - \frac{32\sin(c+dx)}{21d\,(a^4+a^4\cos(c+dx))}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.90 (sec) , antiderivative size = 185, normalized size of antiderivative = 1.54

$$
\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^4}\,dx
= \frac{-1344\cos^8\left(\frac{1}{2}(c+dx)\right)\left(\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)-\log\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)\right.}{}
$$

```
[In] Integrate[Sec[c + d*x]/(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (-1344*Cos[(c + d*x)/2]^8*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - Log[C
os[(c + d*x)/2] + Sin[(c + d*x)/2]]) + Cos[(c + d*x)/2]*Sec[c/2]*(-686*Sin[
(d*x)/2] + 434*Sin[c + (d*x)/2] - 525*Sin[c + (3*d*x)/2] + 147*Sin[2*c + (3
*d*x)/2] - 203*Sin[2*c + (5*d*x)/2] + 21*Sin[3*c + (5*d*x)/2] - 32*Sin[3*c
+ (7*d*x)/2]))/(84*a^4*d*(1 + Cos[c + d*x])^4)
```

Maple [A] (verified)

Time = 1.03 (sec) , antiderivative size = 88, normalized size of antiderivative = 0.73

method	result
derivativedivides	$\frac{-\frac{\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\frac{11\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-15\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-8\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+8\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{8d\,a^4}$
default	$\frac{-\frac{\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\frac{11\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-15\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-8\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+8\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{8d\,a^4}$
parallelrisch	$\frac{-3\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-21\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-77\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-168\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+168\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-315\,\text{ta}}{168a^4d}$
norman	$\frac{-\frac{15\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8da}-\frac{11\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{24da}-\frac{\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)}{8da}-\frac{\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)}{56da}}{a^3}+\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{d\,a^4}-\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^4d}$
risch	$-\frac{2i(21\,\mathrm{e}^{6i(dx+c)}+147\,\mathrm{e}^{5i(dx+c)}+434\,\mathrm{e}^{4i(dx+c)}+686\,\mathrm{e}^{3i(dx+c)}+525\,\mathrm{e}^{2i(dx+c)}+203\,\mathrm{e}^{i(dx+c)}+32)}{21d\,a^4\left(\mathrm{e}^{i(dx+c)}+1\right)^7}+\frac{\ln(\mathrm{e}^{i(dx+c)}+i)}{d\,a^4}-$

```
[In] int(sec(d*x+c)/(a+cos(d*x+c)*a)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/8/d/a^4*(-1/7*tan(1/2*d*x+1/2*c)^7-tan(1/2*d*x+1/2*c)^5-11/3*tan(1/2*d*x+
1/2*c)^3-15*tan(1/2*d*x+1/2*c)-8*ln(tan(1/2*d*x+1/2*c)-1)+8*ln(tan(1/2*d*x+
1/2*c)+1))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.68

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^4}\,dx$$
$$=\frac{21\left(\cos\left(dx+c\right)^4+4\cos\left(dx+c\right)^3+6\cos\left(dx+c\right)^2+4\cos\left(dx+c\right)+1\right)\log\left(\sin\left(dx+c\right)+1\right)-21\left(\cos\left(\right.\right.}{42\left(a^4d\cos\left(d\right.\right.}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/42*(21*(cos(d*x + c)^4 + 4*cos(d*x + c)^3 + 6*cos(d*x + c)^2 + 4*cos(d*x
+ c) + 1)*log(sin(d*x + c) + 1) - 21*(cos(d*x + c)^4 + 4*cos(d*x + c)^3 + 6
*cos(d*x + c)^2 + 4*cos(d*x + c) + 1)*log(-sin(d*x + c) + 1) - 2*(32*cos(d*
x + c)^3 + 107*cos(d*x + c)^2 + 124*cos(d*x + c) + 52)*sin(d*x + c))/(a^4*d
*cos(d*x + c)^4 + 4*a^4*d*cos(d*x + c)^3 + 6*a^4*d*cos(d*x + c)^2 + 4*a^4*d
*cos(d*x + c) + a^4*d)
```

Sympy [F]

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{\int \frac{\sec(c+dx)}{\cos^4(c+dx)+4\cos^3(c+dx)+6\cos^2(c+dx)+4\cos(c+dx)+1}\,dx}{a^4}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))**4,x)
```

```
[Out] Integral(sec(c + d*x)/(cos(c + d*x)**4 + 4*cos(c + d*x)**3 + 6*cos(c + d*x)
**2 + 4*cos(c + d*x) + 1), x)/a**4
```

Maxima [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 139, normalized size of antiderivative = 1.16

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{\frac{\frac{315\,\sin(dx+c)}{\cos(dx+c)+1}+\frac{77\,\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{21\,\sin(dx+c)^5}{(\cos(dx+c)+1)^5}+\frac{3\,\sin(dx+c)^7}{(\cos(dx+c)+1)^7}}{a^4}-\frac{168\,\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a^4}+\frac{168\,\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)}{a^4}}{168\,d}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] -1/168*((315*sin(d*x + c)/(cos(d*x + c) + 1) + 77*sin(d*x + c)^3/(cos(d*x +
 c) + 1)^3 + 21*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 + 3*sin(d*x + c)^7/(cos
(d*x + c) + 1)^7)/a^4 - 168*log(sin(d*x + c)/(cos(d*x + c) + 1) + 1)/a^4 +
168*log(sin(d*x + c)/(cos(d*x + c) + 1) - 1)/a^4)/d
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 110, normalized size of antiderivative = 0.92

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{\frac{168\,\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)}{a^4}-\frac{168\,\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)}{a^4}-\frac{3\,a^{24}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7+21\,a^{24}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5+77\,a^{24}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+315}{a^{28}}}{168\,d}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/168*(168*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^4 - 168*log(abs(tan(1/2*d*x
 + 1/2*c) - 1))/a^4 - (3*a^24*tan(1/2*d*x + 1/2*c)^7 + 21*a^24*tan(1/2*d*x
+ 1/2*c)^5 + 77*a^24*tan(1/2*d*x + 1/2*c)^3 + 315*a^24*tan(1/2*d*x + 1/2*c)
)/a^28)/d
```

Mupad [B] (verification not implemented)

Time = 14.90 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.69

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{\frac{11\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^3}{24a^4}+\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^5}{8a^4}+\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^7}{56a^4}-\frac{2\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}{a^4}+\frac{15\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{8a^4}}{d}$$

```
[In] int(1/(cos(c + d*x)*(a + a*cos(c + d*x))^4),x)
[Out] -((11*tan(c/2 + (d*x)/2)^3)/(24*a^4) + tan(c/2 + (d*x)/2)^5/(8*a^4) + tan(c
/2 + (d*x)/2)^7/(56*a^4) - (2*atanh(tan(c/2 + (d*x)/2)))/a^4 + (15*tan(c/2
+ (d*x)/2))/(8*a^4))/d
```

3.80 $\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 135

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{4\text{arctanh}(\sin(c+dx))}{a^4d}+\frac{664\tan(c+dx)}{105a^4d} - \frac{88\tan(c+dx)}{105a^4d(1+\cos(c+dx))^2}-\frac{4\tan(c+dx)}{a^4d(1+\cos(c+dx))} - \frac{\tan(c+dx)}{7d(a+a\cos(c+dx))^4}-\frac{12\tan(c+dx)}{35ad(a+a\cos(c+dx))^3}$$

```
[Out] -4*arctanh(sin(d*x+c))/a^4/d+664/105*tan(d*x+c)/a^4/d-88/105*tan(d*x+c)/a^4
/d/(1+cos(d*x+c))^2-4*tan(d*x+c)/a^4/d/(1+cos(d*x+c))-1/7*tan(d*x+c)/d/(a+a
*cos(d*x+c))^4-12/35*tan(d*x+c)/a/d/(a+a*cos(d*x+c))^3
```

Rubi [A] (verified)

Time = 0.42 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2845, 3057, 2827, 3852, 8, 3855}

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{4\text{arctanh}(\sin(c+dx))}{a^4d}+\frac{664\tan(c+dx)}{105a^4d} - \frac{4\tan(c+dx)}{a^4d(\cos(c+dx)+1)}-\frac{88\tan(c+dx)}{105a^4d(\cos(c+dx)+1)^2} - \frac{12\tan(c+dx)}{35ad(a\cos(c+dx)+a)^3}-\frac{\tan(c+dx)}{7d(a\cos(c+dx)+a)^4}$$

```
[In] Int[Sec[c + d*x]^2/(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (-4*ArcTanh[Sin[c + d*x]])/(a^4*d) + (664*Tan[c + d*x])/(105*a^4*d) - (88*T
an[c + d*x])/(105*a^4*d*(1 + Cos[c + d*x])^2) - (4*Tan[c + d*x])/(a^4*d*(1
+ Cos[c + d*x])) - Tan[c + d*x]/(7*d*(a + a*Cos[c + d*x])^4) - (12*Tan[c +
d*x])/(35*a*d*(a + a*Cos[c + d*x])^3)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = -\frac{\tan(c+dx)}{7d(a+a\cos(c+dx))^4} + \frac{\int \frac{(8a-4a\cos(c+dx))\sec^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx}{7a^2}$$

$$= -\frac{\tan(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{12\tan(c+dx)}{35ad(a+a\cos(c+dx))^3} + \frac{\int \frac{(52a^2-36a^2\cos(c+dx))\sec^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx}{35a^4}$$

$$= -\frac{88\tan(c+dx)}{105a^4d(1+\cos(c+dx))^2} - \frac{\tan(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{12\tan(c+dx)}{35ad(a+a\cos(c+dx))^3} + \frac{\int \frac{(244a^3-176a^3\cos(c+dx))\sec^2(c+dx)}{a+a\cos(c+dx)}\,dx}{105a^6}$$

$$= -\frac{88\tan(c+dx)}{105a^4d(1+\cos(c+dx))^2} - \frac{\tan(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{12\tan(c+dx)}{35ad(a+a\cos(c+dx))^3} - \frac{4\tan(c+dx)}{d\,(a^4+a^4\cos(c+dx))} + \frac{\int (664a^4-420a^4\cos(c+dx))\sec^2(c+dx)\,dx}{105a^8}$$

$$= -\frac{88\tan(c+dx)}{105a^4d(1+\cos(c+dx))^2} - \frac{\tan(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{12\tan(c+dx)}{35ad(a+a\cos(c+dx))^3} - \frac{4\tan(c+dx)}{d\,(a^4+a^4\cos(c+dx))} - \frac{4\int \sec(c+dx)\,dx}{a^4} + \frac{664\int \sec^2(c+dx)\,dx}{105a^4}$$

$$= -\frac{4\text{arctanh}(\sin(c+dx))}{a^4d} - \frac{88\tan(c+dx)}{105a^4d(1+\cos(c+dx))^2} - \frac{\tan(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{12\tan(c+dx)}{35ad(a+a\cos(c+dx))^3} - \frac{4\tan(c+dx)}{d\,(a^4+a^4\cos(c+dx))} - \frac{664\text{Subst}(\int 1\,dx, x, -\tan(c+dx))}{105a^4d}$$

$$= -\frac{4\text{arctanh}(\sin(c+dx))}{a^4d} + \frac{664\tan(c+dx)}{105a^4d} - \frac{88\tan(c+dx)}{105a^4d(1+\cos(c+dx))^2} - \frac{\tan(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{12\tan(c+dx)}{35ad(a+a\cos(c+dx))^3} - \frac{4\tan(c+dx)}{d\,(a^4+a^4\cos(c+dx))}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 341 vs. $2(135) = 270$.

Time = 3.38 (sec) , antiderivative size = 341, normalized size of antiderivative = 2.53

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx$$
$$= \frac{107520\cos^8\left(\frac{1}{2}(c+dx)\right)\left(\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)-\log\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)\right)}{}$$

```
[In] Integrate[Sec[c + d*x]^2/(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (107520*Cos[(c + d*x)/2]^8*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - Log[
Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) + Cos[(c + d*x)/2]*Sec[c/2]*Sec[c]*Se
c[c + d*x]*(-10780*Sin[(d*x)/2] + 18788*Sin[(3*d*x)/2] - 20524*Sin[c - (d*x
)/2] + 14644*Sin[c + (d*x)/2] - 16660*Sin[2*c + (d*x)/2] - 4690*Sin[c + (3*
d*x)/2] + 14378*Sin[2*c + (3*d*x)/2] - 9100*Sin[3*c + (3*d*x)/2] + 11668*Si
n[c + (5*d*x)/2] - 630*Sin[2*c + (5*d*x)/2] + 9358*Sin[3*c + (5*d*x)/2] - 2
940*Sin[4*c + (5*d*x)/2] + 4228*Sin[2*c + (7*d*x)/2] + 315*Sin[3*c + (7*d*x
)/2] + 3493*Sin[4*c + (7*d*x)/2] - 420*Sin[5*c + (7*d*x)/2] + 664*Sin[3*c +
 (9*d*x)/2] + 105*Sin[4*c + (9*d*x)/2] + 559*Sin[5*c + (9*d*x)/2]))/(1680*a
^4*d*(1 + Cos[c + d*x])^4)
```

Maple [A] (verified)

Time = 1.06 (sec) , antiderivative size = 118, normalized size of antiderivative = 0.87

method	result
derivativedivides	$\frac{\frac{\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+\frac{7\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\frac{23\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+49\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{8}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1}-32\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-\frac{8}{\tan\left(\frac{dx}{2}\right.}}{8d\,a^4}$
default	$\frac{\frac{\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+\frac{7\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\frac{23\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+49\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{8}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1}-32\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-\frac{8}{\tan\left(\frac{dx}{2}\right.}}{8d\,a^4}$
parallelrisch	$\frac{3360\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(dx+c)-3360\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)\cos(dx+c)+2861\left(\cos(dx+c)+\frac{1650\cos(2dx+2c)}{2861}+\frac{559\cos(3}{286}\right.}{840a^4d\cos(dx+c)}$
norman	$\frac{-\frac{65\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8da}+\frac{31\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{6da}+\frac{47\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{60da}+\frac{11\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{70da}+\frac{\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)}{56da}}{\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)a^3}+\frac{4\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^4d}-$
risch	$\frac{8i\left(105\,\mathrm{e}^{8i(dx+c)}+735\,\mathrm{e}^{7i(dx+c)}+2275\,\mathrm{e}^{6i(dx+c)}+4165\,\mathrm{e}^{5i(dx+c)}+5131\,\mathrm{e}^{4i(dx+c)}+4697\,\mathrm{e}^{3i(dx+c)}+2917\,\mathrm{e}^{2i(dx+c)}+1057\,\mathrm{e}^{i}\right.}{105d\,a^4\left(\mathrm{e}^{i(dx+c)}+1\right)^7\left(\mathrm{e}^{2i(dx+c)}+1\right)}$

```
[In] int(sec(d*x+c)^2/(a+cos(d*x+c)*a)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/8/d/a^4*(1/7*tan(1/2*d*x+1/2*c)^7+7/5*tan(1/2*d*x+1/2*c)^5+23/3*tan(1/2*d
*x+1/2*c)^3+49*tan(1/2*d*x+1/2*c)-8/(tan(1/2*d*x+1/2*c)+1)-32*ln(tan(1/2*d*
```

```
x+1/2*c)+1)-8/(tan(1/2*d*x+1/2*c)-1)+32*ln(tan(1/2*d*x+1/2*c)-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 234, normalized size of antiderivative = 1.73

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{210\left(\cos(dx+c)^5+4\cos(dx+c)^4+6\cos(dx+c)^3+4\cos(dx+c)^2+\cos(dx+c)\right)\log\left(\sin(dx+c\right.}{}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^4,x, algorithm="fricas")
[Out] -1/105*(210*(cos(d*x + c)^5 + 4*cos(d*x + c)^4 + 6*cos(d*x + c)^3 + 4*cos(d
*x + c)^2 + cos(d*x + c))*log(sin(d*x + c) + 1) - 210*(cos(d*x + c)^5 + 4*c
os(d*x + c)^4 + 6*cos(d*x + c)^3 + 4*cos(d*x + c)^2 + cos(d*x + c))*log(-si
n(d*x + c) + 1) - (664*cos(d*x + c)^4 + 2236*cos(d*x + c)^3 + 2636*cos(d*x
+ c)^2 + 1184*cos(d*x + c) + 105)*sin(d*x + c))/(a^4*d*cos(d*x + c)^5 + 4*a
^4*d*cos(d*x + c)^4 + 6*a^4*d*cos(d*x + c)^3 + 4*a^4*d*cos(d*x + c)^2 + a^4
*d*cos(d*x + c))
```

Sympy [F]

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{\int \frac{\sec^2(c+dx)}{\cos^4(c+dx)+4\cos^3(c+dx)+6\cos^2(c+dx)+4\cos(c+dx)+1}\,dx}{a^4}$$

```
[In] integrate(sec(d*x+c)**2/(a+a*cos(d*x+c))**4,x)
[Out] Integral(sec(c + d*x)**2/(cos(c + d*x)**4 + 4*cos(c + d*x)**3 + 6*cos(c + d
*x)**2 + 4*cos(c + d*x) + 1), x)/a**4
```

Maxima [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 186, normalized size of antiderivative = 1.38

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{\frac{1680\sin(dx+c)}{\left(a^4-\frac{a^4\sin(dx+c)^2}{(\cos(dx+c)+1)^2}\right)(\cos(dx+c)+1)}+\frac{\frac{5145\sin(dx+c)}{\cos(dx+c)+1}+\frac{805\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{147\sin(dx+c)^5}{(\cos(dx+c)+1)^5}+\frac{15\sin(dx+c)^7}{(\cos(dx+c)+1)^7}}{a^4}-\frac{3360\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a^4}+\frac{33\cdots}{}}{840\,d}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/840*(1680*sin(d*x + c)/((a^4 - a^4*sin(d*x + c)^2/(cos(d*x + c) + 1)^2)*(
cos(d*x + c) + 1)) + (5145*sin(d*x + c)/(cos(d*x + c) + 1) + 805*sin(d*x +
c)^3/(cos(d*x + c) + 1)^3 + 147*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 + 15*si
n(d*x + c)^7/(cos(d*x + c) + 1)^7)/a^4 - 3360*log(sin(d*x + c)/(cos(d*x + c
) + 1) + 1)/a^4 + 3360*log(sin(d*x + c)/(cos(d*x + c) + 1) - 1)/a^4)/d
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 139, normalized size of antiderivative = 1.03

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{\frac{3360\,\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)}{a^4}-\frac{3360\,\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)}{a^4}+\frac{1680\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)a^4}-\frac{15\,a^{24}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7+147\,a^{24}\tan\left(\frac{1}{2}\,dx+\right.}{840\,d}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] -1/840*(3360*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^4 - 3360*log(abs(tan(1/2*
d*x + 1/2*c) - 1))/a^4 + 1680*tan(1/2*d*x + 1/2*c)/((tan(1/2*d*x + 1/2*c)^2
 - 1)*a^4) - (15*a^24*tan(1/2*d*x + 1/2*c)^7 + 147*a^24*tan(1/2*d*x + 1/2*c
)^5 + 805*a^24*tan(1/2*d*x + 1/2*c)^3 + 5145*a^24*tan(1/2*d*x + 1/2*c))/a^2
8)/d
```

Mupad [B] (verification not implemented)

Time = 14.97 (sec) , antiderivative size = 130, normalized size of antiderivative = 0.96

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{23\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^3}{24\,a^4\,d}+\frac{7\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^5}{40\,a^4\,d}+\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^7}{56\,a^4\,d}-\frac{8\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}{a^4\,d}-\frac{2\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{d\,\left(a^4\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2-a^4\right)}+\frac{49\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{8\,a^4\,d}$$

```
[In] int(1/(cos(c + d*x)^2*(a + a*cos(c + d*x))^4),x)
```

```
[Out] (23*tan(c/2 + (d*x)/2)^3)/(24*a^4*d) + (7*tan(c/2 + (d*x)/2)^5)/(40*a^4*d)
+ tan(c/2 + (d*x)/2)^7/(56*a^4*d) - (8*atanh(tan(c/2 + (d*x)/2)))/(a^4*d) -
 (2*tan(c/2 + (d*x)/2))/(d*(a^4*tan(c/2 + (d*x)/2)^2 - a^4)) + (49*tan(c/2
+ (d*x)/2))/(8*a^4*d)
```

3.81 $\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^4} dx$

Optimal result

Integrand size = 21, antiderivative size = 185

$$\begin{aligned}\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^4}\,dx &= \frac{21\text{arctanh}(\sin(c+dx))}{2a^4d} - \frac{576\tan(c+dx)}{35a^4d} \\ &\quad + \frac{21\sec(c+dx)\tan(c+dx)}{2a^4d} \\ &\quad - \frac{43\sec(c+dx)\tan(c+dx)}{35a^4d(1+\cos(c+dx))^2} - \frac{288\sec(c+dx)\tan(c+dx)}{35a^4d(1+\cos(c+dx))} \\ &\quad - \frac{\sec(c+dx)\tan(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{2\sec(c+dx)\tan(c+dx)}{5ad(a+a\cos(c+dx))^3}\end{aligned}$$

```
[Out] 21/2*arctanh(sin(d*x+c))/a^4/d-576/35*tan(d*x+c)/a^4/d+21/2*sec(d*x+c)*tan(
d*x+c)/a^4/d-43/35*sec(d*x+c)*tan(d*x+c)/a^4/d/(1+cos(d*x+c))^2-288/35*sec(
d*x+c)*tan(d*x+c)/a^4/d/(1+cos(d*x+c))-1/7*sec(d*x+c)*tan(d*x+c)/d/(a+a*cos
(d*x+c))^4-2/5*sec(d*x+c)*tan(d*x+c)/a/d/(a+a*cos(d*x+c))^3
```

Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 185, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used

$= \{2845, 3057, 2827, 3853, 3855, 3852, 8\}$

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{21\operatorname{arctanh}(\sin(c+dx))}{2a^4d} - \frac{576\tan(c+dx)}{35a^4d} + \frac{21\tan(c+dx)\sec(c+dx)}{2a^4d} - \frac{288\tan(c+dx)\sec(c+dx)}{35a^4d(\cos(c+dx)+1)} - \frac{43\tan(c+dx)\sec(c+dx)}{35a^4d(\cos(c+dx)+1)^2} - \frac{2\tan(c+dx)\sec(c+dx)}{5ad(a\cos(c+dx)+a)^3} - \frac{\tan(c+dx)\sec(c+dx)}{7d(a\cos(c+dx)+a)^4}$$

```
[In] Int[Sec[c + d*x]^3/(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (21*ArcTanh[Sin[c + d*x]])/(2*a^4*d) - (576*Tan[c + d*x])/(35*a^4*d) + (21*
Sec[c + d*x]*Tan[c + d*x])/(2*a^4*d) - (43*Sec[c + d*x]*Tan[c + d*x])/(35*a
^4*d*(1 + Cos[c + d*x])^2) - (288*Sec[c + d*x]*Tan[c + d*x])/(35*a^4*d*(1 +
 Cos[c + d*x])) - (Sec[c + d*x]*Tan[c + d*x])/(7*d*(a + a*Cos[c + d*x])^4)
- (2*Sec[c + d*x]*Tan[c + d*x])/(5*a*d*(a + a*Cos[c + d*x])^3)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
```

```
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = -\frac{\sec(c+dx)\tan(c+dx)}{7d(a+a\cos(c+dx))^4}+\frac{\int\frac{(9a-5a\cos(c+dx))\sec^3(c+dx)}{(a+a\cos(c+dx))^3}\,dx}{7a^2}$$

$$=-\frac{\sec(c+dx)\tan(c+dx)}{7d(a+a\cos(c+dx))^4}-\frac{2\sec(c+dx)\tan(c+dx)}{5ad(a+a\cos(c+dx))^3}+\frac{\int\frac{(73a^2-56a^2\cos(c+dx))\sec^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx}{35a^4}$$

$$=-\frac{43\sec(c+dx)\tan(c+dx)}{35a^4d(1+\cos(c+dx))^2}-\frac{\sec(c+dx)\tan(c+dx)}{7d(a+a\cos(c+dx))^4}-\frac{2\sec(c+dx)\tan(c+dx)}{5ad(a+a\cos(c+dx))^3}+\frac{\int\frac{(477a^3-387a^3\cos(c+dx))\sec^3(c+dx)}{a+a\cos(c+dx)}\,dx}{105a^6}$$

$$=-\frac{43\sec(c+dx)\tan(c+dx)}{35a^4d(1+\cos(c+dx))^2}-\frac{\sec(c+dx)\tan(c+dx)}{7d(a+a\cos(c+dx))^4}-\frac{2\sec(c+dx)\tan(c+dx)}{5ad(a+a\cos(c+dx))^3}-\frac{288\sec(c+dx)\tan(c+dx)}{35d\,(a^4+a^4\cos(c+dx))}+\frac{\int(2205a^4-1728a^4\cos(c+dx))\sec^3(c+dx)\,dx}{105a^8}$$

$$=-\frac{43\sec(c+dx)\tan(c+dx)}{35a^4d(1+\cos(c+dx))^2}-\frac{\sec(c+dx)\tan(c+dx)}{7d(a+a\cos(c+dx))^4}-\frac{2\sec(c+dx)\tan(c+dx)}{5ad(a+a\cos(c+dx))^3}-\frac{288\sec(c+dx)\tan(c+dx)}{35d\,(a^4+a^4\cos(c+dx))}-\frac{576\int\sec^2(c+dx)\,dx}{35a^4}+\frac{21\int\sec^3(c+dx)\,dx}{a^4}$$

$$= \frac{21\sec(c+dx)\tan(c+dx)}{2a^4d} - \frac{43\sec(c+dx)\tan(c+dx)}{35a^4d(1+\cos(c+dx))^2} - \frac{\sec(c+dx)\tan(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{2\sec(c+dx)\tan(c+dx)}{5ad(a+a\cos(c+dx))^3} - \frac{288\sec(c+dx)\tan(c+dx)}{35d(a^4+a^4\cos(c+dx))} + \frac{21\int\sec(c+dx)\,dx}{2a^4} + \frac{576\text{Subst}(\int 1\,dx, x, -\tan(c+dx))}{35a^4d}$$

$$= \frac{21\text{arctanh}(\sin(c+dx))}{2a^4d} - \frac{576\tan(c+dx)}{35a^4d} + \frac{21\sec(c+dx)\tan(c+dx)}{2a^4d} - \frac{43\sec(c+dx)\tan(c+dx)}{35a^4d(1+\cos(c+dx))^2} - \frac{\sec(c+dx)\tan(c+dx)}{7d(a+a\cos(c+dx))^4} - \frac{2\sec(c+dx)\tan(c+dx)}{5ad(a+a\cos(c+dx))^3} - \frac{288\sec(c+dx)\tan(c+dx)}{35d(a^4+a^4\cos(c+dx))}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 455 vs. 2(185) = 370.

Time = 6.78 (sec) , antiderivative size = 455, normalized size of antiderivative = 2.46

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{168\cos^8\left(\frac{c}{2}+\frac{dx}{2}\right)\log\left(\cos\left(\frac{c}{2}+\frac{dx}{2}\right)-\sin\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}{d(a+a\cos(c+dx))^4} + \frac{168\cos^8\left(\frac{c}{2}+\frac{dx}{2}\right)\log\left(\cos\left(\frac{c}{2}+\frac{dx}{2}\right)+\sin\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}{d(a+a\cos(c+dx))^4} + \frac{\cos\left(\frac{c}{2}+\frac{dx}{2}\right)\sec\left(\frac{c}{2}\right)\sec(c)\sec^2(c+dx)\left(24402\sin\left(\frac{dx}{2}\right)-55556\sin\left(\frac{3dx}{2}\right)+61054\sin\left(c-\frac{dx}{2}\right)-33614\text{si}\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^3/(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (-168*Cos[c/2 + (d*x)/2]^8*Log[Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2]])/(d
*(a + a*Cos[c + d*x])^4) + (168*Cos[c/2 + (d*x)/2]^8*Log[Cos[c/2 + (d*x)/2]
 + Sin[c/2 + (d*x)/2]])/(d*(a + a*Cos[c + d*x])^4) + (Cos[c/2 + (d*x)/2]*Se
c[c/2]*Sec[c]*Sec[c + d*x]^2*(24402*Sin[(d*x)/2] - 55556*Sin[(3*d*x)/2] + 6
1054*Sin[c - (d*x)/2] - 33614*Sin[c + (d*x)/2] + 51842*Sin[2*c + (d*x)/2] +
 12460*Sin[c + (3*d*x)/2] - 33716*Sin[2*c + (3*d*x)/2] + 34300*Sin[3*c + (3
*d*x)/2] - 39788*Sin[c + (5*d*x)/2] + 2940*Sin[2*c + (5*d*x)/2] - 26068*Sin
[3*c + (5*d*x)/2] + 16660*Sin[4*c + (5*d*x)/2] - 21351*Sin[2*c + (7*d*x)/2]
 - 1295*Sin[3*c + (7*d*x)/2] - 14911*Sin[4*c + (7*d*x)/2] + 5145*Sin[5*c +
(7*d*x)/2] - 7329*Sin[3*c + (9*d*x)/2] - 1225*Sin[4*c + (9*d*x)/2] - 5369*S
in[5*c + (9*d*x)/2] + 735*Sin[6*c + (9*d*x)/2] - 1152*Sin[4*c + (11*d*x)/2]
 - 280*Sin[5*c + (11*d*x)/2] - 872*Sin[6*c + (11*d*x)/2]))/(2240*d*(a + a*C
os[c + d*x])^4)
```

Maple [A] (verified)

Time = 1.27 (sec) , antiderivative size = 148, normalized size of antiderivative = 0.80

method	result
derivativedivides	$\frac{-\frac{\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{9\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-13\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-111\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{4}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^2}+\frac{36}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1}+84\ln\left(\right.}{8d\,a^4}$
default	$\frac{-\frac{\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{9\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-13\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-111\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{4}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^2}+\frac{36}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1}+84\ln\left(\right.}{8d\,a^4}$
parallelrisch	$\frac{(-23520\cos(2dx+2c)-23520)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+(23520\cos(2dx+2c)+23520)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-34168\tan\left(\frac{dx}{2}\right.}{2240a^4d(1+\cos(2}$
norman	$\frac{-\frac{167\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8da}+\frac{281\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8da}-\frac{217\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{20da}-\frac{167\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{140da}-\frac{53\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{280da}-\frac{\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)}{56da}}{\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2a^3}-$
risch	$-\frac{i\left(735\,e^{10i(dx+c)}+5145\,e^{9i(dx+c)}+16660\,e^{8i(dx+c)}+34300\,e^{7i(dx+c)}+51842\,e^{6i(dx+c)}+61054\,e^{5i(dx+c)}+55556\,e^{4i(dx\right.}{35d\,a^4\left(e^{2i(dx+c)}+1\right)^2\left(e^{i(dx+c)}+1\right)^7}$

```
[In] int(sec(d*x+c)^3/(a+cos(d*x+c)*a)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/8/d/a^4*(-1/7*tan(1/2*d*x+1/2*c)^7-9/5*tan(1/2*d*x+1/2*c)^5-13*tan(1/2*d*
x+1/2*c)^3-111*tan(1/2*d*x+1/2*c)-4/(tan(1/2*d*x+1/2*c)+1)^2+36/(tan(1/2*d*
x+1/2*c)+1)+84*ln(tan(1/2*d*x+1/2*c)+1)+4/(tan(1/2*d*x+1/2*c)-1)^2+36/(tan(
1/2*d*x+1/2*c)-1)-84*ln(tan(1/2*d*x+1/2*c)-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.35

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^4}\,dx$$
$$= \frac{735\left(\cos\left(dx+c\right)^6+4\,\cos\left(dx+c\right)^5+6\,\cos\left(dx+c\right)^4+4\,\cos\left(dx+c\right)^3+\cos\left(dx+c\right)^2\right)\log\left(\sin\left(dx+c\right)\right.}{}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/140*(735*(cos(d*x + c)^6 + 4*cos(d*x + c)^5 + 6*cos(d*x + c)^4 + 4*cos(d*
x + c)^3 + cos(d*x + c)^2)*log(sin(d*x + c) + 1) - 735*(cos(d*x + c)^6 + 4*
cos(d*x + c)^5 + 6*cos(d*x + c)^4 + 4*cos(d*x + c)^3 + cos(d*x + c)^2)*log(
-sin(d*x + c) + 1) - 2*(1152*cos(d*x + c)^5 + 3873*cos(d*x + c)^4 + 4548*co
s(d*x + c)^3 + 2012*cos(d*x + c)^2 + 140*cos(d*x + c) - 35)*sin(d*x + c))/(
a^4*d*cos(d*x + c)^6 + 4*a^4*d*cos(d*x + c)^5 + 6*a^4*d*cos(d*x + c)^4 + 4*
a^4*d*cos(d*x + c)^3 + a^4*d*cos(d*x + c)^2)
```

Sympy [F]

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{\int \frac{\sec^3(c+dx)}{\cos^4(c+dx)+4\cos^3(c+dx)+6\cos^2(c+dx)+4\cos(c+dx)+1}\,dx}{a^4}$$

```
[In] integrate(sec(d*x+c)**3/(a+a*cos(d*x+c))**4,x)
```

```
[Out] Integral(sec(c + d*x)**3/(cos(c + d*x)**4 + 4*cos(c + d*x)**3 + 6*cos(c + d
*x)**2 + 4*cos(c + d*x) + 1), x)/a**4
```

Maxima [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 231, normalized size of antiderivative = 1.25

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^4}\,dx = -\frac{\frac{280\left(\frac{7\sin(dx+c)}{\cos(dx+c)+1}-\frac{9\sin(dx+c)^3}{(\cos(dx+c)+1)^3}\right)}{a^4-\frac{2a^4\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{a^4\sin(dx+c)^4}{(\cos(dx+c)+1)^4}}+\frac{\frac{3885\sin(dx+c)}{\cos(dx+c)+1}+\frac{455\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{63\sin(dx+c)^5}{(\cos(dx+c)+1)^5}+\frac{5\sin(dx+c)^7}{(\cos(dx+c)+1)^7}}{a^4}-\frac{2940\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a^4}+\frac{2}{}}{280\,d}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] -1/280*(280*(7*sin(d*x + c)/(cos(d*x + c) + 1) - 9*sin(d*x + c)^3/(cos(d*x
+ c) + 1)^3)/(a^4 - 2*a^4*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + a^4*sin(d*x
 + c)^4/(cos(d*x + c) + 1)^4) + (3885*sin(d*x + c)/(cos(d*x + c) + 1) + 455
*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 63*sin(d*x + c)^5/(cos(d*x + c) + 1)
^5 + 5*sin(d*x + c)^7/(cos(d*x + c) + 1)^7)/a^4 - 2940*log(sin(d*x + c)/(co
s(d*x + c) + 1) + 1)/a^4 + 2940*log(sin(d*x + c)/(cos(d*x + c) + 1) - 1)/a^
4)/d
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 155, normalized size of antiderivative = 0.84

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{\frac{2940\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)}{a^4}-\frac{2940\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right)}{a^4}+\frac{280\left(9\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-7\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)^2a^4}-\frac{5a^{24}\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^7+63a}{}}{280\,d}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/280*(2940*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^4 - 2940*log(abs(tan(1/2*d
*x + 1/2*c) - 1))/a^4 + 280*(9*tan(1/2*d*x + 1/2*c)^3 - 7*tan(1/2*d*x + 1/2
*c))/((tan(1/2*d*x + 1/2*c)^2 - 1)^2*a^4) - (5*a^24*tan(1/2*d*x + 1/2*c)^7
+ 63*a^24*tan(1/2*d*x + 1/2*c)^5 + 455*a^24*tan(1/2*d*x + 1/2*c)^3 + 3885*a
^24*tan(1/2*d*x + 1/2*c))/a^28)/d
```

Mupad [B] (verification not implemented)

Time = 15.50 (sec) , antiderivative size = 160, normalized size of antiderivative = 0.86

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^4}\,dx = \frac{21\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}{a^4\,d} - \frac{9\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^5}{40\,a^4\,d} - \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^7}{56\,a^4\,d} - \frac{13\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^3}{8\,a^4\,d} - \frac{7\tan\left(\frac{c}{2}+\frac{dx}{2}\right)-9\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^3}{d\left(a^4\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^4-2\,a^4\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2+a^4\right)} - \frac{111\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{8\,a^4\,d}$$

```
[In] int(1/(cos(c + d*x)^3*(a + a*cos(c + d*x))^4),x)
```

```
[Out] (21*atanh(tan(c/2 + (d*x)/2)))/(a^4*d) - (9*tan(c/2 + (d*x)/2)^5)/(40*a^4*d
) - tan(c/2 + (d*x)/2)^7/(56*a^4*d) - (13*tan(c/2 + (d*x)/2)^3)/(8*a^4*d) -
 (7*tan(c/2 + (d*x)/2) - 9*tan(c/2 + (d*x)/2)^3)/(d*(a^4*tan(c/2 + (d*x)/2)
^4 - 2*a^4*tan(c/2 + (d*x)/2)^2 + a^4)) - (111*tan(c/2 + (d*x)/2))/(8*a^4*d
)
```

3.82 $\int \frac{\cos^7(c+dx)}{(a+a\cos(c+dx))^5}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 225

$$\int \frac{\cos^7(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{31x}{2a^5} - \frac{7664\sin(c+dx)}{315a^5d} + \frac{31\cos(c+dx)\sin(c+dx)}{2a^5d} - \frac{\cos^6(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{17\cos^5(c+dx)\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{28\cos^4(c+dx)\sin(c+dx)}{45a^2d(a+a\cos(c+dx))^3} - \frac{577\cos^3(c+dx)\sin(c+dx)}{315a^3d(a+a\cos(c+dx))^2} - \frac{3832\cos^2(c+dx)\sin(c+dx)}{315d\,(a^5+a^5\cos(c+dx))}$$

```
[Out] 31/2*x/a^5-7664/315*sin(d*x+c)/a^5/d+31/2*cos(d*x+c)*sin(d*x+c)/a^5/d-1/9*c
os(d*x+c)^6*sin(d*x+c)/d/(a+a*cos(d*x+c))^5-17/63*cos(d*x+c)^5*sin(d*x+c)/a
/d/(a+a*cos(d*x+c))^4-28/45*cos(d*x+c)^4*sin(d*x+c)/a^2/d/(a+a*cos(d*x+c))^
3-577/315*cos(d*x+c)^3*sin(d*x+c)/a^3/d/(a+a*cos(d*x+c))^2-3832/315*cos(d*x
+c)^2*sin(d*x+c)/d/(a^5+a^5*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.54 (sec) , antiderivative size = 225, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used

$= \{2844, 3056, 2813\}$

$$\int \frac{\cos^7(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{7664\sin(c+dx)}{315a^5d} - \frac{3832\sin(c+dx)\cos^2(c+dx)}{315d\,(a^5\cos(c+dx)+a^5)} + \frac{31\sin(c+dx)\cos(c+dx)}{2a^5d} + \frac{31x}{2a^5} - \frac{577\sin(c+dx)\cos^3(c+dx)}{315a^3d(a\cos(c+dx)+a)^2} - \frac{28\sin(c+dx)\cos^4(c+dx)}{45a^2d(a\cos(c+dx)+a)^3} - \frac{\sin(c+dx)\cos^6(c+dx)}{9d(a\cos(c+dx)+a)^5} - \frac{17\sin(c+dx)\cos^5(c+dx)}{63ad(a\cos(c+dx)+a)^4}$$

```
[In] Int[Cos[c + d*x]^7/(a + a*Cos[c + d*x])^5,x]
```

```
[Out] (31*x)/(2*a^5) - (7664*Sin[c + d*x])/(315*a^5*d) + (31*Cos[c + d*x]*Sin[c +
 d*x])/(2*a^5*d) - (Cos[c + d*x]^6*Sin[c + d*x])/(9*d*(a + a*Cos[c + d*x])^
5) - (17*Cos[c + d*x]^5*Sin[c + d*x])/(63*a*d*(a + a*Cos[c + d*x])^4) - (28
*Cos[c + d*x]^4*Sin[c + d*x])/(45*a^2*d*(a + a*Cos[c + d*x])^3) - (577*Cos[
c + d*x]^3*Sin[c + d*x])/(315*a^3*d*(a + a*Cos[c + d*x])^2) - (3832*Cos[c +
 d*x]^2*Sin[c + d*x])/(315*d*(a^5 + a^5*Cos[c + d*x]))
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
```

```
NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\text{integral} = -\frac{\cos^6(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{\int \frac{\cos^5(c+dx)(6a-11a\cos(c+dx))}{(a+a\cos(c+dx))^4}\,dx}{9a^2}$$

$$= -\frac{\cos^6(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{17\cos^5(c+dx)\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{\int \frac{\cos^4(c+dx)(85a^2-111a^2\cos(c+dx))}{(a+a\cos(c+dx))^3}\,dx}{63a^4}$$

$$= -\frac{\cos^6(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{17\cos^5(c+dx)\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{28\cos^4(c+dx)\sin(c+dx)}{45a^2d(a+a\cos(c+dx))^3} - \frac{\int \frac{\cos^3(c+dx)(784a^3-947a^3\cos(c+dx))}{(a+a\cos(c+dx))^2}\,dx}{315a^6}$$

$$= -\frac{\cos^6(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{17\cos^5(c+dx)\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{28\cos^4(c+dx)\sin(c+dx)}{45a^2d(a+a\cos(c+dx))^3} - \frac{577\cos^3(c+dx)\sin(c+dx)}{315a^3d(a+a\cos(c+dx))^2} - \frac{\int \frac{\cos^2(c+dx)(5193a^4-6303a^4\cos(c+dx))}{a+a\cos(c+dx)}\,dx}{945a^8}$$

$$= -\frac{\cos^6(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{17\cos^5(c+dx)\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{28\cos^4(c+dx)\sin(c+dx)}{45a^2d(a+a\cos(c+dx))^3} - \frac{577\cos^3(c+dx)\sin(c+dx)}{315a^3d(a+a\cos(c+dx))^2} - \frac{3832\cos^2(c+dx)\sin(c+dx)}{315d\,(a^5+a^5\cos(c+dx))} - \frac{\int \cos(c+dx)\,(22992a^5-29295a^5\cos(c+dx))\,dx}{945a^{10}}$$

$$= \frac{31x}{2a^5} - \frac{7664\sin(c+dx)}{315a^5d} + \frac{31\cos(c+dx)\sin(c+dx)}{2a^5d} - \frac{\cos^6(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{17\cos^5(c+dx)\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{28\cos^4(c+dx)\sin(c+dx)}{45a^2d(a+a\cos(c+dx))^3} - \frac{577\cos^3(c+dx)\sin(c+dx)}{315a^3d(a+a\cos(c+dx))^2} - \frac{3832\cos^2(c+dx)\sin(c+dx)}{315d\,(a^5+a^5\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 8.03 (sec) , antiderivative size = 143, normalized size of antiderivative = 0.64

$$\int \frac{\cos^7(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{\cos\left(\frac{1}{2}(c+dx)\right)\csc^{10}(c+dx)\sin^9\left(\frac{1}{2}(c+dx)\right)\left(984312+1035321\cos(c+dx)-484476\cos(2(c+dx))\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^7/(a + a*Cos[c + d*x])^5,x]
```

```
[Out] -1/1260*(Cos[(c + d*x)/2]*Csc[c + d*x]^10*Sin[(c + d*x)/2]^9*(984312 + 1035
321*Cos[c + d*x] - 484476*Cos[2*(c + d*x)] - 933309*Cos[3*(c + d*x)] - 4915
76*Cos[4*(c + d*x)] - 106807*Cos[5*(c + d*x)] - 3780*Cos[6*(c + d*x)] + 315
*Cos[7*(c + d*x)] + 9999360*ArcSin[Cos[c + d*x]]*Cos[(c + d*x)/2]^8*Sqrt[Si
n[c + d*x]^2]))/(a^5*d)
```

Maple [A] (verified)

Time = 1.00 (sec) , antiderivative size = 98, normalized size of antiderivative = 0.44

method	result
parallelrisch	$\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\cos(6dx+6c)-\frac{854012\cos(dx+c)}{63}-\frac{2250427\cos(2dx+2c)}{315}-\frac{143054\cos(3dx+3c)}{63}-\frac{113422\cos(4dx+4c)}{315}-10\cos(5dx\right.}{1024a^5d}$
derivativedivides	$\frac{-\frac{\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}+\frac{10\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{48\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+50\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-351\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{-176\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-}{\left(1+\tan^2\left(\frac{dx}{2}+\right.\right.}}{16d\,a^5}$
default	$\frac{-\frac{\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}+\frac{10\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{48\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+50\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-351\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{-176\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-}{\left(1+\tan^2\left(\frac{dx}{2}+\right.\right.}}{16d\,a^5}$
risch	$\frac{31x}{2a^5}-\frac{ie^{2i(dx+c)}}{8a^5d}+\frac{5ie^{i(dx+c)}}{2a^5d}-\frac{5ie^{-i(dx+c)}}{2a^5d}+\frac{ie^{-2i(dx+c)}}{8a^5d}-\frac{2i\left(11025\,e^{8i(dx+c)}+77175\,e^{7i(dx+c)}+247695\,e^{6i}\right.}{}$

```
[In] int(cos(d*x+c)^7/(a+cos(d*x+c)*a)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/1024*(tan(1/2*d*x+1/2*c)*(cos(6*d*x+6*c)-854012/63*cos(d*x+c)-2250427/315
*cos(2*d*x+2*c)-143054/63*cos(3*d*x+3*c)-113422/315*cos(4*d*x+4*c)-10*cos(5
*d*x+5*c)-2627186/315)*sec(1/2*d*x+1/2*c)^8+15872*d*x)/a^5/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 207, normalized size of antiderivative = 0.92

$$\int \frac{\cos^7(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{9765\,dx\cos\left(dx+c\right)^5+48825\,dx\cos\left(dx+c\right)^4+97650\,dx\cos\left(dx+c\right)^3+97650\,dx\cos\left(dx+c\right)^2+48825\,d}{630\,\left(a^5d\cos\left(dx+c\right)^5\right.}$$

```
[In] integrate(cos(d*x+c)^7/(a+a*cos(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/630*(9765*d*x*cos(d*x + c)^5 + 48825*d*x*cos(d*x + c)^4 + 97650*d*x*cos(d
*x + c)^3 + 97650*d*x*cos(d*x + c)^2 + 48825*d*x*cos(d*x + c) + 9765*d*x +
(315*cos(d*x + c)^6 - 1575*cos(d*x + c)^5 - 28828*cos(d*x + c)^4 - 87440*co
s(d*x + c)^3 - 112119*cos(d*x + c)^2 - 66875*cos(d*x + c) - 15328)*sin(d*x
+ c))/(a^5*d*cos(d*x + c)^5 + 5*a^5*d*cos(d*x + c)^4 + 10*a^5*d*cos(d*x + c
)^3 + 10*a^5*d*cos(d*x + c)^2 + 5*a^5*d*cos(d*x + c) + a^5*d)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 588 vs. 2(214) = 428.

Time = 19.70 (sec) , antiderivative size = 588, normalized size of antiderivative = 2.61

$$\int \frac{\cos^7(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \begin{cases} \frac{78120dx\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)}{5040a^5d\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)+10080a^5d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+5040a^5d} + \frac{156240dx\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)}{5040a^5d\tan^4\left(\frac{c}{2}+\frac{dx}{2}\right)+10080a^5d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+5040a^5d} + \frac{}{5040a^5d\tan^4\left(\frac{c}{2}\right.} \\ \frac{x\cos^7\left(c\right)}{\left(a\cos\left(c\right)+a\right)^5} \end{cases}$$

```
[In] integrate(cos(d*x+c)**7/(a+a*cos(d*x+c))**5,x)
```

```
[Out] Piecewise((78120*d*x*tan(c/2 + d*x/2)**4/(5040*a**5*d*tan(c/2 + d*x/2)**4 +
 10080*a**5*d*tan(c/2 + d*x/2)**2 + 5040*a**5*d) + 156240*d*x*tan(c/2 + d*x
/2)**2/(5040*a**5*d*tan(c/2 + d*x/2)**4 + 10080*a**5*d*tan(c/2 + d*x/2)**2
+ 5040*a**5*d) + 78120*d*x/(5040*a**5*d*tan(c/2 + d*x/2)**4 + 10080*a**5*d*
tan(c/2 + d*x/2)**2 + 5040*a**5*d) - 35*tan(c/2 + d*x/2)**13/(5040*a**5*d*t
an(c/2 + d*x/2)**4 + 10080*a**5*d*tan(c/2 + d*x/2)**2 + 5040*a**5*d) + 380*
tan(c/2 + d*x/2)**11/(5040*a**5*d*tan(c/2 + d*x/2)**4 + 10080*a**5*d*tan(c/
2 + d*x/2)**2 + 5040*a**5*d) - 2159*tan(c/2 + d*x/2)**9/(5040*a**5*d*tan(c/
2 + d*x/2)**4 + 10080*a**5*d*tan(c/2 + d*x/2)**2 + 5040*a**5*d) + 10152*tan
(c/2 + d*x/2)**7/(5040*a**5*d*tan(c/2 + d*x/2)**4 + 10080*a**5*d*tan(c/2 +
```

```
d*x/2)**2 + 5040*a**5*d) - 82089*tan(c/2 + d*x/2)**5/(5040*a**5*d*tan(c/2 +
 d*x/2)**4 + 10080*a**5*d*tan(c/2 + d*x/2)**2 + 5040*a**5*d) - 260820*tan(c
/2 + d*x/2)**3/(5040*a**5*d*tan(c/2 + d*x/2)**4 + 10080*a**5*d*tan(c/2 + d*
x/2)**2 + 5040*a**5*d) - 155925*tan(c/2 + d*x/2)/(5040*a**5*d*tan(c/2 + d*x
/2)**4 + 10080*a**5*d*tan(c/2 + d*x/2)**2 + 5040*a**5*d), Ne(d, 0)), (x*cos
(c)**7/(a*cos(c) + a)**5, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 224, normalized size of antiderivative = 1.00

$$\int \frac{\cos^7(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{\frac{5040\left(\frac{9\sin(dx+c)}{\cos(dx+c)+1}+\frac{11\sin(dx+c)^3}{(\cos(dx+c)+1)^3}\right)}{a^5+\frac{2a^5\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{a^5\sin(dx+c)^4}{(\cos(dx+c)+1)^4}}+\frac{\frac{110565\sin(dx+c)}{\cos(dx+c)+1}-\frac{15750\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{3024\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{450\sin(dx+c)^7}{(\cos(dx+c)+1)^7}+\frac{35\sin(dx+c)^9}{(\cos(dx+c)+1)^9}}{a^5}-\frac{156240\,a}{}}{5040\,d}$$

```
[In] integrate(cos(d*x+c)^7/(a+a*cos(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] -1/5040*(5040*(9*sin(d*x + c)/(cos(d*x + c) + 1) + 11*sin(d*x + c)^3/(cos(d
*x + c) + 1)^3)/(a^5 + 2*a^5*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + a^5*sin(
d*x + c)^4/(cos(d*x + c) + 1)^4) + (110565*sin(d*x + c)/(cos(d*x + c) + 1)
- 15750*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 3024*sin(d*x + c)^5/(cos(d*x
+ c) + 1)^5 - 450*sin(d*x + c)^7/(cos(d*x + c) + 1)^7 + 35*sin(d*x + c)^9/(
cos(d*x + c) + 1)^9)/a^5 - 156240*arctan(sin(d*x + c)/(cos(d*x + c) + 1))/a
^5)/d
```

Giac [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 145, normalized size of antiderivative = 0.64

$$\int \frac{\cos^7(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{\frac{78120\,(dx+c)}{a^5}-\frac{5040\left(11\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3+9\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2+1\right)^2a^5}-\frac{35a^{40}\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^9-450a^{40}\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^7+3024a^{40}\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5}{a^{45}}}{5040\,d}$$

```
[In] integrate(cos(d*x+c)^7/(a+a*cos(d*x+c))^5,x, algorithm="giac")
```

```
[Out] 1/5040*(78120*(d*x + c)/a^5 - 5040*(11*tan(1/2*d*x + 1/2*c)^3 + 9*tan(1/2*d
*x + 1/2*c))/((tan(1/2*d*x + 1/2*c)^2 + 1)^2*a^5) - (35*a^40*tan(1/2*d*x +
1/2*c)^9 - 450*a^40*tan(1/2*d*x + 1/2*c)^7 + 3024*a^40*tan(1/2*d*x + 1/2*c)
^5 - 15750*a^40*tan(1/2*d*x + 1/2*c)^3 + 110565*a^40*tan(1/2*d*x + 1/2*c))/
a^45)/d
```

Mupad [B] (verification not implemented)

Time = 15.43 (sec) , antiderivative size = 181, normalized size of antiderivative = 0.80

$$\int \frac{\cos^7(c+dx)}{(a+a\cos(c+dx))^5}\,dx =$$
$$-\frac{35\,\sin\left(\frac{c}{2}+\frac{dx}{2}\right)-590\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^2\,\sin\left(\frac{c}{2}+\frac{dx}{2}\right)+4584\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^4\,\sin\left(\frac{c}{2}+\frac{dx}{2}\right)-23288\cos\left(\frac{c}{2}+\frac{dx}{2}\right.}{}$$

```
[In] int(cos(c + d*x)^7/(a + a*cos(c + d*x))^5,x)
```

```
[Out] -(35*sin(c/2 + (d*x)/2) - 590*cos(c/2 + (d*x)/2)^2*sin(c/2 + (d*x)/2) + 458
4*cos(c/2 + (d*x)/2)^4*sin(c/2 + (d*x)/2) - 23288*cos(c/2 + (d*x)/2)^6*sin(
c/2 + (d*x)/2) + 129824*cos(c/2 + (d*x)/2)^8*sin(c/2 + (d*x)/2) + 55440*cos
(c/2 + (d*x)/2)^10*sin(c/2 + (d*x)/2) - 10080*cos(c/2 + (d*x)/2)^12*sin(c/2
 + (d*x)/2) - 78120*cos(c/2 + (d*x)/2)^9*(c + d*x))/(5040*a^5*d*cos(c/2 + (
d*x)/2)^9)
```

3.83 $\int \frac{\cos^6(c+dx)}{(a+a\cos(c+dx))^5}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 191

$$\begin{aligned}\int \frac{\cos^6(c+dx)}{(a+a\cos(c+dx))^5}\,dx =& -\frac{5x}{a^5}+\frac{181\sin(c+dx)}{63a^5d}-\frac{\cos^5(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5}\\ &-\frac{5\cos^4(c+dx)\sin(c+dx)}{21ad(a+a\cos(c+dx))^4}-\frac{29\cos^3(c+dx)\sin(c+dx)}{63a^2d(a+a\cos(c+dx))^3}\\ &-\frac{67\cos^2(c+dx)\sin(c+dx)}{63a^3d(a+a\cos(c+dx))^2}+\frac{5\sin(c+dx)}{d\,(a^5+a^5\cos(c+dx))}\end{aligned}$$

```
[Out] -5*x/a^5+181/63*sin(d*x+c)/a^5/d-1/9*cos(d*x+c)^5*sin(d*x+c)/d/(a+a*cos(d*x
+c))^5-5/21*cos(d*x+c)^4*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^4-29/63*cos(d*x+c)
^3*sin(d*x+c)/a^2/d/(a+a*cos(d*x+c))^3-67/63*cos(d*x+c)^2*sin(d*x+c)/a^3/d/
(a+a*cos(d*x+c))^2+5*sin(d*x+c)/d/(a^5+a^5*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.54 (sec) , antiderivative size = 191, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2844, 3056, 3047, 3102, 12, 2814, 2727}

$$\begin{aligned}\int \frac{\cos^6(c+dx)}{(a+a\cos(c+dx))^5}\,dx =& \frac{181\sin(c+dx)}{63a^5d}+\frac{5\sin(c+dx)}{d\,(a^5\cos(c+dx)+a^5)}-\frac{5x}{a^5}\\ &-\frac{67\sin(c+dx)\cos^2(c+dx)}{63a^3d(a\cos(c+dx)+a)^2}-\frac{29\sin(c+dx)\cos^3(c+dx)}{63a^2d(a\cos(c+dx)+a)^3}\\ &-\frac{\sin(c+dx)\cos^5(c+dx)}{9d(a\cos(c+dx)+a)^5}-\frac{5\sin(c+dx)\cos^4(c+dx)}{21ad(a\cos(c+dx)+a)^4}\end{aligned}$$

```
[In] Int[Cos[c + d*x]^6/(a + a*Cos[c + d*x])^5,x]
```

```
[Out] (-5*x)/a^5 + (181*Sin[c + d*x])/(63*a^5*d) - (Cos[c + d*x]^5*Sin[c + d*x])/
(9*d*(a + a*Cos[c + d*x])^5) - (5*Cos[c + d*x]^4*Sin[c + d*x])/(21*a*d*(a +
 a*Cos[c + d*x])^4) - (29*Cos[c + d*x]^3*Sin[c + d*x])/(63*a^2*d*(a + a*Cos
[c + d*x])^3) - (67*Cos[c + d*x]^2*Sin[c + d*x])/(63*a^3*d*(a + a*Cos[c + d
*x])^2) + (5*Sin[c + d*x])/(d*(a^5 + a^5*Cos[c + d*x]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
```

```
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\text{integral} = -\frac{\cos^5(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{\int \frac{\cos^4(c+dx)(5a-10a\cos(c+dx))}{(a+a\cos(c+dx))^4}\,dx}{9a^2}$$

$$= -\frac{\cos^5(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{5\cos^4(c+dx)\sin(c+dx)}{21ad(a+a\cos(c+dx))^4} - \frac{\int \frac{\cos^3(c+dx)(60a^2-85a^2\cos(c+dx))}{(a+a\cos(c+dx))^3}\,dx}{63a^4}$$

$$= -\frac{\cos^5(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{5\cos^4(c+dx)\sin(c+dx)}{21ad(a+a\cos(c+dx))^4} - \frac{29\cos^3(c+dx)\sin(c+dx)}{63a^2d(a+a\cos(c+dx))^3} - \frac{\int \frac{\cos^2(c+dx)(435a^3-570a^3\cos(c+dx))}{(a+a\cos(c+dx))^2}\,dx}{315a^6}$$

$$= -\frac{\cos^5(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{5\cos^4(c+dx)\sin(c+dx)}{21ad(a+a\cos(c+dx))^4} - \frac{29\cos^3(c+dx)\sin(c+dx)}{63a^2d(a+a\cos(c+dx))^3} - \frac{67\cos^2(c+dx)\sin(c+dx)}{63a^3d(a+a\cos(c+dx))^2} - \frac{\int \frac{\cos(c+dx)(2010a^4-2715a^4\cos(c+dx))}{a+a\cos(c+dx)}\,dx}{945a^8}$$

$$= -\frac{\cos^5(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{5\cos^4(c+dx)\sin(c+dx)}{21ad(a+a\cos(c+dx))^4} - \frac{29\cos^3(c+dx)\sin(c+dx)}{63a^2d(a+a\cos(c+dx))^3} - \frac{67\cos^2(c+dx)\sin(c+dx)}{63a^3d(a+a\cos(c+dx))^2} - \frac{\int \frac{2010a^4\cos(c+dx)-2715a^4\cos^2(c+dx)}{a+a\cos(c+dx)}\,dx}{945a^8}$$

$$
\begin{aligned}
&= \frac{181 \sin(c+dx)}{63a^5d} - \frac{\cos^5(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{5\cos^4(c+dx)\sin(c+dx)}{21ad(a+a\cos(c+dx))^4} \\
&\quad - \frac{29\cos^3(c+dx)\sin(c+dx)}{63a^2d(a+a\cos(c+dx))^3} - \frac{67\cos^2(c+dx)\sin(c+dx)}{63a^3d(a+a\cos(c+dx))^2} - \frac{\int \frac{4725a^5\cos(c+dx)}{a+a\cos(c+dx)}\,dx}{945a^9} \\
&= \frac{181 \sin(c+dx)}{63a^5d} - \frac{\cos^5(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{5\cos^4(c+dx)\sin(c+dx)}{21ad(a+a\cos(c+dx))^4} \\
&\quad - \frac{29\cos^3(c+dx)\sin(c+dx)}{63a^2d(a+a\cos(c+dx))^3} - \frac{67\cos^2(c+dx)\sin(c+dx)}{63a^3d(a+a\cos(c+dx))^2} - \frac{5\int \frac{\cos(c+dx)}{a+a\cos(c+dx)}\,dx}{a^4} \\
&= -\frac{5x}{a^5} + \frac{181 \sin(c+dx)}{63a^5d} - \frac{\cos^5(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{5\cos^4(c+dx)\sin(c+dx)}{21ad(a+a\cos(c+dx))^4} \\
&\quad - \frac{29\cos^3(c+dx)\sin(c+dx)}{63a^2d(a+a\cos(c+dx))^3} - \frac{67\cos^2(c+dx)\sin(c+dx)}{63a^3d(a+a\cos(c+dx))^2} + \frac{5\int \frac{1}{a+a\cos(c+dx)}\,dx}{a^4} \\
&= -\frac{5x}{a^5} + \frac{181 \sin(c+dx)}{63a^5d} - \frac{\cos^5(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{5\cos^4(c+dx)\sin(c+dx)}{21ad(a+a\cos(c+dx))^4} \\
&\quad - \frac{29\cos^3(c+dx)\sin(c+dx)}{63a^2d(a+a\cos(c+dx))^3} - \frac{67\cos^2(c+dx)\sin(c+dx)}{63a^3d(a+a\cos(c+dx))^2} + \frac{5\sin(c+dx)}{d\,(a^5+a^5\cos(c+dx))}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 7.98 (sec) , antiderivative size = 149, normalized size of antiderivative = 0.78

$$
\int \frac{\cos^6(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{2\cos\left(\frac{1}{2}(c+dx)\right)\sin^9\left(\frac{1}{2}(c+dx)\right)\left(161280\arcsin(\cos(c+dx))\cos^{10}\left(\frac{1}{2}(c+dx)\right)+(42676+69350\cos(c+\right.}{63a^5d(-1+\cos(c+dx))^4(}
$$

```
[In] Integrate[Cos[c + d*x]^6/(a + a*Cos[c + d*x])^5,x]
```

```
[Out] (2*Cos[(c + d*x)/2]*Sin[(c + d*x)/2]^9*(161280*ArcSin[Cos[c + d*x]]*Cos[(c
+ d*x)/2]^10 + (42676 + 69350*Cos[c + d*x] + 36632*Cos[2*(c + d*x)] + 11675
*Cos[3*(c + d*x)] + 1892*Cos[4*(c + d*x)] + 63*Cos[5*(c + d*x)])*Sqrt[Sin[c
 + d*x]^2]))/(63*a^5*d*(-1 + Cos[c + d*x])^4*(1 + Cos[c + d*x])^5*Sqrt[Sin[
c + d*x]^2])
```

Maple [A] (verified)

Time = 0.74 (sec) , antiderivative size = 88, normalized size of antiderivative = 0.46

method	result
parallelrisch	$\frac{34675\left(\cos(dx+c)+\frac{964\cos(2dx+2c)}{1825}+\frac{467\cos(3dx+3c)}{2774}+\frac{946\cos(4dx+4c)}{34675}+\frac{63\cos(5dx+5c)}{69350}+\frac{21338}{34675}\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sec^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8064}-$ … $/(a^5 d)$
derivativedivides	$\frac{\frac{\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}-\frac{8\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+6\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-24\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+129\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{32\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}-160\,\mathrm{arc}}{16d\,a^5}$
default	$\frac{\frac{\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}-\frac{8\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+6\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-24\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+129\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{32\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}-160\,\mathrm{arc}}{16d\,a^5}$
risch	$-\frac{5x}{a^5}-\frac{i\mathrm{e}^{i(dx+c)}}{2a^5d}+\frac{i\mathrm{e}^{-i(dx+c)}}{2a^5d}+\frac{2i\left(945\,\mathrm{e}^{8i(dx+c)}+6300\,\mathrm{e}^{7i(dx+c)}+19740\,\mathrm{e}^{6i(dx+c)}+36414\,\mathrm{e}^{5i(dx+c)}+43092\,\mathrm{e}^{4i(d}\right.}{63d\,a^5\left(\mathrm{e}^{i(dx+c)}+1\right)^9}$

```
[In] int(cos(d*x+c)^6/(a+cos(d*x+c)*a)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 5/8064*(6935*(cos(d*x+c)+964/1825*cos(2*d*x+2*c)+467/2774*cos(3*d*x+3*c)+94
6/34675*cos(4*d*x+4*c)+63/69350*cos(5*d*x+5*c)+21338/34675)*tan(1/2*d*x+1/2
*c)*sec(1/2*d*x+1/2*c)^8-8064*d*x)/a^5/d
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 198, normalized size of antiderivative = 1.04

$$\int \frac{\cos^6(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{315\,dx\cos(dx+c)^5+1575\,dx\cos(dx+c)^4+3150\,dx\cos(dx+c)^3+3150\,dx\cos(dx+c)^2+1575\,dx\,\cdots}{63\left(a^5d\cos(dx+c)^5+5\,a^5d\cos(dx\cdots\right)}$$

```
[In] integrate(cos(d*x+c)^6/(a+a*cos(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] -1/63*(315*d*x*cos(d*x + c)^5 + 1575*d*x*cos(d*x + c)^4 + 3150*d*x*cos(d*x
+ c)^3 + 3150*d*x*cos(d*x + c)^2 + 1575*d*x*cos(d*x + c) + 315*d*x - (63*co
s(d*x + c)^5 + 946*cos(d*x + c)^4 + 2840*cos(d*x + c)^3 + 3633*cos(d*x + c)
^2 + 2165*cos(d*x + c) + 496)*sin(d*x + c))/(a^5*d*cos(d*x + c)^5 + 5*a^5*d
*cos(d*x + c)^4 + 10*a^5*d*cos(d*x + c)^3 + 10*a^5*d*cos(d*x + c)^2 + 5*a^5
*d*cos(d*x + c) + a^5*d)
```

Sympy [A] (verification not implemented)

Time = 11.54 (sec) , antiderivative size = 320, normalized size of antiderivative = 1.68

$$\int \frac{\cos^6(c+dx)}{(a+a\cos(c+dx))^5}\,dx$$
$$= \begin{cases} -\frac{5040dx\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)}{1008a^5d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+1008a^5d} - \frac{5040dx}{1008a^5d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+1008a^5d} + \frac{7\tan^{11}\left(\frac{c}{2}+\frac{dx}{2}\right)}{1008a^5d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+1008a^5d} - \frac{65\tan^9\left(\frac{c}{2}+\frac{dx}{2}\right)}{1008a^5d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+100} \\ \frac{x\cos^6(c)}{(a\cos(c)+a)^5} \end{cases}$$

```
[In] integrate(cos(d*x+c)**6/(a+a*cos(d*x+c))**5,x)
```

```
[Out] Piecewise((-5040*d*x*tan(c/2 + d*x/2)**2/(1008*a**5*d*tan(c/2 + d*x/2)**2 +
 1008*a**5*d) - 5040*d*x/(1008*a**5*d*tan(c/2 + d*x/2)**2 + 1008*a**5*d) +
7*tan(c/2 + d*x/2)**11/(1008*a**5*d*tan(c/2 + d*x/2)**2 + 1008*a**5*d) - 65
*tan(c/2 + d*x/2)**9/(1008*a**5*d*tan(c/2 + d*x/2)**2 + 1008*a**5*d) + 306*
tan(c/2 + d*x/2)**7/(1008*a**5*d*tan(c/2 + d*x/2)**2 + 1008*a**5*d) - 1134*
tan(c/2 + d*x/2)**5/(1008*a**5*d*tan(c/2 + d*x/2)**2 + 1008*a**5*d) + 6615*
tan(c/2 + d*x/2)**3/(1008*a**5*d*tan(c/2 + d*x/2)**2 + 1008*a**5*d) + 10143
*tan(c/2 + d*x/2)/(1008*a**5*d*tan(c/2 + d*x/2)**2 + 1008*a**5*d), Ne(d, 0)
), (x*cos(c)**6/(a*cos(c) + a)**5, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 178, normalized size of antiderivative = 0.93

$$\int \frac{\cos^6(c+dx)}{(a+a\cos(c+dx))^5}\,dx$$
$$= \frac{\frac{2016\sin(dx+c)}{\left(a^5+\frac{a^5\sin(dx+c)^2}{(\cos(dx+c)+1)^2}\right)(\cos(dx+c)+1)} + \frac{\frac{8127\sin(dx+c)}{\cos(dx+c)+1} - \frac{1512\sin(dx+c)^3}{(\cos(dx+c)+1)^3} + \frac{378\sin(dx+c)^5}{(\cos(dx+c)+1)^5} - \frac{72\sin(dx+c)^7}{(\cos(dx+c)+1)^7} + \frac{7\sin(dx+c)^9}{(\cos(dx+c)+1)^9}}{a^5} - \frac{10080\arctan\left(\frac{\mathrm{si}}{\mathrm{cos}}\right.}{a^5}}{1008\,d}$$

```
[In] integrate(cos(d*x+c)^6/(a+a*cos(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] 1/1008*(2016*sin(d*x + c)/((a^5 + a^5*sin(d*x + c)^2/(cos(d*x + c) + 1)^2)*
(cos(d*x + c) + 1)) + (8127*sin(d*x + c)/(cos(d*x + c) + 1) - 1512*sin(d*x
+ c)^3/(cos(d*x + c) + 1)^3 + 378*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 72*
sin(d*x + c)^7/(cos(d*x + c) + 1)^7 + 7*sin(d*x + c)^9/(cos(d*x + c) + 1)^9
)/a^5 - 10080*arctan(sin(d*x + c)/(cos(d*x + c) + 1))/a^5)/d
```

Giac [A] (verification not implemented)

none

Time = 0.43 (sec) , antiderivative size = 129, normalized size of antiderivative = 0.68

$$\int \frac{\cos^6(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{\frac{5040\,(dx+c)}{a^5} - \frac{2016\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+1\right)a^5} - \frac{7\,a^{40}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^9 - 72\,a^{40}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7 + 378\,a^{40}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5 - 1512\,a^{40}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3 + 8127\,a^{40}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{a^{45}}}{1008\,d}$$

```
[In] integrate(cos(d*x+c)^6/(a+a*cos(d*x+c))^5,x, algorithm="giac")
```

```
[Out] -1/1008*(5040*(d*x + c)/a^5 - 2016*tan(1/2*d*x + 1/2*c)/((tan(1/2*d*x + 1/2
*c)^2 + 1)*a^5) - (7*a^40*tan(1/2*d*x + 1/2*c)^9 - 72*a^40*tan(1/2*d*x + 1/
2*c)^7 + 378*a^40*tan(1/2*d*x + 1/2*c)^5 - 1512*a^40*tan(1/2*d*x + 1/2*c)^3
 + 8127*a^40*tan(1/2*d*x + 1/2*c))/a^45)/d
```

Mupad [B] (verification not implemented)

Time = 15.06 (sec) , antiderivative size = 159, normalized size of antiderivative = 0.83

$$\int \frac{\cos^6(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{7\sin\left(\frac{c}{2}+\frac{dx}{2}\right) - 100\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^2\sin\left(\frac{c}{2}+\frac{dx}{2}\right) + 636\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^4\sin\left(\frac{c}{2}+\frac{dx}{2}\right) - 2512\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^6\sin\left(\frac{c}{2}+\frac{dx}{2}\right) + 10096\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^8\sin\left(\frac{c}{2}+\frac{dx}{2}\right) + 2016\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^{10}\sin\left(\frac{c}{2}+\frac{dx}{2}\right) - 5040\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^9(c+dx)}{1008\,a^5\,d\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^9}$$

```
[In] int(cos(c + d*x)^6/(a + a*cos(c + d*x))^5,x)
```

```
[Out] (7*sin(c/2 + (d*x)/2) - 100*cos(c/2 + (d*x)/2)^2*sin(c/2 + (d*x)/2) + 636*c
os(c/2 + (d*x)/2)^4*sin(c/2 + (d*x)/2) - 2512*cos(c/2 + (d*x)/2)^6*sin(c/2
+ (d*x)/2) + 10096*cos(c/2 + (d*x)/2)^8*sin(c/2 + (d*x)/2) + 2016*cos(c/2 +
 (d*x)/2)^10*sin(c/2 + (d*x)/2) - 5040*cos(c/2 + (d*x)/2)^9*(c + d*x))/(100
8*a^5*d*cos(c/2 + (d*x)/2)^9)
```

3.84 $\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^5}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 168

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{x}{a^5} - \frac{\cos^4(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{13\cos^3(c+dx)\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{34\cos^2(c+dx)\sin(c+dx)}{105a^2d(a+a\cos(c+dx))^3} + \frac{173\sin(c+dx)}{315a^3d(a+a\cos(c+dx))^2} - \frac{661\sin(c+dx)}{315d\,(a^5+a^5\cos(c+dx))}$$

```
[Out] x/a^5-1/9*cos(d*x+c)^4*sin(d*x+c)/d/(a+a*cos(d*x+c))^5-13/63*cos(d*x+c)^3*s
in(d*x+c)/a/d/(a+a*cos(d*x+c))^4-34/105*cos(d*x+c)^2*sin(d*x+c)/a^2/d/(a+a*
cos(d*x+c))^3+173/315*sin(d*x+c)/a^3/d/(a+a*cos(d*x+c))^2-661/315*sin(d*x+c
)/d/(a^5+a^5*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2844, 3056, 3047, 3098, 2814, 2727}

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{661\sin(c+dx)}{315d\,(a^5\cos(c+dx)+a^5)} + \frac{x}{a^5} + \frac{173\sin(c+dx)}{315a^3d(a\cos(c+dx)+a)^2} - \frac{34\sin(c+dx)\cos^2(c+dx)}{105a^2d(a\cos(c+dx)+a)^3} - \frac{\sin(c+dx)\cos^4(c+dx)}{9d(a\cos(c+dx)+a)^5} - \frac{13\sin(c+dx)\cos^3(c+dx)}{63ad(a\cos(c+dx)+a)^4}$$

```
[In] Int[Cos[c + d*x]^5/(a + a*Cos[c + d*x])^5,x]
```

```
[Out] x/a^5 - (Cos[c + d*x]^4*Sin[c + d*x])/(9*d*(a + a*Cos[c + d*x])^5) - (13*Co
s[c + d*x]^3*Sin[c + d*x])/(63*a*d*(a + a*Cos[c + d*x])^4) - (34*Cos[c + d*
x]^2*Sin[c + d*x])/(105*a^2*d*(a + a*Cos[c + d*x])^3) + (173*Sin[c + d*x])/
(315*a^3*d*(a + a*Cos[c + d*x])^2) - (661*Sin[c + d*x])/(315*d*(a^5 + a^5*C
os[c + d*x]))
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
```

```
egerQ[2*n] || EqQ[c, 0])
```

Rule 3098

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(A*b - a*
B + b*C)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(a*f*(2*m + 1))), x] + Dist[1
/(a^2*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[a*A*(m + 1) + m*(b*
B - a*C) + b*C*(2*m + 1)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A,
B, C}, x] && LtQ[m, -1] && EqQ[a^2 - b^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^4(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{\int \frac{\cos^3(c+dx)(4a-9a\cos(c+dx))}{(a+a\cos(c+dx))^4}\,dx}{9a^2} \\
&= -\frac{\cos^4(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{13\cos^3(c+dx)\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{\int \frac{\cos^2(c+dx)(39a^2-63a^2\cos(c+dx))}{(a+a\cos(c+dx))^3}\,dx}{63a^4} \\
&= -\frac{\cos^4(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{13\cos^3(c+dx)\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} \\
&\quad - \frac{34\cos^2(c+dx)\sin(c+dx)}{105a^2d(a+a\cos(c+dx))^3} - \frac{\int \frac{\cos(c+dx)(204a^3-315a^3\cos(c+dx))}{(a+a\cos(c+dx))^2}\,dx}{315a^6} \\
&= -\frac{\cos^4(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{13\cos^3(c+dx)\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} \\
&\quad - \frac{34\cos^2(c+dx)\sin(c+dx)}{105a^2d(a+a\cos(c+dx))^3} - \frac{\int \frac{204a^3\cos(c+dx)-315a^3\cos^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx}{315a^6} \\
&= -\frac{\cos^4(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{13\cos^3(c+dx)\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} \\
&\quad - \frac{34\cos^2(c+dx)\sin(c+dx)}{105a^2d(a+a\cos(c+dx))^3} \\
&\quad + \frac{173\sin(c+dx)}{315a^3d(a+a\cos(c+dx))^2} + \frac{\int \frac{-1038a^4+945a^4\cos(c+dx)}{a+a\cos(c+dx)}\,dx}{945a^8} \\
&= \frac{x}{a^5} - \frac{\cos^4(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{13\cos^3(c+dx)\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} \\
&\quad - \frac{34\cos^2(c+dx)\sin(c+dx)}{105a^2d(a+a\cos(c+dx))^3} + \frac{173\sin(c+dx)}{315a^3d(a+a\cos(c+dx))^2} - \frac{661\int \frac{1}{a+a\cos(c+dx)}\,dx}{315a^4}
\end{aligned}$$

$$= \frac{x}{a^5} - \frac{\cos^4(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{13\cos^3(c+dx)\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{34\cos^2(c+dx)\sin(c+dx)}{105a^2d(a+a\cos(c+dx))^3} + \frac{173\sin(c+dx)}{315a^3d(a+a\cos(c+dx))^2} - \frac{661\sin(c+dx)}{315d\,(a^5+a^5\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 7.12 (sec) , antiderivative size = 127, normalized size of antiderivative = 0.76

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{8\cos\left(\frac{1}{2}(c+dx)\right)\csc^{10}(c+dx)\sin^{11}\left(\frac{1}{2}(c+dx)\right)\left(80640\arcsin(\cos(c+dx))\cos^{10}\left(\frac{1}{2}(c+dx)\right)+(20689\right.}{315a^5d\sqrt{}}$$

```
[In] Integrate[Cos[c + d*x]^5/(a + a*Cos[c + d*x])^5,x]
```

```
[Out] (-8*Cos[(c + d*x)/2]*Csc[c + d*x]^10*Sin[(c + d*x)/2]^11*(80640*ArcSin[Cos[
c + d*x]]*Cos[(c + d*x)/2]^10 + (20689 + 33440*Cos[c + d*x] + 17648*Cos[2*(
c + d*x)] + 5480*Cos[3*(c + d*x)] + 863*Cos[4*(c + d*x)])*Sqrt[Sin[c + d*x]
^2]))/(315*a^5*d*Sqrt[Sin[c + d*x]^2])
```

Maple [A] (verified)

Time = 0.71 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.46

method	result
parallelrisch	$\frac{-35\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+270\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1008\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+2730\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+5040dx-9765\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{5040a^5d}$
derivativedivides	$\frac{-\frac{\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}+\frac{6\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{16\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\frac{26\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-31\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+32\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{16d\,a^5}$
default	$\frac{-\frac{\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}+\frac{6\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{16\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\frac{26\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-31\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+32\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{16d\,a^5}$
risch	$\frac{x}{a^5}-\frac{2i\left(1575\,e^{8i(dx+c)}+9450\,e^{7i(dx+c)}+28350\,e^{6i(dx+c)}+50400\,e^{5i(dx+c)}+58338\,e^{4i(dx+c)}+44142\,e^{3i(dx+c)}+21618\,e\right.}{315d\,a^5\left(e^{i(dx+c)}+1\right)^9}$

```
[In] int(cos(d*x+c)^5/(a+cos(d*x+c)*a)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/5040*(-35*tan(1/2*d*x+1/2*c)^9+270*tan(1/2*d*x+1/2*c)^7-1008*tan(1/2*d*x+
1/2*c)^5+2730*tan(1/2*d*x+1/2*c)^3+5040*d*x-9765*tan(1/2*d*x+1/2*c))/a^5/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 188, normalized size of antiderivative = 1.12

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^5}\,dx$$
$$= \frac{315\,dx\cos{(dx+c)}^5 + 1575\,dx\cos{(dx+c)}^4 + 3150\,dx\cos{(dx+c)}^3 + 3150\,dx\cos{(dx+c)}^2 + 1575\,dx\cos{(}}{315\,\left(a^5d\cos{(dx+c)}^5 + 5\,a^5d\cos{(dx+c)}^4 + 10\,a^5}$$

```
[In] integrate(cos(d*x+c)^5/(a+a*cos(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/315*(315*d*x*cos(d*x + c)^5 + 1575*d*x*cos(d*x + c)^4 + 3150*d*x*cos(d*x
+ c)^3 + 3150*d*x*cos(d*x + c)^2 + 1575*d*x*cos(d*x + c) + 315*d*x - (863*c
os(d*x + c)^4 + 2740*cos(d*x + c)^3 + 3549*cos(d*x + c)^2 + 2125*cos(d*x +
c) + 488)*sin(d*x + c))/(a^5*d*cos(d*x + c)^5 + 5*a^5*d*cos(d*x + c)^4 + 10
*a^5*d*cos(d*x + c)^3 + 10*a^5*d*cos(d*x + c)^2 + 5*a^5*d*cos(d*x + c) + a^
5*d)
```

Sympy [A] (verification not implemented)

Time = 7.07 (sec) , antiderivative size = 116, normalized size of antiderivative = 0.69

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^5}\,dx$$
$$= \begin{cases} \frac{x}{a^5} - \frac{\tan^9\left(\frac{c}{2}+\frac{dx}{2}\right)}{144a^5d} + \frac{3\tan^7\left(\frac{c}{2}+\frac{dx}{2}\right)}{56a^5d} - \frac{\tan^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{5a^5d} + \frac{13\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{24a^5d} - \frac{31\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{16a^5d} & \text{for } d \neq 0 \\ \frac{x\cos^5(c)}{(a\cos(c)+a)^5} & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)**5/(a+a*cos(d*x+c))**5,x)
```

```
[Out] Piecewise((x/a**5 - tan(c/2 + d*x/2)**9/(144*a**5*d) + 3*tan(c/2 + d*x/2)**
7/(56*a**5*d) - tan(c/2 + d*x/2)**5/(5*a**5*d) + 13*tan(c/2 + d*x/2)**3/(24
*a**5*d) - 31*tan(c/2 + d*x/2)/(16*a**5*d), Ne(d, 0)), (x*cos(c)**5/(a*cos(
c) + a)**5, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 132, normalized size of antiderivative = 0.79

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{\frac{\frac{9765\sin(dx+c)}{\cos(dx+c)+1}-\frac{2730\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{1008\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{270\sin(dx+c)^7}{(\cos(dx+c)+1)^7}+\frac{35\sin(dx+c)^9}{(\cos(dx+c)+1)^9}}{a^5}-\frac{10080\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{a^5}}{5040\,d}$$

```
[In] integrate(cos(d*x+c)^5/(a+a*cos(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] -1/5040*((9765*sin(d*x + c)/(cos(d*x + c) + 1) - 2730*sin(d*x + c)^3/(cos(d
*x + c) + 1)^3 + 1008*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 270*sin(d*x + c
)^7/(cos(d*x + c) + 1)^7 + 35*sin(d*x + c)^9/(cos(d*x + c) + 1)^9)/a^5 - 10
080*arctan(sin(d*x + c)/(cos(d*x + c) + 1))/a^5)/d
```

Giac [A] (verification not implemented)

none

Time = 0.42 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.60

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{\frac{5040\,(dx+c)}{a^5}-\frac{35\,a^{40}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^9-270\,a^{40}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7+1008\,a^{40}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-2730\,a^{40}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+9765\,a^{40}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right.}{a^{45}}}{5040\,d}$$

```
[In] integrate(cos(d*x+c)^5/(a+a*cos(d*x+c))^5,x, algorithm="giac")
```

```
[Out] 1/5040*(5040*(d*x + c)/a^5 - (35*a^40*tan(1/2*d*x + 1/2*c)^9 - 270*a^40*tan
(1/2*d*x + 1/2*c)^7 + 1008*a^40*tan(1/2*d*x + 1/2*c)^5 - 2730*a^40*tan(1/2*
d*x + 1/2*c)^3 + 9765*a^40*tan(1/2*d*x + 1/2*c))/a^45)/d
```

Mupad [B] (verification not implemented)

Time = 14.85 (sec) , antiderivative size = 125, normalized size of antiderivative = 0.74

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{x}{a^5} - \frac{\frac{863\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8}{315}-\frac{356\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6}{315}+\frac{169\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4}{420}-\frac{41\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2}{504}+}{a^5\,d\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9}$$

```
[In] int(cos(c + d*x)^5/(a + a*cos(c + d*x))^5,x)
```

```
[Out] x/a^5 - (sin(c/2 + (d*x)/2)/144 - (41*cos(c/2 + (d*x)/2)^2*sin(c/2 + (d*x)/
2))/504 + (169*cos(c/2 + (d*x)/2)^4*sin(c/2 + (d*x)/2))/420 - (356*cos(c/2
+ (d*x)/2)^6*sin(c/2 + (d*x)/2))/315 + (863*cos(c/2 + (d*x)/2)^8*sin(c/2 +
(d*x)/2))/315)/(a^5*d*cos(c/2 + (d*x)/2)^9)
```

3.85 $\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^5}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 155

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{\cos^3(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{11\cos^2(c+dx)\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} + \frac{67\sin(c+dx)}{315a^2d(a+a\cos(c+dx))^3} - \frac{142\sin(c+dx)}{315a^3d(a+a\cos(c+dx))^2} + \frac{83\sin(c+dx)}{315d\,(a^5+a^5\cos(c+dx))}$$

```
[Out] -1/9*cos(d*x+c)^3*sin(d*x+c)/d/(a+a*cos(d*x+c))^5-11/63*cos(d*x+c)^2*sin(d*
x+c)/a/d/(a+a*cos(d*x+c))^4+67/315*sin(d*x+c)/a^2/d/(a+a*cos(d*x+c))^3-142/
315*sin(d*x+c)/a^3/d/(a+a*cos(d*x+c))^2+83/315*sin(d*x+c)/d/(a^5+a^5*cos(d*
x+c))
```

Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 155, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {2844, 3056, 3047, 3098, 2829, 2727}

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{83\sin(c+dx)}{315d\,(a^5\cos(c+dx)+a^5)} - \frac{142\sin(c+dx)}{315a^3d(a\cos(c+dx)+a)^2} + \frac{67\sin(c+dx)}{315a^2d(a\cos(c+dx)+a)^3} - \frac{\sin(c+dx)\cos^3(c+dx)}{9d(a\cos(c+dx)+a)^5} - \frac{11\sin(c+dx)\cos^2(c+dx)}{63ad(a\cos(c+dx)+a)^4}$$

```
[In] Int[Cos[c + d*x]^4/(a + a*Cos[c + d*x])^5,x]
```

```
[Out] -1/9*(Cos[c + d*x]^3*Sin[c + d*x])/(d*(a + a*Cos[c + d*x])^5) - (11*Cos[c +
 d*x]^2*Sin[c + d*x])/(63*a*d*(a + a*Cos[c + d*x])^4) + (67*Sin[c + d*x])/(
315*a^2*d*(a + a*Cos[c + d*x])^3) - (142*Sin[c + d*x])/(315*a^3*d*(a + a*Co
s[c + d*x])^2) + (83*Sin[c + d*x])/(315*d*(a^5 + a^5*Cos[c + d*x]))
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2829

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((a + b*Sin[e + f*
x])^m/(a*f*(2*m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(a*b*(2*m + 1)), In
t[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && N
eQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
```

```
egerQ[2*n] || EqQ[c, 0])
```

Rule 3098

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(A*b - a*
B + b*C)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(a*f*(2*m + 1))), x] + Dist[1
/(a^2*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[a*A*(m + 1) + m*(b*
B - a*C) + b*C*(2*m + 1)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A,
B, C}, x] && LtQ[m, -1] && EqQ[a^2 - b^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\cos^3(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5}-\frac{\int \frac{\cos^2(c+dx)(3a-8a\cos(c+dx))}{(a+a\cos(c+dx))^4}\,dx}{9a^2}\\
&= -\frac{\cos^3(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5}-\frac{11\cos^2(c+dx)\sin(c+dx)}{63ad(a+a\cos(c+dx))^4}-\frac{\int \frac{\cos(c+dx)\left(22a^2-45a^2\cos(c+dx)\right)}{(a+a\cos(c+dx))^3}\,dx}{63a^4}\\
&= -\frac{\cos^3(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5}-\frac{11\cos^2(c+dx)\sin(c+dx)}{63ad(a+a\cos(c+dx))^4}-\frac{\int \frac{22a^2\cos(c+dx)-45a^2\cos^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx}{63a^4}\\
&= -\frac{\cos^3(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5}-\frac{11\cos^2(c+dx)\sin(c+dx)}{63ad(a+a\cos(c+dx))^4}\\
&\quad+\frac{67\sin(c+dx)}{315a^2d(a+a\cos(c+dx))^3}+\frac{\int \frac{-201a^3+225a^3\cos(c+dx)}{(a+a\cos(c+dx))^2}\,dx}{315a^6}\\
&= -\frac{\cos^3(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5}-\frac{11\cos^2(c+dx)\sin(c+dx)}{63ad(a+a\cos(c+dx))^4}\\
&\quad+\frac{67\sin(c+dx)}{315a^2d(a+a\cos(c+dx))^3}-\frac{142\sin(c+dx)}{315a^3d(a+a\cos(c+dx))^2}+\frac{83\int \frac{1}{a+a\cos(c+dx)}\,dx}{315a^4}\\
&= -\frac{\cos^3(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5}-\frac{11\cos^2(c+dx)\sin(c+dx)}{63ad(a+a\cos(c+dx))^4}\\
&\quad+\frac{67\sin(c+dx)}{315a^2d(a+a\cos(c+dx))^3}\\
&\quad-\frac{142\sin(c+dx)}{315a^3d(a+a\cos(c+dx))^2}+\frac{83\sin(c+dx)}{315d\left(a^5+a^5\cos(c+dx)\right)}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 2.74 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.43

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{(8+40\cos(c+dx)+84\cos^2(c+dx)+100\cos^3(c+dx)+83\cos^4(c+dx))\sin(c+dx)}{315a^5d(1+\cos(c+dx))^5}$$

```
[In] Integrate[Cos[c + d*x]^4/(a + a*Cos[c + d*x])^5,x]
```

```
[Out] ((8 + 40*Cos[c + d*x] + 84*Cos[c + d*x]^2 + 100*Cos[c + d*x]^3 + 83*Cos[c +
 d*x]^4)*Sin[c + d*x])/(315*a^5*d*(1 + Cos[c + d*x])^5)
```

Maple [A] (verified)

Time = 0.74 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.46

method	result
derivativedivides	$\frac{\frac{\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}-\frac{4\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+\frac{6\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-\frac{4\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{16d\,a^5}$
default	$\frac{\frac{\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}-\frac{4\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+\frac{6\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-\frac{4\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{16d\,a^5}$
parallelrisch	$\frac{35\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-180\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+378\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-420\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+315\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{5040a^5d}$
risch	$\frac{2i(315\,e^{8i(dx+c)}+1260\,e^{7i(dx+c)}+3360\,e^{6i(dx+c)}+5040\,e^{5i(dx+c)}+5418\,e^{4i(dx+c)}+3612\,e^{3i(dx+c)}+1728\,e^{2i(dx+c)}+432\,e^{i}}{315d\,a^5\left(e^{i(dx+c)}+1\right)^9}$
norman	$\frac{\frac{\tan^{17}\left(\frac{dx}{2}+\frac{c}{2}\right)}{144ad}+\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{16da}+\frac{\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)}{6da}+\frac{7\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{60da}+\frac{\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)}{70da}+\frac{109\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2520da}+\frac{19\left(\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{630da}-\frac{11}{}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^4a^4}$

```
[In] int(cos(d*x+c)^4/(a+cos(d*x+c)*a)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/16/d/a^5*(1/9*tan(1/2*d*x+1/2*c)^9-4/7*tan(1/2*d*x+1/2*c)^7+6/5*tan(1/2*d
*x+1/2*c)^5-4/3*tan(1/2*d*x+1/2*c)^3+tan(1/2*d*x+1/2*c))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 123, normalized size of antiderivative = 0.79

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{\left(83\,\cos\left(dx+c\right)^4+100\,\cos\left(dx+c\right)^3+84\,\cos\left(dx+c\right)^2+40\,\cos\left(dx+c\right)+8\right)\sin\left(dx+c\right)}{315\,\left(a^5d\cos\left(dx+c\right)^5+5\,a^5d\cos\left(dx+c\right)^4+10\,a^5d\cos\left(dx+c\right)^3+10\,a^5d\cos\left(dx+c\right)^2+5\,a^5d\cos\left(dx+\right.\right.}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/315*(83*cos(d*x + c)^4 + 100*cos(d*x + c)^3 + 84*cos(d*x + c)^2 + 40*cos(
d*x + c) + 8)*sin(d*x + c)/(a^5*d*cos(d*x + c)^5 + 5*a^5*d*cos(d*x + c)^4 +
 10*a^5*d*cos(d*x + c)^3 + 10*a^5*d*cos(d*x + c)^2 + 5*a^5*d*cos(d*x + c) +
 a^5*d)
```

Sympy [A] (verification not implemented)

Time = 5.44 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.69

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \begin{cases} \frac{\tan^9\left(\frac{c}{2}+\frac{dx}{2}\right)}{144a^5d} - \frac{\tan^7\left(\frac{c}{2}+\frac{dx}{2}\right)}{28a^5d} + \frac{3\tan^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{40a^5d} - \frac{\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{12a^5d} + \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{16a^5d} & \text{for}\ d \neq 0 \\ \frac{x\cos^4\left(c\right)}{\left(a\cos\left(c\right)+a\right)^5} & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)**4/(a+a*cos(d*x+c))**5,x)
```

```
[Out] Piecewise((tan(c/2 + d*x/2)**9/(144*a**5*d) - tan(c/2 + d*x/2)**7/(28*a**5*
d) + 3*tan(c/2 + d*x/2)**5/(40*a**5*d) - tan(c/2 + d*x/2)**3/(12*a**5*d) +
tan(c/2 + d*x/2)/(16*a**5*d), Ne(d, 0)), (x*cos(c)**4/(a*cos(c) + a)**5, Tr
ue))
```

Maxima [A] (verification not implemented)

none

Time = 0.22 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.69

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{\frac{315\,\sin(dx+c)}{\cos(dx+c)+1} - \frac{420\,\sin(dx+c)^3}{(\cos(dx+c)+1)^3} + \frac{378\,\sin(dx+c)^5}{(\cos(dx+c)+1)^5} - \frac{180\,\sin(dx+c)^7}{(\cos(dx+c)+1)^7} + \frac{35\,\sin(dx+c)^9}{(\cos(dx+c)+1)^9}}{5040\,a^5d}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] 1/5040*(315*sin(d*x + c)/(cos(d*x + c) + 1) - 420*sin(d*x + c)^3/(cos(d*x +
 c) + 1)^3 + 378*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 180*sin(d*x + c)^7/(
cos(d*x + c) + 1)^7 + 35*sin(d*x + c)^9/(cos(d*x + c) + 1)^9)/(a^5*d)
```

Giac [A] (verification not implemented)

none

Time = 0.42 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.46

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{35\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^9-180\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7+378\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-420\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+315\,\tan\left(\frac{1}{2}\right.}{5040\,a^5d}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^5,x, algorithm="giac")
```

```
[Out] 1/5040*(35*tan(1/2*d*x + 1/2*c)^9 - 180*tan(1/2*d*x + 1/2*c)^7 + 378*tan(1/
2*d*x + 1/2*c)^5 - 420*tan(1/2*d*x + 1/2*c)^3 + 315*tan(1/2*d*x + 1/2*c))/(
a^5*d)
```

Mupad [B] (verification not implemented)

Time = 14.12 (sec) , antiderivative size = 127, normalized size of antiderivative = 0.82

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{\sin\left(\frac{c}{2}+\frac{dx}{2}\right)\,\left(315\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^8-420\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^6\sin\left(\frac{c}{2}+\frac{dx}{2}\right)^2+378\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^4\sin\left(\frac{c}{2}+\frac{dx}{2}\right)^4-180\right.}{5040\,a^5\,d\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^9}$$

```
[In] int(cos(c + d*x)^4/(a + a*cos(c + d*x))^5,x)
```

```
[Out] (sin(c/2 + (d*x)/2)*(315*cos(c/2 + (d*x)/2)^8 + 35*sin(c/2 + (d*x)/2)^8 - 1
80*cos(c/2 + (d*x)/2)^2*sin(c/2 + (d*x)/2)^6 + 378*cos(c/2 + (d*x)/2)^4*sin
(c/2 + (d*x)/2)^4 - 420*cos(c/2 + (d*x)/2)^6*sin(c/2 + (d*x)/2)^2))/(5040*a
^5*d*cos(c/2 + (d*x)/2)^9)
```

3.86 $\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^5}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 147

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{\cos^2(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} + \frac{\sin(c+dx)}{7ad(a+a\cos(c+dx))^4} - \frac{17\sin(c+dx)}{63a^2d(a+a\cos(c+dx))^3} + \frac{5\sin(c+dx)}{63a^3d(a+a\cos(c+dx))^2} + \frac{5\sin(c+dx)}{63d\,(a^5+a^5\cos(c+dx))}$$

```
[Out] -1/9*cos(d*x+c)^2*sin(d*x+c)/d/(a+a*cos(d*x+c))^5+1/7*sin(d*x+c)/a/d/(a+a*c
os(d*x+c))^4-17/63*sin(d*x+c)/a^2/d/(a+a*cos(d*x+c))^3+5/63*sin(d*x+c)/a^3/
d/(a+a*cos(d*x+c))^2+5/63*sin(d*x+c)/d/(a^5+a^5*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {2844, 3047, 3098, 2829, 2729, 2727}

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{5\sin(c+dx)}{63d\,(a^5\cos(c+dx)+a^5)} + \frac{5\sin(c+dx)}{63a^3d(a\cos(c+dx)+a)^2} - \frac{17\sin(c+dx)}{63a^2d(a\cos(c+dx)+a)^3} - \frac{\sin(c+dx)\cos^2(c+dx)}{9d(a\cos(c+dx)+a)^5} + \frac{\sin(c+dx)}{7ad(a\cos(c+dx)+a)^4}$$

```
[In] Int[Cos[c + d*x]^3/(a + a*Cos[c + d*x])^5,x]
```

```
[Out] -1/9*(Cos[c + d*x]^2*Sin[c + d*x])/(d*(a + a*Cos[c + d*x])^5) + Sin[c + d*x
]/(7*a*d*(a + a*Cos[c + d*x])^4) - (17*Sin[c + d*x])/(63*a^2*d*(a + a*Cos[c
 + d*x])^3) + (5*Sin[c + d*x])/(63*a^3*d*(a + a*Cos[c + d*x])^2) + (5*Sin[c
 + d*x])/(63*d*(a^5 + a^5*Cos[c + d*x]))
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2729

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[c
+ d*x]*((a + b*Sin[c + d*x])^n/(a*d*(2*n + 1))), x] + Dist[(n + 1)/(a*(2*n
+ 1)), Int[(a + b*Sin[c + d*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d}, x] &
& EqQ[a^2 - b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2829

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((a + b*Sin[e + f*
x])^m/(a*f*(2*m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(a*b*(2*m + 1)), In
t[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && N
eQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3098

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(A*b - a*
```

```
B + b*C)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(a*f*(2*m + 1))), x] + Dist[1
/(a^2*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[a*A*(m + 1) + m*(b*
B - a*C) + b*C*(2*m + 1)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A,
B, C}, x] && LtQ[m, -1] && EqQ[a^2 - b^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^2(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{\int \frac{\cos(c+dx)(2a-7a\cos(c+dx))}{(a+a\cos(c+dx))^4}\,dx}{9a^2} \\
&= -\frac{\cos^2(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{\int \frac{2a\cos(c+dx)-7a\cos^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx}{9a^2} \\
&= -\frac{\cos^2(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} + \frac{\sin(c+dx)}{7ad(a+a\cos(c+dx))^4} + \frac{\int \frac{-36a^2+49a^2\cos(c+dx)}{(a+a\cos(c+dx))^3}\,dx}{63a^4} \\
&= -\frac{\cos^2(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} + \frac{\sin(c+dx)}{7ad(a+a\cos(c+dx))^4} \\
&\quad - \frac{17\sin(c+dx)}{63a^2d(a+a\cos(c+dx))^3} + \frac{5\int \frac{1}{(a+a\cos(c+dx))^2}\,dx}{21a^3} \\
&= -\frac{\cos^2(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} + \frac{\sin(c+dx)}{7ad(a+a\cos(c+dx))^4} \\
&\quad - \frac{17\sin(c+dx)}{63a^2d(a+a\cos(c+dx))^3} + \frac{5\sin(c+dx)}{63a^3d(a+a\cos(c+dx))^2} + \frac{5\int \frac{1}{a+a\cos(c+dx)}\,dx}{63a^4} \\
&= -\frac{\cos^2(c+dx)\sin(c+dx)}{9d(a+a\cos(c+dx))^5} + \frac{\sin(c+dx)}{7ad(a+a\cos(c+dx))^4} - \frac{17\sin(c+dx)}{63a^2d(a+a\cos(c+dx))^3} \\
&\quad + \frac{5\sin(c+dx)}{63a^3d(a+a\cos(c+dx))^2} + \frac{5\sin(c+dx)}{63d\,(a^5+a^5\cos(c+dx))}
\end{aligned}$$

Mathematica [A] (verified)

Time = 2.69 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.45

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{(2+10\cos(c+dx)+21\cos^2(c+dx)+25\cos^3(c+dx)+5\cos^4(c+dx))\sin(c+dx)}{63a^5d(1+\cos(c+dx))^5}$$

```
[In] Integrate[Cos[c + d*x]^3/(a + a*Cos[c + d*x])^5,x]
[Out] ((2 + 10*Cos[c + d*x] + 21*Cos[c + d*x]^2 + 25*Cos[c + d*x]^3 + 5*Cos[c + d
*x]^4)*Sin[c + d*x])/(63*a^5*d*(1 + Cos[c + d*x])^5)
```

Maple [A] (verified)

Time = 0.84 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.39

method	result
parallelrisch	$-\frac{\left(\tan^{8}\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{18\left(\tan^{6}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+6\left(\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-9\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{144a^{5}d}$
derivativedivides	$\frac{-\frac{\left(\tan^{9}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}+\frac{2\left(\tan^{7}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{2\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{16d\,a^{5}}$
default	$\frac{-\frac{\left(\tan^{9}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}+\frac{2\left(\tan^{7}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{2\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{16d\,a^{5}}$
risch	$\frac{2i\left(63\,e^{7i(dx+c)}+147\,e^{6i(dx+c)}+315\,e^{5i(dx+c)}+315\,e^{4i(dx+c)}+273\,e^{3i(dx+c)}+117\,e^{2i(dx+c)}+45\,e^{i(dx+c)}+5\right)}{63d\,a^{5}\left(e^{i(dx+c)}+1\right)^{9}}$
norman	$\frac{\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{16da}+\frac{7\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{48da}+\frac{\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)}{16da}-\frac{5\left(\tan^{7}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{112da}+\frac{5\left(\tan^{9}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{1008da}+\frac{11\left(\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{336da}-\frac{\tan^{13}\left(\frac{dx}{2}+\frac{c}{2}\right)}{336da}-}{\left(1+\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^{3}a^{4}}$

```
[In] int(cos(d*x+c)^3/(a+cos(d*x+c)*a)^5,x,method=_RETURNVERBOSE)
```

```
[Out] -1/144*(tan(1/2*d*x+1/2*c)^8-18/7*tan(1/2*d*x+1/2*c)^6+6*tan(1/2*d*x+1/2*c)
^2-9)*tan(1/2*d*x+1/2*c)/a^5/d
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 123, normalized size of antiderivative = 0.84

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^5}\,dx$$
$$=\frac{\left(5\cos\left(dx+c\right)^{4}+25\cos\left(dx+c\right)^{3}+21\cos\left(dx+c\right)^{2}+10\cos\left(dx+c\right)+2\right)\sin\left(dx+c\right)}{63\left(a^{5}d\cos\left(dx+c\right)^{5}+5\,a^{5}d\cos\left(dx+c\right)^{4}+10\,a^{5}d\cos\left(dx+c\right)^{3}+10\,a^{5}d\cos\left(dx+c\right)^{2}+5\,a^{5}d\cos\left(dx+c\right)\right.}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/63*(5*cos(d*x + c)^4 + 25*cos(d*x + c)^3 + 21*cos(d*x + c)^2 + 10*cos(d*x
 + c) + 2)*sin(d*x + c)/(a^5*d*cos(d*x + c)^5 + 5*a^5*d*cos(d*x + c)^4 + 10
*a^5*d*cos(d*x + c)^3 + 10*a^5*d*cos(d*x + c)^2 + 5*a^5*d*cos(d*x + c) + a^
5*d)
```

Sympy [A] (verification not implemented)

Time = 4.12 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.59

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \begin{cases} -\frac{\tan^9\left(\frac{c}{2}+\frac{dx}{2}\right)}{144a^5d} + \frac{\tan^7\left(\frac{c}{2}+\frac{dx}{2}\right)}{56a^5d} - \frac{\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{24a^5d} + \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{16a^5d} & \text{for } d \neq 0 \\ \frac{x\cos^3(c)}{(a\cos(c)+a)^5} & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)**3/(a+a*cos(d*x+c))**5,x)
```

```
[Out] Piecewise((-tan(c/2 + d*x/2)**9/(144*a**5*d) + tan(c/2 + d*x/2)**7/(56*a**5
*d) - tan(c/2 + d*x/2)**3/(24*a**5*d) + tan(c/2 + d*x/2)/(16*a**5*d), Ne(d,
 0)), (x*cos(c)**3/(a*cos(c) + a)**5, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.22 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.59

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{\frac{63\sin(dx+c)}{\cos(dx+c)+1} - \frac{42\sin(dx+c)^3}{(\cos(dx+c)+1)^3} + \frac{18\sin(dx+c)^7}{(\cos(dx+c)+1)^7} - \frac{7\sin(dx+c)^9}{(\cos(dx+c)+1)^9}}{1008\,a^5d}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] 1/1008*(63*sin(d*x + c)/(cos(d*x + c) + 1) - 42*sin(d*x + c)^3/(cos(d*x + c
) + 1)^3 + 18*sin(d*x + c)^7/(cos(d*x + c) + 1)^7 - 7*sin(d*x + c)^9/(cos(d
*x + c) + 1)^9)/(a^5*d)
```

Giac [A] (verification not implemented)

none

Time = 0.43 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.40

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{7\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^9 - 18\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^7 + 42\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3 - 63\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{1008\,a^5d}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^5,x, algorithm="giac")
```

```
[Out] -1/1008*(7*tan(1/2*d*x + 1/2*c)^9 - 18*tan(1/2*d*x + 1/2*c)^7 + 42*tan(1/2*
d*x + 1/2*c)^3 - 63*tan(1/2*d*x + 1/2*c))/(a^5*d)
```

Mupad [B] (verification not implemented)

Time = 14.41 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.39

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\,\left(7\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^8-18\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^6+42\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2-63\right)}{1008\,a^5\,d}$$

```
[In] int(cos(c + d*x)^3/(a + a*cos(c + d*x))^5,x)
```

```
[Out] -(tan(c/2 + (d*x)/2)*(42*tan(c/2 + (d*x)/2)^2 - 18*tan(c/2 + (d*x)/2)^6 + 7
*tan(c/2 + (d*x)/2)^8 - 63))/(1008*a^5*d)
```

3.87 $\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^5} dx$

Optimal result

Integrand size = 21, antiderivative size = 139

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^5} dx = \frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{2\sin(c+dx)}{9ad(a+a\cos(c+dx))^4} + \frac{\sin(c+dx)}{15a^2d(a+a\cos(c+dx))^3} + \frac{2\sin(c+dx)}{45a^3d(a+a\cos(c+dx))^2} + \frac{2\sin(c+dx)}{45d\,(a^5+a^5\cos(c+dx))}$$

```
[Out] 1/9*sin(d*x+c)/d/(a+a*cos(d*x+c))^5-2/9*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^4+1
/15*sin(d*x+c)/a^2/d/(a+a*cos(d*x+c))^3+2/45*sin(d*x+c)/a^3/d/(a+a*cos(d*x+
c))^2+2/45*sin(d*x+c)/d/(a^5+a^5*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2837, 2829, 2729, 2727}

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^5} dx = \frac{2\sin(c+dx)}{45d\,(a^5\cos(c+dx)+a^5)} + \frac{2\sin(c+dx)}{45a^3d(a\cos(c+dx)+a)^2} + \frac{\sin(c+dx)}{15a^2d(a\cos(c+dx)+a)^3} - \frac{2\sin(c+dx)}{9ad(a\cos(c+dx)+a)^4} + \frac{\sin(c+dx)}{9d(a\cos(c+dx)+a)^5}$$

```
[In] Int[Cos[c + d*x]^2/(a + a*Cos[c + d*x])^5,x]
```

```
[Out] Sin[c + d*x]/(9*d*(a + a*Cos[c + d*x])^5) - (2*Sin[c + d*x])/(9*a*d*(a + a*
Cos[c + d*x])^4) + Sin[c + d*x]/(15*a^2*d*(a + a*Cos[c + d*x])^3) + (2*Sin[
c + d*x])/(45*a^3*d*(a + a*Cos[c + d*x])^2) + (2*Sin[c + d*x])/(45*d*(a^5 +
 a^5*Cos[c + d*x]))
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2729

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[c
+ d*x]*((a + b*Sin[c + d*x])^n/(a*d*(2*n + 1))), x] + Dist[(n + 1)/(a*(2*n
+ 1)), Int[(a + b*Sin[c + d*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d}, x] &
& EqQ[a^2 - b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2829

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((a + b*Sin[e + f*
x])^m/(a*f*(2*m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(a*b*(2*m + 1)), In
t[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && N
eQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)]
```

Rule 2837

```
Int[sin[(e_.) + (f_.)*(x_)]^2*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_),
x_Symbol] :> Simp[b*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(a*f*(2*m + 1))),
x] - Dist[1/(a^2*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(a*m - b*(2*m
 + 1)*Sin[e + f*x]), x], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 - b^2, 0]
&& LtQ[m, -2^(-1)]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5} + \frac{\int \frac{-5a+9a\cos(c+dx)}{(a+a\cos(c+dx))^4}\,dx}{9a^2} \\
&= \frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{2\sin(c+dx)}{9ad(a+a\cos(c+dx))^4} + \frac{\int \frac{1}{(a+a\cos(c+dx))^3}\,dx}{3a^2} \\
&= \frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{2\sin(c+dx)}{9ad(a+a\cos(c+dx))^4} \\
&\quad + \frac{\sin(c+dx)}{15a^2d(a+a\cos(c+dx))^3} + \frac{2\int \frac{1}{(a+a\cos(c+dx))^2}\,dx}{15a^3}
\end{aligned}
$$

$$= \frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{2\sin(c+dx)}{9ad(a+a\cos(c+dx))^4} + \frac{\sin(c+dx)}{15a^2d(a+a\cos(c+dx))^3} + \frac{2\sin(c+dx)}{45a^3d(a+a\cos(c+dx))^2} + \frac{2\int \frac{1}{a+a\cos(c+dx)}\,dx}{45a^4}$$

$$= \frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{2\sin(c+dx)}{9ad(a+a\cos(c+dx))^4} + \frac{\sin(c+dx)}{15a^2d(a+a\cos(c+dx))^3} + \frac{2\sin(c+dx)}{45a^3d(a+a\cos(c+dx))^2} + \frac{2\sin(c+dx)}{45d\,(a^5+a^5\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 2.26 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.47

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{(2+10\cos(c+dx)+21\cos^2(c+dx)+10\cos^3(c+dx)+2\cos^4(c+dx))\sin(c+dx)}{45a^5d(1+\cos(c+dx))^5}$$

```
[In] Integrate[Cos[c + d*x]^2/(a + a*Cos[c + d*x])^5,x]
```

```
[Out] ((2 + 10*Cos[c + d*x] + 21*Cos[c + d*x]^2 + 10*Cos[c + d*x]^3 + 2*Cos[c + d
*x]^4)*Sin[c + d*x])/(45*a^5*d*(1 + Cos[c + d*x])^5)
```

Maple [A] (verified)

Time = 0.82 (sec) , antiderivative size = 45, normalized size of antiderivative = 0.32

method	result	siz
derivativedivides	$\frac{\frac{\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}-\frac{2\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{16d\,a^5}$	45
default	$\frac{\frac{\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}-\frac{2\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{16d\,a^5}$	45
parallelrisch	$\frac{5\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-18\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+45\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{720a^5d}$	47
risch	$\frac{4i\left(30\,e^{6i(dx+c)}+45\,e^{5i(dx+c)}+81\,e^{4i(dx+c)}+54\,e^{3i(dx+c)}+36\,e^{2i(dx+c)}+9\,e^{i(dx+c)}+1\right)}{45d\,a^5\left(e^{i(dx+c)}+1\right)^9}$	91
norman	$\frac{\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{16da}+\frac{\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)}{8da}+\frac{3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{80da}-\frac{\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)}{20da}-\frac{13\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{720da}+\frac{\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)}{72da}+\frac{\tan^{13}\left(\frac{dx}{2}+\frac{c}{2}\right)}{144da}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2a^4}$	15

```
[In] int(cos(d*x+c)^2/(a+cos(d*x+c)*a)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/16/d/a^5*(1/9*tan(1/2*d*x+1/2*c)^9-2/5*tan(1/2*d*x+1/2*c)^5+tan(1/2*d*x+1
/2*c))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 123, normalized size of antiderivative = 0.88

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{\left(2\,\cos\left(dx+c\right)^4+10\,\cos\left(dx+c\right)^3+21\,\cos\left(dx+c\right)^2+10\,\cos\left(dx+c\right)+2\right)\sin\left(dx+c\right)}{45\,\left(a^5d\cos\left(dx+c\right)^5+5\,a^5d\cos\left(dx+c\right)^4+10\,a^5d\cos\left(dx+c\right)^3+10\,a^5d\cos\left(dx+c\right)^2+5\,a^5d\cos\left(dx+c\right)\right.}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/45*(2*cos(d*x + c)^4 + 10*cos(d*x + c)^3 + 21*cos(d*x + c)^2 + 10*cos(d*x
 + c) + 2)*sin(d*x + c)/(a^5*d*cos(d*x + c)^5 + 5*a^5*d*cos(d*x + c)^4 + 10
*a^5*d*cos(d*x + c)^3 + 10*a^5*d*cos(d*x + c)^2 + 5*a^5*d*cos(d*x + c) + a^
5*d)
```

Sympy [A] (verification not implemented)

Time = 3.42 (sec) , antiderivative size = 68, normalized size of antiderivative = 0.49

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \begin{cases} \frac{\tan^9\left(\frac{c}{2}+\frac{dx}{2}\right)}{144a^5d} - \frac{\tan^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{40a^5d} + \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{16a^5d} & \text{for}\ d \neq 0 \\ \frac{x\cos^2\left(c\right)}{\left(a\cos\left(c\right)+a\right)^5} & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)**2/(a+a*cos(d*x+c))**5,x)
```

```
[Out] Piecewise((tan(c/2 + d*x/2)**9/(144*a**5*d) - tan(c/2 + d*x/2)**5/(40*a**5*
d) + tan(c/2 + d*x/2)/(16*a**5*d), Ne(d, 0)), (x*cos(c)**2/(a*cos(c) + a)**
5, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 67, normalized size of antiderivative = 0.48

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{\frac{45\,\sin\left(dx+c\right)}{\cos\left(dx+c\right)+1} - \frac{18\,\sin\left(dx+c\right)^5}{\left(\cos\left(dx+c\right)+1\right)^5} + \frac{5\,\sin\left(dx+c\right)^9}{\left(\cos\left(dx+c\right)+1\right)^9}}{720\,a^5d}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] 1/720*(45*sin(d*x + c)/(cos(d*x + c) + 1) - 18*sin(d*x + c)^5/(cos(d*x + c)
 + 1)^5 + 5*sin(d*x + c)^9/(cos(d*x + c) + 1)^9)/(a^5*d)
```

Giac [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 46, normalized size of antiderivative = 0.33

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{5\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^9-18\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5+45\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{720\,a^5 d}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^5,x, algorithm="giac")
```

```
[Out] 1/720*(5*tan(1/2*d*x + 1/2*c)^9 - 18*tan(1/2*d*x + 1/2*c)^5 + 45*tan(1/2*d*
x + 1/2*c))/(a^5*d)
```

Mupad [B] (verification not implemented)

Time = 14.01 (sec) , antiderivative size = 45, normalized size of antiderivative = 0.32

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8-18\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+45\right)}{720\,a^5\,d}$$

```
[In] int(cos(c + d*x)^2/(a + a*cos(c + d*x))^5,x)
```

```
[Out] (tan(c/2 + (d*x)/2)*(5*tan(c/2 + (d*x)/2)^8 - 18*tan(c/2 + (d*x)/2)^4 + 45)
)/(720*a^5*d)
```

3.88 $\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^5}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 143

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5}+\frac{5\sin(c+dx)}{63ad(a+a\cos(c+dx))^4}+\frac{\sin(c+dx)}{21a^2d(a+a\cos(c+dx))^3}+\frac{2\sin(c+dx)}{63ad\,(a^2+a^2\cos(c+dx))^2}+\frac{2\sin(c+dx)}{63d\,(a^5+a^5\cos(c+dx))}$$

```
[Out] -1/9*sin(d*x+c)/d/(a+a*cos(d*x+c))^5+5/63*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^4
+1/21*sin(d*x+c)/a^2/d/(a+a*cos(d*x+c))^3+2/63*sin(d*x+c)/a/d/(a^2+a^2*cos(
d*x+c))^2+2/63*sin(d*x+c)/d/(a^5+a^5*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 143, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2829, 2729, 2727}

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{2\sin(c+dx)}{63d\,(a^5\cos(c+dx)+a^5)}+\frac{2\sin(c+dx)}{63ad\,(a^2\cos(c+dx)+a^2)^2}+\frac{\sin(c+dx)}{21a^2d(a\cos(c+dx)+a)^3}+\frac{5\sin(c+dx)}{63ad(a\cos(c+dx)+a)^4}-\frac{\sin(c+dx)}{9d(a\cos(c+dx)+a)^5}$$

```
[In] Int[Cos[c + d*x]/(a + a*Cos[c + d*x])^5,x]
```

```
[Out] -1/9*Sin[c + d*x]/(d*(a + a*Cos[c + d*x])^5) + (5*Sin[c + d*x])/(63*a*d*(a
+ a*Cos[c + d*x])^4) + Sin[c + d*x]/(21*a^2*d*(a + a*Cos[c + d*x])^3) + (2*
Sin[c + d*x])/(63*a*d*(a^2 + a^2*Cos[c + d*x])^2) + (2*Sin[c + d*x])/(63*d*
(a^5 + a^5*Cos[c + d*x]))
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2729

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[c
+ d*x]*((a + b*Sin[c + d*x])^n/(a*d*(2*n + 1))), x] + Dist[(n + 1)/(a*(2*n
+ 1)), Int[(a + b*Sin[c + d*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d}, x] &
& EqQ[a^2 - b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2829

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((a + b*Sin[e + f*
x])^m/(a*f*(2*m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(a*b*(2*m + 1)), In
t[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && N
eQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5}+\frac{5\int \frac{1}{(a+a\cos(c+dx))^4}\,dx}{9a}\\
&= -\frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5}+\frac{5\sin(c+dx)}{63ad(a+a\cos(c+dx))^4}+\frac{5\int \frac{1}{(a+a\cos(c+dx))^3}\,dx}{21a^2}\\
&= -\frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5}+\frac{5\sin(c+dx)}{63ad(a+a\cos(c+dx))^4}\\
&\quad+\frac{\sin(c+dx)}{21a^2d(a+a\cos(c+dx))^3}+\frac{2\int \frac{1}{(a+a\cos(c+dx))^2}\,dx}{21a^3}\\
&= -\frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5}+\frac{5\sin(c+dx)}{63ad(a+a\cos(c+dx))^4}\\
&\quad+\frac{\sin(c+dx)}{21a^2d(a+a\cos(c+dx))^3}+\frac{2\sin(c+dx)}{63a^3d(a+a\cos(c+dx))^2}+\frac{2\int \frac{1}{a+a\cos(c+dx)}\,dx}{63a^4}\\
&= -\frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5}+\frac{5\sin(c+dx)}{63ad(a+a\cos(c+dx))^4}+\frac{\sin(c+dx)}{21a^2d(a+a\cos(c+dx))^3}\\
&\quad+\frac{2\sin(c+dx)}{63a^3d(a+a\cos(c+dx))^2}+\frac{2\sin(c+dx)}{63d\,(a^5+a^5\cos(c+dx))}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.46

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{(5+25\cos(c+dx)+21\cos^2(c+dx)+10\cos^3(c+dx)+2\cos^4(c+dx))\sin(c+dx)}{63a^5d(1+\cos(c+dx))^5}$$

```
[In] Integrate[Cos[c + d*x]/(a + a*Cos[c + d*x])^5,x]
[Out] ((5 + 25*Cos[c + d*x] + 21*Cos[c + d*x]^2 + 10*Cos[c + d*x]^3 + 2*Cos[c + d
*x]^4)*Sin[c + d*x])/(63*a^5*d*(1 + Cos[c + d*x])^5)
```

Maple [A] (verified)

Time = 0.77 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.40

method	result	size
parallelrisch	$-\frac{\left(\tan^8\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{18\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-6\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-9\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{144a^5d}$	57
derivativedivides	$\frac{-\frac{\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}-\frac{2\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+\frac{2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{16d\,a^5}$	58
default	$\frac{-\frac{\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}-\frac{2\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+\frac{2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{16d\,a^5}$	58
risch	$\frac{4i\left(63\,\mathrm{e}^{5i(dx+c)}+63\,\mathrm{e}^{4i(dx+c)}+84\,\mathrm{e}^{3i(dx+c)}+36\,\mathrm{e}^{2i(dx+c)}+9\,\mathrm{e}^{i(dx+c)}+1\right)}{63d\,a^5\left(\mathrm{e}^{i(dx+c)}+1\right)^9}$	80
norman	$\frac{\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{16da}+\frac{5\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{48da}+\frac{\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)}{24da}-\frac{\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)}{56da}-\frac{25\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{1008da}-\frac{\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)}{144da}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a^4}$	133

```
[In] int(cos(d*x+c)/(a+cos(d*x+c)*a)^5,x,method=_RETURNVERBOSE)
[Out] -1/144*(tan(1/2*d*x+1/2*c)^8+18/7*tan(1/2*d*x+1/2*c)^6-6*tan(1/2*d*x+1/2*c)
^2-9)*tan(1/2*d*x+1/2*c)/a^5/d
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 123, normalized size of antiderivative = 0.86

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{\left(2\cos\left(dx+c\right)^4+10\cos\left(dx+c\right)^3+21\cos\left(dx+c\right)^2+25\cos\left(dx+c\right)+5\right)\sin\left(dx+c\right)}{63\left(a^5d\cos\left(dx+c\right)^5+5a^5d\cos\left(dx+c\right)^4+10a^5d\cos\left(dx+c\right)^3+10a^5d\cos\left(dx+c\right)^2+5a^5d\cos\left(dx+c\right)+a^5d\right)}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/63*(2*cos(d*x + c)^4 + 10*cos(d*x + c)^3 + 21*cos(d*x + c)^2 + 25*cos(d*x
 + c) + 5)*sin(d*x + c)/(a^5*d*cos(d*x + c)^5 + 5*a^5*d*cos(d*x + c)^4 + 10
*a^5*d*cos(d*x + c)^3 + 10*a^5*d*cos(d*x + c)^2 + 5*a^5*d*cos(d*x + c) + a^
5*d)
```

Sympy [A] (verification not implemented)

Time = 3.04 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.59

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \begin{cases} -\frac{\tan^9\left(\frac{c}{2}+\frac{dx}{2}\right)}{144a^5d} - \frac{\tan^7\left(\frac{c}{2}+\frac{dx}{2}\right)}{56a^5d} + \frac{\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{24a^5d} + \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{16a^5d} & \text{for } d \neq 0 \\ \frac{x\cos\left(c\right)}{\left(a\cos\left(c\right)+a\right)^5} & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))**5,x)
```

```
[Out] Piecewise((-tan(c/2 + d*x/2)**9/(144*a**5*d) - tan(c/2 + d*x/2)**7/(56*a**5
*d) + tan(c/2 + d*x/2)**3/(24*a**5*d) + tan(c/2 + d*x/2)/(16*a**5*d), Ne(d,
 0)), (x*cos(c)/(a*cos(c) + a)**5, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.61

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{\frac{63\sin(dx+c)}{\cos(dx+c)+1} + \frac{42\sin(dx+c)^3}{(\cos(dx+c)+1)^3} - \frac{18\sin(dx+c)^7}{(\cos(dx+c)+1)^7} - \frac{7\sin(dx+c)^9}{(\cos(dx+c)+1)^9}}{1008\,a^5d}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] 1/1008*(63*sin(d*x + c)/(cos(d*x + c) + 1) + 42*sin(d*x + c)^3/(cos(d*x + c
) + 1)^3 - 18*sin(d*x + c)^7/(cos(d*x + c) + 1)^7 - 7*sin(d*x + c)^9/(cos(d
*x + c) + 1)^9)/(a^5*d)
```

Giac [A] (verification not implemented)

none

Time = 0.44 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.41

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{7\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^9+18\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7-42\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-63\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{1008\,a^5d}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^5,x, algorithm="giac")
```

```
[Out] -1/1008*(7*tan(1/2*d*x + 1/2*c)^9 + 18*tan(1/2*d*x + 1/2*c)^7 - 42*tan(1/2*
d*x + 1/2*c)^3 - 63*tan(1/2*d*x + 1/2*c))/(a^5*d)
```

Mupad [B] (verification not implemented)

Time = 14.06 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.41

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(-7\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8-18\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6+42\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+63\right)}{1008\,a^5\,d}$$

```
[In] int(cos(c + d*x)/(a + a*cos(c + d*x))^5,x)
```

```
[Out] (tan(c/2 + (d*x)/2)*(42*tan(c/2 + (d*x)/2)^2 - 18*tan(c/2 + (d*x)/2)^6 - 7*
tan(c/2 + (d*x)/2)^8 + 63))/(1008*a^5*d)
```

3.89 $\int \frac{1}{(a+a\cos(c+dx))^5}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 143

$$\int \frac{1}{(a+a\cos(c+dx))^5}\,dx = \frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5} + \frac{4\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} + \frac{4\sin(c+dx)}{105a^2d(a+a\cos(c+dx))^3} + \frac{8\sin(c+dx)}{315ad\,(a^2+a^2\cos(c+dx))^2} + \frac{8\sin(c+dx)}{315d\,(a^5+a^5\cos(c+dx))}$$

```
[Out] 1/9*sin(d*x+c)/d/(a+a*cos(d*x+c))^5+4/63*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^4+
4/105*sin(d*x+c)/a^2/d/(a+a*cos(d*x+c))^3+8/315*sin(d*x+c)/a/d/(a^2+a^2*cos
(d*x+c))^2+8/315*sin(d*x+c)/d/(a^5+a^5*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 143, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {2729, 2727}

$$\int \frac{1}{(a+a\cos(c+dx))^5}\,dx = \frac{8\sin(c+dx)}{315d\,(a^5\cos(c+dx)+a^5)} + \frac{8\sin(c+dx)}{315ad\,(a^2\cos(c+dx)+a^2)^2} + \frac{4\sin(c+dx)}{105a^2d(a\cos(c+dx)+a)^3} + \frac{4\sin(c+dx)}{63ad(a\cos(c+dx)+a)^4} + \frac{\sin(c+dx)}{9d(a\cos(c+dx)+a)^5}$$

```
[In] Int[(a + a*Cos[c + d*x])^(-5),x]
```

```
[Out] Sin[c + d*x]/(9*d*(a + a*Cos[c + d*x])^5) + (4*Sin[c + d*x])/(63*a*d*(a + a
*Cos[c + d*x])^4) + (4*Sin[c + d*x])/(105*a^2*d*(a + a*Cos[c + d*x])^3) + (
8*Sin[c + d*x])/(315*a*d*(a^2 + a^2*Cos[c + d*x])^2) + (8*Sin[c + d*x])/(31
5*d*(a^5 + a^5*Cos[c + d*x]))
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2729

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[c
+ d*x]*((a + b*Sin[c + d*x])^n/(a*d*(2*n + 1))), x] + Dist[(n + 1)/(a*(2*n
+ 1)), Int[(a + b*Sin[c + d*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d}, x] &
& EqQ[a^2 - b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5}+\frac{4\int \frac{1}{(a+a\cos(c+dx))^4}\,dx}{9a}\\
&= \frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5}+\frac{4\sin(c+dx)}{63ad(a+a\cos(c+dx))^4}+\frac{4\int \frac{1}{(a+a\cos(c+dx))^3}\,dx}{21a^2}\\
&= \frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5}+\frac{4\sin(c+dx)}{63ad(a+a\cos(c+dx))^4}\\
&\quad+\frac{4\sin(c+dx)}{105a^2d(a+a\cos(c+dx))^3}+\frac{8\int \frac{1}{(a+a\cos(c+dx))^2}\,dx}{105a^3}\\
&= \frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5}+\frac{4\sin(c+dx)}{63ad(a+a\cos(c+dx))^4}+\frac{4\sin(c+dx)}{105a^2d(a+a\cos(c+dx))^3}\\
&\quad+\frac{8\sin(c+dx)}{315a^3d(a+a\cos(c+dx))^2}+\frac{8\int \frac{1}{a+a\cos(c+dx)}\,dx}{315a^4}\\
&= \frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5}+\frac{4\sin(c+dx)}{63ad(a+a\cos(c+dx))^4}+\frac{4\sin(c+dx)}{105a^2d(a+a\cos(c+dx))^3}\\
&\quad+\frac{8\sin(c+dx)}{315a^3d(a+a\cos(c+dx))^2}+\frac{8\sin(c+dx)}{315d\,(a^5+a^5\cos(c+dx))}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.62

$$\int \frac{1}{(a+a\cos(c+dx))^5}\,dx = \frac{\cos\left(\frac{1}{2}(c+dx)\right)\left(126\sin\left(\frac{1}{2}(c+dx)\right)+84\sin\left(\frac{3}{2}(c+dx)\right)+36\sin\left(\frac{5}{2}(c+dx)\right)+9\sin\left(\frac{7}{2}(c+dx)\right)+\sin\left(\right.\right.}{315a^5d(1+\cos(c+dx))^5}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(-5),x]
```

```
[Out] (Cos[(c + d*x)/2]*(126*Sin[(c + d*x)/2] + 84*Sin[(3*(c + d*x))/2] + 36*Sin[
(5*(c + d*x))/2] + 9*Sin[(7*(c + d*x))/2] + Sin[(9*(c + d*x))/2]))/(315*a^5
*d*(1 + Cos[c + d*x])^5)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.78 (sec) , antiderivative size = 69, normalized size of antiderivative = 0.48

method	result	size
risch	$\frac{16i\left(126\,e^{4i(dx+c)}+84\,e^{3i(dx+c)}+36\,e^{2i(dx+c)}+9\,e^{i(dx+c)}+1\right)}{315d\,a^5\left(e^{i(dx+c)}+1\right)^9}$	69
derivativedivides	$\frac{\frac{\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}+\frac{4\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+\frac{6\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\frac{4\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{16d\,a^5}$	71
default	$\frac{\frac{\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}+\frac{4\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+\frac{6\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\frac{4\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{16d\,a^5}$	71
parallelrisch	$\frac{35\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+180\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+378\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+420\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+315\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{5040a^5d}$	73
norman	$\frac{\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{16da}+\frac{\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)}{12da}+\frac{3\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{40da}+\frac{\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)}{28da}+\frac{\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)}{144da}}{a^4}$	99

```
[In] int(1/(a+cos(d*x+c)*a)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 16/315*I*(126*exp(4*I*(d*x+c))+84*exp(3*I*(d*x+c))+36*exp(2*I*(d*x+c))+9*ex
p(I*(d*x+c))+1)/d/a^5/(exp(I*(d*x+c))+1)^9
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 123, normalized size of antiderivative = 0.86

$$\int \frac{1}{(a + a\cos(c+dx))^5}\,dx$$
$$= \frac{\left(8\cos(dx+c)^4 + 40\cos(dx+c)^3 + 84\cos(dx+c)^2 + 100\cos(dx+c) + 83\right)\sin(dx+c)}{315\left(a^5d\cos(dx+c)^5 + 5a^5d\cos(dx+c)^4 + 10a^5d\cos(dx+c)^3 + 10a^5d\cos(dx+c)^2 + 5a^5d\cos(dx+c\right.}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/315*(8*cos(d*x + c)^4 + 40*cos(d*x + c)^3 + 84*cos(d*x + c)^2 + 100*cos(d
*x + c) + 83)*sin(d*x + c)/(a^5*d*cos(d*x + c)^5 + 5*a^5*d*cos(d*x + c)^4 +
 10*a^5*d*cos(d*x + c)^3 + 10*a^5*d*cos(d*x + c)^2 + 5*a^5*d*cos(d*x + c) +
 a^5*d)
```

Sympy [A] (verification not implemented)

Time = 2.76 (sec) , antiderivative size = 102, normalized size of antiderivative = 0.71

$$\int \frac{1}{(a + a\cos(c+dx))^5}\,dx$$
$$= \begin{cases} \frac{\tan^9\left(\frac{c}{2}+\frac{dx}{2}\right)}{144a^5d} + \frac{\tan^7\left(\frac{c}{2}+\frac{dx}{2}\right)}{28a^5d} + \frac{3\tan^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{40a^5d} + \frac{\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{12a^5d} + \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{16a^5d} & \text{for } d \neq 0 \\ \frac{x}{(a\cos(c)+a)^5} & \text{otherwise} \end{cases}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**5,x)
```

```
[Out] Piecewise((tan(c/2 + d*x/2)**9/(144*a**5*d) + tan(c/2 + d*x/2)**7/(28*a**5*
d) + 3*tan(c/2 + d*x/2)**5/(40*a**5*d) + tan(c/2 + d*x/2)**3/(12*a**5*d) +
tan(c/2 + d*x/2)/(16*a**5*d), Ne(d, 0)), (x/(a*cos(c) + a)**5, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.21 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.75

$$\int \frac{1}{(a + a\cos(c+dx))^5}\,dx$$
$$= \frac{\frac{315\sin(dx+c)}{\cos(dx+c)+1} + \frac{420\sin(dx+c)^3}{(\cos(dx+c)+1)^3} + \frac{378\sin(dx+c)^5}{(\cos(dx+c)+1)^5} + \frac{180\sin(dx+c)^7}{(\cos(dx+c)+1)^7} + \frac{35\sin(dx+c)^9}{(\cos(dx+c)+1)^9}}{5040\,a^5d}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] 1/5040*(315*sin(d*x + c)/(cos(d*x + c) + 1) + 420*sin(d*x + c)^3/(cos(d*x +
 c) + 1)^3 + 378*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 + 180*sin(d*x + c)^7/(
cos(d*x + c) + 1)^7 + 35*sin(d*x + c)^9/(cos(d*x + c) + 1)^9)/(a^5*d)
```

Giac [A] (verification not implemented)

none

Time = 0.39 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.50

$$\int \frac{1}{(a+a\cos(c+dx))^5}\,dx = \frac{35\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^9+180\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7+378\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5+420\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+315\,\tan\left(\right.}{5040\,a^5d}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^5,x, algorithm="giac")
```

```
[Out] 1/5040*(35*tan(1/2*d*x + 1/2*c)^9 + 180*tan(1/2*d*x + 1/2*c)^7 + 378*tan(1/
2*d*x + 1/2*c)^5 + 420*tan(1/2*d*x + 1/2*c)^3 + 315*tan(1/2*d*x + 1/2*c))/(
a^5*d)
```

Mupad [B] (verification not implemented)

Time = 14.57 (sec) , antiderivative size = 127, normalized size of antiderivative = 0.89

$$\int \frac{1}{(a+a\cos(c+dx))^5}\,dx = \frac{\sin\left(\frac{c}{2}+\frac{dx}{2}\right)\,\left(315\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^8+420\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^6\sin\left(\frac{c}{2}+\frac{dx}{2}\right)^2+378\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^4\sin\left(\frac{c}{2}+\frac{dx}{2}\right)^4+18\right.}{5040\,a^5\,d\cos\left(\frac{c}{2}+\frac{dx}{2}\right)^9}$$

```
[In] int(1/(a + a*cos(c + d*x))^5,x)
```

```
[Out] (sin(c/2 + (d*x)/2)*(315*cos(c/2 + (d*x)/2)^8 + 35*sin(c/2 + (d*x)/2)^8 + 1
80*cos(c/2 + (d*x)/2)^2*sin(c/2 + (d*x)/2)^6 + 378*cos(c/2 + (d*x)/2)^4*sin
(c/2 + (d*x)/2)^4 + 420*cos(c/2 + (d*x)/2)^6*sin(c/2 + (d*x)/2)^2))/(5040*a
^5*d*cos(c/2 + (d*x)/2)^9)
```

3.90 $\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^5}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 153

$$\begin{aligned}\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^5}\,dx =& \frac{\operatorname{arctanh}(\sin(c+dx))}{a^5d}-\frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5}\\&-\frac{13\sin(c+dx)}{63ad(a+a\cos(c+dx))^4}-\frac{34\sin(c+dx)}{105a^2d(a+a\cos(c+dx))^3}\\&-\frac{173\sin(c+dx)}{315a^3d(a+a\cos(c+dx))^2}-\frac{488\sin(c+dx)}{315d\,(a^5+a^5\cos(c+dx))}\end{aligned}$$

```
[Out] arctanh(sin(d*x+c))/a^5/d-1/9*sin(d*x+c)/d/(a+a*cos(d*x+c))^5-13/63*sin(d*x
+c)/a/d/(a+a*cos(d*x+c))^4-34/105*sin(d*x+c)/a^2/d/(a+a*cos(d*x+c))^3-173/3
15*sin(d*x+c)/a^3/d/(a+a*cos(d*x+c))^2-488/315*sin(d*x+c)/d/(a^5+a^5*cos(d*
x+c))
```

Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 153, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2845, 3057, 12, 3855}

$$\begin{aligned}\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^5}\,dx =& \frac{\operatorname{arctanh}(\sin(c+dx))}{a^5d}-\frac{488\sin(c+dx)}{315d\,(a^5\cos(c+dx)+a^5)}\\&-\frac{173\sin(c+dx)}{315a^3d(a\cos(c+dx)+a)^2}-\frac{34\sin(c+dx)}{105a^2d(a\cos(c+dx)+a)^3}\\&-\frac{13\sin(c+dx)}{63ad(a\cos(c+dx)+a)^4}-\frac{\sin(c+dx)}{9d(a\cos(c+dx)+a)^5}\end{aligned}$$

```
[In] Int[Sec[c + d*x]/(a + a*Cos[c + d*x])^5,x]
```

```
[Out] ArcTanh[Sin[c + d*x]]/(a^5*d) - Sin[c + d*x]/(9*d*(a + a*Cos[c + d*x])^5) -
 (13*Sin[c + d*x])/(63*a*d*(a + a*Cos[c + d*x])^4) - (34*Sin[c + d*x])/(105
*a^2*d*(a + a*Cos[c + d*x])^3) - (173*Sin[c + d*x])/(315*a^3*d*(a + a*Cos[c
 + d*x])^2) - (488*Sin[c + d*x])/(315*d*(a^5 + a^5*Cos[c + d*x]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = -\frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5} + \frac{\int \frac{(9a-4a\cos(c+dx))\sec(c+dx)}{(a+a\cos(c+dx))^4}\,dx}{9a^2}$$

$$= -\frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{13\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} + \frac{\int \frac{(63a^2-39a^2\cos(c+dx))\sec(c+dx)}{(a+a\cos(c+dx))^3}\,dx}{63a^4}$$

$$= -\frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{13\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{34\sin(c+dx)}{105a^2d(a+a\cos(c+dx))^3} + \frac{\int \frac{(315a^3-204a^3\cos(c+dx))\sec(c+dx)}{(a+a\cos(c+dx))^2}dx}{315a^6}$$

$$= -\frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{13\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{34\sin(c+dx)}{105a^2d(a+a\cos(c+dx))^3} - \frac{173\sin(c+dx)}{315a^3d(a+a\cos(c+dx))^2} + \frac{\int \frac{(945a^4-519a^4\cos(c+dx))\sec(c+dx)}{a+a\cos(c+dx)}dx}{945a^8}$$

$$= -\frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{13\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{34\sin(c+dx)}{105a^2d(a+a\cos(c+dx))^3} - \frac{173\sin(c+dx)}{315a^3d(a+a\cos(c+dx))^2} - \frac{488\sin(c+dx)}{315d\,(a^5+a^5\cos(c+dx))} + \frac{\int 945a^5\sec(c+dx)\,dx}{945a^{10}}$$

$$= -\frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{13\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{34\sin(c+dx)}{105a^2d(a+a\cos(c+dx))^3} - \frac{173\sin(c+dx)}{315a^3d(a+a\cos(c+dx))^2} - \frac{488\sin(c+dx)}{315d\,(a^5+a^5\cos(c+dx))} + \frac{\int \sec(c+dx)\,dx}{a^5}$$

$$= \frac{\operatorname{arctanh}(\sin(c+dx))}{a^5d} - \frac{\sin(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{13\sin(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{34\sin(c+dx)}{105a^2d(a+a\cos(c+dx))^3} - \frac{173\sin(c+dx)}{315a^3d(a+a\cos(c+dx))^2} - \frac{488\sin(c+dx)}{315d\,(a^5+a^5\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 1.62 (sec) , antiderivative size = 211, normalized size of antiderivative = 1.38

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{\cos\left(\frac{1}{2}(c+dx)\right)\left(80640\cos^9\left(\frac{1}{2}(c+dx)\right)\left(\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)-\log\left(\cos\left(\frac{1}{2}(c+dx)\right)\right.\right.\right.}{}$$

```
[In] Integrate[Sec[c + d*x]/(a + a*Cos[c + d*x])^5,x]
```

```
[Out] -1/2520*(Cos[(c + d*x)/2]*(80640*Cos[(c + d*x)/2]^9*(Log[Cos[(c + d*x)/2] -
 Sin[(c + d*x)/2]] - Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) + Sec[c/2]*(
35973*Sin[(d*x)/2] - 25515*Sin[c + (d*x)/2] + 29757*Sin[c + (3*d*x)/2] - 11
235*Sin[2*c + (3*d*x)/2] + 14733*Sin[2*c + (5*d*x)/2] - 2835*Sin[3*c + (5*d
*x)/2] + 4077*Sin[3*c + (7*d*x)/2] - 315*Sin[4*c + (7*d*x)/2] + 488*Sin[4*c
 + (9*d*x)/2])))/(a^5*d*(1 + Cos[c + d*x])^5)
```

Maple [A] (verified)

Time = 1.11 (sec) , antiderivative size = 101, normalized size of antiderivative = 0.66

method	result
derivativedivides	$\frac{-\frac{\left(\tan^{9}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}-\frac{6\left(\tan^{7}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{16\left(\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-\frac{26\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-31\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-16\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+1}{16d\,a^{5}}$
default	$\frac{-\frac{\left(\tan^{9}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}-\frac{6\left(\tan^{7}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{16\left(\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-\frac{26\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-31\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-16\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+1}{16d\,a^{5}}$
parallelrisch	$\frac{-35\left(\tan^{9}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-270\left(\tan^{7}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1008\left(\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2730\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-9765\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-5040\ln\left(\right.}{5040a^{5}d}$
norman	$\frac{-\frac{31\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{16da}-\frac{13\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{24da}-\frac{\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)}{5da}-\frac{3\left(\tan^{7}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{56da}-\frac{\tan^{9}\left(\frac{dx}{2}+\frac{c}{2}\right)}{144da}}{a^{4}}+\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{a^{5}d}-\frac{\ln\left(\mathrm{ta}\right.}{}$
risch	$-\frac{2i\left(315\,\mathrm{e}^{8i(dx+c)}+2835\,\mathrm{e}^{7i(dx+c)}+11235\,\mathrm{e}^{6i(dx+c)}+25515\,\mathrm{e}^{5i(dx+c)}+35973\,\mathrm{e}^{4i(dx+c)}+29757\,\mathrm{e}^{3i(dx+c)}+14733\,\mathrm{e}^{2i(dx\right.}{315d\,a^{5}\left(\mathrm{e}^{i(dx+c)}+1\right)^{9}}$

```
[In] int(sec(d*x+c)/(a+cos(d*x+c)*a)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/16/d/a^5*(-1/9*tan(1/2*d*x+1/2*c)^9-6/7*tan(1/2*d*x+1/2*c)^7-16/5*tan(1/2
*d*x+1/2*c)^5-26/3*tan(1/2*d*x+1/2*c)^3-31*tan(1/2*d*x+1/2*c)-16*ln(tan(1/2
*d*x+1/2*c)-1)+16*ln(tan(1/2*d*x+1/2*c)+1))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 246, normalized size of antiderivative = 1.61

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^5}\,dx$$
$$=\frac{315\left(\cos\left(dx+c\right)^{5}+5\,\cos\left(dx+c\right)^{4}+10\,\cos\left(dx+c\right)^{3}+10\,\cos\left(dx+c\right)^{2}+5\,\cos\left(dx+c\right)+1\right)\log\left(\sin\left(\right.\right.}{}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/630*(315*(cos(d*x + c)^5 + 5*cos(d*x + c)^4 + 10*cos(d*x + c)^3 + 10*cos(
d*x + c)^2 + 5*cos(d*x + c) + 1)*log(sin(d*x + c) + 1) - 315*(cos(d*x + c)^
5 + 5*cos(d*x + c)^4 + 10*cos(d*x + c)^3 + 10*cos(d*x + c)^2 + 5*cos(d*x +
c) + 1)*log(-sin(d*x + c) + 1) - 2*(488*cos(d*x + c)^4 + 2125*cos(d*x + c)^
3 + 3549*cos(d*x + c)^2 + 2740*cos(d*x + c) + 863)*sin(d*x + c))/(a^5*d*cos
(d*x + c)^5 + 5*a^5*d*cos(d*x + c)^4 + 10*a^5*d*cos(d*x + c)^3 + 10*a^5*d*c
os(d*x + c)^2 + 5*a^5*d*cos(d*x + c) + a^5*d)
```

Sympy [F]

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{\int \frac{\sec(c+dx)}{\cos^5(c+dx)+5\cos^4(c+dx)+10\cos^3(c+dx)+10\cos^2(c+dx)+5\cos(c+dx)+1}\,dx}{a^5}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))**5,x)
[Out] Integral(sec(c + d*x)/(cos(c + d*x)**5 + 5*cos(c + d*x)**4 + 10*cos(c + d*x
)**3 + 10*cos(c + d*x)**2 + 5*cos(c + d*x) + 1), x)/a**5
```

Maxima [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 159, normalized size of antiderivative = 1.04

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{\frac{\frac{9765\sin(dx+c)}{\cos(dx+c)+1}+\frac{2730\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{1008\sin(dx+c)^5}{(\cos(dx+c)+1)^5}+\frac{270\sin(dx+c)^7}{(\cos(dx+c)+1)^7}+\frac{35\sin(dx+c)^9}{(\cos(dx+c)+1)^9}}{a^5}-\frac{5040\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a^5}+\frac{5040\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-\right.}{a^5}}{5040\,d}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^5,x, algorithm="maxima")
[Out] -1/5040*((9765*sin(d*x + c)/(cos(d*x + c) + 1) + 2730*sin(d*x + c)^3/(cos(d
*x + c) + 1)^3 + 1008*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 + 270*sin(d*x + c
)^7/(cos(d*x + c) + 1)^7 + 35*sin(d*x + c)^9/(cos(d*x + c) + 1)^9)/a^5 - 50
40*log(sin(d*x + c)/(cos(d*x + c) + 1) + 1)/a^5 + 5040*log(sin(d*x + c)/(co
s(d*x + c) + 1) - 1)/a^5)/d
```

Giac [A] (verification not implemented)

none

Time = 0.44 (sec) , antiderivative size = 126, normalized size of antiderivative = 0.82

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{\frac{5040\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)}{a^5}-\frac{5040\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right)}{a^5}-\frac{35a^{40}\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^9+270a^{40}\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^7+1008a^{40}\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5}{a^{45}}}{5040\,d}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^5,x, algorithm="giac")
[Out] 1/5040*(5040*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^5 - 5040*log(abs(tan(1/2*
d*x + 1/2*c) - 1))/a^5 - (35*a^40*tan(1/2*d*x + 1/2*c)^9 + 270*a^40*tan(1/2
*d*x + 1/2*c)^7 + 1008*a^40*tan(1/2*d*x + 1/2*c)^5 + 2730*a^40*tan(1/2*d*x
+ 1/2*c)^3 + 9765*a^40*tan(1/2*d*x + 1/2*c))/a^45)/d
```

Mupad [B] (verification not implemented)

Time = 14.54 (sec) , antiderivative size = 99, normalized size of antiderivative = 0.65

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{\frac{13\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{24\,a^5}+\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{5\,a^5}+\frac{3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{56\,a^5}+\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9}{144\,a^5}-\frac{2\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{a^5}+\frac{31\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{16\,a^5}}{d}$$

```
[In] int(1/(cos(c + d*x)*(a + a*cos(c + d*x))^5),x)
```

```
[Out] -((13*tan(c/2 + (d*x)/2)^3)/(24*a^5) + tan(c/2 + (d*x)/2)^5/(5*a^5) + (3*ta
n(c/2 + (d*x)/2)^7)/(56*a^5) + tan(c/2 + (d*x)/2)^9/(144*a^5) - (2*atanh(ta
n(c/2 + (d*x)/2)))/a^5 + (31*tan(c/2 + (d*x)/2))/(16*a^5))/d
```

3.91 $\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^5}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 168

$$\begin{aligned}\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^5}\,dx = &-\frac{5\text{arctanh}(\sin(c+dx))}{a^5d}+\frac{496\tan(c+dx)}{63a^5d}\\ &-\frac{\tan(c+dx)}{9d(a+a\cos(c+dx))^5}-\frac{5\tan(c+dx)}{21ad(a+a\cos(c+dx))^4}\\ &-\frac{29\tan(c+dx)}{63a^2d(a+a\cos(c+dx))^3}\\ &-\frac{67\tan(c+dx)}{63a^3d(a+a\cos(c+dx))^2}-\frac{5\tan(c+dx)}{d\,(a^5+a^5\cos(c+dx))}\end{aligned}$$

```
[Out] -5*arctanh(sin(d*x+c))/a^5/d+496/63*tan(d*x+c)/a^5/d-1/9*tan(d*x+c)/d/(a+a*
cos(d*x+c))^5-5/21*tan(d*x+c)/a/d/(a+a*cos(d*x+c))^4-29/63*tan(d*x+c)/a^2/d
/(a+a*cos(d*x+c))^3-67/63*tan(d*x+c)/a^3/d/(a+a*cos(d*x+c))^2-5*tan(d*x+c)/
d/(a^5+a^5*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.66 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used

= {2845, 3057, 2827, 3852, 8, 3855}

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{5\text{arctanh}(\sin(c+dx))}{a^5d} + \frac{496\tan(c+dx)}{63a^5d} - \frac{5\tan(c+dx)}{d\left(a^5\cos(c+dx)+a^5\right)} - \frac{67\tan(c+dx)}{63a^3d(a\cos(c+dx)+a)^2} - \frac{29\tan(c+dx)}{63a^2d(a\cos(c+dx)+a)^3} - \frac{5\tan(c+dx)}{21ad(a\cos(c+dx)+a)^4} - \frac{\tan(c+dx)}{9d(a\cos(c+dx)+a)^5}$$

```
[In] Int[Sec[c + d*x]^2/(a + a*Cos[c + d*x])^5,x]
```

```
[Out] (-5*ArcTanh[Sin[c + d*x]])/(a^5*d) + (496*Tan[c + d*x])/(63*a^5*d) - Tan[c
+ d*x]/(9*d*(a + a*Cos[c + d*x])^5) - (5*Tan[c + d*x])/(21*a*d*(a + a*Cos[c
 + d*x])^4) - (29*Tan[c + d*x])/(63*a^2*d*(a + a*Cos[c + d*x])^3) - (67*Tan
[c + d*x])/(63*a^3*d*(a + a*Cos[c + d*x])^2) - (5*Tan[c + d*x])/(d*(a^5 + a
^5*Cos[c + d*x]))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
```

```
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\tan(c+dx)}{9d(a+a\cos(c+dx))^5} + \frac{\int \frac{(10a-5a\cos(c+dx))\sec^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx}{9a^2} \\
&= -\frac{\tan(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{5\tan(c+dx)}{21ad(a+a\cos(c+dx))^4} + \frac{\int \frac{(85a^2-60a^2\cos(c+dx))\sec^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx}{63a^4} \\
&= -\frac{\tan(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{5\tan(c+dx)}{21ad(a+a\cos(c+dx))^4} \\
&\quad - \frac{29\tan(c+dx)}{63a^2d(a+a\cos(c+dx))^3} + \frac{\int \frac{(570a^3-435a^3\cos(c+dx))\sec^2(c+dx)}{(a+a\cos(c+dx))^2}\,dx}{315a^6} \\
&= -\frac{\tan(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{5\tan(c+dx)}{21ad(a+a\cos(c+dx))^4} - \frac{29\tan(c+dx)}{63a^2d(a+a\cos(c+dx))^3} \\
&\quad - \frac{67\tan(c+dx)}{63a^3d(a+a\cos(c+dx))^2} + \frac{\int \frac{(2715a^4-2010a^4\cos(c+dx))\sec^2(c+dx)}{a+a\cos(c+dx)}\,dx}{945a^8} \\
&= -\frac{\tan(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{5\tan(c+dx)}{21ad(a+a\cos(c+dx))^4} \\
&\quad - \frac{29\tan(c+dx)}{63a^2d(a+a\cos(c+dx))^3} - \frac{67\tan(c+dx)}{63a^3d(a+a\cos(c+dx))^2} \\
&\quad - \frac{5\tan(c+dx)}{d\left(a^5+a^5\cos(c+dx)\right)} + \frac{\int (7440a^5-4725a^5\cos(c+dx))\sec^2(c+dx)\,dx}{945a^{10}}
\end{aligned}
$$

$$= -\frac{\tan(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{5\tan(c+dx)}{21ad(a+a\cos(c+dx))^4} - \frac{29\tan(c+dx)}{63a^2d(a+a\cos(c+dx))^3} - \frac{67\tan(c+dx)}{63a^3d(a+a\cos(c+dx))^2} - \frac{5\tan(c+dx)}{d(a^5+a^5\cos(c+dx))} - \frac{5\int\sec(c+dx)\,dx}{a^5} + \frac{496\int\sec^2(c+dx)\,dx}{63a^5}$$

$$= -\frac{5\text{arctanh}(\sin(c+dx))}{a^5d} - \frac{\tan(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{5\tan(c+dx)}{21ad(a+a\cos(c+dx))^4} - \frac{29\tan(c+dx)}{63a^2d(a+a\cos(c+dx))^3} - \frac{67\tan(c+dx)}{63a^3d(a+a\cos(c+dx))^2} - \frac{5\tan(c+dx)}{d(a^5+a^5\cos(c+dx))} - \frac{496\text{Subst}(\int 1\,dx, x, -\tan(c+dx))}{63a^5d}$$

$$= -\frac{5\text{arctanh}(\sin(c+dx))}{a^5d} + \frac{496\tan(c+dx)}{63a^5d} - \frac{\tan(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{5\tan(c+dx)}{21ad(a+a\cos(c+dx))^4} - \frac{29\tan(c+dx)}{63a^2d(a+a\cos(c+dx))^3} - \frac{67\tan(c+dx)}{63a^3d(a+a\cos(c+dx))^2} - \frac{5\tan(c+dx)}{d(a^5+a^5\cos(c+dx))}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 393 vs. $2(168) = 336$.

Time = 5.52 (sec) , antiderivative size = 393, normalized size of antiderivative = 2.34

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{322560\cos^{10}\left(\frac{1}{2}(c+dx)\right)\left(\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)-\log\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx\right)\right.\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^2/(a + a*Cos[c + d*x])^5,x]
```

```
[Out] (322560*Cos[(c + d*x)/2]^10*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - Log
[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) + Cos[(c + d*x)/2]*Sec[c/2]*Sec[c]*S
ec[c + d*x]*(-33978*Sin[(d*x)/2] + 52002*Sin[(3*d*x)/2] - 56952*Sin[c - (d*
x)/2] + 43722*Sin[c + (d*x)/2] - 47208*Sin[2*c + (d*x)/2] - 18144*Sin[c + (
3*d*x)/2] + 41796*Sin[2*c + (3*d*x)/2] - 28350*Sin[3*c + (3*d*x)/2] + 34578
*Sin[c + (5*d*x)/2] - 5691*Sin[2*c + (5*d*x)/2] + 28719*Sin[3*c + (5*d*x)/2
] - 11550*Sin[4*c + (5*d*x)/2] + 15517*Sin[2*c + (7*d*x)/2] - 504*Sin[3*c +
 (7*d*x)/2] + 13186*Sin[4*c + (7*d*x)/2] - 2835*Sin[5*c + (7*d*x)/2] + 4149
*Sin[3*c + (9*d*x)/2] + 252*Sin[4*c + (9*d*x)/2] + 3582*Sin[5*c + (9*d*x)/2
] - 315*Sin[6*c + (9*d*x)/2] + 496*Sin[4*c + (11*d*x)/2] + 63*Sin[5*c + (11
*d*x)/2] + 433*Sin[6*c + (11*d*x)/2]))/(2016*a^5*d*(1 + Cos[c + d*x])^5)
```

Maple [A] (verified)

Time = 1.17 (sec) , antiderivative size = 131, normalized size of antiderivative = 0.78

method	result
derivativedivides	$\frac{\frac{\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}+\frac{8\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+6\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+24\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+129\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{16}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1}+80\ln\left(\tan\left(\right.\right.}{16d\,a^5}$
default	$\frac{\frac{\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}+\frac{8\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+6\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+24\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+129\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{16}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1}+80\ln\left(\tan\left(\right.\right.}{16d\,a^5}$
parallelrisch	$\frac{40320\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(dx+c)-40320\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)\cos(dx+c)+31846\left(\cos(dx+c)+\frac{10010\cos(2dx+2c)}{15923}+\frac{4253}{}\right.}{8064a^5d\cos(dx+c)}$
norman	$\frac{-\frac{161\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{16da}+\frac{105\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{16da}+\frac{9\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8da}+\frac{17\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{56da}+\frac{65\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{1008da}+\frac{\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)}{144da}}{\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)a^4}+\frac{5\ln\left(\mathrm{t}\right.}{}$
risch	$\frac{2i\left(315\,\mathrm{e}^{10i(dx+c)}+2835\,\mathrm{e}^{9i(dx+c)}+11550\,\mathrm{e}^{8i(dx+c)}+28350\,\mathrm{e}^{7i(dx+c)}+47208\,\mathrm{e}^{6i(dx+c)}+56952\,\mathrm{e}^{5i(dx+c)}+52002\,\mathrm{e}^{4i(dx+c)}\right.}{63d\,a^5\left(\mathrm{e}^{i(dx+c)}+1\right)^9\left(\mathrm{e}^{2i(dx+c)}+1\right)}$

```
[In] int(sec(d*x+c)^2/(a+cos(d*x+c)*a)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/16/d/a^5*(1/9*tan(1/2*d*x+1/2*c)^9+8/7*tan(1/2*d*x+1/2*c)^7+6*tan(1/2*d*x
+1/2*c)^5+24*tan(1/2*d*x+1/2*c)^3+129*tan(1/2*d*x+1/2*c)-16/(tan(1/2*d*x+1/
2*c)-1)+80*ln(tan(1/2*d*x+1/2*c)-1)-16/(tan(1/2*d*x+1/2*c)+1)-80*ln(tan(1/2
*d*x+1/2*c)+1))
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 278, normalized size of antiderivative = 1.65

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{315\left(\cos\left(dx+c\right)^6+5\,\cos\left(dx+c\right)^5+10\,\cos\left(dx+c\right)^4+10\,\cos\left(dx+c\right)^3+5\,\cos\left(dx+c\right)^2+\cos\left(dx+\right.\right.}{}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] -1/126*(315*(cos(d*x + c)^6 + 5*cos(d*x + c)^5 + 10*cos(d*x + c)^4 + 10*cos
(d*x + c)^3 + 5*cos(d*x + c)^2 + cos(d*x + c))*log(sin(d*x + c) + 1) - 315*
(cos(d*x + c)^6 + 5*cos(d*x + c)^5 + 10*cos(d*x + c)^4 + 10*cos(d*x + c)^3
+ 5*cos(d*x + c)^2 + cos(d*x + c))*log(-sin(d*x + c) + 1) - 2*(496*cos(d*x
+ c)^5 + 2165*cos(d*x + c)^4 + 3633*cos(d*x + c)^3 + 2840*cos(d*x + c)^2 +
946*cos(d*x + c) + 63)*sin(d*x + c))/(a^5*d*cos(d*x + c)^6 + 5*a^5*d*cos(d*
x + c)^5 + 10*a^5*d*cos(d*x + c)^4 + 10*a^5*d*cos(d*x + c)^3 + 5*a^5*d*cos(
d*x + c)^2 + a^5*d*cos(d*x + c))
```

Sympy [F]

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{\int \frac{\sec^2(c+dx)}{\cos^5(c+dx)+5\cos^4(c+dx)+10\cos^3(c+dx)+10\cos^2(c+dx)+5\cos(c+dx)+1}\,dx}{a^5}$$

```
[In] integrate(sec(d*x+c)**2/(a+a*cos(d*x+c))**5,x)
```

```
[Out] Integral(sec(c + d*x)**2/(cos(c + d*x)**5 + 5*cos(c + d*x)**4 + 10*cos(c +
d*x)**3 + 10*cos(c + d*x)**2 + 5*cos(c + d*x) + 1), x)/a**5
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 206, normalized size of antiderivative = 1.23

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{\frac{2016\sin(dx+c)}{\left(a^5-\frac{a^5\sin(dx+c)^2}{(\cos(dx+c)+1)^2}\right)(\cos(dx+c)+1)} + \frac{\frac{8127\sin(dx+c)}{\cos(dx+c)+1}+\frac{1512\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{378\sin(dx+c)^5}{(\cos(dx+c)+1)^5}+\frac{72\sin(dx+c)^7}{(\cos(dx+c)+1)^7}+\frac{7\sin(dx+c)^9}{(\cos(dx+c)+1)^9}}{a^5} - \frac{5040\log\left(\frac{\sin(c}{\cos(da}\right.}{a^5}}{1008\,d}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] 1/1008*(2016*sin(d*x + c)/((a^5 - a^5*sin(d*x + c)^2/(cos(d*x + c) + 1)^2)*
(cos(d*x + c) + 1)) + (8127*sin(d*x + c)/(cos(d*x + c) + 1) + 1512*sin(d*x
+ c)^3/(cos(d*x + c) + 1)^3 + 378*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 + 72*
sin(d*x + c)^7/(cos(d*x + c) + 1)^7 + 7*sin(d*x + c)^9/(cos(d*x + c) + 1)^9
)/a^5 - 5040*log(sin(d*x + c)/(cos(d*x + c) + 1) + 1)/a^5 + 5040*log(sin(d*
x + c)/(cos(d*x + c) + 1) - 1)/a^5)/d
```

Giac [A] (verification not implemented)

none

Time = 0.44 (sec) , antiderivative size = 155, normalized size of antiderivative = 0.92

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{\frac{5040\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)}{a^5} - \frac{5040\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right)}{a^5} + \frac{2016\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)a^5} - \frac{7a^{40}\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^9+72a^{40}\tan\left(\frac{1}{2}dx+\right.}{}}{1008\,d}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^5,x, algorithm="giac")
```

```
[Out] -1/1008*(5040*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^5 - 5040*log(abs(tan(1/2
*d*x + 1/2*c) - 1))/a^5 + 2016*tan(1/2*d*x + 1/2*c)/((tan(1/2*d*x + 1/2*c)^
2 - 1)*a^5) - (7*a^40*tan(1/2*d*x + 1/2*c)^9 + 72*a^40*tan(1/2*d*x + 1/2*c)
^7 + 378*a^40*tan(1/2*d*x + 1/2*c)^5 + 1512*a^40*tan(1/2*d*x + 1/2*c)^3 + 8
127*a^40*tan(1/2*d*x + 1/2*c))/a^45)/d
```

Mupad [B] (verification not implemented)

Time = 14.78 (sec) , antiderivative size = 149, normalized size of antiderivative = 0.89

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{3\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^3}{2\,a^5\,d}+\frac{3\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^5}{8\,a^5\,d}+\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^7}{14\,a^5\,d}+\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^9}{144\,a^5\,d}-\frac{10\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}{a^5\,d}-\frac{2\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{d\,\left(a^5\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2-a^5\right)}+\frac{129\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{16\,a^5\,d}$$

```
[In] int(1/(cos(c + d*x)^2*(a + a*cos(c + d*x))^5),x)
```

```
[Out] (3*tan(c/2 + (d*x)/2)^3)/(2*a^5*d) + (3*tan(c/2 + (d*x)/2)^5)/(8*a^5*d) + t
an(c/2 + (d*x)/2)^7/(14*a^5*d) + tan(c/2 + (d*x)/2)^9/(144*a^5*d) - (10*ata
nh(tan(c/2 + (d*x)/2)))/(a^5*d) - (2*tan(c/2 + (d*x)/2))/(d*(a^5*tan(c/2 +
(d*x)/2)^2 - a^5)) + (129*tan(c/2 + (d*x)/2))/(16*a^5*d)
```

3.92 $\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^5}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 224

$$\begin{aligned}\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^5}\,dx = {} & \frac{31\text{arctanh}(\sin(c+dx))}{2a^5d} - \frac{7664\tan(c+dx)}{315a^5d} \\ & + \frac{31\sec(c+dx)\tan(c+dx)}{2a^5d} - \frac{\sec(c+dx)\tan(c+dx)}{9d(a+a\cos(c+dx))^5} \\ & - \frac{17\sec(c+dx)\tan(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{28\sec(c+dx)\tan(c+dx)}{45a^2d(a+a\cos(c+dx))^3} \\ & - \frac{577\sec(c+dx)\tan(c+dx)}{315a^3d(a+a\cos(c+dx))^2} - \frac{3832\sec(c+dx)\tan(c+dx)}{315d\,(a^5+a^5\cos(c+dx))}\end{aligned}$$

```
[Out] 31/2*arctanh(sin(d*x+c))/a^5/d-7664/315*tan(d*x+c)/a^5/d+31/2*sec(d*x+c)*ta
n(d*x+c)/a^5/d-1/9*sec(d*x+c)*tan(d*x+c)/d/(a+a*cos(d*x+c))^5-17/63*sec(d*x
+c)*tan(d*x+c)/a/d/(a+a*cos(d*x+c))^4-28/45*sec(d*x+c)*tan(d*x+c)/a^2/d/(a+
a*cos(d*x+c))^3-577/315*sec(d*x+c)*tan(d*x+c)/a^3/d/(a+a*cos(d*x+c))^2-3832
/315*sec(d*x+c)*tan(d*x+c)/d/(a^5+a^5*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.85 (sec) , antiderivative size = 224, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used

= {2845, 3057, 2827, 3853, 3855, 3852, 8}

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{31\mathrm{arctanh}(\sin(c+dx))}{2a^5d} - \frac{7664\tan(c+dx)}{315a^5d} + \frac{31\tan(c+dx)\sec(c+dx)}{2a^5d} - \frac{3832\tan(c+dx)\sec(c+dx)}{315d\,(a^5\cos(c+dx)+a^5)} - \frac{577\tan(c+dx)\sec(c+dx)}{315a^3d(a\cos(c+dx)+a)^2} - \frac{28\tan(c+dx)\sec(c+dx)}{45a^2d(a\cos(c+dx)+a)^3} - \frac{17\tan(c+dx)\sec(c+dx)}{63ad(a\cos(c+dx)+a)^4} - \frac{\tan(c+dx)\sec(c+dx)}{9d(a\cos(c+dx)+a)^5}$$

```
[In] Int[Sec[c + d*x]^3/(a + a*Cos[c + d*x])^5,x]
```

```
[Out] (31*ArcTanh[Sin[c + d*x]])/(2*a^5*d) - (7664*Tan[c + d*x])/(315*a^5*d) + (3
1*Sec[c + d*x]*Tan[c + d*x])/(2*a^5*d) - (Sec[c + d*x]*Tan[c + d*x])/(9*d*(
a + a*Cos[c + d*x])^5) - (17*Sec[c + d*x]*Tan[c + d*x])/(63*a*d*(a + a*Cos[
c + d*x])^4) - (28*Sec[c + d*x]*Tan[c + d*x])/(45*a^2*d*(a + a*Cos[c + d*x]
)^3) - (577*Sec[c + d*x]*Tan[c + d*x])/(315*a^3*d*(a + a*Cos[c + d*x])^2) -
 (3832*Sec[c + d*x]*Tan[c + d*x])/(315*d*(a^5 + a^5*Cos[c + d*x]))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
```

```
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = -\frac{\sec(c+dx)\tan(c+dx)}{9d(a+a\cos(c+dx))^5} + \frac{\int \frac{(11a-6a\cos(c+dx))\sec^3(c+dx)}{(a+a\cos(c+dx))^4}\,dx}{9a^2}$$

$$= -\frac{\sec(c+dx)\tan(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{17\sec(c+dx)\tan(c+dx)}{63ad(a+a\cos(c+dx))^4} + \frac{\int \frac{(111a^2-85a^2\cos(c+dx))\sec^3(c+dx)}{(a+a\cos(c+dx))^3}\,dx}{63a^4}$$

$$= -\frac{\sec(c+dx)\tan(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{17\sec(c+dx)\tan(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{28\sec(c+dx)\tan(c+dx)}{45a^2d(a+a\cos(c+dx))^3} + \frac{\int \frac{(947a^3-784a^3\cos(c+dx))\sec^3(c+dx)}{(a+a\cos(c+dx))^2}\,dx}{315a^6}$$

$$= -\frac{\sec(c+dx)\tan(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{17\sec(c+dx)\tan(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{28\sec(c+dx)\tan(c+dx)}{45a^2d(a+a\cos(c+dx))^3} - \frac{577\sec(c+dx)\tan(c+dx)}{315a^3d(a+a\cos(c+dx))^2} + \frac{\int \frac{(6303a^4-5193a^4\cos(c+dx))\sec^3(c+dx)}{a+a\cos(c+dx)}\,dx}{945a^8}$$

$$
\begin{aligned}
&= -\frac{\sec(c+dx)\tan(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{17\sec(c+dx)\tan(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{28\sec(c+dx)\tan(c+dx)}{45a^2d(a+a\cos(c+dx))^3} \\
&\quad - \frac{577\sec(c+dx)\tan(c+dx)}{315a^3d(a+a\cos(c+dx))^2} - \frac{3832\sec(c+dx)\tan(c+dx)}{315d\,(a^5+a^5\cos(c+dx))} \\
&\quad + \frac{\int (29295a^5 - 22992a^5\cos(c+dx))\sec^3(c+dx)\,dx}{945a^{10}} \\
&= -\frac{\sec(c+dx)\tan(c+dx)}{9d(a+a\cos(c+dx))^5} - \frac{17\sec(c+dx)\tan(c+dx)}{63ad(a+a\cos(c+dx))^4} \\
&\quad - \frac{28\sec(c+dx)\tan(c+dx)}{45a^2d(a+a\cos(c+dx))^3} - \frac{577\sec(c+dx)\tan(c+dx)}{315a^3d(a+a\cos(c+dx))^2} \\
&\quad - \frac{3832\sec(c+dx)\tan(c+dx)}{315d\,(a^5+a^5\cos(c+dx))} - \frac{7664\int\sec^2(c+dx)\,dx}{315a^5} + \frac{31\int\sec^3(c+dx)\,dx}{a^5} \\
&= \frac{31\sec(c+dx)\tan(c+dx)}{2a^5d} - \frac{\sec(c+dx)\tan(c+dx)}{9d(a+a\cos(c+dx))^5} \\
&\quad - \frac{17\sec(c+dx)\tan(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{28\sec(c+dx)\tan(c+dx)}{45a^2d(a+a\cos(c+dx))^3} \\
&\quad - \frac{577\sec(c+dx)\tan(c+dx)}{315a^3d(a+a\cos(c+dx))^2} - \frac{3832\sec(c+dx)\tan(c+dx)}{315d\,(a^5+a^5\cos(c+dx))} \\
&\quad + \frac{31\int\sec(c+dx)\,dx}{2a^5} + \frac{7664\text{Subst}(\int 1\,dx, x, -\tan(c+dx))}{315a^5d} \\
&= \frac{31\text{arctanh}(\sin(c+dx))}{2a^5d} - \frac{7664\tan(c+dx)}{315a^5d} \\
&\quad + \frac{31\sec(c+dx)\tan(c+dx)}{2a^5d} - \frac{\sec(c+dx)\tan(c+dx)}{9d(a+a\cos(c+dx))^5} \\
&\quad - \frac{17\sec(c+dx)\tan(c+dx)}{63ad(a+a\cos(c+dx))^4} - \frac{28\sec(c+dx)\tan(c+dx)}{45a^2d(a+a\cos(c+dx))^3} \\
&\quad - \frac{577\sec(c+dx)\tan(c+dx)}{315a^3d(a+a\cos(c+dx))^2} - \frac{3832\sec(c+dx)\tan(c+dx)}{315d\,(a^5+a^5\cos(c+dx))}
\end{aligned}
$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 507 vs. $2(224) = 448$.

Time = 7.09 (sec) , antiderivative size = 507, normalized size of antiderivative = 2.26

$$
\begin{aligned}
\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^5}\,dx &= -\frac{496\cos^{10}\left(\frac{c}{2}+\frac{dx}{2}\right)\log\left(\cos\left(\frac{c}{2}+\frac{dx}{2}\right)-\sin\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}{d(a+a\cos(c+dx))^5} \\
&\quad + \frac{496\cos^{10}\left(\frac{c}{2}+\frac{dx}{2}\right)\log\left(\cos\left(\frac{c}{2}+\frac{dx}{2}\right)+\sin\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}{d(a+a\cos(c+dx))^5} \\
&\quad + \frac{\cos\left(\frac{c}{2}+\frac{dx}{2}\right)\sec\left(\frac{c}{2}\right)\sec(c)\sec^2(c+dx)\left(1472562\sin\left(\frac{dx}{2}\right)-2822886\sin\left(\frac{3dx}{2}\right)+3057654\sin\left(c-\frac{dx}{2}\right)-1\right.}{}
\end{aligned}
$$

```
[In] Integrate[Sec[c + d*x]^3/(a + a*Cos[c + d*x])^5,x]
```

```
[Out] (-496*Cos[c/2 + (d*x)/2]^10*Log[Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2]])/(
d*(a + a*Cos[c + d*x])^5) + (496*Cos[c/2 + (d*x)/2]^10*Log[Cos[c/2 + (d*x)/
2] + Sin[c/2 + (d*x)/2]])/(d*(a + a*Cos[c + d*x])^5) + (Cos[c/2 + (d*x)/2]*
Sec[c/2]*Sec[c]*Sec[c + d*x]^2*(1472562*Sin[(d*x)/2] - 2822886*Sin[(3*d*x)/
2] + 3057654*Sin[c - (d*x)/2] - 1885854*Sin[c + (d*x)/2] + 2644362*Sin[2*c
+ (d*x)/2] + 867048*Sin[c + (3*d*x)/2] - 1868436*Sin[2*c + (3*d*x)/2] + 182
1498*Sin[3*c + (3*d*x)/2] - 2083537*Sin[c + (5*d*x)/2] + 339885*Sin[2*c + (
5*d*x)/2] - 1456687*Sin[3*c + (5*d*x)/2] + 966735*Sin[4*c + (5*d*x)/2] - 11
95641*Sin[2*c + (7*d*x)/2] + 46515*Sin[3*c + (7*d*x)/2] - 874341*Sin[4*c +
(7*d*x)/2] + 367815*Sin[5*c + (7*d*x)/2] - 494579*Sin[3*c + (9*d*x)/2] - 31
815*Sin[4*c + (9*d*x)/2] - 374879*Sin[5*c + (9*d*x)/2] + 87885*Sin[6*c + (9
*d*x)/2] - 128187*Sin[4*c + (11*d*x)/2] - 18585*Sin[5*c + (11*d*x)/2] - 998
37*Sin[6*c + (11*d*x)/2] + 9765*Sin[7*c + (11*d*x)/2] - 15328*Sin[5*c + (13
*d*x)/2] - 3150*Sin[6*c + (13*d*x)/2] - 12178*Sin[7*c + (13*d*x)/2]))/(4032
0*d*(a + a*Cos[c + d*x])^5)
```

Maple [A] (verified)

Time = 1.22 (sec) , antiderivative size = 160, normalized size of antiderivative = 0.71

method	result
parallelrisch	$\frac{(-1249920\cos(2dx+2c)-1249920)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+(1249920\cos(2dx+2c)+1249920)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)-7664(\cdots}{\cdots}$
derivativedivides	$\frac{-\frac{\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}-\frac{10\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{48\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-50\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-351\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{8}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^2}+\frac{\cdots}{\tan\cdots}}{16d\,a^5}$
default	$\frac{-\frac{\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}-\frac{10\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{48\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-50\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-351\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{8}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^2}+\frac{\cdots}{\tan\cdots}}{16d\,a^5}$
norman	$\frac{-\frac{495\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{16da}+\frac{207\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4da}-\frac{1303\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{80da}-\frac{141\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{70da}-\frac{2159\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5040da}-\frac{19\left(\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\cdots\right)}{252da}}{\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2a^4}$
risch	$-\frac{i\left(9765\,e^{12i(dx+c)}+87885\,e^{11i(dx+c)}+367815\,e^{10i(dx+c)}+966735\,e^{9i(dx+c)}+1821498\,e^{8i(dx+c)}+2644362\,e^{7i(dx+c)}+3\cdots\right)}{315d\,a^5\left(e^{2i(dx+c\cdots}\right)}$

```
[In] int(sec(d*x+c)^3/(a+cos(d*x+c)*a)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/80640*((-1249920*cos(2*d*x+2*c)-1249920)*ln(tan(1/2*d*x+1/2*c)-1)+(124992
0*cos(2*d*x+2*c)+1249920)*ln(tan(1/2*d*x+1/2*c)+1)-7664*(cos(6*d*x+6*c)+871
615/3832*cos(d*x+c)+155317/958*cos(2*d*x+2*c)+684135/7664*cos(3*d*x+3*c)+13
5111/3832*cos(4*d*x+4*c)+66875/7664*cos(5*d*x+5*c)+487469/3832)*tan(1/2*d*x
+1/2*c)*sec(1/2*d*x+1/2*c)^8)/a^5/d/(1+cos(2*d*x+2*c))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 294, normalized size of antiderivative = 1.31

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{9765\left(\cos(dx+c)^7+5\cos(dx+c)^6+10\cos(dx+c)^5+10\cos(dx+c)^4+5\cos(dx+c)^3+\cos(dx+c\right.}{}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/1260*(9765*(cos(d*x + c)^7 + 5*cos(d*x + c)^6 + 10*cos(d*x + c)^5 + 10*co
s(d*x + c)^4 + 5*cos(d*x + c)^3 + cos(d*x + c)^2)*log(sin(d*x + c) + 1) - 9
765*(cos(d*x + c)^7 + 5*cos(d*x + c)^6 + 10*cos(d*x + c)^5 + 10*cos(d*x + c
)^4 + 5*cos(d*x + c)^3 + cos(d*x + c)^2)*log(-sin(d*x + c) + 1) - 2*(15328*
cos(d*x + c)^6 + 66875*cos(d*x + c)^5 + 112119*cos(d*x + c)^4 + 87440*cos(d
*x + c)^3 + 28828*cos(d*x + c)^2 + 1575*cos(d*x + c) - 315)*sin(d*x + c))/(
a^5*d*cos(d*x + c)^7 + 5*a^5*d*cos(d*x + c)^6 + 10*a^5*d*cos(d*x + c)^5 + 1
0*a^5*d*cos(d*x + c)^4 + 5*a^5*d*cos(d*x + c)^3 + a^5*d*cos(d*x + c)^2)
```

Sympy [F]

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{\int \frac{\sec^3(c+dx)}{\cos^5(c+dx)+5\cos^4(c+dx)+10\cos^3(c+dx)+10\cos^2(c+dx)+5\cos(c+dx)+1}\,dx}{a^5}$$

```
[In] integrate(sec(d*x+c)**3/(a+a*cos(d*x+c))**5,x)
```

```
[Out] Integral(sec(c + d*x)**3/(cos(c + d*x)**5 + 5*cos(c + d*x)**4 + 10*cos(c +
d*x)**3 + 10*cos(c + d*x)**2 + 5*cos(c + d*x) + 1), x)/a**5
```

Maxima [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 251, normalized size of antiderivative = 1.12

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^5}\,dx = -\frac{\frac{5040\left(\frac{9\sin(dx+c)}{\cos(dx+c)+1}-\frac{11\sin(dx+c)^3}{(\cos(dx+c)+1)^3}\right)}{a^5-\frac{2a^5\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{a^5\sin(dx+c)^4}{(\cos(dx+c)+1)^4}}+\frac{\frac{110565\sin(dx+c)}{\cos(dx+c)+1}+\frac{15750\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{3024\sin(dx+c)^5}{(\cos(dx+c)+1)^5}+\frac{450\sin(dx+c)^7}{(\cos(dx+c)+1)^7}+\frac{35\sin(dx+c)^9}{(\cos(dx+c)+1)^9}}{a^5}-\frac{78120\log(}{}}{5040\,d}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] -1/5040*(5040*(9*sin(d*x + c)/(cos(d*x + c) + 1) - 11*sin(d*x + c)^3/(cos(d
*x + c) + 1)^3)/(a^5 - 2*a^5*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + a^5*sin(
d*x + c)^4/(cos(d*x + c) + 1)^4) + (110565*sin(d*x + c)/(cos(d*x + c) + 1)
+ 15750*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 3024*sin(d*x + c)^5/(cos(d*x
+ c) + 1)^5 + 450*sin(d*x + c)^7/(cos(d*x + c) + 1)^7 + 35*sin(d*x + c)^9/(
cos(d*x + c) + 1)^9)/a^5 - 78120*log(sin(d*x + c)/(cos(d*x + c) + 1) + 1)/a
^5 + 78120*log(sin(d*x + c)/(cos(d*x + c) + 1) - 1)/a^5)/d
```

Giac [A] (verification not implemented)

none

Time = 0.42 (sec) , antiderivative size = 171, normalized size of antiderivative = 0.76

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^5}\,dx = \frac{\frac{78120\,\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)}{a^5} - \frac{78120\,\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)}{a^5} + \frac{5040\,\left(11\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-9\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)^2 a^5} - 35\,a^{40}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\cdots}{5040\,d}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c))^5,x, algorithm="giac")
```

```
[Out] 1/5040*(78120*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^5 - 78120*log(abs(tan(1/
2*d*x + 1/2*c) - 1))/a^5 + 5040*(11*tan(1/2*d*x + 1/2*c)^3 - 9*tan(1/2*d*x
+ 1/2*c))/((tan(1/2*d*x + 1/2*c)^2 - 1)^2*a^5) - (35*a^40*tan(1/2*d*x + 1/2
*c)^9 + 450*a^40*tan(1/2*d*x + 1/2*c)^7 + 3024*a^40*tan(1/2*d*x + 1/2*c)^5
+ 15750*a^40*tan(1/2*d*x + 1/2*c)^3 + 110565*a^40*tan(1/2*d*x + 1/2*c))/a^4
5)/d
```

Mupad [B] (verification not implemented)

Time = 14.23 (sec) , antiderivative size = 179, normalized size of antiderivative = 0.80

$$\begin{aligned}\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^5}\,dx &= \frac{31\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{a^5\,d} - \frac{3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{5\,a^5\,d} \\ &\quad - \frac{5\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{56\,a^5\,d} - \frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9}{144\,a^5\,d} - \frac{25\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{8\,a^5\,d} \\ &\quad - \frac{9\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-11\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{d\,\left(a^5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-2\,a^5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+a^5\right)} \\ &\quad - \frac{351\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{16\,a^5\,d}\end{aligned}$$

```
[In] int(1/(cos(c + d*x)^3*(a + a*cos(c + d*x))^5),x)
```

```
[Out] (31*atanh(tan(c/2 + (d*x)/2)))/(a^5*d) - (3*tan(c/2 + (d*x)/2)^5)/(5*a^5*d)
 - (5*tan(c/2 + (d*x)/2)^7)/(56*a^5*d) - tan(c/2 + (d*x)/2)^9/(144*a^5*d) -
 (25*tan(c/2 + (d*x)/2)^3)/(8*a^5*d) - (9*tan(c/2 + (d*x)/2) - 11*tan(c/2 +
 (d*x)/2)^3)/(d*(a^5*tan(c/2 + (d*x)/2)^4 - 2*a^5*tan(c/2 + (d*x)/2)^2 + a^
5)) - (351*tan(c/2 + (d*x)/2))/(16*a^5*d)
```

3.93 $\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^6}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 184

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^6}\,dx = \frac{130\sin(c+dx)}{693a^6d(1+\cos(c+dx))^3} - \frac{268\sin(c+dx)}{693a^6d(1+\cos(c+dx))^2} + \frac{146\sin(c+dx)}{693a^6d(1+\cos(c+dx))} - \frac{\cos^4(c+dx)\sin(c+dx)}{11d(a+a\cos(c+dx))^6} - \frac{14\cos^3(c+dx)\sin(c+dx)}{99ad(a+a\cos(c+dx))^5} - \frac{118\cos^2(c+dx)\sin(c+dx)}{693a^2d(a+a\cos(c+dx))^4}$$

```
[Out] 130/693*sin(d*x+c)/a^6/d/(1+cos(d*x+c))^3-268/693*sin(d*x+c)/a^6/d/(1+cos(d
*x+c))^2+146/693*sin(d*x+c)/a^6/d/(1+cos(d*x+c))-1/11*cos(d*x+c)^4*sin(d*x+
c)/d/(a+a*cos(d*x+c))^6-14/99*cos(d*x+c)^3*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^
5-118/693*cos(d*x+c)^2*sin(d*x+c)/a^2/d/(a+a*cos(d*x+c))^4
```

Rubi [A] (verified)

Time = 0.71 (sec) , antiderivative size = 184, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {2844, 3056, 3047, 3098, 2829, 2727}

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^6}\,dx = \frac{146\sin(c+dx)}{693a^6d(\cos(c+dx)+1)} - \frac{268\sin(c+dx)}{693a^6d(\cos(c+dx)+1)^2} + \frac{130\sin(c+dx)}{693a^6d(\cos(c+dx)+1)^3} - \frac{118\sin(c+dx)\cos^2(c+dx)}{693a^2d(a\cos(c+dx)+a)^4} - \frac{\sin(c+dx)\cos^4(c+dx)}{11d(a\cos(c+dx)+a)^6} - \frac{14\sin(c+dx)\cos^3(c+dx)}{99ad(a\cos(c+dx)+a)^5}$$

```
[In] Int[Cos[c + d*x]^5/(a + a*Cos[c + d*x])^6,x]
```

```
[Out] (130*Sin[c + d*x])/(693*a^6*d*(1 + Cos[c + d*x])^3) - (268*Sin[c + d*x])/(6
93*a^6*d*(1 + Cos[c + d*x])^2) + (146*Sin[c + d*x])/(693*a^6*d*(1 + Cos[c +
 d*x])) - (Cos[c + d*x]^4*Sin[c + d*x])/(11*d*(a + a*Cos[c + d*x])^6) - (14
*Cos[c + d*x]^3*Sin[c + d*x])/(99*a*d*(a + a*Cos[c + d*x])^5) - (118*Cos[c
+ d*x]^2*Sin[c + d*x])/(693*a^2*d*(a + a*Cos[c + d*x])^4)
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2829

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((a + b*Sin[e + f*
x])^m/(a*f*(2*m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(a*b*(2*m + 1)), In
t[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && N
eQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
```

```
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3098

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(A*b - a*
B + b*C)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(a*f*(2*m + 1))), x] + Dist[1
/(a^2*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[a*A*(m + 1) + m*(b*
B - a*C) + b*C*(2*m + 1)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A,
B, C}, x] && LtQ[m, -1] && EqQ[a^2 - b^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^4(c+dx)\sin(c+dx)}{11d(a+a\cos(c+dx))^6}-\frac{\int\frac{\cos^3(c+dx)(4a-10a\cos(c+dx))}{(a+a\cos(c+dx))^5}\,dx}{11a^2}\\
&= -\frac{\cos^4(c+dx)\sin(c+dx)}{11d(a+a\cos(c+dx))^6}-\frac{14\cos^3(c+dx)\sin(c+dx)}{99ad(a+a\cos(c+dx))^5}-\frac{\int\frac{\cos^2(c+dx)\left(42a^2-76a^2\cos(c+dx)\right)}{(a+a\cos(c+dx))^4}\,dx}{99a^4}\\
&= -\frac{\cos^4(c+dx)\sin(c+dx)}{11d(a+a\cos(c+dx))^6}-\frac{14\cos^3(c+dx)\sin(c+dx)}{99ad(a+a\cos(c+dx))^5}\\
&\quad-\frac{118\cos^2(c+dx)\sin(c+dx)}{693a^2d(a+a\cos(c+dx))^4}-\frac{\int\frac{\cos(c+dx)\left(236a^3-414a^3\cos(c+dx)\right)}{(a+a\cos(c+dx))^3}\,dx}{693a^6}\\
&= -\frac{\cos^4(c+dx)\sin(c+dx)}{11d(a+a\cos(c+dx))^6}-\frac{14\cos^3(c+dx)\sin(c+dx)}{99ad(a+a\cos(c+dx))^5}\\
&\quad-\frac{118\cos^2(c+dx)\sin(c+dx)}{693a^2d(a+a\cos(c+dx))^4}-\frac{\int\frac{236a^3\cos(c+dx)-414a^3\cos^2(c+dx)}{(a+a\cos(c+dx))^3}\,dx}{693a^6}\\
&= \frac{130\sin(c+dx)}{693a^6d(1+\cos(c+dx))^3}-\frac{\cos^4(c+dx)\sin(c+dx)}{11d(a+a\cos(c+dx))^6}-\frac{14\cos^3(c+dx)\sin(c+dx)}{99ad(a+a\cos(c+dx))^5}\\
&\quad-\frac{118\cos^2(c+dx)\sin(c+dx)}{693a^2d(a+a\cos(c+dx))^4}+\frac{\int\frac{-1950a^4+2070a^4\cos(c+dx)}{(a+a\cos(c+dx))^2}\,dx}{3465a^8}\\
&= \frac{130\sin(c+dx)}{693a^6d(1+\cos(c+dx))^3}-\frac{\cos^4(c+dx)\sin(c+dx)}{11d(a+a\cos(c+dx))^6}-\frac{14\cos^3(c+dx)\sin(c+dx)}{99ad(a+a\cos(c+dx))^5}\\
&\quad-\frac{118\cos^2(c+dx)\sin(c+dx)}{693a^2d(a+a\cos(c+dx))^4}-\frac{268\sin(c+dx)}{693d\left(a^3+a^3\cos(c+dx)\right)^2}+\frac{146\int\frac{1}{a+a\cos(c+dx)}\,dx}{693a^5}\\
&= \frac{130\sin(c+dx)}{693a^6d(1+\cos(c+dx))^3}-\frac{\cos^4(c+dx)\sin(c+dx)}{11d(a+a\cos(c+dx))^6}-\frac{14\cos^3(c+dx)\sin(c+dx)}{99ad(a+a\cos(c+dx))^5}\\
&\quad-\frac{118\cos^2(c+dx)\sin(c+dx)}{693a^2d(a+a\cos(c+dx))^4}-\frac{268\sin(c+dx)}{693d\left(a^3+a^3\cos(c+dx)\right)^2}+\frac{146\sin(c+dx)}{693d\left(a^6+a^6\cos(c+dx)\right)}
\end{aligned}$$

Mathematica [A] (verified)

Time = 5.08 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.41

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^6}\,dx = \frac{(8+48\cos(c+dx)+124\cos^2(c+dx)+184\cos^3(c+dx)+183\cos^4(c+dx)+146\cos^5(c+dx))\sin(c+d}{693a^6d(1+\cos(c+dx))^6}$$

```
[In] Integrate[Cos[c + d*x]^5/(a + a*Cos[c + d*x])^6,x]
```

```
[Out] ((8 + 48*Cos[c + d*x] + 124*Cos[c + d*x]^2 + 184*Cos[c + d*x]^3 + 183*Cos[c
 + d*x]^4 + 146*Cos[c + d*x]^5)*Sin[c + d*x])/(693*a^6*d*(1 + Cos[c + d*x])
^6)
```

Maple [A] (verified)

Time = 0.74 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.45

method	result
parallelrisch	$-\frac{\left(\tan^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{55\left(\tan^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}+\frac{110\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-22\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\frac{55\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}-11\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{352a^6d}$
derivativedivides	$\frac{-\frac{\left(\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{11}+\frac{5\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}-\frac{10\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+2\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\frac{5\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{32d\,a^6}$
default	$\frac{-\frac{\left(\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{11}+\frac{5\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{9}-\frac{10\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+2\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\frac{5\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{32d\,a^6}$
risch	$\frac{2i\left(693\,e^{10i(dx+c)}+3465\,e^{9i(dx+c)}+11550\,e^{8i(dx+c)}+23100\,e^{7i(dx+c)}+33726\,e^{6i(dx+c)}+33726\,e^{5i(dx+c)}+25080\,e^{4i(dx+c)}\right.}{693d\,a^6\left(e^{i(dx+c)}+1\right)^{11}}$

```
[In] int(cos(d*x+c)^5/(a+cos(d*x+c)*a)^6,x,method=_RETURNVERBOSE)
```

```
[Out] -1/352*(tan(1/2*d*x+1/2*c)^10-55/9*tan(1/2*d*x+1/2*c)^8+110/7*tan(1/2*d*x+1
/2*c)^6-22*tan(1/2*d*x+1/2*c)^4+55/3*tan(1/2*d*x+1/2*c)^2-11)*tan(1/2*d*x+1
/2*c)/a^6/d
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 147, normalized size of antiderivative = 0.80

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^6}\,dx$$
$$= \frac{(146\cos(dx+c)^5+183\cos(dx+c)^4+184\cos(dx+c)^3+124\cos(dx+c)^2+48\cos(dx+}{693\,(a^6d\cos(dx+c)^6+6\,a^6d\cos(dx+c)^5+15\,a^6d\cos(dx+c)^4+20\,a^6d\cos(dx+c)^3+15\,a^6d\cos(dx+}$$

```
[In] integrate(cos(d*x+c)^5/(a+a*cos(d*x+c))^6,x, algorithm="fricas")
```

```
[Out] 1/693*(146*cos(d*x + c)^5 + 183*cos(d*x + c)^4 + 184*cos(d*x + c)^3 + 124*c
os(d*x + c)^2 + 48*cos(d*x + c) + 8)*sin(d*x + c)/(a^6*d*cos(d*x + c)^6 + 6
*a^6*d*cos(d*x + c)^5 + 15*a^6*d*cos(d*x + c)^4 + 20*a^6*d*cos(d*x + c)^3 +
 15*a^6*d*cos(d*x + c)^2 + 6*a^6*d*cos(d*x + c) + a^6*d)
```

Sympy [A] (verification not implemented)

Time = 11.97 (sec) , antiderivative size = 129, normalized size of antiderivative = 0.70

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^6}\,dx$$
$$= \begin{cases} -\frac{\tan^{11}\left(\frac{c}{2}+\frac{dx}{2}\right)}{352a^6d}+\frac{5\tan^9\left(\frac{c}{2}+\frac{dx}{2}\right)}{288a^6d}-\frac{5\tan^7\left(\frac{c}{2}+\frac{dx}{2}\right)}{112a^6d}+\frac{\tan^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{16a^6d}-\frac{5\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{96a^6d}+\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{32a^6d} & \text{for } d\neq 0 \\ \frac{x\cos^5(c)}{(a\cos(c)+a)^6} & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)**5/(a+a*cos(d*x+c))**6,x)
```

```
[Out] Piecewise((-tan(c/2 + d*x/2)**11/(352*a**6*d) + 5*tan(c/2 + d*x/2)**9/(288*
a**6*d) - 5*tan(c/2 + d*x/2)**7/(112*a**6*d) + tan(c/2 + d*x/2)**5/(16*a**6
*d) - 5*tan(c/2 + d*x/2)**3/(96*a**6*d) + tan(c/2 + d*x/2)/(32*a**6*d), Ne(
d, 0)), (x*cos(c)**5/(a*cos(c) + a)**6, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 127, normalized size of antiderivative = 0.69

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^6}\,dx$$
$$= \frac{\frac{693\sin(dx+c)}{\cos(dx+c)+1}-\frac{1155\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{1386\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{990\sin(dx+c)^7}{(\cos(dx+c)+1)^7}+\frac{385\sin(dx+c)^9}{(\cos(dx+c)+1)^9}-\frac{63\sin(dx+c)^{11}}{(\cos(dx+c)+1)^{11}}}{22176\,a^6d}$$

```
[In] integrate(cos(d*x+c)^5/(a+a*cos(d*x+c))^6,x, algorithm="maxima")
```

```
[Out] 1/22176*(693*sin(d*x + c)/(cos(d*x + c) + 1) - 1155*sin(d*x + c)^3/(cos(d*x
 + c) + 1)^3 + 1386*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 990*sin(d*x + c)^
7/(cos(d*x + c) + 1)^7 + 385*sin(d*x + c)^9/(cos(d*x + c) + 1)^9 - 63*sin(d
*x + c)^11/(cos(d*x + c) + 1)^11)/(a^6*d)
```

Giac [A] (verification not implemented)

none

Time = 0.42 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.46

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^6}\,dx = -\frac{63\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{11}-385\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{9}+990\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{7}-1386\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{5}+1155\,\mathrm{t}}{22176\,a^6d}$$

```
[In] integrate(cos(d*x+c)^5/(a+a*cos(d*x+c))^6,x, algorithm="giac")
```

```
[Out] -1/22176*(63*tan(1/2*d*x + 1/2*c)^11 - 385*tan(1/2*d*x + 1/2*c)^9 + 990*tan
(1/2*d*x + 1/2*c)^7 - 1386*tan(1/2*d*x + 1/2*c)^5 + 1155*tan(1/2*d*x + 1/2*
c)^3 - 693*tan(1/2*d*x + 1/2*c))/(a^6*d)
```

Mupad [B] (verification not implemented)

Time = 15.31 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.41

$$\int \frac{\cos^5(c+dx)}{(a+a\cos(c+dx))^6}\,dx = \frac{\frac{495\,\sin\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)}{8}+\frac{495\,\sin\left(\frac{5\,c}{2}+\frac{5\,d\,x}{2}\right)}{16}+\frac{275\,\sin\left(\frac{7\,c}{2}+\frac{7\,d\,x}{2}\right)}{8}+\frac{55\,\sin\left(\frac{9\,c}{2}+\frac{9\,d\,x}{2}\right)}{8}+\frac{73\,\sin\left(\frac{11\,c}{2}+\frac{11\,d\,x}{2}\right)}{16}}{22176\,a^6\,d\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{11}}$$

```
[In] int(cos(c + d*x)^5/(a + a*cos(c + d*x))^6,x)
```

```
[Out] ((495*sin((3*c)/2 + (3*d*x)/2))/8 + (495*sin((5*c)/2 + (5*d*x)/2))/16 + (27
5*sin((7*c)/2 + (7*d*x)/2))/8 + (55*sin((9*c)/2 + (9*d*x)/2))/8 + (73*sin((
11*c)/2 + (11*d*x)/2))/16)/(22176*a^6*d*cos(c/2 + (d*x)/2)^11)
```

3.94 $\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^6}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 176

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^6}\,dx = -\frac{241\sin(c+dx)}{1155a^6d(1+\cos(c+dx))^3}+\frac{61\sin(c+dx)}{1155a^6d(1+\cos(c+dx))^2}+\frac{61\sin(c+dx)}{1155a^6d(1+\cos(c+dx))}-\frac{\cos^3(c+dx)\sin(c+dx)}{11d(a+a\cos(c+dx))^6}-\frac{4\cos^2(c+dx)\sin(c+dx)}{33ad(a+a\cos(c+dx))^5}+\frac{9\sin(c+dx)}{77a^2d(a+a\cos(c+dx))^4}$$

```
[Out] -241/1155*sin(d*x+c)/a^6/d/(1+cos(d*x+c))^3+61/1155*sin(d*x+c)/a^6/d/(1+cos
(d*x+c))^2+61/1155*sin(d*x+c)/a^6/d/(1+cos(d*x+c))-1/11*cos(d*x+c)^3*sin(d*
x+c)/d/(a+a*cos(d*x+c))^6-4/33*cos(d*x+c)^2*sin(d*x+c)/a/d/(a+a*cos(d*x+c))
^5+9/77*sin(d*x+c)/a^2/d/(a+a*cos(d*x+c))^4
```

Rubi [A] (verified)

Time = 0.42 (sec) , antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2844, 3056, 3047, 3098, 2829, 2729, 2727}

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^6}\,dx = \frac{61\sin(c+dx)}{1155a^6d(\cos(c+dx)+1)}+\frac{61\sin(c+dx)}{1155a^6d(\cos(c+dx)+1)^2}-\frac{241\sin(c+dx)}{1155a^6d(\cos(c+dx)+1)^3}+\frac{9\sin(c+dx)}{77a^2d(a\cos(c+dx)+a)^4}-\frac{\sin(c+dx)\cos^3(c+dx)}{11d(a\cos(c+dx)+a)^6}-\frac{4\sin(c+dx)\cos^2(c+dx)}{33ad(a\cos(c+dx)+a)^5}$$

```
[In] Int[Cos[c + d*x]^4/(a + a*Cos[c + d*x])^6,x]
```

```
[Out] (-241*Sin[c + d*x])/(1155*a^6*d*(1 + Cos[c + d*x])^3) + (61*Sin[c + d*x])/(
1155*a^6*d*(1 + Cos[c + d*x])^2) + (61*Sin[c + d*x])/(1155*a^6*d*(1 + Cos[c
 + d*x])) - (Cos[c + d*x]^3*Sin[c + d*x])/(11*d*(a + a*Cos[c + d*x])^6) - (
4*Cos[c + d*x]^2*Sin[c + d*x])/(33*a*d*(a + a*Cos[c + d*x])^5) + (9*Sin[c +
 d*x])/(77*a^2*d*(a + a*Cos[c + d*x])^4)
```

Rule 2727

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> Simp[-Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2729

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[c
+ d*x]*((a + b*Sin[c + d*x])^n/(a*d*(2*n + 1))), x] + Dist[(n + 1)/(a*(2*n
+ 1)), Int[(a + b*Sin[c + d*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d}, x] &
& EqQ[a^2 - b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2829

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((a + b*Sin[e + f*
x])^m/(a*f*(2*m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(a*b*(2*m + 1)), In
t[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && N
eQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3098

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(A*b - a*
B + b*C)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(a*f*(2*m + 1))), x] + Dist[1
/(a^2*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[a*A*(m + 1) + m*(b*
B - a*C) + b*C*(2*m + 1)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A,
B, C}, x] && LtQ[m, -1] && EqQ[a^2 - b^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^3(c+dx)\sin(c+dx)}{11d(a+a\cos(c+dx))^6} - \frac{\int \frac{\cos^2(c+dx)(3a-9a\cos(c+dx))}{(a+a\cos(c+dx))^5}\,dx}{11a^2} \\
&= -\frac{\cos^3(c+dx)\sin(c+dx)}{11d(a+a\cos(c+dx))^6} - \frac{4\cos^2(c+dx)\sin(c+dx)}{33ad(a+a\cos(c+dx))^5} - \frac{\int \frac{\cos(c+dx)\left(24a^2-57a^2\cos(c+dx)\right)}{(a+a\cos(c+dx))^4}\,dx}{99a^4} \\
&= -\frac{\cos^3(c+dx)\sin(c+dx)}{11d(a+a\cos(c+dx))^6} - \frac{4\cos^2(c+dx)\sin(c+dx)}{33ad(a+a\cos(c+dx))^5} - \frac{\int \frac{24a^2\cos(c+dx)-57a^2\cos^2(c+dx)}{(a+a\cos(c+dx))^4}\,dx}{99a^4} \\
&= -\frac{\cos^3(c+dx)\sin(c+dx)}{11d(a+a\cos(c+dx))^6} - \frac{4\cos^2(c+dx)\sin(c+dx)}{33ad(a+a\cos(c+dx))^5} \\
&\quad + \frac{9\sin(c+dx)}{77a^2d(a+a\cos(c+dx))^4} + \frac{\int \frac{-324a^3+399a^3\cos(c+dx)}{(a+a\cos(c+dx))^3}\,dx}{693a^6} \\
&= -\frac{241\sin(c+dx)}{1155a^6d(1+\cos(c+dx))^3} - \frac{\cos^3(c+dx)\sin(c+dx)}{11d(a+a\cos(c+dx))^6} \\
&\quad - \frac{4\cos^2(c+dx)\sin(c+dx)}{33ad(a+a\cos(c+dx))^5} + \frac{9\sin(c+dx)}{77a^2d(a+a\cos(c+dx))^4} + \frac{61\int \frac{1}{(a+a\cos(c+dx))^2}\,dx}{385a^4} \\
&= -\frac{241\sin(c+dx)}{1155a^6d(1+\cos(c+dx))^3} - \frac{\cos^3(c+dx)\sin(c+dx)}{11d(a+a\cos(c+dx))^6} - \frac{4\cos^2(c+dx)\sin(c+dx)}{33ad(a+a\cos(c+dx))^5} \\
&\quad + \frac{9\sin(c+dx)}{77a^2d(a+a\cos(c+dx))^4} + \frac{61\sin(c+dx)}{1155d\left(a^3+a^3\cos(c+dx)\right)^2} + \frac{61\int \frac{1}{a+a\cos(c+dx)}\,dx}{1155a^5}
\end{aligned}$$

$$= -\frac{241\sin(c+dx)}{1155a^6d(1+\cos(c+dx))^3} - \frac{\cos^3(c+dx)\sin(c+dx)}{11d(a+a\cos(c+dx))^6} - \frac{4\cos^2(c+dx)\sin(c+dx)}{33ad(a+a\cos(c+dx))^5} + \frac{9\sin(c+dx)}{77a^2d(a+a\cos(c+dx))^4} + \frac{61\sin(c+dx)}{1155d\left(a^3+a^3\cos(c+dx)\right)^2} + \frac{61\sin(c+dx)}{1155d\left(a^6+a^6\cos(c+dx)\right)}$$

Mathematica [A] (verified)

Time = 5.08 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.43

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^6}\,dx = \frac{(16+96\cos(c+dx)+248\cos^2(c+dx)+368\cos^3(c+dx)+366\cos^4(c+dx)+61\cos^5(c+dx))\sin(c+d}{1155a^6d(1+\cos(c+dx))^6}$$

```
[In] Integrate[Cos[c + d*x]^4/(a + a*Cos[c + d*x])^6,x]
```

```
[Out] ((16 + 96*Cos[c + d*x] + 248*Cos[c + d*x]^2 + 368*Cos[c + d*x]^3 + 366*Cos[
c + d*x]^4 + 61*Cos[c + d*x]^5)*Sin[c + d*x])/(1155*a^6*d*(1 + Cos[c + d*x]
)^6)
```

Maple [A] (verified)

Time = 0.87 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.48

method	result
derivativedivides	$\frac{\frac{\left(\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{11}-\frac{\left(\tan^{9}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\frac{2\left(\tan^{7}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+\frac{2\left(\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{32d\,a^6}$
default	$\frac{\frac{\left(\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{11}-\frac{\left(\tan^{9}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3}+\frac{2\left(\tan^{7}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+\frac{2\left(\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}-\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{32d\,a^6}$
parallelrisch	$\frac{105\left(\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-385\left(\tan^{9}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+330\left(\tan^{7}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+462\left(\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1155\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1155\tan(}{36960a^6d}$
risch	$\frac{2i(1155\,e^{9i(dx+c)}+3465\,e^{8i(dx+c)}+9240\,e^{7i(dx+c)}+12936\,e^{6i(dx+c)}+15246\,e^{5i(dx+c)}+10890\,e^{4i(dx+c)}+6600\,e^{3i(dx+c)}+2}{1155d\,a^6\left(e^{i(dx+c)}+1\right)^{11}}$

```
[In] int(cos(d*x+c)^4/(a+cos(d*x+c)*a)^6,x,method=_RETURNVERBOSE)
```

```
[Out] 1/32/d/a^6*(1/11*tan(1/2*d*x+1/2*c)^11-1/3*tan(1/2*d*x+1/2*c)^9+2/7*tan(1/2
*d*x+1/2*c)^7+2/5*tan(1/2*d*x+1/2*c)^5-tan(1/2*d*x+1/2*c)^3+tan(1/2*d*x+1/2
*c))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 147, normalized size of antiderivative = 0.84

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^6}\,dx = \frac{(61\cos(dx+c)^5+366\cos(dx+c)^4+368\cos(dx+c)^3+248\cos(dx+c)^2+96\cos(dx+c)+16)\sin(dx+c)}{1155\left(a^6d\cos(dx+c)^6+6a^6d\cos(dx+c)^5+15a^6d\cos(dx+c)^4+20a^6d\cos(dx+c)^3+15a^6d\cos(dx+c)^2+6a^6d\cos(dx+c)+a^6d\right)}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^6,x, algorithm="fricas")
```

```
[Out] 1/1155*(61*cos(d*x + c)^5 + 366*cos(d*x + c)^4 + 368*cos(d*x + c)^3 + 248*c
os(d*x + c)^2 + 96*cos(d*x + c) + 16)*sin(d*x + c)/(a^6*d*cos(d*x + c)^6 +
6*a^6*d*cos(d*x + c)^5 + 15*a^6*d*cos(d*x + c)^4 + 20*a^6*d*cos(d*x + c)^3
+ 15*a^6*d*cos(d*x + c)^2 + 6*a^6*d*cos(d*x + c) + a^6*d)
```

Sympy [A] (verification not implemented)

Time = 9.67 (sec) , antiderivative size = 124, normalized size of antiderivative = 0.70

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^6}\,dx = \begin{cases} \frac{\tan^{11}\left(\frac{c}{2}+\frac{dx}{2}\right)}{352a^6d} - \frac{\tan^9\left(\frac{c}{2}+\frac{dx}{2}\right)}{96a^6d} + \frac{\tan^7\left(\frac{c}{2}+\frac{dx}{2}\right)}{112a^6d} + \frac{\tan^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{80a^6d} - \frac{\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{32a^6d} + \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{32a^6d} & \text{for}\ d \neq 0 \\ \frac{x\cos^4(c)}{(a\cos(c)+a)^6} & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)**4/(a+a*cos(d*x+c))**6,x)
```

```
[Out] Piecewise((tan(c/2 + d*x/2)**11/(352*a**6*d) - tan(c/2 + d*x/2)**9/(96*a**6
*d) + tan(c/2 + d*x/2)**7/(112*a**6*d) + tan(c/2 + d*x/2)**5/(80*a**6*d) -
tan(c/2 + d*x/2)**3/(32*a**6*d) + tan(c/2 + d*x/2)/(32*a**6*d), Ne(d, 0)),
(x*cos(c)**4/(a*cos(c) + a)**6, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 127, normalized size of antiderivative = 0.72

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^6}\,dx = \frac{\frac{1155\sin(dx+c)}{\cos(dx+c)+1} - \frac{1155\sin(dx+c)^3}{(\cos(dx+c)+1)^3} + \frac{462\sin(dx+c)^5}{(\cos(dx+c)+1)^5} + \frac{330\sin(dx+c)^7}{(\cos(dx+c)+1)^7} - \frac{385\sin(dx+c)^9}{(\cos(dx+c)+1)^9} + \frac{105\sin(dx+c)^{11}}{(\cos(dx+c)+1)^{11}}}{36960\,a^6d}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^6,x, algorithm="maxima")
```

```
[Out] 1/36960*(1155*sin(d*x + c)/(cos(d*x + c) + 1) - 1155*sin(d*x + c)^3/(cos(d*
x + c) + 1)^3 + 462*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 + 330*sin(d*x + c)^
7/(cos(d*x + c) + 1)^7 - 385*sin(d*x + c)^9/(cos(d*x + c) + 1)^9 + 105*sin(
d*x + c)^11/(cos(d*x + c) + 1)^11)/(a^6*d)
```

Giac [A] (verification not implemented)

none

Time = 0.41 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.48

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^6}\,dx = \frac{105\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{11}-385\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{9}+330\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{7}+462\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{5}-1155\,\tan}{36960\,a^6d}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^6,x, algorithm="giac")
```

```
[Out] 1/36960*(105*tan(1/2*d*x + 1/2*c)^11 - 385*tan(1/2*d*x + 1/2*c)^9 + 330*tan
(1/2*d*x + 1/2*c)^7 + 462*tan(1/2*d*x + 1/2*c)^5 - 1155*tan(1/2*d*x + 1/2*c
)^3 + 1155*tan(1/2*d*x + 1/2*c))/(a^6*d)
```

Mupad [B] (verification not implemented)

Time = 14.79 (sec) , antiderivative size = 151, normalized size of antiderivative = 0.86

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^6}\,dx = \frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(1155\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}-1155\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{8}\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{2}+462\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{6}\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{4}+\right.}{36960\,a^6\,d\cos\left(\frac{c}{2}+\frac{dx}{2}\right.}$$

```
[In] int(cos(c + d*x)^4/(a + a*cos(c + d*x))^6,x)
```

```
[Out] (sin(c/2 + (d*x)/2)*(1155*cos(c/2 + (d*x)/2)^10 + 105*sin(c/2 + (d*x)/2)^10
 - 385*cos(c/2 + (d*x)/2)^2*sin(c/2 + (d*x)/2)^8 + 330*cos(c/2 + (d*x)/2)^4
*sin(c/2 + (d*x)/2)^6 + 462*cos(c/2 + (d*x)/2)^6*sin(c/2 + (d*x)/2)^4 - 115
5*cos(c/2 + (d*x)/2)^8*sin(c/2 + (d*x)/2)^2))/(36960*a^6*d*cos(c/2 + (d*x)/
2)^11)
```

3.95 $\int \cos^4(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 158

$$\int \cos^4(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \frac{32a\sin(c+dx)}{45d\sqrt{a+a\cos(c+dx)}} + \frac{16a\cos^3(c+dx)\sin(c+dx)}{63d\sqrt{a+a\cos(c+dx)}} + \frac{2a\cos^4(c+dx)\sin(c+dx)}{9d\sqrt{a+a\cos(c+dx)}} - \frac{64\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{315d} + \frac{32(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{105ad}$$

```
[Out] 32/105*(a+a*cos(d*x+c))^(3/2)*sin(d*x+c)/a/d+32/45*a*sin(d*x+c)/d/(a+a*cos(
d*x+c))^(1/2)+16/63*a*cos(d*x+c)^3*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+2/9*
a*cos(d*x+c)^4*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)-64/315*sin(d*x+c)*(a+a*c
os(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used

$= \{2849, 2838, 2830, 2725\}$

$$\int \cos^4(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \frac{2a\sin(c+dx)\cos^4(c+dx)}{9d\sqrt{a\cos(c+dx)+a}} + \frac{16a\sin(c+dx)\cos^3(c+dx)}{63d\sqrt{a\cos(c+dx)+a}} + \frac{32\sin(c+dx)(a\cos(c+dx)+a)^{3/2}}{105ad} - \frac{64\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{315d} + \frac{32a\sin(c+dx)}{45d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Cos[c + d*x]^4*Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (32*a*Sin[c + d*x])/(45*d*Sqrt[a + a*Cos[c + d*x]]) + (16*a*Cos[c + d*x]^3*
Sin[c + d*x])/(63*d*Sqrt[a + a*Cos[c + d*x]]) + (2*a*Cos[c + d*x]^4*Sin[c +
 d*x])/(9*d*Sqrt[a + a*Cos[c + d*x]]) - (64*Sqrt[a + a*Cos[c + d*x]]*Sin[c
+ d*x])/(315*d) + (32*(a + a*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(105*a*d)
```

Rule 2725

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[-2*b*(Cos
[c + d*x]/(d*Sqrt[a + b*Sin[c + d*x]])), x] /; FreeQ[{a, b, c, d}, x] && Eq
Q[a^2 - b^2, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rule 2838

```
Int[sin[(e_.) + (f_.)*(x_)]^2*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_),
x_Symbol] :> Simp[(-Cos[e + f*x])*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2
))), x] + Dist[1/(b*(m + 2)), Int[(a + b*Sin[e + f*x])^m*(b*(m + 1) - a*Sin
[e + f*x]), x], x] /; FreeQ[{a, b, e, f, m}, x] && EqQ[a^2 - b^2, 0] &&  !L
tQ[m, -2^(-1)]
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
```

```
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2a\cos^4(c+dx)\sin(c+dx)}{9d\sqrt{a+a\cos(c+dx)}}+\frac{8}{9}\int\cos^3(c+dx)\sqrt{a+a\cos(c+dx)}\,dx\\
&= \frac{16a\cos^3(c+dx)\sin(c+dx)}{63d\sqrt{a+a\cos(c+dx)}}+\frac{2a\cos^4(c+dx)\sin(c+dx)}{9d\sqrt{a+a\cos(c+dx)}}\\
&\quad+\frac{16}{21}\int\cos^2(c+dx)\sqrt{a+a\cos(c+dx)}\,dx\\
&= \frac{16a\cos^3(c+dx)\sin(c+dx)}{63d\sqrt{a+a\cos(c+dx)}}+\frac{2a\cos^4(c+dx)\sin(c+dx)}{9d\sqrt{a+a\cos(c+dx)}}\\
&\quad+\frac{32(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{105ad}\\
&\quad+\frac{32\int\left(\frac{3a}{2}-a\cos(c+dx)\right)\sqrt{a+a\cos(c+dx)}\,dx}{105a}\\
&= \frac{16a\cos^3(c+dx)\sin(c+dx)}{63d\sqrt{a+a\cos(c+dx)}}+\frac{2a\cos^4(c+dx)\sin(c+dx)}{9d\sqrt{a+a\cos(c+dx)}}\\
&\quad-\frac{64\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{315d}\\
&\quad+\frac{32(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{105ad}+\frac{16}{45}\int\sqrt{a+a\cos(c+dx)}\,dx\\
&= \frac{32a\sin(c+dx)}{45d\sqrt{a+a\cos(c+dx)}}+\frac{16a\cos^3(c+dx)\sin(c+dx)}{63d\sqrt{a+a\cos(c+dx)}}+\frac{2a\cos^4(c+dx)\sin(c+dx)}{9d\sqrt{a+a\cos(c+dx)}}\\
&\quad-\frac{64\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{315d}+\frac{32(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{105ad}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 92, normalized size of antiderivative = 0.58

$$\int\cos^4(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$$
$$=\frac{\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(1890\sin\left(\frac{1}{2}(c+dx)\right)+420\sin\left(\frac{3}{2}(c+dx)\right)+252\sin\left(\frac{5}{2}(c+dx)\right)+\right.}{2520d}$$

```
[In] Integrate[Cos[c + d*x]^4*Sqrt[a + a*Cos[c + d*x]],x]
```

[Out] (Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(1890*Sin[(c + d*x)/2] + 420*Sin[(3*(c + d*x))/2] + 252*Sin[(5*(c + d*x))/2] + 45*Sin[(7*(c + d*x))/2] + 35*Sin[(9*(c + d*x))/2]))/(2520*d)

Maple [A] (verified)

Time = 0.97 (sec) , antiderivative size = 97, normalized size of antiderivative = 0.61

method	result	size
default	$\frac{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)a\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\left(560\left(\cos^{8}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-800\left(\cos^{6}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+552\left(\cos^{4}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-104\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+107\right)\sqrt{2}}{315\sqrt{a\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$	97

[In] int(cos(d*x+c)^4*(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)

[Out] 2/315*cos(1/2*d*x+1/2*c)*a*sin(1/2*d*x+1/2*c)*(560*cos(1/2*d*x+1/2*c)^8-800*cos(1/2*d*x+1/2*c)^6+552*cos(1/2*d*x+1/2*c)^4-104*cos(1/2*d*x+1/2*c)^2+107)*2^(1/2)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.46

$$\int \cos^4(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \frac{2\left(35\cos(dx+c)^4+40\cos(dx+c)^3+48\cos(dx+c)^2+64\cos(dx+c)+128\right)\sqrt{a\cos(dx+c)+a}\sin(}{315\left(d\cos(dx+c)+d\right)}$$

[In] integrate(cos(d*x+c)^4*(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] 2/315*(35*cos(d*x + c)^4 + 40*cos(d*x + c)^3 + 48*cos(d*x + c)^2 + 64*cos(d*x + c) + 128)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/(d*cos(d*x + c) + d)

Sympy [F(-1)]

Timed out.

$$\int \cos^4(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \text{Timed out}$$

[In] integrate(cos(d*x+c)**4*(a+a*cos(d*x+c))**(1/2),x)

[Out] Timed out

Maxima [A] (verification not implemented)

none

Time = 0.39 (sec) , antiderivative size = 79, normalized size of antiderivative = 0.50

$$\int \cos^4(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$$
$$= \frac{\left(35\sqrt{2}\sin\left(\frac{9}{2}dx+\frac{9}{2}c\right)+45\sqrt{2}\sin\left(\frac{7}{2}dx+\frac{7}{2}c\right)+252\sqrt{2}\sin\left(\frac{5}{2}dx+\frac{5}{2}c\right)+420\sqrt{2}\sin\left(\frac{3}{2}dx+\frac{3}{2}c\right)+18\right.}{2520\,d}$$

```
[In] integrate(cos(d*x+c)^4*(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/2520*(35*sqrt(2)*sin(9/2*d*x + 9/2*c) + 45*sqrt(2)*sin(7/2*d*x + 7/2*c) +
 252*sqrt(2)*sin(5/2*d*x + 5/2*c) + 420*sqrt(2)*sin(3/2*d*x + 3/2*c) + 1890
*sqrt(2)*sin(1/2*d*x + 1/2*c))*sqrt(a)/d
```

Giac [A] (verification not implemented)

none

Time = 0.66 (sec) , antiderivative size = 117, normalized size of antiderivative = 0.74

$$\int \cos^4(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$$
$$= \frac{\sqrt{2}\left(35\,\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)\sin\left(\frac{9}{2}dx+\frac{9}{2}c\right)+45\,\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)\sin\left(\frac{7}{2}dx+\frac{7}{2}c\right)+252\,\mathrm{sgn}\left(\cos\left(\frac{1}{2}\right.\right.\right.}{}$$

```
[In] integrate(cos(d*x+c)^4*(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 1/2520*sqrt(2)*(35*sgn(cos(1/2*d*x + 1/2*c))*sin(9/2*d*x + 9/2*c) + 45*sgn(
cos(1/2*d*x + 1/2*c))*sin(7/2*d*x + 7/2*c) + 252*sgn(cos(1/2*d*x + 1/2*c))*
sin(5/2*d*x + 5/2*c) + 420*sgn(cos(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c) +
 1890*sgn(cos(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c))*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int \cos^4(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \int \cos\left(c+d\,x\right)^4\,\sqrt{a+a\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(cos(c + d*x)^4*(a + a*cos(c + d*x))^(1/2),x)
```

```
[Out] int(cos(c + d*x)^4*(a + a*cos(c + d*x))^(1/2), x)
```

3.96 $\int \cos^3(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 122

$$\int \cos^3(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \frac{4a\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}}+\frac{2a\cos^3(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}} - \frac{8\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{35d} + \frac{12(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{35ad}$$

```
[Out] 12/35*(a+a*cos(d*x+c))^(3/2)*sin(d*x+c)/a/d+4/5*a*sin(d*x+c)/d/(a+a*cos(d*x
+c))^(1/2)+2/7*a*cos(d*x+c)^3*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)-8/35*sin(
d*x+c)*(a+a*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2849, 2838, 2830, 2725}

$$\int \cos^3(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \frac{2a\sin(c+dx)\cos^3(c+dx)}{7d\sqrt{a\cos(c+dx)+a}} + \frac{12\sin(c+dx)(a\cos(c+dx)+a)^{3/2}}{35ad} - \frac{8\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{35d} + \frac{4a\sin(c+dx)}{5d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Cos[c + d*x]^3*Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (4*a*Sin[c + d*x])/(5*d*Sqrt[a + a*Cos[c + d*x]]) + (2*a*Cos[c + d*x]^3*Sin
[c + d*x])/(7*d*Sqrt[a + a*Cos[c + d*x]]) - (8*Sqrt[a + a*Cos[c + d*x]]*Sin
[c + d*x])/(35*d) + (12*(a + a*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(35*a*d)
```

Rule 2725

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[-2*b*(Cos
[c + d*x]/(d*Sqrt[a + b*Sin[c + d*x]])), x] /; FreeQ[{a, b, c, d}, x] && Eq
Q[a^2 - b^2, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rule 2838

```
Int[sin[(e_.) + (f_.)*(x_)]^2*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_),
x_Symbol] :> Simp[(-Cos[e + f*x])*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2
))), x] + Dist[1/(b*(m + 2)), Int[(a + b*Sin[e + f*x])^m*(b*(m + 1) - a*Sin
[e + f*x]), x], x] /; FreeQ[{a, b, e, f, m}, x] && EqQ[a^2 - b^2, 0] &&  !L
tQ[m, -2^(-1)]
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rule steps

$$\begin{aligned}\text{integral} &= \frac{2a\cos^3(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}}+\frac{6}{7}\int\cos^2(c+dx)\sqrt{a+a\cos(c+dx)}\,dx\\ &= \frac{2a\cos^3(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}}+\frac{12(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{35ad}\\ &\quad+\frac{12\int\left(\frac{3a}{2}-a\cos(c+dx)\right)\sqrt{a+a\cos(c+dx)}\,dx}{35a}\end{aligned}$$

$$= \frac{2a\cos^3(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}} - \frac{8\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{35d} + \frac{12(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{35ad} + \frac{2}{5}\int\sqrt{a+a\cos(c+dx)}\,dx$$

$$= \frac{4a\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} + \frac{2a\cos^3(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}} - \frac{8\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{35d} + \frac{12(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{35ad}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 80, normalized size of antiderivative = 0.66

$$\int \cos^3(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$$
$$= \frac{\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(105\sin\left(\frac{1}{2}(c+dx)\right)+35\sin\left(\frac{3}{2}(c+dx)\right)+7\sin\left(\frac{5}{2}(c+dx)\right)+5\sin\left(\right.\right.}{140d}$$

```
[In] Integrate[Cos[c + d*x]^3*Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(105*Sin[(c + d*x)/2] + 35*Sin
[(3*(c + d*x))/2] + 7*Sin[(5*(c + d*x))/2] + 5*Sin[(7*(c + d*x))/2]))/(140*
d)
```

Maple [A] (verified)

Time = 0.80 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.69

method	result	size
default	$\frac{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)a\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\left(40\left(\cos^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-36\left(\cos^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+22\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+9\right)\sqrt{2}}{35\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$	84

```
[In] int(cos(d*x+c)^3*(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/35*cos(1/2*d*x+1/2*c)*a*sin(1/2*d*x+1/2*c)*(40*cos(1/2*d*x+1/2*c)^6-36*co
s(1/2*d*x+1/2*c)^4+22*cos(1/2*d*x+1/2*c)^2+9)*2^(1/2)/(a*cos(1/2*d*x+1/2*c)
^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 62, normalized size of antiderivative = 0.51

$$\int \cos^3(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \frac{2\left(5\,\cos\left(dx+c\right)^3+6\,\cos\left(dx+c\right)^2+8\,\cos\left(dx+c\right)+16\right)\sqrt{a\cos\left(dx+c\right)+a}\sin\left(dx+c\right)}{35\left(d\cos\left(dx+c\right)+d\right)}$$

```
[In] integrate(cos(d*x+c)^3*(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 2/35*(5*cos(d*x + c)^3 + 6*cos(d*x + c)^2 + 8*cos(d*x + c) + 16)*sqrt(a*cos
(d*x + c) + a)*sin(d*x + c)/(d*cos(d*x + c) + d)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^3(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3*(a+a*cos(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.53

$$\int \cos^3(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \frac{\left(5\,\sqrt{2}\sin\left(\frac{7}{2}\,dx+\frac{7}{2}\,c\right)+7\,\sqrt{2}\sin\left(\frac{5}{2}\,dx+\frac{5}{2}\,c\right)+35\,\sqrt{2}\sin\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)+105\,\sqrt{2}\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sqrt{a}}{140\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/140*(5*sqrt(2)*sin(7/2*d*x + 7/2*c) + 7*sqrt(2)*sin(5/2*d*x + 5/2*c) + 35
*sqrt(2)*sin(3/2*d*x + 3/2*c) + 105*sqrt(2)*sin(1/2*d*x + 1/2*c))*sqrt(a)/d
```

Giac [A] (verification not implemented)

none

Time = 0.62 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.79

$$\int \cos^3(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$$
$$=\frac{\sqrt{2}\left(5\operatorname{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{7}{2}\,dx+\frac{7}{2}\,c\right)+7\operatorname{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{5}{2}\,dx+\frac{5}{2}\,c\right)+35\operatorname{sgn}\left(\cos\left(\frac{1}{2}\,dx+\right.\right.\right.}{140\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 1/140*sqrt(2)*(5*sgn(cos(1/2*d*x + 1/2*c))*sin(7/2*d*x + 7/2*c) + 7*sgn(cos
(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 35*sgn(cos(1/2*d*x + 1/2*c))*sin(
3/2*d*x + 3/2*c) + 105*sgn(cos(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c))*sqrt
(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int \cos^3(c+dx)\sqrt{a+a\cos(c+dx)}\,dx=\int {\cos\left(c+d\,x\right)}^3\,\sqrt{a+a\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(cos(c + d*x)^3*(a + a*cos(c + d*x))^(1/2),x)
```

```
[Out] int(cos(c + d*x)^3*(a + a*cos(c + d*x))^(1/2), x)
```

3.97 $\int \cos^2(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 86

$$\int \cos^2(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \frac{14a\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} - \frac{4\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{15d} + \frac{2(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{5ad}$$

```
[Out] 2/5*(a+a*cos(d*x+c))^(3/2)*sin(d*x+c)/a/d+14/15*a*sin(d*x+c)/d/(a+a*cos(d*x
+c))^(1/2)-4/15*sin(d*x+c)*(a+a*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2838, 2830, 2725}

$$\int \cos^2(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \frac{2\sin(c+dx)(a\cos(c+dx)+a)^{3/2}}{5ad} - \frac{4\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{15d} + \frac{14a\sin(c+dx)}{15d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Cos[c + d*x]^2*Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (14*a*Sin[c + d*x])/(15*d*Sqrt[a + a*Cos[c + d*x]]) - (4*Sqrt[a + a*Cos[c +
 d*x]]*Sin[c + d*x])/(15*d) + (2*(a + a*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(
5*a*d)
```

Rule 2725

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[-2*b*(Cos
[c + d*x]/(d*Sqrt[a + b*Sin[c + d*x]])), x] /; FreeQ[{a, b, c, d}, x] && Eq
Q[a^2 - b^2, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rule 2838

```
Int[sin[(e_.) + (f_.)*(x_)]^2*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_),
x_Symbol] :> Simp[(-Cos[e + f*x])*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2
))), x] + Dist[1/(b*(m + 2)), Int[(a + b*Sin[e + f*x])^m*(b*(m + 1) - a*Sin
[e + f*x]), x], x] /; FreeQ[{a, b, e, f, m}, x] && EqQ[a^2 - b^2, 0] &&  !L
tQ[m, -2^(-1)]
```

Rubi steps

$$\begin{aligned}
&\text{integral} \\
&= \frac{2(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{5ad}+\frac{2\int\left(\frac{3a}{2}-a\cos(c+dx)\right)\sqrt{a+a\cos(c+dx)}\,dx}{5a} \\
&= -\frac{4\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{15d} \\
&\quad+\frac{2(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{5ad}+\frac{7}{15}\int\sqrt{a+a\cos(c+dx)}\,dx \\
&= \frac{14a\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}}-\frac{4\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{15d} \\
&\quad+\frac{2(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{5ad}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 68, normalized size of antiderivative = 0.79

$$\int \cos^2(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$$
$$=\frac{\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(30\sin\left(\frac{1}{2}(c+dx)\right)+5\sin\left(\frac{3}{2}(c+dx)\right)+3\sin\left(\frac{5}{2}(c+dx)\right)\right)}{30d}$$

```
[In] Integrate[Cos[c + d*x]^2*Sqrt[a + a*Cos[c + d*x]],x]
[Out] (Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(30*Sin[(c + d*x)/2] + 5*Sin[(
3*(c + d*x))/2] + 3*Sin[(5*(c + d*x))/2]))/(30*d)
```

Maple [A] (verified)

Time = 0.92 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.83

method	result	size
default	$\frac{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)a\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\left(12\left(\cos^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-4\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7\right)\sqrt{2}}{15\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$	71

```
[In] int(cos(d*x+c)^2*(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
[Out] 2/15*cos(1/2*d*x+1/2*c)*a*sin(1/2*d*x+1/2*c)*(12*cos(1/2*d*x+1/2*c)^4-4*cos
(1/2*d*x+1/2*c)^2+7)*2^(1/2)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.60

$$\int \cos^2(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$$
$$=\frac{2\sqrt{a\cos(dx+c)+a}\left(3\cos(dx+c)^2+4\cos(dx+c)+8\right)\sin(dx+c)}{15\,(d\cos(dx+c)+d)}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] 2/15*sqrt(a*cos(d*x + c) + a)*(3*cos(d*x + c)^2 + 4*cos(d*x + c) + 8)*sin(d
*x + c)/(d*cos(d*x + c) + d)
```

Sympy [F]

$$\int \cos^2(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \int \sqrt{a\left(\cos\left(c+dx\right)+1\right)}\cos^2\left(c+dx\right)dx$$

```
[In] integrate(cos(d*x+c)**2*(a+a*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(a*(cos(c + d*x) + 1))*cos(c + d*x)**2, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.44 (sec) , antiderivative size = 51, normalized size of antiderivative = 0.59

$$\int \cos^2(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \frac{\left(3\sqrt{2}\sin\left(\frac{5}{2}\,dx+\frac{5}{2}\,c\right)+5\sqrt{2}\sin\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)+30\sqrt{2}\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sqrt{a}}{30\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] 1/30*(3*sqrt(2)*sin(5/2*d*x + 5/2*c) + 5*sqrt(2)*sin(3/2*d*x + 3/2*c) + 30*
sqrt(2)*sin(1/2*d*x + 1/2*c))*sqrt(a)/d
```

Giac [A] (verification not implemented)

none

Time = 0.48 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.87

$$\int \cos^2(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \frac{\sqrt{2}\left(3\,\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{5}{2}\,dx+\frac{5}{2}\,c\right)+5\,\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)+30\,\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\right.\right.\right.}{30\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] 1/30*sqrt(2)*(3*sgn(cos(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 5*sgn(cos(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c) + 30*sgn(cos(1/2*d*x + 1/2*c))*sin(1
/2*d*x + 1/2*c))*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int \cos^2(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \int \cos(c+d\,x)^2\,\sqrt{a+a\,\cos(c+d\,x)}\,dx$$

```
[In] int(cos(c + d*x)^2*(a + a*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^2*(a + a*cos(c + d*x))^(1/2), x)
```

3.98 $\int \cos(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 56

$$\int \cos(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \frac{2a\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d}$$

```
[Out] 2/3*a*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+2/3*sin(d*x+c)*(a+a*cos(d*x+c))^(
1/2)/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2830, 2725}

$$\int \cos(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \frac{2\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{3d} + \frac{2a\sin(c+dx)}{3d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Cos[c + d*x]*Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (2*a*Sin[c + d*x])/(3*d*Sqrt[a + a*Cos[c + d*x]]) + (2*Sqrt[a + a*Cos[c + d
*x]]*Sin[c + d*x])/(3*d)
```

Rule 2725

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[-2*b*(Cos
[c + d*x]/(d*Sqrt[a + b*Sin[c + d*x]])), x] /; FreeQ[{a, b, c, d}, x] && Eq
```

```
Q[a^2 - b^2, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d} + \frac{1}{3}\int \sqrt{a+a\cos(c+dx)}\,dx \\ &= \frac{2a\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 54, normalized size of antiderivative = 0.96

$$\int \cos(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \frac{\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(3\sin\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{3}{2}(c+dx)\right)\right)}{3d}$$

```
[In] Integrate[Cos[c + d*x]*Sqrt[a + a*Cos[c + d*x]],x]
[Out] (Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(3*Sin[(c + d*x)/2] + Sin[(3*(
c + d*x))/2]))/(3*d)
```

Maple [A] (verified)

Time = 0.78 (sec) , antiderivative size = 58, normalized size of antiderivative = 1.04

method	result	size
default	$\frac{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)a\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\left(1+2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)\sqrt{2}}{3\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$	58

```
[In] int(cos(d*x+c)*(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
[Out] 2/3*cos(1/2*d*x+1/2*c)*a*sin(1/2*d*x+1/2*c)*(1+2*cos(1/2*d*x+1/2*c)^2)*2^(1
/2)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.71

$$\int \cos(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \frac{2\sqrt{a\cos(dx+c)+a}(\cos(dx+c)+2)\sin(dx+c)}{3(d\cos(dx+c)+d)}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] 2/3*sqrt(a*cos(d*x + c) + a)*(cos(d*x + c) + 2)*sin(d*x + c)/(d*cos(d*x + c
) + d)
```

Sympy [F]

$$\int \cos(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \int \sqrt{a(\cos(c+dx)+1)}\cos(c+dx)\,dx$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(a*(cos(c + d*x) + 1))*cos(c + d*x), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.39 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.64

$$\int \cos(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \frac{\left(\sqrt{2}\sin\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)+3\sqrt{2}\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sqrt{a}}{3\,d}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] 1/3*(sqrt(2)*sin(3/2*d*x + 3/2*c) + 3*sqrt(2)*sin(1/2*d*x + 1/2*c))*sqrt(a)
/d
```

Giac [A] (verification not implemented)

none

Time = 0.55 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.95

$$\int \cos(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$$
$$=\frac{\sqrt{2}\left(\operatorname{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)+3\operatorname{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sqrt{a}}{3\,d}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] 1/3*sqrt(2)*(sgn(cos(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c) + 3*sgn(cos(1/2
*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c))*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int \cos(c+dx)\sqrt{a+a\cos(c+dx)}\,dx=\int \cos\left(c+d\,x\right)\,\sqrt{a+a\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(cos(c + d*x)*(a + a*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)*(a + a*cos(c + d*x))^(1/2), x)
```

3.99 $\int \sqrt{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 26

$$\int \sqrt{a+a\cos(c+dx)}\,dx=\frac{2a\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 2*a*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.071, Rules used = {2725}

$$\int \sqrt{a+a\cos(c+dx)}\,dx=\frac{2a\sin(c+dx)}{d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (2*a*Sin[c + d*x])/(d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 2725

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[-2*b*(Cos
[c + d*x]/(d*Sqrt[a + b*Sin[c + d*x]])), x] /; FreeQ[{a, b, c, d}, x] && Eq
Q[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral}=\frac{2a\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.12

$$\int \sqrt{a+a\cos(c+dx)}\,dx = \frac{2\sqrt{a(1+\cos(c+dx))}\tan\left(\frac{1}{2}(c+dx)\right)}{d}$$

```
[In] Integrate[Sqrt[a + a*Cos[c + d*x]],x]
[Out] (2*Sqrt[a*(1 + Cos[c + d*x])]*Tan[(c + d*x)/2])/d
```

Maple [A] (verified)

Time = 0.94 (sec) , antiderivative size = 43, normalized size of antiderivative = 1.65

method	result	size
default	$\frac{2a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2}}{\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$	43
risch	$-\frac{i\sqrt{2}\,\sqrt{a\left(\mathrm{e}^{i(dx+c)}+1\right)^2\mathrm{e}^{-i(dx+c)}}\,\left(\mathrm{e}^{i(dx+c)}-1\right)}{\left(\mathrm{e}^{i(dx+c)}+1\right)d}$	60

```
[In] int((a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
[Out] 2*a*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)*2^(1/2)/(a*cos(1/2*d*x+1/2*c)^2)^
(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 32, normalized size of antiderivative = 1.23

$$\int \sqrt{a+a\cos(c+dx)}\,dx = \frac{2\sqrt{a\cos(dx+c)+a}\sin(dx+c)}{d\cos(dx+c)+d}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] 2*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/(d*cos(d*x + c) + d)
```

Sympy [F]

$$\int \sqrt{a+a\cos(c+dx)}\,dx = \int \sqrt{a\cos{(c+dx)}+a}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(a*cos(c + d*x) + a), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.77

$$\int \sqrt{a+a\cos(c+dx)}\,dx = \frac{2\sqrt{2}\sqrt{a}\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{d}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] 2*sqrt(2)*sqrt(a)*sin(1/2*d*x + 1/2*c)/d
```

Giac [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.15

$$\int \sqrt{a+a\cos(c+dx)}\,dx = \frac{2\sqrt{2}\sqrt{a}\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{d}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] 2*sqrt(2)*sqrt(a)*sgn(cos(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c)/d
```

Mupad [B] (verification not implemented)

Time = 14.12 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.27

$$\int \sqrt{a+a\cos(c+dx)}\,dx = \frac{2\,\sin\left(c+d\,x\right)\,\sqrt{a\,\left(\cos\left(c+d\,x\right)+1\right)}}{d\,\left(\cos\left(c+d\,x\right)+1\right)}$$

```
[In] int((a + a*cos(c + d*x))^(1/2),x)
[Out] (2*sin(c + d*x)*(a*(cos(c + d*x) + 1))^(1/2))/(d*(cos(c + d*x) + 1))
```

3.100 $\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 37

$$\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx=\frac{2\sqrt{a}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

```
[Out] 2*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))*a^(1/2)/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2852, 212}

$$\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx=\frac{2\sqrt{a}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{d}$$

```
[In] Int[Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x],x]
```

```
[Out] (2*Sqrt[a]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/d
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
```

```
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{(2a)\text{Subst}\left(\int \frac{1}{a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}\\ &= \frac{2\sqrt{a}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 50, normalized size of antiderivative = 1.35

$$\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx = \frac{\sqrt{2}\text{arctanh}\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right)\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)}{d}$$

```
[In] Integrate[Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x],x]
[Out] (Sqrt[2]*ArcTanh[Sqrt[2]*Sin[(c + d*x)/2]]*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(
c + d*x)/2])/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 181 vs. 2(31) = 62.

Time = 1.42 (sec) , antiderivative size = 182, normalized size of antiderivative = 4.92

method	result
default	$\frac{\sqrt{a}\,\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\ln\left(\frac{4\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+4\sqrt{2}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{a}+8a}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{2}}\right)+\ln\left(-\frac{4\left(\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-\sqrt{2}\,\sqrt{a\left(\sin^2\left(\frac{dx}{\cdots}\right.\right.}\right.\right.}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-\sqrt{2}}\right.\right.}{\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$

```
[In] int((a+cos(d*x+c)*a)^(1/2)*sec(d*x+c),x,method=_RETURNVERBOSE)
[Out] a^(1/2)*cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(ln(4/(2*cos(1/2*
d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/
2*c)^2)^(1/2)*a^(1/2)+2*a))+ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a
*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a)))/s
in(1/2*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 146, normalized size of antiderivative = 3.95

$$\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx$$
$$=\left[\frac{\sqrt{a}\log\left(\frac{a\cos(dx+c)^3-7\,a\cos(dx+c)^2-4\,\sqrt{a\cos(dx+c)+a}\sqrt{a}(\cos(dx+c)-2)\sin(dx+c)+8\,a}{\cos(dx+c)^3+\cos(dx+c)^2}\right)}{2\,d},\ \frac{\sqrt{-a}\arctan\left(\frac{2\,\sqrt{a\cos(dx+c)+a}\sqrt{-}}{a\cos(dx+c)^2-a\cos(}\right.}{d}\right.$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)*sec(d*x+c),x, algorithm="fricas")
```

```
[Out] [1/2*sqrt(a)*log((a*cos(d*x + c)^3 - 7*a*cos(d*x + c)^2 - 4*sqrt(a*cos(d*x
+ c) + a)*sqrt(a)*(cos(d*x + c) - 2)*sin(d*x + c) + 8*a)/(cos(d*x + c)^3 +
cos(d*x + c)^2))/d, sqrt(-a)*arctan(2*sqrt(a*cos(d*x + c) + a)*sqrt(-a)*sin
(d*x + c)/(a*cos(d*x + c)^2 - a*cos(d*x + c) - 2*a))/d]
```

Sympy [F]

$$\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx=\int \sqrt{a\left(\cos\left(c+dx\right)+1\right)}\sec\left(c+dx\right)dx$$

```
[In] integrate((a+a*cos(d*x+c))**(1/2)*sec(d*x+c),x)
```

```
[Out] Integral(sqrt(a*(cos(c + d*x) + 1))*sec(c + d*x), x)
```

Maxima [F]

$$\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx=\int \sqrt{a\cos\left(dx+c\right)+a}\sec\left(dx+c\right)\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)*sec(d*x+c),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a*cos(d*x + c) + a)*sec(d*x + c), x)
```

Giac [A] (verification not implemented)

none

Time = 0.38 (sec) , antiderivative size = 58, normalized size of antiderivative = 1.57

$$\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx = -\frac{\sqrt{a}\log\left(\frac{\left|-2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}{\left|2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}\right)\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}{d}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)*sec(d*x+c),x, algorithm="giac")
[Out] -sqrt(a)*log(abs(-2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c))/abs(2*sqrt(2) + 4*sin
(1/2*d*x + 1/2*c)))*sgn(cos(1/2*d*x + 1/2*c))/d
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx = \int \frac{\sqrt{a+a\cos(c+dx)}}{\cos(c+dx)}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(1/2)/cos(c + d*x),x)
[Out] int((a + a*cos(c + d*x))^(1/2)/cos(c + d*x), x)
```

3.101 $\int \sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 62

$$\int \sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\,dx=\frac{\sqrt{a}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}+\frac{a\tan(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))*a^(1/2)/d+a*tan(d*x+c)/d
/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2851, 2852, 212}

$$\int \sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\,dx=\frac{\sqrt{a}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{d}+\frac{a\tan(c+dx)}{d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x]^2,x]
```

```
[Out] (Sqrt[a]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/d + (a*T
an[c + d*x])/(d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{a\tan(c+dx)}{d\sqrt{a+a\cos(c+dx)}} + \frac{1}{2}\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx$$

$$= \frac{a\tan(c+dx)}{d\sqrt{a+a\cos(c+dx)}} - \frac{a\text{Subst}\left(\int \frac{1}{a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

$$= \frac{\sqrt{a}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} + \frac{a\tan(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 79, normalized size of antiderivative = 1.27

$$\int \sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\,dx$$
$$= \frac{\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\sec(c+dx)\left(\sqrt{2}\text{arctanh}\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right)\cos(c+dx)+2\sin\left(\frac{1}{2}(c\right.\right.}{2d}$$

```
[In] Integrate[Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x]^2,x]
```

```
[Out] (Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*Sec[c + d*x]*(Sqrt[2]*ArcTanh[
Sqrt[2]*Sin[(c + d*x)/2]]*Cos[c + d*x] + 2*Sin[(c + d*x)/2]))/(2*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 382 vs. $2(54) = 108$.

Time = 1.22 (sec) , antiderivative size = 383, normalized size of antiderivative = 6.18

method	result
default	$\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-2a\left(\ln\left(\frac{4\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+4\sqrt{2}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{a}+8a}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{2}}\right)+\ln\left(-\frac{4\left(\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-\sqrt{2}\,\sqrt{a\left(\sin\right.}\right.}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-}\right.\right.\right.}{\sqrt{a}\left(2\cos\left(\frac{d}{2}\right.\right.}$

```
[In] int((a+cos(d*x+c)*a)^(1/2)*sec(d*x+c)^2,x,method=_RETURNVERBOSE)
```

```
[Out] cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*a*(ln(4/(2*cos(1/2*d*
x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*
c)^2)^(1/2)*a^(1/2)+2*a))+ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*c
os(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a)))*sin
(1/2*d*x+1/2*c)^2+ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*
x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*a+ln(-4/(2*co
s(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*
d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a+2*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2
)*a^(1/2))/a^(1/2)/(2*cos(1/2*d*x+1/2*c)+2^(1/2))/(2*cos(1/2*d*x+1/2*c)-2^(
1/2))/sin(1/2*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 140 vs. $2(54) = 108$.

Time = 0.26 (sec) , antiderivative size = 140, normalized size of antiderivative = 2.26

$$\int \sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\,dx$$
$$=\frac{\left(\cos\left(dx+c\right)^2+\cos\left(dx+c\right)\right)\sqrt{a}\log\left(\frac{a\cos(dx+c)^3-7\,a\cos(dx+c)^2-4\,\sqrt{a\cos(dx+c)+a}\sqrt{a}(\cos(dx+c)-2)\sin(dx+c)+8\,a}{\cos(dx+c)^3+\cos(dx+c)^2}\right)+4}{4\left(d\cos\left(dx+c\right)^2+d\cos\left(dx+c\right)\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)*sec(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] 1/4*((cos(d*x + c)^2 + cos(d*x + c))*sqrt(a)*log((a*cos(d*x + c)^3 - 7*a*co
s(d*x + c)^2 - 4*sqrt(a*cos(d*x + c) + a)*sqrt(a)*(cos(d*x + c) - 2)*sin(d*
x + c) + 8*a)/(cos(d*x + c)^3 + cos(d*x + c)^2)) + 4*sqrt(a*cos(d*x + c) +
a)*sin(d*x + c))/(d*cos(d*x + c)^2 + d*cos(d*x + c))
```

Sympy [F]

$$\int \sqrt{a + a\cos(c + dx)}\sec^2(c + dx)\,dx = \int \sqrt{a\left(\cos\left(c + dx\right) + 1\right)}\sec^2\left(c + dx\right)dx$$

```
[In] integrate((a+a*cos(d*x+c))**(1/2)*sec(d*x+c)**2,x)
[Out] Integral(sqrt(a*(cos(c + d*x) + 1))*sec(c + d*x)**2, x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1170 vs. $2(54) = 108$.

Time = 0.40 (sec) , antiderivative size = 1170, normalized size of antiderivative = 18.87

$$\int \sqrt{a + a\cos(c + dx)}\sec^2(c + dx)\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)*sec(d*x+c)^2,x, algorithm="maxima")
[Out] -1/4*((4*sqrt(2)*sin(1/2*d*x + 1/2*c) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
+ 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2))*cos(2*d*x + 2*c)^2 + (4*sqrt(2)*sin(1/2*d*x +
 1/2*c) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*
c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*
sin(2*d*x + 2*c)^2 + 4*sqrt(2)*cos(5/2*d*x + 5/2*c)*sin(2*d*x + 2*c) + 4*sq
rt(2)*cos(3/2*d*x + 3/2*c)*sin(2*d*x + 2*c) - 2*(2*sqrt(2)*sin(3/2*d*x + 3/
2*c) - 4*sqrt(2)*sin(1/2*d*x + 1/2*c) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
+ 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2))*cos(2*d*x + 2*c) - 4*(sqrt(2)*cos(2*d*x + 2*c
```

```
) + sqrt(2))*sin(5/2*d*x + 5/2*c) - 4*sqrt(2)*sin(3/2*d*x + 3/2*c) + 4*sqrt
(2)*sin(1/2*d*x + 1/2*c) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2))*sqrt(a)/((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(
2*d*x + 2*c) + 1)*d)
```

Giac [A] (verification not implemented)

none

Time = 0.42 (sec) , antiderivative size = 104, normalized size of antiderivative = 1.68

$$\int \sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\,dx = -\frac{\sqrt{2}\left(\sqrt{2}\log\left(\frac{\left|-2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}{\left|2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}\right)\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)+\frac{4\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{2\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1}\right)\sqrt{a}}{4d}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)*sec(d*x+c)^2,x, algorithm="giac")
```

```
[Out] -1/4*sqrt(2)*(sqrt(2)*log(abs(-2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c))/abs(2*sq
rt(2) + 4*sin(1/2*d*x + 1/2*c)))*sgn(cos(1/2*d*x + 1/2*c)) + 4*sgn(cos(1/2*
d*x + 1/2*c))*sin(1/2*d*x + 1/2*c)/(2*sin(1/2*d*x + 1/2*c)^2 - 1))*sqrt(a)/
d
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\,dx = \int \frac{\sqrt{a+a\cos(c+dx)}}{\cos(c+dx)^2}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(1/2)/cos(c + d*x)^2,x)
```

```
[Out] int((a + a*cos(c + d*x))^(1/2)/cos(c + d*x)^2, x)
```

3.102 $\int \sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 102

$$\int \sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\,dx=\frac{3\sqrt{a}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d}+\frac{3a\tan(c+dx)}{4d\sqrt{a+a\cos(c+dx)}}+\frac{a\sec(c+dx)\tan(c+dx)}{2d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 3/4*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))*a^(1/2)/d+3/4*a*tan(
d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+1/2*a*sec(d*x+c)*tan(d*x+c)/d/(a+a*cos(d*x+
c))^(1/2)
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 102, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2851, 2852, 212}

$$\int \sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\,dx=\frac{3\sqrt{a}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{4d}+\frac{3a\tan(c+dx)}{4d\sqrt{a\cos(c+dx)+a}}+\frac{a\tan(c+dx)\sec(c+dx)}{2d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x]^3,x]
```

```
[Out] (3*Sqrt[a]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(4*d)
+ (3*a*Tan[c + d*x])/(4*d*Sqrt[a + a*Cos[c + d*x]]) + (a*Sec[c + d*x]*Tan[c
 + d*x])/(2*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{a\sec(c+dx)\tan(c+dx)}{2d\sqrt{a+a\cos(c+dx)}}+\frac{3}{4}\int\sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\,dx \\
&= \frac{3a\tan(c+dx)}{4d\sqrt{a+a\cos(c+dx)}}+\frac{a\sec(c+dx)\tan(c+dx)}{2d\sqrt{a+a\cos(c+dx)}}+\frac{3}{8}\int\sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx \\
&= \frac{3a\tan(c+dx)}{4d\sqrt{a+a\cos(c+dx)}}+\frac{a\sec(c+dx)\tan(c+dx)}{2d\sqrt{a+a\cos(c+dx)}}-\frac{(3a)\text{Subst}\left(\int\frac{1}{a-x^2}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d} \\
&= \frac{3\sqrt{a}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d}+\frac{3a\tan(c+dx)}{4d\sqrt{a+a\cos(c+dx)}}+\frac{a\sec(c+dx)\tan(c+dx)}{2d\sqrt{a+a\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.92

$$\int \sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\,dx$$
$$= \frac{\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\sec^2(c+dx)\left(3\sqrt{2}\text{arctanh}\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right)\cos^2(c+dx)+\sin\left(\frac{1}{2}(\right.\right.}{8d}$$

```
[In] Integrate[Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x]^3,x]
```

```
[Out] (Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*Sec[c + d*x]^2*(3*Sqrt[2]*ArcT
anh[Sqrt[2]*Sin[(c + d*x)/2]]*Cos[c + d*x]^2 + Sin[(c + d*x)/2] + 3*Sin[(3*
(c + d*x))/2]))/(8*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 550 vs. 2(86) = 172.

Time = 1.56 (sec) , antiderivative size = 551, normalized size of antiderivative = 5.40

method	result
default	$\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(12a\left(\ln\left(\frac{4\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+4\sqrt{2}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{a}+8a}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{2}}\right)+\ln\left(-\frac{4\left(\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-\sqrt{2}\,\sqrt{a\left(\sin^2\left(\right.\right.}\right.}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-\sqrt{2}}\right.\right.\right.}{}$

```
[In] int((a+cos(d*x+c)*a)^(1/2)*sec(d*x+c)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(12*a*(ln(4/(2*cos(1/
2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+
1/2*c)^2)^(1/2)*a^(1/2)+2*a))+ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)
*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a)))
*sin(1/2*d*x+1/2*c)^4+(-12*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-1
2*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)
*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*a-12*ln(-4/(2*cos(1/2*d*x+1/2
*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)
^(1/2)*a^(1/2)-2*a))*a)*sin(1/2*d*x+1/2*c)^2+10*2^(1/2)*(a*sin(1/2*d*x+1/2*
c)^2)^(1/2)*a^(1/2)+3*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/
2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*a+3*ln(-4
/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*si
n(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a)/a^(1/2)/(2*cos(1/2*d*x+1/2*c)+2^
(1/2))^2/(2*cos(1/2*d*x+1/2*c)-2^(1/2))^2/sin(1/2*d*x+1/2*c)/(a*cos(1/2*d*x
+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 155, normalized size of antiderivative = 1.52

$$\int \sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\,dx = \frac{3\left(\cos\left(dx+c\right)^3+\cos\left(dx+c\right)^2\right)\sqrt{a}\log\left(\frac{a\cos(dx+c)^3-7\,a\cos(dx+c)^2-4\,\sqrt{a\cos(dx+c)+a}\sqrt{a}(\cos(dx+c)-2)\sin(dx+c)+8\,a}{\cos(dx+c)^3+\cos(dx+c)^2}\right)}{16\left(d\cos\left(dx+c\right)^3+d\cos\left(dx+c\right)^2\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)*sec(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] 1/16*(3*(cos(d*x + c)^3 + cos(d*x + c)^2)*sqrt(a)*log((a*cos(d*x + c)^3 - 7
*a*cos(d*x + c)^2 - 4*sqrt(a*cos(d*x + c) + a)*sqrt(a)*(cos(d*x + c) - 2)*s
in(d*x + c) + 8*a)/(cos(d*x + c)^3 + cos(d*x + c)^2)) + 4*sqrt(a*cos(d*x +
c) + a)*(3*cos(d*x + c) + 2)*sin(d*x + c))/(d*cos(d*x + c)^3 + d*cos(d*x +
c)^2)
```

Sympy [F]

$$\int \sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\,dx = \int \sqrt{a\left(\cos\left(c+dx\right)+1\right)}\sec^3\left(c+dx\right)\,dx$$

```
[In] integrate((a+a*cos(d*x+c))**(1/2)*sec(d*x+c)**3,x)
```

```
[Out] Integral(sqrt(a*(cos(c + d*x) + 1))*sec(c + d*x)**3, x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2642 vs. 2(86) = 172.

Time = 4.16 (sec) , antiderivative size = 2642, normalized size of antiderivative = 25.90

$$\int \sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)*sec(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] 1/16*(3*(log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
```

2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*c
os(4*d*x + 4*c)^2 + 12*(log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
 - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*
sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x +
 1/2*c) + 2))*cos(2*d*x + 2*c)^2 + 3*(log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x
 + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)
*sin(1/2*d*x + 1/2*c) + 2))*sin(4*d*x + 4*c)^2 + 12*(log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(2*d*x + 2*c)^2 - 24*sqrt(2)*
cos(7/2*d*x + 7/2*c)*sin(2*d*x + 2*c) - 8*sqrt(2)*cos(5/2*d*x + 5/2*c)*sin(
2*d*x + 2*c) + 2*(6*(log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2))*cos(2*d*x + 2*c) + 6*sqrt(2)*sin(7/2*d*x + 7/2*c) + 2*sqrt(2)*si
n(5/2*d*x + 5/2*c) - 2*sqrt(2)*sin(3/2*d*x + 3/2*c) - 6*sqrt(2)*sin(1/2*d*x
 + 1/2*c) + 3*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2))*cos(4*d*x + 4*c) - 4*(2*sqrt(2)*sin(3/2*d*x + 3/2*c) + 6*sqrt(2)*
sin(1/2*d*x + 1/2*c) - 3*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) + 3*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(2*cos(1/2

```
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2))*cos(2*d*x + 2*c) + 4*(3*(log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(2*d*x + 2*c) - 3*sqrt(2)*cos(7/2*d*
x + 7/2*c) - sqrt(2)*cos(5/2*d*x + 5/2*c) + sqrt(2)*cos(3/2*d*x + 3/2*c) +
3*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(4*d*x + 4*c) + 12*(2*sqrt(2)*cos(2*d*x
+ 2*c) + sqrt(2))*sin(7/2*d*x + 7/2*c) + 4*(2*sqrt(2)*cos(2*d*x + 2*c) + sq
rt(2))*sin(5/2*d*x + 5/2*c) + 8*(sqrt(2)*cos(3/2*d*x + 3/2*c) + 3*sqrt(2)*c
os(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) - 4*sqrt(2)*sin(3/2*d*x + 3/2*c) - 12
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 3*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) - 3*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2))*sqrt(a)/((2*(2*cos(2*d*x + 2*c) + 1)*cos(4*d*
x + 4*c) + cos(4*d*x + 4*c)^2 + 4*cos(2*d*x + 2*c)^2 + sin(4*d*x + 4*c)^2 +
 4*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*sin(2*d*x + 2*c)^2 + 4*cos(2*d*x +
 2*c) + 1)*d)
```

Giac [A] (verification not implemented)

none

Time = 0.44 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.28

$$\int \sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\,dx =$$

$$-\frac{\sqrt{2}\left(3\sqrt{2}\log\left(\frac{\left|-2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}{\left|2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}\right)\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)+\frac{4\left(6\,\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-5\,\mathrm{sgn}\left(\cos\left(\frac{1}{2}c\right.\right.\right.}{\left(2\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)^2}}{16\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)*sec(d*x+c)^3,x, algorithm="giac")
```

```
[Out] -1/16*sqrt(2)*(3*sqrt(2)*log(abs(-2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c))/abs(2
*sqrt(2) + 4*sin(1/2*d*x + 1/2*c)))*sgn(cos(1/2*d*x + 1/2*c)) + 4*(6*sgn(co
s(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c)^3 - 5*sgn(cos(1/2*d*x + 1/2*c))*si
n(1/2*d*x + 1/2*c))/(2*sin(1/2*d*x + 1/2*c)^2 - 1)^2)*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\,dx=\int \frac{\sqrt{a+a\,\cos\left(c+d\,x\right)}}{\cos\left(c+d\,x\right)^3}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(1/2)/cos(c + d*x)^3,x)
[Out] int((a + a*cos(c + d*x))^(1/2)/cos(c + d*x)^3, x)
```

3.103 $\int \sqrt{a+a\cos(c+dx)}\sec^4(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 138

$$\int \sqrt{a+a\cos(c+dx)}\sec^4(c+dx)\,dx = \frac{5\sqrt{a}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d} + \frac{5a\tan(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} + \frac{5a\sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{a\sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 5/8*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))*a^(1/2)/d+5/8*a*tan(
d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+5/12*a*sec(d*x+c)*tan(d*x+c)/d/(a+a*cos(d*x
+c))^(1/2)+1/3*a*sec(d*x+c)^2*tan(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.130$, Rules used

$= \{2851, 2852, 212\}$

$$\int \sqrt{a+a\cos(c+dx)}\sec^4(c+dx)\,dx = \frac{5\sqrt{a}\,\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{8d} + \frac{5a\tan(c+dx)}{8d\sqrt{a\cos(c+dx)+a}} + \frac{a\tan(c+dx)\sec^2(c+dx)}{3d\sqrt{a\cos(c+dx)+a}} + \frac{5a\tan(c+dx)\sec(c+dx)}{12d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x]^4,x]
```

```
[Out] (5*Sqrt[a]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(8*d)
+ (5*a*Tan[c + d*x])/(8*d*Sqrt[a + a*Cos[c + d*x]]) + (5*a*Sec[c + d*x]*Tan
[c + d*x])/(12*d*Sqrt[a + a*Cos[c + d*x]]) + (a*Sec[c + d*x]^2*Tan[c + d*x]
)/(3*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{a\sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{5}{6}\int\sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\,dx \\
&= \frac{5a\sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{a\sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} \\
&\quad + \frac{5}{8}\int\sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\,dx \\
&= \frac{5a\tan(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} + \frac{5a\sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} \\
&\quad + \frac{a\sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{5}{16}\int\sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx \\
&= \frac{5a\tan(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} + \frac{5a\sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} \\
&\quad + \frac{a\sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} - \frac{(5a)\text{Subst}\left(\int\frac{1}{a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d} \\
&= \frac{5\sqrt{a}\,\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d} + \frac{5a\tan(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} \\
&\quad + \frac{5a\sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{a\sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 109, normalized size of antiderivative = 0.79

$$\int\sqrt{a+a\cos(c+dx)}\sec^4(c+dx)\,dx$$
$$= \frac{\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\sec^3(c+dx)\left(30\sqrt{2}\,\text{arctanh}\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right)\cos^3(c+dx)+42\,\text{s}\right.}{96d}$$

```
[In] Integrate[Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x]^4,x]
```

```
[Out] (Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*Sec[c + d*x]^3*(30*Sqrt[2]*Arc
Tanh[Sqrt[2]*Sin[(c + d*x)/2]]*Cos[c + d*x]^3 + 42*Sin[(c + d*x)/2] + 5*(Si
n[(3*(c + d*x))/2] + 3*Sin[(5*(c + d*x))/2])))/(96*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 716 vs. $2(118) = 236$.

Time = 1.78 (sec) , antiderivative size = 717, normalized size of antiderivative = 5.20

method	result
default	$\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-120a\left(\ln\left(\frac{4\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+4\sqrt{2}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{a}+8a}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{2}}\right)+\ln\left(-\frac{4\left(\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-\sqrt{2}\,\sqrt{a\left(\sin\right.}\right.}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-}\right.\right.\right.}{}$

```
[In] int((a+cos(d*x+c)*a)^(1/2)*sec(d*x+c)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-120*a*(ln(4/(2*cos(
1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*
x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))+ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/
2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a)
))*sin(1/2*d*x+1/2*c)^6+60*(2*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2
)+3*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/
2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*a+3*ln(-4/(2*cos(1/2*d*x+1/
2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2
)^(1/2)*a^(1/2)-2*a))*a)*sin(1/2*d*x+1/2*c)^4+(-90*ln(-4/(2*cos(1/2*d*x+1/2
*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)
^(1/2)*a^(1/2)-2*a))*a-90*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*co
s(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*a-160
*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2))*sin(1/2*d*x+1/2*c)^2+15*ln
(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a
*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a+15*ln(4/(2*cos(1/2*d*x+1/2*c)+
2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/
2)*a^(1/2)+2*a))*a+66*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2))/a^(1/
2)/(2*cos(1/2*d*x+1/2*c)-2^(1/2))^3/(2*cos(1/2*d*x+1/2*c)+2^(1/2))^3/sin(1/
2*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 165, normalized size of antiderivative = 1.20

$$\int \sqrt{a+a\cos(c+dx)}\sec^4(c+dx)\,dx$$
$$= \frac{15\left(\cos\left(dx+c\right)^4+\cos\left(dx+c\right)^3\right)\sqrt{a}\log\left(\frac{a\cos(dx+c)^3-7\,a\cos(dx+c)^2-4\,\sqrt{a\cos(dx+c)+a}\sqrt{a}(\cos(dx+c)-2)\sin(dx+c)+8\,a}{\cos(dx+c)^3+\cos(dx+c)^2}\right)-}{96\left(d\cos\left(dx+c\right)^4+d\cos\left(dx+c\right.\right.}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)*sec(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] 1/96*(15*(cos(d*x + c)^4 + cos(d*x + c)^3)*sqrt(a)*log((a*cos(d*x + c)^3 -
7*a*cos(d*x + c)^2 - 4*sqrt(a*cos(d*x + c) + a)*sqrt(a)*(cos(d*x + c) - 2)*
sin(d*x + c) + 8*a)/(cos(d*x + c)^3 + cos(d*x + c)^2)) + 4*sqrt(a*cos(d*x +
 c) + a)*(15*cos(d*x + c)^2 + 10*cos(d*x + c) + 8)*sin(d*x + c))/(d*cos(d*x
 + c)^4 + d*cos(d*x + c)^3)
```

Sympy [F]

$$\int \sqrt{a + a\cos(c + dx)}\sec^4(c + dx)\,dx = \int \sqrt{a\left(\cos\left(c + dx\right) + 1\right)}\sec^4\left(c + dx\right)dx$$

```
[In] integrate((a+a*cos(d*x+c))**(1/2)*sec(d*x+c)**4,x)
```

```
[Out] Integral(sqrt(a*(cos(c + d*x) + 1))*sec(c + d*x)**4, x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 5115 vs. $2(118) = 236$.

Time = 45.83 (sec) , antiderivative size = 5115, normalized size of antiderivative = 37.07

$$\int \sqrt{a + a\cos(c + dx)}\sec^4(c + dx)\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)*sec(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] 1/96*(15*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqr
t(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*co
s(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1
/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) - 8*sin(1/2*d*x + 1/2*c))*cos(6*d*x + 6*c)^2
 + 135*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(
2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) - 8*sin(1/2*d*x + 1/2*c))*cos(4*d*x + 4*c)^2 +
 135*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)
```

*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)
*sin(1/2*d*x + 1/2*c) + 2) - 8*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c)^2 + 1
5*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - 8*sin(1/2*d*x + 1/2*c))*sin(6*d*x + 6*c)^2 + 135*
(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) - 8*sin(1/2*d*x + 1/2*c))*sin(4*d*x + 4*c)^2 + 135*(s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) - 8*sin(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c)^2 - 120*(sin
(6*d*x + 6*c) + 3*sin(4*d*x + 4*c) + 3*sin(2*d*x + 2*c))*cos(13/2*d*x + 13/
2*c) + 2*(45*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
 sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 8*sin(1/2*d*x + 1/2*c))*cos(4*d*x + 4*
c) + 45*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt
(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/

2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 8*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 60*sin(11/2*d*x + 11/2*c) + 200*sin(9/2*d*x + 9/2*c) + 168*sin(7/2*d*x + 7/2*c) + 12*sin(5/2*d*x + 5/2*c) - 20*sin(3/2*d*x + 3/2*c) - 120*sin(1/2*d*x + 1/2*c))*cos(6*d*x + 6*c) - 360*(sin(4*d*x + 4*c) + sin(2*d*x + 2*c))*cos(11/2*d*x + 11/2*c) - 1200*(sin(4*d*x + 4*c) + sin(2*d*x + 2*c))*cos(9/2*d*x + 9/2*c) + 6*(45*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 8*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 168*sin(7/2*d*x + 7/2*c) + 12*sin(5/2*d*x + 5/2*c) - 20*sin(3/2*d*x + 3/2*c) - 120*sin(1/2*d*x + 1/2*c))*cos(4*d*x + 4*c) + 30*(3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 4*sin(3/2*d*x + 3/2*c) - 24*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 120*(cos(6*d*x + 6*c) + 3*cos(4*d*x + 4*c) + 3*cos(2*d*x + 2*c) + 1)*sin(13/2*d*x + 13/2*c) + 2*(45*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2

```
*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(
2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 8*sin(1/2*d*x + 1/
2*c))*sin(4*d*x + 4*c) + 45*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
 + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 8*sin(1/2*d*x + 1/2*c))
*sin(2*d*x + 2*c) - 60*cos(11/2*d*x + 11/2*c) - 200*cos(9/2*d*x + 9/2*c) -
168*cos(7/2*d*x + 7/2*c) - 12*cos(5/2*d*x + 5/2*c) + 20*cos(3/2*d*x + 3/2*c
))*sin(6*d*x + 6*c) + 120*(3*cos(4*d*x + 4*c) + 3*cos(2*d*x + 2*c) + 1)*sin
(11/2*d*x + 11/2*c) + 400*(3*cos(4*d*x + 4*c) + 3*cos(2*d*x + 2*c) + 1)*sin
(9/2*d*x + 9/2*c) + 6*(45*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) +
 sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 8*sin(1/2*d*x + 1/2*c))*s
in(2*d*x + 2*c) - 168*cos(7/2*d*x + 7/2*c) - 12*cos(5/2*d*x + 5/2*c) + 20*c
os(3/2*d*x + 3/2*c))*sin(4*d*x + 4*c) + 336*(3*cos(2*d*x + 2*c) + 1)*sin(7/
2*d*x + 7/2*c) + 24*(3*cos(2*d*x + 2*c) + 1)*sin(5/2*d*x + 5/2*c) - 1008*co
s(7/2*d*x + 7/2*c)*sin(2*d*x + 2*c) - 72*cos(5/2*d*x + 5/2*c)*sin(2*d*x + 2
*c) + 120*cos(3/2*d*x + 3/2*c)*sin(2*d*x + 2*c) + 15*sqrt(2)*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) + 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) - 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*
c) + 2) - 40*sin(3/2*d*x + 3/2*c) - 120*sin(1/2*d*x + 1/2*c))*sqrt(a)/((sqr
t(2)*cos(6*d*x + 6*c)^2 + 9*sqrt(2)*cos(4*d*x + 4*c)^2 + 9*sqrt(2)*cos(2*d*
x + 2*c)^2 + sqrt(2)*sin(6*d*x + 6*c)^2 + 9*sqrt(2)*sin(4*d*x + 4*c)^2 + 18
*sqrt(2)*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 9*sqrt(2)*sin(2*d*x + 2*c)^2 +
 2*(3*sqrt(2)*cos(4*d*x + 4*c) + 3*sqrt(2)*cos(2*d*x + 2*c) + sqrt(2))*cos(
6*d*x + 6*c) + 6*(3*sqrt(2)*cos(2*d*x + 2*c) + sqrt(2))*cos(4*d*x + 4*c) +
6*(sqrt(2)*sin(4*d*x + 4*c) + sqrt(2)*sin(2*d*x + 2*c))*sin(6*d*x + 6*c) +
6*sqrt(2)*cos(2*d*x + 2*c) + sqrt(2))*d)
```

Giac [A] (verification not implemented)

none

Time = 0.42 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.12

$$\int \sqrt{a+a\cos(c+dx)}\sec^4(c+dx)\,dx =$$
$$-\frac{\sqrt{2}\left(15\sqrt{2}\log\left(\frac{\left|-2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}{\left|2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}\right)\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)+\frac{4\left(60\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5-80\operatorname{sgn}(\cos}{(2\,\mathrm{s}}}{96\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)*sec(d*x+c)^4,x, algorithm="giac")
```

```
[Out] -1/96*sqrt(2)*(15*sqrt(2)*log(abs(-2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c))/abs(
2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c)))*sgn(cos(1/2*d*x + 1/2*c)) + 4*(60*sgn(
cos(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c)^5 - 80*sgn(cos(1/2*d*x + 1/2*c))
*sin(1/2*d*x + 1/2*c)^3 + 33*sgn(cos(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c)
)/(2*sin(1/2*d*x + 1/2*c)^2 - 1)^3)*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+a\cos(c+dx)}\sec^4(c+dx)\,dx = \int \frac{\sqrt{a+a\cos(c+d\,x)}}{\cos(c+d\,x)^4}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(1/2)/cos(c + d*x)^4,x)
```

```
[Out] int((a + a*cos(c + d*x))^(1/2)/cos(c + d*x)^4, x)
```

3.104 $\int \cos^3(c+dx)(a+a\cos(c+dx))^{3/2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 162

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{68a^2\sin(c+dx)}{45d\sqrt{a+a\cos(c+dx)}} + \frac{34a^2\cos^3(c+dx)\sin(c+dx)}{63d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\cos^4(c+dx)\sin(c+dx)}{9d\sqrt{a+a\cos(c+dx)}} - \frac{136a\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{315d} + \frac{68(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{105d}$$

```
[Out] 68/105*(a+a*cos(d*x+c))^(3/2)*sin(d*x+c)/d+68/45*a^2*sin(d*x+c)/d/(a+a*cos(
d*x+c))^(1/2)+34/63*a^2*cos(d*x+c)^3*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+2/
9*a^2*cos(d*x+c)^4*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)-136/315*a*sin(d*x+c)
*(a+a*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2842, 21, 2849, 2838, 2830, 2725}

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{2a^2\sin(c+dx)\cos^4(c+dx)}{9d\sqrt{a\cos(c+dx)+a}} + \frac{34a^2\sin(c+dx)\cos^3(c+dx)}{63d\sqrt{a\cos(c+dx)+a}} + \frac{68a^2\sin(c+dx)}{45d\sqrt{a\cos(c+dx)+a}} + \frac{68\sin(c+dx)(a\cos(c+dx)+a)^{3/2}}{105d} - \frac{136a\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{315d}$$

```
[In] Int[Cos[c + d*x]^3*(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (68*a^2*Sin[c + d*x])/(45*d*Sqrt[a + a*Cos[c + d*x]]) + (34*a^2*Cos[c + d*x
]^3*Sin[c + d*x])/(63*d*Sqrt[a + a*Cos[c + d*x]]) + (2*a^2*Cos[c + d*x]^4*S
in[c + d*x])/(9*d*Sqrt[a + a*Cos[c + d*x]]) - (136*a*Sqrt[a + a*Cos[c + d*x
]]*Sin[c + d*x])/(315*d) + (68*(a + a*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(10
5*d)
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 2725

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[-2*b*(Cos
[c + d*x]/(d*Sqrt[a + b*Sin[c + d*x]])), x] /; FreeQ[{a, b, c, d}, x] && Eq
Q[a^2 - b^2, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rule 2838

```
Int[sin[(e_.) + (f_.)*(x_)]^2*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_),
x_Symbol] :> Simp[(-Cos[e + f*x])*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2
))), x] + Dist[1/(b*(m + 2)), Int[(a + b*Sin[e + f*x])^m*(b*(m + 1) - a*Sin
[e + f*x]), x], x] /; FreeQ[{a, b, e, f, m}, x] && EqQ[a^2 - b^2, 0] &&  !L
tQ[m, -2^(-1)]
```

Rule 2842

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
+ n)), Int[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^n*Simp[a*b*c*(
m - 2) + b^2*d*(n + 1) + a^2*d*(m + n) - b*(b*c*(m - 1) - a*d*(3*m + 2*n -
2))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c
- a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1] &&  !LtQ[n
, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] || (IntegerQ[m] && EqQ[c
, 0]))
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2a^2\cos^4(c+dx)\sin(c+dx)}{9d\sqrt{a+a\cos(c+dx)}}+\frac{2}{9}\int\frac{\cos^3(c+dx)\left(\frac{17a^2}{2}+\frac{17}{2}a^2\cos(c+dx)\right)}{\sqrt{a+a\cos(c+dx)}}\,dx\\
&= \frac{2a^2\cos^4(c+dx)\sin(c+dx)}{9d\sqrt{a+a\cos(c+dx)}}+\frac{1}{9}(17a)\int\cos^3(c+dx)\sqrt{a+a\cos(c+dx)}\,dx\\
&= \frac{34a^2\cos^3(c+dx)\sin(c+dx)}{63d\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\cos^4(c+dx)\sin(c+dx)}{9d\sqrt{a+a\cos(c+dx)}}\\
&\quad+\frac{1}{21}(34a)\int\cos^2(c+dx)\sqrt{a+a\cos(c+dx)}\,dx\\
&= \frac{34a^2\cos^3(c+dx)\sin(c+dx)}{63d\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\cos^4(c+dx)\sin(c+dx)}{9d\sqrt{a+a\cos(c+dx)}}\\
&\quad+\frac{68(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{105d}\\
&\quad+\frac{68}{105}\int\left(\frac{3a}{2}-a\cos(c+dx)\right)\sqrt{a+a\cos(c+dx)}\,dx\\
&= \frac{34a^2\cos^3(c+dx)\sin(c+dx)}{63d\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\cos^4(c+dx)\sin(c+dx)}{9d\sqrt{a+a\cos(c+dx)}}\\
&\quad-\frac{136a\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{315d}\\
&\quad+\frac{68(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{105d}+\frac{1}{45}(34a)\int\sqrt{a+a\cos(c+dx)}\,dx\\
&= \frac{68a^2\sin(c+dx)}{45d\sqrt{a+a\cos(c+dx)}}+\frac{34a^2\cos^3(c+dx)\sin(c+dx)}{63d\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\cos^4(c+dx)\sin(c+dx)}{9d\sqrt{a+a\cos(c+dx)}}\\
&\quad-\frac{136a\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{315d}+\frac{68(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{105d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 93, normalized size of antiderivative = 0.57

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{a\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(3780\sin\left(\frac{1}{2}(c+dx)\right)+1050\sin\left(\frac{3}{2}(c+dx)\right)+378\sin\right.}{2520d}$$

```
[In] Integrate[Cos[c + d*x]^3*(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (a*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(3780*Sin[(c + d*x)/2] + 105
0*Sin[(3*(c + d*x))/2] + 378*Sin[(5*(c + d*x))/2] + 135*Sin[(7*(c + d*x))/2
] + 35*Sin[(9*(c + d*x))/2]))/(2520*d)
```

Maple [A] (verified)

Time = 0.71 (sec) , antiderivative size = 99, normalized size of antiderivative = 0.61

method	result	size
default	$\frac{4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)a^2\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\left(280\left(\cos^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-220\left(\cos^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+114\left(\cos^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+47\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+94\right)\sqrt{2}}{315\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$	99

```
[In] int(cos(d*x+c)^3*(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 4/315*cos(1/2*d*x+1/2*c)*a^2*sin(1/2*d*x+1/2*c)*(280*cos(1/2*d*x+1/2*c)^8-2
20*cos(1/2*d*x+1/2*c)^6+114*cos(1/2*d*x+1/2*c)^4+47*cos(1/2*d*x+1/2*c)^2+94
)*2^(1/2)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 78, normalized size of antiderivative = 0.48

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{2\left(35\,a\cos\left(dx+c\right)^4+85\,a\cos\left(dx+c\right)^3+102\,a\cos\left(dx+c\right)^2+136\,a\cos\left(dx+c\right)+272\,a\right)\sqrt{}}{315\left(d\cos\left(dx+c\right)+d\right)}$$

```
[In] integrate(cos(d*x+c)^3*(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 2/315*(35*a*cos(d*x + c)^4 + 85*a*cos(d*x + c)^3 + 102*a*cos(d*x + c)^2 + 1
36*a*cos(d*x + c) + 272*a)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/(d*cos(d*x
 + c) + d)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3*(a+a*cos(d*x+c))**(3/2),x)
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.39 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.52

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{\left(35\sqrt{2}a\sin\left(\frac{9}{2}\,dx+\frac{9}{2}\,c\right)+135\sqrt{2}a\sin\left(\frac{7}{2}\,dx+\frac{7}{2}\,c\right)+378\sqrt{2}a\sin\left(\frac{5}{2}\,dx+\frac{5}{2}\,c\right)+1050\sqrt{2}a\sin}{2520\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] 1/2520*(35*sqrt(2)*a*sin(9/2*d*x + 9/2*c) + 135*sqrt(2)*a*sin(7/2*d*x + 7/2
*c) + 378*sqrt(2)*a*sin(5/2*d*x + 5/2*c) + 1050*sqrt(2)*a*sin(3/2*d*x + 3/2
*c) + 3780*sqrt(2)*a*sin(1/2*d*x + 1/2*c))*sqrt(a)/d
```

Giac [A] (verification not implemented)

none

Time = 0.68 (sec) , antiderivative size = 122, normalized size of antiderivative = 0.75

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{\sqrt{2}\left(35\,a\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{9}{2}\,dx+\frac{9}{2}\,c\right)+135\,a\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{7}{2}\,dx+\frac{7}{2}\,c\right)+3}{}$$

```
[In] integrate(cos(d*x+c)^3*(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] 1/2520*sqrt(2)*(35*a*sgn(cos(1/2*d*x + 1/2*c))*sin(9/2*d*x + 9/2*c) + 135*a
*sgn(cos(1/2*d*x + 1/2*c))*sin(7/2*d*x + 7/2*c) + 378*a*sgn(cos(1/2*d*x + 1
/2*c))*sin(5/2*d*x + 5/2*c) + 1050*a*sgn(cos(1/2*d*x + 1/2*c))*sin(3/2*d*x
+ 3/2*c) + 3780*a*sgn(cos(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c))*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \int \cos\left(c+d\,x\right)^3\,\left(a+a\,\cos\left(c+d\,x\right)\right)^{3/2}\,dx$$

```
[In] int(cos(c + d*x)^3*(a + a*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)^3*(a + a*cos(c + d*x))^(3/2), x)
```

3.105 $\int \cos^2(c+dx)(a+a\cos(c+dx))^{3/2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 116

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{152a^2\sin(c+dx)}{105d\sqrt{a+a\cos(c+dx)}} + \frac{38a\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{105d} - \frac{4(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{35d} + \frac{2(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{7ad}$$

```
[Out] -4/35*(a+a*cos(d*x+c))^(3/2)*sin(d*x+c)/d+2/7*(a+a*cos(d*x+c))^(5/2)*sin(d*
x+c)/a/d+152/105*a^2*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+38/105*a*sin(d*x+c
)*(a+a*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {2838, 2830, 2726, 2725}

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{152a^2\sin(c+dx)}{105d\sqrt{a\cos(c+dx)+a}} + \frac{2\sin(c+dx)(a\cos(c+dx)+a)^{5/2}}{7ad} - \frac{4\sin(c+dx)(a\cos(c+dx)+a)^{3/2}}{35d} + \frac{38a\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{105d}$$

```
[In] Int[Cos[c + d*x]^2*(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (152*a^2*Sin[c + d*x])/(105*d*Sqrt[a + a*Cos[c + d*x]]) + (38*a*Sqrt[a + a*
Cos[c + d*x]]*Sin[c + d*x])/(105*d) - (4*(a + a*Cos[c + d*x])^(3/2)*Sin[c +
 d*x])/(35*d) + (2*(a + a*Cos[c + d*x])^(5/2)*Sin[c + d*x])/(7*a*d)
```

Rule 2725

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[-2*b*(Cos
[c + d*x]/(d*Sqrt[a + b*Sin[c + d*x]])), x] /; FreeQ[{a, b, c, d}, x] && Eq
Q[a^2 - b^2, 0]
```

Rule 2726

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos
[c + d*x]*((a + b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[a*((2*n - 1)/n),
Int[(a + b*Sin[c + d*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] && EqQ[a
^2 - b^2, 0] && IGtQ[n - 1/2, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rule 2838

```
Int[sin[(e_.) + (f_.)*(x_)]^2*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_),
x_Symbol] :> Simp[(-Cos[e + f*x])*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2
))), x] + Dist[1/(b*(m + 2)), Int[(a + b*Sin[e + f*x])^m*(b*(m + 1) - a*Sin
[e + f*x]), x], x] /; FreeQ[{a, b, e, f, m}, x] && EqQ[a^2 - b^2, 0] &&  !L
tQ[m, -2^(-1)]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{7ad} \\
&\quad + \frac{2\int \left(\frac{5a}{2}-a\cos(c+dx)\right)(a+a\cos(c+dx))^{3/2}\,dx}{7a} \\
&= -\frac{4(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{35d} \\
&\quad + \frac{2(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{7ad} + \frac{19}{35}\int (a+a\cos(c+dx))^{3/2}\,dx
\end{aligned}$$

$$
\begin{aligned}
&= \frac{38a\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{105d} - \frac{4(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{35d} \\
&\quad + \frac{2(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{7ad} + \frac{1}{105}(76a)\int\sqrt{a+a\cos(c+dx)}\,dx \\
&= \frac{152a^2\sin(c+dx)}{105d\sqrt{a+a\cos(c+dx)}} + \frac{38a\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{105d} \\
&\quad - \frac{4(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{35d} + \frac{2(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{7ad}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.70

$$
\int \cos^2(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{a\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(735\sin\left(\frac{1}{2}(c+dx)\right)+175\sin\left(\frac{3}{2}(c+dx)\right)+63\sin\left(\frac{5}{2}(c
$$

$$
420d
$$

```
[In] Integrate[Cos[c + d*x]^2*(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (a*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(735*Sin[(c + d*x)/2] + 175*
Sin[(3*(c + d*x))/2] + 63*Sin[(5*(c + d*x))/2] + 15*Sin[(7*(c + d*x))/2]))/
(420*d)
```

Maple [A] (verified)

Time = 0.87 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.74

method	result	size
default	$\frac{4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)a^2\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\left(60\left(\cos^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12\left(\cos^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+19\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+38\right)\sqrt{2}}{105\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$	86

```
[In] int(cos(d*x+c)^2*(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 4/105*cos(1/2*d*x+1/2*c)*a^2*sin(1/2*d*x+1/2*c)*(60*cos(1/2*d*x+1/2*c)^6-12
*cos(1/2*d*x+1/2*c)^4+19*cos(1/2*d*x+1/2*c)^2+38)*2^(1/2)/(a*cos(1/2*d*x+1/
2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 67, normalized size of antiderivative = 0.58

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{2\left(15\,a\cos\left(dx+c\right)^3+39\,a\cos\left(dx+c\right)^2+52\,a\cos\left(dx+c\right)+104\,a\right)\sqrt{a\cos\left(dx+c\right)+a}\sin\left(\right.}{105\left(d\cos\left(dx+c\right)+d\right)}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 2/105*(15*a*cos(d*x + c)^3 + 39*a*cos(d*x + c)^2 + 52*a*cos(d*x + c) + 104*
a)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/(d*cos(d*x + c) + d)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**2*(a+a*cos(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.39 (sec) , antiderivative size = 69, normalized size of antiderivative = 0.59

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{\left(15\sqrt{2}a\sin\left(\frac{7}{2}\,dx+\frac{7}{2}\,c\right)+63\sqrt{2}a\sin\left(\frac{5}{2}\,dx+\frac{5}{2}\,c\right)+175\sqrt{2}a\sin\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)+735\sqrt{2}a\sin\left(\right.\right.}{420\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 1/420*(15*sqrt(2)*a*sin(7/2*d*x + 7/2*c) + 63*sqrt(2)*a*sin(5/2*d*x + 5/2*c
) + 175*sqrt(2)*a*sin(3/2*d*x + 3/2*c) + 735*sqrt(2)*a*sin(1/2*d*x + 1/2*c)
)*sqrt(a)/d
```

Giac [A] (verification not implemented)

none

Time = 0.43 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.86

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{\sqrt{2}\left(15\,a\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{7}{2}\,dx+\frac{7}{2}\,c\right)+63\,a\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{5}{2}\,dx+\frac{5}{2}\,c\right)+17}{420\,a}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] 1/420*sqrt(2)*(15*a*sgn(cos(1/2*d*x + 1/2*c))*sin(7/2*d*x + 7/2*c) + 63*a*s
gn(cos(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 175*a*sgn(cos(1/2*d*x + 1/2
*c))*sin(3/2*d*x + 3/2*c) + 735*a*sgn(cos(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1
/2*c))*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \int \cos\left(c+d\,x\right)^2\,\left(a+a\,\cos\left(c+d\,x\right)\right)^{3/2}\,dx$$

```
[In] int(cos(c + d*x)^2*(a + a*cos(c + d*x))^(3/2),x)
```

```
[Out] int(cos(c + d*x)^2*(a + a*cos(c + d*x))^(3/2), x)
```

3.106 $\int \cos(c+dx)(a+a\cos(c+dx))^{3/2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 86

$$\int \cos(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{8a^2\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} + \frac{2a\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{5d} + \frac{2(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{5d}$$

```
[Out] 2/5*(a+a*cos(d*x+c))^(3/2)*sin(d*x+c)/d+8/5*a^2*sin(d*x+c)/d/(a+a*cos(d*x+c
))^(1/2)+2/5*a*sin(d*x+c)*(a+a*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2830, 2726, 2725}

$$\int \cos(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{8a^2\sin(c+dx)}{5d\sqrt{a\cos(c+dx)+a}} + \frac{2a\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{5d} + \frac{2\sin(c+dx)(a\cos(c+dx)+a)^{3/2}}{5d}$$

```
[In] Int[Cos[c + d*x]*(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (8*a^2*Sin[c + d*x])/(5*d*Sqrt[a + a*Cos[c + d*x]]) + (2*a*Sqrt[a + a*Cos[c
 + d*x]]*Sin[c + d*x])/(5*d) + (2*(a + a*Cos[c + d*x])^(3/2)*Sin[c + d*x])/
(5*d)
```

Rule 2725

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[-2*b*(Cos
[c + d*x]/(d*Sqrt[a + b*Sin[c + d*x]])), x] /; FreeQ[{a, b, c, d}, x] && Eq
```

```
Q[a^2 - b^2, 0]
```

Rule 2726

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos
[c + d*x]*((a + b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[a*((2*n - 1)/n),
Int[(a + b*Sin[c + d*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] && EqQ[a
^2 - b^2, 0] && IGtQ[n - 1/2, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{5d}+\frac{3}{5}\int(a+a\cos(c+dx))^{3/2}\,dx\\
&= \frac{2a\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{5d}+\frac{2(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{5d}\\
&\quad+\frac{1}{5}(4a)\int\sqrt{a+a\cos(c+dx)}\,dx\\
&= \frac{8a^2\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}}+\frac{2a\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{5d}\\
&\quad+\frac{2(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{5d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 67, normalized size of antiderivative = 0.78

$$\int\cos(c+dx)(a+a\cos(c+dx))^{3/2}\,dx=\frac{a\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(20\sin\left(\frac{1}{2}(c+dx)\right)+5\sin\left(\frac{3}{2}(c+dx)\right)+\sin\left(\frac{5}{2}(c+dx)\right)\right)}{10d}$$

```
[In] Integrate[Cos[c + d*x]*(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (a*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(20*Sin[(c + d*x)/2] + 5*Sin
[(3*(c + d*x))/2] + Sin[(5*(c + d*x))/2]))/(10*d)
```

Maple [A] (verified)

Time = 0.97 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.83

method	result	size
default	$\frac{4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)a^{2}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\left(2\left(\cos^{4}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)+2\right)\sqrt{2}}{5\sqrt{a\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$	71

```
[In] int(cos(d*x+c)*(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 4/5*cos(1/2*d*x+1/2*c)*a^2*sin(1/2*d*x+1/2*c)*(2*cos(1/2*d*x+1/2*c)^4+cos(1
/2*d*x+1/2*c)^2+2)*2^(1/2)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.64

$$\int \cos(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{2\left(a\cos\left(dx+c\right)^{2}+3\,a\cos\left(dx+c\right)+6\,a\right)\sqrt{a\cos\left(dx+c\right)+a}\sin\left(dx+c\right)}{5\left(d\cos\left(dx+c\right)+d\right)}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 2/5*(a*cos(d*x + c)^2 + 3*a*cos(d*x + c) + 6*a)*sqrt(a*cos(d*x + c) + a)*si
n(d*x + c)/(d*cos(d*x + c) + d)
```

Sympy [F]

$$\int \cos(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \int \left(a\left(\cos\left(c+dx\right)+1\right)\right)^{\frac{3}{2}}\cos\left(c+dx\right)dx$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))**(3/2),x)
```

```
[Out] Integral((a*(cos(c + d*x) + 1))**(3/2)*cos(c + d*x), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.39 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.62

$$\int \cos(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{\left(\sqrt{2}a\sin\left(\frac{5}{2}\,dx+\frac{5}{2}\,c\right)+5\,\sqrt{2}a\sin\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)+20\,\sqrt{2}a\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sqrt{a}}{10\,d}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 1/10*(sqrt(2)*a*sin(5/2*d*x + 5/2*c) + 5*sqrt(2)*a*sin(3/2*d*x + 3/2*c) + 2
0*sqrt(2)*a*sin(1/2*d*x + 1/2*c))*sqrt(a)/d
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.90

$$\int \cos(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{\sqrt{2}\left(a\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{5}{2}\,dx+\frac{5}{2}\,c\right)+5\,a\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)+20\,asg\right.}{10\,d}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] 1/10*sqrt(2)*(a*sgn(cos(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 5*a*sgn(co
s(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c) + 20*a*sgn(cos(1/2*d*x + 1/2*c))*s
in(1/2*d*x + 1/2*c))*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int \cos(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \int \cos\left(c+d\,x\right)\,{\left(a+a\,\cos\left(c+d\,x\right)\right)}^{3/2}\,dx$$

```
[In] int(cos(c + d*x)*(a + a*cos(c + d*x))^(3/2),x)
```

```
[Out] int(cos(c + d*x)*(a + a*cos(c + d*x))^(3/2), x)
```

3.107 $\int (a+a\cos(c+dx))^{3/2}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 59

$$\int (a+a\cos(c+dx))^{3/2}\,dx=\frac{8a^2\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}+\frac{2a\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d}$$

```
[Out] 8/3*a^2*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+2/3*a*sin(d*x+c)*(a+a*cos(d*x+c
))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2726, 2725}

$$\int (a+a\cos(c+dx))^{3/2}\,dx=\frac{8a^2\sin(c+dx)}{3d\sqrt{a\cos(c+dx)+a}}+\frac{2a\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{3d}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (8*a^2*Sin[c + d*x])/(3*d*Sqrt[a + a*Cos[c + d*x]]) + (2*a*Sqrt[a + a*Cos[c
 + d*x]]*Sin[c + d*x])/(3*d)
```

Rule 2725

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[-2*b*(Cos
[c + d*x]/(d*Sqrt[a + b*Sin[c + d*x]])), x] /; FreeQ[{a, b, c, d}, x] && Eq
Q[a^2 - b^2, 0]
```

Rule 2726

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos
[c + d*x]*((a + b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[a*((2*n - 1)/n),
Int[(a + b*Sin[c + d*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] && EqQ[a
^2 - b^2, 0] && IGtQ[n - 1/2, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{2a\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d} + \frac{1}{3}(4a)\int\sqrt{a+a\cos(c+dx)}\,dx\\ &= \frac{8a^2\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{2a\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.93

$$\int(a+a\cos(c+dx))^{3/2}\,dx = \frac{a\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(9\sin\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{3}{2}(c+dx)\right)\right)}{3d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(3/2),x]
[Out] (a*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(9*Sin[(c + d*x)/2] + Sin[(3
*(c + d*x))/2]))/(3*d)
```

Maple [A] (verified)

Time = 0.77 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.98

method	result	size
default	$\frac{4a^2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)+2\right)\sqrt{2}}{3\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$	58

```
[In] int((a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)
[Out] 4/3*a^2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)*(cos(1/2*d*x+1/2*c)^2+2)*2^(1
/2)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 44, normalized size of antiderivative = 0.75

$$\int (a+a\cos(c+dx))^{3/2}\,dx = \frac{2\left(a\cos\left(dx+c\right)+5\,a\right)\sqrt{a\cos\left(dx+c\right)+a}\sin\left(dx+c\right)}{3\left(d\cos\left(dx+c\right)+d\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")
[Out] 2/3*(a*cos(d*x + c) + 5*a)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/(d*cos(d*x
 + c) + d)
```

Sympy [F]

$$\int (a+a\cos(c+dx))^{3/2}\,dx = \int \left(a\cos\left(c+dx\right)+a\right)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))**(3/2),x)
[Out] Integral((a*cos(c + d*x) + a)**(3/2), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.41 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.64

$$\int (a+a\cos(c+dx))^{3/2}\,dx = \frac{\left(\sqrt{2}a\sin\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)+9\,\sqrt{2}a\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sqrt{a}}{3\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] 1/3*(sqrt(2)*a*sin(3/2*d*x + 3/2*c) + 9*sqrt(2)*a*sin(1/2*d*x + 1/2*c))*sqr
t(a)/d
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.93

$$\int (a + a\cos(c + dx))^{3/2}\,dx = \frac{\sqrt{2}\left(a\,\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)\right)\sin\left(\frac{3}{2}\,dx + \frac{3}{2}\,c\right) + 9\,a\,\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)\right)\sin\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)\right)\sqrt{a}}{3\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] 1/3*sqrt(2)*(a*sgn(cos(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c) + 9*a*sgn(cos
(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c))*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^{3/2}\,dx = \int (a + a\,\cos(c + d\,x))^{3/2}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(3/2),x)
```

```
[Out] int((a + a*cos(c + d*x))^(3/2), x)
```

3.108 $\int (a+a\cos(c+dx))^{3/2}\sec(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 66

$$\int (a+a\cos(c+dx))^{3/2}\sec(c+dx)\,dx=\frac{2a^{3/2}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}+\frac{2a^2\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 2*a^(3/2)*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d+2*a^2*sin(d*
x+c)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2842, 21, 2852, 212}

$$\int (a+a\cos(c+dx))^{3/2}\sec(c+dx)\,dx=\frac{2a^{3/2}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{d}+\frac{2a^2\sin(c+dx)}{d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x],x]
```

```
[Out] (2*a^(3/2)*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/d + (2
*a^2*Sin[c + d*x])/(d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2842

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
+ n)), Int[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^n*Simp[a*b*c*(
m - 2) + b^2*d*(n + 1) + a^2*d*(m + n) - b*(b*c*(m - 1) - a*d*(3*m + 2*n -
2))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c
- a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1] &&  !LtQ[n
, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] || (IntegerQ[m] && EqQ[c
, 0]))
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{2a^2\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}} + 2\int \frac{\left(\frac{a^2}{2}+\frac{1}{2}a^2\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx \\
&= \frac{2a^2\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}} + a\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx \\
&= \frac{2a^2\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}} - \frac{(2a^2)\,\text{Subst}\left(\int \frac{1}{a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} \\
&= \frac{2a^{3/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} + \frac{2a^2\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.98

$$\int (a+a\cos(c+dx))^{3/2}\sec(c+dx)\,dx=\frac{a\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(\sqrt{2}\text{arctanh}\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right)+2\sin\left(\frac{1}{2}(c+dx)\right)\right)}{d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x],x]
[Out] (a*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(Sqrt[2]*ArcTanh[Sqrt[2]*Sin
[(c + d*x)/2]] + 2*Sin[(c + d*x)/2]))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 208 vs. 2(58) = 116.

Time = 1.34 (sec) , antiderivative size = 209, normalized size of antiderivative = 3.17

method	result
default	$\frac{\sqrt{a}\,\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(2\sqrt{2}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{a}+\ln\left(\frac{4\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+4\sqrt{2}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{a}+8a}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{2}}\right)a+\ln\left(-\right.\right.}{\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$

```
[In] int((a+cos(d*x+c)*a)^(3/2)*sec(d*x+c),x,method=_RETURNVERBOSE)
[Out] a^(1/2)*cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*2^(1/2)*(a*sin
(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/
2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a)
)*a+ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1
/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a)/sin(1/2*d*x+1/2*c)/(a*c
os(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 127 vs. 2(58) = 116.

Time = 0.26 (sec) , antiderivative size = 127, normalized size of antiderivative = 1.92

$$\int (a+a\cos(c+dx))^{3/2}\sec(c+dx)\,dx=\frac{(a\cos(dx+c)+a)\sqrt{a}\log\left(\frac{a\cos(dx+c)^3-7\,a\cos(dx+c)^2-4\sqrt{a\cos(dx+c)+a}\sqrt{a}(\cos(dx+c)-2)\sin(dx+c)+8\,a}{\cos(dx+c)^3+\cos(dx+c)^2}\right)+4\,\sqrt{}}{2\,(d\cos(dx+c)+d)}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c),x, algorithm="fricas")
```

```
[Out] 1/2*((a*cos(d*x + c) + a)*sqrt(a)*log((a*cos(d*x + c)^3 - 7*a*cos(d*x + c)^
2 - 4*sqrt(a*cos(d*x + c) + a)*sqrt(a)*(cos(d*x + c) - 2)*sin(d*x + c) + 8*
a)/(cos(d*x + c)^3 + cos(d*x + c)^2)) + 4*sqrt(a*cos(d*x + c) + a)*a*sin(d*
x + c))/(d*cos(d*x + c) + d)
```

Sympy [F]

$$\int (a+a\cos(c+dx))^{3/2}\sec(c+dx)\,dx=\int (a(\cos(c+dx)+1))^{\frac{3}{2}}\sec(c+dx)\,dx$$

```
[In] integrate((a+a*cos(d*x+c))**(3/2)*sec(d*x+c),x)
```

```
[Out] Integral((a*(cos(c + d*x) + 1))**(3/2)*sec(c + d*x), x)
```

Maxima [F]

$$\int (a+a\cos(c+dx))^{3/2}\sec(c+dx)\,dx=\int (a\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c),x, algorithm="maxima")
```

```
[Out] integrate((a*cos(d*x + c) + a)^(3/2)*sec(d*x + c), x)
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 89, normalized size of antiderivative = 1.35

$$\int (a+a\cos(c+dx))^{3/2}\sec(c+dx)\,dx=$$
$$-\frac{\sqrt{2}\left(\sqrt{2}a\log\left(\frac{\left|-2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}{\left|2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}\right)\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)-4a\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)\sqrt{a}}{2d}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(2)*(sqrt(2)*a*log(abs(-2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c))/abs(2*
sqrt(2) + 4*sin(1/2*d*x + 1/2*c)))*sgn(cos(1/2*d*x + 1/2*c)) - 4*a*sgn(cos(
1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c))*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{3/2}\sec(c+dx)\,dx=\int \frac{(a+a\,\cos(c+d\,x))^{3/2}}{\cos(c+d\,x)}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(3/2)/cos(c + d*x),x)
[Out] int((a + a*cos(c + d*x))^(3/2)/cos(c + d*x), x)
```

3.109 $\int (a+a\cos(c+dx))^{3/2}\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 65

$$\int (a+a\cos(c+dx))^{3/2}\sec^2(c+dx)\,dx=\frac{3a^{3/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}+\frac{a^2\tan(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 3*a^(3/2)*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d+a^2*tan(d*x+
c)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2841, 21, 2852, 212}

$$\int (a+a\cos(c+dx))^{3/2}\sec^2(c+dx)\,dx=\frac{3a^{3/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{d}+\frac{a^2\tan(c+dx)}{d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^2,x]
```

```
[Out] (3*a^(3/2)*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/d + (a
^2*Tan[c + d*x])/(d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{a^2\tan(c+dx)}{d\sqrt{a+a\cos(c+dx)}} - a\int \frac{\left(-\frac{3a}{2}-\frac{3}{2}a\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx \\
&= \frac{a^2\tan(c+dx)}{d\sqrt{a+a\cos(c+dx)}} + \frac{1}{2}(3a)\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx \\
&= \frac{a^2\tan(c+dx)}{d\sqrt{a+a\cos(c+dx)}} - \frac{(3a^2)\,\text{Subst}\left(\int \frac{1}{a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} \\
&= \frac{3a^{3/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} + \frac{a^2\tan(c+dx)}{d\sqrt{a+a\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.25

$$\int (a+a\cos(c+dx))^{3/2}\sec^2(c+dx)\,dx = \frac{a\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\sec(c+dx)\left(3\sqrt{2}\text{arctanh}\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right)\cos(c+dx)+\right.}{2d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^2,x]
```

```
[Out] (a*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*Sec[c + d*x]*(3*Sqrt[2]*ArcT
anh[Sqrt[2]*Sin[(c + d*x)/2]]*Cos[c + d*x] + 2*Sin[(c + d*x)/2]))/(2*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 384 vs. $2(57) = 114$.

Time = 1.37 (sec) , antiderivative size = 385, normalized size of antiderivative = 5.92

method	result
default	$\frac{\sqrt{a}\,\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-6a\left(\ln\left(\frac{4\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+4\sqrt{2}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{a}+8a}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{2}}\right)+\ln\left(-\frac{4\left(\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-\sqrt{2}\sqrt{a\left(s\right.}\right.}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right.\right.\right.}{\left(2\cos\left(\frac{d}{2}\right.\right.}$

```
[In] int((a+cos(d*x+c)*a)^(3/2)*sec(d*x+c)^2,x,method=_RETURNVERBOSE)
```

```
[Out] a^(1/2)*cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-6*a*(ln(4/(2*co
s(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*
d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))+ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(
1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*
a)))*sin(1/2*d*x+1/2*c)^2+2*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+
3*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)
*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*a+3*ln(-4/(2*cos(1/2*d*x+1/2*
c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^
(1/2)*a^(1/2)-2*a))*a)/(2*cos(1/2*d*x+1/2*c)+2^(1/2))/(2*cos(1/2*d*x+1/2*c)
-2^(1/2))/sin(1/2*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 146 vs. 2(57) = 114.

Time = 0.25 (sec) , antiderivative size = 146, normalized size of antiderivative = 2.25

$$\int (a+a\cos(c+dx))^{3/2}\sec^2(c+dx)\,dx = \frac{3\left(a\cos\left(dx+c\right)^2+a\cos\left(dx+c\right)\right)\sqrt{a}\log\left(\frac{a\cos(dx+c)^3-7\,a\cos(dx+c)^2-4\,\sqrt{a\cos(dx+c)+a}\sqrt{a}(\cos(dx+c)-2)\sin(dx+c)+8\,a}{\cos(dx+c)^3+\cos(dx+c)^2}\right)+4\,\sqrt{a\cos\left(dx+c\right)+a}\,a\sin\left(dx+c\right)}{4\left(d\cos\left(dx+c\right)^2+d\cos\left(dx+c\right)\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] 1/4*(3*(a*cos(d*x + c)^2 + a*cos(d*x + c))*sqrt(a)*log((a*cos(d*x + c)^3 -
7*a*cos(d*x + c)^2 - 4*sqrt(a*cos(d*x + c) + a)*sqrt(a)*(cos(d*x + c) - 2)*
sin(d*x + c) + 8*a)/(cos(d*x + c)^3 + cos(d*x + c)^2)) + 4*sqrt(a*cos(d*x +
 c) + a)*a*sin(d*x + c))/(d*cos(d*x + c)^2 + d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{3/2}\sec^2(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(3/2)*sec(d*x+c)**2,x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1314 vs. 2(57) = 114.

Time = 0.41 (sec) , antiderivative size = 1314, normalized size of antiderivative = 20.22

$$\int (a+a\cos(c+dx))^{3/2}\sec^2(c+dx)\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] -1/4*(2*sqrt(2)*a*cos(7/2*d*x + 7/2*c)*sin(2*d*x + 2*c) + 6*sqrt(2)*a*cos(5
/2*d*x + 5/2*c)*sin(2*d*x + 2*c) + (2*sqrt(2)*a*sin(3/2*d*x + 3/2*c) + 6*sq
rt(2)*a*sin(1/2*d*x + 1/2*c) - 3*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) + 3*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*a
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/
```

```
2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*a*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(2*d*x + 2*c)^2 + (2*sqrt(2)*a*sin(
3/2*d*x + 3/2*c) + 6*sqrt(2)*a*sin(1/2*d*x + 1/2*c) - 3*a*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) - 3*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
 + 3*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(2*d*x + 2*c
)^2 - 4*sqrt(2)*a*sin(3/2*d*x + 3/2*c) + 4*sqrt(2)*a*sin(1/2*d*x + 1/2*c) -
 2*(sqrt(2)*a*sin(3/2*d*x + 3/2*c) - 5*sqrt(2)*a*sin(1/2*d*x + 1/2*c) + 3*a
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*a*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - 3*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
))*cos(2*d*x + 2*c) - 3*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) + 3*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*a*log(2*co
s(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1
/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*a*log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)
*sin(1/2*d*x + 1/2*c) + 2) - 2*(sqrt(2)*a*cos(2*d*x + 2*c) + sqrt(2)*a)*sin
(7/2*d*x + 7/2*c) - 6*(sqrt(2)*a*cos(2*d*x + 2*c) + sqrt(2)*a)*sin(5/2*d*x
+ 5/2*c) + 2*(3*sqrt(2)*a*cos(3/2*d*x + 3/2*c) + sqrt(2)*a*cos(1/2*d*x + 1/
2*c))*sin(2*d*x + 2*c))*sqrt(a)/((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 +
 2*cos(2*d*x + 2*c) + 1)*d)
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.65

$$\int (a+a\cos(c+dx))^{3/2}\sec^2(c+dx)\,dx =$$

$$-\frac{\sqrt{2}\left(3\sqrt{2}a\log\left(\frac{\left|-2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}{\left|2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}\right)\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)+\frac{4a\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{2\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1}\right)\sqrt{a}}{4d}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^2,x, algorithm="giac")
```

```
[Out] -1/4*sqrt(2)*(3*sqrt(2)*a*log(abs(-2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c))/abs(
2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c)))*sgn(cos(1/2*d*x + 1/2*c)) + 4*a*sgn(co
s(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c)/(2*sin(1/2*d*x + 1/2*c)^2 - 1))*sq
rt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^{3/2}\sec^2(c + dx)\,dx = \int \frac{(a + a\,\cos(c + d\,x))^{3/2}}{\cos(c + d\,x)^2}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(3/2)/cos(c + d*x)^2,x)
```

```
[Out] int((a + a*cos(c + d*x))^(3/2)/cos(c + d*x)^2, x)
```

3.110 $\int (a+a\cos(c+dx))^{3/2}\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 106

$$\int (a+a\cos(c+dx))^{3/2}\sec^3(c+dx)\,dx=\frac{7a^{3/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d}+\frac{7a^2\tan(c+dx)}{4d\sqrt{a+a\cos(c+dx)}}+\frac{a^2\sec(c+dx)\tan(c+dx)}{2d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 7/4*a^(3/2)*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d+7/4*a^2*ta
n(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+1/2*a^2*sec(d*x+c)*tan(d*x+c)/d/(a+a*cos(
d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2841, 21, 2851, 2852, 212}

$$\int (a+a\cos(c+dx))^{3/2}\sec^3(c+dx)\,dx=\frac{7a^{3/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{4d}+\frac{7a^2\tan(c+dx)}{4d\sqrt{a\cos(c+dx)+a}}+\frac{a^2\tan(c+dx)\sec(c+dx)}{2d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^3,x]
```

```
[Out] (7*a^(3/2)*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(4*d)
+ (7*a^2*Tan[c + d*x])/(4*d*Sqrt[a + a*Cos[c + d*x]]) + (a^2*Sec[c + d*x]*T
an[c + d*x])/(2*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{a^2\sec(c+dx)\tan(c+dx)}{2d\sqrt{a+a\cos(c+dx)}} - \frac{1}{2}a\int\frac{\left(-\frac{7a}{2}-\frac{7}{2}a\cos(c+dx)\right)\sec^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{a^2\sec(c+dx)\tan(c+dx)}{2d\sqrt{a+a\cos(c+dx)}} + \frac{1}{4}(7a)\int\sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\,dx$$

$$= \frac{7a^2\tan(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\sec(c+dx)\tan(c+dx)}{2d\sqrt{a+a\cos(c+dx)}} + \frac{1}{8}(7a)\int\sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx$$

$$= \frac{7a^2\tan(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\sec(c+dx)\tan(c+dx)}{2d\sqrt{a+a\cos(c+dx)}} - \frac{(7a^2)\,\text{Subst}\left(\int\frac{1}{a-x^2}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d}$$

$$= \frac{7a^{3/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d} + \frac{7a^2\tan(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\sec(c+dx)\tan(c+dx)}{2d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 97, normalized size of antiderivative = 0.92

$$\int(a+a\cos(c+dx))^{3/2}\sec^3(c+dx)\,dx = \frac{a\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\sec^2(c+dx)\left(7\sqrt{2}\text{arctanh}\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right)\cos^2(c+dx)\right.}{8d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^3,x]
```

```
[Out] (a*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*Sec[c + d*x]^2*(7*Sqrt[2]*Ar
cTanh[Sqrt[2]*Sin[(c + d*x)/2]]*Cos[c + d*x]^2 - 3*Sin[(c + d*x)/2] + 7*Sin
[(3*(c + d*x))/2]))/(8*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 550 vs. 2(90) = 180.

Time = 1.56 (sec) , antiderivative size = 551, normalized size of antiderivative = 5.20

method	result
default	$\frac{\sqrt{a}\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(28a\left(\ln\left(\frac{4\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+4\sqrt{2}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{a}+8a}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{2}}\right)+\ln\left(-\frac{4\left(\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-\sqrt{2}\sqrt{a\left(\sin\right.}\right.}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right.\right.\right.}{}$

```
[In] int((a+cos(d*x+c)*a)^(3/2)*sec(d*x+c)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*a^(1/2)*cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(28*a*(ln(4/(
2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(
1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))+ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*
(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2
)-2*a)))*sin(1/2*d*x+1/2*c)^4+(-28*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(
1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*
a))*a-28*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)
-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a-28*2^(1/2)*(a*sin(1
/2*d*x+1/2*c)^2)^(1/2)*a^(1/2))*sin(1/2*d*x+1/2*c)^2+7*ln(4/(2*cos(1/2*d*x+
1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)
^2)^(1/2)*a^(1/2)+2*a))*a+7*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a
*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a+
18*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2))/(2*cos(1/2*d*x+1/2*c)+2^
(1/2))^2/(2*cos(1/2*d*x+1/2*c)-2^(1/2))^2/sin(1/2*d*x+1/2*c)/(a*cos(1/2*d*x
+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.53

$$\int (a+a\cos(c+dx))^{3/2}\sec^3(c+dx)\,dx=\frac{7\left(a\cos(dx+c)^3+a\cos(dx+c)^2\right)\sqrt{a}\log\left(\frac{a\cos(dx+c)^3-7\,a\cos(dx+c)^2-4\,\sqrt{a\cos(dx+c)+a}\sqrt{a}(\cos(dx+c)-2)\sin}{\cos(dx+c)^3+\cos(dx+c)^2}\right.}{16\left(d\cos(dx+c)^3+d\cos(dx+\right.}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] 1/16*(7*(a*cos(d*x + c)^3 + a*cos(d*x + c)^2)*sqrt(a)*log((a*cos(d*x + c)^3
 - 7*a*cos(d*x + c)^2 - 4*sqrt(a*cos(d*x + c) + a)*sqrt(a)*(cos(d*x + c) -
2)*sin(d*x + c) + 8*a)/(cos(d*x + c)^3 + cos(d*x + c)^2)) + 4*(7*a*cos(d*x
+ c) + 2*a)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c))/(d*cos(d*x + c)^3 + d*co
s(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{3/2}\sec^3(c+dx)\,dx=\text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(3/2)*sec(d*x+c)**3,x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 3216 vs. 2(90) = 180.

Time = 0.93 (sec) , antiderivative size = 3216, normalized size of antiderivative = 30.34

$$\int (a + a\cos(c + dx))^{3/2} \sec^3(c + dx) \, dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] 1/16*((7*sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
+ 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 7*
sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 7*sqrt(2)*a
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 7*sqrt(2)*a*log(2*co
s(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1
/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 4*a*sin(5/2*d*x + 5/2*c) - 12
*a*sin(3/2*d*x + 3/2*c) - 56*a*sin(1/2*d*x + 1/2*c))*cos(4*d*x + 4*c)^2 + 4
*(7*sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 7*sqrt(
2)*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 7*sqrt(2)*a*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 7*sqrt(2)*a*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 12*a*sin(3/2*d*x + 3/2*c) - 56*a*s
in(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c)^2 + (7*sqrt(2)*a*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) - 7*sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) + 7*sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) - 7*sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) + 4*a*sin(5/2*d*x + 5/2*c) - 12*a*sin(3/2*d*x + 3/2*c) - 56*a*sin(1/2*
d*x + 1/2*c))*sin(4*d*x + 4*c)^2 - 160*a*cos(7/2*d*x + 7/2*c)*sin(2*d*x + 2
*c) - 168*a*cos(5/2*d*x + 5/2*c)*sin(2*d*x + 2*c) - 72*a*cos(3/2*d*x + 3/2*
c)*sin(2*d*x + 2*c) + 4*(7*sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) - 7*sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) + 7*sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
- 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 7*
sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(
```

2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 12*a*sin(3/
2*d*x + 3/2*c) - 56*a*sin(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c)^2 + 7*sqrt(2)*
a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 7*sqrt(2)*a*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 7*sqrt(2)*a*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 7*sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)
*sin(1/2*d*x + 1/2*c) + 2) + 4*(a*sin(4*d*x + 4*c) + 2*a*sin(2*d*x + 2*c))*
cos(13/2*d*x + 13/2*c) - 12*(a*sin(4*d*x + 4*c) + 2*a*sin(2*d*x + 2*c))*cos
(11/2*d*x + 11/2*c) - 48*(a*sin(4*d*x + 4*c) + 2*a*sin(2*d*x + 2*c))*cos(9/
2*d*x + 9/2*c) + 2*(7*sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) - 7*sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
+ 7*sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 7*sqrt(
2)*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 2*(7*sqrt(2)*a*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 7*sqrt(2)*a*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 7*sqrt(2)*a*log(2*cos(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 7*sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - 12*a*sin(3/2*d*x + 3/2*c) - 56*a*sin(1/2*d*x + 1/
2*c))*cos(2*d*x + 2*c) + 40*a*sin(7/2*d*x + 7/2*c) + 2*(4*a*cos(2*d*x + 2*c
) + 23*a)*sin(5/2*d*x + 5/2*c) + 6*a*sin(3/2*d*x + 3/2*c) - 56*a*sin(1/2*d*
x + 1/2*c))*cos(4*d*x + 4*c) + 4*(7*sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) - 7*sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) + 7*sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) - 7*sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
- 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 6*
a*sin(3/2*d*x + 3/2*c) - 56*a*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) - 4*(a
*cos(4*d*x + 4*c) + 2*a*cos(2*d*x + 2*c) + a)*sin(13/2*d*x + 13/2*c) + 12*(
a*cos(4*d*x + 4*c) + 2*a*cos(2*d*x + 2*c) + a)*sin(11/2*d*x + 11/2*c) + 48*
(a*cos(4*d*x + 4*c) + 2*a*cos(2*d*x + 2*c) + a)*sin(9/2*d*x + 9/2*c) + 4*(4
*a*sin(5/2*d*x + 5/2*c)*sin(2*d*x + 2*c) - 20*a*cos(7/2*d*x + 7/2*c) - 21*a
*cos(5/2*d*x + 5/2*c) - 9*a*cos(3/2*d*x + 3/2*c) + (7*sqrt(2)*a*log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*

```
c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 7*sqrt(2)*a*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) + 7*sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) - 7*sqrt(2)*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) - 12*a*sin(3/2*d*x + 3/2*c) - 56*a*sin(1/2*d*x + 1/2*c))*sin(
2*d*x + 2*c))*sin(4*d*x + 4*c) + 80*(2*a*cos(2*d*x + 2*c) + a)*sin(7/2*d*x
+ 7/2*c) + 8*(2*a*cos(2*d*x + 2*c)^2 + 2*a*sin(2*d*x + 2*c)^2 + 23*a*cos(2*
d*x + 2*c) + 11*a)*sin(5/2*d*x + 5/2*c) + 24*a*sin(3/2*d*x + 3/2*c) - 56*a*
sin(1/2*d*x + 1/2*c))*sqrt(a)/((sqrt(2)*cos(4*d*x + 4*c)^2 + 4*sqrt(2)*cos(
2*d*x + 2*c)^2 + sqrt(2)*sin(4*d*x + 4*c)^2 + 4*sqrt(2)*sin(4*d*x + 4*c)*si
n(2*d*x + 2*c) + 4*sqrt(2)*sin(2*d*x + 2*c)^2 + 2*(2*sqrt(2)*cos(2*d*x + 2*
c) + sqrt(2))*cos(4*d*x + 4*c) + 4*sqrt(2)*cos(2*d*x + 2*c) + sqrt(2))*d)
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 134, normalized size of antiderivative = 1.26

$$\int (a + a\cos(c + dx))^{3/2} \sec^3(c + dx)\,dx =$$

$$-\frac{\sqrt{2}\left(7\sqrt{2}a\log\left(\frac{\left|-2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}{\left|2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}\right)\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)+\frac{4\left(14\,a\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-9\,a\mathrm{sgn}\left(\cos\left(\frac{1}{2}d\right.\right.\right.}{\left(2\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)^2}}{16\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^3,x, algorithm="giac")
```

```
[Out] -1/16*sqrt(2)*(7*sqrt(2)*a*log(abs(-2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c))/abs
(2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c)))*sgn(cos(1/2*d*x + 1/2*c)) + 4*(14*a*s
gn(cos(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c)^3 - 9*a*sgn(cos(1/2*d*x + 1/2
*c))*sin(1/2*d*x + 1/2*c))/(2*sin(1/2*d*x + 1/2*c)^2 - 1)^2)*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^{3/2} \sec^3(c + dx)\,dx = \int \frac{\left(a + a\,\cos\left(c + d\,x\right)\right)^{3/2}}{\cos\left(c + d\,x\right)^3}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(3/2)/cos(c + d*x)^3,x)
```

```
[Out] int((a + a*cos(c + d*x))^(3/2)/cos(c + d*x)^3, x)
```

3.111 $\int (a+a\cos(c+dx))^{3/2}\sec^4(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 144

$$\int (a+a\cos(c+dx))^{3/2}\sec^4(c+dx)\,dx = \frac{11a^{3/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d} + \frac{11a^2\tan(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} + \frac{11a^2\sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 11/8*a^(3/2)*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d+11/8*a^2*
tan(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+11/12*a^2*sec(d*x+c)*tan(d*x+c)/d/(a+a*
cos(d*x+c))^(1/2)+1/3*a^2*sec(d*x+c)^2*tan(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2841, 21, 2851, 2852, 212}

$$\int (a+a\cos(c+dx))^{3/2}\sec^4(c+dx)\,dx = \frac{11a^{3/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{8d} + \frac{11a^2\tan(c+dx)}{8d\sqrt{a\cos(c+dx)+a}} + \frac{a^2\tan(c+dx)\sec^2(c+dx)}{3d\sqrt{a\cos(c+dx)+a}} + \frac{11a^2\tan(c+dx)\sec(c+dx)}{12d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^4,x]
```

```
[Out] (11*a^(3/2)*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(8*d)
 + (11*a^2*Tan[c + d*x])/(8*d*Sqrt[a + a*Cos[c + d*x]]) + (11*a^2*Sec[c + d
*x]*Tan[c + d*x])/(12*d*Sqrt[a + a*Cos[c + d*x]]) + (a^2*Sec[c + d*x]^2*Tan
[c + d*x])/(3*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{a^2\sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} - \frac{1}{3}a\int\frac{\left(-\frac{11a}{2}-\frac{11}{2}a\cos(c+dx)\right)\sec^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{a^2 \sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{1}{6}(11a)\int \sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\,dx$$

$$= \frac{11a^2 \sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{a^2 \sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{1}{8}(11a)\int \sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\,dx$$

$$= \frac{11a^2 \tan(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} + \frac{11a^2 \sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{a^2 \sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{1}{16}(11a)\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx$$

$$= \frac{11a^2 \tan(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} + \frac{11a^2 \sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{a^2 \sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} - \frac{(11a^2)\,\text{Subst}\left(\int \frac{1}{a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d}$$

$$= \frac{11a^{3/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d} + \frac{11a^2 \tan(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} + \frac{11a^2 \sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{a^2 \sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 110, normalized size of antiderivative = 0.76

$$\int (a+a\cos(c+dx))^{3/2}\sec^4(c+dx)\,dx = \frac{a\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\sec^3(c+dx)\left(66\sqrt{2}\text{arctanh}\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right)\cos^3(c+d\right.}{96d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^4,x]
```

```
[Out] (a*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*Sec[c + d*x]^3*(66*Sqrt[2]*A
rcTanh[Sqrt[2]*Sin[(c + d*x)/2]]*Cos[c + d*x]^3 + 54*Sin[(c + d*x)/2] + 11*
(Sin[(3*(c + d*x))/2] + 3*Sin[(5*(c + d*x))/2])))/(96*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 717 vs. 2(124) = 248.

Time = 1.90 (sec) , antiderivative size = 718, normalized size of antiderivative = 4.99

method	result
default	$\frac{\sqrt{a}\,\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-264a\left(\ln\left(\frac{4\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+4\sqrt{2}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{a}+8a}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{2}}\right)+\ln\left(-\frac{4\left(\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-\sqrt{2}\,\sqrt{a}\right.}{2\cos\left(\frac{dx}{2}+\right.}\right.\right.\right.}{}$

```
[In] int((a+cos(d*x+c)*a)^(3/2)*sec(d*x+c)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*a^(1/2)*cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-264*a*(ln(4
/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*si
n(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))+ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2)
)*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1
/2)-2*a)))*sin(1/2*d*x+1/2*c)^6+132*(2*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/
2)*a^(1/2)+3*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2
*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*a+3*ln(-4/(2*cos(1
/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x
+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a)*sin(1/2*d*x+1/2*c)^4-22*(16*2^(1/2)*(a*si
n(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+9*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^
(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2
*a))*a+9*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)
-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a)*sin(1/2*d*x+1/2*c)
^2+33*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(
1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*a+33*ln(-4/(2*cos(1/2*d*x
+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c
)^2)^(1/2)*a^(1/2)-2*a))*a+126*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/
2))/(2*cos(1/2*d*x+1/2*c)+2^(1/2))^3/(2*cos(1/2*d*x+1/2*c)-2^(1/2))^3/sin(1
/2*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.20

$$\int (a+a\cos(c+dx))^{3/2}\sec^4(c+dx)\,dx = \frac{33\left(a\cos\left(dx+c\right)^4+a\cos\left(dx+c\right)^3\right)\sqrt{a}\log\left(\frac{a\cos(dx+c)^3-7\,a\cos(dx+c)^2-4\,\sqrt{a\cos(dx+c)+a}\sqrt{a}(\cos(dx+c)-2)\sin}{\cos(dx+c)^3+\cos(dx+c)^2}\right.}{96\left(d\cos\left(dx+c\right)^4+\right.}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] 1/96*(33*(a*cos(d*x + c)^4 + a*cos(d*x + c)^3)*sqrt(a)*log((a*cos(d*x + c)^
3 - 7*a*cos(d*x + c)^2 - 4*sqrt(a*cos(d*x + c) + a)*sqrt(a)*(cos(d*x + c) -
 2)*sin(d*x + c) + 8*a)/(cos(d*x + c)^3 + cos(d*x + c)^2)) + 4*(33*a*cos(d*
x + c)^2 + 22*a*cos(d*x + c) + 8*a)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c))/
(d*cos(d*x + c)^4 + d*cos(d*x + c)^3)
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{3/2}\sec^4(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(3/2)*sec(d*x+c)**4,x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 5542 vs. 2(124) = 248.

Time = 164.44 (sec) , antiderivative size = 5542, normalized size of antiderivative = 38.49

$$\int (a+a\cos(c+dx))^{3/2}\sec^4(c+dx)\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] -1/96*(774*sqrt(2)*a*cos(7/2*d*x + 7/2*c)*sin(2*d*x + 2*c) + 162*sqrt(2)*a*
cos(5/2*d*x + 5/2*c)*sin(2*d*x + 2*c) + (14*sqrt(2)*a*sin(3/2*d*x + 3/2*c)
+ 90*sqrt(2)*a*sin(1/2*d*x + 1/2*c) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(6*d*x + 6*c)^2 + 9*(14*
sqrt(2)*a*sin(3/2*d*x + 3/2*c) + 90*sqrt(2)*a*sin(1/2*d*x + 1/2*c) - 33*a*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2))*cos(4*d*x + 4*c)^2 + 9*(14*sqrt(2)*a*sin(3/2*d*x + 3/2*c) + 90*sqrt(2)*
```

a*sin(1/2*d*x + 1/2*c) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(2*d*x + 2*c)^2 + (14*sqrt(2)*a*sin(3/2*d*x + 3/2*c) + 90*sqrt(2)*a*sin(1/2*d*x + 1/2*c) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(6*d*x + 6*c)^2 + 9*(14*sqrt(2)*a*sin(3/2*d*x + 3/2*c) + 90*sqrt(2)*a*sin(1/2*d*x + 1/2*c) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(4*d*x + 4*c)^2 + 9*(14*sqrt(2)*a*sin(3/2*d*x + 3/2*c) + 90*sqrt(2)*a*sin(1/2*d*x + 1/2*c) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(2*d*x + 2*c)^2 + 44*sqrt(2)*a*sin(3/2*d*x + 3/2*c) + 132*sqrt(2)*a*sin(1/2*d*x + 1/2*c) + 14*(sqrt(2)*a*sin(6*d*x + 6*c) + 3*sqrt(2)*a*sin(4*d*x + 4*c) + 3*sqrt(2)*a*sin(2*d*x + 2*c))*cos(15/2*d*x + 15/2*c) + 90*(sqrt(2)*a*sin(6*d*x + 6*c) + 3*sqrt(2)*a*sin(4*d*x + 4*c) + 3*sqrt(2)*a*sin(2*d*x + 2*c))*cos(13/2*d*x + 13/2*c) - 2*(87*sqrt(2)*a*sin(11/2*d*x + 11/2*c) + 157*sqrt(2)*a*sin(9/2*d*x + 9/2*c) + 129*sqrt(2)*a*sin(7/2*d*x + 7/2*c) + 27*sqrt(2)*a*sin(5/2*d*x + 5/2*c) - 29*sqrt(2)*a*sin(3/2*d*x + 3/2*c) - 111*sqrt(2)*a*sin(1/2*d*x + 1/2*c) - 3*(14*sqrt(2)*a*sin(3/2*d*x + 3/2*c) + 90*sqrt(2)*a*sin(1/2*d*x + 1/2*c) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 33*a*log(2*cos(1/2*d*x +

1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2))*cos(4*d*x + 4*c) - 3*(14*sqrt(2)*a*sin(3/2*d*x + 3/2*c) +
90*sqrt(2)*a*sin(1/2*d*x + 1/2*c) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(2*d*x + 2*c) + 33*a*log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 33*a*log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x
 + 1/2*c) + 2) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*
cos(6*d*x + 6*c) + 522*(sqrt(2)*a*sin(4*d*x + 4*c) + sqrt(2)*a*sin(2*d*x +
2*c))*cos(11/2*d*x + 11/2*c) + 942*(sqrt(2)*a*sin(4*d*x + 4*c) + sqrt(2)*a*
sin(2*d*x + 2*c))*cos(9/2*d*x + 9/2*c) - 6*(129*sqrt(2)*a*sin(7/2*d*x + 7/2
*c) + 27*sqrt(2)*a*sin(5/2*d*x + 5/2*c) - 29*sqrt(2)*a*sin(3/2*d*x + 3/2*c)
 - 111*sqrt(2)*a*sin(1/2*d*x + 1/2*c) - 3*(14*sqrt(2)*a*sin(3/2*d*x + 3/2*c
) + 90*sqrt(2)*a*sin(1/2*d*x + 1/2*c) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
 + 2) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sq
rt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(2*d*x + 2*c) + 33*a*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 33*a*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2))*cos(4*d*x + 4*c) + 6*(29*sqrt(2)*a*sin(3/2*d*x + 3/2*c) + 111*sqrt(2)*a
*sin(1/2*d*x + 1/2*c) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
 + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sq
rt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 33*a*log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*

x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(2*d*x + 2*c) - 33*a*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 14*(sqrt(2)
*a*cos(6*d*x + 6*c) + 3*sqrt(2)*a*cos(4*d*x + 4*c) + 3*sqrt(2)*a*cos(2*d*x
+ 2*c) + sqrt(2)*a)*sin(15/2*d*x + 15/2*c) - 90*(sqrt(2)*a*cos(6*d*x + 6*c)
 + 3*sqrt(2)*a*cos(4*d*x + 4*c) + 3*sqrt(2)*a*cos(2*d*x + 2*c) + sqrt(2)*a)
*sin(13/2*d*x + 13/2*c) + 2*(87*sqrt(2)*a*cos(11/2*d*x + 11/2*c) + 157*sqrt
(2)*a*cos(9/2*d*x + 9/2*c) + 129*sqrt(2)*a*cos(7/2*d*x + 7/2*c) + 27*sqrt(2
)*a*cos(5/2*d*x + 5/2*c) - 15*sqrt(2)*a*cos(3/2*d*x + 3/2*c) - 21*sqrt(2)*a
*cos(1/2*d*x + 1/2*c) + 3*(14*sqrt(2)*a*sin(3/2*d*x + 3/2*c) + 90*sqrt(2)*a
*sin(1/2*d*x + 1/2*c) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
 + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sq
rt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 33*a*log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(4*d*x + 4*c) + 3*(14*sqrt(2)*a*sin(3/
2*d*x + 3/2*c) + 90*sqrt(2)*a*sin(1/2*d*x + 1/2*c) - 33*a*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(2*d*x +
2*c))*sin(6*d*x + 6*c) - 174*(3*sqrt(2)*a*cos(4*d*x + 4*c) + 3*sqrt(2)*a*co
s(2*d*x + 2*c) + sqrt(2)*a)*sin(11/2*d*x + 11/2*c) - 314*(3*sqrt(2)*a*cos(4
*d*x + 4*c) + 3*sqrt(2)*a*cos(2*d*x + 2*c) + sqrt(2)*a)*sin(9/2*d*x + 9/2*c
) + 18*(43*sqrt(2)*a*cos(7/2*d*x + 7/2*c) + 9*sqrt(2)*a*cos(5/2*d*x + 5/2*c
) - 5*sqrt(2)*a*cos(3/2*d*x + 3/2*c) - 7*sqrt(2)*a*cos(1/2*d*x + 1/2*c) + (
14*sqrt(2)*a*sin(3/2*d*x + 3/2*c) + 90*sqrt(2)*a*sin(1/2*d*x + 1/2*c) - 33*
a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) + 33*a*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +

```
 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
 + 2))*sin(2*d*x + 2*c))*sin(4*d*x + 4*c) - 258*(3*sqrt(2)*a*cos(2*d*x + 2*
c) + sqrt(2)*a)*sin(7/2*d*x + 7/2*c) - 54*(3*sqrt(2)*a*cos(2*d*x + 2*c) + s
qrt(2)*a)*sin(5/2*d*x + 5/2*c) - 18*(5*sqrt(2)*a*cos(3/2*d*x + 3/2*c) + 7*s
qrt(2)*a*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c))*sqrt(a)/((2*(3*cos(4*d*x +
 4*c) + 3*cos(2*d*x + 2*c) + 1)*cos(6*d*x + 6*c) + cos(6*d*x + 6*c)^2 + 6*(
3*cos(2*d*x + 2*c) + 1)*cos(4*d*x + 4*c) + 9*cos(4*d*x + 4*c)^2 + 9*cos(2*d
*x + 2*c)^2 + 6*(sin(4*d*x + 4*c) + sin(2*d*x + 2*c))*sin(6*d*x + 6*c) + si
n(6*d*x + 6*c)^2 + 9*sin(4*d*x + 4*c)^2 + 18*sin(4*d*x + 4*c)*sin(2*d*x + 2
*c) + 9*sin(2*d*x + 2*c)^2 + 6*cos(2*d*x + 2*c) + 1)*d)
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.10

$$\int (a+a\cos(c+dx))^{3/2}\sec^4(c+dx)\,dx =$$

$$-\frac{\sqrt{2}\left(33\sqrt{2}a\log\left(\frac{\left|-2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}{\left|2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}\right)\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)+\frac{4\left(132\,a\,\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5-176\,a\,\mathrm{sgn}(\cdots}{(2\cdots}\right.}{96\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^4,x, algorithm="giac")
```

```
[Out] -1/96*sqrt(2)*(33*sqrt(2)*a*log(abs(-2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c))/ab
s(2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c)))*sgn(cos(1/2*d*x + 1/2*c)) + 4*(132*a
*sgn(cos(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c)^5 - 176*a*sgn(cos(1/2*d*x +
 1/2*c))*sin(1/2*d*x + 1/2*c)^3 + 63*a*sgn(cos(1/2*d*x + 1/2*c))*sin(1/2*d*
x + 1/2*c))/(2*sin(1/2*d*x + 1/2*c)^2 - 1)^3)*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{3/2}\sec^4(c+dx)\,dx = \int \frac{(a+a\,\cos(c+d\,x))^{3/2}}{\cos(c+d\,x)^4}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(3/2)/cos(c + d*x)^4,x)
```

```
[Out] int((a + a*cos(c + d*x))^(3/2)/cos(c + d*x)^4, x)
```

3.112 $\int \cos^3(c+dx)(a+a\cos(c+dx))^{5/2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 203

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{284a^3\sin(c+dx)}{99d\sqrt{a+a\cos(c+dx)}} + \frac{710a^3\cos^3(c+dx)\sin(c+dx)}{693d\sqrt{a+a\cos(c+dx)}} + \frac{46a^3\cos^4(c+dx)\sin(c+dx)}{99d\sqrt{a+a\cos(c+dx)}} - \frac{568a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{693d} + \frac{2a^2\cos^4(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{11d} + \frac{284a(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{231d}$$

```
[Out] 284/231*a*(a+a*cos(d*x+c))^(3/2)*sin(d*x+c)/d+284/99*a^3*sin(d*x+c)/d/(a+a*
cos(d*x+c))^(1/2)+710/693*a^3*cos(d*x+c)^3*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1
/2)+46/99*a^3*cos(d*x+c)^4*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)-568/693*a^2*
sin(d*x+c)*(a+a*cos(d*x+c))^(1/2)/d+2/11*a^2*cos(d*x+c)^4*sin(d*x+c)*(a+a*c
os(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used

= {2842, 3060, 2849, 2838, 2830, 2725}

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{46a^3\sin(c+dx)\cos^4(c+dx)}{99d\sqrt{a\cos(c+dx)+a}} + \frac{710a^3\sin(c+dx)\cos^3(c+dx)}{693d\sqrt{a\cos(c+dx)+a}} + \frac{284a^3\sin(c+dx)}{99d\sqrt{a\cos(c+dx)+a}} + \frac{2a^2\sin(c+dx)\cos^4(c+dx)\sqrt{a\cos(c+dx)+a}}{11d} - \frac{568a^2\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{693d} + \frac{284a\sin(c+dx)(a\cos(c+dx)+a)^{3/2}}{231d}$$

```
[In] Int[Cos[c + d*x]^3*(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (284*a^3*Sin[c + d*x])/(99*d*Sqrt[a + a*Cos[c + d*x]]) + (710*a^3*Cos[c + d
*x]^3*Sin[c + d*x])/(693*d*Sqrt[a + a*Cos[c + d*x]]) + (46*a^3*Cos[c + d*x]
^4*Sin[c + d*x])/(99*d*Sqrt[a + a*Cos[c + d*x]]) - (568*a^2*Sqrt[a + a*Cos[
c + d*x]]*Sin[c + d*x])/(693*d) + (2*a^2*Cos[c + d*x]^4*Sqrt[a + a*Cos[c +
d*x]]*Sin[c + d*x])/(11*d) + (284*a*(a + a*Cos[c + d*x])^(3/2)*Sin[c + d*x]
)/(231*d)
```

Rule 2725

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[-2*b*(Cos
[c + d*x]/(d*Sqrt[a + b*Sin[c + d*x]])), x] /; FreeQ[{a, b, c, d}, x] && Eq
Q[a^2 - b^2, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rule 2838

```
Int[sin[(e_.) + (f_.)*(x_)]^2*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_),
x_Symbol] :> Simp[(-Cos[e + f*x])*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2
))), x] + Dist[1/(b*(m + 2)), Int[(a + b*Sin[e + f*x])^m*(b*(m + 1) - a*Sin
[e + f*x]), x], x] /; FreeQ[{a, b, e, f, m}, x] && EqQ[a^2 - b^2, 0] &&  !L
tQ[m, -2^(-1)]
```

Rule 2842

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x
```

```
])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
+ n)), Int[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^n*Simp[a*b*c*(
m - 2) + b^2*d*(n + 1) + a^2*d*(m + n) - b*(b*c*(m - 1) - a*d*(3*m + 2*n -
2))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c
- a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1] &&  !LtQ[n
, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] || (IntegerQ[m] && EqQ[c
, 0]))
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rule 3060

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[-2*b*B*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(2*n + 3)*Sqrt[a +
b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*c - 2*a*d*(n + 1)))/(b
*d*(2*n + 3)), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
b^2, 0] && NeQ[c^2 - d^2, 0] &&  !LtQ[n, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2a^2\cos^4(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{11d} \\
&\quad+\frac{2}{11}\int\cos^3(c+dx)\sqrt{a+a\cos(c+dx)}\left(\frac{19a^2}{2}+\frac{23}{2}a^2\cos(c+dx)\right)\,dx \\
&= \frac{46a^3\cos^4(c+dx)\sin(c+dx)}{99d\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\cos^4(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{11d} \\
&\quad+\frac{1}{99}\left(355a^2\right)\int\cos^3(c+dx)\sqrt{a+a\cos(c+dx)}\,dx \\
&= \frac{710a^3\cos^3(c+dx)\sin(c+dx)}{693d\sqrt{a+a\cos(c+dx)}}+\frac{46a^3\cos^4(c+dx)\sin(c+dx)}{99d\sqrt{a+a\cos(c+dx)}} \\
&\quad+\frac{2a^2\cos^4(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{11d} \\
&\quad+\frac{1}{231}\left(710a^2\right)\int\cos^2(c+dx)\sqrt{a+a\cos(c+dx)}\,dx
\end{aligned}$$

$$= \frac{710a^3\cos^3(c+dx)\sin(c+dx)}{693d\sqrt{a+a\cos(c+dx)}} + \frac{46a^3\cos^4(c+dx)\sin(c+dx)}{99d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\cos^4(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{11d} + \frac{284a(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{231d} + \frac{1}{231}(284a)\int\left(\frac{3a}{2}-a\cos(c+dx)\right)\sqrt{a+a\cos(c+dx)}\,dx$$

$$= \frac{710a^3\cos^3(c+dx)\sin(c+dx)}{693d\sqrt{a+a\cos(c+dx)}} + \frac{46a^3\cos^4(c+dx)\sin(c+dx)}{99d\sqrt{a+a\cos(c+dx)}} - \frac{568a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{693d} + \frac{2a^2\cos^4(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{11d} + \frac{284a(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{231d} + \frac{1}{99}(142a^2)\int\sqrt{a+a\cos(c+dx)}\,dx$$

$$= \frac{284a^3\sin(c+dx)}{99d\sqrt{a+a\cos(c+dx)}} + \frac{710a^3\cos^3(c+dx)\sin(c+dx)}{693d\sqrt{a+a\cos(c+dx)}} + \frac{46a^3\cos^4(c+dx)\sin(c+dx)}{99d\sqrt{a+a\cos(c+dx)}} - \frac{568a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{693d} + \frac{2a^2\cos^4(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{11d} + \frac{284a(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{231d}$$

Mathematica [A] (verified)

Time = 0.31 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.53

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{a^2\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(31878\sin\left(\frac{1}{2}(c+dx)\right)+8778\sin\left(\frac{3}{2}(c+dx)\right)+3465\right.}{11088d}$$

```
[In] Integrate[Cos[c + d*x]^3*(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (a^2*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(31878*Sin[(c + d*x)/2] +
8778*Sin[(3*(c + d*x))/2] + 3465*Sin[(5*(c + d*x))/2] + 1287*Sin[(7*(c + d*
x))/2] + 385*Sin[(9*(c + d*x))/2] + 63*Sin[(11*(c + d*x))/2]))/(11088*d)
```

Maple [A] (verified)

Time = 5.54 (sec) , antiderivative size = 112, normalized size of antiderivative = 0.55

method	result
default	$\frac{8 \cos\left(\frac{dx}{2}+\frac{c}{2}\right) a^{3} \sin\left(\frac{dx}{2}+\frac{c}{2}\right) \left(504\left(\cos^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-364\left(\cos^{8}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+178\left(\cos^{6}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+75\left(\cos^{4}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+100\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.}{693\sqrt{a\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\, d}$

```
[In] int(cos(d*x+c)^3*(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 8/693*cos(1/2*d*x+1/2*c)*a^3*sin(1/2*d*x+1/2*c)*(504*cos(1/2*d*x+1/2*c)^10-
364*cos(1/2*d*x+1/2*c)^8+178*cos(1/2*d*x+1/2*c)^6+75*cos(1/2*d*x+1/2*c)^4+1
00*cos(1/2*d*x+1/2*c)^2+200)*2^(1/2)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 101, normalized size of antiderivative = 0.50

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{2\left(63\,a^2\cos\left(dx+c\right)^5+224\,a^2\cos\left(dx+c\right)^4+355\,a^2\cos\left(dx+c\right)^3+426\,a^2\cos\left(dx+c\right)^2+568\right.}{693\left(d\cos\left(dx+c\right)+d\right)}$$

```
[In] integrate(cos(d*x+c)^3*(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 2/693*(63*a^2*cos(d*x + c)^5 + 224*a^2*cos(d*x + c)^4 + 355*a^2*cos(d*x + c
)^3 + 426*a^2*cos(d*x + c)^2 + 568*a^2*cos(d*x + c) + 1136*a^2)*sqrt(a*cos(
d*x + c) + a)*sin(d*x + c)/(d*cos(d*x + c) + d)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3*(a+a*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.55

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{\left(63\sqrt{2}a^2\sin\left(\frac{11}{2}\,dx+\frac{11}{2}\,c\right)+385\sqrt{2}a^2\sin\left(\frac{9}{2}\,dx+\frac{9}{2}\,c\right)+1287\sqrt{2}a^2\sin\left(\frac{7}{2}\,dx+\frac{7}{2}\,c\right)+3465\sqrt{\cdots}\right.}{11088\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 1/11088*(63*sqrt(2)*a^2*sin(11/2*d*x + 11/2*c) + 385*sqrt(2)*a^2*sin(9/2*d*
x + 9/2*c) + 1287*sqrt(2)*a^2*sin(7/2*d*x + 7/2*c) + 3465*sqrt(2)*a^2*sin(5
/2*d*x + 5/2*c) + 8778*sqrt(2)*a^2*sin(3/2*d*x + 3/2*c) + 31878*sqrt(2)*a^2
*sin(1/2*d*x + 1/2*c))*sqrt(a)/d
```

Giac [A] (verification not implemented)

none

Time = 1.76 (sec) , antiderivative size = 156, normalized size of antiderivative = 0.77

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{\sqrt{2}\left(63\,a^2\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{11}{2}\,dx+\frac{11}{2}\,c\right)+385\,a^2\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{9}{2}\,dx+\frac{9}{2}\,c\cdots\right.\right.}{\cdots}$$

```
[In] integrate(cos(d*x+c)^3*(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] 1/11088*sqrt(2)*(63*a^2*sgn(cos(1/2*d*x + 1/2*c))*sin(11/2*d*x + 11/2*c) +
385*a^2*sgn(cos(1/2*d*x + 1/2*c))*sin(9/2*d*x + 9/2*c) + 1287*a^2*sgn(cos(1
/2*d*x + 1/2*c))*sin(7/2*d*x + 7/2*c) + 3465*a^2*sgn(cos(1/2*d*x + 1/2*c))*
sin(5/2*d*x + 5/2*c) + 8778*a^2*sgn(cos(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2
*c) + 31878*a^2*sgn(cos(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c))*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int \cos^3(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \int \cos\left(c+d\,x\right)^3\,{\left(a+a\,\cos\left(c+d\,x\right)\right)}^{5/2} \,d x$$

```
[In] int(cos(c + d*x)^3*(a + a*cos(c + d*x))^(5/2),x)
```

```
[Out] int(cos(c + d*x)^3*(a + a*cos(c + d*x))^(5/2), x)
```

3.113 $\int \cos^2(c+dx)(a+a\cos(c+dx))^{5/2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 146

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{832a^3\sin(c+dx)}{315d\sqrt{a+a\cos(c+dx)}} + \frac{208a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{315d} + \frac{26a(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{105d} - \frac{4(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{63d} + \frac{2(a+a\cos(c+dx))^{7/2}\sin(c+dx)}{9ad}$$

```
[Out] 26/105*a*(a+a*cos(d*x+c))^(3/2)*sin(d*x+c)/d-4/63*(a+a*cos(d*x+c))^(5/2)*si
n(d*x+c)/d+2/9*(a+a*cos(d*x+c))^(7/2)*sin(d*x+c)/a/d+832/315*a^3*sin(d*x+c)
/d/(a+a*cos(d*x+c))^(1/2)+208/315*a^2*sin(d*x+c)*(a+a*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {2838, 2830, 2726, 2725}

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{832a^3\sin(c+dx)}{315d\sqrt{a\cos(c+dx)+a}} + \frac{208a^2\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{315d} + \frac{2\sin(c+dx)(a\cos(c+dx)+a)^{7/2}}{9ad} - \frac{4\sin(c+dx)(a\cos(c+dx)+a)^{5/2}}{63d} + \frac{26a\sin(c+dx)(a\cos(c+dx)+a)^{3/2}}{105d}$$

```
[In] Int[Cos[c + d*x]^2*(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (832*a^3*Sin[c + d*x])/(315*d*Sqrt[a + a*Cos[c + d*x]]) + (208*a^2*Sqrt[a +
 a*Cos[c + d*x]]*Sin[c + d*x])/(315*d) + (26*a*(a + a*Cos[c + d*x])^(3/2)*S
in[c + d*x])/(105*d) - (4*(a + a*Cos[c + d*x])^(5/2)*Sin[c + d*x])/(63*d) +
 (2*(a + a*Cos[c + d*x])^(7/2)*Sin[c + d*x])/(9*a*d)
```

Rule 2725

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[-2*b*(Cos
[c + d*x]/(d*Sqrt[a + b*Sin[c + d*x]])), x] /; FreeQ[{a, b, c, d}, x] && Eq
Q[a^2 - b^2, 0]
```

Rule 2726

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos
[c + d*x]*((a + b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[a*((2*n - 1)/n),
Int[(a + b*Sin[c + d*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] && EqQ[a
^2 - b^2, 0] && IGtQ[n - 1/2, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rule 2838

```
Int[sin[(e_.) + (f_.)*(x_)]^2*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_),
x_Symbol] :> Simp[(-Cos[e + f*x])*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2
))), x] + Dist[1/(b*(m + 2)), Int[(a + b*Sin[e + f*x])^m*(b*(m + 1) - a*Sin
[e + f*x]), x], x] /; FreeQ[{a, b, e, f, m}, x] && EqQ[a^2 - b^2, 0] &&  !L
tQ[m, -2^(-1)]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{2(a+a\cos(c+dx))^{7/2}\sin(c+dx)}{9ad} \\ &\quad + \frac{2\int\left(\frac{7a}{2}-a\cos(c+dx)\right)(a+a\cos(c+dx))^{5/2}\,dx}{9a} \\ &= -\frac{4(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{63d} \\ &\quad + \frac{2(a+a\cos(c+dx))^{7/2}\sin(c+dx)}{9ad} + \frac{13}{21}\int(a+a\cos(c+dx))^{5/2}\,dx\end{aligned}$$

$$= \frac{26a(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{105d} - \frac{4(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{63d} + \frac{2(a+a\cos(c+dx))^{7/2}\sin(c+dx)}{9ad} + \frac{1}{105}(104a)\int (a+a\cos(c+dx))^{3/2}\,dx$$

$$= \frac{208a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{315d} + \frac{26a(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{105d} - \frac{4(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{63d} + \frac{2(a+a\cos(c+dx))^{7/2}\sin(c+dx)}{9ad} + \frac{1}{315}(416a^2)\int \sqrt{a+a\cos(c+dx)}\,dx$$

$$= \frac{832a^3\sin(c+dx)}{315d\sqrt{a+a\cos(c+dx)}} + \frac{208a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{315d} + \frac{26a(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{105d} - \frac{4(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{63d} + \frac{2(a+a\cos(c+dx))^{7/2}\sin(c+dx)}{9ad}$$

Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 95, normalized size of antiderivative = 0.65

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{a^2\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(8190\sin\left(\frac{1}{2}(c+dx)\right)+2100\sin\left(\frac{3}{2}(c+dx)\right)+756\sin\left(\right.\right.}{2520d}$$

```
[In] Integrate[Cos[c + d*x]^2*(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (a^2*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(8190*Sin[(c + d*x)/2] + 2
100*Sin[(3*(c + d*x))/2] + 756*Sin[(5*(c + d*x))/2] + 225*Sin[(7*(c + d*x))
/2] + 35*Sin[(9*(c + d*x))/2]))/(2520*d)
```

Maple [A] (verified)

Time = 2.15 (sec) , antiderivative size = 99, normalized size of antiderivative = 0.68

method	result	size
default	$\frac{8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)a^3\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\left(140\left(\cos^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-20\left(\cos^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+39\left(\cos^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+52\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+104\right)\sqrt{2}}{315\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$	99

```
[In] int(cos(d*x+c)^2*(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 8/315*cos(1/2*d*x+1/2*c)*a^3*sin(1/2*d*x+1/2*c)*(140*cos(1/2*d*x+1/2*c)^8-2
0*cos(1/2*d*x+1/2*c)^6+39*cos(1/2*d*x+1/2*c)^4+52*cos(1/2*d*x+1/2*c)^2+104)
*2^(1/2)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 88, normalized size of antiderivative = 0.60

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{2\left(35\,a^2\cos\left(dx+c\right)^4+130\,a^2\cos\left(dx+c\right)^3+219\,a^2\cos\left(dx+c\right)^2+292\,a^2\cos\left(dx+c\right)+584\right.}{315\left(d\cos\left(dx+c\right)+d\right)}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 2/315*(35*a^2*cos(d*x + c)^4 + 130*a^2*cos(d*x + c)^3 + 219*a^2*cos(d*x + c
)^2 + 292*a^2*cos(d*x + c) + 584*a^2)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)
/(d*cos(d*x + c) + d)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**2*(a+a*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.47 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.64

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{\left(35\,\sqrt{2}a^2\sin\left(\frac{9}{2}\,dx+\frac{9}{2}\,c\right)+225\,\sqrt{2}a^2\sin\left(\frac{7}{2}\,dx+\frac{7}{2}\,c\right)+756\,\sqrt{2}a^2\sin\left(\frac{5}{2}\,dx+\frac{5}{2}\,c\right)+2100\,\sqrt{2}a\right.}{2520\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 1/2520*(35*sqrt(2)*a^2*sin(9/2*d*x + 9/2*c) + 225*sqrt(2)*a^2*sin(7/2*d*x +
 7/2*c) + 756*sqrt(2)*a^2*sin(5/2*d*x + 5/2*c) + 2100*sqrt(2)*a^2*sin(3/2*d
*x + 3/2*c) + 8190*sqrt(2)*a^2*sin(1/2*d*x + 1/2*c))*sqrt(a)/d
```

Giac [A] (verification not implemented)

none

Time = 0.81 (sec) , antiderivative size = 132, normalized size of antiderivative = 0.90

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{\sqrt{2}\left(35\,a^2\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{9}{2}\,dx+\frac{9}{2}\,c\right)+225\,a^2\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{7}{2}\,dx+\frac{7}{2}\,c\right)+\cdots\right.}{\cdots}$$

```
[In] integrate(cos(d*x+c)^2*(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] 1/2520*sqrt(2)*(35*a^2*sgn(cos(1/2*d*x + 1/2*c))*sin(9/2*d*x + 9/2*c) + 225
*a^2*sgn(cos(1/2*d*x + 1/2*c))*sin(7/2*d*x + 7/2*c) + 756*a^2*sgn(cos(1/2*d
*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 2100*a^2*sgn(cos(1/2*d*x + 1/2*c))*sin(
3/2*d*x + 3/2*c) + 8190*a^2*sgn(cos(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c))
*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int \cos^2(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \int \cos\left(c+d\,x\right)^2\,{\left(a+a\,\cos\left(c+d\,x\right)\right)}^{5/2}\,dx$$

```
[In] int(cos(c + d*x)^2*(a + a*cos(c + d*x))^(5/2),x)
```

```
[Out] int(cos(c + d*x)^2*(a + a*cos(c + d*x))^(5/2), x)
```

3.114 $\int \cos(c+dx)(a+a\cos(c+dx))^{5/2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 116

$$\int \cos(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{64a^3\sin(c+dx)}{21d\sqrt{a+a\cos(c+dx)}} + \frac{16a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{21d} + \frac{2a(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{7d} + \frac{2(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{7d}$$

```
[Out] 2/7*a*(a+a*cos(d*x+c))^(3/2)*sin(d*x+c)/d+2/7*(a+a*cos(d*x+c))^(5/2)*sin(d*
x+c)/d+64/21*a^3*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+16/21*a^2*sin(d*x+c)*(
a+a*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2830, 2726, 2725}

$$\int \cos(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{64a^3\sin(c+dx)}{21d\sqrt{a\cos(c+dx)+a}} + \frac{16a^2\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{21d} + \frac{2a\sin(c+dx)(a\cos(c+dx)+a)^{3/2}}{7d} + \frac{2\sin(c+dx)(a\cos(c+dx)+a)^{5/2}}{7d}$$

```
[In] Int[Cos[c + d*x]*(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (64*a^3*Sin[c + d*x])/(21*d*Sqrt[a + a*Cos[c + d*x]]) + (16*a^2*Sqrt[a + a*
Cos[c + d*x]]*Sin[c + d*x])/(21*d) + (2*a*(a + a*Cos[c + d*x])^(3/2)*Sin[c
+ d*x])/(7*d) + (2*(a + a*Cos[c + d*x])^(5/2)*Sin[c + d*x])/(7*d)
```

Rule 2725

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[-2*b*(Cos
[c + d*x]/(d*Sqrt[a + b*Sin[c + d*x]])), x] /; FreeQ[{a, b, c, d}, x] && Eq
Q[a^2 - b^2, 0]
```

Rule 2726

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos
[c + d*x]*((a + b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[a*((2*n - 1)/n),
Int[(a + b*Sin[c + d*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] && EqQ[a
^2 - b^2, 0] && IGtQ[n - 1/2, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{2(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{7d}+\frac{5}{7}\int(a+a\cos(c+dx))^{5/2}\,dx\\
&= \frac{2a(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{7d}+\frac{2(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{7d}\\
&\quad+\frac{1}{7}(8a)\int(a+a\cos(c+dx))^{3/2}\,dx\\
&= \frac{16a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{21d}+\frac{2a(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{7d}\\
&\quad+\frac{2(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{7d}+\frac{1}{21}\left(32a^2\right)\int\sqrt{a+a\cos(c+dx)}\,dx\\
&= \frac{64a^3\sin(c+dx)}{21d\sqrt{a+a\cos(c+dx)}}+\frac{16a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{21d}\\
&\quad+\frac{2a(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{7d}+\frac{2(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{7d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.72

$$\int \cos(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{a^2\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(315\sin\left(\frac{1}{2}(c+dx)\right)+77\sin\left(\frac{3}{2}(c+dx)\right)+3\left(7\sin\left(\frac{5}{2}\right.\right.\right.}{84d}$$

[In] Integrate[Cos[c + d*x]*(a + a*Cos[c + d*x])^(5/2),x]

[Out] (a^2*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(315*Sin[(c + d*x)/2] + 77*Sin[(3*(c + d*x))/2] + 3*(7*Sin[(5*(c + d*x))/2] + Sin[(7*(c + d*x))/2])))/(84*d)

Maple [A] (verified)

Time = 1.16 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.74

method	result	size
default	$\frac{8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)a^3\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\left(6\left(\cos^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+3\left(\cos^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+4\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\right)\sqrt{2}}{21\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$	86

[In] int(cos(d*x+c)*(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)

[Out] 8/21*cos(1/2*d*x+1/2*c)*a^3*sin(1/2*d*x+1/2*c)*(6*cos(1/2*d*x+1/2*c)^6+3*cos(1/2*d*x+1/2*c)^4+4*cos(1/2*d*x+1/2*c)^2+8)*2^(1/2)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.65

$$\int \cos(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{2\left(3a^2\cos(dx+c)^3+12a^2\cos(dx+c)^2+23a^2\cos(dx+c)+46a^2\right)\sqrt{a\cos(dx+c)+a}\,\sin}{21\left(d\cos(dx+c)+d\right)}$$

[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")

[Out] 2/21*(3*a^2*cos(d*x + c)^3 + 12*a^2*cos(d*x + c)^2 + 23*a^2*cos(d*x + c) + 46*a^2)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/(d*cos(d*x + c) + d)

Sympy [F(-1)]

Timed out.

$$\int \cos(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))**(5/2),x)
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.66

$$\int \cos(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{\left(3\sqrt{2}a^2\sin\left(\frac{7}{2}dx+\frac{7}{2}c\right)+21\sqrt{2}a^2\sin\left(\frac{5}{2}dx+\frac{5}{2}c\right)+77\sqrt{2}a^2\sin\left(\frac{3}{2}dx+\frac{3}{2}c\right)+315\sqrt{2}a^2\sin\left(\right.\right.}{84\,d}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] 1/84*(3*sqrt(2)*a^2*sin(7/2*d*x + 7/2*c) + 21*sqrt(2)*a^2*sin(5/2*d*x + 5/2
*c) + 77*sqrt(2)*a^2*sin(3/2*d*x + 3/2*c) + 315*sqrt(2)*a^2*sin(1/2*d*x + 1
/2*c))*sqrt(a)/d
```

Giac [A] (verification not implemented)

none

Time = 0.44 (sec) , antiderivative size = 108, normalized size of antiderivative = 0.93

$$\int \cos(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{\sqrt{2}\left(3\,a^2\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)\sin\left(\frac{7}{2}dx+\frac{7}{2}c\right)+21\,a^2\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)\sin\left(\frac{5}{2}dx+\frac{5}{2}c\right)+7\right.}{84\,d}$$

```
[In] integrate(cos(d*x+c)*(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] 1/84*sqrt(2)*(3*a^2*sgn(cos(1/2*d*x + 1/2*c))*sin(7/2*d*x + 7/2*c) + 21*a^2
*sgn(cos(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 77*a^2*sgn(cos(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c) + 315*a^2*sgn(cos(1/2*d*x + 1/2*c))*sin(1/2*d*
x + 1/2*c))*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int \cos(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \int \cos\left(c+d\,x\right)\,\left(a+a\,\cos\left(c+d\,x\right)\right)^{5/2}\,dx$$

```
[In] int(cos(c + d*x)*(a + a*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)*(a + a*cos(c + d*x))^(5/2), x)
```

3.115 $\int (a+a\cos(c+dx))^{5/2}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 89

$$\int (a+a\cos(c+dx))^{5/2}\,dx=\frac{64a^3\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}}+\frac{16a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{15d}+\frac{2a(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{5d}$$

```
[Out] 2/5*a*(a+a*cos(d*x+c))^(3/2)*sin(d*x+c)/d+64/15*a^3*sin(d*x+c)/d/(a+a*cos(d
*x+c))^(1/2)+16/15*a^2*sin(d*x+c)*(a+a*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2726, 2725}

$$\int (a+a\cos(c+dx))^{5/2}\,dx=\frac{64a^3\sin(c+dx)}{15d\sqrt{a\cos(c+dx)+a}}+\frac{16a^2\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{15d}+\frac{2a\sin(c+dx)(a\cos(c+dx)+a)^{3/2}}{5d}$$

```
[In] Int[(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (64*a^3*Sin[c + d*x])/(15*d*Sqrt[a + a*Cos[c + d*x]]) + (16*a^2*Sqrt[a + a*
Cos[c + d*x]]*Sin[c + d*x])/(15*d) + (2*a*(a + a*Cos[c + d*x])^(3/2)*Sin[c
+ d*x])/(5*d)
```

Rule 2725

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[-2*b*(Cos
[c + d*x]/(d*Sqrt[a + b*Sin[c + d*x]])), x] /; FreeQ[{a, b, c, d}, x] && Eq
```

```
Q[a^2 - b^2, 0]
```

Rule 2726

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos
[c + d*x]*((a + b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[a*((2*n - 1)/n),
Int[(a + b*Sin[c + d*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] && EqQ[a
^2 - b^2, 0] && IGtQ[n - 1/2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2a(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{5d}+\frac{1}{5}(8a)\int(a+a\cos(c+dx))^{3/2}\,dx\\
&= \frac{16a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{15d}+\frac{2a(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{5d}\\
&\quad+\frac{1}{15}\left(32a^2\right)\int\sqrt{a+a\cos(c+dx)}\,dx\\
&= \frac{64a^3\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}}+\frac{16a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{15d}\\
&\quad+\frac{2a(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{5d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.80

$$\int(a+a\cos(c+dx))^{5/2}\,dx=\frac{a^2\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(150\sin\left(\frac{1}{2}(c+dx)\right)+25\sin\left(\frac{3}{2}(c+dx)\right)+3\sin\left(\frac{5}{2}(c\right.\right.}{30d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(5/2),x]
[Out] (a^2*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(150*Sin[(c + d*x)/2] + 25
*Sin[(3*(c + d*x))/2] + 3*Sin[(5*(c + d*x))/2]))/(30*d)
```

Maple [A] (verified)

Time = 0.88 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.82

method	result	size
default	$\frac{8a^{3}\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\left(3\left(\cos^{4}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+4\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\right)\sqrt{2}}{15\sqrt{a\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$	73

```
[In] int((a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 8/15*a^3*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)*(3*cos(1/2*d*x+1/2*c)^4+4*co
s(1/2*d*x+1/2*c)^2+8)*2^(1/2)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 62, normalized size of antiderivative = 0.70

$$\int (a+a\cos(c+dx))^{5/2}\,dx = \frac{2\left(3\,a^{2}\cos\left(dx+c\right)^{2}+14\,a^{2}\cos\left(dx+c\right)+43\,a^{2}\right)\sqrt{a\cos\left(dx+c\right)+a}\sin\left(dx+c\right)}{15\left(d\cos\left(dx+c\right)+d\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 2/15*(3*a^2*cos(d*x + c)^2 + 14*a^2*cos(d*x + c) + 43*a^2)*sqrt(a*cos(d*x +
 c) + a)*sin(d*x + c)/(d*cos(d*x + c) + d)
```

Sympy [F]

$$\int (a+a\cos(c+dx))^{5/2}\,dx = \int \left(a\cos\left(c+dx\right)+a\right)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))**(5/2),x)
```

```
[Out] Integral((a*cos(c + d*x) + a)**(5/2), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.67

$$\int (a + a\cos(c + dx))^{5/2}\,dx = \frac{\left(3\sqrt{2}a^2\sin\left(\frac{5}{2}\,dx + \frac{5}{2}\,c\right) + 25\sqrt{2}a^2\sin\left(\frac{3}{2}\,dx + \frac{3}{2}\,c\right) + 150\sqrt{2}a^2\sin\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)\right)\sqrt{a}}{30\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] 1/30*(3*sqrt(2)*a^2*sin(5/2*d*x + 5/2*c) + 25*sqrt(2)*a^2*sin(3/2*d*x + 3/2
*c) + 150*sqrt(2)*a^2*sin(1/2*d*x + 1/2*c))*sqrt(a)/d
```

Giac [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.94

$$\int (a + a\cos(c + dx))^{5/2}\,dx = \frac{\sqrt{2}\left(3\,a^2\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)\right)\sin\left(\frac{5}{2}\,dx + \frac{5}{2}\,c\right) + 25\,a^2\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)\right)\sin\left(\frac{3}{2}\,dx + \frac{3}{2}\,c\right) + \right.}{30\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] 1/30*sqrt(2)*(3*a^2*sgn(cos(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 25*a^2
*sgn(cos(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c) + 150*a^2*sgn(cos(1/2*d*x +
 1/2*c))*sin(1/2*d*x + 1/2*c))*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^{5/2}\,dx = \int \left(a + a\,\cos\left(c + d\,x\right)\right)^{5/2}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(5/2),x)
[Out] int((a + a*cos(c + d*x))^(5/2), x)
```

3.116 $\int (a+a\cos(c+dx))^{5/2}\sec(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 98

$$\int (a+a\cos(c+dx))^{5/2}\sec(c+dx)\,dx=\frac{2a^{5/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}+\frac{14a^3\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d}$$

```
[Out] 2*a^(5/2)*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d+14/3*a^3*sin
(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+2/3*a^2*sin(d*x+c)*(a+a*cos(d*x+c))^(1/2)/
d
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2842, 3060, 2852, 212}

$$\int (a+a\cos(c+dx))^{5/2}\sec(c+dx)\,dx=\frac{2a^{5/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{d}+\frac{14a^3\sin(c+dx)}{3d\sqrt{a\cos(c+dx)+a}}+\frac{2a^2\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{3d}$$

```
[In] Int[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x],x]
```

```
[Out] (2*a^(5/2)*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/d + (1
4*a^3*Sin[c + d*x])/(3*d*Sqrt[a + a*Cos[c + d*x]]) + (2*a^2*Sqrt[a + a*Cos[
c + d*x]]*Sin[c + d*x])/(3*d)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2842

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
+ n)), Int[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^n*Simp[a*b*c*(
m - 2) + b^2*d*(n + 1) + a^2*d*(m + n) - b*(b*c*(m - 1) - a*d*(3*m + 2*n -
2))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c
- a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1] &&  !LtQ[n
, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] || (IntegerQ[m] && EqQ[c
, 0]))
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3060

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[-2*b*B*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(2*n + 3)*Sqrt[a +
b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*c - 2*a*d*(n + 1)))/(b
*d*(2*n + 3)), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
b^2, 0] && NeQ[c^2 - d^2, 0] &&  !LtQ[n, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d} \\
&\quad + \frac{2}{3}\int \sqrt{a+a\cos(c+dx)}\left(\frac{3a^2}{2}+\frac{7}{2}a^2\cos(c+dx)\right)\sec(c+dx)\,dx \\
&= \frac{14a^3\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d} \\
&\quad + a^2\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx
\end{aligned}$$

$$= \frac{14a^3\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d} - \frac{(2a^3)\operatorname{Subst}\left(\int \frac{1}{a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

$$= \frac{2a^{5/2}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} + \frac{14a^3\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d}$$

Mathematica [A] (verified)

Time = 0.28 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.91

$$\int (a+a\cos(c+dx))^{5/2}\sec(c+dx)\,dx = \frac{2a^2\sqrt{a(1+\cos(c+dx))}\left(3\operatorname{arctanh}\left(\sqrt{1-\cos(c+dx)}\right)+\sqrt{1-\cos(c+dx)}(8+\cos(c+dx))\right)\operatorname{ta}}{3d\sqrt{1-\cos(c+dx)}}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x],x]
[Out] (2*a^2*Sqrt[a*(1 + Cos[c + d*x])]*(3*ArcTanh[Sqrt[1 - Cos[c + d*x]]] + Sqrt
[1 - Cos[c + d*x]]*(8 + Cos[c + d*x]))*Tan[(c + d*x)/2])/(3*d*Sqrt[1 - Cos[
c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 245 vs. 2(84) = 168.

Time = 1.97 (sec) , antiderivative size = 246, normalized size of antiderivative = 2.51

method	result
default	$\frac{a^{\frac{3}{2}}\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-4\sqrt{2}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{a}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+18\sqrt{2}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{a}+3\ln\left(\frac{4\sqrt{2}\,a\cos\left(\frac{d}{2}\right.}{}\right.\right.}{3\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}}$

```
[In] int((a+cos(d*x+c)*a)^(5/2)*sec(d*x+c),x,method=_RETURNVERBOSE)
[Out] 1/3*a^(3/2)*cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-4*2^(1/2)*(
a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)*sin(1/2*d*x+1/2*c)^2+18*2^(1/2)*(a*si
n(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+3*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^
(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2
*a))*a+3*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)
-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a)/sin(1/2*d*x+1/2*c)
/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 147, normalized size of antiderivative = 1.50

$$\int (a + a\cos(c+dx))^{5/2}\sec(c+dx)\,dx = \frac{3\left(a^2\cos\left(dx+c\right)+a^2\right)\sqrt{a}\log\left(\frac{a\cos(dx+c)^3-7\,a\cos(dx+c)^2-4\,\sqrt{a\cos(dx+c)+a}\sqrt{a}(\cos(dx+c)-2)\sin(dx+c)+8\,a}{\cos(dx+c)^3+\cos(dx+c)^2}\right)+}{6\left(d\cos\left(dx+c\right)+d\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c),x, algorithm="fricas")
```

```
[Out] 1/6*(3*(a^2*cos(d*x + c) + a^2)*sqrt(a)*log((a*cos(d*x + c)^3 - 7*a*cos(d*x
 + c)^2 - 4*sqrt(a*cos(d*x + c) + a)*sqrt(a)*(cos(d*x + c) - 2)*sin(d*x + c
) + 8*a)/(cos(d*x + c)^3 + cos(d*x + c)^2)) + 4*(a^2*cos(d*x + c) + 8*a^2)*
sqrt(a*cos(d*x + c) + a)*sin(d*x + c))/(d*cos(d*x + c) + d)
```

Sympy [F(-1)]

Timed out.

$$\int (a + a\cos(c+dx))^{5/2}\sec(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(5/2)*sec(d*x+c),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (a + a\cos(c+dx))^{5/2}\sec(c+dx)\,dx = \int \left(a\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}\sec\left(dx+c\right)\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c),x, algorithm="maxima")
```

```
[Out] integrate((a*cos(d*x + c) + a)^(5/2)*sec(d*x + c), x)
```

Giac [A] (verification not implemented)

none

Time = 0.39 (sec) , antiderivative size = 120, normalized size of antiderivative = 1.22

$$\int (a+a\cos(c+dx))^{5/2}\sec(c+dx)\,dx =$$
$$-\frac{\sqrt{2}\left(8\,a^2\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+3\,\sqrt{2}a^2\log\left(\frac{\left|-2\,\sqrt{2}+4\,\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right|}{\left|2\,\sqrt{2}+4\,\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right|}\right)\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\cdots}{6\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c),x, algorithm="giac")
```

```
[Out] -1/6*sqrt(2)*(8*a^2*sgn(cos(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c)^3 + 3*sq
rt(2)*a^2*log(abs(-2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c))/abs(2*sqrt(2) + 4*si
n(1/2*d*x + 1/2*c)))*sgn(cos(1/2*d*x + 1/2*c)) - 36*a^2*sgn(cos(1/2*d*x + 1
/2*c))*sin(1/2*d*x + 1/2*c))*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{5/2}\sec(c+dx)\,dx=\int\frac{(a+a\,\cos\left(c+d\,x\right))^{5/2}}{\cos\left(c+d\,x\right)}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(5/2)/cos(c + d*x),x)
```

```
[Out] int((a + a*cos(c + d*x))^(5/2)/cos(c + d*x), x)
```

3.117 $\int (a+a\cos(c+dx))^{5/2}\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 92

$$\int (a+a\cos(c+dx))^{5/2}\sec^2(c+dx)\,dx=\frac{5a^{5/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}+\frac{a^3\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}+\frac{a^2\sqrt{a+a\cos(c+dx)}\tan(c+dx)}{d}$$

```
[Out] 5*a^(5/2)*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d+a^3*sin(d*x+
c)/d/(a+a*cos(d*x+c))^(1/2)+a^2*(a+a*cos(d*x+c))^(1/2)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2841, 3060, 2852, 212}

$$\int (a+a\cos(c+dx))^{5/2}\sec^2(c+dx)\,dx=\frac{5a^{5/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{d}+\frac{a^3\sin(c+dx)}{d\sqrt{a\cos(c+dx)+a}}+\frac{a^2\tan(c+dx)\sqrt{a\cos(c+dx)+a}}{d}$$

```
[In] Int[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^2,x]
```

```
[Out] (5*a^(5/2)*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/d + (a
^3*Sin[c + d*x])/(d*Sqrt[a + a*Cos[c + d*x]]) + (a^2*Sqrt[a + a*Cos[c + d*x
]]*Tan[c + d*x])/d
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3060

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[-2*b*B*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(2*n + 3)*Sqrt[a +
b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*c - 2*a*d*(n + 1)))/(b
*d*(2*n + 3)), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
b^2, 0] && NeQ[c^2 - d^2, 0] &&  !LtQ[n, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{a^2\sqrt{a+a\cos(c+dx)}\tan(c+dx)}{d} \\ &\quad -a\int\left(-\frac{5a}{2}-\frac{1}{2}a\cos(c+dx)\right)\sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx \\ &= \frac{a^3\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}+\frac{a^2\sqrt{a+a\cos(c+dx)}\tan(c+dx)}{d} \\ &\quad +\frac{1}{2}\left(5a^2\right)\int\sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx\end{aligned}$$

$$= \frac{a^3\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\sqrt{a+a\cos(c+dx)}\tan(c+dx)}{d} - \frac{(5a^3)\,\text{Subst}\left(\int \frac{1}{a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

$$= \frac{5a^{5/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} + \frac{a^3\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\sqrt{a+a\cos(c+dx)}\tan(c+dx)}{d}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 5.58 (sec) , antiderivative size = 217, normalized size of antiderivative = 2.36

$$\int (a+a\cos(c+dx))^{5/2}\sec^2(c+dx)\,dx = \frac{(a(1+\cos(c+dx)))^{5/2}\left(-\frac{35}{8}(2080+3131\cos(c+dx)+728\cos(2(c+dx))+61\cos(3(c+dx)))\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^2,x]
```

```
[Out] ((a*(1 + Cos[c + d*x]))^(5/2)*((-35*(2080 + 3131*Cos[c + d*x] + 728*Cos[2*(
c + d*x)] + 61*Cos[3*(c + d*x)])*Csc[(c + d*x)/2]^6)/8 + (105*ArcTanh[Sqrt[
1 - Cos[c + d*x]]]*(1767 + 1252*Cos[c + d*x] + 872*Cos[2*(c + d*x)] + 108*C
os[3*(c + d*x)] + Cos[4*(c + d*x)])*Csc[(c + d*x)/2]^6)/(16*Sqrt[1 - Cos[c
+ d*x]]) + 1024*Cos[(c + d*x)/2]^4*HypergeometricPFQ[{3/2, 2, 2, 2}, {1, 1,
 9/2}, 2*Sin[(c + d*x)/2]^2])*Sec[(c + d*x)/2]^2*Tan[(c + d*x)/2]^3)/(6720*
d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 431 vs. 2(82) = 164.

Time = 6.56 (sec) , antiderivative size = 432, normalized size of antiderivative = 4.70

method	result
default	$\frac{a^{\frac{3}{2}}\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-8\sqrt{2}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{a}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-10\ln\left(-\frac{4\left(\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-\sqrt{2}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\right.\right.}\right.}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-\sqrt{2}}\right.\right.}{}$

```
[In] int((a+cos(d*x+c)*a)^(5/2)*sec(d*x+c)^2,x,method=_RETURNVERBOSE)
```

```
[Out] a^(3/2)*cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-8*2^(1/2)*(a*si
n(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)*sin(1/2*d*x+1/2*c)^2-10*ln(-4/(2*cos(1/2*
d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/
2*c)^2)^(1/2)*a^(1/2)-2*a))*sin(1/2*d*x+1/2*c)^2*a-10*ln(4/(2*cos(1/2*d*x+1
/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^
2)^(1/2)*a^(1/2)+2*a))*sin(1/2*d*x+1/2*c)^2*a+6*2^(1/2)*(a*sin(1/2*d*x+1/2*
c)^2)^(1/2)*a^(1/2)+5*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1
/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a+5*ln(4
/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*si
n(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*a)/(2*cos(1/2*d*x+1/2*c)-2^(1/2))/(
2*cos(1/2*d*x+1/2*c)+2^(1/2))/sin(1/2*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(
1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 164, normalized size of antiderivative = 1.78

$$\int (a+a\cos(c+dx))^{5/2}\sec^2(c+dx)\,dx = \frac{5\left(a^2\cos\left(dx+c\right)^2+a^2\cos\left(dx+c\right)\right)\sqrt{a}\log\left(\frac{a\cos(dx+c)^3-7\,a\cos(dx+c)^2-4\,\sqrt{a\cos(dx+c)+a}\sqrt{a}(\cos(dx+c)-2)\sin(\cdots}{\cos(dx+c)^3+\cos(dx+c)^2}\cdots\right.}{4\left(d\cos\left(dx+c\right)^2+d\cos\left(dx+\cdots\right.\right.}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] 1/4*(5*(a^2*cos(d*x + c)^2 + a^2*cos(d*x + c))*sqrt(a)*log((a*cos(d*x + c)^
3 - 7*a*cos(d*x + c)^2 - 4*sqrt(a*cos(d*x + c) + a)*sqrt(a)*(cos(d*x + c) -
 2)*sin(d*x + c) + 8*a)/(cos(d*x + c)^3 + cos(d*x + c)^2)) + 4*(2*a^2*cos(d
*x + c) + a^2)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c))/(d*cos(d*x + c)^2 + d
*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{5/2}\sec^2(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(5/2)*sec(d*x+c)**2,x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 10847 vs. $2(82) = 164$.

Time = 0.67 (sec) , antiderivative size = 10847, normalized size of antiderivative = 117.90

$$\int (a + a\cos(c + dx))^{5/2} \sec^2(c + dx)\, dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^2,x, algorithm="maxima")
[Out] -1/252*(1449*sqrt(2)*a^2*cos(5/2*d*x + 5/2*c)^3*sin(2*d*x + 2*c) - 63*(sqrt
(2)*a^2*cos(2*d*x + 2*c)^2 + sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 25*sqrt(2)*a^
2*cos(2*d*x + 2*c) + 24*sqrt(2)*a^2)*sin(5/2*d*x + 5/2*c)^3 - 252*sqrt(2)*a
^2*sin(1/2*d*x + 1/2*c) + 21*(5*(5*sqrt(2)*a^2*sin(3/2*d*x + 3/2*c) + 12*sq
rt(2)*a^2*sin(1/2*d*x + 1/2*c) - 3*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2) + 3*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
 - 3*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*a^2*log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(2*d*x + 2*c)^2 - 15*a^2*
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 15*a^2*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
- 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*a^2*log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) + 15*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) + 5*(5*sqrt(2)*a^2*sin(3/2*d*x + 3/2*c) + 12*sqrt(2)*a^2*sin(1/2*
d*x + 1/2*c) - 3*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) +
3*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*a^2*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*a^2*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2))*sin(2*d*x + 2*c)^2 + 5*(5*sqrt(2)*a^2*sin(3/2*
d*x + 3/2*c) + 12*sqrt(2)*a^2*sin(1/2*d*x + 1/2*c) - 6*a^2*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 6*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) - 6*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
 + 2) + 6*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*s
```

qrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(2*d*
x + 2*c) + (25*sqrt(2)*a^2*cos(3/2*d*x + 3/2*c) + 198*sqrt(2)*a^2*cos(1/2*d
*x + 1/2*c))*sin(2*d*x + 2*c))*cos(5/2*d*x + 5/2*c)^2 + 21*(60*sqrt(2)*a^2*
sin(1/2*d*x + 1/2*c)^3 - 15*(a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) - a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + a^2*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - a^2*log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*
sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(1/2*d*x + 1/2*c)^2 - 15*(a^2*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - a^2*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) + a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) - a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 -
2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(1
/2*d*x + 1/2*c)^2 + 25*(sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*a^2*si
n(1/2*d*x + 1/2*c)^2)*sin(3/2*d*x + 3/2*c) + 12*(5*sqrt(2)*a^2*cos(1/2*d*x
+ 1/2*c)^2 - sqrt(2)*a^2)*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c)^2 - 315*(a
^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - a^2*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
- 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + a^2*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) - a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2))*cos(1/2*d*x + 1/2*c)^2 + 21*(69*sqrt(2)*a^2*cos(5/2*d*x + 5/2*c)*sin(2
*d*x + 2*c) - 144*sqrt(2)*a^2*sin(1/2*d*x + 1/2*c) + (25*sqrt(2)*a^2*sin(3/
2*d*x + 3/2*c) + 54*sqrt(2)*a^2*sin(1/2*d*x + 1/2*c) - 15*a^2*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 15*a^2*log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) - 15*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) + 15*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*co
s(2*d*x + 2*c)^2 - 15*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) + 15*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*a^2*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 15*a^2*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -

2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + (25*sqrt(2)*a^2*sin(3/2*d*x + 3/2*c)
+ 54*sqrt(2)*a^2*sin(1/2*d*x + 1/2*c) - 15*a^2*log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) + 15*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) - 15*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
- 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 15
*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(2*d*x + 2*c)^
2 + 5*(5*sqrt(2)*a^2*sin(3/2*d*x + 3/2*c) - 18*sqrt(2)*a^2*sin(1/2*d*x + 1/
2*c) - 6*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sq
rt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 6*a^2*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 6*a^2*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 6*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2))*cos(2*d*x + 2*c) + 5*(5*sqrt(2)*a^2*cos(3/2*d*x + 3/2*
c) + 12*sqrt(2)*a^2*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c))*sin(5/2*d*x + 5
/2*c)^2 + 21*(60*sqrt(2)*a^2*sin(1/2*d*x + 1/2*c)^3 - 15*(a^2*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - a^2*log(2*cos(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) + a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) - a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(1/2*d*x
 + 1/2*c)^2 - 15*(a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
 a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + a^2*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - a^2*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2))*sin(1/2*d*x + 1/2*c)^2 + 25*(sqrt(2)*a^2*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*a^2*sin(1/2*d*x + 1/2*c)^2)*sin(3/2*d*x + 3/2*c) + 1
2*(5*sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 - sqrt(2)*a^2)*sin(1/2*d*x + 1/2*c)
)*sin(2*d*x + 2*c)^2 - 315*(a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) - a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + a^2*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - a^2*log(2*cos(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(1/2*d*x + 1/2*c)^2 - 35*(sqrt(2)*a^2*

```
cos(5/2*d*x + 5/2*c)^2*sin(2*d*x + 2*c) + 2*sqrt(2)*a^2*cos(5/2*d*x + 5/2*c
)*cos(1/2*d*x + 1/2*c)*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(5/2*d*x + 5/2*c)^
2*sin(2*d*x + 2*c) + 2*sqrt(2)*a^2*sin(5/2*d*x + 5/2*c)*sin(2*d*x + 2*c)*si
n(1/2*d*x + 1/2*c) + (sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*a^2*sin(
1/2*d*x + 1/2*c)^2)*sin(2*d*x + 2*c))*cos(13/2*d*x + 13/2*c) - 135*(sqrt(2)
*a^2*cos(5/2*d*x + 5/2*c)^2*sin(2*d*x + 2*c) + 2*sqrt(2)*a^2*cos(5/2*d*x +
5/2*c)*cos(1/2*d*x + 1/2*c)*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(5/2*d*x + 5/
2*c)^2*sin(2*d*x + 2*c) + 2*sqrt(2)*a^2*sin(5/2*d*x + 5/2*c)*sin(2*d*x + 2*
c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*a^2
*sin(1/2*d*x + 1/2*c)^2)*sin(2*d*x + 2*c))*cos(11/2*d*x + 11/2*c) - 98*(sqr
t(2)*a^2*cos(5/2*d*x + 5/2*c)^2*sin(2*d*x + 2*c) + 2*sqrt(2)*a^2*cos(5/2*d*
x + 5/2*c)*cos(1/2*d*x + 1/2*c)*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(5/2*d*x
+ 5/2*c)^2*sin(2*d*x + 2*c) + 2*sqrt(2)*a^2*sin(5/2*d*x + 5/2*c)*sin(2*d*x
+ 2*c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*a^2*sin(1/2*d*x + 1/2*c)^2)*sin(2*d*x + 2*c))*cos(9/2*d*x + 9/2*c) + 390*(
sqrt(2)*a^2*cos(5/2*d*x + 5/2*c)^2*sin(2*d*x + 2*c) + 2*sqrt(2)*a^2*cos(5/2
*d*x + 5/2*c)*cos(1/2*d*x + 1/2*c)*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(5/2*d
*x + 5/2*c)^2*sin(2*d*x + 2*c) + 2*sqrt(2)*a^2*sin(5/2*d*x + 5/2*c)*sin(2*d
*x + 2*c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*a^2*sin(1/2*d*x + 1/2*c)^2)*sin(2*d*x + 2*c))*cos(7/2*d*x + 7/2*c) + 21
*(10*(5*sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)*sin(3/2*d*x + 3/2*c) + 12*sqrt(2)*
a^2*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(a^2*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) - a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x
 + 1/2*c) + 2) + a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(1/2*d*x + 1/2*
c))*cos(2*d*x + 2*c)^2 + 10*(5*sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)*sin(3/2*d*x
 + 3/2*c) + 12*sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(a
^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - a^2*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
- 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + a^2*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) - a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2))*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c)^2 + 10*(5*sqrt(2)*a^2*cos(1/2*d
*x + 1/2*c)*sin(3/2*d*x + 3/2*c) + 12*sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)*sin(
1/2*d*x + 1/2*c) - 6*(a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) - a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + a^2*log(2*co
s(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1
```

```
/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - a^2*log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)
*sin(1/2*d*x + 1/2*c) + 2))*cos(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) - 30*(a^
2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - a^2*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) - a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2))*cos(1/2*d*x + 1/2*c) + (50*sqrt(2)*a^2*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x
 + 1/2*c) + 189*sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 + 69*sqrt(2)*a^2*sin(1/2
*d*x + 1/2*c)^2)*sin(2*d*x + 2*c))*cos(5/2*d*x + 5/2*c) + 21*(60*sqrt(2)*a^
2*sin(1/2*d*x + 1/2*c)^3 - 30*(a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) - a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + a^2
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - a^2*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(1/2*d*x + 1/2*c)^2 - 30*(a^2*log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - a^2*log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) + a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
 1/2*c) + 2) - a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
- 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin
(1/2*d*x + 1/2*c)^2 + 25*(sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*a^2*
sin(1/2*d*x + 1/2*c)^2)*sin(3/2*d*x + 3/2*c) + 12*(5*sqrt(2)*a^2*cos(1/2*d*
x + 1/2*c)^2 - 2*sqrt(2)*a^2)*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 35*(
sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*a^2*sin(1/2*d*x + 1/2*c)^2 + (
sqrt(2)*a^2*cos(2*d*x + 2*c) + sqrt(2)*a^2)*cos(5/2*d*x + 5/2*c)^2 + (sqrt(
2)*a^2*cos(2*d*x + 2*c) + sqrt(2)*a^2)*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*
a^2*cos(2*d*x + 2*c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*a^2*cos(1/2*d*x + 1/2*c
))*cos(5/2*d*x + 5/2*c) + (sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*a^2
*sin(1/2*d*x + 1/2*c)^2)*cos(2*d*x + 2*c) + 2*(sqrt(2)*a^2*cos(2*d*x + 2*c)
*sin(1/2*d*x + 1/2*c) + sqrt(2)*a^2*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2
*c))*sin(13/2*d*x + 13/2*c) + 135*(sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*a^2*sin(1/2*d*x + 1/2*c)^2 + (sqrt(2)*a^2*cos(2*d*x + 2*c) + sqrt(2)*a
^2)*cos(5/2*d*x + 5/2*c)^2 + (sqrt(2)*a^2*cos(2*d*x + 2*c) + sqrt(2)*a^2)*s
in(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*a^2*cos(2*d*x + 2*c)*cos(1/2*d*x + 1/2*c
) + sqrt(2)*a^2*cos(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c) + (sqrt(2)*a^2*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*a^2*sin(1/2*d*x + 1/2*c)^2)*cos(2*d*x + 2*c
) + 2*(sqrt(2)*a^2*cos(2*d*x + 2*c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*a^2*sin(
```

1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c))*sin(11/2*d*x + 11/2*c) + 7*(9*sqrt(
2)*a^2*cos(1/2*d*x + 1/2*c)^2 + 9*sqrt(2)*a^2*sin(1/2*d*x + 1/2*c)^2 - (5*s
qrt(2)*a^2*cos(2*d*x + 2*c)^2 + 5*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 - 4*sqrt(2
)*a^2*cos(2*d*x + 2*c) - 9*sqrt(2)*a^2)*cos(5/2*d*x + 5/2*c)^2 - 5*(sqrt(2)
*a^2*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*a^2*sin(1/2*d*x + 1/2*c)^2)*cos(2*d*x
 + 2*c)^2 - (5*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 5*sqrt(2)*a^2*sin(2*d*x + 2
*c)^2 - 4*sqrt(2)*a^2*cos(2*d*x + 2*c) - 9*sqrt(2)*a^2)*sin(5/2*d*x + 5/2*c
)^2 - 5*(sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*a^2*sin(1/2*d*x + 1/2
*c)^2)*sin(2*d*x + 2*c)^2 - 2*(5*sqrt(2)*a^2*cos(2*d*x + 2*c)^2*cos(1/2*d*x
 + 1/2*c) + 5*sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)*sin(2*d*x + 2*c)^2 - 4*sqrt(
2)*a^2*cos(2*d*x + 2*c)*cos(1/2*d*x + 1/2*c) - 9*sqrt(2)*a^2*cos(1/2*d*x +
1/2*c))*cos(5/2*d*x + 5/2*c) + 4*(sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*a^2*sin(1/2*d*x + 1/2*c)^2)*cos(2*d*x + 2*c) - 2*(5*sqrt(2)*a^2*cos(2*d
*x + 2*c)^2*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*a^2*sin(2*d*x + 2*c)^2*sin(1/2
*d*x + 1/2*c) - 4*sqrt(2)*a^2*cos(2*d*x + 2*c)*sin(1/2*d*x + 1/2*c) - 9*sqr
t(2)*a^2*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c))*sin(9/2*d*x + 9/2*c) -
 15*(35*sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 + 35*sqrt(2)*a^2*sin(1/2*d*x + 1
/2*c)^2 + (9*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*a^2*sin(2*d*x + 2*c
)^2 + 44*sqrt(2)*a^2*cos(2*d*x + 2*c) + 35*sqrt(2)*a^2)*cos(5/2*d*x + 5/2*c
)^2 + 9*(sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*a^2*sin(1/2*d*x + 1/2
*c)^2)*cos(2*d*x + 2*c)^2 + (9*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*a
^2*sin(2*d*x + 2*c)^2 + 44*sqrt(2)*a^2*cos(2*d*x + 2*c) + 35*sqrt(2)*a^2)*s
in(5/2*d*x + 5/2*c)^2 + 9*(sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*a^2
*sin(1/2*d*x + 1/2*c)^2)*sin(2*d*x + 2*c)^2 + 2*(9*sqrt(2)*a^2*cos(2*d*x +
2*c)^2*cos(1/2*d*x + 1/2*c) + 9*sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)*sin(2*d*x
+ 2*c)^2 + 44*sqrt(2)*a^2*cos(2*d*x + 2*c)*cos(1/2*d*x + 1/2*c) + 35*sqrt(2
)*a^2*cos(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c) + 44*(sqrt(2)*a^2*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*a^2*sin(1/2*d*x + 1/2*c)^2)*cos(2*d*x + 2*c) + 2*(
9*sqrt(2)*a^2*cos(2*d*x + 2*c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*a^2*sin(2
*d*x + 2*c)^2*sin(1/2*d*x + 1/2*c) + 44*sqrt(2)*a^2*cos(2*d*x + 2*c)*sin(1/
2*d*x + 1/2*c) + 35*sqrt(2)*a^2*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c))
*sin(7/2*d*x + 7/2*c) - 21*(72*sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 + 72*sqrt
(2)*a^2*sin(1/2*d*x + 1/2*c)^2 + 3*(sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + sqrt(2
)*a^2*sin(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(2*d*x + 2*c) + 24*sqrt(2)*a^2
)*cos(5/2*d*x + 5/2*c)^2 + (3*sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 - 50*sqrt(
2)*a^2*sin(3/2*d*x + 3/2*c)*sin(1/2*d*x + 1/2*c) - 117*sqrt(2)*a^2*sin(1/2*
d*x + 1/2*c)^2 + 12*sqrt(2)*a^2 + 30*(a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) + a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - a^2*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(1/2*d*x + 1/2*c))*cos(2*d*x
 + 2*c)^2 + (3*sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 - 50*sqrt(2)*a^2*sin(3/2*

```
d*x + 3/2*c)*sin(1/2*d*x + 1/2*c) - 117*sqrt(2)*a^2*sin(1/2*d*x + 1/2*c)^2
+ 12*sqrt(2)*a^2 + 30*(a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) - a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + a^2*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - a^2*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2))*sin(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c)^2 + 12*
sqrt(2)*a^2 + 6*(sqrt(2)*a^2*cos(2*d*x + 2*c)^2*cos(1/2*d*x + 1/2*c) + sqrt
(2)*a^2*cos(1/2*d*x + 1/2*c)*sin(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(2*d*x
+ 2*c)*cos(1/2*d*x + 1/2*c) - 23*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(1/2*d*x +
 1/2*c) + 24*sqrt(2)*a^2*cos(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c) + (75*s
qrt(2)*a^2*cos(1/2*d*x + 1/2*c)^2 - 50*sqrt(2)*a^2*sin(3/2*d*x + 3/2*c)*sin
(1/2*d*x + 1/2*c) - 45*sqrt(2)*a^2*sin(1/2*d*x + 1/2*c)^2 + 24*sqrt(2)*a^2
+ 60*(a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - a^2*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + a^2*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) - a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2))*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) - 10*(5*sqrt(2)*a^2*cos(
3/2*d*x + 3/2*c)*sin(1/2*d*x + 1/2*c) + 12*sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)
*sin(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 30*(a^2*log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)
*sin(1/2*d*x + 1/2*c) + 2) - a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) + a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - a^2*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(1/2*d*x + 1/2*c))*s
in(5/2*d*x + 5/2*c) + 105*(12*sqrt(2)*a^2*cos(1/2*d*x + 1/2*c)^3 + 12*sqrt(
2)*a^2*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c)^2 + 5*(sqrt(2)*a^2*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*a^2*sin(1/2*d*x + 1/2*c)^2)*cos(3/2*d*x + 3/2*c))
*sin(2*d*x + 2*c))*sqrt(a)/(((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*c
os(2*d*x + 2*c) + 1)*cos(5/2*d*x + 5/2*c)^2 + (cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2)*cos(2*d*x + 2*c)^2 + (cos(2*d*x + 2*c)^2 + sin(2*d*x +
 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(5/2*d*x + 5/2*c)^2 + (cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2)*sin(2*d*x + 2*c)^2 + 2*(cos(2*d*x + 2*c)^
2*cos(1/2*d*x + 1/2*c) + cos(1/2*d*x + 1/2*c)*sin(2*d*x + 2*c)^2 + 2*cos(2*
d*x + 2*c)*cos(1/2*d*x + 1/2*c) + cos(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c
) + 2*(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2)*cos(2*d*x + 2*c) +
cos(1/2*d*x + 1/2*c)^2 + 2*(cos(2*d*x + 2*c)^2*sin(1/2*d*x + 1/2*c) + sin(2
*d*x + 2*c)^2*sin(1/2*d*x + 1/2*c) + 2*cos(2*d*x + 2*c)*sin(1/2*d*x + 1/2*c
```

```
) + sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + sin(1/2*d*x + 1/2*c)^2)*d)
```

Giac [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.47

$$\int (a+a\cos(c+dx))^{5/2}\sec^2(c+dx)\,dx = -\frac{\sqrt{2}\left(5\sqrt{2}a^2\log\left(\frac{\left|-2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}{\left|2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}\right)\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)-8a^2\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)+\right.}{4d}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^2,x, algorithm="giac")
[Out] -1/4*sqrt(2)*(5*sqrt(2)*a^2*log(abs(-2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c))/ab
s(2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c)))*sgn(cos(1/2*d*x + 1/2*c)) - 8*a^2*sg
n(cos(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c) + 4*a^2*sgn(cos(1/2*d*x + 1/2*
c))*sin(1/2*d*x + 1/2*c)/(2*sin(1/2*d*x + 1/2*c)^2 - 1))*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{5/2}\sec^2(c+dx)\,dx = \int \frac{(a+a\,\cos(c+d\,x))^{5/2}}{\cos(c+d\,x)^2}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(5/2)/cos(c + d*x)^2,x)
[Out] int((a + a*cos(c + d*x))^(5/2)/cos(c + d*x)^2, x)
```

3.118 $\int (a+a\cos(c+dx))^{5/2}\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 106

$$\int (a+a\cos(c+dx))^{5/2}\sec^3(c+dx)\,dx = \frac{19a^{5/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d} + \frac{9a^3\tan(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\sqrt{a+a\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d}$$

```
[Out] 19/4*a^(5/2)*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d+9/4*a^3*t
an(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+1/2*a^2*sec(d*x+c)*(a+a*cos(d*x+c))^(1/2
)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2841, 3059, 2852, 212}

$$\int (a+a\cos(c+dx))^{5/2}\sec^3(c+dx)\,dx = \frac{19a^{5/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{4d} + \frac{9a^3\tan(c+dx)}{4d\sqrt{a\cos(c+dx)+a}} + \frac{a^2\tan(c+dx)\sec(c+dx)\sqrt{a\cos(c+dx)+a}}{2d}$$

```
[In] Int[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^3,x]
```

```
[Out] (19*a^(5/2)*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(4*d)
 + (9*a^3*Tan[c + d*x])/(4*d*Sqrt[a + a*Cos[c + d*x]]) + (a^2*Sqrt[a + a*Co
s[c + d*x]]*Sec[c + d*x]*Tan[c + d*x])/(2*d)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3059

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[(-b^2)*(B*c - A*d)*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)
*(b*c + a*d)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*
c - 2*a*d*(n + 1)))/(2*d*(n + 1)*(b*c + a*d)), Int[Sqrt[a + b*Sin[e + f*x]]
*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{a^2\sqrt{a+a\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} \\ &\quad -\frac{1}{2}a\int\left(-\frac{9a}{2}-\frac{5}{2}a\cos(c+dx)\right)\sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\,dx \\ &= \frac{9a^3\tan(c+dx)}{4d\sqrt{a+a\cos(c+dx)}}+\frac{a^2\sqrt{a+a\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} \\ &\quad +\frac{1}{8}\left(19a^2\right)\int\sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx\end{aligned}$$

$$= \frac{9a^3 \tan(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\sqrt{a+a\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} - \frac{(19a^3)\,\text{Subst}\left(\int \frac{1}{a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d}$$

$$= \frac{19a^{5/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d} + \frac{9a^3\tan(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\sqrt{a+a\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.37 (sec) , antiderivative size = 267, normalized size of antiderivative = 2.52

$$\int (a+a\cos(c+dx))^{5/2}\sec^3(c+dx)\,dx = -\frac{a^2\sqrt{a(1+\cos(c+dx))}\sec^5\left(\frac{1}{2}(c+dx)\right)\left(19\sqrt{2}\log\left(i-\sqrt{2}e^{\frac{1}{2}i(c+dx)}-ie^{i(c+dx)}\right)+19\sqrt{2}\cos(2(c+dx))\left(\right.\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^3,x]
```

```
[Out] -1/32*(a^2*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]^5*(19*Sqrt[2]*Log[I
- Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))] + 19*Sqrt[2]*Cos[2*(c +
d*x)]*(Log[I - Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))] - Log[I + S
qrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))]) - 19*Sqrt[2]*Log[I + Sqrt[
2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))] + 28*Sin[(c + d*x)/2] - 44*Sin[
(3*(c + d*x))/2]))/(d*(-1 + Tan[(c + d*x)/2]^2)^2)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 550 vs. 2(90) = 180.

Time = 27.53 (sec) , antiderivative size = 551, normalized size of antiderivative = 5.20

method	result
default	$\frac{a^{\frac{3}{2}}\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(76a\left(\ln\left(\frac{4\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+4\sqrt{2}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{a}+8a}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{2}}\right)+\ln\left(-\frac{4\left(\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-\sqrt{2}\sqrt{a\left(\right.}\right.}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right.}\right.\right.\right.}{}$

```
[In] int((a+cos(d*x+c)*a)^(5/2)*sec(d*x+c)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*a^(3/2)*cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(76*a*(ln(4/(
2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(
1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))+ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*
(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2
)-2*a)))*sin(1/2*d*x+1/2*c)^4+(-44*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a
^(1/2)-76*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)
+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*a-76*ln(-4/(2*cos(1/2
*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1
/2*c)^2)^(1/2)*a^(1/2)-2*a))*a)*sin(1/2*d*x+1/2*c)^2+26*2^(1/2)*(a*sin(1/2*
d*x+1/2*c)^2)^(1/2)*a^(1/2)+19*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)
*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*
a+19*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(
1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a)/(2*cos(1/2*d*x+1/2*c)+
2^(1/2))^2/(2*cos(1/2*d*x+1/2*c)-2^(1/2))^2/sin(1/2*d*x+1/2*c)/(a*cos(1/2*d
*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.60

$$\int (a+a\cos(c+dx))^{5/2}\sec^3(c+dx)\,dx = \frac{19\left(a^2\cos(dx+c)^3+a^2\cos(dx+c)^2\right)\sqrt{a}\log\left(\frac{a\cos(dx+c)^3-7\,a\cos(dx+c)^2-4\,\sqrt{a\cos(dx+c)+a}\sqrt{a}(\cos(dx+c)-2)\sin(dx+c)+8\,a}{\cos(dx+c)^3+\cos(dx+c)^2}\right)+4\,(11\,a^2\cos(dx+c)+2\,a^2)\sqrt{a\cos(dx+c)+a}\sin(dx+c)}{16\left(d\cos(dx+c)^3+d\cos(dx+c)^2\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] 1/16*(19*(a^2*cos(d*x + c)^3 + a^2*cos(d*x + c)^2)*sqrt(a)*log((a*cos(d*x +
 c)^3 - 7*a*cos(d*x + c)^2 - 4*sqrt(a*cos(d*x + c) + a)*sqrt(a)*(cos(d*x +
c) - 2)*sin(d*x + c) + 8*a)/(cos(d*x + c)^3 + cos(d*x + c)^2)) + 4*(11*a^2*
cos(d*x + c) + 2*a^2)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c))/(d*cos(d*x + c
)^3 + d*cos(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{5/2}\sec^3(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(5/2)*sec(d*x+c)**3,x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 3667 vs. 2(90) = 180.

Time = 3.25 (sec) , antiderivative size = 3667, normalized size of antiderivative = 34.59

$$\int (a + a\cos(c + dx))^{5/2} \sec^3(c + dx)\, dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] -1/16*(150*sqrt(2)*a^2*cos(7/2*d*x + 7/2*c)*sin(2*d*x + 2*c) + 154*sqrt(2)*
a^2*cos(5/2*d*x + 5/2*c)*sin(2*d*x + 2*c) - 28*sqrt(2)*a^2*sin(3/2*d*x + 3/
2*c) + 44*sqrt(2)*a^2*sin(1/2*d*x + 1/2*c) - (3*sqrt(2)*a^2*sin(7/2*d*x + 7
/2*c) + 5*sqrt(2)*a^2*sin(5/2*d*x + 5/2*c) - 17*sqrt(2)*a^2*sin(3/2*d*x + 3
/2*c) - 55*sqrt(2)*a^2*sin(1/2*d*x + 1/2*c) + 19*a^2*log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) - 19*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2) + 19*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) - 19*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(4*d*x +
 4*c)^2 + 4*(17*sqrt(2)*a^2*sin(3/2*d*x + 3/2*c) + 55*sqrt(2)*a^2*sin(1/2*d
*x + 1/2*c) - 19*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) +
19*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 19*a^2*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 19*a^2*log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(2*d*x + 2*c)^2 - 19*a^2*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 19*a^2*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) - 19*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) + 19*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 -
 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - (3*
sqrt(2)*a^2*sin(7/2*d*x + 7/2*c) + 5*sqrt(2)*a^2*sin(5/2*d*x + 5/2*c) - 17*
sqrt(2)*a^2*sin(3/2*d*x + 3/2*c) - 55*sqrt(2)*a^2*sin(1/2*d*x + 1/2*c) + 19
*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 19*a^2*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 19*a^2*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(
```

2)*sin(1/2*d*x + 1/2*c) + 2) - 19*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x
 + 1/2*c) + 2))*sin(4*d*x + 4*c)^2 + 4*(17*sqrt(2)*a^2*sin(3/2*d*x + 3/2*c)
 + 55*sqrt(2)*a^2*sin(1/2*d*x + 1/2*c) - 19*a^2*log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) + 19*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) - 19*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 1
9*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(2*d*x + 2*c)
^2 - 3*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c))*cos(
15/2*d*x + 15/2*c) - 5*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(2*
d*x + 2*c))*cos(13/2*d*x + 13/2*c) + 11*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*s
qrt(2)*a^2*sin(2*d*x + 2*c))*cos(11/2*d*x + 11/2*c) + 45*(sqrt(2)*a^2*sin(4
*d*x + 4*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c))*cos(9/2*d*x + 9/2*c) - (11*sq
rt(2)*a^2*sin(3/2*d*x + 3/2*c) - 99*sqrt(2)*a^2*sin(1/2*d*x + 1/2*c) + 38*a
^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 38*a^2*log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*
c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 38*a^2*log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)
*sin(1/2*d*x + 1/2*c) + 2) - 38*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x +
 1/2*c) + 2) - 4*(17*sqrt(2)*a^2*sin(3/2*d*x + 3/2*c) + 55*sqrt(2)*a^2*sin(
1/2*d*x + 1/2*c) - 19*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) + 19*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 19*a^2*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 19*a^2*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(2*d*x + 2*c) + 3*(4*sqrt(2)*a^2*co
s(2*d*x + 2*c) + 27*sqrt(2)*a^2)*sin(7/2*d*x + 7/2*c) + (20*sqrt(2)*a^2*cos
(2*d*x + 2*c) + 87*sqrt(2)*a^2)*sin(5/2*d*x + 5/2*c))*cos(4*d*x + 4*c) - 2*
(11*sqrt(2)*a^2*sin(3/2*d*x + 3/2*c) - 99*sqrt(2)*a^2*sin(1/2*d*x + 1/2*c)
+ 38*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 38*a^2*log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 38*a^2*log(2*cos(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 38*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2))*cos(2*d*x + 2*c) + 3*(sqrt(2)*a^2*cos(4*d*x + 4*c) + 2*
sqrt(2)*a^2*cos(2*d*x + 2*c) + sqrt(2)*a^2)*sin(15/2*d*x + 15/2*c) + 5*(sqr

```
t(2)*a^2*cos(4*d*x + 4*c) + 2*sqrt(2)*a^2*cos(2*d*x + 2*c) + sqrt(2)*a^2)*s
in(13/2*d*x + 13/2*c) - 11*(sqrt(2)*a^2*cos(4*d*x + 4*c) + 2*sqrt(2)*a^2*co
s(2*d*x + 2*c) + sqrt(2)*a^2)*sin(11/2*d*x + 11/2*c) - 45*(sqrt(2)*a^2*cos(
4*d*x + 4*c) + 2*sqrt(2)*a^2*cos(2*d*x + 2*c) + sqrt(2)*a^2)*sin(9/2*d*x +
9/2*c) - (12*sqrt(2)*a^2*sin(7/2*d*x + 7/2*c)*sin(2*d*x + 2*c) + 20*sqrt(2)
*a^2*sin(5/2*d*x + 5/2*c)*sin(2*d*x + 2*c) - 75*sqrt(2)*a^2*cos(7/2*d*x + 7
/2*c) - 77*sqrt(2)*a^2*cos(5/2*d*x + 5/2*c) - 45*sqrt(2)*a^2*cos(3/2*d*x +
3/2*c) - 11*sqrt(2)*a^2*cos(1/2*d*x + 1/2*c) - 4*(17*sqrt(2)*a^2*sin(3/2*d*
x + 3/2*c) + 55*sqrt(2)*a^2*sin(1/2*d*x + 1/2*c) - 19*a^2*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 19*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) - 19*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c
) + 2) + 19*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(2*
d*x + 2*c))*sin(4*d*x + 4*c) - 6*(2*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 2*sqrt
(2)*a^2*sin(2*d*x + 2*c)^2 + 27*sqrt(2)*a^2*cos(2*d*x + 2*c) + 13*sqrt(2)*a
^2)*sin(7/2*d*x + 7/2*c) - 2*(10*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 10*sqrt(2
)*a^2*sin(2*d*x + 2*c)^2 + 87*sqrt(2)*a^2*cos(2*d*x + 2*c) + 41*sqrt(2)*a^2
)*sin(5/2*d*x + 5/2*c) + 2*(45*sqrt(2)*a^2*cos(3/2*d*x + 3/2*c) + 11*sqrt(2
)*a^2*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c))*sqrt(a)/((2*(2*cos(2*d*x + 2*
c) + 1)*cos(4*d*x + 4*c) + cos(4*d*x + 4*c)^2 + 4*cos(2*d*x + 2*c)^2 + sin(
4*d*x + 4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*sin(2*d*x + 2*c)^2
 + 4*cos(2*d*x + 2*c) + 1)*d)
```

Giac [A] (verification not implemented)

none

Time = 0.53 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.32

$$\int (a+a\cos(c+dx))^{5/2}\sec^3(c+dx)\,dx =$$

$$-\frac{\sqrt{2}\left(19\sqrt{2}a^2\log\left(\frac{\left|-2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}{\left|2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}\right)\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)+\frac{4\left(22a^2\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-13a^2\mathrm{sgn}}{\left(2\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)}\right.}{16d}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^3,x, algorithm="giac")
```

```
[Out] -1/16*sqrt(2)*(19*sqrt(2)*a^2*log(abs(-2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c))/
abs(2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c)))*sgn(cos(1/2*d*x + 1/2*c)) + 4*(22*
a^2*sgn(cos(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c)^3 - 13*a^2*sgn(cos(1/2*d
*x + 1/2*c))*sin(1/2*d*x + 1/2*c))/(2*sin(1/2*d*x + 1/2*c)^2 - 1)^2)*sqrt(a
)/d
```

Mupad [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^{5/2} \sec^3(c + dx)\, dx = \int \frac{(a + a\,\cos(c + d\,x))^{5/2}}{\cos(c + d\,x)^3}\, dx$$

```
[In] int((a + a*cos(c + d*x))^(5/2)/cos(c + d*x)^3,x)
[Out] int((a + a*cos(c + d*x))^(5/2)/cos(c + d*x)^3, x)
```

3.119 $\int (a+a\cos(c+dx))^{5/2}\sec^4(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 144

$$\int (a+a\cos(c+dx))^{5/2}\sec^4(c+dx)\,dx = \frac{25a^{5/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d} + \frac{25a^3\tan(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} + \frac{13a^3\sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\tan(c+dx)}{3d}$$

```
[Out] 25/8*a^(5/2)*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d+25/8*a^3*
tan(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+13/12*a^3*sec(d*x+c)*tan(d*x+c)/d/(a+a*
cos(d*x+c))^(1/2)+1/3*a^2*sec(d*x+c)^2*(a+a*cos(d*x+c))^(1/2)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.42 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2841, 3059, 2851, 2852, 212}

$$\int (a+a\cos(c+dx))^{5/2}\sec^4(c+dx)\,dx = \frac{25a^{5/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{8d} + \frac{25a^3\tan(c+dx)}{8d\sqrt{a\cos(c+dx)+a}} + \frac{13a^3\tan(c+dx)\sec(c+dx)}{12d\sqrt{a\cos(c+dx)+a}} + \frac{a^2\tan(c+dx)\sec^2(c+dx)\sqrt{a\cos(c+dx)+a}}{3d}$$

```
[In] Int[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^4,x]
```

```
[Out] (25*a^(5/2)*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(8*d)
 + (25*a^3*Tan[c + d*x])/(8*d*Sqrt[a + a*Cos[c + d*x]]) + (13*a^3*Sec[c + d
*x]*Tan[c + d*x])/(12*d*Sqrt[a + a*Cos[c + d*x]]) + (a^2*Sqrt[a + a*Cos[c +
 d*x]]*Sec[c + d*x]^2*Tan[c + d*x])/(3*d)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3059

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[(-b^2)*(B*c - A*d)*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)
*(b*c + a*d)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*
c - 2*a*d*(n + 1)))/(2*d*(n + 1)*(b*c + a*d)), Int[Sqrt[a + b*Sin[e + f*x]]
```

```
*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{a^2\sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\tan(c+dx)}{3d} \\
&\quad -\frac{1}{3}a\int\left(-\frac{13a}{2}-\frac{9}{2}a\cos(c+dx)\right)\sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\,dx \\
&= \frac{13a^3\sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}}+\frac{a^2\sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\tan(c+dx)}{3d} \\
&\quad +\frac{1}{8}(25a^2)\int\sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\,dx \\
&= \frac{25a^3\tan(c+dx)}{8d\sqrt{a+a\cos(c+dx)}}+\frac{13a^3\sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} \\
&\quad +\frac{a^2\sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\tan(c+dx)}{3d} \\
&\quad +\frac{1}{16}(25a^2)\int\sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx \\
&= \frac{25a^3\tan(c+dx)}{8d\sqrt{a+a\cos(c+dx)}}+\frac{13a^3\sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} \\
&\quad +\frac{a^2\sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\tan(c+dx)}{3d} \\
&\quad -\frac{(25a^3)\,\text{Subst}\left(\int\frac{1}{a-x^2}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d} \\
&= \frac{25a^{5/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d}+\frac{25a^3\tan(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} \\
&\quad +\frac{13a^3\sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}}+\frac{a^2\sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\tan(c+dx)}{3d}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.47 (sec) , antiderivative size = 284, normalized size of antiderivative = 1.97

$$\int (a+a\cos(c+dx))^{5/2}\sec^4(c+dx)\,dx = \frac{a^2\sqrt{a(1+\cos(c+dx))}\sec^7\left(\frac{1}{2}(c+dx)\right)\left(225\sqrt{2}\cos(c+dx)\left(\log\left(i-\sqrt{2}e^{\frac{1}{2}i(c+dx)}-ie^{i(c+dx)}\right)-1\right.\right.}{}$$

[In] Integrate[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^4,x]

[Out] (a^2*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]^7*(225*Sqrt[2]*Cos[c + d*x
]*(Log[I - Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))] - Log[I + Sqrt[
2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))]) + 75*Sqrt[2]*Cos[3*(c + d*x)]*
(Log[I - Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))] - Log[I + Sqrt[2]
E^((I/2)(c + d*x)) - I*E^(I*(c + d*x))]) - 4*(114*Sin[(c + d*x)/2] - 7*Si
n[(3*(c + d*x))/2] + 75*Sin[(5*(c + d*x))/2])))/(384*d*(-1 + Tan[(c + d*x)/
2]^2)^3)

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 716 vs. 2(124) = 248.

Time = 96.06 (sec) , antiderivative size = 717, normalized size of antiderivative = 4.98

method	result
default	$\frac{a^{\frac{3}{2}}\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-600a\left(\ln\left(\frac{4\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+4\sqrt{2}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{a}+8a}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{2}}\right)+\ln\left(-\frac{4\left(\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-\sqrt{2}\sqrt{a}\right.}{2\cos\left(\frac{dx}{2}+\right.}\right.\right.\right.}{}$

[In] int((a+cos(d*x+c)*a)^(5/2)*sec(d*x+c)^4,x,method=_RETURNVERBOSE)

[Out] 1/6*a^(3/2)*cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-600*a*(ln(4
/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*si
n(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))+ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2)
)*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1
/2)-2*a)))*sin(1/2*d*x+1/2*c)^6+300*(2*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/
2)*a^(1/2)+3*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2
c)+2^(1/2)(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*a+3*ln(-4/(2*cos(1
/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x
+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a)*sin(1/2*d*x+1/2*c)^4+(-736*2^(1/2)*(a*sin
(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-450*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(
2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)

```
-2*a))*a-450*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2
*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*a)*sin(1/2*d*x+1/2
*c)^2+234*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+75*ln(-4/(2*cos(1/
2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+
1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a+75*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(
1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*
a))*a)/(2*cos(1/2*d*x+1/2*c)-2^(1/2))^3/(2*cos(1/2*d*x+1/2*c)+2^(1/2))^3/si
n(1/2*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 183, normalized size of antiderivative = 1.27

$$\int (a+a\cos(c+dx))^{5/2}\sec^4(c+dx)\,dx = \frac{75\left(a^2\cos(dx+c)^4+a^2\cos(dx+c)^3\right)\sqrt{a}\log\left(\frac{a\cos(dx+c)^3-7a\cos(dx+c)^2-4\sqrt{a\cos(dx+c)+a}\sqrt{a}(\cos(dx+c)-2}{\cos(dx+c)^3+\cos(dx+c)^2}\right.}{96\left(d\cos(dx+c)^4\right.}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] 1/96*(75*(a^2*cos(d*x + c)^4 + a^2*cos(d*x + c)^3)*sqrt(a)*log((a*cos(d*x +
 c)^3 - 7*a*cos(d*x + c)^2 - 4*sqrt(a*cos(d*x + c) + a)*sqrt(a)*(cos(d*x +
c) - 2)*sin(d*x + c) + 8*a)/(cos(d*x + c)^3 + cos(d*x + c)^2)) + 4*(75*a^2*
cos(d*x + c)^2 + 34*a^2*cos(d*x + c) + 8*a^2)*sqrt(a*cos(d*x + c) + a)*sin(
d*x + c))/(d*cos(d*x + c)^4 + d*cos(d*x + c)^3)
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{5/2}\sec^4(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(5/2)*sec(d*x+c)**4,x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 6703 vs. 2(124) = 248.

Time = 44.30 (sec) , antiderivative size = 6703, normalized size of antiderivative = 46.55

$$\int (a + a\cos(c + dx))^{5/2}\sec^4(c + dx)\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] -1/96*(4176*a^2*cos(7/2*d*x + 7/2*c)*sin(2*d*x + 2*c) + 2430*a^2*cos(5/2*d*
x + 5/2*c)*sin(2*d*x + 2*c) + 678*a^2*cos(3/2*d*x + 3/2*c)*sin(2*d*x + 2*c)
 - 75*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 75*
sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 75*sqrt(2
)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 75*sqrt(2)*a^2*
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - (75*sqrt(2)*a^2*log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 75*sqrt(2)*a^2*log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*
c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 75*sqrt(2)*a^2*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 75*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) - 10*a^2*sin(9/2*d*x + 9/2*c) + 30*a^2*sin(7/2
*d*x + 7/2*c) + 78*a^2*sin(5/2*d*x + 5/2*c) - 170*a^2*sin(3/2*d*x + 3/2*c)
- 600*a^2*sin(1/2*d*x + 1/2*c))*cos(6*d*x + 6*c)^2 - 9*(75*sqrt(2)*a^2*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 75*sqrt(2)*a^2*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 75*sqrt(2)*a^2*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 75*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) + 30*a^2*sin(7/2*d*x + 7/2*c) + 78*a^2*sin(5/
2*d*x + 5/2*c) - 170*a^2*sin(3/2*d*x + 3/2*c) - 600*a^2*sin(1/2*d*x + 1/2*c
))*cos(4*d*x + 4*c)^2 - 45*(15*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) - 15*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) + 15*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*
```

c) + 2) - 15*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 34*a^2*sin(3/2*d*x + 3/2*c) - 120*a^2*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c)^2 - (75*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 75*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 75*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 75*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 10*a^2*sin(9/2*d*x + 9/2*c) + 30*a^2*sin(7/2*d*x + 7/2*c) + 78*a^2*sin(5/2*d*x + 5/2*c) - 170*a^2*sin(3/2*d*x + 3/2*c) - 600*a^2*sin(1/2*d*x + 1/2*c))*sin(6*d*x + 6*c)^2 - 9*(75*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 75*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 75*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 75*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 30*a^2*sin(7/2*d*x + 7/2*c) + 78*a^2*sin(5/2*d*x + 5/2*c) - 170*a^2*sin(3/2*d*x + 3/2*c) - 600*a^2*sin(1/2*d*x + 1/2*c))*sin(4*d*x + 4*c)^2 - 45*(15*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 15*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 34*a^2*sin(3/2*d*x + 3/2*c) - 120*a^2*sin(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c)^2 - 56*a^2*sin(3/2*d*x + 3/2*c) + 600*a^2*sin(1/2*d*x + 1/2*c) + 10*(a^2*sin(6*d*x + 6*c) + 3*a^2*sin(4*d*x + 4*c) + 3*a^2*sin(2*d*x + 2*c))*cos(21/2*d*x + 21/2*c) - 30*(a^2*sin(6*d*x + 6*c) + 3*a^2*sin(4*d*x + 4*c) + 3*a^2*sin(2*d*x + 2*c))*cos(19/2*d*x + 19/2*c) - 48*(a^2*sin(6*d*x + 6*c) + 3*a^2*sin(4*d*x + 4*c) + 3*a^2*sin(2*d*x + 2*c))*cos(17/2*d*x + 17/2*c) + 80*(a^2*sin(6*d*x + 6*c) + 3*a^2*sin(4*d*x + 4*c) + 3*a^2*sin(2*d*x + 2*c))*cos(15/2*d*x + 15/2*c) + 396*(a^2*sin(6*d*x + 6*c) + 3*a^2*sin(4*d*x + 4*c) + 3*a^2*sin(2*d*x + 2*c))*cos(13/2*d*x + 13/2*c) - 6*(25*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 25*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 25*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 25*sqrt

(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 170*a^2*sin(1
1/2*d*x + 11/2*c) - 19*a^2*sin(3/2*d*x + 3/2*c) - 200*a^2*sin(1/2*d*x + 1/2
*c) + (75*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
75*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 75*sq
rt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 75*sqrt(2)*
a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 30*a^2*sin(7/2*d*
x + 7/2*c) + 78*a^2*sin(5/2*d*x + 5/2*c) - 170*a^2*sin(3/2*d*x + 3/2*c) - 6
00*a^2*sin(1/2*d*x + 1/2*c))*cos(4*d*x + 4*c) + 5*(15*sqrt(2)*a^2*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*a^2*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 15*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) - 34*a^2*sin(3/2*d*x + 3/2*c) - 120*a^2*sin(1/2*d*
x + 1/2*c))*cos(2*d*x + 2*c) - 10*(a^2*cos(4*d*x + 4*c) + a^2*cos(2*d*x + 2
*c) - 25*a^2)*sin(9/2*d*x + 9/2*c) + 2*(15*a^2*cos(2*d*x + 2*c) + 121*a^2)*
sin(7/2*d*x + 7/2*c) + (78*a^2*cos(2*d*x + 2*c) + 161*a^2)*sin(5/2*d*x + 5/
2*c))*cos(6*d*x + 6*c) + 3060*(a^2*sin(4*d*x + 4*c) + a^2*sin(2*d*x + 2*c))
*cos(11/2*d*x + 11/2*c) + 4560*(a^2*sin(4*d*x + 4*c) + a^2*sin(2*d*x + 2*c)
)*cos(9/2*d*x + 9/2*c) - 18*(25*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) - 25*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) + 25*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) - 25*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) - 19*a^2*sin(3/2*d*x + 3/2*c) - 200*a^2*sin(1/2*d*x + 1/2*c) + 5*(15*sqr
t(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*a
^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 15*sqrt(2)*a^2*log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*a^2*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 34*a^2*sin(3/2*d*x + 3/2*c) -
120*a^2*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 2*(15*a^2*cos(2*d*x + 2*c)
+ 121*a^2)*sin(7/2*d*x + 7/2*c) + (78*a^2*cos(2*d*x + 2*c) + 161*a^2)*sin(

```
5/2*d*x + 5/2*c))*cos(4*d*x + 4*c) - 18*(25*sqrt(2)*a^2*log(2*cos(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 25*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)
*sin(1/2*d*x + 1/2*c) + 2) + 25*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) - 25*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x
 + 1/2*c) + 2) - 19*a^2*sin(3/2*d*x + 3/2*c) - 200*a^2*sin(1/2*d*x + 1/2*c)
)*cos(2*d*x + 2*c) - 10*(a^2*cos(6*d*x + 6*c) + 3*a^2*cos(4*d*x + 4*c) + 3*
a^2*cos(2*d*x + 2*c) + a^2)*sin(21/2*d*x + 21/2*c) + 30*(a^2*cos(6*d*x + 6*
c) + 3*a^2*cos(4*d*x + 4*c) + 3*a^2*cos(2*d*x + 2*c) + a^2)*sin(19/2*d*x +
19/2*c) + 48*(a^2*cos(6*d*x + 6*c) + 3*a^2*cos(4*d*x + 4*c) + 3*a^2*cos(2*d
*x + 2*c) + a^2)*sin(17/2*d*x + 17/2*c) - 80*(a^2*cos(6*d*x + 6*c) + 3*a^2*
cos(4*d*x + 4*c) + 3*a^2*cos(2*d*x + 2*c) + a^2)*sin(15/2*d*x + 15/2*c) - 3
96*(a^2*cos(6*d*x + 6*c) + 3*a^2*cos(4*d*x + 4*c) + 3*a^2*cos(2*d*x + 2*c)
 + a^2)*sin(13/2*d*x + 13/2*c) - 2*(90*a^2*sin(7/2*d*x + 7/2*c)*sin(2*d*x +
2*c) + 234*a^2*sin(5/2*d*x + 5/2*c)*sin(2*d*x + 2*c) - 510*a^2*cos(11/2*d*x
 + 11/2*c) - 760*a^2*cos(9/2*d*x + 9/2*c) - 696*a^2*cos(7/2*d*x + 7/2*c) -
405*a^2*cos(5/2*d*x + 5/2*c) - 113*a^2*cos(3/2*d*x + 3/2*c) - 30*(a^2*sin(4
*d*x + 4*c) + a^2*sin(2*d*x + 2*c))*sin(9/2*d*x + 9/2*c) + 3*(75*sqrt(2)*a^
2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 75*sqrt(2)*a^2*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 75*sqrt(2)*a^2*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 75*sqrt(2)*a^2*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 30*a^2*sin(7/2*d*x + 7/2*c) + 78*a^2*
sin(5/2*d*x + 5/2*c) - 170*a^2*sin(3/2*d*x + 3/2*c) - 600*a^2*sin(1/2*d*x +
 1/2*c))*sin(4*d*x + 4*c) + 15*(15*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) + 15*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) - 15*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
 + 2) - 34*a^2*sin(3/2*d*x + 3/2*c) - 120*a^2*sin(1/2*d*x + 1/2*c))*sin(2*d
*x + 2*c))*sin(6*d*x + 6*c) - 1020*(3*a^2*cos(4*d*x + 4*c) + 3*a^2*cos(2*d*
x + 2*c) + a^2)*sin(11/2*d*x + 11/2*c) + 10*(9*a^2*cos(4*d*x + 4*c)^2 + 9*a
^2*cos(2*d*x + 2*c)^2 + 9*a^2*sin(4*d*x + 4*c)^2 + 18*a^2*sin(4*d*x + 4*c)*
sin(2*d*x + 2*c) + 9*a^2*sin(2*d*x + 2*c)^2 - 450*a^2*cos(2*d*x + 2*c) - 15
1*a^2 + 18*(a^2*cos(2*d*x + 2*c) - 25*a^2)*cos(4*d*x + 4*c))*sin(9/2*d*x +
9/2*c) - 6*(90*a^2*sin(7/2*d*x + 7/2*c)*sin(2*d*x + 2*c) + 234*a^2*sin(5/2*
```

```
d*x + 5/2*c)*sin(2*d*x + 2*c) - 696*a^2*cos(7/2*d*x + 7/2*c) - 405*a^2*cos(
5/2*d*x + 5/2*c) - 113*a^2*cos(3/2*d*x + 3/2*c) + 15*(15*sqrt(2)*a^2*log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*a^2*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 15*sqrt(2)*a^2*log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*
sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*a^2*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) - 34*a^2*sin(3/2*d*x + 3/2*c) - 120*a^2*sin(1/2
*d*x + 1/2*c))*sin(2*d*x + 2*c))*sin(4*d*x + 4*c) - 18*(15*a^2*cos(2*d*x +
2*c)^2 + 15*a^2*sin(2*d*x + 2*c)^2 + 242*a^2*cos(2*d*x + 2*c) + 79*a^2)*sin
(7/2*d*x + 7/2*c) - 6*(117*a^2*cos(2*d*x + 2*c)^2 + 117*a^2*sin(2*d*x + 2*c
)^2 + 483*a^2*cos(2*d*x + 2*c) + 148*a^2)*sin(5/2*d*x + 5/2*c))*sqrt(a)/((s
qrt(2)*cos(6*d*x + 6*c)^2 + 9*sqrt(2)*cos(4*d*x + 4*c)^2 + 9*sqrt(2)*cos(2*
d*x + 2*c)^2 + sqrt(2)*sin(6*d*x + 6*c)^2 + 9*sqrt(2)*sin(4*d*x + 4*c)^2 +
18*sqrt(2)*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 9*sqrt(2)*sin(2*d*x + 2*c)^2
 + 2*(3*sqrt(2)*cos(4*d*x + 4*c) + 3*sqrt(2)*cos(2*d*x + 2*c) + sqrt(2))*co
s(6*d*x + 6*c) + 6*(3*sqrt(2)*cos(2*d*x + 2*c) + sqrt(2))*cos(4*d*x + 4*c)
+ 6*(sqrt(2)*sin(4*d*x + 4*c) + sqrt(2)*sin(2*d*x + 2*c))*sin(6*d*x + 6*c)
+ 6*sqrt(2)*cos(2*d*x + 2*c) + sqrt(2))*d)
```

Giac [A] (verification not implemented)

none

Time = 0.42 (sec) , antiderivative size = 166, normalized size of antiderivative = 1.15

$$\int (a + a\cos(c+dx))^{5/2} \sec^4(c+dx)\,dx =$$

$$-\frac{\sqrt{2}\left(75\sqrt{2}a^2\log\left(\frac{\left|-2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}{\left|2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}\right)\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)+\frac{4\left(300a^2\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5-368a^2\operatorname{sgn}\right.}{\left(2\right.}}{96d}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^4,x, algorithm="giac")
```

```
[Out] -1/96*sqrt(2)*(75*sqrt(2)*a^2*log(abs(-2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c))/
abs(2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c)))*sgn(cos(1/2*d*x + 1/2*c)) + 4*(300
*a^2*sgn(cos(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c)^5 - 368*a^2*sgn(cos(1/2
*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c)^3 + 117*a^2*sgn(cos(1/2*d*x + 1/2*c))*s
in(1/2*d*x + 1/2*c))/(2*sin(1/2*d*x + 1/2*c)^2 - 1)^3)*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{5/2}\sec^4(c+dx)\,dx=\int \frac{\left(a+a\,\cos\left(c+d\,x\right)\right)^{5/2}}{{\cos\left(c+d\,x\right)}^4}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(5/2)/cos(c + d*x)^4,x)
[Out] int((a + a*cos(c + d*x))^(5/2)/cos(c + d*x)^4, x)
```

3.120 $\int (a+a\cos(c+dx))^{5/2}\sec^5(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 182

$$\int (a+a\cos(c+dx))^{5/2}\sec^5(c+dx)\,dx=\frac{163a^{5/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{64d}+\frac{163a^3\tan(c+dx)}{64d\sqrt{a+a\cos(c+dx)}}+\frac{163a^3\sec(c+dx)\tan(c+dx)}{96d\sqrt{a+a\cos(c+dx)}}+\frac{17a^3\sec^2(c+dx)\tan(c+dx)}{24d\sqrt{a+a\cos(c+dx)}}+\frac{a^2\sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\tan(c+dx)}{4d}$$

```
[Out] 163/64*a^(5/2)*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d+163/64*
a^3*tan(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+163/96*a^3*sec(d*x+c)*tan(d*x+c)/d/
(a+a*cos(d*x+c))^(1/2)+17/24*a^3*sec(d*x+c)^2*tan(d*x+c)/d/(a+a*cos(d*x+c))
^(1/2)+1/4*a^2*sec(d*x+c)^3*(a+a*cos(d*x+c))^(1/2)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.58 (sec) , antiderivative size = 182, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}=0.217$, Rules used = {2841, 3059, 2851, 2852, 212}

$$\int (a+a\cos(c+dx))^{5/2}\sec^5(c+dx)\,dx=\frac{163a^{5/2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{64d}+\frac{163a^3\tan(c+dx)}{64d\sqrt{a\cos(c+dx)+a}}+\frac{17a^3\tan(c+dx)\sec^2(c+dx)}{24d\sqrt{a\cos(c+dx)+a}}+\frac{163a^3\tan(c+dx)\sec(c+dx)}{96d\sqrt{a\cos(c+dx)+a}}+\frac{a^2\tan(c+dx)\sec^3(c+dx)\sqrt{a\cos(c+dx)+a}}{4d}$$

```
[In] Int[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^5,x]
```

```
[Out] (163*a^(5/2)*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(64*
d) + (163*a^3*Tan[c + d*x])/(64*d*Sqrt[a + a*Cos[c + d*x]]) + (163*a^3*Sec[
c + d*x]*Tan[c + d*x])/(96*d*Sqrt[a + a*Cos[c + d*x]]) + (17*a^3*Sec[c + d*
x]^2*Tan[c + d*x])/(24*d*Sqrt[a + a*Cos[c + d*x]]) + (a^2*Sqrt[a + a*Cos[c
+ d*x]]*Sec[c + d*x]^3*Tan[c + d*x])/(4*d)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3059

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
```

```
[(-b^2)*(B*c - A*d)*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)
*(b*c + a*d)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*
c - 2*a*d*(n + 1)))/(2*d*(n + 1)*(b*c + a*d)), Int[Sqrt[a + b*Sin[e + f*x]]
*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{a^2\sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\tan(c+dx)}{4d} \\
&\quad -\frac{1}{4}a\int\left(-\frac{17a}{2}-\frac{13}{2}a\cos(c+dx)\right)\sqrt{a+a\cos(c+dx)}\sec^4(c+dx)\,dx \\
&= \frac{17a^3\sec^2(c+dx)\tan(c+dx)}{24d\sqrt{a+a\cos(c+dx)}}+\frac{a^2\sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\tan(c+dx)}{4d} \\
&\quad +\frac{1}{48}\left(163a^2\right)\int\sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\,dx \\
&= \frac{163a^3\sec(c+dx)\tan(c+dx)}{96d\sqrt{a+a\cos(c+dx)}}+\frac{17a^3\sec^2(c+dx)\tan(c+dx)}{24d\sqrt{a+a\cos(c+dx)}} \\
&\quad +\frac{a^2\sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\tan(c+dx)}{4d} \\
&\quad +\frac{1}{64}\left(163a^2\right)\int\sqrt{a+a\cos(c+dx)}\sec^2(c+dx)\,dx \\
&= \frac{163a^3\tan(c+dx)}{64d\sqrt{a+a\cos(c+dx)}}+\frac{163a^3\sec(c+dx)\tan(c+dx)}{96d\sqrt{a+a\cos(c+dx)}} \\
&\quad +\frac{17a^3\sec^2(c+dx)\tan(c+dx)}{24d\sqrt{a+a\cos(c+dx)}}+\frac{a^2\sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\tan(c+dx)}{4d} \\
&\quad +\frac{1}{128}\left(163a^2\right)\int\sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx \\
&= \frac{163a^3\tan(c+dx)}{64d\sqrt{a+a\cos(c+dx)}}+\frac{163a^3\sec(c+dx)\tan(c+dx)}{96d\sqrt{a+a\cos(c+dx)}} \\
&\quad +\frac{17a^3\sec^2(c+dx)\tan(c+dx)}{24d\sqrt{a+a\cos(c+dx)}}+\frac{a^2\sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\tan(c+dx)}{4d} \\
&\quad -\frac{\left(163a^3\right)\text{Subst}\left(\int\frac{1}{a-x^2}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{64d}
\end{aligned}$$

$$= \frac{163a^{5/2}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{64d} + \frac{163a^3\tan(c+dx)}{64d\sqrt{a+a\cos(c+dx)}} + \frac{163a^3\sec(c+dx)\tan(c+dx)}{96d\sqrt{a+a\cos(c+dx)}} + \frac{17a^3\sec^2(c+dx)\tan(c+dx)}{24d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\sqrt{a+a\cos(c+dx)}\sec^3(c+dx)\tan(c+dx)}{4d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.69 (sec) , antiderivative size = 388, normalized size of antiderivative = 2.13

$$\int (a+a\cos(c+dx))^{5/2}\sec^5(c+dx)\,dx =$$

$$-\frac{a^2\sqrt{a(1+\cos(c+dx))}\sec^9\left(\frac{1}{2}(c+dx)\right)\left(1467\sqrt{2}\log\left(i-\sqrt{2}e^{\frac{1}{2}i(c+dx)}-ie^{i(c+dx)}\right)+1956\sqrt{2}\cos(2(c+d$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^5,x]
```

```
[Out] -1/6144*(a^2*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]^9*(1467*Sqrt[2]*Lo
g[I - Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))] + 1956*Sqrt[2]*Cos[2
*(c + d*x)]*(Log[I - Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))] - Log
[I + Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))]) + 489*Sqrt[2]*Cos[4*
(c + d*x)]*(Log[I - Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))] - Log[
I + Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))]) - 1467*Sqrt[2]*Log[I
+ Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))] + 2060*Sin[(c + d*x)/2]
- 6204*Sin[(3*(c + d*x))/2] - 652*Sin[(5*(c + d*x))/2] - 1956*Sin[(7*(c + d
*x))/2]))/(d*(-1 + Tan[(c + d*x)/2]^2)^4)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 881 vs. 2(158) = 316.

Time = 299.26 (sec) , antiderivative size = 882, normalized size of antiderivative = 4.85

method	result	size
default	Expression too large to display	882

```
[In] int((a+cos(d*x+c)*a)^(5/2)*sec(d*x+c)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/24*a^(3/2)*cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(7824*a*(ln(
4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*s
in(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))+ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2
))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(
1/2)-2*a)))*sin(1/2*d*x+1/2*c)^8-7824*(2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/
```

```
2)*a^(1/2)+2*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2
*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*a+2*ln(-4/(2*cos(1
/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x
+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a)*sin(1/2*d*x+1/2*c)^6+1304*(11*2^(1/2)*(a*
sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+9*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(
2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)
+2*a))*a+9*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*
c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a)*sin(1/2*d*x+1/2*
c)^4+(-9212*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-3912*ln(4/(2*cos
(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d
*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*a-3912*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2)
)*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1
/2)-2*a))*a)*sin(1/2*d*x+1/2*c)^2+2094*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/
2)*a^(1/2)+489*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1
/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*a+489*ln(-4/(2*c
os(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2
*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a)/(2*cos(1/2*d*x+1/2*c)+2^(1/2))^4/(2*c
os(1/2*d*x+1/2*c)-2^(1/2))^4/sin(1/2*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1
/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 196, normalized size of antiderivative = 1.08

$$\int (a+a\cos(c+dx))^{5/2}\sec^5(c+dx)\,dx = \frac{489\left(a^2\cos(dx+c)^5+a^2\cos(dx+c)^4\right)\sqrt{a}\log\left(\frac{a\cos(dx+c)^3-7\,a\cos(dx+c)^2-4\,\sqrt{a\cos(dx+c)+a}\sqrt{a}(\cos(dx+c)-2}{\cos(dx+c)^3+\cos(dx+c)^2}\right.}{768\,(d}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] 1/768*(489*(a^2*cos(d*x + c)^5 + a^2*cos(d*x + c)^4)*sqrt(a)*log((a*cos(d*x
 + c)^3 - 7*a*cos(d*x + c)^2 - 4*sqrt(a*cos(d*x + c) + a)*sqrt(a)*(cos(d*x
+ c) - 2)*sin(d*x + c) + 8*a)/(cos(d*x + c)^3 + cos(d*x + c)^2)) + 4*(489*a
^2*cos(d*x + c)^3 + 326*a^2*cos(d*x + c)^2 + 184*a^2*cos(d*x + c) + 48*a^2)
*sqrt(a*cos(d*x + c) + a)*sin(d*x + c))/(d*cos(d*x + c)^5 + d*cos(d*x + c)^
4)
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{5/2}\sec^5(c+dx)\,dx=\text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(5/2)*sec(d*x+c)**5,x)
[Out] Timed out
```

Maxima [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{5/2}\sec^5(c+dx)\,dx=\text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^5,x, algorithm="maxima")
[Out] Timed out
```

Giac [A] (verification not implemented)

none

Time = 0.42 (sec) , antiderivative size = 192, normalized size of antiderivative = 1.05

$$\int (a+a\cos(c+dx))^{5/2}\sec^5(c+dx)\,dx=-\frac{\sqrt{2}\left(489\sqrt{2}a^2\log\left(\frac{\left|-2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}{\left|2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}\right)\text{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)+\frac{4\left(3912\,a^2\text{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^7-7172\right.}{}\right.}{768\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^5,x, algorithm="giac")
[Out] -1/768*sqrt(2)*(489*sqrt(2)*a^2*log(abs(-2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c)
)/abs(2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c)))*sgn(cos(1/2*d*x + 1/2*c)) + 4*(3
912*a^2*sgn(cos(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c)^7 - 7172*a^2*sgn(cos
(1/2*d*x + 1/2*c))*sin(1/2*d*x + 1/2*c)^5 + 4606*a^2*sgn(cos(1/2*d*x + 1/2*
c))*sin(1/2*d*x + 1/2*c)^3 - 1047*a^2*sgn(cos(1/2*d*x + 1/2*c))*sin(1/2*d*x
 + 1/2*c))/(2*sin(1/2*d*x + 1/2*c)^2 - 1)^4)*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{5/2}\sec^5(c+dx)\,dx=\int \frac{(a+a\,\cos(c+d\,x))^{5/2}}{\cos(c+d\,x)^5}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(5/2)/cos(c + d*x)^5,x)
[Out] int((a + a*cos(c + d*x))^(5/2)/cos(c + d*x)^5, x)
```

3.121 $\int (a+a\cos(c+dx))^{7/2}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 119

$$\int (a+a\cos(c+dx))^{7/2}\,dx=\frac{256a^4\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}}+\frac{64a^3\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{35d}+\frac{24a^2(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{35d}+\frac{2a(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{7d}$$

```
[Out] 24/35*a^2*(a+a*cos(d*x+c))^(3/2)*sin(d*x+c)/d+2/7*a*(a+a*cos(d*x+c))^(5/2)*
sin(d*x+c)/d+256/35*a^4*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+64/35*a^3*sin(d
*x+c)*(a+a*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2726, 2725}

$$\int (a+a\cos(c+dx))^{7/2}\,dx=\frac{256a^4\sin(c+dx)}{35d\sqrt{a\cos(c+dx)+a}}+\frac{64a^3\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{35d}+\frac{24a^2\sin(c+dx)(a\cos(c+dx)+a)^{3/2}}{35d}+\frac{2a\sin(c+dx)(a\cos(c+dx)+a)^{5/2}}{7d}$$

```
[In] Int[(a + a*Cos[c + d*x])^(7/2),x]
```

```
[Out] (256*a^4*Sin[c + d*x])/(35*d*Sqrt[a + a*Cos[c + d*x]]) + (64*a^3*Sqrt[a + a
*Cos[c + d*x]]*Sin[c + d*x])/(35*d) + (24*a^2*(a + a*Cos[c + d*x])^(3/2)*Si
n[c + d*x])/(35*d) + (2*a*(a + a*Cos[c + d*x])^(5/2)*Sin[c + d*x])/(7*d)
```

Rule 2725

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[-2*b*(Cos
[c + d*x]/(d*Sqrt[a + b*Sin[c + d*x]])), x] /; FreeQ[{a, b, c, d}, x] && Eq
Q[a^2 - b^2, 0]
```

Rule 2726

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos
[c + d*x]*((a + b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[a*((2*n - 1)/n),
Int[(a + b*Sin[c + d*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] && EqQ[a
^2 - b^2, 0] && IGtQ[n - 1/2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2a(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{7d}+\frac{1}{7}(12a)\int(a+a\cos(c+dx))^{5/2}\,dx\\
&= \frac{24a^2(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{35d}+\frac{2a(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{7d}\\
&\quad+\frac{1}{35}\left(96a^2\right)\int(a+a\cos(c+dx))^{3/2}\,dx\\
&= \frac{64a^3\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{35d}+\frac{24a^2(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{35d}\\
&\quad+\frac{2a(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{7d}+\frac{1}{35}\left(128a^3\right)\int\sqrt{a+a\cos(c+dx)}\,dx\\
&= \frac{256a^4\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}}+\frac{64a^3\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{35d}\\
&\quad+\frac{24a^2(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{35d}+\frac{2a(a+a\cos(c+dx))^{5/2}\sin(c+dx)}{7d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.70

$$\int(a+a\cos(c+dx))^{7/2}\,dx=\frac{a^3\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(1225\sin\left(\frac{1}{2}(c+dx)\right)+245\sin\left(\frac{3}{2}(c+dx)\right)+49\sin\left(\frac{5}{2}(\right.\right.}{140d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(7/2),x]
```

[Out] (a^3*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(1225*Sin[(c + d*x)/2] + 2
45*Sin[(3*(c + d*x))/2] + 49*Sin[(5*(c + d*x))/2] + 5*Sin[(7*(c + d*x))/2])
)/(140*d)

Maple [A] (verified)

Time = 0.98 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.72

method	result	size
default	$\frac{16 a^{4} \cos \left(\frac{d x}{2}+\frac{c}{2}\right) \sin \left(\frac{d x}{2}+\frac{c}{2}\right)\left(5\left(\cos^{6}\left(\frac{d x}{2}+\frac{c}{2}\right)\right)+6\left(\cos^{4}\left(\frac{d x}{2}+\frac{c}{2}\right)\right)+8\left(\cos^{2}\left(\frac{d x}{2}+\frac{c}{2}\right)\right)+16\right) \sqrt{2}}{35 \sqrt{a\left(\cos^{2}\left(\frac{d x}{2}+\frac{c}{2}\right)\right)}\, d}$	86

[In] int((a+cos(d*x+c)*a)^(7/2),x,method=_RETURNVERBOSE)

[Out] 16/35*a^4*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)*(5*cos(1/2*d*x+1/2*c)^6+6*c
os(1/2*d*x+1/2*c)^4+8*cos(1/2*d*x+1/2*c)^2+16)*2^(1/2)/(a*cos(1/2*d*x+1/2*c
)^2)^(1/2)/d

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.63

$$\int (a + a\cos(c + dx))^{7/2}\, dx = \frac{2\left(5\, a^{3} \cos\left(dx + c\right)^{3} + 27\, a^{3} \cos\left(dx + c\right)^{2} + 71\, a^{3} \cos\left(dx + c\right) + 177\, a^{3}\right) \sqrt{a \cos\left(dx + c\right) + a}\, \mathrm{si}}{35\left(d \cos\left(dx + c\right) + d\right)}$$

[In] integrate((a+a*cos(d*x+c))^(7/2),x, algorithm="fricas")

[Out] 2/35*(5*a^3*cos(d*x + c)^3 + 27*a^3*cos(d*x + c)^2 + 71*a^3*cos(d*x + c) +
177*a^3)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/(d*cos(d*x + c) + d)

Sympy [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^{7/2}\, dx = \text{Timed out}$$

[In] integrate((a+a*cos(d*x+c))**(7/2),x)

[Out] Timed out

Maxima [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.65

$$\int (a + a\cos(c+dx))^{7/2} \, dx = \frac{\left(5\sqrt{2}a^3\sin\left(\frac{7}{2}dx + \frac{7}{2}c\right) + 49\sqrt{2}a^3\sin\left(\frac{5}{2}dx + \frac{5}{2}c\right) + 245\sqrt{2}a^3\sin\left(\frac{3}{2}dx + \frac{3}{2}c\right) + 1225\sqrt{2}a^3\sin\ldots}{140\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] 1/140*(5*sqrt(2)*a^3*sin(7/2*d*x + 7/2*c) + 49*sqrt(2)*a^3*sin(5/2*d*x + 5/
2*c) + 245*sqrt(2)*a^3*sin(3/2*d*x + 3/2*c) + 1225*sqrt(2)*a^3*sin(1/2*d*x
+ 1/2*c))*sqrt(a)/d
```

Giac [A] (verification not implemented)

none

Time = 0.44 (sec) , antiderivative size = 108, normalized size of antiderivative = 0.91

$$\int (a + a\cos(c+dx))^{7/2} \, dx = \frac{\sqrt{2}\left(5\,a^3\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx + \frac{1}{2}c\right)\right)\sin\left(\frac{7}{2}dx + \frac{7}{2}c\right) + 49\,a^3\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx + \frac{1}{2}c\right)\right)\sin\left(\frac{5}{2}dx + \frac{5}{2}c\right) + 2\ldots}{140\ldots}$$

```
[In] integrate((a+a*cos(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] 1/140*sqrt(2)*(5*a^3*sgn(cos(1/2*d*x + 1/2*c))*sin(7/2*d*x + 7/2*c) + 49*a^
3*sgn(cos(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 245*a^3*sgn(cos(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c) + 1225*a^3*sgn(cos(1/2*d*x + 1/2*c))*sin(1/2
*d*x + 1/2*c))*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int (a + a\cos(c+dx))^{7/2} \, dx = \int {\left(a+a\,\cos\left(c+d\,x\right)\right)}^{7/2} \,d x$$

```
[In] int((a + a*cos(c + d*x))^(7/2),x)
```

```
[Out] int((a + a*cos(c + d*x))^(7/2), x)
```

3.122 $\int \frac{\cos^4(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 174

$$\int \frac{\cos^4(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} - \frac{148\sin(c+dx)}{105d\sqrt{a+a\cos(c+dx)}} - \frac{2\cos^2(c+dx)\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{2\cos^3(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}} + \frac{62\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{105ad}$$

```
[Out] arctanh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/(a+a*cos(d*x+c))^(1/2))*2^(1/2)/d/a^
(1/2)-148/105*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)-2/35*cos(d*x+c)^2*sin(d*x
+c)/d/(a+a*cos(d*x+c))^(1/2)+2/7*cos(d*x+c)^3*sin(d*x+c)/d/(a+a*cos(d*x+c))
^(1/2)+62/105*sin(d*x+c)*(a+a*cos(d*x+c))^(1/2)/a/d
```

Rubi [A] (verified)

Time = 0.65 (sec) , antiderivative size = 174, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {2857, 3062, 3047, 3102, 2830, 2728, 212}

$$\int \frac{\cos^4(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d} + \frac{2\sin(c+dx)\cos^3(c+dx)}{7d\sqrt{a\cos(c+dx)+a}} - \frac{2\sin(c+dx)\cos^2(c+dx)}{35d\sqrt{a\cos(c+dx)+a}} + \frac{62\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{105ad} - \frac{148\sin(c+dx)}{105d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Cos[c + d*x]^4/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (Sqrt[2]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])]
)/(Sqrt[a]*d) - (148*Sin[c + d*x])/(105*d*Sqrt[a + a*Cos[c + d*x]]) - (2*Co
s[c + d*x]^2*Sin[c + d*x])/(35*d*Sqrt[a + a*Cos[c + d*x]]) + (2*Cos[c + d*x
]^3*Sin[c + d*x])/(7*d*Sqrt[a + a*Cos[c + d*x]]) + (62*Sqrt[a + a*Cos[c + d
*x]]*Sin[c + d*x])/(105*a*d)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rule 2857

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[-2*d*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n - 1)/(f*(2*n - 1)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(b*(2*n - 1))
, Int[((c + d*Sin[e + f*x])^(n - 2)/Sqrt[a + b*Sin[e + f*x]])*Simp[a*c*d -
b*(2*d^2*(n - 1) + c^2*(2*n - 1)) + d*(a*d - b*c*(4*n - 3))*Sin[e + f*x], x
], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
 b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[n, 1] && IntegerQ[2*n]
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3062

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(-B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(f*(m +
n + 1))), x] + Dist[1/(b*(m + n + 1)), Int[(a + b*Sin[e + f*x])^m*(c + d*Si
n[e + f*x])^(n - 1)*Simp[A*b*c*(m + n + 1) + B*(a*c*m + b*d*n) + (A*b*d*(m
+ n + 1) + B*(a*d*m + b*c*n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 -
 d^2, 0] && GtQ[n, 0] && (IntegerQ[n] || EqQ[m + 1/2, 0])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2\cos^3(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}} - \frac{\int \frac{\cos^2(c+dx)(-6a+a\cos(c+dx))}{\sqrt{a+a\cos(c+dx)}}\,dx}{7a} \\
&= -\frac{2\cos^2(c+dx)\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{2\cos^3(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}} - \frac{2\int \frac{\cos(c+dx)\left(2a^2-\frac{31}{2}a^2\cos(c+dx)\right)}{\sqrt{a+a\cos(c+dx)}}\,dx}{35a^2} \\
&= -\frac{2\cos^2(c+dx)\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{2\cos^3(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}} - \frac{2\int \frac{2a^2\cos(c+dx)-\frac{31}{2}a^2\cos^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{35a^2} \\
&= -\frac{2\cos^2(c+dx)\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{2\cos^3(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}} \\
&\quad + \frac{62\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{105ad} - \frac{4\int \frac{-\frac{31a^3}{4}+\frac{37}{2}a^3\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{105a^3} \\
&= -\frac{148\sin(c+dx)}{105d\sqrt{a+a\cos(c+dx)}} - \frac{2\cos^2(c+dx)\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{2\cos^3(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}} \\
&\quad + \frac{62\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{105ad} + \int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx \\
&= -\frac{148\sin(c+dx)}{105d\sqrt{a+a\cos(c+dx)}} - \frac{2\cos^2(c+dx)\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{2\cos^3(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}} \\
&\quad + \frac{62\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{105ad} - \frac{2\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}
\end{aligned}$$

$$= \frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} - \frac{148\sin(c+dx)}{105d\sqrt{a+a\cos(c+dx)}} - \frac{2\cos^2(c+dx)\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{2\cos^3(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}} + \frac{62\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{105ad}$$

Mathematica [A] (verified)

Time = 0.23 (sec) , antiderivative size = 112, normalized size of antiderivative = 0.64

$$\int \frac{\cos^4(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\left(105\sqrt{2}\operatorname{arctanh}\left(\sqrt{\sin^2\left(\frac{1}{2}(c+dx)\right)}\right) + 2\sqrt{1-\cos(c+dx)}(-43+31\cos(c+dx)-3\cos^2(c+dx)+15\,\mathrm{co}\right.}{105d\sqrt{1-\cos(c+dx)}\sqrt{a(1+\cos(c+dx))}}$$

```
[In] Integrate[Cos[c + d*x]^4/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] ((105*Sqrt[2]*ArcTanh[Sqrt[Sin[(c + d*x)/2]^2]] + 2*Sqrt[1 - Cos[c + d*x]]*
(-43 + 31*Cos[c + d*x] - 3*Cos[c + d*x]^2 + 15*Cos[c + d*x]^3))*Sin[c + d*x
])/(105*d*Sqrt[1 - Cos[c + d*x]]*Sqrt[a*(1 + Cos[c + d*x])])
```

Maple [A] (verified)

Time = 1.16 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.11

method	result
default	$\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-240\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{a}\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+336\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{a}\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-280\right.}{105a^{\frac{3}{2}}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$

```
[In] int(cos(d*x+c)^4/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/105*cos(1/2*d*x+1/2*c)*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-240*(a*si
n(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)*sin(1/2*d*x+1/2*c)^6+336*(a*sin(1/2*d*x+1
/2*c)^2)^(1/2)*a^(1/2)*sin(1/2*d*x+1/2*c)^4-280*(a*sin(1/2*d*x+1/2*c)^2)^(1
/2)*a^(1/2)*sin(1/2*d*x+1/2*c)^2+105*ln(4*(a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)
^(1/2)+a)/cos(1/2*d*x+1/2*c))*a)/a^(3/2)/sin(1/2*d*x+1/2*c)/(a*cos(1/2*d*x+
1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 153, normalized size of antiderivative = 0.88

$$\int \frac{\cos^4(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{4\left(15\,\cos\left(dx+c\right)^3 - 3\,\cos\left(dx+c\right)^2 + 31\,\cos\left(dx+c\right) - 43\right)\sqrt{a\cos\left(dx+c\right)+a}\,\sin\left(dx+c\right) + \frac{105\,\sqrt{2}(a\cos}{}}{210\left(ad\cos\left(dx+c\right)+ad\right)}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/210*(4*(15*cos(d*x + c)^3 - 3*cos(d*x + c)^2 + 31*cos(d*x + c) - 43)*sqrt
(a*cos(d*x + c) + a)*sin(d*x + c) + 105*sqrt(2)*(a*cos(d*x + c) + a)*log(-(
cos(d*x + c)^2 - 2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/sqrt(a) -
2*cos(d*x + c) - 3)/(cos(d*x + c)^2 + 2*cos(d*x + c) + 1))/sqrt(a))/(a*d*co
s(d*x + c) + a*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**4/(a+a*cos(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 696204 vs. 2(149) = 298.

Time = 17.57 (sec) , antiderivative size = 696204, normalized size of antiderivative = 4001.17

$$\int \frac{\cos^4(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -1/5040*(180*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + s
in(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2
```

```
*c)^3 - 180*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d
*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
 + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/
2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^3 - 40*((cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^3 - 2*(840*
(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*
c)^3*sin(d*x + c) + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3
/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^
2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^
2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c
)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*
x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c
```

)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 180*(cos
(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2
*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*
c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c
) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c) + 42*(16*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin
(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x
 + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
+ 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(
20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/
2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c)
 + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
- sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)
^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2

*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^
2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c
) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x
 + 3/2*c))*cos(9/2*d*x + 9/2*c)^2 - 42*(40*(cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c
)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) +
 log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x +
c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x +
 c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x
 + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s

```
in(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2
*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5
/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*c
os(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*
x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*c
os(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si
n(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*
d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*
c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*
x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*si
n(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*(90*(cos(5/2*d*x + 5/2*c)^2*
sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + c
os(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) +
2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/
2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^3 - 90*((cos(d*x + c) + 1)*cos(5/
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2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin (5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c) ^3 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c) ^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d *x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^3 - (840*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^ 3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(cos(1/2* d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log (cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c) ^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2 *d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(co s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + s in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2 *c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^ 2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1 /2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c) ^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + l og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2 *d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^ 2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d* x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/

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2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(3/2*d*x + 3/2*c)^2 - 180*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^
2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*
c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))
*cos(7/2*d*x + 7/2*c) + 42*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2
*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5
/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/
2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 +
 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos
(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^
2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
```

/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c)
+ 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^
2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(9/2*d*x + 9/2*c)^2 - 21*(
40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2
*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2
*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2
+ 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 +
 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2
 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)
^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(
d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2

*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*
d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/
2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d
*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2
+ 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*
x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d
*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*co
s(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(
d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)
^2 + (90*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5
/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^
3 - 90*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*co

s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^3 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^3 - (840*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/

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2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 180*(cos(5/2*d*
x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin
(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*si
n(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin
(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c) + 42*(16*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*
x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*
c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x +
 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*s
in(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3
/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45
*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(
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log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*
sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3
*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*
c))*cos(9/2*d*x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 4
5*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 +
45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 1
6*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*
c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*
d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
```

2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2
*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*s
in(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) +
 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x
+ c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x
+ c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x +
 c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3
/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*
(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d
*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 - (840*(cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x

+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 4
5*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d
*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*si
n(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 90*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c)
+ 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x +
3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x
 + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*
x + c))*cos(9/2*d*x + 9/2*c) + 42*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*

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cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*
x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*
d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)
*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x +
 c) + 10)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 1
0)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*
(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3
/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c
)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2
 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^
2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(9/2*d*
x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 4
0*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^
2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 +
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sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)
 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/
2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2
 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2
+ 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^
2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*
x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) -
20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)
^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(

1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) +
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(
3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*
d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin
(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(
d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*s
in(7/2*d*x + 7/2*c)^2 + 2*(45*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2
*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*
cos(7/2*d*x + 7/2*c)^2 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)*sin(7/2*d*x + 7/2*c) + 45*(co
s(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2
*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x +
c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 - 21*(40*(
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^
3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co

```
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x
 + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45
*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (
45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 +
 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 +
7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x
+ c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x
+ 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)
^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x +
```

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 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/
2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x +
 c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40
*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x +
c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*
x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x +
 c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*
x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x
+ c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c))*co
s(9/2*d*x + 9/2*c) - 930*((cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*
d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin
(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(
9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*
x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3
/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2
*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) +
 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3
/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x
 + c))*cos(7/2*d*x + 7/2*c)^2 + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)
^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c)
)*sin(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*
sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*s
```

in(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2)*cos(1/2*arctan2(sin(d*x + c), cos(d*x + c))) - 2*(45*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 45*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 5*((4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d*x + 5/2*c)^2 + 2*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(3/2*d*x + 3/2*c)^2 + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)^2 + 2*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2 + 90*(((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c) - (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2*c) + 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 +

90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2

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 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*co
s(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x
+ c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x +
5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5
/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x
 + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c))*sin(9/2*d*x + 9/2*c)
 - 10*(2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*
c)^2)*cos(7/2*d*x + 7/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 7*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 7*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^
2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)*sin(3/2*d*x + 3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 2016*(((cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
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+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 36*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (

cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2
*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d
*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7
/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(5/2*arctan2(sin(d*x + c), cos(d*x + c))) -
 120*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (

cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2
*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d
*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7
/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) +
 30*(((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(
5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x
 + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2
 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74
*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x +
 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 1

05)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin
(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x +
 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 17
9*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d
*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c
)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(
5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x
 + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2
 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(
9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x +
c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^
2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/
2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c)
+ 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 17
9*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*si
n(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*si
n(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((74*cos(d*x + c)^2 + 74*sin
(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*
x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*
x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)
^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2
+ 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*
d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2
 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(
74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 1
79*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin
(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*
x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*
x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/
2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*co
s(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d
*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)
^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (
74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*s
in(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x
 + 7/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*cos(2/3*arctan2(
sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - (840*(cos(d*x + c) + 1)*si

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n(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 2
1*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^
2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d
*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x +
 c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c
) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
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2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 90*(cos(5/2*d*x + 5/2*c)^2*si
n(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos
(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*
c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c) + 42*(16*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20
*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x +
c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^
2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c
))*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x
 + c) + 10)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 1
1*cos(d*x + c) + 10)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(3/2*d*x + 3/2*c)^2 + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d
*x + c) + 10)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(
3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*
d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin
(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*co
s(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))
*sin(9/2*d*x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3
+ 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3
/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1

/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c)
- 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x
 + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*
x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(

d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 - 504*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2* cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + (90*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^3 - 90*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^3 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7

/2*d*x + 7/2*c)^3 - (840*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 336*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3
 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d
x + c)^2 + 45(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/
2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c)
 - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*
x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si
n(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x

+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*
d*x + 3/2*c)^2 - 180*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x +
 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x
+ c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d
*x + 7/2*c) + 42*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(
d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 20
*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*si
n(7/2*d*x + 7/2*c) + 42*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*
(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x
 + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) +
 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x +
 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(
5/2*d*x + 5/2*c) + 168*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(
d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(9/2*d*x + 9/2*c)^2 - 21*(40*(cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(

d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2
*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(
d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) +
 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
 + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*

```
c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin
(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*
x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x
 + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2
 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*co
s(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)
^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) +
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c)
 + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2
 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 - (840*
(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*
c)^3*sin(d*x + c) + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3
/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^
2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
```

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sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^
2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c
)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*
x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c
)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 90*(cos(
5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c
)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)
 + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c) + 42*(16*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(
3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x
+ 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
```

s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*
x + c)^2 + 11*cos(d*x + c) + 10)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*
sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x +
c) + 10)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/
2*c) + 42*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*c
os(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*
x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*c
os(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si
n(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*
d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*
c) + 168*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*
d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*
sin(3/2*d*x + 3/2*c))*sin(9/2*d*x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 9
0*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x +
c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c

)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +

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1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2
*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x +
 c) + 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*(45*(cos(5/2*d*x
+ 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d
*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(
d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3
/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 - 20*((cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*
c)*sin(7/2*d*x + 7/2*c) + 45*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*
sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*s
in(7/2*d*x + 7/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 +
16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(c
```

```
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) -
40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x +
 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*
x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x
+ 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*
x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*
x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(2
0*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c)
+ 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) -
```

sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^
2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2
 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)
 + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x +
3/2*c))*cos(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2*c) - 930*((cos(5/2*d*x + 5/
2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x +
 c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x
+ c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d
*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c
)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c)
 + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c
) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x
+ 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + (cos(5
/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)
^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)
+ sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 + (cos(5/2*d*
x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin
(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*si
n(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin
(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x +
 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*
x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d
*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/
2*d*x + 3/2*c)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) +
(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x +
5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x
 + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2)*cos(1/
2*arctan2(sin(d*x + c), cos(d*x + c))) - 2*(45*((cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2
 + 45*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos

```
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 35*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + 5*((4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/
2*d*x + 5/2*c)^2 + 2*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c)
 + 13)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*si
n(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(3/2*d*x + 3/2*c)^2 + (4*cos(d*x +
c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)^2 + 2*
(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos
(d*x + c) + 13)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + 35*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 70
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^2 + 90*(((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (co
s(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c) - (cos(5/2*
d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*s
in(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*
sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + s
in(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2
*c) + 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2
*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) -
80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x +
 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
```

x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*
x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x
+ 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si
n(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5
/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/
2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x +
 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2
*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1

```
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)
^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^
2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*
x + 7/2*c))*sin(9/2*d*x + 9/2*c) - 10*(2*((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + 7*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 14*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(3/2*d*x + 3/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + 7*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/
2*d*x + 7/2*c) + 2016*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*
x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
```

*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 36*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co

s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*(
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(
9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(5/2*arctan
2(sin(d*x + c), cos(d*x + c))) - 120*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/
2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co

s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*(
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(
9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(3/2*arctan
2(sin(d*x + c), cos(d*x + c))) + 30*(((74*cos(d*x + c)^2 + 74*sin(d*x + c)^
2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 +
 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d
*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 1
05)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*c
os(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d
*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3
/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(
d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x
 + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x
 + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^
2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 +
 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d
*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 1
05)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((7

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4*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*si
n(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x
 + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^
2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c
)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^
2 + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5
/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x
+ c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2
+ 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*
cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x +
5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 10
5)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(
d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x +
9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 1
05)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179
*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*
x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)
^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5
/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x
+ c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2
+ 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9
/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c
)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2
 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2
*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179
*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin
(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin
(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/2*arctan2(sin(d*x + c),
cos(d*x + c))))*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))
)^2 + 2*(45*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + si
n(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*
c)^2 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
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*c)^2)*cos(7/2*d*x + 7/2*c)*sin(7/2*d*x + 7/2*c) + 45*(cos(5/2*d*x + 5/2*c)
^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c)
+ cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c)
 + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x +
 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (
45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 +
 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x
+ c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6
)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 +
 (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
```

d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(
3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) +
45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*co
s(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x
+ c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x +
5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5
/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x
 + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2*c)
 + 2*(90*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5
/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^
3 - 90*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x +
3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x
 + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^3 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2

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+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^3 - (840*(cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*si
n(d*x + c) + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x
+ 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945
*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 2
1*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^
2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d
*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
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+ 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 180*(cos(5/2*d*
x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin
(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*si
n(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin
(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c) + 42*(16*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*
x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*
c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x +
 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*s
in(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3
/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45
*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
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/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*
sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3
*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*
c))*cos(9/2*d*x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 4
5*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 +
45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 1
6*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*
c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*
d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s

in(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2
*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*s
in(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) +
 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x
+ c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x
+ c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x +
 c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3
/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*
(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d
*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 - (840*(cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +

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 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 4
5*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d
*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*si
n(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 90*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c)
+ 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x +
3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x
 + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*
x + c))*cos(9/2*d*x + 9/2*c) + 42*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*
x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
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+ 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin (1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2* c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d *x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2* d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10) *cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin (d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^ 2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)*si n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 1 0)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos(d*x + c) + 1) *cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4* (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3 /2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2 *d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d* x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d*x + c)^2 + si n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^ 2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(9/2*d* x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d *x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 4 0*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + s in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2 *c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^ 2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si n(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/ 2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)

```
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/
2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2
 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2
+ 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^
2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*
x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) -
20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)
^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) +
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
```

```
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(
3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*
d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin
(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(
d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*s
in(7/2*d*x + 7/2*c)^2 + 2*(45*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2
*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*
cos(7/2*d*x + 7/2*c)^2 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)*sin(7/2*d*x + 7/2*c) + 45*(co
s(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2
*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x +
c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 - 21*(40*(
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^
3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 +
```

```
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x
 + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45
*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (
45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 +
 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 +
7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x
+ c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x
+ 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)
^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
```

*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/
2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x +
 c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40
*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x +
c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*
x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x +
 c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*
x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x
+ c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c))*co
s(9/2*d*x + 9/2*c) - 930*((cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*
d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin
(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(
9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*
x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3
/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2
*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) +
 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3
/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x
 + c))*cos(7/2*d*x + 7/2*c)^2 + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)
^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c)
)*sin(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*
sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*s
in(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x
+ c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d
*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/
2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*s

in(d*x + c))*sin(7/2*d*x + 7/2*c)^2)*cos(1/2*arctan2(sin(d*x + c), cos(d*x + c))) - 2*(45*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 45*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 5*((4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d*x + 5/2*c)^2 + 2*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(3/2*d*x + 3/2*c)^2 + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)^2 + 2*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2 + 90*(((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c) - (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2*c) + 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x

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+ c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6
)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 +
 (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(
3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) +
45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
```

+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*co
s(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x
+ c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x +
5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5
/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x
 + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c))*sin(9/2*d*x + 9/2*c)
 - 10*(2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*
c)^2)*cos(7/2*d*x + 7/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 7*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 7*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^
2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)*sin(3/2*d*x + 3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 2268*(((cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x
+ 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +

c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2
 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*
sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*
x + 7/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))
+ 36*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)

```
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2
*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d
*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7
/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(5/2*arctan2(sin(d*x + c), cos(d*x + c))) -
 120*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)
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^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2
*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d
*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7
/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) +
 30*(((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(
5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x
 + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2
 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74
*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x +
 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 1
05)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin
(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x +
 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 17
```

```
9*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d
*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c
)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(
5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x
 + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2
 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(
9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x +
c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^
2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/
2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c)
+ 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 17
9*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*si
n(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*si
n(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((74*cos(d*x + c)^2 + 74*sin
(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*
x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*
x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)
^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2
+ 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*
d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2
 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(
74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 1
79*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin
(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*
x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*
x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/
2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*co
s(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d
*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)
^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (
74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*s
in(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x
 + 7/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*cos(2/3*arctan2(
sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 930*((cos(5/2*d*x + 5/2*c)^2
*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) +
cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) +
 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3
/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c)^2*si
```

n(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos
(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*
c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + (cos(5/2*d*x
 + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(
d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin
(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(
3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 + (cos(5/2*d*x + 5/
2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x +
 c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x
+ c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d
*x + 3/2*c)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c
)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c)
 + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c
) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x
+ 3/2*c)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + (cos(5
/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)
^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)
+ sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2)*cos(1/2*arct
an2(sin(d*x + c), cos(d*x + c))) - 2*(45*((cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 45*
((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*
c)^2)*cos(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 35*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 5
*((4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)
*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x
+ c)^2 + 17*cos(d*x + c) + 13)*cos(3/2*d*x + 3/2*c)^2 + (4*cos(d*x + c)^2 +
 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)^2 + 2*(4*cos
(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x +
 c) + 13)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 70*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(
3/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(3/2*d*x + 3/2*c)^2 + 90*(((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +

```
 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c) - (cos(5/2*d*x +
5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x
 + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*
x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2
*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2*c) +
21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x +
 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos
(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c
)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)
^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*
c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x
+ c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*
sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
```

- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(
3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x
+ 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*c
os(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c
)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*si
n(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 2
4*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*
sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/
2*c))*sin(9/2*d*x + 9/2*c) - 10*(2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/

2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 560*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c

)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(
7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*
d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x +
 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2
*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2

+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x
+ 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*
d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2
+ 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)
*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*
c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x
+ 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x

+ 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/
2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^
2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2
*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2
*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2
*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)

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+ 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7
/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*
c))))*sin(1/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))) + 2520*(
((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos
(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x +
 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3
/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
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/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 36*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*

```
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/
2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*
x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(5/2*arctan2(sin(d*x + c), cos(d*x
 + c))) - 120*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*
c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2
)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
+ 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
```

sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) + 30*(((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*co s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*cos(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c)))^2 + 2*(90*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^3 - 90*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^3 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^3 - (840*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2* sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))* cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/ 2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2 *d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos (d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2 *d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d *x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^ 2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2* d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log (cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos (1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + si n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2* c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1 /2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/ 2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1 /2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^ 2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + lo g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 180*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2* d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5 /2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2* sin(d*x + c))*cos(7/2*d*x + 7/2*c) + 42*(16*(cos(d*x + c)^2 + sin(d*x + c)^ 2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1 /2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/ 2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2 *(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2

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*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*co
s(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos
(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^
2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(
d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*
cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*
sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(9/2*d*x + 9/
2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(
5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
 - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*
x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
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*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d* x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 - (840*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*

d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) -
 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x
+ 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*
x + 3/2*c)^2 - 90*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c
) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*
x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x
+ 9/2*c) + 42*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x
 + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
 + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 20*((
cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos
(d*x + c) + 10)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(3/2*d*x + 3/2
*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 +
4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d
*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(
5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + si

n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(9/2*d*x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2

```
 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d
*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d
*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2
*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*
x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 +
 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x
 + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*
x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos
(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d
*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^
2 + 2*(45*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos
```

(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(
5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c)
^2 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*cos(7/2*d*x + 7/2*c)*sin(7/2*d*x + 7/2*c) + 45*(cos(5/2*d*x + 5/2*c)^2
*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) +
cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) +
 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3
/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 9
0*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x +
c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co

s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*
sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 4
5*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/
2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45
*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(
5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(co
s(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x +
c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/
2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2
*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x +

c) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2*c) -
930*((cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2
*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*
d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*s
in(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^2 +
2*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x
+ 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(
d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)*cos(7/
2*d*x + 7/2*c) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2
*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c)
+ sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x +
7/2*c)^2 + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + si
n(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*
c)^2 + 2*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5
/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*c)*
sin(7/2*d*x + 7/2*c) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*
x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3
/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2
*d*x + 7/2*c)^2)*cos(1/2*arctan2(sin(d*x + c), cos(d*x + c))) - 2*(45*((cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)
*cos(9/2*d*x + 9/2*c)^2 + 45*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 70*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos
(3/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + 5*((4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*co
s(d*x + c) + 13)*cos(5/2*d*x + 5/2*c)^2 + 2*(4*cos(d*x + c)^2 + 4*sin(d*x +
c)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(3/2*d*x + 3
/2*c)^2 + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(
5/2*d*x + 5/2*c)^2 + 2*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x +
c) + 13)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*

sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x
+ 7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2 + 90*(((cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos
(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d
*x + 7/2*c) - (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) +
sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/
2*c))*cos(9/2*d*x + 9/2*c) + 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 4
5*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 +
45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 1

6*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*
c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*
d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2
*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*s
in(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) +
 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x
 + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x
 + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x +
 c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3
/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*
(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d
*x + 3/2*c))*sin(7/2*d*x + 7/2*c))*sin(9/2*d*x + 9/2*c) - 10*(2*((cos(d*x +

c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*co
s(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x +
7/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 7*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2
*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 2016*(((cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*
d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3
/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)
^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x

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+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/
3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 36*(((cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2
*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
+ 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9
/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
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1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin (d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2* d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3 /2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos (d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos (3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)* cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d* x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7 /2*c)^2)*sin(5/2*arctan2(sin(d*x + c), cos(d*x + c))) - 120*(((cos(d*x + c) ^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d *x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3 /2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co s(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin (d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2 *c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d *x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin (d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2 *c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d *x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3 /2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2 *d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)* sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^ 2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^ 2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos (d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9 /2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +

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1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7
/2*c)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) + 30*(((74*cos(d*x +
c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 +
 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2
*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2
 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74
*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*co
s(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/
2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*co
s(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((74*c
os(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5
/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105
)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d
*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x +
c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 +
 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2
 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos
(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x +
 c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^
2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74
*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x +
 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105
)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*c
os(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x
+ c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2
)*cos(7/2*d*x + 7/2*c)^2 + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*co
s(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*
x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/
2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c
) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2
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+ 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*c
os(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3
/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2
 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 +
74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 10
5)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*co
s(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*
x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/
2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((74*cos(d*x
+ c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2
 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)
^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 +
74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*
cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*
cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/2
*arctan2(sin(d*x + c), cos(d*x + c))))*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c)
, cos(3/2*d*x + 3/2*c)))^2 - 2*(840*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
 + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)
^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) +
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^

2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 90*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c) + 42*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(

3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(9/2*d*x + 9/2*c)^2 - 42*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x +

1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x +
5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*(
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(
16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(
3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x
+ 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3
/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1

/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 - 140*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)

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^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2
*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(s
in(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/
2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
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(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2
*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
+ 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9
/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
```

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+ 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7
/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2
*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*c
os(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x
 + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c
) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
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2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)
*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x
+ 3/2*c))))*cos(1/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c)))*si
n(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))) + 2*(90*(cos(5/2
*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*
sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2
*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) +
sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^3 - 90*((cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(
9/2*d*x + 9/2*c)^3 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^3 - (840*(cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(
45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 +
 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x
+ c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
```

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 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c)
 + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c
)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) +
 log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 180*(cos(5/2*d*x + 5/2*c)^2*sin(
d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3
/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*si
n(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)
^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c) + 42*(16*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*c
os(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c)
 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2
+ 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))
*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin
```

(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*
cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*
c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*s
in(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 +
24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 +
3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(9/2*d*x +
9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*c
os(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 +
45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) +
16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2
*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/
2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +

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1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d
*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 +
45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 +
 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*
sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2
+ (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2
*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x
 + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
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^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*
x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x
 + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(
7/2*d*x + 7/2*c)^2 + (90*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(
d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9
/2*d*x + 9/2*c)^3 - 90*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^3 - 20*((cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/
2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^
3 - (840*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d
*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) -
 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x
+ 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*
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x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 180*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c) + 42*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(

d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*
c) + 42*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos
(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x
+ 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos
(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*
x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c)
 + 168*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*
x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*si
n(3/2*d*x + 3/2*c))*cos(9/2*d*x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c)
 + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d
*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c

os(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*si
n(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*
d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*(
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/
2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)
^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*
c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos

(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d
*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c
) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 - (840*(cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c
) + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x
+ c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*
sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(
d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) +
45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2

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 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*
x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 90*(cos(5/2*d*x + 5/2*c)
^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c)
+ cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c)
 + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x +
 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c) + 42*(16*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c)
 - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d
*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x
+ c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x +
3/2*c))*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 11*co
s(d*x + c) + 10)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 11*cos(d*x + c) + 10)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*
cos(d*x + c) + 10)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x
 + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)
*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin
(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 +
45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 1
2*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos
```

(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(9/2*d*x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/

2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3
/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2
*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)
 + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*
cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*
x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*
x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x
 + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x +
 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) +
8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2
*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*(45*(cos(5/2*d*x + 5/2*c)^2*sin(d
*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/
2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin
(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^
2*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 - 20*((cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)*sin(7/2*d*x +

7/2*c) + 45*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + s
in(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2
c)^2 - 21(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5
/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
- 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x
+ 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*
x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x +
5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*(
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(lo

g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(
16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(
3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x
+ 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3
/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x +
c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c
)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*
d*x + 7/2*c))*cos(9/2*d*x + 9/2*c) - 930*((cos(5/2*d*x + 5/2*c)^2*sin(d*x +
c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*
x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*si
n(d*x + c))*cos(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c)
+ 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x +
3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d
*x + c))*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + (cos(5/2*d*x + 5/2*c)^
2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) +

cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c)
+ 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x +
3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 + (cos(5/2*d*x + 5/2*c)^2*sin
(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(
3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*s
in(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c
)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c)^2*sin(d*
x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2
*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2
*sin(d*x + c))*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + (cos(5/2*d*x + 5
/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x
+ c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x
+ c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*
d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2)*cos(1/2*arctan2(sin(d*
x + c), cos(d*x + c))) - 2*(45*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 45*((cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(
7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 5*((4*cos(d
*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d*x + 5/2*c)^2
+ 2*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 1
7*cos(d*x + c) + 13)*cos(3/2*d*x + 3/2*c)^2 + (4*cos(d*x + c)^2 + 4*sin(d*x
+ c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)^2 + 2*(4*cos(d*x + c)^
2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)*sin(3/2*d
*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*
sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*
d*x + 3/2*c)^2 + 90*(((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*
cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c) - (cos(5/2*d*x + 5/2*c)^2*s
in(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + co

s(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2
*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2
*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2*c) + 21*(40*(co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*
sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x +
 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*(
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 9
0*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*
cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x +
c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2

*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x +
3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2
*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si
n(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*
d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c
)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*(
(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c)
)*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c
) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x
+ c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x +
c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c))*sin(
9/2*d*x + 9/2*c) - 10*(2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2
c) + 7(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x

+ 3/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) +
2016*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/
2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*
d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x +
7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c

)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*
c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2
*d*x + 3/2*c))) + 36*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x
 + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3
/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3
/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)
*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^

```
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(5/2*arctan2(sin(d*x + c),
cos(d*x + c))) - 120*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x
 + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3
/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3
/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)
*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^
```

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2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(3/2*arctan2(sin(d*x + c),
cos(d*x + c))) + 30*(((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x
+ c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)
^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (7
4*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x
+ 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 10
5)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*
cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x
 + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^
2)*cos(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179
*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin
(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos
(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x
+ c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)
^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (7
4*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x
+ 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2
 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(
74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 1
79*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin
(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*
x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*
x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((74*cos(d*x
 + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^
2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c
)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 +
 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74
*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x +
 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179
*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((7
4*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*si
n(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x
 + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^
2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c
)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*
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sin(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - (840*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c

)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 90*(cos(5/2*d
*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*si
n(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*s
in(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + si
n(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c) + 42*(16*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d
*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2
*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c
)^2 + 11*cos(d*x + c) + 10)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(3/2*d*x
 + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) +
10)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 11*cos(d*x + c) + 10)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)
 + 42*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*
cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*
x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*
x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x
 + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/

```
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x +
 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) +
168*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3
/2*d*x + 3/2*c))*sin(9/2*d*x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) +
45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d
*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3
/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
```

n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x
 + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d
*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x
 + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2
+ 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(
3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)
+ 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si
n(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x
+ 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) +
 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 - 504*(((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x

+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2
 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2
)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*
x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*
x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3
/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)
^2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))*sin(2/3*ar
ctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + (90*(cos(5/2*d*x + 5/2
*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x +
c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x +
 c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*
x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^3 - 90*((cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*

d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3
/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x +
9/2*c)^3 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*sin(7/2*d*x + 7/2*c)^3 - (840*(cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/
2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
 + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x +
c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(
3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*lo

g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(3/2*d*x + 3/2*c)^2 - 180*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) +
2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3
/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x
+ c))*cos(7/2*d*x + 7/2*c) + 42*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x
+ 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d
*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*
x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x +
c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*
((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c
))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2

```
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x +
c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x
 + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x
 + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(9/2*d*x + 9/2*c)^2
- 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x
 + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*c
os(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2
*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x +
c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/
2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*
x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c
)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
```

```
) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*si
n(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*
x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4
*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2
*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*
sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 +
 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 +
3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x +
7/2*c)^2 - (840*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*co
s(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2
 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
```

+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)
+ 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3
/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5
/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos
(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c
)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c
)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2
c)^2 - 90(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*co
s(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin
(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2
*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c
) + 42*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d

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*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) -
 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c
)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) +
 log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x
 + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(5/2*d*x + 5/2
*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x +
c) + 10)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos
(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(3/2*d*x + 3/2*c)^2)*
sin(7/2*d*x + 7/2*c) + 42*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2
0*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d
*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c)
 + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x
 + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*si
n(5/2*d*x + 5/2*c) + 168*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*co
s(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(9/2*d*x + 9/2*c)^2 - 21*(40*(cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*si
n(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si
n(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
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sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(

d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*
x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^
2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*
cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x +
c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)
+ log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x +
c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)
^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*(
45*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x
 + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(
d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 - 20
*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*co
s(7/2*d*x + 7/2*c)*sin(7/2*d*x + 7/2*c) + 45*(cos(5/2*d*x + 5/2*c)^2*sin(d*
x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2
*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2
*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(

1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
 + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x +
c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*
x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d
x + c) + 16(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2
*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x +
 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1

/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x
 + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x +
 c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 +
13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/
2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) +
12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x +
5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/
2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3
)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2*c) - 930*((
cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5
/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x
+ c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^2 + 2*(cos
(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2
*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*
c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c
) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x +
 7/2*c) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos
(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(
5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c)
^2 + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*
d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d
*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*si
n(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*c)^2 +
2*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
 + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x
+ 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d
*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*c)*sin(7/2

*d*x + 7/2*c) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*
c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c)
+ sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x +
7/2*c)^2)*cos(1/2*arctan2(sin(d*x + c), cos(d*x + c))) - 2*(45*((cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/
2*d*x + 9/2*c)^2 + 45*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) +
 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 70*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
3/2*d*x + 3/2*c)^2 + 5*((4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x +
 c) + 13)*cos(5/2*d*x + 5/2*c)^2 + 2*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 +
 17*cos(d*x + c) + 13)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (4*cos(d
*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(3/2*d*x + 3/2*c)^2
 + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13
)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x
 + c)^2 + 17*cos(d*x + c) + 13)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c
)^2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2 + 90*(((cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/
2*c) - (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/
2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2
*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*
sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c))*c
os(9/2*d*x + 9/2*c) + 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*
x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*

c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d
x + c) + 16(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2
*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40
*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5
/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x
+ c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x +
3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x
+ c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d
*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -

```
 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*
(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d
*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) +
9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - s
in(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2
+ 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 +
 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) +
 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/
2*c))*sin(7/2*d*x + 7/2*c))*sin(9/2*d*x + 9/2*c) - 10*(2*((cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/
2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^
2 + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
) + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 2016*(((cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
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x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 36*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +

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c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 +
 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*
cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x
+ 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2
)*sin(5/2*arctan2(sin(d*x + c), cos(d*x + c))) - 120*(((cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d
*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
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c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 +
 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*
cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x
+ 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2
)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) + 30*(((74*cos(d*x + c)^2 +
74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*
cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*
cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*
x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x +
 c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*si

n(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(45*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/

2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*s
in(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*co
s(7/2*d*x + 7/2*c)^2 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)*sin(7/2*d*x + 7/2*c) + 45*(cos(
5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c
)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)
+ sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 - 21*(40*(co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*
sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x +
3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*(
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 9
0*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/

2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*
cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x +
c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x +
3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2
*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si
n(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*
d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c
)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*(
(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c)
)*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c
) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x
+ c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x +

c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c))*cos(
9/2*d*x + 9/2*c) + 2*(90*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(
d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9
/2*d*x + 9/2*c)^3 - 90*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^3 - 20*((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/
2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^
3 - (840*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d
*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) -
80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x
+ 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*
x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c

os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*
x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 9
45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 -
 180*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*
d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d
*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*si
n(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c) + 42
(16(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*si
n(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 +
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*
c) + 42*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos
(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x

+ 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos
(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*
x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c)
+ 168*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*
x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*si
n(3/2*d*x + 3/2*c))*cos(9/2*d*x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c)
+ 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d
*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(

1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*si
n(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*
d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*(
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/
2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)
^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*
c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d
*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c

) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 - (840*(cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c
) + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x
+ c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*
sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(
d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) +
 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*
x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*

x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 90*(cos(5/2*d*x + 5/2*c)
^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c)
+ cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c)
+ 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x +
3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c) + 42*(16*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c)
- 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d
x + c) + 45((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x
+ c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x +
3/2*c))*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 11*co
s(d*x + c) + 10)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 11*cos(d*x + c) + 10)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*
cos(d*x + c) + 10)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x
+ 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)
*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin
(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 +
45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 1
2*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/
2*c))*sin(9/2*d*x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*

x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 +
 (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2
+ 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) +
 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/
2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/
2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3
/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)

+ 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2
*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)
+ 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*
cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*
x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*
x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x
+ c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x +
3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) +
8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2
*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*(45*(cos(5/2*d*x + 5/2*c)^2*sin(d
*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/
2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin
(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^
2*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 - 20*((cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)*sin(7/2*d*x +
7/2*c) + 45*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + s
in(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2

c)^2 - 21(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5
/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
- 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x
 + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*
x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x +
 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*(
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2

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*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(
16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(
3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x
 + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3
/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x +
c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c
)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*
d*x + 7/2*c))*cos(9/2*d*x + 9/2*c) - 930*((cos(5/2*d*x + 5/2*c)^2*sin(d*x +
 c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*
x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*si
n(d*x + c))*cos(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c)
 + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x +
 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d
*x + c))*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + (cos(5/2*d*x + 5/2*c)^
2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) +
 cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c)
+ 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x +
3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 + (cos(5/2*d*x + 5/2*c)^2*sin
(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(
```

3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*s
in(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c
)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c)^2*sin(d*
x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2
*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2
*sin(d*x + c))*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + (cos(5/2*d*x + 5
/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x
+ c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x
+ c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*
d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2)*cos(1/2*arctan2(sin(d*
x + c), cos(d*x + c))) - 2*(45*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 45*((cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(
7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 5*((4*cos(d
*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d*x + 5/2*c)^2
+ 2*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 1
7*cos(d*x + c) + 13)*cos(3/2*d*x + 3/2*c)^2 + (4*cos(d*x + c)^2 + 4*sin(d*x
+ c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)^2 + 2*(4*cos(d*x + c)^
2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)*sin(3/2*d
*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*
sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*
d*x + 3/2*c)^2 + 90*(((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*
cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c) - (cos(5/2*d*x + 5/2*c)^2*s
in(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + co
s(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2
*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2
*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2*c) + 21*(40*(co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^

2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*
sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x +
 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*(
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 9
0*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*
cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x +
c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2

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 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x +
3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2
*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si
n(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*
d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c
)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*(
(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c)
)*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c
) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x
+ c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x +
c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c))*sin(
9/2*d*x + 9/2*c) - 10*(2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2
*c) + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
+ 3/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) +
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2268*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2 *d*x + 3/2*c))) + 36*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin (d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2* d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3 /2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin (d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2 *c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5 /2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2 *cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2 *d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)* cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^ 2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2* c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3 /2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos (d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos (d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2 *c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2* d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3 /2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)* sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d* x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c) *sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d* x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^ 2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d* x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/ 2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin (3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(5/2*arctan2(sin(d*x + c), cos(d*x + c))) - 120*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) + 30*(((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*

x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 17
9*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d
*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c
)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*
cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 930*((cos(5/
2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^
2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) +
sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d
*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*si
n(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*s
in(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + si
n(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c
) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d
*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*
x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin
(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 + (
cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5
/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x
+ c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*c)^2 + 2*(cos
(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2
*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*
c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c
) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x +
7/2*c) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos
(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(
5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c)
^2)*cos(1/2*arctan2(sin(d*x + c), cos(d*x + c))) - 2*(45*((cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/
2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x
+ 9/2*c)^2 + 45*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3
/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*si
n(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*
x + 3/2*c)^2 + 5*((4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) +
13)*cos(5/2*d*x + 5/2*c)^2 + 2*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*co

s(d*x + c) + 13)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (4*cos(d*x + c
)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(3/2*d*x + 3/2*c)^2 + (4*
cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2
c)^2 + 2(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^
2 + 17*cos(d*x + c) + 13)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 +
35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
c)^2 + 70(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2 + 90*(((cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c) -
(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
+ 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x +
5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*
x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c))*cos(9/2
*d*x + 9/2*c) + 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 -
40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)
^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c
) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1

/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2 *c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2* d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5 /2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^ 2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d* x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s in(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + si n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2* c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2* d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) ^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d *x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1 /2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin (1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + si n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2* c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2* c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d *x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d *x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3 /2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin (3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2 *d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2* c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d *x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d* x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(lo g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/ 2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2

*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*si
n(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos
(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*
sin(7/2*d*x + 7/2*c))*sin(9/2*d*x + 9/2*c) - 10*(2*((cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
+ 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + 7*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
^2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + 7*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*sin(7/2*d*x + 7/2*c) + 560*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*c
os(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*

c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3

/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)
^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2
*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2
*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2
*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)

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^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7
/2*d*x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*
c)))^2 + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3
/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c)
+ ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*c
os(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^
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2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d
*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), co
s(3/2*d*x + 3/2*c))))*sin(1/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7
/2*c))) + 2520*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
 + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2
*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
```

+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 36*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +

(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x
 + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(5/2*arctan2(sin(d
*x + c), cos(d*x + c))) - 120*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*
d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*co
s(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/
2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +

(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x
 + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(3/2*arctan2(sin(d
*x + c), cos(d*x + c))) + 30*(((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179
*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin
(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos
(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x
+ c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)
^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (7
4*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x
+ 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c
)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2
 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2
*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179
*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin
(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin
(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((74*cos(d
*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c
)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x +
 c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2
 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(
74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x
 + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 1
79*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((7

4*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*si
n(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x
 + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^
2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c
)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^
2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos
(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*
x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^
2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (7
4*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x
+ 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*si
n(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x
+ 9/2*c)*sin(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 1
79*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*s
in(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*c
os(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*
x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x +
c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*
x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x
 + c))))*sin(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c)))^2 - 1
008*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2
)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*s
in(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*

x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*
d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*
x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/
2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*sin(7/2*d*x + 7/2*c)^2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d
*x + 3/2*c)))*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))
+ 2*(90*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3
/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/
2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^3
 - 90*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^3 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^3 - (840*(cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin

(d*x + c) + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 180*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(

d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin
(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(
3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c) + 42*(16*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x
 + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c
)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3
/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x +
3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*si
n(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/
2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*
((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*s
in(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*
cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c
))*cos(9/2*d*x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^
3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*

cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 4
5*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c
) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d
*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si
n(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*
d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*si
n(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos

```
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) +
2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos
(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x +
 c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*
c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x +
 c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x +
c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/
2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*
c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*
x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 - (840*(cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*
x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
```

2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 90*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c) + 42*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*

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cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x +
c) + 10)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10
)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(
4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/
2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)
*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2
+ 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2
 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(9/2*d*x
 + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40
*cos(5/2*d*x + 5/2*c)^3sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2
 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)
+ 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3
/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5
/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
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/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x

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+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(
d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d
*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*si
n(7/2*d*x + 7/2*c)^2 + 2*(45*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*
sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*c
os(7/2*d*x + 7/2*c)^2 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)*sin(7/2*d*x + 7/2*c) + 45*(cos
(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2
*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*
c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c
) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 - 21*(40*(c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3
*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x
+ 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*
((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(l
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og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x

+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x +
c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x
+ c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x +
c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c))*cos
(9/2*d*x + 9/2*c) - 930*((cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(
d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9
/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x
+ c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/
2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*
d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) +
2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/
2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x
+ c))*cos(7/2*d*x + 7/2*c)^2 + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^
2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*
c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))
*sin(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*s
in(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*si
n(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x +
c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*
x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*si
n(d*x + c))*sin(7/2*d*x + 7/2*c)^2)*cos(1/2*arctan2(sin(d*x + c), cos(d*x +
c))) - 2*(45*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(
3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 45*((cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3
/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x

+ 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^
2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 5*((4*cos(d*x + c)^2 + 4*sin
(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d*x + 5/2*c)^2 + 2*(4*cos(d*x +
c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d*x + 5/2*c)*cos(3
/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) +
13)*cos(3/2*d*x + 3/2*c)^2 + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(
d*x + c) + 13)*sin(5/2*d*x + 5/2*c)^2 + 2*(4*cos(d*x + c)^2 + 4*sin(d*x + c
)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (4*
cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(3/2*d*x + 3/2
*c)^2)*sin(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + 35*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2 +
90*(((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*cos(7/2*d*x + 7/2*c) - (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*c
os(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c
)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/
2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c
))*sin(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2*c) + 21*(40*(cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (4
5*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 +
90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x +
c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/

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2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)
*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 +
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3
/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 4
5*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos
(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x +
 c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5
/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos
```

(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/
2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x
+ c) + 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c))*sin(9/2*d*x + 9/2*c)
- 10*(2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*cos(7/2*d*x + 7/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 7*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 7*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 2016*(((cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x +
 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*
d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin

(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 36*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*

x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*
d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*
x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/
2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*sin(7/2*d*x + 7/2*c)^2)*sin(5/2*arctan2(sin(d*x + c), cos(d*x + c))) -
120*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2
)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*s
in(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*

x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*
d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*
x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/
2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*sin(7/2*d*x + 7/2*c)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) +
30*(((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5
/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x
+ c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2
+ 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*
cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x +
5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 10
5)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(
d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x +
9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 1
05)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179
*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*
x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)
^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5
/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x
+ c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2
+ 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9
/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c
)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2
+ 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2

*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 4*(45*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)*sin(7/2*d*x + 7/2*c) + 45*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x

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+ c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d
*x + 7/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 -
40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)
^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c
) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5
/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^
2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2
 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
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1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)
^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d
*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) -
 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c
)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) +
 log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin
(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2
*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*(
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*si
n(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos
(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*
cos(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2*c) + 4*(90*(cos(5/2*d*x + 5/2*c)^2*
sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + c
os(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) +
2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/
2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^3 - 90*((cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
 + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)
^3 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
```

2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*sin(7/2*d*x + 7/2*c)^3 - (840*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^
3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^
2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x +
c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*
x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c

) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(3/2*d*x + 3/2*c)^2 - 180*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^
2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*
c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))
*cos(7/2*d*x + 7/2*c) + 42*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2
*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5
/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/
2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 +
 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos
(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^
2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c)
+ 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co

s(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^
2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(9/2*d*x + 9/2*c)^2 - 21*(
40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2
*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2
*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2
+ 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 +
 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2
 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)
^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(
d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1

))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*
d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/
2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d
*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2
+ 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*
x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d
*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*co
s(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(
d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)
^2 + (90*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5
/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^
3 - 90*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x +
3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x
 + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^3 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2

+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^3 - (840*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*

```
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 180*(cos(5/2*d*
x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin
(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*si
n(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin
(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c) + 42*(16*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*
x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*
c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x +
 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*s
in(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3
/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45
*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*
sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3
```

*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*
c))*cos(9/2*d*x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 4
5*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 +
45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 1
6*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*
c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*
d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)

```
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2
*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*s
in(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) +
 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x
+ c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x
+ c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x +
 c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3
/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*
(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d
*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 - (840*(cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 4
5*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
```

*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d
*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*si
n(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 90*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c)
+ 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x +
3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*
x + c))*cos(9/2*d*x + 9/2*c) + 42*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*
x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(

cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*
d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)
*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x +
c) + 10)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 1
0)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*
(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3
/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c
)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2
+ 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^
2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(9/2*d*
x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 4
0*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^
2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)
+ 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)

^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/
2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2
 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2
+ 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^
2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*
x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) -
20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)
^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) +
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/

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2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(
3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*
d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin
(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(
d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*s
in(7/2*d*x + 7/2*c)^2 + 2*(45*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2
*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*
cos(7/2*d*x + 7/2*c)^2 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)*sin(7/2*d*x + 7/2*c) + 45*(co
s(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2
*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x +
c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 - 21*(40*(
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^
3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x
 + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
```

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2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45
*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (
45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 +
 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 +
7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x
+ c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x
+ 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)
^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/
```

2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x +
 c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40
*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x +
c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*
x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x +
 c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*
x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x
+ c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c))*co
s(9/2*d*x + 9/2*c) - 930*((cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*
d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin
(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(
9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*
x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3
/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2
*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) +
 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3
/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x
 + c))*cos(7/2*d*x + 7/2*c)^2 + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)
^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c)
)*sin(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*
sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*s
in(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x
+ c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d
*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/
2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*s
in(d*x + c))*sin(7/2*d*x + 7/2*c)^2)*cos(1/2*arctan2(sin(d*x + c), cos(d*x
+ c))) - 2*(45*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/

2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 45*((cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)
^2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 5*((4*cos(d*x + c)^2 + 4*si
n(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d*x + 5/2*c)^2 + 2*(4*cos(d*x
+ c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) +
13)*cos(3/2*d*x + 3/2*c)^2 + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos
(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)^2 + 2*(4*cos(d*x + c)^2 + 4*sin(d*x +
c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (4
*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(3/2*d*x + 3/
2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + 35*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2 +
90*(((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*cos(7/2*d*x + 7/2*c) - (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*
cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*
c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5
/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x +
c))*sin(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2*c) + 21*(40*(cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (
45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 +
90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x
+ c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x

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 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6
)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 +
 (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(
3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) +
45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*co
s(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(
```

cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin (1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(co s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/ 2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1 /2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/ 2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2* d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log (cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5 /2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c))*sin(9/2*d*x + 9/2*c) - 10*(2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d* x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos (5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2* c)^2)*cos(7/2*d*x + 7/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d *x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^ 2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d *x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 2016*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)* cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos (d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d *x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3

/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 36*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*

sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2
*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d
*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7
/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(5/2*arctan2(sin(d*x + c), cos(d*x + c))) -
 120*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*

sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2
*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d
*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7
/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) +
 30*(((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(
5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x
 + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2
 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74
*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x +
 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 1
05)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin
(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x +
 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 17
9*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d
*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c
)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(

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5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x
 + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2
 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(
9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x +
c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^
2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/
2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c)
+ 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 17
9*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*si
n(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*si
n(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((74*cos(d*x + c)^2 + 74*sin
(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*
x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*
x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)
^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2
+ 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*
d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2
 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(
74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 1
79*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin
(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*
x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*
x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/
2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*co
s(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d
*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)
^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (
74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*s
in(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x
 + 7/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*cos(2/3*arctan2(
sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - (840*(cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 2
1*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^
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2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 90*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c) + 42*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x +

c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^
2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c
))*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x
 + c) + 10)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 1
1*cos(d*x + c) + 10)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(3/2*d*x + 3/2*c)^2 + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d
*x + c) + 10)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(
3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*
d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin
(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*co
s(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))
*sin(9/2*d*x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3
+ 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3
/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c

os(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c)
- 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x
 + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*
x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(
d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*

d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*
(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3
/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c
) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
 - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c
)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)
^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*
c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x
+ 3/2*c))*sin(7/2*d*x + 7/2*c)^2 - 504*(((cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*co
s(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x +
9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2

+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + (90*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^3 - 90*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^3 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^3 - (840*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^

2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 180*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c) + 42*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(

d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(9/2*d*x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)

^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2
*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(
d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) +
45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*
c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin
(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*
x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1

```
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x
+ 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2
+ 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*co
s(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)
^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) +
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c)
 + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2
 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 - (840*
(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*
c)^3*sin(d*x + c) + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3
/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^
2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^
2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
```

+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c
)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*
x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c
)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 90*(cos(
5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c
)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)
+ sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c) + 42*(16*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(
3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x
+ 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*
x + c)^2 + 11*cos(d*x + c) + 10)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*
sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x +

c) + 10)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/
2*c) + 42*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*c
os(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*
x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*c
os(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si
n(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*
d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*
c) + 168*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*
d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*
sin(3/2*d*x + 3/2*c))*sin(9/2*d*x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 9
0*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x +
c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos

```
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*
sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 4
5*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/
2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45
*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(
5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(co
s(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x +
c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/
2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*
```

x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2
*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x +
 c) + 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*(45*(cos(5/2*d*x
+ 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d
*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(
d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3
/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 - 20*((cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*
c)*sin(7/2*d*x + 7/2*c) + 45*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*
sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*s
in(7/2*d*x + 7/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 +
16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)

```
+ 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) -
40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x +
 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*
x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x
+ 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*
x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*
x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(2
0*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c)
+ 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) -
 sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^
2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2
 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
```

1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)
+ 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x +
3/2*c))*cos(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2*c) - 930*((cos(5/2*d*x + 5/
2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x +
c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x
+ c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d
*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c
)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c)
+ cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c
) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x
+ 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + (cos(5
/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)
^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)
+ sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 + (cos(5/2*d*
x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin
(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*si
n(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin
(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x +
5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*
x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d
*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/
2*d*x + 3/2*c)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) +
(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x +
5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x
+ c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2)*cos(1/
2*arctan2(sin(d*x + c), cos(d*x + c))) - 2*(45*((cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2
+ 45*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 35*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)

^2 + 5*((4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/
2*d*x + 5/2*c)^2 + 2*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c)
 + 13)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*si
n(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(3/2*d*x + 3/2*c)^2 + (4*cos(d*x +
c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)^2 + 2*
(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos
(d*x + c) + 13)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + 35*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 70
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^2 + 90*(((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (co
s(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c) - (cos(5/2*
d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*s
in(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*
sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + s
in(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2
c) + 21(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2
*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) -
80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x +
 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*
x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x
+ 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s

```
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si
n(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5
/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/
2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x +
 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2
*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
```

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 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)
^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^
2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*
x + 7/2*c))*sin(9/2*d*x + 9/2*c) - 10*(2*((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + 7*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 14*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(3/2*d*x + 3/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + 7*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/
2*d*x + 7/2*c) + 2016*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*
x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
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 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c
)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x +
 3/2*c), cos(3/2*d*x + 3/2*c))) + 36*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/
2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
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 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*(
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(
9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(5/2*arctan
2(sin(d*x + c), cos(d*x + c))) - 120*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/
2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
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sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*(
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(
9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(3/2*arctan
2(sin(d*x + c), cos(d*x + c))) + 30*(((74*cos(d*x + c)^2 + 74*sin(d*x + c)^
2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 +
 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d
*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 1
05)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*c
os(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d
*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3
/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(
d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x
 + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x
 + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^
2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 +
 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d
*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 1
05)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((7
4*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*si
n(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x
 + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^
2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c
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)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^
2 + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5
/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x
+ c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2
+ 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*
cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x +
5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 10
5)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(
d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x +
9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 1
05)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179
*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*
x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)
^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5
/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x
+ c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2
+ 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9
/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c
)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2
 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2
*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179
*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin
(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin
(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/2*arctan2(sin(d*x + c),
cos(d*x + c))))*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))
)^2 + 2*(45*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + si
n(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*
c)^2 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^2)*cos(7/2*d*x + 7/2*c)*sin(7/2*d*x + 7/2*c) + 45*(cos(5/2*d*x + 5/2*c)
^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c)
+ cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c)
 + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x +
 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (

45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(

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3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) +
45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*co
s(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x
+ c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x +
5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5
/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x
 + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2*c)
 + 2*(90*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5
/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^
3 - 90*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x +
3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x
 + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^3 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^3 - (840*(cos(d*
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x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c

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)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 180*(cos(5/2*d*
x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin
(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*si
n(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin
(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c) + 42*(16*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*
x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*
c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x +
 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*s
in(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3
/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45
*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*
sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3
*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*
c))*cos(9/2*d*x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x
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+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 4
5*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 +
45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 1
6*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*
c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*
d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2
*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*s

in(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 - (840*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d

```
*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*si
n(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 90*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c)
+ 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x +
3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x
 + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*
x + c))*cos(9/2*d*x + 9/2*c) + 42*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*
x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
```

```
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*
d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)
*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x +
 c) + 10)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 1
0)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*
(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3
/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c
)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2
 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^
2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(9/2*d*
x + 9/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 4
0*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^
2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)
 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
```

))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/
2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2
 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2
+ 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^
2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*
x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) -
20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)
^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) +
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(
3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*
d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c

```
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin
(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(
d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*s
in(7/2*d*x + 7/2*c)^2 + 2*(45*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2
*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*
cos(7/2*d*x + 7/2*c)^2 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)*sin(7/2*d*x + 7/2*c) + 45*(co
s(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2
*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x +
c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 - 21*(40*(
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^
3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x
 + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45
*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
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d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x +

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c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*
x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x +
 c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*
x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x
+ c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c))*co
s(9/2*d*x + 9/2*c) - 930*((cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*
d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin
(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(
9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*
x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3
/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2
*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) +
 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3
/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x
 + c))*cos(7/2*d*x + 7/2*c)^2 + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)
^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c)
)*sin(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*
sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*s
in(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x
+ c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d
*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/
2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*s
in(d*x + c))*sin(7/2*d*x + 7/2*c)^2)*cos(1/2*arctan2(sin(d*x + c), cos(d*x
+ c))) - 2*(45*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/
2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 45*((cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
```

3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
 + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)
^2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 5*((4*cos(d*x + c)^2 + 4*si
n(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d*x + 5/2*c)^2 + 2*(4*cos(d*x
+ c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) +
 13)*cos(3/2*d*x + 3/2*c)^2 + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos
(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)^2 + 2*(4*cos(d*x + c)^2 + 4*sin(d*x +
c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (4
*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(3/2*d*x + 3/
2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + 35*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2 +
 90*(((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x +
 3/2*c)^2)*cos(7/2*d*x + 7/2*c) - (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*
cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*
c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5
/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x +
c))*sin(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2*c) + 21*(40*(cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (
45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 +
 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x
+ c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2

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*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6
)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 +
 (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(
3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) +
45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*co
s(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x
+ c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x +
5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
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+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5
/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x
 + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c))*sin(9/2*d*x + 9/2*c)
 - 10*(2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*
c)^2)*cos(7/2*d*x + 7/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 7*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 7*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^
2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)*sin(3/2*d*x + 3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 2268*(((cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x
+ 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*

x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2
 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*
sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*
x + 7/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))
+ 36*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/

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2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2
*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d
*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7
/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(5/2*arctan2(sin(d*x + c), cos(d*x + c))) -
 120*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
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2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2
*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d
*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7
/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) +
 30*(((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(
5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x
 + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2
 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74
*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x +
 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 1
05)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin
(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x +
 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 17
9*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d
*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c
)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(
5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x
 + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2
 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(
9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x +
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c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^
2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/
2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c)
+ 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 17
9*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*si
n(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*si
n(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((74*cos(d*x + c)^2 + 74*sin
(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*
x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*
x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)
^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2
+ 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*
d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2
 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(
74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 1
79*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin
(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*
x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*
x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/
2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*co
s(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d
*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)
^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (
74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*s
in(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x
 + 7/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*cos(2/3*arctan2(
sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 930*((cos(5/2*d*x + 5/2*c)^2
*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) +
cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) +
 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3
/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c)^2*si
n(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos
(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*
c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + (cos(5/2*d*x
 + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(
d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin
(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(

3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 + (cos(5/2*d*x + 5/
2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x +
 c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x
+ c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d
*x + 3/2*c)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c
)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c)
 + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c
) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x
+ 3/2*c)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + (cos(5
/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)
^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)
+ sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2)*cos(1/2*arct
an2(sin(d*x + c), cos(d*x + c))) - 2*(45*((cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 45*
((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*
c)^2)*cos(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 35*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 5
*((4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)
*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x
+ c)^2 + 17*cos(d*x + c) + 13)*cos(3/2*d*x + 3/2*c)^2 + (4*cos(d*x + c)^2 +
 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)^2 + 2*(4*cos
(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x +
 c) + 13)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 70*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(
3/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(3/2*d*x + 3/2*c)^2 + 90*(((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c) - (cos(5/2*d*x +
5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x
 + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*
x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2

*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2*c) +
21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x +
5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos
(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c
)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)
^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*
c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x
+ c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*
sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +

```
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(
3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x
+ 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*c
os(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c
)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*si
n(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 2
4*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*
sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/
2*c))*sin(9/2*d*x + 9/2*c) - 10*(2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + 7*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 14*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2
*d*x + 3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
```

```
*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + 7*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x
+ 7/2*c) + 595*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
 + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2
*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*s
in(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*
x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(
7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
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+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*
d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x +
9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2
*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x
+ 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c

)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*
d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2
+ 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)
*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*
c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x
 + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
 + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/
2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x

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 + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^
2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2
*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2
*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2
*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
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+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7
/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*
c))))*sin(1/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))) + 2520*(
((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos
(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x +
7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3
/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c)
+ ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c

)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*s
in(7/2*d*x + 7/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x +
3/2*c))) + 36*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*
c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2
)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
+ 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/
2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^

2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(5/2*arctan2(sin(d*x + c), cos(d*x + c))) - 120*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^

2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) + 30*(((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c)

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+ 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 +
179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos
(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2
*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*si
n(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d
*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)
^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*si
n(7/2*d*x + 7/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*cos(2/7
*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))) + 4*(90*(cos(5/2*d*x
+ 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d
*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(
d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3
/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^3 - 90*((cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos
(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d
*x + 9/2*c)^3 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*
d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^3 - (840*(cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)^3 + 336*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(3/2*d*x + 3/2*c)^3 - 840*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c)
+ 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
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*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d
*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)
*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 +
 (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 - 180*(cos(5/2*d*x + 5/2*c)^2*sin(d*x +
 c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*
x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*si
n(d*x + c))*cos(7/2*d*x + 7/2*c) + 42*(16*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/
2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45
*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(
5/2*d*x + 5/2*c) + 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
```

```
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d
*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2
+ 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*
x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d
*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*co
s(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*si
n(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(9/2*d*x + 9/2*
c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/
2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) -
 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x
+ 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d
*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1
```

/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x
 + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x +
5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(1
6*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*
c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3
/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x
+ 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/
2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2

*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c
)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)
^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d
*x + 7/2*c)^2 - (840*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 336*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 8
40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x +
 c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*
x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(5/2*d*x + 5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(3/2*d*x + 3/2*c)^2 + 21*(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 4
0*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x +
5/2*c)^2 + 945*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si

```
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*
x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x
+ 3/2*c)^2 - 90*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*
c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c)
+ sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x +
9/2*c) + 42*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x +
 c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*
x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x +
 c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 20*((co
s(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d
*x + c) + 10)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 1
1*cos(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 11*cos(d*x + c) + 10)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 11*cos(d*x + c) + 10)*sin(3/2*d*x + 3/2*c
)^2)*sin(7/2*d*x + 7/2*c) + 42*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^
2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*
sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x
 + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/
2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 +
 (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(
```

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cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 1
2)*sin(5/2*d*x + 5/2*c) + 168*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 +
 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(9/2*d*x + 9/2*c)^2 - 21*(40*
(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)
^3*sin(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*
x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 4
5*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 +
(45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2
+ 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x
 + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
```

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2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x
 + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c
)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3
/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x
+ c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 4
0*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x +
 c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d
*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d
*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x
 + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2
+ 2*(45*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3
/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/
2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2
 - 20*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
```

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 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*cos(7/2*d*x + 7/2*c)*sin(7/2*d*x + 7/2*c) + 45*(cos(5/2*d*x + 5/2*c)^2*s
in(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + co
s(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2
*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2
*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 - 21*(40*(cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c)
 + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d
*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*si
n(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
```

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sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*
d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*(
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/
2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)
^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*
c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d
*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c
) + 3)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2*c) - 9
30*((cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d
*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*
x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin
(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^2 + 2
*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
+ 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x +
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5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*
x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)*cos(7/2*
d*x + 7/2*c) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) +
sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7
/2*c)^2 + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos
(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(
5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*c)
^2 + 2*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/
2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2
*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*
sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*c)*si
n(7/2*d*x + 7/2*c) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x
+ c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d
*x + 7/2*c)^2)*cos(1/2*arctan2(sin(d*x + c), cos(d*x + c))) - 2*(45*((cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*c
os(9/2*d*x + 9/2*c)^2 + 45*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 70*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3
/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c)^2 + 5*((4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(
d*x + c) + 13)*cos(5/2*d*x + 5/2*c)^2 + 2*(4*cos(d*x + c)^2 + 4*sin(d*x + c
)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (4*
cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(3/2*d*x + 3/2
*c)^2 + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(5/
2*d*x + 5/2*c)^2 + 2*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c)
+ 13)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*si
n(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x +
7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2 + 90*(((cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3
/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)

+ 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x
 + 7/2*c) - (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + si
n(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*
c))*cos(9/2*d*x + 9/2*c) + 21*(40*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3
 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (45*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 45*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c)
 - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*
x + 5/2*c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/

2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin
(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d
*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin
(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 45*((log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2
(20(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(
3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x +
c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*cos(d*x +
c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c
)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2
*c) + 12*sin(d*x + c)^2 + 24*cos(d*x + c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x
 + 3/2*c))*sin(7/2*d*x + 7/2*c))*sin(9/2*d*x + 9/2*c) - 10*(2*((cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/

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2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d
*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) + 2268*(((cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*
x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2
 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2
)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x +
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c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/3*
arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 36*(((cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c
)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2
*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2
*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)

```
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2
*c)^2)*sin(5/2*arctan2(sin(d*x + c), cos(d*x + c))) - 120*(((cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c
)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2
*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2
*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)
```

^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2
*c)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) + 30*(((74*cos(d*x + c)
^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2
*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 +
179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*s
in(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(
d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*
c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(
d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((74*cos
(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2
c)^2 + 2(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*
cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x
+ c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)
^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2
*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 +
179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7
/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c
) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2
+ 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*c
os(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3
/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*
sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos
(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x +
c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*
cos(7/2*d*x + 7/2*c)^2 + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(
d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x
+ c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
+ (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*
d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c)
+ 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 +
179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos
(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2
*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 +
179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74
*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
+ 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)
*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(

d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 1860*((cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*c)^2 + 2*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + (cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2)*cos(1/2*arctan2(sin(d*x + c), cos(d*x + c))) - 315*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*

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d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x +
7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*
c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*c
os(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*
c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(
```

d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d
*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/
2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^
2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3
*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3
/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)

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^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2
*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2
*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2
*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
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*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7
/2*d*x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*
c)))^2 + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3
/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c)
+ ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*c
os(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x
```

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+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d
*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), co
s(3/2*d*x + 3/2*c))))*cos(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7
/2*c)))^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c)
 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*
cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
```

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n(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*
d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), c
os(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2
*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
 + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
```

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x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9
/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*s
in(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
 + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2
*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*co
s(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*co
s(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x +
```

9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d
*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*
cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x +
 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*
d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2
 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*

cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*
x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*
c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2
)*sin(7/2*d*x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x
 + 3/2*c)))^2 + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*

d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x +
7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*
c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*
d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*si
n(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/
2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2
*c), cos(3/2*d*x + 3/2*c))))*sin(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*
d*x + 7/2*c)))^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*

x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2
*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x +
 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*s
in(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/
2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5

/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin

(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2
c)^2 + 2((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
+ 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos
(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/
2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/
2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
 + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (
((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*

x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos
(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x +
 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3
/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c)
+ ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*s
in(7/2*d*x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x +
3/2*c)))^2 + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +

3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*cos(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))) + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^

2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*log(cos(1/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c)))^2 + sin(1/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c)))^2 + 2*sin(1/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))) + 1) + 315*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c

os(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d

*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2
*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9
/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2
(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/

2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*

x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin
(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x +
7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 +
2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)
*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d
*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +

c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2
*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*
x + 3/2*c))))*cos(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c)))^
2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2
)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*s
in(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*
d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)

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+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*
x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/
2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d
*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d
*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7
/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
```

*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*
d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*co
s(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/
2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*
x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*

```
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2
 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2
)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*
arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/
2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^
2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
```

```
*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*
d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*
d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*
c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/
2*d*x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c
)))^2 + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
```

os(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/
2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) +
 ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*co
s(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*
x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos
(3/2*d*x + 3/2*c))))*sin(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/
2*c)))^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2

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*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3
/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c)
+ ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*c
os(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d
*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), co
s(3/2*d*x + 3/2*c)))^2 + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
```

c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
+ 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7
/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d
*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x +
9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^

```
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*
x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 +
2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*s
in(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arc
tan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d
*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 +
 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*
sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*
```

(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x
+ 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/
2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^
2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)
*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d
*x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))
^2 + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x

+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7
/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2
*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x +
7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/
2*d*x + 3/2*c))))*cos(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c

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))) + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*
c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + (
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(
7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/
2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*
c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x
+ 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/
2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3
```

/2*d*x + 3/2*c))))*log(cos(1/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x +
7/2*c)))^2 + sin(1/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c)))^2
 - 2*sin(1/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))) + 1) - 12
60*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)
*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d
*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*
x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/
2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*

x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c

)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/
2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x
+ 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2
+ 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2
)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5

```
/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*
x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*
x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3
/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)
^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/
2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/
2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
```

+ c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/
2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*
c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + (
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(
7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2
*c))))*cos(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c)))^2 + (((
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9
/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)

```
+ 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7
/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) +
((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin
(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/
2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/
2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) +
 ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
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cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*si
n(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d
*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2
*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos

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(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9
/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2
(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*(
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(
9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
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c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(

d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x

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 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*
x + 3/2*c))))*sin(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c)))^
2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2
)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*s
in(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*
d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*
x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/
2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
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2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*sin(7/2*d*x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d
*x + 3/2*c)))^2 + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/
2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*
c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x
+ 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/
2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3
/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)
*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^

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2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*
d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(si
n(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2
*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (
```

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cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*
c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*
c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/
2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/
2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
```

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 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/
2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*
(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*co
s(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x
+ 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c)
 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
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2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*
sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x +
3/2*c))))*cos(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))) + 2
*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*c
os(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x
+ 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c
) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co

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s(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)
*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x
+ 3/2*c))))*log(cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))
)^2 + sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*si
n(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) + 1260*(((c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/
2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/
2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/
2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) +
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((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos
(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*
x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c
)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)

+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 +

2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2
c)^2 + 2((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
+ 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin
(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x +
9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + s

in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*
d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2
+ ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*s
in(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x
 + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*
cos(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c)))^2 + (((cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x
+ 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x

+ 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)

*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d
*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*
x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/
2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d
*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos

(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2
*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x
+ 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/
2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x

+ 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2
+ 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2
)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*
x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*
x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2

+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3
/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)
^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/
2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/
2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/
2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*
c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + (

(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(
7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2
*c))))*sin(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c)))^2 + (((
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9
/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7
/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c

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) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) +
((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin
(7/2*d*x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/
2*c)))^2 + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c
) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)
*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
+ 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
```

2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/
2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*
x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9
/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*s
in(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d
*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*co
s(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +

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sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x +
9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*
x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 +
2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*c
os(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x +
 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
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3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*
d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)
*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d
*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d
*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c
)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
```

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1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2
*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)
)))*cos(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))) + 2*(((cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*
d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*
d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*
c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
```

*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*log(cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) - 1575*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2

```
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*
x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
 + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2
*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
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 + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7
/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d
*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c)
, cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*s
in(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*
x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(
7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*
d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
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1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x
+ 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d
*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 +
 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*
sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(2/3*ar
ctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3
/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)
^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
```

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*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*
d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*
d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*
c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*cos(2/7
*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c)))^2 + (((cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c
)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
```

5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +

c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/
2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/
2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) +
((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos
(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c

) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*
x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c
)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x +
 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/

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2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*
c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9
/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2
*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
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+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
+ 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin
(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x +
9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*
d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2
+ ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*s
in(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +

```
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x
 + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*
sin(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c)))^2 + (((cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x
+ 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2
 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*
sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
```

(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*
x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^
2 + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/
2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2
*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d

```
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x +
 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*s
in(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/
2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
```

c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/
2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*
sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*
d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3
/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)
^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5

/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(2/
3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/
2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/
2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
 + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(
9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x

+ c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*co
s(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x +
7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*cos
(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))) + 2*(((cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9
/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3
/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*
x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 +
((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin
(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)

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+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x +
 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*lo
g(cos(1/2*arctan2(sin(d*x + c), cos(d*x + c)))^2 + sin(1/2*arctan2(sin(d*x
+ c), cos(d*x + c)))^2 + 2*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))) + 1
) + 1575*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) +
((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos
(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2
```

*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*
x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*
c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +

2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/
2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(
sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9
/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si

n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/
2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/
2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
 + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(
9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*co
s(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x +
7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 +
2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos

(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*
cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*
x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*
c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2
)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x
 + 3/2*c))))*cos(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c)))^2
 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +

c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)
*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d
*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2
*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*
x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^

2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*
x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/
2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d
*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos
(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2
*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*

d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x
 + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*
d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2
 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)
*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*
c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*a
rctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)

+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (

cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2
*d*x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)
))^2 + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) +
((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos
(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*

d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x
 + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3
/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(
3/2*d*x + 3/2*c))))*sin(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2
*c)))^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/
2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) +
 ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*co
s(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x

```
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*
x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos
(3/2*d*x + 3/2*c)))^2 + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
+ 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/
2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*
x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
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c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*co
s(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x +
9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
 + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2
*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*si
n(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arct
an2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*
x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5

/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 +
2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*s
in(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x
+ 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2
 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +

c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*
sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*
x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^
2 + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/
2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c

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)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*
d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x +
7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*
c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2
*d*x + 3/2*c))))*cos(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c)
)) + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7
/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
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sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2
*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x +
 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/
2*d*x + 3/2*c))))*log(cos(1/2*arctan2(sin(d*x + c), cos(d*x + c)))^2 + sin(
1/2*arctan2(sin(d*x + c), cos(d*x + c)))^2 - 2*sin(1/2*arctan2(sin(d*x + c)
, cos(d*x + c))) + 1) - 4*(45*((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
 c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 45*((cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7
/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + 35*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 5*((4*cos(d*
x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d*x + 5/2*c)^2
+ 2*(4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17
*cos(d*x + c) + 13)*cos(3/2*d*x + 3/2*c)^2 + (4*cos(d*x + c)^2 + 4*sin(d*x
+ c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)^2 + 2*(4*cos(d*x + c)^2
 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*
x + 3/2*c) + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 17*cos(d*x + c) + 13)*s
in(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + 35*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 70*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + 35*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d

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*x + 3/2*c)^2 + 90*(((cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c)^2 + (cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c) + 1
)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c) - (cos(5/2*d*x + 5/2*c)^2*si
n(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos
(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*
c)^2*sin(d*x + c))*sin(7/2*d*x + 7/2*c))*cos(9/2*d*x + 9/2*c) + 21*(40*(cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 16*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 40*cos(5/2*d*x + 5/2*c)^3*s
in(d*x + c) + (45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(d*x + c)^2 + 90*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 80*cos(3/2*d*x +
3/2*c)*sin(d*x + c) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*c)^2 + 45*((
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c)^2 + (45*
(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(d*x + c)^2 + 45*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 90
*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c) + 16*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*c
os(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 40*cos(5/2*d*x + 5/2*c)*sin(d*x + c
) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 45*((log(cos(1/2*d*x +
```

1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(16*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3
/2*c) - 20*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 20*sin(3/2*d*x + 3/2*c)^2*
sin(d*x + c) + 45*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin
(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d
*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 2*(20*(cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 20*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 4*(4*cos(d*x + c)
^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 40*((
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))
*cos(5/2*d*x + 5/2*c) + 12*cos(d*x + c)^2 + 45*((log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x +
 c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)
 + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 12*sin(d*x + c)^2 + 24*cos(d*x +
 c) + 12)*sin(5/2*d*x + 5/2*c) + 8*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c
)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c))*sin(9
/2*d*x + 9/2*c) - 20*(2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*

x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c) + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
3/2*c)^2 + 7*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)^2 + 14*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + 7*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c) +
112*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2
)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*s
in(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*
d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d
*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d

```
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7
/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*
d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*co
s(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/
2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
```

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 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x
 + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3
/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*
x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/
2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^
2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
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cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d
*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d
*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c
)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9
/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*

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d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7
/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) +
((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin
(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/
2*c))))*cos(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c)))^2 + ((
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(
9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
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+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2

+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x

+ c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/
2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*(
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(
9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan
2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
+ 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*
((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^

2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin
(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*co
s(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x +
9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d
*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 +
((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*si
n(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3

/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x
+ 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2
+ 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2
)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*s
in(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*
d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*
x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*

```
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/
2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d
*x + 3/2*c))))*sin(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c)))
^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2
*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d
*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
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2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7
/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*
d*x + 3/2*c)))^2 + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x
 + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3
/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)

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*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c
)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2
*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(s
in(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
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d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/
2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3
/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2
c)^2 + 2((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
+ 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9
/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x

+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7
/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2
*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*c
os(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x
 + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)

^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*cos(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))) + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +

(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*
c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2
)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x
+ 3/2*c))))*sin(5/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))) -
280*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2
*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*
d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +

(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x +
7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*
c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*
x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2
*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*c
os(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3
/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)

+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*
x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(
3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*
c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d
*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3
/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)
^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2

```
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*
d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*
d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*
c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*((
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(
9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
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n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*co
s(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x +
7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/
2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) +
 ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*si
n(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3
/2*c))))*cos(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c)))^2 + (
((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos
(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*

x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x +
 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3
/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c)
+ ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*s
in(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x +
3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)

```
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c)
 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*
sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2
*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
 + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos
```

(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9
/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*s
in(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
+ 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*
((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin
(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arcta
n2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
 + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2
*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x

+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*si
n(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x +
9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*
d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2
+ ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*s
in(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +

```
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x
 + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2
 + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2
*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d
*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (
```

cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^
2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7
/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*
d*x + 3/2*c))))*sin(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))
)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/
2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*
d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*

x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x +
7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*
c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2
*d*x + 3/2*c)))^2 + 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*
x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*

```
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*
c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/
2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(
sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^
```

2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9
/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(
3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/
2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/
2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
+ 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(
9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x

+ c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*co
s(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x +
7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 +
2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*
cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*
x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +

c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*
c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2
)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x
 + 3/2*c))))*cos(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))) +
 2*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)
*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d
*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
 + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 +

2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*sin(3/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))) + 1260*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/

2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*
c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/
2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x
+ 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/
2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/
2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*
sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3
/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c

) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3
/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)
*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/
2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2
*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c

)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
 + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2
*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x +
3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*si
n(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(2
/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos
(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9
/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2
*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3
/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*
x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 +
((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c
)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin

(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/
2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x +
7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*si
n(1/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))) + 5040*(((cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x
+ 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 +
sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/
2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x
+ c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^
2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (co

s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)
*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*si
n(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)
*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*
c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)
^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d
*x + 7/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))
+ 72*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
+ 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/
2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x

+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*
d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x +
7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos
(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*
c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(5/2*arctan2(sin(d*x + c), cos(d*x + c)))
- 240*(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((c
os(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2
 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5
/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(7/
2*d*x + 7/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x

+ 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) + 60*(((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d

*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*sin(d*x + c
)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2
 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) +
 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((74*cos(d*x + c)^
2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*x + 5/2*c)^2 + 2*
(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 +
179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 + (74*cos(d*x + c)^2 + 74*si
n(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d
*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d
*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7
/2*c) + ((74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*c
os(5/2*d*x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(
d*x + c) + 105)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (74*cos(d*x + c
)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*cos(3/2*d*x + 3/2*c)^2 +
(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(5/2*d*
x + 5/2*c)^2 + 2*(74*cos(d*x + c)^2 + 74*sin(d*x + c)^2 + 179*cos(d*x + c)
+ 105)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (74*cos(d*x + c)^2 + 74*
sin(d*x + c)^2 + 179*cos(d*x + c) + 105)*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*
x + 7/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))/((((sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*co
s(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2
*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2
*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)

^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x
+ 7/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
+ 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c
)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin
(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2
*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^
2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*
d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9

/2*d*x + 9/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5
/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*
d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7
/2*d*x + 7/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x
+ 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
 + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*
c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*si
n(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5
/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*si
n(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)
*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c
)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*

```
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/
2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin
(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/
2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*si
n(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2
*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos
(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d
*x + 9/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
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t(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c

```
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(7/2
*d*x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)
))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2
*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin
(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2
*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 +
 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*
d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
+ (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
+ 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x
 + 9/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)
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^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x
 + 7/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5
/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arct
an2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*cos(2/7*arctan2(sin(7/2*d
*x + 7/2*c), cos(7/2*d*x + 7/2*c)))^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2
*d*x + 9/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2
*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*
x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2
*d*x + 7/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
```

```
))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)
^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2
*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*c
os(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*s
in(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^
2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*
d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(7
/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*
c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*
c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*c
```

```
os(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d
*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5
/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x
 + 9/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x
 + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x
 + 7/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5
/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
```

+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2
*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)
^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2
*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(
9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*
d*x + 7/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x +
3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*

x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2
c)^2 + 2(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^
2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3
/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/
2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3
/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*
c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9
/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5
/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7
/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5
/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +

(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos
(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
+ (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
+ 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*
d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5
/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x
+ 7/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2
*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d

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*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^
2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3
/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*c
os(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d
*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c)
, cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c
)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/
2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/
2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*si
n(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c
) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/
2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)
*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/
2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
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sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5
/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
 (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2
*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x +
 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*
x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x +
7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*sin
(2/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c)))^2 + (((sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*c
os(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*
c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d
*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2
 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x

```
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d
*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/
2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2
*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x +
 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*
x + 7/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x
+ 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
+ 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c
)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin
(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/
2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2
```

```
*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*
c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2
*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x +
9/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2
*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x +
7/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*
c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + (((sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*co
s(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2
*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
```

```
*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*
x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2
*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x
 + 7/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x +
 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/
2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x +
 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)
^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2
*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 +
 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*
d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c
```

```
), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*
sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*
c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*
c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
+ (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*
c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*c
os(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*
d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2 + (((sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/
2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
```

```
cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x +
5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x
 + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3
/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*
c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7
/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2
*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin
(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2
*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 +
 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*
d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
+ (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
+ 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), c
os(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
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)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*s
in(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c
)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c
)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5
/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d*x + 9/2*c)*cos(7/2*d*x + 7/2*c
) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*co
s(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d
*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x + 7/2*c)^2 + ((sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*
d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/
2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 +

```
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/
2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x +
 9/2*c)*sin(7/2*d*x + 7/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)
*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(7/2*d*x + 7/2
*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*cos(2/
7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))) + 2*(((sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
+ (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
+ 3/2*c)^2)*cos(9/2*d*x + 9/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x
+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(9/2*d
*x + 9/2*c)*cos(7/2*d*x + 7/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/
2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*cos(7/2*d*x +
 7/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
```

```
os(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5
/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*
c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)^2 + 2*((sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3
/2*c) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2
 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/
2*d*x + 3/2*c)^2)*sin(9/2*d*x + 9/2*c)*sin(7/2*d*x + 7/2*c) + ((sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*co
s(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c
) + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c)^2 + 2
*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
x + 3/2*c)^2)*sin(7/2*d*x + 7/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c),
 cos(3/2*d*x + 3/2*c))))*sqrt(a)*d)
```

Giac [A] (verification not implemented)

none

Time = 0.58 (sec) , antiderivative size = 141, normalized size of antiderivative = 0.81

$$\int \frac{\cos^4(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$$
$$= \frac{\frac{105\sqrt{2}\log\left(\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{\sqrt{a}\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)} - \frac{105\sqrt{2}\log\left(-\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{\sqrt{a}\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)} - \frac{16\sqrt{2}\left(30a^{\frac{13}{2}}\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^7-42a^{\frac{13}{2}}\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5+35a^{\frac{13}{2}}\sin\left(\frac{1}{2}dx\right.\right.}{a^7\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}}{210\,d}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 1/210*(105*sqrt(2)*log(sin(1/2*d*x + 1/2*c) + 1)/(sqrt(a)*sgn(cos(1/2*d*x +
 1/2*c))) - 105*sqrt(2)*log(-sin(1/2*d*x + 1/2*c) + 1)/(sqrt(a)*sgn(cos(1/2
*d*x + 1/2*c))) - 16*sqrt(2)*(30*a^(13/2)*sin(1/2*d*x + 1/2*c)^7 - 42*a^(13
/2)*sin(1/2*d*x + 1/2*c)^5 + 35*a^(13/2)*sin(1/2*d*x + 1/2*c)^3)/(a^7*sgn(c
os(1/2*d*x + 1/2*c))))/d
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx=\int \frac{\cos\left(c+d\,x\right)^4}{\sqrt{a+a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(cos(c + d*x)^4/(a + a*cos(c + d*x))^(1/2),x)
```

```
[Out] int(cos(c + d*x)^4/(a + a*cos(c + d*x))^(1/2), x)
```

3.123 $\int \frac{\cos^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 140

$$\int \frac{\cos^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d}+\frac{28\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}}+\frac{2\cos^2(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}}-\frac{2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{15ad}$$

```
[Out] -arctanh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/(a+a*cos(d*x+c))^(1/2))*2^(1/2)/d/a
^(1/2)+28/15*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+2/5*cos(d*x+c)^2*sin(d*x+c
)/d/(a+a*cos(d*x+c))^(1/2)-2/15*sin(d*x+c)*(a+a*cos(d*x+c))^(1/2)/a/d
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2857, 3047, 3102, 2830, 2728, 212}

$$\int \frac{\cos^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d}+\frac{2\sin(c+dx)\cos^2(c+dx)}{5d\sqrt{a\cos(c+dx)+a}}-\frac{2\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{15ad}+\frac{28\sin(c+dx)}{15d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Cos[c + d*x]^3/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] -((Sqrt[2]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]]
)])/(Sqrt[a]*d)) + (28*Sin[c + d*x])/(15*d*Sqrt[a + a*Cos[c + d*x]]) + (2*C
```

```
os[c + d*x]^2*Sin[c + d*x])/(5*d*Sqrt[a + a*Cos[c + d*x]]) - (2*Sqrt[a + a*
Cos[c + d*x]]*Sin[c + d*x])/(15*a*d)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rule 2857

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[-2*d*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n - 1)/(f*(2*n - 1)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(b*(2*n - 1))
, Int[((c + d*Sin[e + f*x])^(n - 2)/Sqrt[a + b*Sin[e + f*x]])*Simp[a*c*d -
b*(2*d^2*(n - 1) + c^2*(2*n - 1)) + d*(a*d - b*c*(4*n - 3))*Sin[e + f*x], x
], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
 b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[n, 1] && IntegerQ[2*n]
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
```

```
&&  !LtQ[m, -1]
```

Rubi steps

$$\text{integral} = \frac{2\cos^2(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} - \frac{\int \frac{\cos(c+dx)(-4a+a\cos(c+dx))}{\sqrt{a+a\cos(c+dx)}}\,dx}{5a}$$

$$= \frac{2\cos^2(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} - \frac{\int \frac{-4a\cos(c+dx)+a\cos^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{5a}$$

$$= \frac{2\cos^2(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} - \frac{2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{15ad} - \frac{2\int \frac{\frac{a^2}{2}-7a^2\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{15a^2}$$

$$= \frac{28\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} + \frac{2\cos^2(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} - \frac{2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{15ad} - \int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{28\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} + \frac{2\cos^2(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} - \frac{2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{15ad} + \frac{2\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

$$= -\frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{28\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} + \frac{2\cos^2(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} - \frac{2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{15ad}$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 101, normalized size of antiderivative = 0.72

$$\int \frac{\cos^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\left(-15\sqrt{2}\text{arctanh}\left(\sqrt{\sin^2\left(\frac{1}{2}(c+dx)\right)}\right) + \sqrt{1-\cos(c+dx)}(29-2\cos(c+dx)+3\cos(2(c+dx)))\right)\sin(c}{15d\sqrt{1-\cos(c+dx)}\sqrt{a(1+\cos(c+dx))}}$$

```
[In] Integrate[Cos[c + d*x]^3/Sqrt[a + a*Cos[c + d*x]],x]
[Out] ((-15*Sqrt[2]*ArcTanh[Sqrt[Sin[(c + d*x)/2]^2]] + Sqrt[1 - Cos[c + d*x]]*(2
9 - 2*Cos[c + d*x] + 3*Cos[2*(c + d*x)]))*Sin[c + d*x])/(15*d*Sqrt[1 - Cos[
c + d*x]]*Sqrt[a*(1 + Cos[c + d*x])])
```

Maple [A] (verified)

Time = 1.29 (sec) , antiderivative size = 183, normalized size of antiderivative = 1.31

method	result
default	$-\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-24\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{a}\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+20\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{a}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+15\ln\right.}{15a^{\frac{3}{2}}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$

```
[In] int(cos(d*x+c)^3/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/15*cos(1/2*d*x+1/2*c)*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-24*(a*sin
(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)*sin(1/2*d*x+1/2*c)^4+20*(a*sin(1/2*d*x+1/2
*c)^2)^(1/2)*a^(1/2)*sin(1/2*d*x+1/2*c)^2+15*ln(4*(a^(1/2)*(a*sin(1/2*d*x+1
/2*c)^2)^(1/2)+a)/cos(1/2*d*x+1/2*c))*a-30*a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)
^(1/2))/a^(3/2)/sin(1/2*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 143, normalized size of antiderivative = 1.02

$$\int \frac{\cos^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$$

$$=\frac{4\sqrt{a\cos(dx+c)+a}\left(3\cos(dx+c)^2-\cos(dx+c)+13\right)\sin(dx+c)+\frac{15\sqrt{2}(a\cos(dx+c)+a)\log\left(-\frac{\cos(dx+c)^2+2\sqrt{\cdots}}{\cdots}\right)}{\sqrt{\cdots}}}{30\left(ad\cos(dx+c)+ad\right)}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/30*(4*sqrt(a*cos(d*x + c) + a)*(3*cos(d*x + c)^2 - cos(d*x + c) + 13)*sin
(d*x + c) + 15*sqrt(2)*(a*cos(d*x + c) + a)*log(-(cos(d*x + c)^2 + 2*sqrt(2
)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/sqrt(a) - 2*cos(d*x + c) - 3)/(cos(
d*x + c)^2 + 2*cos(d*x + c) + 1))/sqrt(a))/(a*d*cos(d*x + c) + a*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3/(a+a*cos(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 908518 vs. $2(119) = 238$.

Time = 17.66 (sec) , antiderivative size = 908518, normalized size of antiderivative = 6489.41

$$\int \frac{\cos^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -1/1680*(84*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/
2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/
2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d
*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^3 - 84*((sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7
/2*c)^3 - 24*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt
(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*
d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^3 + 3*(420*sqrt(2)
```

```
*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))
*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)
^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))
*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)
 + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*co
s(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) -
 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*c
os(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) -
 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8
*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1
/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c
```

)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*
sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)
^2 + 56*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*
x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)
^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x +
 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*sin(d*x + c))*cos(5/2*d*x + 5/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2
*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c)
- 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2
+ 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x
 + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
+ c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*s
qrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sq

rt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)
^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*c
os(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*
(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(7/2*
d*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*
d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*
d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqr
t(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*
d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2
)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1
/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1

/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d *x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt (2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1 /2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1 /2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d *x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2 *c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2 *c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2* d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2 *d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin (1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2 *d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2 *d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2 *c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d* x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d *x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/ 2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2* c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))* cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c) ^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin (1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6 *(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/ 2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2 *sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2 *d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +

1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c)^2 + (84*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^3 - 84*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^3 - 24*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^3 + 3*(

420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d*x + c)
 + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 3
5*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*c
os(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) +
 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*c
os(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*
(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 1
2*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c
)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*

d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x
 + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d
*x + 1/2*c)^2 + 56*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)
*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d
*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*si
n(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x
 + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/
2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*
x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(
d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*
sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x +
1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(
2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x +
 c) - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*c
os(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*

x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^
2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*c
os(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos
(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/
2*c) - 140*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c
))*cos(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x
+ c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(
2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(
2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d
*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(
2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
- 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(
1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*
c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^
2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2

)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^
2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*
sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)
 + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*s
in(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x
 + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d
*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/
2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x
 + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x +
 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3
 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si

n(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c)^2 + (84*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^3 - 84*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^3 - 24*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2

c)^3 + 3(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 420*(sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1
/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x
+ 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)
*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x
+ 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*si
n(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/
2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x
 + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*
d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1

))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*
sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(1/2*d*x + 1/2*c)^2 + 56*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c)
 + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2
)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(
d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) - 70*((8*sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1
/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c)
 + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 70*
(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2
c)^2 + 4(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c)
)*cos(d*x + c) - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*si
n(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2
*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqr

t(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*
x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2
*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 +
6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(
sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3
/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*
d*x + 1/2*c))*cos(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)
^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^
3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*s
qrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2
*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^
2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*co
s(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 +

((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*

c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*
(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/
2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^
2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c
) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*s
in(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/
2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c)^2 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c
)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c
)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24
*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2
- 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x
+ 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x +
1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*

d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 28*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) -

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6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
 + c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 8*sqrt(2))*cos(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 9
*sqrt(2)*cos(d*x + c) + 8*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 8*sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*c
os(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
 c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 8*sqrt(2)*cos(1/2*d*x
 + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos
(d*x + c)*sin(1/2*d*x + 1/2*c) + 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*
x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*c
os(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/
2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 1
1*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(7/2*d*x + 7/
2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*
cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/
2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
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2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/
2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin
(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
 + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/
2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/
2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3
- 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12
*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)
^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x
+ 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1
/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1

/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt
(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x +
1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x
+ c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*co
s(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2
))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 +
 (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si
n(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x +
5/2*c)^2 + 6*(14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*c
os(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x

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 + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(
1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)^2 - 8*((sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*
cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*c
os(5/2*d*x + 5/2*c)*sin(5/2*d*x + 5/2*c) + 14*(sqrt(2)*cos(3/2*d*x + 3/2*c)
^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d
*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d
*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c)^2
 + 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3
 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*c
os(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) +
 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*c
os(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
```

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 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2
)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8
*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1
/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c
)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*
sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2
 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c)
- 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d
*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
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/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(
1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqr
t(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d
*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2
*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c))
*cos(7/2*d*x + 7/2*c) + 84*((sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) +
2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*
sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*
x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(
3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*
x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*s
qrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/
2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d
*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
+ sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2
*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)^2 + (sqrt
(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*co
s(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x +
c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
)*sin(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) +
 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)
*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d
*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*

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c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x +
 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*
sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/
2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*si
n(d*x + c))*sin(5/2*d*x + 5/2*c)^2)*cos(1/2*arctan2(sin(d*x + c), cos(d*x +
 c))) - 6*(14*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
 + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2
*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 14*((sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin
(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2
*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 2*((4*sq
rt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) +
 11*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 +
 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*sin(3/2*d
*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*sin(d*x + c)^2 + 11*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4
*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c)*cos(
1/2*d*x + 1/2*c) + 11*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
15*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + 15*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*
c) + 11*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5
/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 10*sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + 10*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 28*(((sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2)
)*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*co
s(5/2*d*x + 5/2*c) - (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(
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2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2
*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*
sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 20
*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 20*(sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) - 35*(12*sqrt(2)*cos(3/2*
d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d
*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2
 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2
*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d
*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x
+ 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x
+ 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x
+ 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)
*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin
(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x
 + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/

2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*
sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2
c)^3 - 3(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d
*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*
d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*si
n(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*s
qrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)
*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x +
 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*
(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x
+ c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sq
rt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*
d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^
2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*s
in(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x +
 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x

 + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/
2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c
)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))
*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) +
2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 20*(sqrt(2)*cos(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*s
qrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c) - 12*(2*((sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3
/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)
^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*co
s(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
 + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos
(5/2*d*x + 5/2*c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 5*(sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*sin(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2
c) + 10(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c) + 10*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/
2*c) + 56*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(

1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2
)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*
cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(
d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
+ c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))
*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
 c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqr
t(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2
*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)

+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(
d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c)
)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d
x + c))) - 84(((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*s
qrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt
(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*
d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*co
s(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d
*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*
sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/
2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(
7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^
2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
(4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x +
c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*c

os(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqr
t(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*co
s(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)
*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c
))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((4*sqrt(2)*cos(d*x + c)^2 +
4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^
2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*
sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c
)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*
cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2
*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((4*sqrt(2)*cos(d*x + c
)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/
2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x
+ c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x +
1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqr
t(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(
d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))
*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*s
in(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2
+ 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(
2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1

/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5
/2*c) + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*c
os(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(
d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))
*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sq
rt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/
2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x +
c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2
c) + 9(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*
sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x
+ 5/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*cos(2/3*arctan2(s
in(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 3*(420*sqrt(2)*cos(3/2*d*x
+ 3/2*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
+ 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3
*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)
^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3
*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3
/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2
*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1
/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*si
n(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2

+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) -
 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x +
3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*s
in(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 3
2*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(
1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*
c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^
2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 28*(sqrt
(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*co
s(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x +
c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
)*cos(7/2*d*x + 7/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x +
1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x
+ c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*c
os(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c
)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x +
1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/
2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 -
 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)

+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 8*sqrt(2))*cos
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 9*sqrt(2)*cos(d*x + c) + 8*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
8*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sq
rt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 8*sqrt(2)*cos(
1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt
(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin
(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^
2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*co
s(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(
2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(7/2*d
*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(s
qrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d
*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d
*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt
(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*

c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -

sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*
x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2
*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*c
os(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
 c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) +
 sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x +
 c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4
*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2
*d*x + 5/2*c)^2 + 1260*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1

/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*(
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*
x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2
*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*
sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqr
t(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)
*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*
d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
 c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
+ 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x +
 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/

2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + (84*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^3 - 84*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^3 - 24*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c

) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
 + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)
^3 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(
d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*
c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1
/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*si
n(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*
x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1
/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c
)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x +
c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
 + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq

rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin
(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(1/2*d*x + 1/2*c)^2 + 56*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2
*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*s
in(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x
+ c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) - 70*((8*sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*
c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) +
2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*
sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/
2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)
^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*c
os(d*x + c) - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*c

os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(s
qrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1
/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2
)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x +
1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sq
rt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqr
t(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*
d*x + 3/2*c) - 140*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x
+ 1/2*c))*cos(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*
sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 -
8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) -
8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*c
os(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) -
8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt
(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*
x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 +

4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +

```
 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sq
rt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) +
2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 +
 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*
(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) -
 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(
3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d
*x + 1/2*c))*cos(5/2*d*x + 5/2*c)^2 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3
*sin(d*x + c) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3
 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3
*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 -
35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
```

x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x +
1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2
*c))*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1
/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x
+ 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)
*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin
(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x
 + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*
sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x +
1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 28*(sqrt(2)*cos(3/
2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x
+ 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqr
t(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*
d*x + 7/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3
*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (
8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x
 + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*
d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin

(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*co
s(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 8*sqrt(2))*cos(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 9*sq
rt(2)*cos(d*x + c) + 8*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 8*sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 8*sqrt(2)*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*
x + c)*sin(1/2*d*x + 1/2*c) + 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqr
t(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d
*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2
*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(7/2*d*x + 7/2*c

)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos
(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c
)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c
))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c
))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3
*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sq
rt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2
- (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1

/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)

+ 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c)^2 + 6*(14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)^2 - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)*sin(5/2*d*x + 5/2*c) + 14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c)^2 + 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +

1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) -
8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*c
os(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) -
20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sq
rt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*
d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2
+ 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin
(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 -
2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/
2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3
*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x
+ 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x

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 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2
*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 1
4*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1
/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt
(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*
x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c))*co
s(7/2*d*x + 7/2*c) + 84*((sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*s
qrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin
(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x +
 c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2
*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x +
 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt
(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d
*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x
+ c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + s
qrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)
*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)^2 + (sqrt(2)
*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c)
+ 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*s
in(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*
```

sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*si
n(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x
+ c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c)
+ (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/
2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin
(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c
) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c))*sin(5/2*d*x + 5/2*c)^2)*cos(1/2*arctan2(sin(d*x + c), cos(d*x + c)
)) - 6*(14*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt
(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c)
)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 14*((sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/
2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*
x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*
x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 2*((4*sqrt(
2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11
*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*
sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*sin(3/2*d*x
+ 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + 11*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c)*cos(1/2
*d*x + 1/2*c) + 11*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 15*
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
 c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 15*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
+ 11*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*
c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 10*sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + 10*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 28*(((sqrt(2)*cos(d*x
+ c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1

/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5
/2*d*x + 5/2*c) - (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*
cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*
x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin
(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 20*(s
qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 20*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) - 35*(12*sqrt(2)*cos(3/2*d*x
 + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
+ 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 +
24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x
+ 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1
/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1
/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1
/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*si
n(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*
x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +

2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x +
1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin
(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)
^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2
*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x
+ 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d
*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt
(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*si
n(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/
2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c
) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(
2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2

*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(
d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/
2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x +
c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c
) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2
 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*co
s(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*s
qrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt
(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3
/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c) - 12*(2*((sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3
/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/
2*d*x + 5/2*c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 5*(sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*sin(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c) + 10*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c
) + 56*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2

+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*c
os(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos
(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x
+ c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/
2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c
)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*c
os(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*co
s(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)

+ 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
+ c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*
sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*s
in(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
+ sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt
(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*
cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d
*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x
+ c))) - 84*(((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt
(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)
*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqr
t(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
+ 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
+ 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqr
t(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d
*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2
*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 +
9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*

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sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)
+ 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(
1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3
/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*si
n(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*
cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((4*sqrt(2)*cos(d*x + c)^2 + 4*
sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x +
3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 +
 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqr
t(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9
*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)
)*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((4*sqrt(2)*cos(d*x + c)^2
 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c
)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
+ 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(
4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2
)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1
/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x
 + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*co
s(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(
d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4
*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
+ c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^
2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*
x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5
```

*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*
cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*
d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*
c) + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(
d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x
 + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*si
n(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(
2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c
) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*
cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
 + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2
*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5
/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*sin(2/3*arctan2(sin(
3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 6*(14*(sqrt(2)*cos(3/2*d*x + 3
/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(
3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2
c)^2 - 8((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)
*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)*sin(5/2*d*x + 5/2*c)
+ 14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x +
 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*
sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/
2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*si
n(d*x + c))*sin(5/2*d*x + 5/2*c)^2 + 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*
sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 -
 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(

1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) -
 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*c
os(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) -
 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt
(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*
x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 +
 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d
x + c)^2 + 3(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d
*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(
d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1
/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1

/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c
))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 +
8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*
d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1
/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x +
1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sq
rt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) +
2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 +
6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*
(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(
3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d
*x + 1/2*c))*cos(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 2*(84*(sqrt(2)*co
s(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*

d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2
*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(
7/2*d*x + 7/2*c)^3 - 84*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
 + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/
2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2
*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^3 - 24*((sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt
(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*
cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d
*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^3 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3
*sin(d*x + c) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3
 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3
*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 -
35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x +
1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2

*c))*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 56*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1

/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3
/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)
^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*co
s(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin
(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/
2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)
*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - s
qrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*co
s(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c
) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d
*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(7/2*d*x + 7/2*c)^2 + 105*(1
2*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +

1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x +
c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*
c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x +
c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))
*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sq
rt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/
2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*s
qrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)
*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x +
1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*
(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x
+ c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d

```
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8
*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x
 + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/
2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x
 + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2
*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d
*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x
+ 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin
(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2
*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqr
t(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
 - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*s
in(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1
/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1
/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c)^2 + 3*(4
20*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d*x + c)
```

+ sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 35
*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*co
s(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) +
2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*co
s(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12
*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)
^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d
*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x

+ 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*
x + 1/2*c)^2 + 28*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*
cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*
x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin
(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2
*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x
+ 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d
*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt
(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*s
in(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1
/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2
*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x +
c) - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*
x + c) + 8*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 8*sqrt(2))*sin(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 8*sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + 8*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(
sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 8*sqrt(2)*si
n(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqr
t(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*

```
x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2
*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 +
6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(
sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3
/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*
d*x + 1/2*c))*sin(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)
^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^
3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*s
qrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2
*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^
2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*co
s(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 +
 ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
```

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2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*co
s(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) +
2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*c
os(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/
2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c)
 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2
 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x
 + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*c
```

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os(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*
(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/
2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)
 + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^
2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c
) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*s
in(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/
2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c)^2 + 6*(14*(sqrt(2)*cos(3/2*d*x + 3/2*c
)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(
d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*
d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)^
2 - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3
/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1
/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)*sin(5/2*d*x + 5/2*c) + 14
*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2
*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(
d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c)
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*
x + c))*sin(5/2*d*x + 5/2*c)^2 + 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(
d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*s
qrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
```

n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*s
qrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*s
qrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*
sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x +
1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(
2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x +
c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x +
c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*
c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x
+ c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c
))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*

```
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2
*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*c
os(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2
*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d
*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*
c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2
)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x +
 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sq
rt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqr
t(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x +
 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*
d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x +
 1/2*c))*cos(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 84*((sqrt(2)*cos(3/2*
```

```
d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x +
1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(
2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*
x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*c
os(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x
 + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(
1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + (sqrt(2
)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(
1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c)
 + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*
cos(5/2*d*x + 5/2*c)^2 + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*s
qrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin
(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x +
 c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2
*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x +
 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt
(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d
*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x
+ c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + s
qrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)
*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c)^2)*cos(1/2*a
rctan2(sin(d*x + c), cos(d*x + c))) - 6*(14*((sqrt(2)*cos(d*x + c) + sqrt(2
))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*
c)^2 + 14*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2
*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))
*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)
^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt
```

(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*
x + c) + 11*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 11*sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x +
 c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
+ 15*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 11*sqrt(2)*cos(1/2*d*x + 1
/2*c))*cos(3/2*d*x + 3/2*c) + 15*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 15*sqrt(2)*c
os(d*x + c)*sin(1/2*d*x + 1/2*c) + 11*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2
*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin
(d*x + c)^2 + 10*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 10*sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 28*(((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/
2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) - (sqrt(2)*cos(3/2*d*x + 3
/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(
3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2
*c))*cos(7/2*d*x + 7/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 20
*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c) - 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos
(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c
)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c
))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c
))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d

*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3
*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sq
rt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2
- (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1
/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*
c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*
c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)
*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2
c) - 3(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x

+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c
) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3
/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*
sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*
cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8
*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1
/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*
d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin
(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2
c) + 20(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c) - 12
(2((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d

*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2
*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + 5*(sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 10*(sqrt(
2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 10*(sqrt(2)*cos(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)
*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*
d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 630*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d
*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*
x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*
x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(
sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x +
5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x

+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*
cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x
+ c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2
*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
 (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c
) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
 + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)
*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2

```
*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(
1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 56*(((sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*c
os(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2
)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*co
s(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
 + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x +
7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2
 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*
```

c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*si
n(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*
c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
+ c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))
*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/
2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + s
qrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2
*d*x + 5/2*c)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) - 84*(((4*sqr
t(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5
*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*
sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x +
3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2

*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt
(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*
((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x +
c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)
^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2
*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4
*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)
*cos(5/2*d*x + 5/2*c) + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)
^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
(4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x +
c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*
cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sq
rt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*c
os(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c
)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*
c))*cos(5/2*d*x + 5/2*c)^2 + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x
+ c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(
d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x +
c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*
c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*
x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*
sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2
+ 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(

d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(
2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos
(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
 c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x
 + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)
*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((4*sqrt(2)*cos
(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2)
)*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*
sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2
 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(
d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2
c)^2 + 2(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt
(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(1/2*arc
tan2(sin(d*x + c), cos(d*x + c))))*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), co
s(3/2*d*x + 3/2*c))) + 84*((sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2
*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*s
in(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x
 + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3
/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x
 + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sq
rt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2
*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*
x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) +
 sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*
c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)^2 + (sqrt(
2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos
(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c
) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))
*sin(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) +
2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*

sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*
x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c
) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x +
3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*s
in(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2
*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin
(d*x + c))*sin(5/2*d*x + 5/2*c)^2)*cos(1/2*arctan2(sin(d*x + c), cos(d*x +
c))) - 6*(14*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
+ 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*
c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 14*((sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*
d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 2*((4*sqr
t(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) +
11*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 +
4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*sin(3/2*d*
x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*sin(d*x + c)^2 + 11*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin
(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*
sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) + 11*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 1
5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + 15*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c
) + 11*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/
2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 10*sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + 10*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 28*(((sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))
*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +

```
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos
(5/2*d*x + 5/2*c) - (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2
)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*
d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*s
in(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 20*
(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 20*(sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) - 35*(12*sqrt(2)*cos(3/2*d
*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2
+ 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*
c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*
x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x +
 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x +
 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*
sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(
d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
```

(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1

/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*si
n(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x
+ c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2
c) + 2(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)
^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*
cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2
*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 20*(sqrt(2)*cos(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sq
rt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin
(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c) - 12*(2*((sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^
2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos
(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(
5/2*d*x + 5/2*c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 5*(sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*sin(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*
c) + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c) + 10*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2
c) - 360(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*

x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2
)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*
cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(
d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
+ c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))
*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2
*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c

)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 +
2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin
(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c
))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c
)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(
sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt
(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3
/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d
*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*
x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*
x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x

+ 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(
sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x +
5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*
cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin
(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3
/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/
2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*si

n(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*
x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt
(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*
d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*co
s(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)
*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos
(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
+ 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7
/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*

```
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2
+ ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin
(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c
))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
 c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))
*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*
sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*
```

d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*
d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))
)^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*
cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*co
s(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*
x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3
/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*
cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*c
os(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1

/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*(
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*
x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2
*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*
sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqr
t(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)
*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*
d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c),
 cos(3/2*d*x + 3/2*c))))*sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x
+ 5/2*c))) - 1260*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*si
n(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2

*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c
)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(
sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt
(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3
/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*
cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(
d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2
c) + 2(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*
c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x

+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*
cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) +
((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(
d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c)
)*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x
+ 3/2*c), cos(3/2*d*x + 3/2*c))) + 56*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
+ 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x
+ 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sq

rt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/
2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*co
s(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*
x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x +
c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c
))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
x + c) + 2(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*s
in(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))

```
*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
+ 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(3/
2*arctan2(sin(d*x + c), cos(d*x + c))) - 84*(((4*sqrt(2)*cos(d*x + c)^2 + 4
*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x +
 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2
+ 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sq
rt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*co
s(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c
))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c
)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/
2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x
+ c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x +
1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqr
t(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) +
 ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x
+ c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c
)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/
2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*s
in(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(
1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9
```

```
*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
+ 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c
)^2 + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos
(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*
x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*s
in(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt
(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*
c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)
*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c
) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*si
n(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/
2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x +
7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt
(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)
*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqr
t(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
 + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
+ 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqr
t(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d
*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2
*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)
*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^
2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt
(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*co
s(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
+ c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*
x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2
)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3
/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(
d*x + c))))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2
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+ (84*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2 *sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1 /2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s in(d*x + c))*cos(7/2*d*x + 7/2*c)^3 - 84*((sqrt(2)*cos(d*x + c) + sqrt(2))* cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2 *c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2 *(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)) *cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d *x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^ 3 - 24*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d* x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1 /2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2* d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d* x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*co s(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/ 2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^3 + 3*(420*sqrt(2)*cos(3 /2*d*x + 3/2*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3 /2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log (cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin (1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d *x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2 *c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d *x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log (cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin (1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*s qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c) ^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2* d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d* x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2* c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1

))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*
sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqr
t(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2
*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sq
rt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(
2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x
 + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 +
4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*
x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 5
6*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/
2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin
(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c
) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c))*cos(5/2*d*x + 5/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2
*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*c
os(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2
*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1

/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d *x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2 *c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x + 1/2 *c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2* sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d* x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqr t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2 *d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sqrt(2) *cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/ 2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d* x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt (2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqr t(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin (d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2 *d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin (1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2) *cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2* d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqrt(2)) *cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*lo g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2* d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2* c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2 *d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2 *d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/ 2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si n(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)* log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(2*sqr t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x +

1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*s
in(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d
x + c) + 2(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(
1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^
3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 +
12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*
c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*
x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x +
1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d

```
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x +
 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1
/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x
+ 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*
x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*
cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt
(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2
 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos
(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x
```

+ 5/2*c)^2 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 420*(sqrt
(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*
x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2
*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sq
rt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c
)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2
*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(
2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x
 + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105
*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2
+ (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) +
 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin
(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c

) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*sin(1/2*d*x + 1/2*c)^2 + 28*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x
+ c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + s
qrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)
*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c) - 70*((8*sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1
/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*
x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1
/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c)
 - 70*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x
+ 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1
/2*c))*cos(d*x + c) - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 9*sqrt(2)*cos(d*x + c) + 8*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 8*sq
rt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x +
c)*cos(1/2*d*x + 1/2*c) + 8*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2
c) + 9(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*
c) + 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/

2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2
*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)
^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*
sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*
x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3
/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)
)*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) +
 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos
(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x +
 c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x
+ 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2
*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2

```
*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2
*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sq
rt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c
)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/
2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqr
t(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x
+ 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3
*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(
1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c
))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2
*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sq
rt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*
d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
```

in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2
 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos
(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin
(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/
2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*
d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*si
n(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
 + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x +
1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqr
t(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*
c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c)^2 + 6*(14*(sqrt(2)*co
s(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*
d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2
*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(
5/2*d*x + 5/2*c)^2 - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
 + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)*sin(5/2*
d*x + 5/2*c) + 14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*
cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*
x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin
(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c)^2 + 35*(12*sqrt(2)*cos(3/2*d*
x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x

+ 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*

```
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x
 + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/
2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*
x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(
d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*s
in(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1
/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2
*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x +
c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt
(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*
x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2
- 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin
(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1
/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x +
 c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*
c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^
2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*c
os(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*
sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
```

2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 84*(
(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*
c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d
*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c)
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
 + c))*cos(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x +
 c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sq
rt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*
sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x +
 5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*
d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*
c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x
 + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)^2 + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*s
in(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x +
 c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x +
 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 + 2
*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2
*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(
d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c)
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*
x + c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*x +
3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin
(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/
2*c)^2)*cos(1/2*arctan2(sin(d*x + c), cos(d*x + c))) - 6*(14*((sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2
))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*c
os(7/2*d*x + 7/2*c)^2 + 14*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(
d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*cos(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqr

t(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 11*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 11*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 15*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 15*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 11*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 10*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 10*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 28*(((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) - (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 20*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) - 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2

*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*
sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d
*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2
- 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3
*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d
*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*s
in(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/
2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x +
c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x

+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/
2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*
c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*si
n(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*
(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x
 + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2
 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*co
s(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(
d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2
c) - 4(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*
sin(5/2*d*x + 5/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*
d*x + 7/2*c) - 12*(2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt

(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 10*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) + 56*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(

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2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
 + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*
sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*s
in(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^
2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos
(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(
7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
 + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
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)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x
+ 5/2*c)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) - 84*(((4*sqrt(2)*
cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt
(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(
2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c
)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2
*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*s
qrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*s
in(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((4*s
qrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) +
 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 +
4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x
+ 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt
(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*
x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sq
rt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(
5/2*d*x + 5/2*c) + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 +
9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*s
qrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) +
 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1
/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)
*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/
2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin
(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*c
os(5/2*d*x + 5/2*c)^2 + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)
^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2

)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
(4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x +
c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*
cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sq
rt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*c
os(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c
)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*
c))*sin(7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d
*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*co
s(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x
+ c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
+ 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(
d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
+ 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((4*sqrt(2)*cos(d*x
+ c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos
(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d
*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2
+ 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*
sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*c
os(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d
*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(1/2*arctan2(
sin(d*x + c), cos(d*x + c))))*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2
*d*x + 3/2*c)))^2 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 42
0*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin
(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*
sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^

2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*
sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) -
8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(
1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*
c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^
2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x
+ c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2
*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x
 + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*
c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 28*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*s
in(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x +

c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 8*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 8*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 8*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2

+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sq
rt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)
*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*
d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*
sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1
/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt
(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2
))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2
+ (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) +
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3
/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*
sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*
sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)

- 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +

1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c)^2 + 60*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +

c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3
/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/
2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)
*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*c
os(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d
*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
 c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))
*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2

*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*
cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*
((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))
*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^
2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sq
rt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2
)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2
*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c)
, cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s

qrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2
+ 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
 + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2
*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
 c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2
*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sq
rt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin
(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/
2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + s

qrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq

```
rt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/
2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2
*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2
*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*s
in(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^
2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sq
rt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2
)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2
*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d
*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt
```

(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +

1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*cos(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + (84*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^3 - 84*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^3 - 24*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^3 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(

cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*
(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2
c)^2 + 4(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c)
)*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*
c)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1
/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*si
n(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*
x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x +
1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin
(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2
c)^3 - 3(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 56*(sqrt(2)*cos(3/2*d
*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1
/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2
)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x
+ 5/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x

+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*s
qrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x +
1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x
 + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d
x + c) - 3(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))
*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3
/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/
2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c
)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*
x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2
*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt
(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3

/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*
d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) +
 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(7/2*d*x + 7/2*c)^2 + 105*(12*s
qrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqr
t(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)
^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))
*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)
 + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*co
s(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(
2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d
*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt
(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)

```
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*si
n(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/
2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c
)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x +
1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d
*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x +
1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c)
 - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x
+ 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1
/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3
/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/
2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)
 + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2
```

)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) -
sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*c
os(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(
1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*
c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*
d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c)^2 + (84*(sq
rt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*
cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x
+ c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c))*cos(7/2*d*x + 7/2*c)^3 - 84*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)
*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*
d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^3 - 24*((
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
 + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*
sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*s
in(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^3 + 3*(420*sqrt(2)*cos(3/2*d*x +
3/2*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2
 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*s

qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 56*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s in(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/

2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(
2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x
 + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(7/2*d*x + 7/2*c)^2
+ 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3
+ ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*c
os(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) +
 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*c
os(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2
)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d

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*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8
*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1
/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c
)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*
sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2
 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c)
- 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d
*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(
1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqr
t(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d
*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2
```

+ 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2
*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c)^
2 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d
*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c
)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/
2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin
(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
+ c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/
2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/
2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)
^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c
)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -

3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
+ 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(
1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si
n(1/2*d*x + 1/2*c)^2 + 28*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*
sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*si
n(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x
+ c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c) - 70*((8*sqrt(2)*cos(
1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c
))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2
*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*s
qrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2
*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^
2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*co
s(d*x + c) - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2
)*cos(d*x + c) + 8*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +

1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 8*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 8*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/

2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^
2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x +
 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/
2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/
2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/
2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin
(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x
 + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1
/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^
3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x +
 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*
d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x
+ 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*
x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(
2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*

```
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin
(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2
*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)
 - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d
*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2
*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c
)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
 + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2
- 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos
(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sq
rt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
)*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c)^2 + 6*(14*(sqrt(2)*cos(3/2*d*x
 + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2
*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*
sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x +
 5/2*c)^2 - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1
```

/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqr
t(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2
*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)*sin(5/2*d*x + 5/2
c) + 14(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d
*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c
)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x
+ 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*sin(d*x + c))*sin(5/2*d*x + 5/2*c)^2 + 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c
)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)
^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3
*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(
2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*
sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/
2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)
^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*c
os(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2
+ ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*c
os(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) +
 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*

```
cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1
/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c
) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^
2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(
1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*
x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 -
 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6
*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c
) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)
```

^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3
*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x +
c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*
sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1
/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 84*((sqrt(2)*
cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) +
2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*co
s(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*s
qrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin
(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x +
c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) +
(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2
*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(
d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c)
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*
x + c))*cos(5/2*d*x + 5/2*c)^2 + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x +
c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqr
t(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*s
in(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)
*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c)
+ 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*s
in(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*
sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x
+ c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x
+ 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c)^2)*c
os(1/2*arctan2(sin(d*x + c), cos(d*x + c))) - 6*(14*((sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/
2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*

x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*
x + 7/2*c)^2 + 14*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/
2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(
d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2
)*cos(d*x + c) + 11*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 11*sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*c
os(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
+ c)^2 + 15*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 11*sqrt(2)*cos(1/2
*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 15*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 15*s
qrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 11*sqrt(2)*sin(1/2*d*x + 1/2*c))
*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*sin(d*x + c)^2 + 10*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 10*sqrt(2)*sin(1/
2*d*x + 1/2*c)^2 + 28*(((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
+ c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2
*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*
d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) - (sqrt(2)*cos(3/2
*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x +
1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt
(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d
*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2
c) + 20(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c) - 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqr
t(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x
+ 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)

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^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x
 + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2
)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x
 + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*s
in(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*
c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2
 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3
/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2
*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*
x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
```

```
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*
x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*
(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8
*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d
*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos
(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c
))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + s
qrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c
)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*
cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(
2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d
*x + 5/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
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(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c) - 12*(2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 10*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) + 56*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1

/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2
*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(s
qrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1
/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(
2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*c
os(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*
x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
+ 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +

1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x +
7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^
2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) - 84*(((4*sqrt(2)*cos(d*x +
c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*
x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2
+ 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*s
qrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*co
s(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*co
s(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2
))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)
*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^
2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin
(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/
2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqr
t(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin
(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x +
5/2*c) + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)
*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*co
s(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2

))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x
+ c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3
/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2
)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
+ 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*
x + 5/2*c)^2 + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sq
rt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(
2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*s
qrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos
(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*
x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*s
qrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2
*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7
/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2
 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (
4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c
) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*co
s(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt
(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos
(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*
sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)
)*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((4*sqrt(2)*cos(d*x + c)^2 +
4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2
 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5
*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*s
qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*c
os(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)

```
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*
c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(1/2*arctan2(sin(d*x +
 c), cos(d*x + c))))*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/
2*c)))^2 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 420*(sqrt(2
)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x
+ 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d
*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt
(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d
*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)
*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x +
 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*
(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 +
(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(
d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3
*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3
/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(c
```

os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*sin(1/2*d*x + 1/2*c)^2 + 28*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x +
c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqr
t(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*s
in(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c) - 70*((8*sqrt(
2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x
+ 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2
c) + 2(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) -
70*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x +
1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2
*c))*cos(d*x + c) - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 9
*sqrt(2)*cos(d*x + c) + 8*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 8*sqrt
(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 8*
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)

*cos(1/2*d*x + 1/2*c) + 8*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c
) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
 + 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*
c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqr
t(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d
*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2
 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*si
n(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x
+ c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2
c) + 2(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)
^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*
cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2
*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2))*sin(1/2*d*x + 1/2*c))*sin(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3
/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/
2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c
)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*

x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/
2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d
*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d
*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d
*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt
(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*
sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*
d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x +
1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1
/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))
*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(
8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt

```
(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*
x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 +
 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d
*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8
*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1
/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)
)*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*
x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(
d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/
2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)
 + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c)^2 + 1260*(((sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*co
s(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)
*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
 + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos
(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
+ 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*
```

c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7
/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2
+ ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin
(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c
))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
 c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))
*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*

```
sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*
d*x + 5/2*c)^2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))
)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + (84*(sqrt(
2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos
(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c
) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))
*cos(7/2*d*x + 7/2*c)^3 - 84*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*co
s(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
 + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^3 - 24*((sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqr
t(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(
3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^3 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2
*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2
*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
```

+ 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 +
24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d
*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x
+ 1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*
x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2
*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sq
rt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c
)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/
2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqr
t(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d
*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2
- 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 1
05*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 56*(sqrt(2)*c
os(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2
*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) +

```
2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos
(5/2*d*x + 5/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c
) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^
2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c
))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)
- 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
 + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c
)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)
)*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)
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^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/
2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sq
rt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*
sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x +
1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(7/2*d*x + 7/2*c)^2 + 1
05*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + (
(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(
d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*
(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(
d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) -
 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*c

os(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2

)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c)^2 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*

```
c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2
 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3
/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2
*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1
/2*d*x + 1/2*c)^2 + 28*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqr
t(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3
/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c
)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c) - 70*((8*sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/
2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*
sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8
*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt
(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*
x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
```

(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 +
4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d
x + c) - 8((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*c
os(d*x + c) + 8*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 8*sqrt(2))*sin(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 8*sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) + 8*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
+ 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 8*sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6
*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c
) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)
^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3
*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x +
c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*
sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin
(1/2*d*x + 1/2*c))*sin(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3
/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/
2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*s
qrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*

```
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 -
 (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/
2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c
))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c
)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c
))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x +
c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*
c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2
*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 -
 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/
2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x
 + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1
/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
```

x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c)^2 + 6*(14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)^2 - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*

x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2
)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)*sin(5/2*d*x + 5/2*c)
 + 14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x
+ 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2
*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1
/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c))*sin(5/2*d*x + 5/2*c)^2 + 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3
*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3
- 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
- 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
- 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqr
t(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d
*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2
+ 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(
d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + (
(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(
d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +

1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*
(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos
(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*
c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 +
8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x +
1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*
(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*
d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) +

2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 84*((sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)^2 + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c)^2)*cos(1/2*arctan2(sin(d*x + c), cos(d*x + c))) - 6*(14*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d

*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x +
7/2*c)^2 + 14*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/
2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x
+ c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*c
os(d*x + c) + 11*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 11*sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
c)^2 + 15*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 11*sqrt(2)*cos(1/2*d*
x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 15*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 15*sqrt
(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 11*sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2
c)^2 + 10(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*sin(d*x + c)^2 + 10*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 10*sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 + 28*(((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) - (sqrt(2)*cos(3/2*d*
x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/
2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)
*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x
+ 5/2*c))*cos(7/2*d*x + 7/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)

+ 20*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c) - 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2
)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x +
1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*s
in(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d
x + c) + 2(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(
1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^
3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 +
12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*
c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +

1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt

(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c) - 12*(2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 10*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) + 56*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*

sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*
x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt
(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*
d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*
cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(
d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*

x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3
/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/
2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + s
qrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*
sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) - 84*(((4*sqrt(2)*cos(d*x + c)
^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x +
 c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^
2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2
*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1
/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt
(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x +
 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d
*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*
cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*si
n(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*
x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c
)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*
d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2
)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/

2*c) + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*co
s(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d
*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*
sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqr
t(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2
*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*
c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x +
 5/2*c)^2 + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(
2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*
cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt
(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
+ 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*
x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt
(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*
x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*
d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 +
9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*s
qrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) +
 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1
/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)
*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/
2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin
(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*s
in(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((4*sqrt(2)*cos(d*x + c)^2 + 4*s
qrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3
/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 +
9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sq

rt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt
(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(
1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*
sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))
*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(1/2*arctan2(sin(d*x + c)
, cos(d*x + c))))*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c
)))^2 + 6*(14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(
3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x +
3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2
*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)^2 - 8*((sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^
2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos
(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(
5/2*d*x + 5/2*c)*sin(5/2*d*x + 5/2*c) + 14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*
sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x
+ c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x
+ 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c)^2 +
35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + (
(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(
d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*
(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(
d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/

2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) -
8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*c
os(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) -
20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sq
rt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*
d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2
+ 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin
(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 -
2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/
2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3
*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d

*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x
+ 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2
*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 1
4*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1
/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt
(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*
x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c))*co
s(7/2*d*x + 7/2*c) + 2*(84*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2
*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*s
in(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x
 + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^3 - 84*((sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(
2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*
sin(7/2*d*x + 7/2*c)^3 - 24*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)

^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + s
qrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^3 +
 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3
 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c
))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c
))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3
- 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2
 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*

d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3
/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2
*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1
/2*d*x + 1/2*c)^2 + 56*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqr
t(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3
/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c
)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) - 70*((8*sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/
2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*
sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8
*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt
(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*
x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 +
4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d
x + c) - 8((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c

os(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(
2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d
*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2
c)^2 - 3(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2
))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)
*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x
+ 3/2*c) - 140*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1
/2*c))*cos(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(
d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*s
qrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*s
qrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*s
qrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*lo

g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*
sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x +
1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(
2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x +
c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x +
c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*
c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x
+ c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c
))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2
*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*c
os(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin

(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c)^2 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1

) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(
8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*
c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))
*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c
)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/
2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin
(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x
 + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1
/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*
c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 28*(sqrt(2)*cos(3/2*d*
x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/
2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)
*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x
+ 7/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2

- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1
/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x
+ 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*
x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*
cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 8*sqrt(2))*cos(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2
)*cos(d*x + c) + 8*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 8*sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
+ c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 8*sqrt(2)*cos(1/2*d*x + 1/2*
c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x +
c)*sin(1/2*d*x + 1/2*c) + 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2
*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*
d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)
*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x +
 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14
*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/
2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(

```
2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x
 + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(7/2*d*x + 7/2*c)^2
+ 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3
+ ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*c
os(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) +
 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*c
os(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2
)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sq
```

rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x

```
+ 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2
*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c)^
2 + 6*(14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*
d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*
c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x
 + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)^2 - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*
d*x + 5/2*c)*sin(5/2*d*x + 5/2*c) + 14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(
d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
 + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/
2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c)^2 + 35*(
12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) +
 sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x
+ c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2
*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x
+ c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
```

n(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*s
qrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3
/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*
sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2
)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x
+ 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4
*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x
 + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((
8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*
x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1
/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*
x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sq

rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 84*((sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(

2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin
(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)^2 + (sqrt(2)*cos
(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d
*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*
sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7
/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt
(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/
2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)
*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + (s
qrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)
*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x
 + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
 c))*sin(5/2*d*x + 5/2*c)^2)*cos(1/2*arctan2(sin(d*x + c), cos(d*x + c))) -
 6*(14*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(s
qrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 14*((sqrt(2)*cos(d*x + c) + sq
rt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x +
5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 2*((4*sqrt(2)*c
os(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqr
t(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt
(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*sin(3/2*d*x + 3/
2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*sin(d*x + c)^2 + 11*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
 + 1/2*c) + 11*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 15*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
+ 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + 15*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 11

```
*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2
 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 10*sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + 10*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 28*(((sqrt(2)*cos(d*x + c)
 + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3
/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d
*x + 5/2*c) - (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(
3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x +
3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2
*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 20*(sqrt(
2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 20*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) - 35*(12*sqrt(2)*cos(3/2*d*x + 3
/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/
2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*s
qrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 -
 (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/
2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c
))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c
```

)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c
))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x +
c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*
c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2
*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/
2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x
+ 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1
/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x +
c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/
2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)
^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +

1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c) - 12*(2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*co s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 10*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 630*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*

x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqr
t(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(
3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*co
s(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)
*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
 + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos
(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
+ 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos
(3/2*d*x + 3/2*c))) + 56*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos

(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
 c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqr
t(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2
*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(
d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c)
)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*
x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
 + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x
 + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +

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1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(s
qrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1
/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5
/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*c
os(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(3/2*arctan2(sin(
d*x + c), cos(d*x + c))) - 84*(((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d
*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
 c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*co
s(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x
+ c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(
d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
 + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2
)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)
^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqr
t(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*c
os(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
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+ c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(
3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((4*sqrt(2)*c
os(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(
2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2
)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)
^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*si
n(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1
/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(
1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*
c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sq
rt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*si
n(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((4*sqrt
(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*
sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*s
qrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3
/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*
x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)
*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*
(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*(
(4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x +
c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^
2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*
d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin
(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*
sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/
2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*

sin(5/2*d*x + 5/2*c) + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^
2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
(4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x +
c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*c
os(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqr
t(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*co
s(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)
*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c
))*sin(5/2*d*x + 5/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*co
s(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 84*((sqrt(2)*c
os(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2
*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) +
2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos
(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sq
rt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(
3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x +
c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) +
(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*
c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d
*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c)
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
 + c))*cos(5/2*d*x + 5/2*c)^2 + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c
) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt
(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*si
n(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*
cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) +
 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*si
n(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*s
in(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x +
 c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x +
 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c)^2)*co
s(1/2*arctan2(sin(d*x + c), cos(d*x + c))) - 6*(14*((sqrt(2)*cos(d*x + c) +
 sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2
*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/

2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 14*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 11*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 11*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 15*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 15*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 11*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 10*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 10*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 28*(((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) - (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 20*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c

os(d*x + c) - 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt
(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x
+ 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x
+ 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)
*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x
+ 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*si
n(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c
)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2
+ 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/
2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*

d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x
 + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x
 + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*
sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x +
 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*
x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(
d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
)*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sq
rt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)
^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*c
os(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +

1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2
*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*
x + 5/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*
c) - 12*(2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2
)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + 5*(sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 5*(sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 10
*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 10*(sqrt(2)*cos(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*
sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*s
in(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 360*(((sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3
/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)
^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*co
s(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
 + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos
(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/

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2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2
*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(s
qrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1
/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
+ sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt
(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*
cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d
*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
```

+ 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x
+ 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c
) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)
^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
c)^2 + 2(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/
2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*
x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x +
c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c
))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c

os(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(
3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5
/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*
c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*
cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*co
s(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*
x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3
/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*

```
cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*s
in(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*
((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))
*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^
2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sq
rt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2
)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2
*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
```

```
+ c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
 + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x
+ 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sq
rt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/
2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*co
s(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3
/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(
```

3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7
/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
+ 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d
*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqr
t(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2
*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*co
s(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)
*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
 + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos
(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
+ 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c

)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7
/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)
*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*sin(1/5*arct
an2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 1260*(((sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x
+ c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2
*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +

c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c
) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
 + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)
*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
+ c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*s
qrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(
3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7
/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +

(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 56*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(

2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/
2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + s
qrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2
*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*
(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*c
os(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d
*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))
) - 84*(((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*c

os(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2)) *sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1 /2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sq rt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/ 2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2 *c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c os(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)* sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sq rt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2 *d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*s qrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d *x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos (d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d* x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2* c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*s qrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2 *d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7 /2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c os(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sq rt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2 *d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)* cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d* x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2* d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*si n(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt (2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin (3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((4*sqrt(2)*cos(d*x + c)^2 + 4* sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c) ^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*co s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*s qrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqr

t(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9
*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)
)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c)
^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x +
 c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^
2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2
*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1
/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt
(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x +
 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) +
((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x +
 c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)
^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2
*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4
*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
 c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)
^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*sin(2/5*arctan2(sin(5/2*d
*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 1260*(((sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3
/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +

sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s

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qrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3
/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/
2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + s
qrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*
cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))*sin(2/3*arctan
2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + (84*(sqrt(2)*cos(3/2*d*x +
 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c
)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*si
n(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7
/2*c)^3 - 84*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
+ 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*
c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^3 - 24*((sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
 + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c
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)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)
)*sin(5/2*d*x + 5/2*c)^3 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x +
c) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt
(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*s
qrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*s
qrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(
2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x
 + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 +
4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*
x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 3
5*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*c
os(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) +
 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*
cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +

1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 56*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +

1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d

*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1
/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1
/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*
sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2
*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(
1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*s
qrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*
x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*
(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2
*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) +
2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*
sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/
2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/

2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c)^2 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt

(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 28*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*

d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x
+ 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3
*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 8*
sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 8*sqrt(2))*sin(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 8*sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 8*
sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 8*sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^
2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*c
os(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos
(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/
2*c) - 140*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c
))*sin(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x
+ c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(
2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/

2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(

cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x
 + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d
*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/
2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x
 + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x +
 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3
 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2
c)^2 - 3(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2
))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)
*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x
+ 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2
*c))*sin(5/2*d*x + 5/2*c)^2 + 6*(14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x

```
 + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) +
sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c
)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)^2 - 8*((sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqr
t(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(
3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)*sin(5/2*d*x + 5/2*c) + 14*(sqrt(2)*c
os(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2
*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) +
2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin
(5/2*d*x + 5/2*c)^2 + 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) -
12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(
1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(
1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8
*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/
2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(
1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sq
rt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x
 + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
```

+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x
+ c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*
d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin
(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin
(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*
c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)
^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*
c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)
- 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(
d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos

```
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x +
 c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 -
 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(
d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*
x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c
) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*co
s(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 84*((sqrt(2)*cos(3/2*d*x + 3/2*c
)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(
d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*
d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^
2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x
+ 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2
*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1
/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d
*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1
/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2
)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x
 + 5/2*c)^2 + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(
3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x +
3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2
*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*
c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin
(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2
*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/
```

2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)
*sin(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sq
rt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(
3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x +
c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c)^2)*cos(1/2*arctan2(sin(
d*x + c), cos(d*x + c))) - 6*(14*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 14*(
(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*c
os(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*
x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqr
t(2)*cos(d*x + c) + 11*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(
2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11
*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 11*sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1
/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 15*sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 11*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(
3/2*d*x + 3/2*c) + 15*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 15*sqrt(2)*cos(d*x + c)
*sin(1/2*d*x + 1/2*c) + 11*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*
c))*sin(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 10*(sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
 + 10*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 10*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
28*(((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos
(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt
(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3

/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) - (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin
(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c
) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3
/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c))*cos(7/
2*d*x + 7/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 20*(sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) - 35*(
12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) +
 sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x
+ c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2
*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x
+ c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*s
qrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3
/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*
sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/

2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2
)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x
+ 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4
*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x
 + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((
8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*
x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1
/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*
x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/
2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*
d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x
 + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/
2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sq

rt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*
sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x +
1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 20*(s
qrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1
/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c) - 12*(2*((sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 10*(sqrt(2)*cos(d*x
+ c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c) + 10*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x +
c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c
))*sin(5/2*d*x + 5/2*c) + 56*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +

sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2

*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x
 + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(
2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d
*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(3/2*arctan2(
sin(d*x + c), cos(d*x + c))) - 84*(((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*s
in(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2
+ 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2
)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x
+ 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*
cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2
*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sq
rt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/
2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9
*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqr

t(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(
2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*s
qrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*
sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((4*sqrt(
2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*s
qrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sq
rt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/
2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(
4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2
)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((4*
sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)
+ 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 +
 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/
2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
+ 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*s
qrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 +
 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*
x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x +
 c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(
3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)
*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
+ 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*co
s(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d

*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c
) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2
*c)*sin(5/2*d*x + 5/2*c) + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x +
 c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^
2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*
x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)
^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9
*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x
+ c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3
/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c)))
)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 6*(14*(s
qrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)
*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x
 + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
 c))*cos(5/2*d*x + 5/2*c)^2 - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
 (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c
) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
 + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)
*sin(5/2*d*x + 5/2*c) + 14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2
*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*s
in(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x
 + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c)^2 + 35*(12*sqrt(2)*c
os(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*si
n(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x

+ 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x
+ c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*
x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si
n(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1
/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1
/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1
/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*
sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2
*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(
1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*s
qrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*
x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*
(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c

os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2
*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) +
 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*
sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/
2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)
^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*c
os(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
+ (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x +
1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqr
t(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/
2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*
sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d
*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*s
qrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/
2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*
c) + 2*(84*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2
*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2
*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*
x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)

^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^3 - 84*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^3 - 24*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^3 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)

+ 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 56*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x

+ 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3
*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
 c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2
*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sq
rt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin
(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^
2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*co
s(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(
2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(7/2*d
*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(s
qrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d
*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d
*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1

/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2* d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c)^2 + (84*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d *x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^3 - 84*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^3 - 24*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^3 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d *x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 56*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*s in(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c

)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*
x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2
)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
- 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1
/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c
)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2
+ 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2
+ (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*s
in(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)
+ 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x
+ 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +

2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*
x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)
*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x
+ 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x +
1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3
- 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)
)*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*
cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x +
3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*
c))*cos(5/2*d*x + 5/2*c)^2 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x
+ c) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sq
rt(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/

2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(

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1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 28*(sqrt(2)*cos(3/2*d*x + 3
/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(
3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2
*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)
*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2
*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c
) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3
/2*d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))
*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 8*sqrt(2))*cos(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos
(d*x + c) + 8*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^
2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sq
rt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 8*sqrt(2)*cos(1/2*d*x + 1/2*c))*c
os(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*si
n(1/2*d*x + 1/2*c) + 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*
sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
```

c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(
1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*
c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt
(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
- sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))
*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/
2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/
2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(7/2*d*x + 7/2*c)^2 + 105
*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c)
 + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3
*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*
x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1
/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3
*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*
x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*
c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8
*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x

+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos
(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 2
0*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt
(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*
x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 +
4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d
x + c)^2 + 3(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*
((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*
d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*
d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x +
3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/
2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d
*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*

```
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*
sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x +
1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2
*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si
n(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c)^2 + 6
*(14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x +
 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*
sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/
2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*si
n(d*x + c))*cos(5/2*d*x + 5/2*c)^2 - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
 c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
+ 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x +
 5/2*c)*sin(5/2*d*x + 5/2*c) + 14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x +
 c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sq
rt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*
sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c)^2 + 35*(12*sq
rt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt
(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^
```

```
2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*
sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)
+ 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos
(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2
)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*
x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(
2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
 - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin
(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2
*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)
^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x
```

+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1
/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*
x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1
/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c)
- 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x +
1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/
2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/
2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)
*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - s
qrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*co
s(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c
) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d
*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c))*cos(7/2*d*x
+ 7/2*c) + 84*((sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*co
s(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x
+ 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1

/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)^2 + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c)^2)*cos(1/2*arctan2(sin(d*x + c), cos(d*x + c))) - 6*(14*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 14*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*sin(3/2*d*x + 3/2*c)^

2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin
(d*x + c)^2 + 11*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/
2*c) + 11*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 15*(sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(
4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + 15*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 11*sqrt
(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + 10
*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 10*sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + 10*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 28*(((sqrt(2)*cos(d*x + c) + sq
rt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x +
5/2*c) - (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d
*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c
)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x
+ 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*sin(d*x + c))*sin(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 20*(sqrt(2)*co
s(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + 20*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) - 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)
^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^
3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*s
qrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x

+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2
*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^
2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*co
s(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 +
((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*co
s(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) +
2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*c
os(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/
2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c)
- 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2
+ 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/

```
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x
 + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*
(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/
2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)
 + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^
2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c
) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*s
in(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/
2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d
*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
3/2*c))*sin(7/2*d*x + 7/2*c) - 12*(2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5
```

/2*c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 5*(sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/
2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*s
in(1/2*d*x + 1/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 10*(sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
 + 10*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) + 56*((
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*
x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2
*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*
sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3
/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)
^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*co
s(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
 + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos
(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1

/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*
x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
 + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x
 + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqr
t(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2
*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
 sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(
2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*c
os(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*
x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d
*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x +
 c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*
c))*sin(5/2*d*x + 5/2*c)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) -

84*(((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d
*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x
+ c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin
(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
 + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*c
os(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
x + c) + 2(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*
c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/
2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2
)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*c
os(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(
2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5
*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x
 + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(
2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
 + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d
*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*s
in(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2
+ 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2
)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x
+ 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*
cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2
*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt
(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*
c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*s
qrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(

2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)
*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d
*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2
*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqr
t(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 +
 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^
2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*
sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c
)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*
cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2
*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((4*
sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)
+ 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 +
 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/
2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
+ 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*s
qrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*
sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*cos(2/3*arctan2(sin(3/2*d*x +
 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*s
in(d*x + c) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 -
 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt
(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*

c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35
*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/
2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c
))*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2
c)^2 + 35((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*s
in(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d
x + c) + 2(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x +
1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*si
n(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/
2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 28*(sqrt(2)*cos(3/2*
d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x +
1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(
2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*
x + 7/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(

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sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*
sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x +
 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*
x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(
d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
)*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 8*sqrt(2))*cos(3/2*d*x + 3
/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt
(2)*cos(d*x + c) + 8*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 8*sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*
x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 8*sqrt(2)*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x
+ c)*sin(1/2*d*x + 1/2*c) + 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3
/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/
2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(
2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x
 + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
```

1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +

1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 -
(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2
c)^2 + 4(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c)
)*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)
^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*c
os(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c
) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)
- 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2
*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*si
n(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*co
s(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2

*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*
x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11
*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1
/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c
)^2 + 1260*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(
2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d
*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*co
s(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)
*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
 + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos
(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
+ 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
 + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2

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+ 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c
)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)
)*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2
*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 +
2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin
(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c
))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c
)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(
sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt
(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3
/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*
c), cos(3/2*d*x + 3/2*c)))*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*
```

x + 3/2*c))) + (84*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)
*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d
*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*si
n(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^3 - 84*((sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*
d*x + 7/2*c)^3 - 24*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^3 + 3*(420*
sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d*x + c) + s
qrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d
*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d
*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2
*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x

+ 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sq
rt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2
- 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x
+ 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1
/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x +
1/2*c)^2 + 56*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos
(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x +
3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/
2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1
/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*
x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x +
1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x
+ c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)
*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2

```
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*sin(
1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*
c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)
 - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
 + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2
*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d
*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x
 + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c)
 - 140*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*c
os(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c)
 - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*s
```

in(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*s
in(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
- 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x +
 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*s
in(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8
*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*
d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2
 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 +
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 +
(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(
d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3
*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3
/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*
sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^

```
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1
/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x +
 c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1
/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2
*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3
*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^
2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*c
os(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos
(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/
2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))
```

*cos(5/2*d*x + 5/2*c)^2 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c
) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(
2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sq
rt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sq
rt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2
)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x
+ 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4
*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x
 + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35
*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*co
s(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) +
2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*c
os(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3
*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/

```
2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 28*(sqrt(2)*cos(3/2*d*x + 3/2*
c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin
(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2
*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)
 - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c)
 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) -
 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*
d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*si
n(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 8*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
 c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*
x + c) + 8*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(
2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 8*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(
3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1
/2*d*x + 1/2*c) + 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin
```

(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)

```
+ 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sq
rt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/
2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*s
qrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)
*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x +
 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*
(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x
+ c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8
*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x
 + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/
2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x
 + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2
*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
```

```
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d
*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x
+ 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin
(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2
*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqr
t(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
 - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*s
in(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1
/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1
/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c)^2 + 6*(1
4*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/
2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin
(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c
) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c))*cos(5/2*d*x + 5/2*c)^2 - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3
/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/
2*c)*sin(5/2*d*x + 5/2*c) + 14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c)
 + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(
2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin
(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c)^2 + 35*(12*sqrt(
2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2)
```

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)*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 +
 (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin
(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3
*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/
2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*s
in(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*s
in(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
- 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x +
 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*
sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) -
32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/
2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)
^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2
```

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+ 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*
c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x +
 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*
c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2
*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/
2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c
))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c
)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*
x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2
*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt
(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3
/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*
d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) +
 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2
```

*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 84*((sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)^2 + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c)^2)*cos(1/2*arctan2(sin(d*x + c), cos(d*x + c))) - 6*(14*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 14*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 2*((4*sqrt(2)*cos(d*x +

c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*co
s(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(
d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*
x + c)^2 + 11*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2
c)^2 + 2(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) + 11*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 15*(sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*s
qrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + 15*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 11*sqrt(2)
*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + 10*(s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*sin(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 10*sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + 10*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 28*(((sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2
*c) - (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x
+ 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2
*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1
/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c))*sin(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 20*(sqrt(2)*cos(d
*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c))*cos(3/2*d*x + 3/2*c) + 20*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) - 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*
sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 -
8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) -
8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*c
os(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) -
8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2

)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt
(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*
x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 +
 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d
x + c)^2 + 3(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d
*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(
d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1
/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c
))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 +
8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*
d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +

sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c) - 12*(2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2

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*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*
c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 5*(sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d
*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(
1/2*d*x + 1/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 10*(sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
10*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) + 56*(((sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
 c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2
*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sq
rt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin
(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3
/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/
2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
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c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x +
5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2
)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*
cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(
d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
+ c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
```

2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) - 84*(((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^

2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt
(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*co
s(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
+ c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*
x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2
)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3
/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*
sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x +
3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 +
 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqr
t(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9
*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)
)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((4*sqr
t(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5
*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*
sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x +
3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2
*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt
(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin
(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*sin(2/3*arctan2(sin(3/2*d*x + 3/
2*c), cos(3/2*d*x + 3/2*c)))^2 + 6*(14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(
d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
 + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/
2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)^2 - 8*((
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +

sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
 + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*
sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*s
in(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)*sin(5/2*d*x + 5/2*c) + 14*(sqrt(2
)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(
1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c)
 + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*
sin(5/2*d*x + 5/2*c)^2 + 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c)
 - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*s
in(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*s
in(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
- 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x +
 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*s
in(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8
*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*
d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2
 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 +
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 +

(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(
d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3
*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3
/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*
sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1
/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x +
c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1
/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2
c) - 6(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3
*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^

2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*c
os(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos
(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/
2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))
*cos(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 2*(84*(sqrt(2)*cos(3/2*d*x +
3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin
(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/
2*c)^3 - 84*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqr
t(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c
))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^3 - 24*((sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
+ c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))
*sin(5/2*d*x + 5/2*c)^3 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c
) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(
2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin

(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sq
rt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sq
rt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2
)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x
+ 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4
*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x
 + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35
*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*co
s(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) +
2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*c
os(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3
*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1

) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 56*(sqrt(2)*cos(3/2*d*x + 3/2*
c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin
(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2
*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)
 - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c)
 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) -
 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*
d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*si
n(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5
/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*

x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/
2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c
)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))
*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d
*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2
c)^2 - 3(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2
))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt(2)*co
s(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin
(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x
+ c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x
 + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin
(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/
2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/
2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/

2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*s
qrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*
c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1
/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sq
rt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x
 + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*
c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) +
2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*s
qrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2
*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^
2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*co
s(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +

(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si
n(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1
/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt
(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*s
in(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*
x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x +
1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sq
rt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2
*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c)^2 + 3*(420*sqrt(2)*c
os(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(3/2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2
+ (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*s
in(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) +
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(
3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +

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sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8
*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos
(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 2
0*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*s
qrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2
*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^
2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*si
n(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2
 + 28*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x
+ 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2
*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1
/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c))*cos(7/2*d*x + 7/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c
))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 +
8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*
d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1
/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x +
 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
```

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+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*
(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 8*s
qrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 8*sqrt(2))*sin(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*
x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 8*sqrt(2)*sin(1/2*d*x + 1/2*c
)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 8*s
qrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 8*sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x
 + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2
 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*co
s(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(
d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2
*c) - 140*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c)
)*sin(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x +
 c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2
)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2
)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(
```

cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*
x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2
)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
- 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1
/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c
)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2
+ 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2
+ (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*s
in(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)
+ 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x
+ 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2

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*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*
x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)
*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x
+ 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x +
1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3
- 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)
)*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*
cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x +
 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*
c))*sin(5/2*d*x + 5/2*c)^2 + 6*(14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x
+ c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + s
qrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)
*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)^2 - 8*((sqrt
```

(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c
)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(
sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt
(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3
/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)*sin(5/2*d*x + 5/2*c) + 14*(sqrt(2)*co
s(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*
d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2
*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(
5/2*d*x + 5/2*c)^2 + 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 1
2*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1
/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1
/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*
sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1
/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqr
t(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x
+ 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3
*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/

2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x
+ c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d
*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(
1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c
) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^
2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c
))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)
- 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x +

```
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d
*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x
 + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c)
 - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos
(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 84*((sqrt(2)*cos(3/2*d*x + 3/2*c)
^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d
*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d
*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2
 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x +
 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*
sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/
2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*si
n(d*x + c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*
x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/
2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)
*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x
+ 5/2*c)^2 + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3
/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3
/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*
d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c
)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(
d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*
d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)*
sin(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqr
t(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3
/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c
```

)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c)^2)*cos(1/2*arctan2(sin(d
*x + c), cos(d*x + c))) - 6*(14*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)
*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*
d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 14*((
sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x +
 c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*co
s(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
 + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 1
0*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt
(2)*cos(d*x + c) + 11*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2
)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 11*sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/
2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 15*sqrt(2)
*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 11*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3
/2*d*x + 3/2*c) + 15*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
 + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 15*sqrt(2)*cos(d*x + c)*
sin(1/2*d*x + 1/2*c) + 11*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c
))*sin(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 10*(sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
 + 10*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 10*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2
8*(((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) - (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(
d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
 + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/
2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +

sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c))*cos(7/2
*d*x + 7/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 20*(sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) - 35*(1
2*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x +
 c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*
c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x +
 c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))
*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sq
rt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/
2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*s
qrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)
*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d

*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x +
1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*
(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x
+ c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8
*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/
2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x
+ 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2
c) - 2(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d
*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x
+ 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin
(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2
*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqr
t(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
- sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*s
in(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x

+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1
/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1
/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 20*(sq
rt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c) - 12*(2*((sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^
2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sq
rt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2
)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2
*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
+ 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
x + c)^2 + 5(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 10*(sqrt(2)*cos(d*x +
c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))
*cos(3/2*d*x + 3/2*c) + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c) + 10*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c
)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)
)*sin(5/2*d*x + 5/2*c) - 630*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d

x + c) + 2(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*s

in(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x
 + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(
2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d
*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(1/3*arctan2(
sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 56*(((sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*
cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*c
os(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +

c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)

+ sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*
c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c
)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) - 84*(((4*sqrt(2)*cos(d*x
+ c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*co
s(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(
d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4
*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
+ c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^
2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*
x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5
*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*
cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*
d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*
cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt
(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(
2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c
)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2
*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*s
qrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*s
in(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x
+ 5/2*c) + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(
2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*
cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt
(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
+ 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*
x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +

3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt
(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*
x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*
d*x + 5/2*c)^2 + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*
sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqr
t(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5
*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2
*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*c
os(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*
d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4
*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1
/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin
(7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)
^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
(4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x +
c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*
cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sq
rt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*c
os(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c
)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*
c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((4*sqrt(2)*cos(d*x + c)^2
+ 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*
x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)
^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4
*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*
c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)
*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/
2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(1/2*arctan2(sin(d*x
+ c), cos(d*x + c))))*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x +

3/2*c))) + 84*((sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos
(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x +
 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/
2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2
*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*si
n(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/
2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c
)*cos(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*s
qrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin
(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x +
 c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)^2 + (sqrt(2)*cos(3/2*d
*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1
/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2
)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d*x
 + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*co
s(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x
+ 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1
/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + (sqrt(2)
*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c)
+ 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*s
in(5/2*d*x + 5/2*c)^2)*cos(1/2*arctan2(sin(d*x + c), cos(d*x + c))) - 6*(14
*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*
x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)
*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*
d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 14*((sqrt(2)*cos(d*x + c) + sqrt(2))
*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/
2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
 + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)
^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 2*((4*sqrt(2)*cos(d*x
 + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*

cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 11*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 11*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 15*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 15*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 11*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 10*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 10*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 28*(((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) - (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 20*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) - 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1

/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sq
rt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*
d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2
+ 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos
(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 +
((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos
(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2
*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*co
s(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2
*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c)
- 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2
+ 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1

/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x
+ 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3
*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(
sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)
 + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2
 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 1
2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)
 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*si
n(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2
*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*
x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3
/2*c))*sin(7/2*d*x + 7/2*c) - 12*(2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3
/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)

*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/
2*c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 5*(sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2
*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 10*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
+ 10*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 390*((
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*
x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2
*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*
sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3
/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)
^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*co
s(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
 + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos
(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(

d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*
x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
 + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x
 + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sq
rt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
+ sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt
(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*
cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d
*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x

```
+ 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x
+ c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2
*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2
 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/
2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
+ c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*s
qrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3
/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
```

) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2
c) + 2(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*
c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*
cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) +
((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(
d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c)
)*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c
)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*c
os(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c

) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*co
s(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/
2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(
sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
+ sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt
(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*
cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d
*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2

+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +

sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7
/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
+ 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x +
5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(
2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d
*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*co
s(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)
*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos
(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
+ 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*

d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
 + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c
)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)
)*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x
 + 3/2*c))))*sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) -
 1260*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*co
s(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x
+ c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2
*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3
/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)
^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*co
s(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*

x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
 + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos
(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
+ 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
+ c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*s
qrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
 sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(
2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*c
os(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*
x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), c
os(3/2*d*x + 3/2*c))) + 56*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sq

rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + s
qrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 +
 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*si
n(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*
c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqr
t(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(
3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*
d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/

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2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqr
t(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d
*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*
(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x +
 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)
*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(3/2*arctan2(si
n(d*x + c), cos(d*x + c))) - 84*(((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin
(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*
cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*
x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*co
s(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d
*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt
(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*
c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
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cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*s
qrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)
*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d
*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2
*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqr
t(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((4*sqrt(2)
*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqr
t(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt
(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*
c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x +
 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/
2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*
sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*
sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((4*sq
rt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) +
5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4
*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x +
 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*
d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(
2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
 + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqr
t(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2
*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x
+ c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c
)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/
2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*s
in(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(

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1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9
*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
+ 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c
)*sin(5/2*d*x + 5/2*c) + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c
)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
+ (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x
+ c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2
*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*s
qrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*
cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x +
c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2
*c))*sin(5/2*d*x + 5/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*
cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 2*(84*(sqrt(
2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos
(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c
) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))
*cos(7/2*d*x + 7/2*c)^3 - 84*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*co
s(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
 + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^3 - 24*((sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqr
t(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(
3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^3 + 3*(420*sqrt(2)*cos(3/2*d*x + 3/2
*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2
```

*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 1

05*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 56*(sqrt(2)*c
os(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2
*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) +
2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos
(5/2*d*x + 5/2*c) - 70*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c
) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^
2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c
))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)
- 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*((sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
 + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c
)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)
)*sin(5/2*d*x + 5/2*c) - 70*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*

x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/
2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sq
rt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*
sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x +
1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(7/2*d*x + 7/2*c)^2 + 1
05*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + (
(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(
d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*
(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(
d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(

1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2

*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 1
4*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1
/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt
(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*
x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(5/2*d*x + 5/2*c)^2 +
 3*(420*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 420*(sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 280*sqrt(2)*sin(1/2*d*x + 1/2*c)^3
 + 35*((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c
))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c
))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3
- 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 105*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(

```
1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + 35*((3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2
 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3
/2*c)^2 - 35*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2
*d*x + 1/2*c))*sin(d*x + c)^2 + 105*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1
/2*d*x + 1/2*c)^2 + 28*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqr
t(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3
/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c
)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c) - 70*((8*sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/
2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*
sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8
*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 70*(8*sqrt
```

(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*
x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 +
4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d
x + c) - 8((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*c
os(d*x + c) + 8*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 8*sqrt(2))*sin(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 8*sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) + 8*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
+ 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 8*sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 70*(6
*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c
) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)
^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3
*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x +
c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*
sin(3/2*d*x + 3/2*c) - 140*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin
(1/2*d*x + 1/2*c))*sin(7/2*d*x + 7/2*c)^2 + 105*(12*sqrt(2)*cos(3/2*d*x + 3
/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/
2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(co

s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*s
qrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 -
 (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/
2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c
))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c
)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c
))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x +
c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*
c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2
*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 -
 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/
2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2

*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c)^2 + 6*(14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x

+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/
2*c)^2 - 8*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2
)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)*sin(5/2*d*x + 5/2*c)
 + 14*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x
+ 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2
*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1
/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c))*sin(5/2*d*x + 5/2*c)^2 + 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3
*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3
- 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
- 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
- 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqr
t(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d
*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2
+ 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(
d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + (
(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*

```
d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(
d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*
(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos
(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*
c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) -
 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 +
 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x +
 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*
(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos
```

(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*
d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) +
 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2
+ 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12
*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)
- 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin
(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*
d*x + 1/2*c))*cos(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 84*((sqrt(2)*cos
(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d
*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*
sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7
/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt
(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/
2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)
*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + (s
qrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)
*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x
 + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
 c))*cos(5/2*d*x + 5/2*c)^2 + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c)
+ 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2
)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(
d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*co
s(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*
d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2
*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(
7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin
(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c

) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3
/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c)^2)*cos(
1/2*arctan2(sin(d*x + c), cos(d*x + c))) - 6*(14*((sqrt(2)*cos(d*x + c) + s
qrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d
*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x +
 7/2*c)^2 + 14*((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/
2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x
 + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
 c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*c
os(d*x + c) + 11*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 11*sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
c)^2 + 15*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 11*sqrt(2)*cos(1/2*d*
x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 15*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 15*sqrt
(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 11*sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2
c)^2 + 10(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*sin(d*x + c)^2 + 10*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 10*sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 + 28*(((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) - (sqrt(2)*cos(3/2*d*
x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/
2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)

```
*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x
+ 5/2*c))*cos(7/2*d*x + 7/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
 + 20*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c) - 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2
)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x +
1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*s
in(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d
*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(
1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^
3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 +
12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*
```

c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*
x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x +
1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x +
1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1
/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x
+ 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*
x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*
cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt
(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2
+ (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos
(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)

^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(5/2*d*x
+ 5/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)
- 12*(2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*
cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + 5*(sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/
2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + 5*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 10*(
sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 10*(sqrt(2)*cos(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sq
rt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin
(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) - 630*(((sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(

3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c

)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7
/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)
*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 56*(((sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*

d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqr
t(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d
*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^
2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/
2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2
*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*c
os(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos
(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x
 + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/
2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2

)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c
)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*c
os(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*si
n(5/2*d*x + 5/2*c)^2)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) - 84*(((
4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c
) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2
 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d
*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(
1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*s
qrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2
*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5
*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2
 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(
d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x
 + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*si
n(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(
2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c
) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*
cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
 + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2
*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7
/2*c)*cos(5/2*d*x + 5/2*c) + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x
 + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(
d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x +
c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +

9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*
c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*
x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*si
n(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)
*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d
*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c
)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*c
os(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*
d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqr
t(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2
c)^2 + 4(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*
sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2
)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(
d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/
2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sq
rt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*s
in(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((4*sqrt(2
)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sq
rt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqr
t(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2
c)^2 + 4(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*c
os(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1
/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4
*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)
*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(1/

```
2*arctan2(sin(d*x + c), cos(d*x + c))))*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c
), cos(3/2*d*x + 3/2*c))) + 84*((sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c
) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt
(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*si
n(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*
cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) +
 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*co
s(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*s
in(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x +
 c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x +
 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)^2 + (
sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*
x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
+ c))*sin(7/2*d*x + 7/2*c)^2 + 2*(sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x +
c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqr
t(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*s
in(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x +
5/2*c) + (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d
*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c
)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x
+ 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*sin(d*x + c))*sin(5/2*d*x + 5/2*c)^2)*cos(1/2*arctan2(sin(d*x + c), cos(d
*x + c))) + 105*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(
sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
```

*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^
2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sq
rt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2
)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2
*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*co
s(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*
x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3
/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
+ (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*
c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c
)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*c

os(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) +
((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))
*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3
/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)
^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*co
s(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos
(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2
*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3

/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x

```
 + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^
2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*
d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqr
t(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d
*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^
2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/
2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2
*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
```

+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2

*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*(
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*
x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2
*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*
sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqr
t(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)
*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*
d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c),
 cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
 + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^
2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3

/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1
/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
 + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*
sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*s
in(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3
/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/
2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*si

n(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*
x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt
(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*
d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2
(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*cos(2/5*arctan2(sin(5/2*d*x
 + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x +
7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt
(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*
d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*
c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 +

sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
c)^2 + 2(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/
2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
 + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))
*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + s
qrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin
(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +

2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*
arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x
+ c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2
*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
 (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c
) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
 + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)
*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)

*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
 + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*
sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*s
in(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^
2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos
(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(
7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
 + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x
+ 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqr

t(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2
*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(
2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*c
os(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*
x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d
*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x +
c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*
c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2
+ 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2

*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
 + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2
*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
 c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2
*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sq
rt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin
(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/
2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
+ (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*
c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c
)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*c

os(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) +
((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))
*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3
/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)
^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*co
s(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
 + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos
(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2
*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3

/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x

```
 + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^
2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
 c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2
*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sq
rt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin
(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3
/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/
2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x +
5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
```

x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2
)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*
cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(
d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
+ c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))
*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x
+ 3/2*c))))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2
+ (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*si
n(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +

1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*
c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
+ c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))
*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/
2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + s
qrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2
*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*
(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(

```
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*c
os(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d
*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3
/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*
((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2
```

*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2

+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)

+ 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2
/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*c
os(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d
*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^
2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/
2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2
*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2
*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 +
(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt

(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(
d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c)
)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*
cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*c
os(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*
d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqr
t(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d
*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(s

qrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1
/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqr
t(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)
*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*
d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos
(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x
 + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/
2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2
*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
 + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)

*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
 + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*
sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*s
in(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
+ sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt
(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*
cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d
*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x +
7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt

(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*

```
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
+ c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*s
qrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/
2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + s
qrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2
*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x
 + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1
```

/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(
2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d
*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(
sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*log(cos(1/5*arctan2(sin(5/2*d
*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + sin(1/5*arctan2(sin(5/2*d*x + 5/2*c
), cos(5/2*d*x + 5/2*c)))^2 + 2*sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5
/2*d*x + 5/2*c))) + 1) - 105*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
x + c) + 2(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2
 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
c)^2 + 2(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/
2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
+ c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*s
qrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*si

n(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3
/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/
2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*
x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt
(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*
d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*co
s(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)

*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^

```
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
 c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))
*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*
sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*
d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))
)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3
/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1
/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d
```

*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x +
c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*
c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^
2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos
(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(
5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
+ 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
+ c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*s
qrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*c

os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(
2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*c
os(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*
x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7
/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(
2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d
*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c
) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x

+ 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2
*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*
d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*
d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*si
n(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2
*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x
+ 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2
)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*

x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(

1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*

d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*
x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
 + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x
 + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
+ (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*
c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c
)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqr
t(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(
3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*

x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/
2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + s
qrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2
*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5
/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2
)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*
cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(
d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +

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3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
+ c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))
*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2
*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 +
2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin
(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c
))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c
)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(
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sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt
(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3
/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d
*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*
x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*
x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(
sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x +
5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*
cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin

(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3
/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/
2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*
x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt
(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*
d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*co
s(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)

*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^

2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
 c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))
*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*
sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*
d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))
)^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*
cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*co

s(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)

```
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqr
t(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)
*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*
d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c),
 cos(3/2*d*x + 3/2*c))))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x
+ 5/2*c)))^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(s
qrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1
/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqr
t(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)
*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*
d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(
```

2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos
(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x
 + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/
2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
 + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^
2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3
/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1
/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
 + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*
sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*s

in(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x +
3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x +
7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt
(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*
d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*
c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
c)^2 + 2(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/
2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*c

```
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
 + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c
)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)
)*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*co
s(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c
)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(
sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt
(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3
```

/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*
d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3
/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/
2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
 + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*
sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*s
in(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2

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*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^
2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos
(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(
7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
 + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x
+ 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqr
t(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2
*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
 sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(
2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*c
os(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*
```

x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2

*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sq
rt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin
(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/
2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3
/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/
2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2
)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c)
 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*si
n(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*

c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*
cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*s
in(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
 c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqr
t(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5
/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*
(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*ar
ctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*cos(2/5*arctan2(sin(5/2
*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c

)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*
d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqr
t(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d
*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*
(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x +
 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)
*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos
(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x

+ c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*log(cos(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 - 2*sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 1) + 315*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x

+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*
(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x +
 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)
*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*co
s(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*
x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3
/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2

c) + 2(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*
c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
 c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqr
t(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (
((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))
*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c
)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*c
os(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*co
s(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*

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x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d
*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*
x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*
x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sq
rt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
+ sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt
(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*
cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d
*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
```

n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^

```
2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/
2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2
*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)
*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c)
+ ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin
(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c
))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c
)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*c
os(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
```

```
*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*si
n(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/
2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(
sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arc
tan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x
+ c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2
*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
```

```
 (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c
) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
 + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)
*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
+ c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*s
qrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(
3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
```

```
+ 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7
/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
 c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
+ 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x +
 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*co
s(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + (((sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
 sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(
2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*c
os(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*
x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
 c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
+ 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x +
 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)
```

```
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
 + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^
2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
 + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2
*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
 + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c
)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)
)*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3
```

/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/
2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c
)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*c
os(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos
(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x
 + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/
2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c
)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*c
os(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*si
n(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/

```
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*(
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*
x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2
*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*
sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqr
t(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)
*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*
d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
```

+ 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x
+ 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sq
rt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/
2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*co
s(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*
x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x +
c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c
))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (

sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
x + c) + 2(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*s
in(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
+ 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/
3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*co
s(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*
x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3
/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
+ (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2

c) + 2(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*
c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
 c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqr
t(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (
((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))
*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c
)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*c
os(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*co
s(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*

x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d
*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*
x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*
x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sq
rt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
+ sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt
(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*
cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d
*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si

n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2 *c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2* d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2 *sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2* d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)* cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)) *sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2 *d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)* sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + s qrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2 *d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqr t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*s in(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2) *sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((s qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s qrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)* sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)* sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2* c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*c os(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c) ^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c) ^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*s qrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*si n(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*c os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))* cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2* d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d *x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d *x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1 /2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*c os(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d* x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin (d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (s qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c

)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7
/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(
2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d
*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c
) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
 + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2
*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*
d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c),
 cos(5/2*d*x + 5/2*c)))^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*

cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2
+ 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2
*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2
*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sq
rt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin
(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*
d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x

+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*si
n(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2
*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x
+ 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2
)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(s
in(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*
cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*c
os(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos

(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt

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(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2
*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*
c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*co
s(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x
+ c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2
*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3
/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)
^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*co
```

s(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos

(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2
*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 +
2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin
(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c
))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c
)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(
sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt
(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3
/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d

```
*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*
x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*
x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(
sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x +
5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*
cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin
(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3
/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)
^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*co
s(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
 + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos
(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
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2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2
*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(s
qrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1
/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(
2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*c
os(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*
x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x

+ 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x +
7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^
2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*cos(2/5*ar
ctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 2*(((sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d
*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x +
c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*
c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*
cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +

2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
 + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
 c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2
*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sq
rt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin
(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3
/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/
2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(

d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x +
5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*log
(cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + sin(1/3*a
rctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(s
in(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) - 315*(((sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d
*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x +
 c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*
c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
 + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*
cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
 + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*

```
sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
+ c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*s
qrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(
3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7
/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
 c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
+ 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x +
 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
```

2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt
(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*
d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*c
os(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2
)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*co
s(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
+ 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*
x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x +
c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c
))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + s

```
qrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 +
 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*si
n(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*
c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqr
t(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(
3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2
*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
 (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c
) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
 + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)
^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
```

)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*co
s(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + (
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*
x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2
*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*
sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^
2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos
(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(
7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
+ 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2

)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*
d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sq
rt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*c
os(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2
)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*co
s(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
 + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x +
7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +

sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
x + c) + 2(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2
)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqr
t(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(
3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/
2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + s
qrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2
*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1

/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5
/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)
*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*c
os(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d
*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
 c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))
*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*
sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x +
 3/2*c))))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 +
 (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c

)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin
(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c
))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
 c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))
*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*
cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*
d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(
sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/

```
2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^
2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sq
rt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2
)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2
*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*co
s(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*
x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3
/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/
2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
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(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2
*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sq
rt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin
(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*c
os(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2
)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*co
s(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
+ 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7
/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(
2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x

+ 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d
*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c
) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2
*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
+ c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))
*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + s
qrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos
(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d

*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*
d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqr
t(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d
*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^
2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/
2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2

*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2
*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
+ c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*s
qrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(
3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7
/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
+ 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x +
5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/

2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt
(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*
d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*c
os(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2
)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*co
s(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
+ 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*
x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x +
c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c
))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + s

```
qrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 +
 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*si
n(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*
c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqr
t(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(
3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2
*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^
2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/
2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2
*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
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)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt

(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x

+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*
cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x
+ c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2
*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
 (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c
) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
 + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)
*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2

*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(
2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(
2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*c
os(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*
x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
+ 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x +
7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^
2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/

2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
c)^2 + 2(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/
2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*
x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x +
c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c
))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(
3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5
/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin

(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqr
t(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(
3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*co
s(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)
*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
 + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos
(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
+ 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos
(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*(
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2

+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*
x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2
*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*
sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
+ sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqr
t(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)
*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*
d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
+ 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x
+ 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sq
rt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*

d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/
2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*co
s(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*
x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x +
c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c
))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
x + c) + 2(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*s
in(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2

*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
+ 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/
3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*co
s(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)
*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
 + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos
(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
+ 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7
/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +

c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin

(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c
)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(
sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt
(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3
/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*
d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3
/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/
2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*

cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*log(cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) + 105*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt

```
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*
d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3
/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/
2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)
*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*c
os(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
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c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d
*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))
*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*
cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqr
t(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2
*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(
d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c)
)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(

```
2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*
x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
 + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x
 + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(s
qrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1
/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5
/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
```

```
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*c
os(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(
3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/
2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + s
qrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2
*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x
 + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(
2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d
*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos
```

(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(

2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c)
)*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*
cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*s
in(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*
d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqr
t(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d
*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))
^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*c
os(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/

2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*

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cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*
sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*s
in(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
+ sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt
(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*
cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d
*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c),
cos(3/2*d*x + 3/2*c))))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x +
 5/2*c)))^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sq
rt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
+ sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt
(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*
cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d
*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x
```

```
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x
+ c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2
*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2
 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/
2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
+ c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
```

```
c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*s
qrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3
/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2
*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*
c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*
cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) +
 ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(
d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c)
)*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2
```

```
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c
)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*c
os(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*co
s(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/
2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(
sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqr
t(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
```

```
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)
*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*
d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*
x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
 + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x
 + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
+ (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*
c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c
)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3
/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1
/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*
```

d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +

c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d
*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))
*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*
sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqr
t(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2
*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(
d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c)
)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(

```
2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*
x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
 + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x
 + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(s
qrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1
/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5
/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
```

+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*c

os(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2
)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*co
s(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
 + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x +
7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
x + c) + 2(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2
)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*sin(2/5*arc
tan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + (((sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*

x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x +
c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c
))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
x + c) + 2(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*c
os(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
+ 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqr
t(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(
3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqr

t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/
2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + s
qrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2
*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5
/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2
*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin
(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c
))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +

```
c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))
*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*
cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*
d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*
(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d
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*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*c
os(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d
*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
+ (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*
c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c
)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*c
os(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) +
((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1

```
/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))
*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x
+ 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7
/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(
2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d
*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c
) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
 + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2
*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)
```

^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
+ c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))
*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + s
qrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos
(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*s

```
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*
d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqr
t(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d
*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^
2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/
2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2
*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(
((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))
*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2
```

+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr t(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1 /2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2* sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*c os(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d *x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*si n(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*co s(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d* x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos (d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c) ^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)* cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d *x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2 *c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt (2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d* x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d* x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1 /2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/ 2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2 *d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)* cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*co s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sq rt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2* d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/ 2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)* cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)) *cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2 *d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt (2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(

d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*
cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d
*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x
+ c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2
*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*
d*x + 3/2*c))))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))
) + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*co
s(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x
+ c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2

*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(

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2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*c
os(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*
x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), c
os(3/2*d*x + 3/2*c))))*log(cos(1/2*arctan2(sin(d*x + c), cos(d*x + c)))^2 +
 sin(1/2*arctan2(sin(d*x + c), cos(d*x + c)))^2 + 2*sin(1/2*arctan2(sin(d*x
 + c), cos(d*x + c))) + 1) - 105*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2
*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*
c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*
cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) +
 ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(
d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
```

+ c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt

(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2

*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1
/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d
*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x +
 c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*
c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^
2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos
(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(
5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2
*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)
*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co

s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*c
os(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d
*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))
*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*
sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqr
t(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2
*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(
d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +

2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c)
)*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1
/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*
x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
 + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x
 + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(s
qrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1
/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5
/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^

```
2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*c
os(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(
3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^
2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos
(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(
7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
 + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*
d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sq
rt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*
```

d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*c
os(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2
)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*co
s(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
 + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x +
7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
x + c) + 2(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2
)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*cos(2/5*arc
tan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + (((sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +

```
2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*
x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x +
c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c
))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*c
os(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
+ 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2
```

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*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqr
t(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(
3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/
2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + s
qrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2
*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5
/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + (
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*
x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2
*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*
sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3
/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
```

(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(

1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*
cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d
*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x
+ c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2
*c))*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
 + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^
2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 +
 sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3
/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1
/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2

```
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
 + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*
sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*s
in(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3
/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/
2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*
x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt
(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*
```

x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*
d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2
(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c
)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*c
os(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*si
n(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/
2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(
sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt

(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2 *c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2) *cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)

+ 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*
c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqr
t(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(
3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2
*c), cos(3/2*d*x + 3/2*c))))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*
d*x + 5/2*c)))^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*
(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqr
t(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(
3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*co
s(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +

c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)
*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
 + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos
(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
+ 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^
2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/
2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2
c)^2 + 2((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)
*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c)
+ ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin
(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x

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 + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c
))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*
x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d
*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*
x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*
x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(
sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x +
5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*
cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
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 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos
(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x
 + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/
2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
+ (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*
c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c
)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
 + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c
```

```
)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*
sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*s
in(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^
2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos
(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(
7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
 + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x
+ 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2
+ ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin
(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c
))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
```

qrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))
*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*
sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*
d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*
(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*s

```
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*c
os(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d
*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
+ (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*
c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c
)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*c
os(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) +
((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^
```

2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*co

```
s(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*
x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x +
c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c
))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*s
in(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
+ 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/
3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*cos(2/5*arctan2(sin
(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 2*(((sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
```

os(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(
3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7
/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))
*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
+ 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d
*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
+ c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2
*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqr
t(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2
*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*co
s(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)
*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
 + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(

2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos
(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
+ 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7
/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)
*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*log(cos(1/2*
arctan2(sin(d*x + c), cos(d*x + c)))^2 + sin(1/2*arctan2(sin(d*x + c), cos(
d*x + c)))^2 - 2*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))) + 1) - 6*(14*
((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*
cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d
*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 14*((sqrt(2)*cos(d*x + c) + sqrt(2))*
cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2
*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2
*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))
*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^

2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c) + 11*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 11*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 15*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 11*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 15*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 15*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 11*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 10*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 10*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 10*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 28*(((sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) - (sqrt(2)*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*cos(3/2*d*x + 3/2*c)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + sqrt(2)*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 2*sqrt(2)*sin(3/2*d*x + 3/2*c)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c))*cos(7/2*d*x + 7/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 20*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) - 35*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos

(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
- 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqr
t(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d
*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2
+ 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(
d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + (
(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(
d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*
(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos
(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*
c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) -
 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2

*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 +
 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x +
 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*
(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*
d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) +
 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2
+ 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12
*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)
- 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin
(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*
d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 20*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x
 + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/
2*c))*sin(7/2*d*x + 7/2*c) - 12*(2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^
2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)

^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/
2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2
c)^2 + 5(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + 5*(sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*
d*x + 3/2*c)^2 + 5*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin
(1/2*d*x + 1/2*c)^2 + 10*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 10*(sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
 10*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c) + 80*(((s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
+ c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*s
qrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(
3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
 sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7

/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
+ 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x +
5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt
(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*
d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*c
os(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2
)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*co
s(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
+ 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*

x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt

(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*
d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*si
n(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2
*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x
 + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2
)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(s
in(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^

2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos
(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(
7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
 + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*
d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sq
rt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
 sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(
2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*c
os(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*
x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s

in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
+ 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)
*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x +
7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1
/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^
2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2
*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
+ c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2

+ 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c
)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)
)*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3
/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/
2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c
)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2
)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*
cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(
d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)

^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2* sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d *x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*co s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/ 2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/ 2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c) *sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)) *cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt (2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt (2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin (1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt (2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos (1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2* (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c) ^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqr t(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2 *((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt (2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt (2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c) ^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^ 2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/ 2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sq rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c) ^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(s qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*s

in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c
), cos(3/2*d*x + 3/2*c))))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*
x + 5/2*c)))^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*
(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*c
os(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d
*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +

3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
 + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
+ (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*
c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c
)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*c
os(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) +
((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))
*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x
+ 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*

```
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7
/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos
(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(
2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d
*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c
) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*s
in(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
 + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2
*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
+ c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))
```

*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + s
qrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos
(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c
)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(
sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt
(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3
/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*co

s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*
d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3
/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/
2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*
cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*co
s(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*
x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3
/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2

```
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*
cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*s
in(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x +
3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt
(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*
d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*c
os(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2
)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*co
s(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
 + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*
```

x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt

(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*
d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*si
n(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2
*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x
 + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2
)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(s
in(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +

c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*
cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*c
os(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos
(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
 c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqr
t(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5
/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*
(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)
*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2)
)*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqr
t(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2
*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)
*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*
d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)

*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2

```
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*
c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c
)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((
sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
 + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*
sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*s
in(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^
2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos
(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(
1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(
```

7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
 + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x
+ 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2
+ 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 +
sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/
2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
c)^2 + 2(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + s
qrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/
2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*
x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x +
c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c
))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + s
qrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2
*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*

d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(
3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1
/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5
/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*c
os(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*
sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*
d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sq
rt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sq
rt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2
*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*co
s(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sq
rt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin
(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*c
os(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2
)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*
x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*
x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt
(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*co
s(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x

+ 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3
/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/
2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2
)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c)
+ ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*si
n(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*
c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d
*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 +
(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1

/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/
2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*co
s(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
 + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2
)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x
+ 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x
+ 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x
 + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/
2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sq
rt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/
2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/
2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*co
s(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x +
 c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*
d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d
*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2
*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x +
 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x +
 c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*

c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*

```
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3
/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/
2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*
sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x +
5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 +
2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*si
n(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*
c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
+ c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))
```

*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*c
os(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(
2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/
2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + s
qrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2
*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2
*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*
(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin
(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*c

os(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*

```
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*
cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
 + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*
((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
 + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(
2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^
2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1
/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))
*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^
2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sq
rt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2
)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2
*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c)
, cos(3/2*d*x + 3/2*c))))*sin(3/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x
 + 5/2*c))) - 420*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*si
```

n(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2
*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c
)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(
sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt
(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3
/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(
d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos
(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*
cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x
+ 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(
d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^
2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sq
rt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x
 + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
 + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/
2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin

(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2
c)^2 + 2((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)
*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c)
+ ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin
(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c
))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqr
t(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
+ 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c
)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*c
os(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c
) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*si
n(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(

1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(
2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
+ sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^
2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/
2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(
sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arc
tan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*
x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2
*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
+ c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c
)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)
)*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +

c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +

sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5
/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)
*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*c
os(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d
*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
+ 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x +
 c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))
*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*

sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*
sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x +
3/2*c)))^2 + 2*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2
)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*
cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(
sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d
*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^
2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sq
rt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2
)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2
*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3
/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*co
s(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*
x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3
/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x
+ c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
+ sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(

2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x +
1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c
) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
 + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)
^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2
+ sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x +
3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*
d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
 sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*co
s(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + (
(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +
 sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*
x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
+ 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/
2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)
*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2
*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*
sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x +
 3/2*c), cos(3/2*d*x + 3/2*c))))*sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(
5/2*d*x + 5/2*c))) - 1260*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^
2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqr
t(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqr
t(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2
*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x

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+ c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 +
2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqr
t(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c
)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin
(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)
^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c
))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt
(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt
(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c
)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(
sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt
(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3
/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2
 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(
1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*
cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d
*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt
(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*
x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*
x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x +
 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(
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3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 56*(((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)

+ 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) +

sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/
2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)
*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d
x + c) + 2(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2
)*sin(3/2*arctan2(sin(d*x + c), cos(d*x + c))) - 84*(((4*sqrt(2)*cos(d*x +
c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3
/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x
+ c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c
)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x +
1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sq
rt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos
(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2)
)*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*
sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2
+ 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(
d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2
c)^2 + 2(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt
(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x +
5/2*c) + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*
cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos
(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2)
)*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1
/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x +
c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/

```
2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)
*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x +
 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x
 + 5/2*c)^2 + ((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqr
t(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*
d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4*sqrt(2
)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sq
rt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*
x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(2)*cos(
d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x
 + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 4*sq
rt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/
2*d*x + 7/2*c)^2 + 2*((4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2
+ 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (4
*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)
 + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sqrt(2)*cos(d*x + c)^2*cos
(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 9*sqrt(
2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(
3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
 + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 9*sqrt(2)*cos(d*x + c)*s
in(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))
*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((4*sqrt(2)*cos(d*x + c)^2 + 4
*sqrt(2)*sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*cos(3/2*d*x +
 3/2*c)^2 + 4*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c)^2 + (4*sqrt(2)*cos(d*x + c)^2 + 4*sqrt(2)*sin(d*x + c)^2
+ 9*sqrt(2)*cos(d*x + c) + 5*sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + 4*(sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 5*
sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 5*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(4*sq
rt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c)^2 + 9*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 5*sqrt(2)*co
s(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 9*(sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(4*sqrt(2)*cos(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + 4*sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
9*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + 5*sqrt(2)*sin(1/2*d*x + 1/2*c
))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(1/2*arctan2(sin(d*x +
c), cos(d*x + c))))*sqrt(a)/((((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*c
```

os(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin
(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x
 + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 +
 (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*s
in(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*c
os(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*
x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/
2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*co
s(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x
 + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1
/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)
^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(
d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x +
5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(
3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*
cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x +
 c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2
*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2
 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*
x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*
cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c
)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/
2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((a*cos(d*x
 + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 +
 (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*c
os(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x
+ c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*
x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)
^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
 + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2
*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(
3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x
 + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1
/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)

^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d
*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d
*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/
2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x
 + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x
 + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x
+ c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*c
os(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x +
 c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2
*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2
 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x
 + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
 + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*
c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x +
 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x +
 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x +
c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos
(5/2*d*x + 5/2*c)^2 + (((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x
+ c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2
 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos
(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*
d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x +
 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*
d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
 a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2
*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2
+ 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d
*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d
*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2
 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2
 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*
(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c
)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3
/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x
 + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c)
+ ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x
 + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 +
 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 +

a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a
*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^
2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((a*cos(d*x + c)^2
+ a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(
1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d
*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a
)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1
/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*
cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*
cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2
*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
+ 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2
+ 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2
+ a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*
cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2
*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^
2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a
*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c
)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin
(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d
*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 +
2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 +
a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*co
s(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c
)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
+ a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*c
os(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
+ a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^
2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1
/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x
+ 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2
+ ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*
x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2
+ 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2
+ a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(

a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)
^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/
2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x
+ 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x + c)
^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*c
os(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/
2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c)
+ a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1
/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*co
s(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x +
c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*
(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*c
os(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d
*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2
 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos
(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*
d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) +
a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2
*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(
1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)
*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a
*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
 + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((a*cos(d*x + c)^2 + a*sin(d*x + c)^2
+ 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2
+ a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*
cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2
*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^
2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a
*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c
)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin
(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d
*x + 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c)
+ a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*
sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*
d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x +
 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*
c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x +

1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c

)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(
d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c
))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*
x + 3/2*c)))^2 + 2*(((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c
) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 +
a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/
2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x
+ 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/
2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x
+ 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*
sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c)
+ a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2
*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x
+ 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 +
2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 +
a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*
cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
+ 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*
d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + (
(a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x +
3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*
a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*co
s(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*
x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/
2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((a*cos(d*x + c)^2 + a
*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2
*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x
+ 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*s
in(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^
2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*
d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos
(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos
(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*

cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3
/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2
*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos
(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)
^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*co
s(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2
+ a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/
2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x
+ 7/2*c)*sin(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a
*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*s
in(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d
*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2
+ (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a
*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(
1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a
*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 +
a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x +
1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x +
5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*cos
(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + (((a*cos(d*x
+ c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 +
(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*co
s(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x +
c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^
2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*
x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
+ 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*
(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2
*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3
/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x
+ c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/
2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^
2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*
x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*
x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2
*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x
+ 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x +

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c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*co
s(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x +
c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*
c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2
+ (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x
+ 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
+ c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c
) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x +
1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x +
1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c
)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(
5/2*d*x + 5/2*c)^2 + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x +
c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 +
 a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1
/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*
x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1
/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*
x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*
d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a
*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c
) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 +
2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x
 + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 +
 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 +
 a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a
*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^
2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x +
 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) +
((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x +
 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
 c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2
*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a
*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*c
os(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
+ 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d
*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d
*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1
/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/
```

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2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((a*cos(d*x + c)^2 + a*sin(d*x +
 c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2
*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2
 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x
 + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
 + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*
c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x +
 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x +
 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x +
c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin
(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x
 + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d
*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^
2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*co
s(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2
*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x
+ 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2
*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/
2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*s
in(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x +
 c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2
+ a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(
1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d
*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x +
1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*
c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 +
 (((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x
 + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
 + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 +
 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 +
 a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a
*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^
2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos
(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x +
 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x + c)^
2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*co
```

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s(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2
*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) +
 a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/
2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos
(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(
a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*co
s(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*
x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2
+ a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(
1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d
*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a
)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*
c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1
/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*
cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*
cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2
*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
+ 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + (((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 +
 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 +
 a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*c
os(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*
c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*
cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c)
 + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)
^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(
1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*
x + 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) +
 a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*s
in(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d
*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x +
1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c
)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x +
1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin
(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*
d*x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a
)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin
```

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(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x
 + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/
2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*
sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*
sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((a*co
s(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c
)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos
(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1
/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x
 + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*
cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3
/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))
*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*si
n(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*
x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1
/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(
3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*
sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x
 + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/
2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/
2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x +
c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos
(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*
c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(
d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x
 + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2
*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/
2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*si
n(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x +
 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*
d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*
d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d
*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)
)*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x
 + 3/2*c)))^2 + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) +
a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*si
n(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*
```

x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1

/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*
cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 +
a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x +
1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d
*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7
/2*c)*cos(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*co
s(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x
+ c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 +
(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*si
n(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2
*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*co
s(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x
 + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2
*c)^2 + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3
/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*c
os(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x +
c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*
c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2
+ 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x
 + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*c
os(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2
*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x
 + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 +
 (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*c
os(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x
+ c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*
x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)
^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)
 + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2
*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(
3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((a*cos(d*x +
 c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (
a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos
(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x +
c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2
*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x
 + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +

```
 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(
a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c
), cos(3/2*d*x + 3/2*c)))^2 + 2*(((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*
a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(
d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^
2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos
(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2
+ a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2
*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x +
 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)
*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(
d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x
+ 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2
*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2
*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*
x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*s
in(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x
 + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*c
os(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*
x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x +
1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c
)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin
(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c
))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin
(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((a*cos(d
*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2
 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a
*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*
x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*
d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x +
c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos
(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*
c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
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2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + (((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos

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(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x
 + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2 +
 a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1
/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*
x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)
*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c
)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/
2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*c
os(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*c
os(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*
a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2
*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos
(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)
^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 +
 a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*co
s(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) +
 a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2
 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x
 + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/
2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x
+ 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a
)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin
(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x
 + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/
2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*
sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*
sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*
x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*
cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d
*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x +
 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*
c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*si
n(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*
c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*si
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n(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*sin(2/3*a
rctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(((a*cos(d*x + c)
^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*c
os(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/
2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c)
+ a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1
/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*co
s(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x +
c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*
(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*c
os(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c)
+ 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d
*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)
^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)
^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 +
(a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x +
3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x +
c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c)
+ a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/
2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/
2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1
/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*
sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/
2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2
 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2
 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a
*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/
2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*
c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*
c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2
*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*si
n(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*
d*x + 5/2*c)^2 + (((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c)
+ a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*
sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*
d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x +
 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*
c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x +
 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*si
n(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
 a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*(
```

(a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin

(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2 + (((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d

*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2
 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a
*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(
1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a
*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 +
 a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x +
 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x +
7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*
cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)
^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d
*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x +
 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*
c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*si
n(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*
c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x
 + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*si
n(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x
+ 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*co
s(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x
 + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1
/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)
^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(
d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(
1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((a*cos(d*
x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2
+ (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*
cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x
 + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d
*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c
)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(
d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c
) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin
(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*
x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x +
1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c
)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*
d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(

d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1
/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*
x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*
x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x
 + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*
sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x
+ c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/
2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^
2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*
x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*
x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2
*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x
+ 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x +
 c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*si
n(5/2*d*x + 5/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3
/2*c)))^2 + 2*(((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a
)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*
c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin
(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x
 + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/
2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*
sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/
2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x +
1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d
*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*
sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((a*
cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2
*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^
2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*c
os(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin
(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d
*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*
a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
 c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c
))*sin(3/2*d*x + 3/2*c))*cos(7/2*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((a*co
s(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c
)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
+ a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos
(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1
/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x

+ c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*
cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3
/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x
+ 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))
*sin(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c)^2 + ((a*cos(d*x + c)^2 + a*sin(
d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x
+ 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2
*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/
2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*si
n(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x +
1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*
d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*
d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d
*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)
)*sin(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*co
s(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x
+ c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 +
(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*si
n(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2
*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*co
s(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x
+ 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2
*c)*sin(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(
d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x +
c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a
*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(
1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d
*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(
1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*si
n(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x +
1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c
)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*cos(2/5*
arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 2*(((a*cos(d*x + c)^
2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*co
s(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2
*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) +
a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/
2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos

(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(
a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*co
s(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*
x + 3/2*c))*cos(7/2*d*x + 7/2*c)^2 + 2*((a*cos(d*x + c)^2 + a*sin(d*x + c)^
2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^
2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (
a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3
/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c
)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) +
 a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2
*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2
*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*s
in(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(7/2
*d*x + 7/2*c)*cos(5/2*d*x + 5/2*c) + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2
 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2
 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*
cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2
*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^
2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a
*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c
)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin
(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(5/2*d
*x + 5/2*c)^2 + ((a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) +
a)*cos(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c)^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*si
n(d*x + c)^2 + 2*a*cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*
x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1
/2*c)^2 + 2*(a*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)
*sin(d*x + c)^2 + 2*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1
/2*c))*cos(3/2*d*x + 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(
d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a
*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)^2 + 2*((a
*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/
2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
^2 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*
cos(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*si
n(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(
d*x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2
*a*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x

```
+ 3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*
d*x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*
c))*sin(3/2*d*x + 3/2*c))*sin(7/2*d*x + 7/2*c)*sin(5/2*d*x + 5/2*c) + ((a*c
os(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*cos(d*x + c) + a)*cos(3/2*d*x + 3/2*
c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2
 + a*cos(1/2*d*x + 1/2*c)^2 + (a*cos(d*x + c)^2 + a*sin(d*x + c)^2 + 2*a*co
s(d*x + c) + a)*sin(3/2*d*x + 3/2*c)^2 + (a*cos(1/2*d*x + 1/2*c)^2 + a*sin(
1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + a*sin(1/2*d*x + 1/2*c)^2 + 2*(a*cos(d*
x + c)^2*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*a
*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + a*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(a*cos(1/2*d*x + 1/2*c)^2 + a*sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
c) + 2*(a*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + a*sin(d*x + c)^2*sin(1/2*d*
x + 1/2*c) + 2*a*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + a*sin(1/2*d*x + 1/2*c)
)*sin(3/2*d*x + 3/2*c))*sin(5/2*d*x + 5/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x
 + 3/2*c), cos(3/2*d*x + 3/2*c))))*d)
```

Giac [A] (verification not implemented)

none

Time = 0.41 (sec) , antiderivative size = 139, normalized size of antiderivative = 0.99

$$\int \frac{\cos^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{\frac{15\sqrt{2}\log\left(\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{\sqrt{a}\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)} - \frac{15\sqrt{2}\log\left(-\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{\sqrt{a}\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)} - \frac{4\sqrt{2}\left(12a^{\frac{9}{2}}\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5-10a^{\frac{9}{2}}\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3+15a^{\frac{9}{2}}\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right.}{a^5\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}}{30d}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] -1/30*(15*sqrt(2)*log(sin(1/2*d*x + 1/2*c) + 1)/(sqrt(a)*sgn(cos(1/2*d*x +
1/2*c))) - 15*sqrt(2)*log(-sin(1/2*d*x + 1/2*c) + 1)/(sqrt(a)*sgn(cos(1/2*d
*x + 1/2*c))) - 4*sqrt(2)*(12*a^(9/2)*sin(1/2*d*x + 1/2*c)^5 - 10*a^(9/2)*s
in(1/2*d*x + 1/2*c)^3 + 15*a^(9/2)*sin(1/2*d*x + 1/2*c))/(a^5*sgn(cos(1/2*d
*x + 1/2*c))))/d
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\cos\left(c+d\,x\right)^3}{\sqrt{a+a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(cos(c + d*x)^3/(a + a*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^3/(a + a*cos(c + d*x))^(1/2), x)
```

3.124 $\int \frac{\cos^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 104

$$\int \frac{\cos^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} - \frac{4\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3ad}$$

```
[Out] arctanh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/(a+a*cos(d*x+c))^(1/2))*2^(1/2)/d/a^
(1/2)-4/3*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+2/3*sin(d*x+c)*(a+a*cos(d*x+c
))^(1/2)/a/d
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 104, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2838, 2830, 2728, 212}

$$\int \frac{\cos^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d} + \frac{2\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{3ad} - \frac{4\sin(c+dx)}{3d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Cos[c + d*x]^2/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (Sqrt[2]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])]
)/(Sqrt[a]*d) - (4*Sin[c + d*x])/(3*d*Sqrt[a + a*Cos[c + d*x]]) + (2*Sqrt[a
 + a*Cos[c + d*x]]*Sin[c + d*x])/(3*a*d)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rule 2838

```
Int[sin[(e_.) + (f_.)*(x_)]^2*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_),
x_Symbol] :> Simp[(-Cos[e + f*x])*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2
))), x] + Dist[1/(b*(m + 2)), Int[(a + b*Sin[e + f*x])^m*(b*(m + 1) - a*Sin
[e + f*x]), x], x] /; FreeQ[{a, b, e, f, m}, x] && EqQ[a^2 - b^2, 0] &&  !L
tQ[m, -2^(-1)]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3ad}+\frac{2\int \frac{\frac{a}{2}-a\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{3a}\\
&= -\frac{4\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}+\frac{2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3ad}+\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx\\
&= -\frac{4\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}+\frac{2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3ad}\\
&\quad-\frac{2\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}\\
&= \frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d}-\frac{4\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}+\frac{2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3ad}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.81

$$\int \frac{\cos^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\left(\sqrt{2}\text{arctanh}\left(\frac{\sqrt{1-\cos(c+dx)}}{\sqrt{2}}\right)-\frac{2}{3}(1-\cos(c+dx))^{3/2}\right)\sin(c+dx)}{d\sqrt{1-\cos(c+dx)}\sqrt{a(1+\cos(c+dx))}}$$

```
[In] Integrate[Cos[c + d*x]^2/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] ((Sqrt[2]*ArcTanh[Sqrt[1 - Cos[c + d*x]]/Sqrt[2]] - (2*(1 - Cos[c + d*x])^(
3/2))/3)*Sin[c + d*x])/(d*Sqrt[1 - Cos[c + d*x]]*Sqrt[a*(1 + Cos[c + d*x])]
)
```

Maple [A] (verified)

Time = 1.41 (sec) , antiderivative size = 132, normalized size of antiderivative = 1.27

method	result	size
default	$\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-4\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{a}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+3\ln\left(\frac{4\sqrt{a}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}+4a}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)a\right)}{3a^{\frac{3}{2}}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$	132

```
[In] int(cos(d*x+c)^2/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*cos(1/2*d*x+1/2*c)*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-4*(a*sin(1/
2*d*x+1/2*c)^2)^(1/2)*a^(1/2)*sin(1/2*d*x+1/2*c)^2+3*ln(4*(a^(1/2)*(a*sin(1
/2*d*x+1/2*c)^2)^(1/2)+a)/cos(1/2*d*x+1/2*c))*a)/a^(3/2)/sin(1/2*d*x+1/2*c)
/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.26

$$\int \frac{\cos^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{4\sqrt{a\cos(dx+c)+a}(\cos(dx+c)-1)\sin(dx+c)+\frac{3\sqrt{2}(a\cos(dx+c)+a)\log\left(-\frac{\cos(dx+c)^2-\frac{2\sqrt{2}\sqrt{a\cos(dx+c)+a}\sin(dx+c)}{\sqrt{a}}-}{\cos(dx+c)^2+2\cos(dx+c)+1}\right.}{\sqrt{a}}}{6(ad\cos(dx+c)+ad)}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/6*(4*sqrt(a*cos(d*x + c) + a)*(cos(d*x + c) - 1)*sin(d*x + c) + 3*sqrt(2)
*(a*cos(d*x + c) + a)*log(-(cos(d*x + c)^2 - 2*sqrt(2)*sqrt(a*cos(d*x + c)
+ a)*sin(d*x + c)/sqrt(a) - 2*cos(d*x + c) - 3)/(cos(d*x + c)^2 + 2*cos(d*x
 + c) + 1))/sqrt(a))/(a*d*cos(d*x + c) + a*d)
```

Sympy [F]

$$\int \frac{\cos^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\cos^2{(c+dx)}}{\sqrt{a\left(\cos{(c+dx)}+1\right)}}\,dx$$

```
[In] integrate(cos(d*x+c)**2/(a+a*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(cos(c + d*x)**2/sqrt(a*(cos(c + d*x) + 1)), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 19437 vs. $2(87) = 174$.

Time = 0.66 (sec) , antiderivative size = 19437, normalized size of antiderivative = 186.89

$$\int \frac{\cos^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/60*(20*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 8*(cos(d*x + c)^2 + si
n(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 20*cos(5/2*d*x
+ 5/2*c)^3*sin(d*x + c) + 2*(15*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 15*(log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(d*x + c)^2 + 30*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 4*(cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 20*c
os(3/2*d*x + 3/2*c)*sin(d*x + c) + 15*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 15*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2
*c)^2 + 30*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x +
```

```
c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/
2*c)^2 + 2*(10*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 4*(cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 10*cos(5/
2*d*x + 5/2*c)^3*sin(d*x + c) + (15*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 15*(
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(d*x + c)^2 + 30*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 4*(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) -
20*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 15*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 15*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x +
 5/2*c)^2 + 15*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*
x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x
+ 3/2*c)^2 + (15*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 15*(log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si
n(d*x + c)^2 + 30*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 4*(cos(d*x + c)^2 + sin(
d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 10*cos(5/2*d*x + 5/
2*c)*sin(d*x + c) + 15*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - 15*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 15*((lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(
```

1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(4*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*
sin(3/2*d*x + 3/2*c) - 5*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 5*sin(3/2*d*
x + 3/2*c)^2*sin(d*x + c) + 15*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 10*(cos(5/2*d*x + 5/2*c)^2
*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) +
cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) +
 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3
/2*c)^2*sin(d*x + c))*cos(1/2*arctan2(sin(d*x + c), cos(d*x + c))) + 2*(5*(
cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 5*(cos(d*x + c) + 1)*cos(3/2*d*x
 + 3/2*c)^2 + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*s
in(3/2*d*x + 3/2*c)^2 + 10*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3
/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 3*cos(d*x + c)^2 + 15*
((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 3*si
n(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(5/2*d*x + 5/2*c) + 2*(2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d
*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c) - 2
4*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
c)^2 + 2(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*
x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c

)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*s
in(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 10*((2*cos(d*
x + c)^2 + 2*sin(d*x + c)^2 + 5*cos(d*x + c) + 3)*cos(5/2*d*x + 5/2*c)^2 +
2*(2*cos(d*x + c)^2 + 2*sin(d*x + c)^2 + 5*cos(d*x + c) + 3)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (2*cos(d*x + c)^2 + 2*sin(d*x + c)^2 + 5*cos(
d*x + c) + 3)*cos(3/2*d*x + 3/2*c)^2 + (2*cos(d*x + c)^2 + 2*sin(d*x + c)^2
 + 5*cos(d*x + c) + 3)*sin(5/2*d*x + 5/2*c)^2 + 2*(2*cos(d*x + c)^2 + 2*sin
(d*x + c)^2 + 5*cos(d*x + c) + 3)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
 + (2*cos(d*x + c)^2 + 2*sin(d*x + c)^2 + 5*cos(d*x + c) + 3)*sin(3/2*d*x +
 3/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*cos(2/3*arctan2(si
n(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(15*(log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
d*x + c)^2 + 15*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 30*(log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos
(d*x + c) + 4*(cos(d*x + c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/
2*d*x + 3/2*c) - 10*cos(5/2*d*x + 5/2*c)*sin(d*x + c) + 15*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 15*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*sin(5/2*d*x + 5/2*c)^2 + 30*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*sin(3/2*d*x + 3/2*c)^2 + 12*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(
d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 +
2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
 + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2
*d*x + 3/2*c)))*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))
) + 2*(10*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 4*(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^3 - 10*cos(5/2*d*x
 + 5/2*c)^3*sin(d*x + c) + (15*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +

1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 15*(log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(d*x + c)^2 + 30*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 4*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 20*co
s(3/2*d*x + 3/2*c)*sin(d*x + c) + 15*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 15*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(5/2*d*x + 5/2*
c)^2 + 15*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c
)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2
c)^2 + (15(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 15*(log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x
 + c)^2 + 30*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 4*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 10*cos(5/2*d*x + 5/2*c)*
sin(d*x + c) + 15*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 15*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c)^2 + 15*((log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c)^2 + 2*(4*(cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3
/2*d*x + 3/2*c) - 5*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 5*sin(3/2*d*x + 3

/2*c)^2*sin(d*x + c) + 15*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 10*(cos(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(1/2*arctan2(sin(d*x + c), cos(d*x + c))) + 2*(5*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 5*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 10*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 3*cos(d*x + c)^2 + 15*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(5/2*d*x + 5/2*c) + 2*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c) - 24*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 10*((2*cos(d*x + c)^2 + 2*sin(d*x + c)^2 + 5*cos(d*x + c) + 3)*cos(5/2*d*x + 5/2*c)^2 + 2*(2*cos(d*x + c)^2 + 2*sin(d*x + c)^2 + 5*cos(d*x + c) + 3)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (2*cos(d*x + c)^2 + 2*sin(d*x + c)^2 + 5*cos(d*x + c) + 3)*cos(3/2*d*x + 3/2*c)^2 + (2*cos(d*x + c)^2 + 2*sin(d*x + c)^2 + 5*cos(d*x + c) + 3)*sin(5/2*d*x + 5/2*c)^2 + 2*(2*cos(d*x + c)^2 + 2*sin(d*x

+ c)^2 + 5*cos(d*x + c) + 3)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (2
*cos(d*x + c)^2 + 2*sin(d*x + c)^2 + 5*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*
c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*sin(2/3*arctan2(sin(3/2
*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 4*(4*(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 5*co
s(3/2*d*x + 3/2*c)^2*sin(d*x + c) - 5*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) +
15*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 +
2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*c
os(5/2*d*x + 5/2*c) + 4*(10*(cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^3 + 4*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
3 - 10*cos(5/2*d*x + 5/2*c)^3*sin(d*x + c) + (15*(log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c)^2 + 15*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 30*(log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c) + 4*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*
x + 3/2*c) - 20*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 15*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 15*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(5/2*d*x + 5/2*c)^2 + 15*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(3/2*d*x + 3/2*c)^2 + (15*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 15*(log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/

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2*c) + 1))*sin(d*x + c)^2 + 30*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 4*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 7*cos(d*x + c) + 6)*sin(3/2*d*x + 3/2*c) - 10*cos
(5/2*d*x + 5/2*c)*sin(d*x + c) + 15*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 15*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(5/2*d*x + 5/2*c
)^2 + 15*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)
^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*
c)^2 + 2*(4*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*
d*x + 3/2*c)*sin(3/2*d*x + 3/2*c) - 5*cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) -
 5*sin(3/2*d*x + 3/2*c)^2*sin(d*x + c) + 15*((log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)
^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) +
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(3/2*d*x + 3/2*c))*cos(5/2*d*x + 5/2*c) + 10*(cos(5/2*d
*x + 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*si
n(d*x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*s
in(d*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + si
n(3/2*d*x + 3/2*c)^2*sin(d*x + c))*cos(1/2*arctan2(sin(d*x + c), cos(d*x +
c))) + 2*(5*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 5*(cos(d*x + c) + 1
)*cos(3/2*d*x + 3/2*c)^2 + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*
x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 10*((cos(d*x + c) + 1)*cos(3/2*d*x + 3
/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 3*cos(d*x
 + c)^2 + 15*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x
+ c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
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2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x +
3/2*c) + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(5/2*d*x + 5/2*c) + 2*(2
*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c
)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x
 + 3/2*c) - 27*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(
5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3
/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) -
10*((2*cos(d*x + c)^2 + 2*sin(d*x + c)^2 + 5*cos(d*x + c) + 3)*cos(5/2*d*x
+ 5/2*c)^2 + 2*(2*cos(d*x + c)^2 + 2*sin(d*x + c)^2 + 5*cos(d*x + c) + 3)*c
os(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (2*cos(d*x + c)^2 + 2*sin(d*x +
c)^2 + 5*cos(d*x + c) + 3)*cos(3/2*d*x + 3/2*c)^2 + (2*cos(d*x + c)^2 + 2*s
in(d*x + c)^2 + 5*cos(d*x + c) + 3)*sin(5/2*d*x + 5/2*c)^2 + 2*(2*cos(d*x +
 c)^2 + 2*sin(d*x + c)^2 + 5*cos(d*x + c) + 3)*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c) + (2*cos(d*x + c)^2 + 2*sin(d*x + c)^2 + 5*cos(d*x + c) + 3)*
sin(3/2*d*x + 3/2*c)^2)*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))))*cos(2
/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 20*(cos(5/2*d*x +
 5/2*c)^2*sin(d*x + c) + 2*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)*sin(d*
x + c) + cos(3/2*d*x + 3/2*c)^2*sin(d*x + c) + sin(5/2*d*x + 5/2*c)^2*sin(d
*x + c) + 2*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + sin(3/
2*d*x + 3/2*c)^2*sin(d*x + c))*cos(1/2*arctan2(sin(d*x + c), cos(d*x + c)))
 + 15*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)
^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5
/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*co
s(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c
), cos(3/2*d*x + 3/2*c)))^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^
2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2 + ((cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*
cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
```

1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(2/3*arct
an2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*((cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x
 + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*
d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(2/3*arctan2(sin(3/2
*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*log(cos(1/3*arctan2(sin(3/2*d*x + 3/
2*c), cos(3/2*d*x + 3/2*c)))^2 + sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(
3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x
+ 3/2*c))) + 1) - 15*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + ((cos(d*x + c)^2
+ sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*
d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3
/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*
sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(2/3*arctan2(sin(
3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d
*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) +
 (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c
)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/
2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x
 + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^
2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*((cos
(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 +
 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2
*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c
) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*
x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c
)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(2/3*

arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*log(cos(1/3*arctan2(s
in(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + sin(1/3*arctan2(sin(3/2*d*x
 + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c
), cos(3/2*d*x + 3/2*c))) + 1) + 15*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*c
os(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*
x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + ((
cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^
2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x +
5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(2
/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + (cos(d*x + c)^2
 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2
*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(
3/2*d*x + 3/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1
)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d
*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/
2*d*x + 3/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c
)))^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*co
s(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
+ 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin
(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c)
 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2
*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*log(co
s(1/2*arctan2(sin(d*x + c), cos(d*x + c)))^2 + sin(1/2*arctan2(sin(d*x + c)
, cos(d*x + c)))^2 + 2*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))) + 1) -
15*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/
2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d
*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos
(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 +
 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2
+ (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*
c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x

+ 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*log(cos(1/2*arctan2(sin(d*x + c), cos(d*x + c)))^2 + sin(1/2*arctan2(sin(d*x + c), cos(d*x + c)))^2 - 2*sin(1/2*arctan2(sin(d*x + c), cos(d*x + c))) + 1) + 4*(5*(cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 5*(cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (4*cos(d*x + c)^2 + 4*sin(d*x + c)^2 + 13*cos(d*x + c) + 9)*sin(3/2*d*x + 3/2*c)^2 + 10*((cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 3*cos(d*x + c)^2 + 15*((log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3/2*d*x + 3/2*c) + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(5/2*d*x + 5/2*c) + 4*(2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 6*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c) - 60*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(5/2*

d*x + 5/2*c)^2 + 2*(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (cos(d*x + c)^2 + sin(d*x + c)^2
 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2)*sin(1/3*arctan2(sin(3/2*d*x
 + 3/2*c), cos(3/2*d*x + 3/2*c))) - 20*((2*cos(d*x + c)^2 + 2*sin(d*x + c)^2
 + 5*cos(d*x + c) + 3)*cos(5/2*d*x + 5/2*c)^2 + 2*(2*cos(d*x + c)^2 + 2*sin
(d*x + c)^2 + 5*cos(d*x + c) + 3)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c)
 + (2*cos(d*x + c)^2 + 2*sin(d*x + c)^2 + 5*cos(d*x + c) + 3)*cos(3/2*d*x +
 3/2*c)^2 + (2*cos(d*x + c)^2 + 2*sin(d*x + c)^2 + 5*cos(d*x + c) + 3)*sin(
5/2*d*x + 5/2*c)^2 + 2*(2*cos(d*x + c)^2 + 2*sin(d*x + c)^2 + 5*cos(d*x + c
) + 3)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (2*cos(d*x + c)^2 + 2*si
n(d*x + c)^2 + 5*cos(d*x + c) + 3)*sin(3/2*d*x + 3/2*c)^2)*sin(1/2*arctan2(
sin(d*x + c), cos(d*x + c))))*sqrt(a)/(((sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)
*a*sin(d*x + c)^2 + 2*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(5/2*d*x + 5/2
c)^2 + 2(sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(d*x + c)^2 + 2*sqrt(2)*
a*cos(d*x + c) + sqrt(2)*a)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sq
rt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(d*x + c)^2 + 2*sqrt(2)*a*cos(d*x + c
) + sqrt(2)*a)*cos(3/2*d*x + 3/2*c)^2 + ((sqrt(2)*a*cos(d*x + c)^2 + sqrt(2
)*a*sin(d*x + c)^2 + 2*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(5/2*d*x + 5/
2*c)^2 + 2*(sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(d*x + c)^2 + 2*sqrt(2)
*a*cos(d*x + c) + sqrt(2)*a)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (s
qrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(d*x + c)^2 + 2*sqrt(2)*a*cos(d*x +
c) + sqrt(2)*a)*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*a*cos(d*x + c)^2 + sqrt(2
)*a*sin(d*x + c)^2 + 2*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(5/2*d*x + 5/
2*c)^2 + 2*(sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(d*x + c)^2 + 2*sqrt(2)
*a*cos(d*x + c) + sqrt(2)*a)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (s
qrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(d*x + c)^2 + 2*sqrt(2)*a*cos(d*x +
c) + sqrt(2)*a)*sin(3/2*d*x + 3/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c
), cos(3/2*d*x + 3/2*c)))^2 + (sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(d*x
 + c)^2 + 2*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(5/2*d*x + 5/2*c)^2 + 2*
(sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(d*x + c)^2 + 2*sqrt(2)*a*cos(d*x
 + c) + sqrt(2)*a)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*a*co
s(d*x + c)^2 + sqrt(2)*a*sin(d*x + c)^2 + 2*sqrt(2)*a*cos(d*x + c) + sqrt(2
)*a)*sin(3/2*d*x + 3/2*c)^2 + ((sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(d*
x + c)^2 + 2*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(5/2*d*x + 5/2*c)^2 + 2
*(sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(d*x + c)^2 + 2*sqrt(2)*a*cos(d*x
 + c) + sqrt(2)*a)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*a*c
os(d*x + c)^2 + sqrt(2)*a*sin(d*x + c)^2 + 2*sqrt(2)*a*cos(d*x + c) + sqrt(
2)*a)*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(d*
x + c)^2 + 2*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(5/2*d*x + 5/2*c)^2 + 2
*(sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(d*x + c)^2 + 2*sqrt(2)*a*cos(d*x
 + c) + sqrt(2)*a)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*a*c
os(d*x + c)^2 + sqrt(2)*a*sin(d*x + c)^2 + 2*sqrt(2)*a*cos(d*x + c) + sqrt(
2)*a)*sin(3/2*d*x + 3/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2
*d*x + 3/2*c)))^2 + 2*((sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(d*x + c)^2
 + 2*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2

```
)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(d*x + c)^2 + 2*sqrt(2)*a*cos(d*x + c) +
sqrt(2)*a)*cos(5/2*d*x + 5/2*c)*cos(3/2*d*x + 3/2*c) + (sqrt(2)*a*cos(d*x +
 c)^2 + sqrt(2)*a*sin(d*x + c)^2 + 2*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*co
s(3/2*d*x + 3/2*c)^2 + (sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(d*x + c)^2
 + 2*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(5/2*d*x + 5/2*c)^2 + 2*(sqrt(2
)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(d*x + c)^2 + 2*sqrt(2)*a*cos(d*x + c) +
sqrt(2)*a)*sin(5/2*d*x + 5/2*c)*sin(3/2*d*x + 3/2*c) + (sqrt(2)*a*cos(d*x +
 c)^2 + sqrt(2)*a*sin(d*x + c)^2 + 2*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*si
n(3/2*d*x + 3/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3
/2*c))))*d)
```

Giac [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 103, normalized size of antiderivative = 0.99

$$\int \frac{\cos^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{\frac{8\sqrt{2}\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3}{\sqrt{a}\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)} - \frac{3\sqrt{2}\log\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{\sqrt{a}\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)} + \frac{3\sqrt{2}\log\left(-\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{\sqrt{a}\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}}{6\,d}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] -1/6*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3/(sqrt(a)*sgn(cos(1/2*d*x + 1/2*c)))
- 3*sqrt(2)*log(sin(1/2*d*x + 1/2*c) + 1)/(sqrt(a)*sgn(cos(1/2*d*x + 1/2*c)
)) + 3*sqrt(2)*log(-sin(1/2*d*x + 1/2*c) + 1)/(sqrt(a)*sgn(cos(1/2*d*x + 1/
2*c))))/d
```

Mupad [B] (verification not implemented)

Time = 14.23 (sec) , antiderivative size = 97, normalized size of antiderivative = 0.93

$$\int \frac{\cos^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{2\,\sin\left(c+d\,x\right)\,\sqrt{a+a\,\cos\left(c+d\,x\right)}}{3\,a\,d} - \frac{2\,\left(4\,a^2\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|1\right)-3\,a^2\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|1\right)\right)\,\sqrt{\frac{a+a\,\cos\left(c+d\,x\right)}{2\,a}}}{3\,a^2\,d\,\sqrt{a+a\,\cos\left(c+d\,x\right)}}$$

```
[In] int(cos(c + d*x)^2/(a + a*cos(c + d*x))^(1/2),x)
```

```
[Out] (2*sin(c + d*x)*(a + a*cos(c + d*x))^(1/2))/(3*a*d) - (2*(4*a^2*ellipticE(c
/2 + (d*x)/2, 1) - 3*a^2*ellipticF(c/2 + (d*x)/2, 1))*((a + a*cos(c + d*x))
/(2*a))^(1/2))/(3*a^2*d*(a + a*cos(c + d*x))^(1/2))
```

3.125 $\int \frac{\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 73

$$\int \frac{\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d}+\frac{2\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -arctanh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/(a+a*cos(d*x+c))^(1/2))*2^(1/2)/d/a
^(1/2)+2*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2830, 2728, 212}

$$\int \frac{\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{2\sin(c+dx)}{d\sqrt{a\cos(c+dx)+a}}-\frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d}$$

```
[In] Int[Cos[c + d*x]/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] -((Sqrt[2]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]]
)])/(Sqrt[a]*d)) + (2*Sin[c + d*x])/(d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rubi steps

$$\begin{aligned} \text{integral} &= \frac{2\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}-\int\frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx\\ &= \frac{2\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}+\frac{2\text{Subst}\left(\int\frac{1}{2a-x^2}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}\\ &= -\frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d}+\frac{2\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}} \end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.73

$$\int\frac{\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{2\cos\left(\frac{1}{2}(c+dx)\right)\left(\text{arctanh}\left(\sin\left(\frac{1}{2}(c+dx)\right)\right)-2\sin\left(\frac{1}{2}(c+dx)\right)\right)}{d\sqrt{a(1+\cos(c+dx))}}$$

```
[In] Integrate[Cos[c + d*x]/Sqrt[a + a*Cos[c + d*x]],x]
[Out] (-2*Cos[(c + d*x)/2]*(ArcTanh[Sin[(c + d*x)/2]] - 2*Sin[(c + d*x)/2]))/(d*S
qrt[a*(1 + Cos[c + d*x])])
```

Maple [A] (verified)

Time = 1.22 (sec) , antiderivative size = 120, normalized size of antiderivative = 1.64

method	result	size
default	$\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\left(2\sqrt{a}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}-\ln\left(\frac{4\sqrt{a}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}+4a}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)a\right)}{a^{\frac{3}{2}}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$	120

```
[In] int(cos(d*x+c)/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] cos(1/2*d*x+1/2*c)*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*a^(1/2)*(a*sin
(1/2*d*x+1/2*c)^2)^(1/2)-ln(4*(a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+a)/co
s(1/2*d*x+1/2*c))*a)/a^(3/2)/sin(1/2*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1
/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.67

$$\int \frac{\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\frac{\sqrt{2}(a\cos(dx+c)+a)\log\left(-\frac{\cos(dx+c)^2+\frac{2\sqrt{2}\sqrt{a\cos(dx+c)+a}\sin(dx+c)}{\sqrt{a}}-2\cos(dx+c)-3}{\cos(dx+c)^2+2\cos(dx+c)+1}\right)}{\sqrt{a}}+4\sqrt{a\cos(dx+c)+a}\sin(dx+c)}{2\left(ad\cos(dx+c)+ad\right)}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/2*(sqrt(2)*(a*cos(d*x + c) + a)*log(-(cos(d*x + c)^2 + 2*sqrt(2)*sqrt(a*c
os(d*x + c) + a)*sin(d*x + c)/sqrt(a) - 2*cos(d*x + c) - 3)/(cos(d*x + c)^2
 + 2*cos(d*x + c) + 1))/sqrt(a) + 4*sqrt(a*cos(d*x + c) + a)*sin(d*x + c))/
(a*d*cos(d*x + c) + a*d)
```

Sympy [F]

$$\int \frac{\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\cos(c+dx)}{\sqrt{a\left(\cos(c+dx)+1\right)}}\,dx$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(cos(c + d*x)/sqrt(a*(cos(c + d*x) + 1)), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 18948 vs. $2(62) = 124$.

Time = 0.58 (sec) , antiderivative size = 18948, normalized size of antiderivative = 259.56

$$\int \frac{\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -1/12*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x
 + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3
+ ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*c
os(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) +
 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*c
os(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + (12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*s
in(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 -
8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) -
8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
```

```
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) -
8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(
2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x
 + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 +
4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*
x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3
*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*
x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1
/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3
*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d
*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/
2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(
1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)
)*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3
*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
```

*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8
*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d
*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/
2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1
/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1
/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqr
t(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*
x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2
*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 +
6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(
sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3
/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*
x + 1/2*c))*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2
+ ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*c
os(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*
x + 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) +

```
2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*
cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 12*((sqrt(2)*cos(d*x + c)^2 + sqrt
(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)
^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(
d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*co
s(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2
)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2
*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1
/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sq
rt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(1/3*
arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))*sin(2/3*arctan2(sin(3/
2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + (12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3
*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3
- 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
- 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
- 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
```

2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqr
t(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d
*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2
+ 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(
d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + (
(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(
d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x +
 1/2*c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*
(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos
(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x +
1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*
c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) -
 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 +
 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2
*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/

2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x +
1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*
(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos
(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*
d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) +
2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2
+ 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12
*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)
- 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin
(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*
d*x + 1/2*c))*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^
2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*co
s(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*si
n(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c)
- 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) -

```
 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(
1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*
d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin
(1/2*d*x + 1/2*c))*cos(d*x + c) + 2*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(
d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*s
qrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*s
qrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*s
qrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*
sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x +
1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(
2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x +
 c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x +
 c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*
c))*sin(d*x + c)^2 + 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
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1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +

1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c) - 6*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 3*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(

1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin
(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*
c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d
*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2
)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1
/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(2/3*arctan2
(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*
d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^
2)*cos(d*x + c) + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*
x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d
*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*si
n(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(
2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*s
in(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(2/3*arctan2(sin(3/2*d*x + 3/
2*c), cos(3/2*d*x + 3/2*c))) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*
c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*l
og(cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + sin(1/3
*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2
(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) - 3*((sqrt(2)*cos(d*x +
c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d
*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2
*c)^2)*cos(d*x + c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 +
 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/
2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2
))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2

)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*log(cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), c

```
os(3/2*d*x + 3/2*c)))^2 - 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d
*x + 3/2*c))) + 1) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/
2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)
*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - s
qrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*co
s(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1
/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c
) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d
*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c) - 12*((sqrt(2)*cos(d*x + c)^2 + sq
rt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*
c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*co
s(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/
2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt
(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3
/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/
2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(1/
3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))/(((cos(d*x + c)^2 +
 sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + ((cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (cos(d*x + c)^2 + sin(
d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)^2 + (cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 2*(cos(d*x + c)^2*cos(1/2
*d*x + 1/2*c) + cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*cos(d*x + c)*cos(1/
2*d*x + 1/2*c) + cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + cos(1/2*d*x + 1/2*c)^
2 + 2*(cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sin(d*x + c)^2*sin(1/2*d*x + 1
/2*c) + 2*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sin(1/2*d*x + 1/2*c))*sin(3/2
```

```
*d*x + 3/2*c) + sin(1/2*d*x + 1/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c
), cos(3/2*d*x + 3/2*c)))^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
+ c) + 1)*sin(3/2*d*x + 3/2*c)^2 + (cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2)*sin(d*x + c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2)*cos(d*x + c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c)
+ 1)*sin(3/2*d*x + 3/2*c)^2 + (cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2)*sin(d*x + c)^2 + 2*(cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + cos(1/2*d*x
+ 1/2*c)*sin(d*x + c)^2 + 2*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + cos(1/2*d*x
 + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c) + cos(1/2*d*x + 1/2*c)^2 + 2*(cos(d*x + c)^2*sin(1/
2*d*x + 1/2*c) + sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*cos(d*x + c)*sin(1
/2*d*x + 1/2*c) + sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c) + sin(1/2*d*x
+ 1/2*c)^2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2
+ 2*(cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + cos(1/2*d*x + 1/2*c)*sin(d*x + c
)^2 + 2*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + cos(1/2*d*x + 1/2*c))*cos(3/2*d
*x + 3/2*c) + 2*(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2)*cos(d*x +
 c) + cos(1/2*d*x + 1/2*c)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(
d*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(3/2*d*x + 3/2*c)^2 + (cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2)*sin(d*x + c)^2 + 2*(cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + cos(1/
2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2)*cos(d*x + c) + cos(1/2*d*x + 1/2*c)^2 + 2*(cos(d*x + c)^2*
sin(1/2*d*x + 1/2*c) + sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*cos(d*x + c)
*sin(1/2*d*x + 1/2*c) + sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c) + sin(1/
2*d*x + 1/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c
))) + 2*(cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sin(d*x + c)^2*sin(1/2*d*x +
 1/2*c) + 2*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sin(1/2*d*x + 1/2*c))*sin(3
/2*d*x + 3/2*c) + sin(1/2*d*x + 1/2*c)^2)*sqrt(a)*d)
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 100, normalized size of antiderivative = 1.37

$$\int \frac{\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{\frac{\sqrt{2}\log\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{\sqrt{a}\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}-\frac{\sqrt{2}\log\left(-\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{\sqrt{a}\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}-\frac{4\sqrt{2}\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\sqrt{a}\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}}{2\,d}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] -1/2*(sqrt(2)*log(sin(1/2*d*x + 1/2*c) + 1)/(sqrt(a)*sgn(cos(1/2*d*x + 1/2*
c))) - sqrt(2)*log(-sin(1/2*d*x + 1/2*c) + 1)/(sqrt(a)*sgn(cos(1/2*d*x + 1/
2*c))) - 4*sqrt(2)*sin(1/2*d*x + 1/2*c)/(sqrt(a)*sgn(cos(1/2*d*x + 1/2*c)))
)/d
```

Mupad [B] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.82

$$\int \frac{\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{2\left(2\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|1\right)-\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|1\right)\right)\sqrt{\frac{a+a\,\cos(c+d\,x)}{2\,a}}}{d\,\sqrt{a+a\,\cos\left(c+d\,x\right)}}$$

```
[In] int(cos(c + d*x)/(a + a*cos(c + d*x))^(1/2),x)
```

```
[Out] (2*(2*ellipticE(c/2 + (d*x)/2, 1) - ellipticF(c/2 + (d*x)/2, 1))*((a + a*co
s(c + d*x))/(2*a))^(1/2))/(d*(a + a*cos(c + d*x))^(1/2))
```

3.126 $\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 46

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx=\frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d}$$

```
[Out] arctanh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/(a+a*cos(d*x+c))^(1/2))*2^(1/2)/d/a^
(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2728, 212}

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx=\frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d}$$

```
[In] Int[1/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (Sqrt[2]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])]
)/(Sqrt[a]*d)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = -\frac{2\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

$$= \frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.87

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{2\text{arctanh}\left(\sin\left(\frac{1}{2}(c+dx)\right)\right)\cos\left(\frac{1}{2}(c+dx)\right)}{d\sqrt{a(1+\cos(c+dx))}}$$

```
[In] Integrate[1/Sqrt[a + a*Cos[c + d*x]],x]
[Out] (2*ArcTanh[Sin[(c + d*x)/2]]*Cos[(c + d*x)/2])/(d*Sqrt[a*(1 + Cos[c + d*x])
])
```

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 3.

Time = 0.44 (sec) , antiderivative size = 56, normalized size of antiderivative = 1.22

method	result	size
default	$\frac{\sqrt{2}\ \text{am}^{-1}\left(\frac{dx}{2}+\frac{c}{2}\middle\vert 1\right)}{d\sec\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\ \text{csgn}\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}$	56

```
[In] int(1/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/d*2^(1/2)/sec(1/2*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/csgn(cos(1/2*
d*x+1/2*c))*InverseJacobiAM(1/2*d*x+1/2*c,1)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 126, normalized size of antiderivative = 2.74

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx = \left[\frac{\sqrt{2}\log\left(-\frac{\cos(dx+c)^2-\frac{2\sqrt{2}\sqrt{a\cos(dx+c)+a}\sin(dx+c)}{\sqrt{a}}-2\cos(dx+c)-3}{\cos(dx+c)^2+2\cos(dx+c)+1}\right)}{2\sqrt{a}d}, -\frac{\sqrt{2}\sqrt{-\frac{1}{a}}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{-\frac{1}{a}}}{\sin(dx+c)}\right)}{d}\right]$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] [1/2*sqrt(2)*log(-(cos(d*x + c)^2 - 2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sin(
d*x + c)/sqrt(a) - 2*cos(d*x + c) - 3)/(cos(d*x + c)^2 + 2*cos(d*x + c) + 1
))/(sqrt(a)*d), -sqrt(2)*sqrt(-1/a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)
*sqrt(-1/a)/sin(d*x + c))/d]
```

Sympy [F]

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{a\cos{(c+dx)}+a}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))**(1/2),x)
[Out] Integral(1/sqrt(a*cos(c + d*x) + a), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 90 vs. 2(37) = 74.

Time = 0.35 (sec) , antiderivative size = 90, normalized size of antiderivative = 1.96

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\sqrt{2}\log\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2+\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2+2\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)-\sqrt{2}\log\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2+\sin\left(\frac{1}{2}\right.\right.}{2\sqrt{a}d}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] 1/2*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))/(sqrt(a)*d)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 93 vs. $2(37) = 74$.

Time = 0.30 (sec) , antiderivative size = 93, normalized size of antiderivative = 2.02

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\frac{\sqrt{2}\log\left(\left|\frac{1}{\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}+\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+2\right|\right)}{\sqrt{a}\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)} - \frac{\sqrt{2}\log\left(\left|\frac{1}{\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}+\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\right|\right)}{\sqrt{a}\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}}{4\,d}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 1/4*(sqrt(2)*log(abs(1/sin(1/2*d*x + 1/2*c) + sin(1/2*d*x + 1/2*c) + 2))/(s
qrt(a)*sgn(cos(1/2*d*x + 1/2*c))) - sqrt(2)*log(abs(1/sin(1/2*d*x + 1/2*c)
+ sin(1/2*d*x + 1/2*c) - 2))/(sqrt(a)*sgn(cos(1/2*d*x + 1/2*c))))/d
```

Mupad [B] (verification not implemented)

Time = 14.13 (sec) , antiderivative size = 45, normalized size of antiderivative = 0.98

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|1\right)\,\sqrt{\frac{2\,(a+a\,\cos(c+d\,x))}{a}}}{d\,\sqrt{a+a\,\cos\left(c+d\,x\right)}}$$

```
[In] int(1/(a + a*cos(c + d*x))^(1/2),x)
```

```
[Out] (ellipticF(c/2 + (d*x)/2, 1)*((2*(a + a*cos(c + d*x)))/a)^(1/2))/(d*(a + a*
cos(c + d*x))^(1/2))
```

3.127 $\int \frac{\sec(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 85

$$\int \frac{\sec(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{2\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} - \frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d}$$

```
[Out] 2*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d/a^(1/2)-arctanh(1/2*
sin(d*x+c)*a^(1/2)*2^(1/2)/(a+a*cos(d*x+c))^(1/2))*2^(1/2)/d/a^(1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2859, 2728, 212, 2852}

$$\int \frac{\sec(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{2\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d} - \frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d}$$

```
[In] Int[Sec[c + d*x]/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (2*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(Sqrt[a]*d) -
(Sqrt[2]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])]
)/(Sqrt[a]*d)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2859

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.)
+ (f_.)*(x_)])), x_Symbol] :> Dist[b/(b*c - a*d), Int[1/Sqrt[a + b*Sin[e +
f*x]], x], x] - Dist[d/(b*c - a*d), Int[Sqrt[a + b*Sin[e + f*x]]/(c + d*Sin
[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx}{a} - \int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx \\
&= -\frac{2\text{Subst}\left(\int \frac{1}{a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} + \frac{2\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} \\
&= \frac{2\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} - \frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.76

$$\int \frac{\sec(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{2\left(\text{arctanh}\left(\sin\left(\frac{1}{2}(c+dx)\right)\right) - \sqrt{2}\text{arctanh}\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right)\right)\cos\left(\frac{1}{2}(c+dx)\right)}{d\sqrt{a(1+\cos(c+dx))}}$$

```
[In] Integrate[Sec[c + d*x]/Sqrt[a + a*Cos[c + d*x]],x]
[Out] (-2*(ArcTanh[Sin[(c + d*x)/2]] - Sqrt[2]*ArcTanh[Sqrt[2]*Sin[(c + d*x)/2]])
*Cos[(c + d*x)/2])/(d*Sqrt[a*(1 + Cos[c + d*x])])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 225 vs. 2(70) = 140.

Time = 1.64 (sec) , antiderivative size = 226, normalized size of antiderivative = 2.66

method	result
default	$-\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\sqrt{2}\,\ln\left(\frac{4\sqrt{a}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}+4a}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)-\ln\left(\frac{4\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+4\sqrt{2}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{a}+8a}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{2}}\right)-\ln\left(\right.}{\sqrt{a}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$

[In] int(sec(d*x+c)/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)

[Out] -cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2^(1/2)*ln(4*(a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+a)/cos(1/2*d*x+1/2*c))-ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))-ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a)))/a^(1/2)/sin(1/2*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 164 vs. 2(70) = 140.

Time = 0.27 (sec) , antiderivative size = 164, normalized size of antiderivative = 1.93

$$\int \frac{\sec(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\sqrt{2}\sqrt{a}\log\left(-\frac{\cos(dx+c)^2+\frac{2\sqrt{2}\sqrt{a\cos(dx+c)+a}\sin(dx+c)}{\sqrt{a}}-2\cos(dx+c)-3}{\cos(dx+c)^2+2\cos(dx+c)+1}\right)+\sqrt{a}\log\left(\frac{a\cos(dx+c)^3-7a\cos(dx+c)^2-4\sqrt{a\cos(dx+c)+}}{\cos(dx+c)^3+\cos(d}\right.}{2\,ad}$$

[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] 1/2*(sqrt(2)*sqrt(a)*log(-(cos(d*x + c)^2 + 2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/sqrt(a) - 2*cos(d*x + c) - 3)/(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)) + sqrt(a)*log((a*cos(d*x + c)^3 - 7*a*cos(d*x + c)^2 - 4*sqrt(a*cos(d*x + c) + a)*sqrt(a)*(cos(d*x + c) - 2)*sin(d*x + c) + 8*a)/(cos(d*x + c)^3 + cos(d*x + c)^2)))/(a*d)

Sympy [F]

$$\int \frac{\sec(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\sec{\left(c+dx \right)}}{\sqrt{a\left(\cos{\left(c+dx \right)}+1\right)}}\,dx$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))**(1/2),x)
[Out] Integral(sec(c + d*x)/sqrt(a*(cos(c + d*x) + 1)), x)
```

Maxima [F]

$$\int \frac{\sec(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)}{\sqrt{a\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)/sqrt(a*cos(d*x + c) + a), x)
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.42

$$\int \frac{\sec(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\left(\frac{\sqrt{2}\log\left(\frac{\left|-2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}{\left|2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}\right)}{\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}+\frac{\log\left(\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}-\frac{\log\left(-\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}\right)}{2\sqrt{a}d}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] -1/2*sqrt(2)*(sqrt(2)*log(abs(-2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c))/abs(2*sq
rt(2) + 4*sin(1/2*d*x + 1/2*c)))/sgn(cos(1/2*d*x + 1/2*c)) + log(sin(1/2*d*
x + 1/2*c) + 1)/sgn(cos(1/2*d*x + 1/2*c)) - log(-sin(1/2*d*x + 1/2*c) + 1)/
sgn(cos(1/2*d*x + 1/2*c)))/(sqrt(a)*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)\,\sqrt{a+a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)*(a + a*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)*(a + a*cos(c + d*x))^(1/2)), x)
```

3.128 $\int \frac{\sec^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 108

$$\int \frac{\sec^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{\tan(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d/a^(1/2)+arctanh(1/2*s
in(d*x+c)*a^(1/2)*2^(1/2)/(a+a*cos(d*x+c))^(1/2))*2^(1/2)/d/a^(1/2)+tan(d*x
+c)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2858, 3064, 2728, 212, 2852}

$$\int \frac{\sec^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d} + \frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d} + \frac{\tan(c+dx)}{d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sec[c + d*x]^2/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] -(ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]/(Sqrt[a]*d)) + (
Sqrt[2]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])])
/(Sqrt[a]*d) + Tan[c + d*x]/(d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 3064

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[(A
*b - a*B)/(b*c - a*d), Int[1/Sqrt[a + b*Sin[e + f*x]], x], x] + Dist[(B*c -
 A*d)/(b*c - a*d), Int[Sqrt[a + b*Sin[e + f*x]]/(c + d*Sin[e + f*x]), x], x
] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{\tan(c+dx)}{d\sqrt{a+a\cos(c+dx)}} - \frac{\int \frac{(a-a\cos(c+dx))\sec(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{2a}$$

$$= \frac{\tan(c+dx)}{d\sqrt{a+a\cos(c+dx)}} - \frac{\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx}{2a} + \int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{\tan(c+dx)}{d\sqrt{a+a\cos(c+dx)}} + \frac{\text{Subst}\left(\int \frac{1}{a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} - \frac{2\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

$$= -\frac{\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{\tan(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.85 (sec) , antiderivative size = 192, normalized size of antiderivative = 1.78

$$\int \frac{\sec^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\cos\left(\frac{1}{2}(c+dx)\right)\left(\sqrt{2}\log\left(i-\sqrt{2}e^{\frac{1}{2}i(c+dx)}-ie^{i(c+dx)}\right)-\sqrt{2}\log\left(i+\sqrt{2}e^{\frac{1}{2}i(c+dx)}-ie^{i(c+dx)}\right)-4\log\left(\cos\right.\right.}{2d\sqrt{a(1+}}$$

```
[In] Integrate[Sec[c + d*x]^2/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (Cos[(c + d*x)/2]*(Sqrt[2]*Log[I - Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c
+ d*x))] - Sqrt[2]*Log[I + Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))]
 - 4*Log[Cos[(c + d*x)/4] - Sin[(c + d*x)/4]] + 4*Log[Cos[(c + d*x)/4] + Si
n[(c + d*x)/4]] + 4*Sec[c + d*x]*Sin[(c + d*x)/2]))/(2*d*Sqrt[a*(1 + Cos[c
+ d*x])])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 465 vs. 2(91) = 182.

Time = 1.75 (sec) , antiderivative size = 466, normalized size of antiderivative = 4.31

method	result
default	$\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(2a\left(-2\sqrt{2}\ln\left(\frac{4\sqrt{a}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}+4a}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)+\ln\left(\frac{4\sqrt{2}a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+4\sqrt{2}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{a}+8a}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{2}}\right.\right.\right.}{}$

```
[In] int(sec(d*x+c)^2/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*a*(-2*2^(1/2)*ln(4*(a^
(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+a)/cos(1/2*d*x+1/2*c))+ln(4/(2*cos(1/2
*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1
/2*c)^2)^(1/2)*a^(1/2)+2*a))+ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*
a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a)))*
sin(1/2*d*x+1/2*c)^2+2*2^(1/2)*ln(4*(a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)
+a)/cos(1/2*d*x+1/2*c))*a-ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*co
s(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*a-ln(
-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*
sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a+2*2^(1/2)*(a*sin(1/2*d*x+1/2*c)
^2)^(1/2)*a^(1/2))/a^(3/2)/(2*cos(1/2*d*x+1/2*c)-2^(1/2))/(2*cos(1/2*d*x+1/
2*c)+2^(1/2))/sin(1/2*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 236 vs. $2(91) = 182$.

Time = 0.27 (sec) , antiderivative size = 236, normalized size of antiderivative = 2.19

$$\int \frac{\sec^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{\left(\cos\left(dx+c\right)^2+\cos\left(dx+c\right)\right)\sqrt{a}\log\left(\frac{a\cos(dx+c)^3-7\,a\cos(dx+c)^2+4\,\sqrt{a\cos(dx+c)+a}\sqrt{a}(\cos(dx+c)-2)\sin(dx+c)+8\,a}{\cos(dx+c)^3+\cos(dx+c)^2}\right)+\frac{2\sqrt{\cdots}}{\cdots}}{4\left(ad\cos\left(dx+c\right)^2\cdots\right.}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/4*((cos(d*x + c)^2 + cos(d*x + c))*sqrt(a)*log((a*cos(d*x + c)^3 - 7*a*co
s(d*x + c)^2 + 4*sqrt(a*cos(d*x + c) + a)*sqrt(a)*(cos(d*x + c) - 2)*sin(d*
x + c) + 8*a)/(cos(d*x + c)^3 + cos(d*x + c)^2)) + 2*sqrt(2)*(a*cos(d*x + c
)^2 + a*cos(d*x + c))*log(-(cos(d*x + c)^2 - 2*sqrt(2)*sqrt(a*cos(d*x + c)
+ a)*sin(d*x + c)/sqrt(a) - 2*cos(d*x + c) - 3)/(cos(d*x + c)^2 + 2*cos(d*x
 + c) + 1))/sqrt(a) + 4*sqrt(a*cos(d*x + c) + a)*sin(d*x + c))/(a*d*cos(d*x
 + c)^2 + a*d*cos(d*x + c))
```

Sympy [F]

$$\int \frac{\sec^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\sec^2\left(c+dx\right)}{\sqrt{a\left(\cos\left(c+dx\right)+1\right)}}\,dx$$

```
[In] integrate(sec(d*x+c)**2/(a+a*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sec(c + d*x)**2/sqrt(a*(cos(c + d*x) + 1)), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 18435 vs. 2(91) = 182.

Time = 0.55 (sec) , antiderivative size = 18435, normalized size of antiderivative = 170.69

$$\int \frac{\sec^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/4*((2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
- log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c)^4 + (2*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2))*sin(d*x + c)^4 + 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^3 + 4*(2*
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*sin(1/2*d*x + 1/2*c) - log(2*co
s(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1
/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c)^3 + (
(2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
```

2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c)^2 + (2*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*
c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*
sin(d*x + c)^2 - 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(2*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) - log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c) + 2*sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1) + 4*sqrt(2)*sin(1/2*d*x + 1/2*c) - log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) +
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(3*d*x + 3*c)^2 + (
(2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c)^2 + (2*sqrt(2)*log(cos(1/2*d*x +

1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*
c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*
sin(d*x + c)^2 - 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(2*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) - log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c) + 2*sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1) + 4*sqrt(2)*sin(1/2*d*x + 1/2*c) - log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) +
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(2*d*x + 2*c)^2 + 6
*(2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) - lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*
c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c)
^2 + ((2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*

c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
 - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*
sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c)^2 + (2*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*
sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2))*sin(d*x + c)^2 - 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(2*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) - log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c) + 2*
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 4*sqrt(2)*sin(1/2*d*x + 1/2*c) - log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(3*d*x + 3*c)
^2 + ((2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
 - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*
sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c)^2 + (2*sqrt(2)*log(cos(1/2*

d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*
sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2))*sin(d*x + c)^2 - 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(2*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) - log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c) + 2*
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 4*sqrt(2)*sin(1/2*d*x + 1/2*c) - log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(2*d*x + 2*c)
^2 + 2*((2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c)^2 + 2*(2*sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*sin(1/2*d*x + 1/2*c) - log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x

+ 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c
) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c) + 2*sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) - log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*
c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*
c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(d*x + c)^2 + 2*((2*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x
 + 1/2*c) + 2))*cos(d*x + c)^3 + 3*(2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c
)^2 + ((2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c) + 2*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqr

t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 4*sqrt(2)*sin(1/2*d*x + 1/2*c) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(d*x + c)^2 + ((2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c)^2 + (2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(d*x + c)^2 - 4*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c) + 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 4*sqrt(2)*sin(1/2*d*x + 1/2*c) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -

log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(2*d*x + 2*c) + 3*(2*sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2
*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c
) + 2))*cos(d*x + c) - 4*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(
2)*cos(1/2*d*x + 1/2*c))*sin(d*x + c) + 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
- log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*
sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(3*d
*x + 3*c) + 2*((2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c)^3 + 3*(2*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2))*cos(d*x + c)^2 + ((2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/

2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c
) + 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 4*sqrt(2)*sin(1/2*d*x + 1/2*c) -
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(d*x +
c)^2 + 3*(2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c) - 4*(sqrt(2)*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(d*x + c) + 2*sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2))*cos(2*d*x + 2*c) + 4*(2*sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1) - 3*sqrt(2)*sin(1/2*d*x + 1/2*c) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - l

```
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c) + 2*((2*sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sq
rt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*co
s(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1
/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
))*sin(d*x + c)^3 + 4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 8*sqrt(
2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + ((2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*
x + c)^2 + (2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)
*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
 + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(d*x + c)^2 - 4*sqrt(2)*cos(1/2*
d*x + 1/2*c)*sin(d*x + c) + 2*(2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2))*cos(d*x + c) + 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
```

1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 4*sqr
t(2)*sin(1/2*d*x + 1/2*c) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2))*sin(2*d*x + 2*c) + ((2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
- log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x
+ c)^2 + 2*(2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
- 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
- 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*co
s(d*x + c) + 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 4*sqrt(2)*sin(1/2*d*x +
1/2*c) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*s
in(d*x + c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(3*d*x + 3*c) + 2*((2*sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt

(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(d*x + c)^3 + 4*sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 8*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + ((2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c)^2 + 2*(2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(d*x + c) + 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 4*sqrt(2)*sin(1/2*d*x + 1/2*c) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(d*x + c) + 4*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 4*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(d*x + c) + 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 4*sqrt(2)*sin(1/2*d*x + 1/2*c) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x

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+ 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c
) + 2) + log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))/((cos(d*x + c
)^4 + sin(d*x + c)^4 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
1)*cos(3*d*x + 3*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) +
 1)*cos(2*d*x + 2*c)^2 + 4*cos(d*x + c)^3 + (cos(d*x + c)^2 + sin(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sin(3*d*x + 3*c)^2 + (cos(d*x + c)^2 + sin(d*x + c)
^2 + 2*cos(d*x + c) + 1)*sin(2*d*x + 2*c)^2 + 2*(cos(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*sin(d*x + c)^2 + 2*(cos(d*x + c)^3 + (cos(d*x + c) + 1)*sin(d*x
+ c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(2*d*x +
 2*c) + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 2*(cos(d*
x + c)^3 + (cos(d*x + c) + 1)*sin(d*x + c)^2 + 3*cos(d*x + c)^2 + 3*cos(d*x
 + c) + 1)*cos(2*d*x + 2*c) + 6*cos(d*x + c)^2 + 2*(sin(d*x + c)^3 + (cos(d
*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(2*d*x + 2*c) + (cos(d*
x + c)^2 + 2*cos(d*x + c) + 1)*sin(d*x + c))*sin(3*d*x + 3*c) + 2*(sin(d*x
+ c)^3 + (cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(d*x + c))*sin(2*d*x + 2*
c) + 4*cos(d*x + c) + 1)*sqrt(a)*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sec^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^2\,\sqrt{a+a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^2*(a + a*cos(c + d*x))^(1/2)),x)
```

```
[Out] int(1/(cos(c + d*x)^2*(a + a*cos(c + d*x))^(1/2)), x)
```

3.129 $\int \frac{\sec^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 147

$$\int \frac{\sec^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{7\,\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4\sqrt{a}d} - \frac{\sqrt{2}\,\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} - \frac{\tan(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{\sec(c+dx)\tan(c+dx)}{2d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 7/4*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d/a^(1/2)-arctanh(1/
2*sin(d*x+c)*a^(1/2)*2^(1/2)/(a+a*cos(d*x+c))^(1/2))*2^(1/2)/d/a^(1/2)-1/4*
tan(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+1/2*sec(d*x+c)*tan(d*x+c)/d/(a+a*cos(d*
x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2858, 3063, 3064, 2728, 212, 2852}

$$\int \frac{\sec^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{7\,\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{4\sqrt{a}d} - \frac{\sqrt{2}\,\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d} - \frac{\tan(c+dx)}{4d\sqrt{a\cos(c+dx)+a}} + \frac{\tan(c+dx)\sec(c+dx)}{2d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sec[c + d*x]^3/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (7*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(4*Sqrt[a]*d)
- (Sqrt[2]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]]
```

```
)])/(Sqrt[a]*d) - Tan[c + d*x]/(4*d*Sqrt[a + a*Cos[c + d*x]]) + (Sec[c + d*
x]*Tan[c + d*x])/(2*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rule 3064

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[(A
```

```
*b - a*B)/(b*c - a*d), Int[1/Sqrt[a + b*Sin[e + f*x]], x], x] + Dist[(B*c -
 A*d)/(b*c - a*d), Int[Sqrt[a + b*Sin[e + f*x]]/(c + d*Sin[e + f*x]), x], x
] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{\sec(c+dx)\tan(c+dx)}{2d\sqrt{a+a\cos(c+dx)}} - \frac{\int \frac{(a-3a\cos(c+dx))\sec^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{4a}$$

$$= -\frac{\tan(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{\sec(c+dx)\tan(c+dx)}{2d\sqrt{a+a\cos(c+dx)}} - \frac{\int \frac{\left(-\frac{7a^2}{2}+\frac{1}{2}a^2\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{4a^2}$$

$$= -\frac{\tan(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{\sec(c+dx)\tan(c+dx)}{2d\sqrt{a+a\cos(c+dx)}} + \frac{7\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx}{8a} - \int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= -\frac{\tan(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{\sec(c+dx)\tan(c+dx)}{2d\sqrt{a+a\cos(c+dx)}} - \frac{7\text{Subst}\left(\int \frac{1}{a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d} + \frac{2\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

$$= \frac{7\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4\sqrt{a}d} - \frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} - \frac{\tan(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{\sec(c+dx)\tan(c+dx)}{2d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.26 (sec) , antiderivative size = 360, normalized size of antiderivative = 2.45

$$\int \frac{\sec^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\cos\left(\frac{1}{2}(c+dx)\right)\sec^2(c+dx)\left(-7\sqrt{2}\log\left(i-\sqrt{2}e^{\frac{1}{2}i(c+dx)}-ie^{i(c+dx)}\right)+7\sqrt{2}\log\left(i+\sqrt{2}e^{\frac{1}{2}i(c+dx)}-ie^{i(c+dx}\right.\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^3/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (Cos[(c + d*x)/2]*Sec[c + d*x]^2*(-7*Sqrt[2]*Log[I - Sqrt[2]*E^((I/2)*(c +
d*x)) - I*E^(I*(c + d*x))] + 7*Sqrt[2]*Log[I + Sqrt[2]*E^((I/2)*(c + d*x))
- I*E^(I*(c + d*x))] + 16*Log[Cos[(c + d*x)/4] - Sin[(c + d*x)/4]] + Cos[2*
(c + d*x)]*(-7*Sqrt[2]*Log[I - Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*
x))] + 7*Sqrt[2]*Log[I + Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))] +
 16*Log[Cos[(c + d*x)/4] - Sin[(c + d*x)/4]] - 16*Log[Cos[(c + d*x)/4] + Si
n[(c + d*x)/4]]) - 16*Log[Cos[(c + d*x)/4] + Sin[(c + d*x)/4]] + 20*Sin[(c
+ d*x)/2] - 4*Sin[(3*(c + d*x))/2]))/(16*d*Sqrt[a*(1 + Cos[c + d*x])])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 676 vs. $2(122) = 244$.

Time = 1.80 (sec) , antiderivative size = 677, normalized size of antiderivative = 4.61

method	result
default	$-\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-4a\left(-8\sqrt{2}\,\ln\left(\frac{4\sqrt{a}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}+4a}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)+7\ln\left(-\frac{4\left(\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-\sqrt{2}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\right.}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-\sqrt{2}}\right.\right.\right.}{}$

```
[In] int(sec(d*x+c)^3/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-4*a*(-8*2^(1/2)*ln
(4*(a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+a)/cos(1/2*d*x+1/2*c))+7*ln(-4/(
2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(
1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))+7*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))
*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/
2)+2*a)))*sin(1/2*d*x+1/2*c)^4+(-32*2^(1/2)*ln(4*(a^(1/2)*(a*sin(1/2*d*x+1/
2*c)^2)^(1/2)+a)/cos(1/2*d*x+1/2*c))*a-4*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(
1/2)*a^(1/2)+28*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+
1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*a+28*ln(-4/(2*c
os(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2
*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a)*sin(1/2*d*x+1/2*c)^2+8*2^(1/2)*ln(4*(
a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+a)/cos(1/2*d*x+1/2*c))*a-2*2^(1/2)*(
a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-7*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))
*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/
2)+2*a))*a-7*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/
2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a)/a^(3/2)/(2*cos
(1/2*d*x+1/2*c)-2^(1/2))^2/(2*cos(1/2*d*x+1/2*c)+2^(1/2))^2/sin(1/2*d*x+1/2
*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 251 vs. 2(122) = 244.

Time = 0.28 (sec) , antiderivative size = 251, normalized size of antiderivative = 1.71

$$\int \frac{\sec^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{7\left(\cos\left(dx+c\right)^3+\cos\left(dx+c\right)^2\right)\sqrt{a}\log\left(\frac{a\cos(dx+c)^3-7\,a\cos(dx+c)^2-4\,\sqrt{a\cos(dx+c)+a}\sqrt{a}(\cos(dx+c)-2)\sin(dx+c)+8\,a}{\cos(dx+c)^3+\cos(dx+c)^2}\right)-}{16\left(ad\,\mathrm{co}\right.}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/16*(7*(cos(d*x + c)^3 + cos(d*x + c)^2)*sqrt(a)*log((a*cos(d*x + c)^3 - 7
*a*cos(d*x + c)^2 - 4*sqrt(a*cos(d*x + c) + a)*sqrt(a)*(cos(d*x + c) - 2)*s
in(d*x + c) + 8*a)/(cos(d*x + c)^3 + cos(d*x + c)^2)) - 4*sqrt(a*cos(d*x +
c) + a)*(cos(d*x + c) - 2)*sin(d*x + c) + 8*sqrt(2)*(a*cos(d*x + c)^3 + a*c
os(d*x + c)^2)*log(-(cos(d*x + c)^2 + 2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*si
n(d*x + c)/sqrt(a) - 2*cos(d*x + c) - 3)/(cos(d*x + c)^2 + 2*cos(d*x + c) +
 1))/sqrt(a))/(a*d*cos(d*x + c)^3 + a*d*cos(d*x + c)^2)
```

Sympy [F]

$$\int \frac{\sec^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\sec^3\left(c+dx\right)}{\sqrt{a\left(\cos\left(c+dx\right)+1\right)}}\,dx$$

```
[In] integrate(sec(d*x+c)**3/(a+a*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sec(c + d*x)**3/sqrt(a*(cos(c + d*x) + 1)), x)
```

Maxima [F(-1)]

Timed out.

$$\int \frac{\sec^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] Timed out
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sec^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^3\,\sqrt{a+a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^3*(a + a*cos(c + d*x))^(1/2)),x)
```

```
[Out] int(1/(cos(c + d*x)^3*(a + a*cos(c + d*x))^(1/2)), x)
```

3.130 $\int \frac{\sec^4(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 181

$$\int \frac{\sec^4(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{9\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8\sqrt{a}d} + \frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{7\tan(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} - \frac{\sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{\sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -9/8*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d/a^(1/2)+arctanh(1
/2*sin(d*x+c)*a^(1/2)*2^(1/2)/(a+a*cos(d*x+c))^(1/2))*2^(1/2)/d/a^(1/2)+7/8
*tan(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)-1/12*sec(d*x+c)*tan(d*x+c)/d/(a+a*cos(
d*x+c))^(1/2)+1/3*sec(d*x+c)^2*tan(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.63 (sec) , antiderivative size = 181, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2858, 3063, 3064, 2728, 212, 2852}

$$\int \frac{\sec^4(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{9\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{8\sqrt{a}d} + \frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d} + \frac{7\tan(c+dx)}{8d\sqrt{a\cos(c+dx)+a}} + \frac{\tan(c+dx)\sec^2(c+dx)}{3d\sqrt{a\cos(c+dx)+a}} - \frac{\tan(c+dx)\sec(c+dx)}{12d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sec[c + d*x]^4/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (-9*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(8*Sqrt[a]*d)
 + (Sqrt[2]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]
])])/(Sqrt[a]*d) + (7*Tan[c + d*x])/(8*d*Sqrt[a + a*Cos[c + d*x]]) - (Sec[c
 + d*x]*Tan[c + d*x])/(12*d*Sqrt[a + a*Cos[c + d*x]]) + (Sec[c + d*x]^2*Tan
[c + d*x])/(3*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
```

```
+ 1/2, 0])
```

Rule 3064

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[(A
*b - a*B)/(b*c - a*d), Int[1/Sqrt[a + b*Sin[e + f*x]], x], x] + Dist[(B*c -
 A*d)/(b*c - a*d), Int[Sqrt[a + b*Sin[e + f*x]]/(c + d*Sin[e + f*x]), x], x
] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{\sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} - \frac{\int \frac{(a-5a\cos(c+dx))\sec^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{6a}$$

$$= -\frac{\sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{\sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} - \frac{\int \frac{\left(-\frac{21a^2}{2}+\frac{3}{2}a^2\cos(c+dx)\right)\sec^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{12a^2}$$

$$= \frac{7\tan(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} - \frac{\sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{\sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} - \frac{\int \frac{\left(\frac{27a^3}{4}-\frac{21}{4}a^3\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{12a^3}$$

$$= \frac{7\tan(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} - \frac{\sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{\sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} - \frac{9\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx}{16a} + \int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{7\tan(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} - \frac{\sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{\sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{9\text{Subst}\left(\int \frac{1}{a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d} - \frac{2\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

$$= -\frac{9\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8\sqrt{a}d} + \frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{7\tan(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} - \frac{\sec(c+dx)\tan(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{\sec^2(c+dx)\tan(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.42 (sec) , antiderivative size = 385, normalized size of antiderivative = 2.13

$$\int \frac{\sec^4(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$$
$$= \frac{\cos\left(\frac{1}{2}(c+dx)\right)\sec^3(c+dx)\left(9\cos(c+dx)\left(9\sqrt{2}\log\left(i-\sqrt{2}e^{\frac{1}{2}i(c+dx)}-ie^{i(c+dx)}\right)-9\sqrt{2}\log\left(i+\sqrt{2}e^{\frac{1}{2}i(\right.\right.\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^4/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (Cos[(c + d*x)/2]*Sec[c + d*x]^3*(9*Cos[c + d*x]*(9*Sqrt[2]*Log[I - Sqrt[2]
*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))] - 9*Sqrt[2]*Log[I + Sqrt[2]*E^((I
/2)*(c + d*x)) - I*E^(I*(c + d*x))] - 32*Log[Cos[(c + d*x)/4] - Sin[(c + d*
x)/4]] + 32*Log[Cos[(c + d*x)/4] + Sin[(c + d*x)/4]]) + 3*Cos[3*(c + d*x)]*
(9*Sqrt[2]*Log[I - Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))] - 9*Sqr
t[2]*Log[I + Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))] - 32*Log[Cos[
(c + d*x)/4] - Sin[(c + d*x)/4]] + 32*Log[Cos[(c + d*x)/4] + Sin[(c + d*x)/
4]]) + 4*(78*Sin[(c + d*x)/2] - 25*Sin[(3*(c + d*x))/2] + 21*Sin[(5*(c + d*
x))/2])))/(192*d*Sqrt[a*(1 + Cos[c + d*x])])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 882 vs. 2(152) = 304.

Time = 2.04 (sec) , antiderivative size = 883, normalized size of antiderivative = 4.88

method	result	size
default	Expression too large to display	883

```
[In] int(sec(d*x+c)^4/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-24*a*(16*2^(1/2)*ln
(4*(a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+a)/cos(1/2*d*x+1/2*c))-9*ln(4/(2
*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1
/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))-9*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))
*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/
2)-2*a)))*sin(1/2*d*x+1/2*c)^6+(576*2^(1/2)*ln(4*(a^(1/2)*(a*sin(1/2*d*x+1/
2*c)^2)^(1/2)+a)/cos(1/2*d*x+1/2*c))*a-324*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/
2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^
(1/2)+2*a))*a-324*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d
*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a+168*2^(1/2
)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2))*sin(1/2*d*x+1/2*c)^4+(-288*2^(1/2
```

```
)*ln(4*(a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+a)/cos(1/2*d*x+1/2*c))*a+162
*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*
(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*a+162*ln(-4/(2*cos(1/2*d*x+1/2
*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)
^(1/2)*a^(1/2)-2*a))*a-160*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2))*
sin(1/2*d*x+1/2*c)^2+48*2^(1/2)*ln(4*(a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2
)+a)/cos(1/2*d*x+1/2*c))*a-27*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*
a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*a
-27*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1
/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*a+54*2^(1/2)*(a*sin(1/2*d*
x+1/2*c)^2)^(1/2)*a^(1/2))/a^(3/2)/(2*cos(1/2*d*x+1/2*c)-2^(1/2))^3/(2*cos(
1/2*d*x+1/2*c)+2^(1/2))^3/sin(1/2*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)
/d
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 263, normalized size of antiderivative = 1.45

$$\int \frac{\sec^4(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{27\left(\cos(dx+c)^4+\cos(dx+c)^3\right)\sqrt{a}\log\left(\frac{a\cos(dx+c)^3-7\,a\cos(dx+c)^2+4\,\sqrt{a\cos(dx+c)+a}\sqrt{a}(\cos(dx+c)-2)\sin(dx+c)+8\,a}{\cos(dx+c)^3+\cos(dx+c)^2}\right) -}{}$$

```
[In] integrate(sec(d*x+c)^4/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/96*(27*(cos(d*x + c)^4 + cos(d*x + c)^3)*sqrt(a)*log((a*cos(d*x + c)^3 -
7*a*cos(d*x + c)^2 + 4*sqrt(a*cos(d*x + c) + a)*sqrt(a)*(cos(d*x + c) - 2)*
sin(d*x + c) + 8*a)/(cos(d*x + c)^3 + cos(d*x + c)^2)) + 4*sqrt(a*cos(d*x +
 c) + a)*(21*cos(d*x + c)^2 - 2*cos(d*x + c) + 8)*sin(d*x + c) + 48*sqrt(2)
*(a*cos(d*x + c)^4 + a*cos(d*x + c)^3)*log(-(cos(d*x + c)^2 - 2*sqrt(2)*sqr
t(a*cos(d*x + c) + a)*sin(d*x + c)/sqrt(a) - 2*cos(d*x + c) - 3)/(cos(d*x +
 c)^2 + 2*cos(d*x + c) + 1))/sqrt(a))/(a*d*cos(d*x + c)^4 + a*d*cos(d*x + c
)^3)
```

Sympy [F]

$$\int \frac{\sec^4(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\sec^4{(c+dx)}}{\sqrt{a\left(\cos{(c+dx)}+1\right)}}\,dx$$

```
[In] integrate(sec(d*x+c)**4/(a+a*cos(d*x+c))**(1/2),x)
[Out] Integral(sec(c + d*x)**4/sqrt(a*(cos(c + d*x) + 1)), x)
```

Maxima [F(-1)]

Timed out.

$$\int \frac{\sec^4(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^4/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] Timed out
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sec^4(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(sec(d*x+c)^4/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^4(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{1}{{\cos\left(c+d\,x\right)}^4\,\sqrt{a+a\,\cos\left(c+d\,x\right)}} \,d x$$

```
[In] int(1/(cos(c + d*x)^4*(a + a*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^4*(a + a*cos(c + d*x))^(1/2)), x)
```

3.131 $\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 183

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = -\frac{15\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\cos^3(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{31\sin(c+dx)}{5ad\sqrt{a+a\cos(c+dx)}} + \frac{9\cos^2(c+dx)\sin(c+dx)}{10ad\sqrt{a+a\cos(c+dx)}} - \frac{13\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{10a^2d}$$

```
[Out] -1/2*cos(d*x+c)^3*sin(d*x+c)/d/(a+a*cos(d*x+c))^(3/2)-15/4*arctanh(1/2*sin(
d*x+c)*a^(1/2)*2^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(3/2)/d*2^(1/2)+31/5*sin(d
*x+c)/a/d/(a+a*cos(d*x+c))^(1/2)+9/10*cos(d*x+c)^2*sin(d*x+c)/a/d/(a+a*cos(
d*x+c))^(1/2)-13/10*sin(d*x+c)*(a+a*cos(d*x+c))^(1/2)/a^2/d
```

Rubi [A] (verified)

Time = 0.49 (sec) , antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {2844, 3062, 3047, 3102, 2830, 2728, 212}

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = -\frac{15\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{13\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{10a^2d} - \frac{\sin(c+dx)\cos^3(c+dx)}{2d(a\cos(c+dx)+a)^{3/2}} + \frac{9\sin(c+dx)\cos^2(c+dx)}{10ad\sqrt{a\cos(c+dx)+a}} + \frac{31\sin(c+dx)}{5ad\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Cos[c + d*x]^4/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-15*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])])/(2
*Sqrt[2]*a^(3/2)*d) - (Cos[c + d*x]^3*Sin[c + d*x])/(2*d*(a + a*Cos[c + d*x
])^(3/2)) + (31*Sin[c + d*x])/(5*a*d*Sqrt[a + a*Cos[c + d*x]]) + (9*Cos[c +
 d*x]^2*Sin[c + d*x])/(10*a*d*Sqrt[a + a*Cos[c + d*x]]) - (13*Sqrt[a + a*Co
s[c + d*x]]*Sin[c + d*x])/(10*a^2*d)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3062

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(-B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(f*(m +
n + 1))), x] + Dist[1/(b*(m + n + 1)), Int[(a + b*Sin[e + f*x])^m*(c + d*Si
n[e + f*x])^(n - 1)*Simp[A*b*c*(m + n + 1) + B*(a*c*m + b*d*n) + (A*b*d*(m
+ n + 1) + B*(a*d*m + b*c*n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 -
 d^2, 0] && GtQ[n, 0] && (IntegerQ[n] || EqQ[m + 1/2, 0])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^3(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}-\frac{\int \frac{\cos^2(c+dx)\left(3a-\frac{9}{2}a\cos(c+dx)\right)}{\sqrt{a+a\cos(c+dx)}}\,dx}{2a^2}\\
&=-\frac{\cos^3(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}+\frac{9\cos^2(c+dx)\sin(c+dx)}{10ad\sqrt{a+a\cos(c+dx)}}-\frac{\int \frac{\cos(c+dx)\left(-9a^2+\frac{39}{4}a^2\cos(c+dx)\right)}{\sqrt{a+a\cos(c+dx)}}\,dx}{5a^3}\\
&=-\frac{\cos^3(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}+\frac{9\cos^2(c+dx)\sin(c+dx)}{10ad\sqrt{a+a\cos(c+dx)}}-\frac{\int \frac{-9a^2\cos(c+dx)+\frac{39}{4}a^2\cos^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{5a^3}\\
&=-\frac{\cos^3(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}+\frac{9\cos^2(c+dx)\sin(c+dx)}{10ad\sqrt{a+a\cos(c+dx)}}\\
&\quad-\frac{13\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{10a^2d}-\frac{2\int \frac{\frac{39a^3}{8}-\frac{93}{4}a^3\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{15a^4}\\
&=-\frac{\cos^3(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}+\frac{31\sin(c+dx)}{5ad\sqrt{a+a\cos(c+dx)}}+\frac{9\cos^2(c+dx)\sin(c+dx)}{10ad\sqrt{a+a\cos(c+dx)}}\\
&\quad-\frac{13\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{10a^2d}-\frac{15\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx}{4a}\\
&=-\frac{\cos^3(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}+\frac{31\sin(c+dx)}{5ad\sqrt{a+a\cos(c+dx)}}+\frac{9\cos^2(c+dx)\sin(c+dx)}{10ad\sqrt{a+a\cos(c+dx)}}\\
&\quad-\frac{13\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{10a^2d}+\frac{15\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{2ad}
\end{aligned}$$

$$= -\frac{15\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\cos^3(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{31\sin(c+dx)}{5ad\sqrt{a+a\cos(c+dx)}} + \frac{9\cos^2(c+dx)\sin(c+dx)}{10ad\sqrt{a+a\cos(c+dx)}} - \frac{13\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{10a^2d}$$

Mathematica [A] (verified)

Time = 0.26 (sec) , antiderivative size = 118, normalized size of antiderivative = 0.64

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{\left(-75\sqrt{2}\operatorname{arctanh}\left(\sqrt{\sin^2\left(\frac{1}{2}(c+dx)\right)}\right)(1+\cos(c+dx)) + 2\sqrt{1-\cos(c+dx)}\right.}{20d\sqrt{1-\cos(c+dx)}(a(}$$

```
[In] Integrate[Cos[c + d*x]^4/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] ((-75*Sqrt[2]*ArcTanh[Sqrt[Sin[(c + d*x)/2]^2]]*(1 + Cos[c + d*x]) + 2*Sqrt
[1 - Cos[c + d*x]]*(47 + 39*Cos[c + d*x] - 2*Cos[2*(c + d*x)] + Cos[3*(c +
d*x)]))*Sin[c + d*x])/(20*d*Sqrt[1 - Cos[c + d*x]]*(a*(1 + Cos[c + d*x]))^(
3/2))
```

Maple [A] (verified)

Time = 1.16 (sec) , antiderivative size = 265, normalized size of antiderivative = 1.45

method	result
default	$\frac{\sqrt{2}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-32\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{a}\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+32\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{a}\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+75\ln\left(\frac{4\sqrt{a}\sqrt{a(\mathrm{si}}}{\mathrm{cos}}\right.\right.}{20\cos\left(\frac{dx}{2}+\frac{c}{2}\right)a^{\frac{5}{2}}}$

```
[In] int(cos(d*x+c)^4/(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/20/cos(1/2*d*x+1/2*c)*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-32*(a*sin(
1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)*sin(1/2*d*x+1/2*c)^6+32*(a*sin(1/2*d*x+1/2*
c)^2)^(1/2)*a^(1/2)*sin(1/2*d*x+1/2*c)^4+75*ln(4*(a^(1/2)*(a*sin(1/2*d*x+1/
2*c)^2)^(1/2)+a)/cos(1/2*d*x+1/2*c))*sin(1/2*d*x+1/2*c)^2*a-80*(a*sin(1/2*d
*x+1/2*c)^2)^(1/2)*a^(1/2)*sin(1/2*d*x+1/2*c)^2-75*ln(4*(a^(1/2)*(a*sin(1/2
*d*x+1/2*c)^2)^(1/2)+a)/cos(1/2*d*x+1/2*c))*a+85*a^(1/2)*(a*sin(1/2*d*x+1/2
*c)^2)^(1/2))/a^(5/2)/sin(1/2*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 184, normalized size of antiderivative = 1.01

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{75\sqrt{2}\left(\cos\left(dx+c\right)^2+2\,\cos\left(dx+c\right)+1\right)\sqrt{a}\log\left(-\frac{a\cos(dx+c)^2+2\sqrt{2}\sqrt{a\cos(dx+c)+}}{\cos(dx+c)^2+2}\right.}{40}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/40*(75*sqrt(2)*(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(a)*log(-(a*cos(
d*x + c)^2 + 2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*sin(d*x + c) - 2*a*
cos(d*x + c) - 3*a)/(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)) + 4*(4*cos(d*x +
 c)^3 - 4*cos(d*x + c)^2 + 36*cos(d*x + c) + 49)*sqrt(a*cos(d*x + c) + a)*s
in(d*x + c))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**4/(a+a*cos(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

Maxima [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] Timed out
```

Giac [A] (verification not implemented)

none

Time = 1.14 (sec) , antiderivative size = 167, normalized size of antiderivative = 0.91

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx =$$
$$-\frac{\frac{75\sqrt{2}\log\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^{\frac{3}{2}}\operatorname{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}-\frac{75\sqrt{2}\log\left(-\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^{\frac{3}{2}}\operatorname{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}+\frac{10\sqrt{2}\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)a^{\frac{3}{2}}\operatorname{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}-\frac{32\sqrt{2}\left(2\,a^{\frac{17}{2}}\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\right.\right.}{a^{10}\operatorname{sgn}(\cos}}{40\,d}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] -1/40*(75*sqrt(2)*log(sin(1/2*d*x + 1/2*c) + 1)/(a^(3/2)*sgn(cos(1/2*d*x +
1/2*c))) - 75*sqrt(2)*log(-sin(1/2*d*x + 1/2*c) + 1)/(a^(3/2)*sgn(cos(1/2*d
*x + 1/2*c))) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c)/((sin(1/2*d*x + 1/2*c)^2 -
1)*a^(3/2)*sgn(cos(1/2*d*x + 1/2*c))) - 32*sqrt(2)*(2*a^(17/2)*sin(1/2*d*x
+ 1/2*c)^5 + 5*a^(17/2)*sin(1/2*d*x + 1/2*c))/(a^10*sgn(cos(1/2*d*x + 1/2*c
))))/d
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{{\cos\left(c+d\,x\right)}^4}{{\left(a+a\,\cos\left(c+d\,x\right)\right)}^{3/2}}\,dx$$

```
[In] int(cos(c + d*x)^4/(a + a*cos(c + d*x))^(3/2),x)
```

```
[Out] int(cos(c + d*x)^4/(a + a*cos(c + d*x))^(3/2), x)
```

3.132 $\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 145

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{11\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\cos^2(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} - \frac{13\sin(c+dx)}{3ad\sqrt{a+a\cos(c+dx)}} + \frac{7\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{6a^2d}$$

```
[Out] -1/2*cos(d*x+c)^2*sin(d*x+c)/d/(a+a*cos(d*x+c))^(3/2)+11/4*arctanh(1/2*sin(
d*x+c)*a^(1/2)*2^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(3/2)/d*2^(1/2)-13/3*sin(d
*x+c)/a/d/(a+a*cos(d*x+c))^(1/2)+7/6*sin(d*x+c)*(a+a*cos(d*x+c))^(1/2)/a^2/
d
```

Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {2844, 3047, 3102, 2830, 2728, 212}

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{11\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d} + \frac{7\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{6a^2d} - \frac{\sin(c+dx)\cos^2(c+dx)}{2d(a\cos(c+dx)+a)^{3/2}} - \frac{13\sin(c+dx)}{3ad\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Cos[c + d*x]^3/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (11*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])])/(2*
Sqrt[2]*a^(3/2)*d) - (Cos[c + d*x]^2*Sin[c + d*x])/(2*d*(a + a*Cos[c + d*x]
```

```
)^(3/2)) - (13*Sin[c + d*x])/(3*a*d*Sqrt[a + a*Cos[c + d*x]]) + (7*Sqrt[a +
 a*Cos[c + d*x]]*Sin[c + d*x])/(6*a^2*d)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
```

```
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^2(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} - \frac{\int \frac{\cos(c+dx)\left(2a-\frac{7}{2}a\cos(c+dx)\right)}{\sqrt{a+a\cos(c+dx)}}\,dx}{2a^2} \\
&= -\frac{\cos^2(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} - \frac{\int \frac{2a\cos(c+dx)-\frac{7}{2}a\cos^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{2a^2} \\
&= -\frac{\cos^2(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{7\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{6a^2d} - \frac{\int \frac{-\frac{7a^2}{4}+\frac{13}{2}a^2\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{3a^3} \\
&= -\frac{\cos^2(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} - \frac{13\sin(c+dx)}{3ad\sqrt{a+a\cos(c+dx)}} \\
&\quad + \frac{7\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{6a^2d} + \frac{11\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx}{4a} \\
&= -\frac{\cos^2(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} - \frac{13\sin(c+dx)}{3ad\sqrt{a+a\cos(c+dx)}} \\
&\quad + \frac{7\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{6a^2d} - \frac{11\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{2ad} \\
&= \frac{11\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\cos^2(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} \\
&\quad - \frac{13\sin(c+dx)}{3ad\sqrt{a+a\cos(c+dx)}} + \frac{7\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{6a^2d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 110, normalized size of antiderivative = 0.76

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{\left(33\sqrt{2}\text{arctanh}\left(\sqrt{\sin^2\left(\frac{1}{2}(c+dx)\right)}\right)(1+\cos(c+dx)) + 2\sqrt{1-\cos(c+dx)}(-\right.}{12d\sqrt{1-\cos(c+dx)}(a(1+\cos(c+\right.}$$

```
[In] Integrate[Cos[c + d*x]^3/(a + a*Cos[c + d*x])^(3/2),x]
[Out] ((33*Sqrt[2]*ArcTanh[Sqrt[Sin[(c + d*x)/2]^2]]*(1 + Cos[c + d*x]) + 2*Sqrt[
1 - Cos[c + d*x]]*(-19 - 12*Cos[c + d*x] + 4*Cos[c + d*x]^2))*Sin[c + d*x])
/(12*d*Sqrt[1 - Cos[c + d*x]]*(a*(1 + Cos[c + d*x]))^(3/2))
```

Maple [A] (verified)

Time = 1.26 (sec) , antiderivative size = 234, normalized size of antiderivative = 1.61

method	result
default	$\frac{\sqrt{2}\,\sqrt{a\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\left(16\sqrt{a\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{a}\,\left(\sin^{4}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\sqrt{a\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{a}\,\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-33\ln\left(\frac{4\sqrt{a}\,\sqrt{a\left(\sin^{2}\right.}}{\cos\left(\frac{d}{2}\right.}\right.\right.}{12\cos\left(\frac{dx}{2}+\frac{c}{2}\right)a^{\frac{5}{2}}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^{2}\left(\right.\right.}}$

[In] int(cos(d*x+c)^3/(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)

```
[Out] 1/12*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(16*(a*sin(1/2*d*x+1/2*c)^2)^(1
/2)*a^(1/2)*sin(1/2*d*x+1/2*c)^4+8*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)*s
in(1/2*d*x+1/2*c)^2-33*ln(4*(a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+a)/cos(
1/2*d*x+1/2*c))*sin(1/2*d*x+1/2*c)^2*a-27*a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^
(1/2)+33*ln(4*(a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+a)/cos(1/2*d*x+1/2*c)
)*a)/cos(1/2*d*x+1/2*c)/a^(5/2)/sin(1/2*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)
^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 174, normalized size of antiderivative = 1.20

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{33\sqrt{2}\left(\cos\left(dx+c\right)^{2}+2\,\cos\left(dx+c\right)+1\right)\sqrt{a}\log\left(-\frac{a\cos(dx+c)^{2}-2\sqrt{2}\sqrt{a\cos(dx+c}}{\cos(dx+c)^{2}}\right.}{24\left(a^{2}d\,\mathrm{co}\right.}$$

[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")

```
[Out] 1/24*(33*sqrt(2)*(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(a)*log(-(a*cos(
d*x + c)^2 - 2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*sin(d*x + c) - 2*a*
cos(d*x + c) - 3*a)/(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)) + 4*sqrt(a*cos(d
*x + c) + a)*(4*cos(d*x + c)^2 - 12*cos(d*x + c) - 19)*sin(d*x + c))/(a^2*d
*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3/(a+a*cos(d*x+c))**(3/2),x)
[Out] Timed out
```

Maxima [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] Timed out
```

Giac [A] (verification not implemented)

none

Time = 0.69 (sec) , antiderivative size = 101, normalized size of antiderivative = 0.70

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{\frac{3\sqrt{2}\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)a^{\frac{3}{2}}\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)} - \frac{8\sqrt{2}\left(2\,a^{\frac{9}{2}}\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+3\,a^{\frac{9}{2}}\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}{a^6\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}}{12\,d}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] 1/12*(3*sqrt(2)*sin(1/2*d*x + 1/2*c)/((sin(1/2*d*x + 1/2*c)^2 - 1)*a^(3/2)*
sgn(cos(1/2*d*x + 1/2*c))) - 8*sqrt(2)*(2*a^(9/2)*sin(1/2*d*x + 1/2*c)^3 +
3*a^(9/2)*sin(1/2*d*x + 1/2*c))/(a^6*sgn(cos(1/2*d*x + 1/2*c))))/d
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{{\cos\left(c+d\,x\right)}^3}{{\left(a+a\,\cos\left(c+d\,x\right)\right)}^{3/2}} \,d x$$

```
[In] int(cos(c + d*x)^3/(a + a*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)^3/(a + a*cos(c + d*x))^(3/2), x)
```

3.133 $\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 105

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = -\frac{7\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} + \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{2\sin(c+dx)}{ad\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 1/2*sin(d*x+c)/d/(a+a*cos(d*x+c))^(3/2)-7/4*arctanh(1/2*sin(d*x+c)*a^(1/2)*
2^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(3/2)/d*2^(1/2)+2*sin(d*x+c)/a/d/(a+a*cos
(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2837, 2830, 2728, 212}

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = -\frac{7\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d} + \frac{2\sin(c+dx)}{ad\sqrt{a\cos(c+dx)+a}} + \frac{\sin(c+dx)}{2d(a\cos(c+dx)+a)^{3/2}}$$

```
[In] Int[Cos[c + d*x]^2/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-7*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])])/(2*
Sqrt[2]*a^(3/2)*d) + Sin[c + d*x]/(2*d*(a + a*Cos[c + d*x])^(3/2)) + (2*Sin
[c + d*x])/(a*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rule 2837

```
Int[sin[(e_.) + (f_.)*(x_)]^2*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_),
x_Symbol] :> Simp[b*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(a*f*(2*m + 1))),
x] - Dist[1/(a^2*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(a*m - b*(2*m
 + 1)*Sin[e + f*x]), x], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 - b^2, 0]
&& LtQ[m, -2^(-1)]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}+\frac{\int\frac{-\frac{3a}{2}+2a\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{2a^2}\\
&= \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}+\frac{2\sin(c+dx)}{ad\sqrt{a+a\cos(c+dx)}}-\frac{7\int\frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx}{4a}\\
&= \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}+\frac{2\sin(c+dx)}{ad\sqrt{a+a\cos(c+dx)}}+\frac{7\text{Subst}\left(\int\frac{1}{2a-x^2}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{2ad}\\
&= -\frac{7\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d}+\frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}+\frac{2\sin(c+dx)}{ad\sqrt{a+a\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.95

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{\left(-7\sqrt{2}\text{arctanh}\left(\sqrt{\sin^2\left(\frac{1}{2}(c+dx)\right)}\right)(1+\cos(c+dx))+2\sqrt{1-\cos(c+dx)}\right.}{4d\sqrt{1-\cos(c+dx)}(a(1+\cos(c+dx)))^{3/2}}$$

[In] Integrate[Cos[c + d*x]^2/(a + a*Cos[c + d*x])^(3/2),x]

[Out] ((-7*Sqrt[2]*ArcTanh[Sqrt[Sin[(c + d*x)/2]^2]]*(1 + Cos[c + d*x]) + 2*Sqrt[1 - Cos[c + d*x]]*(5 + 4*Cos[c + d*x]))*Sin[c + d*x])/(4*d*Sqrt[1 - Cos[c + d*x]]*(a*(1 + Cos[c + d*x]))^(3/2))

Maple [A] (verified)

Time = 1.56 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.65

method	result
default	$\frac{\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-7\sqrt{2}\ln\left(\frac{4\sqrt{a}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}+4a}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{2}\sqrt{a}+\sqrt{2}\right.}{4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)a^{\frac{5}{2}}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$

[In] int(cos(d*x+c)^2/(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)

[Out] 1/4/cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-7*2^(1/2)*ln(2*(2*a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+2*a)/cos(1/2*d*x+1/2*c))*a*cos(1/2*d*x+1/2*c)^2+8*cos(1/2*d*x+1/2*c)^2*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*2^(1/2)*a^(1/2)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2))/a^(5/2)/sin(1/2*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 164, normalized size of antiderivative = 1.56

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{7\sqrt{2}\left(\cos(dx+c)^2+2\cos(dx+c)+1\right)\sqrt{a}\log\left(-\frac{a\cos(dx+c)^2+2\sqrt{2}\sqrt{a\cos(dx+c)}}{\cos(dx+c)^2+}\right.}{8\left(a^2d\cos(dx+c)^2\right.}$$

[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")

[Out] 1/8*(7*sqrt(2)*(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(a)*log(-(a*cos(d*x + c)^2 + 2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*sin(d*x + c) - 2*a*cos(d*x + c) - 3*a)/(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)) + 4*sqrt(a*cos(d*x

```
+ c) + a)*(4*cos(d*x + c) + 5)*sin(d*x + c))/(a^2*d*cos(d*x + c)^2 + 2*a^2
*d*cos(d*x + c) + a^2*d)
```

Sympy [F]

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos^2(c+dx)}{(a(\cos(c+dx)+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)**2/(a+a*cos(d*x+c))**(3/2),x)
[Out] Integral(cos(c + d*x)**2/(a*(cos(c + d*x) + 1))**(3/2), x)
```

Maxima [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] Timed out
```

Giac [A] (verification not implemented)

none

Time = 0.46 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.38

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = -\frac{\frac{7\sqrt{2}\log\left(\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{a^{\frac{3}{2}}\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)} - \frac{7\sqrt{2}\log\left(-\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{a^{\frac{3}{2}}\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)} - \frac{16\sqrt{2}\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{a^{\frac{3}{2}}\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)} + \frac{2\sqrt{2}\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\left(\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)a^{\frac{3}{2}}\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}}{8d}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] -1/8*(7*sqrt(2)*log(sin(1/2*d*x + 1/2*c) + 1)/(a^(3/2)*sgn(cos(1/2*d*x + 1/
2*c))) - 7*sqrt(2)*log(-sin(1/2*d*x + 1/2*c) + 1)/(a^(3/2)*sgn(cos(1/2*d*x
+ 1/2*c))) - 16*sqrt(2)*sin(1/2*d*x + 1/2*c)/(a^(3/2)*sgn(cos(1/2*d*x + 1/2
*c))) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)/((sin(1/2*d*x + 1/2*c)^2 - 1)*a^(3/2
)*sgn(cos(1/2*d*x + 1/2*c))))/d
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)^2}{\left(a+a\,\cos\left(c+d\,x\right)\right)^{3/2}}\,dx$$

```
[In] int(cos(c + d*x)^2/(a + a*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)^2/(a + a*cos(c + d*x))^(3/2), x)
```

3.134 $\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 77

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{3\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}$$

```
[Out] -1/2*sin(d*x+c)/d/(a+a*cos(d*x+c))^(3/2)+3/4*arctanh(1/2*sin(d*x+c)*a^(1/2)
*2^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(3/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2829, 2728, 212}

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{3\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\sin(c+dx)}{2d(a\cos(c+dx)+a)^{3/2}}$$

```
[In] Int[Cos[c + d*x]/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (3*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])])/(2*S
qrt[2]*a^(3/2)*d) - Sin[c + d*x]/(2*d*(a + a*Cos[c + d*x])^(3/2))
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2829

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((a + b*Sin[e + f*
x])^m/(a*f*(2*m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(a*b*(2*m + 1)), In
t[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && N
eQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}+\frac{3\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx}{4a}\\
&= -\frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}-\frac{3\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{2ad}\\
&= \frac{3\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d}-\frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 54, normalized size of antiderivative = 0.70

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx=\frac{3\text{arctanh}\left(\sin\left(\frac{1}{2}(c+dx)\right)\right)\cos^3\left(\frac{1}{2}(c+dx)\right)-\frac{1}{2}\sin(c+dx)}{d(a(1+\cos(c+dx)))^{3/2}}$$

```
[In] Integrate[Cos[c + d*x]/(a + a*Cos[c + d*x])^(3/2),x]
[Out] (3*ArcTanh[Sin[(c + d*x)/2]]*Cos[(c + d*x)/2]^3 - Sin[c + d*x]/2)/(d*(a*(1
+ Cos[c + d*x]))^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 139 vs. 2(62) = 124.

Time = 1.28 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.82

method	result	size
default	$\frac{\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(3\sqrt{2}\,\ln\left(\frac{4\sqrt{a}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}+4a}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\sqrt{2}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{a}\right)}{4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)a^{\frac{5}{2}}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$	140

[In] int(cos(d*x+c)/(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)

[Out] 1/4*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(3*2^(1/2)*ln(2*(2*a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+2*a)/cos(1/2*d*x+1/2*c))*a*cos(1/2*d*x+1/2*c)^2-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2))/cos(1/2*d*x+1/2*c)/a^(5/2)/sin(1/2*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 154 vs. 2(62) = 124.

Time = 0.25 (sec) , antiderivative size = 154, normalized size of antiderivative = 2.00

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{3\sqrt{2}\left(\cos(dx+c)^2+2\cos(dx+c)+1\right)\sqrt{a}\log\left(-\frac{a\cos(dx+c)^2-2\sqrt{2}\sqrt{a\cos(dx+c)+a}}{\cos(dx+c)^2+2}\right.}{8\left(a^2d\cos(dx+c)^2+2a^2d\cos\right.}$$

[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")

[Out] 1/8*(3*sqrt(2)*(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(a)*log(-(a*cos(d*x + c)^2 - 2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*sin(d*x + c) - 2*a*cos(d*x + c) - 3*a)/(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)) - 4*sqrt(a*cos(d*x + c) + a)*sin(d*x + c))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)

Sympy [F]

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos(c+dx)}{(a(\cos(c+dx)+1))^{\frac{3}{2}}}\,dx$$

[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))**(3/2),x)

[Out] Integral(cos(c + d*x)/(a*(cos(c + d*x) + 1))**(3/2), x)

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 46532 vs. $2(62) = 124$.

Time = 2.59 (sec) , antiderivative size = 46532, normalized size of antiderivative = 604.31

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 1/16*(3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 4*sqrt(2)*sin(5/2*d*x + 5/2*c))*
cos(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^
2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + (3*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2
 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3*d*x + 3*c)^2 + 27*(sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*sin(d*x + c)^2 - 96*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 60*sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) +
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 10*sqrt(2)*sin(5/2*d*x + 5/2*c) + 16*
```

sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 60*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 6*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 10*sqrt(2)*cos(5/2*d*x + 5/2*c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(3*d*x + 3*c) - 20*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 32*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 9*(3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 - 96

```
*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 60*sqrt(2)*cos(1/2*d*x + 1/2*c
)*sin(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) +
9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1) - 10*sqrt(2)*sin(5/2*d*x + 5/2*c) + 16*sqrt(2)*sin(3/2*d*x + 3/
2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 60*(sqrt(2)*sin(
2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
+ 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(2*
d*x + 2*c) + 6*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 10*sqrt(2)*sin(1/2*d*
x + 1/2*c))*cos(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x
 + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 10*sqrt(2)*cos
(5/2*d*x + 5/2*c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/2*d*
x + 1/2*c))*sin(3*d*x + 3*c) - 20*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(d*x + c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1
/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 32*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(3/2*d*x + 3/2*c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 20*sqrt(2)*sin(
1/2*d*x + 1/2*c))*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c
)))^2 + 9*(3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3*d*x + 3*c)^2 + 27*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqr
```

t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 - 96*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 60*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 10*sqrt(2)*sin(5/2*d*x + 5/2*c) + 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 60*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 6*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 10*sqrt(2)*cos(5/2*d*x + 5/2*c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(3*d*x + 3*c) - 20*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 32*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x

+ 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(2/
5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 3*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1) + 4*sqrt(2)*sin(5/2*d*x + 5/2*c))*sin(3*d*x + 3*c)^2 + 2
7*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*sin(d*x + c)^2 + (3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2
+ 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 -
96*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 60*sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)
+ 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1) - 10*sqrt(2)*sin(5/2*d*x + 5/2*c) + 16*sqrt(2)*sin(3/2*d*x +
3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 60*(sqrt(2)*si
n(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1

```
) + 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(
2*d*x + 2*c) + 6*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 10*sqrt(2)*sin(1/2*
d*x + 1/2*c))*cos(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d
*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 10*sqrt(2)*c
os(5/2*d*x + 5/2*c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/2*
d*x + 1/2*c))*sin(3*d*x + 3*c) - 20*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(d*x + c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos
(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 32*(3*sqrt(2)*cos(d*x + c) + sqrt(2))
*sin(3/2*d*x + 3/2*c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 20*sqrt(2)*si
n(1/2*d*x + 1/2*c))*sin(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2
*c)))^2 + 9*(3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3*d*x + 3*c)^2 + 27*(s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3*d
*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 27*
(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 - 96*sqrt(2)*cos(3/2*d*x +
 3/2*c)*sin(d*x + c) - 60*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(9*
(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
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*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 10*sqrt(2)*sin(5/2*d*x + 5/2*c) + 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 60*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 6*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 10*sqrt(2)*cos(5/2*d*x + 5/2*c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(3*d*x + 3*c) - 20*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 32*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 96*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 9*(3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +

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1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 3
*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*sin(d*x + c)^2 - 96*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 60*sqrt(2)
*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 10*sqrt(2)*sin(5/2*d*x + 5/2*c) + 16*sqrt
(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c
) + 60*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*cos(5/2*d*x + 5/2*
c) + 6*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1) + 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*
d*x + 1/2*c))*cos(2*d*x + 2*c) + 6*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 1
0*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x +
 c) + 10*sqrt(2)*cos(5/2*d*x + 5/2*c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 1
0*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(3*d*x + 3*c) - 20*(3*sqrt(2)*cos(2*d*x
+ 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c) + 6*(9*(sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c
) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 32*(3*sqrt(2)*cos(d
*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c
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)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1) + 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c),
 cos(5/2*d*x + 5/2*c)))^2 - 96*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) -
60*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x +
 c) + 2*(18*sqrt(2)*cos(2*d*x + 2*c) + 18*sqrt(2)*cos(d*x + c) + sqrt(2))*s
in(5/2*d*x + 5/2*c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 16*sqrt(2)*sin(
3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 60*(
sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 6*(
9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1) + 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/
2*c))*cos(2*d*x + 2*c) + 6*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 10*sqrt(2
)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 2*(3*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
) + 2*sqrt(2)*sin(5/2*d*x + 5/2*c))*cos(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sqrt(2)*sin(5/2*d
*x + 5/2*c))*sin(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 - 96*s
qrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 60*sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2

*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 2*(9*sqrt(2)*cos(2*d*x + 2*c) + 9*sqrt(2)*cos(d*x + c) - 2*sqrt(2))*sin(5/2*d*x + 5/2*c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 60*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 6*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*(3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 - 96*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 60*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/

2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 10*sqrt(2)*
sin(5/2*d*x + 5/2*c) + 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2
*d*x + 1/2*c))*cos(3*d*x + 3*c) + 60*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*si
n(d*x + c))*cos(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 16*sqrt(2)*sin(3/2*d*x
+ 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 6*(3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)
+ 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(d*x + c) + 10*sqrt(2)*cos(5/2*d*x + 5/2*c) - 16*sq
rt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(3*d*x + 3
c) - 20(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*si
n(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) -
16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(2*d*
x + 2*c) + 32*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c) + 3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(4/5
*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 3*(3*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2
 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3*d*x + 3*c)^2 + 27*(sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log

(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*sin(d*x + c)^2 - 96*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 60*sqr
t(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) +
3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 10*sqrt(2)*sin(5/2*d*x + 5/2*c) + 16*
sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3*d*x +
 3*c) + 60*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*cos(5/2*d*x +
5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1) + 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(
1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 6*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
 + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d
*x + c) + 10*sqrt(2)*cos(5/2*d*x + 5/2*c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c)
 - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(3*d*x + 3*c) - 20*(3*sqrt(2)*cos(2*
d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c) + 6*(9*
(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) - 16*sqrt(2)*cos(3/2*d*x + 3
/2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 32*(3*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c) + 3*sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1) + 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(2/5*arctan2(sin(5/2*d*x + 5/2
*c), cos(5/2*d*x + 5/2*c))) + 2*(18*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin
(d*x + c))*sin(5/2*d*x + 5/2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2
*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(

1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 10*sqrt(2)
*cos(5/2*d*x + 5/2*c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/
2*d*x + 1/2*c))*sin(3*d*x + 3*c) + 2*(27*sqrt(2)*cos(2*d*x + 2*c)^2 + 27*sq
rt(2)*cos(d*x + c)^2 + 27*sqrt(2)*sin(2*d*x + 2*c)^2 + 54*sqrt(2)*sin(2*d*x
 + 2*c)*sin(d*x + c) + 27*sqrt(2)*sin(d*x + c)^2 + 6*(9*sqrt(2)*cos(d*x + c
) - 2*sqrt(2))*cos(2*d*x + 2*c) - 12*sqrt(2)*cos(d*x + c) - 7*sqrt(2))*sin(
5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) - 16
*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(2*d*x
+ 2*c) + 32*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c) - 16*(s
qrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*s
qrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt
(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) +
 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d
*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c)
 + sqrt(2))*sin(3/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) -
6*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*co
s(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 +
18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*
sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*
c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin
(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x
+ c) + sqrt(2))*sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))
) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*
cos(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 6*(3*(sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1) + 2*sqrt(2)*sin(5/2*d*x + 5/2*c))*cos(3*d*x + 3*c
)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 27*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1) + 2*sqrt(2)*sin(5/2*d*x + 5/2*c))*sin(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c

```
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*sin(d*x + c)^2 - 96*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 60*sqrt(
2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 2*
(9*sqrt(2)*cos(2*d*x + 2*c) + 9*sqrt(2)*cos(d*x + c) - 2*sqrt(2))*sin(5/2*d
*x + 5/2*c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 16*sqrt(2)*sin(3/2*d*x
+ 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 60*(sqrt(2)*
sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 6*(9*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1) + 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*co
s(2*d*x + 2*c) + 6*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 10*sqrt(2)*sin(1/
2*d*x + 1/2*c))*cos(d*x + c) + 3*(3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3
*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 2
7*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*sin(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin
(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 - 96*
sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 60*sqrt(2)*cos(1/2*d*x + 1/2*c)
*sin(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) + 9
*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
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*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1) - 10*sqrt(2)*sin(5/2*d*x + 5/2*c) + 16*sqrt(2)*sin(3/2*d*x + 3/2
*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 60*(sqrt(2)*sin(2
*d*x + 2*c) + sqrt(2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) +
 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(2*d
*x + 2*c) + 6*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 10*sqrt(2)*sin(1/2*d*x
 + 1/2*c))*cos(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x
+ 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 10*sqrt(2)*cos(
5/2*d*x + 5/2*c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/2*d*x
 + 1/2*c))*sin(3*d*x + 3*c) - 20*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*co
s(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*sin(d*x + c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/
2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 32*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*si
n(3/2*d*x + 3/2*c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 20*sqrt(2)*sin(1
/2*d*x + 1/2*c))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)
)) + 2*(18*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(5/2*d*x +
5/2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 10*sqrt(2)*cos(5/2*d*x + 5/2*c) - 1
6*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(3*d*x
 + 3*c) + 2*(27*sqrt(2)*cos(2*d*x + 2*c)^2 + 27*sqrt(2)*cos(d*x + c)^2 + 27
*sqrt(2)*sin(2*d*x + 2*c)^2 + 54*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 27
*sqrt(2)*sin(d*x + c)^2 + 6*(9*sqrt(2)*cos(d*x + c) - 2*sqrt(2))*cos(2*d*x
+ 2*c) - 12*sqrt(2)*cos(d*x + c) - 7*sqrt(2))*sin(5/2*d*x + 5/2*c) + 6*(9*(
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sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 32*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c) - 16*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 6*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 6*(3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sqrt(2)*sin(5/2*d*x + 5/2*c))*cos(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sqrt(2)*sin(5/2*d*x + 5/2*c))*sin(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 - 96*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 60*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x

+ 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 2*(9*sqrt(2)*cos(2*d*x + 2*
c) + 9*sqrt(2)*cos(d*x + c) - 2*sqrt(2))*sin(5/2*d*x + 5/2*c) + 3*sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1) + 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin
(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 60*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2
)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 16*sqrt(2)*sin(3/2*
d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 6*(3*sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x +
c) + 2*(18*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(5/2*d*x +
5/2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 10*sqrt(2)*cos(5/2*d*x + 5/2*c) -
16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(3*d*
x + 3*c) + 2*(27*sqrt(2)*cos(2*d*x + 2*c)^2 + 27*sqrt(2)*cos(d*x + c)^2 + 2
7*sqrt(2)*sin(2*d*x + 2*c)^2 + 54*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 2
7*sqrt(2)*sin(d*x + c)^2 + 6*(9*sqrt(2)*cos(d*x + c) - 2*sqrt(2))*cos(2*d*x
+ 2*c) - 12*sqrt(2)*cos(d*x + c) - 7*sqrt(2))*sin(5/2*d*x + 5/2*c) + 6*(9*
(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) - 16*sqrt(2)*cos(3/2*d*x + 3
/2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 32*(3*sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c) - 6*(sqrt(2)*cos(3*d*x + 3*c)^2
+ 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*
d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*s
in(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*
sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c
) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d
*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(1/5*arcta
n2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 3*sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1) + 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(2/5*arctan2(sin(5/2*d*x +
5/2*c), cos(5/2*d*x + 5/2*c))) + 3*((sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2

)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^
2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c)
 + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2)
)*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*si
n(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(6/5*arctan2(sin(5/2*
d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 9*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*
sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x +
 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*
x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(
2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + s
qrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x +
c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(4/5*arctan2(si
n(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 9*(sqrt(2)*cos(3*d*x + 3*c)^
2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3
*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*
sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3
*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x +
c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(
d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2/5*arct
an2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + (sqrt(2)*cos(3*d*x + 3
*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*s
in(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2
*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c)
 + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*
sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(6/5*
arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 9*(sqrt(2)*cos(3*d
*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d
*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x
+ 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sq
rt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*si
n(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 18*(sqrt(2)*
cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*
sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos
(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*
c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt
(2))*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))*sin(2/5*a
rctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 9*(sqrt(2)*cos(3*d*x
+ 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2
)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x

+ 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 2*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 3*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 3*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 6*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 3*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 6*(sqrt(2)*c

os(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2
 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*s
in(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(
2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sq
rt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c
) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 6*(sqrt(
2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*((sqrt(2)*
cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^
2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*
sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos
(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*s
qrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*
c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt
(2))*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + (sqrt(2
)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c
)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2
)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*c
os(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3
*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x +
2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sq
rt(2))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))))*sin(6/
5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 6*sqrt(2)*cos(d*x
+ c) + sqrt(2))*log(cos(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2
*c)))^2 + sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 +
2*sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 1) - 3*((s
qrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*s
qrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt
(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) +
 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d
*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c)
 + sqrt(2))*cos(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2
+ 9*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*
cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2
+ 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(
3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x +
3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*s
in(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*
x + c) + sqrt(2))*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c
)))^2 + 9*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sq
rt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2
*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2
 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*
d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqr

t(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x +
5/2*c)))^2 + (sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 +
9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x
+ 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x +
c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*co
s(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*
(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt
(2)*cos(d*x + c) + sqrt(2))*sin(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d
*x + 5/2*c)))^2 + 9*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c
)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin
(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(
d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c
) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) +
6*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos
(5/2*d*x + 5/2*c)))^2 + 18*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*
x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt
(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(
2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c)
+ sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*
x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x +
3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(4/5*arctan2(sin(5/2*d*x + 5/2*
c), cos(5/2*d*x + 5/2*c)))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*
x + 5/2*c))) + 9*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2
+ 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*
d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x
+ c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))
*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) +
6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*s
qrt(2)*cos(d*x + c) + sqrt(2))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/
2*d*x + 5/2*c)))^2 + sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c
)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin
(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(
d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c
) + 2*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^
2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2
*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x
+ 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 3*(sqrt(2)
*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)
*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*co
s(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*

sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 3*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 6*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 3*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 6*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*((sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + (sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c

) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))))*sin(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*log(cos(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 - 2*sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 1) + 2*(36*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(5/2*d*x + 5/2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 10*sqrt(2)*cos(5/2*d*x + 5/2*c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(3*d*x + 3*c) + 4*(27*sqrt(2)*cos(2*d*x + 2*c)^2 + 27*sqrt(2)*cos(d*x + c)^2 + 27*sqrt(2)*sin(2*d*x + 2*c)^2 + 54*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 27*sqrt(2)*sin(d*x + c)^2 + 3*(18*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) - 2*sqrt(2))*sin(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 32*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c) - 2*(6*sqrt(2)*cos(3*d*x + 3*c)^2*cos(5/2*d*x + 5/2*c) + 6*sqrt(2)*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c)^2 + 12*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c)*cos(5/2*d*x + 5/2*c) + 36*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) + 6*(9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c) - 16*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 6*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos

(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 3*(3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*cos(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x +
c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3*d*x + 3*c)^2 + 27*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*sin(d*x + c)^2 - 96*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 60
*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c
) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 10*sqrt(2)*sin(5/2*d*x + 5/2*c) +
 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3*d
*x + 3*c) + 60*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*cos(5/2*d*
x + 5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1) + 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*
sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 6*(3*sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 2*(9*(sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(d*x + c) + 10*sqrt(2)*cos(5/2*d*x + 5/2*c) - 16*sqrt(2)*cos(3/2*d*x + 3/

2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(3*d*x + 3*c) - 20*(3*sqrt(2)*co
s(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c) + 6
(9(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) - 16*sqrt(2)*cos(3/2*d*x
 + 3/2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 32*(3*sqrt(
2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c) + 3*sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1) + 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(4/5*arctan2(sin(5/2*d*x +
 5/2*c), cos(5/2*d*x + 5/2*c))) - 3*(3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2
+ 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 -
96*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 60*sqrt(2)*cos(1/2*d*x + 1/2
*c)*sin(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)
+ 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*s
qrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1) - 10*sqrt(2)*sin(5/2*d*x + 5/2*c) + 16*sqrt(2)*sin(3/2*d*x +
3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 60*(sqrt(2)*si
n(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
) + 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(

2*d*x + 2*c) + 6*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 10*sqrt(2)*sin(1/2*
d*x + 1/2*c))*cos(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d
*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 10*sqrt(2)*c
os(5/2*d*x + 5/2*c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/2*
d*x + 1/2*c))*sin(3*d*x + 3*c) - 20*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)
*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*sin(d*x + c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos
(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 32*(3*sqrt(2)*cos(d*x + c) + sqrt(2))
*sin(3/2*d*x + 3/2*c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 20*sqrt(2)*si
n(1/2*d*x + 1/2*c))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2
*c))))*sin(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 6*(6*
sqrt(2)*cos(3*d*x + 3*c)^2*cos(5/2*d*x + 5/2*c) + 6*sqrt(2)*cos(5/2*d*x + 5
/2*c)*sin(3*d*x + 3*c)^2 + 12*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d
*x + c) + sqrt(2))*cos(3*d*x + 3*c)*cos(5/2*d*x + 5/2*c) + 36*(sqrt(2)*sin(
2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c)
+ 6*(9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + 9*sqrt(2)*si
n(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin
(d*x + c)^2 + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*sqr
t(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2*c) - 16*(sqrt(2)*cos(3*d*x +
3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x +
2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*
c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2
)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/
5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 6*(sqrt(2)*cos(3*d
*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqr
t(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d
*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x
+ 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*
cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sq
rt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*co
s(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 3*(3*(sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si

n(1/2*d*x + 1/2*c) + 1))*cos(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 - 96*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 60*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 10*sqrt(2)*sin(5/2*d*x + 5/2*c) + 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 60*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 16*sqrt(2)*sin(3/2*d*x + 3/2*c) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 6*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 10*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 2*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 10*sqrt(2)*cos(5/2*d*x + 5/2*c) - 16*sqrt(2)*cos(3/2*d*x + 3/2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(3*d*x + 3*c) - 20*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1

/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) - 16*sqrt(2)*cos(3/2*d*
x + 3/2*c) - 10*sqrt(2)*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 32*(3*sqrt
(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c) + 3*sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqr
t(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1) + 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(2/5*arctan2(sin(5/2*d*x
+ 5/2*c), cos(5/2*d*x + 5/2*c))))*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos
(5/2*d*x + 5/2*c))) - 32*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x
+ 2*c)^2 + 9*sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2
)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)
*sin(d*x + c)^2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) +
sqrt(2))*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x
+ 2*c) + 3*(sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x +
2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^
2 + 2*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3
*d*x + 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sq
rt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)
*cos(d*x + c) + sqrt(2))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x
+ 5/2*c))) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x
+ 3*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/5*arctan2(sin(5/2*d*x + 5/
2*c), cos(5/2*d*x + 5/2*c))) - 36*(sqrt(2)*cos(3*d*x + 3*c)^2*cos(5/2*d*x +
5/2*c) + sqrt(2)*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c)^2 + 2*(3*sqrt(2)*co
s(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c)*cos(5/2
*d*x + 5/2*c) + 6*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*cos(5/2
*d*x + 5/2*c)*sin(3*d*x + 3*c) + (9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*
cos(d*x + c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*sin(2*d*x + 2*c)
*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 6*(3*sqrt(2)*cos(d*x + c) + sqrt
(2))*cos(2*d*x + 2*c) + 6*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(5/2*d*x + 5/2
*c) - (sqrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2
)*cos(d*x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^
2 + 18*sqrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2
*(3*sqrt(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x
+ 3*c) + 6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)
*sin(2*d*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(
d*x + c) + sqrt(2))*cos(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2
*c))))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 12*(s
qrt(2)*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*cos(d*
x + c)^2 + sqrt(2)*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*sin(2*d*x + 2*c)^2 + 18*s
qrt(2)*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*sin(d*x + c)^2 + 2*(3*sqrt
(2)*cos(2*d*x + 2*c) + 3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3*d*x + 3*c) +
6*(3*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(2*d*x + 2*c) + 6*(sqrt(2)*sin(2*d
*x + 2*c) + sqrt(2)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*sqrt(2)*cos(d*x + c)
+ sqrt(2))*sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) +

3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*sqrt
(a)/((a^2*cos(3*d*x + 3*c)^2 + 9*a^2*cos(2*d*x + 2*c)^2 + 9*a^2*cos(d*x + c
)^2 + a^2*sin(3*d*x + 3*c)^2 + 9*a^2*sin(2*d*x + 2*c)^2 + 18*a^2*sin(2*d*x
+ 2*c)*sin(d*x + c) + 9*a^2*sin(d*x + c)^2 + 6*a^2*cos(d*x + c) + (a^2*cos(
3*d*x + 3*c)^2 + 9*a^2*cos(2*d*x + 2*c)^2 + 9*a^2*cos(d*x + c)^2 + a^2*sin(
3*d*x + 3*c)^2 + 9*a^2*sin(2*d*x + 2*c)^2 + 18*a^2*sin(2*d*x + 2*c)*sin(d*x
 + c) + 9*a^2*sin(d*x + c)^2 + 6*a^2*cos(d*x + c) + a^2 + 2*(3*a^2*cos(2*d*
x + 2*c) + 3*a^2*cos(d*x + c) + a^2)*cos(3*d*x + 3*c) + 6*(3*a^2*cos(d*x +
c) + a^2)*cos(2*d*x + 2*c) + 6*(a^2*sin(2*d*x + 2*c) + a^2*sin(d*x + c))*si
n(3*d*x + 3*c))*cos(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))
)^2 + 9*(a^2*cos(3*d*x + 3*c)^2 + 9*a^2*cos(2*d*x + 2*c)^2 + 9*a^2*cos(d*x
+ c)^2 + a^2*sin(3*d*x + 3*c)^2 + 9*a^2*sin(2*d*x + 2*c)^2 + 18*a^2*sin(2*d
*x + 2*c)*sin(d*x + c) + 9*a^2*sin(d*x + c)^2 + 6*a^2*cos(d*x + c) + a^2 +
2*(3*a^2*cos(2*d*x + 2*c) + 3*a^2*cos(d*x + c) + a^2)*cos(3*d*x + 3*c) + 6*
(3*a^2*cos(d*x + c) + a^2)*cos(2*d*x + 2*c) + 6*(a^2*sin(2*d*x + 2*c) + a^2
*sin(d*x + c))*sin(3*d*x + 3*c))*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(
5/2*d*x + 5/2*c)))^2 + 9*(a^2*cos(3*d*x + 3*c)^2 + 9*a^2*cos(2*d*x + 2*c)^2
 + 9*a^2*cos(d*x + c)^2 + a^2*sin(3*d*x + 3*c)^2 + 9*a^2*sin(2*d*x + 2*c)^2
 + 18*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 9*a^2*sin(d*x + c)^2 + 6*a^2*cos(
d*x + c) + a^2 + 2*(3*a^2*cos(2*d*x + 2*c) + 3*a^2*cos(d*x + c) + a^2)*cos(
3*d*x + 3*c) + 6*(3*a^2*cos(d*x + c) + a^2)*cos(2*d*x + 2*c) + 6*(a^2*sin(2
*d*x + 2*c) + a^2*sin(d*x + c))*sin(3*d*x + 3*c))*cos(2/5*arctan2(sin(5/2*d
*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + (a^2*cos(3*d*x + 3*c)^2 + 9*a^2*cos
(2*d*x + 2*c)^2 + 9*a^2*cos(d*x + c)^2 + a^2*sin(3*d*x + 3*c)^2 + 9*a^2*sin
(2*d*x + 2*c)^2 + 18*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 9*a^2*sin(d*x + c)
^2 + 6*a^2*cos(d*x + c) + a^2 + 2*(3*a^2*cos(2*d*x + 2*c) + 3*a^2*cos(d*x +
 c) + a^2)*cos(3*d*x + 3*c) + 6*(3*a^2*cos(d*x + c) + a^2)*cos(2*d*x + 2*c)
 + 6*(a^2*sin(2*d*x + 2*c) + a^2*sin(d*x + c))*sin(3*d*x + 3*c))*sin(6/5*ar
ctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 9*(a^2*cos(3*d*x + 3
*c)^2 + 9*a^2*cos(2*d*x + 2*c)^2 + 9*a^2*cos(d*x + c)^2 + a^2*sin(3*d*x + 3
*c)^2 + 9*a^2*sin(2*d*x + 2*c)^2 + 18*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 9
*a^2*sin(d*x + c)^2 + 6*a^2*cos(d*x + c) + a^2 + 2*(3*a^2*cos(2*d*x + 2*c)
+ 3*a^2*cos(d*x + c) + a^2)*cos(3*d*x + 3*c) + 6*(3*a^2*cos(d*x + c) + a^2)
*cos(2*d*x + 2*c) + 6*(a^2*sin(2*d*x + 2*c) + a^2*sin(d*x + c))*sin(3*d*x +
 3*c))*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 18*
(a^2*cos(3*d*x + 3*c)^2 + 9*a^2*cos(2*d*x + 2*c)^2 + 9*a^2*cos(d*x + c)^2 +
 a^2*sin(3*d*x + 3*c)^2 + 9*a^2*sin(2*d*x + 2*c)^2 + 18*a^2*sin(2*d*x + 2*c
)*sin(d*x + c) + 9*a^2*sin(d*x + c)^2 + 6*a^2*cos(d*x + c) + a^2 + 2*(3*a^2
*cos(2*d*x + 2*c) + 3*a^2*cos(d*x + c) + a^2)*cos(3*d*x + 3*c) + 6*(3*a^2*c
os(d*x + c) + a^2)*cos(2*d*x + 2*c) + 6*(a^2*sin(2*d*x + 2*c) + a^2*sin(d*x
 + c))*sin(3*d*x + 3*c))*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x
+ 5/2*c)))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 9
*(a^2*cos(3*d*x + 3*c)^2 + 9*a^2*cos(2*d*x + 2*c)^2 + 9*a^2*cos(d*x + c)^2

+ a^2*sin(3*d*x + 3*c)^2 + 9*a^2*sin(2*d*x + 2*c)^2 + 18*a^2*sin(2*d*x + 2*
c)*sin(d*x + c) + 9*a^2*sin(d*x + c)^2 + 6*a^2*cos(d*x + c) + a^2 + 2*(3*a^
2*cos(2*d*x + 2*c) + 3*a^2*cos(d*x + c) + a^2)*cos(3*d*x + 3*c) + 6*(3*a^2*
cos(d*x + c) + a^2)*cos(2*d*x + 2*c) + 6*(a^2*sin(2*d*x + 2*c) + a^2*sin(d*
x + c))*sin(3*d*x + 3*c))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x
 + 5/2*c)))^2 + a^2 + 2*(3*a^2*cos(2*d*x + 2*c) + 3*a^2*cos(d*x + c) + a^2)
*cos(3*d*x + 3*c) + 6*(3*a^2*cos(d*x + c) + a^2)*cos(2*d*x + 2*c) + 2*(a^2*
cos(3*d*x + 3*c)^2 + 9*a^2*cos(2*d*x + 2*c)^2 + 9*a^2*cos(d*x + c)^2 + a^2*
sin(3*d*x + 3*c)^2 + 9*a^2*sin(2*d*x + 2*c)^2 + 18*a^2*sin(2*d*x + 2*c)*sin
(d*x + c) + 9*a^2*sin(d*x + c)^2 + 6*a^2*cos(d*x + c) + a^2 + 2*(3*a^2*cos(
2*d*x + 2*c) + 3*a^2*cos(d*x + c) + a^2)*cos(3*d*x + 3*c) + 6*(3*a^2*cos(d*
x + c) + a^2)*cos(2*d*x + 2*c) + 3*(a^2*cos(3*d*x + 3*c)^2 + 9*a^2*cos(2*d*
x + 2*c)^2 + 9*a^2*cos(d*x + c)^2 + a^2*sin(3*d*x + 3*c)^2 + 9*a^2*sin(2*d*
x + 2*c)^2 + 18*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 9*a^2*sin(d*x + c)^2 +
6*a^2*cos(d*x + c) + a^2 + 2*(3*a^2*cos(2*d*x + 2*c) + 3*a^2*cos(d*x + c) +
 a^2)*cos(3*d*x + 3*c) + 6*(3*a^2*cos(d*x + c) + a^2)*cos(2*d*x + 2*c) + 6*
(a^2*sin(2*d*x + 2*c) + a^2*sin(d*x + c))*sin(3*d*x + 3*c))*cos(4/5*arctan2
(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 3*(a^2*cos(3*d*x + 3*c)^2 +
 9*a^2*cos(2*d*x + 2*c)^2 + 9*a^2*cos(d*x + c)^2 + a^2*sin(3*d*x + 3*c)^2 +
 9*a^2*sin(2*d*x + 2*c)^2 + 18*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 9*a^2*si
n(d*x + c)^2 + 6*a^2*cos(d*x + c) + a^2 + 2*(3*a^2*cos(2*d*x + 2*c) + 3*a^2
*cos(d*x + c) + a^2)*cos(3*d*x + 3*c) + 6*(3*a^2*cos(d*x + c) + a^2)*cos(2*
d*x + 2*c) + 6*(a^2*sin(2*d*x + 2*c) + a^2*sin(d*x + c))*sin(3*d*x + 3*c))*
cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 6*(a^2*sin(2
*d*x + 2*c) + a^2*sin(d*x + c))*sin(3*d*x + 3*c))*cos(6/5*arctan2(sin(5/2*d
*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 6*(a^2*cos(3*d*x + 3*c)^2 + 9*a^2*cos
(2*d*x + 2*c)^2 + 9*a^2*cos(d*x + c)^2 + a^2*sin(3*d*x + 3*c)^2 + 9*a^2*sin
(2*d*x + 2*c)^2 + 18*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 9*a^2*sin(d*x + c)
^2 + 6*a^2*cos(d*x + c) + a^2 + 2*(3*a^2*cos(2*d*x + 2*c) + 3*a^2*cos(d*x +
 c) + a^2)*cos(3*d*x + 3*c) + 6*(3*a^2*cos(d*x + c) + a^2)*cos(2*d*x + 2*c)
 + 3*(a^2*cos(3*d*x + 3*c)^2 + 9*a^2*cos(2*d*x + 2*c)^2 + 9*a^2*cos(d*x + c
)^2 + a^2*sin(3*d*x + 3*c)^2 + 9*a^2*sin(2*d*x + 2*c)^2 + 18*a^2*sin(2*d*x
+ 2*c)*sin(d*x + c) + 9*a^2*sin(d*x + c)^2 + 6*a^2*cos(d*x + c) + a^2 + 2*(
3*a^2*cos(2*d*x + 2*c) + 3*a^2*cos(d*x + c) + a^2)*cos(3*d*x + 3*c) + 6*(3*
a^2*cos(d*x + c) + a^2)*cos(2*d*x + 2*c) + 6*(a^2*sin(2*d*x + 2*c) + a^2*si
n(d*x + c))*sin(3*d*x + 3*c))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2
*d*x + 5/2*c))) + 6*(a^2*sin(2*d*x + 2*c) + a^2*sin(d*x + c))*sin(3*d*x + 3
*c))*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 6*(a^2*
cos(3*d*x + 3*c)^2 + 9*a^2*cos(2*d*x + 2*c)^2 + 9*a^2*cos(d*x + c)^2 + a^2*
sin(3*d*x + 3*c)^2 + 9*a^2*sin(2*d*x + 2*c)^2 + 18*a^2*sin(2*d*x + 2*c)*sin
(d*x + c) + 9*a^2*sin(d*x + c)^2 + 6*a^2*cos(d*x + c) + a^2 + 2*(3*a^2*cos(
2*d*x + 2*c) + 3*a^2*cos(d*x + c) + a^2)*cos(3*d*x + 3*c) + 6*(3*a^2*cos(d*
x + c) + a^2)*cos(2*d*x + 2*c) + 6*(a^2*sin(2*d*x + 2*c) + a^2*sin(d*x + c)
)*sin(3*d*x + 3*c))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2
c))) + 6(a^2*sin(2*d*x + 2*c) + a^2*sin(d*x + c))*sin(3*d*x + 3*c) + 6*((

```
a^2*cos(3*d*x + 3*c)^2 + 9*a^2*cos(2*d*x + 2*c)^2 + 9*a^2*cos(d*x + c)^2 +
a^2*sin(3*d*x + 3*c)^2 + 9*a^2*sin(2*d*x + 2*c)^2 + 18*a^2*sin(2*d*x + 2*c)
*sin(d*x + c) + 9*a^2*sin(d*x + c)^2 + 6*a^2*cos(d*x + c) + a^2 + 2*(3*a^2*
cos(2*d*x + 2*c) + 3*a^2*cos(d*x + c) + a^2)*cos(3*d*x + 3*c) + 6*(3*a^2*co
s(d*x + c) + a^2)*cos(2*d*x + 2*c) + 6*(a^2*sin(2*d*x + 2*c) + a^2*sin(d*x
+ c))*sin(3*d*x + 3*c))*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x +
 5/2*c))) + (a^2*cos(3*d*x + 3*c)^2 + 9*a^2*cos(2*d*x + 2*c)^2 + 9*a^2*cos(
d*x + c)^2 + a^2*sin(3*d*x + 3*c)^2 + 9*a^2*sin(2*d*x + 2*c)^2 + 18*a^2*sin
(2*d*x + 2*c)*sin(d*x + c) + 9*a^2*sin(d*x + c)^2 + 6*a^2*cos(d*x + c) + a^
2 + 2*(3*a^2*cos(2*d*x + 2*c) + 3*a^2*cos(d*x + c) + a^2)*cos(3*d*x + 3*c)
+ 6*(3*a^2*cos(d*x + c) + a^2)*cos(2*d*x + 2*c) + 6*(a^2*sin(2*d*x + 2*c) +
 a^2*sin(d*x + c))*sin(3*d*x + 3*c))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c),
cos(5/2*d*x + 5/2*c))))*sin(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x +
 5/2*c))))*d)
```

Giac [A] (verification not implemented)

none

Time = 0.38 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.51

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{\frac{3\sqrt{2}\log\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^{\frac{3}{2}}\,\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)} - \frac{3\sqrt{2}\log\left(-\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^{\frac{3}{2}}\,\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)} + \frac{2\sqrt{2}\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{2}-1\right)a^{\frac{3}{2}}\,\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx\right.\right.}}{8\,d}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] 1/8*(3*sqrt(2)*log(sin(1/2*d*x + 1/2*c) + 1)/(a^(3/2)*sgn(cos(1/2*d*x + 1/2
*c))) - 3*sqrt(2)*log(-sin(1/2*d*x + 1/2*c) + 1)/(a^(3/2)*sgn(cos(1/2*d*x +
 1/2*c))) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)/((sin(1/2*d*x + 1/2*c)^2 - 1)*a^
(3/2)*sgn(cos(1/2*d*x + 1/2*c))))/d
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)}{{\left(a+a\,\cos\left(c+d\,x\right)\right)}^{3/2}} \,d x$$

```
[In] int(cos(c + d*x)/(a + a*cos(c + d*x))^(3/2),x)
```

```
[Out] int(cos(c + d*x)/(a + a*cos(c + d*x))^(3/2), x)
```

3.135 $\int \frac{1}{(a+a\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 77

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}}\,dx=\frac{\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d}+\frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}$$

```
[Out] 1/2*sin(d*x+c)/d/(a+a*cos(d*x+c))^(3/2)+1/4*arctanh(1/2*sin(d*x+c)*a^(1/2)*
2^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(3/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {2729, 2728, 212}

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}}\,dx=\frac{\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d}+\frac{\sin(c+dx)}{2d(a\cos(c+dx)+a)^{3/2}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(-3/2),x]
```

```
[Out] ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])]/(2*Sqrt[
2]*a^(3/2)*d) + Sin[c + d*x]/(2*d*(a + a*Cos[c + d*x])^(3/2))
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2729

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[c
+ d*x]*((a + b*Sin[c + d*x])^n/(a*d*(2*n + 1))), x] + Dist[(n + 1)/(a*(2*n
+ 1)), Int[(a + b*Sin[c + d*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d}, x] &
& EqQ[a^2 - b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx}{4a} \\
&= \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} - \frac{\operatorname{Subst}\left(\int \frac{1}{2a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{2ad} \\
&= \frac{\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} + \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.82

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{\cos^2\left(\frac{1}{2}(c+dx)\right)\left(\operatorname{arctanh}\left(\sin\left(\frac{1}{2}(c+dx)\right)\right)\cos\left(\frac{1}{2}(c+dx)\right)+\tan\left(\frac{1}{2}(c+dx\right.\right.}{d(a(1+\cos(c+dx)))^{3/2}}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(-3/2),x]
[Out] (Cos[(c + d*x)/2]^2*(ArcTanh[Sin[(c + d*x)/2]]*Cos[(c + d*x)/2] + Tan[(c +
d*x)/2]))/(d*(a*(1 + Cos[c + d*x]))^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 137 vs. 2(62) = 124.

Time = 1.10 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.79

method	result	size
default	$\frac{\sqrt{a\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\sqrt{2}\,\ln\left(\frac{4\sqrt{a}\,\sqrt{a\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}+4a}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)a\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{2}\,\sqrt{a\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{a}\right)}{4a^{\frac{5}{2}}\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$	138

```
[In] int(1/(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/a^(5/2)/cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2^(1/2)*ln(2
*(2*a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+2*a)/cos(1/2*d*x+1/2*c))*a*cos(1
/2*d*x+1/2*c)^2+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2))/sin(1/2*d*x
+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 153 vs. 2(62) = 124.

Time = 0.25 (sec) , antiderivative size = 153, normalized size of antiderivative = 1.99

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{\sqrt{2}\left(\cos\left(dx+c\right)^{2}+2\,\cos\left(dx+c\right)+1\right)\sqrt{a}\log\left(-\frac{a\cos(dx+c)^{2}-2\,\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cdots}}{\cos(dx+c)^{2}+2\,\cos\cdots}\right.}{8\left(a^{2}d\cos\left(dx+c\right)^{2}+2\,a^{2}d\cos\left(\cdots\right.\right.}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/8*(sqrt(2)*(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(a)*log(-(a*cos(d*x
+ c)^2 - 2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*sin(d*x + c) - 2*a*cos(
d*x + c) - 3*a)/(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)) + 4*sqrt(a*cos(d*x +
 c) + a)*sin(d*x + c))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d
)
```

Sympy [F]

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{\left(a\cos\left(c+dx\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))**(3/2),x)
```

```
[Out] Integral((a*cos(c + d*x) + a)**(-3/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 15721 vs. 2(62) = 124.

Time = 1.14 (sec) , antiderivative size = 15721, normalized size of antiderivative = 204.17

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}}\,dx = \text{Too large to display}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 1/4*(32*(cos(3/2*d*x + 3/2*c)*sin(2*d*x + 2*c) + cos(2*d*x + 2*c)*sin(3/2*d
*x + 3/2*c) + cos(d*x + c)*sin(3/2*d*x + 3/2*c) + cos(3/2*d*x + 3/2*c)*sin(
d*x + c))*cos(3*d*x + 3*c)^2 + 96*(cos(3/2*d*x + 3/2*c)*sin(3*d*x + 3*c) +
3*cos(3/2*d*x + 3/2*c)*sin(2*d*x + 2*c) - (3*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c) - cos(3*d*x + 3*c)*sin(3/2*d*x + 3/2*c) - 3*cos(2*d*x + 2*c)*sin(3
/2*d*x + 3/2*c) + 3*cos(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(4/3*arctan2(sin(
3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 96*(cos(3/2*d*x + 3/2*c)*sin(3
*d*x + 3*c) + 3*cos(3/2*d*x + 3/2*c)*sin(2*d*x + 2*c) - (3*cos(d*x + c) + 1
)*sin(3/2*d*x + 3/2*c) - cos(3*d*x + 3*c)*sin(3/2*d*x + 3/2*c) - 3*cos(2*d*
x + 2*c)*sin(3/2*d*x + 3/2*c) + 3*cos(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(2/
3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - 32*(cos(3/2*d*x
+ 3/2*c)*sin(2*d*x + 2*c) + cos(2*d*x + 2*c)*sin(3/2*d*x + 3/2*c) + cos(d*x
 + c)*sin(3/2*d*x + 3/2*c) + cos(3/2*d*x + 3/2*c)*sin(d*x + c))*sin(3*d*x +
 3*c)^2 + 32*(6*cos(d*x + c) + 1)*cos(2*d*x + 2*c)*sin(3/2*d*x + 3/2*c) + 9
6*cos(2*d*x + 2*c)^2*sin(3/2*d*x + 3/2*c) + 96*sin(2*d*x + 2*c)^2*sin(3/2*d
*x + 3/2*c) + 96*(cos(3/2*d*x + 3/2*c)*sin(3*d*x + 3*c) + 3*cos(3/2*d*x + 3
/2*c)*sin(2*d*x + 2*c) - (3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - cos(3*
d*x + 3*c)*sin(3/2*d*x + 3/2*c) - 3*cos(2*d*x + 2*c)*sin(3/2*d*x + 3/2*c) +
 3*cos(3/2*d*x + 3/2*c)*sin(d*x + c))*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c),
 cos(3/2*d*x + 3/2*c)))^2 + 96*(cos(3/2*d*x + 3/2*c)*sin(3*d*x + 3*c) + 3*c
os(3/2*d*x + 3/2*c)*sin(2*d*x + 2*c) - (3*cos(d*x + c) + 1)*sin(3/2*d*x + 3
/2*c) - cos(3*d*x + 3*c)*sin(3/2*d*x + 3/2*c) - 3*cos(2*d*x + 2*c)*sin(3/2*
d*x + 3/2*c) + 3*cos(3/2*d*x + 3/2*c)*sin(d*x + c))*sin(2/3*arctan2(sin(3/2
*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 32*(2*(3*cos(d*x + c) + 1)*cos(2*
d*x + 2*c)*sin(3/2*d*x + 3/2*c) + 3*cos(2*d*x + 2*c)^2*sin(3/2*d*x + 3/2*c)
 + 3*sin(2*d*x + 2*c)^2*sin(3/2*d*x + 3/2*c) + 2*(3*sin(3/2*d*x + 3/2*c)*si
n(d*x + c) + cos(3/2*d*x + 3/2*c))*sin(2*d*x + 2*c) + (3*cos(d*x + c)^2 + 3
*sin(d*x + c)^2 + 2*cos(d*x + c))*sin(3/2*d*x + 3/2*c) + 2*cos(3/2*d*x + 3/
2*c)*sin(d*x + c))*cos(3*d*x + 3*c) - 4*(6*(sin(2*d*x + 2*c) + sin(d*x + c)
)*sin(3*d*x + 3*c)^2 + sin(3*d*x + 3*c)^3 + (2*(3*cos(2*d*x + 2*c) + 3*cos(
d*x + c) + 1)*cos(3*d*x + 3*c) + cos(3*d*x + 3*c)^2 + 6*(3*cos(d*x + c) + 1
)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 9*sin(2*d*x
+ 2*c)^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x
+ c) + 1)*sin(3*d*x + 3*c) + 3*(2*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)
*cos(3*d*x + 3*c) + cos(3*d*x + 3*c)^2 + 6*(3*cos(d*x + c) + 1)*cos(2*d*x +
```

2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 6*(sin(2*d*x + 2*c) + sin
(d*x + c))*sin(3*d*x + 3*c) + sin(3*d*x + 3*c)^2 + 9*sin(2*d*x + 2*c)^2 + 1
8*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x + c) + 1)*si
n(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 3*(2*(3*cos(2*
d*x + 2*c) + 3*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + cos(3*d*x + 3*c)^2 + 6*
(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x +
c)^2 + 6*(sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + sin(3*d*x + 3
*c)^2 + 9*sin(2*d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x
 + c)^2 + 6*cos(d*x + c) + 1)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2
*d*x + 3/2*c))))*cos(5/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)
)) - 4*(8*cos(3*d*x + 3*c)^2*sin(3/2*d*x + 3/2*c) - 72*cos(2*d*x + 2*c)^2*s
in(3/2*d*x + 3/2*c) - 144*cos(2*d*x + 2*c)*cos(d*x + c)*sin(3/2*d*x + 3/2*c
) - 8*sin(3*d*x + 3*c)^2*sin(3/2*d*x + 3/2*c) - 72*sin(2*d*x + 2*c)^2*sin(3
/2*d*x + 3/2*c) - 16*(3*cos(3/2*d*x + 3/2*c)*sin(2*d*x + 2*c) + 3*cos(3/2*d
*x + 3/2*c)*sin(d*x + c) - sin(3/2*d*x + 3/2*c))*cos(3*d*x + 3*c) - 48*(cos
(3/2*d*x + 3/2*c)*sin(3*d*x + 3*c) + 3*cos(3/2*d*x + 3/2*c)*sin(2*d*x + 2*c
) - (3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - cos(3*d*x + 3*c)*sin(3/2*d*
x + 3/2*c) - 3*cos(2*d*x + 2*c)*sin(3/2*d*x + 3/2*c) + 3*cos(3/2*d*x + 3/2*
c)*sin(d*x + c))*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)
)) - 16*(cos(3*d*x + 3*c)*cos(3/2*d*x + 3/2*c) + 3*sin(2*d*x + 2*c)*sin(3/2
*d*x + 3/2*c) + 3*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c))
*sin(3*d*x + 3*c) - 48*(3*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x +
 3/2*c))*sin(2*d*x + 2*c) - 8*(9*cos(d*x + c)^2 + 9*sin(d*x + c)^2 - 1)*sin
(3/2*d*x + 3/2*c) - 48*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 3*(2*(3*cos(2*d*
x + 2*c) + 3*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + cos(3*d*x + 3*c)^2 + 6*(3
*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)
^2 + 6*(sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + sin(3*d*x + 3*c
)^2 + 9*sin(2*d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x +
 c)^2 + 6*cos(d*x + c) + 1)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d
*x + 3/2*c))))*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))
 - 4*(8*cos(3*d*x + 3*c)^2*sin(3/2*d*x + 3/2*c) - 72*cos(2*d*x + 2*c)^2*sin
(3/2*d*x + 3/2*c) - 144*cos(2*d*x + 2*c)*cos(d*x + c)*sin(3/2*d*x + 3/2*c)
- 8*sin(3*d*x + 3*c)^2*sin(3/2*d*x + 3/2*c) - 72*sin(2*d*x + 2*c)^2*sin(3/2
*d*x + 3/2*c) - 16*(3*cos(3/2*d*x + 3/2*c)*sin(2*d*x + 2*c) + 3*cos(3/2*d*x
 + 3/2*c)*sin(d*x + c) - sin(3/2*d*x + 3/2*c))*cos(3*d*x + 3*c) - 16*(cos(3
*d*x + 3*c)*cos(3/2*d*x + 3/2*c) + 3*sin(2*d*x + 2*c)*sin(3/2*d*x + 3/2*c)
+ 3*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c))*sin(3*d*x + 3
c) - 48(3*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c))*sin(2
*d*x + 2*c) - 8*(9*cos(d*x + c)^2 + 9*sin(d*x + c)^2 - 1)*sin(3/2*d*x + 3/2
*c) - 48*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 3*(2*(3*cos(2*d*x + 2*c) + 3*c
os(d*x + c) + 1)*cos(3*d*x + 3*c) + cos(3*d*x + 3*c)^2 + 6*(3*cos(d*x + c)
+ 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 6*(sin(2*
d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + sin(3*d*x + 3*c)^2 + 9*sin(2*
d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(
d*x + c) + 1)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))

```
*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 4*(6*(sin(2
*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c)^2 + sin(3*d*x + 3*c)^3 + (2*(3
*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + cos(3*d*x + 3*c)
^2 + 6*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos
(d*x + c)^2 + 9*sin(2*d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*s
in(d*x + c)^2 + 6*cos(d*x + c) + 1)*sin(3*d*x + 3*c))*cos(1/3*arctan2(sin(3
/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + (2*(3*cos(2*d*x + 2*c) + 3*cos(d*
x + c) + 2)*cos(3*d*x + 3*c)^3 + cos(3*d*x + 3*c)^4 + 6*(sin(2*d*x + 2*c) +
 sin(d*x + c))*sin(3*d*x + 3*c)^3 + sin(3*d*x + 3*c)^4 + 3*(6*(cos(d*x + c)
 + 1)*cos(2*d*x + 2*c) + 3*cos(2*d*x + 2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(2*
d*x + 2*c)^2 + 6*sin(2*d*x + 2*c)*sin(d*x + c) + 3*sin(d*x + c)^2 + 6*cos(d
*x + c) + 2)*cos(3*d*x + 3*c)^2 + 9*(2*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c)
 + 1)*cos(3*d*x + 3*c) + cos(3*d*x + 3*c)^2 + 6*(3*cos(d*x + c) + 1)*cos(2*
d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 6*(sin(2*d*x + 2*c)
+ sin(d*x + c))*sin(3*d*x + 3*c) + sin(3*d*x + 3*c)^2 + 9*sin(2*d*x + 2*c)^
2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x + c) +
1)*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 9*(2*(3
*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + cos(3*d*x + 3*c)
^2 + 6*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos
(d*x + c)^2 + 6*(sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + sin(3*
d*x + 3*c)^2 + 9*sin(2*d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*
sin(d*x + c)^2 + 6*cos(d*x + c) + 1)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c),
cos(3/2*d*x + 3/2*c)))^2 + (2*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 2)*cos
(3*d*x + 3*c) + 2*cos(3*d*x + 3*c)^2 + 6*(3*cos(d*x + c) + 1)*cos(2*d*x + 2
*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 9*sin(2*d*x + 2*c)^2 + 18*s
in(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x + c) + 2)*sin(3
*d*x + 3*c)^2 + 9*(2*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*cos(3*d*x +
3*c) + cos(3*d*x + 3*c)^2 + 6*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos
(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 6*(sin(2*d*x + 2*c) + sin(d*x + c))*si
n(3*d*x + 3*c) + sin(3*d*x + 3*c)^2 + 9*sin(2*d*x + 2*c)^2 + 18*sin(2*d*x +
 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x + c) + 1)*sin(4/3*arctan2
(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 9*(2*(3*cos(2*d*x + 2*c)
+ 3*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + cos(3*d*x + 3*c)^2 + 6*(3*cos(d*x
+ c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 6*(s
in(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + sin(3*d*x + 3*c)^2 + 9*s
in(2*d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6
*cos(d*x + c) + 1)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*
c)))^2 + 2*(9*(2*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2
+ 9*cos(d*x + c)^2 + 9*sin(2*d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c
) + 9*sin(d*x + c)^2 + 9*cos(d*x + c) + 2)*cos(3*d*x + 3*c) + 6*(3*cos(d*x
+ c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 6*(3
*(2*cos(2*d*x + 2*c) + 2*cos(d*x + c) + 1)*cos(3*d*x + 3*c)^2 + cos(3*d*x +
 3*c)^3 + (cos(3*d*x + 3*c) + 1)*sin(3*d*x + 3*c)^2 + 3*(2*(3*cos(d*x + c)
+ 2)*cos(2*d*x + 2*c) + 3*cos(2*d*x + 2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(2*d
*x + 2*c)^2 + 6*sin(2*d*x + 2*c)*sin(d*x + c) + 3*sin(d*x + c)^2 + 4*cos(d*
```

x + c) + 1)*cos(3*d*x + 3*c) + 6*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*
cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 3*(2*(3*cos(2*d*x + 2*c) + 3*cos(d*
x + c) + 1)*cos(3*d*x + 3*c) + cos(3*d*x + 3*c)^2 + 6*(3*cos(d*x + c) + 1)*
cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 6*(sin(2*d*x +
 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + sin(3*d*x + 3*c)^2 + 9*sin(2*d*x +
 2*c)^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x +
 c) + 1)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 6*(
(sin(2*d*x + 2*c) + sin(d*x + c))*cos(3*d*x + 3*c) + sin(2*d*x + 2*c) + sin
(d*x + c))*sin(3*d*x + 3*c) + 9*sin(2*d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)*si
n(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x + c) + 1)*cos(4/3*arctan2(sin(3/2
*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 6*(3*(2*cos(2*d*x + 2*c) + 2*cos(d*
x + c) + 1)*cos(3*d*x + 3*c)^2 + cos(3*d*x + 3*c)^3 + (cos(3*d*x + 3*c) + 1
)*sin(3*d*x + 3*c)^2 + 3*(2*(3*cos(d*x + c) + 2)*cos(2*d*x + 2*c) + 3*cos(2
*d*x + 2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(2*d*x + 2*c)^2 + 6*sin(2*d*x + 2*c
)*sin(d*x + c) + 3*sin(d*x + c)^2 + 4*cos(d*x + c) + 1)*cos(3*d*x + 3*c) +
6*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x
+ c)^2 + 6*((sin(2*d*x + 2*c) + sin(d*x + c))*cos(3*d*x + 3*c) + sin(2*d*x
+ 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 9*sin(2*d*x + 2*c)^2 + 18*sin(2*d
*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x + c) + 1)*cos(2/3*arc
tan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 6*((sin(2*d*x + 2*c) +
sin(d*x + c))*cos(3*d*x + 3*c)^2 + 2*(sin(2*d*x + 2*c) + sin(d*x + c))*cos(
3*d*x + 3*c) + sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 9*sin(2*
d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*(6*(
sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c)^2 + sin(3*d*x + 3*c)^3 +
(2*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + cos(3*d*x +
 3*c)^2 + 6*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 +
9*cos(d*x + c)^2 + 9*sin(2*d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c)
+ 9*sin(d*x + c)^2 + 6*cos(d*x + c) + 1)*sin(3*d*x + 3*c) + 3*(2*(3*cos(2*d
*x + 2*c) + 3*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + cos(3*d*x + 3*c)^2 + 6*(
3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c
)^2 + 6*(sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + sin(3*d*x + 3*
c)^2 + 9*sin(2*d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x
+ c)^2 + 6*cos(d*x + c) + 1)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*
d*x + 3/2*c))))*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))
) + 6*(6*(sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c)^2 + sin(3*d*x +
 3*c)^3 + (2*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + c
os(3*d*x + 3*c)^2 + 6*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x +
 2*c)^2 + 9*cos(d*x + c)^2 + 9*sin(2*d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)*sin
(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x + c) + 1)*sin(3*d*x + 3*c))*sin(2/
3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 6*cos(d*x + c) + 1
)*log(cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + sin(
1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arct
an2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) - (2*(3*cos(2*d*x + 2
*c) + 3*cos(d*x + c) + 2)*cos(3*d*x + 3*c)^3 + cos(3*d*x + 3*c)^4 + 6*(sin(
2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c)^3 + sin(3*d*x + 3*c)^4 + 3*(6

*(cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 3*cos(2*d*x + 2*c)^2 + 3*cos(d*x + c
)^2 + 3*sin(2*d*x + 2*c)^2 + 6*sin(2*d*x + 2*c)*sin(d*x + c) + 3*sin(d*x +
c)^2 + 6*cos(d*x + c) + 2)*cos(3*d*x + 3*c)^2 + 9*(2*(3*cos(2*d*x + 2*c) +
3*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + cos(3*d*x + 3*c)^2 + 6*(3*cos(d*x +
c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 6*(sin
(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + sin(3*d*x + 3*c)^2 + 9*sin
(2*d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*c
os(d*x + c) + 1)*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)
))^2 + 9*(2*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + co
s(3*d*x + 3*c)^2 + 6*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x +
2*c)^2 + 9*cos(d*x + c)^2 + 6*(sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x +
 3*c) + sin(3*d*x + 3*c)^2 + 9*sin(2*d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)*sin
(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x + c) + 1)*cos(2/3*arctan2(sin(3/2*
d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + (2*(3*cos(2*d*x + 2*c) + 3*cos(d*x
 + c) + 2)*cos(3*d*x + 3*c) + 2*cos(3*d*x + 3*c)^2 + 6*(3*cos(d*x + c) + 1)
*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 9*sin(2*d*x +
 2*c)^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x +
 c) + 2)*sin(3*d*x + 3*c)^2 + 9*(2*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1
)*cos(3*d*x + 3*c) + cos(3*d*x + 3*c)^2 + 6*(3*cos(d*x + c) + 1)*cos(2*d*x
+ 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 6*(sin(2*d*x + 2*c) + si
n(d*x + c))*sin(3*d*x + 3*c) + sin(3*d*x + 3*c)^2 + 9*sin(2*d*x + 2*c)^2 +
18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x + c) + 1)*s
in(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 9*(2*(3*cos
(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + cos(3*d*x + 3*c)^2 +
 6*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x
 + c)^2 + 6*(sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + sin(3*d*x
+ 3*c)^2 + 9*sin(2*d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(
d*x + c)^2 + 6*cos(d*x + c) + 1)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(
3/2*d*x + 3/2*c)))^2 + 2*(9*(2*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2
*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 9*sin(2*d*x + 2*c)^2 + 18*sin(2*d*x + 2*
c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 9*cos(d*x + c) + 2)*cos(3*d*x + 3*c) +
 6*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x
 + c)^2 + 6*(3*(2*cos(2*d*x + 2*c) + 2*cos(d*x + c) + 1)*cos(3*d*x + 3*c)^2
 + cos(3*d*x + 3*c)^3 + (cos(3*d*x + 3*c) + 1)*sin(3*d*x + 3*c)^2 + 3*(2*(3
*cos(d*x + c) + 2)*cos(2*d*x + 2*c) + 3*cos(2*d*x + 2*c)^2 + 3*cos(d*x + c)
^2 + 3*sin(2*d*x + 2*c)^2 + 6*sin(2*d*x + 2*c)*sin(d*x + c) + 3*sin(d*x + c
)^2 + 4*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 6*(3*cos(d*x + c) + 1)*cos(2*d
*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 3*(2*(3*cos(2*d*x + 2
*c) + 3*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + cos(3*d*x + 3*c)^2 + 6*(3*cos(
d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 +
6*(sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + sin(3*d*x + 3*c)^2 +
 9*sin(2*d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2
 + 6*cos(d*x + c) + 1)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x +
3/2*c))) + 6*((sin(2*d*x + 2*c) + sin(d*x + c))*cos(3*d*x + 3*c) + sin(2*d*
x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 9*sin(2*d*x + 2*c)^2 + 18*sin(2

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*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x + c) + 1)*cos(4/3*a
rctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 6*(3*(2*cos(2*d*x + 2
*c) + 2*cos(d*x + c) + 1)*cos(3*d*x + 3*c)^2 + cos(3*d*x + 3*c)^3 + (cos(3*
d*x + 3*c) + 1)*sin(3*d*x + 3*c)^2 + 3*(2*(3*cos(d*x + c) + 2)*cos(2*d*x +
2*c) + 3*cos(2*d*x + 2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(2*d*x + 2*c)^2 + 6*s
in(2*d*x + 2*c)*sin(d*x + c) + 3*sin(d*x + c)^2 + 4*cos(d*x + c) + 1)*cos(3
*d*x + 3*c) + 6*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^
2 + 9*cos(d*x + c)^2 + 6*((sin(2*d*x + 2*c) + sin(d*x + c))*cos(3*d*x + 3*c
) + sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 9*sin(2*d*x + 2*c)^
2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x + c) +
1)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 6*((sin(2
*d*x + 2*c) + sin(d*x + c))*cos(3*d*x + 3*c)^2 + 2*(sin(2*d*x + 2*c) + sin(
d*x + c))*cos(3*d*x + 3*c) + sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3
*c) + 9*sin(2*d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x +
 c)^2 + 6*(6*(sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c)^2 + sin(3*d
*x + 3*c)^3 + (2*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*cos(3*d*x + 3*c)
 + cos(3*d*x + 3*c)^2 + 6*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d
*x + 2*c)^2 + 9*cos(d*x + c)^2 + 9*sin(2*d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)
*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x + c) + 1)*sin(3*d*x + 3*c) + 3
*(2*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + cos(3*d*x
+ 3*c)^2 + 6*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 +
 9*cos(d*x + c)^2 + 6*(sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) +
sin(3*d*x + 3*c)^2 + 9*sin(2*d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c
) + 9*sin(d*x + c)^2 + 6*cos(d*x + c) + 1)*sin(2/3*arctan2(sin(3/2*d*x + 3/
2*c), cos(3/2*d*x + 3/2*c))))*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2
*d*x + 3/2*c))) + 6*(6*(sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c)^2
 + sin(3*d*x + 3*c)^3 + (2*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*cos(3*
d*x + 3*c) + cos(3*d*x + 3*c)^2 + 6*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) +
 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 9*sin(2*d*x + 2*c)^2 + 18*sin(2*
d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x + c) + 1)*sin(3*d*x
+ 3*c))*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 6*co
s(d*x + c) + 1)*log(cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2
*c)))^2 + sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 -
2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) - 32*(2
*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c)*cos(3/2*d*x + 3/2*c) + 3*cos(2*d*x +
 2*c)^2cos(3/2*d*x + 3/2*c) + 3*cos(3/2*d*x + 3/2*c)*sin(2*d*x + 2*c)^2 +
2*(cos(2*d*x + 2*c)*cos(3/2*d*x + 3/2*c) + cos(3/2*d*x + 3/2*c)*cos(d*x + c
) - sin(2*d*x + 2*c)*sin(3/2*d*x + 3/2*c) - sin(3/2*d*x + 3/2*c)*sin(d*x +
c))*cos(3*d*x + 3*c) + (3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + 2*cos(d*x + c
))*cos(3/2*d*x + 3/2*c) + 2*(3*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - sin(3/2*
d*x + 3/2*c))*sin(2*d*x + 2*c) - 2*sin(3/2*d*x + 3/2*c)*sin(d*x + c))*sin(3
*d*x + 3*c) + 32*(6*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + cos(3/2*d*x + 3/2*c
))*sin(2*d*x + 2*c) + 32*(3*cos(d*x + c)^2 + 3*sin(d*x + c)^2 + cos(d*x + c
))*sin(3/2*d*x + 3/2*c) + 32*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 4*(3*(2*co
s(2*d*x + 2*c) + 2*cos(d*x + c) + 1)*cos(3*d*x + 3*c)^2 + cos(3*d*x + 3*c)^
```

3 + (cos(3*d*x + 3*c) + 1)*sin(3*d*x + 3*c)^2 + 3*(2*(3*cos(d*x + c) + 2)*c
os(2*d*x + 2*c) + 3*cos(2*d*x + 2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(2*d*x + 2
*c)^2 + 6*sin(2*d*x + 2*c)*sin(d*x + c) + 3*sin(d*x + c)^2 + 4*cos(d*x + c)
 + 1)*cos(3*d*x + 3*c) + 6*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*
d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 3*(2*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c)
 + 1)*cos(3*d*x + 3*c) + cos(3*d*x + 3*c)^2 + 6*(3*cos(d*x + c) + 1)*cos(2*
d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 6*(sin(2*d*x + 2*c)
+ sin(d*x + c))*sin(3*d*x + 3*c) + sin(3*d*x + 3*c)^2 + 9*sin(2*d*x + 2*c)^
2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x + c) +
1)*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 3*(2*(3*c
os(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + cos(3*d*x + 3*c)^2
 + 6*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d
x + c)^2 + 6(sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + sin(3*d*
x + 3*c)^2 + 9*sin(2*d*x + 2*c)^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*si
n(d*x + c)^2 + 6*cos(d*x + c) + 1)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), co
s(3/2*d*x + 3/2*c))) + 6*((sin(2*d*x + 2*c) + sin(d*x + c))*cos(3*d*x + 3*c
) + sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 9*sin(2*d*x + 2*c)^
2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x + c) +
1)*sin(5/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 4*(8*cos(
3*d*x + 3*c)^2*cos(3/2*d*x + 3/2*c) + 48*(3*cos(d*x + c) + 1)*cos(2*d*x + 2
*c)*cos(3/2*d*x + 3/2*c) + 72*cos(2*d*x + 2*c)^2*cos(3/2*d*x + 3/2*c) - 8*c
os(3/2*d*x + 3/2*c)*sin(3*d*x + 3*c)^2 + 72*cos(3/2*d*x + 3/2*c)*sin(2*d*x
+ 2*c)^2 + 144*cos(3/2*d*x + 3/2*c)*sin(2*d*x + 2*c)*sin(d*x + c) + 16*((3*
cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) + 3*cos(2*d*x + 2*c)*cos(3/2*d*x + 3
/2*c))*cos(3*d*x + 3*c) + 8*(9*cos(d*x + c)^2 + 9*sin(d*x + c)^2 + 6*cos(d*
x + c) + 1)*cos(3/2*d*x + 3/2*c) - 3*(2*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c
) + 1)*cos(3*d*x + 3*c) + cos(3*d*x + 3*c)^2 + 6*(3*cos(d*x + c) + 1)*cos(2
*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 6*(sin(2*d*x + 2*c)
 + sin(d*x + c))*sin(3*d*x + 3*c) + sin(3*d*x + 3*c)^2 + 9*sin(2*d*x + 2*c)
^2 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x + c) +
 1)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 16*((3*c
os(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) + cos(3*d*x + 3*c)*sin(3/2*d*x + 3/2*
c) + 3*cos(2*d*x + 2*c)*sin(3/2*d*x + 3/2*c))*sin(3*d*x + 3*c) - 48*(cos(3/
2*d*x + 3/2*c)*sin(3*d*x + 3*c) + 3*cos(3/2*d*x + 3/2*c)*sin(2*d*x + 2*c) -
 (3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - cos(3*d*x + 3*c)*sin(3/2*d*x +
 3/2*c) - 3*cos(2*d*x + 2*c)*sin(3/2*d*x + 3/2*c) + 3*cos(3/2*d*x + 3/2*c)*
sin(d*x + c))*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))
*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 4*(8*cos(3*
d*x + 3*c)^2*cos(3/2*d*x + 3/2*c) + 48*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c
)*cos(3/2*d*x + 3/2*c) + 72*cos(2*d*x + 2*c)^2*cos(3/2*d*x + 3/2*c) - 8*cos
(3/2*d*x + 3/2*c)*sin(3*d*x + 3*c)^2 + 72*cos(3/2*d*x + 3/2*c)*sin(2*d*x +
2*c)^2 + 144*cos(3/2*d*x + 3/2*c)*sin(2*d*x + 2*c)*sin(d*x + c) + 16*((3*co
s(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) + 3*cos(2*d*x + 2*c)*cos(3/2*d*x + 3/2
*c))*cos(3*d*x + 3*c) + 8*(9*cos(d*x + c)^2 + 9*sin(d*x + c)^2 + 6*cos(d*x
+ c) + 1)*cos(3/2*d*x + 3/2*c) - 3*(2*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c)

```
+ 1)*cos(3*d*x + 3*c) + cos(3*d*x + 3*c)^2 + 6*(3*cos(d*x + c) + 1)*cos(2*d
*x + 2*c) + 9*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 6*(sin(2*d*x + 2*c) +
 sin(d*x + c))*sin(3*d*x + 3*c) + sin(3*d*x + 3*c)^2 + 9*sin(2*d*x + 2*c)^2
 + 18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x + c) + 1
)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 16*((3*cos
(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) + cos(3*d*x + 3*c)*sin(3/2*d*x + 3/2*c)
 + 3*cos(2*d*x + 2*c)*sin(3/2*d*x + 3/2*c))*sin(3*d*x + 3*c))*sin(2/3*arcta
n2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 4*(3*(2*cos(2*d*x + 2*c)
+ 2*cos(d*x + c) + 1)*cos(3*d*x + 3*c)^2 + cos(3*d*x + 3*c)^3 + (cos(3*d*x
+ 3*c) + 1)*sin(3*d*x + 3*c)^2 + 3*(2*(3*cos(d*x + c) + 2)*cos(2*d*x + 2*c)
 + 3*cos(2*d*x + 2*c)^2 + 3*cos(d*x + c)^2 + 3*sin(2*d*x + 2*c)^2 + 6*sin(2
*d*x + 2*c)*sin(d*x + c) + 3*sin(d*x + c)^2 + 4*cos(d*x + c) + 1)*cos(3*d*x
 + 3*c) + 6*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 9*cos(2*d*x + 2*c)^2 +
9*cos(d*x + c)^2 + 6*((sin(2*d*x + 2*c) + sin(d*x + c))*cos(3*d*x + 3*c) +
sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 9*sin(2*d*x + 2*c)^2 +
18*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sin(d*x + c)^2 + 6*cos(d*x + c) + 1)*s
in(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))/((sqrt(2)*a*co
s(3*d*x + 3*c)^4 + sqrt(2)*a*sin(3*d*x + 3*c)^4 + 2*(3*sqrt(2)*a*cos(2*d*x
+ 2*c) + 3*sqrt(2)*a*cos(d*x + c) + 2*sqrt(2)*a)*cos(3*d*x + 3*c)^3 + 6*(sq
rt(2)*a*sin(2*d*x + 2*c) + sqrt(2)*a*sin(d*x + c))*sin(3*d*x + 3*c)^3 + 9*s
qrt(2)*a*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*a*cos(d*x + c)^2 + 9*sqrt(2)*a*sin(
2*d*x + 2*c)^2 + 18*sqrt(2)*a*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*a*s
in(d*x + c)^2 + 3*(3*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 3*sqrt(2)*a*cos(d*x + c
)^2 + 3*sqrt(2)*a*sin(2*d*x + 2*c)^2 + 6*sqrt(2)*a*sin(2*d*x + 2*c)*sin(d*x
 + c) + 3*sqrt(2)*a*sin(d*x + c)^2 + 6*sqrt(2)*a*cos(d*x + c) + 6*(sqrt(2)*
a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c) + 2*sqrt(2)*a)*cos(3*d*x + 3*c
)^2 + 9*(sqrt(2)*a*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 9*
sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*a*sin(2
*d*x + 2*c)^2 + 18*sqrt(2)*a*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*a*si
n(d*x + c)^2 + 6*sqrt(2)*a*cos(d*x + c) + 2*(3*sqrt(2)*a*cos(2*d*x + 2*c) +
 3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*a*co
s(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c) + 6*(sqrt(2)*a*sin(2*d*x + 2*c) +
sqrt(2)*a*sin(d*x + c))*sin(3*d*x + 3*c) + sqrt(2)*a)*cos(4/3*arctan2(sin(3
/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 9*(sqrt(2)*a*cos(3*d*x + 3*c)^2
 + 9*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*
sin(3*d*x + 3*c)^2 + 9*sqrt(2)*a*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*a*sin(2*d*
x + 2*c)*sin(d*x + c) + 9*sqrt(2)*a*sin(d*x + c)^2 + 6*sqrt(2)*a*cos(d*x +
c) + 2*(3*sqrt(2)*a*cos(2*d*x + 2*c) + 3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a
)*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2
*c) + 6*(sqrt(2)*a*sin(2*d*x + 2*c) + sqrt(2)*a*sin(d*x + c))*sin(3*d*x + 3
*c) + sqrt(2)*a)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)
))^2 + (2*sqrt(2)*a*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 9
*sqrt(2)*a*cos(d*x + c)^2 + 9*sqrt(2)*a*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*a*s
in(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*a*sin(d*x + c)^2 + 6*sqrt(2)*a*cos
(d*x + c) + 2*(3*sqrt(2)*a*cos(2*d*x + 2*c) + 3*sqrt(2)*a*cos(d*x + c) + 2*
```

sqrt(2)*a)*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(
2*d*x + 2*c) + 2*sqrt(2)*a)*sin(3*d*x + 3*c)^2 + 9*(sqrt(2)*a*cos(3*d*x + 3
*c)^2 + 9*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*a*cos(d*x + c)^2 + sqrt(
2)*a*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*a*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*a*sin
(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*a*sin(d*x + c)^2 + 6*sqrt(2)*a*cos(d
x + c) + 2(3*sqrt(2)*a*cos(2*d*x + 2*c) + 3*sqrt(2)*a*cos(d*x + c) + sqrt
(2)*a)*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*
x + 2*c) + 6*(sqrt(2)*a*sin(2*d*x + 2*c) + sqrt(2)*a*sin(d*x + c))*sin(3*d*
x + 3*c) + sqrt(2)*a)*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3
/2*c)))^2 + 9*(sqrt(2)*a*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*a*cos(2*d*x + 2*c)^
2 + 9*sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*a
*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*a*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2
)*a*sin(d*x + c)^2 + 6*sqrt(2)*a*cos(d*x + c) + 2*(3*sqrt(2)*a*cos(2*d*x +
2*c) + 3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(3*d*x + 3*c) + 6*(3*sqrt(2
)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c) + 6*(sqrt(2)*a*sin(2*d*x + 2
*c) + sqrt(2)*a*sin(d*x + c))*sin(3*d*x + 3*c) + sqrt(2)*a)*sin(2/3*arctan2
(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 6*sqrt(2)*a*cos(d*x + c)
+ 2*(9*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*a*cos(d*x + c)^2 + 9*sqrt(2
)*a*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*a*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqr
t(2)*a*sin(d*x + c)^2 + 9*sqrt(2)*a*cos(d*x + c) + 9*(2*sqrt(2)*a*cos(d*x +
c) + sqrt(2)*a)*cos(2*d*x + 2*c) + 2*sqrt(2)*a)*cos(3*d*x + 3*c) + 6*(3*sq
rt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c) + 6*(sqrt(2)*a*cos(3*d*x
+ 3*c)^3 + 9*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*a*cos(d*x + c)^2 + 9
*sqrt(2)*a*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*a*sin(2*d*x + 2*c)*sin(d*x + c)
+ 9*sqrt(2)*a*sin(d*x + c)^2 + 3*(2*sqrt(2)*a*cos(2*d*x + 2*c) + 2*sqrt(2)*
a*cos(d*x + c) + sqrt(2)*a)*cos(3*d*x + 3*c)^2 + (sqrt(2)*a*cos(3*d*x + 3*c
) + sqrt(2)*a)*sin(3*d*x + 3*c)^2 + 6*sqrt(2)*a*cos(d*x + c) + 3*(3*sqrt(2)
*a*cos(2*d*x + 2*c)^2 + 3*sqrt(2)*a*cos(d*x + c)^2 + 3*sqrt(2)*a*sin(2*d*x
+ 2*c)^2 + 6*sqrt(2)*a*sin(2*d*x + 2*c)*sin(d*x + c) + 3*sqrt(2)*a*sin(d*x
+ c)^2 + 4*sqrt(2)*a*cos(d*x + c) + 2*(3*sqrt(2)*a*cos(d*x + c) + 2*sqrt(2)
*a)*cos(2*d*x + 2*c) + sqrt(2)*a)*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*a*cos(d*x
+ c) + sqrt(2)*a)*cos(2*d*x + 2*c) + 3*(sqrt(2)*a*cos(3*d*x + 3*c)^2 + 9*s
qrt(2)*a*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(3*
d*x + 3*c)^2 + 9*sqrt(2)*a*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*a*sin(2*d*x + 2*
c)*sin(d*x + c) + 9*sqrt(2)*a*sin(d*x + c)^2 + 6*sqrt(2)*a*cos(d*x + c) + 2
*(3*sqrt(2)*a*cos(2*d*x + 2*c) + 3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(
3*d*x + 3*c) + 6*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c) +
6*(sqrt(2)*a*sin(2*d*x + 2*c) + sqrt(2)*a*sin(d*x + c))*sin(3*d*x + 3*c) +
sqrt(2)*a)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 6
*(sqrt(2)*a*sin(2*d*x + 2*c) + sqrt(2)*a*sin(d*x + c) + (sqrt(2)*a*sin(2*d*
x + 2*c) + sqrt(2)*a*sin(d*x + c))*cos(3*d*x + 3*c))*sin(3*d*x + 3*c) + sqr
t(2)*a)*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 6*(s
qrt(2)*a*cos(3*d*x + 3*c)^3 + 9*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*a*
cos(d*x + c)^2 + 9*sqrt(2)*a*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*a*sin(2*d*x +
2*c)*sin(d*x + c) + 9*sqrt(2)*a*sin(d*x + c)^2 + 3*(2*sqrt(2)*a*cos(2*d*x +

```
2*c) + 2*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(3*d*x + 3*c)^2 + (sqrt(2)
*a*cos(3*d*x + 3*c) + sqrt(2)*a)*sin(3*d*x + 3*c)^2 + 6*sqrt(2)*a*cos(d*x +
 c) + 3*(3*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 3*sqrt(2)*a*cos(d*x + c)^2 + 3*sq
rt(2)*a*sin(2*d*x + 2*c)^2 + 6*sqrt(2)*a*sin(2*d*x + 2*c)*sin(d*x + c) + 3*
sqrt(2)*a*sin(d*x + c)^2 + 4*sqrt(2)*a*cos(d*x + c) + 2*(3*sqrt(2)*a*cos(d*
x + c) + 2*sqrt(2)*a)*cos(2*d*x + 2*c) + sqrt(2)*a)*cos(3*d*x + 3*c) + 6*(3
*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c) + 6*(sqrt(2)*a*sin(2*
d*x + 2*c) + sqrt(2)*a*sin(d*x + c) + (sqrt(2)*a*sin(2*d*x + 2*c) + sqrt(2)
*a*sin(d*x + c))*cos(3*d*x + 3*c))*sin(3*d*x + 3*c) + sqrt(2)*a)*cos(2/3*ar
ctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 6*((sqrt(2)*a*sin(2*d*
x + 2*c) + sqrt(2)*a*sin(d*x + c))*cos(3*d*x + 3*c)^2 + sqrt(2)*a*sin(2*d*x
 + 2*c) + sqrt(2)*a*sin(d*x + c) + 2*(sqrt(2)*a*sin(2*d*x + 2*c) + sqrt(2)*
a*sin(d*x + c))*cos(3*d*x + 3*c))*sin(3*d*x + 3*c) + 6*(sqrt(2)*a*sin(3*d*x
 + 3*c)^3 + 6*(sqrt(2)*a*sin(2*d*x + 2*c) + sqrt(2)*a*sin(d*x + c))*sin(3*d
*x + 3*c)^2 + (sqrt(2)*a*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*a*cos(2*d*x + 2*c)^
2 + 9*sqrt(2)*a*cos(d*x + c)^2 + 9*sqrt(2)*a*sin(2*d*x + 2*c)^2 + 18*sqrt(2
)*a*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*a*sin(d*x + c)^2 + 6*sqrt(2)*
a*cos(d*x + c) + 2*(3*sqrt(2)*a*cos(2*d*x + 2*c) + 3*sqrt(2)*a*cos(d*x + c)
 + sqrt(2)*a)*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*c
os(2*d*x + 2*c) + sqrt(2)*a)*sin(3*d*x + 3*c) + 3*(sqrt(2)*a*cos(3*d*x + 3*
c)^2 + 9*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*a*cos(d*x + c)^2 + sqrt(2
)*a*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*a*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*a*sin(
2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*a*sin(d*x + c)^2 + 6*sqrt(2)*a*cos(d*
x + c) + 2*(3*sqrt(2)*a*cos(2*d*x + 2*c) + 3*sqrt(2)*a*cos(d*x + c) + sqrt(
2)*a)*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x
 + 2*c) + 6*(sqrt(2)*a*sin(2*d*x + 2*c) + sqrt(2)*a*sin(d*x + c))*sin(3*d*x
 + 3*c) + sqrt(2)*a)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/
2*c))))*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 6*(s
qrt(2)*a*sin(3*d*x + 3*c)^3 + 6*(sqrt(2)*a*sin(2*d*x + 2*c) + sqrt(2)*a*sin
(d*x + c))*sin(3*d*x + 3*c)^2 + (sqrt(2)*a*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*a
*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*a*cos(d*x + c)^2 + 9*sqrt(2)*a*sin(2*d*x +
2*c)^2 + 18*sqrt(2)*a*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*a*sin(d*x +
 c)^2 + 6*sqrt(2)*a*cos(d*x + c) + 2*(3*sqrt(2)*a*cos(2*d*x + 2*c) + 3*sqrt
(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*a*cos(d*x +
 c) + sqrt(2)*a)*cos(2*d*x + 2*c) + sqrt(2)*a)*sin(3*d*x + 3*c))*sin(2/3*ar
ctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + sqrt(2)*a)*sqrt(a)*d)
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.45

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{\sqrt{2}\left(\frac{\log\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)} - \frac{\log\left(-\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)} - \frac{2\,\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{2}-1\right)a\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}\right)}{8\,\sqrt{a}d}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] 1/8*sqrt(2)*(log(sin(1/2*d*x + 1/2*c) + 1)/(a*sgn(cos(1/2*d*x + 1/2*c))) -
log(-sin(1/2*d*x + 1/2*c) + 1)/(a*sgn(cos(1/2*d*x + 1/2*c))) - 2*sin(1/2*d*
x + 1/2*c)/((sin(1/2*d*x + 1/2*c)^2 - 1)*a*sgn(cos(1/2*d*x + 1/2*c))))/(sqr
t(a)*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{\left(a+a\,\cos\left(c+d\,x\right)\right)^{3/2}}\,dx$$

```
[In] int(1/(a + a*cos(c + d*x))^(3/2),x)
```

```
[Out] int(1/(a + a*cos(c + d*x))^(3/2), x)
```

3.136 $\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 114

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{2\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{3/2}d} - \frac{5\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}$$

```
[Out] 2*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(3/2)/d-1/2*sin(d*x+
c)/d/(a+a*cos(d*x+c))^(3/2)-5/4*arctanh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/(a+a
*cos(d*x+c))^(1/2))/a^(3/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2845, 3064, 2728, 212, 2852}

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{2\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{a^{3/2}d} - \frac{5\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\sin(c+dx)}{2d(a\cos(c+dx)+a)^{3/2}}$$

```
[In] Int[Sec[c + d*x]/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(a^(3/2)*d) -
(5*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])])/(2*S
qrt[2]*a^(3/2)*d) - Sin[c + d*x]/(2*d*(a + a*Cos[c + d*x])^(3/2))
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3064

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[(A
*b - a*B)/(b*c - a*d), Int[1/Sqrt[a + b*Sin[e + f*x]], x], x] + Dist[(B*c -
 A*d)/(b*c - a*d), Int[Sqrt[a + b*Sin[e + f*x]]/(c + d*Sin[e + f*x]), x], x
] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{\int \frac{\left(2a-\frac{1}{2}a\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{2a^2} \\
&= -\frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx}{a^2} - \frac{5\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx}{4a}
\end{aligned}
$$

$$= -\frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} - \frac{2\text{Subst}\left(\int \frac{1}{a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{ad} + \frac{5\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{2ad}$$

$$= \frac{2\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{3/2}d} - \frac{5\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.27 (sec) , antiderivative size = 227, normalized size of antiderivative = 1.99

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{\cos^3\left(\frac{1}{2}(c+dx)\right)\left(-4\sqrt{2}\log\left(i-\sqrt{2}e^{\frac{1}{2}i(c+dx)}-ie^{i(c+dx)}\right)+4\sqrt{2}\log\left(i+\sqrt{2}e\right.\right.}{}$$

```
[In] Integrate[Sec[c + d*x]/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (Cos[(c + d*x)/2]^3*(-4*Sqrt[2]*Log[I - Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(
I*(c + d*x))] + 4*Sqrt[2]*Log[I + Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c +
 d*x))] + 10*Log[Cos[(c + d*x)/4] - Sin[(c + d*x)/4]] - 10*Log[Cos[(c + d*x
)/4] + Sin[(c + d*x)/4]] - (Cos[(c + d*x)/4] - Sin[(c + d*x)/4])^(-2) + (Co
s[(c + d*x)/4] + Sin[(c + d*x)/4])^(-2)))/(2*d*(a*(1 + Cos[c + d*x]))^(3/2)
)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 289 vs. 2(93) = 186.

Time = 1.95 (sec) , antiderivative size = 290, normalized size of antiderivative = 2.54

method	result
default	$-\frac{\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(5\sqrt{2}\ln\left(\frac{4\sqrt{a}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}+4a}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-4\ln\left(\frac{4\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+4\sqrt{2}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{a}+8a}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{2}}\right.\right.}{4a^{\frac{5}{2}}\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sin\left(\frac{dx}{2}+\right.}$

```
[In] int(sec(d*x+c)/(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/a^(5/2)/cos(1/2*d*x+1/2*c)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(5*2^(1/2)*l
n(2*(2*a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+2*a)/cos(1/2*d*x+1/2*c))*a*co
s(1/2*d*x+1/2*c)^2-4*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2
*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*cos(1/2*d*
```

```
x+1/2*c)^2*a-4*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+
1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*cos(1/2*d*x+1/2
*c)^2*a+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2))/sin(1/2*d*x+1/2*c)/
(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 254 vs. $2(93) = 186$.

Time = 0.26 (sec) , antiderivative size = 254, normalized size of antiderivative = 2.23

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{5\sqrt{2}\left(\cos(dx+c)^2+2\cos(dx+c)+1\right)\sqrt{a}\log\left(-\frac{a\cos(dx+c)^2+2\sqrt{2}\sqrt{a\cos(dx+c)-}}{\cos(dx+c)^2+}\right.}{}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/8*(5*sqrt(2)*(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(a)*log(-(a*cos(d*
x + c)^2 + 2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*sin(d*x + c) - 2*a*co
s(d*x + c) - 3*a)/(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)) + 4*(cos(d*x + c)^
2 + 2*cos(d*x + c) + 1)*sqrt(a)*log((a*cos(d*x + c)^3 - 7*a*cos(d*x + c)^2
- 4*sqrt(a*cos(d*x + c) + a)*sqrt(a)*(cos(d*x + c) - 2)*sin(d*x + c) + 8*a)
/(cos(d*x + c)^3 + cos(d*x + c)^2)) - 4*sqrt(a*cos(d*x + c) + a)*sin(d*x +
c))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)
```

Sympy [F]

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec(c+dx)}{(a(\cos(c+dx)+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))**(3/2),x)
```

```
[Out] Integral(sec(c + d*x)/(a*(cos(c + d*x) + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec(dx+c)}{(a\cos(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(sec(d*x + c)/(a*cos(d*x + c) + a)^(3/2), x)
```

Giac [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.20

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = -\frac{\sqrt{2}\left(\frac{4\sqrt{2}\log\left(\frac{\left|-2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}{\left|2\sqrt{2}+4\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right|}\right)}{a}+\frac{5\log\left(\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{a}-\frac{5\log\left(-\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{a}-\frac{2\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\left(\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)a}\right)}{8\sqrt{a}d\,\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(2)*(4*sqrt(2)*log(abs(-2*sqrt(2) + 4*sin(1/2*d*x + 1/2*c))/abs(2*
sqrt(2) + 4*sin(1/2*d*x + 1/2*c)))/a + 5*log(sin(1/2*d*x + 1/2*c) + 1)/a -
5*log(-sin(1/2*d*x + 1/2*c) + 1)/a - 2*sin(1/2*d*x + 1/2*c)/((sin(1/2*d*x +
 1/2*c)^2 - 1)*a))/(sqrt(a)*d*sgn(cos(1/2*d*x + 1/2*c)))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{\cos(c+d\,x)\,\left(a+a\,\cos(c+d\,x)\right)^{3/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)*(a + a*cos(c + d*x))^(3/2)),x)
```

```
[Out] int(1/(cos(c + d*x)*(a + a*cos(c + d*x))^(3/2)), x)
```

3.137 $\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 144

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = -\frac{3\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{3/2}d} + \frac{9\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\tan(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{3\tan(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -3*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(3/2)/d+9/4*arctanh
(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(3/2)/d*2^(1/2)-1
/2*tan(d*x+c)/d/(a+a*cos(d*x+c))^(3/2)+3/2*tan(d*x+c)/a/d/(a+a*cos(d*x+c))^
(1/2)
```

Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2845, 3063, 3064, 2728, 212, 2852}

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = -\frac{3\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{a^{3/2}d} + \frac{9\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d} + \frac{3\tan(c+dx)}{2ad\sqrt{a\cos(c+dx)+a}} - \frac{\tan(c+dx)}{2d(a\cos(c+dx)+a)^{3/2}}$$

```
[In] Int[Sec[c + d*x]^2/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-3*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(a^(3/2)*d) +
 (9*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])])/(2*
Sqrt[2]*a^(3/2)*d) - Tan[c + d*x]/(2*d*(a + a*Cos[c + d*x])^(3/2)) + (3*Tan
[c + d*x])/(2*a*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rule 3064

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[(A
*b - a*B)/(b*c - a*d), Int[1/Sqrt[a + b*Sin[e + f*x]], x], x] + Dist[(B*c -
 A*d)/(b*c - a*d), Int[Sqrt[a + b*Sin[e + f*x]]/(c + d*Sin[e + f*x]), x], x
] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\tan(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}+\frac{\int \frac{\left(3a-\frac{3}{2}a\cos(c+dx)\right)\sec^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{2a^2}\\
&= -\frac{\tan(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}+\frac{3\tan(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}}+\frac{\int \frac{\left(-3a^2+\frac{3}{2}a^2\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{2a^3}\\
&= -\frac{\tan(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}+\frac{3\tan(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}}\\
&\quad -\frac{3\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx}{2a^2}+\frac{9\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx}{4a}\\
&= -\frac{\tan(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}+\frac{3\tan(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}}\\
&\quad +\frac{3\mathrm{Subst}\left(\int \frac{1}{a-x^2}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{ad}-\frac{9\mathrm{Subst}\left(\int \frac{1}{2a-x^2}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{2ad}\\
&= -\frac{3\mathrm{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{3/2}d}+\frac{9\mathrm{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d}\\
&\quad -\frac{\tan(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}+\frac{3\tan(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.34 (sec) , antiderivative size = 103, normalized size of antiderivative = 0.72

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx=\frac{9\mathrm{arctanh}\left(\sin\left(\frac{1}{2}(c+dx)\right)\right)\cos\left(\frac{1}{2}(c+dx)\right)-6\sqrt{2}\mathrm{arctanh}\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right.}{2ad\sqrt{a(1+\cos(c+dx}}$$

```
[In] Integrate[Sec[c + d*x]^2/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (9*ArcTanh[Sin[(c + d*x)/2]]*Cos[(c + d*x)/2] - 6*Sqrt[2]*ArcTanh[Sqrt[2]*S
in[(c + d*x)/2]]*Cos[(c + d*x)/2] + (3 + 2*Sec[c + d*x])*Tan[(c + d*x)/2])/
(2*a*d*Sqrt[a*(1 + Cos[c + d*x])])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 566 vs. $2(119) = 238$.

Time = 1.68 (sec) , antiderivative size = 567, normalized size of antiderivative = 3.94

method	result
default	$\frac{\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(18\sqrt{2}\,\ln\left(\frac{4\sqrt{a}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}+4a}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)a\left(\cos^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12\ln\left(\frac{4\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+4\sqrt{2}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{a}+8a}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{2}}\right.}{}$

```
[In] int(sec(d*x+c)^2/(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(18*2^(1/2)*ln(2*(2*a^(1/2)*(a*sin(1/2*d
*x+1/2*c)^2)^(1/2)+2*a)/cos(1/2*d*x+1/2*c))*a*cos(1/2*d*x+1/2*c)^4-12*ln(4/
(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin
(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*cos(1/2*d*x+1/2*c)^4*a-12*ln(-4/(2*c
os(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2
*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*cos(1/2*d*x+1/2*c)^4*a-9*2^(1/2)*ln(2*(2
*a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+2*a)/cos(1/2*d*x+1/2*c))*a*cos(1/2*
d*x+1/2*c)^2+6*cos(1/2*d*x+1/2*c)^2*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*2^(1/2)*
a^(1/2)+6*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)
+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*cos(1/2*d*x+1/2*c)^2*
a+6*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1
/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*cos(1/2*d*x+1/2*c)^2*a-2^(
1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2))/a^(5/2)/cos(1/2*d*x+1/2*c)/(2*
cos(1/2*d*x+1/2*c)-2^(1/2))/(2*cos(1/2*d*x+1/2*c)+2^(1/2))/sin(1/2*d*x+1/2*
c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 286 vs. $2(119) = 238$.

Time = 0.31 (sec) , antiderivative size = 286, normalized size of antiderivative = 1.99

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{9\sqrt{2}\left(\cos\left(dx+c\right)^3+2\,\cos\left(dx+c\right)^2+\cos\left(dx+c\right)\right)\sqrt{a}\log\left(-\frac{a\cos(dx+c)^2-2\sqrt{2}\,\cdots}{\cdots}\right.}{}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/8*(9*sqrt(2)*(cos(d*x + c)^3 + 2*cos(d*x + c)^2 + cos(d*x + c))*sqrt(a)*l
og(-(a*cos(d*x + c)^2 - 2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*sin(d*x
+ c) - 2*a*cos(d*x + c) - 3*a)/(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)) + 6*(
cos(d*x + c)^3 + 2*cos(d*x + c)^2 + cos(d*x + c))*sqrt(a)*log((a*cos(d*x +
c)^3 - 7*a*cos(d*x + c)^2 + 4*sqrt(a*cos(d*x + c) + a)*sqrt(a)*(cos(d*x + c
```

```
) - 2)*sin(d*x + c) + 8*a)/(cos(d*x + c)^3 + cos(d*x + c)^2)) + 4*sqrt(a*co
s(d*x + c) + a)*(3*cos(d*x + c) + 2)*sin(d*x + c))/(a^2*d*cos(d*x + c)^3 +
2*a^2*d*cos(d*x + c)^2 + a^2*d*cos(d*x + c))
```

Sympy [F]

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec^2(c+dx)}{(a(\cos(c+dx)+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)**2/(a+a*cos(d*x+c))**(3/2),x)
[Out] Integral(sec(c + d*x)**2/(a*(cos(c + d*x) + 1))**(3/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 139280 vs. $2(119) = 238$.

Time = 5.93 (sec) , antiderivative size = 139280, normalized size of antiderivative = 967.22

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \text{Too large to display}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] -1/4*(48*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqr
t(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*co
s(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1
/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3*d*x + 3*c)^4 +
432*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sq
rt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*
sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^4 + 243*(
```

sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*
sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^4 + 48*(sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3*d*x + 3*c)^4 + 432*(sqrt(2)*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
 + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^4 + 243*(sqrt(2)*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)
*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
 - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^4 + 8*(48*(sqrt(2)*log(2*cos(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c

```
) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 -
2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(2*d*x + 2*c) + 45*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
 sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*cos(d*x + c) + 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) - 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) + 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqr
t(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 45*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 45*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1) - 24*sin(5/2*d*x + 5/2*c) - 16*sin(3/2*d*x + 3/2*c) + 24*sin(1/2*d*x
+ 1/2*c))*cos(3*d*x + 3*c)^3 + 24*(63*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(d*x + c) + 21*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) - 21*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
 + 21*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 21*sqrt
(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 63*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 63*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
```

+ 1) + 16*sin(3/2*d*x + 3/2*c) + 24*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c)^
3 + 324*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt
(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + sin(1/2*d*x + 1/2*c))
*cos(d*x + c)^3 + 8*(48*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*
d*x + 2*c) + 45*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) +
 24*cos(5/2*d*x + 5/2*c) + 16*cos(3/2*d*x + 3/2*c) - 24*cos(1/2*d*x + 1/2*c
))*sin(3*d*x + 3*c)^3 + 24*(63*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*sin(d*x + c) - 16*cos(3/2*d*x + 3/2*c) - 24*cos(1/2*d*x + 1/2*c))*sin(2*d*
x + 2*c)^3 - 324*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^3 + (3*(sqrt(2)*log(2*co
s(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1

/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(d*x + c)^2 + 3*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*
c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 -
2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqr
t(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*sin(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*

d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
+ 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sq
rt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x
+ c)^2 + 2*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
- sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c
) + 9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2
)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*
c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 6*sin(5/2*d*x + 5/2*c) - 8*sin(
3/2*d*x + 3/2*c) + 6*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 36*(sin(2*d*x
+ 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(2*cos(1/2*

d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sin(3/2*d*x + 3/2*c) + 6*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 18*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 2*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2

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*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)
+ 6*cos(5/2*d*x + 5/2*c) + 8*cos(3/2*d*x + 3/2*c) - 6*cos(1/2*d*x + 1/2*c))
*sin(3*d*x + 3*c) - 12*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*sin(5/2*d*
x + 5/2*c) + 6*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)
 + 8*cos(3/2*d*x + 3/2*c) - 6*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) - 16*(
3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) + 48*cos(3/2*d*x + 3/2*c)*sin(d*x
+ c) - 36*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
- 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1) + 12*sin(1/2*d*x + 1/2*c))*cos(5*d*x + 5*c)^2 + 9*(3*
(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3*d*x + 3*c)^2 + 27*(sqrt(
2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(
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2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 27*(sqrt(2)*log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 3*(sqrt(2)*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*sin(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*
sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
- sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) +
3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*sin(d*x + c)^2 + 2*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s

in(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2
)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
+ 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sq
rt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 6*sin(5/2*d*x
+ 5/2*c) - 8*sin(3/2*d*x + 3/2*c) + 6*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c
) + 36*(sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 6*(9*(sqrt(
2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*
c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*

sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sin(3/2*d*x + 3/2*c) + 6*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 18*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 2*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 6*cos(5/2*d*x + 5/2*c) + 8*cos(3/2*d*x + 3/2*c) - 6*cos(1/2*d*x + 1/2*c))*sin(3*d*x + 3*c) - 12*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*co

s(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*sin(d*x + c) + 8*cos(3/2*d*x + 3/2*c) - 6*cos(1/2*d*x + 1/2*c))*sin(2*
d*x + 2*c) - 16*(3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) + 48*cos(3/2*d*x
+ 3/2*c)*sin(d*x + c) - 36*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 3*sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 12*sin(1/2*d*x + 1/2*c))*cos(4*d*x
 + 4*c)^2 + (1056*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x +
2*c)^2 + 891*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
 sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 +
480*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sq
rt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*
sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1

/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 459*(
sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*
sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 576*(sin(2*d*x
 + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 24*(81*(sqrt(2)*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)
*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
 - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 27*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)
*sin(1/2*d*x + 1/2*c) + 2) - 27*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) + 27*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c
) + 2) - 27*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 8
1*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) + 81*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1) - 16*sin(3/2*d*x + 3/2*c) + 40*sin(1/2*d*x + 1/2*c))*c
os(2*d*x + 2*c) + 54*(11*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) - 11*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
+ 11*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sq
rt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 11*sqrt(
2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 33*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 33*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1) + 16*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 96*(10*cos(2*d*x + 2*c) + 9*c
os(d*x + c) + 3)*sin(5/2*d*x + 5/2*c) + 8*(117*(sqrt(2)*log(2*cos(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*s

qrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c
) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 -
2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(d*x + c) + 80*cos(3/2*d*x + 3/2*c) - 72*cos(1/2*d*x +
1/2*c))*sin(2*d*x + 2*c) - 96*(3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) + 6
72*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 576*cos(1/2*d*x + 1/2*c)*sin(d*x + c
) + 99*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 99*sqr
t(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 99*sqrt(2)*log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 99*sqrt(2)*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 297*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 297*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 288*sin(1/
2*d*x + 1/2*c))*cos(3*d*x + 3*c)^2 + (1971*(sqrt(2)*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sq
rt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*cos(d*x + c)^2 + 675*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c
) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 -
2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt
(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*sin(d*x + c)^2 + 18*(73*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
 1/2*c) + 2) - 73*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +

2) + 73*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 73*sq
rt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 219*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 21
9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1) + 80*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 416*(3*cos(d*x + c) + 1)
*sin(3/2*d*x + 3/2*c) - 96*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 576*cos(1/2*
d*x + 1/2*c)*sin(d*x + c) + 219*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) - 219*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*
c) + 2) + 219*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
 219*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sq
rt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 657*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) + 657*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1) + 480*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c)^2 + 162*(sqrt(
2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sin(1/2*d*x + 1/2*c))*cos(d*x + c
)^2 + (3*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqr
t(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*co
s(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1
/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3*d*x + 3*c)^2 +
27*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^

2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 27*(sq
rt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 3*(sqrt(2)*log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*
sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*
c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*
c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x
 + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
- 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)

*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
- sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) +
3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2
)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqr
t(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 6*sin
(5/2*d*x + 5/2*c) - 8*sin(3/2*d*x + 3/2*c) + 6*sin(1/2*d*x + 1/2*c))*cos(3*
d*x + 3*c) + 36*(sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 6*
(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
- 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2

)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sin(3/2*d*x + 3/2*c) + 6*sin(1/2
*d*x + 1/2*c))*cos(2*d*x + 2*c) + 18*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1) + 2*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 2*(9*(sqrt(2)*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sq
rt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(d*x + c) + 6*cos(5/2*d*x + 5/2*c) + 8*cos(3/2*d*x + 3/2*c)
 - 6*cos(1/2*d*x + 1/2*c))*sin(3*d*x + 3*c) - 12*(3*cos(2*d*x + 2*c) + 3*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(c

os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*sin(d*x + c) + 8*cos(3/2*d*x + 3/2*c) - 6*cos(1/2*d*x + 1/2*c
))*sin(2*d*x + 2*c) - 16*(3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) + 48*cos
(3/2*d*x + 3/2*c)*sin(d*x + c) - 36*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 3*s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*
sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 12*sin(1/2*d*x + 1/2*c))*
sin(5*d*x + 5*c)^2 + 9*(3*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) +
 sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
3*d*x + 3*c)^2 + 27*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
 + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(
2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x
+ 2*c)^2 + 27*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
- sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 +

3*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3*d*x + 3*c)^2 + 27*(sq
rt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 27*(sqrt(2)*
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*
sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x +
 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(9*(sqrt(2)*log(2*co
s(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1
/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2

*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 6*sin(5/2*d*x + 5/2*c) - 8*sin(3/2*d*x + 3/2*c) + 6*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 36*(sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sin(3/2*d*x + 3/2*c) + 6*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 18*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +

1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1) + 2*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 2*(9*(sqrt(
2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)*log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c
) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 6*cos(5/2*d*x + 5/2*c) + 8*cos
(3/2*d*x + 3/2*c) - 6*cos(1/2*d*x + 1/2*c))*sin(3*d*x + 3*c) - 12*(3*cos(2*
d*x + 2*c) + 3*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*
sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*
c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 8*cos(3/2*d*x + 3/2*c) - 6*co
s(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) - 16*(3*cos(d*x + c) + 1)*sin(3/2*d*x
+ 3/2*c) + 48*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 36*cos(1/2*d*x + 1/2*c)*s
in(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
 - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sq
rt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2
)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x +

1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 12*sin(1
/2*d*x + 1/2*c))*sin(4*d*x + 4*c)^2 + (96*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x
 + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
+ 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*cos(3*d*x + 3*c)^2 + 480*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*cos(2*d*x + 2*c)^2 + 459*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2
)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*cos(d*x + c)^2 + 1056*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*
d*x + 2*c)^2 + 891*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2

)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*
c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c
)^2 + 8*(48*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*
sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) +
 45*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sq
rt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*
sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 15*sqrt(2)*
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 15*sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 24*sin(5/2*d*x + 5/2*c) - 1
6*sin(3/2*d*x + 3/2*c) + 24*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 96*(10
*sin(2*d*x + 2*c) + 9*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 8*(117*(sqrt(2)*
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*
sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x +

1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 39*sqrt(2)*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 39*sqrt(2)*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) + 39*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - 39*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) - 117*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) + 117*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 80*sin(3/2*d*x + 3/2*c) + 72*sin(1/2*d
*x + 1/2*c))*cos(2*d*x + 2*c) + 18*(17*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - 17*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) + 17*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) - 17*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 -
2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 51*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) + 51*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1) + 32*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 192*(3*cos(2*d*
x + 2*c) + 3*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) + 24*(81*(sqrt(2)*log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*
sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*
c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 16*cos(3/2*d*x + 3/2*c) - 40*
cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) - 224*(3*cos(d*x + c) + 1)*sin(3/2*d
*x + 3/2*c) + 288*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 864*cos(1/2*d*x + 1/2
*c)*sin(d*x + c) + 51*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c
) + 2) - 51*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 5
1*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 51*sqrt(2)*
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 153*log(cos(1/2*d*x +

1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 153*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1) + 192*sin(1/2*d*x + 1/2*c))*sin(3*d*x + 3*c)^2 + (864*(sqrt(2)*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 675*(sqrt(2)*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 1971*(sqrt(2)*log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1))*sin(d*x + c)^2 + 24*(63*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(d*x + c) + 21*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) - 21*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*

c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
 + 21*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 21*sqrt
(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 63*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 63*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1) + 16*sin(3/2*d*x + 3/2*c) + 24*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c)
+ 18*(25*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 25*s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 25*sqrt(2)*log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 25*sqrt(2)*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 75*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 75*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 32*sin(1/2
*d*x + 1/2*c))*cos(d*x + c) + 32*(3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
- 1248*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 1440*cos(1/2*d*x + 1/2*c)*sin(d*
x + c) + 75*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 7
5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 75*sqrt(2)*
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 75*sqrt(2)*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 225*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 225*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 192*s
in(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c)^2 + 54*(9*(sqrt(2)*log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*
sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*
c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 -
 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(d*x + c)^2 + 6*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2

- 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1) + sin(1/2*d*x + 1/2*c))*cos(d*x + c) + sqrt(2)*log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1) + 2*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 2*(12*(sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3*d*x + 3*c)^3 + 108*(sqrt(2)*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^3 + 81*(sqrt(2)*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/

2*d*x + 1/2*c) + 1))*cos(d*x + c)^3 + 3*(28*(sqrt(2)*log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(2*d*x + 2*c) + 27*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
- 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sq
rt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(d*x + c) + 9*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*
c) + 2) - 9*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 9
*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 27*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 27*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) -
 16*sin(5/2*d*x + 5/2*c) - 16*sin(3/2*d*x + 3/2*c) + 16*sin(1/2*d*x + 1/2*c
))*cos(3*d*x + 3*c)^2 + 3*(99*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sq
rt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(d*x + c) + 33*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) - 33*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*sq

rt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 33*sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 99*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 99*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 1
6*sin(3/2*d*x + 3/2*c) + 48*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c)^2 + 27*(
3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 4*sin(1/2*d*x + 1/2*c)
)*cos(d*x + c)^2 + (12*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sq
rt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3*d
*x + 3*c) + 12*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
 - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c
) + 9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2
)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*
c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +

1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 16*sin(3/2*d*x + 3/2*c))*sin(3*
d*x + 3*c)^2 + 9*(12*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c
) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt
(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x
 + 2*c) + 9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*
sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*
sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 16*sin(3/2*d*x + 3/2*c))*
sin(2*d*x + 2*c)^2 + 48*(3*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(d*x +
 c) + 27*(3*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -

```
sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*
sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + sqr
t(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*co
s(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1
/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 144*sin(3/2*d*x +
 3/2*c)*sin(d*x + c)^2 + 3*(3*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sq
rt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
cos(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*
d*x + 2*c)^2 + 27*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c
```

) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)
^2 + 3*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(
2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3*d*x + 3*c)^2 + 27
*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 27*(sqrt
(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(9*(sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)

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^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*
sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
- 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1) - 6*sin(5/2*d*x + 5/2*c) - 8*sin(3/2*d*x + 3/2*c) + 6*sin(1/2
*d*x + 1/2*c))*cos(3*d*x + 3*c) + 36*(sin(2*d*x + 2*c) + sin(d*x + c))*cos(
5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*
x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
+ 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*
sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
- 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sin(3/2*d*x
 + 3/2*c) + 6*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 18*(sqrt(2)*log(2*co
s(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1
/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*
```

d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 2*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 6*cos(5/2*d*x + 5/2*c) + 8*cos(3/2*d*x + 3/2*c) - 6*cos(1/2*d*x + 1/2*c))*sin(3*d*x + 3*c) - 12*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 8*cos(3/2*d*x + 3/2*c) - 6*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) - 16*(3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) + 48*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 36*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2

*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 12*s
in(1/2*d*x + 1/2*c))*cos(4*d*x + 4*c) + 2*(90*(sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 81*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*
sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
- sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) +
3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(d*x + c)^2 + 54*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sq
rt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*
sin(2*d*x + 2*c)^2 + 54*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
+ 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*
x + c)^2 + 72*(sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + (171

*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 57*sqrt(2)*log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 57*sqrt(2)*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 57*sqrt(2)*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) - 57*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - 171*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 171*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 80*sin(3/2*d*x + 3/2*c) + 96
*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 18*(3*sqrt(2)*log(2*cos(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
- 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1) + 5*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 6*(16*cos(2*
d*x + 2*c) + 15*cos(d*x + c) + 5)*sin(5/2*d*x + 5/2*c) + 12*(9*(sqrt(2)*log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 8*cos(3/2*d*x + 3/2*c) - 6*
cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) - 24*(3*cos(d*x + c) + 1)*sin(3/2*d*
x + 3/2*c) + 96*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 72*cos(1/2*d*x + 1/2*c)
*sin(d*x + c) + 9*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/

2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) - 9*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 9*sqrt
(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*sqrt(2)*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 27*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 27*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 30*s
in(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 36*((4*cos(2*d*x + 2*c) + 3*cos(d*x
 + c) + 1)*sin(2*d*x + 2*c) + (3*cos(d*x + c) + 1)*sin(d*x + c) + 4*cos(2*d
*x + 2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 2*(135*(sqrt(2)*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)
*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
 - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 54*(sqrt(2)*log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*sin(d*x + c)^2 + 18*(5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) - 5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) + 5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
- 5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
 + 15*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1) + 7*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 8*(3*cos(d*x + c) + 1
)*sin(3/2*d*x + 3/2*c) + 96*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 72*cos(1/2*
d*x + 1/2*c)*sin(d*x + c) + 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*

x + 1/2*c) + 2) - 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) + 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
- 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15
*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 45*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) +
45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1) + 42*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 9*(3*sqrt(2)*log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 8*sin(1/2*d*x + 1/2*c))*cos(d*x + c) +
2*(4*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqr
t(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*co
s(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1
/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c) + 9*
(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 6*cos(5/2*d*x +
5/2*c) + 8*cos(3/2*d*x + 3/2*c) - 6*cos(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c)
+ 6*(4*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c) + 4*(9*
(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x

+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 8*cos(3/2*d*x +
3/2*c) - 6*cos(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 8*(3*cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c) - 18*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 3*(12*(sqrt(
2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c
) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1) + 16*sin(3/2*d*x + 3/2*c))*sin(2*d*x + 2*c) + 9*(3*(sq
rt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2

```
*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + sqrt(2)*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 48*sin(3/2*d*x + 3/2*c)*sin(d*x +
c) - 6*cos(1/2*d*x + 1/2*c))*sin(3*d*x + 3*c) - 12*(7*(3*cos(d*x + c) + 1)*
cos(2*d*x + 2*c) + 12*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 6*cos(d*x + c
) + 1)*sin(5/2*d*x + 5/2*c) + 6*(4*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(d*x + c) + 8*cos(3/2*d*x + 3/2*c) - 6*cos(1/2*d*x + 1/2*c))*cos
(2*d*x + 2*c) + 8*(3*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - 18*cos(d*x +
c)*cos(1/2*d*x + 1/2*c) + 9*(3*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(d*x + c) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
 - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
```

/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) +
48*sin(3/2*d*x + 3/2*c)*sin(d*x + c) - 6*cos(1/2*d*x + 1/2*c))*sin(2*d*x +
2*c) - 36*(3*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + cos(1/2*d*x + 1/2*c))*sin(
d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 12*sin(1/2*
d*x + 1/2*c))*cos(5*d*x + 5*c) + 6*(12*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*cos(3*d*x + 3*c)^3 + 108*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c
) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 -
2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt
(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(2*d*x + 2*c)^3 + 81*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
+ sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(d*x + c)^3 + 3*(28*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x

```
+ 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c
) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt
(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x
 + 2*c) + 27*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
 sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 9*
sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*sqrt(2)*log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 9*sqrt(2)*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)
*sin(1/2*d*x + 1/2*c) + 2) - 27*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 27*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 16*sin(5/2*d*x + 5/2*c
) - 16*sin(3/2*d*x + 3/2*c) + 16*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c)^2 +
 3*(99*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(
2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 33*sqrt(
2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 33*sqrt(2)*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 33*sqrt(2)*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2
```

*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 33*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 99*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 99*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 16*sin(3/2*d*x + 3/2*c) + 48*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c)^2 + 27*(3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 4*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (12*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3*d*x + 3*c) + 12*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2

```
*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*
c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1) + 16*sin(3/2*d*x + 3/2*c))*sin(3*d*x + 3*c)^2 + 9*(12*(s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1) + 16*sin(3/2*d*x + 3/2*c))*sin(2*d*x + 2*c)^2 + 48
*(3*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 27*(3*(sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
```

2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 144*sin(3/2*d*x + 3/2*c)*sin(d*x + c)^2 + 2*(90*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 81*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 54*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s

in(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 54*(sqrt(2)*log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*
sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*
c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
- 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 72*(sin(2*d*x + 2*c) + sin(
d*x + c))*cos(5/2*d*x + 5/2*c) + (171*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(d*x + c) + 57*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) - 57*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
 + 57*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 57*sqrt
(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 171*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 171*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1) - 80*sin(3/2*d*x + 3/2*c) + 96*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c
) + 18*(3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 5*sin(1/2*d*x
+ 1/2*c))*cos(d*x + c) - 6*(16*cos(2*d*x + 2*c) + 15*cos(d*x + c) + 5)*sin(
5/2*d*x + 5/2*c) + 12*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*

d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) +
sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d
*x + c) + 8*cos(3/2*d*x + 3/2*c) - 6*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c)
 - 24*(3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) + 96*cos(3/2*d*x + 3/2*c)*s
in(d*x + c) - 72*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 9*sqrt(2)*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*sqrt(2)*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) + 9*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) - 9*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c
) + 2) - 27*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) + 27*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1) + 30*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c)
+ 36*((4*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*sin(2*d*x + 2*c) + (3*cos(d
*x + c) + 1)*sin(d*x + c) + 4*cos(2*d*x + 2*c)*sin(d*x + c))*cos(5/2*d*x +
5/2*c) + 2*(135*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
- 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2
 + 54*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2
)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*
c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 18*(5*s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*

cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 5*sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 5*sqrt(2)*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*
sin(1/2*d*x + 1/2*c) + 2) - 15*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 15*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 7*sin(1/2*d*x + 1/2*c))
*cos(d*x + c) - 8*(3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) + 96*cos(3/2*d*
x + 3/2*c)*sin(d*x + c) - 72*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 15*sqrt(2)
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 15*sqrt(2)*log(2*cos(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 42*sin(1/2*d*x + 1/2*c))*c
os(2*d*x + 2*c) + 9*(3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*
c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3
*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 8
*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 2*(4*(9*(sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
 + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/

```
2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*sin(d*x + c) + 6*cos(5/2*d*x + 5/2*c) + 8*cos(3/2*d*x + 3/2*c) - 6*c
os(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 6*(4*cos(2*d*x + 2*c) + 3*cos(d*x +
 c) + 1)*cos(5/2*d*x + 5/2*c) + 4*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
 + 1))*sin(d*x + c) + 8*cos(3/2*d*x + 3/2*c) - 6*cos(1/2*d*x + 1/2*c))*cos(
2*d*x + 2*c) + 8*(3*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - 18*cos(d*x + c
)*cos(1/2*d*x + 1/2*c) + 3*(12*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*
c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqr
t(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*co
s(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1
/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x
+ c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sq
rt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2
*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
```

+ 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 16*sin(3/2*d*x
+ 3/2*c))*sin(2*d*x + 2*c) + 9*(3*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c
) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 -
2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt
(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(d*x + c) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)
 + 48*sin(3/2*d*x + 3/2*c)*sin(d*x + c) - 6*cos(1/2*d*x + 1/2*c))*sin(3*d*x
 + 3*c) - 12*(7*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 12*cos(2*d*x + 2*c)
^2 + 9*cos(d*x + c)^2 + 6*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) + 6*(4*(9*
(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 8*cos(3/2*d*x +
 3/2*c) - 6*cos(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 8*(3*cos(d*x + c) + 1)
*cos(3/2*d*x + 3/2*c) - 18*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 9*(3*(sqrt(2
)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*
c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2

)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x
 + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + sqrt(2)*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 48*sin(3/2*d*x + 3/2*c)*sin(d*x + c) -
 6*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) - 36*(3*cos(d*x + c)*cos(1/2*d*x
+ 1/2*c) + cos(1/2*d*x + 1/2*c))*sin(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1) + 12*sin(1/2*d*x + 1/2*c))*cos(4*d*x + 4*c) + 2*(57
6*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^3 + 405*(sq
rt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2

+ 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^3 + 4*(387*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 129*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 129*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 129*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 129*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 387*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 387*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 16*sin(3/2*d*x + 3/2*c) + 168*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c)^2 + 81*(5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 15*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 6*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 4*(144*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) + 117*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d *x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 39*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 39*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 39*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 39*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 117*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 117*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 112*sin(3/2*d*x + 3/2*c) + 24*sin(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c)^2 + 96*(3*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 27*(15*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 15*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 144*((4*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*sin(2*d*x + 2*c) + (3*cos(d*x + c) + 1)*sin(d*x + c) + 4*cos(2*d*x + 2*c)*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 3*(459*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2 *d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 171*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 6*(51*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 51*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 51*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 51*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 153*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 153*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 64*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 32*(3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) + 160*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 192*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 51*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 51*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 51*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 51*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 153*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 153*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 128*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 27*(5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*

sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - 15*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) + 15*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 12*sin(1/2*d*x + 1/2*c))*cos(d
x + c) - 6(64*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 112*cos(2*d*x + 2*c
)^2 + 81*cos(d*x + c)^2 + 16*sin(2*d*x + 2*c)^2 + 24*sin(2*d*x + 2*c)*sin(d
*x + c) + 9*sin(d*x + c)^2 + 54*cos(d*x + c) + 9)*sin(5/2*d*x + 5/2*c) + 8*
(3*(45*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(
2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 16*cos(3
/2*d*x + 3/2*c) - 24*cos(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 8*(3*cos(d*x
 + c) + 1)*cos(3/2*d*x + 3/2*c) - 54*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 18*
(6*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 2*sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 2*sqrt(2)*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 2*sqrt(2)*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) - 2*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) - 6*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) + 6*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + sin(1/2*d*x + 1/2*c))*sin(d*x + c)
 + 120*sin(3/2*d*x + 3/2*c)*sin(d*x + c) - 18*cos(1/2*d*x + 1/2*c))*sin(2*d
*x + 2*c) + 24*(9*cos(d*x + c)^2 + 21*sin(d*x + c)^2 + 6*cos(d*x + c) + 1)*
sin(3/2*d*x + 3/2*c) - 144*(3*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + cos(1/2*d
*x + 1/2*c))*sin(d*x + c) + 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2) - 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +

1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) + 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
- 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15
*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 45*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) +
45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1) + 54*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 36*(16*sin(2*d*x +
2*c)^3 + 8*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c)*sin(d*x + c) + 16*cos(2*d*
x + 2*c)^2*sin(d*x + c) + 40*sin(2*d*x + 2*c)^2*sin(d*x + c) + 9*sin(d*x +
c)^3 + (8*(3*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 16*cos(2*d*x + 2*c)^2 + 9
*cos(d*x + c)^2 + 33*sin(d*x + c)^2 + 6*cos(d*x + c) + 1)*sin(2*d*x + 2*c)
+ (9*cos(d*x + c)^2 + 6*cos(d*x + c) + 1)*sin(d*x + c))*cos(5/2*d*x + 5/2*c
) + 6*(189*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
+ 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^3 + 9*
(21*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 21*sqrt(2
)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 21*sqrt(2)*log(2*co
s(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1
/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 21*sqrt(2)*log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*
sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 63*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 63*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 22*sin(1/2*d*x
+ 1/2*c))*cos(d*x + c)^2 - 32*(3*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c)*sin
(d*x + c) + 9*(21*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)
+ 7*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sq

rt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 7*sqrt(2
)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 7*sqrt(2)*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 7*sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) - 21*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 21*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 6*sin(1/2*d*x + 1
/2*c))*sin(d*x + c)^2 + 3*(21*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x
 + 1/2*c) + 2) - 21*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) + 21*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 -
 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 21*
sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 63*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 6
3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1) + 44*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 24*(9*cos(d*x + c)^2 + 5
*sin(d*x + c)^2 + 6*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 48*(3*cos(d*x
+ c)*cos(1/2*d*x + 1/2*c) + cos(1/2*d*x + 1/2*c))*sin(d*x + c) + 7*sqrt(2)*
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 7*sqrt(2)*log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*
c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 7*sqrt(2)*log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) - 7*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - 21*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c) + 1) + 21*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 22*sin(1/2*d*x + 1/2*c))*cos(2
*d*x + 2*c) - 48*(9*sin(d*x + c)^3 + (9*cos(d*x + c)^2 + 6*cos(d*x + c) + 1
)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) + 36*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x
 + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
+ 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1) + 3*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 2*(12*(sqrt(2)*log(2*co
s(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1

/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*sin(3*d*x + 3*c)^3 + 108*(sqrt(2)*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*
sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
- 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^3 + 81*(sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c
) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 -
2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*sin(d*x + c)^3 + (12*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*

d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(d*x + c) - 16*cos(3/2*d*x + 3/2*c))*cos(3*d*x + 3*c)^2 + 9*(9*(sqrt(2)*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
- 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) - 16*cos(3/2*d*x + 3/2*c))*
cos(2*d*x + 2*c)^2 + 3*(28*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
+ sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin
(2*d*x + 2*c) + 27*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2
)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*
c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c
) + 16*cos(5/2*d*x + 5/2*c) + 16*cos(3/2*d*x + 3/2*c) - 16*cos(1/2*d*x + 1/
2*c))*sin(3*d*x + 3*c)^2 + 3*(99*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
 + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(
2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1

```
))*sin(d*x + c) + 16*cos(3/2*d*x + 3/2*c) - 48*cos(1/2*d*x + 1/2*c))*sin(2*
d*x + 2*c)^2 - 48*(3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) -
108*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*(3*(9*(sqrt(2)*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*sin(d*x + c) - 16*cos(3/2*d*x + 3/2*c))*cos(2*d*x + 2*c
) - 16*(3*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - 6*(4*sin(2*d*x + 2*c) +
3*sin(d*x + c))*sin(5/2*d*x + 5/2*c) + 4*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*
c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 -
 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqr
t(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*cos(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c
) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
+ 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*
sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*
c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*
sin(3/2*d*x + 3/2*c) + 6*sin(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 9*(3*(sqr
```

t(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*co
s(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1
/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + sqrt(2)*log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*
c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x
 + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1) + 2*sin(1/2*d*x + 1/2*c))*sin(d*x + c) - 24*sin(3/2
*d*x + 3/2*c)*sin(d*x + c))*cos(3*d*x + 3*c) + 36*(4*sin(2*d*x + 2*c)^2 + 7
*sin(2*d*x + 2*c)*sin(d*x + c) + 3*sin(d*x + c)^2)*cos(5/2*d*x + 5/2*c) - 6
(16(3*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - 9*(3*(sqrt(2)*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)
*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
 - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*
d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1
/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1) + 2*sin(1/2*d*x + 1/2*c))*sin(d*x + c) + 24*sin(3/2*d*x + 3/2*c)*sin
(d*x + c))*cos(2*d*x + 2*c) - 16*(9*cos(d*x + c)^2 + 6*cos(d*x + c) + 1)*co
s(3/2*d*x + 3/2*c) + 3*(3*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2

*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 27*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 3*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3*d*x + 3*c)^2 + 27*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*

sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 27*(sqrt(2)*
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*
sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x +
 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 2*(9*(sqrt(2)*log(2*co
s(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1
/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) +
 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1) - 6*sin(5/2*d*x + 5/2*c) - 8*sin(3/2*d*x + 3/2*c) + 6*sin(1/2*d*x
 + 1/2*c))*cos(3*d*x + 3*c) + 36*(sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*

d*x + 5/2*c) + 6*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sin(3/2*d*x + 3/2*c) + 6*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 18*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 2*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2 *sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 6*cos(5/2*d*x + 5/2*c) + 8*cos(3/2*d*x + 3/2*c) - 6*cos(1/2*d*x + 1/2*c))*sin(3*d*x + 3*c) - 12*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) + 6*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 8*cos(3/2*d*x + 3/2*c) - 6*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) - 16*(3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) + 48*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 36*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 12*sin(1/2*d*x + 1/2*c))*sin(4*d*x + 4*c) + 2*(6*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3*d*x + 3*c)^2 + 54*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 -

2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqr
t(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(2*d*x + 2*c)^2 + 54*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*c
os(d*x + c)^2 + 90*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2
)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*
c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x +
2*c)^2 + 81*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 +
4*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)
*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) + 9*(sqr

t(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*co
s(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1
/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 6*sin(5/2*d*x + 5/2*c) - 8*sin(3/2*d*x +
3/2*c) + 6*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 6*(16*sin(2*d*x + 2*c)
+ 15*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*(9*(sqrt(2)*log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*
sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*
c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 -
2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) +
9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1) - 8*sin(3/2*d*x + 3/2*c) + 6*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c
) + 36*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(
2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(

1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sin(1/2*d*x + 1/2*c)
)*cos(d*x + c) - 24*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*sin(5/2*d*x +
 5/2*c) + (171*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
 - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) +
80*cos(3/2*d*x + 3/2*c) - 96*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) - 32*(3
*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) + 72*cos(3/2*d*x + 3/2*c)*sin(d*x +
 c) - 90*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 6*sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) - 6*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) + 6*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) - 6*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
 18*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) + 18*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1) + 24*sin(1/2*d*x + 1/2*c))*sin(3*d*x + 3*c) - 12*(4*
(3*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*sin(2*d*x + 2*c) + 3*(3*cos(d*x +
 c) + 1)*sin(d*x + c) + 9*cos(2*d*x + 2*c)*sin(d*x + c))*sin(5/2*d*x + 5/2*
c) + 2*(54*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2
+ 54*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)

*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 135*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 12*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sin(3/2*d*x + 3/2*c) + 6*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 36*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +

1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 32*(3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) + 24*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 126*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 6*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 6*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 6*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 6*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 18*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 18*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 24*sin(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 9*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 6*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)

+ 1) + 4*sin(1/2*d*x + 1/2*c))*sin(d*x + c))*sin(5*d*x + 5*c) + 6*(12*(sqrt
(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(3*d*x + 3*c)^3 + 108*(sqrt(2)*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
- 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^3 + 81*(sqrt(2)*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
 + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^3 + (12*(sqrt(2)*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c) + 9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)
*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*

c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
 - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) +
 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(d*x + c) - 16*cos(3/2*d*x + 3/2*c))*cos(3*d*x + 3*c)^2 + 9*(
9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) - 16*cos(3/2*d*
x + 3/2*c))*cos(2*d*x + 2*c)^2 + 3*(28*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
 sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*sin(2*d*x + 2*c) + 27*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*sin(d*x + c) + 16*cos(5/2*d*x + 5/2*c) + 16*cos(3/2*d*x + 3/2*c) - 16*cos(
1/2*d*x + 1/2*c))*sin(3*d*x + 3*c)^2 + 3*(99*(sqrt(2)*log(2*cos(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqr
t(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(

```
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
+ 1/2*c) + 1))*sin(d*x + c) + 16*cos(3/2*d*x + 3/2*c) - 48*cos(1/2*d*x + 1/
2*c))*sin(2*d*x + 2*c)^2 - 48*(3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)*sin
(d*x + c) - 108*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*(3*(9*(sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x
 + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(
1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) - 16*cos(3/2*d*x + 3/2*c))*cos
(2*d*x + 2*c) - 16*(3*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - 6*(4*sin(2*d
*x + 2*c) + 3*sin(d*x + c))*sin(5/2*d*x + 5/2*c) + 4*(9*(sqrt(2)*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(2*cos(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c
) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 -
2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*
c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3
*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9
```

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*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1) - 8*sin(3/2*d*x + 3/2*c) + 6*sin(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c)
 + 9*(3*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt
(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + sqrt(2)
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)
*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sin(1/2*d*x + 1/2*c))*sin(d*x + c)
- 24*sin(3/2*d*x + 3/2*c)*sin(d*x + c))*cos(3*d*x + 3*c) + 36*(4*sin(2*d*x
+ 2*c)^2 + 7*sin(2*d*x + 2*c)*sin(d*x + c) + 3*sin(d*x + c)^2)*cos(5/2*d*x
+ 5/2*c) - 6*(16*(3*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - 9*(3*(sqrt(2)*
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*
sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x +
 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + sqrt(2)*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1) + 2*sin(1/2*d*x + 1/2*c))*sin(d*x + c) + 24*sin(3/2*d*x
```

+ 3/2*c)*sin(d*x + c))*cos(2*d*x + 2*c) - 16*(9*cos(d*x + c)^2 + 6*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) + 2*(6*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(3*d*x + 3*c)^2 + 54*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 54*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 90*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^2 + 81*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*c os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 4*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) + 9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 6*sin(5/2*d*x + 5/2*c) - 8*sin(3/2*d*x + 3/2*c) + 6*sin(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 6*(16*sin(2*d*x + 2*c) + 15*sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 12*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(

cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sin(3/2*d*x + 3/2*c) + 6*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 36*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 24*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) + (171*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) + 80*cos(3/2*d*x + 3/2*c) - 96*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) - 32*(3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) + 72*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 90*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 6*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 6*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 6*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 6*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 18*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*

c) + 1) + 18*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 24*sin(1/2*d*x + 1/2*c))*sin(3*d*x + 3*c) - 12*(4*(3*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)*sin(2*d*x + 2*c) + 3*(3*cos(d*x + c) + 1)*sin(d*x + c) + 9*cos(2*d*x + 2*c)*sin(d*x + c))*sin(5/2*d*x + 5/2*c) + 2*(54*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 54*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 135*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 12*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*s qrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sin(3/2*d*x + 3/2*c) + 6*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 36*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 32*(3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) + 24*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 126*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 6*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 6*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 6*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 6*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 18*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 18*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 24*sin(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 9*(9*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 6*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + s

qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^
2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 2*sin
(1/2*d*x + 1/2*c))*cos(d*x + c) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(
2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1
) + 4*sin(1/2*d*x + 1/2*c))*sin(d*x + c))*sin(4*d*x + 4*c) + 2*(576*(sqrt(2
)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*
c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c)^3 + 405*(sqrt(2)*log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^3 + 4*(48*(sqrt(2)*log(2*cos(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(
2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x

+ 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*s
in(1/2*d*x + 1/2*c) + 1))*sin(2*d*x + 2*c) + 45*(sqrt(2)*log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*
sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
 + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*
c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 -
 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d
*x + 1/2*c) + 1))*sin(d*x + c) + 24*cos(5/2*d*x + 5/2*c) + 16*cos(3/2*d*x +
 3/2*c) - 24*cos(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c)^2 + 4*(117*(sqrt(2)*log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin
(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c) - 112*cos(3/2*d*x + 3/2*c) -
24*cos(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c)^2 - 54*cos(d*x + c)^2*cos(1/2*d*x
 + 1/2*c) + 4*(387*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2
)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1
/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*
c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + s
in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c
) - 16*cos(3/2*d*x + 3/2*c) - 168*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c)^2
- 96*(3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)*sin(d*x + c) - 486*cos(1/2*d
*x + 1/2*c)*sin(d*x + c)^2 + 8*(6*(4*cos(2*d*x + 2*c) + 3*cos(d*x + c) + 1)
*cos(5/2*d*x + 5/2*c) + (63*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*
c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2)
 + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2

*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*si
n(d*x + c) - 16*cos(3/2*d*x + 3/2*c) - 24*cos(1/2*d*x + 1/2*c))*cos(2*d*x +
 2*c) - 8*(3*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) - 18*cos(d*x + c)*cos(1
/2*d*x + 1/2*c) - 6*(4*sin(2*d*x + 2*c) + 3*sin(d*x + c))*sin(5/2*d*x + 5/2
c) + (72(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
+ 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sq
rt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c) + 6
3*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 21*sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 21*sqrt(2)*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 21*sqrt(2)*log(2*cos(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt
(2)*sin(1/2*d*x + 1/2*c) + 2) - 21*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) - 63*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 63*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 16*sin(3/2*d*x + 3/2*c) + 24*
sin(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 18*(3*(sqrt(2)*log(2*cos(1/2*d*x +
 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*s
qrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/
2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c
) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 -
2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*

x + 1/2*c) + 1))*cos(d*x + c) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
+ sin(1/2*d*x + 1/2*c))*sin(d*x + c) + 24*sin(3/2*d*x + 3/2*c)*sin(d*x + c)
 - 6*cos(1/2*d*x + 1/2*c))*cos(3*d*x + 3*c) + 6*(8*(3*cos(d*x + c) + 1)*cos
(2*d*x + 2*c) + 16*cos(2*d*x + 2*c)^2 + 9*cos(d*x + c)^2 + 112*sin(2*d*x +
2*c)^2 + 192*sin(2*d*x + 2*c)*sin(d*x + c) + 81*sin(d*x + c)^2 + 6*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c) - 16*(20*(3*cos(d*x + c) + 1)*cos(3/2*d*x +
3/2*c) + 9*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - 9*(6*(sqrt(2)*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
+ 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*s
in(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 2*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - 2*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/
2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x +
 1/2*c) + 2) + 2*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) - 2*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 6*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) + 6*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1) + 3*sin(1/2*d*x + 1/2*c))*sin(d*x + c) + 12*sin(3/2*d*x + 3/2*
c)*sin(d*x + c) + 3*cos(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) - 8*(63*cos(d*x
+ c)^2 + 27*sin(d*x + c)^2 + 42*cos(d*x + c) + 7)*cos(3/2*d*x + 3/2*c) - 36
*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - 48*(4*(3*cos(2*d*x + 2*c) + 3*cos(d*x
+ c) + 1)*sin(2*d*x + 2*c) + 3*(3*cos(d*x + c) + 1)*sin(d*x + c) + 9*cos(2*
d*x + 2*c)*sin(d*x + c))*sin(5/2*d*x + 5/2*c) + (576*(sqrt(2)*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*
sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/

2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(2*d*x + 2*c)^2 + 513*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 1377*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(d*x + c)^2 + 24*(45*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c) + 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 45*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)

- 16*sin(3/2*d*x + 3/2*c) + 24*sin(1/2*d*x + 1/2*c))*cos(2*d*x + 2*c) + 18
*(19*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sq
rt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 19*sqrt(
2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 19*sqrt(2)*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 19*sqrt(2)*log(2*cos(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2
*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 57*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 57*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 32*sin(1/2*d*x
+ 1/2*c))*cos(d*x + c) - 160*(3*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 2
88*cos(3/2*d*x + 3/2*c)*sin(d*x + c) - 1152*cos(1/2*d*x + 1/2*c)*sin(d*x +
c) + 57*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 57*sq
rt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 57*sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
+ 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 57*sqrt(2)*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
- 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 171*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 171*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 192*sin(1
/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 9*(45*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x
+ 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2
) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
+ 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*cos(d*x + c)^2 + 6*(5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - 5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x
+ 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*
c) + 2) + 5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
- 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 5
*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 15*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) +
15*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1) + 8*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 5*sqrt(2)*log(2*cos(1/2*
d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c)

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+ 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)
*sin(1/2*d*x + 1/2*c) + 2) + 5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*
x + 1/2*c) + 2) - 5*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) - 15*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c) + 1) + 15*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
 2*sin(1/2*d*x + 1/2*c) + 1) + 16*sin(1/2*d*x + 1/2*c))*sin(d*x + c) - 6*co
s(1/2*d*x + 1/2*c))*sin(3*d*x + 3*c) - 12*(40*(3*cos(d*x + c) + 1)*cos(2*d*
x + 2*c)^2 + 48*cos(2*d*x + 2*c)^3 + 27*cos(d*x + c)^3 + 16*(3*cos(2*d*x +
2*c) + 3*cos(d*x + c) + 1)*sin(2*d*x + 2*c)^2 + 9*(3*cos(d*x + c) + 1)*sin(
d*x + c)^2 + (99*cos(d*x + c)^2 + 27*sin(d*x + c)^2 + 66*cos(d*x + c) + 11)
*cos(2*d*x + 2*c) + 27*cos(d*x + c)^2 + 24*((3*cos(d*x + c) + 1)*sin(d*x +
c) + 3*cos(2*d*x + 2*c)*sin(d*x + c))*sin(2*d*x + 2*c) + 9*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c) + 2*(567*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*s
in(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*
d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2
)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x +
 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(d*x + c)^3 + 12*(63*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x +
1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) +
 sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(
2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x
 + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
d*x + c) - 16*cos(3/2*d*x + 3/2*c) - 24*cos(1/2*d*x + 1/2*c))*cos(2*d*x + 2
*c)^2 - 162*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 96*(3*cos(d*x + c) + 1)*s
in(3/2*d*x + 3/2*c)*sin(d*x + c) - 594*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
- 48*(4*(3*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2*c) + 9*cos(d*x + c)*cos(1/2*
d*x + 1/2*c) - 9*(3*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
 + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2
*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(
2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(
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1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x +
c) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sq
rt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*
log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c)
 + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*
sin(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1
/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + sin(1/2*d*x + 1/2*c))*sin
(d*x + c) - 12*sin(3/2*d*x + 3/2*c)*sin(d*x + c) + 3*cos(1/2*d*x + 1/2*c))*
cos(2*d*x + 2*c) - 8*(45*cos(d*x + c)^2 + 81*sin(d*x + c)^2 + 30*cos(d*x +
c) + 5)*cos(3/2*d*x + 3/2*c) - 108*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + 9*(6
3*(sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt
(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2
 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*si
n(1/2*d*x + 1/2*c) + 2) - 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 3*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(d*x + c)^2 + 6*(7*sqrt(2
)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1
/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 7*sqrt(2)*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 7*sqrt(2)*log(2*cos(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sq
rt(2)*sin(1/2*d*x + 1/2*c) + 2) - 7*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) - 21*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 21*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*
d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 8*sin(1/2*d*x + 1/2*c))*cos(
d*x + c) + 7*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^
2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
7*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 7*sqrt(2)*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 7*sqrt(2)*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 21*log(cos(1/2*d*x + 1/2*c)^2 + s
```

in(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 21*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 16*sin(1/2*d*x + 1/2*c))*sin(d*x + c) - 18*cos(1/2*d*x + 1/2*c))*sin(2*d*x + 2*c) + 16*(27*cos(d*x + c)^3 + 9*(3*cos(d*x + c) + 1)*sin(d*x + c)^2 + 27*cos(d*x + c)^2 + 9*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c) - 36*(9*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + 6*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + cos(1/2*d*x + 1/2*c))*sin(d*x + c) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 3*sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) + 9*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) + 12*sin(1/2*d*x + 1/2*c))/((16*sqrt(2)*a*cos(3*d*x + 3*c)^4 + 144*sqrt(2)*a*cos(2*d*x + 2*c)^4 + 81*sqrt(2)*a*cos(d*x + c)^4 + 16*sqrt(2)*a*sin(3*d*x + 3*c)^4 + 144*sqrt(2)*a*sin(2*d*x + 2*c)^4 + 504*sqrt(2)*a*sin(2*d*x + 2*c)^3*sin(d*x + c) + 81*sqrt(2)*a*sin(d*x + c)^4 + 108*sqrt(2)*a*cos(d*x + c)^3 + 8*(16*sqrt(2)*a*cos(2*d*x + 2*c) + 15*sqrt(2)*a*cos(d*x + c) + 5*sqrt(2)*a)*cos(3*d*x + 3*c)^3 + 168*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c)^3 + 8*(16*sqrt(2)*a*sin(2*d*x + 2*c) + 15*sqrt(2)*a*sin(d*x + c))*sin(3*d*x + 3*c)^3 + 54*sqrt(2)*a*cos(d*x + c)^2 + (sqrt(2)*a*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*a*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*a*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*a*sin(d*x + c)^2 + 6*sqrt(2)*a*cos(d*x + c) + 2*(3*sqrt(2)*a*cos(2*d*x + 2*c) + 3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c) + 6*(sqrt(2)*a*sin(2*d*x + 2*c) + sqrt(2)*a*sin(d*x + c))*sin(3*d*x + 3*c) + sqrt(2)*a)*cos(5*d*x + 5*c)^2 + 9*(sqrt(2)*a*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*a*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*a*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*a*sin(d*x + c)^2 + 6*sqrt(2)*a*cos(d*x + c) + 2*(3*sqrt(2)*a*cos(2*d*x + 2*c) + 3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c) + 6*(sqrt(2)*a*sin(2*d*x + 2*c) + sqrt(2)*a*sin(d*x + c))*sin(3*d*x + 3*c) + sqrt(2)*a)*cos(4*d*x + 4*c)^2 + (352*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 297*sqrt(2)*a*cos(d*x + c)^2 + 160*sqrt(2)*a*sin(2*d*x + 2*c)^2 + 312*sqrt(2)*a*sin(2*d*x + 2*c)*sin(d*x + c) + 153*sqrt(2)*a*sin(d*x + c)^2 + 198*sqrt(2)*a*cos(d*x + c) + 216*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c) + 33*sqrt(2)*a)*cos(3*d*x + 3*c)^2 + (657*sqrt(2)*a*cos(d*x + c)^2 + 225*sqrt(2)*a*sin(d*x + c)^2 + 438*sqrt(2)*a*cos(d*x + c) + 73*sqrt(2)*a)*cos(2*d*x + 2*c)^2 + (sqrt(2)*a*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 9*sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(3*d*x + 3*c)^2 + 9*sqr

t(2)*a*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*a*sin(2*d*x + 2*c)*sin(d*x + c) + 9*
sqrt(2)*a*sin(d*x + c)^2 + 6*sqrt(2)*a*cos(d*x + c) + 2*(3*sqrt(2)*a*cos(2*
d*x + 2*c) + 3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(3*d*x + 3*c) + 6*(3*
sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c) + 6*(sqrt(2)*a*sin(2*d
*x + 2*c) + sqrt(2)*a*sin(d*x + c))*sin(3*d*x + 3*c) + sqrt(2)*a)*sin(5*d*x
 + 5*c)^2 + 9*(sqrt(2)*a*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*a*cos(2*d*x + 2*c)^
2 + 9*sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*a
*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*a*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2
)*a*sin(d*x + c)^2 + 6*sqrt(2)*a*cos(d*x + c) + 2*(3*sqrt(2)*a*cos(2*d*x +
2*c) + 3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(3*d*x + 3*c) + 6*(3*sqrt(2
)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c) + 6*(sqrt(2)*a*sin(2*d*x + 2
*c) + sqrt(2)*a*sin(d*x + c))*sin(3*d*x + 3*c) + sqrt(2)*a)*sin(4*d*x + 4*c
)^2 + (32*sqrt(2)*a*cos(3*d*x + 3*c)^2 + 160*sqrt(2)*a*cos(2*d*x + 2*c)^2 +
 153*sqrt(2)*a*cos(d*x + c)^2 + 352*sqrt(2)*a*sin(2*d*x + 2*c)^2 + 648*sqrt
(2)*a*sin(2*d*x + 2*c)*sin(d*x + c) + 297*sqrt(2)*a*sin(d*x + c)^2 + 102*sq
rt(2)*a*cos(d*x + c) + 8*(16*sqrt(2)*a*cos(2*d*x + 2*c) + 15*sqrt(2)*a*cos(
d*x + c) + 5*sqrt(2)*a)*cos(3*d*x + 3*c) + 104*(3*sqrt(2)*a*cos(d*x + c) +
sqrt(2)*a)*cos(2*d*x + 2*c) + 17*sqrt(2)*a)*sin(3*d*x + 3*c)^2 + (288*sqrt(
2)*a*cos(2*d*x + 2*c)^2 + 225*sqrt(2)*a*cos(d*x + c)^2 + 657*sqrt(2)*a*sin(
d*x + c)^2 + 150*sqrt(2)*a*cos(d*x + c) + 168*(3*sqrt(2)*a*cos(d*x + c) + s
qrt(2)*a)*cos(2*d*x + 2*c) + 25*sqrt(2)*a)*sin(2*d*x + 2*c)^2 + 18*(9*sqrt(
2)*a*cos(d*x + c)^2 + 6*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(d*x + c)^2
+ 12*sqrt(2)*a*cos(d*x + c) + 2*(4*sqrt(2)*a*cos(3*d*x + 3*c)^3 + 36*sqrt(2
)*a*cos(2*d*x + 2*c)^3 + 27*sqrt(2)*a*cos(d*x + c)^3 + 27*sqrt(2)*a*cos(d*x
 + c)^2 + (28*sqrt(2)*a*cos(2*d*x + 2*c) + 27*sqrt(2)*a*cos(d*x + c) + 9*sq
rt(2)*a)*cos(3*d*x + 3*c)^2 + 33*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos
(2*d*x + 2*c)^2 + (4*sqrt(2)*a*cos(3*d*x + 3*c) + 4*sqrt(2)*a*cos(2*d*x + 2
*c) + 3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(3*d*x + 3*c)^2 + 9*(4*sqrt(
2)*a*cos(2*d*x + 2*c) + 3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(2*d*x + 2
c)^2 + 9(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(d*x + c)^2 + 9*sqrt(2)
*a*cos(d*x + c) + 3*(sqrt(2)*a*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*a*cos(2*d*x +
 2*c)^2 + 9*sqrt(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(3*d*x + 3*c)^2 + 9*sqr
t(2)*a*sin(2*d*x + 2*c)^2 + 18*sqrt(2)*a*sin(2*d*x + 2*c)*sin(d*x + c) + 9*
sqrt(2)*a*sin(d*x + c)^2 + 6*sqrt(2)*a*cos(d*x + c) + 2*(3*sqrt(2)*a*cos(2*
d*x + 2*c) + 3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(3*d*x + 3*c) + 6*(3*
sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c) + 6*(sqrt(2)*a*sin(2*d
*x + 2*c) + sqrt(2)*a*sin(d*x + c))*sin(3*d*x + 3*c) + sqrt(2)*a)*cos(4*d*x
 + 4*c) + 2*(30*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 27*sqrt(2)*a*cos(d*x + c)^2
+ 18*sqrt(2)*a*sin(2*d*x + 2*c)^2 + 36*sqrt(2)*a*sin(2*d*x + 2*c)*sin(d*x +
 c) + 18*sqrt(2)*a*sin(d*x + c)^2 + 18*sqrt(2)*a*cos(d*x + c) + 19*(3*sqrt(
2)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c) + 3*sqrt(2)*a)*cos(3*d*x +
3*c) + 2*(45*sqrt(2)*a*cos(d*x + c)^2 + 18*sqrt(2)*a*sin(d*x + c)^2 + 30*sq
rt(2)*a*cos(d*x + c) + 5*sqrt(2)*a)*cos(2*d*x + 2*c) + 6*(4*sqrt(2)*a*cos(2
*d*x + 2*c)*sin(d*x + c) + 4*(sqrt(2)*a*sin(2*d*x + 2*c) + sqrt(2)*a*sin(d*
x + c))*cos(3*d*x + 3*c) + (4*sqrt(2)*a*cos(2*d*x + 2*c) + 3*sqrt(2)*a*cos(

d*x + c) + sqrt(2)*a)*sin(2*d*x + 2*c) + (3*sqrt(2)*a*cos(d*x + c) + sqrt(2
)*a)*sin(d*x + c))*sin(3*d*x + 3*c) + 18*(4*sqrt(2)*a*cos(2*d*x + 2*c)*sin(
d*x + c) + (3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(d*x + c))*sin(2*d*x +
 2*c) + sqrt(2)*a)*cos(5*d*x + 5*c) + 6*(4*sqrt(2)*a*cos(3*d*x + 3*c)^3 + 3
6*sqrt(2)*a*cos(2*d*x + 2*c)^3 + 27*sqrt(2)*a*cos(d*x + c)^3 + 27*sqrt(2)*a
*cos(d*x + c)^2 + (28*sqrt(2)*a*cos(2*d*x + 2*c) + 27*sqrt(2)*a*cos(d*x + c
) + 9*sqrt(2)*a)*cos(3*d*x + 3*c)^2 + 33*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2
)*a)*cos(2*d*x + 2*c)^2 + (4*sqrt(2)*a*cos(3*d*x + 3*c) + 4*sqrt(2)*a*cos(2
*d*x + 2*c) + 3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(3*d*x + 3*c)^2 + 9*
(4*sqrt(2)*a*cos(2*d*x + 2*c) + 3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(2
*d*x + 2*c)^2 + 9*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(d*x + c)^2 + 9
*sqrt(2)*a*cos(d*x + c) + 2*(30*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 27*sqrt(2)*a
*cos(d*x + c)^2 + 18*sqrt(2)*a*sin(2*d*x + 2*c)^2 + 36*sqrt(2)*a*sin(2*d*x
+ 2*c)*sin(d*x + c) + 18*sqrt(2)*a*sin(d*x + c)^2 + 18*sqrt(2)*a*cos(d*x +
c) + 19*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c) + 3*sqrt(2)
*a)*cos(3*d*x + 3*c) + 2*(45*sqrt(2)*a*cos(d*x + c)^2 + 18*sqrt(2)*a*sin(d*
x + c)^2 + 30*sqrt(2)*a*cos(d*x + c) + 5*sqrt(2)*a)*cos(2*d*x + 2*c) + 6*(4
*sqrt(2)*a*cos(2*d*x + 2*c)*sin(d*x + c) + 4*(sqrt(2)*a*sin(2*d*x + 2*c) +
sqrt(2)*a*sin(d*x + c))*cos(3*d*x + 3*c) + (4*sqrt(2)*a*cos(2*d*x + 2*c) +
3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(2*d*x + 2*c) + (3*sqrt(2)*a*cos(d
*x + c) + sqrt(2)*a)*sin(d*x + c))*sin(3*d*x + 3*c) + 18*(4*sqrt(2)*a*cos(2
*d*x + 2*c)*sin(d*x + c) + (3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(d*x +
 c))*sin(2*d*x + 2*c) + sqrt(2)*a)*cos(4*d*x + 4*c) + 2*(192*sqrt(2)*a*cos(
2*d*x + 2*c)^3 + 135*sqrt(2)*a*cos(d*x + c)^3 + 135*sqrt(2)*a*cos(d*x + c)^
2 + 172*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c)^2 + 4*(48*s
qrt(2)*a*cos(2*d*x + 2*c) + 39*sqrt(2)*a*cos(d*x + c) + 13*sqrt(2)*a)*sin(2
*d*x + 2*c)^2 + 45*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(d*x + c)^2 +
45*sqrt(2)*a*cos(d*x + c) + 3*(153*sqrt(2)*a*cos(d*x + c)^2 + 57*sqrt(2)*a*
sin(d*x + c)^2 + 102*sqrt(2)*a*cos(d*x + c) + 17*sqrt(2)*a)*cos(2*d*x + 2*c
) + 24*(15*sqrt(2)*a*cos(2*d*x + 2*c)*sin(d*x + c) + 4*(3*sqrt(2)*a*cos(d*x
 + c) + sqrt(2)*a)*sin(d*x + c))*sin(2*d*x + 2*c) + 5*sqrt(2)*a)*cos(3*d*x
+ 3*c) + 14*(27*sqrt(2)*a*cos(d*x + c)^3 + 27*sqrt(2)*a*cos(d*x + c)^2 + 9*
(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(d*x + c)^2 + 9*sqrt(2)*a*cos(d*x
 + c) + sqrt(2)*a)*cos(2*d*x + 2*c) + 2*(4*sqrt(2)*a*sin(3*d*x + 3*c)^3 + 3
6*sqrt(2)*a*sin(2*d*x + 2*c)^3 + 27*sqrt(2)*a*cos(2*d*x + 2*c)^2sin(d*x +
c) + 99*sqrt(2)*a*sin(2*d*x + 2*c)^2*sin(d*x + c) + 27*sqrt(2)*a*sin(d*x +
c)^3 + (4*sqrt(2)*a*sin(2*d*x + 2*c) + 3*sqrt(2)*a*sin(d*x + c))*cos(3*d*x
+ 3*c)^2 + (28*sqrt(2)*a*sin(2*d*x + 2*c) + 27*sqrt(2)*a*sin(d*x + c))*sin(
3*d*x + 3*c)^2 + 18*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c)
*sin(d*x + c) + 2*(9*sqrt(2)*a*cos(2*d*x + 2*c)*sin(d*x + c) + 4*(3*sqrt(2)
*a*cos(2*d*x + 2*c) + 3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(2*d*x + 2*c
) + 3*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(d*x + c))*cos(3*d*x + 3*c)
 + 3*(sqrt(2)*a*cos(3*d*x + 3*c)^2 + 9*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 9*sqr
t(2)*a*cos(d*x + c)^2 + sqrt(2)*a*sin(3*d*x + 3*c)^2 + 9*sqrt(2)*a*sin(2*d*
x + 2*c)^2 + 18*sqrt(2)*a*sin(2*d*x + 2*c)*sin(d*x + c) + 9*sqrt(2)*a*sin(d

*x + c)^2 + 6*sqrt(2)*a*cos(d*x + c) + 2*(3*sqrt(2)*a*cos(2*d*x + 2*c) + 3*
sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(3*d*x + 3*c) + 6*(3*sqrt(2)*a*cos(d
*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c) + 6*(sqrt(2)*a*sin(2*d*x + 2*c) + sqr
t(2)*a*sin(d*x + c))*sin(3*d*x + 3*c) + sqrt(2)*a)*sin(4*d*x + 4*c) + 2*(2*
sqrt(2)*a*cos(3*d*x + 3*c)^2 + 18*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 18*sqrt(2)
*a*cos(d*x + c)^2 + 30*sqrt(2)*a*sin(2*d*x + 2*c)^2 + 57*sqrt(2)*a*sin(2*d*
x + 2*c)*sin(d*x + c) + 27*sqrt(2)*a*sin(d*x + c)^2 + 12*sqrt(2)*a*cos(d*x
+ c) + 4*(3*sqrt(2)*a*cos(2*d*x + 2*c) + 3*sqrt(2)*a*cos(d*x + c) + sqrt(2)
*a)*cos(3*d*x + 3*c) + 12*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x
+ 2*c) + 2*sqrt(2)*a)*sin(3*d*x + 3*c) + 2*(18*sqrt(2)*a*cos(2*d*x + 2*c)^2
 + 18*sqrt(2)*a*cos(d*x + c)^2 + 45*sqrt(2)*a*sin(d*x + c)^2 + 12*sqrt(2)*a
*cos(d*x + c) + 12*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c)
+ 2*sqrt(2)*a)*sin(2*d*x + 2*c) + 3*(9*sqrt(2)*a*cos(d*x + c)^2 + 6*sqrt(2)
*a*cos(d*x + c) + sqrt(2)*a)*sin(d*x + c))*sin(5*d*x + 5*c) + 6*(4*sqrt(2)*
a*sin(3*d*x + 3*c)^3 + 36*sqrt(2)*a*sin(2*d*x + 2*c)^3 + 27*sqrt(2)*a*cos(2
*d*x + 2*c)^2*sin(d*x + c) + 99*sqrt(2)*a*sin(2*d*x + 2*c)^2*sin(d*x + c) +
 27*sqrt(2)*a*sin(d*x + c)^3 + (4*sqrt(2)*a*sin(2*d*x + 2*c) + 3*sqrt(2)*a*
sin(d*x + c))*cos(3*d*x + 3*c)^2 + (28*sqrt(2)*a*sin(2*d*x + 2*c) + 27*sqrt
(2)*a*sin(d*x + c))*sin(3*d*x + 3*c)^2 + 18*(3*sqrt(2)*a*cos(d*x + c) + sqr
t(2)*a)*cos(2*d*x + 2*c)*sin(d*x + c) + 2*(9*sqrt(2)*a*cos(2*d*x + 2*c)*sin
(d*x + c) + 4*(3*sqrt(2)*a*cos(2*d*x + 2*c) + 3*sqrt(2)*a*cos(d*x + c) + sq
rt(2)*a)*sin(2*d*x + 2*c) + 3*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(d*
x + c))*cos(3*d*x + 3*c) + 2*(2*sqrt(2)*a*cos(3*d*x + 3*c)^2 + 18*sqrt(2)*a
*cos(2*d*x + 2*c)^2 + 18*sqrt(2)*a*cos(d*x + c)^2 + 30*sqrt(2)*a*sin(2*d*x
+ 2*c)^2 + 57*sqrt(2)*a*sin(2*d*x + 2*c)*sin(d*x + c) + 27*sqrt(2)*a*sin(d*
x + c)^2 + 12*sqrt(2)*a*cos(d*x + c) + 4*(3*sqrt(2)*a*cos(2*d*x + 2*c) + 3*
sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(3*d*x + 3*c) + 12*(3*sqrt(2)*a*cos(
d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c) + 2*sqrt(2)*a)*sin(3*d*x + 3*c) + 2*
(18*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 18*sqrt(2)*a*cos(d*x + c)^2 + 45*sqrt(2)
*a*sin(d*x + c)^2 + 12*sqrt(2)*a*cos(d*x + c) + 12*(3*sqrt(2)*a*cos(d*x + c
) + sqrt(2)*a)*cos(2*d*x + 2*c) + 2*sqrt(2)*a)*sin(2*d*x + 2*c) + 3*(9*sqrt
(2)*a*cos(d*x + c)^2 + 6*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(d*x + c))*
sin(4*d*x + 4*c) + 2*(192*sqrt(2)*a*sin(2*d*x + 2*c)^3 + 156*sqrt(2)*a*cos(
2*d*x + 2*c)^2*sin(d*x + c) + 516*sqrt(2)*a*sin(2*d*x + 2*c)^2*sin(d*x + c)
 + 135*sqrt(2)*a*sin(d*x + c)^3 + 4*(16*sqrt(2)*a*sin(2*d*x + 2*c) + 15*sqr
t(2)*a*sin(d*x + c))*cos(3*d*x + 3*c)^2 + 96*(3*sqrt(2)*a*cos(d*x + c) + sq
rt(2)*a)*cos(2*d*x + 2*c)*sin(d*x + c) + 8*(21*sqrt(2)*a*cos(2*d*x + 2*c)*s
in(d*x + c) + (24*sqrt(2)*a*cos(2*d*x + 2*c) + 21*sqrt(2)*a*cos(d*x + c) +
7*sqrt(2)*a)*sin(2*d*x + 2*c) + 6*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*si
n(d*x + c))*cos(3*d*x + 3*c) + (192*sqrt(2)*a*cos(2*d*x + 2*c)^2 + 171*sqrt
(2)*a*cos(d*x + c)^2 + 459*sqrt(2)*a*sin(d*x + c)^2 + 114*sqrt(2)*a*cos(d*x
 + c) + 120*(3*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c) + 19*sq
rt(2)*a)*sin(2*d*x + 2*c) + 15*(9*sqrt(2)*a*cos(d*x + c)^2 + 6*sqrt(2)*a*co
s(d*x + c) + sqrt(2)*a)*sin(d*x + c))*sin(3*d*x + 3*c) + 6*(84*sqrt(2)*a*co
s(2*d*x + 2*c)^2*sin(d*x + c) + 63*sqrt(2)*a*sin(d*x + c)^3 + 48*(3*sqrt(2)

```
*a*cos(d*x + c) + sqrt(2)*a)*cos(2*d*x + 2*c)*sin(d*x + c) + 7*(9*sqrt(2)*a
*cos(d*x + c)^2 + 6*sqrt(2)*a*cos(d*x + c) + sqrt(2)*a)*sin(d*x + c))*sin(2
*d*x + 2*c) + sqrt(2)*a)*sqrt(a)*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{\cos(c+d\,x)^2\,(a+a\,\cos(c+d\,x))^{3/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^2*(a + a*cos(c + d*x))^(3/2)),x)
```

```
[Out] int(1/(cos(c + d*x)^2*(a + a*cos(c + d*x))^(3/2)), x)
```

3.138 $\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 185

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{19\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4a^{3/2}d} - \frac{13\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{7\tan(c+dx)}{4ad\sqrt{a+a\cos(c+dx)}} - \frac{\sec(c+dx)\tan(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{\sec(c+dx)\tan(c+dx)}{ad\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 19/4*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(3/2)/d-13/4*arctanh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(3/2)/d*2^(1/2)-1/2*sec(d*x+c)*tan(d*x+c)/d/(a+a*cos(d*x+c))^(3/2)-7/4*tan(d*x+c)/a/d/(a+a*cos(d*x+c))^(1/2)+sec(d*x+c)*tan(d*x+c)/a/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.59 (sec) , antiderivative size = 185, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2845, 3063, 3064, 2728, 212, 2852}

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{19\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{4a^{3/2}d} - \frac{13\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{7\tan(c+dx)}{4ad\sqrt{a\cos(c+dx)+a}} + \frac{\tan(c+dx)\sec(c+dx)}{ad\sqrt{a\cos(c+dx)+a}} - \frac{\tan(c+dx)\sec(c+dx)}{2d(a\cos(c+dx)+a)^{3/2}}$$

```
[In] Int[Sec[c + d*x]^3/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (19*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(4*a^(3/2)*d)
 - (13*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])])/
(2*Sqrt[2]*a^(3/2)*d) - (7*Tan[c + d*x])/(4*a*d*Sqrt[a + a*Cos[c + d*x]]) -
 (Sec[c + d*x]*Tan[c + d*x])/(2*d*(a + a*Cos[c + d*x])^(3/2)) + (Sec[c + d*
x]*Tan[c + d*x])/(a*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
```

```
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rule 3064

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[(A
*b - a*B)/(b*c - a*d), Int[1/Sqrt[a + b*Sin[e + f*x]], x], x] + Dist[(B*c -
 A*d)/(b*c - a*d), Int[Sqrt[a + b*Sin[e + f*x]]/(c + d*Sin[e + f*x]), x], x
] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = -\frac{\sec(c+dx)\tan(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{\int \frac{\left(4a-\frac{5}{2}a\cos(c+dx)\right)\sec^3(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{2a^2}$$

$$= -\frac{\sec(c+dx)\tan(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{\sec(c+dx)\tan(c+dx)}{ad\sqrt{a+a\cos(c+dx)}} + \frac{\int \frac{(-7a^2+6a^2\cos(c+dx))\sec^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{4a^3}$$

$$= -\frac{7\tan(c+dx)}{4ad\sqrt{a+a\cos(c+dx)}} - \frac{\sec(c+dx)\tan(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{\sec(c+dx)\tan(c+dx)}{ad\sqrt{a+a\cos(c+dx)}} + \frac{\int \frac{\left(\frac{19a^3}{2}-\frac{7}{2}a^3\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{4a^4}$$

$$= -\frac{7\tan(c+dx)}{4ad\sqrt{a+a\cos(c+dx)}} - \frac{\sec(c+dx)\tan(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{\sec(c+dx)\tan(c+dx)}{ad\sqrt{a+a\cos(c+dx)}} + \frac{19\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx}{8a^2} - \frac{13\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx}{4a}$$

$$= -\frac{7\tan(c+dx)}{4ad\sqrt{a+a\cos(c+dx)}} - \frac{\sec(c+dx)\tan(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{\sec(c+dx)\tan(c+dx)}{ad\sqrt{a+a\cos(c+dx)}} - \frac{19\text{Subst}\left(\int \frac{1}{a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4ad} + \frac{13\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{2ad}$$

$$= \frac{19\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4a^{3/2}d} - \frac{13\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{7\tan(c+dx)}{4ad\sqrt{a+a\cos(c+dx)}} - \frac{\sec(c+dx)\tan(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{\sec(c+dx)\tan(c+dx)}{ad\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.93 (sec) , antiderivative size = 841, normalized size of antiderivative = 4.55

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{19\cos^3\left(\frac{c}{2}+\frac{dx}{2}\right)\left(\frac{ie^{ic}x}{-1+e^{ic}}-\frac{\log\left(i-\sqrt{2}e^{\frac{1}{2}i(c+dx)}-ie^{i(c+dx)}\right)}{d}\right)}{2\sqrt{2}(a(1+\cos(c+dx)))^{3/2}}$$
$$+\frac{19\cos^3\left(\frac{c}{2}+\frac{dx}{2}\right)\left(-\frac{ie^{ic}x}{-1+e^{ic}}+\frac{\log\left(i+\sqrt{2}e^{\frac{1}{2}i(c+dx)}-ie^{i(c+dx)}\right)}{d}\right)}{2\sqrt{2}(a(1+\cos(c+dx)))^{3/2}}$$
$$+\frac{13\cos^3\left(\frac{c}{2}+\frac{dx}{2}\right)\log\left(\cos\left(\frac{c}{4}+\frac{dx}{4}\right)-\sin\left(\frac{c}{4}+\frac{dx}{4}\right)\right)}{d(a(1+\cos(c+dx)))^{3/2}}$$
$$-\frac{13\cos^3\left(\frac{c}{2}+\frac{dx}{2}\right)\log\left(\cos\left(\frac{c}{4}+\frac{dx}{4}\right)+\sin\left(\frac{c}{4}+\frac{dx}{4}\right)\right)}{d(a(1+\cos(c+dx)))^{3/2}}$$
$$-\frac{\cos^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{2d(a(1+\cos(c+dx)))^{3/2}\left(\cos\left(\frac{c}{4}+\frac{dx}{4}\right)-\sin\left(\frac{c}{4}+\frac{dx}{4}\right)\right)^2}$$
$$+\frac{\cos^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{2d(a(1+\cos(c+dx)))^{3/2}\left(\cos\left(\frac{c}{4}+\frac{dx}{4}\right)+\sin\left(\frac{c}{4}+\frac{dx}{4}\right)\right)^2}$$
$$+\frac{\cos^3\left(\frac{c}{2}+\frac{dx}{2}\right)\sin\left(\frac{dx}{2}\right)}{d(a(1+\cos(c+dx)))^{3/2}\left(\cos\left(\frac{c}{2}\right)-\sin\left(\frac{c}{2}\right)\right)\left(\cos\left(\frac{c}{2}+\frac{dx}{2}\right)-\sin\left(\frac{c}{2}+\frac{dx}{2}\right)\right)^2}$$
$$+\frac{\cos^3\left(\frac{c}{2}+\frac{dx}{2}\right)\left(-5\cos\left(\frac{c}{2}\right)+7\sin\left(\frac{c}{2}\right)\right)}{2d(a(1+\cos(c+dx)))^{3/2}\left(\cos\left(\frac{c}{2}\right)-\sin\left(\frac{c}{2}\right)\right)\left(\cos\left(\frac{c}{2}+\frac{dx}{2}\right)-\sin\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}$$
$$+\frac{\cos^3\left(\frac{c}{2}+\frac{dx}{2}\right)\sin\left(\frac{dx}{2}\right)}{d(a(1+\cos(c+dx)))^{3/2}\left(\cos\left(\frac{c}{2}\right)+\sin\left(\frac{c}{2}\right)\right)\left(\cos\left(\frac{c}{2}+\frac{dx}{2}\right)+\sin\left(\frac{c}{2}+\frac{dx}{2}\right)\right)^2}$$
$$+\frac{\cos^3\left(\frac{c}{2}+\frac{dx}{2}\right)\left(5\cos\left(\frac{c}{2}\right)+7\sin\left(\frac{c}{2}\right)\right)}{2d(a(1+\cos(c+dx)))^{3/2}\left(\cos\left(\frac{c}{2}\right)+\sin\left(\frac{c}{2}\right)\right)\left(\cos\left(\frac{c}{2}+\frac{dx}{2}\right)+\sin\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}$$

```
[In] Integrate[Sec[c + d*x]^3/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (19*Cos[c/2 + (d*x)/2]^3*((I*E^(I*c)*x)/(-1 + E^(I*c)) - Log[I - Sqrt[2]*E^
((I/2)*(c + d*x)) - I*E^(I*(c + d*x))]/d))/(2*Sqrt[2]*(a*(1 + Cos[c + d*x])
)^(3/2)) + (19*Cos[c/2 + (d*x)/2]^3*(((-I)*E^(I*c)*x)/(-1 + E^(I*c)) + Log[
I + Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))]/d))/(2*Sqrt[2]*(a*(1 +
 Cos[c + d*x]))^(3/2)) + (13*Cos[c/2 + (d*x)/2]^3*Log[Cos[c/4 + (d*x)/4] -
Sin[c/4 + (d*x)/4]])/(d*(a*(1 + Cos[c + d*x]))^(3/2)) - (13*Cos[c/2 + (d*x)
/2]^3*Log[Cos[c/4 + (d*x)/4] + Sin[c/4 + (d*x)/4]])/(d*(a*(1 + Cos[c + d*x]
))^(3/2)) - Cos[c/2 + (d*x)/2]^3/(2*d*(a*(1 + Cos[c + d*x]))^(3/2)*(Cos[c/4
 + (d*x)/4] - Sin[c/4 + (d*x)/4])^2) + Cos[c/2 + (d*x)/2]^3/(2*d*(a*(1 + Co
s[c + d*x]))^(3/2)*(Cos[c/4 + (d*x)/4] + Sin[c/4 + (d*x)/4])^2) + (Cos[c/2
```

```
+ (d*x)/2]^3*Sin[(d*x)/2])/(d*(a*(1 + Cos[c + d*x]))^(3/2)*(Cos[c/2] - Sin[
c/2])*(Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2])^2) + (Cos[c/2 + (d*x)/2]^3*
(-5*Cos[c/2] + 7*Sin[c/2]))/(2*d*(a*(1 + Cos[c + d*x]))^(3/2)*(Cos[c/2] - S
in[c/2])*(Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2])) + (Cos[c/2 + (d*x)/2]^3
*Sin[(d*x)/2])/(d*(a*(1 + Cos[c + d*x]))^(3/2)*(Cos[c/2] + Sin[c/2])*(Cos[c
/2 + (d*x)/2] + Sin[c/2 + (d*x)/2])^2) + (Cos[c/2 + (d*x)/2]^3*(5*Cos[c/2]
+ 7*Sin[c/2]))/(2*d*(a*(1 + Cos[c + d*x]))^(3/2)*(Cos[c/2] + Sin[c/2])*(Cos
[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2]))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 806 vs. $2(156) = 312$.

Time = 1.81 (sec) , antiderivative size = 807, normalized size of antiderivative = 4.36

method	result	size
default	Expression too large to display	807

```
[In] int(sec(d*x+c)^3/(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(104*2^(1/2)*ln(2*(2*a^(1/2)*(a*sin(1/2
*d*x+1/2*c)^2)^(1/2)+2*a)/cos(1/2*d*x+1/2*c))*cos(1/2*d*x+1/2*c)^6*a-76*ln(
-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*
sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*cos(1/2*d*x+1/2*c)^6*a-76*ln(4/(2
*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1
/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*cos(1/2*d*x+1/2*c)^6*a-104*2^(1/2)*ln(
2*(2*a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+2*a)/cos(1/2*d*x+1/2*c))*a*cos(
1/2*d*x+1/2*c)^4+28*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)*cos(1/2*
d*x+1/2*c)^4+76*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x
+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*cos(1/2*d*x+1/
2*c)^4*a+76*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*
c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*cos(1/2*d*x+1/2*c)^
4*a+26*2^(1/2)*ln(2*(2*a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+2*a)/cos(1/2*
d*x+1/2*c))*a*cos(1/2*d*x+1/2*c)^2-22*cos(1/2*d*x+1/2*c)^2*(a*sin(1/2*d*x+1
/2*c)^2)^(1/2)*2^(1/2)*a^(1/2)-19*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(
1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*
a))*cos(1/2*d*x+1/2*c)^2*a-19*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*
a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*c
os(1/2*d*x+1/2*c)^2*a+2*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2))/a^(
5/2)/cos(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)-2^(1/2))^2/(2*cos(1/2*d*x+1/2
*c)+2^(1/2))^2/sin(1/2*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 302, normalized size of antiderivative = 1.63

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{26\sqrt{2}\left(\cos(dx+c)^4+2\cos(dx+c)^3+\cos(dx+c)^2\right)\sqrt{a}\log\left(-\frac{a\cos(dx+c)^2+2\cdots}{\cdots}\right.}{\cdots}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/16*(26*sqrt(2)*(cos(d*x + c)^4 + 2*cos(d*x + c)^3 + cos(d*x + c)^2)*sqrt(
a)*log(-(a*cos(d*x + c)^2 + 2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*sin(
d*x + c) - 2*a*cos(d*x + c) - 3*a)/(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)) +
 19*(cos(d*x + c)^4 + 2*cos(d*x + c)^3 + cos(d*x + c)^2)*sqrt(a)*log((a*cos
(d*x + c)^3 - 7*a*cos(d*x + c)^2 - 4*sqrt(a*cos(d*x + c) + a)*sqrt(a)*(cos(
d*x + c) - 2)*sin(d*x + c) + 8*a)/(cos(d*x + c)^3 + cos(d*x + c)^2)) - 4*sq
rt(a*cos(d*x + c) + a)*(7*cos(d*x + c)^2 + 3*cos(d*x + c) - 2)*sin(d*x + c)
)/(a^2*d*cos(d*x + c)^4 + 2*a^2*d*cos(d*x + c)^3 + a^2*d*cos(d*x + c)^2)
```

Sympy [F]

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec^3(c+dx)}{(a(\cos(c+dx)+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)**3/(a+a*cos(d*x+c))**(3/2),x)
```

```
[Out] Integral(sec(c + d*x)**3/(a*(cos(c + d*x) + 1))**(3/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Memory limit reached. Please ju
mp to an outer pointer, quit program and enlarge thememory limits before ex
ecuting the program again.
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

[In] integrate(sec(d*x+c)^3/(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^3(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{\cos(c+d\,x)^3\,(a+a\,\cos(c+d\,x))^{3/2}}\,dx$$

[In] int(1/(cos(c + d*x)^3*(a + a*cos(c + d*x))^(3/2)),x)

[Out] int(1/(cos(c + d*x)^3*(a + a*cos(c + d*x))^(3/2)), x)

3.139 $\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 183

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{163\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\cos^3(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{17\cos^2(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} - \frac{197\sin(c+dx)}{24a^2d\sqrt{a+a\cos(c+dx)}} + \frac{95\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{48a^3d}$$

```
[Out] -1/4*cos(d*x+c)^3*sin(d*x+c)/d/(a+a*cos(d*x+c))^(5/2)-17/16*cos(d*x+c)^2*si
n(d*x+c)/a/d/(a+a*cos(d*x+c))^(3/2)+163/32*arctanh(1/2*sin(d*x+c)*a^(1/2)*2
^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(5/2)/d*2^(1/2)-197/24*sin(d*x+c)/a^2/d/(a
+a*cos(d*x+c))^(1/2)+95/48*sin(d*x+c)*(a+a*cos(d*x+c))^(1/2)/a^3/d
```

Rubi [A] (verified)

Time = 0.48 (sec) , antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {2844, 3056, 3047, 3102, 2830, 2728, 212}

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{163\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{95\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{48a^3d} - \frac{197\sin(c+dx)}{24a^2d\sqrt{a\cos(c+dx)+a}} - \frac{\sin(c+dx)\cos^3(c+dx)}{4d(a\cos(c+dx)+a)^{5/2}} - \frac{17\sin(c+dx)\cos^2(c+dx)}{16ad(a\cos(c+dx)+a)^{3/2}}$$

```
[In] Int[Cos[c + d*x]^4/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (163*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])])/(1
6*Sqrt[2]*a^(5/2)*d) - (Cos[c + d*x]^3*Sin[c + d*x])/(4*d*(a + a*Cos[c + d*
x])^(5/2)) - (17*Cos[c + d*x]^2*Sin[c + d*x])/(16*a*d*(a + a*Cos[c + d*x])^
(3/2)) - (197*Sin[c + d*x])/(24*a^2*d*Sqrt[a + a*Cos[c + d*x]]) + (95*Sqrt[
a + a*Cos[c + d*x]]*Sin[c + d*x])/(48*a^3*d)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\text{integral} = -\frac{\cos^3(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{\int \frac{\cos^2(c+dx)\left(3a-\frac{11}{2}a\cos(c+dx)\right)}{(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2}$$

$$= -\frac{\cos^3(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{17\cos^2(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} - \frac{\int \frac{\cos(c+dx)\left(17a^2-\frac{95}{4}a^2\cos(c+dx)\right)}{\sqrt{a+a\cos(c+dx)}}\,dx}{8a^4}$$

$$= -\frac{\cos^3(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{17\cos^2(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} - \frac{\int \frac{17a^2\cos(c+dx)-\frac{95}{4}a^2\cos^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{8a^4}$$

$$= -\frac{\cos^3(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{17\cos^2(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{95\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{48a^3d} - \frac{\int \frac{-\frac{95a^3}{8}+\frac{197}{4}a^3\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{12a^5}$$

$$= -\frac{\cos^3(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{17\cos^2(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} - \frac{197\sin(c+dx)}{24a^2d\sqrt{a+a\cos(c+dx)}} + \frac{95\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{48a^3d} + \frac{163\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx}{32a^2}$$

$$=-\frac{\cos^3(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}}-\frac{17\cos^2(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}-\frac{197\sin(c+dx)}{24a^2d\sqrt{a+a\cos(c+dx)}}$$
$$+\frac{95\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{48a^3d}-\frac{163\text{Subst}\left(\int\frac{1}{2a-x^2}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{16a^2d}$$
$$=\frac{163\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d}-\frac{\cos^3(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}}$$
$$-\frac{17\cos^2(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}-\frac{197\sin(c+dx)}{24a^2d\sqrt{a+a\cos(c+dx)}}$$
$$+\frac{95\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{48a^3d}$$

Mathematica [A] (verified)

Time = 0.42 (sec) , antiderivative size = 123, normalized size of antiderivative = 0.67

$$\int\frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx=$$
$$-\frac{\left(-978\sqrt{2}\text{arctanh}\left(\sqrt{\sin^2\left(\frac{1}{2}(c+dx)\right)}\right)\cos^4\left(\frac{1}{2}(c+dx)\right)+\sqrt{1-\cos(c+dx)}(379+479\cos(c+dx)+80\,\mathrm{co}\right.}{48d\sqrt{1-\cos(c+dx)}(a(1+\cos(c+dx)))^{5/2}}$$

```
[In] Integrate[Cos[c + d*x]^4/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] -1/48*((-978*Sqrt[2]*ArcTanh[Sqrt[Sin[(c + d*x)/2]^2]]*Cos[(c + d*x)/2]^4 +
 Sqrt[1 - Cos[c + d*x]]*(379 + 479*Cos[c + d*x] + 80*Cos[2*(c + d*x)] - 8*C
os[3*(c + d*x)]))*Sin[c + d*x])/(d*Sqrt[1 - Cos[c + d*x]]*(a*(1 + Cos[c + d
*x]))^(5/2))
```

Maple [A] (verified)

Time = 1.42 (sec) , antiderivative size = 242, normalized size of antiderivative = 1.32

method	result
default	$\frac{\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(128\sqrt{2}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{a}\left(\cos^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+489\sqrt{2}\ln\left(\frac{4\sqrt{a}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}+4a}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)a\left(\cos^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-512\right.}{96\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^3a^{\frac{7}{2}}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)}$

```
[In] int(cos(d*x+c)^4/(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/96/cos(1/2*d*x+1/2*c)^3*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(128*2^(1/2)*(a*si
n(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)*cos(1/2*d*x+1/2*c)^6+489*2^(1/2)*ln(2*(2*
a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+2*a)/cos(1/2*d*x+1/2*c))*a*cos(1/2*d
```

```
*x+1/2*c)^4-512*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)*cos(1/2*d*x+
1/2*c)^4-87*cos(1/2*d*x+1/2*c)^2*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*2^(1/2)*a^(
1/2)+6*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2))/a^(7/2)/sin(1/2*d*x+
1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 208, normalized size of antiderivative = 1.14

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{489\sqrt{2}\left(\cos\left(dx+c\right)^3+3\,\cos\left(dx+c\right)^2+3\,\cos\left(dx+c\right)+1\right)\sqrt{a}\log\left(-\frac{a\cos(d}{}\right.}{}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/192*(489*sqrt(2)*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)
*sqrt(a)*log(-(a*cos(d*x + c)^2 - 2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a
)*sin(d*x + c) - 2*a*cos(d*x + c) - 3*a)/(cos(d*x + c)^2 + 2*cos(d*x + c) +
 1)) + 4*(32*cos(d*x + c)^3 - 160*cos(d*x + c)^2 - 503*cos(d*x + c) - 299)*
sqrt(a*cos(d*x + c) + a)*sin(d*x + c))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(
d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**4/(a+a*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] Timed out
```

Giac [A] (verification not implemented)

none

Time = 3.30 (sec) , antiderivative size = 122, normalized size of antiderivative = 0.67

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{\frac{3\sqrt{2}\left(29\sqrt{a}\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-27\sqrt{a}\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}{\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)^2a^3\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)} - \frac{128\sqrt{2}\left(a^{\frac{13}{2}}\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+3\,a^{\frac{13}{2}}\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}{a^9\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}}{96\,d}$$

```
[In] integrate(cos(d*x+c)^4/(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] 1/96*(3*sqrt(2)*(29*sqrt(a)*sin(1/2*d*x + 1/2*c)^3 - 27*sqrt(a)*sin(1/2*d*x
 + 1/2*c))/((sin(1/2*d*x + 1/2*c)^2 - 1)^2*a^3*sgn(cos(1/2*d*x + 1/2*c))) -
 128*sqrt(2)*(a^(13/2)*sin(1/2*d*x + 1/2*c)^3 + 3*a^(13/2)*sin(1/2*d*x + 1/
2*c))/(a^9*sgn(cos(1/2*d*x + 1/2*c))))/d
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)^4}{\left(a+a\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int(cos(c + d*x)^4/(a + a*cos(c + d*x))^(5/2),x)
```

```
[Out] int(cos(c + d*x)^4/(a + a*cos(c + d*x))^(5/2), x)
```

3.140 $\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 145

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = -\frac{75\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\cos^2(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{13\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{9\sin(c+dx)}{4a^2d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -1/4*cos(d*x+c)^2*sin(d*x+c)/d/(a+a*cos(d*x+c))^(5/2)+13/16*sin(d*x+c)/a/d/
(a+a*cos(d*x+c))^(3/2)-75/32*arctanh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/(a+a*co
s(d*x+c))^(1/2))/a^(5/2)/d*2^(1/2)+9/4*sin(d*x+c)/a^2/d/(a+a*cos(d*x+c))^(1
/2)
```

Rubi [A] (verified)

Time = 0.32 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2844, 3047, 3098, 2830, 2728, 212}

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = -\frac{75\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{9\sin(c+dx)}{4a^2d\sqrt{a\cos(c+dx)+a}} - \frac{\sin(c+dx)\cos^2(c+dx)}{4d(a\cos(c+dx)+a)^{5/2}} + \frac{13\sin(c+dx)}{16ad(a\cos(c+dx)+a)^{3/2}}$$

```
[In] Int[Cos[c + d*x]^3/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (-75*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])])/(1
6*Sqrt[2]*a^(5/2)*d) - (Cos[c + d*x]^2*Sin[c + d*x])/(4*d*(a + a*Cos[c + d*
```

```
x])^(5/2)) + (13*Sin[c + d*x])/(16*a*d*(a + a*Cos[c + d*x])^(3/2)) + (9*Sin
[c + d*x])/(4*a^2*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3098

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(A*b - a*
B + b*C)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(a*f*(2*m + 1))), x] + Dist[1
/(a^2*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[a*A*(m + 1) + m*(b*
```

```
B - a*C) + b*C*(2*m + 1)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, 
B, C}, x] && LtQ[m, -1] && EqQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = -\frac{\cos^2(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{\int \frac{\cos(c+dx)\left(2a-\frac{9}{2}a\cos(c+dx)\right)}{(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2}$$

$$= -\frac{\cos^2(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{\int \frac{2a\cos(c+dx)-\frac{9}{2}a\cos^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2}$$

$$= -\frac{\cos^2(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{13\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{\int \frac{-\frac{39a^2}{4}+9a^2\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{8a^4}$$

$$= -\frac{\cos^2(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{13\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{9\sin(c+dx)}{4a^2d\sqrt{a+a\cos(c+dx)}} - \frac{75\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx}{32a^2}$$

$$= -\frac{\cos^2(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{13\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{9\sin(c+dx)}{4a^2d\sqrt{a+a\cos(c+dx)}} + \frac{75\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{16a^2d}$$

$$= -\frac{75\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\cos^2(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{13\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{9\sin(c+dx)}{4a^2d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.31 (sec) , antiderivative size = 113, normalized size of antiderivative = 0.78

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{\left(-150\sqrt{2}\text{arctanh}\left(\sqrt{\sin^2\left(\frac{1}{2}(c+dx)\right)}\right)\cos^4\left(\frac{1}{2}(c+dx)\right) + \sqrt{1-\cos(c+dx}\right.}{16d\sqrt{1-\cos(c+dx)}(a(1+\cos(c}$$

```
[In] Integrate[Cos[c + d*x]^3/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] ((-150*Sqrt[2]*ArcTanh[Sqrt[Sin[(c + d*x)/2]^2]]*Cos[(c + d*x)/2]^4 + Sqrt[
1 - Cos[c + d*x]]*(49 + 85*Cos[c + d*x] + 32*Cos[c + d*x]^2))*Sin[c + d*x])
/(16*d*Sqrt[1 - Cos[c + d*x]]*(a*(1 + Cos[c + d*x]))^(5/2))
```

Maple [A] (verified)

Time = 1.40 (sec) , antiderivative size = 208, normalized size of antiderivative = 1.43

method	result
default	$\frac{\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-75\sqrt{2}\,\ln\left(\frac{4\sqrt{a}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}+4a}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)a\left(\cos^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+64\sqrt{2}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{a}\left(\cos^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+21\left(c\right.\right.}{32\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^3 a^{\frac{7}{2}}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$

```
[In] int(cos(d*x+c)^3/(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/32/cos(1/2*d*x+1/2*c)^3*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-75*2^(1/2)*ln(2*
(2*a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+2*a)/cos(1/2*d*x+1/2*c))*a*cos(1/
2*d*x+1/2*c)^4+64*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)*cos(1/2*d*
x+1/2*c)^4+21*cos(1/2*d*x+1/2*c)^2*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*2^(1/2)*a
^(1/2)-2*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2))/a^(7/2)/sin(1/2*d*
x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 198, normalized size of antiderivative = 1.37

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{75\sqrt{2}\left(\cos\left(dx+c\right)^3+3\cos\left(dx+c\right)^2+3\cos\left(dx+c\right)+1\right)\sqrt{a}\log\left(-\frac{a\cos(dx+c\cdots}{\cdots}\right.\cdots}{64\left(a^3d\cos\left(\cdots\right.\right.}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/64*(75*sqrt(2)*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*s
qrt(a)*log(-(a*cos(d*x + c)^2 + 2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*
sin(d*x + c) - 2*a*cos(d*x + c) - 3*a)/(cos(d*x + c)^2 + 2*cos(d*x + c) + 1
)) + 4*sqrt(a*cos(d*x + c) + a)*(32*cos(d*x + c)^2 + 85*cos(d*x + c) + 49)*
sin(d*x + c))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(
d*x + c) + a^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3/(a+a*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] Timed out
```

Giac [A] (verification not implemented)

none

Time = 2.12 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.11

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = -\frac{\frac{75\sqrt{2}\log\left(\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{a^{\frac{5}{2}}\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)} - \frac{75\sqrt{2}\log\left(-\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{a^{\frac{5}{2}}\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)} - \frac{128\sqrt{2}\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{a^{\frac{5}{2}}\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)} + \frac{2\sqrt{2}\left(21\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-19\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}{\left(\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)^2a^{\frac{5}{2}}\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}}{64\,d}$$

```
[In] integrate(cos(d*x+c)^3/(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] -1/64*(75*sqrt(2)*log(sin(1/2*d*x + 1/2*c) + 1)/(a^(5/2)*sgn(cos(1/2*d*x +
1/2*c))) - 75*sqrt(2)*log(-sin(1/2*d*x + 1/2*c) + 1)/(a^(5/2)*sgn(cos(1/2*d
*x + 1/2*c))) - 128*sqrt(2)*sin(1/2*d*x + 1/2*c)/(a^(5/2)*sgn(cos(1/2*d*x +
 1/2*c))) + 2*sqrt(2)*(21*sin(1/2*d*x + 1/2*c)^3 - 19*sin(1/2*d*x + 1/2*c))
/((sin(1/2*d*x + 1/2*c)^2 - 1)^2*a^(5/2)*sgn(cos(1/2*d*x + 1/2*c))))/d
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)^3}{\left(a+a\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int(cos(c + d*x)^3/(a + a*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)^3/(a + a*cos(c + d*x))^(5/2), x)
```

3.141 $\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 107

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{19\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{13\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}$$

```
[Out] 1/4*sin(d*x+c)/d/(a+a*cos(d*x+c))^(5/2)-13/16*sin(d*x+c)/a/d/(a+a*cos(d*x+c
))^(3/2)+19/32*arctanh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/(a+a*cos(d*x+c))^(1/2
))/a^(5/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2837, 2829, 2728, 212}

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{19\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{13\sin(c+dx)}{16ad(a\cos(c+dx)+a)^{3/2}} + \frac{\sin(c+dx)}{4d(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[Cos[c + d*x]^2/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (19*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])])/(16
*Sqrt[2]*a^(5/2)*d) + Sin[c + d*x]/(4*d*(a + a*Cos[c + d*x])^(5/2)) - (13*S
in[c + d*x])/(16*a*d*(a + a*Cos[c + d*x])^(3/2))
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2829

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((a + b*Sin[e + f*
x])^m/(a*f*(2*m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(a*b*(2*m + 1)), In
t[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && N
eQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)]
```

Rule 2837

```
Int[sin[(e_.) + (f_.)*(x_)]^2*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_),
x_Symbol] :> Simp[b*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(a*f*(2*m + 1))),
x] - Dist[1/(a^2*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(a*m - b*(2*m
 + 1)*Sin[e + f*x]), x], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 - b^2, 0]
&& LtQ[m, -2^(-1)]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}}+\frac{\int \frac{-\frac{5a}{2}+4a\cos(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2}\\
&= \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}}-\frac{13\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}+\frac{19\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx}{32a^2}\\
&= \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}}-\frac{13\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}\\
&\quad -\frac{19\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{16a^2d}\\
&= \frac{19\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d}+\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}}-\frac{13\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 104, normalized size of antiderivative = 0.97

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{\left(76\sqrt{2}\text{arctanh}\left(\sqrt{\sin^2\left(\frac{1}{2}(c+dx)\right)}\right)\cos^4\left(\frac{1}{2}(c+dx)\right)-2\sqrt{1-\cos(c+dx)}(9\right.}{32d\sqrt{1-\cos(c+dx)}(a(1+\cos(c+dx)))^{5/2}}$$

```
[In] Integrate[Cos[c + d*x]^2/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] ((76*Sqrt[2]*ArcTanh[Sqrt[Sin[(c + d*x)/2]^2]]*Cos[(c + d*x)/2]^4 - 2*Sqrt[
1 - Cos[c + d*x]]*(9 + 13*Cos[c + d*x]))*Sin[c + d*x])/(32*d*Sqrt[1 - Cos[c
 + d*x]]*(a*(1 + Cos[c + d*x]))^(5/2))
```

Maple [A] (verified)

Time = 1.28 (sec) , antiderivative size = 174, normalized size of antiderivative = 1.63

method	result
default	$\frac{\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(19\sqrt{2}\ln\left(\frac{4\sqrt{a}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}+4a}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)a\left(\cos^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-13\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{2}\sqrt{a}+2\sqrt{2}\right.}{32\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^3 a^{\frac{7}{2}}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$

```
[In] int(cos(d*x+c)^2/(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/32/cos(1/2*d*x+1/2*c)^3*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(19*2^(1/2)*ln(2*(
2*a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+2*a)/cos(1/2*d*x+1/2*c))*a*cos(1/2
*d*x+1/2*c)^4-13*cos(1/2*d*x+1/2*c)^2*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*2^(1/2
)*a^(1/2)+2*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2))/a^(7/2)/sin(1/2
*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 188 vs. $2(88) = 176$.

Time = 0.26 (sec) , antiderivative size = 188, normalized size of antiderivative = 1.76

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{19\sqrt{2}\left(\cos(dx+c)^3+3\cos(dx+c)^2+3\cos(dx+c)+1\right)\sqrt{a}\log\left(-\frac{a\cos(dx\cdots}{\cdots}\right.}{64\left(a^3d\cos(dx+c)^3\cdots\right.}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/64*(19*sqrt(2)*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*s
qrt(a)*log(-(a*cos(d*x + c)^2 - 2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*
sin(d*x + c) - 2*a*cos(d*x + c) - 3*a)/(cos(d*x + c)^2 + 2*cos(d*x + c) + 1
```

```
)) - 4*sqrt(a*cos(d*x + c) + a)*(13*cos(d*x + c) + 9)*sin(d*x + c))/(a^3*d*
cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**2/(a+a*cos(d*x+c))**(5/2),x)
[Out] Timed out
```

Maxima [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] Timed out
```

Giac [A] (verification not implemented)

none

Time = 1.09 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.29

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{\frac{19\sqrt{2}\log\left(\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{a^{\frac{5}{2}}\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)} - \frac{19\sqrt{2}\log\left(-\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{a^{\frac{5}{2}}\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)} + \frac{2\sqrt{2}\left(13\sqrt{a}\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-11\sqrt{a}\,\mathrm{s}}{\left(\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)^2a^3\operatorname{sgn}(\cos(}}{64\,d}$$

```
[In] integrate(cos(d*x+c)^2/(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] 1/64*(19*sqrt(2)*log(sin(1/2*d*x + 1/2*c) + 1)/(a^(5/2)*sgn(cos(1/2*d*x + 1
/2*c))) - 19*sqrt(2)*log(-sin(1/2*d*x + 1/2*c) + 1)/(a^(5/2)*sgn(cos(1/2*d*
x + 1/2*c))) + 2*sqrt(2)*(13*sqrt(a)*sin(1/2*d*x + 1/2*c)^3 - 11*sqrt(a)*si
n(1/2*d*x + 1/2*c))/((sin(1/2*d*x + 1/2*c)^2 - 1)^2*a^3*sgn(cos(1/2*d*x + 1
/2*c))))/d
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)^2}{\left(a+a\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int(cos(c + d*x)^2/(a + a*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)^2/(a + a*cos(c + d*x))^(5/2), x)
```

3.142 $\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 107

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{5\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{5\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}$$

```
[Out] -1/4*sin(d*x+c)/d/(a+a*cos(d*x+c))^(5/2)+5/16*sin(d*x+c)/a/d/(a+a*cos(d*x+c
))^(3/2)+5/32*arctanh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/(a+a*cos(d*x+c))^(1/2)
)/a^(5/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2829, 2729, 2728, 212}

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{5\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{5\sin(c+dx)}{16ad(a\cos(c+dx)+a)^{3/2}} - \frac{\sin(c+dx)}{4d(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[Cos[c + d*x]/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (5*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])])/(16*
Sqrt[2]*a^(5/2)*d) - Sin[c + d*x]/(4*d*(a + a*Cos[c + d*x])^(5/2)) + (5*Sin
[c + d*x])/(16*a*d*(a + a*Cos[c + d*x])^(3/2))
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2729

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[c
+ d*x]*((a + b*Sin[c + d*x])^n/(a*d*(2*n + 1))), x] + Dist[(n + 1)/(a*(2*n
+ 1)), Int[(a + b*Sin[c + d*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d}, x] &
& EqQ[a^2 - b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2829

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((a + b*Sin[e + f*
x])^m/(a*f*(2*m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(a*b*(2*m + 1)), In
t[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && N
eQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{5\int \frac{1}{(a+a\cos(c+dx))^{3/2}}\,dx}{8a} \\
&= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{5\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{5\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx}{32a^2} \\
&= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{5\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} \\
&\quad - \frac{5\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{16a^2d} \\
&= \frac{5\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{5\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.61

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{40\text{arctanh}\left(\sin\left(\frac{1}{2}(c+dx)\right)\right)\cos^5\left(\frac{1}{2}(c+dx)\right)+2\sin(c+dx)+5\sin(2(c+dx)}{32d(a(1+\cos(c+dx)))^{5/2}}$$

```
[In] Integrate[Cos[c + d*x]/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (40*ArcTanh[Sin[(c + d*x)/2]]*Cos[(c + d*x)/2]^5 + 2*Sin[c + d*x] + 5*Sin[2
*(c + d*x)])/(32*d*(a*(1 + Cos[c + d*x]))^(5/2))
```

Maple [A] (verified)

Time = 1.29 (sec) , antiderivative size = 174, normalized size of antiderivative = 1.63

method	result
default	$\frac{\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(5\sqrt{2}\ln\left(\frac{4\sqrt{a}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}+4a}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)a\left(\cos^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+5\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{2}\sqrt{a}-2\sqrt{2}\sqrt{a(}\right.}{32\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^3 a^{\frac{7}{2}}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$

```
[In] int(cos(d*x+c)/(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/32/cos(1/2*d*x+1/2*c)^3*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(5*2^(1/2)*ln(2*(2
*a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+2*a)/cos(1/2*d*x+1/2*c))*a*cos(1/2*
d*x+1/2*c)^4+5*cos(1/2*d*x+1/2*c)^2*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*2^(1/2)*
a^(1/2)-2*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2))/a^(7/2)/sin(1/2*d
*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 188 vs. 2(88) = 176.

Time = 0.26 (sec) , antiderivative size = 188, normalized size of antiderivative = 1.76

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{5\sqrt{2}\left(\cos(dx+c)^3+3\cos(dx+c)^2+3\cos(dx+c)+1\right)\sqrt{a}\log\left(-\frac{a\cos(dx+c)^2}{}\right.}{64\left(a^3d\cos(dx+c)^3+\right.}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/64*(5*sqrt(2)*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*sq
rt(a)*log(-(a*cos(d*x + c)^2 - 2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*s
in(d*x + c) - 2*a*cos(d*x + c) - 3*a)/(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)
) + 4*sqrt(a*cos(d*x + c) + a)*(5*cos(d*x + c) + 1)*sin(d*x + c))/(a^3*d*co
s(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F]

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(c+dx)}{(a(\cos(c+dx)+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))**(5/2),x)
[Out] Integral(cos(c + d*x)/(a*(cos(c + d*x) + 1))**(5/2), x)
```

Maxima [F(-1)]

Timed out.

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] Timed out
```

Giac [A] (verification not implemented)

none

Time = 0.64 (sec) , antiderivative size = 69, normalized size of antiderivative = 0.64

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = -\frac{\sqrt{2}\left(5\sqrt{a}\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-3\sqrt{a}\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}{32\left(\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)^2a^3d\mathrm{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}$$

```
[In] integrate(cos(d*x+c)/(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] -1/32*sqrt(2)*(5*sqrt(a)*sin(1/2*d*x + 1/2*c)^3 - 3*sqrt(a)*sin(1/2*d*x + 1
/2*c))/((sin(1/2*d*x + 1/2*c)^2 - 1)^2*a^3*d*sgn(cos(1/2*d*x + 1/2*c)))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(c+d\,x)}{(a+a\,\cos(c+d\,x))^{5/2}}\,dx$$

```
[In] int(cos(c + d*x)/(a + a*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)/(a + a*cos(c + d*x))^(5/2), x)
```

3.143 $\int \frac{1}{(a+a\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 107

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{3\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{3\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}$$

```
[Out] 1/4*sin(d*x+c)/d/(a+a*cos(d*x+c))^(5/2)+3/16*sin(d*x+c)/a/d/(a+a*cos(d*x+c)
)^(3/2)+3/32*arctanh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/(a+a*cos(d*x+c))^(1/2))
/a^(5/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {2729, 2728, 212}

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{3\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{3\sin(c+dx)}{16ad(a\cos(c+dx)+a)^{3/2}} + \frac{\sin(c+dx)}{4d(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(-5/2),x]
```

```
[Out] (3*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])])/(16*
Sqrt[2]*a^(5/2)*d) + Sin[c + d*x]/(4*d*(a + a*Cos[c + d*x])^(5/2)) + (3*Sin
[c + d*x])/(16*a*d*(a + a*Cos[c + d*x])^(3/2))
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2729

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[c
+ d*x]*((a + b*Sin[c + d*x])^n/(a*d*(2*n + 1))), x] + Dist[(n + 1)/(a*(2*n
+ 1)), Int[(a + b*Sin[c + d*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d}, x] &
& EqQ[a^2 - b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{3\int \frac{1}{(a+a\cos(c+dx))^{3/2}}\,dx}{8a} \\
&= \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{3\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{3\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx}{32a^2} \\
&= \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{3\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} \\
&\quad - \frac{3\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{16a^2d} \\
&= \frac{3\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{3\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.61

$$
\int \frac{1}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{24\text{arctanh}\left(\sin\left(\frac{1}{2}(c+dx)\right)\right)\cos^5\left(\frac{1}{2}(c+dx)\right) + 14\sin(c+dx) + 3\sin(2(c+d}{32d(a(1+\cos(c+dx)))^{5/2}}
$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(-5/2),x]
```

```
[Out] (24*ArcTanh[Sin[(c + d*x)/2]]*Cos[(c + d*x)/2]^5 + 14*Sin[c + d*x] + 3*Sin[
2*(c + d*x)])/(32*d*(a*(1 + Cos[c + d*x]))^(5/2))
```

Maple [A] (verified)

Time = 1.31 (sec) , antiderivative size = 174, normalized size of antiderivative = 1.63

method	result
default	$\frac{\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(3\sqrt{2}\,\ln\left(\frac{4\sqrt{a}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}+4a}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)a\left(\cos^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+3\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{2}\,\sqrt{a}+2\sqrt{2}\,\sqrt{a(}\right.}{32a^{\frac{7}{2}}\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^3\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$

```
[In] int(1/(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/32/a^(7/2)/cos(1/2*d*x+1/2*c)^3*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(3*2^(1/2)
*ln(2*(2*a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+2*a)/cos(1/2*d*x+1/2*c))*a*
cos(1/2*d*x+1/2*c)^4+3*cos(1/2*d*x+1/2*c)^2*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*
2^(1/2)*a^(1/2)+2*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2))/sin(1/2*d
*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 188 vs. $2(88) = 176$.

Time = 0.26 (sec) , antiderivative size = 188, normalized size of antiderivative = 1.76

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{3\sqrt{2}\left(\cos\left(dx+c\right)^3+3\,\cos\left(dx+c\right)^2+3\,\cos\left(dx+c\right)+1\right)\sqrt{a}\log\left(-\frac{a\cos(dx+c)^{}}{}\right.}{64\left(a^3d\cos\left(dx+c\right)^3+\right.}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/64*(3*sqrt(2)*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*sq
rt(a)*log(-(a*cos(d*x + c)^2 - 2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*s
in(d*x + c) - 2*a*cos(d*x + c) - 3*a)/(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)
) + 4*sqrt(a*cos(d*x + c) + a)*(3*cos(d*x + c) + 7)*sin(d*x + c))/(a^3*d*co
s(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F]

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{\left(a\cos\left(c+dx\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))**(5/2),x)
```

```
[Out] Integral((a*cos(c + d*x) + a)**(-5/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 84332 vs. 2(88) = 176.

Time = 14.94 (sec) , antiderivative size = 84332, normalized size of antiderivative = 788.15

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Too large to display}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 1/32*(512*((2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + cos(5
/2*d*x + 5/2*c)*sin(4*d*x + 4*c) + 2*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c)
+ (2*cos(2*d*x + 2*c) + cos(d*x + c))*sin(5/2*d*x + 5/2*c) + cos(4*d*x + 4*
c)*sin(5/2*d*x + 5/2*c) + 2*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c))*cos(5*d*
x + 5*c)^2 + 2560*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*
c) + cos(5/2*d*x + 5/2*c)*sin(5*d*x + 5*c) + 5*cos(5/2*d*x + 5/2*c)*sin(4*d
*x + 4*c) + 10*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) - (10*cos(2*d*x + 2*c)
 + 5*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) - cos(5*d*x + 5*c)*sin(5/2*d*x
+ 5/2*c) - 5*cos(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) - 10*cos(3*d*x + 3*c)*si
n(5/2*d*x + 5/2*c))*cos(8/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2
*c)))^2 + 10240*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c)
 + cos(5/2*d*x + 5/2*c)*sin(5*d*x + 5*c) + 5*cos(5/2*d*x + 5/2*c)*sin(4*d*x
 + 4*c) + 10*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) - (10*cos(2*d*x + 2*c) +
 5*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) - cos(5*d*x + 5*c)*sin(5/2*d*x +
5/2*c) - 5*cos(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) - 10*cos(3*d*x + 3*c)*sin(
5/2*d*x + 5/2*c))*cos(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c
)))^2 + 10240*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) +
 cos(5/2*d*x + 5/2*c)*sin(5*d*x + 5*c) + 5*cos(5/2*d*x + 5/2*c)*sin(4*d*x +
 4*c) + 10*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) - (10*cos(2*d*x + 2*c) + 5
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) - cos(5*d*x + 5*c)*sin(5/2*d*x + 5/
2*c) - 5*cos(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) - 10*cos(3*d*x + 3*c)*sin(5/
2*d*x + 5/2*c))*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))
)^2 + 2560*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + co
s(5/2*d*x + 5/2*c)*sin(5*d*x + 5*c) + 5*cos(5/2*d*x + 5/2*c)*sin(4*d*x + 4*
c) + 10*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) - (10*cos(2*d*x + 2*c) + 5*co
s(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) - cos(5*d*x + 5*c)*sin(5/2*d*x + 5/2*c
) - 5*cos(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) - 10*cos(3*d*x + 3*c)*sin(5/2*d
*x + 5/2*c))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2
 - 512*((2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + cos(5/2*
d*x + 5/2*c)*sin(4*d*x + 4*c) + 2*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) + (
2*cos(2*d*x + 2*c) + cos(d*x + c))*sin(5/2*d*x + 5/2*c) + cos(4*d*x + 4*c)*
sin(5/2*d*x + 5/2*c) + 2*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c))*sin(5*d*x +
 5*c)^2 + 2560*cos(4*d*x + 4*c)^2*sin(5/2*d*x + 5/2*c) + 1024*(20*cos(2*d*x
 + 2*c) + 10*cos(d*x + c) + 1)*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c) + 1024
0*cos(3*d*x + 3*c)^2*sin(5/2*d*x + 5/2*c) + 2560*sin(4*d*x + 4*c)^2*sin(5/2
```

*d*x + 5/2*c) + 10240*sin(3*d*x + 3*c)^2*sin(5/2*d*x + 5/2*c) + 2560*(5*(2*
sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c
)*sin(5*d*x + 5*c) + 5*cos(5/2*d*x + 5/2*c)*sin(4*d*x + 4*c) + 10*cos(5/2*d
*x + 5/2*c)*sin(3*d*x + 3*c) - (10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*s
in(5/2*d*x + 5/2*c) - cos(5*d*x + 5*c)*sin(5/2*d*x + 5/2*c) - 5*cos(4*d*x +
 4*c)*sin(5/2*d*x + 5/2*c) - 10*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c))*sin(
8/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 10240*(5*(2*si
n(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c)*
sin(5*d*x + 5*c) + 5*cos(5/2*d*x + 5/2*c)*sin(4*d*x + 4*c) + 10*cos(5/2*d*x
 + 5/2*c)*sin(3*d*x + 3*c) - (10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*sin
(5/2*d*x + 5/2*c) - cos(5*d*x + 5*c)*sin(5/2*d*x + 5/2*c) - 5*cos(4*d*x + 4
*c)*sin(5/2*d*x + 5/2*c) - 10*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c))*sin(6/
5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 10240*(5*(2*sin(
2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c)*si
n(5*d*x + 5*c) + 5*cos(5/2*d*x + 5/2*c)*sin(4*d*x + 4*c) + 10*cos(5/2*d*x +
 5/2*c)*sin(3*d*x + 3*c) - (10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*sin(5
/2*d*x + 5/2*c) - cos(5*d*x + 5*c)*sin(5/2*d*x + 5/2*c) - 5*cos(4*d*x + 4*c
)*sin(5/2*d*x + 5/2*c) - 10*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c))*sin(4/5*
arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 2560*(5*(2*sin(2*d
*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c)*sin(5
*d*x + 5*c) + 5*cos(5/2*d*x + 5/2*c)*sin(4*d*x + 4*c) + 10*cos(5/2*d*x + 5/
2*c)*sin(3*d*x + 3*c) - (10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*sin(5/2*
d*x + 5/2*c) - cos(5*d*x + 5*c)*sin(5/2*d*x + 5/2*c) - 5*cos(4*d*x + 4*c)*s
in(5/2*d*x + 5/2*c) - 10*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c))*sin(2/5*arc
tan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 512*(5*cos(4*d*x + 4*
c)^2*sin(5/2*d*x + 5/2*c) + 4*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*co
s(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c) + 20*cos(3*d*x + 3*c)^2*sin(5/2*d*x + 5
/2*c) + 5*sin(4*d*x + 4*c)^2*sin(5/2*d*x + 5/2*c) + 20*sin(3*d*x + 3*c)^2*s
in(5/2*d*x + 5/2*c) + 2*((10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*sin(5/2
*d*x + 5/2*c) + 10*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c))*cos(4*d*x + 4*c)
+ 2*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 2*(5*(2*sin(
2*d*x + 2*c) + sin(d*x + c))*sin(5/2*d*x + 5/2*c) + 10*sin(3*d*x + 3*c)*sin
(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c))*sin(4*d*x + 4*c) + 4*(5*(2*sin(2*
d*x + 2*c) + sin(d*x + c))*sin(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c))*sin
(3*d*x + 3*c) + (4*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 20*cos(2*d*x + 2
*c)^2 + 5*cos(d*x + c)^2 + 20*sin(2*d*x + 2*c)^2 + 20*sin(2*d*x + 2*c)*sin(
d*x + c) + 5*sin(d*x + c)^2 + 2*cos(d*x + c))*sin(5/2*d*x + 5/2*c))*cos(5*d
*x + 5*c) + 512*((20*cos(2*d*x + 2*c) + 10*cos(d*x + c) + 1)*sin(5/2*d*x +
5/2*c) + 20*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c))*cos(4*d*x + 4*c) + 512*(
2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) - 12*(10*(sin(4*d*x
 + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x
 + 5*c)^2 + sin(5*d*x + 5*c)^3 + (2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*
c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x
 + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c)
+ 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5

*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(5*d*x + 5*c) + 5*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(8/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 5*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 +

20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3
*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x +
2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*
sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50
*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c)
+ 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x
 + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x +
 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(2/5*arcta
n2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))))*cos(9/5*arctan2(sin(5/2*d*
x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 4*(128*cos(5*d*x + 5*c)^2*sin(5/2*d*x
+ 5/2*c) - 3200*cos(4*d*x + 4*c)^2*sin(5/2*d*x + 5/2*c) - 12800*(2*cos(2*d*
x + 2*c) + cos(d*x + c))*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c) - 12800*cos(
3*d*x + 3*c)^2*sin(5/2*d*x + 5/2*c) - 128*sin(5*d*x + 5*c)^2*sin(5/2*d*x +
5/2*c) - 3200*sin(4*d*x + 4*c)^2*sin(5/2*d*x + 5/2*c) - 12800*sin(3*d*x + 3
*c)^2*sin(5/2*d*x + 5/2*c) - 256*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos
(5/2*d*x + 5/2*c) + 5*cos(5/2*d*x + 5/2*c)*sin(4*d*x + 4*c) + 10*cos(5/2*d*
x + 5/2*c)*sin(3*d*x + 3*c) - sin(5/2*d*x + 5/2*c))*cos(5*d*x + 5*c) - 6400
*((2*cos(2*d*x + 2*c) + cos(d*x + c))*sin(5/2*d*x + 5/2*c) + 2*cos(3*d*x +
3*c)*sin(5/2*d*x + 5/2*c))*cos(4*d*x + 4*c) - 1280*(2*sin(2*d*x + 2*c) + si
n(d*x + c))*cos(5/2*d*x + 5/2*c) - 2560*(5*(2*sin(2*d*x + 2*c) + sin(d*x +
c))*cos(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c)*sin(5*d*x + 5*c) + 5*cos(5/
2*d*x + 5/2*c)*sin(4*d*x + 4*c) + 10*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c)
- (10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) - cos(5*d
*x + 5*c)*sin(5/2*d*x + 5/2*c) - 5*cos(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) -
10*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c))*cos(6/5*arctan2(sin(5/2*d*x + 5/2
*c), cos(5/2*d*x + 5/2*c))) - 2560*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*c
os(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c)*sin(5*d*x + 5*c) + 5*cos(5/2*d*x
 + 5/2*c)*sin(4*d*x + 4*c) + 10*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) - (10
*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) - cos(5*d*x +
5*c)*sin(5/2*d*x + 5/2*c) - 5*cos(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) - 10*co
s(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c))*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c),
cos(5/2*d*x + 5/2*c))) - 1280*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/
2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c)*sin(5*d*x + 5*c) + 5*cos(5/2*d*x + 5/
2*c)*sin(4*d*x + 4*c) + 10*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) - (10*cos(
2*d*x + 2*c) + 5*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) - cos(5*d*x + 5*c)*
sin(5/2*d*x + 5/2*c) - 5*cos(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) - 10*cos(3*d
*x + 3*c)*sin(5/2*d*x + 5/2*c))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5
/2*d*x + 5/2*c))) - 256*(cos(5*d*x + 5*c)*cos(5/2*d*x + 5/2*c) + 5*(2*sin(2
*d*x + 2*c) + sin(d*x + c))*sin(5/2*d*x + 5/2*c) + 5*sin(4*d*x + 4*c)*sin(5
/2*d*x + 5/2*c) + 10*sin(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c) + cos(5/2*d*x +
5/2*c))*sin(5*d*x + 5*c) - 1280*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(
5/2*d*x + 5/2*c) + 10*sin(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c) + cos(5/2*d*x +
 5/2*c))*sin(4*d*x + 4*c) - 2560*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin
(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c))*sin(3*d*x + 3*c) - 128*(100*cos(2
*d*x + 2*c)^2 + 100*cos(2*d*x + 2*c)*cos(d*x + c) + 25*cos(d*x + c)^2 + 100

*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2
 - 1)*sin(5/2*d*x + 5/2*c) - 70*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c
) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x
+ 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) +
 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*
cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x
 + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 +
10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x +
c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(
2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100
*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c
)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d
*x + c)^2 + 10*cos(d*x + c) + 1)*sin(7/5*arctan2(sin(5/2*d*x + 5/2*c), cos(
5/2*d*x + 5/2*c))) + 70*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*c
os(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2
 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(
4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x
+ c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) +
1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(
4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(
5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x +
2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(
2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 10
0*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^
2 + 10*cos(d*x + c) + 1)*sin(3/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x
+ 5/2*c))) + 15*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x
 + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(1
0*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x +
4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1
)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2
*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x +
4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x +
5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + s
in(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x +
2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*
d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*c
os(d*x + c) + 1)*sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)
)))*cos(8/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 56*(10*(
sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*
sin(5*d*x + 5*c)^2 + sin(5*d*x + 5*c)^3 + (2*(5*cos(4*d*x + 4*c) + 10*cos(3
*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) +
cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(
d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x +
 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*
(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x

+ c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(5*d*x + 5*c) + 10*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 5*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))))*cos(7/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 8*(128*cos(5*d*x + 5*c)^2*sin(5/2*d*x + 5/2*c) - 3200*cos(4*d*x + 4*c)^2*sin(5/2*d*x + 5/2*c) - 12800*(2*cos(2*d*x + 2*c) + cos(d*x + c))*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c) - 12800*cos(3*d*x + 3*c)^2*sin(5/2*d*x + 5/2*c) - 128*sin(5*d*x + 5*c)^2*sin(5/2*d*x + 5/2*c) - 3200*sin(4*d*x + 4*c)^2*sin(5/2*d*x + 5/2*c) - 1

2800*sin(3*d*x + 3*c)^2*sin(5/2*d*x + 5/2*c) - 256*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 5*cos(5/2*d*x + 5/2*c)*sin(4*d*x + 4*c) + 10*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) - sin(5/2*d*x + 5/2*c))*cos(5*d*x + 5*c) - 6400*((2*cos(2*d*x + 2*c) + cos(d*x + c))*sin(5/2*d*x + 5/2*c) + 2*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c))*cos(4*d*x + 4*c) - 1280*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) - 2560*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c)*sin(5*d*x + 5*c) + 5*cos(5/2*d*x + 5/2*c)*sin(4*d*x + 4*c) + 10*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) - (10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) - cos(5*d*x + 5*c)*sin(5/2*d*x + 5/2*c) - 5*cos(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) - 10*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c))*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 1280*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c)*sin(5*d*x + 5*c) + 5*cos(5/2*d*x + 5/2*c)*sin(4*d*x + 4*c) + 10*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) - (10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) - cos(5*d*x + 5*c)*sin(5/2*d*x + 5/2*c) - 5*cos(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) - 10*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 256*(cos(5*d*x + 5*c)*cos(5/2*d*x + 5/2*c) + 5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5/2*d*x + 5/2*c) + 5*sin(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) + 10*sin(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c))*sin(5*d*x + 5*c) - 1280*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5/2*d*x + 5/2*c) + 10*sin(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c))*sin(4*d*x + 4*c) - 2560*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c))*sin(3*d*x + 3*c) - 128*(100*cos(2*d*x + 2*c)^2 + 100*cos(2*d*x + 2*c)*cos(d*x + c) + 25*cos(d*x + c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 - 1)*sin(5/2*d*x + 5/2*c) + 70*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(3/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 15*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*

c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))))*cos(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 8*(128*cos(5*d*x + 5*c)^2*sin(5/2*d*x + 5/2*c) - 3200*cos(4*d*x + 4*c)^2*sin(5/2*d*x + 5/2*c) - 12800*(2*cos(2*d*x + 2*c) + cos(d*x + c))*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c) - 12800*cos(3*d*x + 3*c)^2*sin(5/2*d*x + 5/2*c) - 128*sin(5*d*x + 5*c)^2*sin(5/2*d*x + 5/2*c) - 3200*sin(4*d*x + 4*c)^2*sin(5/2*d*x + 5/2*c) - 12800*sin(3*d*x + 3*c)^2*sin(5/2*d*x + 5/2*c) - 256*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 5*cos(5/2*d*x + 5/2*c)*sin(4*d*x + 4*c) + 10*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) - sin(5/2*d*x + 5/2*c))*cos(5*d*x + 5*c) - 6400*((2*cos(2*d*x + 2*c) + cos(d*x + c))*sin(5/2*d*x + 5/2*c) + 2*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c))*cos(4*d*x + 4*c) - 1280*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) - 1280*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c)*sin(5*d*x + 5*c) + 5*cos(5/2*d*x + 5/2*c)*sin(4*d*x + 4*c) + 10*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) - (10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) - cos(5*d*x + 5*c)*sin(5/2*d*x + 5/2*c) - 5*cos(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) - 10*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 256*(cos(5*d*x + 5*c)*cos(5/2*d*x + 5/2*c) + 5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5/2*d*x + 5/2*c) + 5*sin(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) + 10*sin(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c))*sin(5*d*x + 5*c) - 1280*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5/2*d*x + 5/2*c) + 10*sin(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c))*sin(4*d*x + 4*c) - 2560*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c))*sin(3*d*x + 3*c) - 128*(100*cos(2*d*x + 2*c)^2 + 100*cos(2*d*x + 2*c)*cos(d*x + c) + 25*cos(d*x + c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 - 1)*sin(5/2*d*x + 5/2*c) + 70*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(3/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 15*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 1

0*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*
x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c)
 + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*c
os(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*
x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*
x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c)
 + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*
x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*si
n(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 +
10*cos(d*x + c) + 1)*sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/
2*c))))*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 56*(
10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x +
c))*sin(5*d*x + 5*c)^2 + sin(5*d*x + 5*c)^3 + (2*(5*cos(4*d*x + 4*c) + 10*c
os(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c
) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*
cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d
*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 +
 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos
(d*x + c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*s
in(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x
 + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 +
 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) +
1)*sin(5*d*x + 5*c) + 5*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*c
os(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2
 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(
4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x
+ c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) +
1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(
4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(
5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x +
2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(
2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 10
0*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^
2 + 10*cos(d*x + c) + 1)*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x
+ 5/2*c))))*cos(3/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) -
4*(128*cos(5*d*x + 5*c)^2*sin(5/2*d*x + 5/2*c) - 3200*cos(4*d*x + 4*c)^2*si
n(5/2*d*x + 5/2*c) - 12800*(2*cos(2*d*x + 2*c) + cos(d*x + c))*cos(3*d*x +
3*c)*sin(5/2*d*x + 5/2*c) - 12800*cos(3*d*x + 3*c)^2*sin(5/2*d*x + 5/2*c) -
 128*sin(5*d*x + 5*c)^2*sin(5/2*d*x + 5/2*c) - 3200*sin(4*d*x + 4*c)^2*sin(
5/2*d*x + 5/2*c) - 12800*sin(3*d*x + 3*c)^2*sin(5/2*d*x + 5/2*c) - 256*(5*(
2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 5*cos(5/2*d*x + 5
/2*c)*sin(4*d*x + 4*c) + 10*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) - sin(5/2
*d*x + 5/2*c))*cos(5*d*x + 5*c) - 6400*((2*cos(2*d*x + 2*c) + cos(d*x + c))
*sin(5/2*d*x + 5/2*c) + 2*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c))*cos(4*d*x
+ 4*c) - 1280*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) - 25

6*(cos(5*d*x + 5*c)*cos(5/2*d*x + 5/2*c) + 5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5/2*d*x + 5/2*c) + 5*sin(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) + 10*sin(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c))*sin(5*d*x + 5*c) - 1280*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5/2*d*x + 5/2*c) + 10*sin(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c))*sin(4*d*x + 4*c) - 2560*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c))*sin(3*d*x + 3*c) - 128*(100*cos(2*d*x + 2*c)^2 + 100*cos(2*d*x + 2*c)*cos(d*x + c) + 25*cos(d*x + c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 - 1)*sin(5/2*d*x + 5/2*c) + 15*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 12*(10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c)^2 + sin(5*d*x + 5*c)^3 + (2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(5*d*x + 5*c))*cos(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 3*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 2)*cos(5*d*x + 5*c)^3 + cos(5*d*x + 5*c)^4 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c)^3 + sin(5*d*x + 5*c)^4 + (10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 3)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 3)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 3)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 30*cos(d*x + c

) + 6)*cos(5*d*x + 5*c)^2 + 25*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c)
 + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x +
 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) +
1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*c
os(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x
+ c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 1
0*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c
))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2
*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*
(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)
^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*
x + c)^2 + 10*cos(d*x + c) + 1)*cos(8/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5
/2*d*x + 5/2*c)))^2 + 100*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10
*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)
^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*co
s(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*
x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c)
+ 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(si
n(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*si
n(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x
+ 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*si
n(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 +
100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c
)^2 + 10*cos(d*x + c) + 1)*cos(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*
x + 5/2*c)))^2 + 100*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(
2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 +
10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d
*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c
) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*
cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d
*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d
*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c
) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d
*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*s
in(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 +
 10*cos(d*x + c) + 1)*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5
/2*c)))^2 + 25*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x
+ 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10
*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4
*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)
*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*
d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4
*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5
*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + si
n(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2

*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d
*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*co
s(d*x + c) + 1)*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))
)^2 + (2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) +
5*cos(d*x + c) + 2)*cos(5*d*x + 5*c) + 2*cos(5*d*x + 5*c)^2 + 10*(10*cos(3*
d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 2
5*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*
d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2
*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 50*(2*sin(3*d*x + 3*c) +
 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^
2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*
x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 2
5*sin(d*x + c)^2 + 10*cos(d*x + c) + 2)*sin(5*d*x + 5*c)^2 + 25*(2*(5*cos(4
*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) +
1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos
(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^
2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*co
s(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x
 + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) +
 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 +
 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*
c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*
d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*
x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(8/5*ar
ctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 100*(2*(5*cos(4*d*x
+ 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*co
s(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*
x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 2
0*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d
*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*
c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*si
n(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(
2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) +
25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x +
 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2
*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(6/5*arctan2
(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 100*(2*(5*cos(4*d*x + 4*c
) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d
*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2
*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10
*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x +
3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2
+ 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d
*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin
(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*si

n(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 25*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 2*(5*(20*cos(3*d*x + 3*c) + 20*cos(2*d*x + 2*c) + 10*cos(d*x + c) + 3)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 10*(20*cos(2*d*x + 2*c) + 10*cos(d*x + c) + 3)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 10*(10*cos(d*x + c) + 3)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 15*cos(d*x + c) + 2)*cos(5*d*x + 5*c) + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*((10*cos(4*d*x + 4*c) + 20*cos(3*d*x + 3*c) + 20*cos(2*d*x + 2*c) + 10*cos(d*x + c) + 3)*cos(5*d*x + 5*c)^2 + cos(5*d*x + 5*c)^3 + (cos(5*d*x + 5*c) + 1)*sin(5*d*x + 5*c)^2 + (10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 2)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 2)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 2)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 20*cos(d*x + c) + 3)*cos(5*d*x + 5*c) + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2

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*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2
 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*c
os(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2
*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x
 + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*
x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100
*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x
 + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(6/5*arctan2(sin(5/2*d*
x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d
*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + co
s(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*
x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2
*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5
*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x +
 c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + si
n(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c)
+ 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)
^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d
*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) +
25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(4/5*arctan2(sin(5/2*d*x + 5/2*
c), cos(5/2*d*x + 5/2*c))) + 5*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c)
 + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x +
 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) +
1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*c
os(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x
+ c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 1
0*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c
))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2
*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*
(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)
^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*
x + c)^2 + 10*cos(d*x + c) + 1)*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5
/2*d*x + 5/2*c))) + 10*((sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*
x + 2*c) + sin(d*x + c))*cos(5*d*x + 5*c) + sin(4*d*x + 4*c) + 2*sin(3*d*x
+ 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sin(3*
d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4
*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) +
100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(
d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(8/5*arctan2(sin(5/2
*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 20*((10*cos(4*d*x + 4*c) + 20*cos(3
*d*x + 3*c) + 20*cos(2*d*x + 2*c) + 10*cos(d*x + c) + 3)*cos(5*d*x + 5*c)^2
 + cos(5*d*x + 5*c)^3 + (cos(5*d*x + 5*c) + 1)*sin(5*d*x + 5*c)^2 + (10*(10
*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 2)*cos(4*d*x + 4
*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 2)
*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 2)*cos(2*
```

d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 20*cos(d*x + c) + 3)*cos(5*d*x + 5*c) + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 5*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*((sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5*d*x + 5*c) + sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 20*((10*cos(4*d*x + 4*c) + 20*cos(3*d*x + 3*c) + 20*cos(2*d*x + 2*c) + 10*cos(d*x + c) + 3)*cos(5*d*x + 5*c)^2 + cos(5*d*x + 5*c)^3 + (cos(5*d*x + 5*c) + 1)*sin(5*d*x + 5*c)^2 + (10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 2)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 2)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*

x + c) + 2)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 +
 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*
c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*
d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*
x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 20*cos(d*x + c) + 3)*cos(5*d*x
+ 5*c) + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1
)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*co
s(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x +
 c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 5*
(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(
d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*
c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*
d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*
c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 10
0*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d
*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x
 + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin
(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x +
 c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 1
00*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)
*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*((sin(4*
d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5*
d*x + 5*c) + sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + s
in(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c)
 + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*
x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*si
n(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 +
10*cos(d*x + c) + 1)*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/
2*c))) + 10*((10*cos(4*d*x + 4*c) + 20*cos(3*d*x + 3*c) + 20*cos(2*d*x + 2*
c) + 10*cos(d*x + c) + 3)*cos(5*d*x + 5*c)^2 + cos(5*d*x + 5*c)^3 + (cos(5*
d*x + 5*c) + 1)*sin(5*d*x + 5*c)^2 + (10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*
x + 2*c) + 5*cos(d*x + c) + 2)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 2
0*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 2)*cos(3*d*x + 3*c) + 100*cos(3*d
*x + 3*c)^2 + 20*(5*cos(d*x + c) + 2)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*
c)^2 + 25*cos(d*x + c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + si
n(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2
*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d
*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 20*co
s(d*x + c) + 3)*cos(5*d*x + 5*c) + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x +
 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(
10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x
+ 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^
2 + 25*cos(d*x + c)^2 + 10*((sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(
2*d*x + 2*c) + sin(d*x + c))*cos(5*d*x + 5*c) + sin(4*d*x + 4*c) + 2*sin(3*
d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*si

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n(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*s
in(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c
) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*
sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(2/5*arctan2(sin
(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*((sin(4*d*x + 4*c) + 2*sin(3
*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5*d*x + 5*c)^2 + 2*(si
n(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*co
s(5*d*x + 5*c) + sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c)
 + sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x +
2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(
2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 10
0*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^
2 + 10*(10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + si
n(d*x + c))*sin(5*d*x + 5*c)^2 + sin(5*d*x + 5*c)^3 + (2*(5*cos(4*d*x + 4*c
) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d
*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2
*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10
*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x +
3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2
+ 25*cos(d*x + c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x
 + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) +
 sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x +
2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x
 + c) + 1)*sin(5*d*x + 5*c) + 10*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*
c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x
 + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c)
+ 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5
*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*
x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 +
 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x +
 c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin
(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 10
0*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*
c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(
d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos
(5/2*d*x + 5/2*c))) + 10*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*
cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^
2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos
(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x
 + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) +
 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin
(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin
(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x +
 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin
(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 1
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00*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)
^2 + 10*cos(d*x + c) + 1)*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x
 + 5/2*c))) + 5*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x
 + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(1
0*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x +
4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1
)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2
*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x +
4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x +
5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + s
in(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x +
2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*
d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*c
os(d*x + c) + 1)*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)
)))*sin(8/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 20*(10*(
sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*
sin(5*d*x + 5*c)^2 + sin(5*d*x + 5*c)^3 + (2*(5*cos(4*d*x + 4*c) + 10*cos(3
*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) +
cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(
d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x +
 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*
(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x
 + c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4
*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c
))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100
*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*s
in(5*d*x + 5*c) + 10*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(
2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 +
10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d
*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c
) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*
cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d
*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d
*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c
) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d
*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*s
in(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 +
 10*cos(d*x + c) + 1)*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5
/2*c))) + 5*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2
*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*co
s(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c)
 + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*co
s(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x
 + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c)
 + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c)

+ sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d
*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c)
+ sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x
+ 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d
*x + c) + 1)*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))))*
sin(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 20*(10*(sin(
4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(
5*d*x + 5*c)^2 + sin(5*d*x + 5*c)^3 + (2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x
+ 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(
5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x
+ c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c
) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*c
os(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c
)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x
+ 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*s
in(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin
(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(5
*d*x + 5*c) + 5*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x
+ 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(1
0*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x +
4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1
)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2
*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x +
4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x +
5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + s
in(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x +
2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*
d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*c
os(d*x + c) + 1)*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)
)))*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*(10*(
sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*
sin(5*d*x + 5*c)^2 + sin(5*d*x + 5*c)^3 + (2*(5*cos(4*d*x + 4*c) + 10*cos(3
*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) +
cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(
d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x +
2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*
(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x
+ c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4
*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c
))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100
*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*s
in(5*d*x + 5*c))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)
)) + 10*cos(d*x + c) + 1)*log(cos(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2
*d*x + 5/2*c)))^2 + sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2
*c)))^2 + 2*sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) +

1) - 3*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) +
 5*cos(d*x + c) + 2)*cos(5*d*x + 5*c)^3 + cos(5*d*x + 5*c)^4 + 10*(sin(4*d*
x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*
x + 5*c)^3 + sin(5*d*x + 5*c)^4 + (10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x +
 2*c) + 5*cos(d*x + c) + 3)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(
10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 3)*cos(3*d*x + 3*c) + 100*cos(3*d*x
+ 3*c)^2 + 20*(5*cos(d*x + c) + 3)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^
2 + 25*cos(d*x + c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d
*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c)
 + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x
+ 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 30*cos(d
*x + c) + 6)*cos(5*d*x + 5*c)^2 + 25*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x
+ 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5
*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x +
 c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c)
 + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*co
s(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)
^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d
*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2
*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2
+ 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x
+ 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*
sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(8/5*arctan2(sin(5/2*d*x + 5/2*c),
 cos(5/2*d*x + 5/2*c)))^2 + 100*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c
) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x
+ 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) +
 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*
cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x
 + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 +
10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x +
c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(
2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100
*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c
)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d
*x + c)^2 + 10*cos(d*x + c) + 1)*cos(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(
5/2*d*x + 5/2*c)))^2 + 100*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 1
0*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c
)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*c
os(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d
*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c)
 + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(s
in(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*s
in(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x
 + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*s
in(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 +

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100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x +
c)^2 + 10*cos(d*x + c) + 1)*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d
*x + 5/2*c)))^2 + 25*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(
2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 +
10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d
*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c
) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*
cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d
*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d
*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c
) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d
*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*s
in(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 +
10*cos(d*x + c) + 1)*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5
/2*c)))^2 + (2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2
*c) + 5*cos(d*x + c) + 2)*cos(5*d*x + 5*c) + 2*cos(5*d*x + 5*c)^2 + 10*(10*
cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*
c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*
cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d
*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 50*(2*sin(3*d*x +
3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x +
4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*si
n(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x +
c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 2)*sin(5*d*x + 5*c)^2 + 25*(2*(5
*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x +
c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) +
10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x +
4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) +
100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos
(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x +
3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*
c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*
x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*
sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*si
n(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(
8/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 100*(2*(5*cos(
4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) +
1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*co
s(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)
^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*c
os(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*
x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c)
+ 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2
+ 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4
*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3
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*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d
*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(6/5*a
rctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 100*(2*(5*cos(4*d*x
 + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*c
os(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d
*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 +
20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*
d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2
*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*s
in(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*
(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) +
 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x
+ 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x +
2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(4/5*arctan
2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 25*(2*(5*cos(4*d*x + 4*c
) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d
*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2
*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10
*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x +
3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2
+ 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d
*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin
(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*si
n(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c)
 + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*s
in(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(2/5*arctan2(sin(
5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 2*(5*(20*cos(3*d*x + 3*c) + 20
*cos(2*d*x + 2*c) + 10*cos(d*x + c) + 3)*cos(4*d*x + 4*c) + 25*cos(4*d*x +
4*c)^2 + 10*(20*cos(2*d*x + 2*c) + 10*cos(d*x + c) + 3)*cos(3*d*x + 3*c) +
100*cos(3*d*x + 3*c)^2 + 10*(10*cos(d*x + c) + 3)*cos(2*d*x + 2*c) + 100*co
s(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x
 + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*s
in(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 +
 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x +
c)^2 + 15*cos(d*x + c) + 2)*cos(5*d*x + 5*c) + 10*(10*cos(3*d*x + 3*c) + 10
*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4
c)^2 + 20(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 10
0*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2
*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*((10*cos(4*d*x + 4*c) + 20*cos(3*d*x
 + 3*c) + 20*cos(2*d*x + 2*c) + 10*cos(d*x + c) + 3)*cos(5*d*x + 5*c)^2 + c
os(5*d*x + 5*c)^3 + (cos(5*d*x + 5*c) + 1)*sin(5*d*x + 5*c)^2 + (10*(10*cos
(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 2)*cos(4*d*x + 4*c)
+ 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 2)*cos
(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 2)*cos(2*d*x
+ 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 50*(2*sin(3*d*x + 3*c

) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*
c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3
*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c)
+ 25*sin(d*x + c)^2 + 20*cos(d*x + c) + 3)*cos(5*d*x + 5*c) + 10*(10*cos(3*
d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 2
5*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*
d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2
*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(2*(5*cos(4*d*x + 4*c
) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d
*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2
*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10
*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x +
3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2
+ 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d
*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin
(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*si
n(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c)
 + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*s
in(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(6/5*arctan2(sin(
5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*(2*(5*cos(4*d*x + 4*c) + 10*c
os(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c
) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*
cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d
*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 +
 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos
(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c
) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x +
 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x
+ 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*s
in(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x +
 c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(4/5*arctan2(sin(5/2*d*x
+ 5/2*c), cos(5/2*d*x + 5/2*c))) + 5*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x
+ 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5
*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x +
 c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c)
 + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*co
s(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)
^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d
*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2
*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2
+ 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x
+ 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*
sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c),
 cos(5/2*d*x + 5/2*c))) + 10*((sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*si
n(2*d*x + 2*c) + sin(d*x + c))*cos(5*d*x + 5*c) + sin(4*d*x + 4*c) + 2*sin(

3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*
sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25
*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3
*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c
)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(8/5*arctan2(s
in(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 20*((10*cos(4*d*x + 4*c) + 20
*cos(3*d*x + 3*c) + 20*cos(2*d*x + 2*c) + 10*cos(d*x + c) + 3)*cos(5*d*x +
5*c)^2 + cos(5*d*x + 5*c)^3 + (cos(5*d*x + 5*c) + 1)*sin(5*d*x + 5*c)^2 + (
10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 2)*cos(4*d
*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c
) + 2)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 2)*
cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 50*(2*sin(3
*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(
4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) +
 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin
(d*x + c) + 25*sin(d*x + c)^2 + 20*cos(d*x + c) + 3)*cos(5*d*x + 5*c) + 10*
(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x
+ 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) +
 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos
(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(2*(5*cos(4
*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) +
1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos
(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^
2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*co
s(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x
 + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) +
 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 +
 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*
c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*
d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*
x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(4/5*ar
ctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 5*(2*(5*cos(4*d*x + 4*
c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*
d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x +
2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(1
0*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x +
 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2
 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*
d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*si
n(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*s
in(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c
) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*
sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(2/5*arctan2(sin
(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*((sin(4*d*x + 4*c) + 2*sin(3
*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5*d*x + 5*c) + sin(4*d

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*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d
*x + 5*c) + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin
(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x +
 c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 1
00*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)
*cos(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 20*((10*cos
(4*d*x + 4*c) + 20*cos(3*d*x + 3*c) + 20*cos(2*d*x + 2*c) + 10*cos(d*x + c)
 + 3)*cos(5*d*x + 5*c)^2 + cos(5*d*x + 5*c)^3 + (cos(5*d*x + 5*c) + 1)*sin(
5*d*x + 5*c)^2 + (10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x
 + c) + 2)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*
c) + 5*cos(d*x + c) + 2)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*
cos(d*x + c) + 2)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x +
c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*
x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*
sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*si
n(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 20*cos(d*x + c) + 3)*cos(
5*d*x + 5*c) + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x +
c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c)
+ 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos
(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^
2 + 5*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) +
5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*
x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*
cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*
x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c
) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*s
in(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin
(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c
))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin
(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)
^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c
) + 1)*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*((
sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*
cos(5*d*x + 5*c) + sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*
c) + sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x
+ 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*si
n(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 +
100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c
)^2 + 10*cos(d*x + c) + 1)*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*
x + 5/2*c))) + 10*((10*cos(4*d*x + 4*c) + 20*cos(3*d*x + 3*c) + 20*cos(2*d*
x + 2*c) + 10*cos(d*x + c) + 3)*cos(5*d*x + 5*c)^2 + cos(5*d*x + 5*c)^3 + (
cos(5*d*x + 5*c) + 1)*sin(5*d*x + 5*c)^2 + (10*(10*cos(3*d*x + 3*c) + 10*co
s(2*d*x + 2*c) + 5*cos(d*x + c) + 2)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)
^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 2)*cos(3*d*x + 3*c) + 100*c
os(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 2)*cos(2*d*x + 2*c) + 100*cos(2*d*
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x + 2*c)^2 + 25*cos(d*x + c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c
) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d
*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*s
in(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 +
 20*cos(d*x + c) + 3)*cos(5*d*x + 5*c) + 10*(10*cos(3*d*x + 3*c) + 10*cos(2
*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2
+ 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(
3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x +
 2*c)^2 + 25*cos(d*x + c)^2 + 10*((sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) +
2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5*d*x + 5*c) + sin(4*d*x + 4*c) + 2*
sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + 50
*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c)
+ 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x
 + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x +
 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(2/5*arcta
n2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*((sin(4*d*x + 4*c) + 2
*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5*d*x + 5*c)^2 +
 2*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x +
c))*cos(5*d*x + 5*c) + sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x
+ 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*
d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(
2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^
2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x
 + c)^2 + 10*(10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c
) + sin(d*x + c))*sin(5*d*x + 5*c)^2 + sin(5*d*x + 5*c)^3 + (2*(5*cos(4*d*x
 + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*c
os(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d
*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 +
20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*
d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2
*c)^2 + 25*cos(d*x + c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + s
in(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x +
2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*
d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*c
os(d*x + c) + 1)*sin(5*d*x + 5*c) + 10*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*
x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos
(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x
 + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*
c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*
cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x +
c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin
(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) +
 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^
2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*
x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 2

5*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(6/5*arctan2(sin(5/2*d*x + 5/2*c
), cos(5/2*d*x + 5/2*c))) + 10*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c)
 + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x +
 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) +
1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*c
os(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x
+ c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 1
0*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c
))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2
*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*
(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)
^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*
x + c)^2 + 10*cos(d*x + c) + 1)*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5
/2*d*x + 5/2*c))) + 5*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos
(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 +
 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*
d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x +
c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)
*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*
d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*
d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*
c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*
d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*
sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2
+ 10*cos(d*x + c) + 1)*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x +
5/2*c))))*sin(8/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 20
(10(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x
+ c))*sin(5*d*x + 5*c)^2 + sin(5*d*x + 5*c)^3 + (2*(5*cos(4*d*x + 4*c) + 10
*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5
*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) +
5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2
*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2
 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*c
os(d*x + c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))
*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d
*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2
 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c)
+ 1)*sin(5*d*x + 5*c) + 10*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 1
0*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c
)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*c
os(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d
*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c)
 + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(s
in(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*s
in(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x

+ 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*s
in(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 +
100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x +
c)^2 + 10*cos(d*x + c) + 1)*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d
*x + 5/2*c))) + 5*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d
*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*
(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x
+ 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) +
1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos
(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x
+ 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x
+ 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) +
sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x
+ 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(
2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10
*cos(d*x + c) + 1)*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*
c))))*sin(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 20*(10
*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c)
)*sin(5*d*x + 5*c)^2 + sin(5*d*x + 5*c)^3 + (2*(5*cos(4*d*x + 4*c) + 10*cos
(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c)
+ cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*co
s(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x
+ 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 2
0*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d
x + c)^2 + 50(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin
(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x +
c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 1
00*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)
*sin(5*d*x + 5*c) + 5*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos
(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 +
10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*
d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x +
c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)
*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*
d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*
d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*
c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*
d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*
sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2
+ 10*cos(d*x + c) + 1)*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x +
5/2*c))))*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10
(10(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x
+ c))*sin(5*d*x + 5*c)^2 + sin(5*d*x + 5*c)^3 + (2*(5*cos(4*d*x + 4*c) + 10
*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5
*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) +

5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(5*d*x + 5*c))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*cos(d*x + c) + 1)*log(cos(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 - 2*sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 1) - 512*(5*cos(4*d*x + 4*c)^2*cos(5/2*d*x + 5/2*c) + 4*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c)*cos(5/2*d*x + 5/2*c) + 20*cos(3*d*x + 3*c)^2*cos(5/2*d*x + 5/2*c) + 5*cos(5/2*d*x + 5/2*c)*sin(4*d*x + 4*c)^2 + 20*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c)^2 + 2*((2*cos(2*d*x + 2*c) + cos(d*x + c))*cos(5/2*d*x + 5/2*c) + cos(4*d*x + 4*c)*cos(5/2*d*x + 5/2*c) + 2*cos(3*d*x + 3*c)*cos(5/2*d*x + 5/2*c) - (2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5/2*d*x + 5/2*c) - sin(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) - 2*sin(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c))*cos(5*d*x + 5*c) + 2*((10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c) + 10*cos(3*d*x + 3*c)*cos(5/2*d*x + 5/2*c))*cos(4*d*x + 4*c) + (4*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 20*cos(2*d*x + 2*c)^2 + 5*cos(d*x + c)^2 + 20*sin(2*d*x + 2*c)^2 + 20*sin(2*d*x + 2*c)*sin(d*x + c) + 5*sin(d*x + c)^2 + 2*cos(d*x + c))*cos(5/2*d*x + 5/2*c) + 2*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 10*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) - sin(5/2*d*x + 5/2*c))*sin(4*d*x + 4*c) + 4*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) - sin(5/2*d*x + 5/2*c))*sin(3*d*x + 3*c) - 2*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5/2*d*x + 5/2*c))*sin(5*d*x + 5*c) + 512*(10*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5/2*d*x + 5/2*c) + 20*sin(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c))*sin(4*d*x + 4*c) + 1024*(10*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5/2*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c))*sin(3*d*x + 3*c) + 512*(2*(10*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 20*cos(2*d*x + 2*c)^2 + 5*cos(d*x + c)^2 + 20*sin(2*d*x + 2*c)^2 + 20*sin(2*d*x + 2*c)*sin(d*x + c) + 5*sin(d*x + c)^2 + cos(d*x + c))*sin(5/2*d*x + 5/2*c) + 12*((10*cos(4*d*x + 4*c) + 20*cos(3*d*x + 3*c) + 20*cos(2*d*x + 2*c) + 10*cos(d*x + c) + 3)*cos(5*d*x + 5*c)^2 + cos(5*d*x + 5*c)^3 + (cos(5*d*x + 5*c) + 1)*sin(5*d*x + 5*c)^2 + (10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 2)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 2)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 2)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 20*cos(d*x + c) + 3)*cos(5*d*x + 5*c) + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c

) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) +
 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(
d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2
 + 5*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5
*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x
 + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*c
os(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x
 + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c)
 + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*si
n(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(
5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c)
)*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(
d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^
2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c)
 + 1)*cos(8/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*(2*
(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x
 + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c)
+ 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x
 + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c)
+ 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*c
os(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x
+ 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x +
5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*
d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c)
)*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*
sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*co
s(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*(2*(5*cos(4
*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) +
1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos
(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^
2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*co
s(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x
 + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) +
 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 +
 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*
c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*
d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*
x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(4/5*ar
ctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 5*(2*(5*cos(4*d*x + 4*
c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*
d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x +
2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(1
0*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x +
 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2
 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*

d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*si
n(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*s
in(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c
) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*
sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(2/5*arctan2(sin
(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*((sin(4*d*x + 4*c) + 2*sin(3
*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5*d*x + 5*c) + sin(4*d
*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d
*x + 5*c) + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin
(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x +
 c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 1
00*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)
*sin(9/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 4*(128*cos(
5*d*x + 5*c)^2*cos(5/2*d*x + 5/2*c) + 3200*cos(4*d*x + 4*c)^2*cos(5/2*d*x +
 5/2*c) + 2560*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c)*
cos(5/2*d*x + 5/2*c) + 12800*cos(3*d*x + 3*c)^2*cos(5/2*d*x + 5/2*c) - 128*
cos(5/2*d*x + 5/2*c)*sin(5*d*x + 5*c)^2 + 3200*cos(5/2*d*x + 5/2*c)*sin(4*d
*x + 4*c)^2 + 12800*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c
)*sin(3*d*x + 3*c) + 12800*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c)^2 + 256*((
10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c) + 5*cos(4*d*
x + 4*c)*cos(5/2*d*x + 5/2*c) + 10*cos(3*d*x + 3*c)*cos(5/2*d*x + 5/2*c))*c
os(5*d*x + 5*c) + 1280*((10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5/2*
d*x + 5/2*c) + 10*cos(3*d*x + 3*c)*cos(5/2*d*x + 5/2*c))*cos(4*d*x + 4*c) +
 128*(20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 2
5*cos(d*x + c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x +
c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c) + 70*(2*
(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x
 + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c)
+ 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x
 + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c)
+ 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*c
os(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x
+ 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x +
5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*
d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c)
)*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*
sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*co
s(7/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 70*(2*(5*cos(4
*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) +
1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos
(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^
2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*co
s(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x
 + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) +
 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 +

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50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*
c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*
d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*
x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(3/5*ar
ctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 15*(2*(5*cos(4*d*x + 4
*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5
*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x +
 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(
10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x
+ 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^
2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2
*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*s
in(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*
sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*
c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)
*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(1/5*arctan2(si
n(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 256*((10*cos(2*d*x + 2*c) + 5*
cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) + cos(5*d*x + 5*c)*sin(5/2*d*x + 5/2
*c) + 5*cos(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) + 10*cos(3*d*x + 3*c)*sin(5/2
*d*x + 5/2*c))*sin(5*d*x + 5*c) + 6400*((2*sin(2*d*x + 2*c) + sin(d*x + c))
*cos(5/2*d*x + 5/2*c) + 2*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c))*sin(4*d*x
+ 4*c) - 2560*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) +
 cos(5/2*d*x + 5/2*c)*sin(5*d*x + 5*c) + 5*cos(5/2*d*x + 5/2*c)*sin(4*d*x +
 4*c) + 10*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) - (10*cos(2*d*x + 2*c) + 5
*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) - cos(5*d*x + 5*c)*sin(5/2*d*x + 5/
2*c) - 5*cos(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) - 10*cos(3*d*x + 3*c)*sin(5/
2*d*x + 5/2*c))*sin(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))
) - 2560*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + cos(
5/2*d*x + 5/2*c)*sin(5*d*x + 5*c) + 5*cos(5/2*d*x + 5/2*c)*sin(4*d*x + 4*c)
 + 10*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) - (10*cos(2*d*x + 2*c) + 5*cos(
d*x + c) + 1)*sin(5/2*d*x + 5/2*c) - cos(5*d*x + 5*c)*sin(5/2*d*x + 5/2*c)
- 5*cos(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) - 10*cos(3*d*x + 3*c)*sin(5/2*d*x
 + 5/2*c))*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 1
280*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c) + cos(5/2*d
*x + 5/2*c)*sin(5*d*x + 5*c) + 5*cos(5/2*d*x + 5/2*c)*sin(4*d*x + 4*c) + 10
*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) - (10*cos(2*d*x + 2*c) + 5*cos(d*x +
 c) + 1)*sin(5/2*d*x + 5/2*c) - cos(5*d*x + 5*c)*sin(5/2*d*x + 5/2*c) - 5*c
os(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) - 10*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/
2*c))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))))*sin(8/5
*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 56*((10*cos(4*d*x +
 4*c) + 20*cos(3*d*x + 3*c) + 20*cos(2*d*x + 2*c) + 10*cos(d*x + c) + 3)*co
s(5*d*x + 5*c)^2 + cos(5*d*x + 5*c)^3 + (cos(5*d*x + 5*c) + 1)*sin(5*d*x +
5*c)^2 + (10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) +
2)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*c
os(d*x + c) + 2)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x
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+ c) + 2)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 5
0*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c)
 + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*
x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x
+ 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 20*cos(d*x + c) + 3)*cos(5*d*x +
5*c) + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*
cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(
d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c
) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(
2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d
*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c
) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d
*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c
) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100
*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*
x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x
+ 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(
4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x +
c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 10
0*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*
cos(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*(2*(5*cos
(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c)
+ 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*c
os(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c
)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*
cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d
*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c)
 + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2
 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x +
4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(
3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*
d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(4/5*
arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 5*(2*(5*cos(4*d*x +
4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(
5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x
+ 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*
(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x
 + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)
^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(
2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*
sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25
*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3
*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c
)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(2/5*arctan2(s
in(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*((sin(4*d*x + 4*c) + 2*sin

(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5*d*x + 5*c) + sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(7/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 8*(128*cos(5*d*x + 5*c)^2*cos(5/2*d*x + 5/2*c) + 3200*cos(4*d*x + 4*c)^2*cos(5/2*d*x + 5/2*c) + 2560*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c)*cos(5/2*d*x + 5/2*c) + 12800*cos(3*d*x + 3*c)^2*cos(5/2*d*x + 5/2*c) - 128*cos(5/2*d*x + 5/2*c)*sin(5*d*x + 5*c)^2 + 3200*cos(5/2*d*x + 5/2*c)*sin(4*d*x + 4*c)^2 + 12800*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) + 12800*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c)^2 + 256*((10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c) + 5*cos(4*d*x + 4*c)*cos(5/2*d*x + 5/2*c) + 10*cos(3*d*x + 3*c)*cos(5/2*d*x + 5/2*c))*cos(5*d*x + 5*c) + 1280*((10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c) + 10*cos(3*d*x + 3*c)*cos(5/2*d*x + 5/2*c))*cos(4*d*x + 4*c) + 128*(20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c) - 70*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(3/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 15*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 256*((10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) + cos(5*d*x + 5*c)*sin(5/2

*d*x + 5/2*c) + 5*cos(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) + 10*cos(3*d*x + 3*
c)*sin(5/2*d*x + 5/2*c))*sin(5*d*x + 5*c) + 6400*((2*sin(2*d*x + 2*c) + sin
(d*x + c))*cos(5/2*d*x + 5/2*c) + 2*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c))*
sin(4*d*x + 4*c) - 2560*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x
+ 5/2*c) + cos(5/2*d*x + 5/2*c)*sin(5*d*x + 5*c) + 5*cos(5/2*d*x + 5/2*c)*s
in(4*d*x + 4*c) + 10*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) - (10*cos(2*d*x
+ 2*c) + 5*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) - cos(5*d*x + 5*c)*sin(5/
2*d*x + 5/2*c) - 5*cos(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) - 10*cos(3*d*x + 3
*c)*sin(5/2*d*x + 5/2*c))*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x
 + 5/2*c))) - 1280*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2
*c) + cos(5/2*d*x + 5/2*c)*sin(5*d*x + 5*c) + 5*cos(5/2*d*x + 5/2*c)*sin(4*
d*x + 4*c) + 10*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) - (10*cos(2*d*x + 2*c
) + 5*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) - cos(5*d*x + 5*c)*sin(5/2*d*x
 + 5/2*c) - 5*cos(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) - 10*cos(3*d*x + 3*c)*s
in(5/2*d*x + 5/2*c))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/
2*c))))*sin(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 8*(1
28*cos(5*d*x + 5*c)^2*cos(5/2*d*x + 5/2*c) + 3200*cos(4*d*x + 4*c)^2*cos(5/
2*d*x + 5/2*c) + 2560*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x
+ 3*c)*cos(5/2*d*x + 5/2*c) + 12800*cos(3*d*x + 3*c)^2*cos(5/2*d*x + 5/2*c)
 - 128*cos(5/2*d*x + 5/2*c)*sin(5*d*x + 5*c)^2 + 3200*cos(5/2*d*x + 5/2*c)*
sin(4*d*x + 4*c)^2 + 12800*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x
+ 5/2*c)*sin(3*d*x + 3*c) + 12800*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c)^2 +
 256*((10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c) + 5*c
os(4*d*x + 4*c)*cos(5/2*d*x + 5/2*c) + 10*cos(3*d*x + 3*c)*cos(5/2*d*x + 5/
2*c))*cos(5*d*x + 5*c) + 1280*((10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*c
os(5/2*d*x + 5/2*c) + 10*cos(3*d*x + 3*c)*cos(5/2*d*x + 5/2*c))*cos(4*d*x +
 4*c) + 128*(20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c
)^2 + 25*cos(d*x + c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin
(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c) -
 70*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*
cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x
+ 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*co
s(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x
+ 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c)
+ 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin
(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5
*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))
*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d
*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2
 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c)
+ 1)*cos(3/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 15*(2*(
5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x
+ c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) +
 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x
+ 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) +

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100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*co
s(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x +
 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5
*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d
*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))
*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*s
in(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos
(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 256*((10*cos(2*
d*x + 2*c) + 5*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) + cos(5*d*x + 5*c)*si
n(5/2*d*x + 5/2*c) + 5*cos(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) + 10*cos(3*d*x
 + 3*c)*sin(5/2*d*x + 5/2*c))*sin(5*d*x + 5*c) + 6400*((2*sin(2*d*x + 2*c)
+ sin(d*x + c))*cos(5/2*d*x + 5/2*c) + 2*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3
*c))*sin(4*d*x + 4*c) - 1280*(5*(2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2
*d*x + 5/2*c) + cos(5/2*d*x + 5/2*c)*sin(5*d*x + 5*c) + 5*cos(5/2*d*x + 5/2
*c)*sin(4*d*x + 4*c) + 10*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) - (10*cos(2
*d*x + 2*c) + 5*cos(d*x + c) + 1)*sin(5/2*d*x + 5/2*c) - cos(5*d*x + 5*c)*s
in(5/2*d*x + 5/2*c) - 5*cos(4*d*x + 4*c)*sin(5/2*d*x + 5/2*c) - 10*cos(3*d*
x + 3*c)*sin(5/2*d*x + 5/2*c))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/
2*d*x + 5/2*c))))*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c
))) - 56*((10*cos(4*d*x + 4*c) + 20*cos(3*d*x + 3*c) + 20*cos(2*d*x + 2*c)
+ 10*cos(d*x + c) + 3)*cos(5*d*x + 5*c)^2 + cos(5*d*x + 5*c)^3 + (cos(5*d*x
 + 5*c) + 1)*sin(5*d*x + 5*c)^2 + (10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x +
 2*c) + 5*cos(d*x + c) + 2)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(
10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 2)*cos(3*d*x + 3*c) + 100*cos(3*d*x
+ 3*c)^2 + 20*(5*cos(d*x + c) + 2)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^
2 + 25*cos(d*x + c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d
*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c)
 + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x
+ 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 20*cos(d
*x + c) + 3)*cos(5*d*x + 5*c) + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*
c) + 5*cos(d*x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*
cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3
*c)^2 + 20*(5*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 +
 25*cos(d*x + c)^2 + 5*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d*x + 3*c) + 10*co
s(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + cos(5*d*x + 5*c)^2
+ 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(4
*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d*x +
 c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c) + 1
)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*(sin(4
*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5
*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2
*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2
*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100
*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2
 + 10*cos(d*x + c) + 1)*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x +
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5/2*c))) + 10*((sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c)
+ sin(d*x + c))*cos(5*d*x + 5*c) + sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) +
2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sin(3*d*x + 3*
c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4
c)^2 + 100(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(
3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c)
+ 25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*sin(3/5*arctan2(sin(5/2*d*x + 5
/2*c), cos(5/2*d*x + 5/2*c))) - 4*(128*cos(5*d*x + 5*c)^2*cos(5/2*d*x + 5/2
*c) + 3200*cos(4*d*x + 4*c)^2*cos(5/2*d*x + 5/2*c) + 2560*(10*cos(2*d*x + 2
*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c)*cos(5/2*d*x + 5/2*c) + 12800*cos
(3*d*x + 3*c)^2*cos(5/2*d*x + 5/2*c) - 128*cos(5/2*d*x + 5/2*c)*sin(5*d*x +
5*c)^2 + 3200*cos(5/2*d*x + 5/2*c)*sin(4*d*x + 4*c)^2 + 12800*(2*sin(2*d*x
+ 2*c) + sin(d*x + c))*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c) + 12800*cos(5
/2*d*x + 5/2*c)*sin(3*d*x + 3*c)^2 + 256*((10*cos(2*d*x + 2*c) + 5*cos(d*x
+ c) + 1)*cos(5/2*d*x + 5/2*c) + 5*cos(4*d*x + 4*c)*cos(5/2*d*x + 5/2*c) +
10*cos(3*d*x + 3*c)*cos(5/2*d*x + 5/2*c))*cos(5*d*x + 5*c) + 1280*((10*cos(
2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5/2*d*x + 5/2*c) + 10*cos(3*d*x + 3*
c)*cos(5/2*d*x + 5/2*c))*cos(4*d*x + 4*c) + 128*(20*(5*cos(d*x + c) + 1)*co
s(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 100*sin(2*d*x
+ 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 10*cos(
d*x + c) + 1)*cos(5/2*d*x + 5/2*c) - 15*(2*(5*cos(4*d*x + 4*c) + 10*cos(3*d
*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*cos(5*d*x + 5*c) + co
s(5*d*x + 5*c)^2 + 10*(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*
x + c) + 1)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2
*c) + 5*cos(d*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5
*cos(d*x + c) + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x +
c)^2 + 10*(sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + si
n(d*x + c))*sin(5*d*x + 5*c) + sin(5*d*x + 5*c)^2 + 50*(2*sin(3*d*x + 3*c)
+ 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)
^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d
*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) +
25*sin(d*x + c)^2 + 10*cos(d*x + c) + 1)*cos(1/5*arctan2(sin(5/2*d*x + 5/2*
c), cos(5/2*d*x + 5/2*c))) + 256*((10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1
)*sin(5/2*d*x + 5/2*c) + cos(5*d*x + 5*c)*sin(5/2*d*x + 5/2*c) + 5*cos(4*d*
x + 4*c)*sin(5/2*d*x + 5/2*c) + 10*cos(3*d*x + 3*c)*sin(5/2*d*x + 5/2*c))*s
in(5*d*x + 5*c) + 6400*((2*sin(2*d*x + 2*c) + sin(d*x + c))*cos(5/2*d*x + 5
/2*c) + 2*cos(5/2*d*x + 5/2*c)*sin(3*d*x + 3*c))*sin(4*d*x + 4*c))*sin(2/5*
arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) - 12*((10*cos(4*d*x +
4*c) + 20*cos(3*d*x + 3*c) + 20*cos(2*d*x + 2*c) + 10*cos(d*x + c) + 3)*cos
(5*d*x + 5*c)^2 + cos(5*d*x + 5*c)^3 + (cos(5*d*x + 5*c) + 1)*sin(5*d*x + 5
c)^2 + (10(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 2
)*cos(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*co
s(d*x + c) + 2)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x +
c) + 2)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 50
*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(4*d*x + 4*c)

+ 25*sin(4*d*x + 4*c)^2 + 100*(2*sin(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x
 + 3*c) + 100*sin(3*d*x + 3*c)^2 + 100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x +
 2*c)*sin(d*x + c) + 25*sin(d*x + c)^2 + 20*cos(d*x + c) + 3)*cos(5*d*x + 5
c) + 10(10*cos(3*d*x + 3*c) + 10*cos(2*d*x + 2*c) + 5*cos(d*x + c) + 1)*c
os(4*d*x + 4*c) + 25*cos(4*d*x + 4*c)^2 + 20*(10*cos(2*d*x + 2*c) + 5*cos(d
*x + c) + 1)*cos(3*d*x + 3*c) + 100*cos(3*d*x + 3*c)^2 + 20*(5*cos(d*x + c)
 + 1)*cos(2*d*x + 2*c) + 100*cos(2*d*x + 2*c)^2 + 25*cos(d*x + c)^2 + 10*((
sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*c) + sin(d*x + c))*
cos(5*d*x + 5*c) + sin(4*d*x + 4*c) + 2*sin(3*d*x + 3*c) + 2*sin(2*d*x + 2*
c) + sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sin(3*d*x + 3*c) + 2*sin(2*d*x
+ 2*c) + sin(d*x + c))*sin(4*d*x + 4*c) + 25*sin(4*d*x + 4*c)^2 + 100*(2*si
n(2*d*x + 2*c) + sin(d*x + c))*sin(3*d*x + 3*c) + 100*sin(3*d*x + 3*c)^2 +
100*sin(2*d*x + 2*c)^2 + 100*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sin(d*x + c
)^2 + 10*cos(d*x + c) + 1)*sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*
x + 5/2*c))))/((sqrt(2)*a^2*cos(5*d*x + 5*c)^4 + sqrt(2)*a^2*sin(5*d*x + 5*
c)^4 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)
^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + 2
5*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100
*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x
+ c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 2*(5*sqrt(2)*a^2*cos(4*d*x + 4*c) +
10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(
2)*a^2*cos(d*x + c) + 2*sqrt(2)*a^2)*cos(5*d*x + 5*c)^3 + 10*(sqrt(2)*a^2*s
in(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x
+ 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(5*d*x + 5*c)^3 + 10*sqrt(2)*a^2*cos(
d*x + c) + (25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x +
 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^
2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2
+ 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin
(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 30*sqrt(2)*a^2*cos(d*x + c) + 6
*sqrt(2)*a^2 + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d
*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + 3*sqrt(2)*a^2)*cos(4*d*x + 4*c) +
20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + 3*sqrt(2
)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + 3*sqrt(2)*a^2)*c
os(2*d*x + 2*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*
d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^
2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*cos(5*d*x
+ 5*c)^2 + 25*(sqrt(2)*a^2*cos(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*cos(4*d*x +
4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2
*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + sqrt(2)*a^2*sin(5*d*x + 5*c)^2 + 25
*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*
sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x +
 c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)
a^2 + 2(5*sqrt(2)*a^2*cos(4*d*x + 4*c) + 10*sqrt(2)*a^2*cos(3*d*x + 3*c)
+ 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^
2)*cos(5*d*x + 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*

cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*
c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqr
t(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*
cos(2*d*x + 2*c) + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d
*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(
5*d*x + 5*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x
 + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*s
in(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*cos(8/5*arcta
n2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 100*(sqrt(2)*a^2*cos(5*
d*x + 5*c)^2 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*
x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x +
c)^2 + sqrt(2)*a^2*sin(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 +
 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 +
100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)
^2 + 10*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*sqrt(2)*a^2*cos(4*d*x
 + 4*c) + 10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c)
 + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(5*d*x + 5*c) + 10*(10*sqrt
(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*
cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x
 + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(
5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c) + 10*(sqrt(2)*a^
2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d
*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sqrt(2)*a^2*
sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c
))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin
(d*x + c))*sin(3*d*x + 3*c))*cos(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*
d*x + 5/2*c)))^2 + 100*(sqrt(2)*a^2*cos(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*cos
(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(
2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + sqrt(2)*a^2*sin(5*d*x + 5*
c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)
^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*
sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c)
+ sqrt(2)*a^2 + 2*(5*sqrt(2)*a^2*cos(4*d*x + 4*c) + 10*sqrt(2)*a^2*cos(3*d*
x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + s
qrt(2)*a^2)*cos(5*d*x + 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqr
t(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4
*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x +
 c) + sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt
(2)*a^2)*cos(2*d*x + 2*c) + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^
2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x +
 c))*sin(5*d*x + 5*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*
sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt
(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*cos(
4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 25*(sqrt(2)*a^
2*cos(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*

cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*co
s(d*x + c)^2 + sqrt(2)*a^2*sin(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*sin(4*d*x +
4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2
*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(
d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*sqrt(2)*a^2*c
os(4*d*x + 4*c) + 10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*
x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(5*d*x + 5*c) + 10*
(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt
(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*c
os(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*d*x + 3*c
) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c) + 10*(sq
rt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2
*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sqrt
(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin
(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)
*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c),
cos(5/2*d*x + 5/2*c)))^2 + (2*sqrt(2)*a^2*cos(5*d*x + 5*c)^2 + 25*sqrt(2)*a
^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^
2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + 25*sqrt(2)*a^2*sin(4
*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*
d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a
^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + 2*sqrt(2)*a^2 + 2*(5*sqrt
(2)*a^2*cos(4*d*x + 4*c) + 10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2
*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + 2*sqrt(2)*a^2)*cos(5*d*x +
 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*
c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sq
rt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(
3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*
c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) +
sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x +
 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*sin(5*d*x + 5*c)^2 + 25
*(sqrt(2)*a^2*cos(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*
sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sq
rt(2)*a^2*cos(d*x + c)^2 + sqrt(2)*a^2*sin(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*
sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*s
in(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt
(2)*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*s
qrt(2)*a^2*cos(4*d*x + 4*c) + 10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*
a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(5*d*x
+ 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2
*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*s
qrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos
(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2
c) + 10(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2
*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(5*d*x + 5*c)

+ 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqr
t(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*
c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*sin(8/5*arctan2(sin(5/2*d*
x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 100*(sqrt(2)*a^2*cos(5*d*x + 5*c)^2
+ 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 +
100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + sqrt(2
)*a^2*sin(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*
a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a
^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 10*sqrt(
2)*a^2*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*sqrt(2)*a^2*cos(4*d*x + 4*c) + 10*
sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*
a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(5*d*x + 5*c) + 10*(10*sqrt(2)*a^2*cos(3
*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c)
+ sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*s
qrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2
*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c) + 10*(sqrt(2)*a^2*sin(4*d*x +
4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + s
qrt(2)*a^2*sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3
*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x
+ 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*si
n(3*d*x + 3*c))*sin(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))
)^2 + 100*(sqrt(2)*a^2*cos(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)
^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^
2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + sqrt(2)*a^2*sin(5*d*x + 5*c)^2 + 25*sqr
t(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt
(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c)
+ 25*sqrt(2)*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2
+ 2*(5*sqrt(2)*a^2*cos(4*d*x + 4*c) + 10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10
*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*c
os(5*d*x + 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(
2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) +
20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)
*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(
2*d*x + 2*c) + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x +
3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(5*d*
x + 5*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2
*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2
*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*sin(4/5*arctan2(s
in(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c)))^2 + 25*(sqrt(2)*a^2*cos(5*d*x +
5*c)^2 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3
*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2
+ sqrt(2)*a^2*sin(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*
sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*s
qrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 +
10*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*sqrt(2)*a^2*cos(4*d*x + 4*

c) + 10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*
sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(5*d*x + 5*c) + 10*(10*sqrt(2)*a
^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d
*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*
c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqr
t(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c) + 10*(sqrt(2)*a^2*sin
(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x +
2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sqrt(2)*a^2*sin(3
*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*si
n(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x
+ c))*sin(3*d*x + 3*c))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x +
 5/2*c)))^2 + sqrt(2)*a^2 + 2*(25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt
(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2
)*a^2*cos(d*x + c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*
sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*s
in(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 15*sqrt(2)*a
^2*cos(d*x + c) + 2*sqrt(2)*a^2 + 5*(20*sqrt(2)*a^2*cos(3*d*x + 3*c) + 20*s
qrt(2)*a^2*cos(2*d*x + 2*c) + 10*sqrt(2)*a^2*cos(d*x + c) + 3*sqrt(2)*a^2)*
cos(4*d*x + 4*c) + 10*(20*sqrt(2)*a^2*cos(2*d*x + 2*c) + 10*sqrt(2)*a^2*cos
(d*x + c) + 3*sqrt(2)*a^2)*cos(3*d*x + 3*c) + 10*(10*sqrt(2)*a^2*cos(d*x +
c) + 3*sqrt(2)*a^2)*cos(2*d*x + 2*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) +
 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c
) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d
*x + 3*c))*cos(5*d*x + 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt
(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*
d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x +
c) + sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(
2)*a^2)*cos(2*d*x + 2*c) + 10*(sqrt(2)*a^2*cos(5*d*x + 5*c)^3 + 25*sqrt(2)*
a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a
^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + 25*sqrt(2)*a^2*sin(
4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2
*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*
a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + (10*sqrt(2)*a^2*cos(4*d*
x + 4*c) + 20*sqrt(2)*a^2*cos(3*d*x + 3*c) + 20*sqrt(2)*a^2*cos(2*d*x + 2*c
) + 10*sqrt(2)*a^2*cos(d*x + c) + 3*sqrt(2)*a^2)*cos(5*d*x + 5*c)^2 + (sqrt
(2)*a^2*cos(5*d*x + 5*c) + sqrt(2)*a^2)*sin(5*d*x + 5*c)^2 + sqrt(2)*a^2 +
(25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 1
00*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + 25*sqrt
(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(
2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) +
 25*sqrt(2)*a^2*sin(d*x + c)^2 + 20*sqrt(2)*a^2*cos(d*x + c) + 3*sqrt(2)*a^
2 + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) +
 5*sqrt(2)*a^2*cos(d*x + c) + 2*sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt
(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + 2*sqrt(2)*a^2)*cos(
3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + 2*sqrt(2)*a^2)*cos(2*d*x +

2*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c)
+ sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x
+ 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*cos(5*d*x + 5*c) + 10
*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqr
t(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*
cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*d*x + 3*
c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c) + 10*(s
qrt(2)*a^2*cos(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqr
t(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(
2)*a^2*cos(d*x + c)^2 + sqrt(2)*a^2*sin(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*sin
(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(
2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)
*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*sqrt
(2)*a^2*cos(4*d*x + 4*c) + 10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2
*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(5*d*x + 5
c) + 10(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c)
+ 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt
(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*
d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c)
+ 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sq
rt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(5*d*x + 5*c) + 5
0*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2
)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c)
+ sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*cos(6/5*arctan2(sin(5/2*d*x +
5/2*c), cos(5/2*d*x + 5/2*c))) + 10*(sqrt(2)*a^2*cos(5*d*x + 5*c)^2 + 25*s
qrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sq
rt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + sqrt(2)*a^2*
sin(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*si
n(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin
(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2
*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*sqrt(2)*a^2*cos(4*d*x + 4*c) + 10*sqrt(2
)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*co
s(d*x + c) + sqrt(2)*a^2)*cos(5*d*x + 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x +
3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt
(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)
*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d
*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c) + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c)
+ 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)
*a^2*sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) +
2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c)
+ 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*
x + 3*c))*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 5*
(sqrt(2)*a^2*cos(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*s
qrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqr
t(2)*a^2*cos(d*x + c)^2 + sqrt(2)*a^2*sin(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*s

in(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*si
n(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(
2)*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*sq
rt(2)*a^2*cos(4*d*x + 4*c) + 10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a
^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(5*d*x +
 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*
c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sq
rt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(
3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*
c) + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*
sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(5*d*x + 5*c) +
 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt
(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c
) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*cos(2/5*arctan2(sin(5/2*d*x
 + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sq
rt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*s
in(d*x + c) + (sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c
) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*cos(5*d*x +
5*c))*sin(5*d*x + 5*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2
*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqr
t(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*cos
(8/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 20*(sqrt(2)*a^2
*cos(5*d*x + 5*c)^3 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*c
os(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos
(d*x + c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x
 + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x
+ 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*
x + c) + (10*sqrt(2)*a^2*cos(4*d*x + 4*c) + 20*sqrt(2)*a^2*cos(3*d*x + 3*c)
 + 20*sqrt(2)*a^2*cos(2*d*x + 2*c) + 10*sqrt(2)*a^2*cos(d*x + c) + 3*sqrt(2
)*a^2)*cos(5*d*x + 5*c)^2 + (sqrt(2)*a^2*cos(5*d*x + 5*c) + sqrt(2)*a^2)*si
n(5*d*x + 5*c)^2 + sqrt(2)*a^2 + (25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*s
qrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqr
t(2)*a^2*cos(d*x + c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a
^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^
2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 20*sqrt(2
)*a^2*cos(d*x + c) + 3*sqrt(2)*a^2 + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) +
10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + 2*sqrt(2)*a^
2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*c
os(d*x + c) + 2*sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x +
 c) + 2*sqrt(2)*a^2)*cos(2*d*x + 2*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c)
+ 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*
c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*
d*x + 3*c))*cos(5*d*x + 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqr
t(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4
*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x +

c) + sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt
(2)*a^2)*cos(2*d*x + 2*c) + 10*(sqrt(2)*a^2*cos(5*d*x + 5*c)^2 + 25*sqrt(2)
*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*
a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + sqrt(2)*a^2*sin(5*
d*x + 5*c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*
x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x
 + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d
*x + c) + sqrt(2)*a^2 + 2*(5*sqrt(2)*a^2*cos(4*d*x + 4*c) + 10*sqrt(2)*a^2*
cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x
+ c) + sqrt(2)*a^2)*cos(5*d*x + 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c)
+ 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^
2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*c
os(d*x + c) + sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c
) + sqrt(2)*a^2)*cos(2*d*x + 2*c) + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sq
rt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*s
in(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt
(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100
*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*
c))*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 5*(sqrt(
2)*a^2*cos(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)
*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a
^2*cos(d*x + c)^2 + sqrt(2)*a^2*sin(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*sin(4*d
*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*
x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2
*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*sqrt(2)*
a^2*cos(4*d*x + 4*c) + 10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos
(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(5*d*x + 5*c)
+ 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5
*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*
a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*d*x
+ 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c) + 1
0*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2
)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2
*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^
2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sq
rt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*cos(2/5*arctan2(sin(5/2*d*x + 5/2
*c), cos(5/2*d*x + 5/2*c))) + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*
a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x
 + c) + (sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*
sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*cos(5*d*x + 5*c))*
sin(5*d*x + 5*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2
*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a
^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*cos(6/5*a
rctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 20*(sqrt(2)*a^2*cos(5
*d*x + 5*c)^3 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d

*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + (10*sqrt(2)*a^2*cos(4*d*x + 4*c) + 20*sqrt(2)*a^2*cos(3*d*x + 3*c) + 20*sqrt(2)*a^2*cos(2*d*x + 2*c) + 10*sqrt(2)*a^2*cos(d*x + c) + 3*sqrt(2)*a^2)*cos(5*d*x + 5*c)^2 + (sqrt(2)*a^2*cos(5*d*x + 5*c) + sqrt(2)*a^2)*sin(5*d*x + 5*c)^2 + sqrt(2)*a^2 + (25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 20*sqrt(2)*a^2*cos(d*x + c) + 3*sqrt(2)*a^2 + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + 2*sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + 2*sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + 2*sqrt(2)*a^2)*cos(2*d*x + 2*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*cos(5*d*x + 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c) + 5*(sqrt(2)*a^2*cos(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + sqrt(2)*a^2*sin(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*sqrt(2)*a^2*cos(4*d*x + 4*c) + 10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(5*d*x + 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c) + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c) + (sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*cos(5*d*x + 5*c))*sin(5*d*x + 5*c) + 50*(2*sqrt(2)*a^2*sin(3*d* x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*cos(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*(sqrt(2)*a^2*cos(5*d*x + 5*c)^3 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + (10*sqrt(2)*a^2*cos(4*d*x + 4*c) + 20*sqrt(2)*a^2*cos(3*d*x + 3*c) + 20*sqrt(2)*a^2*cos(2*d*x + 2*c) + 10*sqrt(2)*a^2*cos(d*x + c) + 3*sqrt(2)*a^2)*cos(5*d*x + 5*c)^2 + (sqrt(2)*a^2*cos(5*d*x + 5*c) + sqrt(2)*a^2)*sin(5*d*x + 5*c)^2 + sqrt(2)*a^2 + (25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 20*sqrt(2)*a^2*cos(d*x + c) + 3*sqrt(2)*a^2 + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + 2*sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + 2*sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + 2*sqrt(2)*a^2)*cos(2*d*x + 2*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*cos(5*d*x + 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c) + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c) + (sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*cos(5*d*x + 5*c))*sin(5*d*x + 5*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*cos(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c) + (sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*cos(5*d*x + 5*c)^2 + 2*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*cos(5*d*x + 5*c))*sin(5*d*x + 5*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c) + 10*(sqrt(2)*a^2*sin(5*d*x + 5*c)^3 + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)* a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(5*d*x + 5*c)^2 + (sqrt(2)*a^2*cos(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*sqrt(2)*a^2*cos(4*d*x + 4*c) + 10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(5*d*x + 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*sin(5*d*x + 5*c) + 10*(sqrt(2)*a^2*cos(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + sqrt(2)*a^2*sin(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*sqrt(2)*a^2*cos(4*d*x + 4*c) + 10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(5*d*x + 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c) + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*sin(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*(sqrt(2)*a^2*cos(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + sqrt(2)*a^2*sin(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*sqrt(2)*a^2*cos(4*d*x + 4*c) + 10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(5*d*x + 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*

c) + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*
sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(5*d*x + 5*c) +
 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt
(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c
) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*sin(4/5*arctan2(sin(5/2*d*x
 + 5/2*c), cos(5/2*d*x + 5/2*c))) + 5*(sqrt(2)*a^2*cos(5*d*x + 5*c)^2 + 25*
sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*s
qrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + sqrt(2)*a^2
*sin(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*s
in(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*si
n(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^
2*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*sqrt(2)*a^2*cos(4*d*x + 4*c) + 10*sqrt(
2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*c
os(d*x + c) + sqrt(2)*a^2)*cos(5*d*x + 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x
+ 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqr
t(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2
)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(
d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c) + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c)
 + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2
)*a^2*sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) +
 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c
) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d
*x + 3*c))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))))*si
n(8/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 20*(sqrt(2)*a^
2*sin(5*d*x + 5*c)^3 + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin
(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*
sin(5*d*x + 5*c)^2 + (sqrt(2)*a^2*cos(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*cos(4
*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*
d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4
*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*
c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d
*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*sqrt(2)*a^2*co
s(4*d*x + 4*c) + 10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x
 + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(5*d*x + 5*c) + 10*(
10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(
2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*co
s(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*d*x + 3*c)
 + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c) + 50*(2*s
qrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*
sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt
(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*sin(5*d*x + 5*c) + 10*(sqrt(2)*a^2*
cos(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*co
s(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(
d*x + c)^2 + sqrt(2)*a^2*sin(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*
c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c

)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*sqrt(2)*a^2*cos(4*d*x + 4*c) + 10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(5*d*x + 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c) + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 5*(sqrt(2)*a^2*cos(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + sqrt(2)*a^2*sin(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*sqrt(2)*a^2*cos(4*d*x + 4*c) + 10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(5*d*x + 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c) + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))))*sin(6/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 20*(sqrt(2)*a^2*sin(5*d*x + 5*c)^3 + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(5*d*x + 5*c)^2 + (sqrt(2)*a^2*cos(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*sqrt(2)*a^2*cos(4*d*x + 4*c) + 10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(5*d*x + 5*c) + 10*(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt

(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c) + 50*(2*sqrt(2)*a^2*si
n(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))
*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d
*x + c))*sin(3*d*x + 3*c))*sin(5*d*x + 5*c) + 5*(sqrt(2)*a^2*cos(5*d*x + 5*
c)^2 + 25*sqrt(2)*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)
^2 + 100*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + s
qrt(2)*a^2*sin(5*d*x + 5*c)^2 + 25*sqrt(2)*a^2*sin(4*d*x + 4*c)^2 + 100*sqr
t(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 100*sqrt
(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)*a^2*sin(d*x + c)^2 + 10*
sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*sqrt(2)*a^2*cos(4*d*x + 4*c)
+ 10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqr
t(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(5*d*x + 5*c) + 10*(10*sqrt(2)*a^2*
cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x
+ c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt(2)*a^2*cos(2*d*x + 2*c)
+ 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*d*x + 3*c) + 20*(5*sqrt(2
)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c) + 10*(sqrt(2)*a^2*sin(4*
d*x + 4*c) + 2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c
) + sqrt(2)*a^2*sin(d*x + c))*sin(5*d*x + 5*c) + 50*(2*sqrt(2)*a^2*sin(3*d*
x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c))*sin(4
*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(d*x + c
))*sin(3*d*x + 3*c))*sin(2/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/
2*c))))*sin(4/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 10*(
sqrt(2)*a^2*sin(5*d*x + 5*c)^3 + 10*(sqrt(2)*a^2*sin(4*d*x + 4*c) + 2*sqrt(
2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sqrt(2)*a^2*sin(
d*x + c))*sin(5*d*x + 5*c)^2 + (sqrt(2)*a^2*cos(5*d*x + 5*c)^2 + 25*sqrt(2)
*a^2*cos(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*cos(3*d*x + 3*c)^2 + 100*sqrt(2)*
a^2*cos(2*d*x + 2*c)^2 + 25*sqrt(2)*a^2*cos(d*x + c)^2 + 25*sqrt(2)*a^2*sin
(4*d*x + 4*c)^2 + 100*sqrt(2)*a^2*sin(3*d*x + 3*c)^2 + 100*sqrt(2)*a^2*sin(
2*d*x + 2*c)^2 + 100*sqrt(2)*a^2*sin(2*d*x + 2*c)*sin(d*x + c) + 25*sqrt(2)
*a^2*sin(d*x + c)^2 + 10*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2 + 2*(5*sqrt
(2)*a^2*cos(4*d*x + 4*c) + 10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2
*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(5*d*x + 5
c) + 10(10*sqrt(2)*a^2*cos(3*d*x + 3*c) + 10*sqrt(2)*a^2*cos(2*d*x + 2*c)
 + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(4*d*x + 4*c) + 20*(10*sqrt
(2)*a^2*cos(2*d*x + 2*c) + 5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(3*
d*x + 3*c) + 20*(5*sqrt(2)*a^2*cos(d*x + c) + sqrt(2)*a^2)*cos(2*d*x + 2*c)
 + 50*(2*sqrt(2)*a^2*sin(3*d*x + 3*c) + 2*sqrt(2)*a^2*sin(2*d*x + 2*c) + sq
rt(2)*a^2*sin(d*x + c))*sin(4*d*x + 4*c) + 100*(2*sqrt(2)*a^2*sin(2*d*x + 2
*c) + sqrt(2)*a^2*sin(d*x + c))*sin(3*d*x + 3*c))*sin(5*d*x + 5*c))*sin(2/5
*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))))*sqrt(a)*d)

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 129, normalized size of antiderivative = 1.21

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{\sqrt{2}\left(\frac{3\,\log\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^2\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)} - \frac{3\,\log\left(-\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^2\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)} - \frac{2\left(3\,\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-5\,\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}{\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)^2a^2\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}\right)}{64\,\sqrt{a}d}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] 1/64*sqrt(2)*(3*log(sin(1/2*d*x + 1/2*c) + 1)/(a^2*sgn(cos(1/2*d*x + 1/2*c)
)) - 3*log(-sin(1/2*d*x + 1/2*c) + 1)/(a^2*sgn(cos(1/2*d*x + 1/2*c))) - 2*(
3*sin(1/2*d*x + 1/2*c)^3 - 5*sin(1/2*d*x + 1/2*c))/((sin(1/2*d*x + 1/2*c)^2
 - 1)^2*a^2*sgn(cos(1/2*d*x + 1/2*c))))/(sqrt(a)*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{{\left(a+a\,\cos\left(c+d\,x\right)\right)}^{5/2}} \,d x$$

```
[In] int(1/(a + a*cos(c + d*x))^(5/2),x)
```

```
[Out] int(1/(a + a*cos(c + d*x))^(5/2), x)
```

3.144 $\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 144

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{2\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{5/2}d} - \frac{43\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{11\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}$$

```
[Out] 2*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(5/2)/d-1/4*sin(d*x+
c)/d/(a+a*cos(d*x+c))^(5/2)-11/16*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^(3/2)-43/
32*arctanh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(5/2)/d
*2^(1/2)
```

Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2845, 3057, 3064, 2728, 212, 2852}

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{2\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{a^{5/2}d} - \frac{43\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{11\sin(c+dx)}{16ad(a\cos(c+dx)+a)^{3/2}} - \frac{\sin(c+dx)}{4d(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[Sec[c + d*x]/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(a^(5/2)*d) -
(43*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])])/(16
```

```
*Sqrt[2]*a^(5/2)*d) - Sin[c + d*x]/(4*d*(a + a*Cos[c + d*x])^(5/2)) - (11*S
in[c + d*x])/(16*a*d*(a + a*Cos[c + d*x])^(3/2))
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3064

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[(A
*b - a*B)/(b*c - a*d), Int[1/Sqrt[a + b*Sin[e + f*x]], x], x] + Dist[(B*c -
 A*d)/(b*c - a*d), Int[Sqrt[a + b*Sin[e + f*x]]/(c + d*Sin[e + f*x]), x], x
] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{\int \frac{\left(4a-\frac{3}{2}a\cos(c+dx)\right)\sec(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2}$$

$$= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{11\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{\int \frac{\left(8a^2-\frac{11}{4}a^2\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{8a^4}$$

$$= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{11\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx}{a^3} - \frac{43\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx}{32a^2}$$

$$= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{11\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} - \frac{2\text{Subst}\left(\int \frac{1}{a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^2d} + \frac{43\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{16a^2d}$$

$$= \frac{2\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{5/2}d} - \frac{43\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{11\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 4.76 (sec) , antiderivative size = 279, normalized size of antiderivative = 1.94

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{\cos^5\left(\frac{1}{2}(c+dx)\right)\left(-32\sqrt{2}\log\left(i-\sqrt{2}e^{\frac{1}{2}i(c+dx)}-ie^{i(c+dx)}\right)+32\sqrt{2}\log\left(i+\right.\right.}{}$$

```
[In] Integrate[Sec[c + d*x]/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (Cos[(c + d*x)/2]^5*(-32*Sqrt[2]*Log[I - Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^
(I*(c + d*x))] + 32*Sqrt[2]*Log[I + Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c
```

```
 + d*x))] + 86*Log[Cos[(c + d*x)/4] - Sin[(c + d*x)/4]] - 86*Log[Cos[(c + d
*x)/4] + Sin[(c + d*x)/4]] - (Cos[(c + d*x)/4] - Sin[(c + d*x)/4])^(-4) - 1
1/(Cos[(c + d*x)/4] - Sin[(c + d*x)/4])^2 + (Cos[(c + d*x)/4] + Sin[(c + d*
x)/4])^(-4) + 11/(Cos[(c + d*x)/4] + Sin[(c + d*x)/4])^2))/(8*d*(a*(1 + Cos
[c + d*x]))^(5/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 324 vs. $2(119) = 238$.

Time = 1.75 (sec) , antiderivative size = 325, normalized size of antiderivative = 2.26

method	result
default	$-\frac{\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(43\sqrt{2}\ln\left(\frac{4\sqrt{a}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}+4a}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)a\left(\cos^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-32\ln\left(\frac{4\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+4\sqrt{2}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{a}+}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{2}}\right.}{32}$

```
[In] int(sec(d*x+c)/(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/32/a^(7/2)/cos(1/2*d*x+1/2*c)^3*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(43*2^(1/
2)*ln(2*(2*a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+2*a)/cos(1/2*d*x+1/2*c))*
a*cos(1/2*d*x+1/2*c)^4-32*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*co
s(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*cos(1
/2*d*x+1/2*c)^4*a-32*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/
2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*cos(1/2*d
*x+1/2*c)^4*a+11*cos(1/2*d*x+1/2*c)^2*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*2^(1/2
)*a^(1/2)+2*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2))/sin(1/2*d*x+1/2
*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 298 vs. $2(119) = 238$.

Time = 0.28 (sec) , antiderivative size = 298, normalized size of antiderivative = 2.07

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{43\sqrt{2}\left(\cos\left(dx+c\right)^3+3\cos\left(dx+c\right)^2+3\cos\left(dx+c\right)+1\right)\sqrt{a}\log\left(-\frac{a\cos(dx+c}{}\right.}{}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/64*(43*sqrt(2)*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*s
qrt(a)*log(-(a*cos(d*x + c)^2 + 2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*
sin(d*x + c) - 2*a*cos(d*x + c) - 3*a)/(cos(d*x + c)^2 + 2*cos(d*x + c) + 1
)) + 32*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*sqrt(a)*lo
g((a*cos(d*x + c)^3 - 7*a*cos(d*x + c)^2 - 4*sqrt(a*cos(d*x + c) + a)*sqrt(
```

```
a)*(cos(d*x + c) - 2)*sin(d*x + c) + 8*a)/(cos(d*x + c)^3 + cos(d*x + c)^2)
) - 4*sqrt(a*cos(d*x + c) + a)*(11*cos(d*x + c) + 15)*sin(d*x + c))/(a^3*d*
cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F]

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\sec\left(c+dx\right)}{\left(a\left(\cos\left(c+dx\right)+1\right)\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))**(5/2),x)
[Out] Integral(sec(c + d*x)/(a*(cos(c + d*x) + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\sec\left(dx+c\right)}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)/(a*cos(d*x + c) + a)^(5/2), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(sec(d*x+c)/(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)\,\left(a+a\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)*(a + a*cos(c + d*x))^(5/2)),x)
[Out] int(1/(cos(c + d*x)*(a + a*cos(c + d*x))^(5/2)), x)
```

3.145 $\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 174

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = -\frac{5\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{5/2}d} + \frac{115\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\tan(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{15\tan(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{35\tan(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -5*arctanh(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(5/2)/d+115/32*arct
anh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(5/2)/d*2^(1/2
)-1/4*tan(d*x+c)/d/(a+a*cos(d*x+c))^(5/2)-15/16*tan(d*x+c)/a/d/(a+a*cos(d*x
+c))^(3/2)+35/16*tan(d*x+c)/a^2/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.62 (sec) , antiderivative size = 174, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {2845, 3057, 3063, 3064, 2728, 212, 2852}

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = -\frac{5\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{a^{5/2}d} + \frac{115\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{35\tan(c+dx)}{16a^2d\sqrt{a\cos(c+dx)+a}} - \frac{15\tan(c+dx)}{16ad(a\cos(c+dx)+a)^{3/2}} - \frac{\tan(c+dx)}{4d(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[Sec[c + d*x]^2/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (-5*ArcTanh[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(a^(5/2)*d) +
 (115*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[a + a*Cos[c + d*x]])])/(
16*Sqrt[2]*a^(5/2)*d) - Tan[c + d*x]/(4*d*(a + a*Cos[c + d*x])^(5/2)) - (15
*Tan[c + d*x])/(16*a*d*(a + a*Cos[c + d*x])^(3/2)) + (35*Tan[c + d*x])/(16*
a^2*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2728

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[-2/d, S
ubst[Int[1/(2*a - x^2), x], x, b*(Cos[c + d*x]/Sqrt[a + b*Sin[c + d*x]])],
x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b^2, 0]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2852

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b*c + a*d - d*x^2), x
], x, b*(Cos[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, c, d,
e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
```

```
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rule 3064

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[(A
*b - a*B)/(b*c - a*d), Int[1/Sqrt[a + b*Sin[e + f*x]], x], x] + Dist[(B*c -
 A*d)/(b*c - a*d), Int[Sqrt[a + b*Sin[e + f*x]]/(c + d*Sin[e + f*x]), x], x
] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\tan(c+dx)}{4d(a+a\cos(c+dx))^{5/2}}+\frac{\int \frac{\left(5a-\frac{5}{2}a\cos(c+dx)\right)\sec^2(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2}\\
&= -\frac{\tan(c+dx)}{4d(a+a\cos(c+dx))^{5/2}}-\frac{15\tan(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}+\frac{\int \frac{\left(\frac{35a^2}{2}-\frac{45}{4}a^2\cos(c+dx)\right)\sec^2(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{8a^4}\\
&= -\frac{\tan(c+dx)}{4d(a+a\cos(c+dx))^{5/2}}-\frac{15\tan(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}\\
&\quad+\frac{35\tan(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}}+\frac{\int \frac{\left(-20a^3+\frac{35}{4}a^3\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx}{8a^5}\\
&= -\frac{\tan(c+dx)}{4d(a+a\cos(c+dx))^{5/2}}-\frac{15\tan(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}+\frac{35\tan(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}}\\
&\quad-\frac{5\int \sqrt{a+a\cos(c+dx)}\sec(c+dx)\,dx}{2a^3}+\frac{115\int \frac{1}{\sqrt{a+a\cos(c+dx)}}\,dx}{32a^2}
\end{aligned}
$$

$$= -\frac{\tan(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{15\tan(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{35\tan(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}} + \frac{5\text{Subst}\left(\int \frac{1}{a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^2d} - \frac{115\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{16a^2d}$$

$$= -\frac{5\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{5/2}d} + \frac{115\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\tan(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{15\tan(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{35\tan(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.97 (sec) , antiderivative size = 731, normalized size of antiderivative = 4.20

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{10\sqrt{2}\cos^5\left(\frac{c}{2}+\frac{dx}{2}\right)\left(-\frac{ie^{ic}x}{-1+e^{ic}} + \frac{\log\left(i-\sqrt{2}e^{\frac{1}{2}i(c+dx)}-ie^{i(c+dx)}\right)}{d}\right)}{(a(1+\cos(c+dx)))^{5/2}} + \frac{10\sqrt{2}\cos^5\left(\frac{c}{2}+\frac{dx}{2}\right)\left(\frac{ie^{ic}x}{-1+e^{ic}} - \frac{\log\left(i+\sqrt{2}e^{\frac{1}{2}i(c+dx)}-ie^{i(c+dx)}\right)}{d}\right)}{(a(1+\cos(c+dx)))^{5/2}} - \frac{115\cos^5\left(\frac{c}{2}+\frac{dx}{2}\right)\log\left(\cos\left(\frac{c}{4}+\frac{dx}{4}\right)-\sin\left(\frac{c}{4}+\frac{dx}{4}\right)\right)}{4d(a(1+\cos(c+dx)))^{5/2}} + \frac{115\cos^5\left(\frac{c}{2}+\frac{dx}{2}\right)\log\left(\cos\left(\frac{c}{4}+\frac{dx}{4}\right)+\sin\left(\frac{c}{4}+\frac{dx}{4}\right)\right)}{4d(a(1+\cos(c+dx)))^{5/2}} + \frac{\cos^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{8d(a(1+\cos(c+dx)))^{5/2}\left(\cos\left(\frac{c}{4}+\frac{dx}{4}\right)-\sin\left(\frac{c}{4}+\frac{dx}{4}\right)\right)^4} + \frac{19\cos^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{8d(a(1+\cos(c+dx)))^{5/2}\left(\cos\left(\frac{c}{4}+\frac{dx}{4}\right)-\sin\left(\frac{c}{4}+\frac{dx}{4}\right)\right)^2} - \frac{\cos^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{8d(a(1+\cos(c+dx)))^{5/2}\left(\cos\left(\frac{c}{4}+\frac{dx}{4}\right)+\sin\left(\frac{c}{4}+\frac{dx}{4}\right)\right)^4} - \frac{19\cos^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{8d(a(1+\cos(c+dx)))^{5/2}\left(\cos\left(\frac{c}{4}+\frac{dx}{4}\right)+\sin\left(\frac{c}{4}+\frac{dx}{4}\right)\right)^2} + \frac{4\cos^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{d(a(1+\cos(c+dx)))^{5/2}\left(\cos\left(\frac{c}{2}+\frac{dx}{2}\right)-\sin\left(\frac{c}{2}+\frac{dx}{2}\right)\right)} - \frac{4\cos^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{d(a(1+\cos(c+dx)))^{5/2}\left(\cos\left(\frac{c}{2}+\frac{dx}{2}\right)+\sin\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}$$

[In] Integrate[Sec[c + d*x]^2/(a + a*Cos[c + d*x])^(5/2),x]

[Out] (10*Sqrt[2]*Cos[c/2 + (d*x)/2]^5*(((-I)*E^(I*c)*x)/(-1 + E^(I*c)) + Log[I - Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))]/d))/(a*(1 + Cos[c + d*x]))^(5/2) + (10*Sqrt[2]*Cos[c/2 + (d*x)/2]^5*((I*E^(I*c)*x)/(-1 + E^(I*c)) - Log[I + Sqrt[2]*E^((I/2)*(c + d*x)) - I*E^(I*(c + d*x))]/d))/(a*(1 + Cos[c + d*x]))^(5/2) - (115*Cos[c/2 + (d*x)/2]^5*Log[Cos[c/4 + (d*x)/4] - Sin[c/4 + (d*x)/4]])/(4*d*(a*(1 + Cos[c + d*x]))^(5/2)) + (115*Cos[c/2 + (d*x)/2]^5*Log[Cos[c/4 + (d*x)/4] + Sin[c/4 + (d*x)/4]])/(4*d*(a*(1 + Cos[c + d*x]))^(5/2)) + Cos[c/2 + (d*x)/2]^5/(8*d*(a*(1 + Cos[c + d*x]))^(5/2)*(Cos[c/4 + (d*x)/4] - Sin[c/4 + (d*x)/4])^4) + (19*Cos[c/2 + (d*x)/2]^5)/(8*d*(a*(1 + Cos[c + d*x]))^(5/2)*(Cos[c/4 + (d*x)/4] - Sin[c/4 + (d*x)/4])^2) - Cos[c/2 + (d*x)/2]^5/(8*d*(a*(1 + Cos[c + d*x]))^(5/2)*(Cos[c/4 + (d*x)/4] + Sin[c/4 + (d*x)/4])^4) - (19*Cos[c/2 + (d*x)/2]^5)/(8*d*(a*(1 + Cos[c + d*x]))^(5/2)*(Cos[c/4 + (d*x)/4] + Sin[c/4 + (d*x)/4])^2) + (4*Cos[c/2 + (d*x)/2]^5)/(d*(a*(1 + Cos[c + d*x]))^(5/2)*(Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2])) - (4*Cos[c/2 + (d*x)/2]^5)/(d*(a*(1 + Cos[c + d*x]))^(5/2)*(Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2]))

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 600 vs. $2(145) = 290$.

Time = 1.69 (sec) , antiderivative size = 601, normalized size of antiderivative = 3.45

method	result
default	$\frac{\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(230\sqrt{2}\,\ln\left(\frac{4\sqrt{a}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}+4a}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)\left(\cos^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-160\ln\left(\frac{4\sqrt{2}\,a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+4\sqrt{2}\,\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{a}}{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{2}}\right.}{}$

[In] int(sec(d*x+c)^2/(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)

[Out] 1/16*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*(230*2^(1/2)*ln(2*(2*a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+2*a)/cos(1/2*d*x+1/2*c))*cos(1/2*d*x+1/2*c)^6*a-160*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*cos(1/2*d*x+1/2*c)^6*a-160*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*cos(1/2*d*x+1/2*c)^6*a-115*2^(1/2)*ln(2*(2*a^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)+2*a)/cos(1/2*d*x+1/2*c))*a*cos(1/2*d*x+1/2*c)^4+70*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)*cos(1/2*d*x+1/2*c)^4+80*ln(4/(2*cos(1/2*d*x+1/2*c)+2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)+2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)+2*a))*cos(1/2*d*x+1/2*c)^4*a+80*ln(-4/(2*cos(1/2*d*x+1/2*c)-2^(1/2))*(2^(1/2)*a*cos(1/2*d*x+1/2*c)-2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2)-2*a))*cos(1/2*d*x+1/2*c)^4*a-15*cos(1/2*d*x+1/2*c)^2*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*2^(1/2)*a^(1/2

```
)-2*2^(1/2)*(a*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^(1/2))/a^(7/2)/cos(1/2*d*x+1/2
*c)^3/(2*cos(1/2*d*x+1/2*c)+2^(1/2))/(2*cos(1/2*d*x+1/2*c)-2^(1/2))/sin(1/2
*d*x+1/2*c)/(a*cos(1/2*d*x+1/2*c)^2)^(1/2)/d
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 330 vs. 2(145) = 290.

Time = 0.27 (sec) , antiderivative size = 330, normalized size of antiderivative = 1.90

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{115\sqrt{2}\left(\cos(dx+c)^4+3\cos(dx+c)^3+3\cos(dx+c)^2+\cos(dx+c)\right)\sqrt{a}\,\mathrm{lo}}{}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/64*(115*sqrt(2)*(cos(d*x + c)^4 + 3*cos(d*x + c)^3 + 3*cos(d*x + c)^2 + c
os(d*x + c))*sqrt(a)*log(-(a*cos(d*x + c)^2 - 2*sqrt(2)*sqrt(a*cos(d*x + c)
 + a)*sqrt(a)*sin(d*x + c) - 2*a*cos(d*x + c) - 3*a)/(cos(d*x + c)^2 + 2*co
s(d*x + c) + 1)) + 80*(cos(d*x + c)^4 + 3*cos(d*x + c)^3 + 3*cos(d*x + c)^2
 + cos(d*x + c))*sqrt(a)*log((a*cos(d*x + c)^3 - 7*a*cos(d*x + c)^2 + 4*sqr
t(a*cos(d*x + c) + a)*sqrt(a)*(cos(d*x + c) - 2)*sin(d*x + c) + 8*a)/(cos(d
*x + c)^3 + cos(d*x + c)^2)) + 4*sqrt(a*cos(d*x + c) + a)*(35*cos(d*x + c)^
2 + 55*cos(d*x + c) + 16)*sin(d*x + c))/(a^3*d*cos(d*x + c)^4 + 3*a^3*d*cos
(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + a^3*d*cos(d*x + c))
```

Sympy [F]

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\sec^2(c+dx)}{(a(\cos(c+dx)+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)**2/(a+a*cos(d*x+c))**(5/2),x)
```

```
[Out] Integral(sec(c + d*x)**2/(a*(cos(c + d*x) + 1))**(5/2), x)
```

Maxima [F(-1)]

Timed out.

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] Timed out
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(sec(d*x+c)^2/(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^2(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{\cos(c+d\,x)^2\,(a+a\,\cos(c+d\,x))^{5/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^2*(a + a*cos(c + d*x))^(5/2)),x)
```

```
[Out] int(1/(cos(c + d*x)^2*(a + a*cos(c + d*x))^(5/2)), x)
```

3.146 $\int \cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 111

$$\int \cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))\,dx = \frac{6aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{10a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d}+\frac{10a\sqrt{\cos(c+dx)}\sin(c+dx)}{21d}+\frac{2a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{2a\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}$$

```
[Out] 6/5*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x
+1/2*c),2^(1/2))/d+10/21*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*
EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/5*a*cos(d*x+c)^(3/2)*sin(d*x+c)/d
+2/7*a*cos(d*x+c)^(5/2)*sin(d*x+c)/d+10/21*a*sin(d*x+c)*cos(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used

$= \{2827, 2715, 2719, 2720\}$

$$\int \cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))\,dx = \frac{10a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{6aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{2a\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{7d} + \frac{2a\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{5d} + \frac{10a\sin(c+dx)\sqrt{\cos(c+dx)}}{21d}$$

```
[In] Int[Cos[c + d*x]^(5/2)*(a + a*Cos[c + d*x]),x]
```

```
[Out] (6*a*EllipticE[(c + d*x)/2, 2])/(5*d) + (10*a*EllipticF[(c + d*x)/2, 2])/(2
1*d) + (10*a*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(21*d) + (2*a*Cos[c + d*x]^(3
/2)*Sin[c + d*x])/(5*d) + (2*a*Cos[c + d*x]^(5/2)*Sin[c + d*x])/(7*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = a\int \cos^{\frac{5}{2}}(c+dx)\,dx + a\int \cos^{\frac{7}{2}}(c+dx)\,dx$$

$$= \frac{2a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{1}{5}(3a)\int \sqrt{\cos(c+dx)}\,dx + \frac{1}{7}(5a)\int \cos^{\frac{3}{2}}(c+dx)\,dx$$

$$= \frac{6aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{10a\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} + \frac{2a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{1}{21}(5a)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{6aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{10a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{10a\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} + \frac{2a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 4.64 (sec) , antiderivative size = 241, normalized size of antiderivative = 2.17

$$\int \cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))\,dx$$
$$= \frac{a(1+\cos(c+dx))\sec^2\left(\frac{1}{2}(c+dx)\right)\left(\frac{63(3\cos(c-dx-\arctan(\tan(c)))+\cos(c+dx+\arctan(\tan(c))))\csc(c)\sec(c)}{\sqrt{\sec^2(c)}} - 100\cos(c+\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)*(a + a*Cos[c + d*x]),x]
```

```
[Out] (a*(1 + Cos[c + d*x])*Sec[(c + d*x)/2]^2*((63*(3*Cos[c - d*x - ArcTan[Tan[c
]]] + Cos[c + d*x + ArcTan[Tan[c]]])*Csc[c]*Sec[c])/Sqrt[Sec[c]^2] - 100*Co
s[c + d*x]*Sqrt[Cos[d*x - ArcTan[Cot[c]]]^2]*Sqrt[Csc[c]^2]*HypergeometricP
FQ[{1/4, 1/2}, {5/4}, Sin[d*x - ArcTan[Cot[c]]]^2]*Sec[d*x - ArcTan[Cot[c]]
]*Sin[c] + Cos[c + d*x]*(-252*Cot[c] + 115*Sin[c + d*x] + 42*Sin[2*(c + d*x
)] + 15*Sin[3*(c + d*x)]) - 126*Cos[c]*Csc[d*x + ArcTan[Tan[c]]]*Hypergeome
tricPFQ[{-1/2, -1/4}, {3/4}, Cos[d*x + ArcTan[Tan[c]]]^2]*Sqrt[Sec[c]^2]*Sq
rt[Sin[d*x + ArcTan[Tan[c]]]^2]))/(420*d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 8.85 (sec) , antiderivative size = 270, normalized size of antiderivative = 2.43

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a\left(240\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-528\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+448\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.}{105\sqrt{-2\left(\sin^4\right.}}$
parts	$-\frac{2a\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\text{co}\right.}{5\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\right.\right.}}$

```
[In] int(cos(d*x+c)^(5/2)*(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] -2/105*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a*(240*cos(1
/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8-528*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c
)^6+448*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-122*sin(1/2*d*x+1/2*c)^2*co
s(1/2*d*x+1/2*c)+25*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)
^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-63*(sin(1/2*d*x+1/2*c)^2)^(1/2
)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(
-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*c
os(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.33

$$\int \cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))\,dx$$
$$=\frac{2\left(15\,a\cos\left(dx+c\right)^{2}+21\,a\cos\left(dx+c\right)+25\,a\right)\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-25i\,\sqrt{2}a\text{weierstrassPInverse}($$

```
[In] integrate(cos(d*x+c)^(5/2)*(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/105*(2*(15*a*cos(d*x + c)^2 + 21*a*cos(d*x + c) + 25*a)*sqrt(cos(d*x + c)
)*sin(d*x + c) - 25*I*sqrt(2)*a*weierstrassPInverse(-4, 0, cos(d*x + c) + I
*sin(d*x + c)) + 25*I*sqrt(2)*a*weierstrassPInverse(-4, 0, cos(d*x + c) - I
*sin(d*x + c)) + 63*I*sqrt(2)*a*weierstrassZeta(-4, 0, weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 63*I*sqrt(2)*a*weierstrassZeta(-4,
 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/d
```

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))\,dx=\text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)*(a+a*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))\,dx = \int (a\cos(dx+c)+a)\cos(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)*(a+a*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)*cos(d*x + c)^(5/2), x)
```

Giac [F]

$$\int \cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))\,dx = \int (a\cos(dx+c)+a)\cos(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)*(a+a*cos(d*x+c)),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)*cos(d*x + c)^(5/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.49 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.78

$$\begin{aligned}\int \cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))\,dx &= -\frac{2\,a\cos(c+d\,x)^{7/2}\,\sin(c+d\,x)\;{}_2F_1\left(\frac{1}{2},\frac{7}{4};\;\frac{11}{4};\;\cos(c+d\,x)^2\right)}{7\,d\,\sqrt{\sin(c+d\,x)^2}} \\ &\quad - \frac{2\,a\cos(c+d\,x)^{9/2}\,\sin(c+d\,x)\;{}_2F_1\left(\frac{1}{2},\frac{9}{4};\;\frac{13}{4};\;\cos(c+d\,x)^2\right)}{9\,d\,\sqrt{\sin(c+d\,x)^2}}\end{aligned}$$

```
[In] int(cos(c + d*x)^(5/2)*(a + a*cos(c + d*x)),x)
[Out] - (2*a*cos(c + d*x)^(7/2)*sin(c + d*x)*hypergeom([1/2, 7/4], 11/4, cos(c +
d*x)^2))/(7*d*(sin(c + d*x)^2)^(1/2)) - (2*a*cos(c + d*x)^(9/2)*sin(c + d*x
)*hypergeom([1/2, 9/4], 13/4, cos(c + d*x)^2))/(9*d*(sin(c + d*x)^2)^(1/2))
```

3.147 $\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 87

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))\,dx=\frac{6aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2a\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2a\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}+\frac{2a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}$$

```
[Out] 6/5*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x
+1/2*c),2^(1/2))/d+2/3*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*El
lipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/5*a*cos(d*x+c)^(3/2)*sin(d*x+c)/d+2
/3*a*sin(d*x+c)*cos(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2827, 2715, 2720, 2719}

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))\,dx=\frac{2a\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{6aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2a\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{5d}+\frac{2a\sin(c+dx)\sqrt{\cos(c+dx)}}{3d}$$

```
[In] Int[Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x]),x]
```

```
[Out] (6*a*EllipticE[(c + d*x)/2, 2])/(5*d) + (2*a*EllipticF[(c + d*x)/2, 2])/(3*
d) + (2*a*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(3*d) + (2*a*Cos[c + d*x]^(3/2)*
Sin[c + d*x])/(5*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= a\int \cos^{\frac{3}{2}}(c+dx)\,dx + a\int \cos^{\frac{5}{2}}(c+dx)\,dx \\
&= \frac{2a\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} \\
&\quad + \frac{1}{3}a\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx + \frac{1}{5}(3a)\int \sqrt{\cos(c+dx)}\,dx \\
&= \frac{6aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{2a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} \\
&\quad + \frac{2a\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}
\end{aligned}
$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 3.56 (sec) , antiderivative size = 232, normalized size of antiderivative = 2.67

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))\,dx$$

$$= \frac{a(1+\cos(c+dx))\sec^2\left(\frac{1}{2}(c+dx)\right)\left(\frac{9(3\cos(c-dx-\arctan(\tan(c)))+\cos(c+dx+\arctan(\tan(c))))\csc(c)\sec(c)}{\sqrt{\sec^2(c)}}-20\cos(c+d\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x]),x]
```

```
[Out] (a*(1 + Cos[c + d*x])*Sec[(c + d*x)/2]^2*((9*(3*Cos[c - d*x - ArcTan[Tan[c]
]] + Cos[c + d*x + ArcTan[Tan[c]]])*Csc[c]*Sec[c])/Sqrt[Sec[c]^2] - 20*Cos[
c + d*x]*Sqrt[Cos[d*x - ArcTan[Cot[c]]]^2]*Sqrt[Csc[c]^2]*HypergeometricPFQ
[{1/4, 1/2}, {5/4}, Sin[d*x - ArcTan[Cot[c]]]^2]*Sec[d*x - ArcTan[Cot[c]]]*
Sin[c] + 2*Cos[c + d*x]*(-18*Cot[c] + 10*Sin[c + d*x] + 3*Sin[2*(c + d*x)])
 - 18*Cos[c]*Csc[d*x + ArcTan[Tan[c]]]*HypergeometricPFQ[{-1/2, -1/4}, {3/4
}, Cos[d*x + ArcTan[Tan[c]]]^2]*Sqrt[Sec[c]^2]*Sqrt[Sin[d*x + ArcTan[Tan[c]
]]^2]))/(60*d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 6.66 (sec) , antiderivative size = 219, normalized size of antiderivative = 2.52

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a\left(24\left(\cos^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-28\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+5\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\right.}{15\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)}$
parts	$-\frac{2a\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2}\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int(cos(d*x+c)^(3/2)*(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] -2/15*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a*(24*cos(1/2
*d*x+1/2*c)^7-28*cos(1/2*d*x+1/2*c)^5+5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*co
s(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-9*(sin(1/
2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticE(cos(1/2*d
*x+1/2*c),2^(1/2))+4*cos(1/2*d*x+1/2*c))/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d
*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.57

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))\,dx$$
$$= \frac{2\,(3\,a\cos{(dx+c)}+5\,a)\sqrt{\cos{(dx+c)}}\sin{(dx+c)}-5i\,\sqrt{2}a\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/15*(2*(3*a*cos(d*x + c) + 5*a)*sqrt(cos(d*x + c))*sin(d*x + c) - 5*I*sqrt
(2)*a*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 5*I*sqrt(
2)*a*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 9*I*sqrt(2
)*a*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(
d*x + c))) - 9*I*sqrt(2)*a*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0
, cos(d*x + c) - I*sin(d*x + c))))/d
```

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(3/2)*(a+a*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))\,dx = \int (a\cos{(dx+c)}+a)\cos{(dx+c)}^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] integrate((a*cos(d*x + c) + a)*cos(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))\,dx = \int (a\cos(dx+c)+a)\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c)),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)*cos(d*x + c)^(3/2), x)
```

Mupad [B] (verification not implemented)

Time = 0.17 (sec) , antiderivative size = 80, normalized size of antiderivative = 0.92

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))\,dx = \frac{2\,a\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{3\,d} + \frac{2\,a\,\sqrt{\cos(c+d\,x)}\,\sin(c+d\,x)}{3\,d} - \frac{2\,a\cos(c+d\,x)^{7/2}\,\sin(c+d\,x)\;{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{7}{4};\ \frac{11}{4};\ \cos(c+d\,x)^2\right)}{7\,d\,\sqrt{\sin(c+d\,x)^2}}$$

```
[In] int(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x)),x)
[Out] (2*a*ellipticF(c/2 + (d*x)/2, 2))/(3*d) + (2*a*cos(c + d*x)^(1/2)*sin(c + d
*x))/(3*d) - (2*a*cos(c + d*x)^(7/2)*sin(c + d*x)*hypergeom([1/2, 7/4], 11/
4, cos(c + d*x)^2))/(7*d*(sin(c + d*x)^2)^(1/2))
```

3.148 $\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 61

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))\,dx = \frac{2aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2a\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2a\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}$$

```
[Out] 2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1
/2*c),2^(1/2))/d+2/3*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elli
pticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/3*a*sin(d*x+c)*cos(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2827, 2719, 2715, 2720}

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))\,dx = \frac{2a\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2a\sin(c+dx)\sqrt{\cos(c+dx)}}{3d}$$

```
[In] Int[Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x]),x]
```

```
[Out] (2*a*EllipticE[(c + d*x)/2, 2])/d + (2*a*EllipticF[(c + d*x)/2, 2])/(3*d) +
 (2*a*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(3*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
```

```
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= a\int \sqrt{\cos(c+dx)}\,dx + a\int \cos^{\frac{3}{2}}(c+dx)\,dx \\
&= \frac{2aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2a\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{1}{3}a\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{2aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2a\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}
\end{aligned}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 3.19 (sec) , antiderivative size = 222, normalized size of antiderivative = 3.64

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))\,dx = \frac{a(1+\cos(c+dx))\sec^2\left(\frac{1}{2}(c+dx)\right)\left(\frac{3(3\cos(c-dx-\arctan(\tan(c)))+\cos(c+dx+\arctan(\tan(c))))\csc(c)\sec(c)}{\sqrt{\sec^2(c)}} - 4\cos(c+dx\right.}{}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x]),x]
```

```
[Out] (a*(1 + Cos[c + d*x])*Sec[(c + d*x)/2]^2*((3*(3*Cos[c - d*x - ArcTan[Tan[c]
]] + Cos[c + d*x + ArcTan[Tan[c]]])*Csc[c]*Sec[c])/Sqrt[Sec[c]^2] - 4*Cos[c
```

```
 + d*x]*Sqrt[Cos[d*x - ArcTan[Cot[c]]]^2]*Sqrt[Csc[c]^2]*HypergeometricPFQ[
{1/4, 1/2}, {5/4}, Sin[d*x - ArcTan[Cot[c]]]^2]*Sec[d*x - ArcTan[Cot[c]]]*S
in[c] - 4*Cos[c + d*x]*(3*Cot[c] - Sin[c + d*x]) - 6*Cos[c]*Csc[d*x + ArcTa
n[Tan[c]]]*HypergeometricPFQ[{-1/2, -1/4}, {3/4}, Cos[d*x + ArcTan[Tan[c]]]
^2]*Sqrt[Sec[c]^2]*Sqrt[Sin[d*x + ArcTan[Tan[c]]]^2]))/(12*d*Sqrt[Cos[c + d
*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 224 vs. $2(107) = 214$.

Time = 5.08 (sec) , antiderivative size = 225, normalized size of antiderivative = 3.69

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a\left(4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2(s}}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{}}$
parts	$-\frac{2a\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2(s}}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int(cos(d*x+c)^(1/2)*(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a*(4*sin(1/2*d
*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-2*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+(s
in(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1
/2*d*x+1/2*c),2^(1/2))-3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)
^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-2*sin(1/2*d*x+1/2*c)^4
+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^
(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 125, normalized size of antiderivative = 2.05

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))\,dx$$
$$=\frac{2\,a\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-i\,\sqrt{2}a\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))+i\,\sqrt{2}a\text{weie}}{}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/3*(2*a*sqrt(cos(d*x + c))*sin(d*x + c) - I*sqrt(2)*a*weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c)) + I*sqrt(2)*a*weierstrassPInverse(-4,
```

```
 0, cos(d*x + c) - I*sin(d*x + c)) + 3*I*sqrt(2)*a*weierstrassZeta(-4, 0, w
eierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*I*sqrt(2)*a*w
eierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x +
 c))))/d
```

Sympy [F]

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))\,dx = a\left(\int \sqrt{\cos{(c+dx)}}\,dx + \int \cos^{\frac{3}{2}}{(c+dx)}\,dx\right)$$

```
[In] integrate(cos(d*x+c)**(1/2)*(a+a*cos(d*x+c)),x)
[Out] a*(Integral(sqrt(cos(c + d*x)), x) + Integral(cos(c + d*x)**(3/2), x))
```

Maxima [F]

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))\,dx = \int (a\cos{(dx+c)}+a)\sqrt{\cos{(dx+c)}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)*sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))\,dx = \int (a\cos{(dx+c)}+a)\sqrt{\cos{(dx+c)}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c)),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)*sqrt(cos(d*x + c)), x)
```

Mupad [B] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.87

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))\,dx = \frac{2\,a\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d} + \frac{2\,a\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{3\,d} + \frac{2\,a\,\sqrt{\cos{(c+d\,x)}}\,\sin{(c+d\,x)}}{3\,d}$$

```
[In] int(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x)),x)
[Out] (2*a*ellipticE(c/2 + (d*x)/2, 2))/d + (2*a*ellipticF(c/2 + (d*x)/2, 2))/(3*
d) + (2*a*cos(c + d*x)^(1/2)*sin(c + d*x))/(3*d)
```

3.149 $\int \frac{a+a\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 35

$$\int \frac{a+a\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx=\frac{2aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}$$

```
[Out] 2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1
/2*c),2^(1/2))/d+2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icF(sin(1/2*d*x+1/2*c),2^(1/2))/d
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2827, 2720, 2719}

$$\int \frac{a+a\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx=\frac{2a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}+\frac{2aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}$$

```
[In] Int[(a + a*Cos[c + d*x])/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (2*a*EllipticE[(c + d*x)/2, 2])/d + (2*a*EllipticF[(c + d*x)/2, 2])/d
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned} \text{integral} &= a\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx + a\int \sqrt{\cos(c+dx)}\,dx \\ &= \frac{2aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} \end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.33 (sec) , antiderivative size = 155, normalized size of antiderivative = 4.43

$$\int \frac{a+a\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{a\sqrt{\cos(c+dx)}(1+\cos(c+dx))\sec^2\left(\frac{1}{2}(c+dx)\right)\left(-2\sqrt{\cos^2(dx-\arctan(\cot(c)))}\sqrt{\csc^2(c)}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{5}{4};\text{si}\right.\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (a*Sqrt[Cos[c + d*x]]*(1 + Cos[c + d*x])*Sec[(c + d*x)/2]^2*(-2*Sqrt[Cos[d*
x - ArcTan[Cot[c]]]^2]*Sqrt[Csc[c]^2]*HypergeometricPFQ[{1/4, 1/2}, {5/4},
Sin[d*x - ArcTan[Cot[c]]]^2]*Sec[d*x - ArcTan[Cot[c]]]*Sin[c] + Tan[d*x + A
rcTan[Tan[c]]] - (HypergeometricPFQ[{-1/2, -1/4}, {3/4}, Cos[d*x + ArcTan[T
an[c]]]^2]*Tan[d*x + ArcTan[Tan[c]]])/Sqrt[Sin[d*x + ArcTan[Tan[c]]]^2]))/(
2*d)
```

Maple [A] (verified)

Time = 2.60 (sec) , antiderivative size = 150, normalized size of antiderivative = 4.29

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\, a\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,\left(F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\right.}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$
parts	$\frac{2a\,\mathrm{am}^{-1}\left(\frac{dx}{2}+\frac{c}{2}\vert\sqrt{2}\right)}{d}+\frac{2a\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$
risch	$-\frac{i\left(e^{2i(dx+c)}+1\right)a\sqrt{2}\,e^{-i(dx+c)}}{d\sqrt{\left(e^{2i(dx+c)}+1\right)e^{-i(dx+c)}}}-\frac{i\left(\frac{i\sqrt{-i\left(e^{i(dx+c)}+i\right)}\,\sqrt{2}\,\sqrt{i\left(e^{i(dx+c)}-i\right)}\,\sqrt{ie^{i(dx+c)}}\,F\left(\sqrt{-i\left(e^{i(dx+c)}+i\right)},\frac{\sqrt{2}}{2}\right)}{\sqrt{e^{3i(dx+c)}+e^{i(dx+c)}}}-\frac{2\left(e^{2i(dx+c)}+1\right.}{\sqrt{\left(e^{2i(dx+c)}+1\right)e^{i(\cdot}}}\right.}{}$

[In] int((a+cos(d*x+c)*a)/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)

[Out] -2*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.08 (sec) , antiderivative size = 107, normalized size of antiderivative = 3.06

$$\int \frac{a+a\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx = \frac{-i\,\sqrt{2}a\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin{(dx+c)})+i\,\sqrt{2}a\text{weierstrassPInverse}(-4,0,\cos{(dx}}{}$$

[In] integrate((a+a*cos(d*x+c))/cos(d*x+c)^(1/2),x, algorithm="fricas")

[Out] (-I*sqrt(2)*a*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + I*sqrt(2)*a*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + I*sqrt(2)*a*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - I*sqrt(2)*a*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/d

Sympy [F]

$$\int \frac{a+a\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx = a\left(\int \frac{1}{\sqrt{\cos{(c+dx)}}}\,dx + \int \sqrt{\cos{(c+dx)}}\,dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))/cos(d*x+c)**(1/2),x)
[Out] a*(Integral(1/sqrt(cos(c + d*x)), x) + Integral(sqrt(cos(c + d*x)), x))
```

Maxima [F]

$$\int \frac{a+a\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{a\cos{(dx+c)}+a}{\sqrt{\cos{(dx+c)}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))/cos(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)/sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \frac{a+a\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{a\cos{(dx+c)}+a}{\sqrt{\cos{(dx+c)}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))/cos(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)/sqrt(cos(d*x + c)), x)
```

Mupad [B] (verification not implemented)

Time = 14.94 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.77

$$\int \frac{a+a\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx = \frac{2\,a\left(\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)+\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)\right)}{d}$$

```
[In] int((a + a*cos(c + d*x))/cos(c + d*x)^(1/2),x)
[Out] (2*a*(ellipticE(c/2 + (d*x)/2, 2) + ellipticF(c/2 + (d*x)/2, 2)))/d
```

3.150 $\int \frac{a+a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 57

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx = -\frac{2aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}+\frac{2a\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[Out] -2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+
1/2*c),2^(1/2))/d+2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellip
ticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2*a*sin(d*x+c)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2827, 2716, 2719, 2720}

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}-\frac{2aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2a\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + a*Cos[c + d*x])/Cos[c + d*x]^(3/2),x]
```

```
[Out] (-2*a*EllipticE[(c + d*x)/2, 2])/d + (2*a*EllipticF[(c + d*x)/2, 2])/d + (2
*a*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]])
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
```

```
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= a\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx + a\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{2a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{2a\sin(c+dx)}{d\sqrt{\cos(c+dx)}} - a\int \sqrt{\cos(c+dx)}\,dx\\
&= -\frac{2aE\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{d} + \frac{2a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{2a\sin(c+dx)}{d\sqrt{\cos(c+dx)}}\end{aligned}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 3.24 (sec) , antiderivative size = 209, normalized size of antiderivative = 3.67

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$
$$= \frac{a(1+\cos(c+dx))\sec^2\left(\frac{1}{2}(c+dx)\right)\left(4\cos(dx)\csc(c) - \frac{(3\cos(c-dx-\arctan(\tan(c)))+\cos(c+dx+\arctan(\tan(c))))\csc(c)\sec}{\sqrt{\sec^2(c)}}\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])/Cos[c + d*x]^(3/2),x]
```

```
[Out] (a*(1 + Cos[c + d*x])*Sec[(c + d*x)/2]^2*(4*Cos[d*x]*Csc[c] - ((3*Cos[c - d
*x - ArcTan[Tan[c]]] + Cos[c + d*x + ArcTan[Tan[c]]])*Csc[c]*Sec[c])/Sqrt[S
```

```
ec[c]^2] - 4*Cos[c + d*x]*Sqrt[Cos[d*x - ArcTan[Cot[c]]]^2]*Sqrt[Csc[c]^2]*
HypergeometricPFQ[{1/4, 1/2}, {5/4}, Sin[d*x - ArcTan[Cot[c]]]^2]*Sec[d*x -
 ArcTan[Cot[c]]]*Sin[c] + 2*Cos[c]*Csc[d*x + ArcTan[Tan[c]]]*Hypergeometric
PFQ[{-1/2, -1/4}, {3/4}, Cos[d*x + ArcTan[Tan[c]]]^2]*Sqrt[Sec[c]^2]*Sqrt[S
in[d*x + ArcTan[Tan[c]]]^2]))/(4*d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 3.10 (sec) , antiderivative size = 148, normalized size of antiderivative = 2.60

method	result
default	$\frac{2a\left(2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-}}{\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$
parts	$-\frac{2a\left(-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\right.\right.}}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int((a+cos(d*x+c)*a)/cos(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2*a*(2*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-(sin(1/2*d*x+1/2*c)^2)^(1/2)
*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-(si
n(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/
2*d*x+1/2*c),2^(1/2)))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/
d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 156, normalized size of antiderivative = 2.74

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$
$$= \frac{-i\sqrt{2}a\cos(dx+c)\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+i\sqrt{2}a\cos(dx+c)\,\text{weierstra}}{}$$

```
[In] integrate((a+a*cos(d*x+c))/cos(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] (-I*sqrt(2)*a*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(
d*x + c)) + I*sqrt(2)*a*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c
) - I*sin(d*x + c)) - I*sqrt(2)*a*cos(d*x + c)*weierstrassZeta(-4, 0, weier
strassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + I*sqrt(2)*a*cos(d*x
 + c)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*si
n(d*x + c))) + 2*a*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c))
```

Sympy [F]

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx = a\left(\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx + \int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))/cos(d*x+c)**(3/2),x)
[Out] a*(Integral(cos(c + d*x)**(-3/2), x) + Integral(1/sqrt(cos(c + d*x)), x))
```

Maxima [F]

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{a\cos(dx+c)+a}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))/cos(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)/cos(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{a\cos(dx+c)+a}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))/cos(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)/cos(d*x + c)^(3/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.55 (sec) , antiderivative size = 60, normalized size of antiderivative = 1.05

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\,a\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d} + \frac{2\,a\,\sin(c+d\,x)\,{}_2\mathrm{F}_1\left(-\frac{1}{4},\frac{1}{2};\ \frac{3}{4};\ \cos(c+d\,x)^2\right)}{d\,\sqrt{\cos(c+d\,x)}\,\sqrt{\sin(c+d\,x)^2}}$$

```
[In] int((a + a*cos(c + d*x))/cos(c + d*x)^(3/2),x)
[Out] (2*a*ellipticF(c/2 + (d*x)/2, 2))/d + (2*a*sin(c + d*x)*hypergeom([-1/4, 1/
2], 3/4, cos(c + d*x)^2))/(d*cos(c + d*x)^(1/2)*(sin(c + d*x)^2)^(1/2))
```

3.151 $\int \frac{a+a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 83

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx = -\frac{2aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2a\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{2a\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[Out] -2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+
1/2*c),2^(1/2))/d+2/3*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ell
ipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/3*a*sin(d*x+c)/d/cos(d*x+c)^(3/2)+2*
a*sin(d*x+c)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2827, 2716, 2720, 2719}

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}-\frac{2aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2a\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{2a\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + a*Cos[c + d*x])/Cos[c + d*x]^(5/2),x]
```

```
[Out] (-2*a*EllipticE[(c + d*x)/2, 2])/d + (2*a*EllipticF[(c + d*x)/2, 2])/(3*d)
+ (2*a*Sin[c + d*x])/(3*d*Cos[c + d*x]^(3/2)) + (2*a*Sin[c + d*x])/(d*Sqrt[
Cos[c + d*x]])
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= a\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)}\,dx + a\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx\\ &= \frac{2a\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{2a\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{1}{3}a\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx - a\int \sqrt{\cos(c+dx)}\,dx\\ &= -\frac{2aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2a\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{2a\sin(c+dx)}{d\sqrt{\cos(c+dx)}}\end{aligned}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 4.51 (sec) , antiderivative size = 247, normalized size of antiderivative = 2.98

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx$$

$$= \frac{a(1+\cos(c+dx))\sec^2\left(\frac{1}{2}(c+dx)\right)\left(2(3\cos(c)+\cos(dx)-\cos(2c+dx)+3\cos(c+2dx))\csc(c)-4\cos\right.}{}$$

[In] Integrate[(a + a*Cos[c + d*x])/Cos[c + d*x]^(5/2),x]

[Out] (a*(1 + Cos[c + d*x])*Sec[(c + d*x)/2]^2*(2*(3*Cos[c] + Cos[d*x] - Cos[2*c + d*x] + 3*Cos[c + 2*d*x])*Csc[c] - 4*Cos[c + d*x]^2*Sqrt[Cos[d*x - ArcTan[Cot[c]]]^2]*Sqrt[Csc[c]^2]*HypergeometricPFQ[{1/4, 1/2}, {5/4}, Sin[d*x - ArcTan[Cot[c]]]^2]*Sec[d*x - ArcTan[Cot[c]]]*Sin[c] - (3*Cos[c + d*x]*Sec[c]*(-2*HypergeometricPFQ[{-1/2, -1/4}, {3/4}, Cos[d*x + ArcTan[Tan[c]]]^2]*Sin[d*x + ArcTan[Tan[c]]] + (3*Cos[c - d*x - ArcTan[Tan[c]]] + Cos[c + d*x + ArcTan[Tan[c]]])*Csc[c]*Sqrt[Sin[d*x + ArcTan[Tan[c]]]^2]))/(Sqrt[Sec[c]^2]*Sqrt[Sin[d*x + ArcTan[Tan[c]]]^2])))/(12*d*Cos[c + d*x]^(3/2))

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 367 vs. 2(127) = 254.

Time = 4.27 (sec) , antiderivative size = 368, normalized size of antiderivative = 4.43

method	result
default	$-\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\, a\left(12\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\, F\left(\cos\left(\right.\right.}{}$
parts	$-\frac{2a\left(-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\, F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c}{2}}\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right.}$

[In] int((a+cos(d*x+c)*a)/cos(d*x+c)^(5/2),x,method=_RETURNVERBOSE)

[Out] -2/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a/(4*sin(1/2*d*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)/sin(1/2*d*x+1/2*c)^3*(12*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2-6*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2-8*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 175, normalized size of antiderivative = 2.11

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx$$
$$= \frac{-i\sqrt{2}a\cos{(dx+c)}^2 \operatorname{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin{(dx+c)})+i\sqrt{2}a\cos{(dx+c)}^2 \operatorname{weier}}{}$$

```
[In] integrate((a+a*cos(d*x+c))/cos(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/3*(-I*sqrt(2)*a*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x + c) +
I*sin(d*x + c)) + I*sqrt(2)*a*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos
(d*x + c) - I*sin(d*x + c)) - 3*I*sqrt(2)*a*cos(d*x + c)^2*weierstrassZeta(
-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 3*I*sqr
t(2)*a*cos(d*x + c)^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos
(d*x + c) - I*sin(d*x + c))) + 2*(3*a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*
sin(d*x + c))/(d*cos(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))/cos(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{a\cos{(dx+c)}+a}{\cos{(dx+c)}^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))/cos(d*x+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((a*cos(d*x + c) + a)/cos(d*x + c)^(5/2), x)
```

Giac [F]

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{a\cos(dx+c)+a}{\cos(dx+c)^{\frac{5}{2}}}\,dx$$

[In] integrate((a+a*cos(d*x+c))/cos(d*x+c)^(5/2),x, algorithm="giac")

[Out] integrate((a*cos(d*x + c) + a)/cos(d*x + c)^(5/2), x)

Mupad [B] (verification not implemented)

Time = 15.32 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.05

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2a\sin(c+dx)\;{}_2F_1\left(-\frac{1}{4},\frac{1}{2};\;\frac{3}{4};\;\cos(c+dx)^2\right)}{d\sqrt{\cos(c+dx)}\sqrt{\sin(c+dx)^2}} + \frac{2a\sin(c+dx)\;{}_2F_1\left(-\frac{3}{4},\frac{1}{2};\;\frac{1}{4};\;\cos(c+dx)^2\right)}{3d\cos(c+dx)^{3/2}\sqrt{\sin(c+dx)^2}}$$

[In] int((a + a*cos(c + d*x))/cos(c + d*x)^(5/2),x)

[Out] (2*a*sin(c + d*x)*hypergeom([-1/4, 1/2], 3/4, cos(c + d*x)^2))/(d*cos(c + d*x)^(1/2)*(sin(c + d*x)^2)^(1/2)) + (2*a*sin(c + d*x)*hypergeom([-3/4, 1/2], 1/4, cos(c + d*x)^2))/(3*d*cos(c + d*x)^(3/2)*(sin(c + d*x)^2)^(1/2))

3.152 $\int \frac{a+a\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 111

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)}\,dx = -\frac{6aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2a\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{2a\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{6a\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

```
[Out] -6/5*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*
x+1/2*c),2^(1/2))/d+2/3*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*E
llipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/5*a*sin(d*x+c)/d/cos(d*x+c)^(5/2)+
2/3*a*sin(d*x+c)/d/cos(d*x+c)^(3/2)+6/5*a*sin(d*x+c)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2827, 2716, 2719, 2720}

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}-\frac{6aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2a\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{2a\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{6a\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + a*Cos[c + d*x])/Cos[c + d*x]^(7/2),x]
```

```
[Out] (-6*a*EllipticE[(c + d*x)/2, 2])/(5*d) + (2*a*EllipticF[(c + d*x)/2, 2])/(3
*d) + (2*a*Sin[c + d*x])/(5*d*Cos[c + d*x]^(5/2)) + (2*a*Sin[c + d*x])/(3*d
*Cos[c + d*x]^(3/2)) + (6*a*Sin[c + d*x])/(5*d*Sqrt[Cos[c + d*x]])
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= a\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)}\,dx + a\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{2a\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{2a\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{1}{3}a\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx + \frac{1}{5}(3a)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{2a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2a\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{2a\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} \\
&\quad + \frac{6a\sin(c+dx)}{5d\sqrt{\cos(c+dx)}} - \frac{1}{5}(3a)\int \sqrt{\cos(c+dx)}\,dx \\
&= -\frac{6aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{2a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} \\
&\quad + \frac{2a\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{2a\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{6a\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}
\end{aligned}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 6.32 (sec) , antiderivative size = 477, normalized size of antiderivative = 4.30

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)}\,dx = a\left(\sqrt{\cos(c+dx)}(1+\cos(c+dx))\sec^2\left(\frac{c}{2}+\frac{dx}{2}\right)\left(\frac{3\csc(c)\sec(c)}{5d} + \frac{\sec(c)\sec^3(c+dx)\sin(dx)}{5d} + \frac{\sec(c)\sec^2(c+dx)(3\sin(c)+5\sin(dx))}{15d} + \frac{\sec(c)\sec(c+dx)(5\sin(c)+9\sin(dx))}{15d}\right) - \frac{(1+\cos(c+dx))\csc(c)\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{5}{4};\sin^2(dx-\arctan(\cot(c)))\right)\sec^2\left(\frac{c}{2}+\frac{dx}{2}\right)\sec(dx-\arctan(\cot(c)))\sqrt{\ldots}}{3d\sqrt{\ldots}} + \frac{3(1+\cos(c+dx))\csc(c)\sec^2\left(\frac{c}{2}+\frac{dx}{2}\right)\left(\frac{{}_2F_1\left(-\frac{1}{2},-\frac{1}{4};\frac{3}{4};\cos^2(dx+\arctan(\tan(c)))\right)\sin(dx+\arctan(\tan(\ldots}{\sqrt{1-\cos(dx+\arctan(\tan(c)))}\sqrt{1+\cos(dx+\arctan(\tan(c)))}\sqrt{\cos(c)\cos(dx+\arctan(t\ldots}}\ldots\right)}{10d}\ldots\right.$$

```
[In] Integrate[(a + a*Cos[c + d*x])/Cos[c + d*x]^(7/2),x]
```

```
[Out] a*(Sqrt[Cos[c + d*x]]*(1 + Cos[c + d*x])*Sec[c/2 + (d*x)/2]^2*((3*Csc[c]*Se
c[c])/(5*d) + (Sec[c]*Sec[c + d*x]^3*Sin[d*x])/(5*d) + (Sec[c]*Sec[c + d*x]
^2*(3*Sin[c] + 5*Sin[d*x]))/(15*d) + (Sec[c]*Sec[c + d*x]*(5*Sin[c] + 9*Sin
[d*x]))/(15*d)) - ((1 + Cos[c + d*x])*Csc[c]*HypergeometricPFQ[{1/4, 1/2},
{5/4}, Sin[d*x - ArcTan[Cot[c]]]^2]*Sec[c/2 + (d*x)/2]^2*Sec[d*x - ArcTan[C
ot[c]]]*Sqrt[1 - Sin[d*x - ArcTan[Cot[c]]]]*Sqrt[-(Sqrt[1 + Cot[c]^2]*Sin[c
]*Sin[d*x - ArcTan[Cot[c]]])]*Sqrt[1 + Sin[d*x - ArcTan[Cot[c]]]])/(3*d*Sqr
t[1 + Cot[c]^2]) + (3*(1 + Cos[c + d*x])*Csc[c]*Sec[c/2 + (d*x)/2]^2*((Hype
rgeometricPFQ[{-1/2, -1/4}, {3/4}, Cos[d*x + ArcTan[Tan[c]]]^2]*Sin[d*x + A
rcTan[Tan[c]]]*Tan[c])/(Sqrt[1 - Cos[d*x + ArcTan[Tan[c]]]]*Sqrt[1 + Cos[d*
x + ArcTan[Tan[c]]]]*Sqrt[Cos[c]*Cos[d*x + ArcTan[Tan[c]]]*Sqrt[1 + Tan[c]^
2]]*Sqrt[1 + Tan[c]^2]) - ((Sin[d*x + ArcTan[Tan[c]]]*Tan[c])/Sqrt[1 + Tan[
c]^2] + (2*Cos[c]^2*Cos[d*x + ArcTan[Tan[c]]]*Sqrt[1 + Tan[c]^2])/(Cos[c]^2
 + Sin[c]^2))/Sqrt[Cos[c]*Cos[d*x + ArcTan[Tan[c]]]*Sqrt[1 + Tan[c]^2]]))/(
10*d))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 383 vs. $2(147) = 294$.

Time = 6.21 (sec) , antiderivative size = 384, normalized size of antiderivative = 3.46

method	result
default	$-\frac{4\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\, a\left(-\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}{12\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{1}{2}\right)^2}+\frac{7\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right) \cdots\right.}}{15\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right) \cdots}} \cdots\right.}{\cdots}$
parts	$-\frac{2a\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(24\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\, E\left(\cos \cdots\right.\right.}{\cdots}$

```
[In] int((a+cos(d*x+c)*a)/cos(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -4*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a*(-1/12*cos(1
/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2
*d*x+1/2*c)^2-1/2)^2+7/15*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*
c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Elliptic
F(cos(1/2*d*x+1/2*c),2^(1/2))-1/40*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c
)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^3-3/5*sin(1/2*d*
x+1/2*c)^2*cos(1/2*d*x+1/2*c)/(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2
*c)^2)^(1/2)-3/10*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^
(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1
/2*d*x+1/2*c),2^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))))/sin(1/2*d*x+
1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 188, normalized size of antiderivative = 1.69

$$\int \frac{a + a\cos(c + dx)}{\cos^{\frac{7}{2}}(c + dx)}\, dx$$
$$= \frac{-5i\sqrt{2}a\cos(dx + c)^3 \operatorname{weierstrassPInverse}(-4, 0, \cos(dx + c) + i\sin(dx + c)) + 5i\sqrt{2}a\cos(dx + c)^3 \operatorname{weier}\cdots}{\cdots}$$

```
[In] integrate((a+a*cos(d*x+c))/cos(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] 1/15*(-5*I*sqrt(2)*a*cos(d*x + c)^3*weierstrassPInverse(-4, 0, cos(d*x + c)
 + I*sin(d*x + c)) + 5*I*sqrt(2)*a*cos(d*x + c)^3*weierstrassPInverse(-4, 0
, cos(d*x + c) - I*sin(d*x + c)) - 9*I*sqrt(2)*a*cos(d*x + c)^3*weierstrass
Zeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 9*
```

```
I*sqrt(2)*a*cos(d*x + c)^3*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0
, cos(d*x + c) - I*sin(d*x + c))) + 2*(9*a*cos(d*x + c)^2 + 5*a*cos(d*x + c
) + 3*a)*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^3)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))/cos(d*x+c)**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{a\cos(dx+c)+a}{\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))/cos(d*x+c)^(7/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)/cos(d*x + c)^(7/2), x)
```

Giac [F]

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{a\cos(dx+c)+a}{\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))/cos(d*x+c)^(7/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)/cos(d*x + c)^(7/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.45 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.78

$$\int \frac{a+a\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2\,a\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{3}{4},\frac{1}{2};\ \frac{1}{4};\ \cos\left(c+d\,x\right)^2\right)}{3\,d\cos\left(c+d\,x\right)^{3/2}\,\sqrt{\sin\left(c+d\,x\right)^2}} + \frac{2\,a\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{5}{4},\frac{1}{2};\ -\frac{1}{4};\ \cos\left(c+d\,x\right)^2\right)}{5\,d\cos\left(c+d\,x\right)^{5/2}\,\sqrt{\sin\left(c+d\,x\right)^2}}$$

```
[In] int((a + a*cos(c + d*x))/cos(c + d*x)^(7/2),x)
```

```
[Out] (2*a*sin(c + d*x)*hypergeom([-3/4, 1/2], 1/4, cos(c + d*x)^2))/(3*d*cos(c +
 d*x)^(3/2)*(sin(c + d*x)^2)^(1/2)) + (2*a*sin(c + d*x)*hypergeom([-5/4, 1/
2], -1/4, cos(c + d*x)^2))/(5*d*cos(c + d*x)^(5/2)*(sin(c + d*x)^2)^(1/2))
```

3.153 $\int \cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^2\,dx$

Optimal result

Integrand size = 23, antiderivative size = 147

$$\int \cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{32a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15d} + \frac{20a^2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{20a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} + \frac{32a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{45d} + \frac{4a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{2a^2\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d}$$

```
[Out] 32/15*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2
*d*x+1/2*c),2^(1/2))/d+20/21*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1
/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+32/45*a^2*cos(d*x+c)^(3/2)*si
n(d*x+c)/d+4/7*a^2*cos(d*x+c)^(5/2)*sin(d*x+c)/d+2/9*a^2*cos(d*x+c)^(7/2)*s
in(d*x+c)/d+20/21*a^2*sin(d*x+c)*cos(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2836, 2715, 2719, 2720}

$$\int \cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{20a^2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{32a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15d} + \frac{2a^2\sin(c+dx)\cos^{\frac{7}{2}}(c+dx)}{9d} + \frac{4a^2\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{7d} + \frac{32a^2\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{45d} + \frac{20a^2\sin(c+dx)\sqrt{\cos(c+dx)}}{21d}$$

```
[In] Int[Cos[c + d*x]^(5/2)*(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (32*a^2*EllipticE[(c + d*x)/2, 2])/(15*d) + (20*a^2*EllipticF[(c + d*x)/2,
2])/(21*d) + (20*a^2*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(21*d) + (32*a^2*Cos[
c + d*x]^(3/2)*Sin[c + d*x])/(45*d) + (4*a^2*Cos[c + d*x]^(5/2)*Sin[c + d*x
])/(7*d) + (2*a^2*Cos[c + d*x]^(7/2)*Sin[c + d*x])/(9*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
```

```
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(a^2\cos^{\frac{5}{2}}(c+dx)+2a^2\cos^{\frac{7}{2}}(c+dx)+a^2\cos^{\frac{9}{2}}(c+dx)\right)dx\\
&= a^2\int \cos^{\frac{5}{2}}(c+dx)\,dx+a^2\int \cos^{\frac{9}{2}}(c+dx)\,dx+\left(2a^2\right)\int \cos^{\frac{7}{2}}(c+dx)\,dx\\
&= \frac{2a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{4a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}+\frac{2a^2\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d}\\
&\quad+\frac{1}{5}\left(3a^2\right)\int \sqrt{\cos(c+dx)}\,dx+\frac{1}{9}\left(7a^2\right)\int \cos^{\frac{5}{2}}(c+dx)\,dx+\frac{1}{7}\left(10a^2\right)\int \cos^{\frac{3}{2}}(c+dx)\,dx\\
&= \frac{6a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{20a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{21d}\\
&\quad+\frac{32a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{45d}+\frac{4a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}\\
&\quad+\frac{2a^2\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d}+\frac{1}{15}\left(7a^2\right)\int \sqrt{\cos(c+dx)}\,dx\\
&\quad+\frac{1}{21}\left(10a^2\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{32a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15d}+\frac{20a^2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d}\\
&\quad+\frac{20a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{21d}+\frac{32a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{45d}\\
&\quad+\frac{4a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}+\frac{2a^2\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 5.28 (sec) , antiderivative size = 255, normalized size of antiderivative = 1.73

$$\int \cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^2\,dx$$

$$=\frac{a^2(1+\cos(c+dx))^2\sec^4\left(\frac{1}{2}(c+dx)\right)\left(\frac{672(3\cos(c-dx-\arctan(\tan(c)))+\cos(c+dx+\arctan(\tan(c))))\csc(c)\sec(c)}{\sqrt{\sec^2(c)}}-1200\cos\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)*(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (a^2*(1 + Cos[c + d*x])^2*Sec[(c + d*x)/2]^4*((672*(3*Cos[c - d*x - ArcTan[
Tan[c]]] + Cos[c + d*x + ArcTan[Tan[c]]])*Csc[c]*Sec[c])/Sqrt[Sec[c]^2] - 1
200*Cos[c + d*x]*Sqrt[Cos[d*x - ArcTan[Cot[c]]]^2]*Sqrt[Csc[c]^2]*Hypergeom
etricPFQ[{1/4, 1/2}, {5/4}, Sin[d*x - ArcTan[Cot[c]]]^2]*Sec[d*x - ArcTan[C
ot[c]]]*Sin[c] + Cos[c + d*x]*(-2688*Cot[c] + 1380*Sin[c + d*x] + 518*Sin[2
*(c + d*x)] + 180*Sin[3*(c + d*x)] + 35*Sin[4*(c + d*x)]) - 1344*Cos[c]*Csc
[d*x + ArcTan[Tan[c]]]*HypergeometricPFQ[{-1/2, -1/4}, {3/4}, Cos[d*x + Arc
Tan[Tan[c]]]^2]*Sqrt[Sec[c]^2]*Sqrt[Sin[d*x + ArcTan[Tan[c]]]^2]))/(5040*d*
Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 12.15 (sec) , antiderivative size = 260, normalized size of antiderivative = 1.77

method	result
default	$-\frac{4\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^2\left(560\left(\cos^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-960\left(\cos^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+608\left(\cos^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-96\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\cdots\right.\right.}{315\sqrt{-2\left(\sin^4\left(\cdots\right.\right.}}$
parts	$-\frac{2a^2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cdots\right.}{5\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\cdots\right.\right.}}$

```
[In] int(cos(d*x+c)^(5/2)*(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -4/315*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^2*(560*cos
(1/2*d*x+1/2*c)^11-960*cos(1/2*d*x+1/2*c)^9+608*cos(1/2*d*x+1/2*c)^7-96*cos
(1/2*d*x+1/2*c)^5-205*cos(1/2*d*x+1/2*c)^3+75*(sin(1/2*d*x+1/2*c)^2)^(1/2)*
(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-168
*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticE(c
os(1/2*d*x+1/2*c),2^(1/2))+93*cos(1/2*d*x+1/2*c))/(-2*sin(1/2*d*x+1/2*c)^4+
sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(
1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 175, normalized size of antiderivative = 1.19

$$\int \cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^2\,dx =$$
$$-\frac{2\left(75i\sqrt{2}a^2\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))-75i\sqrt{2}a^2\text{weierstrassPInverse}(-4\cdots\right.}{}$$

```
[In] integrate(cos(d*x+c)^(5/2)*(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -2/315*(75*I*sqrt(2)*a^2*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*
x + c)) - 75*I*sqrt(2)*a^2*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(
d*x + c)) - 168*I*sqrt(2)*a^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4
, 0, cos(d*x + c) + I*sin(d*x + c))) + 168*I*sqrt(2)*a^2*weierstrassZeta(-4
, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (35*a^2*c
os(d*x + c)^3 + 90*a^2*cos(d*x + c)^2 + 112*a^2*cos(d*x + c) + 150*a^2)*sqr
t(cos(d*x + c))*sin(d*x + c))/d
```

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^2\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)*(a+a*cos(d*x+c))**2,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^2\,dx = \int (a\cos(dx+c)+a)^2\cos(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)*(a+a*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] integrate((a*cos(d*x + c) + a)^2*cos(d*x + c)^(5/2), x)
```

Giac [F]

$$\int \cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^2\,dx = \int (a\cos(dx+c)+a)^2\cos(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)*(a+a*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((a*cos(d*x + c) + a)^2*cos(d*x + c)^(5/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.07 (sec) , antiderivative size = 136, normalized size of antiderivative = 0.93

$$\int \cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^2\,dx$$
$$= -\frac{2\,a^2\cos\left(c+d\,x\right)^{7/2}\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{7}{4};\ \frac{11}{4};\ \cos\left(c+d\,x\right)^2\right)}{7\,d\,\sqrt{\sin\left(c+d\,x\right)^2}}$$
$$-\frac{4\,a^2\cos\left(c+d\,x\right)^{9/2}\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{9}{4};\ \frac{13}{4};\ \cos\left(c+d\,x\right)^2\right)}{9\,d\,\sqrt{\sin\left(c+d\,x\right)^2}}$$
$$-\frac{2\,a^2\cos\left(c+d\,x\right)^{11/2}\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{11}{4};\ \frac{15}{4};\ \cos\left(c+d\,x\right)^2\right)}{11\,d\,\sqrt{\sin\left(c+d\,x\right)^2}}$$

```
[In] int(cos(c + d*x)^(5/2)*(a + a*cos(c + d*x))^2,x)
```

```
[Out] - (2*a^2*cos(c + d*x)^(7/2)*sin(c + d*x)*hypergeom([1/2, 7/4], 11/4, cos(c
+ d*x)^2))/(7*d*(sin(c + d*x)^2)^(1/2)) - (4*a^2*cos(c + d*x)^(9/2)*sin(c +
 d*x)*hypergeom([1/2, 9/4], 13/4, cos(c + d*x)^2))/(9*d*(sin(c + d*x)^2)^(1
/2)) - (2*a^2*cos(c + d*x)^(11/2)*sin(c + d*x)*hypergeom([1/2, 11/4], 15/4,
 cos(c + d*x)^2))/(11*d*(sin(c + d*x)^2)^(1/2))
```

3.154 $\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2\,dx$

Optimal result

Integrand size = 23, antiderivative size = 121

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2\,dx=\frac{12a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{8a^2\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{7d}+\frac{8a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{7d}+\frac{4a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{2a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}$$

```
[Out] 12/5*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*
d*x+1/2*c),2^(1/2))/d+8/7*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*
c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+4/5*a^2*cos(d*x+c)^(3/2)*sin(d*x
+c)/d+2/7*a^2*cos(d*x+c)^(5/2)*sin(d*x+c)/d+8/7*a^2*sin(d*x+c)*cos(d*x+c)^(
1/2)/d
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used

$= \{2836, 2715, 2720, 2719\}$

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{8a^2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{7d} + \frac{12a^2E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{5d} + \frac{2a^2\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{7d} + \frac{4a^2\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{5d} + \frac{8a^2\sin(c+dx)\sqrt{\cos(c+dx)}}{7d}$$

```
[In] Int[Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (12*a^2*EllipticE[(c + d*x)/2, 2])/(5*d) + (8*a^2*EllipticF[(c + d*x)/2, 2]
)/(7*d) + (8*a^2*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(7*d) + (4*a^2*Cos[c + d*
x]^(3/2)*Sin[c + d*x])/(5*d) + (2*a^2*Cos[c + d*x]^(5/2)*Sin[c + d*x])/(7*d
)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(a^2\cos^{\frac{3}{2}}(c+dx)+2a^2\cos^{\frac{5}{2}}(c+dx)+a^2\cos^{\frac{7}{2}}(c+dx)\right)\,dx\\
&= a^2\int \cos^{\frac{3}{2}}(c+dx)\,dx+a^2\int \cos^{\frac{7}{2}}(c+dx)\,dx+\left(2a^2\right)\int \cos^{\frac{5}{2}}(c+dx)\,dx\\
&= \frac{2a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}+\frac{4a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{2a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}\\
&\quad+\frac{1}{3}a^2\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx+\frac{1}{7}\left(5a^2\right)\int \cos^{\frac{3}{2}}(c+dx)\,dx+\frac{1}{5}\left(6a^2\right)\int \sqrt{\cos(c+dx)}\,dx\\
&= \frac{12a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2a^2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}\\
&\quad+\frac{8a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{7d}+\frac{4a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}\\
&\quad+\frac{2a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}+\frac{1}{21}\left(5a^2\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{12a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{8a^2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{7d}+\frac{8a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{7d}\\
&\quad+\frac{4a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{2a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 4.74 (sec) , antiderivative size = 245, normalized size of antiderivative = 2.02

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2\,dx$$

$$= \frac{a^2(1+\cos(c+dx))^2\sec^4\left(\frac{1}{2}(c+dx)\right)\left(\frac{42(3\cos(c-dx-\arctan(\tan(c)))+\cos(c+dx+\arctan(\tan(c))))\csc(c)\sec(c)}{\sqrt{\sec^2(c)}}-80\cos(c\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (a^2*(1 + Cos[c + d*x])^2*Sec[(c + d*x)/2]^4*((42*(3*Cos[c - d*x - ArcTan[T
an[c]]] + Cos[c + d*x + ArcTan[Tan[c]]])*Csc[c]*Sec[c])/Sqrt[Sec[c]^2] - 80
*Cos[c + d*x]*Sqrt[Cos[d*x - ArcTan[Cot[c]]]^2]*Sqrt[Csc[c]^2]*Hypergeometr
icPFQ[{1/4, 1/2}, {5/4}, Sin[d*x - ArcTan[Cot[c]]]^2]*Sec[d*x - ArcTan[Cot[
c]]]*Sin[c] + Cos[c + d*x]*(-168*Cot[c] + 85*Sin[c + d*x] + 28*Sin[2*(c + d
*x)] + 5*Sin[3*(c + d*x)]) - 84*Cos[c]*Csc[d*x + ArcTan[Tan[c]]]*Hypergeome
tricPFQ[{-1/2, -1/4}, {3/4}, Cos[d*x + ArcTan[Tan[c]]]^2]*Sqrt[Sec[c]^2]*Sq
rt[Sin[d*x + ArcTan[Tan[c]]]^2]))/(280*d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 9.44 (sec) , antiderivative size = 272, normalized size of antiderivative = 2.25

method	result
default	$-\frac{4\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^2\left(40\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-116\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+126\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.}{35\sqrt{-2\left(\sin^4\left(\right.\right.}}$
parts	$-\frac{2a^2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\right.}\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int(cos(d*x+c)^(3/2)*(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -4/35*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^2*(40*cos(1
/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8-116*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c
)^6+126*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-39*sin(1/2*d*x+1/2*c)^2*cos
(1/2*d*x+1/2*c)+10*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^
(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-21*(sin(1/2*d*x+1/2*c)^2)^(1/2)
*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-
2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*co
s(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.34

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2\,dx =$$

$$-\frac{2\left(10i\sqrt{2}a^2\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))-10i\sqrt{2}a^2\text{weierstrassPInverse}(-4\right.}{}$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -2/35*(10*I*sqrt(2)*a^2*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x
 + c)) - 10*I*sqrt(2)*a^2*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d
*x + c)) - 21*I*sqrt(2)*a^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4,
0, cos(d*x + c) + I*sin(d*x + c))) + 21*I*sqrt(2)*a^2*weierstrassZeta(-4, 0
, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (5*a^2*cos(d
*x + c)^2 + 14*a^2*cos(d*x + c) + 20*a^2)*sqrt(cos(d*x + c))*sin(d*x + c))/
d
```

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(3/2)*(a+a*cos(d*x+c))**2,x)
[Out] Timed out
```

Maxima [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2\,dx = \int (a\cos(dx+c)+a)^2\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^2*cos(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2\,dx = \int (a\cos(dx+c)+a)^2\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^2*cos(d*x + c)^(3/2), x)
```

Mupad [B] (verification not implemented)

Time = 14.54 (sec) , antiderivative size = 129, normalized size of antiderivative = 1.07

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{2\left(a^2\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)+a^2\,\sqrt{\cos(c+d\,x)}\,\sin(c+d\,x)\right)}{3\,d} - \frac{4\,a^2\cos(c+d\,x)^{7/2}\,\sin(c+d\,x)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{7}{4};\ \frac{11}{4};\ \cos(c+d\,x)^2\right)}{7\,d\,\sqrt{\sin(c+d\,x)^2}} - \frac{2\,a^2\cos(c+d\,x)^{9/2}\,\sin(c+d\,x)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{9}{4};\ \frac{13}{4};\ \cos(c+d\,x)^2\right)}{9\,d\,\sqrt{\sin(c+d\,x)^2}}$$

```
[In] int(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^2,x)
```

```
[Out] (2*(a^2*ellipticF(c/2 + (d*x)/2, 2) + a^2*cos(c + d*x)^(1/2)*sin(c + d*x)))
/(3*d) - (4*a^2*cos(c + d*x)^(7/2)*sin(c + d*x)*hypergeom([1/2, 7/4], 11/4,
 cos(c + d*x)^2))/(7*d*(sin(c + d*x)^2)^(1/2)) - (2*a^2*cos(c + d*x)^(9/2)*
sin(c + d*x)*hypergeom([1/2, 9/4], 13/4, cos(c + d*x)^2))/(9*d*(sin(c + d*x
)^2)^(1/2))
```

3.155 $\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2\,dx$

Optimal result

Integrand size = 23, antiderivative size = 95

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2\,dx = \frac{16a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{4a^2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{4a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}$$

```
[Out] 16/5*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*
d*x+1/2*c),2^(1/2))/d+4/3*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*
c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/5*a^2*cos(d*x+c)^(3/2)*sin(d*x
+c)/d+4/3*a^2*sin(d*x+c)*cos(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {2836, 2719, 2715, 2720}

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2\,dx = \frac{4a^2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{16a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{2a^2\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{5d} + \frac{4a^2\sin(c+dx)\sqrt{\cos(c+dx)}}{3d}$$

```
[In] Int[Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (16*a^2*EllipticE[(c + d*x)/2, 2])/(5*d) + (4*a^2*EllipticF[(c + d*x)/2, 2]
)/(3*d) + (4*a^2*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(3*d) + (2*a^2*Cos[c + d*
x]^(3/2)*Sin[c + d*x])/(5*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(a^2\sqrt{\cos(c+dx)}+2a^2\cos^{\frac{3}{2}}(c+dx)+a^2\cos^{\frac{5}{2}}(c+dx)\right)\,dx\\
&= a^2\int \sqrt{\cos(c+dx)}\,dx+a^2\int \cos^{\frac{5}{2}}(c+dx)\,dx+\left(2a^2\right)\int \cos^{\frac{3}{2}}(c+dx)\,dx\\
&= \frac{2a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{4a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}+\frac{2a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}\\
&\quad+\frac{1}{5}\left(3a^2\right)\int \sqrt{\cos(c+dx)}\,dx+\frac{1}{3}\left(2a^2\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{16a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{4a^2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}\\
&\quad+\frac{4a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}+\frac{2a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}
\end{aligned}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 3.87 (sec) , antiderivative size = 235, normalized size of antiderivative = 2.47

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2\,dx$$
$$= \frac{a^2(1+\cos(c+dx))^2\sec^4\left(\frac{1}{2}(c+dx)\right)\left(\frac{12(3\cos(c-dx-\arctan(\tan(c)))+\cos(c+dx+\arctan(\tan(c))))\csc(c)\sec(c)}{\sqrt{\sec^2(c)}}-20\cos(c+\right.}{}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (a^2*(1 + Cos[c + d*x])^2*Sec[(c + d*x)/2]^4*((12*(3*Cos[c - d*x - ArcTan[T
an[c]]] + Cos[c + d*x + ArcTan[Tan[c]]])*Csc[c]*Sec[c])/Sqrt[Sec[c]^2] - 20
*Cos[c + d*x]*Sqrt[Cos[d*x - ArcTan[Cot[c]]]^2]*Sqrt[Csc[c]^2]*Hypergeometr
icPFQ[{1/4, 1/2}, {5/4}, Sin[d*x - ArcTan[Cot[c]]]^2]*Sec[d*x - ArcTan[Cot[
c]]]*Sin[c] + Cos[c + d*x]*(-48*Cot[c] + 20*Sin[c + d*x] + 3*Sin[2*(c + d*x
)]) - 24*Cos[c]*Csc[d*x + ArcTan[Tan[c]]]*HypergeometricPFQ[{-1/2, -1/4}, {
3/4}, Cos[d*x + ArcTan[Tan[c]]]^2]*Sqrt[Sec[c]^2]*Sqrt[Sin[d*x + ArcTan[Tan
[c]]]^2]))/(60*d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 7.08 (sec) , antiderivative size = 250, normalized size of antiderivative = 2.63

method	result
default	$-\frac{4\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^2\left(-12\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+32\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-13\left(\sin^2\left(\frac{dx}{2}+\right.\right.\right.}{15\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2}}$
parts	$-\frac{2a^2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right.\right.}{5\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}\right.\right.}}$

```
[In] int(cos(d*x+c)^(1/2)*(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -4/15*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^2*(-12*cos(
1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+32*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2
*c)-13*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+5*(sin(1/2*d*x+1/2*c)^2)^(1/
2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1
2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(c
os(1/2*d*x+1/2*c),2^(1/2)))/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^
(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 149, normalized size of antiderivative = 1.57

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2\,dx =$$
$$-\frac{2\left(5i\sqrt{2}a^2\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))-5i\sqrt{2}a^2\text{weierstrassPInverse}(-4,0\right.}{}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -2/15*(5*I*sqrt(2)*a^2*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x
+ c)) - 5*I*sqrt(2)*a^2*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x
 + c)) - 12*I*sqrt(2)*a^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0,
 cos(d*x + c) + I*sin(d*x + c))) + 12*I*sqrt(2)*a^2*weierstrassZeta(-4, 0,
weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (3*a^2*cos(d*x
 + c) + 10*a^2)*sqrt(cos(d*x + c))*sin(d*x + c))/d
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(1/2)*(a+a*cos(d*x+c))**2,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2\,dx = \int (a\cos(dx+c)+a)^2\sqrt{\cos(dx+c)}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] integrate((a*cos(d*x + c) + a)^2*sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2\,dx = \int (a\cos(dx+c)+a)^2\sqrt{\cos(dx+c)}\,dx$$

[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c))^2,x, algorithm="giac")

[Out] integrate((a*cos(d*x + c) + a)^2*sqrt(cos(d*x + c)), x)

Mupad [B] (verification not implemented)

Time = 14.62 (sec) , antiderivative size = 104, normalized size of antiderivative = 1.09

$$\begin{aligned}\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2\,dx &= \frac{2\,a^2\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d} + \frac{4\,a^2\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{3\,d} + \frac{4\,a^2\,\sqrt{\cos\left(c+d\,x\right)}\,\sin\left(c+d\,x\right)}{3\,d} \\ &\quad - \frac{2\,a^2\,{\cos\left(c+d\,x\right)}^{7/2}\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{7}{4};\ \frac{11}{4};\ {\cos\left(c+d\,x\right)}^2\right)}{7\,d\,\sqrt{{\sin\left(c+d\,x\right)}^2}}\end{aligned}$$

[In] int(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^2,x)

[Out] (2*a^2*ellipticE(c/2 + (d*x)/2, 2))/d + (4*a^2*ellipticF(c/2 + (d*x)/2, 2))/(3*d) + (4*a^2*cos(c + d*x)^(1/2)*sin(c + d*x))/(3*d) - (2*a^2*cos(c + d*x)^(7/2)*sin(c + d*x)*hypergeom([1/2, 7/4], 11/4, cos(c + d*x)^2))/(7*d*(sin(c + d*x)^2)^(1/2))

3.156 $\int \frac{(a+a\cos(c+dx))^2}{\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 67

$$\int \frac{(a+a\cos(c+dx))^2}{\sqrt{\cos(c+dx)}}\,dx = \frac{4a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{8a^2\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}$$

```
[Out] 4*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x
+1/2*c),2^(1/2))/d+8/3*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*
EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/3*a^2*sin(d*x+c)*cos(d*x+c)^(1/2)
/d
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {2836, 2720, 2719, 2715}

$$\int \frac{(a+a\cos(c+dx))^2}{\sqrt{\cos(c+dx)}}\,dx = \frac{8a^2\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{4a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2a^2\sin(c+dx)\sqrt{\cos(c+dx)}}{3d}$$

```
[In] Int[(a + a*Cos[c + d*x])^2/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (4*a^2*EllipticE[(c + d*x)/2, 2])/d + (8*a^2*EllipticF[(c + d*x)/2, 2])/(3*
d) + (2*a^2*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(3*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{a^2}{\sqrt{\cos(c+dx)}} + 2a^2\sqrt{\cos(c+dx)} + a^2\cos^{\frac{3}{2}}(c+dx)\right) dx \\
&= a^2\int \frac{1}{\sqrt{\cos(c+dx)}}\, dx + a^2\int \cos^{\frac{3}{2}}(c+dx)\, dx + \left(2a^2\right)\int \sqrt{\cos(c+dx)}\, dx \\
&= \frac{4a^2 E\left(\frac{1}{2}(c+dx)\middle|\, 2\right)}{d} + \frac{2a^2\,\text{EllipticF}\left(\frac{1}{2}(c+dx), 2\right)}{d} \\
&\quad + \frac{2a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{1}{3}a^2\int \frac{1}{\sqrt{\cos(c+dx)}}\, dx \\
&= \frac{4a^2 E\left(\frac{1}{2}(c+dx)\middle|\, 2\right)}{d} + \frac{8a^2\,\text{EllipticF}\left(\frac{1}{2}(c+dx), 2\right)}{3d} + \frac{2a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}
\end{aligned}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 3.86 (sec) , antiderivative size = 224, normalized size of antiderivative = 3.34

$$\int \frac{(a+a\cos(c+dx))^2}{\sqrt{\cos(c+dx)}}\,dx = \frac{a^2(1+\cos(c+dx))^2\sec^4\left(\frac{1}{2}(c+dx)\right)\left(\frac{3(3\cos(c-dx-\arctan(\tan(c)))+\cos(c+dx+\arctan(\tan(c))))\csc(c)\sec(c)}{\sqrt{\sec^2(c)}}-8\cos(c+dx\right.}{}$$

[In] Integrate[(a + a*Cos[c + d*x])^2/Sqrt[Cos[c + d*x]],x]

[Out] (a^2*(1 + Cos[c + d*x])^2*Sec[(c + d*x)/2]^4*((3*(3*Cos[c - d*x - ArcTan[Tan[c]]] + Cos[c + d*x + ArcTan[Tan[c]]])*Csc[c]*Sec[c])/Sqrt[Sec[c]^2] - 8*Cos[c + d*x]*Sqrt[Cos[d*x - ArcTan[Cot[c]]]^2]*Sqrt[Csc[c]^2]*HypergeometricPFQ[{1/4, 1/2}, {5/4}, Sin[d*x - ArcTan[Cot[c]]]^2]*Sec[d*x - ArcTan[Cot[c]]]*Sin[c] + 2*Cos[c + d*x]*(-6*Cot[c] + Sin[c + d*x]) - 6*Cos[c]*Csc[d*x + ArcTan[Tan[c]]]*HypergeometricPFQ[{-1/2, -1/4}, {3/4}, Cos[d*x + ArcTan[Tan[c]]]^2]*Sqrt[Sec[c]^2]*Sqrt[Sin[d*x + ArcTan[Tan[c]]]^2]))/(12*d*Sqrt[Cos[c + d*x]])

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 227 vs. 2(113) = 226.

Time = 3.94 (sec) , antiderivative size = 228, normalized size of antiderivative = 3.40

method	result
default	$-\frac{4\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^2\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2}\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)}$
parts	$\frac{2a^2\operatorname{am}^{-1}\left(\frac{dx}{2}+\frac{c}{2}\middle|\sqrt{2}\right)}{d}-\frac{2a^2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\right.\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2(\cdots}}$

[In] int((a+cos(d*x+c)*a)^2/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)

[Out] -4/3*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^2*(2*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 134, normalized size of antiderivative = 2.00

$$\int \frac{(a + a\cos(c + dx))^2}{\sqrt{\cos(c + dx)}}\,dx$$
$$= \frac{2\left(a^2\sqrt{\cos(dx + c)}\sin(dx + c) - 2i\sqrt{2}a^2\text{weierstrassPInverse}(-4, 0, \cos(dx + c) + i\sin(dx + c)) + 2i\sqrt{}\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^2/cos(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] 2/3*(a^2*sqrt(cos(d*x + c))*sin(d*x + c) - 2*I*sqrt(2)*a^2*weierstrassPInve
rse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 2*I*sqrt(2)*a^2*weierstrassPInv
erse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 3*I*sqrt(2)*a^2*weierstrassZet
a(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*I*s
qrt(2)*a^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) -
 I*sin(d*x + c))))/d
```

Sympy [F]

$$\int \frac{(a + a\cos(c + dx))^2}{\sqrt{\cos(c + dx)}}\,dx = a^2\left(\int \frac{1}{\sqrt{\cos(c + dx)}}\,dx + \int 2\sqrt{\cos(c + dx)}\,dx + \int \cos^{\frac{3}{2}}(c + dx)\,dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))**2/cos(d*x+c)**(1/2),x)
```

```
[Out] a**2*(Integral(1/sqrt(cos(c + d*x)), x) + Integral(2*sqrt(cos(c + d*x)), x)
 + Integral(cos(c + d*x)**(3/2), x))
```

Maxima [F]

$$\int \frac{(a + a\cos(c + dx))^2}{\sqrt{\cos(c + dx)}}\,dx = \int \frac{(a\cos(dx + c) + a)^2}{\sqrt{\cos(dx + c)}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^2/cos(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((a*cos(d*x + c) + a)^2/sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \frac{(a + a\cos(c + dx))^2}{\sqrt{\cos(c + dx)}}\,dx = \int \frac{(a\cos(dx + c) + a)^2}{\sqrt{\cos(dx + c)}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^2/cos(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^2/sqrt(cos(d*x + c)), x)
```

Mupad [B] (verification not implemented)

Time = 14.89 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.88

$$\int \frac{(a + a\cos(c + dx))^2}{\sqrt{\cos(c + dx)}}\,dx = \frac{4\,a^2\,\mathrm{E}\left(\frac{c}{2} + \frac{d\,x}{2}\middle|2\right)}{d} + \frac{8\,a^2\,\mathrm{F}\left(\frac{c}{2} + \frac{d\,x}{2}\middle|2\right)}{3\,d} + \frac{2\,a^2\,\sqrt{\cos\left(c + d\,x\right)}\,\sin\left(c + d\,x\right)}{3\,d}$$

```
[In] int((a + a*cos(c + d*x))^2/cos(c + d*x)^(1/2),x)
[Out] (4*a^2*ellipticE(c/2 + (d*x)/2, 2))/d + (8*a^2*ellipticF(c/2 + (d*x)/2, 2))
/(3*d) + (2*a^2*cos(c + d*x)^(1/2)*sin(c + d*x))/(3*d)
```

3.157 $\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 44

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{4a^2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{2a^2\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[Out] 4*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x
+1/2*c),2^(1/2))/d+2*a^2*sin(d*x+c)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2836, 2716, 2719, 2720}

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{4a^2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{2a^2\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + a*Cos[c + d*x])^2/Cos[c + d*x]^(3/2),x]
```

```
[Out] (4*a^2*EllipticF[(c + d*x)/2, 2])/d + (2*a^2*Sin[c + d*x])/(d*Sqrt[Cos[c +
d*x]])
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{a^2}{\cos^{\frac{3}{2}}(c+dx)}+\frac{2a^2}{\sqrt{\cos(c+dx)}}+a^2\sqrt{\cos(c+dx)}\right) dx \\
&= a^2\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx+a^2\int \sqrt{\cos(c+dx)}\,dx+\left(2a^2\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{2a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{4a^2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}+\frac{2a^2\sin(c+dx)}{d\sqrt{\cos(c+dx)}}-a^2\int \sqrt{\cos(c+dx)}\,dx \\
&= \frac{4a^2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}+\frac{2a^2\sin(c+dx)}{d\sqrt{\cos(c+dx)}}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.26 (sec) , antiderivative size = 112, normalized size of antiderivative = 2.55

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{3}{2}}(c+dx)}\,dx = -\frac{2a^2\csc(c+dx)\left(-3\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},\cos^2(c+dx)\right)+\cos(c+dx)\left(6\,\text{Hypergeometric2F1}\left(\right.\right.\right.}{3d\sqrt{\cos(c+}}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^2/Cos[c + d*x]^(3/2),x]
```

```
[Out] (-2*a^2*Csc[c + d*x]*(-3*Hypergeometric2F1[-1/4, 1/2, 3/4, Cos[c + d*x]^2]
+ Cos[c + d*x]*(6*Hypergeometric2F1[1/4, 1/2, 5/4, Cos[c + d*x]^2] + Cos[c
+ d*x]*Hypergeometric2F1[1/2, 3/4, 7/4, Cos[c + d*x]^2]))*Sqrt[Sin[c + d*x]
^2])/(3*d*Sqrt[Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 184 vs. $2(68) = 136$.

Time = 4.04 (sec) , antiderivative size = 185, normalized size of antiderivative = 4.20

method	result
default	$-\frac{4a^2\left(-\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\right.}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$
parts	$-\frac{2a^2\left(-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{-2\left(\sin^4\left(\frac{dx}{2}\right.\right.}}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int((a+cos(d*x+c)*a)^2/cos(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -4*a^2*(-cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^
(1/2)*sin(1/2*d*x+1/2*c)^2+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*
c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*(-2*sin(1/2*d*x+1/2*c)^
4+sin(1/2*d*x+1/2*c)^2)^(1/2))/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.08 (sec) , antiderivative size = 97, normalized size of antiderivative = 2.20

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{3}{2}}(c+dx)}\,dx = -\frac{2\left(i\sqrt{2}a^2\cos(dx+c)\,\mathrm{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))-i\sqrt{2}a^2\cos(dx+c)\,\mathrm{we}\right.}{d\cos(dx+c)}$$

```
[In] integrate((a+a*cos(d*x+c))^2/cos(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] -2*(I*sqrt(2)*a^2*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c)) - I*sqrt(2)*a^2*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d
*x + c) - I*sin(d*x + c)) - a^2*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x
 + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**2/cos(d*x+c)**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{(a\cos(dx+c)+a)^2}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^2/cos(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^2/cos(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{(a\cos(dx+c)+a)^2}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^2/cos(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^2/cos(d*x + c)^(3/2), x)
```

Mupad [B] (verification not implemented)

Time = 14.90 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.86

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\frac{2\,a^2\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d}+\frac{4\,a^2\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d}+\frac{2\,a^2\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{1}{4},\frac{1}{2};\ \frac{3}{4};\ \cos\left(c+d\,x\right)^2\right)}{d\,\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{\sin\left(c+d\,x\right)^2}}$$

```
[In] int((a + a*cos(c + d*x))^2/cos(c + d*x)^(3/2),x)
[Out] (2*a^2*ellipticE(c/2 + (d*x)/2, 2))/d + (4*a^2*ellipticF(c/2 + (d*x)/2, 2))
/d + (2*a^2*sin(c + d*x)*hypergeom([-1/4, 1/2], 3/4, cos(c + d*x)^2))/(d*co
s(c + d*x)^(1/2)*(sin(c + d*x)^2)^(1/2))
```

3.158 $\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 91

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{5}{2}}(c+dx)}\,dx = -\frac{4a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{8a^2\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2a^2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{4a^2\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[Out] -4*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*
x+1/2*c),2^(1/2))/d+8/3*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)
*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/3*a^2*sin(d*x+c)/d/cos(d*x+c)^(3
/2)+4*a^2*sin(d*x+c)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2836, 2716, 2720, 2719}

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{8a^2\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}-\frac{4a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2a^2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{4a^2\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + a*Cos[c + d*x])^2/Cos[c + d*x]^(5/2),x]
```

```
[Out] (-4*a^2*EllipticE[(c + d*x)/2, 2])/d + (8*a^2*EllipticF[(c + d*x)/2, 2])/(3
*d) + (2*a^2*Sin[c + d*x])/(3*d*Cos[c + d*x]^(3/2)) + (4*a^2*Sin[c + d*x])/
(d*Sqrt[Cos[c + d*x]])
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{a^2}{\cos^{\frac{5}{2}}(c+dx)}+\frac{2a^2}{\cos^{\frac{3}{2}}(c+dx)}+\frac{a^2}{\sqrt{\cos(c+dx)}}\right)dx\\
&= a^2\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)}\,dx+a^2\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx+\left(2a^2\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx\\
&= \frac{2a^2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}+\frac{2a^2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{4a^2\sin(c+dx)}{d\sqrt{\cos(c+dx)}}\\
&\quad+\frac{1}{3}a^2\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx-\left(2a^2\right)\int \sqrt{\cos(c+dx)}\,dx\\
&= -\frac{4a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{8a^2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2a^2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{4a^2\sin(c+dx)}{d\sqrt{\cos(c+dx)}}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.22 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.22

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2a^2\csc(c+dx)\left(\text{Hypergeometric2F1}\left(-\frac{3}{4},\frac{1}{2},\frac{1}{4},\cos^2(c+dx)\right)+6\cos(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\right.\right.}{3d\cos^{\frac{3}{2}}(c+dx}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^2/Cos[c + d*x]^(5/2),x]
```

```
[Out] (2*a^2*Csc[c + d*x]*(Hypergeometric2F1[-3/4, 1/2, 1/4, Cos[c + d*x]^2] + 6*
Cos[c + d*x]*Hypergeometric2F1[-1/4, 1/2, 3/4, Cos[c + d*x]^2] - 3*Cos[c +
d*x]^2*Hypergeometric2F1[1/4, 1/2, 5/4, Cos[c + d*x]^2])*Sqrt[Sin[c + d*x]^
2])/(3*d*Cos[c + d*x]^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 370 vs. 2(135) = 270.

Time = 4.83 (sec) , antiderivative size = 371, normalized size of antiderivative = 4.08

method	result
default	$-\frac{4\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^2\left(12\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-6\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,E\left(\text{co}\right.\right.}{}$
parts	$-\frac{2a^2\left(-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(d}{2}}\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right.}$

```
[In] int((a+cos(d*x+c)*a)^2/cos(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -4/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^2/(4*sin(1
/2*d*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)/sin(1/2*d*x+1/2*c)^3*(12*sin(1/2*
d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-6*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2
*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*
c)^2-4*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Ellipt
icF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2-7*sin(1/2*d*x+1/2*c)^2
*cos(1/2*d*x+1/2*c)+3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-
1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+2*(sin(1/2*d*x+1/2*c)^2)^(1/
2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))*
(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^
2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 187, normalized size of antiderivative = 2.05

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{5}{2}}(c+dx)}\,dx = -\frac{2\left(2i\sqrt{2}a^2\cos(dx+c)^2\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c)) - 2i\sqrt{2}a^2\cos(dx+c)^2\right.}{}$$

[In] integrate((a+a*cos(d*x+c))^2/cos(d*x+c)^(5/2),x, algorithm="fricas")

[Out] -2/3*(2*I*sqrt(2)*a^2*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x + c
) + I*sin(d*x + c)) - 2*I*sqrt(2)*a^2*cos(d*x + c)^2*weierstrassPInverse(-4
, 0, cos(d*x + c) - I*sin(d*x + c)) + 3*I*sqrt(2)*a^2*cos(d*x + c)^2*weiers
trassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)))
 - 3*I*sqrt(2)*a^2*cos(d*x + c)^2*weierstrassZeta(-4, 0, weierstrassPInvers
e(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (6*a^2*cos(d*x + c) + a^2)*sqrt(
cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^2)

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

[In] integrate((a+a*cos(d*x+c))**2/cos(d*x+c)**(5/2),x)

[Out] Timed out

Maxima [F]

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(a\cos(dx+c)+a)^2}{\cos(dx+c)^{\frac{5}{2}}}\,dx$$

[In] integrate((a+a*cos(d*x+c))^2/cos(d*x+c)^(5/2),x, algorithm="maxima")

[Out] integrate((a*cos(d*x + c) + a)^2/cos(d*x + c)^(5/2), x)

Giac [F]

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{\left(a\cos\left(dx+c\right)+a\right)^2}{\cos\left(dx+c\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^2/cos(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^2/cos(d*x + c)^(5/2), x)
```

Mupad [B] (verification not implemented)

Time = 14.96 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.20

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2\,a^2\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d} + \frac{4\,a^2\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{1}{4},\frac{1}{2};\ \frac{3}{4};\ \cos\left(c+d\,x\right)^2\right)}{d\,\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{\sin\left(c+d\,x\right)^2}} + \frac{2\,a^2\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{3}{4},\frac{1}{2};\ \frac{1}{4};\ \cos\left(c+d\,x\right)^2\right)}{3\,d\cos\left(c+d\,x\right)^{3/2}\,\sqrt{\sin\left(c+d\,x\right)^2}}$$

```
[In] int((a + a*cos(c + d*x))^2/cos(c + d*x)^(5/2),x)
[Out] (2*a^2*ellipticF(c/2 + (d*x)/2, 2))/d + (4*a^2*sin(c + d*x)*hypergeom([-1/4
, 1/2], 3/4, cos(c + d*x)^2))/(d*cos(c + d*x)^(1/2)*(sin(c + d*x)^2)^(1/2))
 + (2*a^2*sin(c + d*x)*hypergeom([-3/4, 1/2], 1/4, cos(c + d*x)^2))/(3*d*co
s(c + d*x)^(3/2)*(sin(c + d*x)^2)^(1/2))
```

3.159 $\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 121

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{7}{2}}(c+dx)}\,dx = -\frac{16a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{4a^2\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2a^2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{4a^2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{16a^2\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

```
[Out] -16/5*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2
*d*x+1/2*c),2^(1/2))/d+4/3*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2
*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/5*a^2*sin(d*x+c)/d/cos(d*x+c)
^(5/2)+4/3*a^2*sin(d*x+c)/d/cos(d*x+c)^(3/2)+16/5*a^2*sin(d*x+c)/d/cos(d*x+
c)^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2836, 2716, 2719, 2720}

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{4a^2\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}-\frac{16a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{4a^2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{2a^2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{16a^2\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + a*Cos[c + d*x])^2/Cos[c + d*x]^(7/2),x]
```

```
[Out] (-16*a^2*EllipticE[(c + d*x)/2, 2])/(5*d) + (4*a^2*EllipticF[(c + d*x)/2, 2
])/(3*d) + (2*a^2*Sin[c + d*x])/(5*d*Cos[c + d*x]^(5/2)) + (4*a^2*Sin[c + d
```

```
*x])/(3*d*Cos[c + d*x]^(3/2)) + (16*a^2*Sin[c + d*x])/(5*d*Sqrt[Cos[c + d*x
]])
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{a^2}{\cos^{\frac{7}{2}}(c+dx)}+\frac{2a^2}{\cos^{\frac{5}{2}}(c+dx)}+\frac{a^2}{\cos^{\frac{3}{2}}(c+dx)}\right) dx \\
&= a^2\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)}\,dx + a^2\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx + \left(2a^2\right)\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{2a^2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{4a^2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{2a^2\sin(c+dx)}{d\sqrt{\cos(c+dx)}}+\frac{1}{5}\left(3a^2\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\
&\quad +\frac{1}{3}\left(2a^2\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx - a^2\int \sqrt{\cos(c+dx)}\,dx \\
&= -\frac{2a^2E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{d}+\frac{4a^2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2a^2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} \\
&\quad +\frac{4a^2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{16a^2\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}-\frac{1}{5}\left(3a^2\right)\int \sqrt{\cos(c+dx)}\,dx
\end{aligned}$$

$$= -\frac{16a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{4a^2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2a^2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{4a^2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{16a^2\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.28 (sec) , antiderivative size = 114, normalized size of antiderivative = 0.94

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{7}{2}}(c+dx)}\,dx$$
$$= \frac{2a^2\csc(c+dx)\left(3\,\text{Hypergeometric2F1}\left(-\frac{5}{4},\frac{1}{2},-\frac{1}{4},\cos^2(c+dx)\right)+5\cos(c+dx)\left(2\,\text{Hypergeometric2F1}\left(-\right.\right.\right.}{15d\cos^{\frac{5}{2}}(c+}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^2/Cos[c + d*x]^(7/2),x]
```

```
[Out] (2*a^2*Csc[c + d*x]*(3*Hypergeometric2F1[-5/4, 1/2, -1/4, Cos[c + d*x]^2] +
 5*Cos[c + d*x]*(2*Hypergeometric2F1[-3/4, 1/2, 1/4, Cos[c + d*x]^2] + 3*Co
s[c + d*x]*Hypergeometric2F1[-1/4, 1/2, 3/4, Cos[c + d*x]^2]))*Sqrt[Sin[c +
 d*x]^2])/(15*d*Cos[c + d*x]^(5/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 385 vs. 2(157) = 314.

Time = 7.27 (sec) , antiderivative size = 386, normalized size of antiderivative = 3.19

method	result
default	$-\frac{8\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^2\left(-\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}{12\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{1}{2}\right)^2}+\frac{17\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}\right.\right.}}{30\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right.}}\right.}{}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*a)^2/cos(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -8*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^2*(-1/12*cos
(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1
/2*d*x+1/2*c)^2-1/2)^2+17/30*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1
/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellip
ticF(cos(1/2*d*x+1/2*c),2^(1/2))-4/5*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c
)/(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)-2/5*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^
```

```
4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-Ellipt
icE(cos(1/2*d*x+1/2*c),2^(1/2)))-1/80*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/
2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^3)/sin(1/2*d*
x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.67

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{7}{2}}(c+dx)}\,dx = -\frac{2\left(5i\sqrt{2}a^2\cos\left(dx+c\right)^3\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))-5i\sqrt{2}a^2\cos\left(dx+c\right)\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^2/cos(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] -2/15*(5*I*sqrt(2)*a^2*cos(d*x + c)^3*weierstrassPInverse(-4, 0, cos(d*x +
c) + I*sin(d*x + c)) - 5*I*sqrt(2)*a^2*cos(d*x + c)^3*weierstrassPInverse(-
4, 0, cos(d*x + c) - I*sin(d*x + c)) + 12*I*sqrt(2)*a^2*cos(d*x + c)^3*weie
rstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)
)) - 12*I*sqrt(2)*a^2*cos(d*x + c)^3*weierstrassZeta(-4, 0, weierstrassPInv
erse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (24*a^2*cos(d*x + c)^2 + 10*a
^2*cos(d*x + c) + 3*a^2)*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^3
)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**2/cos(d*x+c)**(7/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(a\cos(dx+c)+a)^2}{\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^2/cos(d*x+c)^(7/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^2/cos(d*x + c)^(7/2), x)
```

Giac [F]

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(a\cos(dx+c)+a)^2}{\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^2/cos(d*x+c)^(7/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^2/cos(d*x + c)^(7/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.27 (sec) , antiderivative size = 114, normalized size of antiderivative = 0.94

$$\int \frac{(a+a\cos(c+dx))^2}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{6\,a^2\,\sin(c+d\,x)\;{}_2\mathrm{F}_1\left(-\frac{5}{4},\frac{1}{2};\ -\frac{1}{4};\ \cos(c+d\,x)^2\right)+20\,a^2\,\cos(c+d\,x)\,\sin(c+d\,x)\;{}_2\mathrm{F}_1\left(-\frac{3}{4},\frac{1}{2};\ \frac{1}{4};\ \cos(c+\right.}{15\,d\cos(c+d\,x)^{5/2}\sqrt{1-\cos(c+d\,x}}$$

```
[In] int((a + a*cos(c + d*x))^2/cos(c + d*x)^(7/2),x)
[Out] (6*a^2*sin(c + d*x)*hypergeom([-5/4, 1/2], -1/4, cos(c + d*x)^2) + 20*a^2*c
os(c + d*x)*sin(c + d*x)*hypergeom([-3/4, 1/2], 1/4, cos(c + d*x)^2) + 30*a
^2*cos(c + d*x)^2*sin(c + d*x)*hypergeom([-1/4, 1/2], 3/4, cos(c + d*x)^2))
/(15*d*cos(c + d*x)^(5/2)*(1 - cos(c + d*x)^2)^(1/2))
```

3.160 $\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3\,dx$

Optimal result

Integrand size = 23, antiderivative size = 147

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3\,dx = \frac{68a^3E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{15d} + \frac{44a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{44a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} + \frac{68a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{45d} + \frac{6a^3\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{2a^3\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d}$$

```
[Out] 68/15*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2
*d*x+1/2*c),2^(1/2))/d+44/21*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1
/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+68/45*a^3*cos(d*x+c)^(3/2)*si
n(d*x+c)/d+6/7*a^3*cos(d*x+c)^(5/2)*sin(d*x+c)/d+2/9*a^3*cos(d*x+c)^(7/2)*s
in(d*x+c)/d+44/21*a^3*sin(d*x+c)*cos(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {2836, 2715, 2720, 2719}

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3\,dx = \frac{44a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{68a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15d} + \frac{2a^3\sin(c+dx)\cos^{\frac{7}{2}}(c+dx)}{9d} + \frac{6a^3\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{7d} + \frac{68a^3\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{45d} + \frac{44a^3\sin(c+dx)\sqrt{\cos(c+dx)}}{21d}$$

```
[In] Int[Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (68*a^3*EllipticE[(c + d*x)/2, 2])/(15*d) + (44*a^3*EllipticF[(c + d*x)/2,
2])/(21*d) + (44*a^3*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(21*d) + (68*a^3*Cos[
c + d*x]^(3/2)*Sin[c + d*x])/(45*d) + (6*a^3*Cos[c + d*x]^(5/2)*Sin[c + d*x
])/(7*d) + (2*a^3*Cos[c + d*x]^(7/2)*Sin[c + d*x])/(9*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
```

```
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(a^3\cos^{\frac{3}{2}}(c+dx)+3a^3\cos^{\frac{5}{2}}(c+dx)+3a^3\cos^{\frac{7}{2}}(c+dx)+a^3\cos^{\frac{9}{2}}(c+dx)\right)dx \\
&= a^3\int \cos^{\frac{3}{2}}(c+dx)\,dx+a^3\int \cos^{\frac{9}{2}}(c+dx)\,dx \\
&\quad+\left(3a^3\right)\int \cos^{\frac{5}{2}}(c+dx)\,dx+\left(3a^3\right)\int \cos^{\frac{7}{2}}(c+dx)\,dx \\
&= \frac{2a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}+\frac{6a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} \\
&\quad+\frac{6a^3\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}+\frac{2a^3\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d} \\
&\quad+\frac{1}{3}a^3\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx+\frac{1}{9}\left(7a^3\right)\int \cos^{\frac{5}{2}}(c+dx)\,dx \\
&\quad+\frac{1}{5}\left(9a^3\right)\int \sqrt{\cos(c+dx)}\,dx+\frac{1}{7}\left(15a^3\right)\int \cos^{\frac{3}{2}}(c+dx)\,dx \\
&= \frac{18a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} \\
&\quad+\frac{44a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{21d}+\frac{68a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{45d} \\
&\quad+\frac{6a^3\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}+\frac{2a^3\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d} \\
&\quad+\frac{1}{15}\left(7a^3\right)\int \sqrt{\cos(c+dx)}\,dx+\frac{1}{7}\left(5a^3\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{68a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15d}+\frac{44a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} \\
&\quad+\frac{44a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{21d}+\frac{68a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{45d} \\
&\quad+\frac{6a^3\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}+\frac{2a^3\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 6.71 (sec) , antiderivative size = 255, normalized size of antiderivative = 1.73

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3\,dx$$
$$=\frac{a^3(1+\cos(c+dx))^3\sec^6\left(\frac{1}{2}(c+dx)\right)\left(\frac{1428(3\cos(c-dx-\arctan(\tan(c)))+\cos(c+dx+\arctan(\tan(c))))\csc(c)\sec(c)}{\sqrt{\sec^2(c)}}-2640\cos(\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (a^3*(1 + Cos[c + d*x])^3*Sec[(c + d*x)/2]^6*((1428*(3*Cos[c - d*x - ArcTan
[Tan[c]]] + Cos[c + d*x + ArcTan[Tan[c]]])*Csc[c]*Sec[c])/Sqrt[Sec[c]^2] -
2640*Cos[c + d*x]*Sqrt[Cos[d*x - ArcTan[Cot[c]]]^2]*Sqrt[Csc[c]^2]*Hypergeo
metricPFQ[{1/4, 1/2}, {5/4}, Sin[d*x - ArcTan[Cot[c]]]^2]*Sec[d*x - ArcTan[
Cot[c]]]*Sin[c] + Cos[c + d*x]*(-5712*Cot[c] + 2910*Sin[c + d*x] + 1022*Sin
[2*(c + d*x)] + 270*Sin[3*(c + d*x)] + 35*Sin[4*(c + d*x)]) - 2856*Cos[c]*C
sc[d*x + ArcTan[Tan[c]]]*HypergeometricPFQ[{-1/2, -1/4}, {3/4}, Cos[d*x + A
rcTan[Tan[c]]]^2]*Sqrt[Sec[c]^2]*Sqrt[Sin[d*x + ArcTan[Tan[c]]]^2]))/(10080
*d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 12.95 (sec) , antiderivative size = 260, normalized size of antiderivative = 1.77

method	result
default	$-\frac{4\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^3\left(560\left(\cos^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-600\left(\cos^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+212\left(\cos^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+66\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right.\right.}{315\sqrt{-2\left(\sin^4\left(\right.\right.}}$
parts	Expression too large to display

```
[In] int(cos(d*x+c)^(3/2)*(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -4/315*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^3*(560*cos
(1/2*d*x+1/2*c)^11-600*cos(1/2*d*x+1/2*c)^9+212*cos(1/2*d*x+1/2*c)^7+66*cos
(1/2*d*x+1/2*c)^5-430*cos(1/2*d*x+1/2*c)^3+165*(sin(1/2*d*x+1/2*c)^2)^(1/2)
*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-35
7*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticE(
cos(1/2*d*x+1/2*c),2^(1/2))+192*cos(1/2*d*x+1/2*c))/(-2*sin(1/2*d*x+1/2*c)^
4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)
^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 175, normalized size of antiderivative = 1.19

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3\,dx =$$
$$-\frac{2\left(165i\sqrt{2}a^3\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))-165i\sqrt{2}a^3\text{weierstrassPInverse}\right.}{}$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] -2/315*(165*I*sqrt(2)*a^3*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d
*x + c)) - 165*I*sqrt(2)*a^3*weierstrassPInverse(-4, 0, cos(d*x + c) - I*si
n(d*x + c)) - 357*I*sqrt(2)*a^3*weierstrassZeta(-4, 0, weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 357*I*sqrt(2)*a^3*weierstrassZeta(
-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (35*a^3
*cos(d*x + c)^3 + 135*a^3*cos(d*x + c)^2 + 238*a^3*cos(d*x + c) + 330*a^3)*
sqrt(cos(d*x + c))*sin(d*x + c))/d
```

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(3/2)*(a+a*cos(d*x+c))**3,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3\,dx = \int (a\cos(dx+c)+a)^3\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] integrate((a*cos(d*x + c) + a)^3*cos(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3\,dx = \int (a\cos(dx+c)+a)^3\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((a*cos(d*x + c) + a)^3*cos(d*x + c)^(3/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.00 (sec) , antiderivative size = 206, normalized size of antiderivative = 1.40

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3\,dx$$
$$= \frac{2\left(a^3\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)+a^3\,\sqrt{\cos(c+d\,x)}\,\sin(c+d\,x)\right)}{3\,d} - \frac{2\left(\frac{33\,a^3\cos(c+d\,x)^{7/2}\,\sin(c+d\,x)}{\sqrt{\sin(c+d\,x)^2}}-\frac{5\,a^3\cos(c+d\,x)^{11/2}\,\sin(c+d\,x)}{\sqrt{\sin(c+d\,x)^2}}\right)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{11}{4};\ \frac{15}{4};\ \cos(c+d\,x)^2\right)}{77\,d} - \frac{2\,a^3\cos(c+d\,x)^{9/2}\,\sin(c+d\,x)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{9}{4};\ \frac{13}{4};\ \cos(c+d\,x)^2\right)}{3\,d\,\sqrt{\sin(c+d\,x)^2}} - \frac{104\,a^3\cos(c+d\,x)^{11/2}\,\sin(c+d\,x)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{11}{4};\ \frac{19}{4};\ \cos(c+d\,x)^2\right)}{385\,d\,\sqrt{\sin(c+d\,x)^2}}$$

```
[In] int(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^3,x)
```

```
[Out] (2*(a^3*ellipticF(c/2 + (d*x)/2, 2) + a^3*cos(c + d*x)^(1/2)*sin(c + d*x)))
/(3*d) - (2*((33*a^3*cos(c + d*x)^(7/2)*sin(c + d*x))/(sin(c + d*x)^2)^(1/2
) - (5*a^3*cos(c + d*x)^(11/2)*sin(c + d*x))/(sin(c + d*x)^2)^(1/2))*hyperg
eom([1/2, 11/4], 15/4, cos(c + d*x)^2))/(77*d) - (2*a^3*cos(c + d*x)^(9/2)*
sin(c + d*x)*hypergeom([1/2, 9/4], 13/4, cos(c + d*x)^2))/(3*d*(sin(c + d*x
)^2)^(1/2)) - (104*a^3*cos(c + d*x)^(11/2)*sin(c + d*x)*hypergeom([1/2, 11/
4], 19/4, cos(c + d*x)^2))/(385*d*(sin(c + d*x)^2)^(1/2))
```

3.161 $\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3\,dx$

Optimal result

Integrand size = 23, antiderivative size = 121

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3\,dx = \frac{28a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{52a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{52a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} + \frac{6a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a^3\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}$$

```
[Out] 28/5*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*
d*x+1/2*c),2^(1/2))/d+52/21*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/
2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+6/5*a^3*cos(d*x+c)^(3/2)*sin(d
*x+c)/d+2/7*a^3*cos(d*x+c)^(5/2)*sin(d*x+c)/d+52/21*a^3*sin(d*x+c)*cos(d*x+
c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used

$= \{2836, 2719, 2715, 2720\}$

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3\,dx = \frac{52a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{28a^3E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{5d} + \frac{2a^3\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{7d} + \frac{6a^3\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{5d} + \frac{52a^3\sin(c+dx)\sqrt{\cos(c+dx)}}{21d}$$

```
[In] Int[Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (28*a^3*EllipticE[(c + d*x)/2, 2])/(5*d) + (52*a^3*EllipticF[(c + d*x)/2, 2
])/(21*d) + (52*a^3*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(21*d) + (6*a^3*Cos[c
+ d*x]^(3/2)*Sin[c + d*x])/(5*d) + (2*a^3*Cos[c + d*x]^(5/2)*Sin[c + d*x])/
(7*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$\text{integral} = \int \left(a^3\sqrt{\cos(c+dx)}+3a^3\cos^{\frac{3}{2}}(c+dx)+3a^3\cos^{\frac{5}{2}}(c+dx)+a^3\cos^{\frac{7}{2}}(c+dx)\right)\,dx$$
$$= a^3\int\sqrt{\cos(c+dx)}\,dx+a^3\int\cos^{\frac{7}{2}}(c+dx)\,dx + \left(3a^3\right)\int\cos^{\frac{3}{2}}(c+dx)\,dx+\left(3a^3\right)\int\cos^{\frac{5}{2}}(c+dx)\,dx$$
$$= \frac{2a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{d}+\frac{6a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a^3\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}+\frac{1}{7}\left(5a^3\right)\int\cos^{\frac{3}{2}}(c+dx)\,dx + a^3\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx+\frac{1}{5}\left(9a^3\right)\int\sqrt{\cos(c+dx)}\,dx$$
$$= \frac{28a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{52a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{21d}+\frac{6a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a^3\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}+\frac{1}{21}\left(5a^3\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx$$
$$= \frac{28a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{52a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{52a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} + \frac{6a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{2a^3\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 5.46 (sec) , antiderivative size = 245, normalized size of antiderivative = 2.02

$$\int\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3\,dx = \frac{a^3(1+\cos(c+dx))^3\sec^6\left(\frac{1}{2}(c+dx)\right)\left(\frac{294(3\cos(c-dx-\arctan(\tan(c)))+\cos(c+dx+\arctan(\tan(c))))\csc(c)\sec(c)}{\sqrt{\sec^2(c)}}-520\cos(\right.}{}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (a^3*(1 + Cos[c + d*x])^3*Sec[(c + d*x)/2]^6*((294*(3*Cos[c - d*x - ArcTan[
Tan[c]]] + Cos[c + d*x + ArcTan[Tan[c]]])*Csc[c]*Sec[c])/Sqrt[Sec[c]^2] - 5
```

```
20*Cos[c + d*x]*Sqrt[Cos[d*x - ArcTan[Cot[c]]]^2]*Sqrt[Csc[c]^2]*Hypergeome
tricPFQ[{1/4, 1/2}, {5/4}, Sin[d*x - ArcTan[Cot[c]]]^2]*Sec[d*x - ArcTan[Co
t[c]]]*Sin[c] + Cos[c + d*x]*(-1176*Cot[c] + 535*Sin[c + d*x] + 126*Sin[2*(
c + d*x)] + 15*Sin[3*(c + d*x)]) - 588*Cos[c]*Csc[d*x + ArcTan[Tan[c]]]*Hyp
ergeometricPFQ[{-1/2, -1/4}, {3/4}, Cos[d*x + ArcTan[Tan[c]]]^2]*Sqrt[Sec[c
]^2]*Sqrt[Sin[d*x + ArcTan[Tan[c]]]^2]))/(1680*d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 10.53 (sec) , antiderivative size = 272, normalized size of antiderivative = 2.25

method	result
default	$-\frac{4\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^3\left(120\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-432\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+602\left(\sin^4\left(\frac{dx}{2}+\right.\right.\right.}{105\sqrt{-2\left(\sin\right.}}$
parts	Expression too large to display

```
[In] int(cos(d*x+c)^(1/2)*(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -4/105*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^3*(120*cos
(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8-432*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2
*c)^6+602*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-208*sin(1/2*d*x+1/2*c)^2*
cos(1/2*d*x+1/2*c)+65*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-
1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-147*(sin(1/2*d*x+1/2*c)^2)^(
1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))
)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(
2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.34

$$\int\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3\,dx =$$

$$-\frac{2\left(65i\sqrt{2}a^3\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))-65i\sqrt{2}a^3\text{weierstrassPInverse}(-4\right.}{}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] -2/105*(65*I*sqrt(2)*a^3*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*
x + c)) - 65*I*sqrt(2)*a^3*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(
d*x + c)) - 147*I*sqrt(2)*a^3*weierstrassZeta(-4, 0, weierstrassPInverse(-4
, 0, cos(d*x + c) + I*sin(d*x + c))) + 147*I*sqrt(2)*a^3*weierstrassZeta(-4
```

```
, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (15*a^3*c
os(d*x + c)^2 + 63*a^3*cos(d*x + c) + 130*a^3)*sqrt(cos(d*x + c))*sin(d*x +
 c))/d
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(1/2)*(a+a*cos(d*x+c))**3,x)
[Out] Timed out
```

Maxima [F]

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3\,dx = \int (a\cos(dx+c)+a)^3\sqrt{\cos(dx+c)}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c))^3,x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^3*sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3\,dx = \int (a\cos(dx+c)+a)^3\sqrt{\cos(dx+c)}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^3*sqrt(cos(d*x + c)), x)
```

Mupad [B] (verification not implemented)

Time = 14.75 (sec) , antiderivative size = 143, normalized size of antiderivative = 1.18

$$\begin{aligned}
&\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3\,dx \\
&= \frac{2\left(a^3\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)+a^3\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)+a^3\,\sqrt{\cos\left(c+d\,x\right)}\,\sin\left(c+d\,x\right)\right)}{d} \\
&\quad-\frac{6\,a^3\,{\cos\left(c+d\,x\right)}^{7/2}\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{7}{4};\ \frac{11}{4};\ {\cos\left(c+d\,x\right)}^2\right)}{7\,d\,\sqrt{{\sin\left(c+d\,x\right)}^2}} \\
&\quad-\frac{2\,a^3\,{\cos\left(c+d\,x\right)}^{9/2}\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{9}{4};\ \frac{13}{4};\ {\cos\left(c+d\,x\right)}^2\right)}{9\,d\,\sqrt{{\sin\left(c+d\,x\right)}^2}}
\end{aligned}$$

```
[In] int(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^3,x)
```

```
[Out] (2*(a^3*ellipticE(c/2 + (d*x)/2, 2) + a^3*ellipticF(c/2 + (d*x)/2, 2) + a^3
*cos(c + d*x)^(1/2)*sin(c + d*x)))/d - (6*a^3*cos(c + d*x)^(7/2)*sin(c + d*
x)*hypergeom([1/2, 7/4], 11/4, cos(c + d*x)^2))/(7*d*(sin(c + d*x)^2)^(1/2)
) - (2*a^3*cos(c + d*x)^(9/2)*sin(c + d*x)*hypergeom([1/2, 9/4], 13/4, cos(
c + d*x)^2))/(9*d*(sin(c + d*x)^2)^(1/2))
```

3.162 $\int \frac{(a+a\cos(c+dx))^3}{\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 91

$$\int \frac{(a+a\cos(c+dx))^3}{\sqrt{\cos(c+dx)}}\,dx = \frac{36a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{4a^3\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}+\frac{2a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{d}+\frac{2a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}$$

```
[Out] 36/5*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*
d*x+1/2*c),2^(1/2))/d+4*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)
*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/5*a^3*cos(d*x+c)^(3/2)*sin(d*x+c
)/d+2*a^3*sin(d*x+c)*cos(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2836, 2720, 2719, 2715}

$$\int \frac{(a+a\cos(c+dx))^3}{\sqrt{\cos(c+dx)}}\,dx = \frac{4a^3\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}+\frac{36a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2a^3\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{5d}+\frac{2a^3\sin(c+dx)\sqrt{\cos(c+dx)}}{d}$$

```
[In] Int[(a + a*Cos[c + d*x])^3/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (36*a^3*EllipticE[(c + d*x)/2, 2])/(5*d) + (4*a^3*EllipticF[(c + d*x)/2, 2]
)/d + (2*a^3*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/d + (2*a^3*Cos[c + d*x]^(3/2)
*Sin[c + d*x])/(5*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(\frac{a^3}{\sqrt{\cos(c+dx)}}+3a^3\sqrt{\cos(c+dx)}+3a^3\cos^{\frac{3}{2}}(c+dx)+a^3\cos^{\frac{5}{2}}(c+dx)\right)dx\\
&= a^3\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx+a^3\int \cos^{\frac{5}{2}}(c+dx)\,dx\\
&\quad+\left(3a^3\right)\int \sqrt{\cos(c+dx)}\,dx+\left(3a^3\right)\int \cos^{\frac{3}{2}}(c+dx)\,dx\\
&= \frac{6a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}+\frac{2a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{d}\\
&\quad+\frac{2a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{1}{5}\left(3a^3\right)\int \sqrt{\cos(c+dx)}\,dx+a^3\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{36a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{4a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}\\
&\quad+\frac{2a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{d}+\frac{2a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}
\end{aligned}
$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 5.01 (sec) , antiderivative size = 233, normalized size of antiderivative = 2.56

$$\int \frac{(a+a\cos(c+dx))^3}{\sqrt{\cos(c+dx)}}\,dx$$
$$= \frac{a^3(1+\cos(c+dx))^3\sec^6\left(\frac{1}{2}(c+dx)\right)\left(\frac{9(3\cos(c-dx-\arctan(\tan(c)))+\cos(c+dx+\arctan(\tan(c))))\csc(c)\sec(c)}{\sqrt{\sec^2(c)}}-20\cos(c+\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^3/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (a^3*(1 + Cos[c + d*x])^3*Sec[(c + d*x)/2]^6*((9*(3*Cos[c - d*x - ArcTan[Ta
n[c]]] + Cos[c + d*x + ArcTan[Tan[c]]])*Csc[c]*Sec[c])/Sqrt[Sec[c]^2] - 20*
Cos[c + d*x]*Sqrt[Cos[d*x - ArcTan[Cot[c]]]^2]*Sqrt[Csc[c]^2]*Hypergeometri
cPFQ[{1/4, 1/2}, {5/4}, Sin[d*x - ArcTan[Cot[c]]]^2]*Sec[d*x - ArcTan[Cot[c
]]]*Sin[c] + Cos[c + d*x]*(-36*Cot[c] + 10*Sin[c + d*x] + Sin[2*(c + d*x)])
 - 18*Cos[c]*Csc[d*x + ArcTan[Tan[c]]]*HypergeometricPFQ[{-1/2, -1/4}, {3/4
}, Cos[d*x + ArcTan[Tan[c]]]^2]*Sqrt[Sec[c]^2]*Sqrt[Sin[d*x + ArcTan[Tan[c]
]]^2]))/(40*d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.94 (sec) , antiderivative size = 250, normalized size of antiderivative = 2.75

method	result
default	$-\frac{4\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^3\left(-4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+14\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-6\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.}{5\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\right.}}$
parts	$\frac{2a^3\operatorname{am}^{-1}\left(\frac{dx}{2}+\frac{c}{2}\middle\|\sqrt{2}\right)}{d}-\frac{2a^3\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\right.\right.}{5\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}$

```
[In] int((a+cos(d*x+c)*a)^3/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -4/5*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^3*(-4*cos(1/
2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+14*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c
)-6*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*
(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-9*(s
in(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1
/2*d*x+1/2*c),2^(1/2)))/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2
)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.63

$$\int \frac{(a + a\cos(c + dx))^3}{\sqrt{\cos(c + dx)}}\, dx =$$
$$-\frac{2\left(5i\sqrt{2}a^3\text{weierstrassPInverse}(-4, 0, \cos(dx + c) + i\sin(dx + c)) - 5i\sqrt{2}a^3\text{weierstrassPInverse}(-4, 0\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^3/cos(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] -2/5*(5*I*sqrt(2)*a^3*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x +
 c)) - 5*I*sqrt(2)*a^3*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x
+ c)) - 9*I*sqrt(2)*a^3*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, c
os(d*x + c) + I*sin(d*x + c))) + 9*I*sqrt(2)*a^3*weierstrassZeta(-4, 0, wei
erstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (a^3*cos(d*x + c)
 + 5*a^3)*sqrt(cos(d*x + c))*sin(d*x + c))/d
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a + a\cos(c + dx))^3}{\sqrt{\cos(c + dx)}}\, dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**3/cos(d*x+c)**(1/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a + a\cos(c + dx))^3}{\sqrt{\cos(c + dx)}}\, dx = \int \frac{(a\cos(dx + c) + a)^3}{\sqrt{\cos(dx + c)}}\, dx$$

```
[In] integrate((a+a*cos(d*x+c))^3/cos(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((a*cos(d*x + c) + a)^3/sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \frac{(a + a\cos(c + dx))^3}{\sqrt{\cos(c + dx)}}\, dx = \int \frac{(a\cos(dx + c) + a)^3}{\sqrt{\cos(dx + c)}}\, dx$$

```
[In] integrate((a+a*cos(d*x+c))^3/cos(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^3/sqrt(cos(d*x + c)), x)
```

Mupad [B] (verification not implemented)

Time = 13.92 (sec) , antiderivative size = 104, normalized size of antiderivative = 1.14

$$\int \frac{(a + a\cos(c + dx))^3}{\sqrt{\cos(c + dx)}}\, dx = \frac{6\, a^3\, \mathrm{E}\left(\frac{c}{2} + \frac{d\, x}{2} \middle| 2\right)}{d} + \frac{4\, a^3\, \mathrm{F}\left(\frac{c}{2} + \frac{d\, x}{2} \middle| 2\right)}{d} + \frac{2\, a^3\, \sqrt{\cos\left(c + d\, x\right)}\, \sin\left(c + d\, x\right)}{d} - \frac{2\, a^3 \cos\left(c + d\, x\right)^{7/2}\, \sin\left(c + d\, x\right)\, {}_2\mathrm{F}_1\left(\frac{1}{2}, \frac{7}{4};\ \frac{11}{4};\ \cos\left(c + d\, x\right)^2\right)}{7\, d\, \sqrt{\sin\left(c + d\, x\right)^2}}$$

```
[In] int((a + a*cos(c + d*x))^3/cos(c + d*x)^(1/2),x)
[Out] (6*a^3*ellipticE(c/2 + (d*x)/2, 2))/d + (4*a^3*ellipticF(c/2 + (d*x)/2, 2))
/d + (2*a^3*cos(c + d*x)^(1/2)*sin(c + d*x))/d - (2*a^3*cos(c + d*x)^(7/2)*
sin(c + d*x)*hypergeom([1/2, 7/4], 11/4, cos(c + d*x)^2))/(7*d*(sin(c + d*x
)^2)^(1/2))
```

3.163 $\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 91

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\frac{4a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{20a^3\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2a^3\sin(c+dx)}{d\sqrt{\cos(c+dx)}}+\frac{2a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}$$

```
[Out] 4*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x
+1/2*c),2^(1/2))/d+20/3*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)
*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2*a^3*sin(d*x+c)/d/cos(d*x+c)^(1/2
)+2/3*a^3*sin(d*x+c)*cos(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2836, 2716, 2719, 2720, 2715}

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\frac{20a^3\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{4a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2a^3\sin(c+dx)\sqrt{\cos(c+dx)}}{3d}+\frac{2a^3\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + a*Cos[c + d*x])^3/Cos[c + d*x]^(3/2),x]
```

```
[Out] (4*a^3*EllipticE[(c + d*x)/2, 2])/d + (20*a^3*EllipticF[(c + d*x)/2, 2])/(3
*d) + (2*a^3*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]]) + (2*a^3*Sqrt[Cos[c + d*x
]]*Sin[c + d*x])/(3*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(\frac{a^3}{\cos^{\frac{3}{2}}(c+dx)}+\frac{3a^3}{\sqrt{\cos(c+dx)}}+3a^3\sqrt{\cos(c+dx)}+a^3\cos^{\frac{3}{2}}(c+dx)\right)dx\\
&= a^3\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx+a^3\int \cos^{\frac{3}{2}}(c+dx)\,dx\\
&\quad+\left(3a^3\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx+\left(3a^3\right)\int \sqrt{\cos(c+dx)}\,dx\\
&= \frac{6a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{6a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}+\frac{2a^3\sin(c+dx)}{d\sqrt{\cos(c+dx)}}\\
&\quad+\frac{2a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}+\frac{1}{3}a^3\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx-a^3\int \sqrt{\cos(c+dx)}\,dx
\end{aligned}
$$

$$=\frac{4a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{20a^3\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2a^3\sin(c+dx)}{d\sqrt{\cos(c+dx)}}+\frac{2a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.40 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.60

$$\int\frac{(a+a\cos(c+dx))^3}{\cos^{\frac{3}{2}}(c+dx)}\,dx=$$
$$-\frac{2a^3\csc(c+dx)\left(-3\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},\cos^2(c+dx)\right)\sqrt{\sin^2(c+dx)}+\cos(c+dx)\left(-1+\text{co}\right.\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^3/Cos[c + d*x]^(3/2),x]
```

```
[Out] (-2*a^3*Csc[c + d*x]*(-3*Hypergeometric2F1[-1/4, 1/2, 3/4, Cos[c + d*x]^2]*
Sqrt[Sin[c + d*x]^2] + Cos[c + d*x]*(-1 + Cos[c + d*x]^2 + 10*Hypergeometri
c2F1[1/4, 1/2, 5/4, Cos[c + d*x]^2]*Sqrt[Sin[c + d*x]^2] + 3*Cos[c + d*x]*H
ypergeometric2F1[1/2, 3/4, 7/4, Cos[c + d*x]^2]*Sqrt[Sin[c + d*x]^2])))/(3*
d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.97 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.89

method	result
default	$-\frac{4a^3\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-4\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+5\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-\right.}{3\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$
parts	$-\frac{2a^3\left(-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\right.\right.}\right.}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int((a+cos(d*x+c)*a)^3/cos(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -4/3*a^3*(2*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-4*sin(1/2*d*x+1/2*c)^2*
cos(1/2*d*x+1/2*c)+5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1
)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-3*(sin(1/2*d*x+1/2*c)^2)^(1/2
)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/s
in(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 180, normalized size of antiderivative = 1.98

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{3}{2}}(c+dx)}\,dx =$$
$$-\frac{2\left(5i\sqrt{2}a^3\cos(dx+c)\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))-5i\sqrt{2}a^3\cos(dx+c)\right.}{}$$

[In] integrate((a+a*cos(d*x+c))^3/cos(d*x+c)^(3/2),x, algorithm="fricas")

[Out] -2/3*(5*I*sqrt(2)*a^3*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) - 5*I*sqrt(2)*a^3*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 3*I*sqrt(2)*a^3*cos(d*x + c)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 3*I*sqrt(2)*a^3*cos(d*x + c)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (a^3*cos(d*x + c) + 3*a^3)*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c))

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

[In] integrate((a+a*cos(d*x+c))**3/cos(d*x+c)**(3/2),x)

[Out] Timed out

Maxima [F]

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(a\cos(dx+c)+a)^3}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

[In] integrate((a+a*cos(d*x+c))^3/cos(d*x+c)^(3/2),x, algorithm="maxima")

[Out] integrate((a*cos(d*x + c) + a)^3/cos(d*x + c)^(3/2), x)

Giac [F]

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(a\cos(dx+c)+a)^3}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

[In] integrate((a+a*cos(d*x+c))^3/cos(d*x+c)^(3/2),x, algorithm="giac")

[Out] integrate((a*cos(d*x + c) + a)^3/cos(d*x + c)^(3/2), x)

Mupad [B] (verification not implemented)

Time = 14.64 (sec) , antiderivative size = 104, normalized size of antiderivative = 1.14

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{6\,a^3\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d} + \frac{20\,a^3\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{3\,d} + \frac{2\,a^3\,\sqrt{\cos(c+d\,x)}\,\sin(c+d\,x)}{3\,d} + \frac{2\,a^3\,\sin(c+d\,x)\,{}_2\mathrm{F}_1\left(-\frac{1}{4},\frac{1}{2};\ \frac{3}{4};\ \cos(c+d\,x)^2\right)}{d\,\sqrt{\cos(c+d\,x)}\,\sqrt{\sin(c+d\,x)^2}}$$

[In] int((a + a*cos(c + d*x))^3/cos(c + d*x)^(3/2),x)

[Out] (6*a^3*ellipticE(c/2 + (d*x)/2, 2))/d + (20*a^3*ellipticF(c/2 + (d*x)/2, 2))/(3*d) + (2*a^3*cos(c + d*x)^(1/2)*sin(c + d*x))/(3*d) + (2*a^3*sin(c + d*x)*hypergeom([-1/4, 1/2], 3/4, cos(c + d*x)^2))/(d*cos(c + d*x)^(1/2)*(sin(c + d*x)^2)^(1/2))

3.164 $\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 91

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{5}{2}}(c+dx)}\,dx = -\frac{4a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{20a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2a^3\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{6a^3\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[Out] -4*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*
x+1/2*c),2^(1/2))/d+20/3*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c
)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/3*a^3*sin(d*x+c)/d/cos(d*x+c)^(
3/2)+6*a^3*sin(d*x+c)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2836, 2716, 2720, 2719}

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{20a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}-\frac{4a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2a^3\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{6a^3\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + a*Cos[c + d*x])^3/Cos[c + d*x]^(5/2),x]
```

```
[Out] (-4*a^3*EllipticE[(c + d*x)/2, 2])/d + (20*a^3*EllipticF[(c + d*x)/2, 2])/(
3*d) + (2*a^3*Sin[c + d*x])/(3*d*Cos[c + d*x]^(3/2)) + (6*a^3*Sin[c + d*x])
/(d*Sqrt[Cos[c + d*x]])
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{a^3}{\cos^{\frac{5}{2}}(c+dx)}+\frac{3a^3}{\cos^{\frac{3}{2}}(c+dx)}+\frac{3a^3}{\sqrt{\cos(c+dx)}}+a^3\sqrt{\cos(c+dx)}\right)dx \\
&= a^3\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)}\,dx+a^3\int \sqrt{\cos(c+dx)}\,dx \\
&\quad +\left(3a^3\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx+\left(3a^3\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{2a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{6a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}+\frac{2a^3\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} \\
&\quad +\frac{6a^3\sin(c+dx)}{d\sqrt{\cos(c+dx)}}+\frac{1}{3}a^3\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx-\left(3a^3\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= -\frac{4a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{20a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2a^3\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{6a^3\sin(c+dx)}{d\sqrt{\cos(c+dx)}}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.32 (sec) , antiderivative size = 139, normalized size of antiderivative = 1.53

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2a^3\csc(c+dx)\left(\text{Hypergeometric2F1}\left(-\frac{3}{4},\frac{1}{2},\frac{1}{4},\cos^2(c+dx)\right)+9\cos(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2}\right.\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^3/Cos[c + d*x]^(5/2),x]
```

```
[Out] (2*a^3*Csc[c + d*x]*(Hypergeometric2F1[-3/4, 1/2, 1/4, Cos[c + d*x]^2] + 9*
Cos[c + d*x]*Hypergeometric2F1[-1/4, 1/2, 3/4, Cos[c + d*x]^2] - Cos[c + d*
x]^2*(9*Hypergeometric2F1[1/4, 1/2, 5/4, Cos[c + d*x]^2] + Cos[c + d*x]*Hyp
ergeometric2F1[1/2, 3/4, 7/4, Cos[c + d*x]^2]))*Sqrt[Sin[c + d*x]^2])/(3*d*
Cos[c + d*x]^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 370 vs. 2(135) = 270.

Time = 6.45 (sec) , antiderivative size = 371, normalized size of antiderivative = 4.08

method	result
default	$-\frac{4\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^3\left(18\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-10\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\right.\right.}{}$
parts	$-\frac{2a^3\left(-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx}{2}}\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right.}$

```
[In] int((a+cos(d*x+c)*a)^3/cos(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -4/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^3/(4*sin(1
/2*d*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)/sin(1/2*d*x+1/2*c)^3*(18*sin(1/2*
d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-10*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*
d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2
*c)^2-6*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellip
ticE(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2-10*sin(1/2*d*x+1/2*c)
^2*cos(1/2*d*x+1/2*c)+5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^
2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+3*(sin(1/2*d*x+1/2*c)^2)^(
1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))
```

```
)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c
)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 187, normalized size of antiderivative = 2.05

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{5}{2}}(c+dx)}\,dx = -\frac{2\left(5i\sqrt{2}a^3\cos{(dx+c)}^2 \text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\sin{(dx+c)}) - 5i\sqrt{2}a^3\cos{(dx+c)}^2\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^3/cos(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] -2/3*(5*I*sqrt(2)*a^3*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x + c
) + I*sin(d*x + c)) - 5*I*sqrt(2)*a^3*cos(d*x + c)^2*weierstrassPInverse(-4
, 0, cos(d*x + c) - I*sin(d*x + c)) + 3*I*sqrt(2)*a^3*cos(d*x + c)^2*weiers
trassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)))
 - 3*I*sqrt(2)*a^3*cos(d*x + c)^2*weierstrassZeta(-4, 0, weierstrassPInvers
e(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (9*a^3*cos(d*x + c) + a^3)*sqrt(
cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**3/cos(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(a\cos{(dx+c)}+a)^3}{\cos{(dx+c)}^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^3/cos(d*x+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((a*cos(d*x + c) + a)^3/cos(d*x + c)^(5/2), x)
```

Giac [F]

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(a\cos(dx+c)+a)^3}{\cos(dx+c)^{\frac{5}{2}}}\,dx$$

[In] integrate((a+a*cos(d*x+c))^3/cos(d*x+c)^(5/2),x, algorithm="giac")

[Out] integrate((a*cos(d*x + c) + a)^3/cos(d*x + c)^(5/2), x)

Mupad [B] (verification not implemented)

Time = 14.49 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.38

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2\left(a^3\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)+3\,a^3\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)\right)}{d} + \frac{6\,a^3\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{1}{4},\frac{1}{2};\ \frac{3}{4};\ \cos\left(c+d\,x\right)^2\right)}{d\,\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{\sin\left(c+d\,x\right)^2}} + \frac{2\,a^3\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{3}{4},\frac{1}{2};\ \frac{1}{4};\ \cos\left(c+d\,x\right)^2\right)}{3\,d\cos\left(c+d\,x\right)^{3/2}\,\sqrt{\sin\left(c+d\,x\right)^2}}$$

[In] int((a + a*cos(c + d*x))^3/cos(c + d*x)^(5/2),x)

[Out] (2*(a^3*ellipticE(c/2 + (d*x)/2, 2) + 3*a^3*ellipticF(c/2 + (d*x)/2, 2)))/d
 + (6*a^3*sin(c + d*x)*hypergeom([-1/4, 1/2], 3/4, cos(c + d*x)^2))/(d*cos(
c + d*x)^(1/2)*(sin(c + d*x)^2)^(1/2)) + (2*a^3*sin(c + d*x)*hypergeom([-3/
4, 1/2], 1/4, cos(c + d*x)^2))/(3*d*cos(c + d*x)^(3/2)*(sin(c + d*x)^2)^(1/
2))

3.165 $\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 117

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{7}{2}}(c+dx)}\,dx = -\frac{36a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{4a^3\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{2a^3\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{2a^3\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)} + \frac{36a^3\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

```
[Out] -36/5*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2
*d*x+1/2*c),2^(1/2))/d+4*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c
)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/5*a^3*sin(d*x+c)/d/cos(d*x+c)^(
5/2)+2*a^3*sin(d*x+c)/d/cos(d*x+c)^(3/2)+36/5*a^3*sin(d*x+c)/d/cos(d*x+c)^(
1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2836, 2716, 2719, 2720}

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{4a^3\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} - \frac{36a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{2a^3\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)} + \frac{2a^3\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{36a^3\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + a*Cos[c + d*x])^3/Cos[c + d*x]^(7/2),x]
```

```
[Out] (-36*a^3*EllipticE[(c + d*x)/2, 2])/(5*d) + (4*a^3*EllipticF[(c + d*x)/2, 2
])/d + (2*a^3*Sin[c + d*x])/(5*d*Cos[c + d*x]^(5/2)) + (2*a^3*Sin[c + d*x])
/(d*Cos[c + d*x]^(3/2)) + (36*a^3*Sin[c + d*x])/(5*d*Sqrt[Cos[c + d*x]])
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{a^3}{\cos^{\frac{7}{2}}(c+dx)}+\frac{3a^3}{\cos^{\frac{5}{2}}(c+dx)}+\frac{3a^3}{\cos^{\frac{3}{2}}(c+dx)}+\frac{a^3}{\sqrt{\cos(c+dx)}}\right) dx \\
&= a^3\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)}\,dx+a^3\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&\quad+\left(3a^3\right)\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)}\,dx+\left(3a^3\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{2a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}+\frac{2a^3\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{2a^3\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)}+\frac{6a^3\sin(c+dx)}{d\sqrt{\cos(c+dx)}} \\
&\quad+\frac{1}{5}\left(3a^3\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx+a^3\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx-\left(3a^3\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= -\frac{6a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{4a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}+\frac{2a^3\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} \\
&\quad+\frac{2a^3\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)}+\frac{36a^3\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}-\frac{1}{5}\left(3a^3\right)\int \sqrt{\cos(c+dx)}\,dx
\end{aligned}$$

$$= -\frac{36a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{4a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{2a^3\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{2a^3\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)} + \frac{36a^3\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.44 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.18

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{7}{2}}(c+dx)}\,dx$$
$$= \frac{2a^3\csc(c+dx)\left(\text{Hypergeometric2F1}\left(-\frac{5}{4},\frac{1}{2},-\frac{1}{4},\cos^2(c+dx)\right)+5\cos(c+dx)\left(\text{Hypergeometric2F1}\left(-\frac{3}{4},\right.\right.\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^3/Cos[c + d*x]^(7/2),x]
```

```
[Out] (2*a^3*Csc[c + d*x]*(Hypergeometric2F1[-5/4, 1/2, -1/4, Cos[c + d*x]^2] + 5
*Cos[c + d*x]*(Hypergeometric2F1[-3/4, 1/2, 1/4, Cos[c + d*x]^2] + Cos[c +
d*x]*(3*Hypergeometric2F1[-1/4, 1/2, 3/4, Cos[c + d*x]^2] - Cos[c + d*x]*Hy
pergeometric2F1[1/4, 1/2, 5/4, Cos[c + d*x]^2])))*Sqrt[Sin[c + d*x]^2])/(5*
d*Cos[c + d*x]^(5/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 385 vs. 2(157) = 314.

Time = 7.48 (sec) , antiderivative size = 386, normalized size of antiderivative = 3.30

method	result
default	$-\frac{16\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^3\left(\frac{7\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{10\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}-\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin\right.}}{16\left(\cos^2\left(\right.\right.}\right.}{}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*a)^3/cos(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -16*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^3*(7/10*(si
n(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x
+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))
-1/16*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/
2)/(cos(1/2*d*x+1/2*c)^2-1/2)^2-9/10*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c
)/(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)-9/20*(sin(1/2*d
```

```
*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)
^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-Ellip
ticE(cos(1/2*d*x+1/2*c),2^(1/2)))-1/160*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+
1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^3)/sin(1/2*
d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 200, normalized size of antiderivative = 1.71

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{7}{2}}(c+dx)}\,dx = -\frac{2\left(5i\sqrt{2}a^3\cos(dx+c)^3\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c)) - 5i\sqrt{2}a^3\cos(dx+c\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^3/cos(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] -2/5*(5*I*sqrt(2)*a^3*cos(d*x + c)^3*weierstrassPInverse(-4, 0, cos(d*x + c
) + I*sin(d*x + c)) - 5*I*sqrt(2)*a^3*cos(d*x + c)^3*weierstrassPInverse(-4
, 0, cos(d*x + c) - I*sin(d*x + c)) + 9*I*sqrt(2)*a^3*cos(d*x + c)^3*weiers
trassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)))
 - 9*I*sqrt(2)*a^3*cos(d*x + c)^3*weierstrassZeta(-4, 0, weierstrassPInvers
e(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (18*a^3*cos(d*x + c)^2 + 5*a^3*c
os(d*x + c) + a^3)*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^3)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**3/cos(d*x+c)**(7/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a + a\cos(c + dx))^3}{\cos^{\frac{7}{2}}(c + dx)}\, dx = \int \frac{(a\cos(dx + c) + a)^3}{\cos(dx + c)^{\frac{7}{2}}}\, dx$$

[In] integrate((a+a*cos(d*x+c))^3/cos(d*x+c)^(7/2),x, algorithm="maxima")

[Out] integrate((a*cos(d*x + c) + a)^3/cos(d*x + c)^(7/2), x)

Giac [F]

$$\int \frac{(a + a\cos(c + dx))^3}{\cos^{\frac{7}{2}}(c + dx)}\, dx = \int \frac{(a\cos(dx + c) + a)^3}{\cos(dx + c)^{\frac{7}{2}}}\, dx$$

[In] integrate((a+a*cos(d*x+c))^3/cos(d*x+c)^(7/2),x, algorithm="giac")

[Out] integrate((a*cos(d*x + c) + a)^3/cos(d*x + c)^(7/2), x)

Mupad [B] (verification not implemented)

Time = 15.24 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.32

$$\begin{aligned}\int \frac{(a + a\cos(c + dx))^3}{\cos^{\frac{7}{2}}(c + dx)}\, dx &= \frac{2\,a^3\,\mathrm{F}\left(\frac{c}{2} + \frac{d\,x}{2}\middle|2\right)}{d} \\ &+ \frac{6\,a^3\,\sin\left(c + d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{1}{4}, \frac{1}{2};\ \frac{3}{4};\ \cos\left(c + d\,x\right)^2\right)}{d\,\sqrt{\cos\left(c + d\,x\right)}\,\sqrt{\sin\left(c + d\,x\right)^2}} \\ &+ \frac{2\,a^3\,\sin\left(c + d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{3}{4}, \frac{1}{2};\ \frac{1}{4};\ \cos\left(c + d\,x\right)^2\right)}{d\cos\left(c + d\,x\right)^{3/2}\,\sqrt{\sin\left(c + d\,x\right)^2}} \\ &+ \frac{2\,a^3\,\sin\left(c + d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{5}{4}, \frac{1}{2};\ -\frac{1}{4};\ \cos\left(c + d\,x\right)^2\right)}{5\,d\cos\left(c + d\,x\right)^{5/2}\,\sqrt{\sin\left(c + d\,x\right)^2}}\end{aligned}$$

[In] int((a + a*cos(c + d*x))^3/cos(c + d*x)^(7/2),x)

[Out] (2*a^3*ellipticF(c/2 + (d*x)/2, 2))/d + (6*a^3*sin(c + d*x)*hypergeom([-1/4, 1/2], 3/4, cos(c + d*x)^2))/(d*cos(c + d*x)^(1/2)*(sin(c + d*x)^2)^(1/2)) + (2*a^3*sin(c + d*x)*hypergeom([-3/4, 1/2], 1/4, cos(c + d*x)^2))/(d*cos(c + d*x)^(3/2)*(sin(c + d*x)^2)^(1/2)) + (2*a^3*sin(c + d*x)*hypergeom([-5/4, 1/2], -1/4, cos(c + d*x)^2))/(5*d*cos(c + d*x)^(5/2)*(sin(c + d*x)^2)^(1/2))

3.166 $\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{9}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 147

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{9}{2}}(c+dx)}\,dx = -\frac{28a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{52a^3\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{2a^3\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{6a^3\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{52a^3\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)} + \frac{28a^3\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

```
[Out] -28/5*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2
*d*x+1/2*c),2^(1/2))/d+52/21*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1
/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/7*a^3*sin(d*x+c)/d/cos(d*x+
c)^(7/2)+6/5*a^3*sin(d*x+c)/d/cos(d*x+c)^(5/2)+52/21*a^3*sin(d*x+c)/d/cos(d
*x+c)^(3/2)+28/5*a^3*sin(d*x+c)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2836, 2716, 2720, 2719}

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{52a^3\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} - \frac{28a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{52a^3\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)} + \frac{6a^3\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{2a^3\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{28a^3\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + a*Cos[c + d*x])^3/Cos[c + d*x]^(9/2),x]
```

```
[Out] (-28*a^3*EllipticE[(c + d*x)/2, 2])/(5*d) + (52*a^3*EllipticF[(c + d*x)/2, 2])/(21*d) + (2*a^3*Sin[c + d*x])/(7*d*Cos[c + d*x]^(7/2)) + (6*a^3*Sin[c + d*x])/(5*d*Cos[c + d*x]^(5/2)) + (52*a^3*Sin[c + d*x])/(21*d*Cos[c + d*x]^(3/2)) + (28*a^3*Sin[c + d*x])/(5*d*Sqrt[Cos[c + d*x]])
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), Int[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e + f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGtQ[m, 0] && RationalQ[n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{a^3}{\cos^{\frac{9}{2}}(c+dx)}+\frac{3a^3}{\cos^{\frac{7}{2}}(c+dx)}+\frac{3a^3}{\cos^{\frac{5}{2}}(c+dx)}+\frac{a^3}{\cos^{\frac{3}{2}}(c+dx)}\right)dx\\
&= a^3\int \frac{1}{\cos^{\frac{9}{2}}(c+dx)}\,dx + a^3\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx\\
&\quad + \left(3a^3\right)\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)}\,dx + \left(3a^3\right)\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)}\,dx\\
&= \frac{2a^3\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)}+\frac{6a^3\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{2a^3\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)}+\frac{2a^3\sin(c+dx)}{d\sqrt{\cos(c+dx)}}\\
&\quad + \frac{1}{7}\left(5a^3\right)\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)}\,dx + a^3\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\\
&\quad - a^3\int \sqrt{\cos(c+dx)}\,dx + \frac{1}{5}\left(9a^3\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx
\end{aligned}$$

$$= -\frac{2a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{2a^3\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{6a^3\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{52a^3\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)} + \frac{28a^3\sin(c+dx)}{5d\sqrt{\cos(c+dx)}} + \frac{1}{21}(5a^3)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx - \frac{1}{5}(9a^3)\int\sqrt{\cos(c+dx)}\,dx$$

$$= -\frac{28a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{52a^3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{2a^3\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{6a^3\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{52a^3\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)} + \frac{28a^3\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.64 (sec) , antiderivative size = 140, normalized size of antiderivative = 0.95

$$\int\frac{(a+a\cos(c+dx))^3}{\cos^{\frac{9}{2}}(c+dx)}\,dx$$

$$= \frac{2a^3\csc(c+dx)\left(5\,\text{Hypergeometric2F1}\left(-\frac{7}{4},\frac{1}{2},-\frac{3}{4},\cos^2(c+dx)\right)+7\cos(c+dx)\left(3\,\text{Hypergeometric2F1}\left(\right.\right.\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^3/Cos[c + d*x]^(9/2),x]
```

```
[Out] (2*a^3*Csc[c + d*x]*(5*Hypergeometric2F1[-7/4, 1/2, -3/4, Cos[c + d*x]^2] +
 7*Cos[c + d*x]*(3*Hypergeometric2F1[-5/4, 1/2, -1/4, Cos[c + d*x]^2] + 5*C
os[c + d*x]*(Hypergeometric2F1[-3/4, 1/2, 1/4, Cos[c + d*x]^2] + Cos[c + d*
x]*Hypergeometric2F1[-1/4, 1/2, 3/4, Cos[c + d*x]^2])))*Sqrt[Sin[c + d*x]^2
])/(35*d*Cos[c + d*x]^(7/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 438 vs. 2(179) = 358.

Time = 10.41 (sec) , antiderivative size = 439, normalized size of antiderivative = 2.99

method	result
default	$-\frac{16\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^3\left(-\frac{13\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}{168\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{1}{2}\right)^2}+\frac{53\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos\right.}}{105\sqrt{-2\left(\sin^4\left(\right.\right.}}\right.}{}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*a)^3/cos(d*x+c)^(9/2),x,method=_RETURNVERBOSE)
```

```
[Out] -16*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^3*(-13/168*
cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(co
s(1/2*d*x+1/2*c)^2-1/2)^2+53/105*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d
*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*E
llipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/448*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d
*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^4-7/10*s
in(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)/(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/
2*d*x+1/2*c)^2)^(1/2)-7/20*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2
*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(Ellipt
icF(cos(1/2*d*x+1/2*c),2^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))-3/16
0*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(
cos(1/2*d*x+1/2*c)^2-1/2)^3)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^
(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 215, normalized size of antiderivative = 1.46

$$\int \frac{(a + a\cos(c + dx))^3}{\cos^{\frac{9}{2}}(c + dx)}\, dx = -\frac{2\left(65i\sqrt{2}a^3\cos(dx + c)^4 \operatorname{weierstrassPInverse}(-4, 0, \cos(dx + c) + i\sin(dx + c)) - 65i\sqrt{2}a^3\cos(dx + \right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^3/cos(d*x+c)^(9/2),x, algorithm="fricas")
```

```
[Out] -2/105*(65*I*sqrt(2)*a^3*cos(d*x + c)^4*weierstrassPInverse(-4, 0, cos(d*x
+ c) + I*sin(d*x + c)) - 65*I*sqrt(2)*a^3*cos(d*x + c)^4*weierstrassPInvers
e(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 147*I*sqrt(2)*a^3*cos(d*x + c)^4*
weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x
+ c))) - 147*I*sqrt(2)*a^3*cos(d*x + c)^4*weierstrassZeta(-4, 0, weierstras
sPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (294*a^3*cos(d*x + c)^3
+ 130*a^3*cos(d*x + c)^2 + 63*a^3*cos(d*x + c) + 15*a^3)*sqrt(cos(d*x + c))
*sin(d*x + c))/(d*cos(d*x + c)^4)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{9}{2}}(c+dx)}\,dx=\text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**3/cos(d*x+c)**(9/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{9}{2}}(c+dx)}\,dx=\int \frac{(a\cos(dx+c)+a)^3}{\cos(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^3/cos(d*x+c)^(9/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^3/cos(d*x + c)^(9/2), x)
```

Giac [F]

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{9}{2}}(c+dx)}\,dx=\int \frac{(a\cos(dx+c)+a)^3}{\cos(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^3/cos(d*x+c)^(9/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^3/cos(d*x + c)^(9/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.57 (sec) , antiderivative size = 145, normalized size of antiderivative = 0.99

$$\int \frac{(a+a\cos(c+dx))^3}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{\frac{2\,a^3\,\sin(c+d\,x)\,{}_2\mathrm{F}_1\left(-\frac{7}{4},\frac{1}{2};\ -\frac{3}{4};\ \cos(c+d\,x)^2\right)}{7}+\frac{6\,a^3\,\cos(c+d\,x)\,\sin(c+d\,x)\,{}_2\mathrm{F}_1\left(-\frac{5}{4},\frac{1}{2};\ -\frac{1}{4};\ \cos(c+d\,x)^2\right)}{5}+2\,a^3\cos\left(c+d\,x\right)^2\,\sin}{d\cos\left(c+d\,x\right)^{7/2}\,\sqrt{}}$$

```
[In] int((a + a*cos(c + d*x))^3/cos(c + d*x)^(9/2),x)
[Out] ((2*a^3*sin(c + d*x)*hypergeom([-7/4, 1/2], -3/4, cos(c + d*x)^2))/7 + (6*a
^3*cos(c + d*x)*sin(c + d*x)*hypergeom([-5/4, 1/2], -1/4, cos(c + d*x)^2))/
5 + 2*a^3*cos(c + d*x)^2*sin(c + d*x)*hypergeom([-3/4, 1/2], 1/4, cos(c + d
*x)^2) + 2*a^3*cos(c + d*x)^3*sin(c + d*x)*hypergeom([-1/4, 1/2], 3/4, cos(
c + d*x)^2))/(d*cos(c + d*x)^(7/2)*(1 - cos(c + d*x)^2)^(1/2))
```

3.167 $\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^4\,dx$

Optimal result

Integrand size = 23, antiderivative size = 173

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^4\,dx = \frac{128a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15d} + \frac{904a^4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{231d} + \frac{904a^4\sqrt{\cos(c+dx)}\sin(c+dx)}{231d} + \frac{128a^4\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{45d} + \frac{150a^4\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{77d} + \frac{8a^4\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d} + \frac{2a^4\cos^{\frac{9}{2}}(c+dx)\sin(c+dx)}{11d}$$

```
[Out] 128/15*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/
2*d*x+1/2*c),2^(1/2))/d+904/231*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*
x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+128/45*a^4*cos(d*x+c)^(3/2
)*sin(d*x+c)/d+150/77*a^4*cos(d*x+c)^(5/2)*sin(d*x+c)/d+8/9*a^4*cos(d*x+c)^
(7/2)*sin(d*x+c)/d+2/11*a^4*cos(d*x+c)^(9/2)*sin(d*x+c)/d+904/231*a^4*sin(d
*x+c)*cos(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2836, 2715, 2720, 2719}

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^4\,dx = \frac{904a^4 \operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{231d} + \frac{128a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15d} + \frac{2a^4\sin(c+dx)\cos^{\frac{9}{2}}(c+dx)}{11d} + \frac{8a^4\sin(c+dx)\cos^{\frac{7}{2}}(c+dx)}{9d} + \frac{150a^4\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{77d} + \frac{128a^4\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{45d} + \frac{904a^4\sin(c+dx)\sqrt{\cos(c+dx)}}{231d}$$

```
[In] Int[Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (128*a^4*EllipticE[(c + d*x)/2, 2])/(15*d) + (904*a^4*EllipticF[(c + d*x)/2
, 2])/(231*d) + (904*a^4*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(231*d) + (128*a^
4*Cos[c + d*x]^(3/2)*Sin[c + d*x])/(45*d) + (150*a^4*Cos[c + d*x]^(5/2)*Sin
[c + d*x])/(77*d) + (8*a^4*Cos[c + d*x]^(7/2)*Sin[c + d*x])/(9*d) + (2*a^4*
Cos[c + d*x]^(9/2)*Sin[c + d*x])/(11*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$\text{integral} = \int \left(a^4\cos^{\frac{3}{2}}(c+dx)+4a^4\cos^{\frac{5}{2}}(c+dx)+6a^4\cos^{\frac{7}{2}}(c+dx)+4a^4\cos^{\frac{9}{2}}(c+dx)+a^4\cos^{\frac{11}{2}}(c+dx)\right)dx$$

$$= a^4\int\cos^{\frac{3}{2}}(c+dx)\,dx+a^4\int\cos^{\frac{11}{2}}(c+dx)\,dx+\left(4a^4\right)\int\cos^{\frac{5}{2}}(c+dx)\,dx+\left(4a^4\right)\int\cos^{\frac{9}{2}}(c+dx)\,dx+\left(6a^4\right)\int\cos^{\frac{7}{2}}(c+dx)\,dx$$

$$= \frac{2a^4\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}+\frac{8a^4\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{12a^4\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}+\frac{8a^4\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d}+\frac{2a^4\cos^{\frac{9}{2}}(c+dx)\sin(c+dx)}{11d}+\frac{1}{3}a^4\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx+\frac{1}{11}\left(9a^4\right)\int\cos^{\frac{7}{2}}(c+dx)\,dx+\frac{1}{5}\left(12a^4\right)\int\sqrt{\cos(c+dx)}\,dx+\frac{1}{9}\left(28a^4\right)\int\cos^{\frac{5}{2}}(c+dx)\,dx+\frac{1}{7}\left(30a^4\right)\int\cos^{\frac{3}{2}}(c+dx)\,dx$$

$$= \frac{24a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2a^4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{74a^4\sqrt{\cos(c+dx)}\sin(c+dx)}{21d}+\frac{128a^4\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{45d}+\frac{150a^4\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{77d}+\frac{8a^4\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d}+\frac{2a^4\cos^{\frac{9}{2}}(c+dx)\sin(c+dx)}{11d}+\frac{1}{77}\left(45a^4\right)\int\cos^{\frac{3}{2}}(c+dx)\,dx+\frac{1}{7}\left(10a^4\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx+\frac{1}{15}\left(28a^4\right)\int\sqrt{\cos(c+dx)}\,dx$$

$$
\begin{aligned}
&= \frac{128a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15d} + \frac{74a^4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} \\
&+ \frac{904a^4\sqrt{\cos(c+dx)}\sin(c+dx)}{231d} + \frac{128a^4\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{45d} \\
&+ \frac{150a^4\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{77d} + \frac{8a^4\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d} \\
&+ \frac{2a^4\cos^{\frac{9}{2}}(c+dx)\sin(c+dx)}{11d} + \frac{1}{77}(15a^4)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{128a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15d} + \frac{904a^4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{231d} \\
&+ \frac{904a^4\sqrt{\cos(c+dx)}\sin(c+dx)}{231d} \\
&+ \frac{128a^4\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{45d} + \frac{150a^4\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{77d} \\
&+ \frac{8a^4\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d} + \frac{2a^4\cos^{\frac{9}{2}}(c+dx)\sin(c+dx)}{11d}
\end{aligned}
$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 3.09 (sec) , antiderivative size = 271, normalized size of antiderivative = 1.57

$$
\int\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^4\,dx
$$

$$
= \frac{a^4(1+\cos(c+dx))^4\sec^8\left(\frac{1}{2}(c+dx)\right)\left(-108480\cos(c+dx)\sqrt{\cos^2(dx-\arctan(\cot(c)))}\sqrt{\csc^2(c)}\,{}_2F_1\left(\frac{1}{4},\right.\right.}{}
$$

```
[In] Integrate[Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (a^4*(1 + Cos[c + d*x])^4*Sec[(c + d*x)/2]^8*(-108480*Cos[c + d*x]*Sqrt[Cos
[d*x - ArcTan[Cot[c]]]^2]*Sqrt[Csc[c]^2]*HypergeometricPFQ[{1/4, 1/2}, {5/4
}, Sin[d*x - ArcTan[Cot[c]]]^2]*Sec[d*x - ArcTan[Cot[c]]]*Sin[c] + Cos[c +
d*x]*(-236544*Cot[c] + 122610*Sin[c + d*x] + 45584*Sin[2*(c + d*x)] + 14445
*Sin[3*(c + d*x)] + 3080*Sin[4*(c + d*x)] + 315*Sin[5*(c + d*x)]) + (59136*
Sec[c]*(-2*HypergeometricPFQ[{-1/2, -1/4}, {3/4}, Cos[d*x + ArcTan[Tan[c]]]
^2]*Sin[d*x + ArcTan[Tan[c]]] + (3*Cos[c - d*x - ArcTan[Tan[c]]] + Cos[c +
d*x + ArcTan[Tan[c]]])*Csc[c]*Sqrt[Sin[d*x + ArcTan[Tan[c]]]^2]))/(Sqrt[Sec
[c]^2]*Sqrt[Sin[d*x + ArcTan[Tan[c]]]^2])))/(443520*d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 15.95 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.58

method	result
default	$-\frac{8\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\, a^4\left(5040\left(\cos^{13}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-5320\left(\cos^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1740\left(\cos^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+326\left(\cos^7\left(\frac{dx}{2}\right.\right.\right.}{3}$
parts	Expression too large to display

[In] int(cos(d*x+c)^(3/2)*(a+cos(d*x+c)*a)^4,x,method=_RETURNVERBOSE)

[Out] -8/3465*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^4*(5040*cos(1/2*d*x+1/2*c)^13-5320*cos(1/2*d*x+1/2*c)^11+1740*cos(1/2*d*x+1/2*c)^9+326*cos(1/2*d*x+1/2*c)^7+678*cos(1/2*d*x+1/2*c)^5-4465*cos(1/2*d*x+1/2*c)^3+1695*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-3696*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+2001*cos(1/2*d*x+1/2*c))/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 188, normalized size of antiderivative = 1.09

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^4\,dx = -\frac{2\left(3390i\sqrt{2}a^4\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\sin\left(dx+c\right))-3390i\sqrt{2}a^4\text{weierstrassPInverse}\right.}{}$$

[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c))^4,x, algorithm="fricas")

[Out] -2/3465*(3390*I*sqrt(2)*a^4*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) - 3390*I*sqrt(2)*a^4*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 7392*I*sqrt(2)*a^4*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 7392*I*sqrt(2)*a^4*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (315*a^4*cos(d*x + c)^4 + 1540*a^4*cos(d*x + c)^3 + 3375*a^4*cos(d*x + c)^2 + 4928*a^4*cos(d*x + c) + 6780*a^4)*sqrt(cos(d*x + c))*sin(d*x + c))/d

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^4\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(3/2)*(a+a*cos(d*x+c))**4,x)
[Out] Timed out
```

Maxima [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^4\,dx = \int (a\cos(dx+c)+a)^4\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c))^4,x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^4*cos(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^4\,dx = \int (a\cos(dx+c)+a)^4\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c))^4,x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^4*cos(d*x + c)^(3/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.03 (sec) , antiderivative size = 221, normalized size of antiderivative = 1.28

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^4\,dx$$
$$= \frac{2\,a^4\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{3\,d}+\frac{2\,a^4\,\sqrt{\cos\left(c+d\,x\right)}\,\sin\left(c+d\,x\right)}{3\,d}$$
$$-\frac{8\,a^4\cos\left(c+d\,x\right)^{7/2}\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{7}{4};\ \frac{11}{4};\ \cos\left(c+d\,x\right)^2\right)}{7\,d\,\sqrt{\sin\left(c+d\,x\right)^2}}$$
$$-\frac{4\,a^4\cos\left(c+d\,x\right)^{9/2}\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{9}{4};\ \frac{13}{4};\ \cos\left(c+d\,x\right)^2\right)}{3\,d\,\sqrt{\sin\left(c+d\,x\right)^2}}$$
$$-\frac{8\,a^4\cos\left(c+d\,x\right)^{11/2}\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{11}{4};\ \frac{15}{4};\ \cos\left(c+d\,x\right)^2\right)}{11\,d\,\sqrt{\sin\left(c+d\,x\right)^2}}$$
$$-\frac{2\,a^4\cos\left(c+d\,x\right)^{13/2}\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{13}{4};\ \frac{17}{4};\ \cos\left(c+d\,x\right)^2\right)}{13\,d\,\sqrt{\sin\left(c+d\,x\right)^2}}$$

```
[In] int(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^4,x)
```

```
[Out] (2*a^4*ellipticF(c/2 + (d*x)/2, 2))/(3*d) + (2*a^4*cos(c + d*x)^(1/2)*sin(c
 + d*x))/(3*d) - (8*a^4*cos(c + d*x)^(7/2)*sin(c + d*x)*hypergeom([1/2, 7/4
], 11/4, cos(c + d*x)^2))/(7*d*(sin(c + d*x)^2)^(1/2)) - (4*a^4*cos(c + d*x
)^(9/2)*sin(c + d*x)*hypergeom([1/2, 9/4], 13/4, cos(c + d*x)^2))/(3*d*(sin
(c + d*x)^2)^(1/2)) - (8*a^4*cos(c + d*x)^(11/2)*sin(c + d*x)*hypergeom([1/
2, 11/4], 15/4, cos(c + d*x)^2))/(11*d*(sin(c + d*x)^2)^(1/2)) - (2*a^4*cos
(c + d*x)^(13/2)*sin(c + d*x)*hypergeom([1/2, 13/4], 17/4, cos(c + d*x)^2))
/(13*d*(sin(c + d*x)^2)^(1/2))
```

3.168 $\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^4\,dx$

Optimal result

Integrand size = 23, antiderivative size = 147

$$\begin{aligned}\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^4\,dx &= \frac{152a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15d} \\ &+ \frac{32a^4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{7d} \\ &+ \frac{32a^4\sqrt{\cos(c+dx)}\sin(c+dx)}{7d} \\ &+ \frac{122a^4\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{45d} \\ &+ \frac{8a^4\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} \\ &+ \frac{2a^4\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d}\end{aligned}$$

```
[Out] 152/15*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/
2*d*x+1/2*c),2^(1/2))/d+32/7*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1
/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+122/45*a^4*cos(d*x+c)^(3/2)*s
in(d*x+c)/d+8/7*a^4*cos(d*x+c)^(5/2)*sin(d*x+c)/d+2/9*a^4*cos(d*x+c)^(7/2)*
sin(d*x+c)/d+32/7*a^4*sin(d*x+c)*cos(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2836, 2719, 2715, 2720}

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^4\,dx = \frac{32a^4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{7d} + \frac{152a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15d} + \frac{2a^4\sin(c+dx)\cos^{\frac{7}{2}}(c+dx)}{9d} + \frac{8a^4\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{7d} + \frac{122a^4\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{45d} + \frac{32a^4\sin(c+dx)\sqrt{\cos(c+dx)}}{7d}$$

```
[In] Int[Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (152*a^4*EllipticE[(c + d*x)/2, 2])/(15*d) + (32*a^4*EllipticF[(c + d*x)/2,
 2])/(7*d) + (32*a^4*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(7*d) + (122*a^4*Cos[
c + d*x]^(3/2)*Sin[c + d*x])/(45*d) + (8*a^4*Cos[c + d*x]^(5/2)*Sin[c + d*x
])/(7*d) + (2*a^4*Cos[c + d*x]^(7/2)*Sin[c + d*x])/(9*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
```

```
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$\text{integral} = \int \left(a^4\sqrt{\cos(c+dx)} + 4a^4\cos^{\frac{3}{2}}(c+dx) + 6a^4\cos^{\frac{5}{2}}(c+dx) + 4a^4\cos^{\frac{7}{2}}(c+dx) + a^4\cos^{\frac{9}{2}}(c+dx)\right)dx$$

$$= a^4\int \sqrt{\cos(c+dx)}\,dx + a^4\int \cos^{\frac{9}{2}}(c+dx)\,dx + \left(4a^4\right)\int \cos^{\frac{3}{2}}(c+dx)\,dx + \left(4a^4\right)\int \cos^{\frac{7}{2}}(c+dx)\,dx + \left(6a^4\right)\int \cos^{\frac{5}{2}}(c+dx)\,dx$$

$$= \frac{2a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{8a^4\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{12a^4\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{8a^4\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{2a^4\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d} + \frac{1}{9}\left(7a^4\right)\int \cos^{\frac{5}{2}}(c+dx)\,dx + \frac{1}{3}\left(4a^4\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx + \frac{1}{7}\left(20a^4\right)\int \cos^{\frac{3}{2}}(c+dx)\,dx + \frac{1}{5}\left(18a^4\right)\int \sqrt{\cos(c+dx)}\,dx$$

$$= \frac{46a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{8a^4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{32a^4\sqrt{\cos(c+dx)}\sin(c+dx)}{7d} + \frac{122a^4\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{45d} + \frac{8a^4\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{2a^4\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d} + \frac{1}{15}\left(7a^4\right)\int \sqrt{\cos(c+dx)}\,dx + \frac{1}{21}\left(20a^4\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{152a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15d} + \frac{32a^4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{7d} + \frac{32a^4\sqrt{\cos(c+dx)}\sin(c+dx)}{7d} + \frac{122a^4\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{45d} + \frac{8a^4\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{2a^4\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 5.93 (sec) , antiderivative size = 255, normalized size of antiderivative = 1.73

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^4\,dx$$
$$= \frac{a^4(1+\cos(c+dx))^4\sec^8\left(\frac{1}{2}(c+dx)\right)\left(\frac{3192(3\cos(c-dx-\arctan(\tan(c)))+\cos(c+dx+\arctan(\tan(c))))\csc(c)\sec(c)}{\sqrt{\sec^2(c)}}-5760\cos(\right.}{}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (a^4*(1 + Cos[c + d*x])^4*Sec[(c + d*x)/2]^8*((3192*(3*Cos[c - d*x - ArcTan
[Tan[c]]] + Cos[c + d*x + ArcTan[Tan[c]]])*Csc[c]*Sec[c])/Sqrt[Sec[c]^2] -
5760*Cos[c + d*x]*Sqrt[Cos[d*x - ArcTan[Cot[c]]]^2]*Sqrt[Csc[c]^2]*Hypergeo
metricPFQ[{1/4, 1/2}, {5/4}, Sin[d*x - ArcTan[Cot[c]]]^2]*Sec[d*x - ArcTan[
Cot[c]]]*Sin[c] + Cos[c + d*x]*(-12768*Cot[c] + 6120*Sin[c + d*x] + 1778*Si
n[2*(c + d*x)] + 360*Sin[3*(c + d*x)] + 35*Sin[4*(c + d*x)]) - 6384*Cos[c]*
Csc[d*x + ArcTan[Tan[c]]]*HypergeometricPFQ[{-1/2, -1/4}, {3/4}, Cos[d*x +
ArcTan[Tan[c]]]^2]*Sqrt[Sec[c]^2]*Sqrt[Sin[d*x + ArcTan[Tan[c]]]^2]))/(2016
0*d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 12.70 (sec) , antiderivative size = 260, normalized size of antiderivative = 1.77

method	result
default	$-\frac{8\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^4\left(280\left(\cos^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-120\left(\cos^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+34\left(\cos^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+72\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right.}{315\sqrt{-2\left(\sin^4\left(\right.\right.}}$
parts	Expression too large to display

```
[In] int(cos(d*x+c)^(1/2)*(a+cos(d*x+c)*a)^4,x,method=_RETURNVERBOSE)
```

```
[Out] -8/315*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^4*(280*cos
(1/2*d*x+1/2*c)^11-120*cos(1/2*d*x+1/2*c)^9+34*cos(1/2*d*x+1/2*c)^7+72*cos(
1/2*d*x+1/2*c)^5-485*cos(1/2*d*x+1/2*c)^3+180*(sin(1/2*d*x+1/2*c)^2)^(1/2)*
(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-399
*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticE(c
os(1/2*d*x+1/2*c),2^(1/2))+219*cos(1/2*d*x+1/2*c))/(-2*sin(1/2*d*x+1/2*c)^4
+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^
(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 175, normalized size of antiderivative = 1.19

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^4\,dx = -\frac{2\left(360i\sqrt{2}a^4\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))-360i\sqrt{2}a^4\text{weierstrassPInverse}\right.}{}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] -2/315*(360*I*sqrt(2)*a^4*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d
*x + c)) - 360*I*sqrt(2)*a^4*weierstrassPInverse(-4, 0, cos(d*x + c) - I*si
n(d*x + c)) - 798*I*sqrt(2)*a^4*weierstrassZeta(-4, 0, weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 798*I*sqrt(2)*a^4*weierstrassZeta(
-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (35*a^4
*cos(d*x + c)^3 + 180*a^4*cos(d*x + c)^2 + 427*a^4*cos(d*x + c) + 720*a^4)*
sqrt(cos(d*x + c))*sin(d*x + c))/d
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^4\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(1/2)*(a+a*cos(d*x+c))**4,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^4\,dx = \int (a\cos\left(dx+c\right)+a)^4\sqrt{\cos\left(dx+c\right)}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] integrate((a*cos(d*x + c) + a)^4*sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^4\,dx = \int (a\cos(dx+c)+a)^4\sqrt{\cos(dx+c)}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c))^4,x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^4*sqrt(cos(d*x + c)), x)
```

Mupad [B] (verification not implemented)

Time = 15.16 (sec) , antiderivative size = 223, normalized size of antiderivative = 1.52

$$\begin{aligned}\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^4\,dx &= \frac{2\left(3a^4\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)+4a^4\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)+4a^4\sqrt{\cos(c+d\,x)}\,\sin(c+d\,x)\right)}{3d} \\ &\quad - \frac{2\left(\frac{66a^4\cos(c+d\,x)^{7/2}\sin(c+d\,x)}{\sqrt{\sin(c+d\,x)^2}}-\frac{17a^4\cos(c+d\,x)^{11/2}\sin(c+d\,x)}{\sqrt{\sin(c+d\,x)^2}}\right){}_2\mathrm{F}_1\left(\frac{1}{2},\frac{11}{4};\ \frac{15}{4};\ \cos(c+d\,x)^2\right)}{77d} \\ &\quad - \frac{8a^4\cos(c+d\,x)^{9/2}\sin(c+d\,x)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{9}{4};\ \frac{13}{4};\ \cos(c+d\,x)^2\right)}{9d\sqrt{\sin(c+d\,x)^2}} \\ &\quad - \frac{208a^4\cos(c+d\,x)^{11/2}\sin(c+d\,x)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{11}{4};\ \frac{19}{4};\ \cos(c+d\,x)^2\right)}{385d\sqrt{\sin(c+d\,x)^2}}\end{aligned}$$

```
[In] int(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^4,x)
[Out] (2*(3*a^4*ellipticE(c/2 + (d*x)/2, 2) + 4*a^4*ellipticF(c/2 + (d*x)/2, 2) +
 4*a^4*cos(c + d*x)^(1/2)*sin(c + d*x)))/(3*d) - (2*((66*a^4*cos(c + d*x)^(
7/2)*sin(c + d*x))/(sin(c + d*x)^2)^(1/2) - (17*a^4*cos(c + d*x)^(11/2)*sin
(c + d*x))/(sin(c + d*x)^2)^(1/2))*hypergeom([1/2, 11/4], 15/4, cos(c + d*x
)^2))/(77*d) - (8*a^4*cos(c + d*x)^(9/2)*sin(c + d*x)*hypergeom([1/2, 9/4],
 13/4, cos(c + d*x)^2))/(9*d*(sin(c + d*x)^2)^(1/2)) - (208*a^4*cos(c + d*x
)^(11/2)*sin(c + d*x)*hypergeom([1/2, 11/4], 19/4, cos(c + d*x)^2))/(385*d*
(sin(c + d*x)^2)^(1/2))
```

3.169 $\int \frac{(a+a\cos(c+dx))^4}{\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 121

$$\int \frac{(a+a\cos(c+dx))^4}{\sqrt{\cos(c+dx)}}\,dx = \frac{64a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{136a^4\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{94a^4\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} + \frac{8a^4\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a^4\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}$$

```
[Out] 64/5*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*
d*x+1/2*c),2^(1/2))/d+136/21*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1
/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+8/5*a^4*cos(d*x+c)^(3/2)*sin(
d*x+c)/d+2/7*a^4*cos(d*x+c)^(5/2)*sin(d*x+c)/d+94/21*a^4*sin(d*x+c)*cos(d*x
+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {2836, 2720, 2719, 2715}

$$\int \frac{(a+a\cos(c+dx))^4}{\sqrt{\cos(c+dx)}}\,dx = \frac{136a^4\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{64a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{2a^4\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{7d} + \frac{8a^4\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{5d} + \frac{94a^4\sin(c+dx)\sqrt{\cos(c+dx)}}{21d}$$

```
[In] Int[(a + a*Cos[c + d*x])^4/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (64*a^4*EllipticE[(c + d*x)/2, 2])/(5*d) + (136*a^4*EllipticF[(c + d*x)/2,
2])/(21*d) + (94*a^4*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(21*d) + (8*a^4*Cos[c
 + d*x]^(3/2)*Sin[c + d*x])/(5*d) + (2*a^4*Cos[c + d*x]^(5/2)*Sin[c + d*x])
/(7*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \int \left(\frac{a^4}{\sqrt{\cos(c+dx)}}+4a^4\sqrt{\cos(c+dx)}+6a^4\cos^{\frac{3}{2}}(c+dx)+4a^4\cos^{\frac{5}{2}}(c+dx)\right.\\ &\qquad \left.+a^4\cos^{\frac{7}{2}}(c+dx)\right)dx\\ &= a^4\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx+a^4\int \cos^{\frac{7}{2}}(c+dx)\,dx+\left(4a^4\right)\int \sqrt{\cos(c+dx)}\,dx\\ &\quad+\left(4a^4\right)\int \cos^{\frac{5}{2}}(c+dx)\,dx+\left(6a^4\right)\int \cos^{\frac{3}{2}}(c+dx)\,dx\end{aligned}$$

$$= \frac{8a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2a^4 \operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{4a^4\sqrt{\cos(c+dx)}\sin(c+dx)}{d} + \frac{8a^4\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a^4\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{1}{7}(5a^4)\int\cos^{\frac{3}{2}}(c+dx)\,dx + (2a^4)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx + \frac{1}{5}(12a^4)\int\sqrt{\cos(c+dx)}\,dx$$

$$= \frac{64a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{6a^4 \operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{94a^4\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} + \frac{8a^4\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a^4\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{1}{21}(5a^4)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{64a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{136a^4 \operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{94a^4\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} + \frac{8a^4\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a^4\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 5.78 (sec) , antiderivative size = 245, normalized size of antiderivative = 2.02

$$\int\frac{(a+a\cos(c+dx))^4}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{a^4(1+\cos(c+dx))^4\sec^8\left(\frac{1}{2}(c+dx)\right)\left(\frac{672(3\cos(c-dx-\arctan(\tan(c)))+\cos(c+dx+\arctan(\tan(c))))\csc(c)\sec(c)}{\sqrt{\sec^2(c)}} - 1360\cos\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^4/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (a^4*(1 + Cos[c + d*x])^4*Sec[(c + d*x)/2]^8*((672*(3*Cos[c - d*x - ArcTan[
Tan[c]]] + Cos[c + d*x + ArcTan[Tan[c]]])*Csc[c]*Sec[c])/Sqrt[Sec[c]^2] - 1
360*Cos[c + d*x]*Sqrt[Cos[d*x - ArcTan[Cot[c]]]^2]*Sqrt[Csc[c]^2]*Hypergeom
etricPFQ[{1/4, 1/2}, {5/4}, Sin[d*x - ArcTan[Cot[c]]]^2]*Sec[d*x - ArcTan[C
ot[c]]]*Sin[c] + Cos[c + d*x]*(-2688*Cot[c] + 955*Sin[c + d*x] + 168*Sin[2*
(c + d*x)] + 15*Sin[3*(c + d*x)]) - 1344*Cos[c]*Csc[d*x + ArcTan[Tan[c]]]*H
ypergeometricPFQ[{-1/2, -1/4}, {3/4}, Cos[d*x + ArcTan[Tan[c]]]^2]*Sqrt[Sec
[c]^2]*Sqrt[Sin[d*x + ArcTan[Tan[c]]]^2]))/(3360*d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 9.15 (sec) , antiderivative size = 272, normalized size of antiderivative = 2.25

method	result
default	$-\frac{8\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^4\left(60\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-258\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+448\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.}{105\sqrt{-2\left(\sin^4\right.}}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*a)^4/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -8/105*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^4*(60*cos(
1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8-258*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*
c)^6+448*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-167*sin(1/2*d*x+1/2*c)^2*c
os(1/2*d*x+1/2*c)+85*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1
)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-168*(sin(1/2*d*x+1/2*c)^2)^(1
/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))
/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2
*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.34

$$\int \frac{(a+a\cos(c+dx))^4}{\sqrt{\cos(c+dx)}}\,dx = -\frac{2\left(170i\sqrt{2}a^4\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))-170i\sqrt{2}a^4\text{weierstrassPInverse}(-\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^4/cos(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] -2/105*(170*I*sqrt(2)*a^4*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d
*x + c)) - 170*I*sqrt(2)*a^4*weierstrassPInverse(-4, 0, cos(d*x + c) - I*si
n(d*x + c)) - 336*I*sqrt(2)*a^4*weierstrassZeta(-4, 0, weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 336*I*sqrt(2)*a^4*weierstrassZeta(
-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (15*a^4
*cos(d*x + c)^2 + 84*a^4*cos(d*x + c) + 235*a^4)*sqrt(cos(d*x + c))*sin(d*x
 + c))/d
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^4}{\sqrt{\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**4/cos(d*x+c)**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+a\cos(c+dx))^4}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(a\cos(dx+c)+a)^4}{\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^4/cos(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^4/sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \frac{(a+a\cos(c+dx))^4}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(a\cos(dx+c)+a)^4}{\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^4/cos(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^4/sqrt(cos(d*x + c)), x)
```

Mupad [B] (verification not implemented)

Time = 15.01 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.21

$$\int \frac{(a+a\cos(c+dx))^4}{\sqrt{\cos(c+dx)}}\,dx = \frac{2\left(4a^4\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)+3a^4\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)+2a^4\sqrt{\cos(c+d\,x)}\,\sin(c+d\,x)\right)}{d} - \frac{8a^4\cos(c+d\,x)^{7/2}\sin(c+d\,x)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{7}{4};\ \frac{11}{4};\ \cos(c+d\,x)^2\right)}{7d\sqrt{\sin(c+d\,x)^2}} - \frac{2a^4\cos(c+d\,x)^{9/2}\sin(c+d\,x)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{9}{4};\ \frac{13}{4};\ \cos(c+d\,x)^2\right)}{9d\sqrt{\sin(c+d\,x)^2}}$$

```
[In] int((a + a*cos(c + d*x))^4/cos(c + d*x)^(1/2),x)
```

```
[Out] (2*(4*a^4*ellipticE(c/2 + (d*x)/2, 2) + 3*a^4*ellipticF(c/2 + (d*x)/2, 2) +
 2*a^4*cos(c + d*x)^(1/2)*sin(c + d*x)))/d - (8*a^4*cos(c + d*x)^(7/2)*sin(
c + d*x)*hypergeom([1/2, 7/4], 11/4, cos(c + d*x)^2))/(7*d*(sin(c + d*x)^2)
^(1/2)) - (2*a^4*cos(c + d*x)^(9/2)*sin(c + d*x)*hypergeom([1/2, 9/4], 13/4
, cos(c + d*x)^2))/(9*d*(sin(c + d*x)^2)^(1/2))
```

3.170 $\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 119

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{56a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{32a^4\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2a^4\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{8a^4\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2a^4\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}$$

```
[Out] 56/5*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*
d*x+1/2*c),2^(1/2))/d+32/3*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2
*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/5*a^4*cos(d*x+c)^(3/2)*sin(d*
x+c)/d+2*a^4*sin(d*x+c)/d/cos(d*x+c)^(1/2)+8/3*a^4*sin(d*x+c)*cos(d*x+c)^(1
/2)/d
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2836, 2716, 2719, 2720, 2715}

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{32a^4\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{56a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{2a^4\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{5d} + \frac{8a^4\sin(c+dx)\sqrt{\cos(c+dx)}}{3d} + \frac{2a^4\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + a*Cos[c + d*x])^4/Cos[c + d*x]^(3/2),x]
```

```
[Out] (56*a^4*EllipticE[(c + d*x)/2, 2])/(5*d) + (32*a^4*EllipticF[(c + d*x)/2, 2
])/(3*d) + (2*a^4*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]]) + (8*a^4*Sqrt[Cos[c
+ d*x]]*Sin[c + d*x])/(3*d) + (2*a^4*Cos[c + d*x]^(3/2)*Sin[c + d*x])/(5*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$\text{integral} = \int \left(\frac{a^4}{\cos^{\frac{3}{2}}(c+dx)} + \frac{4a^4}{\sqrt{\cos(c+dx)}} + 6a^4\sqrt{\cos(c+dx)} + 4a^4\cos^{\frac{3}{2}}(c+dx) + a^4\cos^{\frac{5}{2}}(c+dx)\right) dx$$

$$= a^4 \int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\, dx + a^4 \int \cos^{\frac{5}{2}}(c+dx)\, dx + (4a^4) \int \frac{1}{\sqrt{\cos(c+dx)}}\, dx + (4a^4) \int \cos^{\frac{3}{2}}(c+dx)\, dx + (6a^4) \int \sqrt{\cos(c+dx)}\, dx$$

$$= \frac{12a^4 E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{8a^4 \text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{2a^4\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{8a^4\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2a^4\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{1}{5}(3a^4)\int\sqrt{\cos(c+dx)}\,dx - a^4\int\sqrt{\cos(c+dx)}\,dx + \frac{1}{3}(4a^4)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{56a^4 E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{32a^4 \text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2a^4\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{8a^4\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2a^4\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.94 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.32

$$\int\frac{(a+a\cos(c+dx))^4}{\cos^{\frac{3}{2}}(c+dx)}\,dx = -\frac{2a^4\csc(c+dx)\left(-15\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},\cos^2(c+dx)\right)\sqrt{\sin^2(c+dx)}+\cos(c+dx)\left(-((20\right.\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^4/Cos[c + d*x]^(3/2),x]
```

```
[Out] (-2*a^4*Csc[c + d*x]*(-15*Hypergeometric2F1[-1/4, 1/2, 3/4, Cos[c + d*x]^2]
*Sqrt[Sin[c + d*x]^2] + Cos[c + d*x]*(-((20 + 3*Cos[c + d*x])*Sin[c + d*x]^
2) + 80*Hypergeometric2F1[1/4, 1/2, 5/4, Cos[c + d*x]^2]*Sqrt[Sin[c + d*x]^
2] + 33*Cos[c + d*x]*Hypergeometric2F1[1/2, 3/4, 7/4, Cos[c + d*x]^2]*Sqrt[
Sin[c + d*x]^2])))/(15*d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 8.78 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.63

method	result
default	$\frac{8a^4\left(6\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-26\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+19\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-20\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\right.\right.}\right.}{15\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-}}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*a)^4/cos(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 8/15*a^4*(6*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6-26*sin(1/2*d*x+1/2*c)^4
*cos(1/2*d*x+1/2*c)+19*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-20*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+
1/2*c),2^(1/2))+21*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^
(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*
d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.63

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{3}{2}}(c+dx)}\,dx = -\frac{2\left(40i\sqrt{2}a^4\cos(dx+c)\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))-40i\sqrt{2}a^4\cos(dx+c\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^4/cos(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] -2/15*(40*I*sqrt(2)*a^4*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c
) + I*sin(d*x + c)) - 40*I*sqrt(2)*a^4*cos(d*x + c)*weierstrassPInverse(-4,
 0, cos(d*x + c) - I*sin(d*x + c)) - 42*I*sqrt(2)*a^4*cos(d*x + c)*weierstr
assZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) +
 42*I*sqrt(2)*a^4*cos(d*x + c)*weierstrassZeta(-4, 0, weierstrassPInverse(-
4, 0, cos(d*x + c) - I*sin(d*x + c))) - (3*a^4*cos(d*x + c)^2 + 20*a^4*cos(
d*x + c) + 15*a^4)*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**4/cos(d*x+c)**(3/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(a\cos(dx+c)+a)^4}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

[In] integrate((a+a*cos(d*x+c))^4/cos(d*x+c)^(3/2),x, algorithm="maxima")

[Out] integrate((a*cos(d*x + c) + a)^4/cos(d*x + c)^(3/2), x)

Giac [F]

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(a\cos(dx+c)+a)^4}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

[In] integrate((a+a*cos(d*x+c))^4/cos(d*x+c)^(3/2),x, algorithm="giac")

[Out] integrate((a*cos(d*x + c) + a)^4/cos(d*x + c)^(3/2), x)

Mupad [B] (verification not implemented)

Time = 15.02 (sec) , antiderivative size = 149, normalized size of antiderivative = 1.25

$$\begin{aligned}\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{3}{2}}(c+dx)}\,dx &= \frac{12\,a^4\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d} + \frac{32\,a^4\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{3\,d} \\ &+ \frac{8\,a^4\,\sqrt{\cos(c+d\,x)}\,\sin(c+d\,x)}{3\,d} \\ &+ \frac{2\,a^4\,\sin(c+d\,x)\,{}_2\mathrm{F}_1\left(-\frac{1}{4},\frac{1}{2};\ \frac{3}{4};\ \cos(c+d\,x)^2\right)}{d\,\sqrt{\cos(c+d\,x)}\,\sqrt{\sin(c+d\,x)^2}} \\ &- \frac{2\,a^4\cos(c+d\,x)^{7/2}\,\sin(c+d\,x)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{7}{4};\ \frac{11}{4};\ \cos(c+d\,x)^2\right)}{7\,d\,\sqrt{\sin(c+d\,x)^2}}\end{aligned}$$

[In] int((a + a*cos(c + d*x))^4/cos(c + d*x)^(3/2),x)

[Out] (12*a^4*ellipticE(c/2 + (d*x)/2, 2))/d + (32*a^4*ellipticF(c/2 + (d*x)/2, 2))/(3*d) + (8*a^4*cos(c + d*x)^(1/2)*sin(c + d*x))/(3*d) + (2*a^4*sin(c + d*x)*hypergeom([-1/4, 1/2], 3/4, cos(c + d*x)^2))/(d*cos(c + d*x)^(1/2)*(sin(c + d*x)^2)^(1/2)) - (2*a^4*cos(c + d*x)^(7/2)*sin(c + d*x)*hypergeom([1/2, 7/4], 11/4, cos(c + d*x)^2))/(7*d*(sin(c + d*x)^2)^(1/2))

3.171 $\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 98

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{40a^4 \operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2a^4\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{8a^4\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{2a^4\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}$$

```
[Out] 40/3*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*
d*x+1/2*c),2^(1/2))/d+2/3*a^4*sin(d*x+c)/d/cos(d*x+c)^(3/2)+8*a^4*sin(d*x+c
)/d/cos(d*x+c)^(1/2)+2/3*a^4*sin(d*x+c)*cos(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2836, 2716, 2720, 2719, 2715}

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{40a^4 \operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2a^4\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{2a^4\sin(c+dx)\sqrt{\cos(c+dx)}}{3d} + \frac{8a^4\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + a*Cos[c + d*x])^4/Cos[c + d*x]^(5/2),x]
```

```
[Out] (40*a^4*EllipticF[(c + d*x)/2, 2])/(3*d) + (2*a^4*Sin[c + d*x])/(3*d*Cos[c
+ d*x]^(3/2)) + (8*a^4*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]]) + (2*a^4*Sqrt[C
os[c + d*x]]*Sin[c + d*x])/(3*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$\text{integral} = \int \left(\frac{a^4}{\cos^{\frac{5}{2}}(c+dx)} + \frac{4a^4}{\cos^{\frac{3}{2}}(c+dx)} + \frac{6a^4}{\sqrt{\cos(c+dx)}} + 4a^4\sqrt{\cos(c+dx)} + a^4\cos^{\frac{3}{2}}(c+dx)\right) dx$$

$$= a^4\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)}\,dx + a^4\int \cos^{\frac{3}{2}}(c+dx)\,dx + (4a^4)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx + (4a^4)\int \sqrt{\cos(c+dx)}\,dx + (6a^4)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{8a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{12a^4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{2a^4\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{8a^4\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{2a^4\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + 2\left(\frac{1}{3}a^4\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx\right) - (4a^4)\int\sqrt{\cos(c+dx)}\,dx$$

$$= \frac{40a^4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2a^4\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{8a^4\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{2a^4\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.69 (sec) , antiderivative size = 186, normalized size of antiderivative = 1.90

$$\int\frac{(a+a\cos(c+dx))^4}{\cos^{\frac{5}{2}}(c+dx)}\,dx = -\frac{2a^4\csc(c+dx)\left(-\text{Hypergeometric2F1}\left(-\frac{3}{4},\frac{1}{2},\frac{1}{4},\cos^2(c+dx)\right)\sqrt{\sin^2(c+dx)}+\cos(c+dx)\left(-12\,\text{Hyp}\right.\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^4/Cos[c + d*x]^(5/2),x]
```

```
[Out] (-2*a^4*Csc[c + d*x]*(-(Hypergeometric2F1[-3/4, 1/2, 1/4, Cos[c + d*x]^2]*S
qrt[Sin[c + d*x]^2]) + Cos[c + d*x]*(-12*Hypergeometric2F1[-1/4, 1/2, 3/4,
Cos[c + d*x]^2]*Sqrt[Sin[c + d*x]^2] + Cos[c + d*x]*(-1 + Cos[c + d*x]^2 +
19*Hypergeometric2F1[1/4, 1/2, 5/4, Cos[c + d*x]^2]*Sqrt[Sin[c + d*x]^2] +
4*Cos[c + d*x]*Hypergeometric2F1[1/2, 3/4, 7/4, Cos[c + d*x]^2]*Sqrt[Sin[c
+ d*x]^2]))))/(3*d*Cos[c + d*x]^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 291 vs. 2(112) = 224.

Time = 8.24 (sec) , antiderivative size = 292, normalized size of antiderivative = 2.98

method	result
default	$\frac{8\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^4\left(2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-14\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+10\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\right.}{3\left(4\left(\sin^4\right.\right.}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*a)^4/cos(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 8/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^4/(4*sin(1/
2*d*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)/sin(1/2*d*x+1/2*c)^3*(2*cos(1/2*d*
x+1/2*c)*sin(1/2*d*x+1/2*c)^6-14*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+10
*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(co
s(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2+7*sin(1/2*d*x+1/2*c)^2*cos(1
/2*d*x+1/2*c)-5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/
2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*
d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.28

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{5}{2}}(c+dx)}\,dx = -\frac{2\left(10i\sqrt{2}a^4\cos(dx+c)^2\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))-10i\sqrt{2}a^4\cos(dx-\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^4/cos(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] -2/3*(10*I*sqrt(2)*a^4*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x +
c) + I*sin(d*x + c)) - 10*I*sqrt(2)*a^4*cos(d*x + c)^2*weierstrassPInverse(
-4, 0, cos(d*x + c) - I*sin(d*x + c)) - (a^4*cos(d*x + c)^2 + 12*a^4*cos(d*
x + c) + a^4)*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**4/cos(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(a\cos(dx+c)+a)^4}{\cos(dx+c)^{\frac{5}{2}}}\,dx$$

[In] integrate((a+a*cos(d*x+c))^4/cos(d*x+c)^(5/2),x, algorithm="maxima")

[Out] integrate((a*cos(d*x + c) + a)^4/cos(d*x + c)^(5/2), x)

Giac [F]

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(a\cos(dx+c)+a)^4}{\cos(dx+c)^{\frac{5}{2}}}\,dx$$

[In] integrate((a+a*cos(d*x+c))^4/cos(d*x+c)^(5/2),x, algorithm="giac")

[Out] integrate((a*cos(d*x + c) + a)^4/cos(d*x + c)^(5/2), x)

Mupad [B] (verification not implemented)

Time = 15.02 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.48

$$\begin{aligned}\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{5}{2}}(c+dx)}\,dx &= \frac{2\left(12\,a^4\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)+19\,a^4\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)+a^4\,\sqrt{\cos\left(c+d\,x\right)}\,\sin\left(c+d\,x\right)\right)}{3\,d}\\&\quad+\frac{8\,a^4\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{1}{4},\frac{1}{2};\ \frac{3}{4};\ \cos\left(c+d\,x\right)^2\right)}{d\,\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{\sin\left(c+d\,x\right)^2}}\\&\quad+\frac{2\,a^4\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{3}{4},\frac{1}{2};\ \frac{1}{4};\ \cos\left(c+d\,x\right)^2\right)}{3\,d\cos\left(c+d\,x\right)^{3/2}\,\sqrt{\sin\left(c+d\,x\right)^2}}\end{aligned}$$

[In] int((a + a*cos(c + d*x))^4/cos(c + d*x)^(5/2),x)

[Out] (2*(12*a^4*ellipticE(c/2 + (d*x)/2, 2) + 19*a^4*ellipticF(c/2 + (d*x)/2, 2) + a^4*cos(c + d*x)^(1/2)*sin(c + d*x)))/(3*d) + (8*a^4*sin(c + d*x)*hypergeom([-1/4, 1/2], 3/4, cos(c + d*x)^2))/(d*cos(c + d*x)^(1/2)*(sin(c + d*x)^2)^(1/2)) + (2*a^4*sin(c + d*x)*hypergeom([-3/4, 1/2], 1/4, cos(c + d*x)^2))/(3*d*cos(c + d*x)^(3/2)*(sin(c + d*x)^2)^(1/2))

3.172 $\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 121

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{7}{2}}(c+dx)}\,dx = -\frac{56a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{32a^4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2a^4\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{8a^4\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{66a^4\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

```
[Out] -56/5*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2
*d*x+1/2*c),2^(1/2))/d+32/3*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/
2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/5*a^4*sin(d*x+c)/d/cos(d*x+c
)^(5/2)+8/3*a^4*sin(d*x+c)/d/cos(d*x+c)^(3/2)+66/5*a^4*sin(d*x+c)/d/cos(d*x
+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2836, 2716, 2719, 2720}

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{32a^4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}-\frac{56a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{8a^4\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{2a^4\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{66a^4\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + a*Cos[c + d*x])^4/Cos[c + d*x]^(7/2),x]
```

```
[Out] (-56*a^4*EllipticE[(c + d*x)/2, 2])/(5*d) + (32*a^4*EllipticF[(c + d*x)/2,
2])/(3*d) + (2*a^4*Sin[c + d*x])/(5*d*Cos[c + d*x]^(5/2)) + (8*a^4*Sin[c +
```

```
d*x])/(3*d*Cos[c + d*x]^(3/2)) + (66*a^4*Sin[c + d*x])/(5*d*Sqrt[Cos[c + d*
x]])
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(\frac{a^4}{\cos^{\frac{7}{2}}(c+dx)}+\frac{4a^4}{\cos^{\frac{5}{2}}(c+dx)}+\frac{6a^4}{\cos^{\frac{3}{2}}(c+dx)}+\frac{4a^4}{\sqrt{\cos(c+dx)}}+a^4\sqrt{\cos(c+dx)}\right)dx \\
&= a^4\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)}\,dx+a^4\int \sqrt{\cos(c+dx)}\,dx+\left(4a^4\right)\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)}\,dx \\
&\quad +\left(4a^4\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx+\left(6a^4\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{2a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{8a^4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}+\frac{2a^4\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} \\
&\quad +\frac{8a^4\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{12a^4\sin(c+dx)}{d\sqrt{\cos(c+dx)}}+\frac{1}{5}\left(3a^4\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\
&\quad +\frac{1}{3}\left(4a^4\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx-\left(6a^4\right)\int \sqrt{\cos(c+dx)}\,dx
\end{aligned}
$$

$$= -\frac{10a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{32a^4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2a^4\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{8a^4\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{66a^4\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}-\frac{1}{5}(3a^4)\int\sqrt{\cos(c+dx)}\,dx$$

$$= -\frac{56a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{32a^4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2a^4\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{8a^4\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{66a^4\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.66 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.40

$$\int\frac{(a+a\cos(c+dx))^4}{\cos^{\frac{7}{2}}(c+dx)}\,dx$$

$$= \frac{2a^4\csc(c+dx)\left(3\,\text{Hypergeometric2F1}\left(-\frac{5}{4},\frac{1}{2},-\frac{1}{4},\cos^2(c+dx)\right)-5\cos(c+dx)\left(-4\,\text{Hypergeometric2F1}\right.\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^4/Cos[c + d*x]^(7/2),x]
```

```
[Out] (2*a^4*Csc[c + d*x]*(3*Hypergeometric2F1[-5/4, 1/2, -1/4, Cos[c + d*x]^2] -
 5*Cos[c + d*x]*(-4*Hypergeometric2F1[-3/4, 1/2, 1/4, Cos[c + d*x]^2] + Cos
[c + d*x]*(-18*Hypergeometric2F1[-1/4, 1/2, 3/4, Cos[c + d*x]^2] + 12*Cos[c
 + d*x]*Hypergeometric2F1[1/4, 1/2, 5/4, Cos[c + d*x]^2] + Cos[c + d*x]^2*H
ypergeometric2F1[1/2, 3/4, 7/4, Cos[c + d*x]^2])))*Sqrt[Sin[c + d*x]^2])/(1
5*d*Cos[c + d*x]^(5/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 385 vs. $2(157) = 314$.

Time = 8.79 (sec) , antiderivative size = 386, normalized size of antiderivative = 3.19

method	result
default	$-\frac{32\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^4\left(\frac{41\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{60\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}-\frac{7\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}}{}\right.}{}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*a)^4/cos(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -32*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^4*(41/60*(s
in(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*
x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)
)-7/20*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*s
in(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*
c),2^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))-1/24*cos(1/2*d*x+1/2*c)*
(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-
1/2)^2-33/40*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)/(-(-2*cos(1/2*d*x+1/2*
c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)-1/320*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*
x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^3)/sin(1/
2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.67

$$\int \frac{(a + a\cos(c + dx))^4}{\cos^{\frac{7}{2}}(c + dx)}\, dx =$$

$$-\frac{2\left(40i\sqrt{2}a^4\cos(dx + c)^3 \operatorname{weierstrassPInverse}(-4, 0, \cos(dx + c) + i\sin(dx + c)) - 40i\sqrt{2}a^4\cos(dx + \right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^4/cos(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] -2/15*(40*I*sqrt(2)*a^4*cos(d*x + c)^3*weierstrassPInverse(-4, 0, cos(d*x +
 c) + I*sin(d*x + c)) - 40*I*sqrt(2)*a^4*cos(d*x + c)^3*weierstrassPInverse
(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 42*I*sqrt(2)*a^4*cos(d*x + c)^3*we
ierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x +
c))) - 42*I*sqrt(2)*a^4*cos(d*x + c)^3*weierstrassZeta(-4, 0, weierstrassPI
nverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (99*a^4*cos(d*x + c)^2 + 20
*a^4*cos(d*x + c) + 3*a^4)*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)
^3)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a + a\cos(c + dx))^4}{\cos^{\frac{7}{2}}(c + dx)}\, dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**4/cos(d*x+c)**(7/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a + a\cos(c + dx))^4}{\cos^{\frac{7}{2}}(c + dx)}\,dx = \int \frac{(a\cos(dx + c) + a)^4}{\cos(dx + c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^4/cos(d*x+c)^(7/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^4/cos(d*x + c)^(7/2), x)
```

Giac [F]

$$\int \frac{(a + a\cos(c + dx))^4}{\cos^{\frac{7}{2}}(c + dx)}\,dx = \int \frac{(a\cos(dx + c) + a)^4}{\cos(dx + c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^4/cos(d*x+c)^(7/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^4/cos(d*x + c)^(7/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.64 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.67

$$\begin{aligned}
&\int \frac{(a + a\cos(c + dx))^4}{\cos^{\frac{7}{2}}(c + dx)}\,dx \\
&= \frac{2\left(a^4\,\mathrm{E}\left(\frac{c}{2} + \frac{dx}{2}\middle|2\right) + 4\,a^4\,\mathrm{F}\left(\frac{c}{2} + \frac{dx}{2}\middle|2\right)\right)}{d} \\
&\quad + \frac{2\left(\frac{34\,a^4\,\sin(c+d\,x)}{\sqrt{\cos(c+d\,x)}\,\sqrt{\sin(c+d\,x)^2}} + \frac{a^4\,\sin(c+d\,x)}{\cos(c+d\,x)^{5/2}\,\sqrt{\sin(c+d\,x)^2}}\right)\,{}_2\mathrm{F}_1\left(-\frac{1}{4},\frac{1}{2};\ \frac{3}{4};\ \cos\left(c+d\,x\right)^2\right)}{5\,d} \\
&\quad + \frac{8\,a^4\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{3}{4},\frac{1}{2};\ \frac{1}{4};\ \cos\left(c+d\,x\right)^2\right)}{3\,d\cos\left(c+d\,x\right)^{3/2}\,\sqrt{\sin\left(c+d\,x\right)^2}} \\
&\quad - \frac{8\,a^4\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{1}{4},\frac{1}{2};\ \frac{7}{4};\ \cos\left(c+d\,x\right)^2\right)}{15\,d\,\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{\sin\left(c+d\,x\right)^2}}
\end{aligned}$$

```
[In] int((a + a*cos(c + d*x))^4/cos(c + d*x)^(7/2),x)
[Out] (2*(a^4*ellipticE(c/2 + (d*x)/2, 2) + 4*a^4*ellipticF(c/2 + (d*x)/2, 2)))/d
 + (2*((34*a^4*sin(c + d*x))/(cos(c + d*x)^(1/2)*(sin(c + d*x)^2)^(1/2)) +
(a^4*sin(c + d*x))/(cos(c + d*x)^(5/2)*(sin(c + d*x)^2)^(1/2)))*hypergeom([
-1/4, 1/2], 3/4, cos(c + d*x)^2))/(5*d) + (8*a^4*sin(c + d*x)*hypergeom([-3
/4, 1/2], 1/4, cos(c + d*x)^2))/(3*d*cos(c + d*x)^(3/2)*(sin(c + d*x)^2)^(1
/2)) - (8*a^4*sin(c + d*x)*hypergeom([-1/4, 1/2], 7/4, cos(c + d*x)^2))/(15
*d*cos(c + d*x)^(1/2)*(sin(c + d*x)^2)^(1/2))
```

3.173 $\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{9}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 147

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{9}{2}}(c+dx)}\,dx = -\frac{64a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{136a^4\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d}+\frac{2a^4\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)}+\frac{8a^4\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{94a^4\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)}+\frac{64a^4\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

```
[Out] -64/5*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2
*d*x+1/2*c),2^(1/2))/d+136/21*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+
1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/7*a^4*sin(d*x+c)/d/cos(d*x
+c)^(7/2)+8/5*a^4*sin(d*x+c)/d/cos(d*x+c)^(5/2)+94/21*a^4*sin(d*x+c)/d/cos(
d*x+c)^(3/2)+64/5*a^4*sin(d*x+c)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2836, 2716, 2720, 2719}

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{136a^4\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d}-\frac{64a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{94a^4\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)}+\frac{8a^4\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{2a^4\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)}+\frac{64a^4\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + a*Cos[c + d*x])^4/Cos[c + d*x]^(9/2),x]
```

```
[Out] (-64*a^4*EllipticE[(c + d*x)/2, 2])/(5*d) + (136*a^4*EllipticF[(c + d*x)/2,
 2])/(21*d) + (2*a^4*Sin[c + d*x])/(7*d*Cos[c + d*x]^(7/2)) + (8*a^4*Sin[c
+ d*x])/(5*d*Cos[c + d*x]^(5/2)) + (94*a^4*Sin[c + d*x])/(21*d*Cos[c + d*x]
^(3/2)) + (64*a^4*Sin[c + d*x])/(5*d*Sqrt[Cos[c + d*x]])
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2836

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(a + b*sin[e + f*x])^m*(d*sin[e +
f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && IGt
Q[m, 0] && RationalQ[n]
```

Rubi steps

$$\text{integral} = \int \left(\frac{a^4}{\cos^{\frac{9}{2}}(c+dx)}+\frac{4a^4}{\cos^{\frac{7}{2}}(c+dx)}+\frac{6a^4}{\cos^{\frac{5}{2}}(c+dx)}+\frac{4a^4}{\cos^{\frac{3}{2}}(c+dx)}+\frac{a^4}{\sqrt{\cos(c+dx)}}\right)dx$$

$$= a^4\int \frac{1}{\cos^{\frac{9}{2}}(c+dx)}\,dx + a^4\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx + \left(4a^4\right)\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)}\,dx + \left(4a^4\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx + \left(6a^4\right)\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)}\,dx$$

$$=\frac{2a^4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}+\frac{2a^4\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)}+\frac{8a^4\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{4a^4\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)}+\frac{8a^4\sin(c+dx)}{d\sqrt{\cos(c+dx)}}+\frac{1}{7}\left(5a^4\right)\int\frac{1}{\cos^{\frac{5}{2}}(c+dx)}\,dx+\left(2a^4\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx+\frac{1}{5}\left(12a^4\right)\int\frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx-\left(4a^4\right)\int\sqrt{\cos(c+dx)}\,dx$$

$$=-\frac{8a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{6a^4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}+\frac{2a^4\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)}+\frac{8a^4\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{94a^4\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)}+\frac{64a^4\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}+\frac{1}{21}\left(5a^4\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx-\frac{1}{5}\left(12a^4\right)\int\sqrt{\cos(c+dx)}\,dx$$

$$=-\frac{64a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{136a^4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d}+\frac{2a^4\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)}+\frac{8a^4\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{94a^4\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)}+\frac{64a^4\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.04 (sec) , antiderivative size = 171, normalized size of antiderivative = 1.16

$$\int\frac{(a+a\cos(c+dx))^4}{\cos^{\frac{9}{2}}(c+dx)}\,dx$$

$$=\frac{2a^4\csc(c+dx)\left(5\,\text{Hypergeometric2F1}\left(-\frac{7}{4},\frac{1}{2},-\frac{3}{4},\cos^2(c+dx)\right)+7\cos(c+dx)\left(4\,\text{Hypergeometric2F1}\left(-\right.\right.\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^4/Cos[c + d*x]^(9/2),x]
```

```
[Out] (2*a^4*Csc[c + d*x]*(5*Hypergeometric2F1[-7/4, 1/2, -3/4, Cos[c + d*x]^2] +
 7*Cos[c + d*x]*(4*Hypergeometric2F1[-5/4, 1/2, -1/4, Cos[c + d*x]^2] + 5*C
os[c + d*x]*(2*Hypergeometric2F1[-3/4, 1/2, 1/4, Cos[c + d*x]^2] + 4*Cos[c
+ d*x]*Hypergeometric2F1[-1/4, 1/2, 3/4, Cos[c + d*x]^2] - Cos[c + d*x]^2*H
ypergeometric2F1[1/4, 1/2, 5/4, Cos[c + d*x]^2])))*Sqrt[Sin[c + d*x]^2])/(3
5*d*Cos[c + d*x]^(7/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 438 vs. $2(179) = 358$.

Time = 10.46 (sec) , antiderivative size = 439, normalized size of antiderivative = 2.99

method	result
default	$-\frac{32\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^4\left(\frac{253\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{420\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}-\frac{47\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{}}{672}\right.}{}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*a)^4/cos(d*x+c)^(9/2),x,method=_RETURNVERBOSE)
```

```
[Out] -32*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^4*(253/420*
(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*
d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/
2))-47/672*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2
)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^2-4/5*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1
/2*c)/(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)-2/5*(sin(1/
2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2
*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-El
lipticE(cos(1/2*d*x+1/2*c),2^(1/2)))-1/80*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*
x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^3-1/896*c
os(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos
(1/2*d*x+1/2*c)^2-1/2)^4)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/
2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 215, normalized size of antiderivative = 1.46

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{9}{2}}(c+dx)}\,dx =$$
$$-\frac{2\left(170i\sqrt{2}a^4\cos\left(dx+c\right)^4\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\sin\left(dx+c\right))-170i\sqrt{2}a^4\cos\left(dx\right.\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^4/cos(d*x+c)^(9/2),x, algorithm="fricas")
```

```
[Out] -2/105*(170*I*sqrt(2)*a^4*cos(d*x + c)^4*weierstrassPInverse(-4, 0, cos(d*x
 + c) + I*sin(d*x + c)) - 170*I*sqrt(2)*a^4*cos(d*x + c)^4*weierstrassPInve
rse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 336*I*sqrt(2)*a^4*cos(d*x + c)^
```

```
4*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*
x + c))) - 336*I*sqrt(2)*a^4*cos(d*x + c)^4*weierstrassZeta(-4, 0, weierstr
assPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (672*a^4*cos(d*x + c)^
3 + 235*a^4*cos(d*x + c)^2 + 84*a^4*cos(d*x + c) + 15*a^4)*sqrt(cos(d*x + c
))*sin(d*x + c))/(d*cos(d*x + c)^4)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**4/cos(d*x+c)**(9/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(a\cos(dx+c)+a)^4}{\cos(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^4/cos(d*x+c)^(9/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^4/cos(d*x + c)^(9/2), x)
```

Giac [F]

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(a\cos(dx+c)+a)^4}{\cos(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^4/cos(d*x+c)^(9/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^4/cos(d*x + c)^(9/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.67 (sec) , antiderivative size = 199, normalized size of antiderivative = 1.35

$$\int \frac{(a+a\cos(c+dx))^4}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{2\,a^4\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d} + \frac{8\,a^4\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{1}{4},\frac{1}{2};\ \frac{3}{4};\ \cos\left(c+d\,x\right)^2\right)}{d\,\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{\sin\left(c+d\,x\right)^2}} + \frac{4\,a^4\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{3}{4},\frac{1}{2};\ \frac{1}{4};\ \cos\left(c+d\,x\right)^2\right)}{d\cos\left(c+d\,x\right)^{3/2}\,\sqrt{\sin\left(c+d\,x\right)^2}} + \frac{8\,a^4\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{5}{4},\frac{1}{2};\ -\frac{1}{4};\ \cos\left(c+d\,x\right)^2\right)}{5\,d\cos\left(c+d\,x\right)^{5/2}\,\sqrt{\sin\left(c+d\,x\right)^2}} + \frac{2\,a^4\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{7}{4},\frac{1}{2};\ -\frac{3}{4};\ \cos\left(c+d\,x\right)^2\right)}{7\,d\cos\left(c+d\,x\right)^{7/2}\,\sqrt{\sin\left(c+d\,x\right)^2}}$$

```
[In] int((a + a*cos(c + d*x))^4/cos(c + d*x)^(9/2),x)
```

```
[Out] (2*a^4*ellipticF(c/2 + (d*x)/2, 2))/d + (8*a^4*sin(c + d*x)*hypergeom([-1/4
, 1/2], 3/4, cos(c + d*x)^2))/(d*cos(c + d*x)^(1/2)*(sin(c + d*x)^2)^(1/2))
 + (4*a^4*sin(c + d*x)*hypergeom([-3/4, 1/2], 1/4, cos(c + d*x)^2))/(d*cos(
c + d*x)^(3/2)*(sin(c + d*x)^2)^(1/2)) + (8*a^4*sin(c + d*x)*hypergeom([-5/
4, 1/2], -1/4, cos(c + d*x)^2))/(5*d*cos(c + d*x)^(5/2)*(sin(c + d*x)^2)^(1
/2)) + (2*a^4*sin(c + d*x)*hypergeom([-7/4, 1/2], -3/4, cos(c + d*x)^2))/(7
*d*cos(c + d*x)^(7/2)*(sin(c + d*x)^2)^(1/2))
```

3.174 $\int \frac{\cos^{\frac{7}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 128

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{21E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5ad} - \frac{5\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3ad} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{3ad} + \frac{7\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5ad} - \frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))}$$

```
[Out] 21/5*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+
1/2*c),2^(1/2))/a/d-5/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ell
ipticF(sin(1/2*d*x+1/2*c),2^(1/2))/a/d+7/5*cos(d*x+c)^(3/2)*sin(d*x+c)/a/d-
cos(d*x+c)^(5/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))-5/3*sin(d*x+c)*cos(d*x+c)^(1
/2)/a/d
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2846, 2827, 2715, 2720, 2719}

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{5\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3ad} + \frac{21E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5ad} - \frac{\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{d(a\cos(c+dx)+a)} + \frac{7\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{5ad} - \frac{5\sin(c+dx)\sqrt{\cos(c+dx)}}{3ad}$$

```
[In] Int[Cos[c + d*x]^(7/2)/(a + a*Cos[c + d*x]),x]
```

```
[Out] (21*EllipticE[(c + d*x)/2, 2])/(5*a*d) - (5*EllipticF[(c + d*x)/2, 2])/(3*a
*d) - (5*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(3*a*d) + (7*Cos[c + d*x]^(3/2)*S
in[c + d*x])/(5*a*d) - (Cos[c + d*x]^(5/2)*Sin[c + d*x])/(d*(a + a*Cos[c +
d*x]))
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2846

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/((a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((c + d*Sin[e +
 f*x])^(n - 1)/(a*f*(a + b*Sin[e + f*x]))), x] - Dist[d/(a*b), Int[(c + d*S
in[e + f*x])^(n - 2)*Simp[b*d*(n - 1) - a*c*n + (b*c*(n - 1) - a*d*n)*Sin[e
 + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[n, 1] && (IntegerQ[2*n] || E
qQ[c, 0])
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} - \frac{\int \cos^{\frac{3}{2}}(c+dx)\left(\frac{5a}{2}-\frac{7}{2}a\cos(c+dx)\right)\,dx}{a^2} \\
&= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} - \frac{5\int \cos^{\frac{3}{2}}(c+dx)\,dx}{2a} + \frac{7\int \cos^{\frac{5}{2}}(c+dx)\,dx}{2a}
\end{aligned}
$$

$$= -\frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{3ad} + \frac{7\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5ad} - \frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} - \frac{5\int\frac{1}{\sqrt{\cos(c+dx)}}dx}{6a} + \frac{21\int\sqrt{\cos(c+dx)}dx}{10a}$$

$$= \frac{21E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5ad} - \frac{5\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3ad} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{3ad} + \frac{7\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5ad} - \frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.86 (sec) , antiderivative size = 315, normalized size of antiderivative = 2.46

$$\int\frac{\cos^{\frac{7}{2}}(c+dx)}{a+a\cos(c+dx)}dx = \frac{\cos^2\left(\frac{1}{2}(c+dx)\right)\left(\frac{2i\sqrt{2}e^{-i(c+dx)}\left(63\left(1+e^{2i(c+dx)}\right)+63\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)+25e^{i(c+dx)}\left(-\right.\right.}{d\left(-1+e^{2ic}\right)\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}}\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(7/2)/(a + a*Cos[c + d*x]),x]
```

```
[Out] (Cos[(c + d*x)/2]^2*(((2*I)*Sqrt[2]*(63*(1 + E^((2*I)*(c + d*x))) + 63*(-1
 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3
/4, -E^((2*I)*(c + d*x))] + 25*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 +
E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]
))/(d*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(
I*(c + d*x))]) - (2*Sqrt[Cos[c + d*x]]*Csc[c]*(15 + 10*Cos[d*x]*Sin[c]^2 -
6*Cos[c]*(-8 + Cos[2*d*x]*Sin[c]^2) + 30*Sec[(c + d*x)/2]*Sin[c/2]*Sin[(d*x
)/2] + 5*Sin[2*c]*Sin[d*x] - 3*Cos[2*c]*Sin[c]*Sin[2*d*x]))/d))/(15*a*(1 +
Cos[c + d*x]))
```

Maple [A] (verified)

Time = 5.28 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.79

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\left(25F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)+63E\left(\cos\right.\right.\right.}{15a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}\right.}$

```
[In] int(cos(d*x+c)^(7/2)/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] -1/15*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-cos(1/2*d*x
+1/2*c)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(25*E
llipticF(cos(1/2*d*x+1/2*c),2^(1/2))+63*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2
)))+48*sin(1/2*d*x+1/2*c)^8-56*sin(1/2*d*x+1/2*c)^6-30*sin(1/2*d*x+1/2*c)^4
+23*sin(1/2*d*x+1/2*c)^2)/a/cos(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^4+sin
(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2
)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 208, normalized size of antiderivative = 1.62

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{2\left(6\cos\left(dx+c\right)^{2}-4\cos\left(dx+c\right)-25\right)\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-25\left(-i\sqrt{2}\cos\left(dx+c\right)-i\sqrt{2}\right)\text{weie}}{}$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/30*(2*(6*cos(d*x + c)^2 - 4*cos(d*x + c) - 25)*sqrt(cos(d*x + c))*sin(d*x
 + c) - 25*(-I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0,
 cos(d*x + c) + I*sin(d*x + c)) - 25*(I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*w
eierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 63*(-I*sqrt(2)*c
os(d*x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0,
cos(d*x + c) + I*sin(d*x + c))) - 63*(I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*w
eierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x +
 c))))/(a*d*cos(d*x + c) + a*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(7/2)/(a+a*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{7}{2}}}{a\cos\left(dx+c\right)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+a*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(7/2)/(a*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{7}{2}}}{a\cos\left(dx+c\right)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+a*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(7/2)/(a*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \int \frac{\cos\left(c+d\,x\right)^{7/2}}{a+a\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(cos(c + d*x)^(7/2)/(a + a*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^(7/2)/(a + a*cos(c + d*x)), x)
```

3.175 $\int \frac{\cos^{\frac{5}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 100

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad} + \frac{5\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3ad} + \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{3ad} - \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))}$$

```
[Out] -3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/
2*c),2^(1/2))/a/d+5/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellip
ticF(sin(1/2*d*x+1/2*c),2^(1/2))/a/d-cos(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos
(d*x+c))+5/3*sin(d*x+c)*cos(d*x+c)^(1/2)/a/d
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2846, 2827, 2719, 2715, 2720}

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{5\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3ad} - \frac{3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad} - \frac{\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{d(a\cos(c+dx)+a)} + \frac{5\sin(c+dx)\sqrt{\cos(c+dx)}}{3ad}$$

```
[In] Int[Cos[c + d*x]^(5/2)/(a + a*Cos[c + d*x]),x]
```

```
[Out] (-3*EllipticE[(c + d*x)/2, 2])/(a*d) + (5*EllipticF[(c + d*x)/2, 2])/(3*a*d
) + (5*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(3*a*d) - (Cos[c + d*x]^(3/2)*Sin[c
 + d*x])/(d*(a + a*Cos[c + d*x]))
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2846

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/((a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((c + d*Sin[e +
 f*x])^(n - 1)/(a*f*(a + b*Sin[e + f*x]))), x] - Dist[d/(a*b), Int[(c + d*S
in[e + f*x])^(n - 2)*Simp[b*d*(n - 1) - a*c*n + (b*c*(n - 1) - a*d*n)*Sin[e
 + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[n, 1] && (IntegerQ[2*n] || E
qQ[c, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} - \frac{\int \sqrt{\cos(c+dx)}\left(\frac{3a}{2}-\frac{5}{2}a\cos(c+dx)\right)\,dx}{a^2} \\
&= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} - \frac{3\int \sqrt{\cos(c+dx)}\,dx}{2a} + \frac{5\int \cos^{\frac{3}{2}}(c+dx)\,dx}{2a} \\
&= -\frac{3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad} + \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{3ad} \\
&\quad - \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} + \frac{5\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{6a}
\end{aligned}$$

$$= -\frac{3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad} + \frac{5\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3ad} + \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{3ad} - \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.35 (sec) , antiderivative size = 289, normalized size of antiderivative = 2.89

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx$$
$$= \frac{\cos^2\left(\frac{1}{2}(c+dx)\right)\left(-\frac{2i\sqrt{2}e^{-i(c+dx)}\left(9\left(1+e^{2i(c+dx)}\right)+9\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)+5e^{i(c+dx)}(\cdots}{d\left(-1+e^{2ic}\right)\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}}\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)/(a + a*Cos[c + d*x]),x]
```

```
[Out] (Cos[(c + d*x)/2]^2*(((-2*I)*Sqrt[2]*(9*(1 + E^((2*I)*(c + d*x))) + 9*(-1 +
 E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/
4, -E^((2*I)*(c + d*x))] + 5*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^
((2*I)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))
/(d*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(I*
(c + d*x))]) + (2*Sqrt[Cos[c + d*x]]*Csc[c]*(3 + 6*Cos[c] + 2*Cos[d*x]*Sin[
c]^2 + 6*Sec[(c + d*x)/2]*Sin[c/2]*Sin[(d*x)/2] + Sin[2*c]*Sin[d*x]))/d))/(
3*a*(1 + Cos[c + d*x]))
```

Maple [A] (verified)

Time = 4.19 (sec) , antiderivative size = 215, normalized size of antiderivative = 2.15

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\left(5F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)+9E\left(\cos\left(\cdots\right.\right.\right.\right.}{3a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos\cdots\right.}}$

```
[In] int(cos(d*x+c)^(5/2)/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(cos(1/2*d*x+1
/2*c)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(5*Elli
pticF(cos(1/2*d*x+1/2*c),2^(1/2))+9*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))-
8*sin(1/2*d*x+1/2*c)^6+18*sin(1/2*d*x+1/2*c)^4-7*sin(1/2*d*x+1/2*c)^2)/a/co
s(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1
/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 198, normalized size of antiderivative = 1.98

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{2\,(2\,\cos(dx+c)+5)\sqrt{\cos(dx+c)}\sin(dx+c) - 5\,(i\sqrt{2}\cos(dx+c)+i\sqrt{2})\text{weierstrassPInverse}(-4,0,c}{}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/6*(2*(2*cos(d*x + c) + 5)*sqrt(cos(d*x + c))*sin(d*x + c) - 5*(I*sqrt(2)*
cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d
*x + c)) - 5*(-I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4,
0, cos(d*x + c) - I*sin(d*x + c)) - 9*(I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*
weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x
+ c))) - 9*(-I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, wei
erstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/(a*d*cos(d*x + c)
+ a*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)/(a+a*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \int \frac{\cos(dx+c)^{\frac{5}{2}}}{a\cos(dx+c)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] integrate(cos(d*x + c)^(5/2)/(a*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{a\cos\left(dx+c\right)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(5/2)/(a*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \int \frac{\cos\left(c+d\,x\right)^{5/2}}{a+a\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(cos(c + d*x)^(5/2)/(a + a*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^(5/2)/(a + a*cos(c + d*x)), x)
```

3.176 $\int \frac{\cos^{\frac{3}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 72

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad} - \frac{\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{ad} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d(a+a\cos(c+dx))}$$

```
[Out] 3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2
*c),2^(1/2))/a/d-(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(
sin(1/2*d*x+1/2*c),2^(1/2))/a/d-sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x+
c))
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2846, 2827, 2720, 2719}

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{ad} + \frac{3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad} - \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{d(a\cos(c+dx)+a)}$$

```
[In] Int[Cos[c + d*x]^(3/2)/(a + a*Cos[c + d*x]),x]
```

```
[Out] (3*EllipticE[(c + d*x)/2, 2])/(a*d) - EllipticF[(c + d*x)/2, 2]/(a*d) - (Sq
rt[Cos[c + d*x]]*Sin[c + d*x])/(d*(a + a*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2846

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/((a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((c + d*Sin[e +
 f*x])^(n - 1)/(a*f*(a + b*Sin[e + f*x]))), x] - Dist[d/(a*b), Int[(c + d*S
in[e + f*x])^(n - 2)*Simp[b*d*(n - 1) - a*c*n + (b*c*(n - 1) - a*d*n)*Sin[e
 + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[n, 1] && (IntegerQ[2*n] || E
qQ[c, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d(a+a\cos(c+dx))} - \frac{\int \frac{\frac{a}{2}-\frac{3}{2}a\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx}{a^2} \\
&= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d(a+a\cos(c+dx))} - \frac{\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{2a} + \frac{3\int \sqrt{\cos(c+dx)}\,dx}{2a} \\
&= \frac{3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad} - \frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{ad} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d(a+a\cos(c+dx))}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 2.20 (sec) , antiderivative size = 264, normalized size of antiderivative = 3.67

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx$$
$$= \frac{\cos^2\left(\frac{1}{2}(c+dx)\right)\left(\frac{2i\sqrt{2}e^{-i(c+dx)}\left(3\left(1+e^{2i(c+dx)}\right)+3\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)+e^{i(c+dx)}\left(-1+e^{\cdots}\right.\right.}{d\left(-1+e^{2ic}\right)\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}}}{a(1+\cos(c+\cdots}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)/(a + a*Cos[c + d*x]),x]
```

```
[Out] (Cos[(c + d*x)/2]^2*(((2*I)*Sqrt[2]*(3*(1 + E^((2*I)*(c + d*x))) + 3*(-1 +
E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4
, -E^((2*I)*(c + d*x))] + E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2
*I)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/(d
*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(I*(c
+ d*x))]) - (2*Sqrt[Cos[c + d*x]]*(2*Cot[c] + Csc[c] + Sec[c/2]*Sec[(c + d*
x)/2]*Sin[(d*x)/2]))/d))/(a*(1 + Cos[c + d*x]))
```

Maple [A] (verified)

Time = 3.26 (sec) , antiderivative size = 199, normalized size of antiderivative = 2.76

method	result
default	$\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\left(F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)+3E\left(\cos\left(\frac{dx}{2}+\cdots\right.\right.\right.\right.}{a\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\cdots}$

```
[In] int(cos(d*x+c)^(3/2)/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] ((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(cos(1/2*d*x+1/2*c)
*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(EllipticF(c
os(1/2*d*x+1/2*c),2^(1/2))+3*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))+2*sin(1
/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)/a/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*
x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*
c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 186, normalized size of antiderivative = 2.58

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx$$
$$= \frac{(i\sqrt{2}\cos(dx+c)+i\sqrt{2})\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+(-i\sqrt{2}\cos(dx+c)}{}$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/2*((I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*
x + c) + I*sin(d*x + c)) + (-I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstras
sPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 3*(-I*sqrt(2)*cos(d*x + c
) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x +
c) + I*sin(d*x + c))) - 3*(I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZ
eta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - 2*s
qrt(cos(d*x + c))*sin(d*x + c))/(a*d*cos(d*x + c) + a*d)
```

Sympy [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\cos(c+dx)+1}\,dx}{a}$$

```
[In] integrate(cos(d*x+c)**(3/2)/(a+a*cos(d*x+c)),x)
```

```
[Out] Integral(cos(c + d*x)**(3/2)/(cos(c + d*x) + 1), x)/a
```

Maxima [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \int \frac{\cos(dx+c)^{\frac{3}{2}}}{a\cos(dx+c)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] integrate(cos(d*x + c)^(3/2)/(a*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx=\int \frac{\cos\left(dx+c\right)^{\frac{3}{2}}}{a\cos\left(dx+c\right)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(3/2)/(a*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx=\int \frac{\cos\left(c+d\,x\right)^{3/2}}{a+a\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)/(a + a*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^(3/2)/(a + a*cos(c + d*x)), x)
```

3.177 $\int \frac{\sqrt{\cos(c+dx)}}{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 70

$$\int \frac{\sqrt{\cos(c+dx)}}{a+a\cos(c+dx)}\,dx=-\frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad}+\frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{ad}+\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d(a+a\cos(c+dx))}$$

```
[Out] -(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*
c),2^(1/2))/a/d+(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(s
in(1/2*d*x+1/2*c),2^(1/2))/a/d+sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x+c
))
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2848, 2827, 2720, 2719}

$$\int \frac{\sqrt{\cos(c+dx)}}{a+a\cos(c+dx)}\,dx=\frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{ad}-\frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad}+\frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{d(a\cos(c+dx)+a)}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/(a + a*Cos[c + d*x]),x]
```

```
[Out] -(EllipticE[(c + d*x)/2, 2]/(a*d)) + EllipticF[(c + d*x)/2, 2]/(a*d) + (Sqr
t[Cos[c + d*x]]*Sin[c + d*x])/(d*(a + a*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2848

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/((a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*((c + d*Sin[e + f*x])^n/(
a*f*(a + b*Sin[e + f*x]))), x] + Dist[d*(n/(a*b)), Int[(c + d*Sin[e + f*x])
^(n - 1)*(a - b*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] &&
 NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && (IntegerQ[2
*n] || EqQ[c, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d(a+a\cos(c+dx))} + \frac{\int \frac{a-a\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx}{2a^2} \\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d(a+a\cos(c+dx))} + \frac{\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{2a} - \frac{\int \sqrt{\cos(c+dx)}\,dx}{2a} \\
&= -\frac{E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{ad} + \frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{ad} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d(a+a\cos(c+dx))}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.00 (sec) , antiderivative size = 256, normalized size of antiderivative = 3.66

$$\int \frac{\sqrt{\cos(c+dx)}}{a+a\cos(c+dx)}\,dx$$
$$= \frac{\cos^2\left(\frac{1}{2}(c+dx)\right)\left(-\frac{2i\sqrt{2}e^{-i(c+dx)}\left(1+e^{2i(c+dx)}+\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)+e^{i(c+dx)}\left(-1+e^{2ic}\right.\right.}{d\left(-1+e^{2ic}\right)\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}}\right.}{a(1+\cos(c+dx))}$$

[In] Integrate[Sqrt[Cos[c + d*x]]/(a + a*Cos[c + d*x]),x]

[Out] (Cos[(c + d*x)/2]^2*(((-2*I)*Sqrt[2]*(1 + E^((2*I)*(c + d*x)) + (-1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x))] + E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/(d*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(I*(c + d*x))]) + (2*Sqrt[Cos[c + d*x]]*(Csc[c] + Sec[c/2]*Sec[(c + d*x)/2]*Sin[(d*x)/2]))/d))/(a*(1 + Cos[c + d*x]))

Maple [A] (verified)

Time = 2.40 (sec) , antiderivative size = 198, normalized size of antiderivative = 2.83

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\left(F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)+E\left(\cos\left(\frac{dx}{2}\cdots\right.\right.\right.\right.}{a\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cdots}}$

[In] int(cos(d*x+c)^(1/2)/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)

[Out] -((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(cos(1/2*d*x+1/2*c)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))+2*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)/a/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 184, normalized size of antiderivative = 2.63

$$\int \frac{\sqrt{\cos(c+dx)}}{a+a\cos(c+dx)}\,dx = \frac{\left(-i\sqrt{2}\cos\left(dx+c\right)-i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\sin\left(dx+c\right))+\left(i\sqrt{2}\cos\left(dx+c\right)\cdots\right.}{}$$

[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c)),x, algorithm="fricas")

[Out] 1/2*((-I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + (I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + (-I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + (I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(

```
-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*sqrt(
cos(d*x + c))*sin(d*x + c))/(a*d*cos(d*x + c) + a*d)
```

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{a+a\cos(c+dx)}\,dx = \frac{\int \frac{\sqrt{\cos(c+dx)}}{\cos(c+dx)+1}\,dx}{a}$$

```
[In] integrate(cos(d*x+c)**(1/2)/(a+a*cos(d*x+c)),x)
[Out] Integral(sqrt(cos(c + d*x))/(cos(c + d*x) + 1), x)/a
```

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{a+a\cos(c+dx)}\,dx = \int \frac{\sqrt{\cos(dx+c)}}{a\cos(dx+c)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(sqrt(cos(d*x + c))/(a*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{a+a\cos(c+dx)}\,dx = \int \frac{\sqrt{\cos(dx+c)}}{a\cos(dx+c)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(sqrt(cos(d*x + c))/(a*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{a+a\cos(c+dx)}\,dx = \int \frac{\sqrt{\cos(c+d\,x)}}{a+a\,\cos(c+d\,x)}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(a + a*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^(1/2)/(a + a*cos(c + d*x)), x)
```

3.178 $\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 70

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))}\,dx = \frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad}+\frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{ad}-\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d(a+a\cos(c+dx))}$$

```
[Out] (cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c
),2^(1/2))/a/d+(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(si
n(1/2*d*x+1/2*c),2^(1/2))/a/d-sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x+c)
)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2847, 2827, 2720, 2719}

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))}\,dx = \frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{ad}+\frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad}-\frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{d(a\cos(c+dx)+a)}$$

```
[In] Int[1/(Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])),x]
```

```
[Out] EllipticE[(c + d*x)/2, 2]/(a*d) + EllipticF[(c + d*x)/2, 2]/(a*d) - (Sqrt[C
os[c + d*x]]*Sin[c + d*x])/(d*(a + a*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2847

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/((a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(b*c - a*d)*(a + b*Sin[e + f*x]))), x] + Dist[d/(a*(b*c - a*d))
, Int[(c + d*Sin[e + f*x])^n*(a*n - b*(n + 1)*Sin[e + f*x]), x], x] /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c
^2 - d^2, 0] && LtQ[n, 0] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d(a+a\cos(c+dx))}-\frac{\int\frac{-\frac{a}{2}-\frac{1}{2}a\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx}{a^2}\\
&= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d(a+a\cos(c+dx))}+\frac{\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{2a}+\frac{\int\sqrt{\cos(c+dx)}\,dx}{2a}\\
&= \frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad}+\frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{ad}-\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d(a+a\cos(c+dx))}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.07 (sec) , antiderivative size = 257, normalized size of antiderivative = 3.67

$$\int\frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))}\,dx$$
$$=\frac{\cos^2\left(\frac{1}{2}(c+dx)\right)\left(\frac{2i\sqrt{2}e^{-i(c+dx)}\left(1+e^{2i(c+dx)}+\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)-e^{i(c+dx)}\left(-1+e^{2ic}\right)\sqrt{\ }\right.}{d\left(-1+e^{2ic}\right)\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}}\right.}{a(1+\cos(c+dx))}$$

```
[In] Integrate[1/(Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])),x]
```

```
[Out] (Cos[(c + d*x)/2]^2*(((2*I)*Sqrt[2]*(1 + E^((2*I)*(c + d*x)) + (-1 + E^((2*
I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^(
(2*I)*(c + d*x))] - E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c
 + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/(d*E^(I*
(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(I*(c + d*x)
)]) - (2*Sqrt[Cos[c + d*x]]*(Csc[c] + Sec[c/2]*Sec[(c + d*x)/2]*Sin[(d*x)/2
]))/d))/(a*(1 + Cos[c + d*x]))
```

Maple [A] (verified)

Time = 1.70 (sec) , antiderivative size = 200, normalized size of antiderivative = 2.86

method	result
default	$\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\left(F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-E\left(\cos\left(\frac{dx}{2}\right.\right.\right.\right.}{a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-}}$

```
[In] int(1/cos(d*x+c)^(1/2)/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] ((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-cos(1/2*d*x+1/2*c
)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(
cos(1/2*d*x+1/2*c),2^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))+2*sin(1/
2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)/a/cos(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1
/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c
)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 184, normalized size of antiderivative = 2.63

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))}\,dx = \frac{\left(-i\sqrt{2}\cos\left(dx+c\right)-i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))+\left(i\sqrt{2}\cos\left(dx+c\right)\right.}{}$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/2*((-I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d
*x + c) + I*sin(d*x + c)) + (I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstras
sPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + (I*sqrt(2)*cos(d*x + c) +
 I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c)
+ I*sin(d*x + c))) + (-I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(
```

```
-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - 2*sqrt(
cos(d*x + c))*sin(d*x + c))/(a*d*cos(d*x + c) + a*d)
```

Sympy [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))}\,dx = \frac{\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)+\sqrt{\cos(c+dx)}}\,dx}{a}$$

```
[In] integrate(1/cos(d*x+c)**(1/2)/(a+a*cos(d*x+c)),x)
[Out] Integral(1/(cos(c + d*x)**(3/2) + sqrt(cos(c + d*x))), x)/a
```

Maxima [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))}\,dx = \int \frac{1}{(a\cos(dx+c)+a)\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)*sqrt(cos(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))}\,dx = \int \frac{1}{(a\cos(dx+c)+a)\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)*sqrt(cos(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))}\,dx = \int \frac{1}{\sqrt{\cos(c+d\,x)}\,(a+a\,\cos(c+d\,x))}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))), x)
```

3.179 $\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 96

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))}\,dx = -\frac{3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad} - \frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{ad} + \frac{3\sin(c+dx)}{ad\sqrt{\cos(c+dx)}} - \frac{\sin(c+dx)}{d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))}$$

```
[Out] -3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/
2*c),2^(1/2))/a/d-(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF
(sin(1/2*d*x+1/2*c),2^(1/2))/a/d+3*sin(d*x+c)/a/d/cos(d*x+c)^(1/2)-sin(d*x+
c)/d/(a+a*cos(d*x+c))/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2847, 2827, 2716, 2719, 2720}

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))}\,dx = -\frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{ad} - \frac{3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad} + \frac{3\sin(c+dx)}{ad\sqrt{\cos(c+dx)}} - \frac{\sin(c+dx)}{d\sqrt{\cos(c+dx)}(a\cos(c+dx)+a)}$$

```
[In] Int[1/(Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])),x]
```

```
[Out] (-3*EllipticE[(c + d*x)/2, 2])/(a*d) - EllipticF[(c + d*x)/2, 2]/(a*d) + (3
*Sin[c + d*x])/(a*d*Sqrt[Cos[c + d*x]]) - Sin[c + d*x]/(d*Sqrt[Cos[c + d*x]
]*(a + a*Cos[c + d*x]))
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2847

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/((a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(b*c - a*d)*(a + b*Sin[e + f*x]))), x] + Dist[d/(a*(b*c - a*d))
, Int[(c + d*Sin[e + f*x])^n*(a*n - b*(n + 1)*Sin[e + f*x]), x], x] /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c
^2 - d^2, 0] && LtQ[n, 0] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{\sin(c+dx)}{d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))} - \frac{\int \frac{-\frac{3a}{2}+\frac{1}{2}a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx}{a^2} \\ &= -\frac{\sin(c+dx)}{d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))} - \frac{\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{2a} + \frac{3\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx}{2a}\end{aligned}$$

$$
\begin{aligned}
&= -\frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{ad} + \frac{3\sin(c+dx)}{ad\sqrt{\cos(c+dx)}} \\
&\quad - \frac{\sin(c+dx)}{d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))} - \frac{3\int\sqrt{\cos(c+dx)}\,dx}{2a} \\
&= -\frac{3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad} - \frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{ad} \\
&\quad + \frac{3\sin(c+dx)}{ad\sqrt{\cos(c+dx)}} - \frac{\sin(c+dx)}{d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.79 (sec) , antiderivative size = 297, normalized size of antiderivative = 3.09

$$
\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))}\,dx
$$

$$
= \frac{\cos^2\left(\frac{1}{2}(c+dx)\right)\left(-\frac{2i\sqrt{2}e^{-i(c+dx)}\left(3\left(1+e^{2i(c+dx)}\right)+3\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)-e^{i(c+dx)}\left(-\right.\right.}{d\left(-1+e^{2ic}\right)\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}}\right.}{a(1+}
$$

```
[In] Integrate[1/(Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])),x]
```

```
[Out] (Cos[(c + d*x)/2]^2*(((-2*I)*Sqrt[2]*(3*(1 + E^((2*I)*(c + d*x))) + 3*(-1 +
 E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/
4, -E^((2*I)*(c + d*x))] - E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^((
2*I)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/(
d*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(I*(c
 + d*x))]) + ((2*Cos[(c - d*x)/2] + Cos[(3*c + d*x)/2] + 3*Cos[(c + 3*d*x)/
2])*Csc[c/2]*Sec[c/2]*Sec[(c + d*x)/2])/(2*d*Sqrt[Cos[c + d*x]])))/(a*(1 +
Cos[c + d*x]))
```

Maple [A] (verified)

Time = 2.54 (sec) , antiderivative size = 253, normalized size of antiderivative = 2.64

method	result
default	$-\frac{-\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\left(F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-3E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.}{a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right.}}$

```
[In] int(1/cos(d*x+c)^(3/2)/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] -(-cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*
(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(co
s(1/2*d*x+1/2*c),2^(1/2))-3*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))+6*(-2*si
n(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)^4-5*(-2*s
in(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)^2)/a/cos
(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/
2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 236, normalized size of antiderivative = 2.46

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))}\,dx = \frac{2\,(3\,\cos(dx+c)+2)\sqrt{\cos(dx+c)}\sin(dx+c)+\left(i\,\sqrt{2}\cos(dx+c)^2+i\,\sqrt{2}\cos(dx+c)\right)\text{weierstrassPInve}}{}$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/2*(2*(3*cos(d*x + c) + 2)*sqrt(cos(d*x + c))*sin(d*x + c) + (I*sqrt(2)*co
s(d*x + c)^2 + I*sqrt(2)*cos(d*x + c))*weierstrassPInverse(-4, 0, cos(d*x +
 c) + I*sin(d*x + c)) + (-I*sqrt(2)*cos(d*x + c)^2 - I*sqrt(2)*cos(d*x + c)
)*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 3*(I*sqrt(2)*
cos(d*x + c)^2 + I*sqrt(2)*cos(d*x + c))*weierstrassZeta(-4, 0, weierstrass
PInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*(-I*sqrt(2)*cos(d*x + c
)^2 - I*sqrt(2)*cos(d*x + c))*weierstrassZeta(-4, 0, weierstrassPInverse(-4
, 0, cos(d*x + c) - I*sin(d*x + c))))/(a*d*cos(d*x + c)^2 + a*d*cos(d*x + c
))
```

Sympy [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))}\,dx = \frac{\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)+\cos^{\frac{3}{2}}(c+dx)}\,dx}{a}$$

```
[In] integrate(1/cos(d*x+c)**(3/2)/(a+a*cos(d*x+c)),x)
```

```
[Out] Integral(1/(cos(c + d*x)**(5/2) + cos(c + d*x)**(3/2)), x)/a
```

Maxima [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))}\,dx = \int \frac{1}{(a\cos(dx+c)+a)\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)*cos(d*x + c)^(3/2)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))}\,dx = \int \frac{1}{(a\cos(dx+c)+a)\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)*cos(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))}\,dx = \int \frac{1}{\cos(c+d\,x)^{3/2}\,(a+a\,\cos(c+d\,x))}\,dx$$

```
[In] int(1/(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))),x)
[Out] int(1/(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))), x)
```

3.180 $\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 124

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))}\,dx = \frac{3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad} + \frac{5\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3ad} + \frac{5\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)} - \frac{3\sin(c+dx)}{ad\sqrt{\cos(c+dx)}} - \frac{\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))}$$

```
[Out] 3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2
*c),2^(1/2))/a/d+5/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icF(sin(1/2*d*x+1/2*c),2^(1/2))/a/d+5/3*sin(d*x+c)/a/d/cos(d*x+c)^(3/2)-sin
(d*x+c)/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))-3*sin(d*x+c)/a/d/cos(d*x+c)^(1/
2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$, Rules used = {2847, 2827, 2716, 2720, 2719}

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))}\,dx = \frac{5\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3ad} + \frac{3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad} - \frac{\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)(a\cos(c+dx)+a)} + \frac{5\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)} - \frac{3\sin(c+dx)}{ad\sqrt{\cos(c+dx)}}$$

```
[In] Int[1/(Cos[c + d*x]^(5/2)*(a + a*Cos[c + d*x])),x]
```

```
[Out] (3*EllipticE[(c + d*x)/2, 2])/(a*d) + (5*EllipticF[(c + d*x)/2, 2])/(3*a*d)
 + (5*Sin[c + d*x])/(3*a*d*Cos[c + d*x]^(3/2)) - (3*Sin[c + d*x])/(a*d*Sqrt
[Cos[c + d*x]]) - Sin[c + d*x]/(d*Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x]))
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2847

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/((a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(b*c - a*d)*(a + b*Sin[e + f*x]))), x] + Dist[d/(a*(b*c - a*d))
, Int[(c + d*Sin[e + f*x])^n*(a*n - b*(n + 1)*Sin[e + f*x]), x], x] /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c
^2 - d^2, 0] && LtQ[n, 0] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))}-\frac{\int\frac{-\frac{5a}{2}+\frac{3}{2}a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx}{a^2}\\ &= -\frac{\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))}-\frac{3\int\frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx}{2a}+\frac{5\int\frac{1}{\cos^{\frac{5}{2}}(c+dx)}\,dx}{2a}\end{aligned}$$

$$= \frac{5\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)} - \frac{3\sin(c+dx)}{ad\sqrt{\cos(c+dx)}} - \frac{\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))} + \frac{5\int\frac{1}{\sqrt{\cos(c+dx)}}dx}{6a} + \frac{3\int\sqrt{\cos(c+dx)}dx}{2a}$$

$$= \frac{3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad} + \frac{5\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3ad} + \frac{5\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)} - \frac{3\sin(c+dx)}{ad\sqrt{\cos(c+dx)}} - \frac{\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 2.91 (sec) , antiderivative size = 332, normalized size of antiderivative = 2.68

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))}\,dx$$

$$= \frac{\cos^2\left(\frac{1}{2}(c+dx)\right)\left(\frac{2i\sqrt{2}e^{-i(c+dx)}\left(9\left(1+e^{2i(c+dx)}\right)+9\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)-5e^{i(c+dx)}\left(-1+\right.\right.}{d\left(-1+e^{2ic}\right)\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}}\right.}{}$$

```
[In] Integrate[1/(Cos[c + d*x]^(5/2)*(a + a*Cos[c + d*x])),x]
```

```
[Out] (Cos[(c + d*x)/2]^2*(((2*I)*Sqrt[2]*(9*(1 + E^((2*I)*(c + d*x))) + 9*(-1 +
E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4
, -E^((2*I)*(c + d*x))] - 5*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^(
(2*I)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/
(d*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(I*(
c + d*x))]) - ((10*Cos[(c - d*x)/2] + 8*Cos[(3*c + d*x)/2] + 4*Cos[(c + 3*d
*x)/2] + 5*Cos[(5*c + 3*d*x)/2] + 9*Cos[(3*c + 5*d*x)/2])*Csc[c/2]*Sec[c/2]
*Sec[(c + d*x)/2])/(4*d*Cos[c + d*x]^(3/2))))/(3*a*(1 + Cos[c + d*x]))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 412 vs. 2(166) = 332.

Time = 3.73 (sec) , antiderivative size = 413, normalized size of antiderivative = 3.33

method	result
default	$\frac{\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\left(10\cos\left(\frac{dx}{2}+\frac{c}{2}\right)F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\sqrt{\frac{1}{2}-\frac{\cos(dx+}{2}}\right.}{}$

```
[In] int(1/cos(d*x+c)^(5/2)/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)/a/cos(1/2*d*x
+1/2*c)/sin(1/2*d*x+1/2*c)^3/(4*sin(1/2*d*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2
+1)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(10*cos(1/2*d*x+1/
2*c)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*
sin(1/2*d*x+1/2*c)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2-18*cos(1/2*d*x+1/2*c)*El
lipticE(cos(1/2*d*x+1/2*c),2^(1/2))*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2
*d*x+1/2*c)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2-36*sin(1/2*d*x+1/2*c)^6-5*cos(1
/2*d*x+1/2*c)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)
*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+9*cos(1/2*d*x+1/2*c)*(sin(1/2*d*x+1/
2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c)
,2^(1/2))+44*sin(1/2*d*x+1/2*c)^4-11*sin(1/2*d*x+1/2*c)^2)/(2*cos(1/2*d*x+1
/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 258, normalized size of antiderivative = 2.08

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))}\,dx = -\frac{2\left(9\cos\left(dx+c\right)^2+4\cos\left(dx+c\right)-2\right)\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)+5\left(i\sqrt{2}\cos\left(dx+c\right)^3+i\sqrt{2}\cos\left(d\right.\right.}{}$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] -1/6*(2*(9*cos(d*x + c)^2 + 4*cos(d*x + c) - 2)*sqrt(cos(d*x + c))*sin(d*x
+ c) + 5*(I*sqrt(2)*cos(d*x + c)^3 + I*sqrt(2)*cos(d*x + c)^2)*weierstrassP
Inverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 5*(-I*sqrt(2)*cos(d*x + c)^
3 - I*sqrt(2)*cos(d*x + c)^2)*weierstrassPInverse(-4, 0, cos(d*x + c) - I*s
in(d*x + c)) + 9*(-I*sqrt(2)*cos(d*x + c)^3 - I*sqrt(2)*cos(d*x + c)^2)*wei
erstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c
))) + 9*(I*sqrt(2)*cos(d*x + c)^3 + I*sqrt(2)*cos(d*x + c)^2)*weierstrassZe
ta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/(a*d*
cos(d*x + c)^3 + a*d*cos(d*x + c)^2)
```

Sympy [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))}\,dx = \frac{\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)+\cos^{\frac{5}{2}}(c+dx)}\,dx}{a}$$

```
[In] integrate(1/cos(d*x+c)**(5/2)/(a+a*cos(d*x+c)),x)
[Out] Integral(1/(cos(c + d*x)**(7/2) + cos(c + d*x)**(5/2)), x)/a
```

Maxima [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))}\,dx = \int \frac{1}{(a\cos(dx+c)+a)\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)*cos(d*x + c)^(5/2)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))}\,dx = \int \frac{1}{(a\cos(dx+c)+a)\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)*cos(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))}\,dx = \int \frac{1}{\cos(c+d\,x)^{5/2}\,(a+a\,\cos(c+d\,x))}\,dx$$

```
[In] int(1/(cos(c + d*x)^(5/2)*(a + a*cos(c + d*x))),x)
[Out] int(1/(cos(c + d*x)^(5/2)*(a + a*cos(c + d*x))), x)
```

3.181 $\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^2} dx$

Optimal result

Integrand size = 23, antiderivative size = 160

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^2} dx = \frac{56E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^2d} - \frac{5\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{a^2d} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{a^2d} + \frac{56\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15a^2d} - \frac{3\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{a^2d(1+\cos(c+dx))} - \frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2}$$

```
[Out] 56/5*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+
1/2*c),2^(1/2))/a^2/d-5*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ell
ipticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/d+56/15*cos(d*x+c)^(3/2)*sin(d*x+c)/
a^2/d-3*cos(d*x+c)^(5/2)*sin(d*x+c)/a^2/d/(1+cos(d*x+c))-1/3*cos(d*x+c)^(7/
2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^2-5*sin(d*x+c)*cos(d*x+c)^(1/2)/a^2/d
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 160, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2844, 3056, 2827, 2715, 2720, 2719}

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^2} dx = -\frac{5\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{a^2d} + \frac{56E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^2d} - \frac{3\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{a^2d(\cos(c+dx)+1)} + \frac{56\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{15a^2d} - \frac{5\sin(c+dx)\sqrt{\cos(c+dx)}}{a^2d} - \frac{\sin(c+dx)\cos^{\frac{7}{2}}(c+dx)}{3d(a\cos(c+dx)+a)^2}$$

```
[In] Int[Cos[c + d*x]^(9/2)/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (56*EllipticE[(c + d*x)/2, 2])/(5*a^2*d) - (5*EllipticF[(c + d*x)/2, 2])/(a
^2*d) - (5*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(a^2*d) + (56*Cos[c + d*x]^(3/2
)*Sin[c + d*x])/(15*a^2*d) - (3*Cos[c + d*x]^(5/2)*Sin[c + d*x])/(a^2*d*(1
+ Cos[c + d*x])) - (Cos[c + d*x]^(7/2)*Sin[c + d*x])/(3*d*(a + a*Cos[c + d*
x])^2)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
```

```
1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{\int \frac{\cos^{\frac{5}{2}}(c+dx)\left(\frac{7a}{2}-\frac{11}{2}a\cos(c+dx)\right)}{a+a\cos(c+dx)}\,dx}{3a^2} \\
&= -\frac{3\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{a^2d(1+\cos(c+dx))} - \frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} \\
&\quad - \frac{\int \cos^{\frac{3}{2}}(c+dx)\left(\frac{45a^2}{2}-28a^2\cos(c+dx)\right)\,dx}{3a^4} \\
&= -\frac{3\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{a^2d(1+\cos(c+dx))} - \frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} \\
&\quad - \frac{15\int \cos^{\frac{3}{2}}(c+dx)\,dx}{2a^2} + \frac{28\int \cos^{\frac{5}{2}}(c+dx)\,dx}{3a^2} \\
&= -\frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{a^2d} + \frac{56\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15a^2d} \\
&\quad - \frac{3\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{a^2d(1+\cos(c+dx))} - \frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} \\
&\quad - \frac{5\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{2a^2} + \frac{28\int \sqrt{\cos(c+dx)}\,dx}{5a^2} \\
&= \frac{56E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^2d} - \frac{5\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{a^2d} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{a^2d} \\
&\quad + \frac{56\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15a^2d} - \frac{3\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{a^2d(1+\cos(c+dx))} - \frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.94 (sec) , antiderivative size = 148, normalized size of antiderivative = 0.92

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx$$

$$= \frac{\sqrt{\cos(c+dx)}\csc^3(c+dx)\left(-240-1186\cos(c+dx)+340\cos(2(c+dx))+207\cos(3(c+dx))-20\cos\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(9/2)/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*Csc[c + d*x]^3*(-240 - 1186*Cos[c + d*x] + 340*Cos[2*(c
 + d*x)] + 207*Cos[3*(c + d*x)] - 20*Cos[4*(c + d*x)] + 3*Cos[5*(c + d*x)]
+ 600*Hypergeometric2F1[1/4, 1/2, 5/4, Cos[c + d*x]^2]*(Sin[c + d*x]^2)^(3/
2) + 1792*Cos[c + d*x]*Hypergeometric2F1[3/4, 5/2, 7/4, Cos[c + d*x]^2]*(Si
n[c + d*x]^2)^(3/2)))/(120*a^2*d)
```

Maple [A] (verified)

Time = 6.38 (sec) , antiderivative size = 283, normalized size of antiderivative = 1.77

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(96\left(\cos^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-352\left(\cos^{8}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+120\left(\cos^{6}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-150\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-}\right.}{30a^2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}$

```
[In] int(cos(d*x+c)^(9/2)/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/30*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(96*cos(1/2*d
*x+1/2*c)^10-352*cos(1/2*d*x+1/2*c)^8+120*cos(1/2*d*x+1/2*c)^6-150*(sin(1/2
*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*
x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^3-336*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^3*EllipticE(cos(1/2*d*x+1
/2*c),2^(1/2))+266*cos(1/2*d*x+1/2*c)^4-135*cos(1/2*d*x+1/2*c)^2+5)/a^2/cos
(1/2*d*x+1/2*c)^3/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(
1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 288, normalized size of antiderivative = 1.80

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{2\left(6\cos(dx+c)^3-8\cos(dx+c)^2-94\cos(dx+c)-75\right)\sqrt{\cos(dx+c)}\sin(dx+c)-75\left(-i\sqrt{2}\cos(dx\right.}{}$$

```
[In] integrate(cos(d*x+c)^(9/2)/(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/30*(2*(6*cos(d*x + c)^3 - 8*cos(d*x + c)^2 - 94*cos(d*x + c) - 75)*sqrt(c
os(d*x + c))*sin(d*x + c) - 75*(-I*sqrt(2)*cos(d*x + c)^2 - 2*I*sqrt(2)*cos
(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x
+ c)) - 75*(I*sqrt(2)*cos(d*x + c)^2 + 2*I*sqrt(2)*cos(d*x + c) + I*sqrt(2)
)*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 168*(-I*sqrt(
```

```
2)*cos(d*x + c)^2 - 2*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(-
4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 168*(I*s
qrt(2)*cos(d*x + c)^2 + 2*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZe
ta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/(a^2*
d*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(9/2)/(a+a*cos(d*x+c))**2,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{9}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^(9/2)/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(9/2)/(a*cos(d*x + c) + a)^2, x)
```

Giac [F]

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{9}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^(9/2)/(a+a*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(9/2)/(a*cos(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\cos(c+d\,x)^{9/2}}{(a+a\,\cos(c+d\,x))^2}\,dx$$

```
[In] int(cos(c + d*x)^(9/2)/(a + a*cos(c + d*x))^2,x)
[Out] int(cos(c + d*x)^(9/2)/(a + a*cos(c + d*x))^2, x)
```

3.182 $\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 138

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{7E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} + \frac{10\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} + \frac{10\sqrt{\cos(c+dx)}\sin(c+dx)}{3a^2d} - \frac{7\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2}$$

```
[Out] -7*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/
2*c),2^(1/2))/a^2/d+10/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*El
lipticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/d-7/3*cos(d*x+c)^(3/2)*sin(d*x+c)/a
^2/d/(1+cos(d*x+c))-1/3*cos(d*x+c)^(5/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^2+10
/3*sin(d*x+c)*cos(d*x+c)^(1/2)/a^2/d
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2844, 3056, 2827, 2719, 2715, 2720}

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{10\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} - \frac{7E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} - \frac{7\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{3a^2d(\cos(c+dx)+1)} + \frac{10\sin(c+dx)\sqrt{\cos(c+dx)}}{3a^2d} - \frac{\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{3d(a\cos(c+dx)+a)^2}$$

```
[In] Int[Cos[c + d*x]^(7/2)/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (-7*EllipticE[(c + d*x)/2, 2])/(a^2*d) + (10*EllipticF[(c + d*x)/2, 2])/(3*
a^2*d) + (10*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(3*a^2*d) - (7*Cos[c + d*x]^(
3/2)*Sin[c + d*x])/(3*a^2*d*(1 + Cos[c + d*x])) - (Cos[c + d*x]^(5/2)*Sin[c
 + d*x])/(3*d*(a + a*Cos[c + d*x])^2)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
```

```
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{\int \frac{\cos^{\frac{3}{2}}(c+dx)\left(\frac{5a}{2}-\frac{9}{2}a\cos(c+dx)\right)}{a+a\cos(c+dx)}\,dx}{3a^2} \\
&= -\frac{7\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} \\
&\quad - \frac{\int \sqrt{\cos(c+dx)}\left(\frac{21a^2}{2}-15a^2\cos(c+dx)\right)dx}{3a^4} \\
&= -\frac{7\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} \\
&\quad - \frac{7\int \sqrt{\cos(c+dx)}\,dx}{2a^2} + \frac{5\int \cos^{\frac{3}{2}}(c+dx)\,dx}{a^2} \\
&= -\frac{7E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} + \frac{10\sqrt{\cos(c+dx)}\sin(c+dx)}{3a^2d} \\
&\quad - \frac{7\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} + \frac{5\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3a^2} \\
&= -\frac{7E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} + \frac{10\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} + \frac{10\sqrt{\cos(c+dx)}\sin(c+dx)}{3a^2d} \\
&\quad - \frac{7\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.61 (sec) , antiderivative size = 136, normalized size of antiderivative = 0.99

$$
\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx
= \frac{\sqrt{\cos(c+dx)}\csc^3(c+dx)\left(15+76\cos(c+dx)-24\cos(2(c+dx))-12\cos(3(c+dx))+\cos(4(c+dx)\right)}{}
$$

```
[In] Integrate[Cos[c + d*x]^(7/2)/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*Csc[c + d*x]^3*(15 + 76*Cos[c + d*x] - 24*Cos[2*(c + d*
x)] - 12*Cos[3*(c + d*x)] + Cos[4*(c + d*x)] - 40*Hypergeometric2F1[1/4, 1/
2, 5/4, Cos[c + d*x]^2]*(Sin[c + d*x]^2)^(3/2) - 112*Cos[c + d*x]*Hypergeom
etric2F1[3/4, 5/2, 7/4, Cos[c + d*x]^2]*(Sin[c + d*x]^2)^(3/2)))/(12*a^2*d)
```

Maple [A] (verified)

Time = 6.20 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.96

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(16\left(\cos^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+12\left(\cos^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+20\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\right.\right.}{6a^2\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2}}$

[In] int(cos(d*x+c)^(7/2)/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)

[Out] -1/6*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(16*cos(1/2*d*x+1/2*c)^8+12*cos(1/2*d*x+1/2*c)^6+20*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^3+42*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^3*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-48*cos(1/2*d*x+1/2*c)^4+21*cos(1/2*d*x+1/2*c)^2-1)/a^2/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)^3/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 278, normalized size of antiderivative = 2.01

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx$$
$$=\frac{2\left(2\cos(dx+c)^2+13\cos(dx+c)+10\right)\sqrt{\cos(dx+c)}\sin(dx+c)-10\left(i\sqrt{2}\cos(dx+c)^2+2i\sqrt{2}\cos(c\right.}{}$$

[In] integrate(cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^2,x, algorithm="fricas")

[Out] 1/6*(2*(2*cos(d*x + c)^2 + 13*cos(d*x + c) + 10)*sqrt(cos(d*x + c))*sin(d*x + c) - 10*(I*sqrt(2)*cos(d*x + c)^2 + 2*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) - 10*(-I*sqrt(2)*cos(d*x + c)^2 - 2*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 21*(I*sqrt(2)*cos(d*x + c)^2 + 2*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 21*(-I*sqrt(2)*cos(d*x + c)^2 - 2*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(7/2)/(a+a*cos(d*x+c))**2,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{7}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(7/2)/(a*cos(d*x + c) + a)^2, x)
```

Giac [F]

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{7}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(7/2)/(a*cos(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{{\cos\left(c+d\,x\right)}^{7/2}}{{\left(a+a\,\cos\left(c+d\,x\right)\right)}^2}\,dx$$

```
[In] int(cos(c + d*x)^(7/2)/(a + a*cos(c + d*x))^2,x)
[Out] int(cos(c + d*x)^(7/2)/(a + a*cos(c + d*x))^2, x)
```

3.183 $\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 112

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} - \frac{5\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2}$$

```
[Out] 4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2
*c),2^(1/2))/a^2/d-5/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elli
pticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/d-1/3*cos(d*x+c)^(3/2)*sin(d*x+c)/d/(
a+a*cos(d*x+c))^2-5/3*sin(d*x+c)*cos(d*x+c)^(1/2)/a^2/d/(1+cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2844, 3056, 2827, 2720, 2719}

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{5\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} + \frac{4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} - \frac{5\sin(c+dx)\sqrt{\cos(c+dx)}}{3a^2d(\cos(c+dx)+1)} - \frac{\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{3d(a\cos(c+dx)+a)^2}$$

```
[In] Int[Cos[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (4*EllipticE[(c + d*x)/2, 2])/(a^2*d) - (5*EllipticF[(c + d*x)/2, 2])/(3*a^
2*d) - (5*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(3*a^2*d*(1 + Cos[c + d*x])) - (
Cos[c + d*x]^(3/2)*Sin[c + d*x])/(3*d*(a + a*Cos[c + d*x])^2)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\text{integral} = -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{\int \frac{\sqrt{\cos(c+dx)}\left(\frac{3a}{2}-\frac{7}{2}a\cos(c+dx)\right)}{a+a\cos(c+dx)}\,dx}{3a^2}$$

$$= -\frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{\int \frac{\frac{5a^2}{2}-6a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx}{3a^4}$$

$$= -\frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{5\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{6a^2} + \frac{2\int\sqrt{\cos(c+dx)}\,dx}{a^2}$$

$$= \frac{4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} - \frac{5\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.50 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.14

$$\int\frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\sqrt{\cos(c+dx)}\csc^3(c+dx)\left(-6-46\cos(c+dx)+14\cos(2(c+dx))+6\cos(3(c+dx))+20\,\text{Hypergeomet}\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*Csc[c + d*x]^3*(-6 - 46*Cos[c + d*x] + 14*Cos[2*(c + d*
x)] + 6*Cos[3*(c + d*x)] + 20*Hypergeometric2F1[1/4, 1/2, 5/4, Cos[c + d*x]
^2]*(Sin[c + d*x]^2)^(3/2) + 64*Cos[c + d*x]*Hypergeometric2F1[3/4, 5/2, 7/
4, Cos[c + d*x]^2]*(Sin[c + d*x]^2)^(3/2)))/(12*a^2*d)
```

Maple [A] (verified)

Time = 5.04 (sec) , antiderivative size = 257, normalized size of antiderivative = 2.29

method	result
default	$\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(24\left(\cos^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+10\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\cos^3\right.\right.}{6a^2\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\ \text{co}}$

```
[In] int(cos(d*x+c)^(5/2)/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(24*cos(1/2*d*x
+1/2*c)^6+10*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)
*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^3+24*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^3*Ell
ipticE(cos(1/2*d*x+1/2*c),2^(1/2))-38*cos(1/2*d*x+1/2*c)^4+15*cos(1/2*d*x+1
```

```
/2*c)^2-1)/a^2/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2
*d*x+1/2*c)^3/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 268, normalized size of antiderivative = 2.39

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{2\,(6\,\cos(dx+c)+5)\sqrt{\cos(dx+c)}\sin(dx+c)+5\left(-i\sqrt{2}\cos(dx+c)^2-2i\sqrt{2}\cos(dx+c)-i\sqrt{2}\right)\dots}{\dots}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -1/6*(2*(6*cos(d*x + c) + 5)*sqrt(cos(d*x + c))*sin(d*x + c) + 5*(-I*sqrt(2
)*cos(d*x + c)^2 - 2*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInvers
e(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 5*(I*sqrt(2)*cos(d*x + c)^2 + 2*I
*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c)
- I*sin(d*x + c)) + 12*(-I*sqrt(2)*cos(d*x + c)^2 - 2*I*sqrt(2)*cos(d*x + c
) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x +
c) + I*sin(d*x + c))) + 12*(I*sqrt(2)*cos(d*x + c)^2 + 2*I*sqrt(2)*cos(d*x
+ c) + I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x
 + c) - I*sin(d*x + c))))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^
2*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)/(a+a*cos(d*x+c))**2,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(5/2)/(a*cos(d*x + c) + a)^2, x)
```

Giac [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(5/2)/(a*cos(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\cos\left(c+d\,x\right)^{5/2}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^2}\,dx$$

```
[In] int(cos(c + d*x)^(5/2)/(a + a*cos(c + d*x))^2,x)
[Out] int(cos(c + d*x)^(5/2)/(a + a*cos(c + d*x))^2, x)
```

3.184 $\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 109

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d}+\frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d}+\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{a^2d(1+\cos(c+dx))}-\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{3d(a+a\cos(c+dx))^2}$$

```
[Out] -(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*
c),2^(1/2))/a^2/d+2/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellip
ticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/d+sin(d*x+c)*cos(d*x+c)^(1/2)/a^2/d/(1
+cos(d*x+c))-1/3*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^2
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2844, 3057, 2827, 2720, 2719}

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d}-\frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d}+\frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{a^2d(\cos(c+dx)+1)}-\frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{3d(a\cos(c+dx)+a)^2}$$

```
[In] Int[Cos[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] -(EllipticE[(c + d*x)/2, 2]/(a^2*d)) + (2*EllipticF[(c + d*x)/2, 2])/(3*a^2
*d) + (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(a^2*d*(1 + Cos[c + d*x])) - (Sqrt[
Cos[c + d*x]]*Sin[c + d*x])/(3*d*(a + a*Cos[c + d*x])^2)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\text{integral} = -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{\int \frac{\frac{a}{2}-\frac{5}{2}a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))}\,dx}{3a^2}$$

$$= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{a^2d(1+\cos(c+dx))} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{3d(a+a\cos(c+dx))^2} - \frac{\int \frac{-a^2+\frac{3}{2}a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx}{3a^4}$$

$$= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{a^2d(1+\cos(c+dx))} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{3d(a+a\cos(c+dx))^2} + \frac{\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3a^2} - \frac{\int \sqrt{\cos(c+dx)}\,dx}{2a^2}$$

$$= -\frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} + \frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{a^2d(1+\cos(c+dx))} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{3d(a+a\cos(c+dx))^2}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.38 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.05

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{2\sqrt{\cos(c+dx)}\csc^3(c+dx)\left(-2\cos(c+dx)+\cos(2(c+dx))+\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},\cos^2(c+\right.\right.}{3a^2d}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (-2*Sqrt[Cos[c + d*x]]*Csc[c + d*x]^3*(-2*Cos[c + d*x] + Cos[2*(c + d*x)] +
 Hypergeometric2F1[1/4, 1/2, 5/4, Cos[c + d*x]^2]*(Sin[c + d*x]^2)^(3/2) +
2*Cos[c + d*x]*Hypergeometric2F1[3/4, 5/2, 7/4, Cos[c + d*x]^2]*(Sin[c + d*
x]^2)^(3/2)))/(3*a^2*d)
```

Maple [A] (verified)

Time = 3.26 (sec) , antiderivative size = 257, normalized size of antiderivative = 2.36

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(12\left(\cos^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+4\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\right.}{6a^2\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}$

```
[In] int(cos(d*x+c)^(3/2)/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/6*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(12*cos(1/2*d*
x+1/2*c)^6+4*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)
*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^3+6*(sin(1/2*d*x+
1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^3*Elli
pticE(cos(1/2*d*x+1/2*c),2^(1/2))-20*cos(1/2*d*x+1/2*c)^4+9*cos(1/2*d*x+1/2
```

```
*c)^2-1)/a^2/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d
*x+1/2*c)^3/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 268, normalized size of antiderivative = 2.46

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx$$
$$= \frac{2\,(3\,\cos(dx+c)+2)\sqrt{\cos(dx+c)}\sin(dx+c) - 2\left(i\sqrt{2}\cos(dx+c)^2 + 2i\sqrt{2}\cos(dx+c) + i\sqrt{2}\right)\mathrm{weiers}}{}$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/6*(2*(3*cos(d*x + c) + 2)*sqrt(cos(d*x + c))*sin(d*x + c) - 2*(I*sqrt(2)*
cos(d*x + c)^2 + 2*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c)) - 2*(-I*sqrt(2)*cos(d*x + c)^2 - 2*I*
sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) -
 I*sin(d*x + c)) - 3*(I*sqrt(2)*cos(d*x + c)^2 + 2*I*sqrt(2)*cos(d*x + c) +
 I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c)
+ I*sin(d*x + c))) - 3*(-I*sqrt(2)*cos(d*x + c)^2 - 2*I*sqrt(2)*cos(d*x + c
) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x +
c) - I*sin(d*x + c))))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d
)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(3/2)/(a+a*cos(d*x+c))**2,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{3}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(3/2)/(a*cos(d*x + c) + a)^2, x)
```

Giac [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{3}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(3/2)/(a*cos(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\cos\left(c+d\,x\right)^{3/2}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^2}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)/(a + a*cos(c + d*x))^2,x)
[Out] int(cos(c + d*x)^(3/2)/(a + a*cos(c + d*x))^2, x)
```

3.185 $\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 57

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^2}\,dx=\frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d}+\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{3d(a+a\cos(c+dx))^2}$$

```
[Out] 1/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1
/2*c),2^(1/2))/a^2/d+1/3*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^2
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2843, 21, 2720}

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^2}\,dx=\frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d}+\frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{3d(a\cos(c+dx)+a)^2}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] EllipticF[(c + d*x)/2, 2]/(3*a^2*d) + (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(3*
d*(a + a*Cos[c + d*x])^2)
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2843

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*
((c + d*Sin[e + f*x])^n/(a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[a*d*n - b*c*
(m + 1) - b*d*(m + n + 1)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e,
 f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && L
tQ[m, -1] && LtQ[0, n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c,
 0]))
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{3d(a+a\cos(c+dx))^2}+\frac{\int\frac{\frac{a}{2}+\frac{1}{2}a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))}\,dx}{3a^2}\\ &= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{3d(a+a\cos(c+dx))^2}+\frac{\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{6a^2}\\ &= \frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d}+\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{3d(a+a\cos(c+dx))^2}\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.28 (sec) , antiderivative size = 71, normalized size of antiderivative = 1.25

$$\int\frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^2}\,dx$$
$$=\frac{\sqrt{\cos(c+dx)}\csc(c+dx)\left(-\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},\cos^2(c+dx)\right)\sqrt{\sin^2(c+dx)}+\tan^2\left(\frac{1}{2}(c+dx\right.\right.}{3a^2d}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*Csc[c + d*x]*(-(Hypergeometric2F1[1/4, 1/2, 5/4, Cos[c
+ d*x]^2]*Sqrt[Sin[c + d*x]^2]) + Tan[(c + d*x)/2]^2))/(3*a^2*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 187 vs. $2(77) = 154$.

Time = 2.90 (sec) , antiderivative size = 188, normalized size of antiderivative = 3.30

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\cos^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+2\left(\cos^4\right.\right.}{6a^2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int(cos(d*x+c)^(1/2)/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/6*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*x+1
/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^3+2*cos(1/2*d*x+1/2*c)^4-3*cos(1/2*d*x+1/
2*c)^2+1)/a^2/cos(1/2*d*x+1/2*c)^3/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2
*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 150, normalized size of antiderivative = 2.63

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^2}\,dx = \frac{\left(-i\sqrt{2}\cos\left(dx+c\right)^2-2i\sqrt{2}\cos\left(dx+c\right)-i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))}{6\left(a^2d\,\mathrm{co}\right.}$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/6*((-I*sqrt(2)*cos(d*x + c)^2 - 2*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*wei
erstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + (I*sqrt(2)*cos(d*x
 + c)^2 + 2*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0,
cos(d*x + c) - I*sin(d*x + c)) + 2*sqrt(cos(d*x + c))*sin(d*x + c))/(a^2*d*
cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)
```

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^2}\,dx = \frac{\int \frac{\sqrt{\cos(c+dx)}}{\cos^2(c+dx)+2\cos(c+dx)+1}\,dx}{a^2}$$

```
[In] integrate(cos(d*x+c)**(1/2)/(a+a*cos(d*x+c))**2,x)
[Out] Integral(sqrt(cos(c + d*x))/(cos(c + d*x)**2 + 2*cos(c + d*x) + 1), x)/a**2
```

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\sqrt{\cos(dx+c)}}{(a\cos(dx+c)+a)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(sqrt(cos(d*x + c))/(a*cos(d*x + c) + a)^2, x)
```

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\sqrt{\cos(dx+c)}}{(a\cos(dx+c)+a)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(sqrt(cos(d*x + c))/(a*cos(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\sqrt{\cos(c+d\,x)}}{(a+a\,\cos(c+d\,x))^2}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(a + a*cos(c + d*x))^2,x)
[Out] int(cos(c + d*x)^(1/2)/(a + a*cos(c + d*x))^2, x)
```

3.186 $\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 109

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2}\,dx = \frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d}+\frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d}-\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{a^2d(1+\cos(c+dx))}-\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{3d(a+a\cos(c+dx))^2}$$

```
[Out] (cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c
),2^(1/2))/a^2/d+2/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icF(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/d-sin(d*x+c)*cos(d*x+c)^(1/2)/a^2/d/(1+
cos(d*x+c))-1/3*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^2
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2845, 3057, 2827, 2720, 2719}

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2}\,dx = \frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d}+\frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d}-\frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{a^2d(\cos(c+dx)+1)}-\frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{3d(a\cos(c+dx)+a)^2}$$

```
[In] Int[1/(Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^2),x]
```

```
[Out] EllipticE[(c + d*x)/2, 2]/(a^2*d) + (2*EllipticF[(c + d*x)/2, 2])/(3*a^2*d)
 - (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(a^2*d*(1 + Cos[c + d*x])) - (Sqrt[Cos
[c + d*x]]*Sin[c + d*x])/(3*d*(a + a*Cos[c + d*x])^2)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\text{integral} = -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{3d(a+a\cos(c+dx))^2} + \frac{\int \frac{\frac{5a}{2}-\frac{1}{2}a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))}\,dx}{3a^2}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{a^2d(1+\cos(c+dx))} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{3d(a+a\cos(c+dx))^2} + \frac{\int \frac{a^2+\frac{3}{2}a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx}{3a^4}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{a^2d(1+\cos(c+dx))} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{3d(a+a\cos(c+dx))^2} + \frac{\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3a^2} + \frac{\int \sqrt{\cos(c+dx)}\,dx}{2a^2}$$

$$= \frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} + \frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{a^2d(1+\cos(c+dx))} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{3d(a+a\cos(c+dx))^2}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 2.41 (sec) , antiderivative size = 304, normalized size of antiderivative = 2.79

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2}\,dx$$

$$= \frac{\cos^4\left(\frac{1}{2}(c+dx)\right)\left(\frac{4i\sqrt{2}e^{-i(c+dx)}\left(3\left(1+e^{2i(c+dx)}\right)+3\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)-2e^{i(c+dx)}\left(-1+\right.\right.}{d\left(-1+e^{2ic}\right)\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}}\right.}{3a^2}$$

```
[In] Integrate[1/(Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^2),x]
```

```
[Out] (Cos[(c + d*x)/2]^4*(((4*I)*Sqrt[2]*(3*(1 + E^((2*I)*(c + d*x))) + 3*(-1 +
E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4
, -E^((2*I)*(c + d*x))] - 2*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^(
(2*I)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/
(d*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(I*(
c + d*x))]) - (Sqrt[Cos[c + d*x]]*(7*Cos[(c - d*x)/2] + 2*Cos[(3*c + d*x)/2
] + 3*Cos[(c + 3*d*x)/2])*Csc[c/2]*Sec[c/2]*Sec[(c + d*x)/2]^3)/(2*d))/(3*
a^2*(1 + Cos[c + d*x])^2)
```

Maple [A] (verified)

Time = 1.87 (sec) , antiderivative size = 257, normalized size of antiderivative = 2.36

method	result
default	$\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(12\left(\cos^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-4\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\cos\right.\right.}{6a^2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin}}$

[In] int(1/cos(d*x+c)^(1/2)/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)

[Out] 1/6*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(12*cos(1/2*d*x+1/2*c)^6-4*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^3+6*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^3*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-16*cos(1/2*d*x+1/2*c)^4+3*cos(1/2*d*x+1/2*c)^2+1)/a^2/cos(1/2*d*x+1/2*c)^3/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 268, normalized size of antiderivative = 2.46

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2}\,dx = -\frac{2\left(3\cos\left(dx+c\right)+4\right)\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)+2\left(i\sqrt{2}\cos\left(dx+c\right)^2+2i\sqrt{2}\cos\left(dx+c\right)+i\sqrt{2}\right)\mathrm{we}}{}$$

[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^2,x, algorithm="fricas")

[Out] -1/6*(2*(3*cos(d*x + c) + 4)*sqrt(cos(d*x + c))*sin(d*x + c) + 2*(I*sqrt(2)*cos(d*x + c)^2 + 2*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 2*(-I*sqrt(2)*cos(d*x + c)^2 - 2*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 3*(-I*sqrt(2)*cos(d*x + c)^2 - 2*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 3*(I*sqrt(2)*cos(d*x + c)^2 + 2*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)

Sympy [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2}\,dx = \frac{\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)+2\cos^{\frac{3}{2}}(c+dx)+\sqrt{\cos(c+dx)}}\,dx}{a^2}$$

```
[In] integrate(1/cos(d*x+c)**(1/2)/(a+a*cos(d*x+c))**2,x)
```

```
[Out] Integral(1/(cos(c + d*x)**(5/2) + 2*cos(c + d*x)**(3/2) + sqrt(cos(c + d*x)
)), x)/a**2
```

Maxima [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^2\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] integrate(1/((a*cos(d*x + c) + a)^2*sqrt(cos(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^2\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((a*cos(d*x + c) + a)^2*sqrt(cos(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2}\,dx = \int \frac{1}{\sqrt{\cos(c+d\,x)}\,(a+a\,\cos(c+d\,x))^2}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^2),x)
```

```
[Out] int(1/(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^2), x)
```

3.187 $\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 136

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2}\,dx = -\frac{4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} - \frac{5\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} + \frac{4\sin(c+dx)}{a^2d\sqrt{\cos(c+dx)}} - \frac{5\sin(c+dx)}{3a^2d\sqrt{\cos(c+dx)}(1+\cos(c+dx))} - \frac{\sin(c+dx)}{3d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2}$$

```
[Out] -4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/
2*c),2^(1/2))/a^2/d-5/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ell
ipticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/d+4*sin(d*x+c)/a^2/d/cos(d*x+c)^(1/2
)-5/3*sin(d*x+c)/a^2/d/(1+cos(d*x+c))/cos(d*x+c)^(1/2)-1/3*sin(d*x+c)/d/(a+
a*cos(d*x+c))^2/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used

$= \{2845, 3057, 2827, 2716, 2719, 2720\}$

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2}\,dx = -\frac{5\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} - \frac{4E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{a^2d} + \frac{4\sin(c+dx)}{a^2d\sqrt{\cos(c+dx)}} - \frac{5\sin(c+dx)}{3a^2d\sqrt{\cos(c+dx)}(\cos(c+dx)+1)} - \frac{\sin(c+dx)}{3d\sqrt{\cos(c+dx)}(a\cos(c+dx)+a)^2}$$

```
[In] Int[1/(Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^2),x]
```

```
[Out] (-4*EllipticE[(c + d*x)/2, 2])/(a^2*d) - (5*EllipticF[(c + d*x)/2, 2])/(3*a
^2*d) + (4*Sin[c + d*x])/(a^2*d*Sqrt[Cos[c + d*x]]) - (5*Sin[c + d*x])/(3*a
^2*d*Sqrt[Cos[c + d*x]]*(1 + Cos[c + d*x])) - Sin[c + d*x]/(3*d*Sqrt[Cos[c
+ d*x]]*(a + a*Cos[c + d*x])^2)
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
```

```
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\sin(c+dx)}{3d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2} + \frac{\int \frac{\frac{7a}{2}-\frac{3}{2}a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))}\,dx}{3a^2} \\
&= -\frac{5\sin(c+dx)}{3a^2d\sqrt{\cos(c+dx)}(1+\cos(c+dx))} \\
&\quad - \frac{\sin(c+dx)}{3d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2} + \frac{\int \frac{6a^2-\frac{5}{2}a^2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx}{3a^4} \\
&= -\frac{5\sin(c+dx)}{3a^2d\sqrt{\cos(c+dx)}(1+\cos(c+dx))} - \frac{\sin(c+dx)}{3d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2} \\
&\quad - \frac{5\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{6a^2} + \frac{2\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx}{a^2} \\
&= -\frac{5\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} + \frac{4\sin(c+dx)}{a^2d\sqrt{\cos(c+dx)}} \\
&\quad - \frac{5\sin(c+dx)}{3a^2d\sqrt{\cos(c+dx)}(1+\cos(c+dx))} \\
&\quad - \frac{\sin(c+dx)}{3d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2} - \frac{2\int \sqrt{\cos(c+dx)}\,dx}{a^2}
\end{aligned}
$$

$$= -\frac{4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} - \frac{5\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} + \frac{4\sin(c+dx)}{a^2d\sqrt{\cos(c+dx)}} - \frac{5\sin(c+dx)}{3a^2d\sqrt{\cos(c+dx)}(1+\cos(c+dx))} - \frac{\sin(c+dx)}{3d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 2.37 (sec) , antiderivative size = 334, normalized size of antiderivative = 2.46

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2}\,dx$$

$$= \frac{\cos^4\left(\frac{1}{2}(c+dx)\right)\left(-\frac{4i\sqrt{2}e^{-i(c+dx)}\left(12\left(1+e^{2i(c+dx)}\right)+12\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)-5e^{i(c+dx)}\left(\right.\right.}{d\left(-1+e^{2ic}\right)\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}}$$

```
[In] Integrate[1/(Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^2),x]
```

```
[Out] (Cos[(c + d*x)/2]^4*(((-4*I)*Sqrt[2]*(12*(1 + E^((2*I)*(c + d*x))) + 12*(-1
 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2,
3/4, -E^((2*I)*(c + d*x))] - 5*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 +
E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]
))/(d*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(
I*(c + d*x))]) + ((29*Cos[(c - d*x)/2] + 19*Cos[(3*c + d*x)/2] + 31*Cos[(c
+ 3*d*x)/2] + 5*Cos[(5*c + 3*d*x)/2] + 12*Cos[(3*c + 5*d*x)/2])*Csc[c/2]*Se
c[c/2]*Sec[(c + d*x)/2]^3)/(4*d*Sqrt[Cos[c + d*x]])))/(3*a^2*(1 + Cos[c + d
*x])^2)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 404 vs. 2(176) = 352.

Time = 3.29 (sec) , antiderivative size = 405, normalized size of antiderivative = 2.98

method	result
default	$-\frac{2\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\left(5F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-12E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\right)\cos\left(\right.}{}$

```
[In] int(1/cos(d*x+c)^(3/2)/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/6*(2*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*s
in(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(5*EllipticF(cos(1/2*d*x+1/
2*c),2^(1/2))-12*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*cos(1/2*d*x+1/2*c)*
```

```
sin(1/2*d*x+1/2*c)^2-2*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)
^2)^(1/2)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(5*EllipticF
(cos(1/2*d*x+1/2*c),2^(1/2))-12*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*cos(
1/2*d*x+1/2*c)-48*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*sin(
1/2*d*x+1/2*c)^6+86*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*si
n(1/2*d*x+1/2*c)^4-37*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*
sin(1/2*d*x+1/2*c)^2)/a^2/cos(1/2*d*x+1/2*c)^3/(-2*sin(1/2*d*x+1/2*c)^4+sin
(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2
)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 318, normalized size of antiderivative = 2.34

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2}\,dx$$
$$= \frac{2\left(12\cos\left(dx+c\right)^2+19\cos\left(dx+c\right)+6\right)\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-5\left(-i\sqrt{2}\cos\left(dx+c\right)^3-2i\sqrt{2}\cos\right.}{}$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/6*(2*(12*cos(d*x + c)^2 + 19*cos(d*x + c) + 6)*sqrt(cos(d*x + c))*sin(d*x
 + c) - 5*(-I*sqrt(2)*cos(d*x + c)^3 - 2*I*sqrt(2)*cos(d*x + c)^2 - I*sqrt(
2)*cos(d*x + c))*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))
- 5*(I*sqrt(2)*cos(d*x + c)^3 + 2*I*sqrt(2)*cos(d*x + c)^2 + I*sqrt(2)*cos(
d*x + c))*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 12*(I
*sqrt(2)*cos(d*x + c)^3 + 2*I*sqrt(2)*cos(d*x + c)^2 + I*sqrt(2)*cos(d*x +
c))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(
d*x + c))) - 12*(-I*sqrt(2)*cos(d*x + c)^3 - 2*I*sqrt(2)*cos(d*x + c)^2 - I
*sqrt(2)*cos(d*x + c))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, co
s(d*x + c) - I*sin(d*x + c))))/(a^2*d*cos(d*x + c)^3 + 2*a^2*d*cos(d*x + c)
^2 + a^2*d*cos(d*x + c))
```

Sympy [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2}\,dx = \frac{\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)+2\cos^{\frac{5}{2}}(c+dx)+\cos^{\frac{3}{2}}(c+dx)}\,dx}{a^2}$$

```
[In] integrate(1/cos(d*x+c)**(3/2)/(a+a*cos(d*x+c))**2,x)
```

```
[Out] Integral(1/(cos(c + d*x)**(7/2) + 2*cos(c + d*x)**(5/2) + cos(c + d*x)**(3/
2)), x)/a**2
```

Maxima [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^2\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^2*cos(d*x + c)^(3/2)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^2\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)^2*cos(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2}\,dx = \int \frac{1}{\cos(c+d\,x)^{3/2}\,(a+a\,\cos(c+d\,x))^2}\,dx$$

```
[In] int(1/(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^2),x)
[Out] int(1/(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^2), x)
```

3.188 $\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^2} dx$

Optimal result

Integrand size = 23, antiderivative size = 162

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^2} dx = \frac{7E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} + \frac{10\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} + \frac{10\sin(c+dx)}{3a^2d\cos^{\frac{3}{2}}(c+dx)} - \frac{7\sin(c+dx)}{a^2d\sqrt{\cos(c+dx)}} - \frac{7\sin(c+dx)}{3a^2d\cos^{\frac{3}{2}}(c+dx)(1+\cos(c+dx))} - \frac{\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2}$$

```
[Out] 7*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2
*c),2^(1/2))/a^2/d+10/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ell
ipticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/d+10/3*sin(d*x+c)/a^2/d/cos(d*x+c)^(
3/2)-7/3*sin(d*x+c)/a^2/d/cos(d*x+c)^(3/2)/(1+cos(d*x+c))-1/3*sin(d*x+c)/d/
cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^2-7*sin(d*x+c)/a^2/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used

$= \{2845, 3057, 2827, 2716, 2720, 2719\}$

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^2}\,dx = \frac{10\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} + \frac{7E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{a^2d} - \frac{7\sin(c+dx)}{3a^2d\cos^{\frac{3}{2}}(c+dx)(\cos(c+dx)+1)} + \frac{10\sin(c+dx)}{3a^2d\cos^{\frac{3}{2}}(c+dx)} - \frac{7\sin(c+dx)}{a^2d\sqrt{\cos(c+dx)}} - \frac{\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)(a\cos(c+dx)+a)^2}$$

```
[In] Int[1/(Cos[c + d*x]^(5/2)*(a + a*Cos[c + d*x])^2),x]
```

```
[Out] (7*EllipticE[(c + d*x)/2, 2])/(a^2*d) + (10*EllipticF[(c + d*x)/2, 2])/(3*a
^2*d) + (10*Sin[c + d*x])/(3*a^2*d*Cos[c + d*x]^(3/2)) - (7*Sin[c + d*x])/(
a^2*d*Sqrt[Cos[c + d*x]]) - (7*Sin[c + d*x])/(3*a^2*d*Cos[c + d*x]^(3/2)*(1
 + Cos[c + d*x])) - Sin[c + d*x]/(3*d*Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x
])^2)
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
```

```
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2} + \frac{\int \frac{\frac{9a}{2}-\frac{5}{2}a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))}\,dx}{3a^2} \\
&= -\frac{7\sin(c+dx)}{3a^2d\cos^{\frac{3}{2}}(c+dx)(1+\cos(c+dx))} \\
&\quad -\frac{\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2} + \frac{\int \frac{15a^2-\frac{21}{2}a^2\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx}{3a^4} \\
&= -\frac{7\sin(c+dx)}{3a^2d\cos^{\frac{3}{2}}(c+dx)(1+\cos(c+dx))} - \frac{\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2} \\
&\quad -\frac{7\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx}{2a^2} + \frac{5\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)}\,dx}{a^2} \\
&= \frac{10\sin(c+dx)}{3a^2d\cos^{\frac{3}{2}}(c+dx)} - \frac{7\sin(c+dx)}{a^2d\sqrt{\cos(c+dx)}} - \frac{7\sin(c+dx)}{3a^2d\cos^{\frac{3}{2}}(c+dx)(1+\cos(c+dx))} \\
&\quad -\frac{\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2} + \frac{5\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3a^2} + \frac{7\int \sqrt{\cos(c+dx)}\,dx}{2a^2} \\
&= \frac{7E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} + \frac{10\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} + \frac{10\sin(c+dx)}{3a^2d\cos^{\frac{3}{2}}(c+dx)} \\
&\quad -\frac{7\sin(c+dx)}{a^2d\sqrt{\cos(c+dx)}} - \frac{7\sin(c+dx)}{3a^2d\cos^{\frac{3}{2}}(c+dx)(1+\cos(c+dx))} - \frac{\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 4.96 (sec) , antiderivative size = 364, normalized size of antiderivative = 2.25

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^2}\,dx = \frac{\cos^4\left(\frac{1}{2}(c+dx)\right)\left(\frac{4i\sqrt{2}e^{-i(c+dx)}\left(21\left(1+e^{2i(c+dx)}\right)+21\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)-10e^{i(c+dx)}\left(-\right.\right.}{d\left(-1+e^{2ic}\right)\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}}\right.}{}$$

```
[In] Integrate[1/(Cos[c + d*x]^(5/2)*(a + a*Cos[c + d*x])^2),x]
```

```
[Out] (Cos[(c + d*x)/2]^4*(((4*I)*Sqrt[2]*(21*(1 + E^((2*I)*(c + d*x))) + 21*(-1
+ E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3
/4, -E^((2*I)*(c + d*x))] - 10*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 +
E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]
))/(d*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(
I*(c + d*x))]) - ((82*Cos[(c - d*x)/2] + 65*Cos[(3*c + d*x)/2] + 68*Cos[(c
+ 3*d*x)/2] + 37*Cos[(5*c + 3*d*x)/2] + 53*Cos[(3*c + 5*d*x)/2] + 10*Cos[(7
*c + 5*d*x)/2] + 21*Cos[(5*c + 7*d*x)/2])*Csc[c/2]*Sec[c/2]*Sec[(c + d*x)/2
]^3)/(8*d*Cos[c + d*x]^(3/2))))/(3*a^2*(1 + Cos[c + d*x])^2)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 412 vs. 2(198) = 396.

Time = 4.55 (sec) , antiderivative size = 413, normalized size of antiderivative = 2.55

method	result
default	$-\frac{\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\frac{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}{3\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^3}+\frac{6\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}-\frac{22\sqrt{\frac{1}{2}-\frac{\cos(d}{}}}{}\right.}{}$

```
[In] int(1/cos(d*x+c)^(5/2)/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)/a^2*(1/3*(-2
*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)^3+6*(-
2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)-22/3*
(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*
d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/
2))+14*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*s
in(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*
c),2^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))-2/3*cos(1/2*d*x+1/2*c)*(
```

```
-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1
/2)^2+16*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)/(-(-2*cos(1/2*d*x+1/2*c)^2
+1)*sin(1/2*d*x+1/2*c)^2)^(1/2))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2
-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 338, normalized size of antiderivative = 2.09

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^2}\,dx = -\frac{2\left(21\cos\left(dx+c\right)^3+32\cos\left(dx+c\right)^2+8\cos\left(dx+c\right)-2\right)\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)+10\left(i\sqrt{2}\cos\left(\right.\right.}{}$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -1/6*(2*(21*cos(d*x + c)^3 + 32*cos(d*x + c)^2 + 8*cos(d*x + c) - 2)*sqrt(c
os(d*x + c))*sin(d*x + c) + 10*(I*sqrt(2)*cos(d*x + c)^4 + 2*I*sqrt(2)*cos(
d*x + c)^3 + I*sqrt(2)*cos(d*x + c)^2)*weierstrassPInverse(-4, 0, cos(d*x +
 c) + I*sin(d*x + c)) + 10*(-I*sqrt(2)*cos(d*x + c)^4 - 2*I*sqrt(2)*cos(d*x
 + c)^3 - I*sqrt(2)*cos(d*x + c)^2)*weierstrassPInverse(-4, 0, cos(d*x + c)
 - I*sin(d*x + c)) + 21*(-I*sqrt(2)*cos(d*x + c)^4 - 2*I*sqrt(2)*cos(d*x +
c)^3 - I*sqrt(2)*cos(d*x + c)^2)*weierstrassZeta(-4, 0, weierstrassPInverse
(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 21*(I*sqrt(2)*cos(d*x + c)^4 + 2*
I*sqrt(2)*cos(d*x + c)^3 + I*sqrt(2)*cos(d*x + c)^2)*weierstrassZeta(-4, 0,
 weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/(a^2*d*cos(d*x
 + c)^4 + 2*a^2*d*cos(d*x + c)^3 + a^2*d*cos(d*x + c)^2)
```

Sympy [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^2}\,dx = \frac{\int \frac{1}{\cos^{\frac{9}{2}}(c+dx)+2\cos^{\frac{7}{2}}(c+dx)+\cos^{\frac{5}{2}}(c+dx)}\,dx}{a^2}$$

```
[In] integrate(1/cos(d*x+c)**(5/2)/(a+a*cos(d*x+c))**2,x)
```

```
[Out] Integral(1/(cos(c + d*x)**(9/2) + 2*cos(c + d*x)**(7/2) + cos(c + d*x)**(5/
2)), x)/a**2
```

Maxima [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^2}\,dx = \int \frac{1}{\left(a\cos\left(dx+c\right)+a\right)^2\cos\left(dx+c\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^2*cos(d*x + c)^(5/2)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^2}\,dx = \int \frac{1}{\left(a\cos\left(dx+c\right)+a\right)^2\cos\left(dx+c\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)^2*cos(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^2}\,dx = \int \frac{1}{{\cos\left(c+d\,x\right)}^{5/2}\,{\left(a+a\,\cos\left(c+d\,x\right)\right)}^2}\,dx$$

```
[In] int(1/(cos(c + d*x)^(5/2)*(a + a*cos(c + d*x))^2),x)
[Out] int(1/(cos(c + d*x)^(5/2)*(a + a*cos(c + d*x))^2), x)
```

3.189 $\int \frac{\cos^{\frac{11}{2}}(c+dx)}{(a+a\cos(c+dx))^3} dx$

Optimal result

Integrand size = 23, antiderivative size = 207

$$\int \frac{\cos^{\frac{11}{2}}(c+dx)}{(a+a\cos(c+dx))^3} dx = \frac{231E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} - \frac{21\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{2a^3d} - \frac{21\sqrt{\cos(c+dx)}\sin(c+dx)}{2a^3d} + \frac{77\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{10a^3d} - \frac{\cos^{\frac{9}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{4\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5ad(a+a\cos(c+dx))^2} - \frac{63\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{10d\,(a^3+a^3\cos(c+dx))}$$

```
[Out] 231/10*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*
x+1/2*c),2^(1/2))/a^3/d-21/2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c
)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^3/d+77/10*cos(d*x+c)^(3/2)*sin(d*
x+c)/a^3/d-1/5*cos(d*x+c)^(9/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^3-4/5*cos(d*x
+c)^(7/2)*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^2-63/10*cos(d*x+c)^(5/2)*sin(d*x+
c)/d/(a^3+a^3*cos(d*x+c))-21/2*sin(d*x+c)*cos(d*x+c)^(1/2)/a^3/d
```

Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used

$= \{2844, 3056, 2827, 2715, 2720, 2719\}$

$$\int \frac{\cos^{\frac{11}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{21\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{2a^3d} + \frac{231E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{10a^3d} - \frac{63\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{10d\,(a^3\cos(c+dx)+a^3)} + \frac{77\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{10a^3d} - \frac{21\sin(c+dx)\sqrt{\cos(c+dx)}}{2a^3d} - \frac{\sin(c+dx)\cos^{\frac{9}{2}}(c+dx)}{5d(a\cos(c+dx)+a)^3} - \frac{4\sin(c+dx)\cos^{\frac{7}{2}}(c+dx)}{5ad(a\cos(c+dx)+a)^2}$$

```
[In] Int[Cos[c + d*x]^(11/2)/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (231*EllipticE[(c + d*x)/2, 2])/(10*a^3*d) - (21*EllipticF[(c + d*x)/2, 2])
/(2*a^3*d) - (21*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(2*a^3*d) + (77*Cos[c + d
*x]^(3/2)*Sin[c + d*x])/(10*a^3*d) - (Cos[c + d*x]^(9/2)*Sin[c + d*x])/(5*d
*(a + a*Cos[c + d*x])^3) - (4*Cos[c + d*x]^(7/2)*Sin[c + d*x])/(5*a*d*(a +
a*Cos[c + d*x])^2) - (63*Cos[c + d*x]^(5/2)*Sin[c + d*x])/(10*d*(a^3 + a^3*
Cos[c + d*x]))
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
```

```
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\cos^{\frac{9}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3}-\frac{\int\frac{\cos^{\frac{7}{2}}(c+dx)\left(\frac{9a}{2}-\frac{15}{2}a\cos(c+dx)\right)}{(a+a\cos(c+dx))^2}\,dx}{5a^2}\\
&=-\frac{\cos^{\frac{9}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3}-\frac{4\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5ad(a+a\cos(c+dx))^2}-\frac{\int\frac{\cos^{\frac{5}{2}}(c+dx)\left(42a^2-\frac{105}{2}a^2\cos(c+dx)\right)}{a+a\cos(c+dx)}\,dx}{15a^4}\\
&=-\frac{\cos^{\frac{9}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3}-\frac{4\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5ad(a+a\cos(c+dx))^2}\\
&\quad-\frac{63\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{10d\left(a^3+a^3\cos(c+dx)\right)}-\frac{\int\cos^{\frac{3}{2}}(c+dx)\left(\frac{945a^3}{4}-\frac{1155}{4}a^3\cos(c+dx)\right)dx}{15a^6}\\
&=-\frac{\cos^{\frac{9}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3}-\frac{4\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5ad(a+a\cos(c+dx))^2}\\
&\quad-\frac{63\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{10d\left(a^3+a^3\cos(c+dx)\right)}-\frac{63\int\cos^{\frac{3}{2}}(c+dx)\,dx}{4a^3}+\frac{77\int\cos^{\frac{5}{2}}(c+dx)\,dx}{4a^3}\\
&=-\frac{21\sqrt{\cos(c+dx)}\sin(c+dx)}{2a^3d}+\frac{77\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{10a^3d}\\
&\quad-\frac{\cos^{\frac{9}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3}-\frac{4\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5ad(a+a\cos(c+dx))^2}\\
&\quad-\frac{63\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{10d\left(a^3+a^3\cos(c+dx)\right)}-\frac{21\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{4a^3}+\frac{231\int\sqrt{\cos(c+dx)}\,dx}{20a^3}
\end{aligned}
$$

$$= \frac{231E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} - \frac{21\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{2a^3d} - \frac{21\sqrt{\cos(c+dx)}\sin(c+dx)}{2a^3d} + \frac{77\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{10a^3d} - \frac{\cos^{\frac{9}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{4\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5ad(a+a\cos(c+dx))^2} - \frac{63\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{10d\left(a^3+a^3\cos(c+dx)\right)}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 2.10 (sec) , antiderivative size = 175, normalized size of antiderivative = 0.85

$$\int \frac{\cos^{\frac{11}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\sqrt{\cos(c+dx)}\csc(c+dx)\left(-((614+2995\cos(c+dx)-766\cos(2(c+dx))-1139\cos(3(c+dx))+290\,\text{co}\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(11/2)/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*Csc[c + d*x]*(-((614 + 2995*Cos[c + d*x] - 766*Cos[2*(c
 + d*x)] - 1139*Cos[3*(c + d*x)] + 290*Cos[4*(c + d*x)] + 127*Cos[5*(c + d*
x)] - 10*Cos[6*(c + d*x)] + Cos[7*(c + d*x)])*Csc[c + d*x]^4) + 1680*Hyperg
eometric2F1[1/4, 1/2, 5/4, Cos[c + d*x]^2]*Sqrt[Sin[c + d*x]^2] + 7040*Cos[
c + d*x]*Hypergeometric2F1[3/4, 7/2, 7/4, Cos[c + d*x]^2]*Sqrt[Sin[c + d*x]
^2]))/(160*a^3*d)
```

Maple [A] (verified)

Time = 11.21 (sec) , antiderivative size = 296, normalized size of antiderivative = 1.43

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(64\left(\cos^{12}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-288\left(\cos^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-76\left(\cos^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-210\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-}\right.}{20a^3\sqrt{}}$

```
[In] int(cos(d*x+c)^(11/2)/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/20*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(64*cos(1/2*d
*x+1/2*c)^12-288*cos(1/2*d*x+1/2*c)^10-76*cos(1/2*d*x+1/2*c)^8-210*(sin(1/2
*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*
x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^5-462*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^5*EllipticE(cos(1/2*d*x+1
/2*c),2^(1/2))+530*cos(1/2*d*x+1/2*c)^6-248*cos(1/2*d*x+1/2*c)^4+19*cos(1/2
```

```
*d*x+1/2*c)^2-1)/a^3/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/c
os(1/2*d*x+1/2*c)^5/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 364, normalized size of antiderivative = 1.76

$$\int \frac{\cos^{\frac{11}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{2\left(4\cos(dx+c)^4-8\cos(dx+c)^3-147\cos(dx+c)^2-238\cos(dx+c)-105\right)\sqrt{\cos(dx+c)}\sin(dx-}{}$$

```
[In] integrate(cos(d*x+c)^(11/2)/(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/20*(2*(4*cos(d*x + c)^4 - 8*cos(d*x + c)^3 - 147*cos(d*x + c)^2 - 238*cos
(d*x + c) - 105)*sqrt(cos(d*x + c))*sin(d*x + c) - 105*(-I*sqrt(2)*cos(d*x
+ c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))
*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) - 105*(I*sqrt(2)
*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + 3*I*sqrt(2)*cos(d*x + c) + I
*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 231*(
-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3*I*sqrt(2)*cos(d*
x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d
*x + c) + I*sin(d*x + c))) - 231*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*co
s(d*x + c)^2 + 3*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(-4, 0,
 weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/(a^3*d*cos(d*x
 + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{11}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(11/2)/(a+a*cos(d*x+c))**3,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{11}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\cos(dx+c)^{\frac{11}{2}}}{(a\cos(dx+c)+a)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(11/2)/(a+a*cos(d*x+c))^3,x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(11/2)/(a*cos(d*x + c) + a)^3, x)
```

Giac [F]

$$\int \frac{\cos^{\frac{11}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\cos(dx+c)^{\frac{11}{2}}}{(a\cos(dx+c)+a)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(11/2)/(a+a*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(11/2)/(a*cos(d*x + c) + a)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{11}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\cos(c+d\,x)^{11/2}}{(a+a\,\cos(c+d\,x))^3}\,dx$$

```
[In] int(cos(c + d*x)^(11/2)/(a + a*cos(c + d*x))^3,x)
[Out] int(cos(c + d*x)^(11/2)/(a + a*cos(c + d*x))^3, x)
```

3.190 $\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 181

$$\begin{aligned}\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = & -\frac{119E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d}+\frac{11\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{2a^3d} \\ & +\frac{11\sqrt{\cos(c+dx)}\sin(c+dx)}{2a^3d}-\frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} \\ & -\frac{2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3ad(a+a\cos(c+dx))^2}-\frac{119\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{30d\left(a^3+a^3\cos(c+dx)\right)}\end{aligned}$$

```
[Out] -119/10*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d
*x+1/2*c),2^(1/2))/a^3/d+11/2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*
c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^3/d-1/5*cos(d*x+c)^(7/2)*sin(d*x
+c)/d/(a+a*cos(d*x+c))^3-2/3*cos(d*x+c)^(5/2)*sin(d*x+c)/a/d/(a+a*cos(d*x+c
))^2-119/30*cos(d*x+c)^(3/2)*sin(d*x+c)/d/(a^3+a^3*cos(d*x+c))+11/2*sin(d*x
+c)*cos(d*x+c)^(1/2)/a^3/d
```

Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 181, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2844, 3056, 2827, 2719, 2715, 2720}

$$\begin{aligned}\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = & \frac{11\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{2a^3d}-\frac{119E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} \\ & -\frac{119\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{30d\left(a^3\cos(c+dx)+a^3\right)}+\frac{11\sin(c+dx)\sqrt{\cos(c+dx)}}{2a^3d} \\ & -\frac{\sin(c+dx)\cos^{\frac{7}{2}}(c+dx)}{5d(a\cos(c+dx)+a)^3}-\frac{2\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{3ad(a\cos(c+dx)+a)^2}\end{aligned}$$

```
[In] Int[Cos[c + d*x]^(9/2)/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (-119*EllipticE[(c + d*x)/2, 2])/(10*a^3*d) + (11*EllipticF[(c + d*x)/2, 2]
)/(2*a^3*d) + (11*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(2*a^3*d) - (Cos[c + d*x
]^(7/2)*Sin[c + d*x])/(5*d*(a + a*Cos[c + d*x])^3) - (2*Cos[c + d*x]^(5/2)*
Sin[c + d*x])/(3*a*d*(a + a*Cos[c + d*x])^2) - (119*Cos[c + d*x]^(3/2)*Sin[
c + d*x])/(30*d*(a^3 + a^3*Cos[c + d*x]))
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
```

```
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{\int \frac{\cos^{\frac{5}{2}}(c+dx)\left(\frac{7a}{2}-\frac{13}{2}a\cos(c+dx)\right)}{(a+a\cos(c+dx))^2}\,dx}{5a^2}\\
&= -\frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3ad(a+a\cos(c+dx))^2} - \frac{\int \frac{\cos^{\frac{3}{2}}(c+dx)\left(25a^2-\frac{69}{2}a^2\cos(c+dx)\right)}{a+a\cos(c+dx)}\,dx}{15a^4}\\
&= -\frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3ad(a+a\cos(c+dx))^2}\\
&\quad - \frac{119\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{30d\left(a^3+a^3\cos(c+dx)\right)} - \frac{\int \sqrt{\cos(c+dx)}\left(\frac{357a^3}{4}-\frac{495}{4}a^3\cos(c+dx)\right)\,dx}{15a^6}\\
&= -\frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3ad(a+a\cos(c+dx))^2}\\
&\quad - \frac{119\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{30d\left(a^3+a^3\cos(c+dx)\right)} - \frac{119\int \sqrt{\cos(c+dx)}\,dx}{20a^3} + \frac{33\int \cos^{\frac{3}{2}}(c+dx)\,dx}{4a^3}\\
&= -\frac{119E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} + \frac{11\sqrt{\cos(c+dx)}\sin(c+dx)}{2a^3d} - \frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3}\\
&\quad - \frac{2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3ad(a+a\cos(c+dx))^2} - \frac{119\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{30d\left(a^3+a^3\cos(c+dx)\right)} + \frac{11\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{4a^3}\\
&= -\frac{119E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} + \frac{11\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{2a^3d} + \frac{11\sqrt{\cos(c+dx)}\sin(c+dx)}{2a^3d}\\
&\quad - \frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3ad(a+a\cos(c+dx))^2} - \frac{119\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{30d\left(a^3+a^3\cos(c+dx)\right)}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.34 (sec) , antiderivative size = 166, normalized size of antiderivative = 0.92

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx$$
$$= \frac{\sqrt{\cos(c+dx)}\csc(c+dx)\left((511+2260\cos(c+dx)-559\cos(2(c+dx))-910\cos(3(c+dx))+245\cos(4\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(9/2)/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*Csc[c + d*x]*((511 + 2260*Cos[c + d*x] - 559*Cos[2*(c +
 d*x)] - 910*Cos[3*(c + d*x)] + 245*Cos[4*(c + d*x)] + 90*Cos[5*(c + d*x)]
- 5*Cos[6*(c + d*x)])*Csc[c + d*x]^4 - 1320*Hypergeometric2F1[1/4, 1/2, 5/4
, Cos[c + d*x]^2]*Sqrt[Sin[c + d*x]^2] - 5440*Cos[c + d*x]*Hypergeometric2F
1[3/4, 7/2, 7/4, Cos[c + d*x]^2]*Sqrt[Sin[c + d*x]^2]))/(240*a^3*d)
```

Maple [A] (verified)

Time = 10.45 (sec) , antiderivative size = 283, normalized size of antiderivative = 1.56

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(160\left(\cos^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+468\left(\cos^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+330\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\right.}{60a^3\sqrt{-2\left(\sin^4\right.}}$

```
[In] int(cos(d*x+c)^(9/2)/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/60*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(160*cos(1/2*
d*x+1/2*c)^10+468*cos(1/2*d*x+1/2*c)^8+330*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/
2*d*x+1/2*c)^5+714*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)
^(1/2)*cos(1/2*d*x+1/2*c)^5*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-1058*cos(
1/2*d*x+1/2*c)^6+474*cos(1/2*d*x+1/2*c)^4-47*cos(1/2*d*x+1/2*c)^2+3)/a^3/(-
2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)^5/sin
(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 354, normalized size of antiderivative = 1.96

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx$$
$$= \frac{2\left(20\cos\left(dx+c\right)^3+237\cos\left(dx+c\right)^2+376\cos\left(dx+c\right)+165\right)\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-165\left(i\sqrt{2}\right.}{}$$

```
[In] integrate(cos(d*x+c)^(9/2)/(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/60*(2*(20*cos(d*x + c)^3 + 237*cos(d*x + c)^2 + 376*cos(d*x + c) + 165)*s
qrt(cos(d*x + c))*sin(d*x + c) - 165*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2
)*cos(d*x + c)^2 + 3*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInvers
e(-4, 0, cos(d*x + c) + I*sin(d*x + c)) - 165*(-I*sqrt(2)*cos(d*x + c)^3 -
3*I*sqrt(2)*cos(d*x + c)^2 - 3*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstr
assPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 357*(I*sqrt(2)*cos(d*x
+ c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + 3*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))
*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x
 + c))) - 357*(-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3*I
*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInver
se(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*
cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(9/2)/(a+a*cos(d*x+c))**3,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{9}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(9/2)/(a+a*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] integrate(cos(d*x + c)^(9/2)/(a*cos(d*x + c) + a)^3, x)
```

Giac [F]

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{9}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^3}\,dx$$

[In] integrate(cos(d*x+c)^(9/2)/(a+a*cos(d*x+c))^3,x, algorithm="giac")

[Out] integrate(cos(d*x + c)^(9/2)/(a*cos(d*x + c) + a)^3, x)

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\cos\left(c+d\,x\right)^{9/2}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^3}\,dx$$

[In] int(cos(c + d*x)^(9/2)/(a + a*cos(c + d*x))^3,x)

[Out] int(cos(c + d*x)^(9/2)/(a + a*cos(c + d*x))^3, x)

3.191 $\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 155

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{49E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} - \frac{13\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{6a^3d} - \frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{8\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{13\sqrt{\cos(c+dx)}\sin(c+dx)}{6d\left(a^3+a^3\cos(c+dx)\right)}$$

```
[Out] 49/10*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x
+1/2*c),2^(1/2))/a^3/d-13/6*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)
*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^3/d-1/5*cos(d*x+c)^(5/2)*sin(d*x+c
)/d/(a+a*cos(d*x+c))^3-8/15*cos(d*x+c)^(3/2)*sin(d*x+c)/a/d/(a+a*cos(d*x+c)
)^2-13/6*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a^3+a^3*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 155, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2844, 3056, 2827, 2720, 2719}

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{13\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{6a^3d} + \frac{49E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} - \frac{13\sin(c+dx)\sqrt{\cos(c+dx)}}{6d\left(a^3\cos(c+dx)+a^3\right)} - \frac{\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{5d(a\cos(c+dx)+a)^3} - \frac{8\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{15ad(a\cos(c+dx)+a)^2}$$

```
[In] Int[Cos[c + d*x]^(7/2)/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (49*EllipticE[(c + d*x)/2, 2])/(10*a^3*d) - (13*EllipticF[(c + d*x)/2, 2])/
(6*a^3*d) - (Cos[c + d*x]^(5/2)*Sin[c + d*x])/(5*d*(a + a*Cos[c + d*x])^3)
- (8*Cos[c + d*x]^(3/2)*Sin[c + d*x])/(15*a*d*(a + a*Cos[c + d*x])^2) - (13
*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(6*d*(a^3 + a^3*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{\int \frac{\cos^{\frac{3}{2}}(c+dx)\left(\frac{5a}{2}-\frac{11}{2}a\cos(c+dx)\right)}{(a+a\cos(c+dx))^2}\,dx}{5a^2} \\
&= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{8\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{\int \frac{\sqrt{\cos(c+dx)}\left(12a^2-\frac{41}{2}a^2\cos(c+dx)\right)}{a+a\cos(c+dx)}\,dx}{15a^4} \\
&= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{8\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} \\
&\quad - \frac{13\sqrt{\cos(c+dx)}\sin(c+dx)}{6d\,(a^3+a^3\cos(c+dx))} - \frac{\int \frac{\frac{65a^3}{4}-\frac{147}{4}a^3\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx}{15a^6} \\
&= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{8\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} \\
&\quad - \frac{13\sqrt{\cos(c+dx)}\sin(c+dx)}{6d\,(a^3+a^3\cos(c+dx))} - \frac{13\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{12a^3} + \frac{49\int \sqrt{\cos(c+dx)}\,dx}{20a^3} \\
&= \frac{49E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} - \frac{13\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{6a^3d} - \frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3} \\
&\quad - \frac{8\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{13\sqrt{\cos(c+dx)}\sin(c+dx)}{6d\,(a^3+a^3\cos(c+dx))}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.29 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.01

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx$$
$$= \frac{\sqrt{\cos(c+dx)}\csc(c+dx)\left(-((241+860\cos(c+dx)-164\cos(2(c+dx))-410\cos(3(c+dx))+115\text{co}\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(7/2)/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*Csc[c + d*x]*(-((241 + 860*Cos[c + d*x] - 164*Cos[2*(c
+ d*x)] - 410*Cos[3*(c + d*x)] + 115*Cos[4*(c + d*x)] + 30*Cos[5*(c + d*x)]
)*Csc[c + d*x]^4) + 520*Hypergeometric2F1[1/4, 1/2, 5/4, Cos[c + d*x]^2]*Sq
rt[Sin[c + d*x]^2] + 2240*Cos[c + d*x]*Hypergeometric2F1[3/4, 7/2, 7/4, Cos
[c + d*x]^2]*Sqrt[Sin[c + d*x]^2]))/(240*a^3*d)
```

Maple [A] (verified)

Time = 10.24 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.74

method	result
default	$\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(348\left(\cos^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+130\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\cos\right.\right.}{60a^3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin}}$

[In] int(cos(d*x+c)^(7/2)/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)

[Out] 1/60*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(348*cos(1/2*d*x+1/2*c)^8+130*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^5+294*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^5*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-578*cos(1/2*d*x+1/2*c)^6+264*cos(1/2*d*x+1/2*c)^4-37*cos(1/2*d*x+1/2*c)^2+3)/a^3/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)^5/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 344, normalized size of antiderivative = 2.22

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{2\left(87\cos\left(dx+c\right)^2+146\cos\left(dx+c\right)+65\right)\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)+65\left(-i\sqrt{2}\cos\left(dx+c\right)^3-3i\sqrt{}\right.}{}$$

[In] integrate(cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^3,x, algorithm="fricas")

[Out] -1/60*(2*(87*cos(d*x + c)^2 + 146*cos(d*x + c) + 65)*sqrt(cos(d*x + c))*sin(d*x + c) + 65*(-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 65*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + 3*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 147*(-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 147*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + 3*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(7/2)/(a+a*cos(d*x+c))**3,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\cos(dx+c)^{\frac{7}{2}}}{(a\cos(dx+c)+a)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^3,x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(7/2)/(a*cos(d*x + c) + a)^3, x)
```

Giac [F]

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\cos(dx+c)^{\frac{7}{2}}}{(a\cos(dx+c)+a)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(7/2)/(a*cos(d*x + c) + a)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\cos(c+d\,x)^{7/2}}{(a+a\,\cos(c+d\,x))^3}\,dx$$

```
[In] int(cos(c + d*x)^(7/2)/(a + a*cos(c + d*x))^3,x)
[Out] int(cos(c + d*x)^(7/2)/(a + a*cos(c + d*x))^3, x)
```

3.192 $\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 155

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{9E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d}+\frac{\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{2a^3d}-\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3}-\frac{2\sqrt{\cos(c+dx)}\sin(c+dx)}{5ad(a+a\cos(c+dx))^2}+\frac{9\sqrt{\cos(c+dx)}\sin(c+dx)}{10d\left(a^3+a^3\cos(c+dx)\right)}$$

```
[Out] -9/10*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x
+1/2*c),2^(1/2))/a^3/d+1/2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*
EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^3/d-1/5*cos(d*x+c)^(3/2)*sin(d*x+c)
/d/(a+a*cos(d*x+c))^3-2/5*sin(d*x+c)*cos(d*x+c)^(1/2)/a/d/(a+a*cos(d*x+c))^
2+9/10*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a^3+a^3*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 155, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2844, 3056, 3057, 2827, 2720, 2719}

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{2a^3d}-\frac{9E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d}+\frac{9\sin(c+dx)\sqrt{\cos(c+dx)}}{10d\left(a^3\cos(c+dx)+a^3\right)}-\frac{\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{5d(a\cos(c+dx)+a)^3}-\frac{2\sin(c+dx)\sqrt{\cos(c+dx)}}{5ad(a\cos(c+dx)+a)^2}$$

```
[In] Int[Cos[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (-9*EllipticE[(c + d*x)/2, 2])/(10*a^3*d) + EllipticF[(c + d*x)/2, 2]/(2*a^
3*d) - (Cos[c + d*x]^(3/2)*Sin[c + d*x])/(5*d*(a + a*Cos[c + d*x])^3) - (2*
Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(5*a*d*(a + a*Cos[c + d*x])^2) + (9*Sqrt[C
os[c + d*x]]*Sin[c + d*x])/(10*d*(a^3 + a^3*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3}-\frac{\int\frac{\sqrt{\cos(c+dx)}\left(\frac{3a}{2}-\frac{9}{2}a\cos(c+dx)\right)}{(a+a\cos(c+dx))^2}\,dx}{5a^2}\\
&= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3}-\frac{2\sqrt{\cos(c+dx)}\sin(c+dx)}{5ad(a+a\cos(c+dx))^2}-\frac{\int\frac{3a^2-\frac{21}{2}a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))}\,dx}{15a^4}\\
&= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3}-\frac{2\sqrt{\cos(c+dx)}\sin(c+dx)}{5ad(a+a\cos(c+dx))^2}\\
&\quad+\frac{9\sqrt{\cos(c+dx)}\sin(c+dx)}{10d\left(a^3+a^3\cos(c+dx)\right)}-\frac{\int\frac{-\frac{15a^3}{4}+\frac{27}{4}a^3\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx}{15a^6}\\
&= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3}-\frac{2\sqrt{\cos(c+dx)}\sin(c+dx)}{5ad(a+a\cos(c+dx))^2}\\
&\quad+\frac{9\sqrt{\cos(c+dx)}\sin(c+dx)}{10d\left(a^3+a^3\cos(c+dx)\right)}+\frac{\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{4a^3}-\frac{9\int\sqrt{\cos(c+dx)}\,dx}{20a^3}\\
&= -\frac{9E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d}+\frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{2a^3d}-\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\cos(c+dx))^3}\\
&\quad-\frac{2\sqrt{\cos(c+dx)}\sin(c+dx)}{5ad(a+a\cos(c+dx))^2}+\frac{9\sqrt{\cos(c+dx)}\sin(c+dx)}{10d\left(a^3+a^3\cos(c+dx)\right)}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.02 (sec) , antiderivative size = 146, normalized size of antiderivative = 0.94

$$\int\frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx$$

$$=\frac{\sqrt{\cos(c+dx)}\csc(c+dx)\left((259+120\cos(c+dx)+84\cos(2(c+dx))-280\cos(3(c+dx))+105\cos(4(c\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*Csc[c + d*x]*((259 + 120*Cos[c + d*x] + 84*Cos[2*(c + d
*x)] - 280*Cos[3*(c + d*x)] + 105*Cos[4*(c + d*x)])*Csc[c + d*x]^4 - 280*Hy
pergeometric2F1[1/4, 1/2, 5/4, Cos[c + d*x]^2]*Sqrt[Sin[c + d*x]^2] - 960*C
os[c + d*x]*Hypergeometric2F1[3/4, 7/2, 7/4, Cos[c + d*x]^2]*Sqrt[Sin[c + d
*x]^2]))/(560*a^3*d)
```

Maple [A] (verified)

Time = 9.68 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.74

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(36\left(\cos^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+10\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\right.}{20a^3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\mathrm{si}}}$

```
[In] int(cos(d*x+c)^(5/2)/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/20*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(36*cos(1/2*d
*x+1/2*c)^8+10*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/
2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^5+18*(sin(1/2*d
*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^5*E
llipticE(cos(1/2*d*x+1/2*c),2^(1/2))-66*cos(1/2*d*x+1/2*c)^6+38*cos(1/2*d*x
+1/2*c)^4-9*cos(1/2*d*x+1/2*c)^2+1)/a^3/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*
x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)^5/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/
2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 344, normalized size of antiderivative = 2.22

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx$$
$$=\frac{2\left(9\cos\left(dx+c\right)^2+12\cos\left(dx+c\right)+5\right)\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-5\left(i\sqrt{2}\cos\left(dx+c\right)^3+3i\sqrt{2}\cos\left(d\right.\right.}{}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/20*(2*(9*cos(d*x + c)^2 + 12*cos(d*x + c) + 5)*sqrt(cos(d*x + c))*sin(d*x
 + c) - 5*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + 3*I*sqrt
(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) + I*s
in(d*x + c)) - 5*(-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 -
3*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x +
```

```
c) - I*sin(d*x + c)) - 9*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x +
c)^2 + 3*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(-4, 0, weierst
rassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 9*(-I*sqrt(2)*cos(d*x
 + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3*I*sqrt(2)*cos(d*x + c) - I*sqrt(2)
)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*
x + c))))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x
+ c) + a^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)/(a+a*cos(d*x+c))**3,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^3,x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(5/2)/(a*cos(d*x + c) + a)^3, x)
```

Giac [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(5/2)/(a*cos(d*x + c) + a)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx=\int \frac{\cos\left(c+d\,x\right)^{5/2}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^3}\,dx$$

```
[In] int(cos(c + d*x)^(5/2)/(a + a*cos(c + d*x))^3,x)
[Out] int(cos(c + d*x)^(5/2)/(a + a*cos(c + d*x))^3, x)
```

3.193 $\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 155

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} + \frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{6a^3d} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{5d(a+a\cos(c+dx))^3} + \frac{4\sqrt{\cos(c+dx)}\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{10d\,(a^3+a^3\cos(c+dx))}$$

```
[Out] -1/10*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x
+1/2*c),2^(1/2))/a^3/d+1/6*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*
EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^3/d-1/5*sin(d*x+c)*cos(d*x+c)^(1/2)
/d/(a+a*cos(d*x+c))^3+4/15*sin(d*x+c)*cos(d*x+c)^(1/2)/a/d/(a+a*cos(d*x+c))
^2+1/10*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a^3+a^3*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 155, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2844, 3057, 2827, 2720, 2719}

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{6a^3d} - \frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} + \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{10d\,(a^3\cos(c+dx)+a^3)} + \frac{4\sin(c+dx)\sqrt{\cos(c+dx)}}{15ad(a\cos(c+dx)+a)^2} - \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{5d(a\cos(c+dx)+a)^3}$$

```
[In] Int[Cos[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] -1/10*EllipticE[(c + d*x)/2, 2]/(a^3*d) + EllipticF[(c + d*x)/2, 2]/(6*a^3*
d) - (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(5*d*(a + a*Cos[c + d*x])^3) + (4*Sq
rt[Cos[c + d*x]]*Sin[c + d*x])/(15*a*d*(a + a*Cos[c + d*x])^2) + (Sqrt[Cos[
c + d*x]]*Sin[c + d*x])/(10*d*(a^3 + a^3*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\text{integral} = -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{5d(a+a\cos(c+dx))^3} - \frac{\int \frac{\frac{a}{2}-\frac{7}{2}a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2}\,dx}{5a^2}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{5d(a+a\cos(c+dx))^3} + \frac{4\sqrt{\cos(c+dx)}\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{\int \frac{-\frac{a^2}{2}-2a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))}\,dx}{15a^4}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{5d(a+a\cos(c+dx))^3} + \frac{4\sqrt{\cos(c+dx)}\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{10d(a^3+a^3\cos(c+dx))} - \frac{\int \frac{-\frac{5a^3}{4}+\frac{3}{4}a^3\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx}{15a^6}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{5d(a+a\cos(c+dx))^3} + \frac{4\sqrt{\cos(c+dx)}\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{10d(a^3+a^3\cos(c+dx))} - \frac{\int \sqrt{\cos(c+dx)}\,dx}{20a^3} + \frac{\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{12a^3}$$

$$= -\frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} + \frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{6a^3d} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{5d(a+a\cos(c+dx))^3} + \frac{4\sqrt{\cos(c+dx)}\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{10d(a^3+a^3\cos(c+dx))}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.08 (sec) , antiderivative size = 146, normalized size of antiderivative = 0.94

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{\sqrt{\cos(c+dx)}\csc(c+dx)\left((497-1160\cos(c+dx)+812\cos(2(c+dx))-280\cos(3(c+dx))+35\cos(\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] -1/1680*(Sqrt[Cos[c + d*x]]*Csc[c + d*x]*((497 - 1160*Cos[c + d*x] + 812*Co
s[2*(c + d*x)] - 280*Cos[3*(c + d*x)] + 35*Cos[4*(c + d*x)])*Csc[c + d*x]^4
 + 280*Hypergeometric2F1[1/4, 1/2, 5/4, Cos[c + d*x]^2]*Sqrt[Sin[c + d*x]^2
] + 320*Cos[c + d*x]*Hypergeometric2F1[3/4, 7/2, 7/4, Cos[c + d*x]^2]*Sqrt[
Sin[c + d*x]^2]))/(a^3*d)
```

Maple [A] (verified)

Time = 4.30 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.74

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(12\left(\cos^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+10\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\right.}{60a^3\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^5\sqrt{-2\left(\sin^4\right.}}$

```
[In] int(cos(d*x+c)^(3/2)/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/60*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(12*cos(1/2*d
*x+1/2*c)^8+10*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/
2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^5+6*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^5*El
lipticE(cos(1/2*d*x+1/2*c),2^(1/2))-2*cos(1/2*d*x+1/2*c)^6-24*cos(1/2*d*x+1
/2*c)^4+17*cos(1/2*d*x+1/2*c)^2-3)/a^3/cos(1/2*d*x+1/2*c)^5/(-2*sin(1/2*d*x
+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2
*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 344, normalized size of antiderivative = 2.22

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{2\left(3\cos(dx+c)^2+14\cos(dx+c)+5\right)\sqrt{\cos(dx+c)}\sin(dx+c)-5\left(i\sqrt{2}\cos(dx+c)^3+3i\sqrt{2}\cos(d\right.}{}$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/60*(2*(3*cos(d*x + c)^2 + 14*cos(d*x + c) + 5)*sqrt(cos(d*x + c))*sin(d*x
 + c) - 5*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + 3*I*sqrt
(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) + I*s
in(d*x + c)) - 5*(-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 -
3*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x +
c) - I*sin(d*x + c)) - 3*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x +
c)^2 + 3*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(-4, 0, weierst
rassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*(-I*sqrt(2)*cos(d*x
 + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3*I*sqrt(2)*cos(d*x + c) - I*sqrt(2)
)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*
x + c))))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x
+ c) + a^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(3/2)/(a+a*cos(d*x+c))**3,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{3}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^3,x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(3/2)/(a*cos(d*x + c) + a)^3, x)
```

Giac [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{3}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(3/2)/(a*cos(d*x + c) + a)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\cos\left(c+d\,x\right)^{3/2}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^3}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)/(a + a*cos(c + d*x))^3,x)
[Out] int(cos(c + d*x)^(3/2)/(a + a*cos(c + d*x))^3, x)
```

3.194 $\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^3} dx$

Optimal result

Integrand size = 23, antiderivative size = 155

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^3} dx = \frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} + \frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{6a^3d} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{5d(a+a\cos(c+dx))^3} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{15ad(a+a\cos(c+dx))^2} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{10d\left(a^3+a^3\cos(c+dx)\right)}$$

```
[Out] 1/10*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+
1/2*c),2^(1/2))/a^3/d+1/6*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*E
llipticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^3/d+1/5*sin(d*x+c)*cos(d*x+c)^(1/2)/
d/(a+a*cos(d*x+c))^3+1/15*sin(d*x+c)*cos(d*x+c)^(1/2)/a/d/(a+a*cos(d*x+c))^
2-1/10*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a^3+a^3*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.36 (sec) , antiderivative size = 155, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2843, 3057, 2827, 2720, 2719}

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^3} dx = \frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{6a^3d} + \frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} - \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{10d\left(a^3\cos(c+dx)+a^3\right)} + \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{15ad(a\cos(c+dx)+a)^2} + \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{5d(a\cos(c+dx)+a)^3}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] EllipticE[(c + d*x)/2, 2]/(10*a^3*d) + EllipticF[(c + d*x)/2, 2]/(6*a^3*d)
+ (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(5*d*(a + a*Cos[c + d*x])^3) + (Sqrt[Co
s[c + d*x]]*Sin[c + d*x])/(15*a*d*(a + a*Cos[c + d*x])^2) - (Sqrt[Cos[c + d
*x]]*Sin[c + d*x])/(10*d*(a^3 + a^3*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2843

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*
((c + d*Sin[e + f*x])^n/(a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[a*d*n - b*c*
(m + 1) - b*d*(m + n + 1)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e,
 f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && L
tQ[m, -1] && LtQ[0, n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c,
 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{5d(a+a\cos(c+dx))^3}+\frac{\int \frac{\frac{a}{2}+\frac{3}{2}a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2}\,dx}{5a^2}\\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{5d(a+a\cos(c+dx))^3}+\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{15ad(a+a\cos(c+dx))^2}+\frac{\int \frac{2a^2+\frac{1}{2}a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))}\,dx}{15a^4}\\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{5d(a+a\cos(c+dx))^3}+\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{15ad(a+a\cos(c+dx))^2}\\
&\quad -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{10d\left(a^3+a^3\cos(c+dx)\right)}+\frac{\int \frac{\frac{5a^3}{4}+\frac{3}{4}a^3\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx}{15a^6}\\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{5d(a+a\cos(c+dx))^3}+\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{15ad(a+a\cos(c+dx))^2}\\
&\quad -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{10d\left(a^3+a^3\cos(c+dx)\right)}+\frac{\int \sqrt{\cos(c+dx)}\,dx}{20a^3}+\frac{\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{12a^3}\\
&= \frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d}+\frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{6a^3d}+\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{5d(a+a\cos(c+dx))^3}\\
&\quad +\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{15ad(a+a\cos(c+dx))^2}-\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{10d\left(a^3+a^3\cos(c+dx)\right)}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 2.24 (sec) , antiderivative size = 139, normalized size of antiderivative = 0.90

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^3}\,dx = -\frac{\sqrt{\cos(c+dx)}\csc(c+dx)\left(\frac{1}{8}(-847+1440\cos(c+dx)-532\cos(2(c+dx))+35\cos(4(c+dx)))\csc^4(\right.}{}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] -1/210*(Sqrt[Cos[c + d*x]]*Csc[c + d*x]*(((-847 + 1440*Cos[c + d*x] - 532*C
os[2*(c + d*x)] + 35*Cos[4*(c + d*x)])*Csc[c + d*x]^4)/8 + 35*Hypergeometri
c2F1[1/4, 1/2, 5/4, Cos[c + d*x]^2]*Sqrt[Sin[c + d*x]^2] - 40*Cos[c + d*x]*
Hypergeometric2F1[3/4, 7/2, 7/4, Cos[c + d*x]^2]*Sqrt[Sin[c + d*x]^2]))/(a^
3*d)
```

Maple [A] (verified)

Time = 4.19 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.74

method	result
default	$\frac{\sqrt{\left(2\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(12\left(\cos^{8}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-10\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\cos^{5}\right.\right.}{60a^{3}\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^{5}\sqrt{-2\left(\sin^{4}\left(\frac{dx}{2}+\right.\right.}}$

[In] int(cos(d*x+c)^(1/2)/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)

[Out] 1/60*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(12*cos(1/2*d*x+1/2*c)^8-10*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^5+6*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^5*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-22*cos(1/2*d*x+1/2*c)^6+6*cos(1/2*d*x+1/2*c)^4+7*cos(1/2*d*x+1/2*c)^2-3)/a^3/cos(1/2*d*x+1/2*c)^5/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 344, normalized size of antiderivative = 2.22

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^3}\,dx = -\frac{2\left(3\cos\left(dx+c\right)^{2}+4\cos\left(dx+c\right)-5\right)\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)+5\left(i\sqrt{2}\cos\left(dx+c\right)^{3}+3i\sqrt{2}\cos\left(d\right.\right.}{}$$

[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^3,x, algorithm="fricas")

[Out] -1/60*(2*(3*cos(d*x + c)^2 + 4*cos(d*x + c) - 5)*sqrt(cos(d*x + c))*sin(d*x + c) + 5*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + 3*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 5*(-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 3*(-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 3*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + 3*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^3}\,dx = \frac{\int \frac{\sqrt{\cos(c+dx)}}{\cos^3(c+dx)+3\cos^2(c+dx)+3\cos(c+dx)+1}\,dx}{a^3}$$

```
[In] integrate(cos(d*x+c)**(1/2)/(a+a*cos(d*x+c))**3,x)
[Out] Integral(sqrt(cos(c + d*x))/(cos(c + d*x)**3 + 3*cos(c + d*x)**2 + 3*cos(c
+ d*x) + 1), x)/a**3
```

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\sqrt{\cos(dx+c)}}{(a\cos(dx+c)+a)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^3,x, algorithm="maxima")
[Out] integrate(sqrt(cos(d*x + c))/(a*cos(d*x + c) + a)^3, x)
```

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\sqrt{\cos(dx+c)}}{(a\cos(dx+c)+a)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate(sqrt(cos(d*x + c))/(a*cos(d*x + c) + a)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\sqrt{\cos(c+d\,x)}}{(a+a\,\cos(c+d\,x))^3}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(a + a*cos(c + d*x))^3,x)
[Out] int(cos(c + d*x)^(1/2)/(a + a*cos(c + d*x))^3, x)
```

3.195 $\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 155

$$\begin{aligned}\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3}\,dx &= \frac{9E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d}+\frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{2a^3d}\\ &\quad-\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{5d(a+a\cos(c+dx))^3}\\ &\quad-\frac{2\sqrt{\cos(c+dx)}\sin(c+dx)}{5ad(a+a\cos(c+dx))^2}\\ &\quad-\frac{9\sqrt{\cos(c+dx)}\sin(c+dx)}{10d\left(a^3+a^3\cos(c+dx)\right)}\end{aligned}$$

```
[Out] 9/10*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+
1/2*c),2^(1/2))/a^3/d+1/2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*E
llipticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^3/d-1/5*sin(d*x+c)*cos(d*x+c)^(1/2)/
d/(a+a*cos(d*x+c))^3-2/5*sin(d*x+c)*cos(d*x+c)^(1/2)/a/d/(a+a*cos(d*x+c))^2
-9/10*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a^3+a^3*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 155, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used

$= \{2845, 3057, 2827, 2720, 2719\}$

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3}\,dx = \frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{2a^3d} + \frac{9E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} - \frac{9\sin(c+dx)\sqrt{\cos(c+dx)}}{10d\left(a^3\cos(c+dx)+a^3\right)} - \frac{2\sin(c+dx)\sqrt{\cos(c+dx)}}{5ad(a\cos(c+dx)+a)^2} - \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{5d(a\cos(c+dx)+a)^3}$$

```
[In] Int[1/(Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^3),x]
```

```
[Out] (9*EllipticE[(c + d*x)/2, 2])/(10*a^3*d) + EllipticF[(c + d*x)/2, 2]/(2*a^3
*d) - (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(5*d*(a + a*Cos[c + d*x])^3) - (2*S
qrt[Cos[c + d*x]]*Sin[c + d*x])/(5*a*d*(a + a*Cos[c + d*x])^2) - (9*Sqrt[Co
s[c + d*x]]*Sin[c + d*x])/(10*d*(a^3 + a^3*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{5d(a+a\cos(c+dx))^3}+\frac{\int\frac{\frac{9a}{2}-\frac{3}{2}a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2}\,dx}{5a^2}\\
&=-\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{5d(a+a\cos(c+dx))^3}-\frac{2\sqrt{\cos(c+dx)}\sin(c+dx)}{5ad(a+a\cos(c+dx))^2}+\frac{\int\frac{\frac{21a^2}{2}-3a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))}\,dx}{15a^4}\\
&=-\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{5d(a+a\cos(c+dx))^3}-\frac{2\sqrt{\cos(c+dx)}\sin(c+dx)}{5ad(a+a\cos(c+dx))^2}\\
&\quad-\frac{9\sqrt{\cos(c+dx)}\sin(c+dx)}{10d\left(a^3+a^3\cos(c+dx)\right)}+\frac{\int\frac{\frac{15a^3}{4}+\frac{27}{4}a^3\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx}{15a^6}\\
&=-\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{5d(a+a\cos(c+dx))^3}-\frac{2\sqrt{\cos(c+dx)}\sin(c+dx)}{5ad(a+a\cos(c+dx))^2}\\
&\quad-\frac{9\sqrt{\cos(c+dx)}\sin(c+dx)}{10d\left(a^3+a^3\cos(c+dx)\right)}+\frac{\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{4a^3}+\frac{9\int\sqrt{\cos(c+dx)}\,dx}{20a^3}\\
&=\frac{9E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d}+\frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{2a^3d}-\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{5d(a+a\cos(c+dx))^3}\\
&\quad-\frac{2\sqrt{\cos(c+dx)}\sin(c+dx)}{5ad(a+a\cos(c+dx))^2}-\frac{9\sqrt{\cos(c+dx)}\sin(c+dx)}{10d\left(a^3+a^3\cos(c+dx)\right)}
\end{aligned}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 4.94 (sec) , antiderivative size = 304, normalized size of antiderivative = 1.96

$$\int\frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3}\,dx$$

$$=\frac{\cos^6\left(\frac{1}{2}(c+dx)\right)\csc\left(\frac{c}{2}\right)\sec\left(\frac{c}{2}\right)\left(\frac{36(3\cos(c-dx-\arctan(\tan(c)))+\cos(c+dx+\arctan(\tan(c))))\sec(c)}{\sqrt{\sec^2(c)}}-\cos(c+dx)\left(62\cos\left(\frac{1}{2}\right.\right.\right.}{}$$

```
[In] Integrate[1/(Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^3),x]
```

```
[Out] (Cos[(c + d*x)/2]^6*Csc[c/2]*Sec[c/2]*((36*(3*Cos[c - d*x - ArcTan[Tan[c]]]
 + Cos[c + d*x + ArcTan[Tan[c]]])*Sec[c])/Sqrt[Sec[c]^2] - Cos[c + d*x]*(62
*Cos[(c - d*x)/2] + 28*Cos[(3*c + d*x)/2] + 40*Cos[(c + 3*d*x)/2] + 5*Cos[(
5*c + 3*d*x)/2] + 9*Cos[(3*c + 5*d*x)/2])*Sec[(c + d*x)/2]^5 - (80*Cos[c +
d*x]*Sqrt[Cos[d*x - ArcTan[Cot[c]]]^2]*HypergeometricPFQ[{1/4, 1/2}, {5/4},
 Sin[d*x - ArcTan[Cot[c]]]^2]*Sec[d*x - ArcTan[Cot[c]]])/Sqrt[Csc[c]^2] - (
72*HypergeometricPFQ[{-1/2, -1/4}, {3/4}, Cos[d*x + ArcTan[Tan[c]]]^2]*Sin[
d*x + ArcTan[Tan[c]]]*Tan[c])/(Sqrt[Sec[c]^2]*Sqrt[Sin[d*x + ArcTan[Tan[c]]
]^2])))/(40*a^3*d*Sqrt[Cos[c + d*x]]*(1 + Cos[c + d*x])^3)
```

Maple [A] (verified)

Time = 2.31 (sec) , antiderivative size = 268, normalized size of antiderivative = 1.73

method	result
default	$\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(36\left(\cos^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-10\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\mathrm{co}\right.\right.}{20a^3\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^5\sqrt{-2\left(\sin^4\left(\frac{dx}{2}\right.\right.}}$

```
[In] int(1/cos(d*x+c)^(1/2)/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/20*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(36*cos(1/2*d*
x+1/2*c)^8-10*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2
)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^5+18*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^5*El
lipticE(cos(1/2*d*x+1/2*c),2^(1/2))-46*cos(1/2*d*x+1/2*c)^6+8*cos(1/2*d*x+1
/2*c)^4+cos(1/2*d*x+1/2*c)^2+1)/a^3/cos(1/2*d*x+1/2*c)^5/(-2*sin(1/2*d*x+1/
2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)
^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 344, normalized size of antiderivative = 2.22

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3}\,dx =$$
$$-\frac{2\left(9\cos\left(dx+c\right)^2+22\cos\left(dx+c\right)+15\right)\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)+5\left(i\sqrt{2}\cos\left(dx+c\right)^3+3i\sqrt{2}\,\mathrm{co}\right.}{}$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] -1/20*(2*(9*cos(d*x + c)^2 + 22*cos(d*x + c) + 15)*sqrt(cos(d*x + c))*sin(d
*x + c) + 5*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + 3*I*sq
rt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) + I
*sin(d*x + c)) + 5*(-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2
- 3*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x
+ c) - I*sin(d*x + c)) + 9*(-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x
 + c)^2 - 3*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, weie
rstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 9*(I*sqrt(2)*cos(d
*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + 3*I*sqrt(2)*cos(d*x + c) + I*sqrt(
2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(
d*x + c))))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*
x + c) + a^3*d)
```

Sympy [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3}\,dx = \frac{\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)+3\cos^{\frac{5}{2}}(c+dx)+3\cos^{\frac{3}{2}}(c+dx)+\sqrt{\cos(c+dx)}}\,dx}{a^3}$$

```
[In] integrate(1/cos(d*x+c)**(1/2)/(a+a*cos(d*x+c))**3,x)
```

```
[Out] Integral(1/(cos(c + d*x)**(7/2) + 3*cos(c + d*x)**(5/2) + 3*cos(c + d*x)**(
3/2) + sqrt(cos(c + d*x))), x)/a**3
```

Maxima [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^3\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] integrate(1/((a*cos(d*x + c) + a)^3*sqrt(cos(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^3\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate(1/((a*cos(d*x + c) + a)^3*sqrt(cos(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3}\,dx = \int \frac{1}{\sqrt{\cos\left(c+d\,x\right)}\,{\left(a+a\,\cos\left(c+d\,x\right)\right)}^3}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^3),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^3), x)
```

3.196 $\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 181

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3}\,dx = -\frac{49E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d}-\frac{13\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{6a^3d}+\frac{49\sin(c+dx)}{10a^3d\sqrt{\cos(c+dx)}}-\frac{\sin(c+dx)}{5d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3}-\frac{8\sin(c+dx)}{15ad\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2}-\frac{13\sin(c+dx)}{6d\sqrt{\cos(c+dx)}\,(a^3+a^3\cos(c+dx))}$$

```
[Out] -49/10*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*
x+1/2*c),2^(1/2))/a^3/d-13/6*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c
)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^3/d+49/10*sin(d*x+c)/a^3/d/cos(d*
x+c)^(1/2)-1/5*sin(d*x+c)/d/(a+a*cos(d*x+c))^3/cos(d*x+c)^(1/2)-8/15*sin(d*
x+c)/a/d/(a+a*cos(d*x+c))^2/cos(d*x+c)^(1/2)-13/6*sin(d*x+c)/d/(a^3+a^3*cos
(d*x+c))/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.51 (sec) , antiderivative size = 181, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2845, 3057, 2827, 2716, 2719, 2720}

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3}\,dx = -\frac{13\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{6a^3d} - \frac{49E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} + \frac{49\sin(c+dx)}{10a^3d\sqrt{\cos(c+dx)}} - \frac{13\sin(c+dx)}{6d\sqrt{\cos(c+dx)}\,(a^3\cos(c+dx)+a^3)} - \frac{8\sin(c+dx)}{15ad\sqrt{\cos(c+dx)}(a\cos(c+dx)+a)^2} - \frac{\sin(c+dx)}{5d\sqrt{\cos(c+dx)}(a\cos(c+dx)+a)^3}$$

```
[In] Int[1/(Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^3),x]
```

```
[Out] (-49*EllipticE[(c + d*x)/2, 2])/(10*a^3*d) - (13*EllipticF[(c + d*x)/2, 2])
/(6*a^3*d) + (49*Sin[c + d*x])/(10*a^3*d*Sqrt[Cos[c + d*x]]) - Sin[c + d*x]
/(5*d*Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^3) - (8*Sin[c + d*x])/(15*a*d
*Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^2) - (13*Sin[c + d*x])/(6*d*Sqrt[C
os[c + d*x]]*(a^3 + a^3*Cos[c + d*x]))
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
```

```
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sin(c+dx)}{5d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3}+\frac{\int \frac{\frac{11a}{2}-\frac{5}{2}a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2}\,dx}{5a^2}\\
&= -\frac{\sin(c+dx)}{5d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3}\\
&\quad -\frac{8\sin(c+dx)}{15ad\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2}+\frac{\int \frac{\frac{41a^2}{2}-12a^2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))}\,dx}{15a^4}\\
&= -\frac{\sin(c+dx)}{5d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3}-\frac{8\sin(c+dx)}{15ad\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2}\\
&\quad -\frac{13\sin(c+dx)}{6d\sqrt{\cos(c+dx)}\,(a^3+a^3\cos(c+dx))}+\frac{\int \frac{\frac{147a^3}{4}-\frac{65}{4}a^3\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx}{15a^6}
\end{aligned}$$

$$= -\frac{\sin(c+dx)}{5d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3} - \frac{8\sin(c+dx)}{15ad\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2} - \frac{13\sin(c+dx)}{6d\sqrt{\cos(c+dx)}\,(a^3+a^3\cos(c+dx))} - \frac{13\int \frac{1}{\sqrt{\cos(c+dx)}}dx}{12a^3} + \frac{49\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}dx}{20a^3}$$

$$= -\frac{13\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{6a^3d} + \frac{49\sin(c+dx)}{10a^3d\sqrt{\cos(c+dx)}} - \frac{\sin(c+dx)}{5d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3} - \frac{8\sin(c+dx)}{15ad\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2} - \frac{13\sin(c+dx)}{6d\sqrt{\cos(c+dx)}\,(a^3+a^3\cos(c+dx))} - \frac{49\int \sqrt{\cos(c+dx)}\,dx}{20a^3}$$

$$= -\frac{49E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} - \frac{13\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{6a^3d} + \frac{49\sin(c+dx)}{10a^3d\sqrt{\cos(c+dx)}} - \frac{\sin(c+dx)}{5d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^3} - \frac{8\sin(c+dx)}{15ad\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^2} - \frac{13\sin(c+dx)}{6d\sqrt{\cos(c+dx)}\,(a^3+a^3\cos(c+dx))}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 2.44 (sec) , antiderivative size = 364, normalized size of antiderivative = 2.01

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3}\,dx = \frac{\cos^6\left(\frac{1}{2}(c+dx)\right)\left(-\frac{4i\sqrt{2}e^{-i(c+dx)}\left(147\left(1+e^{2i(c+dx)}\right)+147\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)-65e^{i(c+\cdots}\right.}{d\left(-1+e^{2ic}\right)\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}}\cdots}{\cdots}$$

```
[In] Integrate[1/(Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^3),x]
```

```
[Out] (Cos[(c + d*x)/2]^6*(((-4*I)*Sqrt[2]*(147*(1 + E^((2*I)*(c + d*x))) + 147*(
-1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2
, 3/4, -E^((2*I)*(c + d*x))] - 65*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1
 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x
))]))/(d*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[(1 + E^((2*I)*(c + d*x)))/
E^(I*(c + d*x))]) + ((1284*Cos[(c - d*x)/2] + 921*Cos[(3*c + d*x)/2] + 1243
*Cos[(c + 3*d*x)/2] + 374*Cos[(5*c + 3*d*x)/2] + 670*Cos[(3*c + 5*d*x)/2] +
 65*Cos[(7*c + 5*d*x)/2] + 147*Cos[(5*c + 7*d*x)/2])*Csc[c/2]*Sec[c/2]*Sec[
(c + d*x)/2]^5)/(16*d*Sqrt[Cos[c + d*x]])))/(15*a^3*(1 + Cos[c + d*x])^3)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 554 vs. 2(213) = 426.

Time = 4.15 (sec) , antiderivative size = 555, normalized size of antiderivative = 3.07

method	result
default	$-\frac{-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\left(65F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-147E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\right)}{}$

```
[In] int(1/cos(d*x+c)^(3/2)/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/60*(-2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(-2
*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(65*EllipticF(cos(1/2*d*x
+1/2*c),2^(1/2))-147*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*cos(1/2*d*x+1/2
*c)*sin(1/2*d*x+1/2*c)^4+4*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*
c)^2-1)^(1/2)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(65*Elli
pticF(cos(1/2*d*x+1/2*c),2^(1/2))-147*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))
)*sin(1/2*d*x+1/2*c)^2cos(1/2*d*x+1/2*c)-2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2
*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)*(65*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-147*EllipticE(cos(1/2*d*
x+1/2*c),2^(1/2)))*cos(1/2*d*x+1/2*c)+588*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*
d*x+1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)^8-1634*(-2*sin(1/2*d*x+1/2*c)^4+sin(
1/2*d*x+1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)^6+1488*(-2*sin(1/2*d*x+1/2*c)^4+
sin(1/2*d*x+1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)^4-439*(-2*sin(1/2*d*x+1/2*c)
^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)^2)/a^3/cos(1/2*d*x+1/2*c)
^5/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/
(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 394, normalized size of antiderivative = 2.18

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3}\,dx$$
$$= \frac{2\left(147\cos\left(dx+c\right)^3+376\cos\left(dx+c\right)^2+295\cos\left(dx+c\right)+60\right)\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-65\left(-i\sqrt{2}\,c\right.}{}$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/60*(2*(147*cos(d*x + c)^3 + 376*cos(d*x + c)^2 + 295*cos(d*x + c) + 60)*s
qrt(cos(d*x + c))*sin(d*x + c) - 65*(-I*sqrt(2)*cos(d*x + c)^4 - 3*I*sqrt(2
)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - I*sqrt(2)*cos(d*x + c))*wei
```

```
erstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) - 65*(I*sqrt(2)*cos(
d*x + c)^4 + 3*I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + I*sq
rt(2)*cos(d*x + c))*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c
)) - 147*(I*sqrt(2)*cos(d*x + c)^4 + 3*I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(
2)*cos(d*x + c)^2 + I*sqrt(2)*cos(d*x + c))*weierstrassZeta(-4, 0, weierstr
assPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 147*(-I*sqrt(2)*cos(d*
x + c)^4 - 3*I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - I*sqrt
(2)*cos(d*x + c))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x
 + c) - I*sin(d*x + c))))/(a^3*d*cos(d*x + c)^4 + 3*a^3*d*cos(d*x + c)^3 +
3*a^3*d*cos(d*x + c)^2 + a^3*d*cos(d*x + c))
```

Sympy [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3}\,dx = \frac{\int \frac{1}{\cos^{\frac{9}{2}}(c+dx)+3\cos^{\frac{7}{2}}(c+dx)+3\cos^{\frac{5}{2}}(c+dx)+\cos^{\frac{3}{2}}(c+dx)}\,dx}{a^3}$$

```
[In] integrate(1/cos(d*x+c)**(3/2)/(a+a*cos(d*x+c))**3,x)
```

```
[Out] Integral(1/(cos(c + d*x)**(9/2) + 3*cos(c + d*x)**(7/2) + 3*cos(c + d*x)**(
5/2) + cos(c + d*x)**(3/2)), x)/a**3
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^3\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate(1/((a*cos(d*x + c) + a)^3*cos(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^{3/2}\,\left(a+a\,\cos\left(c+d\,x\right)\right)^3}\,dx$$

```
[In] int(1/(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^3),x)
[Out] int(1/(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^3), x)
```

3.197 $\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 207

$$\begin{aligned}\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^3}\,dx &= \frac{119E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d}+\frac{11\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{2a^3d}\\&\quad+\frac{11\sin(c+dx)}{2a^3d\cos^{\frac{3}{2}}(c+dx)}-\frac{119\sin(c+dx)}{10a^3d\sqrt{\cos(c+dx)}}\\&\quad-\frac{\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3}\\&\quad-\frac{2\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2}\\&\quad-\frac{119\sin(c+dx)}{30d\cos^{\frac{3}{2}}(c+dx)\left(a^3+a^3\cos(c+dx)\right)}\end{aligned}$$

```
[Out] 119/10*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*
x+1/2*c),2^(1/2))/a^3/d+11/2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c
)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^3/d+11/2*sin(d*x+c)/a^3/d/cos(d*x
+c)^(3/2)-1/5*sin(d*x+c)/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^3-2/3*sin(d*x+
c)/a/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^2-119/30*sin(d*x+c)/d/cos(d*x+c)^(
3/2)/(a^3+a^3*cos(d*x+c))-119/10*sin(d*x+c)/a^3/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.65 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {2845, 3057, 2827, 2716, 2720, 2719}

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^3}\,dx = \frac{11\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{2a^3d}+\frac{119E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} - \frac{119\sin(c+dx)}{30d\cos^{\frac{3}{2}}(c+dx)\left(a^3\cos(c+dx)+a^3\right)} + \frac{11\sin(c+dx)}{2a^3d\cos^{\frac{3}{2}}(c+dx)} - \frac{119\sin(c+dx)}{10a^3d\sqrt{\cos(c+dx)}} - \frac{2\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)(a\cos(c+dx)+a)^2} - \frac{\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)(a\cos(c+dx)+a)^3}$$

```
[In] Int[1/(Cos[c + d*x]^(5/2)*(a + a*Cos[c + d*x])^3),x]
```

```
[Out] (119*EllipticE[(c + d*x)/2, 2])/(10*a^3*d) + (11*EllipticF[(c + d*x)/2, 2])
/(2*a^3*d) + (11*Sin[c + d*x])/(2*a^3*d*Cos[c + d*x]^(3/2)) - (119*Sin[c +
d*x])/(10*a^3*d*Sqrt[Cos[c + d*x]]) - Sin[c + d*x]/(5*d*Cos[c + d*x]^(3/2)*
(a + a*Cos[c + d*x])^3) - (2*Sin[c + d*x])/(3*a*d*Cos[c + d*x]^(3/2)*(a + a
*Cos[c + d*x])^2) - (119*Sin[c + d*x])/(30*d*Cos[c + d*x]^(3/2)*(a^3 + a^3*
Cos[c + d*x]))
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3} + \frac{\int \frac{\frac{13a}{2}-\frac{7}{2}a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^2}\,dx}{5a^2} \\
&= -\frac{\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3} \\
&\quad - \frac{2\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2} + \frac{\int \frac{\frac{69a^2}{2}-25a^2\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))}\,dx}{15a^4} \\
&= -\frac{\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3} - \frac{2\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2} \\
&\quad - \frac{119\sin(c+dx)}{30d\cos^{\frac{3}{2}}(c+dx)\left(a^3+a^3\cos(c+dx)\right)} + \frac{\int \frac{\frac{495a^3}{4}-\frac{357}{4}a^3\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx}{15a^6}
\end{aligned}
$$

$$= -\frac{\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3} - \frac{2\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2} - \frac{119\sin(c+dx)}{30d\cos^{\frac{3}{2}}(c+dx)\left(a^3+a^3\cos(c+dx)\right)} - \frac{119\int\frac{1}{\cos^{\frac{3}{2}}(c+dx)}dx}{20a^3} + \frac{33\int\frac{1}{\cos^{\frac{5}{2}}(c+dx)}dx}{4a^3}$$

$$= \frac{11\sin(c+dx)}{2a^3d\cos^{\frac{3}{2}}(c+dx)} - \frac{119\sin(c+dx)}{10a^3d\sqrt{\cos(c+dx)}} - \frac{\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3} - \frac{2\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2} - \frac{119\sin(c+dx)}{30d\cos^{\frac{3}{2}}(c+dx)\left(a^3+a^3\cos(c+dx)\right)} + \frac{11\int\frac{1}{\sqrt{\cos(c+dx)}}dx}{4a^3} + \frac{119\int\sqrt{\cos(c+dx)}dx}{20a^3}$$

$$= \frac{119E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} + \frac{11\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{2a^3d} + \frac{11\sin(c+dx)}{2a^3d\cos^{\frac{3}{2}}(c+dx)} - \frac{119\sin(c+dx)}{10a^3d\sqrt{\cos(c+dx)}} - \frac{\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^3} - \frac{2\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^2} - \frac{119\sin(c+dx)}{30d\cos^{\frac{3}{2}}(c+dx)\left(a^3+a^3\cos(c+dx)\right)}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 2.83 (sec) , antiderivative size = 394, normalized size of antiderivative = 1.90

$$\int\frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^3}\,dx = \frac{\cos^6\left(\frac{1}{2}(c+dx)\right)\left(\frac{4i\sqrt{2}e^{-i(c+dx)}\left(119\left(1+e^{2i(c+dx)}\right)+119\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)-55e^{i(c+dx)}\right.}{d\left(-1+e^{2ic}\right)\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}}}{}$$

```
[In] Integrate[1/(Cos[c + d*x]^(5/2)*(a + a*Cos[c + d*x])^3),x]
```

```
[Out] (Cos[(c + d*x)/2]^6*(((4*I)*Sqrt[2]*(119*(1 + E^((2*I)*(c + d*x))) + 119*(-
1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2,
 3/4, -E^((2*I)*(c + d*x))] - 55*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1
+ E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x)
)]))/(d*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[(1 + E^((2*I)*(c + d*x)))/E
^(I*(c + d*x))]) - ((5134*Cos[(c - d*x)/2] + 4148*Cos[(3*c + d*x)/2] + 4664
*Cos[(c + 3*d*x)/2] + 2476*Cos[(5*c + 3*d*x)/2] + 3340*Cos[(3*c + 5*d*x)/2]
 + 944*Cos[(7*c + 5*d*x)/2] + 1620*Cos[(5*c + 7*d*x)/2] + 165*Cos[(9*c + 7*
d*x)/2] + 357*Cos[(7*c + 9*d*x)/2])*Csc[c/2]*Sec[c/2]*Sec[(c + d*x)/2]^5)/(
96*d*Cos[c + d*x]^(3/2))))/(5*a^3*(1 + Cos[c + d*x])^3)
```

Maple [A] (verified)

Time = 5.21 (sec) , antiderivative size = 453, normalized size of antiderivative = 2.19

method	result
default	$-\frac{\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\frac{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}{5\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^5}+\frac{32\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}{15\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^3}+\frac{118\sqrt{-2(\ldots}}{}\right.}{}$

```
[In] int(1/cos(d*x+c)^(5/2)/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)/a^3*(1/5*(-2
*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)^5+32/1
5*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)^3
+118/5*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2
*c)-128/5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-
2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/
2*c),2^(1/2))+238/5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1
)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos
(1/2*d*x+1/2*c),2^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))-4/3*cos(1/2
*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d
*x+1/2*c)^2-1/2)^2+48*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)/(-(-2*cos(1/2
*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2))/sin(1/2*d*x+1/2*c)/(2*cos(1/2
*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 414, normalized size of antiderivative = 2.00

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^3}\,dx = -\frac{2\left(357\cos(dx+c)^4+906\cos(dx+c)^3+695\cos(dx+c)^2+120\cos(dx+c)-20\right)\sqrt{\cos(dx+c)}\sin\ldots}{}$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] -1/60*(2*(357*cos(d*x + c)^4 + 906*cos(d*x + c)^3 + 695*cos(d*x + c)^2 + 12
0*cos(d*x + c) - 20)*sqrt(cos(d*x + c))*sin(d*x + c) + 165*(I*sqrt(2)*cos(d
*x + c)^5 + 3*I*sqrt(2)*cos(d*x + c)^4 + 3*I*sqrt(2)*cos(d*x + c)^3 + I*sqr
t(2)*cos(d*x + c)^2)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x +
c)) + 165*(-I*sqrt(2)*cos(d*x + c)^5 - 3*I*sqrt(2)*cos(d*x + c)^4 - 3*I*sqr
t(2)*cos(d*x + c)^3 - I*sqrt(2)*cos(d*x + c)^2)*weierstrassPInverse(-4, 0,
```

```
cos(d*x + c) - I*sin(d*x + c)) + 357*(-I*sqrt(2)*cos(d*x + c)^5 - 3*I*sqrt(
2)*cos(d*x + c)^4 - 3*I*sqrt(2)*cos(d*x + c)^3 - I*sqrt(2)*cos(d*x + c)^2)*
weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x
+ c))) + 357*(I*sqrt(2)*cos(d*x + c)^5 + 3*I*sqrt(2)*cos(d*x + c)^4 + 3*I*s
qrt(2)*cos(d*x + c)^3 + I*sqrt(2)*cos(d*x + c)^2)*weierstrassZeta(-4, 0, we
ierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/(a^3*d*cos(d*x +
c)^5 + 3*a^3*d*cos(d*x + c)^4 + 3*a^3*d*cos(d*x + c)^3 + a^3*d*cos(d*x + c)
^2)
```

Sympy [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^3}\,dx = \frac{\int \frac{1}{\cos^{\frac{11}{2}}(c+dx)+3\cos^{\frac{9}{2}}(c+dx)+3\cos^{\frac{7}{2}}(c+dx)+\cos^{\frac{5}{2}}(c+dx)}\,dx}{a^3}$$

```
[In] integrate(1/cos(d*x+c)**(5/2)/(a+a*cos(d*x+c))**3,x)
[Out] Integral(1/(cos(c + d*x)**(11/2) + 3*cos(c + d*x)**(9/2) + 3*cos(c + d*x)**
(7/2) + cos(c + d*x)**(5/2)), x)/a**3
```

Maxima [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^3}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^3\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^3,x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^3*cos(d*x + c)^(5/2)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^3}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^3\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)^3*cos(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^3}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^{5/2}\,\left(a+a\,\cos\left(c+d\,x\right)\right)^3}\,dx$$

```
[In] int(1/(cos(c + d*x)^(5/2)*(a + a*cos(c + d*x))^3),x)
[Out] int(1/(cos(c + d*x)^(5/2)*(a + a*cos(c + d*x))^3), x)
```

3.198 $\int \cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 154

$$\int \cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \frac{5\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d} + \frac{5a\sqrt{\cos(c+dx)}\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} + \frac{5a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{a\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 5/8*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))*a^(1/2)/d+5/12*a*cos(
d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+1/3*a*cos(d*x+c)^(5/2)*sin
(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+5/8*a*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a+a*c
os(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used

= {2849, 2853, 222}

$$\int \cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \frac{5\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{8d} + \frac{a\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{3d\sqrt{a\cos(c+dx)+a}} + \frac{5a\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{12d\sqrt{a\cos(c+dx)+a}} + \frac{5a\sin(c+dx)\sqrt{\cos(c+dx)}}{8d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Cos[c + d*x]^(5/2)*Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (5*Sqrt[a]*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(8*d) +
 (5*a*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(8*d*Sqrt[a + a*Cos[c + d*x]]) + (5*
a*Cos[c + d*x]^(3/2)*Sin[c + d*x])/(12*d*Sqrt[a + a*Cos[c + d*x]]) + (a*Cos
[c + d*x]^(5/2)*Sin[c + d*x])/(3*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rubi steps

$$\text{integral} = \frac{a\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{5}{6}\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$$

$$= \frac{5a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{a\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{5}{8}\int\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx$$

$$= \frac{5a\sqrt{\cos(c+dx)}\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} + \frac{5a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{a\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{5}{16}\int\frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}dx$$

$$= \frac{5a\sqrt{\cos(c+dx)}\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} + \frac{5a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{a\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} - \frac{5\text{Subst}\left(\int\frac{1}{\sqrt{1-\frac{x^2}{a}}}dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d}$$

$$= \frac{5\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d} + \frac{5a\sqrt{\cos(c+dx)}\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} + \frac{5a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{a\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.23 (sec) , antiderivative size = 105, normalized size of antiderivative = 0.68

$$\int\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$$

$$= \frac{\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(15\sqrt{2}\arcsin\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right)+2\sqrt{\cos(c+dx)}\left(14\sin\left(\frac{1}{2}(c+dx\right.\right.\right.}{48d}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)*Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(15*Sqrt[2]*ArcSin[Sqrt[2]*Sin
[(c + d*x)/2]] + 2*Sqrt[Cos[c + d*x]]*(14*Sin[(c + d*x)/2] + 3*Sin[(3*(c +
d*x))/2] + 2*Sin[(5*(c + d*x))/2])))/(48*d)
```

Maple [A] (verified)

Time = 11.51 (sec) , antiderivative size = 180, normalized size of antiderivative = 1.17

method	result
default	$\frac{\left(8\sin(dx+c)\left(\cos^2(dx+c)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+10\sin(dx+c)\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+15\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+15\arctan\left(\tan(dx+\right.\right.}{24d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$

[In] int(cos(d*x+c)^(5/2)*(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)

[Out] 1/24/d*(8*sin(d*x+c)*cos(d*x+c)^2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+10*sin(d*x+c)*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+15*sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+15*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)))*cos(d*x+c)^(1/2)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 108, normalized size of antiderivative = 0.70

$$\int \cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$$
$$=\frac{\sqrt{a\cos(dx+c)+a}\left(8\cos(dx+c)^2+10\cos(dx+c)+15\right)\sqrt{\cos(dx+c)}\sin(dx+c)-15\sqrt{a}(\cos(dx-}{24\left(d\cos(dx+c)+d\right)}$$

[In] integrate(cos(d*x+c)^(5/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] 1/24*(sqrt(a*cos(d*x + c) + a)*(8*cos(d*x + c)^2 + 10*cos(d*x + c) + 15)*sqrt(cos(d*x + c))*sin(d*x + c) - 15*sqrt(a)*(cos(d*x + c) + 1)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))))/(d*cos(d*x + c) + d)

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx=\text{Timed out}$$

[In] integrate(cos(d*x+c)**(5/2)*(a+a*cos(d*x+c))**(1/2),x)

[Out] Timed out

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1921 vs. $2(128) = 256$.

Time = 0.58 (sec) , antiderivative size = 1921, normalized size of antiderivative = 12.47

$$\int \cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^(5/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] 1/96*(4*(cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*a
rctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x
 + 3*c), cos(3*d*x + 3*c))) + 1)^(3/4)*(cos(3/2*arctan2(sin(2/3*arctan2(sin
(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*
d*x + 3*c))) + 1))*sin(3*d*x + 3*c) - (cos(3*d*x + 3*c) - 1)*sin(3/2*arctan
2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin
(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)))*sqrt(a) + 6*(cos(2/3*arctan2(sin(3
*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3
*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) +
1)^(1/4)*((sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 5*sin(1/3
*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))))*cos(1/2*arctan2(sin(2/3*arct
an2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c),
 cos(3*d*x + 3*c))) + 1)) - (cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x +
3*c))) + 3*cos(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) - 4)*sin(1/
2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arc
tan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)))*sqrt(a) + 15*sqrt(a)*(arct
an2(-(cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arct
an2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x +
3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*(cos(1/2*arctan2(sin(2/3*arctan2(sin(3*
d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x
 + 3*c))) + 1))*sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) - cos(
1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))*sin(1/2*arctan2(sin(2/3*ar
ctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c
), cos(3*d*x + 3*c))) + 1))), (cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x
+ 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos
(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*(cos(1/3*arcta
n2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))*cos(1/2*arctan2(sin(2/3*arctan2(sin
(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*
d*x + 3*c))) + 1)) + sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))*s
in(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/
3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1))) + 1) - arctan2(-(cos(
2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*
d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(
3*d*x + 3*c))) + 1)^(1/4)*(cos(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c)
, cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))
```

```
+ 1))*sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) - cos(1/3*arctan
2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))*sin(1/2*arctan2(sin(2/3*arctan2(sin(
3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d
*x + 3*c))) + 1))), (cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2
 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arcta
n2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*(cos(1/3*arctan2(sin(3*d
*x + 3*c), cos(3*d*x + 3*c)))*cos(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3
*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)
)) + 1)) + sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))*sin(1/2*arc
tan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(
sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1))) - 1) - arctan2((cos(2/3*arctan2
(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c),
 cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c
))) + 1)^(1/4)*sin(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x
+ 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)), (cos(
2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*
d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(
3*d*x + 3*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c),
 cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) +
 1)) + 1) + arctan2((cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2
 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arcta
n2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*sin(1/2*arctan2(sin(2/3*
arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3
*c), cos(3*d*x + 3*c))) + 1)), (cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x
 + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*co
s(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*cos(1/2*arcta
n2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(si
n(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)) - 1)))/d
```

Giac [F]

$$\int \cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \int \sqrt{a\cos(dx+c)+a}\cos(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(a*cos(d*x + c) + a)*cos(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \int \cos\left(c+d\,x\right)^{5/2}\,\sqrt{a+a\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(cos(c + d*x)^(5/2)*(a + a*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(5/2)*(a + a*cos(c + d*x))^(1/2), x)
```

3.199 $\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 116

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx=\frac{3\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d}+\frac{3a\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}}+\frac{a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 3/4*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))*a^(1/2)/d+1/2*a*cos(d
*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+3/4*a*sin(d*x+c)*cos(d*x+c)
^(1/2)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {2849, 2853, 222}

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx=\frac{3\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{4d}+\frac{a\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{2d\sqrt{a\cos(c+dx)+a}}+\frac{3a\sin(c+dx)\sqrt{\cos(c+dx)}}{4d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Cos[c + d*x]^(3/2)*Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (3*Sqrt[a]*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(4*d) +
 (3*a*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(4*d*Sqrt[a + a*Cos[c + d*x]]) + (a*
Cos[c + d*x]^(3/2)*Sin[c + d*x])/(2*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rubi steps

$$\text{integral} = \frac{a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}} + \frac{3}{4}\int \sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx$$

$$= \frac{3a\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}} + \frac{3}{8}\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{3a\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}} - \frac{3\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d}$$

$$= \frac{3\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d} + \frac{3a\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 91, normalized size of antiderivative = 0.78

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$$
$$=\frac{\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(3\sqrt{2}\arcsin\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right)+2\sqrt{\cos(c+dx)}\left(2\sin\left(\frac{1}{2}(c+dx\right.\right.\right.}{8d}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)*Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(3*Sqrt[2]*ArcSin[Sqrt[2]*Sin[
(c + d*x)/2]] + 2*Sqrt[Cos[c + d*x]]*(2*Sin[(c + d*x)/2] + Sin[(3*(c + d*x)
)/2])))/(8*d)
```

Maple [A] (verified)

Time = 11.60 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.25

method	result
default	$\frac{\left(2\sin(dx+c)\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+3\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+3\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\right)\left(\sqrt{\cos}(dx+c)\right)\sqrt{a(1+\cos(}}{4d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$

```
[In] int(cos(d*x+c)^(3/2)*(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/d*(2*sin(d*x+c)*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+3*sin(d*x+
c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+3*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)))*cos(d*x+c)^(1/2)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))/
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 98, normalized size of antiderivative = 0.84

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$$
$$=\frac{\sqrt{a\cos(dx+c)+a}(2\cos(dx+c)+3)\sqrt{\cos(dx+c)}\sin(dx+c)-3\sqrt{a}(\cos(dx+c)+1)\arctan\left(\frac{\sqrt{a\cos}}{}\right.}{4\,(d\cos(dx+c)+d)}$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/4*(sqrt(a*cos(d*x + c) + a)*(2*cos(d*x + c) + 3)*sqrt(cos(d*x + c))*sin(d
*x + c) - 3*sqrt(a)*(cos(d*x + c) + 1)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt
(cos(d*x + c))/(sqrt(a)*sin(d*x + c))))/(d*cos(d*x + c) + d)
```

Sympy [F]

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \int \sqrt{a\left(\cos\left(c+dx\right)+1\right)}\cos^{\frac{3}{2}}\left(c+dx\right)dx$$

```
[In] integrate(cos(d*x+c)**(3/2)*(a+a*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(a*(cos(c + d*x) + 1))*cos(c + d*x)**(3/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1059 vs. $2(96) = 192$.

Time = 0.47 (sec) , antiderivative size = 1059, normalized size of antiderivative = 9.13

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] 1/16*(2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^
(1/4)*((cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(2*d*x + 2*
c) - (cos(2*d*x + 2*c) - 2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c))) + sin(2*d*x + 2*c))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c
) + 1)) + ((cos(2*d*x + 2*c) - 2)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c))) + sin(2*d*x + 2*c)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c))) - cos(2*d*x + 2*c) + 2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c) + 1)))*sqrt(a) + 3*sqrt(a)*(arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*
x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c)))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
1)) - cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arct
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))), (cos(2*d*x + 2*c)^2 + sin(2*d*x
+ 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c) + 1))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan
2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))) + 1) - arctan2((cos(2*d*x + 2*c)^2
+ sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c) + 1)) - cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*si
n(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))), (cos(2*d*x + 2*c)^2 +
sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d
*x + 2*c), cos(2*d*x + 2*c) + 1))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(
1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))) - 1) - arctan2((cos(2*d*x
 + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arct
```

```
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d
*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c) + 1)) + 1) + arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x +
2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*
x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)
) - 1)))/d
```

Giac [F]

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \int \sqrt{a\cos(dx+c)+a}\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(a*cos(d*x + c) + a)*cos(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx = \int \cos(c+d\,x)^{3/2}\,\sqrt{a+a\,\cos(c+d\,x)}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^(1/2), x)
```

3.200 $\int \sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 72

$$\int \sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx = \frac{\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} + \frac{a\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))*a^(1/2)/d+a*sin(d*x+c)*co
s(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {2849, 2853, 222}

$$\int \sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx = \frac{\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{d} + \frac{a\sin(c+dx)\sqrt{\cos(c+dx)}}{d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (Sqrt[a]*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/d + (a*Sq
rt[Cos[c + d*x]]*Sin[c + d*x])/(d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{a\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}+\frac{1}{2}\int\frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{a\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}-\frac{\text{Subst}\left(\int\frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}\\
&= \frac{\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}+\frac{a\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 77, normalized size of antiderivative = 1.07

$$\int\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx = \frac{\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(\sqrt{2}\arcsin\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right)+2\sqrt{\cos(c+dx)}\sin\left(\frac{1}{2}(c+dx)\right)\right)}{2d}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]],x]
[Out] (Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(Sqrt[2]*ArcSin[Sqrt[2]*Sin[(c
 + d*x)/2]] + 2*Sqrt[Cos[c + d*x]]*Sin[(c + d*x)/2]))/(2*d)
```

Maple [A] (verified)

Time = 11.62 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.50

method	result	size
default	$\frac{\left(\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\right)\left(\sqrt{\cos}(dx+c)\right)\sqrt{a(1+\cos(dx+c))}}{d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$	108

[In] int(cos(d*x+c)^(1/2)*(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)

[Out] 1/d*(sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)))*cos(d*x+c)^(1/2)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.22

$$\int \sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx = -\frac{\sqrt{a}(\cos(dx+c)+1)\arctan\left(\frac{\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}\sin(dx+c)}{d\cos(dx+c)+d}$$

[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] -(sqrt(a)*(cos(d*x + c) + 1)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c) + d)

Sympy [F]

$$\int \sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx = \int \sqrt{a(\cos(c+dx)+1)}\sqrt{\cos(c+dx)}\,dx$$

[In] integrate(cos(d*x+c)**(1/2)*(a+a*cos(d*x+c))**(1/2),x)

[Out] Integral(sqrt(a*(cos(c + d*x) + 1))*sqrt(cos(c + d*x)), x)

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 791 vs. $2(62) = 124$.

Time = 0.44 (sec) , antiderivative size = 791, normalized size of antiderivative = 10.99

$$\int \sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/4*(2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(
1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x + c)
 - (cos(d*x + c) - 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
1)))*sqrt(a) + sqrt(a)*(arctan2(-(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 +
 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c) + 1))*sin(d*x + c) - cos(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c) + 1))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(
2*d*x + 2*c) + 1)^(1/4)*(cos(d*x + c)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c) + 1)) + sin(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*
d*x + 2*c) + 1))) + 1) - arctan2(-(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2
+ 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c) + 1))*sin(d*x + c) - cos(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c)
, cos(2*d*x + 2*c) + 1))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos
(2*d*x + 2*c) + 1)^(1/4)*(cos(d*x + c)*cos(1/2*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c) + 1)) + sin(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c) + 1))) - 1) - arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2
+ 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c
) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1)
+ arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1
)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (cos(2*d*
x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1)))/d
```

Giac [F]

$$\int \sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx = \int \sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx = \int \sqrt{\cos\left(c+d\,x\right)}\,\sqrt{a+a\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^(1/2), x)
```

3.201 $\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 37

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = \frac{2\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

```
[Out] 2*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))*a^(1/2)/d
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2853, 222}

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = \frac{2\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{d}$$

```
[In] Int[Sqrt[a + a*Cos[c + d*x]]/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (2*Sqrt[a]*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/d
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
```

```
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rubi steps

$$\text{integral} = -\frac{2\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}$$
$$= \frac{2\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 50, normalized size of antiderivative = 1.35

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx$$
$$= \frac{\sqrt{2}\arcsin\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right)\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)}{d}$$

```
[In] Integrate[Sqrt[a + a*Cos[c + d*x]]/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (Sqrt[2]*ArcSin[Sqrt[2]*Sin[(c + d*x)/2]]*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c
 + d*x)/2])/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 71 vs. 2(31) = 62.

Time = 4.03 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.95

method	result	size
default	$\frac{2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{a(1+\cos(dx+c))}\,\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)}{d\sqrt{\cos(dx+c)}}$	72

```
[In] int((a+cos(d*x+c)*a)^(1/2)/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d/cos(d*x+c)^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(a*(1+cos(d*x+c)))^(
1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 119, normalized size of antiderivative = 3.22

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = \left[\frac{\sqrt{-a}\log\left(\frac{2\,a\cos(dx+c)^2-2\,\sqrt{a\cos(dx+c)+a}\sqrt{-a}\sqrt{\cos(dx+c)}\sin(dx+c)+a\cos(dx+c)-a}{\cos(dx+c)+1}\right)}{d}, -\frac{2\,\sqrt{a}\arctan\left(\frac{\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)}{d}\right]$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] [sqrt(-a)*log((2*a*cos(d*x + c)^2 - 2*sqrt(a*cos(d*x + c) + a)*sqrt(-a)*sqr
t(cos(d*x + c))*sin(d*x + c) + a*cos(d*x + c) - a)/(cos(d*x + c) + 1))/d, -
2*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d
*x + c)))/d]
```

Sympy [F]

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{\sqrt{a\left(\cos\left(c+dx\right)+1\right)}}{\sqrt{\cos\left(c+dx\right)}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))**(1/2)/cos(d*x+c)**(1/2),x)
```

```
[Out] Integral(sqrt(a*(cos(c + d*x) + 1))/sqrt(cos(c + d*x)), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 146 vs. 2(31) = 62.

Time = 0.41 (sec) , antiderivative size = 146, normalized size of antiderivative = 3.95

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = \frac{\sqrt{a}\arctan\left(\left(\cos\left(2\,dx+2\,c\right)^2+\sin\left(2\,dx+2\,c\right)^2+2\,\cos\left(2\,dx+2\,c\right)+1\right)^{\frac{1}{4}}\sin\left(\frac{1}{2}\arctan\left(\sin\left(2\,dx+2\,c\right),\right.\right.\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] sqrt(a)*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*
c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + si
n(d*x + c), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) +
 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + cos(d*
x + c))/d
```

Giac [F]

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx=\int \frac{\sqrt{a\cos\left(dx+c\right)+a}}{\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(a*cos(d*x + c) + a)/sqrt(cos(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx=\int \frac{\sqrt{a+a\,\cos\left(c+d\,x\right)}}{\sqrt{\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(1/2)/cos(c + d*x)^(1/2),x)
[Out] int((a + a*cos(c + d*x))^(1/2)/cos(c + d*x)^(1/2), x)
```

3.202 $\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 36

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\frac{2a\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 2*a*sin(d*x+c)/d/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 36, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.040, Rules used = {2850}

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\frac{2a\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sqrt[a + a*Cos[c + d*x]]/Cos[c + d*x]^(3/2),x]
[Out] (2*a*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]])
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral}=\frac{2a\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 39, normalized size of antiderivative = 1.08

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\frac{2\sqrt{a(1+\cos(c+dx))}\tan\left(\frac{1}{2}(c+dx)\right)}{d\sqrt{\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[a + a*Cos[c + d*x]]/Cos[c + d*x]^(3/2),x]
[Out] (2*Sqrt[a*(1 + Cos[c + d*x])]*Tan[(c + d*x)/2])/(d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.37 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.17

method	result	size
default	$\frac{2\sqrt{a(1+\cos(dx+c))}\,\sin(dx+c)}{d(1+\cos(dx+c))\sqrt{\cos(dx+c)}}$	42

```
[In] int((a+cos(d*x+c)*a)^(1/2)/cos(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
[Out] 2/d*(a*(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/(1+cos(d*x+c))/cos(d*x+c)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.36

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\frac{2\,\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}\sin(dx+c)}{d\cos(dx+c)^2+d\cos(dx+c)}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/cos(d*x+c)^(3/2),x, algorithm="fricas")
[Out] 2*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*sin(d*x + c)/(d*cos(d*x + c)^
2 + d*cos(d*x + c))
```

Sympy [F]

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{\sqrt{a\left(\cos\left(c+dx\right)+1\right)}}{\cos^{\frac{3}{2}}\left(c+dx\right)}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))**(1/2)/cos(d*x+c)**(3/2),x)
[Out] Integral(sqrt(a*(cos(c + d*x) + 1))/cos(c + d*x)**(3/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 98 vs. $2(32) = 64$.

Time = 0.36 (sec) , antiderivative size = 98, normalized size of antiderivative = 2.72

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\left(\frac{\sqrt{2}\sqrt{a}\sin(dx+c)}{\cos(dx+c)+1} - \frac{\sqrt{2}\sqrt{a}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}\right)}{d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{3}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{3}{2}}}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/cos(d*x+c)^(3/2),x, algorithm="maxima")
[Out] 2*(sqrt(2)*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) - sqrt(2)*sqrt(a)*sin(d*
x + c)^3/(cos(d*x + c) + 1)^3)/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(3/
2)*(-sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(3/2))
```

Giac [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 58, normalized size of antiderivative = 1.61

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{4\sqrt{2}\sqrt{a}\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)}{\sqrt{\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^4 - 6\,\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+1}d}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/cos(d*x+c)^(3/2),x, algorithm="giac")
[Out] 4*sqrt(2)*sqrt(a)*sgn(cos(1/2*d*x + 1/2*c))*tan(1/4*d*x + 1/4*c)/(sqrt(tan(
1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1)*d)
```

Mupad [B] (verification not implemented)

Time = 14.47 (sec) , antiderivative size = 41, normalized size of antiderivative = 1.14

$$\int \frac{\sqrt{a + a\cos(c + dx)}}{\cos^{\frac{3}{2}}(c + dx)}\,dx = \frac{2\,\sin\left(c + d\,x\right)\,\sqrt{a\,\left(\cos\left(c + d\,x\right) + 1\right)}}{d\,\sqrt{\cos\left(c + d\,x\right)}\,\left(\cos\left(c + d\,x\right) + 1\right)}$$

```
[In] int((a + a*cos(c + d*x))^(1/2)/cos(c + d*x)^(3/2),x)
[Out] (2*sin(c + d*x)*(a*(cos(c + d*x) + 1))^(1/2))/(d*cos(c + d*x)^(1/2)*(cos(c
+ d*x) + 1))
```

3.203 $\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 77

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx=\frac{2a\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}+\frac{4a\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 2/3*a*sin(d*x+c)/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2)+4/3*a*sin(d*x+c)
/d/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2851, 2850}

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx=\frac{2a\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}}+\frac{4a\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sqrt[a + a*Cos[c + d*x]]/Cos[c + d*x]^(5/2),x]
```

```
[Out] (2*a*Sin[c + d*x])/(3*d*Cos[c + d*x]^(3/2)*Sqrt[a + a*Cos[c + d*x]]) + (4*a
*Sin[c + d*x])/(3*d*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]])
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{2a\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}+\frac{2}{3}\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx\\ &= \frac{2a\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}+\frac{4a\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 51, normalized size of antiderivative = 0.66

$$\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx=\frac{2\sqrt{a(1+\cos(c+dx))}(1+2\cos(c+dx))\tan\left(\frac{1}{2}(c+dx)\right)}{3d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Integrate[Sqrt[a + a*Cos[c + d*x]]/Cos[c + d*x]^(5/2),x]
[Out] (2*Sqrt[a*(1 + Cos[c + d*x])]*(1 + 2*Cos[c + d*x])*Tan[(c + d*x)/2])/(3*d*C
os[c + d*x]^(3/2))
```

Maple [A] (verified)

Time = 4.07 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.68

method	result	size
default	$\frac{2\sin(dx+c)(2\cos(dx+c)+1)\sqrt{a(1+\cos(dx+c))}}{3d(1+\cos(dx+c))\cos(dx+c)^{\frac{3}{2}}}$	52

```
[In] int((a+cos(d*x+c)*a)^(1/2)/cos(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3/d*sin(d*x+c)*(2*cos(d*x+c)+1)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))/c
os(d*x+c)^(3/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.79

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2\sqrt{a\cos(dx+c)+a}(2\cos(dx+c)+1)\sqrt{\cos(dx+c)}\sin(dx+c)}{3\left(d\cos(dx+c)^3+d\cos(dx+c)^2\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/cos(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 2/3*sqrt(a*cos(d*x + c) + a)*(2*cos(d*x + c) + 1)*sqrt(cos(d*x + c))*sin(d*
x + c)/(d*cos(d*x + c)^3 + d*cos(d*x + c)^2)
```

Sympy [F]

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{\sqrt{a(\cos(c+dx)+1)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))**(1/2)/cos(d*x+c)**(5/2),x)
```

```
[Out] Integral(sqrt(a*(cos(c + d*x) + 1))/cos(c + d*x)**(5/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 190 vs. $2(65) = 130$.

Time = 0.37 (sec) , antiderivative size = 190, normalized size of antiderivative = 2.47

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2\left(\frac{3\sqrt{2}\sqrt{a}\sin(dx+c)}{\cos(dx+c)+1}-\frac{4\sqrt{2}\sqrt{a}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{\sqrt{2}\sqrt{a}\sin(dx+c)^5}{(\cos(dx+c)+1)^5}\right)\left(\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+1\right)^2}{3\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{5}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{5}{2}}\left(\frac{2\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+1\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/cos(d*x+c)^(5/2),x, algorithm="maxima")
```

```
[Out] 2/3*(3*sqrt(2)*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) - 4*sqrt(2)*sqrt(a)*
sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + sqrt(2)*sqrt(a)*sin(d*x + c)^5/(cos(d
*x + c) + 1)^5)*(sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 1)^2/(d*(sin(d*x + c
)/(cos(d*x + c) + 1) + 1)^(5/2)*(-sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(5/2
)*(2*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + sin(d*x + c)^4/(cos(d*x + c) + 1
)^4 + 1))
```

Giac [A] (verification not implemented)

none

Time = 0.47 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.13

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{4\sqrt{2}\left(\left(3\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-10\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+3\right)\sqrt{a}\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)}{3\left(\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^4-6\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+1\right)^{\frac{3}{2}}d}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/cos(d*x+c)^(5/2),x, algorithm="giac")
```

```
[Out] 4/3*sqrt(2)*((3*tan(1/4*d*x + 1/4*c)^2 - 10)*tan(1/4*d*x + 1/4*c)^2 + 3)*sq
rt(a)*sgn(cos(1/2*d*x + 1/2*c))*tan(1/4*d*x + 1/4*c)/((tan(1/4*d*x + 1/4*c)
^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1)^(3/2)*d)
```

Mupad [B] (verification not implemented)

Time = 14.77 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.06

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{4\sqrt{a\,\left(\cos\left(c+d\,x\right)+1\right)}\,\left(\sin\left(c+d\,x\right)+\sin\left(2\,c+2\,d\,x\right)+\sin\left(3\,c+3\,d\,x\right)\right)}{3\,d\,\sqrt{\cos\left(c+d\,x\right)}\,\left(3\,\cos\left(c+d\,x\right)+2\,\cos\left(2\,c+2\,d\,x\right)+\cos\left(3\,c+3\,d\,x\right)+2\right)}$$

```
[In] int((a + a*cos(c + d*x))^(1/2)/cos(c + d*x)^(5/2),x)
```

```
[Out] (4*(a*(cos(c + d*x) + 1))^(1/2)*(sin(c + d*x) + sin(2*c + 2*d*x) + sin(3*c
+ 3*d*x)))/(3*d*cos(c + d*x)^(1/2)*(3*cos(c + d*x) + 2*cos(2*c + 2*d*x) + c
os(3*c + 3*d*x) + 2))
```

3.204 $\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 115

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2a\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{8a\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{16a\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 2/5*a*sin(d*x+c)/d/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(1/2)+8/15*a*sin(d*x+c
)/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2)+16/15*a*sin(d*x+c)/d/cos(d*x+c)
^(1/2)/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2851, 2850}

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{8a\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{2a\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{16a\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sqrt[a + a*Cos[c + d*x]]/Cos[c + d*x]^(7/2),x]
```

```
[Out] (2*a*Sin[c + d*x])/(5*d*Cos[c + d*x]^(5/2)*Sqrt[a + a*Cos[c + d*x]]) + (8*a
*Sin[c + d*x])/(15*d*Cos[c + d*x]^(3/2)*Sqrt[a + a*Cos[c + d*x]]) + (16*a*S
in[c + d*x])/(15*d*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]])
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2a\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{4}{5}\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{2a\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} \\
&\quad + \frac{8a\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{8}{15}\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{2a\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{8a\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} \\
&\quad + \frac{16a\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.53

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx$$
$$=\frac{2\sqrt{a(1+\cos(c+dx))}(7+4\cos(c+dx)+4\cos(2(c+dx)))\tan\left(\frac{1}{2}(c+dx)\right)}{15d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Integrate[Sqrt[a + a*Cos[c + d*x]]/Cos[c + d*x]^(7/2),x]
[Out] (2*Sqrt[a*(1 + Cos[c + d*x])]*(7 + 4*Cos[c + d*x] + 4*Cos[2*(c + d*x)])*Tan
[(c + d*x)/2])/(15*d*Cos[c + d*x]^(5/2))
```

Maple [A] (verified)

Time = 5.25 (sec) , antiderivative size = 62, normalized size of antiderivative = 0.54

method	result	size
default	$\frac{2\sin(dx+c)\left(8\left(\cos^{2}(dx+c)\right)+4\cos(dx+c)+3\right)\sqrt{a(1+\cos(dx+c))}}{15d(1+\cos(dx+c))\cos(dx+c)^{\frac{5}{2}}}$	62

```
[In] int((a+cos(d*x+c)*a)^(1/2)/cos(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
[Out] 2/15/d*sin(d*x+c)*(8*cos(d*x+c)^2+4*cos(d*x+c)+3)*(a*(1+cos(d*x+c)))^(1/2)/
(1+cos(d*x+c))/cos(d*x+c)^(5/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.62

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx$$
$$=\frac{2\sqrt{a\cos(dx+c)+a}\left(8\cos(dx+c)^{2}+4\cos(dx+c)+3\right)\sqrt{\cos(dx+c)}\sin(dx+c)}{15\left(d\cos(dx+c)^{4}+d\cos(dx+c)^{3}\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/cos(d*x+c)^(7/2),x, algorithm="fricas")
[Out] 2/15*sqrt(a*cos(d*x + c) + a)*(8*cos(d*x + c)^2 + 4*cos(d*x + c) + 3)*sqrt(
cos(d*x + c))*sin(d*x + c)/(d*cos(d*x + c)^4 + d*cos(d*x + c)^3)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx=\text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(1/2)/cos(d*x+c)**(7/2),x)
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 237 vs. 2(97) = 194.

Time = 0.34 (sec) , antiderivative size = 237, normalized size of antiderivative = 2.06

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2\left(\frac{15\sqrt{2}\sqrt{a}\sin(dx+c)}{\cos(dx+c)+1}-\frac{25\sqrt{2}\sqrt{a}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{17\sqrt{2}\sqrt{a}\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{7\sqrt{2}\sqrt{a}\sin(dx+c)^7}{(\cos(dx+c)+1)^7}\right)\left(\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+1\right)^3}{15\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{7}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{7}{2}}\left(\frac{3\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{3\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+\frac{\sin(dx+c)^6}{(\cos(dx+c)+1)^6}+1\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/cos(d*x+c)^(7/2),x, algorithm="maxima")
[Out] 2/15*(15*sqrt(2)*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) - 25*sqrt(2)*sqrt(
a)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 17*sqrt(2)*sqrt(a)*sin(d*x + c)^5/
(cos(d*x + c) + 1)^5 - 7*sqrt(2)*sqrt(a)*sin(d*x + c)^7/(cos(d*x + c) + 1)^
7)*(sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 1)^3/(d*(sin(d*x + c)/(cos(d*x +
c) + 1) + 1)^(7/2)*(-sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(7/2)*(3*sin(d*x
+ c)^2/(cos(d*x + c) + 1)^2 + 3*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + sin(d
*x + c)^6/(cos(d*x + c) + 1)^6 + 1))
```

Giac [A] (verification not implemented)

none

Time = 0.45 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.01

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{4\sqrt{2}\left(\left(\left(5\left(3\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-20\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+282\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-100\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2\right.}{15\left(\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^4-6\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+1\right)^{\frac{5}{2}}d}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/cos(d*x+c)^(7/2),x, algorithm="giac")
```

```
[Out] 4/15*sqrt(2)*(((5*(3*tan(1/4*d*x + 1/4*c)^2 - 20)*tan(1/4*d*x + 1/4*c)^2 +
282)*tan(1/4*d*x + 1/4*c)^2 - 100)*tan(1/4*d*x + 1/4*c)^2 + 15)*sqrt(a)*sgn
(cos(1/2*d*x + 1/2*c))*tan(1/4*d*x + 1/4*c)/((tan(1/4*d*x + 1/4*c)^4 - 6*ta
n(1/4*d*x + 1/4*c)^2 + 1)^(5/2)*d)
```

Mupad [B] (verification not implemented)

Time = 16.18 (sec) , antiderivative size = 132, normalized size of antiderivative = 1.15

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx$$
$$=\frac{8\sqrt{a\,\left(\cos\left(c+d\,x\right)+1\right)}\left(7\,\sin\left(c+d\,x\right)+4\,\sin\left(2\,c+2\,d\,x\right)+9\,\sin\left(3\,c+3\,d\,x\right)+2\,\sin\left(4\,c+4\,d\,x\right)+2\,s\right.}{15\,d\,\sqrt{\cos\left(c+d\,x\right)}\,\left(10\,\cos\left(c+d\,x\right)+8\,\cos\left(2\,c+2\,d\,x\right)+5\,\cos\left(3\,c+3\,d\,x\right)+2\,\cos\left(4\,c+4\,d\,x\right)+\cos\left(\right.\right.}$$

```
[In] int((a + a*cos(c + d*x))^(1/2)/cos(c + d*x)^(7/2),x)
```

```
[Out] (8*(a*(cos(c + d*x) + 1))^(1/2)*(7*sin(c + d*x) + 4*sin(2*c + 2*d*x) + 9*si
n(3*c + 3*d*x) + 2*sin(4*c + 4*d*x) + 2*sin(5*c + 5*d*x)))/(15*d*cos(c + d*
x)^(1/2)*(10*cos(c + d*x) + 8*cos(2*c + 2*d*x) + 5*cos(3*c + 3*d*x) + 2*cos
(4*c + 4*d*x) + cos(5*c + 5*d*x) + 6))
```

3.205 $\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 153

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{2a\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{12a\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{16a\sin(c+dx)}{35d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{32a\sin(c+dx)}{35d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 2/7*a*sin(d*x+c)/d/cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^(1/2)+12/35*a*sin(d*x+
c)/d/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(1/2)+16/35*a*sin(d*x+c)/d/cos(d*x+c
)^(3/2)/(a+a*cos(d*x+c))^(1/2)+32/35*a*sin(d*x+c)/d/cos(d*x+c)^(1/2)/(a+a*c
os(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 153, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.080$, Rules used

$= \{2851, 2850\}$

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{16a\sin(c+dx)}{35d\cos^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{12a\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{2a\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{32a\sin(c+dx)}{35d\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sqrt[a + a*Cos[c + d*x]]/Cos[c + d*x]^(9/2),x]
```

```
[Out] (2*a*Sin[c + d*x])/(7*d*Cos[c + d*x]^(7/2)*Sqrt[a + a*Cos[c + d*x]]) + (12*
a*Sin[c + d*x])/(35*d*Cos[c + d*x]^(5/2)*Sqrt[a + a*Cos[c + d*x]]) + (16*a*
Sin[c + d*x])/(35*d*Cos[c + d*x]^(3/2)*Sqrt[a + a*Cos[c + d*x]]) + (32*a*Si
n[c + d*x])/(35*d*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]])
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rubi steps

$$\text{integral} = \frac{2a\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{6}{7}\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx$$

$$= \frac{2a\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{12a\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{24}{35}\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx$$

$$= \frac{2a\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{12a\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{16a\sin(c+dx)}{35d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{16}{35}\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \frac{2a\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{12a\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{16a\sin(c+dx)}{35d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{32a\sin(c+dx)}{35d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.46

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{2\sqrt{a(1+\cos(c+dx))}(9+18\cos(c+dx)+4\cos(2(c+dx))+4\cos(3(c+dx)))\tan\left(\frac{1}{2}(c+dx)\right)}{35d\cos^{\frac{7}{2}}(c+dx)}$$

```
[In] Integrate[Sqrt[a + a*Cos[c + d*x]]/Cos[c + d*x]^(9/2),x]
[Out] (2*Sqrt[a*(1 + Cos[c + d*x])]*(9 + 18*Cos[c + d*x] + 4*Cos[2*(c + d*x)] + 4
*Cos[3*(c + d*x)])*Tan[(c + d*x)/2])/(35*d*Cos[c + d*x]^(7/2))
```

Maple [A] (verified)

Time = 4.55 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.47

method	result	size
default	$\frac{2\sin(dx+c)\left(16\left(\cos^{3}(dx+c)\right)+8\left(\cos^{2}(dx+c)\right)+6\cos(dx+c)+5\right)\sqrt{a(1+\cos(dx+c))}}{35d(1+\cos(dx+c))\cos(dx+c)^{\frac{7}{2}}}$	72

```
[In] int((a+cos(d*x+c)*a)^(1/2)/cos(d*x+c)^(9/2),x,method=_RETURNVERBOSE)
[Out] 2/35/d*sin(d*x+c)*(16*cos(d*x+c)^3+8*cos(d*x+c)^2+6*cos(d*x+c)+5)*(a*(1+cos
(d*x+c)))^(1/2)/(1+cos(d*x+c))/cos(d*x+c)^(7/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.53

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{2\,\left(16\,\cos\left(dx+c\right)^{3}+8\,\cos\left(dx+c\right)^{2}+6\,\cos\left(dx+c\right)+5\right)\sqrt{a\cos\left(dx+c\right)+a}\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)}{35\,\left(d\cos\left(dx+c\right)^{5}+d\cos\left(dx+c\right)^{4}\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/cos(d*x+c)^(9/2),x, algorithm="fricas")
[Out] 2/35*(16*cos(d*x + c)^3 + 8*cos(d*x + c)^2 + 6*cos(d*x + c) + 5)*sqrt(a*cos
(d*x + c) + a)*sqrt(cos(d*x + c))*sin(d*x + c)/(d*cos(d*x + c)^5 + d*cos(d*
x + c)^4)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(1/2)/cos(d*x+c)**(9/2),x)
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 283 vs. 2(129) = 258.

Time = 0.37 (sec) , antiderivative size = 283, normalized size of antiderivative = 1.85

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{2\left(\frac{35\sqrt{2}\sqrt{a}\sin(dx+c)}{\cos(dx+c)+1}-\frac{70\sqrt{2}\sqrt{a}\sin(dx+c)^{3}}{(\cos(dx+c)+1)^{3}}+\frac{84\sqrt{2}\sqrt{a}\sin(dx+c)^{5}}{(\cos(dx+c)+1)^{5}}-\frac{58\sqrt{2}\sqrt{a}\sin(dx+c)^{7}}{(\cos(dx+c)+1)^{7}}+\frac{9\sqrt{2}\sqrt{a}\sin(dx+c)^{9}}{(\cos(dx+c)+1)^{9}}\right)\left(\frac{\sin(dx+c)^{2}}{(\cos(dx+c)+1)}\right.}{35\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{9}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{9}{2}}\left(\frac{4\sin(dx+c)^{2}}{(\cos(dx+c)+1)^{2}}+\frac{6\sin(dx+c)^{4}}{(\cos(dx+c)+1)^{4}}+\frac{4\sin(dx+c)^{6}}{(\cos(dx+c)+1)^{6}}+\frac{\sin(dx+c)^{8}}{(\cos(dx+c)+1)^{8}}\right.}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/cos(d*x+c)^(9/2),x, algorithm="maxima")
[Out] 2/35*(35*sqrt(2)*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) - 70*sqrt(2)*sqrt(
a)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 84*sqrt(2)*sqrt(a)*sin(d*x + c)^5/
(cos(d*x + c) + 1)^5 - 58*sqrt(2)*sqrt(a)*sin(d*x + c)^7/(cos(d*x + c) + 1)
```

```
^7 + 9*sqrt(2)*sqrt(a)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9)*(sin(d*x + c)^2
/(cos(d*x + c) + 1)^2 + 1)^4/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(9/2)
*(-sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(9/2)*(4*sin(d*x + c)^2/(cos(d*x +
c) + 1)^2 + 6*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + 4*sin(d*x + c)^6/(cos(d
*x + c) + 1)^6 + sin(d*x + c)^8/(cos(d*x + c) + 1)^8 + 1))
```

Giac [A] (verification not implemented)

none

Time = 0.55 (sec) , antiderivative size = 143, normalized size of antiderivative = 0.93

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx$$
$$= \frac{4\sqrt{2}\left(\left(\left(\left(7\left(5\left(\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-10\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+267\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-3684\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right.\right.\right.\right.}{35\left(\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^4-6\tan\right.}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/cos(d*x+c)^(9/2),x, algorithm="giac")
```

```
[Out] 4/35*sqrt(2)*((((7*(5*(tan(1/4*d*x + 1/4*c)^2 - 10)*tan(1/4*d*x + 1/4*c)^2
+ 267)*tan(1/4*d*x + 1/4*c)^2 - 3684)*tan(1/4*d*x + 1/4*c)^2 + 1869)*tan(1/
4*d*x + 1/4*c)^2 - 350)*tan(1/4*d*x + 1/4*c)^2 + 35)*sqrt(a)*sgn(cos(1/2*d*
x + 1/2*c))*tan(1/4*d*x + 1/4*c)/((tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x +
 1/4*c)^2 + 1)^(7/2)*d)
```

Mupad [B] (verification not implemented)

Time = 19.82 (sec) , antiderivative size = 415, normalized size of antiderivative = 2.71

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx$$
$$= \frac{\sqrt{a+a\left(\mathrm{e}^{-}\right.}}{\sqrt{\frac{\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}}{2}+\frac{\mathrm{e}^{c\,1\mathrm{i}+d\,x\,1\mathrm{i}}}{2}}+\mathrm{e}^{c\,1\mathrm{i}+d\,x\,1\mathrm{i}}\sqrt{\frac{\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}}{2}+\frac{\mathrm{e}^{c\,1\mathrm{i}+d\,x\,1\mathrm{i}}}{2}}+3\,\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\sqrt{\frac{\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}}{2}+\frac{\mathrm{e}^{c\,1\mathrm{i}+d\,x\,1\mathrm{i}}}{2}}+3\,\mathrm{e}^{c\,3\mathrm{i}+d\,x\,3\mathrm{i}}\sqrt{}}$$

```
[In] int((a + a*cos(c + d*x))^(1/2)/cos(c + d*x)^(9/2),x)
```

```
[Out] ((a + a*(exp(- c*1i - d*x*1i)/2 + exp(c*1i + d*x*1i)/2))^(1/2)*(32i/(35*d)
+ (exp(c*2i + d*x*2i)*16i)/(5*d) - (exp(c*5i + d*x*5i)*16i)/(5*d) - (exp(c*
7i + d*x*7i)*32i)/(35*d)))/((exp(- c*1i - d*x*1i)/2 + exp(c*1i + d*x*1i)/2)
^(1/2) + exp(c*1i + d*x*1i)*(exp(- c*1i - d*x*1i)/2 + exp(c*1i + d*x*1i)/2)
^(1/2) + 3*exp(c*2i + d*x*2i)*(exp(- c*1i - d*x*1i)/2 + exp(c*1i + d*x*1i)/
```

```
2)^(1/2) + 3*exp(c*3i + d*x*3i)*(exp(- c*1i - d*x*1i)/2 + exp(c*1i + d*x*1i
)/2)^(1/2) + 3*exp(c*4i + d*x*4i)*(exp(- c*1i - d*x*1i)/2 + exp(c*1i + d*x*
1i)/2)^(1/2) + 3*exp(c*5i + d*x*5i)*(exp(- c*1i - d*x*1i)/2 + exp(c*1i + d*
x*1i)/2)^(1/2) + exp(c*6i + d*x*6i)*(exp(- c*1i - d*x*1i)/2 + exp(c*1i + d*
x*1i)/2)^(1/2) + exp(c*7i + d*x*7i)*(exp(- c*1i - d*x*1i)/2 + exp(c*1i + d*
x*1i)/2)^(1/2))
```

3.206 $\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 160

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{11a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d} + \frac{11a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} + \frac{11a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 11/8*a^(3/2)*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d+11/12*a^2*
cos(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+1/3*a^2*cos(d*x+c)^(5/
2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+11/8*a^2*sin(d*x+c)*cos(d*x+c)^(1/2)
/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 160, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2842, 21, 2849, 2853, 222}

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{11a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{8d} + \frac{a^2\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{3d\sqrt{a\cos(c+dx)+a}} + \frac{11a^2\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{12d\sqrt{a\cos(c+dx)+a}} + \frac{11a^2\sin(c+dx)\sqrt{\cos(c+dx)}}{8d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (11*a^(3/2)*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(8*d)
+ (11*a^2*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(8*d*Sqrt[a + a*Cos[c + d*x]]) +
 (11*a^2*Cos[c + d*x]^(3/2)*Sin[c + d*x])/(12*d*Sqrt[a + a*Cos[c + d*x]]) +
 (a^2*Cos[c + d*x]^(5/2)*Sin[c + d*x])/(3*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2842

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
+ n)), Int[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^n*Simp[a*b*c*(
m - 2) + b^2*d*(n + 1) + a^2*d*(m + n) - b*(b*c*(m - 1) - a*d*(3*m + 2*n -
2))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c
- a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1] &&  !LtQ[n
, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] || (IntegerQ[m] && EqQ[c
, 0]))
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}+\frac{1}{3}\int\frac{\cos^{\frac{3}{2}}(c+dx)\left(\frac{11a^2}{2}+\frac{11}{2}a^2\cos(c+dx)\right)}{\sqrt{a+a\cos(c+dx)}}\,dx\\
&= \frac{a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}+\frac{1}{6}(11a)\int\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx\\
&= \frac{11a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}}+\frac{a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}\\
&\quad+\frac{1}{8}(11a)\int\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx\\
&= \frac{11a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}}+\frac{11a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}}\\
&\quad+\frac{a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}+\frac{1}{16}(11a)\int\frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{11a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}}+\frac{11a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}}\\
&\quad+\frac{a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}-\frac{(11a)\text{Subst}\left(\int\frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d}\\
&= \frac{11a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d}+\frac{11a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}}\\
&\quad+\frac{11a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}}+\frac{a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.25 (sec) , antiderivative size = 106, normalized size of antiderivative = 0.66

$$\int\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}\,dx=\frac{a\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(33\sqrt{2}\arcsin\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right)+2\sqrt{\cos(c+dx)}(26$$
$$48d$$

```
[In] Integrate[Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^(3/2),x]
[Out] (a*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(33*Sqrt[2]*ArcSin[Sqrt[2]*S
in[(c + d*x)/2]] + 2*Sqrt[Cos[c + d*x]]*(26*Sin[(c + d*x)/2] + 9*Sin[(3*(c
+ d*x))/2] + 2*Sin[(5*(c + d*x))/2])))/(48*d)
```

Maple [A] (verified)

Time = 11.91 (sec) , antiderivative size = 181, normalized size of antiderivative = 1.13

method	result
default	$\frac{\left(8\sin(dx+c)\left(\cos^2(dx+c)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+22\sin(dx+c)\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+33\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+33\arctan\left(\tan(dx+\right.\right.}{24d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$

```
[In] int(cos(d*x+c)^(3/2)*(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/24/d*(8*sin(d*x+c)*cos(d*x+c)^2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+22*sin(
d*x+c)*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+33*sin(d*x+c)*(cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)+33*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(
1/2)))*(a*(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^(1/2)/(1+cos(d*x+c))/(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*a
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 114, normalized size of antiderivative = 0.71

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \frac{(8\,a\cos(dx+c)^2+22\,a\cos(dx+c)+33\,a)\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}\sin(dx+c)-}{24\,(d\cos(dx+c)+d)}$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/24*((8*a*cos(d*x + c)^2 + 22*a*cos(d*x + c) + 33*a)*sqrt(a*cos(d*x + c) +
 a)*sqrt(cos(d*x + c))*sin(d*x + c) - 33*(a*cos(d*x + c) + a)*sqrt(a)*arcta
n(sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))))/(d*c
os(d*x + c) + d)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(3/2)*(a+a*cos(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1942 vs. $2(134) = 268$.

Time = 0.59 (sec) , antiderivative size = 1942, normalized size of antiderivative = 12.14

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 1/96*(4*(a*cos(3/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*
c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1))*sin(3*d*x
+ 3*c) - (a*cos(3*d*x + 3*c) - a)*sin(3/2*arctan2(sin(2/3*arctan2(sin(3*d*x
 + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x +
3*c))) + 1)))*(cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin
(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin
(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(3/4)*sqrt(a) + 6*(cos(2/3*arctan2(s
in(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), c
os(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))
) + 1)^(1/4)*((3*a*sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1
1*a*sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))))*cos(1/2*arctan2(s
in(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*
d*x + 3*c), cos(3*d*x + 3*c))) + 1)) - (3*a*cos(2/3*arctan2(sin(3*d*x + 3*c
), cos(3*d*x + 3*c))) + 5*a*cos(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3
*c))) - 8*a)*sin(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x +
3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)))*sqrt(a)
 + 33*(a*arctan2(-(cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 +
 sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2
(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*(cos(1/2*arctan2(sin(2/3*a
rctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*
c), cos(3*d*x + 3*c))) + 1))*sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x +
3*c))) - cos(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))*sin(1/2*arcta
n2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(si
n(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1))), (cos(2/3*arctan2(sin(3*d*x + 3*c
), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c
)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*(
cos(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))*cos(1/2*arctan2(sin(2/
3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x +
 3*c), cos(3*d*x + 3*c))) + 1)) + sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d
*x + 3*c)))*sin(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3
*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1))) + 1) - a
*arctan2(-(cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3
*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d
*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*(cos(1/2*arctan2(sin(2/3*arctan2(s
in(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(
```

```
3*d*x + 3*c))) + 1))*sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) -
 cos(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))*sin(1/2*arctan2(sin(2
/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x
+ 3*c), cos(3*d*x + 3*c))) + 1))), (cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3
*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 +
2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*(cos(1/3*
arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))*cos(1/2*arctan2(sin(2/3*arctan
2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), c
os(3*d*x + 3*c))) + 1)) + sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c
)))*sin(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), c
os(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1))) - 1) - a*arctan2
((cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(
sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c)
, cos(3*d*x + 3*c))) + 1)^(1/4)*sin(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x +
 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*
c))) + 1)), (cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2
/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3
*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(2/3*arctan2(
sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos
(3*d*x + 3*c))) + 1)) + 1) + a*arctan2((cos(2/3*arctan2(sin(3*d*x + 3*c), c
os(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^
2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*sin(1
/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*ar
ctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)), (cos(2/3*arctan2(sin(3*d*
x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*
x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^
(1/4)*cos(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))),
 cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)) - 1))*sqrt(a))/
d
```

Giac [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \int (a\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^(3/2)*cos(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}\,dx = \int \cos\left(c+d\,x\right)^{3/2}\,\left(a+a\,\cos\left(c+d\,x\right)\right)^{3/2}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^(3/2), x)
```

3.207 $\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 120

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}\,dx = \frac{7a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d} + \frac{7a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 7/4*a^(3/2)*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d+1/2*a^2*cos
(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+7/4*a^2*sin(d*x+c)*cos(d*
x+c)^(1/2)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 120, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2842, 21, 2849, 2853, 222}

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}\,dx = \frac{7a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{4d} + \frac{a^2\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{2d\sqrt{a\cos(c+dx)+a}} + \frac{7a^2\sin(c+dx)\sqrt{\cos(c+dx)}}{4d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (7*a^(3/2)*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(4*d) +
 (7*a^2*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(4*d*Sqrt[a + a*Cos[c + d*x]]) + (
a^2*Cos[c + d*x]^(3/2)*Sin[c + d*x])/(2*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2842

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
+ n)), Int[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^n*Simp[a*b*c*(
m - 2) + b^2*d*(n + 1) + a^2*d*(m + n) - b*(b*c*(m - 1) - a*d*(3*m + 2*n -
2))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c
- a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1] &&  !LtQ[n
, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] || (IntegerQ[m] && EqQ[c
, 0]))
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rubi steps

$$\text{integral} = \frac{a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}} + \frac{1}{2}\int\frac{\sqrt{\cos(c+dx)}\left(\frac{7a^2}{2}+\frac{7}{2}a^2\cos(c+dx)\right)}{\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{a^2 \cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}} + \frac{1}{4}(7a)\int \sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx$$

$$= \frac{7a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}} + \frac{1}{8}(7a)\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{7a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}} - \frac{(7a)\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d}$$

$$= \frac{7a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d} + \frac{7a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 92, normalized size of antiderivative = 0.77

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}\,dx = \frac{a\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(7\sqrt{2}\arcsin\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right) + 2\sqrt{\cos(c+dx)}(6\,\mathrm{s}\right.}{8d}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^(3/2),x]
[Out] (a*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(7*Sqrt[2]*ArcSin[Sqrt[2]*Si
n[(c + d*x)/2]] + 2*Sqrt[Cos[c + d*x]]*(6*Sin[(c + d*x)/2] + Sin[(3*(c + d*
x))/2])))/(8*d)
```

Maple [A] (verified)

Time = 11.74 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.22

method	result
default	$\frac{\left(2\sin(dx+c)\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+7\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+7\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\right)\sqrt{a(1+\cos(dx+c))}\,(\sqrt{\cos}}{4d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$

```
[In] int(cos(d*x+c)^(1/2)*(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)
[Out] 1/4/d*(2*sin(d*x+c)*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+7*sin(d*x+
c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+7*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)))*(a*(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^(1/2)/(1+cos(d*x+c))/
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 103, normalized size of antiderivative = 0.86

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}\,dx = \frac{(2\,a\cos(dx+c)+7\,a)\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}\sin(dx+c)-7\,(a\cos(dx+c)+a)\sqrt{}}{4\,(d\cos(dx+c)+d)}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/4*((2*a*cos(d*x + c) + 7*a)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*s
in(d*x + c) - 7*(a*cos(d*x + c) + a)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a
)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))))/(d*cos(d*x + c) + d)
```

Sympy [F]

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}\,dx = \int (a(\cos(c+dx)+1))^{\frac{3}{2}}\sqrt{\cos(c+dx)}\,dx$$

```
[In] integrate(cos(d*x+c)**(1/2)*(a+a*cos(d*x+c))**(3/2),x)
```

```
[Out] Integral((a*(cos(c + d*x) + 1))**(3/2)*sqrt(cos(c + d*x)), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1080 vs. 2(100) = 200.

Time = 0.47 (sec) , antiderivative size = 1080, normalized size of antiderivative = 9.00

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 1/16*(2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^
(1/4)*((a*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(2*d*x +
2*c) + a*sin(2*d*x + 2*c) - (a*cos(2*d*x + 2*c) - 6*a)*sin(1/2*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c))))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c) + 1)) + (a*sin(2*d*x + 2*c)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c))) - a*cos(2*d*x + 2*c) + (a*cos(2*d*x + 2*c) - 6*a)*cos(1/2*a
rctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 6*a)*sin(1/2*arctan2(sin(2*d*
x + 2*c), cos(2*d*x + 2*c) + 1)))*sqrt(a) + 7*(a*arctan2((cos(2*d*x + 2*c)^
```

```
2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c) + 1)) - cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*
sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))), (cos(2*d*x + 2*c)^2
+ sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c) + 1))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*si
n(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))) + 1) - a*arctan2((cos(2
*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c) + 1)) - cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))), (cos(2*d
*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*a
rctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*cos(1/2*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))) - 1) - a*ar
ctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1
/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (cos(2*d*x +
2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2
(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1) + a*arctan2((cos(2*d*x + 2*c
)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(si
n(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2
*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c) + 1)) - 1))*sqrt(a))/d
```

Giac [F]

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}\,dx = \int (a\cos(dx+c)+a)^{\frac{3}{2}}\sqrt{\cos(dx+c)}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^(3/2)*sqrt(cos(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}\,dx = \int \sqrt{\cos(c+d\,x)}\,(a+a\,\cos(c+d\,x))^{3/2}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^(3/2), x)
```

3.208 $\int \frac{(a+a\cos(c+dx))^{3/2}}{\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 75

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\sqrt{\cos(c+dx)}}\,dx=\frac{3a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}+\frac{a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 3*a^(3/2)*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d+a^2*sin(d*x+c
)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2842, 21, 2853, 222}

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\sqrt{\cos(c+dx)}}\,dx=\frac{3a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{d}+\frac{a^2\sin(c+dx)\sqrt{\cos(c+dx)}}{d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2)/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (3*a^(3/2)*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/d + (a^
2*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2842

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
+ n)), Int[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^n*Simp[a*b*c*(
m - 2) + b^2*d*(n + 1) + a^2*d*(m + n) - b*(b*c*(m - 1) - a*d*(3*m + 2*n -
2))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c
- a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1] &&  !LtQ[n
, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] || (IntegerQ[m] && EqQ[c
, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}+\int \frac{\frac{3a^2}{2}+\frac{3}{2}a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx\\
&= \frac{a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}+\frac{1}{2}(3a)\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}-\frac{(3a)\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}\\
&= \frac{3a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}+\frac{a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 79, normalized size of antiderivative = 1.05

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\sqrt{\cos(c+dx)}}\,dx = \frac{a\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\left(3\sqrt{2}\arcsin\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right)+2\sqrt{}\right.}{2d}$$

[In] Integrate[(a + a*Cos[c + d*x])^(3/2)/Sqrt[Cos[c + d*x]],x]

[Out] (a*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(3*Sqrt[2]*ArcSin[Sqrt[2]*Si
n[(c + d*x)/2]] + 2*Sqrt[Cos[c + d*x]]*Sin[(c + d*x)/2]))/(2*d)

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 151 vs. 2(65) = 130.

Time = 13.85 (sec) , antiderivative size = 152, normalized size of antiderivative = 2.03

method	result
default	$\frac{\left(3\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)+\cos(dx+c)\sin(dx+c)+3\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+}{1+\cos(dx}}\right.\right.}{d\sqrt{\cos(dx+c)}\,(1+\cos(dx+c))}$

[In] int((a+cos(d*x+c)*a)^(3/2)/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)

[Out] 1/d*(3*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(tan(d*x+c)*(cos(
d*x+c)/(1+cos(d*x+c)))^(1/2))+cos(d*x+c)*sin(d*x+c)+3*(cos(d*x+c)/(1+cos(d*
x+c)))^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)))*(a*(1+co
s(d*x+c)))^(1/2)/cos(d*x+c)^(1/2)/(1+cos(d*x+c))*a

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 90, normalized size of antiderivative = 1.20

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\sqrt{\cos(c+dx)}}\,dx = \frac{\sqrt{a\cos(dx+c)+a}\,a\sqrt{\cos(dx+c)}\sin(dx+c)-3\left(a\cos(dx+c)+a\right)\sqrt{a}\,\mathrm{arc}}{d\cos(dx+c)+d}$$

[In] integrate((a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(1/2),x, algorithm="fricas")

[Out] (sqrt(a*cos(d*x + c) + a)*a*sqrt(cos(d*x + c))*sin(d*x + c) - 3*(a*cos(d*x
+ c) + a)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(
a)*sin(d*x + c))))/(d*cos(d*x + c) + d)

Sympy [F]

$$\int \frac{(a + a\cos(c + dx))^{3/2}}{\sqrt{\cos(c + dx)}}\,dx = \int \frac{(a(\cos(c + dx) + 1))^{\frac{3}{2}}}{\sqrt{\cos(c + dx)}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))**(3/2)/cos(d*x+c)**(1/2),x)
[Out] Integral((a*(cos(c + d*x) + 1))**(3/2)/sqrt(cos(c + d*x)), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 803 vs. $2(65) = 130$.

Time = 0.45 (sec) , antiderivative size = 803, normalized size of antiderivative = 10.71

$$\int \frac{(a + a\cos(c + dx))^{3/2}}{\sqrt{\cos(c + dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(1/2),x, algorithm="maxima")
[Out] 1/4*(2*(a*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x
+ c) - (a*cos(d*x + c) - a)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c) + 1)))*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) +
1)^(1/4)*sqrt(a) + 3*(a*arctan2(-(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 +
 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c) + 1))*sin(d*x + c) - cos(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c) + 1))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(
2*d*x + 2*c) + 1)^(1/4)*(cos(d*x + c)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c) + 1)) + sin(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*
d*x + 2*c) + 1))) + 1) - a*arctan2(-(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^
2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*
d*x + 2*c) + 1))*sin(d*x + c) - cos(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*
c), cos(2*d*x + 2*c) + 1))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*c
os(2*d*x + 2*c) + 1)^(1/4)*(cos(d*x + c)*cos(1/2*arctan2(sin(2*d*x + 2*c),
cos(2*d*x + 2*c) + 1)) + sin(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c) + 1))) - 1) - a*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c
)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x +
 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) +
 1) + a*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*
c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (co
s(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1
/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1))*sqrt(a))/d
```

Giac [F(-1)]

Timed out.

$$\int \frac{(a + a\cos(c + dx))^{3/2}}{\sqrt{\cos(c + dx)}}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(1/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a + a\cos(c + dx))^{3/2}}{\sqrt{\cos(c + dx)}}\,dx = \int \frac{(a + a\,\cos(c + d\,x))^{3/2}}{\sqrt{\cos(c + d\,x)}}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(3/2)/cos(c + d*x)^(1/2),x)
[Out] int((a + a*cos(c + d*x))^(3/2)/cos(c + d*x)^(1/2), x)
```

3.209 $\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 76

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} + \frac{2a^2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 2*a^(3/2)*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d+2*a^2*sin(d*x
+c)/d/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 76, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2841, 21, 2853, 222}

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{d} + \frac{2a^2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(3/2),x]
```

```
[Out] (2*a^(3/2)*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/d + (2*
a^2*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2a^2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} - (2a)\int \frac{-\frac{a}{2}-\frac{1}{2}a\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx \\
&= \frac{2a^2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} + a\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{2a^2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} - \frac{(2a)\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} \\
&= \frac{2a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} + \frac{2a^2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.12

$$\int \frac{(a + a\cos(c + dx))^{3/2}}{\cos^{\frac{3}{2}}(c + dx)}\,dx = \frac{a\sqrt{a(1 + \cos(c + dx))}\sec\left(\frac{1}{2}(c + dx)\right)\left(\sqrt{2}\arcsin\left(\sqrt{2}\sin\left(\frac{1}{2}(c + dx)\right)\right)\sqrt{\cos}\right.}{d\sqrt{\cos(c + dx)}}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(3/2),x]
[Out] (a*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*(Sqrt[2]*ArcSin[Sqrt[2]*Sin[
(c + d*x)/2]]*Sqrt[Cos[c + d*x]] + 2*Sin[(c + d*x)/2]))/(d*Sqrt[Cos[c + d*x
]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 143 vs. 2(66) = 132.

Time = 5.44 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.89

method	result
default	$\frac{2\left(\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)+\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)+\sin(dx+c)\right)\sqrt{a}}{d(1+\cos(dx+c))\sqrt{\cos(dx+c)}}$

```
[In] int((a+cos(d*x+c)*a)^(3/2)/cos(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
[Out] 2/d*(cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(tan(d*x+c)*(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2))+(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(tan(d*
x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))+sin(d*x+c))*(a*(1+cos(d*x+c)))^(1/2
)/(1+cos(d*x+c))/cos(d*x+c)^(1/2)*a
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.43

$$\int \frac{(a + a\cos(c + dx))^{3/2}}{\cos^{\frac{3}{2}}(c + dx)}\,dx = \frac{2\left(\sqrt{a\cos(dx + c) + a}a\sqrt{\cos(dx + c)}\sin(dx + c) - \left(a\cos(dx + c)^2 + a\cos\right.\right.}{d\cos(dx + c)^2 + d\cos(dx + c}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(3/2),x, algorithm="fricas")
[Out] 2*(sqrt(a*cos(d*x + c) + a)*a*sqrt(cos(d*x + c))*sin(d*x + c) - (a*cos(d*x
+ c)^2 + a*cos(d*x + c))*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(cos(d
*x + c))/(sqrt(a)*sin(d*x + c))))/(d*cos(d*x + c)^2 + d*cos(d*x + c))
```

Sympy [F]

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(a(\cos(c+dx)+1))^{\frac{3}{2}}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))**(3/2)/cos(d*x+c)**(3/2),x)
[Out] Integral((a*(cos(c + d*x) + 1))**(3/2)/cos(c + d*x)**(3/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 997 vs. $2(66) = 132$.

Time = 0.47 (sec) , antiderivative size = 997, normalized size of antiderivative = 13.12

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(3/2),x, algorithm="maxima")
[Out] 1/2*((a*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*
c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/2
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - cos(1/2*arctan2(sin(2*d
*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c)))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c)
 + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*cos(1
/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x
 + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c)))) + 1) - a*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*co
s(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c)))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - cos(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c)))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(
2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
 + 1))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c)))) - 1) - a*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2
*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x
 + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))
 + 1) + a*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x +
2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (
cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos
(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1))*(cos(2*d*x + 2*
```

```
c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sqrt(a) + 4*(a*co
s(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c))) - (a*cos(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c))) - a)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1
)))*sqrt(a))/((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c)
 + 1)^(1/4)*d)
```

Giac [F]

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{(a\cos(dx+c)+a)^{\frac{3}{2}}}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^(3/2)/cos(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{(a+a\,\cos(c+d\,x))^{3/2}}{\cos(c+d\,x)^{3/2}}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(3/2)/cos(c + d*x)^(3/2),x)
[Out] int((a + a*cos(c + d*x))^(3/2)/cos(c + d*x)^(3/2), x)
```

3.210 $\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 81

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2a^2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{10a^2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 2/3*a^2*sin(d*x+c)/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2)+10/3*a^2*sin(d
*x+c)/d/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {2841, 21, 2850}

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2a^2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{10a^2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(5/2),x]
```

```
[Out] (2*a^2*Sin[c + d*x])/(3*d*Cos[c + d*x]^(3/2)*Sqrt[a + a*Cos[c + d*x]]) + (1
0*a^2*Sin[c + d*x])/(3*d*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{2a^2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}-\frac{1}{3}(2a)\int\frac{-\frac{5a}{2}-\frac{5}{2}a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx\\ &= \frac{2a^2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}+\frac{1}{3}(5a)\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx\\ &= \frac{2a^2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}+\frac{10a^2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.64

$$\int\frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx=\frac{2a\sqrt{a(1+\cos(c+dx))}(1+5\cos(c+dx))\tan\left(\frac{1}{2}(c+dx)\right)}{3d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(5/2),x]
[Out] (2*a*Sqrt[a*(1 + Cos[c + d*x])]*(1 + 5*Cos[c + d*x])*Tan[(c + d*x)/2])/(3*d
*Cos[c + d*x]^(3/2))
```

Maple [A] (verified)

Time = 5.23 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.65

method	result	size
default	$\frac{2 \sin(dx+c)(5 \cos(dx+c)+1)\sqrt{a(1+\cos(dx+c))}\, a}{3d(1+\cos(dx+c)) \cos(dx+c)^{\frac{3}{2}}}$	53

```
[In] int((a+cos(d*x+c)*a)^(3/2)/cos(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
[Out] 2/3/d*sin(d*x+c)*(5*cos(d*x+c)+1)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))/c
os(d*x+c)^(3/2)*a
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 62, normalized size of antiderivative = 0.77

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx=\frac{2\,(5\,a\cos\left(dx+c\right)+a)\sqrt{a\cos\left(dx+c\right)+a}\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)}{3\,\left(d\cos\left(dx+c\right)^{3}+d\cos\left(dx+c\right)^{2}\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(5/2),x, algorithm="fricas")
[Out] 2/3*(5*a*cos(d*x + c) + a)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*sin(
d*x + c)/(d*cos(d*x + c)^3 + d*cos(d*x + c)^2)
```

Sympy [F]

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx=\int \frac{(a(\cos\left(c+dx\right)+1))^{\frac{3}{2}}}{\cos^{\frac{5}{2}}\left(c+dx\right)}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))**(3/2)/cos(d*x+c)**(5/2),x)
[Out] Integral((a*(cos(c + d*x) + 1))**(3/2)/cos(c + d*x)**(5/2), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.54

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{4\left(\frac{3\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)}{\cos(dx+c)+1} - \frac{5\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)^3}{(\cos(dx+c)+1)^3} + \frac{2\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)^5}{(\cos(dx+c)+1)^5}\right)}{3\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{5}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{5}{2}}}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(5/2),x, algorithm="maxima")
```

```
[Out] 4/3*(3*sqrt(2)*a^(3/2)*sin(d*x + c)/(cos(d*x + c) + 1) - 5*sqrt(2)*a^(3/2)*
sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 2*sqrt(2)*a^(3/2)*sin(d*x + c)^5/(cos
(d*x + c) + 1)^5)/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(5/2)*(-sin(d*x
+ c)/(cos(d*x + c) + 1) + 1)^(5/2))
```

Giac [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [B] (verification not implemented)

Time = 15.38 (sec) , antiderivative size = 89, normalized size of antiderivative = 1.10

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2\,a\,\sqrt{a\,\left(\cos\left(c+d\,x\right)+1\right)}\,\left(5\,\sin\left(c+d\,x\right)+2\,\sin\left(2\,c+2\,d\,x\right)+5\,\sin\left(3\,c+3\cdots\right.\right.}{3\,d\,\sqrt{\cos\left(c+d\,x\right)}\,\left(3\,\cos\left(c+d\,x\right)+2\,\cos\left(2\,c+2\,d\,x\right)+\cos\left(3\,c+3\,d\,x\right)+\cdots\right.}$$

```
[In] int((a + a*cos(c + d*x))^(3/2)/cos(c + d*x)^(5/2),x)
```

```
[Out] (2*a*(a*(cos(c + d*x) + 1))^(1/2)*(5*sin(c + d*x) + 2*sin(2*c + 2*d*x) + 5*
sin(3*c + 3*d*x)))/(3*d*cos(c + d*x)^(1/2)*(3*cos(c + d*x) + 2*cos(2*c + 2*
d*x) + cos(3*c + 3*d*x) + 2))
```

3.211 $\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 121

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2a^2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{6a^2\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{12a^2\sin(c+dx)}{5d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 2/5*a^2*sin(d*x+c)/d/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(1/2)+6/5*a^2*sin(d*
x+c)/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2)+12/5*a^2*sin(d*x+c)/d/cos(d*
x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2841, 21, 2851, 2850}

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{6a^2\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{2a^2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{12a^2\sin(c+dx)}{5d\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(7/2),x]
```

```
[Out] (2*a^2*Sin[c + d*x])/(5*d*Cos[c + d*x]^(5/2)*Sqrt[a + a*Cos[c + d*x]]) + (6
*a^2*Sin[c + d*x])/(5*d*Cos[c + d*x]^(3/2)*Sqrt[a + a*Cos[c + d*x]]) + (12*
a^2*Sin[c + d*x])/(5*d*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rubi steps

$$\text{integral} = \frac{2a^2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{1}{5}(2a)\int \frac{-\frac{9a}{2}-\frac{9}{2}a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{2a^2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{1}{5}(9a)\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx$$

$$= \frac{2a^2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{6a^2\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{1}{5}(6a)\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \frac{2a^2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{6a^2\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{12a^2\sin(c+dx)}{5d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 62, normalized size of antiderivative = 0.51

$$\int\frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2a\sqrt{a(1+\cos(c+dx))}(4+3\cos(c+dx)+3\cos(2(c+dx)))\tan\left(\frac{1}{2}(c+dx)\right)}{5d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(7/2),x]
[Out] (2*a*Sqrt[a*(1 + Cos[c + d*x])]*(4 + 3*Cos[c + d*x] + 3*Cos[2*(c + d*x)])*T
an[(c + d*x)/2])/(5*d*Cos[c + d*x]^(5/2))
```

Maple [A] (verified)

Time = 4.95 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.52

method	result	size
default	$\frac{2\sin(dx+c)\left(6\left(\cos^2(dx+c)\right)+3\cos(dx+c)+1\right)\sqrt{a(1+\cos(dx+c))}\,a}{5d(1+\cos(dx+c))\cos(dx+c)^{\frac{5}{2}}}$	63

```
[In] int((a+cos(d*x+c)*a)^(3/2)/cos(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
[Out] 2/5/d*sin(d*x+c)*(6*cos(d*x+c)^2+3*cos(d*x+c)+1)*(a*(1+cos(d*x+c)))^(1/2)/(
1+cos(d*x+c))/cos(d*x+c)^(5/2)*a
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.60

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2\left(6\,a\cos\left(dx+c\right)^{2}+3\,a\cos\left(dx+c\right)+a\right)\sqrt{a\cos\left(dx+c\right)+a}\sqrt{\cos\left(dx+c\right)}}{5\left(d\cos\left(dx+c\right)^{4}+d\cos\left(dx+c\right)^{3}\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] 2/5*(6*a*cos(d*x + c)^2 + 3*a*cos(d*x + c) + a)*sqrt(a*cos(d*x + c) + a)*sq
rt(cos(d*x + c))*sin(d*x + c)/(d*cos(d*x + c)^4 + d*cos(d*x + c)^3)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(3/2)/cos(d*x+c)**(7/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 217 vs. 2(103) = 206.

Time = 0.35 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.79

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{4\left(\frac{5\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)}{\cos(dx+c)+1}-\frac{10\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)^{3}}{(\cos(dx+c)+1)^{3}}+\frac{7\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)^{5}}{(\cos(dx+c)+1)^{5}}-\frac{2\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)^{7}}{(\cos(dx+c)+1)^{7}}\right)\left(\frac{\sin(dx+c)^{2}}{(\cos(dx+c)+1)^{2}}+1\right)^{2}}{5\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{7}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{7}{2}}\left(\frac{2\sin(dx+c)^{2}}{(\cos(dx+c)+1)^{2}}+\frac{\sin(dx+c)^{4}}{(\cos(dx+c)+1)^{4}}+1\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(7/2),x, algorithm="maxima")
```

```
[Out] 4/5*(5*sqrt(2)*a^(3/2)*sin(d*x + c)/(cos(d*x + c) + 1) - 10*sqrt(2)*a^(3/2)
*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 7*sqrt(2)*a^(3/2)*sin(d*x + c)^5/(co
s(d*x + c) + 1)^5 - 2*sqrt(2)*a^(3/2)*sin(d*x + c)^7/(cos(d*x + c) + 1)^7)*
(sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 1)^2/(d*(sin(d*x + c)/(cos(d*x + c)
+ 1) + 1)^(7/2)*(-sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(7/2)*(2*sin(d*x + c
)^2/(cos(d*x + c) + 1)^2 + sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + 1))
```

Giac [F(-1)]

Timed out.

$$\int \frac{(a + a\cos(c + dx))^{3/2}}{\cos^{\frac{7}{2}}(c + dx)}\, dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(7/2),x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [B] (verification not implemented)

Time = 16.40 (sec) , antiderivative size = 133, normalized size of antiderivative = 1.10

$$\int \frac{(a + a\cos(c + dx))^{3/2}}{\cos^{\frac{7}{2}}(c + dx)}\, dx = \frac{4\,a\,\sqrt{a\,\left(\cos\left(c+d\,x\right)+1\right)}\,\left(8\,\sin\left(c+d\,x\right)+6\,\sin\left(2\,c+2\,d\,x\right)+11\,\sin\left(3\,c+3\right.\right.}{5\,d\,\sqrt{\cos\left(c+d\,x\right)}\,\left(10\,\cos\left(c+d\,x\right)+8\,\cos\left(2\,c+2\,d\,x\right)+5\,\cos\left(3\,c+3\,d\,x\right)\right.}$$

```
[In] int((a + a*cos(c + d*x))^(3/2)/cos(c + d*x)^(7/2),x)
```

```
[Out] (4*a*(a*(cos(c + d*x) + 1))^(1/2)*(8*sin(c + d*x) + 6*sin(2*c + 2*d*x) + 11
*sin(3*c + 3*d*x) + 3*sin(4*c + 4*d*x) + 3*sin(5*c + 5*d*x)))/(5*d*cos(c +
d*x)^(1/2)*(10*cos(c + d*x) + 8*cos(2*c + 2*d*x) + 5*cos(3*c + 3*d*x) + 2*c
os(4*c + 4*d*x) + cos(5*c + 5*d*x) + 6))
```

3.212 $\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 161

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{2a^2\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{26a^2\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{104a^2\sin(c+dx)}{105d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{208a^2\sin(c+dx)}{105d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 2/7*a^2*sin(d*x+c)/d/cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^(1/2)+26/35*a^2*sin(
d*x+c)/d/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(1/2)+104/105*a^2*sin(d*x+c)/d/c
os(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2)+208/105*a^2*sin(d*x+c)/d/cos(d*x+c)^
(1/2)/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2841, 21, 2851, 2850}

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{104a^2\sin(c+dx)}{105d\cos^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{26a^2\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{2a^2\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{208a^2\sin(c+dx)}{105d\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(9/2),x]
```

```
[Out] (2*a^2*Sin[c + d*x])/(7*d*Cos[c + d*x]^(7/2)*Sqrt[a + a*Cos[c + d*x]]) + (2
6*a^2*Sin[c + d*x])/(35*d*Cos[c + d*x]^(5/2)*Sqrt[a + a*Cos[c + d*x]]) + (1
04*a^2*Sin[c + d*x])/(105*d*Cos[c + d*x]^(3/2)*Sqrt[a + a*Cos[c + d*x]]) +
(208*a^2*Sin[c + d*x])/(105*d*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rubi steps

$$\text{integral} = \frac{2a^2\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{1}{7}(2a)\int \frac{-\frac{13a}{2}-\frac{13}{2}a\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{2a^2\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{1}{7}(13a)\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx$$

$$= \frac{2a^2\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{26a^2\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{1}{35}(52a)\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx$$

$$= \frac{2a^2\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{26a^2\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{104a^2\sin(c+dx)}{105d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{1}{105}(104a)\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \frac{2a^2\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{26a^2\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{104a^2\sin(c+dx)}{105d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{208a^2\sin(c+dx)}{105d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.45

$$\int\frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{2a\sqrt{a(1+\cos(c+dx))}(41+117\cos(c+dx)+26\cos(2(c+dx))+26\cos(3(}{105d\cos^{\frac{7}{2}}(c+dx)}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(9/2),x]
[Out] (2*a*Sqrt[a*(1 + Cos[c + d*x])]*(41 + 117*Cos[c + d*x] + 26*Cos[2*(c + d*x)
] + 26*Cos[3*(c + d*x)])*Tan[(c + d*x)/2])/(105*d*Cos[c + d*x]^(7/2))
```

Maple [A] (verified)

Time = 5.29 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.45

method	result	size
default	$\frac{2\sin(dx+c)\left(104\left(\cos^3(dx+c)\right)+52\left(\cos^2(dx+c)\right)+39\cos(dx+c)+15\right)\sqrt{a(1+\cos(dx+c))}\,a}{105d(1+\cos(dx+c))\cos(dx+c)^{\frac{7}{2}}}$	73

```
[In] int((a+cos(d*x+c)*a)^(3/2)/cos(d*x+c)^(9/2),x,method=_RETURNVERBOSE)
[Out] 2/105/d*sin(d*x+c)*(104*cos(d*x+c)^3+52*cos(d*x+c)^2+39*cos(d*x+c)+15)*(a*(
1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))/cos(d*x+c)^(7/2)*a
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.53

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{2\left(104\,a\cos\left(dx+c\right)^{3}+52\,a\cos\left(dx+c\right)^{2}+39\,a\cos\left(dx+c\right)+15\,a\right)\sqrt{a\cos\left(d\right.}}{105\left(d\cos\left(dx+c\right)^{5}+d\cos\left(dx+c\right)^{4}\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(9/2),x, algorithm="fricas")
```

```
[Out] 2/105*(104*a*cos(d*x + c)^3 + 52*a*cos(d*x + c)^2 + 39*a*cos(d*x + c) + 15*
a)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*sin(d*x + c)/(d*cos(d*x + c)
^5 + d*cos(d*x + c)^4)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(3/2)/cos(d*x+c)**(9/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 263, normalized size of antiderivative = 1.63

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{4\left(\frac{105\,\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)}{\cos(dx+c)+1}-\frac{245\,\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)^{3}}{(\cos(dx+c)+1)^{3}}+\frac{273\,\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)^{5}}{(\cos(dx+c)+1)^{5}}-\frac{171\,\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)^{7}}{(\cos(dx+c)+1)^{7}}+\right.}{105\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{9}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{9}{2}}\left(\frac{3\,\sin(dx+c)^{2}}{(\cos(dx+c)+1)^{2}}+\frac{3\,\sin(\right.}{(\cos(dx}}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(9/2),x, algorithm="maxima")
```

```
[Out] 4/105*(105*sqrt(2)*a^(3/2)*sin(d*x + c)/(cos(d*x + c) + 1) - 245*sqrt(2)*a^
(3/2)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 273*sqrt(2)*a^(3/2)*sin(d*x + c
)^5/(cos(d*x + c) + 1)^5 - 171*sqrt(2)*a^(3/2)*sin(d*x + c)^7/(cos(d*x + c)
 + 1)^7 + 38*sqrt(2)*a^(3/2)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9)*(sin(d*x
+ c)^2/(cos(d*x + c) + 1)^2 + 1)^3/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)
^(9/2)*(-sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(9/2)*(3*sin(d*x + c)^2/(cos(
d*x + c) + 1)^2 + 3*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + sin(d*x + c)^6/(c
os(d*x + c) + 1)^6 + 1))
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 233.17 (sec) , antiderivative size = 87931, normalized size of antiderivative = 546.16

$$\int \frac{(a + a\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(9/2),x, algorithm="giac")
[Out] 134217728/105*sqrt(2)*sqrt(-tan(1/4*d*x + c)^4*tan(1/2*c)^8 + 14*tan(1/4*d*
x + c)^4*tan(1/2*c)^6 - 24*tan(1/4*d*x + c)^3*tan(1/2*c)^7 + 6*tan(1/4*d*x
+ c)^2*tan(1/2*c)^8 + 56*tan(1/4*d*x + c)^3*tan(1/2*c)^5 - 84*tan(1/4*d*x +
 c)^2*tan(1/2*c)^6 + 24*tan(1/4*d*x + c)*tan(1/2*c)^7 - tan(1/2*c)^8 - 14*t
an(1/4*d*x + c)^4*tan(1/2*c)^2 + 56*tan(1/4*d*x + c)^3*tan(1/2*c)^3 - 56*ta
n(1/4*d*x + c)*tan(1/2*c)^5 + 14*tan(1/2*c)^6 + tan(1/4*d*x + c)^4 - 24*tan
(1/4*d*x + c)^3*tan(1/2*c) + 84*tan(1/4*d*x + c)^2*tan(1/2*c)^2 - 56*tan(1/
4*d*x + c)*tan(1/2*c)^3 - 6*tan(1/4*d*x + c)^2 + 24*tan(1/4*d*x + c)*tan(1/
2*c) - 14*tan(1/2*c)^2 + 1)*((((((((((((((-26*I*a*e^(1055/2*I*c) - 10504*I
*a*e^(1053/2*I*c) - 2116556*I*a*e^(1051/2*I*c) - 283618504*I*a*e^(1049/2*I*
c) - 28432755026*I*a*e^(1047/2*I*c) - 2274620402080*I*a*e^(1045/2*I*c) - 15
1262256738489*I*a*e^(1043/2*I*c) - 8600339740332756*I*a*e^(1041/2*I*c) - 42
6791859624382434*I*a*e^(1039/2*I*c) - 18778841824711012321*I*a*e^(1037/2*I*
c) - 741764252188078830689*I*a*e^(1035/2*I*c) - 26568646859265646058950*I*a
*e^(1033/2*I*c) - 870123185139944470654786*I*a*e^(1031/2*I*c) - 26237560685
859258651673169*I*a*e^(1029/2*I*c) - 732777588939374143249503406*I*a*e^(102
7/2*I*c) - 19052217362358251291769232228*I*a*e^(1025/2*I*c) - 4632070364761
52149238073238832*I*a*e^(1023/2*I*c) - 10572019483402811301975746281474*I*a
*e^(1021/2*I*c) - 227298420835979818145918471098570*I*a*e^(1019/2*I*c) - 46
17746921046245570620730707402520*I*a*e^(1017/2*I*c) - 888916297102032235566
68933908311334*I*a*e^(1015/2*I*c) - 1625446980015332177755918014501608982*I
*a*e^(1013/2*I*c) - 28297555097893393021020676691580988233*I*a*e^(1011/2*I*
c) - 469985499033039677874623273935334240076*I*a*e^(1009/2*I*c) - 746102018
3678979972532247003767832497030*I*a*e^(1007/2*I*c) - 1134075143499574369671
42625811402104148561*I*a*e^(1005/2*I*c) - 165313275328330015489593384758165
2791644965*I*a*e^(1003/2*I*c) - 2314386102212629093579514744696779433078876
4*I*a*e^(1001/2*I*c) - 311615599009998457055428626562611218440152906*I*a*e^
(999/2*I*c) - 40402580917125792223490270822458573000045844265*I*a*e^(997/2*I
*c) - 50503236456021701342291384690765044913121286031*I*a*e^(995/2*I*c) - 6
09297262840711915743663065579736975124435730278*I*a*e^(993/2*I*c) - 7102123
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635292584058316806336315160604010*I*a*e^(985/2*I*c) - 946608933713441777201
63398371692357473361249542281324*I*a*e^(983/2*I*c) - 9414928240218725385714
```

07241795810657020217893835828847*I*a*e^(981/2*I*c) - 9092846502857218261462
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11677629126536894715822244726480090*I*a*e^(977/2*I*c) - 7786641378440594926
87126944618806483697276408481076541824*I*a*e^(975/2*I*c) - 6913027812800192
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*c) - 33015189183442105731730952102686078554556811480087134425669934*I*a*e^
(965/2*I*c) - 2576627521764579828166282791344882800098730222812489282691092
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c) - 35480723438231712844684785105847570910860568249280080967679923825908
I*a*e^(951/2*I*c) - 2356471921691593101191613443407382001865279341517292517
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e^(901/2*I*c) - 159255512903666965947392050482627777652855525628647598071 48
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*a*e^(865/2*I*c) - 195758646963105984513821530787277010349734174197605014 62
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68960940*I*a*e^(613/2*I*c) + 450864052506273528333921347261618114674346898З
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0*I*a*e^(611/2*I*c) + 134373946463544483939193158440319190954779730332932855
4832052915711911612344383418766608011863070070271134159756438724511480*I*a*
e^(609/2*I*c) + 221034257892392428506776513729559457247579927221728582941833
2739190163959979535188907184118401352847011402341171183153330400*I*a*e^(607
/2*I*c) + 303409839775241340348800685971884147465797827674549775052181699893
605576672194645212093459076166299568495347142098625376060*I*a*e^(605/2*I*c
) + 379979787117931179687380662746570800769009286292103738378140902975891500

4813248606746718458290904172947709059780815722352620*I*a*e^(603/2*I*c) + 44
940591083600674896239360382318518653571603370750962153622001376900165216026
6321868773593038071461031867255150268333080200*I*a*e^(601/2*I*c) + 51057091
721960329893092708641214813382863249945105550621003328053803999858580557045
0486684217149260136863823464698025514400*I*a*e^(599/2*I*c) + 56260715453424
961141470384233351833575263273087377725906266226541526519731875734257884216
0394845870139211686607258163271980*I*a*e^(597/2*I*c) + 60491494623493828222
108611301240361714341393927533594418900947640722960566307588693769380053338
4123491506489579681833036880*I*a*e^(595/2*I*c) + 63717008070001493684421499
871540921968231902315964970521369009232212902279975611798506238620790767687
9268835925347571814760*I*a*e^(593/2*I*c) + 65932058255391991207519161926924
538287660508423693384264677808141712011861339760734907885315822276750767056
4574204234442160*I*a*e^(591/2*I*c) + 67157341637660034425547689084008410706
874849719793262470140403410965336801304677467935973143246176329476681331674
0570321920*I*a*e^(589/2*I*c) + 67437223903275439537820503853552513441399182
106780864259314798220249384365267792708254178181036981063884223447619432891
7280*I*a*e^(587/2*I*c) + 66836769653635175402821738142912436935510599170659
6728061963354863236879295944678255966593383757885721698666786195936988720*I
*a*e^(585/2*I*c) + 65438203681888711529241778924250092106742526224072869056
3625955515997936064156892229191882650976483089469657316496979497920*I*a*e^(
583/2*I*c) + 63336997046623115163959349863305250081699258822228970806190440
8614478071012324018301393989621376114495936107929638109352240*I*a*e^(581/2*
I*c) + 60637775514913064468548364113378389407451763395155900350517703826060
9373787904347095041198589577627025869566789105127854940*I*a*e^(579/2*I*c) +
57450241170903365426020832853871513572899855105089906678617222593840958046
4129402448537468149317355804595816458074515452280*I*a*e^(577/2*I*c) + 53885
281323820259810451411439759853728315471784068284835012155363183588104204929
9653608342888243843496016154319713358492360*I*a*e^(575/2*I*c) + 50051414111
687569446796470145331706246370984263721939905498360654812297696040180164504
4637308666501943921790160591726142140*I*a*e^(573/2*I*c) + 46051689575810431
145060712787131747587618178118061597193237132520046311646843775945121827051
2614846167126411504887103639420*I*a*e^(571/2*I*c) + 41981130860866133276775
830224625176730685073365325659522890994828774416917695532055410288426468668
3175846620329681501389720*I*a*e^(569/2*I*c) + 37924764966616668993253874443
984268431502016172591058492646782564664088361844020015549276580301421245120
1418879737084175200*I*a*e^(567/2*I*c) + 33956258365604170538449551246179949
014809149484416111667393330776287174267697272330398214311481505560053859867
4333818006140*I*a*e^(565/2*I*c) + 30137141726354276247494280303342811319844
751824421835539801274269143465154276945394229989740940738862410829963380510
9409320*I*a*e^(563/2*I*c) + 26516581453342395966498559782234985695018851622
657829929240027253920806897363772384189339977048708284015835826655548698188
0*I*a*e^(561/2*I*c) + 23131634811694770274393784785855608711191418837262783
6780990986990309150303501014036898617069788744248382411616930060590160*I*a*
e^(559/2*I*c) + 20007910594766327195563250951598099940618344458553311779784
9122654482023351610633374676069055506407150129677270455507223800*I*a*e^(557

/2*I*c) + 171605486957459662750676535846047739137214911399784738960265764988070463454234816351437243248376883372505719428491381980392*I*a*e^(555/2*I*c
) + 1459542922461096997199122221237817383353906259665061272690983548867946949918750839288836258767375438125817503683603486935 28*I*a*e^(553/2*I*c) + 12
31052429703509239386516781172864437549103594074207676996781739986039139812854128747060492238260342109098941331543057116 32*I*a*e^(551/2*I*c) + 10297312
397609124984148657207722188850112340121053935825085071057596024457612854855090380005293784816382488806371077361168 8*I*a*e^(549/2*I*c) + 85421852279646
559159940111327081238178956474950230875118810643314639931537207781953980988720021516214669798986825724375032*I*a*e^(547/2*I*c) + 702778908561436462870
175933201068691827609640028479309917143519681905864654184793580358274490940097459787845064031198111 20*I*a*e^(545/2*I*c) + 5734256013731445208854173408
6541916634164548525108288581823624632355858872350966292386326440523022152879291694690278241978*I*a*e^(543/2*I*c) + 46402932547295212381676170516766288
2510680826676862896621709868144232969555830801650761118315567462408230526368959140883 52*I*a*e^(541/2*I*c) + 372411212727020742867785367281276422588180
680725597659094510647668238594209452592717403098304203348491058356450383541 34788*I*a*e^(539/2*I*c) + 2964188709823277397398565433057937948382124476932
398021117544731321946270453188040080180240080692964637934301513072388367 2*I
*a*e^(537/2*I*c) + 23398582340521584219692739918602629576737063867809667736
3480812909477222836660668200996554847559718208281363221719216660 98*I*a*e^(5
35/2*I*c) + 183175263910895824505565576225483261015979145299235796538887920
9915336157123282457319545983523340258113762462398643414364 0*I*a*e^(533/2*I*
c) + 1422096255936507476331430849012547478681676010516903806540846148028804
7031021663614568854283660670738808692795002194734697*I*a*e^(531/2*I*c) + 10
948781640409755536653618878020227586096531153252918259760911769700775752607
0912110599326595980539747905707367514990789 48*I*a*e^(529/2*I*c) + 835921585
525270059274636632763640027045000249563752770351589923039914836784921459256
4997399354344495040435849157657695842*I*a*e^(527/2*I*c) + 63287101890827098
013439395292353019142419756835338499063105744749243277482710437122101671047
842109847058554679619163061 61*I*a*e^(525/2*I*c) + 4751169737901457396207176
711967933179363677478581181612846070387281280000757129577641826784358070259
73021672723581869060 9*I*a*e^(523/2*I*c) + 353676461326065445325819276169145
836984896738655835870701106999280831997418448425789700221226148531872501461
0659806587718*I*a*e^(521/2*I*c) + 26104512439239812601045343301245482286721
738771000303049982303620541264736593591686034766432115959581784629113174285
91330*I*a*e^(519/2*I*c) + 1910343223430788602372199148905316683910021942415
008389270429889705177139255081101273218946424866081924816129975411078465*I*
a*e^(517/2*I*c) + 138603841629113966677521737046806457587286373607779128668
239428274584755056608200145082656362062788523071150737005659187 8*I*a*e^(515
/2*I*c) + 99698359441354323795166381340478739419369614575348281904494353290
400603851363815918420838033402440279897517381816932584 4*I*a*e^(513/2*I*c) +
71093467623617819931529362965394957514618742322833987960295461503835664219
295213865836977240201203051150652436608718233 6*I*a*e^(511/2*I*c) + 50255047
099219587862641183807985000665977919581454351822399978129428805689682441109

8205470727732618356886370847708708442*I*a*e^(509/2*I*c) + 35214107792273673
0546898110712009539372175536582481680338223417210222349307364684263727611886
0803222344128198352327695010*I*a*e^(507/2*I*c) + 24457882041294122241339544
8190925169184058675448514568342704435560427553614905283048112187005746964409
0261842716041958472*I*a*e^(505/2*I*c) + 16836963099756122755933363603068050
5097931214578041180941450461063477255836777741106503139414783875934618403506
6189272070*I*a*e^(503/2*I*c) + 11487580338590154703533073303734992526459079
1175334294610155096056593848065467484845287083746515024420618289251515633198
8*I*a*e^(501/2*I*c) + 77676555142903920918742869451767200086404378777218239
528959225606553643216179633134107155344214086969807897418659931017*I*a*e^(4
99/2*I*c) + 52050424536608710685076935662030308074907036863740702779368475
7255220552917964923103037215024188293833964746024169725 40*I*a*e^(497/2*I*c)
+ 34562688658335649211235815116322537997756450074163387284377781559313893378
888095966995972985174402809832848723518472890 2*I*a*e^(495/2*I*c) + 22741305
8786351473070381534886728259479879780194573281217903854812186023297971373799
2359639791125701815081057612998642 41*I*a*e^(493/2*I*c) + 1482597913528423746
2226719438636827970156048051160166462384448383493151512293285705772099118859
2107170607681823985077157*I*a*e^(491/2*I*c) + 95764982457308878595876534947
1305196386850809210989361982863148932862127489647280009682811661925642220300
1427328938060*I*a*e^(489/2*I*c) + 61283072797448975766537063738340083584620
2652485602861930650162676637289161428815346565423045111826183623444214492
7690*I*a*e^(487/2*I*c) + 388507789813532475586164549780192878883540696244375
73298971908419258614516593037253555392783178746767134179126021517 85*I*a*e^
(485/2*I*c) + 2439827741847387640648859734577926475542979210917703206702312
6683130955186856176073728556616971902536967432867806671 83*I*a*e^(483/2*I*c)
 + 15177267577232388524583385233643113573456904675796159553155145390502154
00801547691758586164717780698532261211210676134*I*a*e^(481/2*I*c) + 93514230
9058644648996306800248685199060934241266676135556650246097289205034092387373
9497393217230503719781101257817 08*I*a*e^(479/2*I*c) + 570671487070895844624
3766686998711188720051887409634811328400701506757962547805027587776046716435
56111867698875355315*I*a*e^(477/2*I*c) + 34490035354976891452641194237459
7368779545029739787329071887057800090344123223642583873423162351462269773310
642073463*I*a*e^(475/2*I*c) + 20643092016747077912907823241483413891537685
712587009198439125543936865264826943778936136375611710126260807475077412 2*I
*a*e^(473/2*I*c) + 12235005251853116401410643849239077476211550363939898847
02142027038397448400333912278239277381368234670539204860031 00*I*a*e^(471/2*
I*c) + 71805309593088734534182328800742749493154891157519618233998054566080
84692526702600708134914971888265664189976969934 3*I*a*e^(469/2*I*c) + 417259
9134954602125985964954763710995733952767863225515182161583206688887442502972
620212517696827813378668550786579 0*I*a*e^(467/2*I*c) + 2400652133051861941
0117787050262411608350306884259736598396370271394691940783119373097697849962
988467299495366349818*I*a*e^(465/2*I*c) + 1367411005845812309435216469469 1
4569546024886025003555102038229237289423514613908742024104899918290182240221
72756144*I*a*e^(463/2*I*c) + 771065067832387504303985863253313532066682438
6583692473836465776809056255028607596799784311313743491088689654262026*I*a*

e^(461/2*I*c) + 4304076708196868623182033776806377443199259967769349066155975950428294505280637590876357992866456385230699336439762*I*a*e^(459/2*I*c) + 2378159273032121110604246379705300581511164593758967872239281896998173201558987639246325006007724766172710488108360*I*a*e^(457/2*I*c) + 1300615174271010524481136646953158324736944464052932946836830203015550268173675607727307084706325098884799728006340*I*a*e^(455/2*I*c) + 704009729937813921690706496710889899788434054131439662107181131420712162600554109916450181425438322392204166968902*I*a*e^(453/2*I*c) + 377142540527901948948638950467507037490336862439884119528845344255236737968714764289755834224007993516760655927631*I*a*e^(451/2*I*c) + 199942201925298499861324281146334926533714538945870178594046781580871260287770985229020625257582980635730225596574*I*a*e^(449/2*I*c) + 104893986154804101296916258335583569488825031337940879705887720891017009057737287233126607468682692414623104616138*I*a*e^(447/2*I*c) + 54452642914272730607209059956928793329411850728280306564009762144470353759860633440913049919720954752768197793167*I*a*e^(445/2*I*c) + 27969497581502989878044021159896294705281853520414801800856230671667421994293925781447451022557190042490393634543*I*a*e^(443/2*I*c) + 14214210534577278513465563854370433231934531532131982087187864816589649495421026029699207505243396560387206439630*I*a*e^(441/2*I*c) + 7146743752116835696646457888685953635190050205364442589239754498947790079457620288669958662869113747109252011972*I*a*e^(439/2*I*c) + 3554806987990197776445869286315539003513648984994079123806662496505394242907964145674445025619936991568879491783*I*a*e^(437/2*I*c) + 1749125934439599213152683239419477381889125305076480377326824972897585677418916594095435586707281927023930690932*I*a*e^(435/2*I*c) + 851330476367280675931975863605407903147652289552972334476403837141273395148705506900158560019626231978044203758*I*a*e^(433/2*I*c) + 409847262333561884793176079911000774943237907896725050192873946316017656875993526712458367191600832293291122032*I*a*e^(431/2*I*c) + 195149410499491059972295971340541623205014478485259218183564112297195495432447981697623978433168097927188489160*I*a*e^(429/2*I*c) + 91898464215137332126596549205674856438317557197351584304760723812330051881370624842695522772767931492290924348*I*a*e^(427/2*I*c) + 42797595829831672985306108079022076606648329018648897202993638057186135621171784408511776555724216303427661062*I*a*e^(425/2*I*c) + 19709460490564965385561803040597477627919893623964549850251247634144502731961702165480743287298391566662175368*I*a*e^(423/2*I*c) + 8975285853701358274702317193638300392915140185413802501007132352939624150862231577879738561005464285728950292*I*a*e^(421/2*I*c) + 4041231871090109046687153428258621968875255262763820985144556783792101620081675023154167930533684581024874268*I*a*e^(419/2*I*c) + 1799056023235771797186810917719379254648844020291348114199995277306725921780651883266662884996146999653568600*I*a*e^(417/2*I*c) + 791797833199627836948743904893083516778740662517693894919607742925640625105771158237179198488030147594263020*I*a*e^(415/2*I*c) + 344505081824778437645788999066343041845046916298803112223744796287266870120059274579365813673652734652520860*I*a*e^(413/2*I*c) + 148170372481752681412605856390708157556929105970750484058252083383402807240476275164707994006284231733473540*I*a*e^(411/2*I*c) + 62991788302738889334378246177490929980502834

395575555703321916458754517369753884106316753560824690112805080*I*a*e^(409/
2*I*c) + 264688706737974967590923321425254619636800803395790418098415740101
749239230179605504887057831186110252319 00*I*a*e^(407/2*I*c) + 1099227368741
104265960827879402879682744502105532980172184977676201498091273500377344150
71337265499722741 40*I*a*e^(405/2*I*c) + 4511403508274736689214557264253227 2
569245520843991157790788787038908737773502516606421704808303078839301 90*I*a
*e^(403/2*I*c) + 182969548864472193661367056267261147164462175904198629159 2
974000076597401110348056876443996820050899846880*I*a*e^(401/2*I*c) + 733262
615944250250700290992591262141599937580410232623396266193728726497598828508
1172645472353811938846 20*I*a*e^(399/2*I*c) + 2903514517931898988994927415 56
697043777221617969524731942883589465588614512062844825790429284872923161710
*I*a*e^(397/2*I*c) + 113590468467563256057986526514167954781776847099101767
609994370709250217377586572896526050715752951812430*I*a*e^(395/2*I*c) + 439
018112015045685056900939335989748633216730861830038502636480625932094071093
55666758585680043907834980*I*a*e^(393/2*I*c) + 16761557735442086558865078 19
069258816081905262904500765650270953154799273548403327039324116368185985654
0*I*a*e^(391/2*I*c) + 632129310137770553459850143456357886943376811138925 57
152035894573575286639697291975485394655258020017 90*I*a*e^(389/2*I*c) + 2354
641367283844474755708554386157141460452019630966364104906530187054447060414
009835524070257156040960*I*a*e^(387/2*I*c) + 866239576421815307507281274641
113115501900542064258358681945153517620235306644376865761912243559851440*I*
a*e^(385/2*I*c) + 314711214529371424992788713845747425849189730314416398704
121265827004417977443472234197727267055736520*I*a*e^(383/2*I*c) + 112905029
373268064608678917166797205473844987041134184835386265805093053876406216627
623784532569846520*I*a*e^(381/2*I*c) + 399950757236912370381952787687805998
326193529815026005839444745109758406883882653155820108719542115 60*I*a*e^(37
9/2*I*c) + 139880302353639240750491684435137322249209761735967189805879375 8
097285825967657795900242505642130436 0*I*a*e^(377/2*I*c) + 48297801283886815
417134199531741902386125783621934152011287465572901018172493554744157991532
09807700*I*a*e^(375/2*I*c) + 164619835933874297052945673172560504489848475 0
147452152323408580882886785796463137774250844390402000*I*a*e^(373/2*I*c) +
553838940597037209801420093339031465928345342466968134327170356436277614050
695088234925854972461590*I*a*e^(371/2*I*c) + 183904807224491919846530211566
172865275646148609389197477057237389158397210607704335080668307676320*I*a*e
^(369/2*I*c) + 602659362849005578742780582711292436289148540723110542636999
564444979537866227546387047519477673 00*I*a*e^(367/2*I*c) + 1948857617595825
986849208666366913599389167032693503673342407965939565494739504167122607796
8039510*I*a*e^(365/2*I*c) + 621837611987085292775662096664408954642024400 75
717802438763696310906310483356014556247857083120 30*I*a*e^(363/2*I*c) + 1957
586469631059845138215307872770103497341741976050146298563390984316998623891
058083233354950720*I*a*e^(361/2*I*c) + 607952325065380552231765878979364337
92261856200178968194469267330870452834002467117504960484774 0*I*a*e^(359/2*I
*c) + 186242701415300150260367661909796221932019732537024634010976646542647
17836637661337123797846895 0*I*a*e^(357/2*I*c) + 562737379422812172158325781
000732358582736284930271747071169054554986005529944770173533356931 30*I*a*e^

(355/2*I*c) + 16768862813742570497359327685745671257365058909271489112829760986508383352816248603242238251460*I*a*e^(353/2*I*c) + 49274967292830834500120997678402033520557202853197818577009635951507746267135030666824566320 0*I*a*e^(351/2*I*c) + 142766534765971531787121468360030135662981807815701180963132320068366501520709652554641165485 0*I*a*e^(349/2*I*c) + 407807461714197071178872620082184411365896862940021562248885259817851441393751779677614254090*I*a*e^(347/2*I*c) + 11483195709771919270611169705763287240925693313421210595325532758731557146619122589272245894 0*I*a*e^(345/2*I*c) + 31871183114651835736278225480719985131360742804792653167920265913904648857223319205558481280*I*a*e^(343/2*I*c) + 871784512153854396500065550892757615645450996512457822766611186159953047047316549474112193 0*I*a*e^(341/2*I*c) + 2349860552604700274370411952452920438650006836481438508181807279875096925888687475349639360*I*a*e^(339/2*I*c) + 624082643961029037312709284672126976697873212538908890262985442647874324392878156690829740*I*a*e^(337/2*I*c) + 163287484325599994722817042441220130107697316248983794524997603902832643977337412661872760*I*a*e^(335/2*I*c) + 42083973507831971365951079505656822321370151622842020026197681285864461893407471640353960*I*a*e^(333/2*I*c) + 10682536878135513811598686678158308084092593434324791253827853349664088304211712490029720*I*a*e^(331/2*I*c) + 267033108043813673925169942118847715281698388264651831361830005519049877486172195608412 0*I*a*e^(329/2*I*c) + 65724378186986858433214274523779730657690803818117487937586102230650649472513431246424 0*I*a*e^(327/2*I*c) + 1592555129036669659473920504826277776528555256286475980714877103567656193381644476784 80*I*a*e^(325/2*I*c) + 37984226942784466728066963318356113137634905014288785261844980339121431692865121528770*I*a*e^(323/2*I*c) + 891631388090861606194167299299998448298607578597088588065262025339499077331115218186 0*I*a*e^(321/2*I*c) + 205954451320666914305466797161323566250098209629523881816279242995442881462955840086 0*I*a*e^(319/2*I*c) + 46804691242254382757936461729097613166861829260526758142680888093094205683622574085 0*I*a*e^(317/2*I*c) + 104632479285330168704567624173205774202975142869561651398142015702621321511418637970*I*a*e^(315/2*I*c) + 2300525379255875761865019325026166717489244654533102090028568362012614594842515186 0*I*a*e^(313/2*I*c) + 4973855633580303620126032637869477500107676182499873076094518413397303603804906240*I*a*e^(311/2*I*c) + 1057267590272325636639773903752531171523549537193854805338038288437194124266978930*I*a*e^(309/2*I*c) + 22091226783717640245723993873623894310798569049922261515012957756701334397281490 0*I*a*e^(307/2*I*c) + 45364173423147247508135549562011538428683560420839172608314747026780336705078884*I*a*e^(305/2*I*c) + 9153283321740997122951578693088645450336613285754578953646231535187679288519816*I*a*e^(303/2*I*c) + 181435100463883053545097464908045123290996284051809518330766825050273897979444 4*I*a*e^(301/2*I*c) + 353226389272834924314189317058363954203171842049410810171865734368883820818996*I*a*e^(299/2*I*c) + 6752682980371408820784121748009856094383803689375257216147308962311713997160 4*I*a*e^(297/2*I*c) + 126733614191388349406171784712736556600698565264069673421187037626721104802 00*I*a*e^(295/2*I*c) + 23345174198859668743509654880268166794662083102598557325074351051753134 57396*I*a*e^(293/2*I*c) + 4219747349096187780741342759182006525742147279404

438445345023730855803286O4*I*a*e^(291/2*I*c) + 7482563792634097992622245193
3992320121926362312065461272342106878301448536*I*a*e^(289/2*I*c) + 13012954
846383921360783439001134235337905843280455893166840706360597524134*I*a*e^(2
87/2*I*c) + 221894153908280997998580146226159783968435134891227557737760365
8269150756*I*a*e^(285/2*I*c) + 37088479298325400055072142587332657491012428
2599731660698821060848882320*I*a*e^(283/2*I*c) + 60747701724909506776211674
773541506177265806300575091658980807046860704*I*a*e^(281/2*I*c) + 974738630
8281902182329846941952263067390253415184368339278176002138446*I*a*e^(279/2*
I*c) + 15317187004832417969924973618448513278312446142210602969590007998433
24*I*a*e^(277/2*I*c) + 2356471921691593101191613443407382001865279341517292
51738259408174007*I*a*e^(275/2*I*c) + 3548072343823171284468478510584757091
0860568249280080967679923825908*I*a*e^(273/2*I*c) + 52265900544796578224837
80963008017596290103718605086715148151861646*I*a*e^(271/2*I*c) + 7529792233
11236135673287737101570895147168873416246633317325038975*I*a*e^(269/2*I*c)
+ 106052903363069013135578220340114498079609654804470793711887113055*I*a*e^
(267/2*I*c) + 145971076634287904419124491510555697826555105498817253810600
7306*I*a*e^(265/2*I*c) + 19626290453792900877515775414919491704740150645549
05158361368638*I*a*e^(263/2*I*c) + 2576627521764579828166282791344882800098
73022281248928269109247*I*a*e^(261/2*I*c) + 3301518918344210573173095210268
6078554556811480087134425669934*I*a*e^(259/2*I*c) + 41268884219832498876875
07689195856719564200342340690922960020*I*a*e^(257/2*I*c) + 5029991671775131
08237013793834321163983016591115064062192504*I*a*e^(255/2*I*c) + 5974840826
0336333152741949120162468054098096806527992694330*I*a*e^(253/2*I*c) + 69130
27812800192462704129875030929367293369791365329368306*I*a*e^(251/2*I*c) + 7
78664137844059492687126944618806483697276408481076541824*I*a*e^(249/2*I*c)
+ 85332954326120674272311677629126536894715822244726480090*I*a*e^(247/2*I*c
) + 9092846502857218261462182868864364624762389989516884454*I*a*e^(245/2*I*
c) + 941492824021872538571407241795810657020217893835828847*I*a*e^(243/2*I*
c) + 94660893371344177720163398371692357473361249542281324*I*a*e^(241/2*I*c
) + 9235203345455625183635292584058316806336315160604010*I*a*e^(239/2*I*c)
+ 873599857808953513616291826808640309239785388357815*I*a*e^(237/2*I*c) + 8
0060329141110785684222094424093216574599312586835*I*a*e^(235/2*I*c) + 71021
23372769126439065816004234917371096063247516*I*a*e^(233/2*I*c) + 6092972628
40711915743663065579736975124435730278*I*a*e^(231/2*I*c) + 5050323645602170
1342291384690765044913121286031*I*a*e^(229/2*I*c) + 40402580917125792223490
27082245857300045844265*I*a*e^(227/2*I*c) + 3116155990099984570554286265626
11218440152906*I*a*e^(225/2*I*c) + 2314386102212629093579514744696779433078
8764*I*a*e^(223/2*I*c) + 1653132753283300154895933847581652791644965*I*a*e^
(221/2*I*c) + 113407514349957436967142625811402104148561*I*a*e^(219/2*I*c)
+ 7461020183678979972532247003767832497030*I*a*e^(217/2*I*c) + 469985499033
039677874623273935334240076*I*a*e^(215/2*I*c) + 282975550978933930210206766
91580988233*I*a*e^(213/2*I*c) + 1625446980015332177755918014501608982*I*a*e
^(211/2*I*c) + 88891629710203223556668933908311334*I*a*e^(209/2*I*c) + 4617
746921046245570620730707402520*I*a*e^(207/2*I*c) + 227298420835979818145918
471098570*I*a*e^(205/2*I*c) + 10572019483402811301975746281474*I*a*e^(203/2

*I*c) + 463207036476152149238073238832*I*a*e^(201/2*I*c) + 1905221736235825
1291769232228*I*a*e^(199/2*I*c) + 732777588939374143249503406*I*a*e^(197/2*
I*c) + 262375606858592586516731 69*I*a*e^(195/2*I*c) + 870123185139944470654
786*I*a*e^(193/2*I*c) + 26568646859265646058950*I*a*e^(191/2*I*c) + 7417642
52188078830689*I*a*e^(189/2*I*c) + 18778841824711012321*I*a*e^(187/2*I*c) +
426791859624382434*I*a*e^(185/2*I*c) + 8600339740332756*I*a*e^(183/2*I*c)
+ 151262256738489*I*a*e^(181/2*I*c) + 2274620402080*I*a*e^(179/2*I*c) + 284
32755026*I*a*e^(177/2*I*c) + 283618504*I*a*e^(175/2*I*c) + 2116556*I*a*e^(1
73/2*I*c) + 10504*I*a*e^(171/2*I*c) + 26*I*a*e^(169/2*I*c))*tan(1/4*d*x + c
)/(e^(531*I*c) + 432*e^(530*I*c) + 93096*e^(529*I*c) + 13343760*e^(528*I*c)
+ 1431118260*e^(527*I*c) + 122503723056*e^(526*I*c) + 8718181624155*e^(525
*I*c) + 530563624556832*e^(524*I*c) + 28186192554792138*e^(523*I*c) + 13278
82849274858880*e^(522*I*c) + 56169444526926562260*e^(521*I*c) + 21548641447
81257856128*e^(520*I*c) + 75599817092670157806639*e^(519*I*c) + 24424556298
94502983849104*e^(518*I*c) + 73099207817335597247098038*e^(517*I*c) + 20370
31259470368160131922320*e^(516*I*c) + 53090127264630963470039804475*e^(515*
I*c) + 1299146645993240318167826532288*e^(514*I*c) + 2995254774926549967525
7842032197*e^(513*I*c) + 652650253343206047453620559993840*e^(512*I*c) + 13
477227799524701956579274210395326*e^(511*I*c) + 264410375780310742518099326
419685040*e^(510*I*c) + 4939666610818025798809586352543471345*e^(509*I*c) +
88054927598941411145869950813388040256*e^(508*I*c) + 150060274793739728640
5577818722691539392*e^(507*I*c) + 24489837337812338687718622491865013839488
*e^(506*I*c) + 383360155801054824529764688213114368047154*e^(505*I*c) + 576
460104656315130421385471071534683844 7392*e^(504*I*c) + 83380839911837894453
136303673785039051506805*e^(503*I*c) + 116158141373397175153362251190904691
7188768400*e^(502*I*c) + 15603911277687607099721623771744933086920587272*e^
(501*I*c) + 2023475097244621713139666435802340785081798383 20*e^(500*I*c) +
2535667460650279776834561566186591213109251642859*e^(499*I*c) + 30735366512
830562160991166338490057308062762518496*e^(498*I*c) + 360688613036389349413
809780004559963548775423325255*e^(497*I*c) + 410154543993719579395995670844
2496709433800261224880*e^(496*I*c) + 45230940039830738332025694784646206844
854827698075736*e^(495*I*c) + 484093410240488718655917025303662581091659126
182344528*e^(494*I*c) + 503202490340145182407421394376601192202650700631198
2753*e^(493*I*c) + 50836369508171099437019348610847391946736185108017183136
*e^(492*I*c) + 499467506558531733671585862910572702811545035730398749530*e^
(491*I*c) + 4775398607100853263534207733818266777478693412738731031680*e^(4
90*I*c) + 44456708175258821024400946210535004523775722190977468484496*e^(48
9*I*c) + 403212225957798188840846139960995624144491271694336796459584*e^(48
8*I*c) + 3564764890628724017088487996688178929195787613958545474804845*e^(4
87*I*c) + 30736217404321009965231037419663053962881035281709221697785072*e^
(486*I*c) + 258585348715977270155829115684193411072034541491364393985491350
*e^(485*I*c) + 212370296918887131826671878122392706783994901572729388406538
8080*e^(484*I*c) + 17033886027390615741040977721655541665612162275485028584
310890417*e^(483*I*c) + 133490210052026183779673313868332303530332906163247
194627808410304*e^(482*I*c) + 102253643746829673729306586270524644969368741

5559865844306888705423*e^(481*I*c) + 76590105201875496517771183576768719270
81898989131125755798204236112*e^(480*I*c) + 5611708107634117538408757018518
8538660375932013674735519055227368366*e^(479*I*c) + 40234969226612115893400
3582839428785116904903936409545602519219664720*e^(478*I*c) + 28239051519365
86678382525706564457280290098698638597987628380245881715*e^(477*I*c) + 1940
7979215594566593535008103303255257745408070082431338945184797463936*e^(476*
I*c) + 13065766022656041933512143438993896188459543406998482430714933213174
7540*e^(475*I*c) + 86188485109499190876424680547467242860375731548445397471
3612812215428992*e^(474*I*c) + 55725511573286711210162164163075961618619559
69011697222340926210112854418*e^(473*I*c) + 3532444720677901811537805282078
9411687581004582367431006205879633729015200*e^(472*I*c) + 21960128133951556
1500261478844190024870555261281946058839614044697037963695*e^(471*I*c) + 13
39214374254245553564884406801945353385000254030655765953770237607180089968*
e^(470*I*c) + 8013729580790752434361964945761543761469520791210746972675870
481058674277844*e^(469*I*c) + 470650446111351581084873533674842431026982488
38312635876283099427442745866704*e^(468*I*c) + 2713612075032665707344865170
77181014801775322183181055638619257836143271472358*e^(467*I*c) + 1536333238
444927583532734556016494671674916578907116984548489078241693926940560*e^(46
6*I*c) + 854301344112621233483354066506962147247908583804136056455072203672
3654297540205*e^(465*I*c) + 46668223548266017806854592468100570289355960869
613650856575756758180182223308768*e^(464*I*c) + 250501028608928332469340456
829902067712233644464602753159945727868485722395506952*e^(463*I*c) + 132149
805527130085142999386663161987442453442518818359204972768757103215643507728
0*e^(462*I*c) + 68529932231457366873288853116177954355929408414398663510796
55652312894721972796266*e^(461*I*c) + 3494107161327670464947794304333945020
1504075335160361865916029213860778606230624960*e^(460*I*c) + 17519317050061
8300241515632381912285157790097816049220671217212220015297133400636060*e^(4
59*I*c) + 86397993362233034955629682002839551319870806494050570212606865293
6800794826651264256*e^(458*I*c) + 41915425006568261480933394145441591439644
78472492315931809171859902114109005939942952*e^(457*I*c) + 2000800680303004
7137293278250321597113540716201983333126349281186679153199068045257216*e^(4
56*I*c) + 93986915313068179149083606065681482780836060510530154618486949839
4671313788859885998210*e^(455*I*c) + 434546676780280045346344498763892540797
175105756827515509297024187660299345484920192480*e^(454*I*c) + 197779298066
581813565130009432623915860544887080697086057732538502860998303453467231850
0*e^(453*I*c) + 88627521427569572856813408857649045979353495693553218156477
21172537159186491471311666400*e^(452*I*c) + 3910803125560180947653753536961
1844440844903751605645023514572352045248104262933598850730*e^(451*I*c) + 16
995632796992976777390209665262925328370450547712754455653441737668654093670
6073847337600*e^(450*I*c) + 72752101071839422929177407384469425579873866706
7535379759732795567942578751384250780476310*e^(449*I*c) + 30679742964317473
64198159623962463671617006419626851426148418602934852907379021659761911840*
e^(448*I*c) + 1274721961650332054135634306256284736860162214085678602544581
4532037904111523242298235713300*e^(447*I*c) + 52190912207661824215812271854
269748071292843243227894769229690720010547141334131610989636000*e^(446*I*c)

+ 2105943013856484711843290788803175049533618399541594274340098846617772597525426477091500369 90*e^(445*I*c) + 8375792069234119324587864867653735339465452397089907694887248139821891651045898955189092563 20*e^(444*I*c) + 3283874760555818676726309480306734420155098583948074469014168171874442170109648521627538755920*e^(443*I*c) + 12693496932964920565073673637181280088548682508880255337280065006566138696041797353216584528640*e^(442*I*c) + 48379489756434099843857791816589379406815042609340378747586437145781646245422045101230417309900*e^(441*I*c) + 18183466140617790131533012967714538116644918841319414116934435475492096903495261037894528225760 0*e^(440*I*c) + 6740255305431330088948457752366252374507431144735445378181704471346071025756766760566753289 61590*e^(439*I*c) + 2464382190807439609079774226855679629367885709776435876630851716253962696192341706239192878728160*e^(438*I*c) + 8888295028751024667044203837607976101480053134418614474620767522824868911959884352666444917404000*e^(437*I*c) + 31626644674725547731176795687527653571305969985923688392112164915553242573269490908989570248533280*e^(436*I*c) + 111034148797008819443143895644469242295049867464313710969257619338899133799285616020069872611710850*e^(435*I*c) + 38465584208066627445406307878483717499894905250097532216200339254995341359246151936517790868207840 0*e^(434*I*c) + 1315052120930692122102297105327622842335870743428530891072983535862280094446607723473800477453914130*e^(433*I*c) + 44372109178431823477643495444439046990200565950694708471936170921147140776330772349728253512269793 60*e^(432*I*c) + 14777955096617128998712745182071495362176506973183081650233605274051677624970464340242755840025673760*e^(431*I*c) + 48584258153140280447314836868772131390195412419046732778458706015096881437076337910793584122475073760*e^(430*I*c) + 1576858455288509187214628778644350902575831494155613234273865628944475982779356298009392371756251498 30*e^(429*I*c) + 5052936631230152588784830257388128132033977668453400653812610163534197223826203930325359606609219504 00*e^(428*I*c) + 159877110105819269227052899967744474268563100623245618584492522014400230587812038082848398866357482910 0*e^(427*I*c) + 4995241956279138180205186744401688024388272113921255663734956946927571305533146776898787878059685108480*e^(426*I*c) + 15413111211486023937294970820797376716081344788163386543522421939737507962125854981881879168348260330000*e^(425*I*c) + 46970224727117281826454045018070670522559756627580347784535320014963482632359729444541885102274546002560*e^(424*I*c) + 141379938253556843280565505807403304130606130725434751745794079833141361748917639986145377066437210546190*e^(423*I*c) + 420358024835146798583611210145942154684437949365647899088372524802156222884839580011688655664280691773600*e^(422*I*c) + 12346680418924099787800180817554402160125824763969419379658996319530792039742221387946043284989721447669 00*e^(421*I*c) + 35827180021632960614145367037151098971071982527392845461493431023484561240896574285949464386608597738862 40*e^(420*I*c) + 102716025302028890024978135168494525909715128095290606651973010970522100645760883480232346719754636774184 70*e^(419*I*c) + 290976510612474534066475697818369100621655598523590528042591541656871254287525623854923737494863517144531 20*e^(418*I*c) + 814520814138291118288754175642500548460376933128114804929091607581959891557681070225683509538618159407040 90*e^(417*I*c) + 22532053259322065776 79

411092895162489997945210155641349828272417100196754866944996893124665619072
12627820000*e^(416*I*c) + 616003116022979584937125701757887212998354300989
9136262803886109391456133207119190971494942658793691030330O*e^(415*I*c) + 1
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6996210*e^(413*I*c) + 1173585692624511849311309100250160403234187698599908 2
82352067224153020018822382639298230219408466753848866560O*e^(412*I*c) + 306
275810542219573783905472892776091295728139310827335202473872260000200435382
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723238835290914498274717185677246322380899336709150340287646727017612434269
9654400*e^(410*I*c) + 201557947424794098026772478462040883395867512562930 86
294375356869008401558559801015478154862523940958190739750O*e^(409*I*c) + 50
832459930108546016697862968303266142765447408293904809793963839156729879578
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11765699610*e^(407*I*c) + 31256834931787017434797047503074901786662921507 20
179363604335113528623329684606343185540756019935662148267863968*e^(406*I*c)
 + 762178879191204706203884091779937460042889225819436763668294435609668140
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027649217621144116091735572216620788861535803449702273802588359076704241840
733513439114113248*e^(404*I*c) + 438349721429193776853786922330210637445540
33100928502737480438978976746989895784070951905237783490374305934542955*e^(
403*I*c) + 103399755467257436489847837640753754718204394473055795001467604 3
264198765555568738295317372110961151960056477304 80*e^(402*I*c) + 2412460212
824400617929083177830328761948015971332060520912869970437291453457558057100
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612342300366025046741742856580445289401786656311685859023084716*e^(399*I*c)
 + 287049613141231445183467471535358943955329443080853193346608628854370924
623076915139218069941340562301724775353294 4*e^(398*I*c) + 64133818958559251
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0080*e^(396*I*c) + 310043192060694170770693631414234874318280090981847446 35
678652284177439464941651812564519144918003174108077634846014*e^(395*I*c) +
670917061305296691250198992100215765802378434622295353862950870761892978499
959313606456052921309614961067075215064 32*e^(394*I*c) + 14365768713804479 69
429471197042595384588181994235168246745862936910561192098663581236377722454
095307992305537672222 52*e^(393*I*c) + 304384471106813336010284160123906370 4
338888284906274226525512369667909161745208577591439301401871734923949819082
58944*e^(392*I*c) + 638218892914533741505806399662488556066783600496091876 4
083749748774489717780360749962455811242834604380651820719760 85*e^(391*I*c)
+ 1324311324984027428355222938147682378672860708817161741448749689593588020

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682839262900821584671180006985027193799390459183442221927421457112570280409
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897793553584634929042582157038309042541141852151667037137204520656834 5*e^(3
87*I*c) + 221407350017086032709151807692413916620355787559039791489092136 03
822554792749183517160255571915875356439553717130797888*e^(386*I*c) + 436383
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995946490063776073572970562122138000583720836915779467304967542879981787543
143024633262589963016 0*e^(384*I*c) + 164437500676906892741323260154394278 50
395456193602013359658180644935724027734944792733451710580999530009354927993
1273178*e^(383*I*c) + 314409035808225861565595436938354945445473991043129 72
204674722881303092520496850341856681883861186670980704079349536449 6*e^(382*
I*c) + 595157615500431514947479282336547053827926087916425263497187757029 41
338547183543419824680709621453689544138830602723789 9*e^(381*I*c) + 11153982
855456015505333280456001843179938993592179967298183407042218011956674104858
469961790567335585124522385831607925 12*e^(380*I*c) + 206969828950086064346 1
665762373807957513019424041178871904960551829412449344722432125679417958403
007551179298315947373776*e^(379*I*c) + 380260499670589110696462063384896480
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4188013440*e^(378*I*c) + 691783894521484427849333045936139492337233385361 98
796373726731849428597124310663457268704220998931248907776780373699881 50*e^(
377*I*c) + 124621404440537258084928596709872066857757070943124868554500948 15
475686345430803292540834031123785001781470789698696908681 6*e^(376*I*c) + 22
231341131801535345406399037721686840208397941952580135584645966746736656716
2715548264762829910660765649214326143393997 35*e^(375*I*c) + 392742004143298
611693979445162250010812274333985850072063992312119071577953597196482415987
542665798402445514914764678999 52*e^(374*I*c) + 687124660159856415124685861 7
365974773487959171009835465278612493602307394314104957360664856300535941171
276489568390380608 8*e^(373*I*c) + 119060591849660546834765693227676449067 58
414824888267844750482607723633344451345409512666875005729581119164335690897
2191440*e^(372*I*c) + 204325557265186000767402710230847896459761583922763 69
8235433212833313077783041040074669379017394836761539649081690630811665*e^(3
71*I*c) + 347310053810935290419455560555957314129569210735745983234369659 97
641337477407800017307007524865452491717912895050744305820 8*e^(370*I*c) + 58
474957368230458617938462884488332758149896988654038037889676799907561496400
717460081109294535663511879582479936971674210 9*e^(369*I*c) + 97521033944404
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543314484853245991987547981758158 4*e^(368*I*c) + 161109254140006052595485 93
752641941783476434718370782014462624356151429445873378335135860227298495233
584364935860422529956 08*e^(367*I*c) + 263666241043079934044752228477824428 3
740751068658140726576446671207798325606832295937705061686297930296382338892
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238547153435933360618957183244464136413289310866357620513387067215626416411
5*e^(365*I*c) + 686642533751866826266269375090895696573292457814218163062221
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c) + 1092721060347354481027979234784453607458889680623004111008954473160586
3146104181739039426674855453466097402330688331845602302*e^(363*I*c) + 17229
502824367647334400721998417596703948657394738805209391636597370380572398964
715080095366818322029152193635869784095333760*e^(362*I*c) + 269177947010866
150978901202368905011051467999960217751957108662262286389847034568326941532
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56176*e^(358*I*c) + 1463904484563511812182373827403741241916648199977469880
76598391862733629670142241546375533903130605297580105675355629160198162*e^(
357*I*c) + 2185631666596493122474836409562721492124991153838287710296542833
63972585118090479413696638108156385244646591328454425745117584*e^(356*I*c)
+ 3234131780148410037141511382460791525763609760350584578904099377387231715
37036573043681997163745313602400139153046673668433091*e^(355*I*c) + 4743230
435631005423773386299319662481291759769823324460180560093911540204388959031
40822967769494019446166779954024655344116288*e^(354*I*c) + 6895184493287935
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63669880057908765898949268614772285*e^(353*I*c) + 9935556536495211272264439
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628822322333309573730716310743838935832201454293617293175086458389621425307
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882429905873921544608349935146762533444967075776406669065615094901494404399
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81*e^(349*I*c) + 3925697658415778352768103942856011840211642769621717217996
614398473887186074391482638547212826538270453912634540299792270321024*e^(34
8*I*c) + 541666280405243634958559598281835795386625846164435401820515891774
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4246872041775159838468077381562338745636398374*e^(345*I*c) + 13521230411945
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421264083328215417400645945829264406094792490731373592156169015393990601751
8647182491616573724049744*e^(342*I*c) + 31295263688189838313772775873307260

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+ 1051782100428834371944508170051219187116816349766953322637182149610875004223784784183284961906494422955462431208645690802526770780*e^(323*I*c) + 118781794307939031610880232479811012902082278266008724859936764348120020604682216614428542592222937541367653507114100528643148160 0*e^(322*I*c) + 13313961146267230358024621235315820503397499960141524528353059563674253702227586217539224587275248560729508809606575647204758385 00*e^(321*I*c) + 1481187117089246662466955694965677855524730313260552690821602657176218737426245522795329891464091005878304304075953693546767206080*e^(320*I*c) + 163556974464142190065788638128907665322758017205667758745140206923435528368748965961391376195914077333973601479008181451662522444 0*e^(319*I*c) + 1792649078089632298936945728481969334964391597506285088488350622937252533420980803144316431701452 1

90522716124797875257437516360640*e^(318*I*c) + 1950286550780181919244992961
204487010056460362845218501674423766266321558791436917317878702232679213868
287926294665202769722927380*e^(317*I*c) + 210614190346834430711254976120248
454340279425235248219981741042486967726271509828843764651868348794546277422
3656471345899082156800*e^(316*I*c) + 22577262191038562868128330126815737654
962622414206129320761431511719608545541241446990230098420805151579235293571
89869943515991200*e^(315*I*c) + 2402464595569686086120001803034211056739445
588621946141384106162886246161815149763025030834875234067267774023433418269
982431265280*e^(314*I*c) + 253776641546503033081547174669298859606991189469
722505292832045254217558715484809648333120980743011394301539836266967333795
7755720*e^(313*I*c) + 26611006479757835838282351392014419301783966433834239
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00*e^(312*I*c) + 2770073207150768645597507281382065497924968466054527414122
339827333783770068305883487309979315983718403740872884345746380680204260*e^
(311*I*c) + 286250312632046179777066778072564418499125562317462617567905067
2100848988119391841466573417019247590580735265143427289340450811200*e^(310*
I*c) + 29364942143518684987032394554267711043448273062675589165508774672324
55153286140521089582733932202553130712723836983468866230908800*e^(309*I*c)
+ 2990498949622543608538129380283866335190087115124858818143787619186957111
903765723974899651518555144924290346242595167274383008960*e^(308*I*c) + 302
337164350822502717560317521295321902248504585073184530751900827738515473146
1213388035579159917590062343527464977286601165100620*e^(307*I*c) + 30344083
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43205604202307836897073595410412575660465787520*e^(306*I*c) + 3023371643508
225027175603175212953219022485045850731845307519008277385154731461213388035
579159917590062343527464977286601165100620*e^(305*I*c) + 299049894962254360
853812938028386633519008711512485881814378761918695711190376572397489965151
8555144924290346242595167274383008960*e^(304*I*c) + 29364942143518684987032
394554267711043448273062675589165508774672324551532861405210895827339322025
53130712723836983468866230908800*e^(303*I*c) + 2862503126320461797770667780
725644184991255623174626175679050672100848988119391841466573417019247590580
735265143427289340450811200*e^(302*I*c) + 277007320715076864559750728138206
549792496846605452741412233982733378377006830588348730997931598371840374087
2884345746380680204260*e^(301*I*c) + 26611006479757835838282351392014419301
783966433834239035838625472558807723820492010155372149008327456015197371418
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894697225052928320452542175587154848096483331209807430113943015398362669673
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194614138410616288624616181514976302503083487523406726777402343341826998243
1265280*e^(298*I*c) + 22577262191038562868128330126815737654962622414206129
320761431511719608545541241446990230098420805151579235293571898699435159912
00*e^(297*I*c) + 2106141903468344307112549761202484543402794252352482199817
410424869677262715098288437646518683487945462774223656471345899082156800*e^
(296*I*c) + 195028655078018191924499296120448701005646036284521850167442376
6266321558791436917317878702232679213868287926294665202769722927380*e^(295*

I*c) + 1792649078089632298936945728481969334964391597506285088488350622937252533420980803144316431701452190522716124797875257437516360640*e^(294*I*c) + 163556974464142190065788638128907665322758017205667758745140206923435528368748965961391376195914077333973601479008181451662522444 0*e^(293*I*c) + 148118711708924666246695569496567785552473031326055269082160265717621873742624552279532989146409100587830430407595369354676720608 0*e^(292*I*c) + 13313961146267230358024621235315820503397499960141524528353059563674253702227586217539224587275248560729508809606575647204758385 00*e^(291*I*c) + 1187817943079390316108802324798110129020822782660087248599367643481200206046822166144285425922229375413676535071141005286431481600*e^(290*I*c) + 105178210042883437194450817005121918711681634976695332263718214961087500422378478418328496190649442295546243120864569080252677078 0*e^(289*I*c) + 924320052867522584035777495761072351222534420784861960001821020509468146356756433795246446491396141583854513687104334429566707520*e^(288*I*c) + 806169671327625532424575340089775733681994991576674446922354099714615192085443245663852257001115644286660304979476023966071898200*e^(287*I*c) + 697789106925924614816713747684682785083659819027952244447043355869741368500452561164024636073401929693105801105522738405349028160*e^(286*I*c) + 599378484771733474809376142401554850207064972118137572949257503651444541939309025276896049622515630263162184526394317285457368300*e^(285*I*c) + 510907615111134507452623846147137141450275722444316385531648429230851686635827717488464500331623385777400744950538410637735936000*e^(284*I*c) + 432147856464086938023811561808678589594702047904674282297959658800170984456799067751878044806619012452636891350731618278545690160*e^(283*I*c) + 362706307563843231135699157418510732452420614013624168879312187645233450153927975793326834780741391203430153093712635355523960320*e^(282*I*c) + 302060638030868463461139442279360499718906917482524894483356220196138377050828911383056860425370161157201493696073712322595776808*e^(281*I*c) + 2495930722825658663983899515096192026826344554871287146314618917708232013675276457937702037887846773439349714243179878952550319 36*e^(280*I*c) + 204622295535729109519829916789867225319429705162560082648840394965423112809336591921290309392396263834674368977840527147037426908*e^(279*I*c) + 16643233292225891951305583292663987533898239557375985275560960930624735597695457723219789693189041925727339978882309864690059708 80*e^(278*I*c) + 13429774202347942990462961610455961009607475872106802270446893806301705968802336343645897153496466503631988911922980997380690968 0*e^(277*I*c) + 107504737406576916123480399169759633328321407419400510017498849830598621565428266546315933920821527544726380201659114903834605888*e^(276*I*c) + 853681184302153128482312917396737358877462018516662996003921994187647500868281987198727440477677836673253262892218819749875822 15*e^(275*I*c) + 672440879690807038237032571996630476068906104820904946194928029351302159798194699663833367886939001391155946468937840954184723 36*e^(274*I*c) + 525392233467407711425870923702570695360603196444395016676104827679558002760528924321527988146079751103662249450814281218884733 24*e^(273*I*c) + 407159889637019189500203483367364234205133113590104852469190746528833939708053744708301562297056473122654775842560272127629410 40*e^(272*I*c) + 3129526368818983831377277587330726033411722725862950 19

923586956360926628660628198456890642358136229741501206689213918783989783 80*
e^(271*I*c) + 2385639856556280203069527817421264083328215417400645945829264
4060947924907313735921561690153939906017518647182491616573724049744*e^(270*
I*c) + 1803532733817745547117756859485168297797834644977719357208768851039 2
426884519272991560851326393852241961470040819793627127923997*e^(269*I*c) +
1352123041194543691555885470685179654156739981165687002156735297532681546 78
178465332891238716960561952316961461627209922217609 92*e^(268*I*c) + 1005220
952436958182758815498534554967803144574449998520825938543560974027240030145
424687204177515983846807738156233874563639 8374*e^(267*I*c) + 74103726128911
522243646332961280439716571932803277543043822356727737814030238141276103555
6250527196904517770472605490714578496 0*e^(266*I*c) + 5416662804052436349585
595982818357953866258461644354018205158917742576425344364964596750653177677
8034921868173051711750320115 00*e^(265*I*c) + 3925697658415778352768103942 85
601184021164276962171721799661439847388718607439148263854721282653827045391
2634540299792270321024*e^(264*I*c) + 2820819298562215959107529807289628449 6
213867989894363693931160698940187812010002756331044983989593466317955680225
19974400130281*e^(263*I*c) + 2009496110092687738152782085683737222727968824
299058739215446083499351467625334449670757764066690656150949014944043994822
823920*e^(262*I*c) + 1419164481422176573858234013898999628822322333309573 73
071631074383893583220145429361729317508645838962142530705175061212976149 8*e
^(261*I*c) + 9935556536495211272264439608202336493864885100818925458667004 4
409666158279044124183085560957706203955562509094333226490178072 0*e^(260*I*c
) + 689518449328793559903260418149974190253578340058895035589606468244680 59
15561181703040050375636698800579087658989492686147722 85*e^(259*I*c) + 47432
304356310054237733862993196624812917597698233244601805600939115402043889590
3140822967769494019446166779954024655344116288*e^(258*I*c) + 32341317801484
100371415113824607915257636097603505845789040993773872317153703657304368199
716374531360240013915304667366843309 1*e^(257*I*c) + 2185631666596493122474 8
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52446465913284544257451175 84*e^(256*I*c) + 1463904484563511812182373827403 7
412419166481999774698807659839186273362967014224154637553390313060529758010
567535562916019816 2*e^(255*I*c) + 971730550247426800586167224613688926611 41
295540263493013032746083536157324268333390400308958318370219154887169702257
444756176*e^(254*I*c) + 63923019433761989090614801288635098123199445102303 1
226165446482089987678039444557770428865527384997471837131360691046518122 15*
e^(253*I*c) + 416704403753905436434182193422717480400350714901190805852815 2
249818881837590690036870123453130463316344631994513019647691360 0*e^(252*I*c
) + 269177947010866150978901202368905011051467999960217751957108662262286 38
98470345683269415323061160726344418350102619856341961 6*e^(251*I*c) + 172295
028243676473344007219984175967039486573947388052093916365973703805723989647
15080095366818322029152193635869784095333760*e^(250*I*c) + 1092721060347354
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485545346609740233068833184560230 2*e^(249*I*c) + 6866425337518668262662693 7
509089569657329245781421816306221578028998808746815510311363140641999486040
01529894566235238597088*e^(248*I*c) + 427482690772059175252671133682087150 0

8443456479223854715343593336061895718324446413641328931086635762051338706721
56264164115*e^(247*I*c) + 26366624104307993404475222847782442837407510686581
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0*e^(246*I*c) + 1611092541400060525954859375264194178347643471837078201446262
43561514294458733783351358602272984952335843649358604225299560 8*e^(245*I*
c) + 975210339444049318757282311763517786673223175594457946383279264635085041
00491730029590427543314484853245991987547981758158 4*e^(244*I*c) + 5847495
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0081109294535663511879582479936971674210 9*e^(243*I*c) + 347310053810935290419
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545249171791289505074430582 08*e^(242*I*c) + 204325557265186000767402710230847
8964597615839227636982354332128333130777830410400746693790173948367615396
4908169063081166 5*e^(241*I*c) + 1190605918496605468347656932276764490675841
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I*c) + 39274200414329861169397944516225001081227433398585007206399231211907
157795359719648241598754266579840244551491476467899952*e^(238*I*c) + 222313
411318015353454063990377216868402083979419525801355846459667467366567162715
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*e^(234*I*c) + 206969828950086064346166576237380795751301942404117887190496
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070962145368954413883060272378 99*e^(231*I*c) + 31440903580822586156559543693
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8*e^(229*I*c) + 8513953323478645577958995946490063776073572970562122138000
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51857911222911989837615452608512356008400295*e^(227*I*c) + 221407350017086
032709151807692413916620355787559039791489092136038225547927491835171602555
719158753564395537171307978 88*e^(226*I*c) + 1111949964536320108088106282488
633849242537565844897793553584634929042582157038309042541141852151667037137
2045206568345*e^(225*I*c) + 552749884903117835586123000932666828392629008215
8467118000698502719379939045918344222192742145711257028040974074674736*e^(
224*I*c) + 271958928348374392604080510108034192124453031125460725092919277390
933152322663503581567286256929669371164352107033139 4*e^(223*I*c) + 132431

1324984027428355222938147682378672860708817161741448749689593588020860847508703702325320304649883120684987556400*e^(222*I*c) + 638218892914533741505806399662488556066783600496091876408374974877448971778036074996245581124283460438065182071976085*e^(221*I*c) + 3043844711068133360102841601239063704338888284906274226525512369667909161745208577591439301401871734923949819082589 44*e^(220*I*c) + 143657687138044796942947119704259538458818199423516824674586293691056119209866358123637772245409530799230553767222252*e^(219*I*c) + 67091706130529669125019899210021576580237843462229535386295087076189297849995931360645605292130961496106707521506432*e^(218*I*c) + 310043192060694170770693631414234874318280090981847446356786522841774394649416518125645191449180031741080776348460l4*e^(217*I*c) + 141764836528757049572020133432411179043699777966538499599025244219806351890116348156532796054977833828889327667300 80*e^(216*I*c) + 641338189585592518475823145106255638032859493851100657701521811978653639021305728401820220163109443481958402511346 5*e^(215*I*c) + 2870496131412314451834674715353589439553294430808531933466086288543709246230769151392180699413405623017247753532944*e^(214*I*c) + 127103308293804895020136055483127034266234399127750461234230036602504674174285658044528940178665631168585902308471 6*e^(213*I*c) + 55675638871118234034102619273421954611365176831738053900589367904939471401706369856527272881366905477907720897784 0*e^(212*I*c) + 2412460212824400617929083177830328761948015971332060520912869970437291453457558057100814890067418394395739848326 78*e^(211*I*c) + 10339975546725743648984783764075375471820439447305579500146760432641987655555687382953173721109611519600564773048 0*e^(210*I*c) + 438349721429193776853786922330210637445540331009285027374804389789767469898957840709519052377834903743059345429 55*e^(209*I*c) + 183798070840033597660276492176211441160917355722166207888615358034497022738025883590767042418407335134391141132 48*e^(208*I*c) + 7621788791912047062038840917799374600428892258194367636682944356096681400246312138001769285020661445991073249416*e^(207*I*c) + 31256834931787017434797047503074901786662921507201793636043351135286233296846063431855407560199356621482678639 68*e^(206*I*c) + 126759701729481291340014627604212692998648029287019039910755431107996422728019652247537010873847785631176569961 0*e^(205*I*c) + 508324599301085460166978629683032661427654474082939048097939638391567298795788389433842285751054665210868287680*e^(204*I*c) + 20155794742479409802677247846204088339586751256293086294375356869008401558559801015478154862523940958190739750 0*e^(203*I*c) + 790191495587665692547839884872323883529091449827471718567724632238089933670915034028764672701761243426996544 00*e^(202*I*c) + 30627581054221957378390547289277609129572813931082733520247387226000020043538279468776707958420892547870128680*e^(201*I*c) + 117358569262451184931130910025016040323418769859990828235206722415302001882238263929823021940846675384886656 00*e^(200*I*c) + 4445412259295474625067659514198312966015416299968930393345630345914109720740573618884980520010028451496996210*e^(199*I*c) + 16644750343872118093949177435029376389785749377547647639878358724104499306901315729042799954845810139650014 40*e^(198*I*c) + 616003116022979584937125701757887212998354300989991362628038861093914561332071191909714949426587936910303300*e^(197*I*c) + 22532053259322065776794110928951624899979452101

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768107022568350953861815940704090*e^(195*I*c) + 290976510612474534066475697
818369100621655598523590528042591541656871254287525623854923737494863517144
53120*e^(194*I*c) + 1027160253020288900249781351684945259097151280952906066
5197301097052210064576088348023234671975463677418470*e^(193*I*c) + 35827180
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94946438660859773886240*e^(192*I*c) + 1234668041892409978780018081755440216
012582476396941937965899631953079203974222138794604328498972144766900*e^(19
1*I*c) + 420358024835146798583611210145942154684437949365647899088372524802
156222884839580011688655664280691773600*e^(190*I*c) + 141379938253556843280
565505807403304130606130725434751745794079833141361748917639986145377066437
210546190*e^(189*I*c) + 469702247271172818264540450180706705225597566275803
47784535320014963482632359729444541885102274546002560*e^(188*I*c) + 1541311
121148602393729497082079737671608134478816338654352242193973750796212585498
1881879168348260330000*e^(187*I*c) + 49952419562791381802051867444016880243
88272113921255663734956946927571305533146776898787878059685108480*e^(186*I*
c) + 1598771101058192692270528999677444742685631006232456185844925220144002
305878120380828483988663574829100*e^(185*I*c) + 505293663123015258878483025
738812813203397766845340065381261016353419722382620393032535960660921950400
*e^(184*I*c) + 157685845528850918721462877864435090257583149415561323427386
562894447598277935629800939237175625149830*e^(183*I*c) + 485842581531402804
473148368687721313901954124190467327784587060150968814370763379107935841224
75073760*e^(182*I*c) + 1477795509661712899871274518207149536217650697318308
1650233605274051677624970464340242755840025673760*e^(181*I*c) + 44372109178
431823477643495444439046990200565950694708471936170921147140776330772349728
25351226979360*e^(180*I*c) + 1315052120930692122102297105327622842335870743
428530891072983535862280094446607723473800477453914130*e^(179*I*c) + 384655
842080666274454063078784837174998949052500975322162003392549953413592461519
365177908682078400*e^(178*I*c) + 111034148797008819443143895644469242295049
867464313710969257619338899133799285616020069872611710850*e^(177*I*c) + 316
266446747255477311767956875276535713059699859236883921121649155532425732694
90908989570248533280*e^(176*I*c) + 8888295028751024667044203837607976101480
053134418614474620767522824868911959884352666444917404000*e^(175*I*c) + 246
438219080743960907977422685567962936788570977643587663085171625396269619234
1706239192878728160*e^(174*I*c) + 67402553054313300889484577523662523745074
3114473544537818170447134607102575676676056675328961590*e^(173*I*c) + 18183
466140617790131533012967714538116644918841319414116934435475492096903495261
0378945282257600*e^(172*I*c) + 48379489756434099843857791816589379406815042
609340378747586437145781646245422045101230417309900*e^(171*I*c) + 126934969
329649205650736736371812800885486825088802553372800650065661386960417973532
16584528640*e^(170*I*c) + 3283874760555818676726309480306734420155098583948
074469014168171874442170109648521627538755920*e^(169*I*c) + 837579206923411
932458786486765373533946545239708990769488724813982189165104589895518909256
320*e^(168*I*c) + 210594301385648471184329078880317504953361839954159427434

0098846617772597525426477091500369990*e^(167*I*c) + 521909122076618242158122
718542697480712928432432278947692296907200105471413341316109896360000*e^(166
*I*c) + 1274721961650332054135634306256284736860162214085678602544581453203
7904111523242298235713300*e^(165*I*c) + 30679742964317473641981596239624636
71617006419626851426148418602934852907379021659761911840*e^(164*I*c) + 7275
210107183942292917740738446942557987386670675353797597327955679425787513842
50780476310*e^(163*I*c) + 1699563279699297677739020966526292532837045054771
27544556534417376686540936706073847337600*e^(162*I*c) + 3910803125560180947
6537535369611844440844903751605645023514572352045248104262933598850730*e^(1
61*I*c) + 88627521427569572856813408857649045979353495693553218156477211725
37159186491471311666400*e^(160*I*c) + 1977792980665818135651300094326239158
605448870806970860577325385028609983034534672318500*e^(159*I*c) + 434546676
780280045346344498763892540797175105756827515509297024187660299345484920192
480*e^(158*I*c) + 939869153130681791490836060656814827808360605105301546184
86949839467131378859885998210*e^(157*I*c) + 2000800680303004713729327825032
1597113540716201983333126349281186679153199068045257216*e^(156*I*c) + 41915
425006568261480933394145441591439644784724923159318091718599021141090059399
42952*e^(155*I*c) + 8639799336223303495562968200283955131987080649405057021
26068652936800794826651264256*e^(154*I*c) + 1751931705006183002415156323819
12285157790097816049220671217212220015297133400636060*e^(153*I*c) + 3494107
161327670464947794304333945020150407533516036186591602921386077860623062496
0*e^(152*I*c) + 68529932231457366873288853116177954355929408414398663510796
55652312894721972796266*e^(151*I*c) + 1321498055271300851429993866631619874
424534425188183592049727687571032156435077280*e^(150*I*c) + 250501028608928
332469340456829902067712233644464602753159945727868485722395506952*e^(149*I
*c) + 466682235482660178068545924681005702893559608696136508565757567581801
82223308768*e^(148*I*c) + 8543013441126212334833540665069621472479085838041
360564550722036723654297540205*e^(147*I*c) + 153633323844492758353273455601
6494671674916578907116984548489078241693926940560*e^(146*I*c) + 27136120750
3266570734486517077181014801775322183181055638619257836143271472358*e^(145*
I*c) + 47065044611135158108487353367484243102698248838312635876283099427442
745866704*e^(144*I*c) + 801372958079075243436196494576154376146952079121074
6972675870481058674277844*e^(143*I*c) + 13392143742542455535648844068019453
53385000254030655765953770237607180089968*e^(142*I*c) + 2196012813395155615
00261478844190024870555261281946058839614044697037963695*e^(141*I*c) + 3532
4447206779018115378052820789411687581004582367431006205879633729015200*e^(1
40*I*c) + 55725511573286711210162164163075961618619559690116972223409262101
12854418*e^(139*I*c) + 8618848510949919087642468054746724286037573154844539
74713612812215428992*e^(138*I*c) + 1306576602265604193351214343899389618845
95434069984824307149332131747540*e^(137*I*c) + 1940797921559456659353500810
3303255257745408070082431338945184797463936*e^(136*I*c) + 28239051519365866
78382525706564457280290098698638597987628380245881715*e^(135*I*c) + 4023496
92266121158934003582839428785116904903936409545602519219664720*e^(134*I*c)
+ 56117081076341175384087570185188538660375932013674735519055227368366*e^(1
33*I*c) + 76590105201875496517771183576768719270818989891311257557982042361

12*e^(132*I*c) + 10225364374682967372930658627052464496936874155598658443068 88705423*e^(131*I*c) + 13349021005202618377967331386833230353033290616324719 4627808410304*e^(130*I*c) + 17033886027390615741040977721655541665612162275 48502858431089041 7*e^(129*I*c) + 21237029691888713182667187812239270678399 490157272938840653880 80*e^(128*I*c) + 25858534871597727015582911568419341107 20345414913643939854913 50*e^(127*I*c) + 30736217404321009965231037419663053 9628810352817092216977850 72*e^(126*I*c) + 35647648906287240170884879966881 7892919578761395854547480484 5*e^(125*I*c) + 40321222595779818884084613996099 56241444912716943367964595 84*e^(124*I*c) + 4445670817525882102440094621053 5004523775722190977468484496*e^(123*I*c) + 4775398607100853263534207733818 2667774786934127387310316 80*e^(122*I*c) + 49946750655853173367158586291057 27028115450357303987495 30*e^(121*I*c) + 50836369508171099437019348610847391 9467361851080171831 36*e^(120*I*c) + 50320249034014518240742139437660119220 26507006311982753*e^(119*I*c) + 48409341024048871865591702530366258109165912 6182344528*e^(118*I*c) + 45230940039830738332025694784646206844854827698075 736*e^(117*I*c) + 41015454399371957939599567084424967094338002612248 80*e^(116*I*c) + 36068861303638934941380978000455996354877542332525 5*e^(115*I*c) + 30735366512830562160991166338490057308062762518496*e^(114*I*c) + 2535667460 65027977683456156618659121310925164285 9*e^(113*I*c) + 20234750972446217131 39666435802340785081798383 20*e^(112*I*c) + 156039112776876070997216237717449 33086920587272*e^(111*I*c) + 116158141373397175153362251190904691718876840 0*e^(110*I*c) + 83380839911837894453136303673785039051506805*e^(109*I*c) + 5 7646010465631513042138547107153468384473 92*e^(108*I*c) + 383360155801054824 5297646882131143680471 54*e^(107*I*c) + 24489837337812338687718622491865013839488*e^(106*I*c) + 15006027479373972864055778187226915393 92*e^(105*I*c) + 88054927598941411145869950813388040256*e^(104*I*c) + 49396666108180257988095 86352543471345*e^(103*I*c) + 26441037578031074251809932641968504 0*e^(102*I*c) + 13477227799524701956579274210395326*e^(101*I*c) + 652650253343206047453620559993840*e^(100*I*c) + 29952547749265499675257842032197*e^(99*I*c) + 1299146645993240318167826532288*e^(98*I*c) + 53090127264630963470039804475*e^(97*I*c) + 2037031259470368160131922320*e^(96*I*c) + 730992078173355972470 98038*e^(95*I*c) + 2442455629894502983849104*e^(94*I*c) + 75599817092670157806639*e^(93*I*c) + 2154864144781257856128*e^(92*I*c) + 5616944452692656226 0*e^(91*I*c) + 1327882849274858880*e^(90*I*c) + 28186192554792138*e^(89*I*c) + 530563624556832*e^(88*I*c) + 8718181624155*e^(87*I*c) + 122503723056*e^(86*I*c) + 1431118260*e^(85*I*c) + 13343760*e^(84*I*c) + 93096*e^(83*I*c) + 432*e^(82*I*c) + e^(81*I*c)) + 14*(26*a*e^(1055/2*I*c) + 10504*a*e^(1053/2*I*c) + 2116556*a*e^(1051/2*I*c) + 283618504*a*e^(1049/2*I*c) + 28432755026*a*e^(1047/2*I*c) + 2274620402080*a*e^(1045/2*I*c) + 151262256738437*a*e^(1043/2*I*c) + 8600339740311748*a*e^(1041/2*I*c) + 426791859620149322*a*e^(1039/2*I*c) + 18778841824143775343*a*e^(1037/2*I*c) + 741764252131213332757*a*e^(1035/2*I*c) + 26568646854716407696970*a*e^(1033/2*I*c) + 870123184837420284430070*a*e^(1031/2*I*c) + 26237560668658611978090055*a*e^(1029/2*I*c) + 732777588085793048574300590*a*e^(1027/2*I*c) + 19052217324800742177269360704*a*e^(1025/2*I*c) + 463207034992633568486133297596*a*e^(1023/2*I*c) + 10

5720194302660100480130977529 34*a*e^(1021/2*I*c) + 2272984190957551165865667
99957934*a*e^(1019/2*I*c) + 461774686857198012770269825075 3676*a*e^(1017/2*
I*c) + 888916282446787041398483273057540 38*a*e^(1015/2*I*c) + 1625446941911
901543891066605266178710*a*e^(1013/2*I*c) + 2829755417150959822835916906873
7992545*a*e^(1011/2*I*c) + 46998547788984636877657100563512 1060828*a*e^(100
9/2*I*c) + 746101972910412638047714652148823292 0426*a*e^(1007/2*I*c) + 1134
0750511499820782828683995935681833 1515*a*e^(1005/2*I*c) + 16531325755122432
20555792873383292580108953*a*e^(1003/2*I*c) + 2314385777149470236669933 2162
923093803819912*a*e^(1001/2*I*c) + 3116155424202189605705498912105541315411
98338*a*e^(999/2*I*c) + 40402571518442061595422665880799058707526025 11*a*e^
(997/2*I*c) + 50503221535858091096582689376221786704600600455*a*e^(995/2*I*
c) + 609297036058359460142063362206138699889504487122*a*e^(993/2*I*c) + 710
21200670463962996341932926887235367130173001 28*a*e^(991/2*I*c) + 8006028286
2006487921860873353861357672073071040769*a*e^(989/2*I*c) + 8735992347087648
580557213403907360195955483915 97091*a*e^(987/2*I*c) + 9235195266849469317 52
112421704276367697376625310 4794*a*e^(985/2*I*c) + 9466079239161646653433315
123584191606797870019724 2708*a*e^(983/2*I*c) + 9414916057875226479999780186
153683088305440852531286 17*a*e^(981/2*I*c) + 9092832303281336816233580227 46
257787119781396327607 5330*a*e^(979/2*I*c) + 8533279426386174534195194156863
380104429920918919046 9846*a*e^(977/2*I*c) + 7786623913490808819340683704304
761031787480885520876 31588*a*e^(975/2*I*c) + 6913009350610322446047428627 40
881115915833888574749 0127762*a*e^(973/2*I*c) + 5974821903120267852023564378
900609314361268150895 0204493778*a*e^(971/2*I*c) + 5029972852031920598400132
443256317349159391214 04020646790260*a*e^(969/2*I*c) + 4126870246985029536 01
810708613669250579891 5934457479856887816*a*e^(967/2*I*c) + 3301501862719472
603985478604861978431492 057857051338139599 0898*a*e^(965/2*I*c) + 2576611959
392903086066077612980640290 1098044627792363772 7940695*a*e^(963/2*I*c) + 196
26152298658365182700677326625677942031304421831143048 75477510*a*e^(961/2*I*
c) + 14596988265590225707951774554192673478049322662209596418132188458*a*e^
(959/2*I*c) + 10605189826833375691056489755868863808080691523810858185486 82
57941*a*e^(957/2*I*c) + 752970977560607563719398585207010863604321557616289
473063991767039*a*e^(955/2*I*c) + 5226524093507646193682839275968943608 6267
86700142487822871933708874*a*e^(953/2*I*c) + 354802086973620760088737097767
0229454196739571829783256925004718 0556*a*e^(951/2*I*c) + 235643271710602776
98597681250339791872336070784319023866645438415 3669*a*e^(949/2*I*c) + 15316
89544688533128267835220826660575517763556541402057407422275055260*a*e^(947/
2*I*c) + 9747174502524139248442188739775017562567649540786887839358187040 91
2530*a*e^(945/2*I*c) + 607461980535619195835294948202520064328801684025 9290
659436305965678 8960*a*e^(943/2*I*c) + 370874356826170622561211031579288 5225
3650376073953611911744510348793 0880*a*e^(941/2*I*c) + 2218870701411021049 78
94214368503019763357572076766900627594431580946156 52*a*e^(939/2*I*c) + 1301
24844315334923787462420792031934352476316829766587775009459507586042 98*a*e^
(937/2*I*c) + 748225805992854809332407047961969129851422645611568263487 1717
4043201630392*a*e^(935/2*I*c) + 42195528165505707093861193718352258719208 63
13169152717515130361078410110468*a*e^(933/2*I*c) + 23343962004920902169 8057

7767310744650580417606589598674389591775624513302292*a*e^(931/2*I*c) + 1267
262144544006762348670729430578970678220955845758628394837421693911754268O*a
*e^(929/2*I*c) + 6752240336121207913629144799891108270384536184910825436843
868658460021997491６*a*e^(927/2*I*c) + 35320043474230796153704475299012452 86
5364993104081072377717578262861596469884４*a*e^(925/2*I*c) + 181420178966324
7503683990869126253542318071421878870447076671569392523282426716*a*e^(923/2
*I*c) + 915244198576107944544371609198480077086176609875536500157821502781４
025637822344*a*e^(921/2*I*c) + 4535951973461225073999629610614837615488499４
292039155402760649106566139277798596*a*e^(919/2*I*c) + 220887009474485548４1
0918212534797139518487225151752041095525819264180469636552620*a*e^(917/2*I*
c) + 105713303560808033451746784210224700122917340119339580019502859879394６
241985524410*a*e^(915/2*I*c) + 49731519454378183332079785198122292839906876
8126620986782740255724142741672475960０*a*e^(913/2*I*c) + 230016401216572533
16651693705684837372513278520836331991407615544187744222242128500*a*e^(911/
2*I*c) + 104614252934905612199658590379588736548577356327149679159709209471
984279805545840510*a*e^(909/2*I*c) + 4679566043712408315646376748441571277５
0964967487710258048711564849492193413275081370*a*e^(907/2*I*c) + 2059104851
2339638888423795257729360343917011991841683380719770727130807934469962963４0
*a*e^(905/2*I*c) + 891421027524593774701305889025999040677202573103172232６4
3977493331001848072058617622０*a*e^(903/2*I*c) + 3797433349972025965815062６0
5507467260208448589078269220593237264216425725582827527723０*a*e^(901/2*I*c)
 + 159209767180955530325047227583177604233946016419587011038408978676950649
660142022326320*a*e^(899/2*I*c) + 657035786703317073872276183466655536833２9
4806445692036603437064145864115975619273310760*a*e^(897/2*I*c) + 2669400972
789686981296836875076250459931673689078037577064328933999433324588323107010
000*a*e^(895/2*I*c) + 1067844553682541137674668046315205503487286703673470５
05227808832457485901021679530975492０*a*e^(893/2*I*c) + 420662673673182161９3
8421914169097389485256198852594011595923598286892960157918638257984８0*a*e^(
891/2*I*c) + 163212083006997268729159246549906660867373069285799943509652０2
2515969021706052860626138960*a*e^(889/2*I*c) + 62376663456757847178915746４6
273051693924187168921074065740867702296791401889723301408505４0*a*e^(887/2*I
*c) + 234855692258423706200419810716707127388721793315640118242397689383442
548001784656443910036０*a*e^(885/2*I*c) + 871255083430742284346360395591301８
1531985516293260828864216008246077078814538261192252684１0*a*e^(883/2*I*c) +
 318500130024494941917886742794149946716078652242449450002006655762610900３1
451234274836807440*a*e^(881/2*I*c) + 114748596008954399470560820523282802９7
2560754779166281576532046193721730617184676146208454500*a*e^(879/2*I*c) + 4
074841744653947362116914863644020728687905524304051798805074217510942824078
3585809134302667０*a*e^(877/2*I*c) + 142643037425091059133790826183498942347
188298170986358315977537153771801693201246835148013857０*a*e^(875/2*I*c) + 4
922849139190761971912744518550936831750167555165468970439911091242197041305
307652588826163080*a*e^(873/2*I*c) + 1675163004358564804546609710507623366３
4139804131773537744568223051876438412368485589819322984２0*a*e^(871/2*I*c) +
 562107737084046939123077874109892295809692161998879915496580973593067160２8
570932883897745531110*a*e^(869/2*I*c) + 186015977452550255092157917440324３0

0818135019254799070536796872549263250091086090579550703698310*a*e^(867/2*I*
c) + 6071476558117846180525934068675294373925386810781848667804435379321003
36168022295156652479524980*a*e^(865/2*I*c) + 195477130098723468429915723650
2544878646869538838413631422449979548647041435372549308338323983400*a*e^(86
3/2*I*c) + 6208666376133327662787020371327223738306905395229403481688606039
769774018193877054980125219300650*a*e^(861/2*I*c) + 19455556288210142197792
399701441683457177993888604394571936075981048677773457499402098681541345230
*a*e^(859/2*I*c) + 60155208943075208721970485637459885199389358781088969898
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79728598394985334382381190569025961084792025986226970*a*e^(853/2*I*c) + 164
235585052369408178165987548747970648759912590938897517892628070386544161757
8142680863389145680280*a*e^(851/2*I*c) + 4817584949915740964852355271716409
235848785641998844676677492209743884414375678304126912661883888620*a*e^(849
/2*I*c) + 13949845316042293786528514094535620274951482636695793685790781893
931237847288558891416636782386235120*a*e^(847/2*I*c) + 39877107005816808842
474290443185467296349332073686639497504608960180007893671571725169560655925
320000*a*e^(845/2*I*c) + 11254540176202178596753890614510262974982280482013
1541462936025973893544847020246173693665097678958840*a*e^(843/2*I*c) + 3136
293088020715462733207570165074527613810476767113929416368676209987438529454
22691370541694930187760*a*e^(841/2*I*c) + 863027290376938136286146320587382
966922778739244634235519200955649593051035611434988433819531197898760*a*e^(
839/2*I*c) + 23452275720630232633764343055786061690911043360812978713567227
44639904016570907272826407742463307924640*a*e^(837/2*I*c) + 629406122506786
447764803532819614352598375975595100354714074485443115126708614333203407245
7898773808110*a*e^(835/2*I*c) + 1668379197470897218586915631182682117015529
7607333534880763775663291322286056634684196941640082885613980*a*e^(833/2*I*
c) + 4368256487624130087749635757075188322826448323418589792049592125168459
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21364250*a*e^(829/2*I*c) + 288673978616124351576066193803621410940049987233
564354069965128114229512608260120320153840315109513240510*a*e^(827/2*I*c) +
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5652269962227400682354338997620*a*e^(825/2*I*c) + 1817491183507803277646434
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193680*a*e^(823/2*I*c) + 44790946053124559401311878991986757364901787900997
45194145235324134619699772544528969129449757743039635770*a*e^(821/2*I*c) +
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61493183977361964833748319598140*a*e^(819/2*I*c) + 262506700598237870871324
313040849655957123767320824379561378686494524463490057790192498722891461579
88186820*a*e^(817/2*I*c) + 624350634603888862944275086050183454453771965931
51678464550029733503722062639199339939077739315562684600360*a*e^(815/2*I*c)
 + 146767097463970982808607791792512370924531634905313051233506563629059084
334858680054056774768242705313471500*a*e^(813/2*I*c) + 34101053275050840101

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61/2*I*c) + 227914492230573423183794384642924067618367063004688929366445938
50736816226075816614000005128630118631272047930585354*a*e^(759/2*I*c) + 394
964421757197854804800626261040141950619117362572826461311558661205389432919
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0087418438148849381541 5*a*e^(755/2*I*c) + 115078679074156921003896211506744
040757448129755518072610974597692499116476780735959201587866777427373854139
852271484*a*e^(753/2*I*c) + 193505704830181054189159721642887130138475582 52
793401773242056315727571038403878051901634108322171753816041007162928 6*a*e^
(751/2*I*c) + 322165205145142363570118403921081223172103670428827434903217 3
678984087527916867962164455822089877072166612707523481 89*a*e^(749/2*I*c) +
531097086226002776844822503685026440629965503462454662271767664538175076793
50199049608943012406599232788507912142934 3*a*e^(747/2*I*c) + 86697045893774
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3573129277135387631125832240*a*e^(745/2*I*c) + 140150502286482175999051491 1
774358655464920980642918627032979165269601299928150161830021936830813736871
417390373928686*a*e^(743/2*I*c) + 224372744426019935616907530711533047497 82
099134550029336700431895279027708625136468016040067582424263135720298511008
89*a*e^(741/2*I*c) + 355759052364744337578248508929766292922882754286156673
41106417373295977843916533578834729756769993156054453842529678 57*a*e^(739/2
*I*c) + 558698893967464591432536355071628268483019312293467595456665060150 1
265101993368547501997769261446740200272717454879998*a*e^(737/2*I*c) + 86908
344287462640820635666870922769031917378894184093446251988265759445886970611
993059324406214851023667457610480306 32*a*e^(735/2*I*c) + 133916171433813415
617973822475038584786946514869762411301721921550415535983934943380724683336
187857976278550478795357 19*a*e^(733/2*I*c) + 204417835019961259801359073735
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90*a*e^(729/2*I*c) + 463169064421787428773107530128748877142514289777958793
153580120909470200672823314958039316051513419832893758193034974 28*a*e^(727/
2*I*c) + 687588340824290493941730231472874639260477373072581343050011943174
958579815785773697014919831698299888764640820238814 39*a*e^(725/2*I*c) + 101
143876200907701458145589433650452267328419069640282011909099693348827229087
77481470174642516409784983669454212598838 6*a*e^(723/2*I*c) + 14743495097122
257892001302754560741045764055468918914770666990802436741262512060095882016
917065278931689868346343469943 4*a*e^(721/2*I*c) + 212980072887213248427695 7
411841611559855081082818965937685889049569831974956079164659144035890164426
99445092549476690660*a*e^(719/2*I*c) + 304918178534066785990007348109251411
831147410206280250705996608101203138903042698601813697013463781101658444684
909249658*a*e^(717/2*I*c) + 432675100311478232681920379445423307009664359 86
817673117402364955963817104066125257700650919500562711379206820897059067 4*a
*e^(715/2*I*c) + 608560000378994462454360725994938388425387255926195914009
725963943273686384386501149939378187614970307178961382413630 60*a*e^(713/2*I
*c) + 848470498946001634567581956874393834016146789764834275392720475291429

146661138402672991032856375125997801887991514934480*a*e^(711/2*I*c) + 11727
113126584939536498388369849154117904014614045634840053843288777020371629671
20070585970799957845874604153354692701754*a*e^(709/2*I*c) + 160692624306626
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1796510775305152151669953445033*a*e^(707/2*I*c) + 2183136663673238874306231
186152025274688130245012528032646406775075995457404272096460063109834340128
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959178235822249108880611909943048931093638636029968254017904185889712749007
67917143382*a*e^(703/2*I*c) + 392836097149201063465198049040617150440014024
676010743447318264062075917380066973102851810619473316703925248564260153788
3*a*e^(701/2*I*c) + 5203763588007696555866441944538215327243563612139283244
175384029625341239582454293417845888737748393246675398200066703617*a*e^(699
/2*I*c) + 68363653907343935490083740060526889623052085887268921617240025435
45109906070875455109463119424154633158689756128755804310*a*e^(697/2*I*c) +
890769951839117842912980641402497841569803028507622901399151629297555758814
3549142778717881866319712550105543451994921740*a*e^(695/2*I*c) + 1151250370
118722932321754624292796931844868480402772030853088627243410611741428798087
6927354781721804664473558899761393515*a*e^(693/2*I*c) + 1475943096641637266
026391584135364038980566865549449523589098309458194274936068085056080535365
5895626485394213426659661080*a*e^(691/2*I*c) + 1877141777593854101016581170
965589125417404752437554585584113289037225874320065787936848261828833468461
5818699392418342286*a*e^(689/2*I*c) + 2368560957440153387573223776855359788
750496757000209731449894900700078096335324585104460952194609728104516073162
8195279464*a*e^(687/2*I*c) + 2965274439563358013315895980670116385427021037
517126720851863333216136474940528326162682504535882839974231851656862748495
6*a*e^(685/2*I*c) + 3683590220184064905914922714927576872979791050338928752
0100466864775463578466769724598377043872510103817701793820475775984*a*e^(68
3/2*I*c) + 4540854188536614387278871721876377305403940060205798303633337681
6522774495334926169325754390780348094316862266665965991846*a*e^(681/2*I*c)
+ 5555176982051654281141921884692657977308709975397899169675671615736895025
3678159527340671056699387281634743181637981363440*a*e^(679/2*I*c) + 6745081
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8879978783463264636089137056491006523208*a*e^(677/2*I*c) + 8129071018204356
616701379173280267172954967390383067644635798771483933905417558570172260688
4268548187402687095553510812392*a*e^(675/2*I*c) + 9725126358288451269473326
158366739119204994534604768047558453841096717393945458322040125713163484526
9872208901982900506288*a*e^(673/2*I*c) + 1155013660100496806832702398001686
029727691282930709002561705121779982424918713245705795383463814149293141687
62720397958392*a*e^(671/2*I*c) + 136192832394833900835393035860717631858240
644738806126199965701046979626441751102715242872161933462105757019809834502
589368*a*e^(669/2*I*c) + 15945393607422544108744443544559732263801034995914
0938824355029415044951858795370137083023423725977662050522985425476876440*a
*e^(667/2*I*c) + 1853828765700121741147743144859216195375688381584788222948
99038884738131663676924882800088555461036440639784323290982435920*a*e^(665/
2*I*c) + 214041440126824842352708511077845618878866223151781361633546874774

038204026567692011971405221478790305862726998272063222200*a*e^(663/2*I*c) +
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c) + 106686235473495162934108578129511224562420403415950902955267806348062224
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7/2*I*c) + 726625524054874396729548904429989754634649183846135021779065652886
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+ 678308554005074900817733933728713694643911068994805169147351517503405026
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0*a*e^(571/2*I*c) + 3556279295236020904249629525406965646392232243605226674
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(569/2*I*c) + 316348884263616362042842543901080546281501211987656004780654651440103299682244533088533089753616985689239381646035489221440*a*e^(567/2*I*c) + 279578067821774001544429837120309276532260516704930830717667421621248225175842302586295274927274086096056979473472729880620*a*e^(565/2*I*c) + 245449132529438786571460282569147316623840827389821685091527463648881363528910037224877635235250886963822468275620946735000*a*e^(563/2*I*c) + 214041440126824842352708511077845618878866223151781361633546874774038204026567692011971405221478790305862726998272063222200*a*e^(561/2*I*c) + 185382876570012174114774314485921619537568838158478822294899038884738131663676924882800088555461036440639784323290982435920*a*e^(559/2*I*c) + 159453936074225441087444435445597322638010349959140938824355029415044951858795370137083023423725977662050522985425476876440*a*e^(557/2*I*c) + 136192832394833900835393035860717631858240644738806126199965701046979626441751102715242872161933462105757019809834502589368*a*e^(555/2*I*c) + 115501366010049680683270239800168602972769128293070900256170512177998242491871324570579538346381414929314168762720397958392*a*e^(553/2*I*c) + 97251263582884512694733261583667391192049945346047680475584538410967173939454583220401257131634845269872208901982900506288*a*e^(551/2*I*c) + 81290710182043566167013791732802671729549673903830676446357987714839339054175585701722606884268548187402687095553510812392*a*e^(549/2*I*c) + 67450813471126706935490518568202390849221640275494605206650667907051518329294951998879978783463264636089137056491006523208*a*e^(547/2*I*c) + 55551769820516542811419218846926579773087099753978991696756716157368950253678159527340671056699387281634743181637981363440*a*e^(545/2*I*c) + 45408541885366143872788717218763773054039400602057983036333376816522774495334926169325754390780348094316862266665965991846*a*e^(543/2*I*c) + 36835902201840649059149227149275768729797910503389287520100466864775463578466769724598377043872510103817701793820475775984*a*e^(541/2*I*c) + 29652744395633580133158959806701163854270210375171267208518633332161364749405283261626825045358828399742318516568627484956*a*e^(539/2*I*c) + 23685609574401533875732237768553597887504967570002097314498949007000780963353245851044609521946097281045160731628195279464*a*e^(537/2*I*c) + 18771417775938541010165811709655891254174047524375545855841132890372258743200657879368482618288334684615818699392418342286*a*e^(535/2*I*c) + 14759430966416372660263915841353640389805668655494495235890983094581942749360680850560805353655895626485394213426659661080*a*e^(533/2*I*c) + 11512503701187229323217546242927969318448684804027720308530886272434106117414287980876927354781721804664473558899761393515*a*e^(531/2*I*c) + 8907699518391178429129806414024978415698030285076229013991516292975557588143549142778717881866319712550105543451994921740*a*e^(529/2*I*c) + 6836365390734393549008374006052688962305208588726892161724002543545109906070875455109463119424154633158689756128755804310*a*e^(527/2*I*c) + 5203763588007696555866441944538215327243563612139283244175384029625341239582454293417845888737748393246675398200066703617*a*e^(525/2*I*c) + 3928360971492010634651980490406171504400140246760107434473182640620759173800669731028518106194733167039252485642601537883*a*e^(523/2*I*c) + 294087118247175053123855033288460269591782358222491088806119099430489310936386360299682540179041858897127490076791

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2*I*c) + 394964421757197854804800626261040141950619117362572826461311558661
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I*c) + 22818654910004353256520815711929593145995527450941003981475857689013
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e^(451/2*I*c) + 19352737493776155106975449584051738189540453017146222106374
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 + 697745399097009589387051799033958620978960769975387378294213069494594652
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^(427/2*I*c) + 421488318183379605264415423924469270354566939628166561985944
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23012645019617538312082871128*a*e^(423/2*I*c) + 885605196595303487966234065
733860296508373759769686898565697938788076949495486430428730940615968943340

1344052*a*e^(421/2*I*c) + 39910101962043329372125868519988343753118778760345495258801213079744295651659499740079814919606856665064285548*a*e^(419/2*I*c
) + 1778151606792735693184576305171006554591730889801463470834571569649456632925027058049883289543294859615339320*a*e^(417/2*I*c) + 783199511028604830305265171241783073558871641563886451764214478656600184324031802959178677178450742159624260*a*e^(415/2*I*c) + 341010532750508401010512572574256433550588192252263514909935663911418354657799482940339817517181660633925100*a*e^(41
3/2*I*c) + 146767097463970982808607791792512370924531634905313051233506563629059084334858680054056774768242705313471500*a*e^(411/2*I*c) + 62435063460388886294427508605018345445377196593151678464550029733503722062639199339939077739315562684600360*a*e^(409/2*I*c) + 26250670059823787087132431304084965595712376732082437956137868649452446349005779019249872289146157988186820*a*e
^(407/2*I*c) + 10907792551328601262223619496641755337904777369851587593737697263911418412361493183977361964833748319598140*a*e^(405/2*I*c) + 4479094605312455940131187899198675736490178790099745194145235324134619699772544528969129449757743039635770*a*e^(403/2*I*c) + 1817491183507803277646434154563247687916502767732579734578654547931596925444779173074576528904820222193680*a*
e^(401/2*I*c) + 728709577013049306851455830045786258395785594957055604204925387842039994625652269962227400682354338997620*a*e^(399/2*I*c) + 288673978616124351576066193803621410940049987233564354069965128114229512608260120320153840315109513240510*a*e^(397/2*I*c) + 112980168249357900386494611302233425325484148661095936167081471345600663852911028639756655134829221364250*a*e^(
395/2*I*c) + 43682564876241300877496357570751883228264483234185897920495921251684596213376975639862720078190049382420*a*e^(393/2*I*c) + 16683791974708972185869156311826821170155297607333534880763775663291322286056634684196941640082885613980*a*e^(391/2*I*c) + 6294061225067864477648035328196143525983759755951003547140744854431151267086143332034072457898773808110*a*e^(389/2*I
*c) + 2345227572063023263376434305578606169091104336081297871356722744639904016570907272826407742463307924640*a*e^(387/2*I*c) + 863027290376938136286146320587382966922778739244634235519200955649593051035611434988433819531197898760*a*e^(385/2*I*c) + 313629308802071546273320757016507452761381047676711392941636867620998743852945422691370541694930187760*a*e^(383/2*I*c) + 112545401762021785967538906145102629749822804820131541462936025973893544847020246173693665097678958840*a*e^(381/2*I*c) + 39877107005816808842474290443185467296349332073686639497504608960180007893671571725169560655925320000*a*e^(37
9/2*I*c) + 13949845316042293786528514094535620274951482636695793685790781893931237847288558891416636782386235120*a*e^(377/2*I*c) + 4817584949915740964852355271716409235848785641998844676677492209743884414375678304126912661883888620*a*e^(375/2*I*c) + 1642355850523694081781659875487479706487599125909388975178926280703865441617578142680863389145680280*a*e^(373/2*I*c) + 552644594394330981404683589085114642280906553679728598394985334382381190569025961084792025986226970*a*e^(371/2*I*c) + 183538629866030645516929289398516242583510847808790824780933371253504023929536299207100681758720560*a*e^(369/2*I*
c) + 60155208943075208721970485637459885199389358781088969898509767201637525536232949225931564636017060*a*e^(367/2*I*c) + 1945555628821014219779239970

1441683457177993888604394571936075981048677773457499402098681541345230*a*e^
(365/2*I*c) + 6208666376133327662787020371327223738306905395229403481688606
039769774018193877054980125219300650*a*e^(363/2*I*c) + 19547713009872346842
991572365025448786468695388384136314224499795486470414353725493083383239834
00*a*e^(361/2*I*c) + 607147655811784618052593406867529437392538681078184866
780443537932100336168022295156652479524980*a*e^(359/2*I*c) + 18601597745255
025509215791744032430081813501925479907053679687254926325009108609057955070
3698310*a*e^(357/2*I*c) + 5621077370840469391230778741098922958096921619988
7991549658097359306716028570932883897745531110*a*e^(355/2*I*c) + 1675163004
358564804546609710507623366341398041317735377445682230518764384123684855898
1932298420*a*e^(353/2*I*c) + 4922849139190761971912744518550936831750167555
165468970439911091242197041305307652588826163080*a*e^(351/2*I*c) + 14264303
742509105913379082618349894234718829817098635831597753715377180169320124683
51480138570*a*e^(349/2*I*c) + 407484174465394736211691486364402072868790552
430405179880507421751094282407835858091343026670*a*e^(347/2*I*c) + 11474859
600895439947056082052328280297256075477916628157653204619372173061718467614
6208454500*a*e^(345/2*I*c) + 3185001300244949419178867427941499467160786522
4244945000200665576261090031451234274836807440*a*e^(343/2*I*c) + 8712550834
307422843463603955913018153198551629326082886421600824607707881453826119225
268410*a*e^(341/2*I*c) + 23485569225842370620041981071670712738872179331564
01182423976893834425480017846564439100360*a*e^(339/2*I*c) + 623766634567578
471789157464627305169392418716892107406574086770229679140188972330140850540
*a*e^(337/2*I*c) + 16321208300699726872915924654990666086737306928579994350
9652022515969021706052860626138960*a*e^(335/2*I*c) + 4206626736731821619384
2191416909738948525619885259401159592359828689296015791863825798480*a*e^(33
3/2*I*c) + 1067844553682541137674668046315205503487286703673470505227808832
4574859010216795309754920*a*e^(331/2*I*c) + 2669400972789686981296836875076
250459931673689078037577064328933999433324588323107010000*a*e^(329/2*I*c) +
 65703578670331707387227618346665553683329480644569203660343706414586411597
5619273310760*a*e^(327/2*I*c) + 1592097671809555303250472275831776042339460
16419587011038408978676950649660142022326320*a*e^(325/2*I*c) + 379743334997
20259658150626055074672602084485890782692205932372642164257255828275277230*
a*e^(323/2*I*c) + 891421027524593774701305889025999040677202573103172232643
9774933310018480720586176220*a*e^(321/2*I*c) + 2059104851233963888842379525
772936034391701199184168338071977072713080793446996296340*a*e^(319/2*I*c) +
 46795660437124083156463767484415712775096496748771025804871156484949219341
3275081370*a*e^(317/2*I*c) + 1046142529349056121996585903795887365485773563
27149679159709209471984279805545840510*a*e^(315/2*I*c) + 230016401216572533
16651693705684837372513278520836331991407615544187744222242128500*a*e^(313/
2*I*c) + 497315194543781833320797851981222928399068768126620986782740255724
1427416724759600*a*e^(311/2*I*c) + 1057133035608080334517467842102247001229
173401193395800195028598793946241985524410*a*e^(309/2*I*c) + 22088700947448
5548410918212534797139518487225151752041095525819264180469636552620*a*e^(30
7/2*I*c) + 4535951973461225073999629610614837615488499429203915540276064910
6566139277798596*a*e^(305/2*I*c) + 9152441985761079445443716091984800770861

7660987553650015782150278140256378223 44*a*e^(303/2*I*c) + 18142017896632475
0368399086912625354231807142187887044707667156939252328242 6716*a*e^(301/2*I
*c) + 353200434742307961537044752990124528653649931040810723777175782628615
964698844*a*e^(299/2*I*c) + 675224033612120791362914479989110827038453618 49
108254368438686584600219974916*a*e^(297/2*I*c) + 126726214454400676234867 07
294305789706782209558457586283948374216939117542680*a*e^(295/2*I*c) + 23343
962004920902169805777673107446505804176065895986743895917756245133 02292*a*e
^(293/2*I*c) + 421955281655057070938611937183522587192086313169152717515130
361078410110468*a*e^(291/2*I*c) + 748225805992854809332407047961969129851 42
264561156826348717174043201630392*a*e^(289/2*I*c) + 130124844315334923787 46
242079203193435247631682976658777500945950758604298*a*e^(287/2*I*c) + 22188
707014110210497894214368503019763357572076766900627594431580946156 52*a*e^(2
85/2*I*c) + 370874356826170622561211031579288522536503760739536119117445103
487930880*a*e^(283/2*I*c) + 607461980535619195835294948202520064328801684 02
592906594363059656788960*a*e^(281/2*I*c) + 974717450252413924844218873977 50
175625676495407868878393581870409125 30*a*e^(279/2*I*c) + 153168954468853312
826783522082666057551776355654140205740742227505 5260*a*e^(277/2*I*c) + 2356
432717106027769859768125033979187233607078431902386664543841536 69*a*e^(275/
2*I*c) + 354802086973620760088737097767022945419673957182978325692500471805
56*a*e^(273/2*I*c) + 522652409350764619368283927596894360862678670014248782
2871933708874*a*e^(271/2*I*c) + 752970977560607563719398585207010863604321 5
576162894730639917670 39*a*e^(269/2*I*c) + 106051898268333756910564897558688
638080806915238108581854868257941*a*e^(267/2*I*c) + 145969882655902257079 51
774554192673478049322662209596418132188458*a*e^(265/2*I*c) + 1962615229865 8
365182700677326625677942031304421831143048754775 10*a*e^(263/2*I*c) + 257661
1959392903086066077612980640290109804462779236377279406 95*a*e^(261/2*I*c) +
 33015018627194726039854786048619784314920578570513381395990898*a*e^(259/2*
I*c) + 41268702469850295360181070861366925057989159344574798568878 16*a*e^(2
57/2*I*c) + 502997285203192059840013244325631734915939121404020646790260*a*
e^(255/2*I*c) + 597482190312026785202356437890060931436126815089502044937 78
*a*e^(253/2*I*c) + 691300935061032244604742862740881115915833888574749012 77
62*a*e^(251/2*I*c) + 778662391349080881934068370430476103178748088552087631
588*a*e^(249/2*I*c) + 853327942638617453419519415686338010442992091891904 69
846*a*e^(247/2*I*c) + 909283230328133681623358022746257787119781396327607 53
30*a*e^(245/2*I*c) + 941491605787522647999978018615368308830544085253128617
*a*e^(243/2*I*c) + 946607923916164665343331512358419160679787001972427 08*a*
e^(241/2*I*c) + 923519526684946931752112421704276367697376625310479 4*a*e^(2
39/2*I*c) + 873599234708764858055721340390736019595548391597091*a*e^(237/2*
I*c) + 800602828620064879218608733538613576720730710407 69*a*e^(235/2*I*c) +
 7102120067046396299634193292688723536713017300128*a*e^(233/2*I*c) + 609297
036058359460142063362206138699889504487122*a*e^(231/2*I*c) + 50503221535858
091096582689376221786704600600455*a*e^(229/2*I*c) + 404025715184420615954 22
665880799058707526025 11*a*e^(227/2*I*c) + 311615542420218960570549891210554
131541198338*a*e^(225/2*I*c) + 23143857771494702366699332162923093803819912
*a*e^(223/2*I*c) + 165313257551224322055579287338329258010895 3*a*e^(221/2*I

*c) + 1134075051149982078282868399593568183315 15*a*e^(219/2*I*c) + 74610197 2910412638047714652148823292042 6*a*e^(217/2*I*c) + 4699854778898463687765 71 005635121060828*a*e^(215/2*I*c) + 2829755417150959822835916906873799254 5*a* e^(213/2*I*c) + 16254469419119015438910666052661787 10*a*e^(211/2*I*c) + 888 91628244678704139848327305754038*a*e^(209/2*I*c) + 4617746868571980127702 69 8250753676*a*e^(207/2*I*c) + 22729841909575511658656679995793 4*a*e^(205/2*I *c) + 1057201943026601004801309775293 4*a*e^(203/2*I*c) + 463207034992633568 486133297596*a*e^(201/2*I*c) + 190522173248007421772693607 04*a*e^(199/2*I*c) + 732777588085793048574300590*a*e^(197/2*I*c) + 262375606686586119780900 5 5*a*e^(195/2*I*c) + 870123184837420284430070*a*e^(193/2*I*c) + 265686468547 16407696970*a*e^(191/2*I*c) + 741764252131213332757*a*e^(189/2*I*c) + 18778 841824143775343*a*e^(187/2*I*c) + 426791859620149322*a*e^(185/2*I*c) + 8600 339740311748*a*e^(183/2*I*c) + 151262256738437*a*e^(181/2*I*c) + 2274620402 080*a*e^(179/2*I*c) + 28432755026*a*e^(177/2*I*c) + 283618504*a*e^(175/2*I* c) + 2116556*a*e^(173/2*I*c) + 10504*a*e^(171/2*I*c) + 26*a*e^(169/2*I*c))/ (e^(531*I*c) + 432*e^(530*I*c) + 93096*e^(529*I*c) + 13343760*e^(528*I*c) + 1431118260*e^(527*I*c) + 122503723056*e^(526*I*c) + 8718181624155*e^(525*I *c) + 530563624556832*e^(524*I*c) + 28186192554792138*e^(523*I*c) + 1327882 849274858880*e^(522*I*c) + 56169444526926562260*e^(521*I*c) + 2154864144781 257856128*e^(520*I*c) + 75599817092670157806639*e^(519*I*c) + 2442455629894 502983849104*e^(518*I*c) + 73099207817335597247098038*e^(517*I*c) + 2037031 259470368160131922320*e^(516*I*c) + 53090127264630963470039804475*e^(515*I* c) + 1299146645993240318167826532288*e^(514*I*c) + 299525477492654996752578 42032197*e^(513*I*c) + 652650253343206047453620559993840*e^(512*I*c) + 1347 7227799524701956579274210395326*e^(511*I*c) + 264410375780310742518099326 41 9685040*e^(510*I*c) + 4939666610818025798809586352543471345*e^(509*I*c) + 8 8054927598941411145869950813388040256*e^(508*I*c) + 150060274793739728640 55 77818722691539392*e^(507*I*c) + 24489837337812338687718622491865013839488*e ^(506*I*c) + 383360155801054824529764688213114368047154*e^(505*I*c) + 57646 01046563151304213854710715346838447392*e^(504*I*c) + 833808399118378944531 3 630367378503905150680 5*e^(503*I*c) + 116158141373397175153362251190904691 71 88768400*e^(502*I*c) + 1560391127768760709972162377174493308692058 7272*e^(5 01*I*c) + 2023475097244621713139666435802340785081798383 20*e^(500*I*c) + 25 3566746065027977683456156618659121310925164285 9*e^(499*I*c) + 3073536651283 0562160991166338490057308062762518496*e^(498*I*c) + 360688613036389349413 80 97800045599635487754233252 55*e^(497*I*c) + 4101545439937195793959956708442 4 96709433800261224880*e^(496*I*c) + 452309400398307383320256947846462068448 5 4827698075736*e^(495*I*c) + 484093410240488718655917025303662581091659126 18 2344528*e^(494*I*c) + 503202490340145182407421394376601192202650700631198 27 53*e^(493*I*c) + 508363695081710994370193486108473919467361851080171831 36*e ^(492*I*c) + 4994675065585317336715858629105727028115450357303987495 30*e^(4 91*I*c) + 4775398607100853263534207733818266777478693412738731031680*e^(490 *I*c) + 444567081752588210244009462105350045237757221909774684844 96*e^(489* I*c) + 403212225957798188840846139960995624144491271694336796459584*e^(488* I*c) + 356476489062872401708848799668817892919578761395854547480484 5*e^(487

*I*c) + 307362174043210099652310374196630539628810352817092216977850 72*e^(4
86*I*c) + 2585853487159772701558291156841934110720345414913643939854913 50*e
^(485*I*c) + 212370296918887131826671878122392706783994901572729388406538 80
80*e^(484*I*c) + 170338860273906157410409777216555416656121622754850285843 1
0890417*e^(483*I*c) + 133490210052026183779673313868332303530332906163247 19
4627808410304*e^(482*I*c) + 102253643746829673729306586270524644969368741 55
5986584430688870542 3*e^(481*I*c) + 765901052018754965177711835767687192708 1
8989891311257557982042361 12*e^(480*I*c) + 561170810763411753840875701851885
386603759320136747355190552273683 66*e^(479*I*c) + 402349692266121158934003 5
8283942878511690490393640954560251921966472 0*e^(478*I*c) + 282390515193658 6
678382525706564457280290098698638597987628380245881715*e^(477*I*c) + 194079
79215594566593535008103303255257745408070082431338945184797463936*e^(476*I*
c) + 130657660226560419335121434389938961884595434069984824307149332131747 5
40*e^(475*I*c) + 861884851094991908764246805474672428603757315484453974713 6
12812215428992*e^(474*I*c) + 557255115732867112101621641630759616186195596 9
0116972223409262101128544 18*e^(473*I*c) + 353244472067790181153780528207894
11687581004582367431006205879633729015200*e^(472*I*c) + 219601281339515561 5
002614788441900248705552612819460588396140446970379636 95*e^(471*I*c) + 1339
2143742542455535648844068019453533850002540306557659537702376071800899 68*e^
(470*I*c) + 801372958079075243436196494576154376146952079121074697267587048
1058674277844*e^(469*I*c) + 470650446111351581084873533674842431026982488 38
3126358762830994274427458667 04*e^(468*I*c) + 271361207503266570734486517077
1810148017753221831810556386192578361432714723 58*e^(467*I*c) + 153633323844
4927583532734556016494671674916578907116984548489078241693926940560*e^(466*
I*c) + 854301344112621233483354066506962147247908583804136056455072203672 36
54297540205*e^(465*I*c) + 466682235482660178068545924681005702893559608696 1
36508565757567581801822233087 68*e^(464*I*c) + 250501028608928332469340456 82
990206771223364446460275315994572786848572239550695 2*e^(463*I*c) + 13214980
55271300851429993866631619874424534425188183592049727687571032156435077280*
e^(462*I*c) + 685299322314573668732888531161779543559294084143986635107965 5
6523128947219727962 66*e^(461*I*c) + 349410716132767046494779430433394502015
04075335160361865916029213860778606230624960*e^(460*I*c) + 175193170500618 3
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4724923159318091718599021141090059399429 52*e^(457*I*c) + 200080068030300471
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*I*c) + 939869153130681791490836060656814827808360605105301546184869498394 6
71313788598859982 10*e^(455*I*c) + 434546676780280045346344498763892540797 17
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c) + 595157615500431514947479282336547053827926087916425263497187757029413 3
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*I*c) + 347310053810935290419455560555957314129569210735745983234369659976 4
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c) + 293649421435186849870323945542677110434482730626755891655087746723245 5
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e^(246*I*c) + 161109254140006052595485937526419417834764347183707820144626 2
435615142944587337833513586022729849523358436493586042252995608*e^(245*I*c)
 + 975210339444049318757282311763517786673223175594457946383279264635085041
004917300295904275433144848532459919875479817581584*e^(244*I*c) + 584749573
682304586179384628844883327581498969886540380378896767999075614964007174600
811092945356635118795824799369716742109*e^(243*I*c) + 347310053810935290419
455560555957314129569210735745983234369659976413374774078000173070075248654
524917179128950507443058208*e^(242*I*c) + 204325557265186000767402710230847
896459761583922763698235433212833313077783041040074669379017394836761539649
081690630811665*e^(241*I*c) + 119060591849660546834765693227676449067584148
248882678447504826077236333444513454095126668750057295811191643356908972191
440*e^(240*I*c) + 687124660159856415124685861736597477348795917100983546527
861249360230739431410495736066485630053594117127648956839038060 88*e^(239*I*
c) + 392742004143298611693979445162250010812274333985850072063992312119071 5
779535971964824159875426657984024455149147646789995 2*e^(238*I*c) + 22231341
131801535345406399037721686840208397941952580135584645966746736656716271554
826476282991066076564921432614339399735*e^(237*I*c) + 124621404405372580849
285967098720668577570709431248685545009481547568634543080329254083403112378
500178147078969869690868 16*e^(236*I*c) + 691783894521484427849333045936139 4
923372333853619879637372673184942859712431066345726870422099893124890777678
037369988150*e^(235*I*c) + 380260499670589110696462063384896480703709885451
018226324303059729563076035359753197432475226638919318576087827418801344 0*e
^(234*I*c) + 206969828950086064346166576237380795751301942404117887190496 05
518294124493447224321256794179584030075511792983159473737 76*e^(233*I*c) + 1
115398285545601550533328045600184317993899359217996729818340704221801195667
410485846996179056733558512452238583160792512*e^(232*I*c) + 595157615500431
514947479282336547053827926087916425263497187757029413385471835434198246807
096214536895441388306027237899*e^(231*I*c) + 314409035808225861565595436938
354945445473991043129722046747228813030925204968503418566818838611866709807
040793495364496*e^(230*I*c) + 164437500676906892741323260154394278503954561
936020133596581806449357240277349447927334517105809995300093549279931273178
*e^(229*I*c) + 851395332347864557795899594649006377607357297056212213800058
372083691577946730496754287998178754314302463326258996301 60*e^(228*I*c) + 4
363830007581517102594621146446568961896577348866098585794565747985408510885
185791122291198983761545260851235600840029 5*e^(227*I*c) + 221407350017086 03
270915180769241391662035578755903979148909213603822554792749183517160255571

915875356439553717130797888*e^(226*I*c) + 11119499645363201080881062824886338492425375658448977935535846349290425821570383090425411418521516670371372045206568345*e^(225*I*c) + 55274988490311783558612300093266682839262900821584671180006985027193799390459183442221927421457112570280409740746747
36*e^(224*I*c) + 27195892834837439260408051010803419212445303112546072509291927739093315232266350358156728625692966937116435210703313
94*e^(223*I*c) + 13243113249840274283552229381476823786728607088171617414487496895935880208608475087037023253203046498831206849875564
00*e^(222*I*c) + 63821889291453374150580639966248855606678360049609187640837497487744897177803607499624558112428346043806518207197608
5*e^(221*I*c) + 30438447110681333601028416012390637043388882849062742265255123696679091617452085775914393014018717349239498190825894
4*e^(220*I*c) + 14365768713804479694294711970425953845881819942351682467458629369105611920986635812363777224540953079923055376722225
2*e^(219*I*c) + 67091706130529669125019899210021576580237843462229535386295087076189297849995931360645605292130961496106707521506432*e^(218*I*c) + 310043192060694170770693631414234874318280090981847446356786522841774394649416518125645191449180031741080776348460
14*e^(217*I*c) + 14176483652875704957202013343241117904369977796653849959902524421980635189011634815653279605497783382888932766730080*e^(216*I*c) + 6413381895855925184758231451062556380328594938511006577015218119786536390213057284018202201631094434819584025113465*e^(215*I*c) + 28704961314123144518346747153535894395532944308085319334660862885437092462307691513921806994134056230172477535329
44*e^(214*I*c) + 12710330829380489502013605548312703426623439912775046123423003660250467417428565804452894017866563116858590230847
16*e^(213*I*c) + 55675638871118234034102619273421954611365176831738053900589367904939471401706369856527272881366905477907720897784
0*e^(212*I*c) + 24124602128244006179290831778303287619480159713320605209128699704372914534575580571008148900674183943957398483267
8*e^(211*I*c) + 1033997554672574364898478376407537547182043944730557950014676043264198765555568738295317372110961151960056477304
80*e^(210*I*c) + 43834972142919377685378692233021063744554033100928502737480438978976746989895784070951905237783490374305934542955*e^(209*I*c) + 1837980708400335976602764921762114411609173557221662078886153580344970227380258835907670424184073351343911411324
8*e^(208*I*c) + 762178879191204706203884091779937460042889225819436763668294435609668140024631213800176928502066144599107324941
6*e^(207*I*c) + 3125683493178701743479704750307490178666292150720179363604335113528623329684606343185540756019935662148267863968*e^(206*I*c) + 1267597017294812913400146276042126929986480292870190399107554311079964227280196522475370108738477856311765699610*e^(205*I*c) + 50832459930108546016697862968303266142765447408293904809793963839156729879578838943384228575105466521086828768
0*e^(204*I*c) + 2015579472479409802677247846204088339586751256293086294375356869008401558559801015478154862523940958190739750
0*e^(203*I*c) + 79019149558766569254783988487232388352909144982747171856772463223808993367091503402876467270176124342699654400*e^(202*I*c) + 30627581054221957378390547289277609129572813931082733520247387226000020043538279468776707958420892547870128680*e^(201*I*c) + 117358569262451184931130910025016040323418769859990828235206722415302001882238263929823021940
84

667538488665600*e^(200*I*c) + 4445412259295474625067659514198312966015416299968930393345630345914109720740573618884980520010028451496996210*e^(199*I*c) + 1664475034387211809394917743502937638978574937754764763987835872410449930690131572904279995484581013965001440*e^(198*I*c) + 616003116022979584937125701757887212998354300989991362628038861093914561332071191909714949426587936910303300*e^(197*I*c) + 225320532593220657767941109289516248999794521015564134982827241710019675486694499689312466561907212627820000*e^(196*I*c) + 814520814138291118288754175642500548460376933128114804929091607581959891557681070225683509538618159407040900*e^(195*I*c) + 2909765106124745340664756978183691006216555985235905280425915416568712542875256238549237374948635171445312 0*e^(194*I*c) + 1027160253020288900249781351684945259097151280952906066519730109705221006457608834802323467197546367741847 0*e^(193*I*c) + 35827180021632960614145367037151098971071982527392845461493431023484561240896574285949464386608597738862 40*e^(192*I*c) + 123466804189240997878001808175544021601258247639694193796589963195307920397422213879460432849897214476690 0*e^(191*I*c) + 420358024835146798583611210145942154684437949365647899088372524802156222884839580011688655664280691773600*e^(190*I*c) + 14137993825355684328056550580740330413060613072543475174579407983314136174891763998614537706643721 0546190*e^(189*I*c) + 4697022472711728182645404501807067052255975662758034778453532001496348263235972944454188510227454600256 0*e^(188*I*c) + 154131112114860239372949708207973767160813447881633865435224219397375079621258549818818791683482603300 00*e^(187*I*c) + 499524195627913818020518674440168802438827211392125566373495694692757130553314677689878787805968510848 0*e^(186*I*c) + 159877110105819269227052899967744474268563100623245618584492522014400230587812038082848398866357482910 0*e^(185*I*c) + 505293663123015258878483025738812813203397766845340065381261016353419722382620393032535960660921950400*e^(184*I*c) + 157685845528850918721462877864435090257583149415561323427386562894447598277935629800939237175625149830*e^(183*I*c) + 485842581531402804473148368687721313901954124190467327784587060150968814370763379107935841224750 73760*e^(182*I*c) + 14777955096617128998712745182071495362176506973183081650233605274051677624970464340242755840025673760*e^(181*I*c) + 4437210917843182347764349544443904699020056595069470847193617092114714077633077234972825351226979360*e^(180*I*c) + 131505212093069212210229710532762284233587074342853089107298353586228009444660772347380047745391413 0*e^(179*I*c) + 38465584208066627445406307878483717499894905250097532216200339254995341359246151936517790868207840 0*e^(178*I*c) + 11103414879700881944314389564446924229504986746431371096925761933889913379928561602006987261171085 0*e^(177*I*c) + 3162664467472554773117679568752765357130596998592368839211216491555324257326949090898957024853328 0*e^(176*I*c) + 888829502875102466704420383760797610148005313441861447462076752282486891195988435266644491740400 0*e^(175*I*c) + 246438219080743960907977422685567962936788570977643587663085171625396269619234170623919287872816 0*e^(174*I*c) + 674025530543133008894845775236625237450743114473544537818170447134607102575676676056675328961590*e^(173*I*c) + 18183466140617790131533012967714538116644918841319414116934435475492096903495261037894528225760 0*e^(172*I*c) + 4837948975643409984385779181658937940681504260

934037874758643714578164624542204510123041730990 0*e^(171*I*c) + 12693496932
964920565073673637181280088548682508880255337280065006566138696041797353216
584528640*e^(170*I*c) + 3283874760555818676726309480306734420155098583948 07
44690141681718744421701096485216275387559 20*e^(169*I*c) + 83757920692341193
2458786486765373533946545239708990769488724813982189165104589895518909256 32
0*e^(168*I*c) + 2105943013856484711843290788803175049533618399541594274340 0
98846617772597525426477091500369 90*e^(167*I*c) + 52190912207661824215812271
85426974807129284324322789476922969072001054714133413161098963600 0*e^(166*I
*c) + 1274721961650332054135634306256284736860162214085678602544581453203 79
041115232422982357133 00*e^(165*I*c) + 306797429643174736419815962396246367 1
6170064196268514261484186029348529073790216597619118 40*e^(164*I*c) + 727521
0107183942292917740738446942557987386670675353797597327955679425787513842 50
780476310*e^(163*I*c) + 169956327969929767773902096652629253283704505477127
54455653441737668654093670607384733760 0*e^(162*I*c) + 391080312556018094765
37535369611844440844903751605645023514572352045248104262933598850730*e^(161
*I*c) + 886275214275695728568134088576490459793534956935532181564772117253 7
159186491471311666400*e^(160*I*c) + 197779298066581813565130009432623915860
54488708069708605773253850286099830345346723185 00*e^(159*I*c) + 43454667678
028004534634449876389254079717510575682751550929702418766029934548492019248
0*e^(158*I*c) + 939869153130681791490836060656814827808360605105301546184 86
9498394671313788598859982 10*e^(157*I*c) + 200080068030300471372932782503215
971135407162019833331263492811866791531990680452572 16*e^(156*I*c) + 4191542
500656826148093339414544159143964478472492315931809171859902114109005939942
952*e^(155*I*c) + 86397993362233034955629682002839551319870806494050570212 6
06865293680079482665126425 6*e^(154*I*c) + 17519317050061830024151563238191 2
2851577900978160492206712172122200152971334006360 60*e^(153*I*c) + 349410716
13276704649477943043339450201504075335160361865916029213860778606230624960*
e^(152*I*c) + 68529932231457366873288853116177954355929408414398663510796 55
6523128947219727962 66*e^(151*I*c) + 132149805527130085142999386663161987442
4534425188183592049727687571032156435077280*e^(150*I*c) + 25050102860892833
2469340456829902067712233644464602753159945727868485722395506952*e^(149*I*c
) + 46668223548266017806854592468100570289355960869613650856575756758180182
223308768*e^(148*I*c) + 854301344112621233483354066506962147247908583804136
0564550722036723654297540205*e^(147*I*c) + 153633323844492758353273455601 64
94671674916578907116984548489078241693926940560*e^(146*I*c) + 2713612075032
665707344865170771810148017753221831810556386192578361432714723 58*e^(145*I*
c) + 470650446111351581084873533674842431026982488383126358762830994274427 4
5866704*e^(144*I*c) + 80137295807907524343619649457615437614695207912107469
72675870481058674277844*e^(143*I*c) + 13392143742542455535648844068019453 53
385000254030655765953770237607180089968*e^(142*I*c) + 219601281339515561500
2614788441900248705552612819460588396140446970379636 95*e^(141*I*c) + 353244
472067790181153780528207894116875810045823674310062058796337290152 00*e^(140
*I*c) + 557255115732867112101621641630759616186195596901169722234092621011 2
854418*e^(139*I*c) + 86188485109499190876424680547467242860375731548445397 4
713612812215428992*e^(138*I*c) + 130657660226560419335121434389938961884595

434069984824307149332131747540*e^(137*I*c) + 19407979215594566593535008103303255257745408070082431338945184797463936*e^(136*I*c) + 2823905151936586678382525706564457280290098698638597987628380245881715*e^(135*I*c) + 402349692266121158934003582839428785116904903936409545602519219664720*e^(134*I*c) + 56117081076341175384087570185188538660375932013674735519055227368366*e^(133*I*c) + 7659010520187549651777118357676871927081898989131125755798204236112*e^(132*I*c) + 1022536437468296737293065862705246449693687415559865844306888705423*e^(131*I*c) + 133490210052026183779673313868332303530332906163247194627808410304*e^(130*I*c) + 17033886027390615741040977721655541665612162275485028584310890417*e^(129*I*c) + 2123702969188871318266718781223927067839949015727293884065388080*e^(128*I*c) + 258585348715977270155829115684193411072034541491364393985491350*e^(127*I*c) + 30736217404321009965231037419663053962881035281709221697785072*e^(126*I*c) + 3564764890628724017088487996688178929195787613958545474804845*e^(125*I*c) + 403212225957798188840846139960995624144491271694336796459584*e^(124*I*c) + 44456708175258821024400946210535004523775722190977468484496*e^(123*I*c) + 4775398607100853263534207733818266777478693412738731031680*e^(122*I*c) + 499467506558531733671585862910572702811545035730398749530*e^(121*I*c) + 50836369508171099437019348610847391946736185108017183136*e^(120*I*c) + 5032024903401451824074213943766011922026507006311982753*e^(119*I*c) + 484093410240488718655917025303662581091659126182344528*e^(118*I*c) + 45230940039830738332025694784646206844854827698075736*e^(117*I*c) + 4101545439937195793959956708442496709433800261224880*e^(116*I*c) + 360688613036389349413809780004559963548775423325255*e^(115*I*c) + 30735366512830562160991166338490057308062762518496*e^(114*I*c) + 2535667460650279776834561566186591213109251642859*e^(113*I*c) + 202347509724462171313966643580234078508179838320*e^(112*I*c) + 15603911277687607099721623771744933086920587272*e^(111*I*c) + 1161581413733971751533622511909046917188768400*e^(110*I*c) + 83380839911837894453136303673785039051506805*e^(109*I*c) + 5764601046563151304213854710715346838447392*e^(108*I*c) + 383360155801054824529764688213114368047154*e^(107*I*c) + 24489837337812338687718622491865013839488*e^(106*I*c) + 1500602747937397286405577818722691539392*e^(105*I*c) + 88054927598941411145869950813388040256*e^(104*I*c) + 4939666610818025798809586352543471345*e^(103*I*c) + 264410375780310742518099326419685040*e^(102*I*c) + 13477227799524701956579274210395326*e^(101*I*c) + 652650253343206047453620559993840*e^(100*I*c) + 29952547749265499675257842032197*e^(99*I*c) + 1299146645993240318167826532288*e^(98*I*c) + 53090127264630963470039804475*e^(97*I*c) + 2037031259470368160131922320*e^(96*I*c) + 73099207817335597247098038*e^(95*I*c) + 2442455629894502983849104*e^(94*I*c) + 75599817092670157806639*e^(93*I*c) + 2154864144781257856128*e^(92*I*c) + 56169444526926562260*e^(91*I*c) + 1327882849274858880*e^(90*I*c) + 28186192554792138*e^(89*I*c) + 530563624556832*e^(88*I*c) + 8718181624155*e^(87*I*c) + 122503723056*e^(86*I*c) + 1431118260*e^(85*I*c) + 13343760*e^(84*I*c) + 93096*e^(83*I*c) + 432*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) + 7*(338*I*a*e^(1055/2*I*c) + 136552*I*a*e^(1053/2*I*c) + 27515228*I*a*e^(1051/2*I*c) + 3687040552*I*a*e^(1049/2*I*c) + 369625815338*I*a*e^(1047/2*I*c) + 29570065227040*I*a*e^(10

45/2*I*c) + 1966409337599317*I*a*e^(1043/2*I*c) + 111804416623905668*I*a*e^
(1041/2*I*c) + 5548294175032309402*I*a*e^(1039/2*I*c) + 2441249437098984204
93*I*a*e^(1037/2*I*c) + 9642935277307714791837*I*a*e^(1035/2*I*c) + 3453924
09079468621758030*I*a*e^(1033/2*I*c) + 11311601400768793085009738*I*a*e^(10
31/2*I*c) + 341088288572157297772118077*I*a*e^(1029/2*I*c) + 95261086391402
31470517528278*I*a*e^(1027/2*I*c) + 247678824959506386373000637444*I*a*e^(1
025/2*I*c) + 6021691444519566631530369807136*I*a*e^(1023/2*I*c) + 137436252
221498552065844084546042*I*a*e^(1021/2*I*c) + 295487943606315693499393106722
26770*I*a*e^(1019/2*I*c) + 600307089241124601382401475283562 00*I*a*e^(1017/
2*I*c) + 11555911569220288986290413215378431 82*I*a*e^(1015/2*I*c) + 2113080
997812668991148529643592367908 6*I*a*e^(1013/2*I*c) + 3678681977448171261151
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1007/2*I*c) + 1474297501848124542057148378045565788918733*I*a*e^(1005/2*I*c
) + 21490722237212978408403217414663518345362065*I*a*e^(1003/2*I*c) + 30087
0128273961175599469606519345892299669212*I*a*e^(1001/2*I*c) + 4051001655313
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319808183527724091 23*I*a*e^(995/2*I*c) + 79208598811516585056809290249748 48
479434840259054*I*a*e^(993/2*I*c) + 923275377293759706647808962879230340914
45656319868*I*a*e^(991/2*I*c) + 104078335321793877641102874801365357655621 3
918915335*I*a*e^(989/2*I*c) + 113567856889895513439085155111988872331623017
12666395*I*a*e^(987/2*I*c) + 120057481911175947127117391278335425038727525 1
57415250*I*a*e^(985/2*I*c) + 123058959412619402320332081172699213202129919 7
471177852*I*a*e^(983/2*I*c) + 1223938234616051389224060123845504712501102 86
91886256771*I*a*e^(981/2*I*c) + 118206720526999189093597542167372456853664 2
93435038820382*I*a*e^(979/2*I*c) + 110932520476158284666974936630918973599 0
268133663930730770*I*a*e^(977/2*I*c) + 101225988592648902717939158690840034
207108263106168181189 92*I*a*e^(975/2*I*c) + 8986899228987572447754752957763
012061563144888229172411 7498*I*a*e^(973/2*I*c) + 776725522432810590073028 51
73659372403594540028309812903419 70*I*a*e^(971/2*I*c) + 6538951529796735469 9
11010316324282233950224197184638863745512*I*a*e^(969/2*I*c) + 5364918594328
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) + 3349584649215974064494562288169726260989776567520122206199301331*I*a*e^
(963/2*I*c) + 255139012378080683332612889253421319964838366702154952529687 6
5174*I*a*e^(961/2*I*c) + 18976001127512012080908245217116426083644447991720
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+ 4612391075676271473260766540574566584570434255113452760820203282036 84*I*a
*e^(951/2*I*c) + 306333507006544731530813385284806699210102124868856774330 7
391113472411*I*a*e^(949/2*I*c) + 199117598387417926031189003205662174209347
8617273037612776530224207521 2*I*a*e^(947/2*I*c) + 126711784709453338605660 7

780685425440226433492563996597269461536562337l8*I*a*e^(945/2*I*c) + 7896900
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3/2*I*c) + 482129351867308516736349333820384884784419025319396549368074637З
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2361347991921490581545289294 8*I*a*e^(939/2*I*c) + 169159001254667821791360 7
84785389073333265377052642698186735860494211567022*I*a*e^(937/2*I*c) + 9726
72122556805618091233812449540815508255737026698123751589823682626604408*I*a
*e^(935/2*I*c) + 5485282326270569168343744931160098443379763576662271067319
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5542769581726281227020546178825446212118 8*I*a*e^(931/2*I*c) + 1647388919690
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9/2*I*c) + 877760214042329341241985800973285159873655058190336423511206801 5
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3/2*I*c) + 118975846340172913159248725555818206928962615117446304843044326 1
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a*e^(907/2*I*c) + 2676527721098582468811607891362736092835822022359849509 48
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*I*c) + 493596876266214810762641882245481873457367886905402994350243807840 6
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2181880*I*a*e^(889/2*I*c) + 810674495140204035565067389115601368638382784 15
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+ 6396431913830536683852424390350391246093878486472172857619258907137976008
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/2*I*c) + 73029655258696344225597087065783914623049345083825117804758766586
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e^(857/2*I*c) + 23834175127565223830229822759473644638224519265209696409146
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c) + 6254243401902741848509484824848454113338082680345171591207671628116975
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*I*a*e^(841/2*I*c) + 111966121821141964442037838123563295873180241684479076
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*I*a*e^(835/2*I*c) + 216337990832542916463946367030741381088306321383016439
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+ 9440883227662672550065366923781042631437653007247333510037128999390205650

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468050499031963788857958876373842602694229861678706462050372207 0*I*a*e^(821
/2*I*c) + 141200237267633382241038296294808993573915159549661817646553617 43
735913370088115761505169716332843645569502 0*I*a*e^(819/2*I*c) + 33970536672
655873836914010596386451773527523414340051373935767448448366505976532073655
790225683251588226750 0*I*a*e^(817/2*I*c) + 807690225035659484831707795132 78
182902665161792021013282953291691617090536488162475060828002976266044874284
0*I*a*e^(815/2*I*c) + 189797053532870412198132213256930840056692247833463 27
827843944552207708108835604144419762684381536366773784 20*I*a*e^(813/2*I*c)
+ 440821420748076802971697314985978040432443894760783642549937575008430918 8
687239341140052519808074207080308780*I*a*e^(811/2*I*c) + 101202318762952166
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36974162704806460*I*a*e^(809/2*I*c) + 229666878772454570257941020733776773 5
799562907617385409585469868279630014888568822269725161591439507868575500 0*I
*a*e^(807/2*I*c) + 515242433799031147034524750967624413857758082389284472 66
375386475837054738084592021134353327686946496437282284*I*a*e^(805/2*I*c) +
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467632034006400828150383133866837214270664111437963716798350612156148456206
*I*a*e^(799/2*I*c) + 116469103885404056506882596475507370970791963843625556
656755514840812087630996886422262545815546431690236495252 4*I*a*e^(797/2*I*c
) + 246897953212028922726884061682000445045811742376948064434322797188956 68
767331500043690353556685539489333088214 80*I*a*e^(795/2*I*c) + 5175761305072
823696040196698965533450997327744793152831047341015798393926092260966184527
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17668374*I*a*e^(791/2*I*c) + 22000378044285344028734825732866676658762934 87
196524967452738085046934084718783479165005392353776984023049376419 6*I*a*e^(
789/2*I*c) + 446143909636284293788743299098785506052308309631835620205042 14
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872505724728370624201553901098068070796612063573577599972562878494813596597
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532070304768547726662435411567457405751271227211038129174484594994757961542
107089593282490286 30*I*a*e^(783/2*I*c) + 348455253838688201360505783941113 7
322515274454773630574061883426726340639345544052866635925010406288601835439
05219*I*a*e^(781/2*I*c) + 676536112375453533535322327435304762507116008362 9
881863325862713933727863220393920907895303279930450454048210290 11*I*a*e^(77
9/2*I*c) + 129946617033448034154313556098280097304638859163208110232192776 1
098390304943531108062897890291528379823914088825794*I*a*e^(777/2*I*c) + 246
939675213444454420928792091871436788268416425362146048269276656983377978163
385746162394741883067618259686863010 2*I*a*e^(775/2*I*c) + 4642912078915683 0

1035808600708701702397396571313145932835197822571065308694580149827568319464747401340969666382896 3*I*a*e^(773/2*I*c) + 863744842941260314523229548697057916457328835904360877982533410558787348530678200531058403233492333446905299 2471566*I*a*e^(771/2*I*c) + 15900016629399098377063336514832119057657813148770829120355232070502630384804444889767486179756113401575843696792900*I*a*e^(769/2*I*c) + 28963327006745382557260523392521002766162424431473143306015072868867675529419511652966969349719029403862600773620600*I*a*e^(767/2*I*c) + 52210724333347160801501773165819812944993848127565638741792799335959055388789921819771479296204943724701127192070026*I*a*e^(765/2*I*c) + 931436044993931263445166225811972204036547143672127723996445360856060800463349334285456267386377122170679550724500 98*I*a*e^(763/2*I*c) + 164456137643484023027839220727810183979810742984557443986573106465730160243136051096488426970563221576065210083954112*I*a*e^(761/2*I*c) + 287390605926275542575548421622839871210234972126160885732249644221593342784630319023739202442479202690546380883489714*I*a*e^(759/2*I*c) + 497098270574416977793999010222689126124145532539385786619997307437512184918383346787544613378048611753919877456321 50*I*a*e^(757/2*I*c) + 851100755495948167311967384799382325393908473708133536744004690162732128381564701822378684740339904953764853311657379*I*a*e^(755/2*I*c) + 144248286052702172702599867899041110732102138783554237730758028751205157398910770094022536021643299117535262767495166 0*I*a*e^(753/2*I*c) + 242021155405915375047953074533158882160450744844571122745730374460166840055721317889651737694959095234376899079777262 6*I*a*e^(751/2*I*c) + 402004684403232580660668695877853944429907645823280533620874832281062815458076465290663534546672061117052129908769557 9*I*a*e^(749/2*I*c) + 661098649072206465880090899659497008914803169805631254689397472755172529683819281310941646254378116981914120597964029 5*I*a*e^(747/2*I*c) + 107641858801753142474554137806023873166880496795733541361846183879500257001189713176124123961781803519004352221120 93164*I*a*e^(745/2*I*c) + 173539525561180440918662500439042795248766397370138401213332252278702388231958689166601845365407091102371079277868828 62*I*a*e^(743/2*I*c) + 277038806587974180141417983697673080045258504292996485969691064788691581398120823337173880829468215087660494810779730 59*I*a*e^(741/2*I*c) + 437956160097493579765068474053492147508352811690398993662144001844139449912928813473902845331911549108666500177149410 45*I*a*e^(739/2*I*c) + 685632677248015258355300911856323421533702194419680931994934395853992799009930275945464787349053463622515717326079847 70*I*a*e^(737/2*I*c) + 106303211582360290790936880607620902869189699089065072282269865838237662096415215608213465309152317417335803254777646540*I*a*e^(735/2*I*c) + 163237001530064152367556061225580097437980440405517572183927035767230181309962814642060879444377285948362185495154086161*I*a*e^(733/2*I*c) + 248274248932561617945703697663525200610078574434061409813889001382353910308109390899727706580406596640482574074089879213*I*a*e^(731/2*I*c) + 374032418751198811720228463857324874288132848827443258157560342664115974974673969717323610620078985028167266946798247966*I*a*e^(729/2*I*c) + 558181091554576795340867544237149825366660083449432838329374039537797461902854863923357577080240107340008718422024591820*I*a*e^(727/2*I*c) + 825188646712371299176685383003741545151966237396648273936 61

4407065191999961220292971482894130114743521964516001714179861*I*a*e^(725/2*
I*c) + 12085585125205618679814100562904687888330622454974050388723038643523
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753648721621948344665323035344500928169246731037156030237049745174658096990
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822840814497403707614675960285810411663855353744002021745697040909473065379
32375368463669065056965813788820546l6*I*a*e^(719/2*I*c) + 35914593751591787
152728742998311655187833617405919229803455910474415178178055595362360826739
85676829650893577170263379850*I*a*e^(717/2*I*c) + 506959224352422540565268 8
460326152875966709816050275878460357717440876793202354867243322880737700534
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1064231210928*I*a*e^(713/2*I*c) + 983047519912706540661010703023284227178 22
031819476675378378907425848514987139484100775572274654750919377102497693237
67412*I*a*e^(711/2*I*c) + 135058634355458842650400260598485982958999604837 1
603358598681843838160995212633242091181353602215558250547480219482951969 4*I
*a*e^(709/2*I*c) + 183907877778527114028112334341834251524172200260755115 06
882808089209223235028530568167961786178831641276993498874053500525*I*a*e^(7
07/2*I*c) + 248217417034951034650827387237655682083567507014810112474664187
972004024509208509686392276254395498494742762274350398584 10*I*a*e^(705/2*I*
c) + 332079174054798249717723168438274555044030503995354429426135394115093 5
054709243497020828677639491500693292939452250029729 4*I*a*e^(703/2*I*c) + 44
040443029368273279921818885276545283392557505519036132927785267603972753156
57201164746852378800499940454256951758151735 7*I*a*e^(701/2*I*c) + 579008746
767270585768451007780664586553146539732308445153172147345172454032245121379
1941691058525266290162918623275964425 3*I*a*e^(699/2*I*c) + 7546823932870119
439529542933759974862513581047508822037598365484305167320538287023700169066
716624344040800700170457702594 6*I*a*e^(697/2*I*c) + 975237948816934370707 48
447421304334356560534454944874598301077916325487914962129843509415087293500
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984963568884711132991033324124065991407644096671531128521516242907079372487
2404018948209113 01*I*a*e^(693/2*I*c) + 158740600917927756806842461346197698
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460625495480*I*a*e^(691/2*I*c) + 199966978737582534787918030254773650478417
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*I*a*e^(687/2*I*c) + 309422498620400775071454638476849117557897927017418041
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^(685/2*I*c) + 380108285039915468450978858646485727016104746077018138051055
881056469177249022540749317142917534972043461283677156449777056*I*a*e^(683/
2*I*c) + 463077887159345985240066365048769653961899496722147648006706160892
430828599260536532398498029152984249659429757073514254834*I*a*e^(681/2*I*c)
 + 559504894566289361813285134367579689512812244042262151586772699084107339
658616004499973602767883158496957453596573417243760*I*a*e^(679/2*I*c) + 670

450434518367673310598723205770260142877601963255249446103714768964388684117
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127205348435487247165418262903769157172660389764200902221523637457788073902
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256858724777153745047266128618306504565373058620598129538692444814409538758
715775229246278785994 96*I*a*e^(669/2*I*c) + 146397694096391244765136551546 7
185405762501924914077047324754706711366589407997958028777358245267180524254
879552356822975000*I*a*e^(667/2*I*c) + 166964498101759185688009959290938726
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6660820289680*I*a*e^(665/2*I*c) + 188846335050117779727798407766525006762 50
657886706129959370168287364866134703413117858923348162704534361325290917160
95385240*I*a*e^(663/2*I*c) + 211819764314729217746001876774538699660028698 8
408731141330032157425554534393958723652997267660637525977591682505254490180
360*I*a*e^(661/2*I*c) + 235597159356506010403841878445160808428982313839723
075669825867917007174549868443415711190596516938721160049074363901193422 0*I
*a*e^(659/2*I*c) + 259826526077940977532035190023439153950984791616983838 99
845927952721993054694461322744247602981918112423534656347100311800 00*I*a*e^
(657/2*I*c) + 284093768039125337669479323538626026416518195446107386026066 3
943093784238240140243587013416430815228684501592017944484715960*I*a*e^(655/
2*I*c) + 307927617921356210953777107862724068817115384009612166108122831524
410445278683948607856949184501486817025066511528749394926 0*I*a*e^(653/2*I*c
) + 330807349588094395329838590330628341966566130982940989461985416377454 34
459595639103170044754555768656478629478877789620830 20*I*a*e^(651/2*I*c) + 3
521732622041061038550984940990187934660572168825766556068910780855010177940
2575651174508550258562472558019964137699872134 80*I*a*e^(649/2*I*c) + 371439
792624457786523536688662927317155788405019136216329247132549822732080321052
02772224042792152834556520344732108633036 40*I*a*e^(647/2*I*c) + 38801097142
781304168851412266740882386770409188825219490326196287424645516944761604588
7516253515077887175500346230775158302 0*I*a*e^(645/2*I*c) + 4012977992311501
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554742032304564034581648071441520*I*a*e^(643/2*I*c) + 410736991435895460891
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215854051744404698992977856 0*I*a*e^(641/2*I*c) + 415810429418153031826915 99
910307796054226321620259136051809827170067553972826431184119541582131734856
27554911230413551069360*I*a*e^(639/2*I*c) + 416064571900427556530496021536 9
141503063578927293698222851613642937196324199454397834076656748547427159039
3583575643046222 40*I*a*e^(637/2*I*c) + 411129028232729378919209515264935437
007088137901238016084937413844813831101022171430989588860917911870175942 80
72999658441 60*I*a*e^(635/2*I*c) + 400733480395617206484764562457397504475 29
022059146357971496852115844588791691449653159891664422568049504033358903448
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19/2*I*c) - 9699325329624174519929905452260723947555 0*I*a*e^(217/2*I*c) - 6
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) - 247678824959506386373000637444*I*a*e^(199/2*I*c) - 952610863914023147 05
17528278*I*a*e^(197/2*I*c) - 3410882885721572977721180 77*I*a*e^(195/2*I*c)
- 1131160140076879308500973 8*I*a*e^(193/2*I*c) - 345392409079468621758030*I
*a*e^(191/2*I*c) - 96429352773077147918 37*I*a*e^(189/2*I*c) - 2441249437098
98420493*I*a*e^(187/2*I*c) - 5548294175032309402*I*a*e^(185/2*I*c) - 111804
416623905668*I*a*e^(183/2*I*c) - 1966409337599317*I*a*e^(181/2*I*c) - 29570
065227040*I*a*e^(179/2*I*c) - 369625815338*I*a*e^(177/2*I*c) - 3687040552*I
*a*e^(175/2*I*c) - 27515228*I*a*e^(173/2*I*c) - 136552*I*a*e^(171/2*I*c) -
338*I*a*e^(169/2*I*c))/(e^(531*I*c) + 432*e^(530*I*c) + 93096*e^(529*I*c) +
13343760*e^(528*I*c) + 1431118260*e^(527*I*c) + 122503723056*e^(526*I*c) +
8718181624155*e^(525*I*c) + 530563624556832*e^(524*I*c) + 2818619255479213
8*e^(523*I*c) + 1327882849274858880*e^(522*I*c) + 56169444526926562260*e^(5
21*I*c) + 2154864144781257856128*e^(520*I*c) + 75599817092670157806639*e^(5
19*I*c) + 2442455629894502983849104*e^(518*I*c) + 7309920781733559724709803

8*e^(517*I*c) + 2037031259470368160131922320*e^(516*I*c) + 5309012726463096
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3840*e^(512*I*c) + 13477227799524701956579274210395326*e^(511*I*c) + 264410
375780310742518099326419685040*e^(510*I*c) + 493966661081802579880958635254
3471345*e^(509*I*c) + 88054927598941411145869950813388040256*e^(508*I*c) +
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718622491865013839488*e^(506*I*c) + 383360155801054824529764688213114368047
154*e^(505*I*c) + 5764601046563151304213854710715346838447392*e^(504*I*c) +
 83380839911837894453136303673785039051506805*e^(503*I*c) + 116158141373397
1751533622511909046917188768400*e^(502*I*c) + 15603911277687607099721623771
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838320*e^(500*I*c) + 2535667460650279776834561566186591213109251642859*e^(4
99*I*c) + 30735366512830562160991166338490057308062762518496*e^(498*I*c) +
360688613036389349413809780004559963548775423325255*e^(497*I*c) + 410154543
9937195793959956708442496709433800261224880*e^(496*I*c) + 45230940039830738
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025303662581091659126182344528*e^(494*I*c) + 503202490340145182407421394376
6011922026507006311982753*e^(493*I*c) + 50836369508171099437019348610847391
946736185108017183136*e^(492*I*c) + 499467506558531733671585862910572702811
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694336796459584*e^(488*I*c) + 356476489062872401708848799668817892919578761
3958545474804845*e^(487*I*c) + 30736217404321009965231037419663053962881035
281709221697785072*e^(486*I*c) + 258585348715977270155829115684193411072034
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6341175384087570185188538660375932013674735519055227368366*e^(479*I*c) + 40
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I*c) + 28239051519365866783825257065644572802900986986385979876283802458817
15*e^(477*I*c) + 1940797921559456659353500810330325525774540807008243133894
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16416307596161861955969011697222340926210112854418*e^(473*I*c) + 3532444720
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) + 21960128133951556150026147884419002487055526128194605883961404469703796
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467*I*c) + 15363332384449275835327345560164946716749165789071169845484890078
241693926940560*e^(466*I*c) + 854301344112621233483354066506962147247908583
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*e^(463*I*c) + 1321498055271300851429993866631619874424534425188183592O4972
768757103215643507728O*e^(462*I*c) + 68529932231457366873288853116177954355
92940841439866351079655652312894721972796266*e^(461*I*c) + 3494107161327670
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I*c) + 17519317050061830024151563238191228515779009781604922067121721222001
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c) + 2000800680303004713729327825032159711354071620198333312634928118667915
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4*I*c) + 197779298066581813565130009432623915860544887080697086057732538502
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) + 30679742964317473641981596239624636716170064196268514261484186029348529
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*e^(444*I*c) + 328387476055581867672630948030673442015509858394807446901416
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2*I*c) + 483794897564340998438577918165893794068150426093403787475864371457
81646245422045101230417309900*e^(441*I*c) + 1818346614061779013153301296771
45381166449188413194141169344354754920969034952610378945282257600*e^(440*I*
c) + 6740255305431330088948457752366252374507431144735445378181704471346071
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 + 888829502875102466704420383760797610148005313441861447462076752282486891
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+ 1110341487970088194431438956444692422950498674643137109692576193388991337992856160200698726117108 50*e^(435*I*c) + 384655842080666274454063078784837174998949052500975322162003392549953413592461519365177908682078400*e^(434*I*c) + 13150521209306921221022971053276228423358707434285308910729835358622800944466077234738004774539141 30*e^(433*I*c) + 4437210917843182347764349544443904699020056595069470847193617092114714077633077234972825351226979360*e^(432*I*c) + 147779550966171289987127451820714953621765069731830816502336052740516776249704643402427558400256737 60*e^(431*I*c) + 485842581531402804473148368687721313901954124190467327784587060150968814370763379107935841224750737 60*e^(430*I*c) + 157685845528850918721462877864435090257583149415561323427386562894447598277935629800939237175625149830*e^(429*I*c) + 505293663123015258878483025738812813203397766845340065381261016353419722382620393032535960660921950400*e^(428*I*c) + 15987711010581926922705289996774447426856310062324561858449252201440023058781203808284839886635748291 00*e^(427*I*c) + 49952419562791381802051867444016880243882721139212556637349569469275713055331467768987878780596851084 80*e^(426*I*c) + 1541311121148602393729497082079737671608134478816338654352242193973750796212585498188187916834826033 0000*e^(425*I*c) + 469702247271172818264540450180706705225597566275803477845353200149634826323597294445418851022745460025 60*e^(424*I*c) + 1413799382535568432805655058074033041306061307254347517457940798331413617489176399861453770664372105461 90*e^(423*I*c) + 4203580248351467985836112101459421546844379493656478990883725248021562228848395800116886556642806917736 00*e^(422*I*c) + 1234668041892409978780018081755440216012582476396941937965899631953079203974222138794604328498972144766 900*e^(421*I*c) + 3582718002163296061414536703715109897107198252739284546149343102348456124089657428594946438660859773886240*e^(420*I*c) + 10271602530202889002497813516849452590971512809529060665197301097052210064576088348023234671975463677418470*e^(419*I*c) + 2909765106124745340664756978183691006216555985235905280425915416568712542875256238549237374948635171445312 0*e^(418*I*c) + 8145208141382911182887541756425005484603769331281148049290916075819598915576810702256835095386181594070409 0*e^(417*I*c) + 2253205325932206577679411092895162489997945210155641349828272417100196754866944996893124665619072126278200 00*e^(416*I*c) + 6160031160229795849371257017578872129983543009899913626280388610939145613320711919097149494265879369103 03300*e^(415*I*c) + 1664475034387211809394917743502937638978574937754764763987835872410449930690131572904279995484581013965001 440*e^(414*I*c) + 4445412259295474625067659514198312966015416299968930393345630345914109720740573618884980520010028451496996 210*e^(413*I*c) + 1173585692624511849311309100250160403234187698599908282352067224153020018822382639298230219408466753848866 5600*e^(412*I*c) + 3062758105422195737839054728927760912957281393108273352024738722600002004353827946877670795842089254787012 8680*e^(411*I*c) + 7901914955876656925478398848723238835290914498274717185677246322380899336709150340287646727017612434269965 4400*e^(410*I*c) + 2015579474247940980267724784620408833958675125629308629437535686900840155855980101547815486252394095819073 97500*e^(409*I*c) + 5083245993010854601669786296830326614276544740829390480979396383915672987957883894338422857510546652108682876 80*e^(408*I*c) + 12675

97017294812913400146276042126929986480292870190399107554311079964227280196522475370108738477856311765699610*e^(407*I*c) + 3125683493178701743479704750307490178666292150720179363604335113528623329684606343185540756019935662148267863968*e^(406*I*c) + 7621788791912047062038840917799374600428892258194367636682944356096681400246312138001769285020661445991073249416*e^(405*I*c) + 18379807084003359766027649217621144116091735572216620788861535803449702273802588359076704241840733513439114113248*e^(404*I*c) + 43834972142919377685378692233021063744554033100928502737480438978976746989895784070951905237783490374305934542955*e^(403*I*c) + 103399755467257436489847837640753754718204394473055795001467604326419876555556873829531737211096115196005647730480*e^(402*I*c) + 241246021282440061792908317783032876194801597133206052091286997043729145345755805710081489006741839439573984832678*e^(401*I*c) + 556756388711182340341026192734219546113651768317380539005893679049394714017063698565272728813669054779077208977840*e^(400*I*c) + 1271033082938048950201360554831270342662343991277504612342300366025046741742856580445289401786656311685859023084716*e^(399*I*c) + 2870496131412314451834674715353589439553294430808531933466086288543709246230769151392180699413405623017247753532944*e^(398*I*c) + 6413381895855925184758231451062556380328594938511006577015218119786536390213057284018202201631094434819584025113465*e^(397*I*c) + 14176483652875704957202013343241117904369977796653849959902524421980635189011634815653279605497783382888932766730080*e^(396*I*c) + 31004319206069417077069363141423487431828009098184744635678652284177439464941651812564519144918003174108077634846014*e^(395*I*c) + 67091706130529669125019899210021576580237843462229535386295087076189297849995931360645605292130961496106707521506432*e^(394*I*c) + 143657687138044796942947119704259538458818199423516824674586293691056119209866358123637772245409530799230553767222252*e^(393*I*c) + 304384471106813336010284160123906370433888828490627422652551236966790916174520857759143930140187173492394981908258944*e^(392*I*c) + 638218892914533741505806399662488556066783600496091876408374974877448971778036074996245581124283460438065182071976085*e^(391*I*c) + 13243113249840274283555222938147682378672860708817161741448749689593588020860847508703702325320304649883120684987556400*e^(390*I*c) + 2719589283483743926040805101080341921244530311254607250929192773909331523226635035815672862569296693711643521070331394*e^(389*I*c) + 5527498849031178355861230009326668283926290082158467118000698502719379939045918344222192742145711257028040974074674736*e^(388*I*c) + 11119499645363201080881062824886338492425375658448977935535846349290425821570383090425411418521516670371372045206568345*e^(387*I*c) + 22140735001708603270915180769241391662035578755903979148909213603822554792749183517160255571915875356439553717130797888*e^(386*I*c) + 43638300075815171025946211464465689618965773488660985857945657479854085108851857911222911989837615452608512356008400295*e^(385*I*c) + 85139533234786455779589959464900637760735729705621221380005837208369157794673049675428799817875431430246332625899630160*e^(384*I*c) + 164437500676906892741323260154394278503954561936020133596581806449357240277349447927334517105809995300093549279931273178*e^(383*I*c) + 31440903580822586156559543693835494544547399104312972204674722881303092520496850341856681883861186670980704

0793495364496*e^(382*I*c) + 5951576155004315149474792823365470538279260879164252634971877570294133854718354341982468070962145368954413883060272378 99*e
^(381*I*c) + 1115398285545601550533328045600184317993899359217996729818340704221801195667410485846996179056733558512452238583160792512*e^(380*I*c) + 2
06969828950086064346166576237380795751301942404117887190496055182941244934472243212567941795840300755117929831594737 3776*e^(379*I*c) + 380260499670589
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*c) + 3927420041432986116939794451622500108122743339858500720639923121190715779535971964824159875426657984024455149147646789 9952*e^(374*I*c) + 6871246
60159856415124685861736597477348795917100983546527861249360230739431410495736066485630053594117127648956839038060 88*e^(373*I*c) + 1190605918496605468347656932276764490675841482488826784475048260772363334445134540951266687500572958111916433569089721914 40*e^(372*I*c) + 2043255572651860007674027102308478964597615839227636982354332128333130777830410400746693790173948367615396490816906308116 65*e^(371*I*c) + 347310053810935290419455560555957314129569210735745983234369659976413374774078000173070075248654524917179128950507443058208*e^(370*I*c) + 584749573682304586179384628844883327581498969886540380378896767999075614964007174600811092945356635118795824799369716742109*e^(369*
I*c) + 9752103394440493187572823117635177866732231755944579463832792646350850410049173002959042754331448485324599198754798175815 84*e^(368*I*c) + 16110
92541400060525954859375264194178347643471837078201446262435615142944587337833513586022729849523358436493586042252995608*e^(367*I*c) + 2636662410430799340447522284778244283740751068658140726576446671207798325606832295937705061686297930296382338892574900819440*e^(366*I*c) + 4274826907720591752526711336820871500844345647922385471534359333606189571832444641364132893108663576205133870672156264164115*e^(365*I*c) + 686642533751866826266269375090895696573292457814218163062215780289988087468155103113631406419994860400152989456623523859708 8*e^(364*I*c) + 1092721060347354481027979234784453607458889680623004111008954473160586314610418173903942667485545346609740233068833184560230
2*e^(363*I*c) + 1722950282436764733440072199841759670394865739473880520939163659737038057239896471508009536681832202915219363586978409533376 0*e^(362*I
*c) + 26917794701086615097890120236890501105146799996021775195710866226228638984703456832694153230611607263444183501026198563419616*e^(361*I*c) + 4167
0440375390543643418219342271748040035071490119080585281522498188818375906900368701234531304633163446319945130196476913600*e^(360*I*c) + 63923019433761989090614801288635098123199445102303122616544648208998767803944455777042886552738499747183713136069104651812215*e^(359*I*c) + 97173055024742680058616722461368892661141295540263493013032746083536157324268333390400308958318370219154887169702257444756176*e^(358*I*c) + 146390448456351181218237382740374 1

241916648199977469880765983918627336296701422415463755339031306052975801056
75355629160198162*e^(357*I*c) + 2185631666596493122474836409562721492124991
153838287710296542833639725851180904794136966381081563852446465913284544257
45117584*e^(356*I*c) + 3234131780148410037141511382460791525763609760350584
57890409937738723171537036573043681997163745313602400139153046673668433091*
e^(355*I*c) + 4743230435631005423773386299319662481291759769823324460180560
09391154020438895903140822967769494019446166779954024655344116288*e^(354*I*
c) + 6895184493287935599032604181499741902535783400588950355896064682446805
91556118170304005037563669880057908765898949268614772285*e^(353*I*c) + 9935
556536495211272264439608202336493864885100818925458667004440966615827904412
41830855609577062039555625090943332264901780720*e^(352*I*c) + 1419164481422
17657385823401389899962882232233309573730716310743838935832201454293617293
175086458389621425307051750612129761498*e^(351*I*c) + 200949611009268773815
278208568373722272796882429905873921544608349935146762533444967075776406669
0656150949014944043994822823920*e^(350*I*c) + 28208192985622159591075298072
896284496213867989894363693931160698940187812010002756331044983989593466317
95568022519974400130281*e^(349*I*c) + 3925697658415778352768103942856011840
211642769621717217996614398473887186074391482638547212826538270453912634540
299792270321024*e^(348*I*c) + 541666280405243634958559598281835795386625846
164435401820515891774257642534436496459675065317767780349218681730517117503
2011500*e^(347*I*c) + 74103726128911522243646332961280439716571932803277543
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e^(346*I*c) + 1005220952436958182758815498534554967803144574449998520825938
5435609740272400301454246872041775159838468077381562338745636398374*e^(345*
I*c) + 13521230411945436915558854706851796541567399811656870021567352975326
815467817846533289123871696056195231696146162720992221760992*e^(344*I*c) +
180353273381774554711775685948516829779783464497771935720876885103924268845
19272991560851326393852241961470040819793627127923997*e^(343*I*c) + 2385639
856556280203069527817421264083328215417400645945829264406094792490731373592
1561690153939906017518647182491616573724049744*e^(342*I*c) + 31295263688189
838313772775873307260334117227258629501992358695636092662866062819845689064
235813622974150120668921391878398978380*e^(341*I*c) + 407159889637019189500
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47312265477584256027212762941040*e^(340*I*c) + 5253922334674077114258709237
025706953606031964443950166761048276795580027605289243215279881460797511036
6224945081428121888473324*e^(339*I*c) + 67244087969080703823703257199663047
606890610482090494619492802935130215979819469966383336788693900139115594646
893784095418472336*e^(338*I*c) + 853681184302153128482312917396737358877462
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74987582215*e^(337*I*c) + 1075047374065769161234803991697596333283214074194
005100174988498305986215654282665463159339208215275447263802016591149038346
05888*e^(336*I*c) + 1342977420234794299046296161045596100960747587210680227
04468938063017059688023363436458971534964665036319889119229809973806909680*
e^(335*I*c) + 1664323329225891951305583292663987533898239557375985275560960
93062473559769545772321978969318904192572733997888230986469005970880*e^(334

*I*c) + 20462229553572910951982991678986722531942970516256008264884039496542311280933659192129030939239626383467436897784052714703742690 8*e^(333*I*c) + 24959307228256586639838995150961920268263445548712871463146189177082320136752764579377020378878467734393497142431798789525503193 6*e^(332*I*c) + 30206063803086846346113944227936049971890691748252489448335622019613837705082891138305686042537016115720149369607371232259577680 8*e^(331*I*c) + 36270630756384323113569915741851073245242061401362416887931218764523345015392797579332683478074139120343015309371263535552396032 0*e^(330*I*c) + 43214785646408693802381156180867858959470204790467428229795965880017098445679906775187804480661901245263689135073161827854569016 0*e^(329*I*c) + 51090761511113450745262384614713714145027572244431638553164842923085168663582771748846450033162338577740074495053841063773593600 0*e^(328*I*c) + 59937848477173347480937614240155485020706497211813757294925750365144454193930902527689604962251563026316218452639431728545736830 0*e^(327*I*c) + 69778910692592461481671374768468278508365981902795224444704335586974136850045256116402463607340192969310580110552273840534902816 0*e^(326*I*c) + 80616967132762553242457534008977573368199499157667444692235409971461519208544324566385225700111564428666030497947602396607189820 0*e^(325*I*c) + 92432005286752258403577749576107235122253442078486196000182102050946814635675643379524644649139614158385451368710433442956670752 0*e^(324*I*c) + 10517821004288343719445081700512191871168163497669533226371821496108750042237847841832849619064944229554624312086456908025267707 80*e^(323*I*c) + 11878179430793903161088023247981101290208227826600872485993676434812002060468221661442854259222293754136765350711410052864314816 00*e^(322*I*c) + 13313961146267230358024621235315820503397499960141524528353059563674253702227586217539224587275248560729508809606575647204758385 00*e^(321*I*c) + 14811871170892466624669556949656778555247303132605526908216026571762187374262455227953298914640910058783043040759536935467672060 80*e^(320*I*c) + 16355697446414219006578863812890766532275801720566775874514020692343552836874896596139137619591407733397360147900818145166252244 40*e^(319*I*c) + 17926490780896322989369457284819693349643915975062850884883506229372525334209808031443164317014521905227161247978752574375163606 40*e^(318*I*c) + 19502865507801819192449929612044870100564603628452185016744237662663215587914369173178787022326792138682879262946652027697229273 80*e^(317*I*c) + 21061419034683443071125497612024845434027942523524821998174104248696772627150982884376465186834879454627742236564713458990821568 00*e^(316*I*c) + 22577262191038562868128330126815737654962622414206129320761431511719608545541241446990230098420805151579235293571898699435159912 00*e^(315*I*c) + 24024645955696860861200018030342110567394455886219461413841061628862461618151497630250308348752340672677740234334182699824312652 80*e^(314*I*c) + 25377664154650303308154717466929885960699118946972250529283204525421755871548480964833312098074301139430153983626696733379577557 20*e^(313*I*c) + 26611006479757835838282351392014419301783966433834239035838625472558807723820492010155372149008327456015197371418498025066852640 00*e^(312*I*c) + 27700732071507686455975072813820654979249684660545274141223398273337837700683058834873099793159837184037408728843457463806802042 60*e^(311*I*c) + 286250312632046179777066778072564418499125

5623174626175679050672100848988119391841466573417019247590580735265143427289340450811200*e^(310*I*c) + 293649421435186849870323945542677110434482730626755891655087746723245515328614052108958273393220255313071272383698346886623090880 0*e^(309*I*c) + 299049894962254360853812938028386633519008711512485881814378761918695711190376572397489965151855514492429034624259516727438300896 0*e^(308*I*c) + 302337164350822502717560317521295321902248504585073184530751900827738515473146121338803557915991759006234352746497728660116510062 0*e
^(307*I*c) + 303440835553095707578773174532256798168461655016284547325767967428021694735678578384320560420230783689707359541041257566046578752 0*e^(306
*I*c) + 302337164350822502717560317521295321902248504585073184530751900827738515473146121338803557915991759006234352746497728660116510062 0*e^(305*I*c)
 + 299049894962254360853812938028386633519008711512485881814378761918695711190376572397489965151855514492429034624259516727438300896 0*e^(304*I*c) + 29
364942143518684987032394554267711043448273062675589165508774672324551532861405210895827339322025531307127238369834688662309088 00*e^(303*I*c) + 2862503
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^(292*I*c) + 133139611462672303580246212353158205033974999601415245283530595636742537022275862175392245872752485607295088096065756472047583850 0*e^(291
*I*c) + 118781794307939031610880232479811012902082278266008724859936764348120020604682216614428542592222937541367653507114100528643148160 0*e^(290*I*c)
 + 105178210042883437194450817005121918711681634976695332263718214961087500422378478418328496190649442295546243120864569080252677078 0*e^(289*I*c) + 92
432005286752258403577749576107235122253442078486196000182102050946814635675643379524644649139614158385451368710433442956670752 0*e^(288*I*c) + 80616967
1327625532424575340089775733681994991576674446922354099714615192085443245 66

3852257001115644286660304979476023966071898200*e^(287*I*c) + 69778910692592
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6073401929693105801105522738405349028160*e^(286*I*c) + 59937848477173347480
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5630263162184526394317285457368300*e^(285*I*c) + 51090761511113450745262384
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1936*e^(280*I*c) + 20462229553572910951982991678986722531942970516256008264
8840394965423112809336591921290309392396263834674368977840527147037426908*e
^(279*I*c) + 16643233292258919513055832926639875338982395573759852755609609
3062473559769545772321978969318904192572733997888230986469005970880*e^(278*
I*c) + 13429774202347942990462961610455961009607475872106802270446893806301
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118430215312848231291739673735887746201851666299600392199418764750086828198
719872744047767783667325326289221881974987582215*e^(275*I*c) + 672440879690
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36788693900139115594646893784095418472336*e^(274*I*c) + 5253922334674077114
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336736423420513311359010485246919074652883393970805374470830156229705647312
265477584256027212762941040*e^(272*I*c) + 312952636881898383137727758733072
603341172272586295019923586956360926628660628198456890642358136229741501206
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215417400645945829264406094792490731373592156169015393990601751864718249161
6573724049744*e^(270*I*c) + 18035327338177455471177568594851682977978346449
777193572087688510392426884519272991560851326393852241961470040819793627127
923997*e^(269*I*c) + 135212304119454369155588547068517965415673998116568700
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e^(268*I*c) + 1005220952436958182758815498534554967803144574449998520825938
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I*c) + 74103726128911522243646332961280439716571932803277543043822356727737
81403023814127610355562505271969045177704726054907145784960*e^(266*I*c) + 5
416662804052436349585595982818357953866258461644354018205158917742576425344
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8547212826538270453912634540299792270321024*e^(264*I*c) + 28208192985622159

591075298072896284496213867989894363693931160698940187812010002756331044983
98959346631795568022519974400130281*e^(263*I*c) + 200949611009268773815278208568373722272796882429905873921544608349935146762533444967075776406669065615094901494404399482282392O*e^(262*I*c) + 14191644814221765738582340138989996288223223333095737307163107438389358322014542936172931750864583896214253070517506121297614 98*e^(261*I*c) + 99355565364952112722644396082023364938648851008189254586670044409666158279044124183085560957706203955562509094333226490178072O*e^(260*I*c) + 68951844932879355990326041814997419025357834005889503558960646824468059155611817030400503756366988005790876589894926861477228 5*e^(259*I*c) + 47432304356310054237733862993196624812917597698233244601805600939115402043889590314082296776949401944616677995402465534411628 8*e^(258*I*c) + 32341317801484100371415113824607915257636097603505845789040993773872317153703657304368199716374531360240013915304667366843309 1*e^(257*I*c) + 21856316665964931224748364095627214921249911538382877102965428336397258511809047941369663810815638524464659132845442574511758 4*e^(256*I*c) + 14639044845635118121823738274037412419166481999774698807659839186273362967014224154637553390313060529758010567535562916019816 2*e^(255*I*c) + 97173055024742680058616722461368892661141295540263493013032746083536157324268333390400308958318370219154887169702257444756176*e^(254*I*c) + 63923019433761989090614801288635098123199445102303122616544648208998767803944455777042886552738499747183713136069104651812215*e^(253*I*c) + 41670440375390543643418219342271748040035071490119080585281522498188818375906900368701234531304633163446319945130196476913600*e^(252*I*c) + 26917794701086615097890120236890501105146799996021775195710866226228638984703456832694153230611607263444183501026198563419616*e^(251*I*c) + 17229502824367647334400721998417596703948657394738805209391636597370380572398964715080095366818322029152193635869784095333760*e^(250*I*c) + 10927210603473544810279792347844536074588896806230041110089544731605863146104181739039426674855453466097402330688331845602302*e^(249*I*c) + 68664253375186682626662693750908956965732924578142181630622157802899880874681551031136314064199948604001529894566235238597088*e^(248*I*c) + 4274826907720591752526711336820871500844345647922385471534359333606189571832444641364132893108663576205133870672156264164115*e^(247*I*c) + 263666241043079934044752228477824428374075106865814072657644667120779832560683229593770506168629793029638233889257490081944 0*e^(246*I*c) + 16110925414000605259548593752641941783476434718370782014462624356151429445873378335135860227298495233584364935860422529956 08*e^(245*I*c) + 97521033944404931875728231176351778667322317559445794638327926463508504100491730029590427543314484853245991987547981758158 4*e^(244*I*c) + 58474957368230458617938462884488332758149896988654038037889676799907561496400717460081109294535663511879582479936971674210 9*e^(243*I*c) + 34731005381093529041945556055595731412956921073574598323436965997641337477407800017307007524865452491717912895050744305820 8*e^(242*I*c) + 20432555726518600076740271023084789645976158392276369823543321283331307778304104007466937901739483676153964908169063081166 5*e^(241*I*c) + 11906059184966054683476569322767644906758414824888267844750482607723633344451345409512666875005729581119164335690897219144 0*e^(240*I*c) + 6871246601598564151246858617365974

773487959171009835465278612493602307394314104957360664856300535941171276489
5683903806088*e^(239*I*c) + 392742004143298611693979445162250010812274333398
585007206399231211907157795359719648241598754266579840244551491476467899952
*e^(238*I*c) + 222313411318015353454063990377216868402083979419525801355846
459667467366567162715548264762829910660765649214326143399735*e^(237*I*c)
+ 1246214044053725808492859670987206685775707094312486855450094815475686345
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70422099893124890777678037369988150*e^(235*I*c) + 3802604996705891106964620
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185760878274188013440*e^(234*I*c) + 206969828950086064346166576237380795751
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7373776*e^(233*I*c) + 11153982855456015505333280456001843179938993592179967
29818340704221801195667410485846996179056733558512452238583160792512*e^(232
*I*c) + 5951576155004315149474792823365470538279260879164252634971877570294
13385471835434198246807096214536895441388306027237899*e^(231*I*c) + 3144090
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*c) + 221407350017086032709151807692413916620355787559039791489092136038225
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*e^(223*I*c) + 132431132498402742835522293814768237867286070881716174144874
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821889291453374150580639966248855606678360049609187640837497487744897177803
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2252*e^(219*I*c) + 67091706130529669125019899210021576580237843462229535386
295087076189297849995931360645605292130961496106707521506432*e^(218*I*c) +
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41651812564519144918003174108077634846014*e^(217*I*c) + 1417648365287570495
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65*e^(215*I*c) + 2870496131412314451834674715353589439553294430808531933466

086288543709246230769151392180699413405623017247753532944*e^(214*I*c) + 127
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+ 201557947424794098026772478462040883395867512562930862943753568690084015585598010154781548625239409581907397500*e^(203*I*c) + 79019149558766569254783988487232388352909144982747171856772463223808993367091503402876467270176124342699654400*e^(202*I*c) + 30627581054221957378390547289277609129572813931082733520247387226000020043538279468776707958420892547870128680*e^(201*I*c)
+ 11735856926245118493113091002501604032341876985999082823520672241530200188223826392982302194084667538488665600*e^(200*I*c) + 4445412259295474625067659514198312966015416299968930393345630345914109720740573618884980520010028451496996210*e^(199*I*c) + 1664475034387211809394917743502937638978574937754764763987835872410449930690131572904279995484581013965001440*e^(198*I*c) +
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^(193*I*c) + 3582718002163296061414536703715109897107198252739284546149343102348456124089657428594946438660859773886240*e^(192*I*c) + 1234668041892409978780018081755440216012582476396941937965899631953079203974222138794604328498972144766900*e^(191*I*c) + 420358024835146798583611210145942154684437949365647899088372524802156222884839580011688655664280691773600*e^(190*I*c) +
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e^(188*I*c) + 1541311121148602393729497082079737671608134478816338654352242

1939737507962125854981881879168348260330000*e^(187*I*c) + 49952419562791381802051867444016880243882721139212556637349569469275713055331467768987878780 59685108480*e^(186*I*c) + 15987711010581926922705289996774447426856310062324561858449252201440023058781203808284839886635748291 00*e^(185*I*c) + 505293663123015258878483025738812813203397766845340065381261016353419722382620393032535960660921950400*e^(184*I*c) + 15768584552885091872146287786443509025758314941556132342738656289444759827793562980093923717562514983 0*e^(183*I*c) + 48584258153140280447314836868772131390195412419046732778458706015096881437076337910793584122475073760*e^(182*I*c) + 147779550966171289987127451820714953621765069731830816502336052740516776249704643402427558400256737 60*e^(181*I*c) + 443721091784318234776434954444390469902005659506947084719361709211471407763307723497282535122697936 0*e^(180*I*c) + 131505212093069212210229710532762284233587074342853089107298353586228009444660772347380047745391413 0*e^(179*I*c) + 384655842080666274454063078784837174998949052500975322162003392549953413592461519365177908682078400*e^(178*I*c) + 111034148797008819443143895644469242295049867464313710969257619338899133799285616020069872611710 850*e^(177*I*c) + 316266446747255477311767956875276535713059699859236883921121649155532425732694909089895702485332 80*e^(176*I*c) + 888829502875102466704420383760797610148005313441861447462076752282486891195988435266644491740 4000*e^(175*I*c) + 246438219080743960907977422685567962936788570977643587663085171625396269619234170623919287872816 0*e^(174*I*c) + 674025530543133008894845775236625237450743114473544537818170447134607102575676676056675328961590*e^(173*I*c) + 181834661406177901315330129677145381166449188413194141169344354754920969034952610378945282257600*e^(172*I*c) + 48379489756434099843857791816589379406815042609340378747586437145781646245422045101230417309900*e^(171*I*c) + 12693496932964920565073673637181280088548682508880255337280065006566138696041797353216584528640*e^(170*I*c) + 32838747605558186767263094803067344201550985839480744690141681718744421701096485216275387559 20*e^(169*I*c) + 83757920692341193245878648676537353394654523970899076948872481398218916510458989551890925632 0*e^(168*I*c) + 21059430138564847118432907888031750495336183995415942743400988466177725975254264770915003699 0*e^(167*I*c) + 52190912207661824215812271854269748071292843243227894769229690720010547141334131610989636000*e^(166*I*c) + 127472196165033205413563430625628473686016221408567860254458145320379041115232422982357133 00*e^(165*I*c) + 3067974296431747364198159623962463671617006419626851426148418602934852907379021659761911840*e^(164*I*c) + 72752101071839422929177407384469425579873866706753537975973279556794257875138425078047631 0*e^(163*I*c) + 169956327969929767773902096652629253283704505477127544556534417376686540936706073847337600*e^(162*I*c) + 391080312556018094765375353696118444408449037516056450235145723520452481042629335988507 30*e^(161*I*c) + 886275214275695728568134088576490459793534956935532181564772117253715918649147131166640 0*e^(160*I*c) + 19777929806658181356513000943262391586054488708069708605773253850286099830345346723185 00*e^(159*I*c) + 434546676780280045346344498763892540797175105756827515509297024187660299345484920192480*e^(158*I*c) + 939869153130681791490836060656814827808360605105301546184869498394671313788598859982 10*e^(157*I*c) + 2000800680

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4620684485482769807573 6*e^(117*I*c) + 41015454399371957939599567084424967094 33800261224880*e^(116*I*c) + 360688613036389349413809780004559963548775423 325255*e^(115*I*c) + 307353665128305621609911663384900573080627625184 96*e^(114*I*c) + 25356674606502797768345615661865912131092516428 59*e^(113*I*c) + 2023475097244621713139666435802340785081798383 20*e^(112*I*c) + 156039112776876070997216237717449330869205872 72*e^(111*I*c) + 1161581413733971751533622511909046917188768400*e^(110*I*c) + 83380839911837894453136303673785039051506805*e^(109*I*c) + 576460104656315130421385471071534683844739 2*e^(108*I*c) + 38336015580105482452976468821311436804715 4*e^(107*I*c) + 244898373378123386877186224918650138394 88*e^(106*I*c) + 150060274793739728640557781872269153939 2*e^(105*I*c) + 880549275989414111458699508133880402 56*e^(104*I*c) + 49396666108180257988095863525434713 45*e^(103*I*c) + 2644103757803107425180993264196850 40*e^(102*I*c) + 13477227799524701956579274210395326*e^(101*I*c) + 652650253343206047453620559993840*e^(100*I*c) + 2995254774926549967525784203219 7*e^(99*I*c) + 1299146645993240318167826532288*e^(98*I*c) + 530901272646309634700398044 75*e^(97*I*c) + 2037031259470368160131922320*e^(96*I*c) + 73099207817335597247098038*e^(95*I*c) + 2442455629894502983849104*e^(94*I*c) + 75599817092670157806639*e^(93*I*c) + 2154864144781257856128*e^(92*I*c) + 56169444526926562260*e^(91*I*c) + 1327882849274858880*e^(90*I*c) + 28186192554792138*e^(89*I*c) + 530563624556832*e^(88*I*c) + 8718181624155*e^(87*I*c) + 122503723056*e^(86*I*c) + 1431118260*e^(85*I*c) + 13343760*e^(84*I*c) + 93096*e^(83*I*c) + 432*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) - 28*(338*a*e^(1055/2*I*c) + 136552*a*e^(1053/2*I*c) + 27515228*a*e^(1051/2*I*c) + 3687040552*a*e^(1049/2*I*c) + 369625815338*a*e^(1047/2*I*c) + 29570065227040*a*e^(1045/2*I*c) + 1966409337599161*a*e^(1043/2*I*c) + 111804416623842644*a*e^(1041/2*I*c) + 5548294175019610066*a*e^(1039/2*I*c) + 244124943708196709459*a*e^(1037/2*I*c) + 9642935277137118257641*a*e^(1035/2*I*c) + 345392409065820898531490*a*e^(1033/2*I*c) + 11311601399861219435495350*a*e^(1031/2*I*c) + 341088288520555248394683275*a*e^(1029/2*I*c) + 95261086365794379649367 90*a*e^(1027/2*I*c) + 247678824846833277253335834952*a*e^(1025/2*I*c) + 6021691440068977811219750309348*a*e^(1023/2*I*c) + 13743625206208650681080140882886 2*a*e^(1021/2*I*c) + 2954879430842410604932011265442302*a*e^(1019/2*I*c) + 60030708766686810922979823601133828*a*e^(1017/2*I*c) + 11555911525253531559016939513325285 74*a*e^(1015/2*I*c) + 21130809863813051497818215704863434230*a*e^(1013/2*I*c) + 367868194965564832606935721682843410685*a*e^(1011/2*I*c) + 6109811001129869767843196320577458616044*a*e^(1009/2*I*c) + 96993251932443912018716975689508023006378*a*e^(1007/2*I*c) + 1474297474141465450580152071694890996247655*a*e^(1005/2*I*c) + 21490721703859150501477595681763435720778909*a*e^(1003/2*I*c) + 3008701185211923024440851621356627234585054 56*a*e^(1001/2*I*c) + 405100148552598682984514700153591381830206719 4*a*e^(999/2*I*c) + 52523333574538984648429489695519406526756976563*a*e^(997/2*I*c) + 656541730750769495168952644914474242735369097675*a*e^(995/2*I*c) + 7920859200695792807006454406332207329276812132106*a*e^(993/2*I*c) + 92327527810400690773733044860754764248910029932264*a*e^(991/2*I*c) + 1040783214351939655185196194449040653397856679303077*a*e^(989/2*I*c) + 11356783819252

97678449970428155489572404954529674718 3*a*e^(987/2*I*c) + 12005745766900216
915740638095197654140481726098999420 2*a*e^(985/2*I*c) + 1230589291098041959
151565198792286611164919449523155204*a*e^(983/2*I*c) + 1223937869025964067 6
098190698651937625584285361664235941*a*e^(981/2*I*c) + 11820667791274226530
815106863277985361261900745777891445 0*a*e^(979/2*I*c) + 1109324724380705292
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779615238657652696098111886565122548407614061743 4*a*e^(971/2*I*c) + 6538945
880517523468866323420234290611269386227470050003903740*a*e^(969/2*I*c) + 53
649131382810104977802029620946554089637208561026255904068048*a*e^(967/2*I*c
) + 429193535791556847068138327994764831727769099957108368643958154*a*e^(96
5/2*I*c) + 3349579976888722895534725449848627543256623010923459353099036635
*a*e^(963/2*I*c) + 2551385975635207757232243707848711162032096347605900101 3
262542630*a*e^(961/2*I*c) + 1897596527539835604798736972009161275339635281 4
3615261433871315234*a*e^(959/2*I*c) + 1378664619969635806325626967277078749
677173011656393858195336896873*a*e^(957/2*I*c) + 9788540192454256321255171 0
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7841679053774529171148470922697988578316163083576888 2*a*e^(953/2*I*c) + 461
23756141520107036405797776753727537528923292944198128745122581682 8*a*e^(951
/2*I*c) + 3063323292859702877329490930028863711679805587445419775185809699 4
25497*a*e^(949/2*I*c) + 1991167224474414510598158720752001324149743842367 28
2442612221394169630 0*a*e^(947/2*I*c) + 126711148304267514241908091838693049
594473410683838555696089694914431850*a*e^(945/2*I*c) + 7896855214518767691 5
558281252891118043362363027816645808365997718118112 0*a*e^(943/2*I*c) + 4821
262154262488189638345987905919984432326565079712079669628450138845920*a*e^(
941/2*I*c) + 2884460984899114192779857608949197580816265052571384463669481 7
073554205876*a*e^(939/2*I*c) + 1691575871261344171246507479203089822250010 7
1457475688802526063335881435874*a*e^(937/2*I*c) + 9726629305633107245966511
928223950904378469047680283381796284611566447611 76*a*e^(935/2*I*c) + 548522
38306960748702326704307050035472433362344978025748475559671965929404 04*a*e^
(933/2*I*c) + 3034593643234220864981688011795852870078325964381028101501180
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37931278840039090867647515115028970040*a*e^(929/2*I*c) + 877746897443579121
2360753774903550684040097090427558170103495734257378699003 08*a*e^(927/2*I*c
) + 4591345596645571682092817716756142718329238022456900510608005443836033 8
79600972*a*e^(925/2*I*c) + 2358312800567615222040698767520687772002719908 92
52365783381244222564261342679308*a*e^(923/2*I*c) + 118973313857946531056557
15724616432599593579578912435085803333068441982775202887 2*a*e^(921/2*I*c) +
 589627110666913950676757546277033132409936475850749602886519410515281489 83
5432948*a*e^(919/2*I*c) + 2871277913186241419584133533827623298277835710354
99712873031652967948282659546086 0*a*e^(917/2*I*c) + 13741380386275892220936
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) + 646439188934259501773881548478593914787828461389088834632048536478022 14
592593258800*a*e^(913/2*I*c) + 2989850790026969240892379366745706536870238 9

2479672655281622093032615608331810198500*a*e^(911/2*I*c) + 1359802460968616
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909/2*I*c) + 60825298300431024154835691072077923487801633182127113659132393
32777970405599581316610*a*e^(907/2*I*c) + 267639513250336669548004139167656
684596873824093521162371214650282882065319636855956 20*a*e^(905/2*I*c) + 115
8636213001522984396475259451114899203704039927743043113550522779453868267 08
814291260*a*e^(903/2*I*c) + 493567023640867640299972889502944748943106881 12
5111509805464276652017586793148209575990*a*e^(901/2*I*c) + 2069267679845930
1303811753340564576882852676499890231347872014109293933968366956895781 60*a*
e^(899/2*I*c) + 853937649559215328894585928446323687279216270239144935461 29
8123420992019705360971954828 0*a*e^(897/2*I*c) + 3469287030636283103099005 16
75345388059171005150015300151358457747567034555085057721123200*a*e^(895/2*I
*c) + 138778687909946600865367388761087962678079037327882508538788609272464
232291741120175647560*a*e^(893/2*I*c) + 546683548162320318755607543063540 85
914245366871425253510554306348109808822307574227469104 0*a*e^(891/2*I*c) + 2
12099919547452096234381035763712228220140803949731611567515783451171552584 1
111903287821280*a*e^(889/2*I*c) + 8105789144183930797661099129038091554545 5
87802074817715094441746173533262684806046690657020*a*e^(887/2*I*c) + 305181
30135951809799990437898771229881249172761806983346196310869995337802376609 7
17118084280*a*e^(885/2*I*c) + 113209905005294985203964615738175308537606762
720615035742593838863752559149966030961364432530*a*e^(883/2*I*c) + 41383715
74399715139574753471061220904180961031210935033845864225970885483870076427 7
8689392720*a*e^(881/2*I*c) + 1490892736239643826349298194172347730859393184
729348390955768602845045895181329808155623088100*a*e^(879/2*I*c) + 52940394
8242749884236210152522243397628453213697989996531767345819855472860089818 23
20842047910*a*e^(877/2*I*c) + 185311575956915491903936356712375479862040958
356367714573990225950776293573406120251414542394 10*a*e^(875/2*I*c) + 639502
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03002345066040*a*e^(873/2*I*c) + 2175975289313732717556558179281138686319 16
330150550078003801892262646350629271469008473415746660*a*e^(871/2*I*c) + 73
0105325802915088473068866423446534384705188187298829342664068496621137095 58
932887437403483803 0*a*e^(869/2*I*c) + 241592133355152499026838910461888965 0
7991053678323288318671994003935679976572633035119216455844 30*a*e^(867/2*I*c
) + 788480197052081195544100883764586283521271251634452063268969005539862 29
203996786755555578908055 40*a*e^(865/2*I*c) + 253836166254933485118820982113
674727691750143548072413000950826667593790812387940818509412369222 00*a*e^(8
63/2*I*c) + 806146354312988706244395040330930438241580527688457923866164254
30054670214293015106952021225106450*a*e^(861/2*I*c) + 2525887363443550550 32
4328455696833710718332821151662439010856980050806776748479421910339765164 38
790*a*e^(859/2*I*c) + 780898924997682350986110257817759988022377335774494 44
702112833892239416873933805948340209181715818 0*a*e^(857/2*I*c) + 2382300742
4533580795058170909195710112200199794409373992652432796754733646671122246 83
580742416880880*a*e^(855/2*I*c) + 717230153942362051793528638390242865974 02
548156271645232161025928206763073718732068569963953871978 10*a*e^(853/2*I*c)
 + 2131174983032621220698667413947866789125714774584406288147909013353452 10

94852002361976434826499389640*a*e^(851/2*I*c) + 625051628242471442925710487
33415581477053088822642095333462366631829558281303110976783578410692040060*
a*e^(849/2*I*c) + 180961288176734209022437313266581102621868947359969028289
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527423933715170812385400189629059534876927495124302268825779661057231498734
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I*c) + 40662075707504936772057335424718975259655520778602911959930973823174
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93829770850278568809909050230*a*e^(835/2*I*c) + 216098738191195691073884838
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540*a*e^(833/2*I*c) + 56564314344488004859133467053941411771442658443299199
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530218978002981214579686179196234895642459370576507150726645426795532204892
523476949341669543643800450*a*e^(829/2*I*c) + 37356763881922178059298875437
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30*a*e^(827/2*I*c) + 942682005728444778196310755751381759067350544069564584
5734753585643633077515924434771991502983134459465060*a*e^(825/2*I*c) + 2350
291388414583187433121250509539022598335395261617304489120785691712272664473
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9410*a*e^(821/2*I*c) + 1409384442983762699168937114336324967714380857089225
41655406018353943269164564745597706818400543286501171020*a*e^(819/2*I*c) +
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236549855602442049297404176384842308042398321863605332592288792671695920641
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419968099348407060708046548568397551017687935610548803578917500*a*e^(813/2*
I*c) + 43973333030386009091653033607968159002906500495742365171786730492219
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529258020368638012421632116064743382522556636322387459122205834683440665777
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36420948713161325757783624831891169692007204195378391317610973058655935960*
a*e^(807/2*I*c) + 513672538957285383949905581668971446228052831255870390485
41605029080310508962829559065760790760349012514574324*a*e^(805/2*I*c) + 113
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99/2*I*c) + 116001605090320766784189852473116448704256191850911800787750661

2429202374013486500542675475746584871022464343284*a*e^(797/2*I*c) + 2458371
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206416846940147483817202804120*a*e^(795/2*I*c) + 51519670409967739886114822
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79084914448*a*e^(793/2*I*c) + 106773451206115010316915177025157556222038526
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91/2*I*c) + 218846998697445948227976513999219963532135383045671481597307612
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e^(783/2*I*c) + 34606840858170005542670863991251388916277002843247539209630
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715894581490223423381875873103135599401069792029954889309548169394108055424
31176677931049253422876784424817016775*a*e^(779/2*I*c) + 128932750625588726
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12895074567249940816451512616367674551127607081333270181526998549*a*e^(773/
2*I*c) + 855573479483030694276062658642039017301381734938615418725528935144
2131157588880818086547678120350930967986819636206*a*e^(771/2*I*c) + 1573972
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482895606687503232118780055778547642671930573936597865733021532003186231832
8782*a*e^(765/2*I*c) + 9200978996533686300086017071701952083217979747204988
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*I*c) + 1623259213671149201253425026233024146083260448733520018556420724261
78071258568253753649777482260604487791662279095380*a*e^(761/2*I*c) + 283430
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570379832176219683475585745980384642*a*e^(759/2*I*c) + 48981527576421563052
339169497851992367594557903028751693728789261368473412858996478196365109587
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(753/2*I*c) + 2377677385281450780276535003632106957838315432294980074044721
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71077576449964287503346809348891265398259857*a*e^(749/2*I*c) + 648007496619
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9726012628871843958339023337019*a*e^(747/2*I*c) + 10538065164253899680934080924911049375848306986850557084580551955642451251771191418581692424478501246323800746129573800*a*e^(745/2*I*c) + 16967387711496224477823443941591378783239620293504740492314898728896897745532993133409667857013503734512617665480477878*a*e^(743/2*I*c) + 27049783811768063343955843328931388922560300965972200104848675102101401505754650642355872221358066002741301627025812757*a*e^(741/2*I*c) + 4270010330103377865053557708694148066803302990098735840711865716884587219045914023413725085698021434756439677135383181*a*e^(739/2*I*c) + 66747057127074268619023973404244446728857896584691340086047718832817237937379017743449379623461239962563329874824019974*a*e^(737/2*I*c) + 103322596182279139344692583372921792481340062327412457604573055278086602887748185048531214610304639645383482596676893056*a*e^(735/2*I*c) + 158394676850912040582941140342441453463440676565557261331557154602069504766857910520692027298938218954032119203110414947*a*e^(733/2*I*c) + 240486228156867390964755237862526828070805042305465156788364442627761972364982396289899653761051586004176156357053438713*a*e^(731/2*I*c) + 361631832412353361979158598436439573362393207038652296132511637528660854756889993338874388973764737310559108721961804950*a*e^(729/2*I*c) + 538632494001899503823161396844566466894862982480795241656663858431115927193564638280643271545140293504620018648806033924*a*e^(727/2*I*c) + 794677171590557834431965981683368663864926220664837337279578587219324929588856910779705968796220532402758676260405879107*a*e^(725/2*I*c) + 1161406469681514686930231057169282810901036258055622532359913997313204117553887393212328822273602211299474414691345126818*a*e^(723/2*I*c) + 1681497695671000636215144582963607157017178521461687498309132637123908932777244895367507216314619532694155538887238368802*a*e^(721/2*I*c) + 2411849750493332664787005550106117832730566983047917107231565370377973153490494465299891092551283476181625151984127753260*a*e^(719/2*I*c) + 3427439132936962218965045556690424755097418918332324019145162160654311058062898282097500536856553443553377411829820283274*a*e^(717/2*I*c) + 4825902627466762698823807773321203231601263493217828532189450537425528946780148114383027368752159205150948205408147495002*a*e^(715/2*I*c) + 6732875921482629385826983468653794448719288975818597029221935080325837839653180167035072543738369936072307403835829117580*a*e^(713/2*I*c) + 9308078563784043781017671130610248182087046913252916996880386765608626993343281123190939712394958769614572944446169239240*a*e^(711/2*I*c) + 12752082903980424859973782251580364392177685341537086604305318227869656657064262679580181162371557742791081894355841587442*a*e^(709/2*I*c) + 17313637307222450012881686695186108423735807528718156899578111200509974666183011894235219699372581227561012842803845507749*a*e^(707/2*I*c) + 23297332527241334865760084343467850152477287148995908606680514595755613320785430623562079774389532374413873170123179910986*a*e^(705/2*I*c) + 31071306638867887145486464243102830719563075151549726084666050681757993075426708570569040294724757843388933295162320833726*a*e^(703/2*I*c) + 41074582160388455294632132080196811133391850599884224560084096210500036772683324177263871865645028380575643276712484382279*a*e^(701/2*I*c) + 53823524702485318601656281997663882683788476647986193555036044978138774992020063718500148457278526659285673723602694

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37760*a*e^(639/2*I*c) + 438813356691874296623589709553772672914984549164820
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*e^(637/2*I*c) + 4534439976333459310511482504990119650672839429847590278620
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/2*I*c) + 46641735971564011756333525390837410179024153544719843471640392086
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 + 477735667572291477242788068085209794733382474511349117627392160272442581
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360*a*e^(617/2*I*c) + 51908489944204076650057446454521036150556279903379990
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^(615/2*I*c) + 519806428086287421165688613951756416147995641412176872720892
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*I*c) + 5198064280862874211656886139517564161479956414121768727208920751520
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024609505464674676976202255204827218471556567919827900412983564860896596196
3638205672345664098844084476717934767765360*a*e^(607/2*I*c) + 5153008003173
357195789061945736317915267127659146027577937446882680816453705847341473856
934451889447842664418960798801389660*a*e^(605/2*I*c) + 51207212535516830195

0288482078749611909895524575143974904749227931910333784445676668941642330850382872294112209057815778322O*a*e^(603/2*I*c) + 507802005419236558820490482561501954862434968815803334760399525582020656475736911704403434979904850117375287518119099785068O*a*e^(601/2*I*c) + 502360397556685133411332704356697506265365584465606240891406574370079536006792629619460725611027426204850287152413436343072O*a*e^(599/2*I*c) + 495615112514236503966923498388797623512188087820720497989002471517228132783667683162018090926271749711139672600107609679542O*a*e^(597/2*I*c) + 487442130425961717527650059920304297345996116629620426299356802648481012729938614907315819094824976537408708886369443575520O*a*e^(595/2*I*c) + 477735667572291477242788068085209794733382474511349117627392160272442581969204328281047970893973237622049256721584676382164O*a*e^(593/2*I*c) + 466417359715640117563335253908374101790241535447198434716403920864999158555384602021368246402964176452241422653762290366736O*a*e^(591/2*I*c) + 453443997633345931051148250499011965067283942984759027862012615398218816207060400300306746503427107867668229845257488522376O*a*e^(589/2*I*c) + 438813356691874296623589709553772672914984549164820834699073213918440500081559070809248842064720846857332644897999323891984O*a*e^(587/2*I*c) + 422567795892632749399376347225596580682829367588163316714951015247372328183126617784589896266254708828315341081154076393776O*a*e^(585/2*I*c) + 404795452293663586301595872787961053774872040614739375472850428532596575934312865005993738836041286643104911964561963684408O*a*e^(583/2*I*c) + 385629012761269004523983508968714311032763185387401712825777974712386427509471961921712939294748427543524894662798305437112O*a*e^(581/2*I*c) + 365242195411312022531084117567914139896304362355079720420530478975874726152466529151417981964943784438151898478855472481490O*a*e^(579/2*I*c) + 343844207611450756582822762976765746521906220363406316774466921625914062567998791791335291072502438017239249240807859784756O*a*e^(577/2*I*c) + 321672557507420652882892410005858474866554248955010598380892000356880845989548491941765585710862416327421233992744074082572O*a*e^(575/2*I*c) + 298984675479563088451742611699327002567506887325697076095597491657316974565555081484620661748715564758983923646470179627958O*a*e^(573/2*I*c) + 276048847146553607900165140742040618677360592610819558290806380573776619017848400674978875365643131819967512129061937561442O*a*e^(571/2*I*c) + 253134969683085098902842312671793025142106793828413761786635271988152846776207061522427944786499898098288576470133575029964O*a*e^(569/2*I*c) + 230505620108564577340321150349581540605350708690562007261504097847392313384365081192510128367961898615128909409657966942432O*a*e^(567/2*I*c) + 208407871933677540917899940456096383454677914237869374731808161997221064406209816031325427641825129411357648711890171113526O*a*e^(565/2*I*c) + 187066221020888088529998809098955509325203817865681910497590287277487884734303575272263127913613463619019462002877706277100O*a*e^(563/2*I*c) + 166676889819198732299914423573743887087955756775775148281132080264808169270014560763317844260183830794082992954221939481660O*a*e^(561/2*I*c) + 147403678911314512551158602765451942976784711541874878030161967756912464481716292555681407152865081422082647584171197039816O*a*e^(559/2*I*c) + 1293754336043276107635519825743806752370832157765902836816009878921593531107159739081983326648534990963952

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*e^(501/2*I*c) + 7946771715905578344319659816833686638649262206648373372795
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*c) + 538632494001899503823161396844566466894862982480795241656663858431115
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(487/2*I*c) + 427001033010337786505355770869414806680330299009873584071186
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+ 2704978381176806334395584332893138892256030096597220010484867510210140150
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+ 1418614463474745931939580690625796435620927402326725707128978611183225665
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642*a*e^(465/2*I*c) + 16232592136711492012534250262330241460832604487335200
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*I*c) + 9200978996533686300086017071701952083217979747204988707843061021752
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1695920641604014628O*a*e^(409/2*I*c) + 3390284229878333978558706614105802727832419445203049929169612721423237938658782648305980398192033825213854 60*a*e^(407/2*I*c) + 14093844429837626991689371143363249677143808570892254165540601835394326916456474559770681840054328650117102O*a*e^(405/2*I*c) + 5789847874548404866954317068245529292730188272321513952449528244196894384174589566247623093618880995136941O*a*e^(403/2*I*c) + 23502913884145831874331212505095390225983353952616173044891207856917122726644734230198671436996652682109840*a*e^(401/2*I*c) + 942682005728444778196310755751381759067350544069564584573475358564363307751592443477199150298313445946506O*a*e^(399/2*I*c) + 37356763881922178059298875437491269152714003934322610550534396246143578332587567355865516316424683950690 30*a*e^(397/2*I*c) + 14625302189780029812145796861791962348956424593705765071507266454267955322048925234769493416695436438004 50*a*e^(395/2*I*c) + 565643143444880048591334670539414117714426584432991996919574779333959694062618454004998070039855100793060*a*e^(393/2*I*c) + 21609873819119569107388483888513005160694166063281459328180764307845304446142585984113348739848548338854O*a*e^(391/2*I*c) + 8154612486147939753961450172387416038040673187870338376416899499805543285693829770850278568809909050230*a*e^(389/2*I*c) + 3039237129038547978545375775633824894441801783369328767608982430107639809721866030402408932431416962032O*a*e^(387/2*I*c) + 11186755735982119629198830648437726101312278573506457168349138206372529199037094900014443021705886779480*a*e^(385/2*I*c) + 4066207570750493677205733542471897525965552077860291195993097382317471471408387205631440905418660098080*a*e^(383/2*I*c) + 14594445607455126842046773928689829032070971702740919245896897345803056631025316941897664094400274169 20*a*e^(381/2*I*c) + 517207118625274239337151708123854001896290595348769274951243022688257796610572314987340186199489059600*a*e^(379/2*I*c) + 180961288176734209022437313266581102621868947359969028289341259075645977162094115793342533495420437760*a*e^(377/2*I*c) + 625051628242471442925710487334155814770530888226420953334623666318295582813031109767835784106920400 60*a*e^(375/2*I*c) + 213117498303262122069866741394786678912571477458440628814790901335345210948520023619764348264993896 40*a*e^(373/2*I*c) + 717230153942362051793528638390242865974025481562716452321610259282067630737187320685699639538719781O*a*e^(371/2*I*c) + 23823007424533580795058170909195710112200199794409373992652432796754733646671122246835807424168808 80*a*e^(369/2*I*c) + 780898924997682350986110257817759988022377335774494447021128338922394168739338059483402091817158180*a*e^(367/2*I*c) + 25258873634435505503243284556968337107183328211516624390108569800508067767484794219103397651643879O*a*e^(365/2*I*c) + 806146354312988706244395040330930438241580527688457923866164254300546702142930151069520212251064 50*a*e^(363/2*I*c) + 25383616625493348511882098211367472769175014354807241300095082666759379081238794081850941236922200*a*e^(361/2*I*c) + 788480197052081195544100883764586283521271251634452063268969005539862292039967867555555789080554O*a*e^(359/2*I*c) + 2415921333551524990268389104618889650799105367832328831867199400393567997657263303511921645584430*a*e^(357/2*I*c) + 730105325802915088473068866423446534384705188187298829342664068496621137095589328874374034838030*a*e^(355/2*I*c) + 2175975289313732717556558179281138686319163301505500780O3

801892262646350629271469008473415746660*a*e^(353/2*I*c) + 63950218579261019
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040*a*e^(351/2*I*c) + 185311575956915491903936356712375479862040958356367714
573990225950776293573406120251414542394 10*a*e^(349/2*I*c) + 52940394824274
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47910*a*e^(347/2*I*c) + 1490892736239643826349298194172347730859393184729 34
839095576860284504589518132980815562308 8100*a*e^(345/2*I*c) + 4138371574399
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92720*a*e^(343/2*I*c) + 113209905005294985203964615738175308537606762720615
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150944417461735332626848060466906570 20*a*e^(337/2*I*c) + 212099919547452096
234381035763712228220140803949731611567515783451171552584111119032878212 80*a
*e^(335/2*I*c) + 5466835481623203187556075430635408591424536687142525351055
430634810980882230757422746910 40*a*e^(333/2*I*c) + 138778687909946600865367
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/2*I*c) + 34692870306362831030990051675345388059171005150015300151358457747
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3687279216270239144935461298123420992019705360971954 8280*a*e^(327/2*I*c) +
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6695689578160*a*e^(325/2*I*c) + 493567023640867640299972889502944748943106 8
811251115098054642766520175867931482095 75990*a*e^(323/2*I*c) + 115863621300
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 + 135980246096861627023186829981433807602507555571554492000921126567924838
7475802712230*a*e^(315/2*I*c) + 298985079002696924089237936674570653687023 8
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11/2*I*c) + 137413803862758922209369554288843652796575683649634958691273768
594641080939671249 30*a*e^(309/2*I*c) + 287127791318624141958413353382762329
827783571035499712873031652967948282659546 0860*a*e^(307/2*I*c) + 5896271106
669139506767575462770331324099364758507496028865194105152814898354329 48*a*e
^(305/2*I*c) + 118973313857946531056557157246164325995935795789124350858033
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720027199089252365783381244222564261342679308*a*e^(301/2*I*c) + 45913455966
455716820928177167561427183292380224569005106080054438360338796009 72*a*e^(2
99/2*I*c) + 877746897443579121236075377490355068404009709042755817010349573
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793127884003909086764751511502897004 0*a*e^(295/2*I*c) + 303459364323422086 4
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+ 548522383069607487023267043070500354724333623449780257484755596719659294 0
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0*a*e^(197/2*I*c) + 341088288520555248394683275*a*e^(195/2*I*c) + 113116013
99861219435495350*a*e^(193/2*I*c) + 345392409065820898531490*a*e^(191/2*I*c
) + 9642935277137118257641*a*e^(189/2*I*c) + 244124943708196709459*a*e^(187
/2*I*c) + 5548294175019610066*a*e^(185/2*I*c) + 111804416623842644*a*e^(183
/2*I*c) + 1966409337599161*a*e^(181/2*I*c) + 29570065227040*a*e^(179/2*I*c)
+ 369625815338*a*e^(177/2*I*c) + 3687040552*a*e^(175/2*I*c) + 27515228*a*e
^(173/2*I*c) + 136552*a*e^(171/2*I*c) + 338*a*e^(169/2*I*c))/(e^(531*I*c) +
432*e^(530*I*c) + 93096*e^(529*I*c) + 13343760*e^(528*I*c) + 1431118260*e^
(527*I*c) + 122503723056*e^(526*I*c) + 8718181624155*e^(525*I*c) + 53056362
4556832*e^(524*I*c) + 28186192554792138*e^(523*I*c) + 1327882849274858880*e
^(522*I*c) + 56169444526926562260*e^(521*I*c) + 2154864144781257856128*e^(5
20*I*c) + 75599817092670157806639*e^(519*I*c) + 2442455629894502983849104*e
^(518*I*c) + 73099207817335597247098038*e^(517*I*c) + 203703125947036816013
1922320*e^(516*I*c) + 53090127264630963470039804475*e^(515*I*c) + 129914664
5993240318167826532288*e^(514*I*c) + 29952547749265499675257842032197*e^(51
3*I*c) + 652650253343206047453620559993840*e^(512*I*c) + 134772277995247019
56579274210395326*e^(511*I*c) + 264410375780310742518099326419685040*e^(510
*I*c) + 4939666610818025798809586352543471345*e^(509*I*c) + 880549275989414
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392*e^(507*I*c) + 24489837337812338687718622491865013839488*e^(506*I*c) + 3
83360155801054824529764688213114368047154*e^(505*I*c) + 5764601046563151304
213854710715346838447392*e^(504*I*c) + 833808399118378944531363036737850390
51506805*e^(503*I*c) + 1161581413733971751533622511909046917188768400*e^(50
2*I*c) + 15603911277687607099721623771744933086920587272*e^(501*I*c) + 2023
47509724462171313966643580234078508179838320*e^(500*I*c) + 2535667460650279
776834561566186591213109251642859*e^(499*I*c) + 307353665128305621609911663
38490057308062762518496*e^(498*I*c) + 3606886130363893494138097800045599635
48775423325255*e^(497*I*c) + 4101545439937195793959956708442496709433800261
224880*e^(496*I*c) + 45230940039830738332025694784646206844854827698075736*
e^(495*I*c) + 484093410240488718655917025303662581091659126182344528*e^(494
*I*c) + 5032024903401451824074213943766011922026507006311982753*e^(493*I*c)
+ 50836369508171099437019348610847391946736185108017183136*e^(492*I*c) + 4
99467506558531733671585862910572702811545035730398749530*e^(491*I*c) + 4775
398607100853263534207733818266777478693412738731031680*e^(490*I*c) + 444567
08175258821024400946210535004523775722190977468484496*e^(489*I*c) + 4032122
25957798188840846139960995624144491271694336796459584*e^(488*I*c) + 3564764
890628724017088487996688178929195787613958545474804845*e^(487*I*c) + 307362
17404321009965231037419663053962881035281709221697785072*e^(486*I*c) + 2585
85348715977270155829115684193411072034541491364393985491350*e^(485*I*c) + 2
123702969188871318266718781223927067839949015727293884065388080*e^(484*I*c)
+ 17033886027390615741040977721655541665612162275485028584310890417*e^(483
*I*c) + 133490210052026183779673313868332303530332906163247194627808410304*
e^(482*I*c) + 1022536437468296737293065862705246449693687415559865844306888
705423*e^(481*I*c) + 765901052018754965177711835767687192708189898913112575
5798204236112*e^(480*I*c) + 56117081076341175384087570185188538660375932013

6747355190552273683666*e^(479*I*c) + 402349692266121158934003582839428785116
904903936409545602519219664720*e^(478*I*c) + 282390515193658667838252570656
445728029009869863859798762838024588171 5*e^(477*I*c) + 19407979215594566593
5350081033032552577454080700824313389451847974639 36*e^(476*I*c) + 130657660
2265604193351214343899389618845954340699848243071493321317475 40*e^(475*I*c)
 + 8618848510949919087642468054746724286037573154844539747136128122154 28992
*e^(474*I*c) + 557255115732867112101621641630759616186195596901169722234092
6210112854418*e^(473*I*c) + 353244472067790181153780528207894116875810045 82
36743100620587963372901520 0*e^(472*I*c) + 219601281339515561500261478844190
024870555261281946058839614044697037963695*e^(471*I*c) + 133921437425424555
35648844068019453533850002540306557659537702376071800899 68*e^(470*I*c) + 80
1372958079075243436196494576154376146952079121074697267587048105867427784 4*
e^(469*I*c) + 470650446111351581084873533674842431026982488383126358762830 9
9427442745866704*e^(468*I*c) + 27136120750326657073448651707718101480177532
218318105563861925783614327147235 8*e^(467*I*c) + 1536333238444927583532734 5
5601649467167491657890711698454848907824169392694056 0*e^(466*I*c) + 8543013
441126212334833540665069621472479085838041360564550722036723654297540205*e^
(465*I*c) + 46668223548266017806854592468100570289355960869613650856575756 7
58180182223308768*e^(464*I*c) + 2505010286089283324693404568299020677122336
44464602753159945727868485722395506952*e^(463*I*c) + 13214980552713008514 29
99386663161987442453442518818359204972768757103215643507728 0*e^(462*I*c) +
6852993223145736687328885311617795435592940841439866351079655652312894721 97
2796266*e^(461*I*c) + 34941071613276704649477943043339450201504075335160361
86591602921386077860623062496 0*e^(460*I*c) + 17519317050061830024151563238 1
912285157790097816049220671217212220015297133400636060*e^(459*I*c) + 863979
933622330349556296820028395513198708064940505702126068652936800794826651264
256*e^(458*I*c) + 419154250065682614809333941454415914396447847249231593180
917185990211410900593994295 2*e^(457*I*c) + 20008006803030047137293278250321
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153130681791490836060656814827808360605105301546184869498394671313788598859
98210*e^(455*I*c) + 434546676780280045346344498763892540797175105756827515 5
0929702418766029934548492019248 0*e^(454*I*c) + 19777929806658181356513000 94
326239158605448870806970860577325385028609983034534672318500*e^(453*I*c) +
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1471311666400*e^(452*I*c) + 391080312556018094765375353696118444408449037 51
605645023514572352045248104262933598850730*e^(451*I*c) + 169956327969929767
773902096652629253283704505477127544556534417376686540936706073847337600*e^
(450*I*c) + 727521010718394229291774073844694255798738667067535379759732795
5679425787513842507804763 10*e^(449*I*c) + 3067974296431747364198159623962 46
367161700641962685142614841860293485290737902165976191184 0*e^(448*I*c) + 12
747219616503320541356343062562847368601622140856786025445814532037904111523
242298235713300*e^(447*I*c) + 5219091220766182421581227185426974807129284 32
43227894769229690720010547141334131610989636000*e^(446*I*c) + 2105943013856
484711843290788803175049533618399541594274340098846617772597525426477091500
36990*e^(445*I*c) + 837579206923411932458786486765373533946545239708990769 4

887248139821891651045898955189092563 20*e^(444*I*c) + 3283874760555818676726
30948030673442015509858394807446901416817187444217010964852162753875592 0*e^
(443*I*c) + 1269349693296492056507367363718128008854868250888025533728006 50
065661386960417973532165845286 40*e^(442*I*c) + 483794897564340998438577918 1
6589379406815042609340378747586437145781646245422045101230417309900*e^(441*
I*c) + 1818346614061779013153301296771453811664491884131941411693443547549 2
09690349526103789452822576 00*e^(440*I*c) + 674025530543133008894845775236 62
5237450743114473544537818170447134607102575676676056675328961590*e^(439*I*c
) + 24643821908074396090797742268556796293678857097764358766308517162539626
961923417062391928787281 60*e^(438*I*c) + 888829502875102466704420383760797 6
1014800531344186144746207675228248689119598843526664449174040 00*e^(437*I*c)
 + 316266446747255477311767956875276535713059699859236883921121649155532425
73269490908989570248533280*e^(436*I*c) + 111034148797008819443143895644469 2
4229504986746431371096925761933889913379928561602006987261171085 0*e^(435*I*
c) + 3846558420806662744540630787848371749989490525009753221620033925499534
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3*I*c) + 443721091784318234776434954444390469902005659506947084719361709211
471407763307723497282535122697936 0*e^(432*I*c) + 147779550966171289987127 45
18207149536217650697318308165023360527405167762497046434024275584002567376 0
*e^(431*I*c) + 4858425815314028044731483686877213139019541241904673277845 87
06015096881437076337910793584122475073760*e^(430*I*c) + 157685845528850918 7
2146287786443509025758314941556132342738656289444759827793562980093923717 56
25149830*e^(429*I*c) + 5052936631230152588784830257388128132033977668453400
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21139212556637349569469275713055331467768987878780596851084 80*e^(426*I*c) +
 1541311121148602393729497082079737671608134478816338654352242193973750796 2
1258549818818791683482603300 00*e^(425*I*c) + 4697022472711728182645404501 80
706705225597566275803477845353200149634826323597294445418851022745460025 60*
e^(424*I*c) + 1413799382535568432805655058074033041306061307254347517457940
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470*e^(419*I*c) + 2909765106124745340664756978183691006216555985235905280 42
591541656871254287525623854923737494863517144531 20*e^(418*I*c) + 814520814 1
382911182887541756425005484603769331281148049290916075819598915576810702256
835095386181594070409 0*e^(417*I*c) + 225320532593220657767941109289516248 99
97945210155641349828272417100196754866944996893124665619072126278200 00*e^(4
16*I*c) + 616003116022979584937125701757887212998354300989991362628038861 09

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2999689303933456303459141097207405736188849805200100284514969962 10*e^(413*I
*c) + 117358569262451184931130910025016040323418769859990828235206722415302
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982747171856772463223808993367091503402876467270176124342699654400*e^(410*I
*c) + 201557947424794098026772478462040883395867512562930862943753568690084
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029287019039910755431107996422728019652247537010873847785631176569961 0*e^(4
07*I*c) + 312568349317870174347970475030749017866629215072017936360433511 35
28623329684606343185540756019935662148267863968*e^(406*I*c) + 7621788791912
047062038840917799374600428892258194367636682944356096681400246312138001769
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48*e^(404*I*c) + 4383497214291937768537869223302106374455403310092850273748
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975546725743648984783764075375471820439447305579500146760432641987655555687
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77830328761948015971332060520912869970437291453457558057100814890067418394 3
9573984832678*e^(401*I*c) + 5567563887111823403410261927342195461136517683 1
73805390058936790493947140170636985652727288136690547790772089778 40*e^(400*
I*c) + 1271033082938048950201360554831270342662343991277504612342300366025 0
4674174285658044528940178665631168585902308471 6*e^(399*I*c) + 2870496131412
31445183467471535358943955329443080853193346608628854370924623076915139218 0
699413405623017247753532944*e^(398*I*c) + 641338189585592518475823145106255
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 + 3100431920606941707706936314142348743182800909818474463567865228417743 94
6494165181256451914491800317410807763484601 4*e^(395*I*c) + 6709170613052966
91250198992100215765802378434622295353862950870761892978499959313606456052 9
2130961496106707521506432*e^(394*I*c) + 143657687138044796942947119704259 53
845881819942351682467458629369105611920986635812363777224540953079923055376
7222252*e^(393*I*c) + 304384471106813336010284160123906370433888828490627 42
265255123696679091617452085775914393014018717349239498190825894 4*e^(392*I*c
) + 6382188929145337415058063996624885560667836004960918764083749748774489 7
177803607499624558112428346043806518207197608 5*e^(391*I*c) + 13243113249840
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2532030464988312068498755640 0*e^(390*I*c) + 271958928348374392604080510108 0
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0072199841759670394865739473880520939163659737038057239896471508009536681832
20291521936358697840953337 60*e^(362*I*c) + 2691779470108661509789012023689
0501105146799996021775195710866226228638984703456832694153230611607263444183
50102619856341961 6*e^(361*I*c) + 41670440375390543643418219342271748040035
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76913600*e^(360*I*c) + 6392301943376198909061480128863509812319944510230312
26165446482089987678039444557770428865527384997471837131360691046518122 15*
e^(359*I*c) + 971730550247426800586167224613688926611412955402634930130327 4
608353615732426833339040030895831837021915488716970225744475617 6*e^(358*I*c
) + 146390448456351181218237382740374124191664819997746988076598391862733629
670142241546375533903130605297580105675355629160198162*e^(357*I*c) + 21856
3166659649312247483640956272149212499115383828771029654283363972585118090479
413696638108156385244646591328454425745117584*e^(356*I*c) + 32341317801484
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163745313602400139153046673668433091*e^(355*I*c) + 474323043563100542377338
6299319662481291759769823324460180560093911540204388959031408229677694940194
461667799540246553441162 88*e^(354*I*c) + 689518449328793559903260418149974
19025357834005889503558960646824468059155611817030400503756366988005790876 5
898949268614772285*e^(353*I*c) + 993555653649521127226443960820233649386488
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*e^(351*I*c) + 2009496110092687738152782085683737222727968824299058739215
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0*I*c) + 282081929856221595910752980728962844962138679898943636939311606989
40187812010002756331044983989593466317955680225199744001302 81*e^(349*I*c) +
392569765841577835276810394285601184021164276962171721799661439847388718607
439148263854721282653827045391263454029979227032 1024*e^(348*I*c) + 5416662
8040524363495855959828183579538662584616443540182051589177425764253443649645
967506531776778034921868173051711750320115 00*e^(347*I*c) + 741037261289115
2224364633296128043971657193280327754304382235672773781403023814127610355562
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5498534554967803144574449998520825938543560974027240030145424687204177515983
8468077381562338745636398374*e^(345*I*c) + 135212304119454369155588547068
5179654156739981165687002156735297532681546781784653328912387169605619523169
614616272099222176099 2*e^(344*I*c) + 180353273381774554711775685948516829779
7834644977719357208768851039242688451927299156085132639385224196147004081979
3627127923997*e^(343*I*c) + 23856398565562802030695278174212640833282154
1740064594582926440609479249073137359215616901539399060175186471824916165737
24049744*e^(342*I*c) + 312952636881898383137727758733072603341172272586295
0199235869563609266286606281984568906423581362297415012066892139187839897838
0*e^(341*I*c) + 4071598896370191895002034833673642342051331135901048524691

9074652883393970805374470830156229705647312265477584256027212762941040*e^(3
40*I*c) + 52539223346740771142587092370257069536060319644439501667610482767
955800276052892432152798814607975110366224945081428121888473324*e^(339*I*c)
 + 672440879690807038237032571996630476068906104820904946194928029351302159
79819469966383336788693900139115594646893784095418472336*e^(338*I*c) + 8536
811843021531284823129173967373588774620185166629960039219941876475008682819
8719872744047767783667325326289221881974987582215*e^(337*I*c) + 10750473740
657691612348039916975963332832140741940051001749884983059862156542826654631
5933920821527544726380201659114903834605888*e^(336*I*c) + 13429774202347942
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4964665036319889119229809973806909680*e^(335*I*c) + 16643233292258919513055
832926639875338982395573759852755609609306247355976954577232197896931890419
2572733997888230986469005970880*e^(334*I*c) + 20462229553572910951982991678
986722531942970516256008264884039496542311280933659192129030939239626383467
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268263445548712871463146189177082320136752764579377020378878467734393497142
4317987895255031936*e^(332*I*c) + 30206063803086846346113944227936049971890
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2322595776808*e^(331*I*c) + 36270630756384323113569915741851073245242061401
362416887931218764523345015392797579332683478074139120343015309371263535552
3960320*e^(330*I*c) + 43214785646408693802381156180867858959470204790467428
229795965880017098445679906775187804480661901245263689135073161827854569016
0*e^(329*I*c) + 51090761511113450745262384614713714145027572244431638553164
8429230851686635827717488464500331623385777400744950538410637735936000*e^(3
28*I*c) + 59937848477173347480937614240155485020706497211813757294925750365
1444541939309025276896049622515630263162184526394317285457368300*e^(327*I*c
) + 69778910692592461481671374768468278508365981902795224444704335586974136
8500452561164024636073401929693105801105522738405349028160*e^(326*I*c) + 80
616967132762553242457534008977573368199499157667444692235409971461519208544
3245663852257001115644286660304979476023966071898200*e^(325*I*c) + 92432005
286752258403577749576107235122253442078486196000182102050946814635675643379
5246446491396141583854513687104334429566707520*e^(324*I*c) + 10517821004288
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61906494422955462431208645690802526770780*e^(323*I*c) + 1187817943079390316
108802324798110129020822782660087248599367643481200206046822166144285425922
229375413676535071141005286431481600*e^(322*I*c) + 133139611462672303580246
212353158205033974999601415245283530595636742537022275862175392245872752485
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04304075953693546767206080*e^(320*I*c) + 1635569744641421900657886381289076
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790081814516625224440*e^(319*I*c) + 179264907808963229893694572848196933496
439159750628508848835062293725253342098080314431643170145219052271612479787
5257437516360640*e^(318*I*c) + 19502865507801819192449929612044870100564603
628452185016744237662663215587914369173178787022326792138682879262946652027

69722927380*e^(317*I*c) + 2106141903468344307112549761202484543402794252352482199817410424869677262715098288437646518683487945462774223656471345899082156800*e^(316*I*c) + 2257726219103856286812833012681573765496262241420612932076143151171960854554124144699023009842080515157923529357189869943515991200*e^(315*I*c) + 2402464595569686086120001803034211056739445588621946141384106162886246161815149763025030834875234067267774023433418269982431265280*e^(314*I*c) + 2537766415465030330815471746692988596069911894697225052928320452542175587154848096483331209807430113943015398362669673337957755720*e^(313*I*c) + 2661100647975783583828235139201441930178396643383423903583862547255880772382049201015537214900832745601519737141849802506685264000*e^(312*I*c) + 2770073207150768645597507281382065497924968466054527414122339827333783770068305883487309979315983718403740872884345746380680204260*e^(311*I*c) + 2862503126320461797770667780725644184991255623174626175679050672100848988119391841466573417019247590580735265143427289340450811200*e^(310*I*c) + 2936494214351868498703239455426771104344827306267558916550877467232455153286140521089582733932202553130712723836983468866230908800*e^(309*I*c) + 2990498949622543608538129380283866335190087115124858818143787619186957111903765723974899651518555144924290346242595167274383008960*e^(308*I*c) + 3023371643508225027175603175212953219022485045850731845307519008277385154731461213388035579159917590062343527464977286601165100620*e^(307*I*c) + 3034408355530957075787731745322567981684616550162845473257679674280216947356785783843205604202307836897073595410412575660465787520*e^(306*I*c) + 3023371643508225027175603175212953219022485045850731845307519008277385154731461213388035579159917590062343527464977286601165100620*e^(305*I*c) + 2990498949622543608538129380283866335190087115124858818143787619186957111903765723974899651518555144924290346242595167274383008960*e^(304*I*c) + 2936494214351868498703239455426771104344827306267558916550877467232455153286140521089582733932202553130712723836983468866230908800*e^(303*I*c) + 2862503126320461797770667780725644184991255623174626175679050672100848988119391841466573417019247590580735265143427289340450811200*e^(302*I*c) + 2770073207150768645597507281382065497924968466054527414122339827333783770068305883487309979315983718403740872884345746380680204260*e^(301*I*c) + 2661100647975783583828235139201441930178396643383423903583862547255880772382049201015537214900832745601519737141849802506685264000*e^(300*I*c) + 2537766415465030330815471746692988596069911894697225052928320452542175587154848096483331209807430113943015398362669673337957755720*e^(299*I*c) + 2402464595569686086120001803034211056739445588621946141384106162886246161815149763025030834875234067267774023433418269982431265280*e^(298*I*c) + 2257726219103856286812833012681573765496262241420612932076143151171960854554124144699023009842080515157923529357189869943515991200*e^(297*I*c) + 2106141903468344307112549761202484543402794252352482199817410424869677262715098288437646518683487945462774223656471345899082156800*e^(296*I*c) + 1950286550780181919244992961204487010056460362845218501674423766266321558791436917317878702232679213868287926294665202769722927380*e^(295*I*c) + 1792649078089632298936945728481969334964391597506285088488350622937252533420980803144316431701452190522716124797875257437516360640*e^(294*I*c) + 16355697446414

219006578863812890766532275801720566775874514020692343552836874896596139137
61959140773339736014790081814516625224440*e^(293*I*c) + 1481187117089246662
4669556949656778555247303132605526908216026571762187374262455227953298914640
91005878304304075953693546767206080*e^(292*I*c) + 13313961146267230358024621
2353158205033974999601415245283530595636742537022275862175392245872752485
6072950880960657564720475838500*e^(291*I*c) + 1187817943079390316108802324798
110129020822782660087248599367643481200206046822166144285425922229375413676
535071141005286431481600*e^(290*I*c) + 1051782100428834371944508170051219
1871168163497669533226371821496108750042237847841832849619064944229554624312
08645690802526770780*e^(289*I*c) + 924320052867522584035777495761072351222
534420784861960001821020509468146356756433795246446491396141583854513687104
334429566707520*e^(288*I*c) + 806169671327625532424575340089775733681994991
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71898200*e^(287*I*c) + 697789106925924614816713747684682785083659819027952
2444470433558697413685004525611640246360734019296931058011055227384053490281
60*e^(286*I*c) + 599378484771733474809376142401554850207064972118137572949
257503651444541939309025276896049622515630263162184526394317285457368300*e^
(285*I*c) + 510907615111134507452623846147137141450275722444316385531648429
230851686635827717488464500331623385777400744950538410637735936000*e^(284*I
*c) + 432147856464086938023811561808678589594702047904674282297959658800170
984456799067751878044806619012452636891350731618278545690160*e^(283*I*c) +
362706307563843231135699157418510732452420614013624168879312187645233450153
927975793326834780741391203430153093712635355523960320*e^(282*I*c) + 302060
638030868463461139442279360499718906917482524894483356220196138377050828911
383056860425370161157201493696073712322595776808*e^(281*I*c) + 249593072282
565866398389951509619202682634455487128714631461891770823201367527645793770
203788784677343934971424317987895255031936*e^(280*I*c) + 204622295535729109
519829916789867225319429705162560082648840394965423112809336591921290309392
396263834674368977840527147037426908*e^(279*I*c) + 166432332922589195130558
329266398753389823955737598527556096093062473559769545772321978969318904192
572733997888230986469005970880*e^(278*I*c) + 134297742023479429904629616104
5596100960747587210680227044689380630170596880233634364589715349646650363198
89119229809973806909680*e^(277*I*c) + 107504737406576916123480399169759633
3283214074194005100174988498305986215654282665463159339208215275447263802016
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0185166629960039219941876475008682819871987274404776778366732532628922188197
4987582215*e^(275*I*c) + 672440879690807038237032571996630476068906104820904
946194928029351302159798194699663833367886939001391155946468937840954184723
36*e^(274*I*c) + 525392233467407711425870923702570695360603196444395016676
10482767955800276052892432152798814607975110366224945081428121888473324*e^
(273*I*c) + 407159889637019189500203483367364234205133113590104852469190746
52883393970805374470830156229705647312265477584256027212762941040*e^(272*I*
c) + 3129526368818983831377277587330726033411722725862950199235869563609266
2866062819845689064235813622974150120668921391878398978380*e^(271*I*c) + 23
856398565562802030695278174212640833282154174006459458292644060947924907313

7359215616901539399060175186471824916165737240497 44*e^(270*I*c) + 180353273
381774554711775685948516829779783464497771935720876885103924268845192729915
608513263938522419614700408197936271279239 97*e^(269*I*c) + 1352123041194543
691555885470685179654156739981165687002156735297532681546781784653328912387
169605619523169614616272099222176099 2*e^(268*I*c) + 1005220952436958182758 8
154985345549678031445744499985208259385435609740272400301454246872041775159
838468077381562338745636398374*e^(267*I*c) + 741037261289115222436463329612
804397165719328032775430438223567277378140302381412761035556250527196904517
770472605490714578496 0*e^(266*I*c) + 541666280405243634958559598281835795 38
662584616443540182051589177425764253443649645967506531776778034921868173051
71175032011500*e^(265*I*c) + 392569765841577835276810394285601184021164276 9
621717217996614398473887186074391482638547212826538270453912634540299792270
321024*e^(264*I*c) + 282081929856221595910752980728962844962138679898943636
939311606989401878120100027563310449839895934663179556802251997440013028 1*e
^(263*I*c) + 200949611009268773815278208568373722272796882429905873921544 60
834993514676253344496707577640666906561509490149440439948228239 20*e^(262*I*
c) + 141916448142217657385823401389899962882232233330957373071631074383893 5
832201454293617293175086458389621425307051750612129761498*e^(261*I*c) + 993
555653649521127226443960820233649386488510081892545866700444096661582790441
241830855609577062039555625090943332264901780720*e^(260*I*c) + 689518449328
793559903260418149974190253578340058895035589606468244680591556118170304005
037563669880057908765898949268614772285*e^(259*I*c) + 474323043563100542377
338629931966248129175976982332446018056009391154020438895903140822967769494
019446166779954024655344116288*e^(258*I*c) + 323413178014841003714151138246
079152576360976035058457890409937738723171537036573043681997163745313602400
139153046673668433091*e^(257*I*c) + 218563166659649312247483640956272149212
499115383828771029654283363972585118090479413696638108156385244646591328454
425745117584*e^(256*I*c) + 146390448456351181218237382740374124191664819997
746988076598391862733629670142241546375533903130605297580105675355629160198
162*e^(255*I*c) + 971730550247426800586167224613688926611412955402634930130
327460835361573242683333904003089583183702191548871697022574447561 76*e^(254
*I*c) + 639230194337619890906148012886350981231994451023031226165446482089 9
876780394445577704288655273849974718371313606910465181221 5*e^(253*I*c) + 41
670440375390543643418219342271748040035071490119080585281522498188818375906
900368701234531304633163446319945130196476913600*e^(252*I*c) + 269177947010
866150978901202368905011051467999960217751957108662262286389847034568326941
532306116072634441835010261985634196 16*e^(251*I*c) + 172295028243676473344 0
072199841759670394865739473880520939163659737038057239896471508009536681832
202915219363586978409533376 0*e^(250*I*c) + 109272106034735448102797923478 44
536074588896806230041110089544731605863146104181739039426674855453466097402
330688331845602302*e^(249*I*c) + 686642533751866826266269375090895696573292
457814218163062215780289988087468155103113631406419994860400152989456623523
8597088*e^(248*I*c) + 427482690772059175252671133682087150084434564792238 54
715343593336061895718324446413641328931086635762051338706721562641641 15*e^(
247*I*c) + 263666241043079934044752228477824428374075106865814072657644667 1

207798325606832295937705061686297930296382338892574900819440*e^(246*I*c) +
1611092541400060525954859375264194178347643471837078201446262435615142944587
33783351358602272984952335843649358604225299560 8*e^(245*I*c) + 97521033944
404931875728231176351778667322317559445794638327926463508504100491730029590
4275433144848532459919875479817581584*e^(244*I*c) + 58474957368230458617938
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0507443058208*e^(242*I*c) + 204325557265186000767402710230847896459761583922
76369823543321283331307778304104007466937901739483676153964908169063081166
5*e^(241*I*c) + 119060591849660546834765693227676449067584148248882678447504
82607723633344451345409512666875005729581119164335690897219144 0*e^(240*I*c
) + 687124660159856415124685861736597477348795917100983546527861249360230739
43141049573606648563005359411712764895683903806088*e^(239*I*c) + 392742004
143298611693979445162250010812274333985850072063992312119071577953597196482
41598754266579840244551491476467899952*e^(238*I*c) + 22231341131801535345406
39903772168684020839794195258013558464596674673665671627155482647628299106
60765649214326143393997 35*e^(237*I*c) + 1246214044053725808492859670987206 6
857757070943124868554500948154756863454308032925408340311237850017814707896
986969086816*e^(236*I*c) + 691783894521484427849333045936139492337233385361
98796373726731849428597124310663457268704220998931248907776780373699881 50*e
^(235*I*c) + 380260499670589110696462063384896480703709885451018226324303 05
972956307603535975319743247522663891931857608782741880134 40*e^(234*I*c) + 2
069698289500860643461665762373807957513019424041178871904960551829412449344
722432125679417958403007551179298315947373776*e^(233*I*c) + 111539828554560
155053332804560018431799389935921799672981834070422180119566741048584699617
905673355851245223858316079251 2*e^(232*I*c) + 595157615500431514947479282 33
654705382792608791642526349718775702941338547183543419824680709621453689544
1388306027237899*e^(231*I*c) + 314409035808225861565595436938354945445473 99
104312972204674722881303092520496850341856681883861186670980704079349536449
6*e^(230*I*c) + 164437500676906892741323260154394278503954561936020133596 58
1806449357240277349447927334517105809995300093549279931273178*e^(229*I*c) +
 851395332347864557795899594649006377607357297056212213800058372083691577946
7304967542879981787543143024633262589963016 0*e^(228*I*c) + 436383000758151
710259462114644656896189657734886609858579456574798540851088518579112229119
898376154526085123560084002 95*e^(227*I*c) + 2214073500170860327091518076924
139166203557875590397914890921360382255479274918351716025557191587535643955
3717130797888*e^(226*I*c) + 111194996453632010808810628248863384924253756 58
4489779355358463492904258215703830904254114185215166703713720452065683 45*e^
(225*I*c) + 5527498849031178355861230009326668283926290082158467118000698 50
271937993904591834422219274214571125702804097407467473 6*e^(224*I*c) + 27195
892834837439260408051010803419212445303112546072509291927739093315232266350
35815672862569296693711643521070331394*e^(223*I*c) + 1324311324984027428355
222938147682378672860708817161741448749689593588020860847508703702325320304
64988312068498755640 0*e^(222*I*c) + 6382188929145337415058063996624885560 66

783600496091876408374974877448971778036074996245581124283460438065182071976
085*e^(221*I*c) + 304384471106813336010284160123906370433888828490627422652
5512369667909161745208577591439301401871734923949819082589 44*e^(220*I*c) +
143657687138044796942947119704259538458881819942351682467458629369105611 9209
866358123637772245409530799230553767222252*e^(219*I*c) + 670917061305296691
250198992100215765802378434622295353862950870761892978499959313606456052921
3096149610670752150643 2*e^(218*I*c) + 310043192060694170770693631414234 8743
182800909818474463567865228417743946494165181256451914491800317410807763484
6014*e^(217*I*c) + 141764836528757049572020133432411179043699777966538 49959
902524421980635189011634815653279605497783382888932766730080*e^(216*I*c) +
641338189585592518475823145106255638032859493851100657701521811978653639021
305728401820220163109443481958402511346 5*e^(215*I*c) + 287049613141231445 18
346747153535894395532944308085319334660862885437092462307691513921806994134
056230172477535329 44*e^(214*I*c) + 127103308293804895020136055483127034 2662
343991277504612342300366025046741742856580445289401786656311685859023084716
*e^(213*I*c) + 556756388711182340341026192734219546113651768317380539005893
67904939471401706369856527272881366905477907720897 7840*e^(212*I*c) + 241246
021282440061792908317783032876194801597133206052091286997043729145345755805
710081489006741839439573984832678*e^(211*I*c) + 103399755467257436489847837
640753754718204394473055795001467604326419876555556873829531737211096115196
005647730480*e^(210*I*c) + 438349721429193776853786922330210637445540331009
285027374804389789767469898957840709519052377834903743059345 42955*e^(209*I*
c) + 183798070840033597660276492176211441160917355722166207888615358034497 0
227380258835907670424184073351343911411324 8*e^(208*I*c) + 762178879191204 70
620388409177993746004288922581943676366829443560966814002463121380017692850
206614459910732494 16*e^(207*I*c) + 312568349317870174347970475030749017 8666
292150720179363604335113528623329684606343185540756019935662148267863968*e^
(206*I*c) + 126759701729481291340014627604212692998648029287019039910755431
1079964227280196522475370108738477856311765699610*e^(205*I*c) + 50832459930
108546016697862968303266142765447408293904809793963839156729879578838943384
2285751054665210868287680*e^(204*I*c) + 201557947424794098026772478462040 88
339586751256293086294375356869008401558559801015478154862523940958190739750
0*e^(203*I*c) + 790191495587665692547839884872323883529091449827471718567 72
463223808993367091503402876467270176124342699654400*e^(202*I*c) + 306275810
542219573783905472892776091295728139310827335202473872260000200435382794687
7670795842089254787012868 0*e^(201*I*c) + 117358569262451184931130910025016 0
403234187698599908282352067224153020018822382639298230219408466753848866560
0*e^(200*I*c) + 444541225929547462506765951419831296601541629996893039334 56
303459141097207405736188849805200100284514969962 10*e^(199*I*c) + 1664475034
387211809394917743502937638978574937754764763987835872410449930690131572904
279995484581013965001440*e^(198*I*c) + 616003116022979584937125701757887212
998354300989991362628038861093914561332071191909714949426587936910303300*e^
(197*I*c) + 225320532593220657767941109289516248999794521015564134982827241
71001967548669449968931246656190721262782000 0*e^(196*I*c) + 814520814138291
118288754175642500548460376933128114804929091607581959891557681070225683509

53861815940704090*e^(195*I*c) + 2909765106124745340664756978183691006216555
98523590528042591541656871254287525623854923737494863517144531 20*e^(194*I*c
) + 10271602530202889002497813516849452590971512809529060665197301097052210
06457608834802323467197546367741 8470*e^(193*I*c) + 358271800216329606141453
67037151098971071982527392845461493431023484561240896574285949464386608597 7
3886240*e^(192*I*c) + 123466804189240997878001808175544021601258247639694 19
37965899631953079203974222138794604328498972144766900*e^(191*I*c) + 4203580
24835146798583611210145942154684437949365647899088372524802156222884839580 0
1168865566428069177 3600*e^(190*I*c) + 14137993825355684328056550580740330 41
30606130725434751745794079833141361748917639986145377066437210546190*e^(189
*I*c) + 469702247271172818264540450180706705225597566275803477845353200149 6
3482632359729444541885102274546002560*e^(188*I*c) + 15413111211486023937294
97082079737671608134478816338654352242193973750796212585498188187916834826 0
330000*e^(187*I*c) + 4995241956279138180205186744401688024388272113921255 66
37349569469275713055331467768987878780596851084 80*e^(186*I*c) + 15987711010
58192692270528999677444742685631006232456185844925220144002305878120380828 4
8398866357482910 0*e^(185*I*c) + 505293663123015258878483025738812813203397 7
66845340065381261016353419722382620393032535960660921950400*e^(184*I*c) + 1
57685845528850918721462877864435090257583149415561323427386562894447598277 9
3562980093923717562514983 0*e^(183*I*c) + 4858425815314028044731483686877213
13901954124190467327784587060150968814370763379107935841224750737 60*e^(182*
I*c) + 147779550966171289987127451820714953621765069731830816502336052740 51
677624970464340242755840025673760*e^(181*I*c) + 443721091784318234776434954
4443904699020056595069470847193617092114714077633077234972825351226979360*e
^(180*I*c) + 131505212093069212210229710532762284233587074342853089107298 35
35862280094446607723473800477453914130*e^(179*I*c) + 38465584208066627445 40
63078784837174998949052500975322162003392549953413592461519365177908682078 4
00*e^(178*I*c) + 111034148797008819443143895644469242295049867464313710969 2
576193388991337992856160200698726117108 50*e^(177*I*c) + 3162664467472554773
11767956875276535713059699859236883921121649155532425732694909089895702485 3
3280*e^(176*I*c) + 888829502875102466704420383760797610148005313441861447 46
207675228248689119598843526664449174040 00*e^(175*I*c) + 246438219080743960 9
07977422685567962936788570977643587663085171625396269619234170623919287872 8
160*e^(174*I*c) + 674025530543133008894845775236625237450743114473544537818
17044713460710257567667605667532896159 0*e^(173*I*c) + 181834661406177901315
33012967714538116644918841319414116934435475492096903495261037894528225760 0
*e^(172*I*c) + 483794897564340998438577918165893794068150426093403787475864
37145781646245422045101230417309900*e^(171*I*c) + 126934969329649205650736 7
36371812800885486825088802553372800650065661386960417973532165845286 40*e^(1
70*I*c) + 328387476055581867672630948030673442015509858394807446901416817 18
744421701096485216275387559 20*e^(169*I*c) + 8375792069234119324587864867653
7353394654523970899076948872481398218916510458989551890925632 0*e^(168*I*c)
+ 210594301385648471184329078880317504953361839954159427434009884661777259 7
525426477091500369 90*e^(167*I*c) + 521909122076618242158122718542697480712 9
284324322789476922969072001054714133413161098963600 0*e^(166*I*c) + 12747219

616503320541356343062562847368601622140856786025445814532037904111523242298
235713300*e^(165*I*c) + 306797429643174736419815962396246367161700641962685
1426148418602934852907379021659761911840*e^(164*I*c) + 72752101071839422929
1774073844694255798738667067535379759732795567942578751384250780476310*e^(1
63*I*c) + 16995632796992976777390209665262925328370450547712754455653441737
6686540936706073847337600*e^(162*I*c) + 39108031255601809476537535369611844
440844903751605645023514572352045248104262933598850730*e^(161*I*c) + 886275
214275695728568134088576490459793534956935532181564772117253715918649147131
1666400*e^(160*I*c) + 19777929806658181356513000943262391586054488708069708
60577325385028609983034534672318500*e^(159*I*c) + 4345466767802800453463444
98763892540797175105756827515509297024187660299345484920192480*e^(158*I*c)
+ 9398691531306817914908360606568148278083606051053015461848694983946713137
8859885998210*e^(157*I*c) + 20008006803030047137293278250321597113540716201
983333126349281186679153199068045257216*e^(156*I*c) + 419154250065682614809
3339414544159143964478472492315931809171859902114109005939942952*e^(155*I*c
) + 86397993362233034955629682002839551319870806494050570212606865293680079
4826651264256*e^(154*I*c) + 17519317050061830024151563238191228515779009781
6049220671217212220015297133400636060*e^(153*I*c) + 34941071613276704649477
943043339450201504075335160361865916029213860778606230624960*e^(152*I*c) +
685299322314573668732888531161779543559294084143986635107965565231289472197
2796266*e^(151*I*c) + 13214980552713008514299938666316198744245344251881835
92049727687571032156435077280*e^(150*I*c) + 2505010286089283324693404568299
02067712233644464602753159945727868485722395506952*e^(149*I*c) + 4666822354
8266017806854592468100570289355960869613650856575756758180182223308768*e^(1
48*I*c) + 85430134411262123348335406650696214724790858380413605645507220367
23654297540205*e^(147*I*c) + 1536333238444927583532734556016494671674916578
907116984548489078241693926940560*e^(146*I*c) + 271361207503266570734486517
077181014801775322183181055638619257836143271472358*e^(145*I*c) + 470650446
11135158108487353367484243102698248838312635876283099427442745866704*e^(144
*I*c) + 8013729580790752434361964945761543761469520791210746972675870481058
674277844*e^(143*I*c) + 133921437425424555356488440680194535338500025403065
5765953770237607180089968*e^(142*I*c) + 21960128133951556150026147884419002
4870555261281946058839614044697037963695*e^(141*I*c) + 35324447206779018115
378052820789411687581004582367431006205879633729015200*e^(140*I*c) + 557255
11573286711210106216416307596161861955969011697222340926210112854418*e^(139*
I*c) + 86188485109499190876424680547467242860375731548445397471361281221542
8992*e^(138*I*c) + 13065766022656041933512143438993896188459543406998482430
7149332131747540*e^(137*I*c) + 19407979215594566593535008103303255257745408
070082431338945184797463936*e^(136*I*c) + 282390515193658667838252570656445
7280290098698638597987628380245881715*e^(135*I*c) + 40234969226612115893400
3582839428785116904903936409545602519219664720*e^(134*I*c) + 56117081076341
175384087570185188538660375932013674735519055227368366*e^(133*I*c) + 765901
0520187549651777118357676871927081898989131125755798204236112*e^(132*I*c) +
1022536437468296737293065862705246449693687415559865844306888705423*e^(131
*I*c) + 133490210052026183779673313868332303530332906163247194627808410304*

e^(130*I*c) + 17033886027390615741040977721655541665612162275485028584310890417*e^(129*I*c) + 2123702969188871318266718781223927067839949015727293884065388080*e^(128*I*c) + 258585348715977270155829115684193411072034541491364393985491350*e^(127*I*c) + 30736217404321009965231037419663053962881035281709221697785072*e^(126*I*c) + 356476489062872401708848799668817892919578761395854547480484 5*e^(125*I*c) + 403212225957798188840846139960995624144491271694336796459584*e^(124*I*c) + 44456708175258821024400946210535004523775722190977468484496*e^(123*I*c) + 477539860710085326353420773381826677747869341273873103168 0*e^(122*I*c) + 499467506558531733671585862910572702811545035730398749530*e^(121*I*c) + 5083636950817109943701934861084739194673618510801718 3136*e^(120*I*c) + 503202490340145182407421394376601192202650700631198275 3*e^(119*I*c) + 4840934102404887186559170253036625810916591261823445 28*e^(118*I*c) + 452309400398307383320256947846462068448548276980757 36*e^(117*I*c) + 410154543993719579395995670844249670943380026122488 0*e^(116*I*c) + 36068861303638934941380978000455996354877542332525 5*e^(115*I*c) + 30735366512830562160991166338490057308062762518496*e^(114*I*c) + 25356674606502797768345615661865912131092516428 59*e^(113*I*c) + 2023475097244621713139666435802340785081798383 20*e^(112*I*c) + 1560391127768760709972162377174493308692058727 2*e^(111*I*c) + 116158141373397175153362251190904691718876840 0*e^(110*I*c) + 833808399118378944531363036737850390515068 05*e^(109*I*c) + 5764601046563151304213854710715346838447392*e^(108*I*c) + 383360155801054824529764688213114368047154*e^(107*I*c) + 24489837337812338687718622491865013839488*e^(106*I*c) + 15006027479373972864055778187226915393 92*e^(105*I*c) + 8805492759894141114586995081338804025 6*e^(104*I*c) + 4939666610818025798809586352543471345*e^(103*I*c) + 264410375780310742518099326419685040*e^(102*I*c) + 1347722779952470195657927421039532 6*e^(101*I*c) + 652650253343206047453620559993840*e^(100*I*c) + 29952547749265499675257842032197*e^(99*I*c) + 1299146645993240318167826532288*e^(98*I*c) + 53090127264630963470039804475*e^(97*I*c) + 2037031259470368160131922320*e^(96*I*c) + 73099207817335597247098038*e^(95*I*c) + 2442455629894502983849104*e^(94*I*c) + 75599817092670157806639*e^(93*I*c) + 2154864144781257856128*e^(92*I*c) + 56169444526926562260*e^(91*I*c) + 1327882849274858880*e^(90*I*c) + 28186192554792138*e^(89*I*c) + 530563624556832*e^(88*I*c) + 8718181624155*e^(87*I*c) + 122503723056*e^(86*I*c) + 1431118260*e^(85*I*c) + 13343760*e^(84*I*c) + 93096*e^(83*I*c) + 432*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) + 7*(-3718*I*a*e^(1055/2*I*c) - 1502072*I*a*e^(1053/2*I*c) - 302667508*I*a*e^(1051/2*I*c) - 40557446072*I*a*e^(1049/2*I*c) - 4065883968718*I*a*e^(1047/2*I*c) - 325270717497440*I*a*e^(1045/2*I*c) - 21630502713590407*I*a*e^(1043/2*I*c) - 1229848582862122028*I*a*e^(1041/2*I*c) - 61031235925186078942*I*a*e^(1039/2*I*c) - 2685374380786193144783*I*a*e^(1037/2*I*c) - 106072288048110242178847*I*a*e^(1035/2*I*c) - 3799316499692185181122010*I*a*e^(1033/2*I*c) - 124427615396355739905346318*I*a*e^(1031/2*I*c) - 3751971173605702746328148447*I*a*e^(1029/2*I*c) - 104787194996399169411032876338*I*a*e^(1027/2*I*c) - 2724467073052261042519716192524*I*a*e^(1025/2*I*c) - 66238605830373986929763608958656*I*a*e^(1023/2*I*c) - 1511798772310987071825034633753982*I*a*e^(1021/2*I*c) - 3250367372708464039374

5736284624870*I*a*e^(1019/2*I*c) - 66033779606622307975966054299242200*I*a
*e^(1017/2*I*c) - 12711502667519783895793526074473028922*I*a*e^(1015/2*I*c)
 - 232438908235205496318447910669140546906*I*a*e^(1013/2*I*c) - 40465501381
36102762173994148249330760039*I*a*e^(1011/2*I*c) - 672079208644143772696713
08107198146913908*I*a*e^(1009/2*I*c) - 106692576807455129582881800556344121
0737450*I*a*e^(1007/2*I*c) - 16217272150903922938701499630023289700137263*I
*a*e^(1005/2*I*c) - 236397937497882482710239205369322834941776795*I*a*e^(10
03/2*I*c) - 3309571280975022580464977398526908985926399572*I*a*e^(1001/2*I*
c) - 44561015944582807131288351508188541688368025238*I*a*e^(999/2*I*c) - 57
7756662739414343075056408130898651215560673415*I*a*e^(997/2*I*c) - 72219589
33791063354338252758241260927009958649153*I*a*e^(995/2*I*c) - 8712944961972
0167774738382114174206125338079715514*I*a*e^(993/2*I*c) - 10156027827667569
61606511195529506434692326161772148*I*a*e^(991/2*I*c) - 1144861503379709196
3830678407271581987220664774793965*I*a*e^(989/2*I*c) - 12492461764824963085
4756820327923512635952856544140745*I*a*e^(987/2*I*c) - 13206319777820792138
55125832510824438184906553225344870*I*a*e^(985/2*I*c) - 1353648149484655119
1615296983753871336900108337339193172*I*a*e^(983/2*I*c) - 13463315706018250
6966654568330522152247118398756303435361*I*a*e^(981/2*I*c) - 13002733575778
78235630889983970871898843384241082917039402*I*a*e^(979/2*I*c) - 1220257084
6936266971537615599091003952667395073528912708550*I*a*e^(977/2*I*c) - 11134
8517556517214393482430347520024901285561594013324999952*I*a*e^(975/2*I*c) -
 988558176286135607113625950318361683964799348363993276036638*I*a*e^(973/2*
I*c) - 8543973172918851719756469222929408444037078724153454872120390*I*a*e^
(971/2*I*c) - 7192839149776427713448991220281034099272124959254612166822543
2*I*a*e^(969/2*I*c) - 59014031783678345158240084114054772902359501968016523
1818378300*I*a*e^(967/2*I*c) - 47211276982847511798865587536612064531103445
69457416745986959922*I*a*e^(965/2*I*c) - 3684536883691245223855750548794910
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^(487/2*I*c) + 466822963677192661817331692307767055928258847749833780466192188737545805803679028894427817375583837205119809040687012935*I*a*e^(485/2*I*c) + 295836191977555337516502759047146340088063683853123342002123301118180522953314880146816183888113061523938713872940614049*I*a*e^(483/2*I*c) + 185633805219350815197506350903977557107252277227219361709459901437719214218026047853241796305910447871730808241890424442*I*a*e^(481/2*I*c) + 115331633399545294784116715872366046039996439419217339810253656785321781700967045714777723718363358804096119332434747204*I*a*e^(479/2*I*c) + 70942172862561164058160179868818732419788734739752023491932850774923156332944622492598440157306713277485913625566923405*I*a*e^(477/2*I*c) + 43202050357851481166487014480064062972447184469570109898781666839150161921519823032876311654002974726935391777697053449*I*a*e^(475/2*I*c) + 26045177287912241176067222920901853851313554636809138208225364272427146197041803852090395533633595587669906282640335206*I*a*e^(473/2*I*c) + 15543639159508751019062182299258908799569819876132985160704675357166344312257501069237830360698174149396040851872785700*I*a*e^(471/2*I*c) + 9182478844644152792789990874629586776827818503877874267474333149197309164002316988444567545080601139568783596754328769*I*a*e^(469/2*I*c) + 5369433703713650579657543421925621273779896095493124094058368897075192179929265569591470701092735447407195008016032850*I*a*e^(467/2*I*c) + 3107691289092245086594223914288496405389912389910983836087828161704430807791962044864438637368112933607786892490134694*I*a*e^(465/2*I*c) + 1780195287370357324046533363473674962784595946909397017548451036643167283461157097955927272971697034280841666570691552*I*a*e^(463/2*I*c) + 1009246808215446773786470351065504168479007663131458451632962527621336116095194061192741636596970745081763545649524358*I*a*e^(461/2*I*c) + 566247967747539203316452281620817272281666307082660014096267849457251167177487374739068973058719778175038716340060846*I*a*e^(459/2*I*c) + 314394559945691969426730118914299243777370900558133083240266421794715966982810304291470328806778764207633221621542600*I*a*e^(457/2*I*c) + 172735664884456033063606016692856749426128644694123118126741869894500269515702878867401279635331386515415677529225100*I*a*e^(455/2*I*c) + 93908980208956081110791543951772985370600517586262249095832986389557258513757169577939649993369495960643164181810586*I*a*e^(453/2*I*c) + 50516095571770273670680658730054460527763259356319978317789374345400938440125042061448809087158872073418586148121473*I*a*e^(451/2*I*c) + 26886193720919073370988929546745045319078132873757042641225271946983029782743313786423870951765027326861300318178642*I*a*e^(449/2*I*c) + 14157449655540836037828005969786800176631864151856876634713547605341520538812026850026666968584541575064351905970774*I*a*e^(447/2*I*c) + 7375237914096075753162757165114932907142763715319826841589592004329773561580320189977859708165438687906157904775921*I*a*e^(445/2*I*c) + 3800855643399505520069453594410972028098868410346248575837746476106755638552361174314174233599317030879593032072609*I*a*e^(443/2*I*c) + 1937670525270251509451678468483387984129872967538542952639048449569636581336018975500784323892713878389595738475570*I*a*e^(441/2*I*c) + 977125696367158781879935803084928183110588096954532024018846643158415313905036398953539486071073924163775202836156*I*a*e^(439/2*I*c) + 487384184545517828048292377274889764

924631864066054597518560594306296038854621408587615306610365269386295410913
209*I*a*e^(437/2*I*c) + 240448066444268276150657582600282806736882299475006
92977386764027808220947638519883281618632553473394593105473671 6*I*a*e^(435/
2*I*c) + 117321649413688805541489535769494623870692198518938820841919455374
9465160307432733514887547024680324066990779527 54*I*a*e^(433/2*I*c) + 566134
964506713070924629978112007703878668613634184664482274913284090412872330960
946076701585918429952123157808 16*I*a*e^(431/2*I*c) + 2701621072515344146131
402425368020110690494127021479232055469033618750854315350522823645075427649
5512692743900280*I*a*e^(429/2*I*c) + 127487900594545700949445753568911833 06
355672515080113302539504189301580044931131951492677371440091923947401124164
*I*a*e^(427/2*I*c) + 594881887451755154647732399814599054530375204610055390
687135952509139436529055201539527556940248039490325398146 6*I*a*e^(425/2*I*c
) + 274464792210396745066535152891244533850843173453297733925892435463241 84
137557140661267625948167645345779436600 24*I*a*e^(423/2*I*c) + 1252025659809
341407225419006492626474816512541093036664002973216176119522637183550660057
342417535420038395747756*I*a*e^(421/2*I*c) + 5646596581438170762044322139 44
725285346043737598644238824183882546233010176533216691973768066147098418777
561124*I*a*e^(419/2*I*c) + 2517579247104576529840431568873409877774997658 44
068808649192255015133673742362290431699054972850328850024201000*I*a*e^(417/
2*I*c) + 110962940683089939119784926809098350196267205293097933934506361993
4366713670928774398984623381132256232091686 60*I*a*e^(415/2*I*c) + 483444222
719571672115283780376316317858047715234526783830382249238165252080018836178
909560285715174123002573 80*I*a*e^(413/2*I*c) + 2081916009657441298952351526
902094940934436381403124863224816590166089265933322581676907490783064713110
6973820*I*a*e^(411/2*I*c) + 8861410362893548513378543661666922979212879162 5
468553689430211225725172169527153225794607986977485417833616 40*I*a*e^(409/2
*I*c) + 3727685690743909795581760930725419308750587813165730468793831046647
1317961212809522421023086342804986129105 00*I*a*e^(407/2*I*c) + 154969439176
876112859296706362143095821677931109206307000795601115272064011371678113908
303298467677428704522 0*I*a*e^(405/2*I*c) + 6366434300683097077968230787104 7
283430709842994913413062564401278355421062181433392867579320727100311006117
0*I*a*e^(403/2*I*c) + 25844164954447508105108617067262460235318095770556449
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 1036613634386302978611085100021449663947095828207642709799823773144376222 0
575484163036015266130276451462706 0*I*a*e^(399/2*I*c) + 4108006470987728373 4
887584286870615187909186938494335754863409747746758750561170745510692753019
453256230130*I*a*e^(397/2*I*c) + 1608333862845013203592048799562408252551 67
148168145758179005156485766154668077621070006858276768766150470 90*I*a*e^(39
5/2*I*c) + 6220463245033442486970965431823733752822029473563015032522697711
385753292200817503166820643981171972227740*I*a*e^(393/2*I*c) + 237651562626
525439152900401728989412156753196374638996570170926255037566888287901191239
3122776372223417220*I*a*e^(391/2*I*c) + 89680795103511447814058492212920166
64142568920540244247793212952782701566318527057628719142722919038415 70*I*a*
e^(389/2*I*c) + 334247263529532786787967963944018153390895299080625650162 62
5033301387415089670209519217032467321603326080*I*a*e^(387/2*I*c) + 12303086

815692272305679075836631831047214060472197947425229713527282252993132636810
8994384850189269222320*I*a*e^(385/2*I*c) + 447203996229481968238739971898645
500160905696730195693098411725777718941421992979705222237696090447011160*I*
a*e^(383/2*I*c) + 160512736936774650149178398393766191845774391311876711661
3908497908985843009689435296011522630896577076O*I*a*e^(381/2*I*c) + 5688421
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636435864135629276280*I*a*e^(379/2*I*c) + 199029717646465954833239130033434
784206990857842383267953420387636772343309244076609945092229407709068O*I*a*
e^(377/2*I*c) + 687468451828804461383475161107226172541378472469340108548455
3628584356757564117582602376376619756273900*I*a*e^(375/2*I*c) + 23440145177
1836384905885411514199002779892609861347882287443973824302713590379994139571
196743269525200*I*a*e^(373/2*I*c) + 788866885356930177297637238699696087295
78477562178100186251707803654595227995531245155841610652335370*I*a*e^(371/
2*I*c) + 262026661413661375338099973457430738047247625045775712054342620577
865059821687785945889988438430641 60*I*a*e^(369/2*I*c) + 858909024593856905 7
2054968945373811217365568059933994220699944125861136507158965548795185655 45
033500*I*a*e^(367/2*I*c) + 277823843403015038991200428997889236893953745348
6552521474417159987795798634573042959267684684956330*I*a*e^(365/2*I*c) + 88
669118294726958970476865059787128995449404848479690905773574060752253415308
699408885709991030749 0*I*a*e^(363/2*I*c) + 2791995661876077347993984326338 5
51708739118104211637242680104530940504540300828674775010637995857 60*I*a*e^(
361/2*I*c) + 867270492914981311948002649555955510933975288970545515623372 32
22971000391959992546219664841634042 0*I*a*e^(359/2*I*c) + 265735099311760349
6186701315441157317451982694633064657274027562305829111844727537538243744 76
50250*I*a*e^(357/2*I*c) + 803070782591103975090175005660880931482571278326 2
6468507886202955617198664261387148110181716071 90*I*a*e^(355/2*I*c) + 239344
95693112363809057812170710904525842778999381544232962644506953113291607306 4
4154303696630780*I*a*e^(353/2*I*c) + 703419195877349272531000174934492153 3
07617036888805486546054730754380850708567814491963769984 00*I*a*e^(351/2*I*c
) + 2038339172494790103489692111623492350421219469119722088673185810541223 9
46965046600303202801307 50*I*a*e^(349/2*I*c) + 5823212841513982124122237392 4
89397976319502585987471058025816607404370962195102151099211024767 0*I*a*e^(3
47/2*I*c) + 1639922601368913497298942996203406384160694513796789627031679 09
958581199795545507992572818052 20*I*a*e^(345/2*I*c) + 455205798219961954027 9
66989161116897266451246992227330435029563064906844994766165485985152064 0*I*
a*e^(343/2*I*c) + 1245271284565916890986163112110928054968065630101571542 97
643935484821202013924974417238619119 0*I*a*e^(341/2*I*c) + 3356901627452344 0
689722952306357800187992714315613796580609367280150561989873665145003393808
0*I*a*e^(339/2*I*c) + 891614354024715746833105670830055000797948846843614 21
770824844212210441358440351257958080020*I*a*e^(337/2*I*c) + 233304558129349
1910978826971454644283908372281478095052979676445878280533632029051609278 30
80*I*a*e^(335/2*I*c) + 601339340351409082550343975633802324824311347262100 4
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807650852823638884657007690227993556 0*I*a*e^(329/2*I*c) + 9393166846586109 7
29576766939719397834812279377975807203353276241109935505274496474607672 0*I*
a*e^(327/2*I*c) + 22761620701415099882494286205736390708863914410390369574 4
311032521892399941563646388002 40*I*a*e^(325/2*I*c) + 542916727542397241437 0
1181381514260611355609616962500859136018941147702648328555617325 10*I*a*e^(3
23/2*I*c) + 127448496163639347102604757977951048480001088144145292270612281
1798463818843113785401980*I*a*e^(321/2*I*c) + 2944003577142698726124009086 1
331027791142352406441607584926398059657246046789310155178 0*I*a*e^(319/2*I*c
) + 669071902831193884595171435748124316860228470548780888704206943456894 35
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2*I*c) + 3158387903014139545897850788312701084074960560385276314437246690 58
1338141139291150 0*I*a*e^(307/2*I*c) + 6485865431691803112160646709240463402
5719928003705978242914370726231683912710676 12*I*a*e^(305/2*I*c) + 130870052
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5148843639870850445567092*I*a*e^(301/2*I*c) + 5050461890156366422569498902 0
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14006136853589089587942200*I*a*e^(295/2*I*c) + 33380444841812354407431172 17
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73253923893461450646519779455978230548381037422207922523835827754698108 52*I
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4029479060130343273430382098603478677010682*I*a*e^(287/2*I*c) + 31729021076
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/2*I*c) + 530338104081943022133966528235334710451708839659465040405780057 64
694599600*I*a*e^(283/2*I*c) + 868653017859292125478617485640182306852250101
1656089237471028876240107552*I*a*e^(281/2*I*c) + 139382114454752543408039 01
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7/2*I*c) + 336965287116246797297799000938287246006592298365911951331998880 4
6174281*I*a*e^(275/2*I*c) + 507360956426058871091645301670256403257182961 85
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616476736656427902161924019977453841 78*I*a*e^(271/2*I*c) + 1076738842851268
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267/2*I*c) + 20873553431310800483666932530451017660181981017813066706220177
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 854397317291885171975646922292940844403707872415345487212039 0*I*a*e^(253/2
*I*c) + 988558176286135607113625950318361683964799348363993276036638*I*a*e^
(251/2*I*c) + 111348517556517214393482430347520024901285561594013324999952*
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0664774793965*I*a*e^(235/2*I*c) + 1015602782766756961606511195529506434692 3
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9715514*I*a*e^(231/2*I*c) + 7221958933791063354338252758241260927009958649 1
53*I*a*e^(229/2*I*c) + 577756662739414343075056408130898651215560673415*I*a
*e^(227/2*I*c) + 445610159445828071312883515081885416883680 25238*I*a*e^(225
/2*I*c) + 330957128097502258046497739852690898592639957 2*I*a*e^(223/2*I*c)
+ 236397937497882482710239205369322834941776795*I*a*e^(221/2*I*c) + 1621727
215090392293870149963002328970013726 3*I*a*e^(219/2*I*c) + 10669257680745512
958288180055634412107374 50*I*a*e^(217/2*I*c) + 672079208644143772696713081 0
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I*a*e^(213/2*I*c) + 23243890823520549631844791066914054690 6*I*a*e^(211/2*I*
c) + 12711502667519783895793526074473028922*I*a*e^(209/2*I*c) + 66033779606
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I*c) + 662386058303739869297636089586 56*I*a*e^(201/2*I*c) + 272446707305226
104251971619252 4*I*a*e^(199/2*I*c) + 10478719499639916941103287633 8*I*a*e^(
197/2*I*c) + 3751971173605702746328148447*I*a*e^(195/2*I*c) + 1244276153963
55739905346318*I*a*e^(193/2*I*c) + 37993164996921851811220 10*I*a*e^(191/2*I
*c) + 106072288048110242178847*I*a*e^(189/2*I*c) + 2685374380786193144783*I
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2028*I*a*e^(183/2*I*c) + 21630502713590407*I*a*e^(181/2*I*c) + 325270717497
440*I*a*e^(179/2*I*c) + 4065883968718*I*a*e^(177/2*I*c) + 40557446072*I*a*e
^(175/2*I*c) + 302667508*I*a*e^(173/2*I*c) + 1502072*I*a*e^(171/2*I*c) + 37
18*I*a*e^(169/2*I*c))/(e^(531*I*c) + 432*e^(530*I*c) + 93096*e^(529*I*c) +
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871818162 4155*e^(525*I*c) + 530563624556832*e^(524*I*c) + 28186192554792138
*e^(523*I*c) + 1327882849274858880*e^(522*I*c) + 56169444526926562260*e^(52
1*I*c) + 2154864144781257856128*e^(520*I*c) + 75599817092670157806639*e^(51
9*I*c) + 2442455629894502983849104*e^(518*I*c) + 73099207817335597247098038
*e^(517*I*c) + 2037031259470368160131922320*e^(516*I*c) + 530901272646309 63
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*c) + 28239051519365866783825257065644572802900986986385979876283802458817 1
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 + 2196012813395155615002614788441900248705552612819460588396140446970379 63
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3367484243102698248838312635876283099427442745866704*e^(468*I*c) + 27136120
75032665707344865170771810148017753221831810556386192578361432714723 58*e^(4

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*c) + 175193170500618300241515632381912285157790097816049220671217212220015
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) + 200080068030300471372932782503215971135407162019833331263492811866791 53
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*I*c) + 483794897564340998438577918165893794068150426093403787475864371457 8
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) + 674025530543133008894845775236625237450743114473544537818170447134607 10
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+ 888829502875102466704420383760797610148005313441861447462076752282486891 1
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+ 111034148797008819443143895644469242295049867464313710969257619338899133 7
9928561602006987261171085 0*e^(435*I*c) + 384655842080666274454063078784837 1

74998949052500975322162003392549953413592461519365177908682078400*e^(434*I*c) + 1315052120930692122102297105327622842335870743428530891072983535862280094446607723473800477453914130*e^(433*I*c) + 4437210917843182347764349544443904699020056595069470847193617092114714077633077234972825351226979360*e^(432*I*c) + 14777955096617128998712745182071495362176506973183081650233605274051677624970464340242755840025673760*e^(431*I*c) + 48584258153140280447314836868772131390195412419046732778458706015096881437076337910793584122475073760*e^(430*I*c) + 157685845528850918721462877864435090257583149415561323427386562894447598277935629800939237175625149830*e^(429*I*c) + 505293663123015258878483025738812813203397766845340065381261016353419722382620393032535960660921950400*e^(428*I*c) + 1598771101058192692270528999677444742685631006232456185844925220144002305878120380828483988663574829100*e^(427*I*c) + 4995241956279138180205186744401688024388272113921255663734956946927571305533146776898787878059685108480*e^(426*I*c) + 15413111211486023937294970820797376716081344788163386543522421939737507962125854981881879168348260330000*e^(425*I*c) + 46970224727117281826454045018070670522559756627580347784535320014963482632359729444541885102274546002560*e^(424*I*c) + 141379938253556843280565505807403304130606130725434751745794079833141361748917639986145377066437210546190*e^(423*I*c) + 420358024835146798583611210145942154684437949365647899088372524802156222884839580011688655664280691773600*e^(422*I*c) + 1234668041892409978780018081755440216012582476396941937965899631953079203974222138794604328498972144766900*e^(421*I*c) + 3582718002163296061414536703715109897107198252739284546149343102348456124089657428594946438660859773886240*e^(420*I*c) + 10271602530202889002497813516849452590971512809529060665197301097052210064576088348023234671975463677418470*e^(419*I*c) + 29097651061247453406647569781836910062165559852359052804259154165687125428752562385492373749486351714453120*e^(418*I*c) + 81452081413829111828875417564250054846037693312811480492909160758195989155768107022568350953861815940704090*e^(417*I*c) + 225320532593220657767941109289516248999794521015564134982827241710019675486694499689312466561907212627820000*e^(416*I*c) + 616003116022979584937125701757887212998354300989991362628038861093914561332071191909714949426587936910303300*e^(415*I*c) + 1664475034387211809394917743502937638978574937754764763987835872410449930690131572904279995484581013965001440*e^(414*I*c) + 4445412259295474625067659514198312966015416299968930393345630345914109720740573618884980520010028451496996210*e^(413*I*c) + 11735856926245118493113091002501604032341876985999082823520672241530200188223826392982302194084667538488665600*e^(412*I*c) + 30627581054221957378390547289277609129572813931082733520247387226000020043538279468776707958420892547870128680*e^(411*I*c) + 79019149558766569254783988487232388352909144982747171856772463223808993367091503402876467270176124342699654400*e^(410*I*c) + 201557947424794098026772478462040883395867512562930862943753568690084015585598010154781548625239409581907397500*e^(409*I*c) + 508324599301085460166978629683032661427654474082939048097939638391567298795788389433842285751054665210868287680*e^(408*I*c) + 1267597017294812913400146276042126929986480292870190399107554311079964227280196522475370108738477856311765699610*e^(407*I*c) + 31256834931787017434797047503

07490178666292150720179363604335113528623329684606343185540756019935662148267863968*e^(406*I*c) + 76217887919120470620388409177993746004288922581943676366829443560966814002463121380017692850206614459910732494 16*e^(405*I*c) + 18379807084003359766027649217621144116091735572216620788861535803449702273802588359076704241840733513439114113248*e^(404*I*c) + 43834972142919377685378692233021063744554033100928502737480438978976746989895784070951905237783490374305934542955*e^(403*I*c) + 10339975546725743648984783764075375471820439447305579500146760432641987655555687382953173721109611519600564773048 0*e^(402*I*c) + 24124602128244006179290831778303287619480159713320605209128699704372914534575580571008148900674183943957398483267 8*e^(401*I*c) + 55675638871118234034102619273421954611365176831738053900589367904939471401706369856527272881366905477907720897784 0*e^(400*I*c) + 12710330829380489502013605548312703426623439912775046123423003660250467417428565804452894017866563116858590 23084716*e^(399*I*c) + 28704961314123144518346747153535894395532944308085319334660862885437092462307691513921806994134056230172477535329 44*e^(398*I*c) + 64133818958559251847582314510625563803285949385110065770152181197865363902130572840182022016310944348195840251134 65*e^(397*I*c) + 14176483652875704957202013343241117904369977796653849959902524421980635189011634815653279605497783382888932766730080*e^(396*I*c) + 3100431920606941707706936314142348743182800909818474463567865228417743946494165181256451914491800317410807763484 6014*e^(395*I*c) + 67091706130529669125019899210021576580237843462229535386295087076189297849995931360645605292130961496106707521506432*e^(394*I*c) + 14365768713804479694294711970425953845881819942351682467458629369105611920986635812363777224540953079923055376722225 2*e^(393*I*c) + 30438447110681333601028416012390637043388882849062742265255123696679091617452085775914393014018717349239498190825894 4*e^(392*I*c) + 63821889291453374150580639966248855606678360049609187640837497487744897177803607499624558112428346043806518207 1976085*e^(391*I*c) + 13243113249840274283552229381476823786728607088171617414487496895935880208608475087037023253203046498831206849875564 00*e^(390*I*c) + 27195892834837439260408051010803419212445303112546072509291927739093315232266350358156728625692966937116435210703313 94*e^(389*I*c) + 55274988490311783558612300093266682839262900821584671180006985027193799390459183442221927421457112570280409740746747 36*e^(388*I*c) + 11119499645363201080881062824886338492425375658448977935535846349290425821570383090425411418521516670371372045206568345*e^(387*I*c) + 22140735001708603270915180769241391662035578755903979148909213603822554792749183517160255571915875356439553717130797888*e^(386*I*c) + 43638300075815171025946211464465689618965773488660985857945657479854085108851857911222911989837615452608512356008400295*e^(385*I*c) + 85139533234786455779589959464900637760735729705621221380005837208369157794673049675428799817875431430246332625899630160*e^(384*I*c) + 16443750067690689274132326015439427850395456193602013359658180644935724027734944792733451710580999530009354927993127317 8*e^(383*I*c) + 31440903580822586156559543693835494544547399104312972204674722881303092520496850341856681883861186670980704079349536449 6*e^(382*I*c) + 59515761550043151494747928233654705382792608791642526349718775702941338547183543419824680709621453689544138830602723789 9*e^^

(381*I*c) + 1115398285545601550533328045600184317993899359217996729818340704221801195667410485846996179056733558512452238583160792512*e^(380*I*c) + 2069698289500860643461665762373807957513019424041178871904960551829412449344722432125679417958403007551179298315947373776*e^(379*I*c) + 38026049967058911069646206338489648070370988545101822632430305972956307603535975319743247522663891931857608782741880134440*e^(378*I*c) + 691783894521484427849333045936139492337233385361987963737267318494285971243106634572687042209989312489077767803736998815 0*e^(377*I*c) + 1246214044053725808492859670987206685775707094312486855450094815475686345430803292540834031123785001781470789698696908 6816*e^(376*I*c) + 22231341131801535345406399037721686840208397941952580135584645966746736656716271554826476282991066076564921432614339399735*e^(375*I*c) + 3927420041432986116939794451622500108122743339858500720639923121190715779535971964824159875426657984024455149147646789995 2*e^(374*I*c) + 687124660159856415124685861736597477348795917100983546527861249360230739431410495736066485630053594117127648956839038060 88*e^(373*I*c) + 119060591849660546834765693227676449067584148248882678447504826077236333444513454095126668750057295811191643356908972191440*e^(372*I*c) + 20432555726518600076740271023084789645976158392276369823543321283331307778304104007466937901739483676153964908169063081166 5*e^(371*I*c) + 34731005381093529041945556055595731412956921073574598323436965997641337477407800017307007524865452491717912895050744305820 8*e^(370*I*c) + 584749573682304586179384628844883327581498969886540380378896767999075614964007174600811092945356635118795824799369716742109*e^(369*I*c) + 97521033944404931875728231176351778667322317559445794638327926463508504100491730029590427543314484853245991987547981758158 4*e^(368*I*c) + 161109254140006052595485937526419417834764347183707820144626243561514294458733783351358602272984952335843649358604225299560 8*e^(367*I*c) + 26366624104307993404475222847782442837407510686581407265764466712077983256068322959377050616862979302963823388925749008194 40*e^(366*I*c) + 427482690772059175252671133682087150084434564792238547153435933360618957183244464136413289310866357620513387067215626416411 5*e^(365*I*c) + 686642533751866826266269375090895696573292457814218163062215780289988087468155103113631406419994860400152989456623523859708 8*e^(364*I*c) + 109272106034735448102797923478445360745888968062300411100895447316058631461041817390394266748554534660974023306883318456023 02*e^(363*I*c) + 1722950282436764733440072199841759670394865739473880520939163659737038057239896471508009536681832202915219363586978409533376 0*e^(362*I*c) + 26917794701086615097890120236890501105146799996021775195710866226228638984703456832694153230611607263444183501026198563419616*e^(361*I*c) + 416704403753905436434182193422717480400350714901190805852815224981888183759069003687012345313046331634463199451301964769136 00*e^(360*I*c) + 63923019433761989090614801288635098123199445102303122616544648208998767803944455777042886552738499747183713136069104651812215*e^(359*I*c) + 97173055024742680058616722461368892661141295540263493013032746083536157324268333390400308958318370219154887169702257444756176*e^(358*I*c) + 146390448456351181218237382740374124191664819997746988076598391862733629670142241546375533903130605297580105675355629160198162*e^(357*I*c) + 218563166659649312247483640956272149212499 11

5383828771029654283363972585118090479413696638108156385244646591328454425745117584*e^(356*I*c) + 323413178014841003714151138246079152576360976035058457890409937738723171537036573043681997163745313602400139153046673668433091*e^(355*I*c) + 474323043563100542377338629931966248129175976982332446018056009391154020438895903140822967769494019446166779954024655344116288*e^(354*I*c) + 689518449328793559903260418149974190253578340058895035589606468244680591556118170304005037563669880057908765898949268614772285*e^(353*I*c) + 993555653649521127226443960820233649386488510081892545866700444096661582790441241830855609577062039555625090943332264901780720*e^(352*I*c) + 141916448142217657385823401389899962882232233309573730716310743838935832201454293617293175086458389621425307051750612129761498*e^(351*I*c) + 2009496110092687738152782085683737222727968824299058739215446083499351467625334449670757764066690656150949014944043994822823920*e^(350*I*c) + 2820819298562215959107529807289628449621386798989436369393116069894018781201000275633104498398959346631795568022519974400130281*e^(349*I*c) + 3925697658415778352768103942856011840211642769621717217996614398473887186074391482638547212826538270453912634540299792270321024*e^(348*I*c) + 5416662804052436349585595982818357953866258461644354018205158917742576425344364964596750653177677803492186817305171175032011500*e^(347*I*c) + 7410372612891152224364633296128043971657193280327754304382235672773781403023814127610355562505271969045177704726054907145784960*e^(346*I*c) + 10052209524369581827588154985345549678031445744499985208259385435609740272400301454246872041775159838468077381562338745636398374*e^(345*I*c) + 13521230411945436915558854706851796541567399811656870021567352975326815467817846533289123871696056195231696146162720992221760992*e^(344*I*c) + 18035327338177455471177568594851682977978346449777193572087688510392426884519272991560851326393852241961470040819793627127923997*e^(343*I*c) + 23856398565562802030695278174212640833282154174006459458292644060947924907313735921561690153939906017518647182491616573724049744*e^(342*I*c) + 31295263688189838313772775873307260334117227258629501992358695636092662866062819845689064235813622974150120668921391878398978380*e^(341*I*c) + 40715988963701918950020348336736423420513311359010485246919074652883393970805374470830156229705647312265477584256027212762941040*e^(340*I*c) + 52539223346740771142587092370257069536060319644439501667610482767955800276052892432152798814607975110366224945081428121888473324*e^(339*I*c) + 67244087969080703823703257199663047606890610482090494619492802935130215979819469966383336788693900139115594646893784095418472336*e^(338*I*c) + 85368118430215312848231291739673735887746201851666299600392199418764750086828198719872744047767783667325326289221881974987582215*e^(337*I*c) + 107504737406576916123480399169759633328321407419400510017498849830598621565428266546315933920821527544726380201659114903834605888*e^(336*I*c) + 134297742023479429904629616104559610096074758721068022704468938063017059688023363436458971534964665036319889119229809973806909680*e^(335*I*c) + 1664323329222589195130558329266398753389823955737598527556096093062473559769545772321978969318904192572733997888230986469005970880*e^(334*I*c) + 204622295535729109519829916789867225319429705162560082648840394965423112809336591921290309392396263834674368977840527147037426908*e^(333*I*c) +

24959307228256586639838995150961920268263445548712871463146189177082320136
7527645793770203788784677343934971424317987895255031936*e^(332*I*c) + 30206
063803086846346113944227936049971890691748252489448335622019613837705082891
1383056860425370161157201493696073712322595776808*e^(331*I*c) + 36270630756
384323113569915741851073245242061401362416887931218764523345015392797579332
6834780741391203430153093712635355523960320*e^(330*I*c) + 43214785646408693
802381156180867858959470204790467428229795965880017098445679906775187804480
6619012452636891350731618278545690160*e^(329*I*c) + 51090761511113450745262
384614713714145027572244431638553164842923085168663582771748846450033162338
5777400744950538410637735936000*e^(328*I*c) + 59937848477173347480937614240
155485020706497211813757294925750365144454193930902527689604962251563026316
2184526394317285457368300*e^(327*I*c) + 69778910692592461481671374768468278
508365981902795224444704335586974136850045256116402463607340192969310580110
5522738405349028160*e^(326*I*c) + 80616967132762553242457534008977573368199
499157667444692235409971461519208544324566385225700111564428666030497947602
3966071898200*e^(325*I*c) + 92432005286752258403577749576107235122253442078
486196000182102050946814635675643379524644649139614158385451368710433442956
6707520*e^(324*I*c) + 10517821004288343719445081700512191871168163497669533
226371821496108750042237847841832849619064944229554624312086456908025267707
80*e^(323*I*c) + 1187817943079390316108802324798110129020822782660087248599
367643481200206046822166144285425922229375413676535071141005286431481600*e^
(322*I*c) + 133139611462672303580246212353158205033974999601415245283530595
6367425370222758621753922458727524856072950880960657564720475838500*e^(321*
I*c) + 14811871170892466624669556949656778555247303132605526908216026571762
18737426245522795329891464091005878304304075953693546767206080*e^(320*I*c)
+ 1635569744641421900657886381289076653227580172056677587451402069234355283
687489659613913761959140773339736014790081814516625224440*e^(319*I*c) + 179
264907808963229893694572848196933496439159750628508848835062293725253342098
0803144316431701452190522716124797875257437516360640*e^(318*I*c) + 19502865
507801819192449929612044870100564603628452185016744237662663215587914369173
17878702232679213868287926294665202769722927380*e^(317*I*c) + 2106141903468
344307112549761202484543402794252352482199817410424869677262715098288437646
518683487945462774223656471345899082156800*e^(316*I*c) + 225772621910385628
681283301268157376549626224142061293207614315117196085455412414469902300984
2080515157923529357189869943515991200*e^(315*I*c) + 24024645955696860861200
018030342110567394455886219461413841061628862461618151497630250308348752340
67267774023433418269982431265280*e^(314*I*c) + 2537766415465030330815471746
692988596069911894697225052928320452542175587154848096483331209807430113943
015398362669673337957755720*e^(313*I*c) + 266110064797578358382823513920144
193017839664338342390358386254725588077238204920101553721490083274560151973
7141849802506685264000*e^(312*I*c) + 27700732071507686455975072813820654979
249684660545274141223398273337837700683058834873099793159837184037408728843
45746380680204260*e^(311*I*c) + 2862503126320461797770667780725644184991255
623174626175679050672100848988119391841466573417019247590580735265143427289
340450811200*e^(310*I*c) + 293649421435186849870323945542677110434482730626

7558916550877467232455153286140521089582733932202553130712723836983468866230908800*e^(309*I*c) + 29904989496225436085381293802838663351900871151248588181437876191869571119037657239748996515185551449242903462425951672743830089 60*e^(308*I*c) + 30233716435082250271756031752129532190224850458507318453075190082773851547314612133880355791599175900623435274649772866011651006 20*e^(307*I*c) + 30344083555309570757877317453225679816846165501628454732576796742802169473567857838432056042023078368970735954104125756604657875 20*e^(306*I*c) + 30233716435082250271756031752129532190224850458507318453075190082773851547314612133880355791599175900623435274649772866011651006 20*e^(305*I*c) + 29904989496225436085381293802838663351900871151248588181437876191869571119037657239748996515185551449242903462425951672743830089 60*e^(304*I*c) + 29364942143518684987032394554267711043448273062675589165508774672324551532861405210895827339322025531307127238369834688662309088 00*e^(303*I*c) + 28625031263204617977706677807256441849912556231746261756790506721008489881193918414665734170192475905807352651434272893404508112 00*e^(302*I*c) + 27700732071507686455975072813820654979249684660545274141223398273337837700683058834873099793159837184037408728843457463806802042 60*e^(301*I*c) + 26611006479757835838282351392014419301783966433834239035838625472558807723820492010155372149008327456015197371418498025066852640 00*e^(300*I*c) + 25377664154650303308154717466929885960699118946972250529283204525421755871548480964833312098074301139430153983626696733379577557 20*e^(299*I*c) + 24024645955696860861200018030342110567394455886219461413841061628862461618151497630250308348752340672677740234334182699824312652 80*e^(298*I*c) + 22577262191038562868128330126815737654962622414206129320761431511719608545541241446990230098420805151579235293571898699435159912 00*e^(297*I*c) + 21061419034683443071125497612024845434027942523524821998174104248696772627150982884376465186834879454627742236564713458990821568 00*e^(296*I*c) + 19502865507801819192449929612044870100564603628452185016744237662663215587914369173178787022326792138682879262946652027697229273 80*e^(295*I*c) + 17926490780896322989369457284819693349643915975062850884883506229372525334209808031443164317014521905227161247978752574375163606 40*e^(294*I*c) + 16355697446414219006578863812890766532275801720566775874514020692343552836874896596139137619591407733397360147900818145166252244 40*e^(293*I*c) + 14811871170892466624669556949656778555247303132605526908216026571762187374262455227953298914640910058783043040759536935467672060 80*e^(292*I*c) + 13313961146267230358024621235315820503397499960141524528353059563674253702227586217539224587275248560729508809606575647204758385 00*e^(291*I*c) + 11878179430793903161088023247981101290208227826600872485993676434812002060468221661442854259222293754136765350711410052864314816 00*e^(290*I*c) + 10517821004288343719445081700512191871168163497669533226371821496108750042237847841832849619064944229554624312086456908025267707 80*e^(289*I*c) + 92432005286752258403577749576107235122253442078486196000182102050946814635675643379524644649139614158385451368710433442956670752 0*e^(288*I*c) + 80616967132762553242457534008977573368199499157667444692235409971461519208544324566385225700111564428666030497947602396607189820 0*e^(287*I*c) + 697789106925924614816713747684682785083659819027952244447043355869741368500452561164024636

073401929693105801105522738405349028160*e^(286*I*c) + 599378484771733474809
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630263162184526394317285457368300*e^(285*I*c) + 510907615111134507452623846
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635355523960320*e^(282*I*c) + 302060638030868463461139442279360499718906917
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595776808*e^(281*I*c) + 249593072282565866398389951509619202682634455487128
714631461891770823201367527645793770203788784677343934971424317987895255031
936*e^(280*I*c) + 204622295535729109519829916789867225319429705162560082648
840394965423112809336591921290309392396263834674368977840527147037426908*e^
(279*I*c) + 166432332922589195130558329266398753389823955737598527556096093
062473559769545772321978969318904192572733997888230986469005970880*e^(278*I
*c) + 134297742023479429904629616104559610096074758721068022704468938063017
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573724049744*e^(270*I*c) + 180353273381774554711775685948516829779783464497
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23997*e^(269*I*c) + 1352123041194543691555885470685179654156739981165687002
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^(268*I*c) + 10052209524369581827588154985345549678031445744499985208259385
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*c) + 741037261289115222436463329612804397165719328032775430438223567277378
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166628040524363495855959828183579538662584616443540182051589177425764253443
64964596750653177677803492186817305171175032011500*e^(265*I*c) + 3925697658
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8959346631795568022519974400130281*e^(263*I*c) + 20094961100926877381527820

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510081892545866700444096661582790441241830855609577062039555625090943332264
901780720*e^(260*I*c) + 6895184493287935599032604181499741902535783400588 95
035589606468244680591556118170304005037563669880057908765898949268614772285
*e^(259*I*c) + 4743230435631005423773386299319662481291759769823324460180 56
009391154020438895903140822967769494019446166779954024655344116288*e^(258*I
*c) + 3234131780148410037141511382460791525763609760350584578904099377387 23
171537036573043681997163745313602400139153046673668433091*e^(257*I*c) + 218
563166659649312247483640956272149212499115383828771029654283363972585118090
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702191548871697022574447561 76*e^(254*I*c) + 639230194337619890906148012886 3
509812319944510230312261654464820899876780394445577704288655273849974718371
313606910465181221 5*e^(253*I*c) + 416704403753905436434182193422717480400 35
071490119080585281522498188818375906900368701234531304633163446319945130196
476913600*e^(252*I*c) + 269177947010866150978901202368905011051467999960217
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e^(251*I*c) + 172295028243676473344007219984175967039486573947388052093916 3
659737038057239896471508009536681832202915219363586978409533376 0*e^(250*I*c
) + 109272106034735448102797923478445360745888968062300411100895447316058 63
146104181739039426674855453466097402330688331845602302*e^(249*I*c) + 686642
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525267113368208715008443456479223854715343593336061895718324446413641328931
086635762051338706721562641641 15*e^(247*I*c) + 263666241043079934044752228 4
778244283740751068658140726576446671207798325606832295937705061686297930296
38233889257490081944 0*e^(246*I*c) + 161109254140006052595485937526419417834
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2252995608*e^(245*I*c) + 975210339444049318757282311763517786673223175594 45
794638327926463508504100491730029590427543314484853245991987547981758158 4*e
^(244*I*c) + 584749573682304586179384628844883327581498969886540380378896 76
799907561496400717460081109294535663511879582479936971674210 9*e^(243*I*c) +
 347310053810935290419455560555957314129569210735745983234369659976413374 77
40780001730700752486545249171791289505074430582 08*e^(242*I*c) + 20432555726
518600076740271023084789645976158392276369823543321283331307778304104007466
93790173948367615396490816906308116 65*e^(241*I*c) + 1190605918496605468347 6
569322767644906758414824888267844750482607723633344451345409512666875005729
5811191643356908972191440*e^(240*I*c) + 687124660159856415124685861736597 47
734879591710098354652786124936023073943141049573606648563005359411712764895
683903806088*e^(239*I*c) + 392742004143298611693979445162250010812274333985

85007206399231211907157795359719648241598754266579840244551491476467899952*
e^(238*I*c) + 2223134113180153534540639903772168684020839794195258013558464
5966746736656716271554826476282991066076564921432614339399735*e^(237*I*c) +
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484427849333045936139492337233385361987963737267318494285971243106634572687
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373776*e^(233*I*c) + 111539828554560155053332804560018431799389935921799672
9818340704221801195667410485846996179056733558512452238583160792512*e^(232*
I*c) + 59515761550043151494747928233654705382792608791642526349718775702941
3385471835434198246807096214536895441388306027237899*e^(231*I*c) + 31440903
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c) + 2214073500170860327091518076924139166203557875590397914890921360382255
4792749183517160255571915875356439553717130797888*e^(226*I*c) + 11119499645
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411418521516670371372045206568345*e^(225*I*c) + 552749884903117835586123000
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11254607250929192773909331523226635035815672862569296693711643521070331394*
e^(223*I*c) + 1324311324984027428355222938147682378672860708817161741448749
689593588020860847508703702325320304649883120684987556400*e^(222*I*c) + 638
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252*e^(219*I*c) + 670917061305296691250198992100215765802378434622295353862
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5*e^(215*I*c) + 28704961314123144518346747153535894395532944308085319334660
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580445289401786656311685859023084716*e^(213*I*c) + 556756388711182340341026192734219546113651768317380539005893679049394714017063698565272728813669054779077208977840*e^(212*I*c) + 241246021282440061792908317783032876194801597133206052091286997043729145345755805710081489006741839439573984832678*e^(211*I*c) + 103399755467257436489847837640753754718204394473055795001467604326419876555556873829531737211096115196005647730480*e^(210*I*c) + 43834972142919377685378692233021063744554033100928502737480438978976746989895784070951905237783490374305934542955*e^(209*I*c) + 18379807084003359766027649217621144116091735572216620788861535803449702273802588359076704241840733513439114113248*e^(208*I*c) + 7621788791912047062038840917799374600428892258194367636682944356096681400246312138001769285020661445991073249416*e^(207*I*c) + 3125683493178701743479704750307490178666292150720179363604335113528623329684606343185540756019935662148267863968*e^(206*I*c) + 1267597017294812913400146276042126929986480292870190399107554311079964227280196522475370108738477856311765699610*e^(205*I*c) + 508324599301085460166978629683032661427654474082939048097939638391567298795788389433842285751054665210868287680*e^(204*I*c) + 201557947424794098026772478462040883395867512562930862943753568690084015585598010154781548625239409581907397500*e^(203*I*c) + 79019149558766569254783988487232388352909144982747171856772463223808993367091503402876467270176124342699654400*e^(202*I*c) + 30627581054221957378390547289277609129572813931082733520247387226000020043538279468776707958420892547870128680*e^(201*I*c) + 11735856926245118493113091002501604032341876985999082823520672241530200188223826392982302194084667538488665600*e^(200*I*c) + 4445412259295474625067659514198312966015416299968930393345630345914109720740573618884980520010028451496996210*e^(199*I*c) + 1664475034387211809394917743502937638978574937754764763987835872410449930690131572904279995484581013965001440*e^(198*I*c) + 616003116022979584937125701757887212998354300989991362628038861093914561332071191909714949426587936910303300*e^(197*I*c) + 225320532593220657767941109289516248999794521015564134982827241710019675486694499689312466561907212627820000*e^(196*I*c) + 81452081413829111828875417564250054846037693312811480492909160758195989155768107022568350953861815940704090*e^(195*I*c) + 29097651061247453406647569781836910062165559852359052804259154165687125428752562385492373749486351714453120*e^(194*I*c) + 10271602530202889002497813516849452590971512809529060665197301097052210064576088348023234671975463677418470*e^(193*I*c) + 3582718002163296061414536703715109897107198252739284546149343102348456124089657428594946438660859773886240*e^(192*I*c) + 1234668041892409978780018081755440216012582476396941937965899631953079203974222138794604328498972144766900*e^(191*I*c) + 420358024835146798583611210145942154684437949365647899088372524802156222884839580011688655664280691773600*e^(190*I*c) + 141379938253556843280565505807403304130606130725434751745794079833141361748917639986145377066437210546190*e^(189*I*c) + 46970224727117281826454045018070670522559756627580347784535320014963482632359729444541885102274546002560*e^(188*I*c) + 15413111211486023937294970820797376716081344788163386543522421939737507962125854981881879168348260330000*e^(187*I*c) + 499524195627913818020518674440168802438827211392125566373495694692757130553314677689878787805

9685108480*e^(186*I*c) + 1598771101058192692270528999677444742685631006232456185844925220144002305878120380828483988663574829100*e^(185*I*c) + 505293663123015258878483025738812813203397766845340065381261016353419722382620393032535960660921950400*e^(184*I*c) + 157685845528850918721462877864435090257583149415561323427386562894447598277935629800939237175625149830*e^(183*I*c) + 48584258153140280447314836868772131390195412419046732778458706015096881437076337910793584122475073760*e^(182*I*c) + 14777955096617128998712745182071495362176506973183081650233605274051677624970464340242755840025673760*e^(181*I*c) + 44372109178431823477643495444439046990200565950694708471936170921147140776330772349728253512269793600*e^(180*I*c) + 13150521209306921221022971053276228423358707434285308910729835358622800944466077234738004774539141300*e^(179*I*c) + 384655842080666274454063078784837174998949052500975322162003392549953413592461519365177908682078400*e^(178*I*c) + 11103414879700881944314389564446924229504986746431371096925761933889133799285616020069872611710850*e^(177*I*c) + 31626644674725547731176795687527653571305969985923688392112164915553242573269490908989570248533280*e^(176*I*c) + 8888295028751024667044203837607976101480053134418614474620767522824868911959884352666444917404000*e^(175*I*c) + 2464382190807439609079774226855679629367885709776435876630851716253962696192341706239192878728160*e^(174*I*c) + 674025530543133008894845775236625237450743114473544537818170447134607102575676676056675328961590*e^(173*I*c) + 181834661406177901315330129677145381166449188413194141169344354754920969034952610378945282257600*e^(172*I*c) + 48379489756434099843857791816589379406815042609340378747586437145781646245422045101230417309900*e^(171*I*c) + 12693496932964920565073673637181280088548682508880255337280065006566138696041797353216584528640*e^(170*I*c) + 3283874760555818676726309480306734420155098583948074469014168171874442170109648521627538755920*e^(169*I*c) + 837579206923411932458786486765373533946545239708990769488724813982189165104589895518909256320*e^(168*I*c) + 210594301385648471184329078880317504953361839954159427434009884661777259752542647709150036990*e^(167*I*c) + 52190912207661824215812271854269748071292843243227894769229690720010547141334131610989636000*e^(166*I*c) + 12747219616503320541356343062562847368601622140856786025445814532037904111523242298235713300*e^(165*I*c) + 3067974296431747364198159623962463671617006419626851426148418602934852907379021659761911840*e^(164*I*c) + 727521010718394229291774073844694255798738667067535379759732795567942578751384250780476310*e^(163*I*c) + 169956327969929767773902096652629253283704505477127544556534417376686540936706073847337600*e^(162*I*c) + 39108031255601809476537535369611844440844903751605645023514572352045248104262933598850730*e^(161*I*c) + 8862752142756957285681340885764904597935349569355321815647721172537159186491471311666400*e^(160*I*c) + 1977792980665818135651300094326239158605448870806970860577325385028609983034534672318500*e^(159*I*c) + 434546676780280045346344498763892540797175105756827515509297024187660299345484920192480*e^(158*I*c) + 93986915313068179149083606065681482780836060510530154618486949839467131378859885998210*e^(157*I*c) + 20008006803030047137293278250321597113540716201983333126349281186679153199068045257216*e^(156*I*c) + 419154250065682614809333941454415914396447847249231593180917

1859902114109005939942952*e^(155*I*c) + 863979933622330349556296820028395513198708064940505702126068652936800794826651264256*e^(154*I*c) + 175193170500618300241515632381912285157790097816049220671217212220015297133400636060*e^(153*I*c) + 349410716132767046494779430433394502015040753351603618659160292138607786062306249 60*e^(152*I*c) + 68529932231457366873288853116177954355929408414398663510796556523128947219727962 66*e^(151*I*c) + 132149805527130085142999386663161987442453442518818359204972768757103215643507728 0*e^(150*I*c) + 250501028608928332469340456829902067712233644464602753159945727868485722395506952*e^(149*I*c) + 466682235482660178068545924681005702893559608696136508565757567581801822233087 68*e^(148*I*c) + 854301344112621233483354066506962147247908583804136056455072203672365429754020 5*e^(147*I*c) + 15363332384449275835327345560164946716749165789071169845484890782416939269405 60*e^(146*I*c) + 271361207503266570734486517077181014801775322183181055638619257836143271472358*e^(145*I*c) + 470650446111351581084873533674842431026982488383126358762830994274427458667 04*e^(144*I*c) + 801372958079075243436196494576154376146952079121074697267587048105867427784 4*e^(143*I*c) + 133921437425424555356488440680194535338500025403065576595377023760718008996 8*e^(142*I*c) + 219601281339515561500261478844190024870555261281946058839614044697037963695*e^(141*I*c) + 353244472067790181153780528207894116875810045823674310062058796337290152 00*e^(140*I*c) + 557255115732867112101621641630759616186195596901169722234092621011285441 8*e^(139*I*c) + 861884851094991908764246805474672428603757315484453974713612812215428992*e^(138*I*c) + 130657660226560419335121434389938961884595434069984824307149332131747540*e^(137*I*c) + 19407979215594566593535008103303255257745408070082431338945184797463936*e^(136*I*c) + 2823905151936586678382525706564457280290098698638597987628380245881715*e^(135*I*c) + 40234969226612115893400358283942878511690490393640954560251921966472 0*e^(134*I*c) + 5611708107634117538408757018518853866037593201367473551905522736836 6*e^(133*I*c) + 7659010520187549651777118357676871927081898989131125755798204236112*e^(132*I*c) + 102253643746829673729306586270524644969368741555986584430688870542 3*e^(131*I*c) + 1334902100520261837796733138683323035303329061632471946278084103 04*e^(130*I*c) + 170338860273906157410409777216555416656121622754850285843108904 17*e^(129*I*c) + 21237029691888713182667187812239270678399490157272938840653880 80*e^(128*I*c) + 258585348715977270155829115684193411072034541491364393985491350*e^(127*I*c) + 307362174043210099652310374196630539628810352817092216977850 72*e^(126*I*c) + 35647648906287240170884879966881789291957876139585454748048 45*e^(125*I*c) + 40321222595779818884084613996099562414449127169433679645958 4*e^(124*I*c) + 44456708175258821024400946210535004523775722190977468484496*e^(123*I*c) + 4775398607100853263534207733818266777478693412738731031680*e^(122*I*c) + 499467506558531733671585862910572702811545035730398749530*e^(121*I*c) + 508363695081710994370193486108473919467361851080171831 36*e^(120*I*c) + 50320249034014518240742139437660119220265070063119827 53*e^(119*I*c) + 484093410240488718655917025303662581091659126182344528*e^(118*I*c) + 452309400398307383320256947846462068448548276980757 36*e^(117*I*c) + 410154543993719579395995670844249670943380026122488 0*e^(116*I*c) + 3606886130363893494138097800045599635487754233

25255*e^(115*I*c) + 30735366512830562160991166338490057308062762518496*e^(1
14*I*c) + 2535667460650279776834561566186591213109251642859*e^(113*I*c) + 2
02347509724462171313966643580234078508179838320*e^(112*I*c) + 1560391127768
7607099721623771744933086920587272*e^(111*I*c) + 11615814137339717515336225
11909046917188768400*e^(110*I*c) + 8338083991183789445313630367378503905150
6805*e^(109*I*c) + 5764601046563151304213854710715346838447392*e^(108*I*c)
+ 383360155801054824529764688213114368047154*e^(107*I*c) + 2448983733781233
8687718622491865013839488*e^(106*I*c) + 15006027479373972864055778187226915
39392*e^(105*I*c) + 88054927598941411145869950813388040256*e^(104*I*c) + 49
39666610818025798809586352543471345*e^(103*I*c) + 2644103757803107425180993
26419685040*e^(102*I*c) + 13477227799524701956579274210395326*e^(101*I*c) +
 652650253343206047453620559993840*e^(100*I*c) + 29952547749265499675257842
032197*e^(99*I*c) + 1299146645993240318167826532288*e^(98*I*c) + 5309012726
4630963470039804475*e^(97*I*c) + 2037031259470368160131922320*e^(96*I*c) +
73099207817335597247098038*e^(95*I*c) + 2442455629894502983849104*e^(94*I*c
) + 75599817092670157806639*e^(93*I*c) + 2154864144781257856128*e^(92*I*c)
+ 56169444526926562260*e^(91*I*c) + 1327882849274858880*e^(90*I*c) + 281861
92554792138*e^(89*I*c) + 530563624556832*e^(88*I*c) + 8718181624155*e^(87*I
*c) + 122503723056*e^(86*I*c) + 1431118260*e^(85*I*c) + 13343760*e^(84*I*c)
 + 93096*e^(83*I*c) + 432*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) + 14*(
3718*a*e^(1055/2*I*c) + 1502072*a*e^(1053/2*I*c) + 302667508*a*e^(1051/2*I*
c) + 40557446072*a*e^(1049/2*I*c) + 4065883968718*a*e^(1047/2*I*c) + 325270
717497440*a*e^(1045/2*I*c) + 21630502713590667*a*e^(1043/2*I*c) + 122984858
2862227068*a*e^(1041/2*I*c) + 61031235925207244502*a*e^(1039/2*I*c) + 26853
74380789029329793*a*e^(1037/2*I*c) + 106072288048394569716987*a*e^(1035/2*I
*c) + 3799316499714931382700630*a*e^(1033/2*I*c) + 124427615397868362145478
058*a*e^(1031/2*I*c) + 3751971173691706110924034857*a*e^(1029/2*I*c) + 1047
87195000667085382630850098*a*e^(1027/2*I*c) + 27244670732400492862222174995
20*a*e^(1025/2*I*c) + 66238605837791619527049091465540*a*e^(1023/2*I*c) + 1
511798772576673047875435387479418*a*e^(1021/2*I*c) + 3250367373578585057125
8452122985714*a*e^(1019/2*I*c) + 660337796328597830395723099421064436*a*e^(
1017/2*I*c) + 12711502674847529112148726218999140522*a*e^(1015/2*I*c) + 232
438908425726665209807096498775079690*a*e^(1013/2*I*c) + 4046550142768142823
441656912104576646575*a*e^(1011/2*I*c) + 6720792097013372553856472690688276
9461732*a*e^(1009/2*I*c) + 1066925770347513486390409808978976432165366*a*e^
(1007/2*I*c) + 16217272197080856640086895687618882654237557*a*e^(1005/2*I*c
) + 236397938386786552298680619962344215977635255*a*e^(1003/2*I*c) + 330957
1297229229358438719595781123324700153528*a*e^(1001/2*I*c) + 445610162275530
11590271450799436600978561400862*a*e^(999/2*I*c) + 577756667439166347317361
298827893686038031023201*a*e^(997/2*I*c) + 72219590083993806706485241468939
79780310767551977*a*e^(995/2*I*c) + 871294507537624773100558274127043266953
73797670990*a*e^(993/2*I*c) + 101560279929753868188150233243857821464483874
4212768*a*e^(991/2*I*c) + 1144861526522702892033202005487246473789283762409
1599*a*e^(989/2*I*c) + 1249246207642736450589157509159738782200983226912971
01*a*e^(987/2*I*c) + 132063201818273405043449076959796054660794302120955437

4*a*e^(985/2*I*c) + 13536481999851915706958049067829203397030845591800979948*a*e^(983/2*I*c) + 1346331631527910859062275189596447146295754269413452748 55*a*e^(981/2*I*c) + 1300273428594384632178804915869348076492496040528026941982*a*e^(979/2*I*c) + 1220257164748036847894733934719754255437366012976630 5670026*a*e^(977/2*I*c) + 111348526291800411107246584226952800505326877479452354210332*a*e^(975/2*I*c) + 98855826862981422860092804734086480058877254501820062077575 8*a*e^(973/2*I*c) + 85439741194334071599751662430130262799909855492628010225650 70*a*e^(971/2*I*c) + 71928400911660376402320318751672710160518473805095916511887372*a*e^(969/2*I*c) + 590140408754311076687013315279638319827311377295800031121209656*a*e^(967/2*I*c) + 47211285515018981347023498996790825807795148921607537412619260 62*a*e^(965/2*I*c) + 368453766224328778425584144170038872780489758206010951260646784 25*a*e^(963/2*I*c) + 2806524295838718418985556121503766503330757957883424134413606416 90*a*e^(961/2*I*c
) + 20873559405129506084431058976989204103021620800678368208217712805 02*a*e
^(959/2*I*c) + 15165308800486166402472766122974437831930120746836471291819780637051*a*e^(957/2*I*c) + 1076739255456741445886930960211126871364433226989051460908037101834 09*a*e^(955/2*I*c) + 7473855515088898008257285924653334698705101375361302756654505247154 78*a*e^(953/2*I*c) + 5073612140276869022785810697789013952147928175584559508062569934520500*a*e^(951/2*I*c) + 336965483328793735102555813785378142355585023148641449540374099765434 35*a*e^(949/2*
I*c) + 219028335999286257776369634146613713106509647861704677410488454471041828*a*e^(947/2*I*c) + 1393822204759320545751155434910006366369348464487459381028813178904280462*a*e^(945/2*I*c) + 8686537705957015746874556647503611978485575286577500733201504080157038368*a*e^(943/2*I*c) + 5303386265594344453065147141731165909374896767141080819977254587256625 0240*a*e^(941/2*I*c) +
3172905654382992959442279818904470736524232582433554695127746505478318087 32
*a*e^(939/2*I*c) + 1860732508857587132839919523366305804938874482315206088251791750125084597398*a*e^(937/2*I*c) + 10699286061146541741114037718913122166739129443783960920451139637868310953672*a*e^(935/2*I*c) + 603374228211089054421888052377053809021565385730677776476436552563422160481 88*a*e^(933/2*I
*c) + 333805055593388567427808201926960940156572529198077839859476641115104007423532*a*e^(931/2*I*c) + 18121018304254363008917205726286783630423541985551477267012751500755466435830 80*a*e^(929/2*I*c) + 96552069063089810510876615027724717296685509203961726169315466717341914306043 48*a*e^(927/2*I*c) + 5
05047489516749565942417191650205007396461300415114387673377667664040187217 99652*a*e^(925/2*I*c) + 2594141053437586143844290455743529031819611343826803341193957353446431173649698 28*a*e^(923/2*I*c) + 130870474410323324494283271137947516165306600037126036106476549415377492930454271 2*a*e^(921/2*I*c) + 6
48588875944189426448192545257731919037580329366533172224855354136988829225 0431868*a*e^(919/2*I*c) + 3158400566270860454470176476213179265096752402024294199264378218523986141359049602 0*a*e^(917/2*I*c) + 1511549102573694346925967358088798515844042393077900476020412759024434952924596667 90*a*e^(915/2*I*
c) + 711081673436185451924040793669141298969626722796614395742802361266093633641264085200*a*e^(913/2*I*c) + 3288828495006098780525142569296800128547751347678538502742954742586652543592821521100*a*e^(911/2*I*c) + 1495778983626

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*e^(909/2*I*c) + 6690764342465983818454577392490887995470152568741037622719
9214504402274227244630158470*a*e^(907/2*I*c) + 2944025642405920618949693968
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 + 127449552107113874458321583563395128080302542623822937083806236749728719
5705487702727780*a*e^(903/2*I*c) + 5429216947618612587547123012480165658464
605296922357528675368754249200100593150293185330*a*e^(901/2*I*c) + 22761850
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299920*a*e^(899/2*I*c) + 93932713207395265486897880366664895741093700695924
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*e^(895/2*I*c) + 1526557117570036622571918876778252127468437541774623614619
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91/2*I*c) + 233308349176317150934664814200838330299476688805134989663781375
98401377993510086729958534960*a*e^(889/2*I*c) + 891630246675288443652575569
46977068950919875040439960342188615542362550926345388079651264340*a*e^(887/
2*I*c) + 335696720738936570706713403614929944912226507516523422878616118942
760950780230341688669154360*a*e^(885/2*I*c) + 12452979254554264676850036797
83202930885617600557716500473909654045354638798448652726086548710*a*e^(883/
2*I*c) + 455216454198570115836444083320219736044501483971095697077034024097
3634689769418208918160590320*a*e^(881/2*I*c) + 1639964574077305109297539230
9744789183304727620673733635277139746257521706440274686262794198620*a*e^(87
9/2*I*c) + 5823375669931839000990917236761189568577386782678355064920050086
9687498091353927199571718405490*a*e^(877/2*I*c) + 2038401394201733506465998
63519636205648295919156240767205893957321010048179259062568208312088790*a*e
^(875/2*I*c) + 703442619798587327256518771953962641129807006145552665167689
345204662084900828221826842429079160*a*e^(873/2*I*c) + 23935364531901942975
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20*a*e^(871/2*I*c) + 803102539288425206417745098787909283292860806299086446
1726329576684085419875495358549722887030650*a*e^(869/2*I*c) + 2657465386577
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2286190810*a*e^(867/2*I*c) + 8673111081249706024196404770369878197649324163
5614918587219564911585800789497248326704733021564620*a*e^(865/2*I*c) + 2792
137812408373062631492392777412785041807648142163207685231265451122669432308
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I*c) + 27784053052143436342726424781153687621685136571720170670300841434525
83457313885656093029057631444370*a*e^(859/2*I*c) + 858965006761491323319609
660407459749256654782245376571508197972507715623929328837727749947754206006
0*a*e^(857/2*I*c) + 2620451831207455850865238131984749663471988374403165108
8258490824465738576863175200241054655253538000*a*e^(855/2*I*c) + 7889273247
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28319962595741737151538794823588356166465622241503448244518760*a*e^(851/2*I

*c) + 6875302244726200927911732813454970749262714300760196163220853611448794295500584095658716214540602339 40*a*e^(849/2*I*c) + 19904906928755272586672364990174607843663079232802966549317359979549411477932072990417750800461458 53840*a*e^(847/2*I*c) + 56890194714102202460669086034840043513299826737773542476615625242216921150063581988807750651470994 37120*a*e^(845/2*I*c) + 16053098146865366570614226985936175148028466685745428670334943691048314134627977747488782883668338627720*a*e^(843/2*I*c) + 447258913014794496180216536130218409258208310521650357249468652198838166621230552028960184573336879005 60*a*e^(841/2*I*c) + 12304718259132723929105983780313299023656095154142609150259213307988993082073673597693006264230444576076 0*a*e^(839/2*I*c) + 33429510129159839440538592697492334182123443936999400397029100177133981824485796920784207105436960232944 0*a*e^(837/2*I*c) + 89694641544949502177330565213252148914368338808468137749089095217876836694915316100191749797355898463461 0*a*e^(835/2*I*c) + 23769112749784751700037321362357881818593856532982808428141057546244636203561833840215925564924510168618 0*a*e^(833/2*I*c) + 62215793900366012619065913586228573658637652713363638132589281020472312697012877444357519256766194662543 80*a*e^(831/2*I*c) + 16086447516084063163243689050215879761267599809808958182816872155074721707033313657170678606565171911318 790*a*e^(829/2*I*c) + 41088615308485898366172497268874114351478780113160576839336545240589947982864125921136564058023293113177 890*a*e^(827/2*I*c) + 10368458695315805266176100219485622001607820217543667402241703073831604805925786533298982793313473743242 5420*a*e^(825/2*I*c) + 25850394142741877598344935825722712932718703102540535230494615859661794773224169018013860902417961989654808 0*a*e^(823/2*I*c) + 63680845082005250841339490337361369940898513179337822532263092681601027818866435487336584940505080755959 0630*a*e^(821/2*I*c) + 15501261892513220914565662933210413046613323736053019777036811495932422370323105857584520499798363321820 19460*a*e^(819/2*I*c) + 37288017476089265495513190379614293274474046317883570540358136176654173880298483054802698223221150475630 31420*a*e^(817/2*I*c) + 88642599821438870660522413394953025195926517437063956099181051142416423446261549001781452189838566327622 82840*a*e^(815/2*I*c) + 20826348139765728145502300250230633528625368811037926283789182837817572337323284403311770372970302291071 410100*a*e^(813/2*I*c) + 48362336013775503343319693154600872180208893665329972255007464669036745521843710761901688665256224358994 271700*a*e^(811/2*I*c) + 11100705114840212534522028371427117398262903538522312264680563658365493589352770549994269342371512198942 4818940*a*e^(809/2*I*c) + 25186525048428154589423818001709359561079691188227199925007018115951871609335240425433726136059212928624 3867720*a*e^(807/2*I*c) + 56491770603803702788592000743376407605164806140939010812663502809191357241464734717803992357829937985993 5849404*a*e^(805/2*I*c) + 12526387958474669137661250066696258739073266378432081991738278084004598902322960943621702398733188610048 96614156*a*e^(803/2*I*c) + 27460877130459664927598197470575345372957948511425219013508840686869727033854628850909135636107420004269 52431144*a*e^(801/2*I*c) + 59521604667866061656535562465898355618400210490063676342925965659352808181951413746952362518369677085997 80176746*a*e^(799/2*I*c) + 127564556178413915139143847288988400427256611136687918466219278080687859904900

7723894849271955293649990034423068 4*a*e^(797/2*I*c) + 27033592530880002226 7
37465321359138464847484153982687697594699044738257454819138210737641742661 5
88856574025344360*a*e^(795/2*I*c) + 566524575090192173328098322533937654900
26446523156131066467177640614737878543683747754276689674112796652581318416*
a*e^(793/2*I*c) + 117407982036395964616775103428880300577811655638673060994
605539426451393694076705057517258363475234790358732617874*a*e^(791/2*I*c) +
 2406371921769259955547697638221965496951501064127678402468060155887850014 6
654979811673168754953974316020669051227 6*a*e^(789/2*I*c) + 4877938040040138
25009296221609997616820891599158999011226672490129857245007433873787162629 6
263323833047605388135 09*a*e^(787/2*I*c) + 978002873261192283457582949969456
05283494631114856409194548008391237574275009549672318807057897029719169180 1
222556*a*e^(785/2*I*c) + 193952786969132205721734701058954719411935238878 81
932903668807261404224359166495144011717932426968495551743936438 50*a*e^(783/
2*I*c) + 380474446496892135901546187311383678115984042854196339778614189930
89452745453669309377025204845662571791380224785 59*a*e^(781/2*I*c) + 7383289
56991590596622744469611098349215000500983969326803957345776259724464129140 6
8437922786635243511272776100685 01*a*e^(779/2*I*c) + 141739356433255984532 02
41239662131717328589391607607357284997082995826759173790728661921962477320 0
857453140746381674*a*e^(777/2*I*c) + 269195769225792606752145769442826156 53
05870826086180561575949842123724197715928816535784780394241026226515846546 7
750*a*e^(775/2*I*c) + 505829522181672507409706444229176144626319674426544 32
14234792132302951522052836401839713551106322842409173499267205 5*a*e^(773/2*
I*c) + 940414097395855760889319663270055553239711080741367215796434630893 64
171018456699048513026812223168440576516628683514*a*e^(771/2*I*c) + 17299512
37565501066373781323570103064875660499788882050882654953322633031655037800 6
630540866868769892013997009453871 2*a*e^(769/2*I*c) + 3148973829894315833326
80096827162919531673302471680460640021147765185388299005207883488229333447 6
153527272889839461 48*a*e^(767/2*I*c) + 567211894570524721264934335244788478
90560872631873068997993999457406523592886164302978649905934746685407795490 4
040746*a*e^(765/2*I*c) + 101107480011495937671953662497709473896428560464 30
627991117789420153873257066242789644965752707686019124888332968285 70*a*e^(7
63/2*I*c) + 178362473864714504760191755645106188793385377435414139252892685
541211998149779379927041712713499075341574638083974370 0*a*e^(761/2*I*c) + 3
11405651550129739902696800285085492813895466455247866716835158661279717661 8
25298130844832082891577630780573951311272 6*a*e^(759/2*I*c) + 53811222485671
62421157383569756630220328293397938837982011834598823639708711693916980646 4
416422107420722774426927957 38*a*e^(757/2*I*c) + 920371533810205201395399465
52723277011695069761353025614149815993296716911320747520228322414249119164 5
97106005874375 61*a*e^(755/2*I*c) + 155818159342604828535450784192195521288 7
51828771105437306863202634250014615678114112631922445275453555226798187075 2
0580*a*e^(753/2*I*c) + 261130863864249786194062720874834843116867783534698 1
028004560245181361610163509568582635874473432349528434601021481311 4*a*e^(75
1/2*I*c) + 433215831899998200118255135359611536322617099362042508599444261 5
2513525897996934481741824822705710882414313119272790131*a*e^(749/2*I*c) + 7
11503798031823306249982271868966924061978594340540844828806706143215424249 4

6546285172306349522048789631550138215923153*a*e^(747/2*I*c) + 1156905307506
944415897628755570187804393124142353468057244506458568792123744039674834976
77636041575439277920548968229136*a*e^(745/2*I*c) + 186246058051488407504035
604030386554718066896118691201386319926538759246009834321804025886034942775
247389666416855412210*a*e^(743/2*I*c) + 29686989431234102588261475688184880
118254809571823190101744270051097013220747369708584337037406840973428721573
0709535159*a*e^(741/2*I*c) + 4685503252933359349996733690917671179857892633
80711414814986160196520127079260704512548045596385215149194149787362058847*
a*e^(739/2*I*c) + 732282573074945415241191984024036255668279273758317972537
870914592731850184818289172732027744954335864633099347774743778*a*e^(737/2*
I*c) + 11333264072490566772651823572830413026805965657533923303560137333862
67578802249101009054033933358184582360056565943982872*a*e^(735/2*I*c) + 173
702790473065474636132103848495836822591755750686241516886200436892400895652
9402849910157768607834197363252609518902089*a*e^(733/2*I*c) + 2636670293606
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322915002420199553549738131324075*a*e^(731/2*I*c) + 39639120705364146651009
937160909528466211708624286633319606811297764001906634621181840423762056572
05476237354164748568266*a*e^(729/2*I*c) + 590246486578182874643375962611573
129936862803877686353791928675712191961984875667858576596127229260923575004
3165001541228*a*e^(727/2*I*c) + 8705750656639962805019357547403610399215124
329872130490106158502891057402404433904178771049787603257660231907442902723
601*a*e^(725/2*I*c) + 12719346510829980167691769356005135310633717185977594
866088135331067145022553996096352557277491441427340072720038453020094*a*e^(
723/2*I*c) + 18409060258976502497717330256964155108641749728335469201164427
871721771346762241189212154587072288919159051458074105345270*a*e^(721/2*I*c
) + 26395464183288948474053286863120161200727884088708580750264073545101364
060793692377715714056166397802814429763618417822876*a*e^(719/2*I*c) + 37495
624966289314777017990976471297474782544902192217644185887694081271123513263
069199075270691251282255239872596210514278*a*e^(717/2*I*c) + 52772584002591
202607152756706889895749307537002629823015890630924021431243053135308382138
154153897041915995771633984281806*a*e^(715/2*I*c) + 73592839927564405504042
127592762819931998928642896919811011301927328743837627845050154224299851252
425467281991751035964300*a*e^(713/2*I*c) + 10169164442095007002502401105745
299738150028346657473063428389325495918846662740294688296269207633447157874
3932496642334320*a*e^(711/2*I*c) + 1392453280183338807743649688008531425847
282555130434164378701124696315506658696053430278963530231765576944002004994
61146726*a*e^(709/2*I*c) + 188949118902042756365887767234643113787797409285
875028353410293464440403604554265358653936413844588923365518512812155564263
*a*e^(707/2*I*c) + 25409801152668679501782688899786288110769817827980307837
0347724142537822230167040460676758302527381200018338794267668213782*a*e^(70
5/2*I*c) + 3386672073660640286700358693759763701110349823161844797535928303
55581796704600824509215308211821300197041784861670006680074*a*e^(703/2*I*c)
 + 447387531042524414883193986439269112293394102569954189918196551016064656
984949980121125552746165717302725948575549803471765*a*e^(701/2*I*c) + 58581
008784009063895935259311520749333040938830433364858650872625496666627261727

1460912163699959246766169974995865625894415*a*e^(699/2*I*c) + 7603533619508
856466413519768608931920221645629023321616921264819927797879971183785022008
34924391895215671091534427467182154*a*e^(697/2*I*c) + 978325068291196614130
480547884149187418948183584483275851528436468279773867175472874823772301653
470715495906310752113906356*a*e^(695/2*I*c) + 12479104898517248121534775616
840297489853271667611766490178937644627425409558103593603457524987374393381
73328941693214996869*a*e^(693/2*I*c) + 157811889103642503017552977572861318
482559349051118394199347762880076205789091813709818058882334843395130982221
1104517241960*a*e^(691/2*I*c) + 1978680026480285014646438754061123105498563
130238883005535552359464916952802872195794689967236683993035275155224868084
857426*a*e^(689/2*I*c) + 24598838797251652924524255220681788806897094208434
92989019614310088740969485770831889636928119055954588263689191708179939864*
a*e^(687/2*I*c) + 303235865118925529668391399505846717618104455596520952274
902769437231450093202047850794503241948933618164312397995151020196*a*e^(68
5/2*I*c) + 3706784707748169939476939927418306117137807661216185577529307951
968534891054102022599875800521028818591703507213651354601744*a*e^(683/2*I*c
) + 44935456833121271857607041861967869268635584109539353473633873054553903
18278646691517592351147942162829757283672732654718906*a*e^(681/2*I*c) + 540
232208427635848639217080716045249230373661054399375678239756345118322037171
9416455539109849685147683838533792416380394000*a*e^(679/2*I*c) + 6441637428
661563057501000533820791389212722899725158982575438650338723590004865678079
355102867423082969123638559458360395064*a*e^(677/2*I*c) + 76183718752941105
641961216543842531245115661575434720951365646384764643713912959262094351323
61790499815979231439230353607576*a*e^(675/2*I*c) + 893726314795215763676240
123736328390606017542376255907971017911134989189214771319978309964087646551
3972490960354416509072464*a*e^(673/2*I*c) + 1040041893956882969269067276155
936052619321420158220168021731056876014136218320434031791899929050060158731
2837404209184604296*a*e^(671/2*I*c) + 1200686847036478596522350752575807406
469533716196491478100076629062585153133503282262264135067153407165146097530
2014909903304*a*e^(669/2*I*c) + 1375218304672657470338894314471659653008968
125070292383699730867185051197745096339649145804854866887117801543267700931
4283240*a*e^(667/2*I*c) + 1562819593656972303993395151637678670901706644270
936369302808183275576843663926339199860583111614265415631132444804399401848
0*a*e^(665/2*I*c) + 1762285033050908883568393767823870507177042348428327355
2938412847052745751689386549302132045239654150557454790469375312979400*a*e^
(663/2*I*c) + 1972020040177886458475718370782644717819555915506351150427313
8952837613637477930413174805644097852673575370034436363705076200*a*e^(661/2
*I*c) + 2190058446852995951675880083747992895130646084645872903937594321885
3680130886800630510267887849815785681169229247800599653780*a*e^(659/2*I*c)
+ 2414098113448315778195563275126534688906203426418723305867304386086256924
5974192234790942766740180569345117561729698386920640*a*e^(657/2*I*c) + 2641
554936314980668503966145439267020612265815370183362673368419575522391115846
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995152667938703217258208832021982349861252001550039646159536474283494228504
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876397294420077045455933742686055117788039367854141746562086078917937839946
7769874414988489807528551280728660*a*e^(651/2*I*c) + 3315959531533147356972
129975249200797729277076478250842859830047423405667239637471651007463754767
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196139129202552397407753688852390329126523164795493945472750687369015565309
3593169057488857882680*a*e^(647/2*I*c) + 3730052132945941573170425140100281
097958573471097898833362149624623385633902760886025231028469080717397743055
3976853710509180*a*e^(645/2*I*c) + 3918541339920238362207362760432918908988
417940727975797151686773589816813803571996282173607691297122540475978028583
3325366160*a*e^(643/2*I*c) + 4091866128725715758651661611002142378118037703
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5360*a*e^(641/2*I*c) + 4248493411020465375586079150675238474650067449607667
3967800901085937786065818126999716652181441925069428597465940270175008320*a
*e^(639/2*I*c) + 4387412945552773996857990988634756853286259349716761883768
1590989053474358012316788203258490840630555174376169174989395181280*a*e^(63
7/2*I*c) + 4508169844824075318026237569200492792750653834504367393946898174
1472441127727726396712184152830435376131283599596954371095120*a*e^(635/2*I*
c) + 4610868869849396905397932192065957729063974918507803832843791155932457
5990868098570200478146083617100445871110853633600291520*a*e^(633/2*I*c) + 4
696149188100867407357195325873944929763110725688718438336243163643469188472
2589930145727930608372648302523392227498002326040*a*e^(631/2*I*c) + 4765130
082013758403198130130623713278481811240638734049548215491661694777530918141
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3857916729329041495496560962652110580*a*e^(627/2*I*c) + 4860562864748522153
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873872320155547846238824199438934372686877163666449245704006018847791874396
5347339416057414940*a*e^(621/2*I*c) + 4926446454215570587003863454233878821
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2275120*a*e^(617/2*I*c) + 4940704972449785792364641812280241807866341597430
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0*a*e^(615/2*I*c) + 4943050029347945929542918221066724141015407481608712897
8164893559373471444466906250076413859410320538676562475573896009453900*a*e^
(613/2*I*c) + 4943050029347945929542918221066724141015407481608712897816489
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*I*c) + 4940704972449785792364641812280241807866341597430108985830932523362
8714614313902610437654951417123467208217070390610584251240*a*e^(609/2*I*c)
+ 4935501586955109511259058056365233382148713502940320429787113638575117708
2668822483114895823989375806441500725710546732275120*a*e^(607/2*I*c) + 4926
446454215570587003863454233878821243879853070543498183705855935512352332142

0453290054924412360694086356486267112390442900*a*e^(605/2*I*c) + 4912130122
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7040060188477918743965347339416057414940*a*e^(603/2*I*c) + 4890818092533230
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217235337720840743097068652259424626292339759049078074577607385791672932904
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278481811240638734049548215491661694777530918141053496401176637587650438720
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8002326040*a*e^(593/2*I*c) + 4610868869849396905397932192065957729063974918
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3939468981741472441127727726396712184152830435376131283599596954371095120*a
*e^(589/2*I*c) + 4387412945552773996857990988634756853286259349716761883768
1590989053474358012316788203258490840630555174376169174989395181280*a*e^(58
7/2*I*c) + 4248493411020465375586079150675238474650067449607667396780090108
5937786065818126999716652181441925069428597465940270175008320*a*e^(585/2*I*
c) + 4091866128725715758651661611002142378118037703292223884980027067357955
3338073950681237233866877936152591013115793335322605360*a*e^(583/2*I*c) + 3
918541339920238362207362760432918908988417940727975797151686773589816813803
5719962821736076912971225404759780285833325366160*a*e^(581/2*I*c) + 3730052
132945941573170425140100281097958573471097898833362149624623385633902760886
0252310284690807173977430553976853710509180*a*e^(579/2*I*c) + 3528396681263
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972129975249200797729277076478250842859830047423405667239637471651007463754
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4988489807528551280728660*a*e^(573/2*I*c) + 2869634223995152667938703217258
208832021982349861252001550039646159536474283494228504071065120744774725499
7240669017588581660*a*e^(571/2*I*c) + 2641554936314980668503966145439267020
612265815370183362673368419575522391115846996135434051991645372003156367319
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6920640*a*e^(567/2*I*c) + 2190058446852995951675880083747992895130646084645
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0*a*e^(565/2*I*c) + 1972020040177886458475718370782644717819555915506351150
4273138952837613637477930413174805644097852673575370034436363705076200*a*e^
(563/2*I*c) + 1762285033050908883568393767823870507177042348428327355293841
2847052745751689386549302132045239654150557454790469375312979400*a*e^(561/2
*I*c) + 1562819593656972303993395151637678670901706644270936369302808183275
5768436639263391998605831116142654156311324448043994018480*a*e^(559/2*I*c)

+ 1375218304672657470338894314471659653008968125070292383699730867185051197
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6868470364785965223507525758074064695337161964914781000766290625851531335O3
2822622641350671534071651460975302014909903304*a*e^(555/2*I*c) + 1040041893
956882969269067276155936052619321420158220168021731056876014136218320434031
7918999290500601587312837404209184604296*a*e^(553/2*I*c) + 8937263147952157
6367624012373632839060601754237625590797101791113498918921477131997830996 40
8764655139724909603544165090724 64*a*e^(551/2*I*c) + 7618371875294110564 1961
2165438425312451156615754347209513656463847646437139129592620943513236179 04
9981597923143923035360757 6*a*e^(549/2*I*c) + 6441637428661563057501000533 82
0791389212722899725158982575438650338723590004865678079355102867423082969 12
3638559458360395064*a*e^(547/2*I*c) + 5402322084276358486392170807160452492
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416380394000*a*e^(545/2*I*c) + 4493545683312127185760704186196786926863558 4
1095393534736338730545539031827864669151759235114794216282975728367273265 47
18906*a*e^(543/2*I*c) + 3706784707748169939476939927418306117137807661216 18
5577529307951968534891054102022599875800521028818591703507213651354601744*a
*e^(541/2*I*c) + 3032358651189255296683913995058467176181044555965209522749
0276943723145009320204785079450324194893361816431239799951510201 96*a*e^(539
/2*I*c) + 2459883879725165292452425522068178880689709420843492989019614310 0
8874096948577083188963692811905595458826368919170817993986 4*a*e^(537/2*I*c)
 + 1978680026480285014646438754061123105498563130238883005535552359464916 95
2802872195794689967236683993035275155224868084857426*a*e^(535/2*I*c) + 1578
1188910364250301755297757286131848255934905111839419934776288007620578909 18
13709818058882334843395130982221110451724 1960*a*e^(533/2*I*c) + 12479104898
5172481215347756168402974898532716676117664901789376446274254095581035936 03
4575249873743933817332894169321499686 9*a*e^(531/2*I*c) + 978325068291196614
1304805478841491874189481835844832758515284364682797738671754728748237723 01
65347071549590631075211390635 6*a*e^(529/2*I*c) + 760353361950885646641351 97
6860893192022164562902332161692126481992779787997118378502200834924391895 21
5671091534427467182154*a*e^(527/2*I*c) + 5858100878400906389593525931152074
9333040938830433364858650872625496666627261727146091216369995924676616997 49
95865625894415*a*e^(525/2*I*c) + 4473875310425244148831939864392691122933 94
1025699541899181965510160646569849499801211255527461657173027259485755498 03
471765*a*e^(523/2*I*c) + 3386672073660640286700358693759763701110349823161 8
4479753592830355581796704600824509215308211821300197041784861670006680074*a
*e^(521/2*I*c) + 2540980115266867950178268889978628811076981782798030783703
4772414253782223016704046067675830252738120001833879426766821378 2*a*e^(519/
2*I*c) + 1889491189020427563658877672346431137877974092858750283534102934 64
4404036045542653586539364138445889233655185128121555642 63*a*e^(517/2*I*c) +
 1392453280183338807743649688008531425847282555130434164378701124696315506 6
58696053430278963530231765576944002004994611467 26*a*e^(515/2*I*c) + 1016916
4442095007002502401105745299738150028346657473063428389325495918846662740 29
4688296269207633447157874393249664233432 0*a*e^(513/2*I*c) + 735928399275644
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998512524254672819917510359643OO*a*e^(511/2*I*c) + 527725840025912026071527
567068898957493075370026298230158906309240214312430531353083821381541538970
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22876*a*e^(505/2*I*c) + 184090602589765024977173302569641551086417497283354
69201164427871721771346762241189212154587072288919159051458074105345270*a*e
^(503/2*I*c) + 127193465108299801676917693560051353106337171859775948660881
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*c) + 870575065663996280501935754740361039921512432987213049010615850289105
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678585765961272292609235750043165001541228*a*e^(497/2*I*c) + 39639120705364
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657533923303560137333862675788022491010090540339333581845823600565659439828
72*a*e^(489/2*I*c) + 732282573074945415241191984024036255668279273758317972
537870914592731850184818289172732027744954335864633099347774743778*a*e^(487
/2*I*c) + 46855032529333593499967336909176711798578926338071141481498616019
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968698943123410258826147568818488011825480957182319010174427005109701322074
73697085843370374068409734287215730709535159*a*e^(483/2*I*c) + 186246058051
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6204250859944426152513525897996934481741824822705710882414313119272790131*a
*e^(475/2*I*c) + 2611308638642497861940627208748348431168677835346981028004
5602451813616101635095685826358744734323495284346010214813114*a*e^(473/2*I*
c) + 1558181593426048285354507841921955212887518287711054373068632026342500
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338102052013953994655272327701169506976135302561414981599329671691132074752
022832241424911916459710600587437561*a*e^(469/2*I*c) + 53811222485671624211
573835697566302203282933979388379820118345988236397087116939169806464416422
10742072277442692795738*a*e^(467/2*I*c) + 311405651550129739902696800285085
492813895466455247866716835158661279717661825298130844832082891577630780573
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354141392528926855412119981497793799270417127134990753415746380839743700*a*

e^(463/2*I*c) + 10110748001149593767195366249770947389642856046430627991117
78942015387325706624278964496575270768601912488833296828570*a*e^(461/2*I*c)
 + 567211894570524721264934335244788478905608726318730689979939994574065235
928861643029786499059347466854077954904040746*a*e^(459/2*I*c) + 31489738298
943158333268009682716291953167330247168046064002114776518538829900520788348
8229333447615352727288983946148*a*e^(457/2*I*c) + 1729951237565501066373781
323570103064875660499788882050882654953322633031655037800663054086686876989
20139970094538712*a*e^(455/2*I*c) + 940414097395855760889319663270055553239
711080741367215796434630893641710184566990485130268122231684405765166286835
14*a*e^(453/2*I*c) + 505829522181672507409706444229176144626319674426544321
42347921323029515220528364018397135511063228424091734992672055*a*e^(451/2*I
*c) + 269195769225792606752145769442826156530587082608618056157594984212372
41977159288165357847803942410262265158465467750*a*e^(449/2*I*c) + 141739356
433255984532024123966213171732858939160760735728499708299582675917379072866
19219624773200857453140746381674*a*e^(447/2*I*c) + 738328956991590596622744
469611098349215000500983969326803957345776259724464129140684379227866352435
1127277610068501*a*e^(445/2*I*c) + 3804744464968921359015461873113836781159
840428541963397786141899308945274545366930937702520484566257179138022478559
*a*e^(443/2*I*c) + 19395278696913220572173470105895471941193523887881932903
66880726140422435916649514401171793242696849555174393643850*a*e^(441/2*I*c)
 + 978002873261192283457582949969456052834946311148564091945480083912375742
750095496723188070578970297191691801222556*a*e^(439/2*I*c) + 48779380400401
382500929622160999761682089159915899901122667249012985724500743387378716262
9626332383304760538813509*a*e^(437/2*I*c) + 2406371921769259955547697638221
965496951501064127678402468060155887850014665497981167316875495397431602066
90512276*a*e^(435/2*I*c) + 117407982036395964616775103428880300577811655638
673060994605539426451393694076705057517258363475234790358732617874*a*e^(433
/2*I*c) + 56652457509019217332809832253393765490026446523156131066467177640
614737878543683747754276689674112796652581318416*a*e^(431/2*I*c) + 27033592
530880002226737465321359138464847484153982687697594699044738257454819138210
737641742661588856574025344360*a*e^(429/2*I*c) + 12756455617841391513914384
728898840042725661113668791846621927808068785990490077238948492719552936499
900344230684*a*e^(427/2*I*c) + 595216046678660616565535562465898355618400210
49006367634292596565935280818195141374695236251836967708599780176746*a*e^(4
25/2*I*c) + 274608771304596649275981974705753453729579485114252190135088406
8686972703385462885090913563610742000426952431144*a*e^(423/2*I*c) + 1252638
795847466913766125006669625873907326637843208199173827808400459890232296094
362170239873318861004896614156*a*e^(421/2*I*c) + 56491770603803702788592000
743376407605164806140939010812663502809191357241464734717803992357829937985
9935849404*a*e^(419/2*I*c) + 2518652504842815458942381800170935956107969118
82271999250070181159518716093352404254337261360592129286243867720*a*e^(417/
2*I*c) + 111007051148402125345220283714271173982629035385223122646805636583
654935893527705499942693423715121989424818940*a*e^(415/2*I*c) + 48362336013
775503343319693154600872180208893665329972255007464669036745521843710761901
68866525622435894271700*a*e^(413/2*I*c) + 20826348139765728145502300250230

633528625368811037926283789182837817572337323284403311770372970302291071410
100*a*e^(411/2*I*c) + 88642599821438870660522413394953025195926517437063956
09918105114241642344626154900178145218983856632762282840*a*e^(409/2*I*c) +
372880174760892654955131903796142932744740463178835705403581361766541738802
9848305480269822322115047563031420*a*e^(407/2*I*c) + 1550126189251322091456
566293321041304661332373605301977703681149593242237032310585758452049979836
332182019460*a*e^(405/2*I*c) + 63680845082005250841339490337361369940898513
1793378225322630926816010278188664354873365849405050807559590630*a*e^(403/2
*I*c) + 2585039414274187759834493582572271293271870310254053523049461585966
17947732241690180138609024179619896548080*a*e^(401/2*I*c) + 103684586953158
052661761002194856220016078202175436674022417030738316048059257865332989827
933134737432425420*a*e^(399/2*I*c) + 41088615308485898366172497268874114351
478780113160576839336545240589947982864125921136564058023293113177890*a*e^(
397/2*I*c) + 16086447516084063163243689050215879761267599809808958182816872
155074721707033313657170678606565171911318790*a*e^(395/2*I*c) + 62215793900
366012619065913586228573658637652713363638132589281020472312697012877444357
51925676619466254380*a*e^(393/2*I*c) + 237691127497847517000373213623578818
1859385653298280842814105754624463620356183384021592556492451101686180*a*e^
(391/2*I*c) + 8969464154494950217733056521325214891436833880846813774908909
52178768366949153161001917497973558984634610*a*e^(389/2*I*c) + 334295101291
598394405385926974923341821234439369994003970291001771339818244857969207842
071054369602329440*a*e^(387/2*I*c) + 12304718259132723929105983780313299023
6560951541426091502592133079889930820736735976930062642304445760760*a*e^(38
5/2*I*c) + 4472589130147944961802165361302184092582083105216503572494686521
9883816662123055202896018457333687900560*a*e^(383/2*I*c) + 1605309814686536
657061422698593617514802846668574542867033494369104831413462797774748878288
3668338627720*a*e^(381/2*I*c) + 5689019471410220246066908603484004351329982
673777354247661562524221692115006358198880775065147099437120*a*e^(379/2*I*c
) + 19904906928755272586672364990174607843663079232802966549317359979549411
47793207299041775080046145853840*a*e^(377/2*I*c) + 687530224472620092791173
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940*a*e^(375/2*I*c) + 23442090586166750167351495144027547182182831996259574
1737151538794823588356166465622241503448244518760*a*e^(373/2*I*c) + 7889273
247555062920716015061964951885967133305942536387072760442653882061519707285
9753978543934017670*a*e^(371/2*I*c) + 2620451831207455850865238131984749663
4719883744031651088258490824465738576863175200241054655253538000*a*e^(369/2
*I*c) + 8589650067614913233196096604074597492566547822453765715081979725077
156239293288377277499477542060060*a*e^(367/2*I*c) + 27784053052143436342726
424781153687621685136571720170670300841434525834573138856560930290576314443
70*a*e^(365/2*I*c) + 886740231925532664522771055553453849969744152256079998
032209234008019622116815785290576730828104950*a*e^(363/2*I*c) + 27921378124
083730626314923927774127850418076481421632076852312654511226694323086992504
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1635614918587219564911585800789497248326704733021564620*a*e^(359/2*I*c) + 2
657465386577270594551688425896691792857739954492665110111547126128141566277

4645920805562286190810*a*e^(357/2*I*c) + 803102539288425206417745098787909283292860806299086446172632957668408541987549535854972288703065 0*a*e^(355/2*I*c) + 23935364531901942975725216426094858411453720475694518714819436739240842285781199927263643140430 20*a*e^(353/2*I*c) + 70344261979858732725651877195396264112980700614555266516768934520466208490082822182684242907916 0*a*e^(351/2*I*c) + 20384013942017335064659986351963620564829591915624076720589395732101004817925906256820831208879 0*a*e^(349/2*I*c) + 58233756699318390009909172367611895685773867826783550649200500869687498091353927199571718405490*a*e^(347/2*I*c) + 16399645740773051092975392309744789183304727620673733635277139746257521706440274686262794198620*a*e^(345/2*I*c) + 45521645419857011583644408332021973604450148397109569707703402409736346897694182089181605903 20*a*e^(343/2*I*c) + 12452979254554264676850036797832029308856176005577165004739096540453546387984486527260865487 10*a*e^(341/2*I*c) + 33569672073893657070671340361492994491222650751652342287861611894276095078023034168866915436 0*a*e^(339/2*I*c) + 89163024667528844365257556946977068950919875040439960342188615542362550926345388079651264340*a*e^(337/2*I*c) + 23330834917631715093466481420083833029947668880513498966378137598401377993510086729958534960*a*e^(335/2*I*c) + 60134824039422697813758951361927203212332666389054962148661329743407622984430255595369976 80*a*e^(333/2*I*c) + 15265571175700366225719188767782521274684375417746236146193026796584975168400092788493522 80*a*e^(331/2*I*c) + 38161965549422077466794983338247534272338553397448685624309875037076700109628305594550264 0*a*e^(329/2*I*c) + 93932713207395265486897880366664895741093700695924344009200350068922566762007052749646040*a*e^(327/2*I*c) + 22761850427041663890460996661405723193407183947233163896700853295630681434965577357299920*a*e^(325/2*I*c) + 54292169476186125875471230124801656584646052969223575286753687542492001005931502931853 30*a*e^(323/2*I*c) + 12744955210711387445832158356339512808030254262382293708380623674972871957054877027277 80*a*e^(321/2*I*c) + 29440256424059206189496939686815693205792480390369535730682432257725837176842728828766 0*a*e^(319/2*I*c) + 66907643424659838184545773924908879954701525687410376227199214504402274227244630158470*a*e^(317/2*I*c) + 14957789836260035053720288689121945297194278508615355005723695241121674541179126990690*a*e^(315/2*I*c) + 32888284950060987805251425692968001285477513476785385027429547425866525435928215211 00*a*e^(313/2*I*c) + 71108167343618545192404079366914129896962672279661439574280236126609363364126408520 0*a*e^(311/2*I*c) + 15115491025736943469259673580887985158440423930779004760204127590244349529245966679 0*a*e^(309/2*I*c) + 31584005662708604544701764762131792650967524020242941992643782185239861413590496020*a*e^(307/2*I*c) + 64858887594418942644819254525773191903758032936653317222485535413698882922504318 68*a*e^(305/2*I*c) + 13087047441032332449428327113794751616530660003712603610647654941537749293045427 12*a*e^(303/2*I*c) + 25941410534375861438442904557435290318196113438268033411939573534464311736496982 8*a*e^(301/2*I*c) + 50504748951674956594241719165020500739646130041511438767337766766404018721799652*a*e^(299/2*I*c) + 96552069063089810510876615027724717296685509203961726169315466717341914306043 48*a*e^(297/2*I*c) + 18121018304254363008917205726286783630423541985551477267012751500755466435830 80*a*e^(295/2*I*c) +

333805055593388567427808201926960940156572529198077839859476641115104007423532*a*e^(293/2*I*c) + 603374228211089054421888052377053809021565385730677776476436552563422160481 88*a*e^(291/2*I*c) + 106992860611465417411140377189131221667391294437839609204511396378683109536 72*a*e^(289/2*I*c) + 186073250885758713283991952336630580493887448231520608825179175012508459739 8*a*e^(287/2*I*c) + 317290565438299295944227981890447073652423258243355469512774650547831808732*a*e^(285/2*I*c) + 530338626559434445306514714173116590937489676714108081997725458725662502 40*a*e^(283/2*I*c) + 868653770595701574687455664750361197848557528657750073320150408015703836 8*a*e^(281/2*I*c) + 139382220475932054575115543491000636636934846448745938102881317890428046 2*a*e^(279/2*I*c) + 219028335999286257776369634146613713106509647861704677410488454471041828*a*e^(277/2*I*c) + 336965483328793735102555813785378142355585023148641449540374099765434 35*a*e^(275/2*I*c) + 507361214027686902278581069778901395214792817558455950806256993452050 0*a*e^(273/2*I*c) + 747385551508889800825728592465333469870510137536130275665450524715478*a*e^(271/2*I*c) + 107673925545674144588693096021112687136443322698905146090803710183409*a*e^(269/2*I*c) + 151653088004861664024727661229744378319301207468364712918197806370 51*a*e^(267/2*I*c) + 208735594051295060844310589769892041030216208006783682082177128050 2*a*e^(265/2*I*c) + 280652429583871841898555612150376650333075795788342413441360641690*a*e^(263/2*I*c) + 368453766224328778425584144170038872780489758206010951260646784 25*a*e^(261/2*I*c) + 472112855150189813470234989967908258077951489216075374126192606 2*a*e^(259/2*I*c) + 590140408754311076687013315279638319827311377295800031121209656*a*e^(257/2*I*c) + 719284009116603764023203187516727101605184738050959165118873 72*a*e^(255/2*I*c) + 854397411943340715997516624301302627999098554926280102256507 0*a*e^(253/2*I*c) + 988558268629814228600928047340864800588772545018200620775758*a*e^(251/2*I*c) + 111348526291800411107246584226952800505326877479452354210332*a*e^(249/2*I*c) + 122025716474803684789473393471975425543736601297663056700 26*a*e^(247/2*I*c) + 130027342859438463217880491586934807649249604052802694198 2*a*e^(245/2*I*c) + 134633163152791085906227518959644714629575426941345274855*a*e^(243/2*I*c) + 135364819998519157069580490678292033970308455918009799 48*a*e^(241/2*I*c) + 132063201818273405043449076959796054660794302120955437 4*a*e^(239/2*I*c) + 124924620764273645058915750915973878220098322691297101*a*e^(237/2*I*c) + 114486152652270289203320200548724647378928376240915 99*a*e^(235/2*I*c) + 101560279929753868188150233243857821464483874421276 8*a*e^(233/2*I*c) + 87129450753762477310055827412704326695373797670990*a*e^(231/2*I*c) + 72219590083993806706485241468939797803107675519 77*a*e^(229/2*I*c) + 577756667439166347317361298827893686038031023201*a*e^(227/2*I*c) + 4456101622755301159027145079943660097856140086 2*a*e^(225/2*I*c) + 330957129722922935843871959578112332470015352 8*a*e^(223/2*I*c) + 236397938386786552298680619962344215977635255*a*e^(221/2*I*c) + 16217272197080856640086895687618882654237557*a*e^(219/2*I*c) + 1066925770347513486390409808978976432165366*a*e^(217/2*I*c) + 672079209701337255385647269068827694617 32*a*e^(215/2*I*c) + 404655014276814282344165691210457664657 5*a*e^(213/2*I*c) + 23243890842572666520980709649877507969 0*a*e^(211/2*I*c) + 1271150267484752911214872621899914052 2*a*e^(209/2*I

*c) + 660337796328597830395723099421064436*a*e^(207/2*I*c) + 32503673735785
8505712584521229857l4*a*e^(205/2*I*c) + 151179877257667304787543538747941 8*
a*e^(203/2*I*c) + 66238605837791619527049091465540*a*e^(201/2*I*c) + 272446
7073240049286222217499520*a*e^(199/2*I*c) + 1047871950006670853826308500 98*
a*e^(197/2*I*c) + 37519711736917061109240348 57*a*e^(195/2*I*c) + 1244276153
97868362145478058*a*e^(193/2*I*c) + 37993164997149313827 00630*a*e^(191/2*I*
c) + 1060722880483945697169 87*a*e^(189/2*I*c) + 26853743807890293297 93*a*e^
(187/2*I*c) + 610312359252072445 02*a*e^(185/2*I*c) + 1229848582862270 68*a*
e^(183/2*I*c) + 2163050271359066 7*a*e^(181/2*I*c) + 325270717497440*a*e^(17
9/2*I*c) + 4065883968718*a*e^(177/2*I*c) + 40557446072*a*e^(175/2*I*c) + 30
2667508*a*e^(173/2*I*c) + 1502072*a*e^(171/2*I*c) + 3718*a*e^(169/2*I*c))/(
e^(531*I*c) + 432*e^(530*I*c) + 93096*e^(529*I*c) + 13343760*e^(528*I*c) +
1431118260*e^(527*I*c) + 122503723056*e^(526*I*c) + 8718181624155*e^(525*I*
c) + 530563624556832*e^(524*I*c) + 28186192554792138*e^(523*I*c) + 13278828
49274858880*e^(522*I*c) + 56169444526926562260*e^(521*I*c) + 21548641447812
57856128*e^(520*I*c) + 75599817092670157806639*e^(519*I*c) + 24424556298945
02983849104*e^(518*I*c) + 73099207817335597247098038*e^(517*I*c) + 20370312
594703681601319223 20*e^(516*I*c) + 530901272646309634700398044 75*e^(515*I*c
) + 129914664599324031816782653228 8*e^(514*I*c) + 299525477492654996752578 4
2032197*e^(513*I*c) + 652650253343206047453620559993840*e^(512*I*c) + 13477
22779952470195657927421039532 6*e^(511*I*c) + 264410375780310742518099326419
685040*e^(510*I*c) + 49396661081802579880958635254347 1345*e^(509*I*c) + 88
054927598941411145869950813388040256*e^(508*I*c) + 150060274793739728640557
7818722691539392*e^(507*I*c) + 24489837337812338687718622491865013839488*e^
(506*I*c) + 383360155801054824529764688213114368047154*e^(505*I*c) + 576460
1046563151304213854710715346838447392*e^(504*I*c) + 833808399118378944531 36
303673785039051506805*e^(503*I*c) + 1161581413733971751533622511909046917 18
8768400*e^(502*I*c) + 1560391127768760709972162377174493308692058727 2*e^(50
1*I*c) + 2023475097244621713139666435802340785081798383 20*e^(500*I*c) + 253
566746065027977683456156618659121310925164285 9*e^(499*I*c) + 30735366512830
5621609911663384900573080627625184 96*e^(498*I*c) + 360688613036389349413809
7800045599635487754233252 55*e^(497*I*c) + 410154543993719579395995670844249
670943380026122488 0*e^(496*I*c) + 452309400398307383320256947846462068448 54
827698075736*e^(495*I*c) + 48409341024048871865591702530366258109165912618 2
344528*e^(494*I*c) + 503202490340145182407421394376601192202650700631198275
3*e^(493*I*c) + 5083636950817109943701934861084739194673618510801718313 6*e^
(492*I*c) + 4994675065585317336715858629105727028115450357303987495 30*e^(49
1*I*c) + 47753986071008532635342077338182667747869341273873103168 0*e^(490*
I*c) + 44456708175258821024400946210535004523775722190977468484496*e^(489*I
*c) + 403212225957798188840846139960995624144491271694336796459584*e^(488*I
*c) + 356476489062872401708848799668817892919578761395854547480484 5*e^(487*
I*c) + 30736217404321009965231037419663053962881035281709221697785072*e^(48
6*I*c) + 2585853487159772701558291156841934110720345414913643939854913 50*e^
(485*I*c) + 21237029691888713182667187812239270678399490157272938840653880 8
0*e^(484*I*c) + 170338860273906157410409777216555416656121622754850285843 10

890417*e^(483*I*c) + 1334902100520261837796733138683323035303329061632471946
627808410304*e^(482*I*c) + 1022536437468296737293065862705246449693687415559
865844306888705423*e^(481*I*c) + 7659010520187549651777118357676871927081898
9891311257557982042361112*e^(480*I*c) + 561170810763411753840875701851885386
6037593201367473551905522736836 6*e^(479*I*c) + 40234969226612115893400358
283942878511690490393640954560251921966472 0*e^(478*I*c) + 28239051519365866
783825257065644572802900986986385979876283802458817 15*e^(477*I*c) + 1940797
92155945665935350081033032552577454080700824313389451847974639 36*e^(476*I*c
) + 13065766022656041933512143438993896188459543406998482430714933213174754
0*e^(475*I*c) + 86188485109499190876424680547467242860375731548445397471361
2812215428992*e^(474*I*c) + 557255115732867112101621641630759616186195596 90
1169722234092621011285441 8*e^(473*I*c) + 35324447206779018115378052820789 41
168758100458236743100620587963372901520 0*e^(472*I*c) + 21960128133951556150
0261478844190024870555261281946058839614044697037963695*e^(471*I*c) + 13392
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470*I*c) + 80137295807907524343619649457615437614695207912107469726758704 81
058674277844*e^(469*I*c) + 47065044611135158108487353367484243102698248838 3
126358762830994274427458667 04*e^(468*I*c) + 271361207503266570734486517077 1
810148017753221831810556386192578361432714723 58*e^(467*I*c) + 1536333238444
927583532734556016494671674916578907116984548489078241693926940560*e^(466*I
*c) + 854301344112621233483354066506962147247908583804136056455072203672365
4297540205*e^(465*I*c) + 466682235482660178068545924681005702893559608696 13
650856575756758180182223308768*e^(464*I*c) + 250501028608928332469340456829
902067712233644464602753159945727868485722395506952*e^(463*I*c) + 132149805
527130085142999386663161987442453442518818359204972768757103215643507728 0*e
^(462*I*c) + 685299322314573668732888531161779543559294084143986635107965 56
523128947219727962 66*e^(461*I*c) + 34941071613276704649477943043339450201 50
407533516036186591602921386077860623062496 0*e^(460*I*c) + 17519317050061830
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I*c) + 86397993362233034955629682002839551319870806494050570212606865293680
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724923159318091718599021141090059399429 52*e^(457*I*c) + 20008006803030047 13
729327825032159711354071620198333312634928118667915319906804525721 6*e^(456*
I*c) + 93986915313068179149083606065681482780836060510530154618486949839467
131378859885998210*e^(455*I*c) + 43454667678028004534634449876389254079717 5
1057568275155092970241876602993454849201924 80*e^(454*I*c) + 197779298066581
813565130009432623915860544887080697086057732538502860998303453467231850 0*e
^(453*I*c) + 886275214275695728568134088576490459793534956935532181564772 11
725371591864914713116664 00*e^(452*I*c) + 391080312556018094765375353696118 4
444084490375160564502351457235204524810426293359885073 0*e^(451*I*c) + 16995
632796992976777390209665262925328370450547712754455653441737668654093670607
3847337600*e^(450*I*c) + 727521010718394229291774073844694255798738667067 53
53797597327955679425787513842507804763 10*e^(449*I*c) + 30679742964317473641
981596239624636716170064196268514261484186029348529073790216597619118 40*e^(
448*I*c) + 127472196165033205413563430625628473686016221408567860254458145 3

20379041115232422982357133OO*e^(447*I*c) + 5219091220766182421581227185426974807129284324322789476922969072001054714133413161098963600O*e^(446*I*c) + 210594301385648471184329078880317504953361839954159427434009884661777259752542647709150036990*e^(445*I*c) + 83757920692341193245878648676537353394654523970899076948872481398218916510458989551890925632O*e^(444*I*c) + 32838747605558186767263094803067344201550985839480744690141681718744421701096485216275387559 20*e^(443*I*c) + 1269349693296492056507367363718128008854868250888025533728006500656613869604179735321658452864O*e^(442*I*c) + 48379489756434099843857791816589379406815042609340378747586437145781646245422045101230417309900*e^(441*I*c) + 181834661406177901315330129677145381166449188413194141169344354754920969034952610378945282257600*e^(440*I*c) + 674025530543133008894845775236625237450743114473544537818170447134607102575676676056675328961590*e^(439*I*c) + 246438219080743960907977422685567962936788570977643587663085171625396269619234170623919287872816O*e^(438*I*c) + 888829502875102466704420383760797610148005313441861447462076752282486891195988435266644491740400O*e^(437*I*c) + 316266446747255477311767956875276535713059699859236883921121649155532425732694909089895702485332 80*e^(436*I*c) + 1110341487970088194431438956444692422950498674643137109692576193388991337992856160200698726117108 50*e^(435*I*c) + 384655842080666274454063078784837174998949052500975322162003392549953413592461519365177908682078400*e^(434*I*c) + 13150521209306921221022971053276228423358707434285308910729835358622800944466077234738004774539141 30*e^(433*I*c) + 443721091784318234776434954444390469902005659506947084719361709211471407763307723497282535122697936O*e^(432*I*c) + 14777955096617128998712745182071495362176506973183081650233605274051677624970464340242755840025673760*e^(431*I*c) + 485842581531402804473148368687721313901954124190467327784587060150968814370763379107935841224750737 60*e^(430*I*c) + 157685845528850918721462877864435090257583149415561323427386562894447598277935629800939237175625149830*e^(429*I*c) + 5052936631230152588784830257388128132033977668453400653812610163534197223826203930325359606609219504 00*e^(428*I*c) + 1598771101058192692270528999677444742685631006232456185844925220144002305878120380828483988663574829100*e^(427*I*c) + 499524195627913818020518674440168802438827211392125566373495694692757130553314677689878787805968510848 0*e^(426*I*c) + 15413111211486023937294970820797376716081344788163386543522421939737507962125854981881879168348260330000*e^(425*I*c) + 46970224727117281826454045018070670522559756627580347784535320014963482632359729444541885102274546002560*e^(424*I*c) + 14137993825355684328056550580740330413060613072543475174579407983314136174891763998614537706643721054619O*e^(423*I*c) + 42035802483514679858361121014594215468443794936564789908837252480215622288483958001168865566428069177360O*e^(422*I*c) + 12346680418924099787800180817554402160125824763969419379658996319530792039742221387946043284989721447669OO*e^(421*I*c) + 35827180021632960614145367037151098971071982527392845461493431023484561240896574285949464386608597738624O*e^(420*I*c) + 10271602530202889002497813516849452590971512809529060665197301097052210064576088348023234671975463677418470*e^(419*I*c) + 29097651061247453406647569781836910062165559852359052804259154165687125428752562385492373749486351714453120*e^(418*I*c)

+ 81452081413829111828875417564250054846037693312811480492909160758195989155768107022568350953861815940704090*e^(417*I*c) + 225320532593220657767941109289516248999794521015564134982827241710019675486694499689312466561907212627820000*e^(416*I*c) + 616003116022979584937125701757887212998354300989991362628038861093914561332071191909714949426587936910303300*e^(415*I*c) + 1664475034387211809394917743502937638978574937754764763987835872410449930690131572904279995484581013965001440*e^(414*I*c) + 4445412259295474625067659514198312966015416299968930393345630345914109720740573618884980520010028451496996210*e^(413*I*c) + 11735856926245118493113091002501604032341876985999082823520672241530200188223826392982302194084667538488665600*e^(412*I*c) + 30627581054221957378390547289277609129572813931082733520247387226000020043538279468776707958420892547870128680*e^(411*I*c) + 79019149558766569254783988487232388352909144982747171856772463223808993367091503402876467270176124342699654400*e^(410*I*c) + 201557947424794098026772478462040883395867512562930862943753568690084015585598010154781548625239409581907397500*e^(409*I*c) + 508324599301085460166978629683032661427654474082939048097939638391567298795788389433842285751054665210868287680*e^(408*I*c) + 1267597017294812913400146276042126929986480292870190399107554311079964227280196522475370108738477856311765699610*e^(407*I*c) + 3125683493178701743479704750307490178666292150720179363604335113528623329684606343185540756019935662148267863968*e^(406*I*c) + 7621788791912047062038840917799374600428892258194367636682944356096681400246312138001769285020661445991073249416*e^(405*I*c) + 18379807084003359766027649217621144116091735572216620788861535803449702273802588359076704241840733513439114113248*e^(404*I*c) + 43834972142919377685378692233021063744554033100928502737480438978976746989895784070951905237783490374305934542955*e^(403*I*c) + 103399755467257436489847837640753754718204394473055795001467604326419876555556873829531737211096115196005647730480*e^(402*I*c) + 241246021282440061792908317783032876194801597133206052091286997043729145345755805710081489006741839439573984832678*e^(401*I*c) + 556756388711182340341026192734219546113651768317380539005893679049394714017063698565272728813669054779077208977840*e^(400*I*c) + 1271033082938048950201360554831270342662343991277504612342300366025046741742856580445289401786656311685859023084716*e^(399*I*c) + 2870496131412314451834674715353589439553294430808531933466086288543709246230769151392180699413405623017247753532944*e^(398*I*c) + 6413381895855925184758231451062556380328594938511006577015218119786536390213057284018202201631094434819584025113465*e^(397*I*c) + 14176483652875704957202013343241117904369977796653849959902524421980635189011634815653279605497783382888932766730080*e^(396*I*c) + 31004319206069417077069363141423487431828009098184744635678652284177439464941651812564519144918003174108077634846014*e^(395*I*c) + 67091706130529669125019899210021576580237843462229535386295087076189297849995931360645605292130961496106707521506432*e^(394*I*c) + 143657687138044796942947119704259538458818199423516824674586293691056119209866358123637772245409530799230553767222252*e^(393*I*c) + 304384471106813336010284160123906370433888828490627422652551236966790916174520857759143930140187173492394981908258944*e^(392*I*c) + 6382188929145337415058063996624885560667836004960918764083

7497487744897177803607499624558112428346043806518207197608 5*e^(391*I*c) + 1
3243113249840274283552229381476823786728607088171617414487496895935880208 60
847508703702325320304649883120684987556400*e^(390*I*c) + 271958928348374392
604080510108034192124453031125460725092919277390933152322663503581567286256
929669371164352107033 1394*e^(389*I*c) + 552749884903117835586123000932666 82
839262900821584671180006985027193799390459183442221927421457112570280409740
74674736*e^(388*I*c) + 111194996453632010808810628248863384924253756584489 7
793553584634929042582157038309042541141852151667037137204520656834 5*e^(387*
I*c) + 221407350017086032709151807692413916620355787559039791489092136038 22
554792749183517160255571915875356439553717130797888*e^(386*I*c) + 436383000
758151710259462114644656896189657734886609858579456574798540851088518579112
229119898376154526085123560084002 95*e^(385*I*c) + 85139533234786455779589 95
946490063776073572970562122138000583720836915779467304967542879981787543143
0246332625899630160*e^(384*I*c) + 164437500676906892741323260154394278503 95
456193602013359658180644935724027734944792733451710580999530009354927993127
3178*e^(383*I*c) + 314409035808225861565595436938354945445473991043129722 04
674722881303092520496850341856681883861186670980704079349536449 6*e^(382*I*c
) + 595157615500431514947479282336547053827926087916425263497187757029413 38
547183543419824680709621453689544138830602723789 9*e^(381*I*c) + 11153982855
456015505333280456001843179938993592179967298183407042218011956674104858469
961790567335585124522385831607925 12*e^(380*I*c) + 206969828950086064346166 5
762373807957513019424041178871904960551829412449344722432125679417958403007
551179298315947373776*e^(379*I*c) + 380260499670589110696462063384896480703
709885451018226324303059729563076035359753197432475226638919318576087827418
8013440*e^(378*I*c) + 691783894521484427849333045936139492337233385361987 96
373726731849428597124310663457268704220998931248907776780373699881 50*e^(377
*I*c) + 124621404405372580849285967098720668577570709431248685545009481547 5
68634543080329254083403112378500178147078969869690868 16*e^(376*I*c) + 22231
341131801535345406399037721686840208397941952580135584645966746736656716271
554826476282991066076564921432614339399735*e^(375*I*c) + 392742004143298611
693979445162250010812274333985850072063992312119071577953597196482415987542
6657984024455149147646789995 2*e^(374*I*c) + 687124660159856415124685861736 5
974773487959171009835465278612493602307394314104957360664856300535941171276
4895683903806088*e^(373*I*c) + 119060591849660546834765693227676449067584 14
824888267844750482607723633344451345409512666875005729581119164335690897219
1440*e^(372*I*c) + 204325557265186000767402710230847896459761583922763698 23
543321283331307778304104007466937901739483676153964908169063081166 5*e^(371*
I*c) + 347310053810935290419455560555957314129569210735745983234369659976 41
337477407800017307007524865452491717912895050744305820 8*e^(370*I*c) + 58474
957368230458617938462884488332758149896988654038037889676799907561496400717
460081109294535663511879582479936971674210 9*e^(369*I*c) + 97521033944404931
875728231176351778667322317559445794638327926463508504100491730029590427543
314484853245991987547981758158 4*e^(368*I*c) + 161109254140006052595485937 52
641941783476434718370782014462624356151429445873378335135860227298495233584
3649358604225299560 8*e^(367*I*c) + 263666241043079934044752228477824428374 0

751068658140726576446671207798325606832295937705061686297930296382338892574
900819440*e^(366*I*c) + 427482690772059175252671133682087150084434564792238
5471534359333606189571832444641364132893108663576205133870672156264164115*e
^(365*I*c) + 686642533751866826266269375090895696573292457814218163062215780
2899880874681551031136314064199948604001529894566235238597088*e^(364*I*c)
+ 1092721060347354481027979234784453607458889680623004111008954473160586314
6104181739039426674855453466097402330688331845602302*e^(363*I*c) + 17229502
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080095366818322029152193635869784095333760*e^(362*I*c) + 269177947010866150
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199445102303122616544648208998767803944455777042886552738499747183713136069
104651812215*e^(359*I*c) + 971730550247426800586167224613688926611412955402
634930130327460835361573242683333904003089583183702191548871697022574447561
76*e^(358*I*c) + 1463904484563511812182373827403741241916648199977469880765
98391862733629670142241546375533903130605297580105675355629160198162*e^(357
*I*c) + 2185631666596493122474836409562721492124991153838287710296542833639
72585118090479413696638108156385244646591328454425745117584*e^(356*I*c) + 3
234131780148410037141511382460791525763609760350584578904099377387231715370
36573043681997163745313602400139153046673668433091*e^(355*I*c) + 4743230435
631005423773386299319662481291759769823324460180560093911540204388959031408
22967769494019446166779954024655344116288*e^(354*I*c) + 6895184493287935599
032604181499741902535783400588950355896064682446805915561181703040050375636
69880057908765898949268614772285*e^(353*I*c) + 9935556536495211272264439608
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25090943332264901780720*e^(352*I*c) + 1419164481422176573858234013898999628
822322333309573730716310743838935832201454293617293175086458389621425307051
750612129761498*e^(351*I*c) + 200949611009268773815278208568373722272796882
429905873921544608349935146762533444967075776406669065615094901494404399482
2823920*e^(350*I*c) + 28208192985622159591075298072896284496213867989894363
69393116069894018781201000275633104498398959346631795568022519974400130281*
e^(349*I*c) + 3925697658415778352768103942856011840211642769621717217996614
398473887186074391482638547212826538270453912634540299792270321024*e^(348*I
*c) + 541666280405243634958559598281835795386625846164435401820515891774257
6425344364964596750653177677803492186817305171175032011500*e^(347*I*c) + 74
103726128911522243646332961280439716571932803277543043822356727737814030238
14127610355562505271969045177704726054907145784960*e^(346*I*c) + 1005220952
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915558854706851796541567399811656870021567352975326815467817846533289123871
696056195231696146162720992221760992*e^(344*I*c) + 180353273381774554711775
685948516829779783464497771935720876885103924268845192729915608513263938522
41961470040819793627127923997*e^(343*I*c) + 2385639856556280203069527817421

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) + 17926490780896322989369457284819693349643915975062850884883506229372525334209808031443164317014521905227161247978752574375163606 40*e^(294*I*c) + 1
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^(283*I*c) + 362706307563843231135699157418510732452420614013624168879312187645233450153927975793326834780741391203430153093712635355523960320*e^(282*
I*c) + 30206063803086846346113944227936049971890691748252489448335622019613837705082891138305686042537016115720149369607371232259577680 8*e^(281*I*c) +
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271*I*c) + 238563985655628020306952781742126408332821541740064594582926440 6
094792490731373592156169015393990601751864718249161657372404974 4*e^(270*I*c
) + 180353273381774554711775685948516829779783464497771935720876885103924 26
884519272991560851326393852241961470040819793627127923997*e^(269*I*c) + 135
212304119454369155588547068517965415673998116568700215673529753268154678178
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545346609740233068833184560230 2*e^(249*I*c) + 686642533751866826266269375 09

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*I*c) + 2719589283483743926040805101080341921244530311254607250929192773909331523226635035815672862569296693711643521070331394*e^(223*I*c) + 1324311324984027428355222938147682378672860708817161741448749689593588020860847508703702325320304649883120684987556400*e^(222*I*c) + 638218892914533741505806399662488556066783600496091876408374974877448971778036074996245581124283460438065182071976085*e^(221*I*c) + 304384471106813336010284160123906370433888828490627422652551236966790916174520857759143930140187173492394981908258944*e^(220*I*c) + 143657687138044796942947119704259538458818199423516824674586293691056119209866358123637772245409530799230553767222252*e^(219*I*c) + 67091706130529669125019899210021576580237843462229535386295087076189297849995931360645605292130961496106707521506432*e^(218*I*c) + 31004319206069417077069363141423487431828009098184744635678652284177439464941651812564519144918003174108077634846014*e^(217*I*c) + 14176483652875704957202013343241117904369977796653849959902524421980635189011634815653279605497783382888932766730080*e^(216*I*c) + 6413381895855925184758231451062556380328594938511006577015218119786536390213057284018202201631094434819584025113465*e^(215*I*c) + 2870496131412314451834674715353589439553294430808531933466086288543709246230769151392180699413405623017247753532944*e^(214*I*c) + 1271033082938048950201360554831270342662343991277504612342300366025046741742856580445289401786656311685859023084716*e^(213*I*c) + 556756388711182340341026192734219546113651768317380539005893679049394714017063698565272728813669054779077208977840*e^(212*I*c) + 241246021282440061792908317783032876194801597133206052091286997043729145345755805710081489006741839439573984832678*e^(211*I*c) + 103399755467257436489847837640753754718204394473055795001467604326419876555556873829531737211096115196005647730480*e^(210*I*c) + 43834972142919377685378692233021063744554033100928502737480438978976746989895784070951905237783490374305934542955*e^(209*I*c) + 18379807084003359766027649217621144116091735572216620788861535803449702273802588359076704241840733513439114113248*e^(208*I*c) + 7621788791912047062038840917799374600428892258194367636682944356096681400246312138001769285020661445991073249416*e^(207*I*c) + 3125683493178701743479704750307490178666292150720179363604335113528623329684606343185540756019935662148267863968*e^(206*I*c) + 1267597017294812913400146276042126929986480292870190399107554311079964227280196522475370108738477856311765699610*e^(205*I*c) + 508324599301085460166978629683032661427654474082939048097939638391567298795788389433842285751054665210868287680*e^(204*I*c) + 201557947424794098026772478462040883395867512562930862943753568690084015585598010154781548625239409581907397500*e^(203*I*c) + 79019149558766569254783988487232388352909144982747171856772463223808993367091503402876467270176124342699654400*e^(202*I*c) + 30627581054221957378390547289277609129572813931082733520247387226000020043538279468776707958420892547870128680*e^(201*I*c) + 11735856926245118493113091002501604032341876985999082823520672241530200188223826392982302194084667538488665600*e^(200*I*c) + 4445412259295474625067659514198312966015416299968930393345630345914109720740573618884980520010028451496996210*e^(199*I*c) + 1664475034387211809394917743502937638978574937754764763987835872410449930690131572904279995484581013965001440*e^(198*I*c) + 61600311602297958493712

570175788721299835430098999136262803886109391456133207119190971494942658793
6910303300*e^(197*I*c) + 225320532593220657767941109289516248999794521015 56
413498282724171001967548669449968931246656190721262782000 0*e^(196*I*c) + 81
452081413829111828875417564250054846037693312811480492909160758195989155768
1070225683509538618159407040 90*e^(195*I*c) + 290976510612474534066475697818
369100621655598523590528042591541656871254287525623854923737494863517144531
20*e^(194*I*c) + 102716025302028890024978135168494525909715128095290606651 9
7301097052210064576088348023234671975463677418470*e^(193*I*c) + 35827180021
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4643866085977388624 0*e^(192*I*c) + 123466804189240997878001808175544021601 2
5824763969419379658996319530792039742221387946043284989721447669 00*e^(191*I
*c) + 420358024835146798583611210145942154684437949365647899088372524802156
2228848395800116886556642806917736 00*e^(190*I*c) + 1413799382535568432805 65
505807403304130606130725434751745794079833141361748917639986145377066437210
546190*e^(189*I*c) + 469702247271172818264540450180706705225597566275803477
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1879168348260330000*e^(187*I*c) + 499524195627913818020518674440168802438 82
72113921255663734956946927571305533146776898787878059685108480*e^(186*I*c)
+ 159877110105819269227052899967744474268563100623245618584492522014400230 5
8781203808284839886635748291 00*e^(185*I*c) + 505293663123015258878483025738
812813203397766845340065381261016353419722382620393032535960660921950400*e^
(184*I*c) + 157685845528850918721462877864435090257583149415561323427386562
894447598277935629800939237175625149830*e^(183*I*c) + 485842581531402804473
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73760*e^(182*I*c) + 147779550966171289987127451820714953621765069731830816 5
0233605274051677624970464340242755840025673760*e^(181*I*c) + 44372109178431
823477643495444439046990200565950694708471936170921147140776330772349728253
51226979360*e^(180*I*c) + 131505212093069212210229710532762284233587074342 8
530891072983535862280094446607723473800477453914130*e^(179*I*c) + 384655842
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177908682078400*e^(178*I*c) + 111034148797008819443143895644469242295049867
464313710969257619338899133799285616020069872611710850*e^(177*I*c) + 316266
446747255477311767956875276535713059699859236883921121649155532425732694909
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134418614474620767522824868911959884352666444917404000*e^(175*I*c) + 246438
219080743960907977422685567962936788570977643587663085171625396269619234170
6239192878728160*e^(174*I*c) + 674025530543133008894845775236625237450743 11
447354453781817044713460710257567667605667532896159 0*e^(173*I*c) + 18183466
140617790131533012967714538116644918841319414116934435475492096903495261037
8945282257600*e^(172*I*c) + 483794897564340998438577918165893794068150426 09
340378747586437145781646245422045101230417309900*e^(171*I*c) + 126934969329
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84528640*e^(170*I*c) + 328387476055581867672630948030673442015509858394807 4
469014168171874442170109648521627538755920*e^(169*I*c) + 837579206923411932

458786486765373533946545239708990769488724813982189165104589895518909256320
*e^(168*I*c) + 210594301385648471184329078880317504953361839954159427434009
884661777259752542647709150036990*e^(167*I*c) + 521909122076618242158122718
54269748071292843243227894769229690720010547141334131610989636000*e^(166*I*
c) + 1274721961650332054135634306256284736860162214085678602544581453203790
4111523242298235713300*e^(165*I*c) + 30679742964317473641981596239624636716
17006419626851426148418602934852907379021659761911840*e^(164*I*c) + 7275210
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I*c) + 88627521427569572856813408857649045979353495693553218156477211725371
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*e^(158*I*c) + 939869153130681791490836060656814827808360605105301546184869
49839467131378859885998210*e^(157*I*c) + 2000800680303004713729327825032159
7113540716201983333126349281186679153199068045257216*e^(156*I*c) + 41915425
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52*e^(155*I*c) + 8639799336223303495562968200283955131987080649405057021260
68652936800794826651264256*e^(154*I*c) + 1751931705006183002415156323819122
85157790097816049220671217212220015297133400636060*e^(153*I*c) + 3494107161
3276704649477943043339450201504075335160361865916029213860778606230624960*e
^(152*I*c) + 68529932231457366873288853116177954355929408414398663510796556
52312894721972796266*e^(151*I*c) + 1321498055271300851429993866631619874424
534425188183592049727687571032156435077280*e^(150*I*c) + 250501028608928332
469340456829902067712233644464602753159945727868485722395506952*e^(149*I*c)
+ 466682235482660178068545924681005702893559608696136508565757567581801822
23308768*e^(148*I*c) + 8543013441126212334833540665069621472479085838041360
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) + 47065044611135158108487353367484243102698248838312635876283099427442745
866704*e^(144*I*c) + 801372958079075243436196494576154376146952079121074697
2675870481058674277844*e^(143*I*c) + 13392143742542455535648844068019453533
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7206779018115378052820789411687581004582367431006205879633729015200*e^(140*
I*c) + 55725511573286711210162164163075961618619559690116972223409262101128
54418*e^(139*I*c) + 8618848510949919087642468054746724286037573154844539747
13612812215428992*e^(138*I*c) + 1306576602265604193351214343899389618845954
34069984824307149332131747540*e^(137*I*c) + 1940797921559456659353500810330
3255257745408070082431338945184797463936*e^(136*I*c) + 28239051519365866783
82525706564457280290098698638597987628380245881715*e^(135*I*c) + 4023496922
66121158934003582839428785116904903936409545602519219664720*e^(134*I*c) + 5

6117081076341175384087570185188538660375932013674735519055227368366*e^(133*I*c) + 76590105201875496517771183576768719270818989891311257557982042361 12*e^(132*I*c) + 1022536437468296737293065862705246449693687415559865844306888705423*e^(131*I*c) + 1334902100520261837796733138683323035303329061632471946278084103 04*e^(130*I*c) + 17033886027390615741040977721655541665612162275485028584310890417*e^(129*I*c) + 2123702969188871318266718781223927067839949015727293884065388080*e^(128*I*c) + 2585853487159772701558291156841934110720345414913643939854913 50*e^(127*I*c) + 3073621740432100996523103741966305396288103528170922169778507 2*e^(126*I*c) + 3564764890628724017088487996688178929195787613958545474804845*e^(125*I*c) + 4032122259577981888408461399609956241444912716943367964595 84*e^(124*I*c) + 444567081752588210244009462105350045237757221909774684844 96*e^(123*I*c) + 477539860710085326353420773381826677747869341273873103168 0*e^(122*I*c) + 49946750655853173367158586291057270281154503573039874953 0*e^(121*I*c) + 508363695081710994370193486108473919467361851080171831 36*e^(120*I*c) + 503202490340145182407421394376601192202650700631198275 3*e^(119*I*c) + 484093410240488718655917025303662581091659126182344528*e^(118*I*c) + 452309400398307383320256947846462068448548276980757 36*e^(117*I*c) + 410154543993719579395995670844249670943380026122488 0*e^(116*I*c) + 360688613036389349413809780004559963548775423325255*e^(115*I*c) + 307353665128305621609911663384900573080627625184 96*e^(114*I*c) + 253566746065027977683456156618659121310925164285 9*e^(113*I*c) + 20234750972446217131396664358023407850817983832 0*e^(112*I*c) + 1560391127768760709972162377174493308692058727 2*e^(111*I*c) + 116158141373397175153362251190904691718876840 0*e^(110*I*c) + 8338083991183789445313630367378503905150680 5*e^(109*I*c) + 57646010465631513042138547107153468384473 92*e^(108*I*c) + 383360155801054824529764688213114368047154*e^(107*I*c) + 244898373378123386877186224918650138394 88*e^(106*I*c) + 150060274793739728640557781872269153939 2*e^(105*I*c) + 880549275989414111458699508133880402 56*e^(104*I*c) + 493966661081802579880958635254347134 5*e^(103*I*c) + 264410375780310742518099326419685040*e^(102*I*c) + 134772277995247019565792742103953 26*e^(101*I*c) + 65265025334320604745362055999384 0*e^(100*I*c) + 2995254774926549967525784203219 7*e^(99*I*c) + 1299146645993240318167826532288*e^(98*I*c) + 530901272646309634700398044 75*e^(97*I*c) + 2037031259470368160131922320*e^(96*I*c) + 730992078173355972470980 38*e^(95*I*c) + 2442455629894502983849104*e^(94*I*c) + 75599817092670157806639*e^(93*I*c) + 215486414478125785612 8*e^(92*I*c) + 56169444526926562260*e^(91*I*c) + 1327882849274858880*e^(90*I*c) + 28186192554792138*e^(89*I*c) + 530563624556832*e^(88*I*c) + 8718181624155*e^(87*I*c) + 122503723056*e^(86*I*c) + 1431118260*e^(85*I*c) + 13343760*e^(84*I*c) + 93096*e^(83*I*c) + 432*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) + 7*(11154*I*a*e^(1055/2*I*c) + 4506216*I*a*e^(1053/2*I*c) + 908002524*I*a*e^(1051/2*I*c) + 121672338216*I*a*e^(1049/2*I*c) + 12197651906154*I*a*e^(1047/2*I*c) + 975812152492320*I*a*e^(1045/2*I*c) + 64891508140773093*I*a*e^(1043/2*I*c) + 3689545748587122372*I*a*e^(1041/2*I*c) + 183093707775710628858*I*a*e^(1039/2*I*c) + 8056123142378999966797*I*a*e^(1037/2*I*c) + 318216864146377884963053*I*a*e^(1035/2*I*c) + 11397949499240328225340750*I*a*e^(1033/2*I*c) + 3732828461999581039

46548090*I*a*e^(1031/2*I*c) + 112559135214363328752564922285*I*a*e^(1029/2*I*c) + 31436158501992653612317177990*I*a*e^(1027/2*I*c) + 8173401220508860669709781109364*I*a*e^(1025/2*I*c) + 198715817544529039864660110471376*I*a*e^(1023/2*I*c) + 4535396318845906415166472261686554*I*a*e^(1021/2*I*c) + 97511021243902906034367815029181218*I*a*e^(1019/2*I*c) + 1981013390087778171143744488041442712*I*a*e^(1017/2*I*c) + 38134508055319501480202851957227724462*I*a*e^(1015/2*I*c) + 697316726077381488801524339658757026686*I*a*e^(1013/2*I*c) + 12139650447759376183227584660170495869589*I*a*e^(1011/2*I*c) + 201623763354433037155766729846494383292508*I*a*e^(1009/2*I*c) + 3200777320589257207465955323343789287604398*I*a*e^(1007/2*I*c) + 48651816785192390862949346064352748595789341*I*a*e^(1005/2*I*c) + 709193818893909656677523349582328791900299617*I*a*e^(1003/2*I*c) + 9928713959958644143611456276187690708075285068*I*a*e^(1001/2*I*c) + 133683049871200685767730244065634086417919364482*I*a*e^(999/2*I*c) + 1733270022057743255812637849164901656684569946869*I*a*e^(997/2*I*c) + 21665877338576587360651194480041798194029867090275*I*a*e^(995/2*I*c) + 261388357024674483234213954236474266534206934500718*I*a*e^(993/2*I*c) + 3046808467328698391993011459852063034674399964693132*I*a*e^(991/2*I*c) + 34345846767794763840341317174417543493362860419944375*I*a*e^(989/2*I*c) + 374773875381762608573480596867444622808315521135770955*I*a*e^(987/2*I*c) + 3961896224254872041251938157236050043036325552867100290*I*a*e^(985/2*I*c) + 40609448120913176083174637180877049405994150689208285948*I*a*e^(983/2*I*c) + 403899515051838803400194879806531247927007890538062521027*I*a*e^(981/2*I*c) + 3900820584110953912072698502834368654421340467896495241550*I*a*e^(979/2*I*c) + 36607718305457313571850609230094969421310836249109701091666*I*a*e^(977/2*I*c) + 334045615572410482684075553294675381058554260440184749831968*I*a*e^(975/2*I*c) + 2965675193835710066559916582743095158371951788246043891048682*I*a*e^(973/2*I*c) + 25631926334820519324289406607504181260913532669181012596611058*I*a*e^(971/2*I*c) + 215785242285994868818528731430540812422314520336288528460007864*I*a*e^(969/2*I*c) + 1770421608250297155611599130292037434814100286157679816873050532*I*a*e^(967/2*I*c) + 14163389239388825902842073391400806825940375203939456957445830422*I*a*e^(965/2*I*c) + 110536162580123562634802981277497355054368691566003022338877490451*I*a*e^(963/2*I*c) + 841957579184928615664618341834644691840690166368399913404427216774*I*a*e^(961/2*I*c) + 6262070331779324000513806613163981009868362783949768253661316894658*I*a*e^(959/2*I*c) + 45495947534779552008093888439933100139363372706825172710009091580883*I*a*e^(957/2*I*c) + 323021950031541227897801407171566170150519245202346540397613583355667*I*a*e^(955/2*I*c) + 2242158041727235117364957739459342847819393345842116256845583655236406*I*a*e^(953/2*I*c) + 15220847247394291084416636302914971818756836097657800823465735035857764*I*a*e^(951/2*I*c) + 101089727467776956523475550836202489574004061008016807940002791738698571*I*a*e^(949/2*I*c) + 657085621385514241363241301495127058109065015699304745663817714211556940*I*a*e^(947/2*I*c) + 4181471070907387612659598631606751788208788794201536282802542477878283190*I*a*e^(945/2*I*c) + 26059644761295218063521552347914441867779264013071310596786890247411087520*I*a*e^(943/2*I*c) + 159101807620372457710230554627597385485602304037309714

4527429662565489018 40*I*a*e^(941/2*I*c) + 9518731874891467462383380080222399063180718980280168640905680308036873986 12*I*a*e^(939/2*I*c) + 558220743072176742491092216915571190739856972193711407348033116444086246263 8*I*a*e^(937/2*I*c) + 3209792256384850694306647346934075366278307678423267147114394964455815648063 2*I*a*e^(935/2*I*c) + 181012678179948465189891189876844835204795688801735709176963393606289585383 48*I*a*e^(933/2*I*c) + 100141772034465691525192490100975093999014916096514954092988982438840262645501 2*I*a*e^(931/2*I*c) + 54363210824381420294157398855539147675527182044111772774155362548632315231814 80*I*a*e^(929/2*I*c) + 2896571400325784692154085898638895400812211161271236335436098185168742472410803 6*I*a*e^(927/2*I*c) + 1515147939504428613363570068725124580644466534745535258021935836986200141216411 24*I*a*e^(925/2*I*c) + 778245462061092938241128952993007961165558304583117537979936583232925968316199 836*I*a*e^(923/2*I*c) + 39261319752280473730214398836102939446474469286733442972947459247010961607608884 24*I*a*e^(921/2*I*c) + 1945776444472852135264155548538846919753047225818921179643393843708342001009173339 6*I*a*e^(919/2*I*c) + 947525499371759344004997562709757106164911328438430080414847445222570683223025495 40*I*a*e^(917/2*I*c) + 45346757064767872676283079632467074894354021191861311598138279899614366629481091489 0*I*a*e^(915/2*I*c) + 21332598764537892264267387392042665593669227991550217930454351397295093587906247603 20*I*a*e^(913/2*I*c) + 986656179921067405042262616811879997621874203873738525581870114278608719673421159818 0*I*a*e^(911/2*I*c) + 44873754537280086404910910878863721864966849160970709878039315079653743556851113962410*I*a*e^(909/2*I*c) + 2007248386409743561842549760243571135146314637070833790715586667472878534571668173216 10*I*a*e^(907/2*I*c) + 883216986720209151837022414332672328111515000315030045611168408538524032471081357579180*I*a*e^(905/2*I*c) + 382353104707450177390188261707972547464613720560863584085118450043338205544733422571618 0*I*a*e^(903/2*I*c) + 162878601318734262976659541958720073403894486961553667821028178633639647487335181249373 70*I*a*e^(901/2*I*c) + 682865193737006066629695185960729429904028294236603307183660069608657276168009602844384 80*I*a*e^(899/2*I*c) + 281802543079970773764222747501103240510862783237481025696735711115713233601841503443789040*I*a*e^(897/2*I*c) + 114487866597334536288031280499292234026314441356757106089623565009992240715993867118363020 0*I*a*e^(895/2*I*c) + 457975804408353384764807088661806323690119216200423393607834885485455365837960603407513388 0*I*a*e^(893/2*I*c) + 180408225561821368966387131008923443583280530071736796287656571474509593980263412544111157 20*I*a*e^(891/2*I*c) + 699941038998544496880448144712017434184138066665836281830066331220341253848744429258817561 20*I*a*e^(889/2*I*c) + 267495779341793686858892087186701348017864136095797204004377097030869586488588546928368741180*I*a*e^(887/2*I*c) + 1007117837657373369468729725719820597008572465469753257215153626598733911453021524113695566720*I*a*e^(885/2*I*c) + 373600623051027567561006154412697155739342112194941088700365497572643198566106143161271496621 0*I*a*e^(883/2*I*c) + 136569435378663165623450228850387707808124957970975163508057319135658882442432291313241829446 40*I*a*e^(881/2*I*c) + 492007098311708479797833179493938037470720276948913690559938806720070495939139296198331292715 00*I*a*e^(879/2*I*c) + 17470814857695450813 3

108566432138482752871314388735390819701558304621069749665356028799825469570
*I*a*e^(877/2*I*c) + 611546710350755227094210555322738233573992238438880922
442071495399840623270733748703638918730970*I*a*e^(875/2*I*c) + 211042686701
657901173815999545210644960709417069397550562541081212722173793102352142744
6997422880*I*a*e^(873/2*I*c) + 718097670878156415201193307932406639694127779
797207321263052443046599307097042065311693543323309620*I*a*e^(871/2*I*c) + 2
409441928790210422014636431525698756343032323446865385718272253087317365650
762075737077623472525О*I*a*e^(869/2*I*c) + 797288013004555441220963581345999
530539313996522871876150671326770147866624403122038941020982112670*I*a*e^(8
67/2*I*c) + 260210521546648324710601552017336263001665484044998430835364683
575217699721326919568028661098556620*I*a*e^(865/2*I*c) + 837701525654515943
160919065652989402268629196598907039545164356949845716819867090707769561650
988160*I*a*e^(863/2*I*c) + 266042842931571103774675083618235061716695085166
608818552512359080832931505161849525689703794439559О*I*a*e^(861/2*I*c) + 83
359229219753395548749857408099513531307771208171816871848757958934640668766
776293826532643936016З0*I*a*e^(859/2*I*c) + 257713230157059254645021382770З
561797567243049210542925645622182915488724235264717412449305180809458О*I*a*
e^(857/2*I*c) + 786214086194952740599806202838541462089842440645354074772611
926286982916818434658466433148202509344800*I*a*e^(855/2*I*c) + 236703836252
587779323701434388787465249427045104853012907439025264086299638762864112564
049076655732830*I*a*e^(853/2*I*c) + 703345279898755583562127912601131791334
107956711719030548547943555221102827637472553536460508801363920*I*a*e^(851/
2*I*c) + 206285295492081618602391594125111752795850045368393587517339248395
259900929513998798562823322973147898О*I*a*e^(849/2*I*c) + 59722941276362590
674151260506011593791666320614098219152734656592985426908363278178714123202
20580305480*I*a*e^(847/2*I*c) + 1706960063470899691725822494164793138249211
553225201264157629288181085985313526579659241489212483238900О*I*a*e^(845/2*
I*c) + 481670525246914607848605960005431263250829711216988146336202912491900
839220221789221157407204913360887960*I*a*e^(843/2*I*c) + 134201038644703507
385888818415634883722891759405213144807057882964953199405626071972925310751
903480110440*I*a*e^(841/2*I*c) + 369210997610108799944611140506231611589949
279646373920938134598886382202697574571710903344492696653736880*I*a*e^(839/
2*I*c) + 100308906580872377987604746044435692379102789056152055267941705646
982891543117675896790791915198570383872О*I*a*e^(837/2*I*c) + 26914293841250
094130608671518641177000729853137740390405183243788052379353447158363657003
45548762139320230*I*a*e^(835/2*I*c) + 7132421149055578168006796797797943674
026134220971516324623846545930681177797566466263020966077638684308780*I*a*e
^(833/2*I*c) + 186695013151690567802855585778163774515738518543184957254613
26689178551127951637356019031393026858408569620*I*a*e^(831/2*I*c) + 4827261
875576824255901844040633795968313307135325975392553055937185084404452329574
594324918443303839190655О*I*a*e^(829/2*I*c) + 12330238631943173760301230788
568046145553392342651686293163036989653681052433842494658667855571241483833
0710*I*a*e^(827/2*I*c) + 31115307812434068987682163412997317426688473577707
506916311083159021322634012266049240630391945249216879382О*I*a*e^(825/2*I*c
) + 77577842500154404097242752774500834816804684020962178036963319225555426

6684373520182047073542988726249962080*I*a*e^(823/2*I*c) + 19111321825020891
877081664786859019352013524355598757051509077545383989033395660206645244926
74910743672362870*I*a*e^(821/2*I*c) + 4652229613980190281092438412966980324
563941911273487870254673754078512908450865883806375186718602486878389420*I*
a*e^(819/2*I*c) + 111911937372368801918281190224557235328802284114807569582
10492395616704273180646550698293673440285122201506540*I*a*e^(817/2*I*c) + 2
660501738325959941125486653387063070184684544114538539883726653793136940859
5315781206468524649149866075877240*I*a*e^(815/2*I*c) + 62509941784743120997
663879158557982155081149380070540181443212715349440122956954676521201490211
883966367828020*I*a*e^(813/2*I*c) + 145164084395384796858807452169156193314
757794283400173793760462753468308342626556407070906048758273598047775980*I*
a*e^(811/2*I*c) + 333211138005255761240200864910933592348294347179262547321
519853589485903531852562513295558687155952554066590460*I*a*e^(809/2*I*c) +
756058495767730773659409931369268584451348889364804029349493357426339750910
243652561427608338124503345850013560*I*a*e^(807/2*I*c) + 169586694384839863
762082875542402504079804383725498790646540871293177075734811292316429856498
3018936301335935212*I*a*e^(805/2*I*c) + 37605659493035666864233856362234082
094465498792886874861655868160002208520695808993984464267495572535029400183
08*I*a*e^(803/2*I*c) + 8244492425854132814040653088604670129631127112463111
698869090178226433285329901659997552076882534722621154663912*I*a*e^(801/2*I
*c) + 178709569969992802875872825562267623650671756493247528499380693654045
51598981972431698224836196155095718947401358*I*a*e^(799/2*I*c) + 3830261707
190416013199912010998899180421021407244116125726026137468537377000578615018
9477516514391979924577468172*I*a*e^(797/2*I*c) + 81176276038870735325330852
188233888929463718282951750613849345989835502222967166292107718062084091143
361182517160*I*a*e^(795/2*I*c) + 170126842297170420289826544603513884546736
532165273225663609085918787724504183838886776200509606191937033678162224*I*
a*e^(793/2*I*c) + 352600027682002951366552195831292961904393452031839665434
742581379773740338046042737991951645221266975380498373846*I*a*e^(791/2*I*c)
 + 722736724787787124132763159445766235279414024537115241684494028855350914
895151999785034206184040168317292786589284*I*a*e^(789/2*I*c) + 146517146645
611822858332172737413341944831073458968335363906687277370038676579338217934
0075277656508354859972911131*I*a*e^(787/2*I*c) + 29378484206865194916839528
936523698208356730302085912803094623807212834844907441695442915323208158084
09450100179444*I*a*e^(785/2*I*c) + 5826728456998393838746283558785767736418
444764516351018178688292977826358717393165474435299003815460564340303035510
*I*a*e^(783/2*I*c) + 114313182922035384495360621046134469254143793530201476
45218488194165850651837526675988253582086095570243158171594435*I*a*e^(781/2
*I*c) + 2218531084901737614494058133508448821593174865751884625102376972508
4130717621880836878455248575979783141226165618755*I*a*e^(779/2*I*c) + 42594
522671068860883864561229655566037459988103599672363573691551514146031450943
546205718366811710531905255429039490*I*a*e^(777/2*I*c) + 809062879793839605
960149642537205140747506339361059008351912777079735013049055460658979356673
54719683918092356762982*I*a*e^(775/2*I*c) + 1520450247419420210318434501382
836778647301515591782012337386341960572966347276438075116206347002158599878

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58540208163*I*a*e^(773/2*I*c) + 28271223825049008168913497477329586237010134
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02*I*a*e^(771/2*I*c) + 520140205211740146146328886033919284277656267013037
61597566286810206364494111611614037419476386807084456722564953064
4*I*a*e^(769/2*I*c) + 946935858248416137618817803374372741611141859282335132028137887552832387239243837518791104798117018522060501489612616*I*a*e^(767/2*I*c) + 1705948357752683688609383556611544971698931045395116831763212880566314009847795209812264993457998814619114688074679466*I*a*e^(765/2*I*c) + 304142566853240586400498135898699141795898114585235603666143538212285529007098174186120342967503569732349480715310569 8*I*a*e^(763/2*I*c) + 5366305102100739830987106326107450288434449943234368381217650935821942651819315271205766739758555936419394930826692752*I*a*e^(761/2*I*c) + 93708970024282572671233152837217972544475388159882233718463994587610767241361733526759761576250733670908087270288 17394*I*a*e^(759/2*I*c) + 16196286852618836939550629765851735936671619340033188646816345459125057185947699008626649435369257313552045494568159814*I*a*e^(757/2*I*c) + 27707613760424321092809773488341710056091016299430822811850368205505386666892248077868916795733514784560970590740995043*I*a*e^(755/2*I*c) + 46919468887999820120797066437767350896395887972340669168418033185399584359856915397601507103516462593793662665388320876*I*a*e^(753/2*I*c) + 786499297907510768672074582401143110998685640861404828533880308670564283751695023513612591615262969463129881370215947 54*I*a*e^(751/2*I*c) + 1305136545651806596808576107518103309191826804511798147243018089725819932514585681580430205100424554572257556907570905 71*I*a*e^(749/2*I*c) + 21441100998422864618966359242073761899927550252146524463648583854416753855554905698363037169609756051680448036474806184 7*I*a*e^(747/2*I*c) + 348732962052059827140563731113032413729067822993902351106193053703931092696239294111150008109768220326322348527847477500*I*a*e^(745/2*I*c) + 56158445303526739364095540252707463907899290685390862228809785792419688520122580195898186291551931348203078546027388 4334*I*a*e^(743/2*I*c) + 895436548145082745323612571193623405869074164117234358676031591115885958848259250172134566787604094987664728603369653891*I*a*e^(741/2*I*c) + 14137540203088201789613288890573757847503249412057312206327993529975679394675268328412220473353548482441716566146255160 85*I*a*e^(739/2*I*c) + 22103139162487533763554624610296871976607002050484827757589324253427818096011551660377560631973342342474635156367026913 30*I*a*e^(737/2*I*c) +
```

6374364629*I*a*e^(725/2*I*c) + 38514520648760918228036755788926097489724496
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246*I*a*e^(723/2*I*c) + 5577436508820713830618234281369072856759015988904155
79007946978228143889730779948322963998644219045352889801185546869084174*I*a
*e^(721/2*I*c) + 8001811557783642701076696476946993118662492011906234468644
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/2*I*c) + 11373880699718367608654346517232895570860701851878364855552562510
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) + 16018390310024491399589891810028467230424870758017612489626238141446543
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3847453*I*a*e^(699/2*I*c) + 23247415130512690281765260929546689247279241363
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a*e^(695/2*I*c) + 382264697413215166970786157267327925910297091788357983560
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693/2*I*c) + 48387996361111263172080964351011092440835595380669484893874298
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*I*c) + 6072817074204712468274441182835677570948620936784622005264549151564
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 + 755685058467942384069281977003129681151363129234954433023067473886036825
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(575/2*I*c) - 923065589340104601543145479762607871429873522429580600113216816396460269930076126069766989958212133572256055690037530640065 40*I*a*e^(573
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1/2*I*c) - 4534675706476787267628307963246707489435402119186131159813827989
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) - 15151479395044286133635700687251245806444665347455352580219358369862001
4121641124*I*a*e^(299/2*I*c) - 28965714003257846921540858986388954008122111
612712363354360981851687424724108036*I*a*e^(297/2*I*c) - 543632108243814202
9415739885553914767552718204411177277415536254863231523181480*I*a*e^(295/2*
I*c) - 10014177203446569152519249010097509399901491609651495409298898243884
02626455012*I*a*e^(293/2*I*c) - 1810126781799484651898911898768444835204795
68880173570917696339360628958538348*I*a*e^(291/2*I*c) - 3209792256384850694
3066473469340753662783076784232671471143949644558156480632*I*a*e^(289/2*I*c
) - 55822074307217674249109221691557119073985697219371140734803311644408624
62638*I*a*e^(287/2*I*c) - 9518731874891467462383380080222399063180718980280
16864090568030803687398612*I*a*e^(285/2*I*c) - 1591018076203724577102305546
27597385485602304037309714452742966256548901840*I*a*e^(283/2*I*c) - 2605964
4761295218063521552347914441867779264013071310596786890247411087520*I*a*e^(
281/2*I*c) - 41814710709073876126595986316067517882087887942015362828025424
77878283190*I*a*e^(279/2*I*c) - 6570856213855142413632413014951270581090650
15699304745663817714211556940*I*a*e^(277/2*I*c) - 1010897274677769565234755
50836202489574004061008016807940002791738698571*I*a*e^(275/2*I*c) - 1522084
7247394291084416636302914971818756836097657800823465735035857764*I*a*e^(273

/2*I*c) - 22421580417272351173649577394593428478193933458421162568455836552 36406*I*a*e^(271/2*I*c) - 32302195003154122789780140717156617015051924520234654039761358335 5667*I*a*e^(269/2*I*c) - 45495947534779552008093888439933100139363372706825172710009091580883*I*a*e^(267/2*I*c) - 62620703317793240005138066131639810098683627839497682536613168946 58*I*a*e^(265/2*I*c) - 84195757918492861566461834183464469184069016636839991340442721677 4*I*a*e^(263/2*I*c) - 110536162580123562634802981277497355054368691566003022338877490451*I*a*e^(261/2*I*c) - 14163389239388825902842073391400806825940375203939456957445830422*I*a*e^(259/2*I*c) - 17704216082502971556115991302920374348141002861576798168730505 32*I*a*e^(257/2*I*c) - 215785242285994868818528731430540812422314520336288528460007864*I*a*e^(255/2*I*c) - 2563192633482051932428940660750418126091353266918101259661105 8*I*a*e^(253/2*I*c) - 296567519383571006655991658274309515837195178824604389104868 2*I*a*e^(251/2*I*c) - 33404561557241048268407555329467538105855426044018474983196 8*I*a*e^(249/2*I*c) - 36607718305457313571850609230094969421310836249109701091666*I*a*e^(247/2*I*c) - 3900820584110953912072698502834368654421340467896495241550*I*a*e^(245/2*I*c) - 403899515051838803400194879806531247927007890538062521027*I*a*e^(243/2*I*c) - 40609448120913176083174637180877049405994150689208285948*I*a*e^(241/2*I*c) - 3961896224254872041251938157236050043036325552867100290*I*a*e^(239/2*I*c) - 374773875381762608573480596867444622808315521135770955*I*a*e^(237/2*I*c) - 34345846767794763840341317174417543493362860419944375*I*a*e^(235/2*I*c) - 3046808467328698391993011459852063034674399964693132*I*a*e^(233/2*I*c) - 261388357024674483234213954236474266534206934500718*I*a*e^(231/2*I*c) - 21665877338576587360651194480041798194029867090275*I*a*e^(229/2*I*c) - 1733270022057743255812637849164901656684569946869*I*a*e^(227/2*I*c) - 133683049871200685767730244065634086417919364482*I*a*e^(225/2*I*c) - 99287139599586441436114562761876907080752850 68*I*a*e^(223/2*I*c) - 709193818893909656677523349582328791900299617*I*a*e^(221/2*I*c) - 48651816785192390862949346064352748595789341*I*a*e^(219/2*I*c) - 3200777320589257207465955323343789287604398*I*a*e^(217/2*I*c) - 201623763354433037155766729846494383292508*I*a*e^(215/2*I*c) - 12139650447759376183227584660170495869589*I*a*e^(213/2*I*c) - 6973167260773814888015243396587570266 86*I*a*e^(211/2*I*c) - 38134508055319501480202851957227724462*I*a*e^(209/2*I*c) - 1981013390087778171143744488041442712*I*a*e^(207/2*I*c) - 97511021243902906034367815029181218*I*a*e^(205/2*I*c) - 4535396318845906415166472261686554*I*a*e^(203/2*I*c) - 1987158175445290398646601104713 76*I*a*e^(201/2*I*c) - 8173401220508860669709781109364*I*a*e^(199/2*I*c) - 314361585019926536123171779990*I*a*e^(197/2*I*c) - 11255913521436332875256492285*I*a*e^(195/2*I*c) - 373282846199958103946548090*I*a*e^(193/2*I*c) - 11397949499240328225340750*I*a*e^(191/2*I*c) - 318216864146377884963053*I*a*e^(189/2*I*c) - 8056123142378999966797*I*a*e^(187/2*I*c) - 183093707775710628858*I*a*e^(185/2*I*c) - 3689545748587122372*I*a*e^(183/2*I*c) - 64891508140773093*I*a*e^(181/2*I*c) - 975812152492320*I*a*e^(179/2*I*c) - 12197651906154*I*a*e^(177/2*I*c) - 121672338216*I*a*e^(175/2*I*c) - 908002524*I*a*e^(173/2*I*c) - 4506216*I*a*e^(171/2*I*c) - 11154*I*a*e^(169/2*I*c))/(e^(531*I*c) + 432*e^(530*I*c) + 93096*e^(529*I*c) + 13343760*e^(5

28*I*c) + 1431118260*e^(527*I*c) + 122503723056*e^(526*I*c) + 8718181624155
*e^(525*I*c) + 530563624556832*e^(524*I*c) + 28186192554792138*e^(523*I*c)
+ 1327882849274858880*e^(522*I*c) + 56169444526926562260*e^(521*I*c) + 2154
864144781257856128*e^(520*I*c) + 75599817092670157806639*e^(519*I*c) + 2442
455629894502983849104*e^(518*I*c) + 73099207817335597247098038*e^(517*I*c)
+ 2037031259470368160131922320*e^(516*I*c) + 53090127264630963470039804475*
e^(515*I*c) + 1299146645993240318167826532288*e^(514*I*c) + 299525477492654
99675257842032197*e^(513*I*c) + 652650253343206047453620559993840*e^(512*I*
c) + 13477227799524701956579274210395326*e^(511*I*c) + 26441037578031074251
8099326419685040*e^(510*I*c) + 4939666610818025798809586352543471345*e^(509
*I*c) + 88054927598941411145869950813388040256*e^(508*I*c) + 15006027479373
97286405577818722691539392*e^(507*I*c) + 2448983733781233868771862249186501
3839488*e^(506*I*c) + 383360155801054824529764688213114368047154*e^(505*I*c
) + 5764601046563151304213854710715346838447392*e^(504*I*c) + 8338083991183
7894453136303673785039051506805*e^(503*I*c) + 11615814137339717515336225119
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7272*e^(501*I*c) + 202347509724462171313966643580234078508179838320*e^(500*
I*c) + 2535667460650279776834561566186591213109251642859*e^(499*I*c) + 3073
5366512830562160991166338490057308062762518496*e^(498*I*c) + 36068861303638
9349413809780004559963548775423325255*e^(497*I*c) + 41015454399371957939599
56708442496709433800261224880*e^(496*I*c) + 4523094003983073833202569478464
6206844854827698075736*e^(495*I*c) + 48409341024048871865591702530366258109
1659126182344528*e^(494*I*c) + 50320249034014518240742139437660119220265070
06311982753*e^(493*I*c) + 5083636950817109943701934861084739194673618510801
7183136*e^(492*I*c) + 49946750655853173367158586291057270281154503573039874
9530*e^(491*I*c) + 47753986071008532635342077338182667774786934127387310316
80*e^(490*I*c) + 4445670817525882102440094621053500452377572219097746848449
6*e^(489*I*c) + 40321222595779818884084613996099562414449127169433679645958
4*e^(488*I*c) + 35647648906287240170884879966881789291957876139585454748048
45*e^(487*I*c) + 3073621740432100996523103741966305396288103528170922169778
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5491350*e^(485*I*c) + 21237029691888713182667187812239270678399490157272938
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6163247194627808410304*e^(482*I*c) + 10225364374682967372930658627052464496
93687415559865844306888705423*e^(481*I*c) + 7659010520187549651777118357676
871927081898989131125755798204236112*e^(480*I*c) + 561170810763411753840875
70185188538660375932013674735519055227368366*e^(479*I*c) + 4023496922661211
58934003582839428785116904903936409545602519219664720*e^(478*I*c) + 2823905
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+ 19407979215594566593535008103303255257745408070082431338945184797463936*
e^(476*I*c) + 1306576602265604193351214343899389618845954340699848243071493
32131747540*e^(475*I*c) + 8618848510949919087642468054746724286037573154844
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861955969011697222340926210112854418*e^(473*I*c) + 353244472067790181153780

52820789411687581004582367431006205879633729015200*e^(472*I*c) + 2196012813
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c) + 1339214374254245553564884406801945353385000254030655765953770237607180
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2675870481058674277844*e^(469*I*c) + 47065044611135158108487353367484243102
698248838312635876283099427442745866704*e^(468*I*c) + 271361207503266570734
486517077181014801775322183181055638619257836143271472358*e^(467*I*c) + 153
633323844492758353273455601649467167491657890711698454848907824169392694056
0*e^(466*I*c) + 85430134411262123348335406650696214724790858380413605645507
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351079655652312894721972796266*e^(461*I*c) + 349410716132767046494779430433
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16*e^(456*I*c) + 9398691531306817914908360606568148278083606051053015461848
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72318500*e^(453*I*c) + 8862752142756957285681340885764904597935349569355321
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c) + 1699563279699297677739020966526292532837045054771275445565344173766865
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38667067535379759732795567942578751384250780476310*e^(449*I*c) + 3067974296
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911840*e^(448*I*c) + 127472196165033205413563430625628473686016221408567860
25445814532037904111523242298235713300*e^(447*I*c) + 5219091220766182421581
2271854269748071292843243227894769229690720010547141334131610989636000*e^(4
46*I*c) + 21059430138564847118432907888031750495336183995415942743400988466
1777259752542647709150036990*e^(445*I*c) + 83757920692341193245878648676537
3533946545239708990769488724813982189165104589895518909256320*e^(444*I*c) +
32838747605558186767263094803067344201550985839480744690141681718744421701
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8682508880255337280065006566138696041797353216584528640*e^(442*I*c) + 48379
489756434099843857791816589379406815042609340378747586437145781646245422045
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675328961590*e^(439*I*c) + 2464382190807439609079774226855679629367885709776435876630851716253962696192341706239192878728160*e^(438*I*c) + 888829502875102466704420383760797610148005313441861447462076752282486891195988435266644917404000*e^(437*I*c) + 3162664467472554773117679568752765357130596998592368839211216491555324257326949090898957024853328 0*e^(436*I*c) + 111034148797008819443143895644469242295049867464313710969257619338899133799285616020069872611710850*e^(435*I*c) + 384655842080666274454063078784837174998949052500975322162003392549953413592461519365177908682078400*e^(434*I*c) + 131505212093069212210229710532762284233587074342853089107298353586228009444660772347380047745391413 0*e^(433*I*c) + 443721091784318234776434954444390469902005659506947084719361709211471407763307723497282535122697936 0*e^(432*I*c) + 1477795509661712899871274518207149536217650697318308165023360527405167762497046434024275584002567376 0*e^(431*I*c) + 4858425815314028044731483686877213139019541241904673277845870601509688143707633791079358412247507376 0*e^(430*I*c) + 15768584552885091872146287786443509025758314941556132342738656289444759827793562980093923717562514983 0*e^(429*I*c) + 5052936631230152588784830257388128132033977668453400653812610163534197223826203930325359606609219504 00*e^(428*I*c) + 1598771101058192692270528999677444742685631006232456185844925220144002305878120380828483988663574829100*e^(427*I*c) + 4995241956279138180205186744401688024388272113921255663734956946927571305533146776898787878059685108480*e^(426*I*c) + 1541311121148602393729497082079737671608134478816338654352242193973750796212585498188187916834826033000 0*e^(425*I*c) + 46970224727117281826454045018070670522559756627580347784535320014963482632359729444541885102274546002560*e^(424*I*c) + 14137993825355684328056550580740330413060613072543475174579407983314136174891763998614537706643721054619 0*e^(423*I*c) + 42035802483514679858361121014594215468443794936564789908837252480215622288483958001168865566428069177360 0*e^(422*I*c) + 1234668041892409978780018081755440216012582476396941937965899631953079203974222138794604328498972144766900*e^(421*I*c) + 3582718002163296061414536703715109897107198252739284546149343102348456124089657428594946438660859773886240*e^(420*I*c) + 1027160253020288900249781351684945259097151280952906066519730109705221006457608834802323467197546367741847 0*e^(419*I*c) + 2909765106124745340664756978183691006216555985235905280425915416568712542875256238549237374948635171445312 0*e^(418*I*c) + 8145208141382911182887541756425005484603769331281148049290916075819598915576810702256835095386181594070409 0*e^(417*I*c) + 2253205325932206577679411092895162489979452101556413498282724171001967548669449968931246656190721262782000 0*e^(416*I*c) + 6160031160229795849371257017578872129983543009899913626280388610939145613320711919097149494265879369103033 00*e^(415*I*c) + 1664475034387211809394917743502937638978574937754764763987835872410449930690131572904279995484581013965001440*e^(414*I*c) + 44454122592954746250676595141983129660154162999689303933456303459141097207405736188849805200100284514969962 10*e^(413*I*c) + 117358569262451184931130910025016040323418769859990828235206722415302001882238263929823021940846675384886656 00*e^(412*I*c) + 3062758105422195737839054728927760912957281393108273352024738722600002004353827946877670795842089254787012868 0*e^(411*I*c) + 7901914955876656925 47

839884872323883529091449827471718567724632238089933670915034028764672701761
24342699654400*e^(410*I*c) + 2015579474247940980267724784620408833958675125
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c) + 508324599301085460166978629683032661427654474082939048097939638391567
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215072017936360433511352862332968460634318554075601993566214826786396 8*e^(4
06*I*c) + 762178879191204706203884091779937460042889225819436763668294435609
66814002463121380017692850206614459910732494 16*e^(405*I*c) + 1837980708400
335976602764921762114411609173557221662078886153580344970227380258835907670
424184073351343911411 3248*e^(404*I*c) + 43834972142919377685378692233021063
744554033100928502737480438978976746989895784070951905237783490374305934542
955*e^(403*I*c) + 103399755467257436489847837640753754718204394473055795001
4676043264198765555568738295317372110961151960056477 30480*e^(402*I*c) + 241
246021282440061792908317783032876194801597133206052091286997043729145345755
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192734219546113651768317380539005893679049394714017063698565272728813669054
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127750461234230036602504674174285658044528940178665631168585902308471 6*e^(3
99*I*c) + 287049613141231445183467471535358943955329443080853193346608628 85
437092462307691513921806994134056230172477535329 44*e^(398*I*c) + 6413381895
855925184758231451062556380328594938511006577015218119786536390213057284018
20220163109443481958402511 3465*e^(397*I*c) + 141764836528757049572020133432
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32766730080*e^(396*I*c) + 310043192060694170770693631414234874318280090981 8
474463567865228417743946494165181256451914491800317410807763484601 4*e^(395*
I*c) + 670917061305296691250198992100215765802378434622295353862950870761 89
297849995931360645605292130961496106707521506432*e^(394*I*c) + 143657687138
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772245409530799230553767222252*e^(393*I*c) + 304384471106813336010284160123
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1*I*c) + 132431132498402742835522293814768237867286070881716174144874968959
358802086084750870370232532030464988312068498755 6400*e^(390*I*c) + 27195892
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15672862569296693711643521070331394*e^(389*I*c) + 552749884903117835586123 0
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02804097407467473 6*e^(388*I*c) + 111194996453632010808810628248863384924253
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45*e^(387*I*c) + 221407350017086032709151807692413916620355787559039791489 0
921360382255479274918351716025557191587535643955371713079788 8*e^(386*I*c) +
 436383000758151710259462114644656896189657734886609858579456574798540851 08
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e^(382*I*c) + 5951576155004315149474792823365470538279260879164252634971877
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115398285545601550533328045600184317993899359217996729818340704221801195667
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150*e^(377*I*c) + 1246214044053725808492859670987206685775707094312486855 45
0094815475686345430803292540834031123785001781470789698696908681 6*e^(376*I*
c) + 2223134113180153534540639903772168684020839794195258013558464596674673
665671627155482647628299106607656492143261433939973 5*e^(375*I*c) + 39274200
4143298611693979445162250010812274333985850072063992312119071577953597196 48
241598754266579840244551491476467899952*e^(374*I*c) + 687124660159856415124
685861736597477348795917100983546527861249360230739431410495736066485630053
594117127648956839038060 88*e^(373*I*c) + 1190605918496605468347656932276764
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65*e^(371*I*c) + 347310053810935290419455560555957314129569210735745983 2343
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c) + 5847495736823045861793846288448833275814989698865403803788967679990756
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2338892574900819440*e^(366*I*c) + 427482690772059175252671133682087150084 43
456479223854715343593336061895718324446413641328931086635762051338706721562
64164115*e^(365*I*c) + 6866425337518668262662693750908956965732924578142181
63062215780289988087468155103113631406419994860400152989456623523859708 8*e^
(364*I*c) + 109272106034735448102797923478445360745888968062300411100895447
3160586314610418173903942667485545346609740233068833184560230 2*e^(363*I*c)
+ 172295028243676473344007219984175967039486573947388052093916365973703 8057
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6*I*c) + 323413178014841003714151138246079152576360976035058457890409937738
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4*e^(348*I*c) + 54166628040524363495855959828183579538662584616443540182051
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*I*c) + 7410372612891152224364633296128043971657193280327754304382235672773
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8305986215654282665463159339208215275447263802016591149038346058888*e^(336*I
*c) + 134297742023479429904629616104559610096074758721068022704468938063017
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5457723219789693189041925727339978882309864690059708800*e^(334*I*c) + 204622
295535729109519829916789867225319429705162560082648840394965423112809336591
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20378878467734393497142431798789525503193 6*e^(332*I*c) + 302060638030868463
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*e^(325*I*c) + 924320052867522584035777495761072351222534420784861960001821
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4*I*c) + 105178210042883437194450817005121918711681634976695332263718214961
087500422378478418328496190649442295546243120864569080252677078 0*e^(323*I*c
) + 118781794307939031610880232479811012902082278266008724859936764348120 02
0604682216614428542592222937541367653507114100528643148160 0*e^(322*I*c) + 1
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414219006578863812890766532275801720566775874514020692343552836874896596139
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921386828792629466520276972292738 0*e^(317*I*c) + 2106141903468344307112549 7
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039428560118402116427696217172179966143984738871860743914826385472128265382
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260*I*c) + 689518449328793559903260418149974190253578340058895035589606468 2
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+ 474323043563100542377338629931966248129175976982332446018056009391154020 4
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(245*I*c) + 975210339444049318757282311763517786673223175594457946383279264
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98354652786124936023073943141049573606648563005359411712764895683903806088*
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7162715548264762829910660765649214326143393997 35*e^(237*I*c) + 124621404405
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*I*c) + 1115398285545601550533328045600184317993899359217996729818340704221
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61550043151494747928233654705382792608791642526349718775702941338547183543 4
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86670980704079349536 4496*e^(230*I*c) + 1644375006769068927413232601543942 78
50395456193602013359658180644935724027734944792733451710580999530009354927 9
931273178*e^(229*I*c) + 85139533234786455779589959464900637760735729705621 2
213800058372083691577946730496754287998178754314302463326258996301 60*e^(228
*I*c) + 4363830007581517102594621146446568961896577348866098585794565747985
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736*e^(224*I*c) + 271958928348374392604080510108034192124453031125460725092
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08258944*e^(220*I*c) + 14365768713804479694294711970425953845881819942351 68
24674586293691056119209866358123637772245409530799230553767222252*e^(219*I*
c) + 670917061305296691250198992100215765802378434622295353862950870761892 9
78499959313606456052921309614961067075215064 32*e^(218*I*c) + 31004319206069
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1449180031741080776348460 14*e^(217*I*c) + 141764836528757049572020133432411
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 + 2870496131412314451834674715353589439553294430808531933466086288543709246230769151392180699413405623017247753532944*e^(214*I*c) + 127103308293804895020136055483127034266234399127750461234230036602504674174285658044528940178665631168585902308471 6*e^(213*I*c) + 556756388711182340341026192734219546113651768317380539005893679049394714017063698565272728813669054779077208977840*e^(212*I*c) + 24124602128244006179290831778303287619480159713320605209128699704372914534575580571008148900674183943957398483267 8*e^(211*I*c) + 1033997554672574364898478376407537547182043944730557950014676043264198765555568738295317372110961151960056477304 80*e^(210*I*c) + 4383497214291937768537869223302106374455403310092850273748043897897674698989578407095190523778349037430593454295 5*e^(209*I*c) + 1837980708400335976602764921762114411609173557221662078886153580344970227380258835907670424184073351343911411324 8*e^(208*I
*c) + 762178879191204706203884091779937460042889225819436763668294435609668140024631213800176928502066144599107324941 6*e^(207*I*c) + 312568349317870174347970475030749017866629215072017936360433511352862332968460634318554075601993566214826786396 8*e^(206*I*c) + 1267597017294812913400146276042126929986480292870190399107554311079964227280196522475370108738477856311765699610*e^
(205*I*c) + 50832459930108546016697862968303266142765447408293904809793963839156729879578838943384228575105466521086828768 0*e^(204*I*c) + 2015579474247940980267724784620408833958675125629308629437535686900840155855980101547815486252394095819073975 00*e^(203*I*c) + 790191495587665692547839884872323883529091449827471718567724632238089933670915034028764672701761243426996544 00*
e^(202*I*c) + 30627581054221957378390547289277609129572813931082733520247387226000020043538279468776707958420892547870128680*e^(201*I*c) + 117358569262451184931130910025016040323418769859990828235206722415302001882238263929823021940846675384886656 00*e^(200*I*c) + 44454122592954746250676595141983129660154162999689303933456303459141097207405736188849805200100284514969962 10*e
^(199*I*c) + 16644750343872118093949177435029376389785749377547647639878358724104499306901315729042799954845810139650014 40*e^(198*I*c) + 616003116022979584937125701757887212998354300989991362628038861093914561332071191909714949426587936910303300*e^(197*I*c) + 2253205325932206577679411092895162489997945210155641349828272417100196754866944996893124665619072126278200 00*e^(196
*I*c) + 814520814138291118288754175642500548460376933128114804929091607581959891557681070225683509538618159407040 90*e^(195*I*c) + 2909765106124745340664756978183691006216555985235905280425915416568712542875256238549237374948635171445312 0*e^(194*I*c) + 1027160253020288900249781351684945259097151280952906066519730109705221006457608834802323467197546367741847 0*e^(193*I*c) + 3582718002163296061414536703715109897107198252739284546149343102348456124089657428594946438660859773886240*e^(192*I*c) + 12346680418924099787800180817554402160125824763969419379658996319530792039742221387946043284989721447669 00*e^(191*I*c) + 420358024835146798583611210145942154684437949365647899 08837

252480215622288483958001168865566428069177 3600*e^(190*I*c) + 14137993825355
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7066437210546190*e^(189*I*c) + 469702247271172818264540450180706705225597 56
627580347784535320014963482632359729444541885102274546002560*e^(188*I*c) +
154131112114860239372949708207973767160813447881633865435224219397375079621
2585498188187916834826033000 0*e^(187*I*c) + 49952419562791381802051867 44401
688024388272113921255663734956946927571305533146776898787878059685108480*e^
(186*I*c) + 159877110105819269227052899967744474268563100623245618584492522
014400230587812038082848398866357482910 0*e^(185*I*c) + 505293663123015258 87
848302573881281320339776684534006538126101635341972238262039303253596066092
1950400*e^(184*I*c) + 157685845528850918721462877864435090257583149415561 32
342738656289444759827793562980093923717562514983 0*e^(183*I*c) + 48584258153
140280447314836868772131390195412419046732778458706015096881437076337910793
584122475073760*e^(182*I*c) + 147779550966171289987127451820714953621765069
731830816502336052740516776249704643402427558400256737 60*e^(181*I*c) + 4437
210917843182347764349544443904699020056595069470847193617092114714077633077
234972825351226979360*e^(180*I*c) + 131505212093069212210229710532762284233
58707434285308910729835358622800944466077234738004774539141 30*e^(179*I*c) +
384655842080666274454063078784837174998949052500975322162003392549953413 59
246151936517790868207840 0*e^(178*I*c) + 111034148797008819443143895644469 24
229504986746431371096925761933889913379928561602006987261171085 0*e^(177*I*c
) + 316266446747255477311767956875276535713059699859236883921121649155532 42
573269490908989570248533280*e^(176*I*c) + 888829502875102466704420383760797
610148005313441861447462076752282486891195988435266644491740400 0*e^(175*I*c
) + 246438219080743960907977422685567962936788570977643587663085171625396 26
961923417062391928787281 60*e^(174*I*c) + 674025530543133008894845775236625 2
374507431144735445378181704471346071025756766760566753289615 90*e^(173*I*c)
+ 181834661406177901315330129677145381166449188413194141169344354754920969 0
349526103789452822576 00*e^(172*I*c) + 48379489756434099843857791816589379 40
681504260934037874758643714578164624542204510123041730990 0*e^(171*I*c) + 12
693496932964920565073673637181280088548682508880255337280065006566138696041
797353216584528640*e^(170*I*c) + 328387476055581867672630948030673442015509
8583948074469014168171874442170109648521627538755920*e^(169*I*c) + 83757920
692341193245878648676537353394654523970899076948872481398218916510458989551
8909256320*e^(168*I*c) + 210594301385648471184329078880317504953361839954 15
942743400988466177725975254264770915003699 0*e^(167*I*c) + 52190912207661824
215812271854269748071292843243227894769229690720010547141334131610989636000
*e^(166*I*c) + 127472196165033205413563430625628473686016221408567860254458
145320379041115232422982357133 00*e^(165*I*c) + 306797429643174736419815962 3
962463671617006419626851426148418602934852907379021659761911840*e^(164*I*c)
+ 727521010718394229291774073844694255798738667067535379759732795567942578
751384250780476310*e^(163*I*c) + 169956327969929767773902096652629253283704
5054771275445565344173766865409367060738473376 00*e^(162*I*c) + 391080312556
018094765375353696118444408449037516056450235145723520452481042629335988507
30*e^(161*I*c) + 886275214275695728568134088576490459793534956935532181 5647

721172537159186491471311666400*e^(160*I*c) + 19777929806658181356513000943262391586054488708069708605773253850286099830345346723185 00*e^(159*I*c) + 434546676780280045346344498763892540797175105756827515509297024187660299345484920192480*e^(158*I*c) + 939869153130681791490836060656814827808360605105301546184869498394671313788598859982 10*e^(157*I*c) + 2000800680303004713729327825032159711354071620198333312634928118667915319906804525721 6*e^(156*I*c) + 4191542500656826148093339414544159143964478472492315931809171859902114109005939942952*e^(155*I*c) + 86397993362233034955629682002839551319870806494050570212606865293680079482665126425 6*e^(154*I*c) + 17519317050061830024151563238191228515779009781604922067121721222001529713340063606 0*e^(153*I*c) + 34941071613276704649477943043339450201504075335160361865916029213860778606230624960*e^(152*I*c) + 685299322314573668732888531161779543559294084143986635107965565231289472197279626 6*e^(151*I*c) + 13214980552713008514299938666316198744245344251881835920497276875710321564350772 80*e^(150*I*c) + 25050102860892833246934045682990206771223364446460275315994572786848572239550695 2*e^(149*I*c) + 46668223548266017806854592468100570289355960869613650856575756758180182223308768*e^(148*I*c) + 8543013441126212334833540665069621472479085838041360564550722036723654297540205*e^(147*I*c) + 15363332384449275835327345560164946716749165789071169845484890782416939269405 60*e^(146*I*c) + 2713612075032665707344865170771810148017753221831810556386192578361432714723 58*e^(145*I*c) + 47065044611135158108487353367484243102698248838312635876283099427442745866704*e^(144*I*c) + 8013729580790752434361964945761543761469520791210746972675870481058674277844*e^(143*I*c) + 1339214374254245553564884406801945353385000254030655765953770237607180089968*e^(142*I*c) + 2196012813395155615002614788441900248705552612819460588396140446970379636 95*e^(141*I*c) + 353244472067790181153780528207894116875810045823674310062058796337290152 00*e^(140*I*c) + 557255115732867112101621641630759616186195596901169722234092621011285441 8*e^(139*I*c) + 861884851094991908764246805474672428603757315484453974713612812215428992*e^(138*I*c) + 130657660226560419335121434389938961884595434069984824307149332131747540*e^(137*I*c) + 194079792155945665935350081033032552577454080700824313389451847974639 36*e^(136*I*c) + 28239051519365866783825257065644572802900986986385979876283802458817 15*e^(135*I*c) + 402349692266121158934003582839428785116904903936409545602519219664720*e^(134*I*c) + 56117081076341175384087570185188538660375932013674735519055227368366*e^(133*I*c) + 7659010520187549651777118357676871927081898989131125755798204236112*e^(132*I*c) + 10225364374682967372930658627052464496936874155598658443068887054 23*e^(131*I*c) + 133490210052026183779673313868332303530332906163247194627808410304*e^(130*I*c) + 170338860273906157410409777216555416656121622754850285843108904 17*e^(129*I*c) + 21237029691888713182667187812239270678399490157272938840653880 80*e^(128*I*c) + 25858534871597727015582911568419341107203454149136439398549135 0*e^(127*I*c) + 30736217404321009965231037419663053962881035281709221697785072*e^(126*I*c) + 35647648906287240170884879966881789291957876139585454748048 45*e^(125*I*c) + 403212225957798188840846139960995624144491271694336796459584*e^(124*I*c) + 444567081752588210244009462105350045237757221909774684844 96*e^(123*I*c) + 4775398607100853263534 20

7733818266777478693412738731031680*e^(122*I*c) + 49946750655853173367158586
2910572702811545035730398749530*e^(121*I*c) + 50836369508171099437019348610
847391946736185108017183136*e^(120*I*c) + 503202490340145182407421394376601
1922026507006311982753*e^(119*I*c) + 48409341024048871865591702530366258109
1659126182344528*e^(118*I*c) + 45230940039830738332025694784646206844854827
698075736*e^(117*I*c) + 410154543993719579395995670844249670943380026122488
0*e^(116*I*c) + 360688613036389349413809780004559963548775423325255*e^(115*
I*c) + 30735366512830562160991166338490057308062762518496*e^(114*I*c) + 253
5667460650279776834561566186591213109251642859*e^(113*I*c) + 20234750972446
2171313966643580234078508179838320*e^(112*I*c) + 15603911277687607099721623
771744933086920587272*e^(111*I*c) + 116158141373397175153362251190904691718
8768400*e^(110*I*c) + 83380839911837894453136303673785039051506805*e^(109*I
*c) + 5764601046563151304213854710715346838447392*e^(108*I*c) + 38336015580
1054824529764688213114368047154*e^(107*I*c) + 24489837337812338687718622491
865013839488*e^(106*I*c) + 1500602747937397286405577818722691539392*e^(105*
I*c) + 88054927598941411145869950813388040256*e^(104*I*c) + 493966661081802
5798809586352543471345*e^(103*I*c) + 264410375780310742518099326419685040*e
^(102*I*c) + 13477227799524701956579274210395326*e^(101*I*c) + 652650253343
206047453620559993840*e^(100*I*c) + 29952547749265499675257842032197*e^(99*
I*c) + 1299146645993240318167826532288*e^(98*I*c) + 53090127264630963470039
804475*e^(97*I*c) + 2037031259470368160131922320*e^(96*I*c) + 7309920781733
5597247098038*e^(95*I*c) + 2442455629894502983849104*e^(94*I*c) + 755998170
92670157806639*e^(93*I*c) + 2154864144781257856128*e^(92*I*c) + 56169444526
926562260*e^(91*I*c) + 1327882849274858880*e^(90*I*c) + 28186192554792138*e
^(89*I*c) + 530563624556832*e^(88*I*c) + 8718181624155*e^(87*I*c) + 1225037
23056*e^(86*I*c) + 1431118260*e^(85*I*c) + 13343760*e^(84*I*c) + 93096*e^(8
3*I*c) + 432*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) - 8*(11154*a*e^(105
5/2*I*c) + 4506216*a*e^(1053/2*I*c) + 908002524*a*e^(1051/2*I*c) + 12167233
8216*a*e^(1049/2*I*c) + 12197651906154*a*e^(1047/2*I*c) + 975812152492320*a
*e^(1045/2*I*c) + 64891508140773561*a*e^(1043/2*I*c) + 3689545748587311444*
a*e^(1041/2*I*c) + 183093707775748726866*a*e^(1039/2*I*c) + 805612314238410
5100019*a*e^(1037/2*I*c) + 318216864146889674614121*a*e^(1035/2*I*c) + 1139
7949499281271404789090*a*e^(1033/2*I*c) + 373282846202680826204100054*a*e^(
1031/2*I*c) + 11255913521591139154617026091*a*e^(1029/2*I*c) + 314361585027
608802719103613974*a*e^(1027/2*I*c) + 8173401220846880695205758846440*a*e^(
1025/2*I*c) + 198715817557880846019817635638340*a*e^(1023/2*I*c) + 45353963
19324144520768178591431614*a*e^(1021/2*I*c) + 97511021259565231697992928696
183262*a*e^(1019/2*I*c) + 1981013390560058542422694832888372388*a*e^(1017/2
*I*c) + 38134508068509651338161782530249790846*a*e^(1015/2*I*c) + 697316726
420326420226818605542124203670*a*e^(1013/2*I*c) + 1213965045609725416931589
4492857358348125*a*e^(1011/2*I*c) + 201623763544733613950600829151019284608
876*a*e^(1009/2*I*c) + 320077732468073865102863655867556361155978*a*e^(100
7/2*I*c) + 48651816868314506338966571934860812829084391*a*e^(1005/2*I*c) +
709193820494019943354343470410215009861831325*a*e^(1003/2*I*c) + 9928713989
218000067239217146577130297436860304*a*e^(1001/2*I*c) + 1336830503805832927

5980727190245915522192132626 6*a*e^(999/2*I*c) + 17332700305179944900545415 5
5914528946987399507283*a*e^(997/2*I*c) + 21665877472884315675187015601036 05
4026439130732651*a*e^(995/2*I*c) + 2613883590661727412848063331363568543260
16097969610*a*e^(993/2*I*c) + 3046808497087794490022188569750541728488343 18
2667144*a*e^(991/2*I*c) + 3434584718442721669725639327266274282823521060344
7717*a*e^(989/2*I*c) + 3747738809914961000287614260595582528481431164912335
83*a*e^(987/2*I*c) + 3961896296989029006971841445652283627926050438580538 04
2*a*e^(985/2*I*c) + 4060944903010454199463398191888662924984771679038975808
4*a*e^(983/2*I*c) + 4038995260209810459155678125511202679913875302830052160
05*a*e^(981/2*I*c) + 3900820711972392395320770531146704159375652160514958 78
0466*a*e^(979/2*I*c) + 3660771974683332327017333510537817068380688319428350
2572958*a*e^(977/2*I*c) + 3340456313007058705883041585142571550296109888736
39068542876*a*e^(975/2*I*c) + 2965675360110120697249228947959169960721153 73
5047384406327794*a*e^(973/2*I*c) + 25631928039175694441559654718673739138 80
4185560774185672766170*a*e^(971/2*I*c) + 2157852592378720168676186753222766
5174676191403492987937422063 6*a*e^(969/2*I*c) + 17704217719744216227091458 7
8462925518593050670543424508511160048*a*e^(967/2*I*c) + 1416339077592369884
0349913696288805073818903748549770982099621066*a*e^(965/2*I*c) + 1105361766
0146144633936209569690471316329692768741954961666327675*a*e^(963/2*I*c) +
841957703671377547101115934348899568986163724166597446960696905670*a*e^(961
/2*I*c) + 6262071407737746651726828051883625281536772230146111829846964645 9
86*a*e^(959/2*I*c) + 4549595659320482545897041641407156839552061041006661 10
11076531123433*a*e^(957/2*I*c) + 3230220243549132261466062791086782196166 51
564707789831198960566522147*a*e^(955/2*I*c) + 2242158636340627862127320016 3
3395018933335631101984057111683400211 8194*a*e^(953/2*I*c) + 152208518881827
2874078275036082576343307013527187300884471819214604902 0*a*e^(951/2*I*c) +
1010897628185268489404093103463509322682836138484712496133237149589033 85*a*
e^(949/2*I*c) + 6570858843206240832064291419381736562950181001102685162240 4
0799717224364*a*e^(947/2*I*c) + 4181472981318382654497651147465017493829958
10941526743769579004114259370 6*a*e^(945/2*I*c) + 2605965832601618948879155 7
218632775709151983873327181283009050908453688384*a*e^(943/2*I*c) + 15910190
178138447223952374393263070614011902018673312996294395005311202672 0*a*e^(94
1/2*I*c) + 9518738267397863802852345898801577462611900015140162777134396547
50846059956*a*e^(939/2*I*c) + 5582211676606992496845481327264981244740012 05
729123667445782820185923283523 4*a*e^(937/2*I*c) + 3209795016413281711580362
1585892838016332860939330285771049589504254327493976*a*e^(935/2*I*c) + 1810
12853831745679282416051344942263215904480326976416514252463543134260124404*
a*e^(933/2*I*c) + 1001418815121242432011194881350042888741731327908457902 22
269520128019539079315 6*a*e^(931/2*I*c) + 5436327766912905456994738945036935
6332000471918984463948506509249661703661796 40*a*e^(929/2*I*c) + 28965753998
48336112837518724860972276280949244636300000069876998551004961199464 4*a*e^(
927/2*I*c) + 1515150285211017790993952569735928655092976383410045806716272 3
24145328752036365 56*a*e^(925/2*I*c) + 7782468109778386565721189179139516347
16997865633712601174220799241685098928335884*a*e^(923/2*I*c) + 392613958303
7514980862266059833351755777935293123288314534508002591338991682219336*a*e^

(921/2*I*c) + 19457806537768694048209781006664310130470075857592678483876983129530380918539494004*a*e^(919/2*I*c) + 947527784689311180853090626341373858167804895864283405501843934606928666348697296 60*a*e^(917/2*I*c) + 4534687884428446337415399584948720853235894643167677840355434888986277028599374999 70*a*e^(915/2*I*c) + 213326624728047057622598356992495288818408186451218110515559131049384485726790181996 00*a*e^(913/2*I*c) + 98665945265243332252846997469474236210561545377582664231327772022948181673145348993 00*a*e^(911/2*I*c) + 4487391966272985667914575602725605848705279222782866507578267857038153605116487111767 0*a*e^(909/2*I*c) + 20072565710547280650521283907508435534876120724237355564801371642925889353954328813901 0*a*e^(907/2*I*c) + 88322097291124153120487238094084059863887725115913605556878804185900947497033316365380*a*e^(905/2*I*c) + 3823550126984869810060720480378212576630863649197003268812200176029853869143883259372540*a*e^(903/2*I*c) + 16287949903571905740162779090603628412377720468039404006167093404295378080939699332502390*a*e^(901/2*I*c) + 68286934643050139940323916578567575941438528756978738176778753728051071752354796643709360*a*e^(899/2*I*c) + 281804432061359269867944398257579674637432999117233397059536410474449872076551395746129720*a*e^(897/2*I*c) + 11448871170218459900008734070148505127887472906326621531601015092295409474743884719786563 20*a*e^(895/2*I*c) + 457979523648050920266441127246876691931956288277825243497840444218953748354557849138290004 0*a*e^(893/2*I*c) + 18040983595466984885878007365734448155005057683579992022758394768630235475311641910974225440*a*e^(891/2*I*c) + 69994790043406292839026175163841940048198660179478150539131705393762570348229558917524315680*a*e^(889/2*I*c) + 267498656561808992457303874299828241344353240871083913762113171457984179086434445936669700220*a*e^(887/2*I*c) + 1007129713752251234868254087759675535888677155631019333522995080270882748550110427116557445880*a*e^(885/2*I*c) + 37360544899750791063541843619131572688619307962473318376105028254162418042956244492719753109 30*a*e^(883/2*I*c) + 136571366295717469893522360083351382675021656176707767825063523166425164805820652878585113549 60*a*e^(881/2*I*c) + 492014706466686391880133776761877789597454179588934807427700764455508644778118845217737490730 60*a*e^(879/2*I*c) + 174711101080471994990887097621209864618235930291877442803658578096718181438954083545775558767270*a*e^(877/2*I*c) + 611557996765529999301622842050393958742086552374610236490615243112421593573435237134063616533170*a*e^(875/2*I*c) + 211046937140451890994592044071324870102253041255279516917087359387038936765653959469761669149068 0*a*e^(873/2*I*c) + 718113442629596250415530442542256723043154864097674188350586586844679930486104429974193035038666 0*a*e^(871/2*I*c) + 2409499598703815579606545024538285973746343326267426268979365466493503940825603621986088904422715 0*a*e^(869/2*I*c) + 7973087953888236101996330206176624001085572209405251613968361899833096340077920349203622015290123 0*a*e^(867/2*I*c) + 260217903483151829093716530516190668583821940861461483281216448823551734330201315644832519365482660*a*e^(865/2*I*c) + 837727373539837493168349685109390167037489001289537635907868254276871639349234894861317508580200600*a*e^(863/2*I*c) + 2660517658969571246912951290672187792083797820694140421836394949047894222007034274605942965668984850*a*e^(861/2*I*c) + 8336226640582877814375395368596623370 2

3837368284480745463010699123739069816551011339057109182041191O*a*e^(859/2*I
*c) + 257723424493994596747148455306987447158228614659746355547707657696516
5191805766652556657788487053898O*a*e^(857/2*I*c) + 786247831880172272212718
198383648014818245439118249623311406619698585841828193229414408180452072092
00*a*e^(855/2*I*c) + 23671485404118158444761445155265170179747149991498297 4
46360339040121370668538871033655764000119933061O*a*e^(853/2*I*c) + 70338076
383100911366932827516044752365318982521945458459886812685865044840195458149
765968253384160948O*a*e^(851/2*I*c) + 2062965693714750235067564405338921374
554548468969024643489620343184854915274816524086649932505557498620*a*e^(849
/2*I*c) + 597264752362749340295672778924566561666580083133198732948759988 74
2138523298583470832549157283613651232O*a*e^(847/2*I*c) + 170706936790260123
938426614442418799102036095130027247812807566205231412293118130551919029088
78349108560*a*e^(845/2*I*c) + 4817038864933620843436906276440849562106090 37
563792875474551360541833388524054392291335957935094208991 60*a*e^(843/2*I*c)
 + 1342110874555693919930370899713448508267941015220829180329040653655611 54
29149193397970357446921857750448O*a*e^(841/2*I*c) + 3692408716324670998048 0
044053159959407607774913382508761439855275786996954495311212595020599856332
4077080*a*e^(839/2*I*c) + 1003176728997484447898771022327222595016528556449
971374706484597613376742091449978571381520265096549223520*a*e^(837/2*I*c) +
 269168331907643804490057651732948941867648218307833289813174455880978242 10
797219830633230680887373673366 30*a*e^(835/2*I*c) + 71331473314471714578897 3
462038051706913328151470784513707706666333052589601057881527553406651105641
8010940*a*e^(833/2*I*c) + 18671551639618144124255294063846217830711142951 60
40235120349509750523573633508569306383661163758638578823 40*a*e^(831/2*I*c)
+ 48278334700596237874547411546910432076103096220654509695606750031939270 73
38585783463011641369031267450087 70*a*e^(829/2*I*c) + 12331812166407243575 75
555885267829259130760244774776563032781298993663789826694352606370726303144
15613631270*a*e^(827/2*I*c) + 311195856161614323352630504511761603172739768
941213790291237430115115150792860742309567092063322246220261860*a*e^(825/2*
I*c) + 775893281281358791373514101779303870170463704279415843648559548529 01
394210919452396995982762641278422231464O*a*e^(823/2*I*c) + 1911436768719782
288999540325472146134322970444655309319583417672491603875380587266190085405
2243723013521930 90*a*e^(821/2*I*c) + 465302746000324733467289356614219012 00
985235940458911270334661947223239460320224613011607488605971490072247 80*a*e
^(819/2*I*c) + 1119325822544457130150423007162798286516540317269448258351 64
193434980080470045685916307067560383922214322238 60*a*e^(817/2*I*c) + 266102
947930130638238728238368746480972834091121747235656339391230401580406819995
0083526055999984450463431012O*a*e^(815/2*I*c) + 6252327007324603215535873 71
050084348389683924504408397906937312545543701237544880788549287567167591576
96466300*a*e^(813/2*I*c) + 1451973428972442974336340892058841676877648143 20
219463291543467642188350261872080176726805087772378655781459100*a*e^(811/2*
I*c) + 333293141958687042802582181517524590962268007901894177397330594816 81
4779451881594947809096302954987869523422420*a*e^(809/2*I*c) + 7562582975360
233577252027947010632267401534276887167063717492873906459409169196863982496
205307274740470188607 60*a*e^(807/2*I*c) + 1696348031788872794277133030579 27

277079359213981549388986796158228213350979928778672092338004688069940429121
0612*a*e^(805/2*I*c) + 3761710771325835521801477079120704187229783360504762
3210656044639179042032585533403763055959660434944282723656668*a*e^(803/2*I*c
) + 824718499706545063683390264508727795989936168405576046694928128930197266
6822817688997267791955291152552467144383 2*a*e^(801/2*I*c) + 178772164894330
951029064697572798411166624139605801184320488965100852620426851236985361777
1222967818650768074383 8*a*e^(799/2*I*c) + 383170010946699352365004737441442
116339073722214515022588412864096168170947539486408813156569598230715995485
29652*a*e^(797/2*I*c) + 812089511609375494408963761485072165160645985072002
4622295784532261475648650364727744372008182477041283973806748 0*a*e^(795/2*I
*c) + 170200221953232931986455647854273859562845748654874472429340774688584
0877055247120651006472632011007655058523429 28*a*e^(793/2*I*c) + 35276295031
401588148749225952837635364581450519265488913903945198226064169728006890525
969730729512981734714715794 2*a*e^(791/2*I*c) + 723094376155411890468758 3101
547420609492909802339004327428236753491839662168866663472119243910458994518
88015744508*a*e^(789/2*I*c) + 146594777843443224560876958048506099568446407
766327228362031692469320155107874440178164959129717280031616659334184 7*a*e^
(787/2*I*c) + 293951465316590451143465501210515082890400759682592947699967 1
465422724758128470982083055835294931929377197195285748*a*e^(785/2*I*c) + 58
302650299275916227107054982145988672056465410297488052315860618291374784874
397186272533497691765256512712823399 50*a*e^(783/2*I*c) + 114387416774835002
287847205454594548722288194278596749810185800029555472736335279688751577272
2958678908676555740071 7*a*e^(781/2*I*c) + 222007214034938782361045031171802
474684508421507320435951147859643125395662798747629539547252171211010758089
61057863*a*e^(779/2*I*c) + 426261640814423367900443928740643212661243656930
555780625359476464384908458485614051411655785660224209049849927 79262*a*e^(7
77/2*I*c) + 809705477346197792524991834059292203357066547910088788113919402
7115078553339958009159616030157614178409733972898009 0*a*e^(775/2*I*c) + 152
174114651836920279709831963803377982356186827751705484345314660768355526131
5374829059347607247966866926148830191 25*a*e^(773/2*I*c) + 28296876925658410
281879282983134031372419660366028167555906899906983413091676412157767918738
8938656817063251770095022*a*e^(771/2*I*c) + 520644525166533596061375795940 6
570747666605448098580380508628333217633440609658655436048796007266599713454
31129847296*a*e^(769/2*I*c) + 947916737695979066656478842193532082586367581
8059307807047545238360401191545332616557418710820940905488201911777368 84*a*
e^(767/2*I*c) + 170783588363657585718670505049809663315797831039187532771 91
4293338700463063067085284239066277472536196224802277872327 8*a*e^(765/2*I*c)
 + 304501954197584663501883258182032274485361678548198781813392827237146298
5129663419186138280673182752234472745408285510*a*e^(763/2*I*c) + 5373076061
973168504014181459519819721508275880784253991903654691196339007406080147476
6967067264085116632976564491253 00*a*e^(761/2*I*c) + 93835205260308053440484
819628244701833083469043395267356881867434313239135004639698687201315004288
3055988807701019641 8*a*e^(759/2*I*c) + 162195773890998650017790861946896936
634022983061549686004373771804028557232275860397899262942432280165504357426
02136054*a*e^(757/2*I*c) + 2775014156655595162375608671637105868131679510 94

44727785594328908441218495107612157679112376946419989454625088610911643*a*e
^(755/2*I*c) + 469963266239089896578886833492238682795778407137777519034242
99836299363657745857514934182927561870099251068169102199820*a*e^(753/2*I*c)
+ 787874132322296430777642020879382478313017314162672625674445056459432851
09559656037217616994737395772316148327891471302*a*e^(751/2*I*c) + 130757092
982902523772408546910270270217553445051652898981442079835320326376505227529
154501020728626159470929494044207633*a*e^(749/2*I*c) + 21483771935885237738
394744368610522252356389816528190813049070485967794521941557311526730280410
8890941570998616137840699*a*e^(747/2*I*c) + 3494734343971712888377042144779
844754736698072103755994909988000274804998906578292863060593961100203846340
76939313007368*a*e^(745/2*I*c) + 562856635056256522897295635187644403242633
887267858968379604254363064108890906869496730352389810427434831340032592335
350*a*e^(743/2*I*c) + 89760068438882857561569840914545736409207339419570854
8474214631467676943800634808122870620940628733790867239511160865397*a*e^(74
1/2*I*c) + 1417399437191054323839106392665411305862914101585825022283885579
483586672008506936972830021650145621200685041810287064301*a*e^(739/2*I*c) +
22163948552537554153117696425164084833125683279918194569435445726655879893
41669065966415431960005186052908659861771471174*a*e^(737/2*I*c) + 343218022
711576040491697168029506446272753132246810590899265221050901706072748366569
5250186544493349252686330433955313376*a*e^(735/2*I*c) + 5263608430798021988
512603950847390921256551866219090577603956112275050115597501030429610982200
369929372389895438604735587*a*e^(733/2*I*c) + 79948488145396147587671881182
940160466975819167796878015069418200801859756270153002058697145200704130301
23095531003290745*a*e^(731/2*I*c) + 120274340335685963574796945743632655201
492044667649156439996418350448071425395206138913435308553046616435786083915
40037558*a*e^(729/2*I*c) + 179223442423092111123085142070904611727690600231
86678888125375232294636141950170069922592546432072256690280201930015285124*
a*e^(727/2*I*c) + 264544667257628713686194515680728643738272691440428880419
55082747247267325324943486097333234252334413537567942897374486243*a*e^(725/
2*I*c) + 386820109739823575544913927638282776265309386641426699074289633383
97512335069535559962305954403609176276589299921949303042*a*e^(723/2*I*c) +
560336084278280009691377030978044973196236559281085693587773018747505499031
28662509955413199447848429732621413779639624290*a*e^(721/2*I*c) + 804158282
228122214306018937726982639881571301397138573534003104431019647862664651064
97352458508320193679809189270395189388*a*e^(719/2*I*c) + 114343631608925883
4073103732190469384993390362411083174486668876266687514027677976291595996209
697034615765954684303162952874*a*e^(717/2*I*c) + 16109579844808771133633398
501845128614249944752747636857583734750833717984985176122251946484471861153
0929945237812223712858*a*e^(715/2*I*c) + 2248965180131652569006723228722098
209463641972986735223565856373546259573908926828296912287224946232680396577
16264090221100*a*e^(713/2*I*c) + 311123077520821182661400197392400502848451
085231967404189415031214666716333382727640087182723744328071082256937126787
518760*a*e^(711/2*I*c) + 42653785427007861538014680289194543197999430879059
7186556743002620082507967337801063312521286799161839548882443173283066418*a
*e^(709/2*I*c) + 5795405950312360962351926688236015842262090471528145938558

94141916452918266691180249939843124623425348125525255775702439429*a*e^(707/
2*I*c) + 780434260513757032567868066635568515793145500827706415413194947155
129096500358128954342424580618054152762185523771214603306*a*e^(705/2*I*c) +
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2922936936162304870322182003248106590848503313431O2*a*e^(703/2*I*c) + 137823
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0750586411465537396094529761988971561274055*a*e^(701/2*I*c) + 1807615478092
428422586742709696692811895332427746348368604855468543776298223239993229039
784665919612645743781029502335900285*a*e^(699/2*I*c) + 23502788927076768740
554130642361122245814004763554864200511318963106542906171225198904360869451
31040778770847639389879805902*a*e^(697/2*I*c) + 302961851346903955146825656
795861097743609586460997415007283495515682424639012969996237397242827275991
0731542596087674887228*a*e^(695/2*I*c) + 387202441933455457942046704603139
5921549818528162349987615698433421440396242863792881072470370499151581175133
609251380773047*a*e^(693/2*I*c) + 490677859299894019023141414347470604783328
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60753080*a*e^(691/2*I*c) + 61658076975472869947932829468616738298152384612
8840747077285016671845269213716152898133050036712251037966712392543828523595
8*a*e^(689/2*I*c) + 768326561026910659310034800962703434782436315151736317
722142064979271587778452485632422011941139077296932632968988655337831 2*a*e^(
687/2*I*c) + 949492765936800832543300464948344033461530786249128760094666 57
801270523734957306405383184746416290254053131300183881713578 68*a*e^(685/2*I
*c) + 116373858411965061630973626230419974385250718712191236540146811766574
708752144923057905090828225045634894139213355872138791 52*a*e^(683/2*I*c) +
141470440164930732450776615666314115455835411275845909958691630899066385040
600781248204357542061037945386048896561443979803 98*a*e^(681/2*I*c) + 170589
239640152444033499284397690714719291820929075803352515822398222602748552573
624813769446943550515787171240661379781868 00*a*e^(679/2*I*c) + 204053067463
745290545736774834770450591858211618481952507321379809428512590615108830028
742141292714923083837014786964241643 92*a*e^(677/2*I*c) + 242142484147402472
888196588867656073071905413044581300074913364221933209580067043613589086740
271259109046065934537765870339 28*a*e^(675/2*I*c) + 285080237233288780967575
214463695898134726405773514745595018550629865497920541737879721362675232987
5214030885991116287513419 2*a*e^(673/2*I*c) + 333015651374150036074961865003
399084901277051358311626016743046664252782794600423077963394789753609361729
1948740824103294728 8*a*e^(671/2*I*c) + 386009757817994088882815931562872586
787646154265778480927188004150473475198308221604715948399662199253469913478
9650935501071 2*a*e^(669/2*I*c) + 444022028468575168779244113679353800600509
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42508920*a*e^(667/2*I*c) + 506899611846388853164867916703438317336756983469
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40*a*e^(665/2*I*c) + 574369944241760348692836013425853069214373031885183180
998424999198846568242117834558695977573638454587400142612340145816262 00*a*e
^(663/2*I*c) + 646037522633182149884507533121493887106735609341214381420087
838643794223170044352344617079455979460678667807368952891907006 00*a*e^(661/

2*I*c) + 72138547421892020038048355239174111826621175775606960200964203311422673485210729157141087289517598043801848625484306799328540*a*e^(659/2*I*c) + 79978234332950254992450486639813176350017483694332938500083822564082720208751313740900328892353116973355066036775494328765120*a*e^(657/2*I*c) + 88049424811863246007041704852717229739362782325671343952267538240583807951714247800388339978768161265599420577081086275111160*a*e^(655/2*I*c) + 96270225024707820411530109680694614437236266949615101681613685959098775320171837136274199340417404214583084453939806659575380*a*e^(653/2*I*c) + 10455244491631212600687741648643777771759090846878772024312244728026775020168727130930737774290428519675374098391693263364278O*a*e^(651/2*I*c) + 11280419808233481207736486249079312363327270082232642717106213022801211237635329630755350945657113813610943712623745922908172O*a*e^(649/2*I*c) + 12093277934771448101080707375011663643984862965791083501207485539272913204675147471088848120199368743159243844723572684964724O*a*e^(647/2*I*c) + 12884768156900282454041008224893689293696749181773289059845408624907892369464750074146519493680858245908282985139373487346834O*a*e^(645/2*I*c) + 13646359477785763333632590519188123937110654688598380889628333204942065186458624338743919006329074162216473998693357765020088O*a*e^(643/2*I*c) + 14370322172220940964523362909818417041023530841247713129040166678879958401420386902427907019864219755089635118771255670292088O*a*e^(641/2*I*c) + 15049974556004393212148482195375000456958377762007855437045783807361367582491843710801309161685499106364234471719300528191856O*a*e^(639/2*I*c) + 15679879859448719992189716943464233141793387261169010187777798613091976355152812898085050331307868001189674596237358413988624O*a*e^(637/2*I*c) + 16255980532504399251291274128709686138855690031676549553543717426709067076765330688951793541052755597281232348781238976436296O*a*e^(635/2*I*c) + 16775660763901781512282672573940942127544124577707157403183052385218371698808683094697034567243260477194464949235236809867216O*a*e^(633/2*I*c) + 17237732271319674646365057966354138721148026981289246438621489879445435638625058737811144188477684258865885493289665680393812O*a*e^(631/2*I*c) + 17642343240547945381613133843635700994434107158720467976991940705350249618905308556556075547787343170893045935406430514615712O*a*e^(629/2*I*c) + 17990815327270667000089252597834588746218890004018554632217512554347035216029963507874462939956797091028508192455193640057334O*a*e^(627/2*I*c) + 18285418520065773445627970978893120176590668351478586444659742512659741786766206540845607574101976464142854993876145751561504O*a*e^(625/2*I*c) + 18529098027189634850904538224704583515791783997770680528221371955528547961795923770656852235216589993724395616396908364454316O*a*e^(623/2*I*c) + 18725170848074439262529378302158792032186128999320123130764653871796124076962210163240176965424928058515394142812647165706002O*a*e^(621/2*I*c) + 18877012033954588099191816676545145142571992540109029074001938664626522043103659091926892710506914947728481465245563858461910O*a*e^(619/2*I*c) + 18987751622724415564983953742945513233085574424815460594276024603178958111996706623513538520405612904086483101105080107190296O*a*e^(617/2*I*c) + 19060002744177026933177787209862555606302505370810109208750920397305309477322727639289959251061102769294921736757464414201132O*a*e^(615/2*I*c) + 1909563943901118604069257425196847O

1440797875668725635899750842621088925878453091067330232430147950545756566907118285339121700*a*e^(613/2*I*c) + 19095639439011186040692574251968470144079787566872563589975084262108892587845309106733023243014795054575656690711828533912170 0*a*e^(611/2*I*c) + 19060002744177026933177787209862555606302505370810109208750920397305309477322727639289959251061102769294921736757464414201132 0*a*e^(609/2*I*c) + 18987751622724415564983953742945513233085574424815460594276024603178958111996706623513538520405612904086483101105080107190296 0*a*e^(607/2*I*c) + 18877012033954588099191816676545145142571992540109029074001938664626522043103659091926892710506914947728481465245563858461910 0*a*e^(605/2*I*c) + 18725170848074439262529378302158792032186128999320123130764653871796124076962210163240176965424928058515394142812647165706002 0*a*e^(603/2*I*c) + 18529098027189634850904538224704583515791783997770680528221371955528547961795923770656852235216589993724395616396908364454316 0*a*e^(601/2*I*c) + 18285418520065773445627970978893120176590668351478586444659742512659741786766206540845607574101976464142854993876145751561504 0*a*e^(599/2*I*c) + 17990815327270667000089252597834588746218890004018554632217512554347035216029963507874462939956797091028508192455193640057334 0*a*e^(597/2*I*c) + 17642343240547945381613133843635700994434107158720467976991940705350249618905308556556075547787343170893045935406430514615712 0*a*e^(595/2*I*c) + 17237732271319674646365057966354138721148026981289246438621489879445435638625058737811144188477684258865885493289665680393812 0*a*e^(593/2*I*c) + 16775660763901781512282672573940942127544124577707157403183052385218371698808683094697034567243260477194464949235236809867216 0*a*e^(591/2*I*c) + 16255980532504399251291274128709686138855690031676549553543717426709067076765330688951793541052755597281232348781238976436296 0*a*e^(589/2*I*c) + 15679879859448719992189716943464233141793387261169010187777798613091976355152812898085050331307868001189674596237358413988624 0*a*e^(587/2*I*c) + 15049974556004393212148482195375000456958377762007855437045783807361367582491843710801309161685499106364234471719300528191856 0*a*e^(585/2*I*c) + 14370322172220940964523362909818417041023530841247713129040166678879958401420386902427907019864219755089635118771255670292088 0*a*e^(583/2*I*c) + 13646359477785763333632590519188123937110654688598380889628333204942065186458624338743919006329074162216473998693357765020088 0*a*e^(581/2*I*c) + 12884768156900282454041008224893689293696749181773289059845408624907892369464750074146519493680858245908282985139373487346834 0*a*e^(579/2*I*c) + 12093277934771448101080707375011663643984862965791083501207485539272913204675147471088848120199368743159243844723572684964724 0*a*e^(577/2*I*c) + 11280419808233481207736486249079312363327270082232642717106213022801211237635329630755350945657113813610943712623745922908172 0*a*e^(575/2*I*c) + 10455244491631212600687741648643777771759090846878772024312244728026775020168727130930737774290428519675374098391693263364278 0*a*e^(573/2*I*c) + 96270225024707820411530109680694614437236266949615101681613685959098775320171837136274199340417404214583084453939806659575380*a*e^(571/2*I*c) + 88049424811863246007041704852717229739362782325671343952267538240583807951714247800388339978768161265599420577081086275111160*a*e^(569/2*I*c) + 79978234332950254992450486639813176350017483694332938500083822564082720208751

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947288*a*e^(553/2*I*c) + 28508023723328878096757521446369589813472640577351
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*a*e^(551/2*I*c) + 24214248414740247288819658886765607307190541304458130007
491336422193320958006704361358908674027125910904606593453776587033928*a*e^(
549/2*I*c) + 20405306746374529054573677483477045059185821161848195250732137
980942851259061510883002874214129271492308383701478696424164392*a*e^(547/2*
I*c) + 17058923964015244403349928439769071471929182092907580335251582239822
260274855257362481376944694355051578717124066137978186800*a*e^(545/2*I*c) +
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228*a*e^(529/2*I*c) + 23502788927076768740554130642361122245814004763554864
20051131896310654290617122519890436086945131040778770847639389879805902*a*e
^(527/2*I*c) + 180761547809242842258674270969669281189533242774634836860485
5468543776298223239993229039784665919612645743781029502335900285*a*e^(525/2
*I*c) + 1378230051104463935433589661162755408374497874301786200581579116590
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 10416945830850610852374324265843085406619236363691449958554363895366497512
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+ 9475277846893111808530906263413738581678048958642834055018439346069286663 4869729660*a*e^(307/2*I*c) + 1945780653776869404820978100666431013047007585 7592678483876983129530380918539494004*a*e^(305/2*I*c) + 392613958303751498 0862266059833351755777935293123288314534508002591338991682219336*a*e^(303/2* I*c) + 778246810977838656572118917913951634716997865633712601174220799241685 098928335884*a*e^(301/2*I*c) + 1515150285211017790993952569735928655092976 38341004580671627232414532875203636556*a*e^(299/2*I*c) + 28965753998483361 12837518724860972276280949244636300000069876998551004961199464 4*a*e^(297/2*I *c) + 5436327766912905456994738945036935633200047191898446394850650924966170 366179640*a*e^(295/2*I*c) + 1001418815121242432011194881350042888741731327 908457902222695201280195390793156*a*e^(293/2*I*c) + 1810128538317456792824 16051344942263215904480326976416514252463543134260124404*a*e^(291/2*I*c) + 3 20979501641328171158036215858928380163328609393302857710495895042543274939 76*a*e^(289/2*I*c) + 558221167660699249684548132726498124474001205729123667 44578282018592328352 34*a*e^(287/2*I*c) + 951873826739786380285234589880157746 26119000151401627771343965475084605995 6*a*e^(285/2*I*c) + 1591019017813844 722395237439326307061401190201867331299629439500531120267 20*a*e^(283/2*I*c) + 260596583260161894887915572186327757091519838733271812830090509084536883 84*a*e^(281/2*I*c) + 4181472981318382654497651147465017493829958109415267437 695790041142593706*a*e^(279/2*I*c) + 657085884320624083206429141938173656 2950181001102685162240407997172243 64*a*e^(277/2*I*c) + 10108976281852684894 04093103463509322682836138484712496133237149589033 85*a*e^(275/2*I*c) + 15220 85188818272874078275036082576343307013527187300884471819214604902 0*a*e^(273 /2*I*c) + 2242158636340627862127320016333950189333356311019840571116834002 118194*a*e^(271/2*I*c) + 32302202435491322614660627910867821961665156470778 983119896056652214 7*a*e^(269/2*I*c) + 454959565932048254589704164140715683 95520610410066611011076531123433*a*e^(267/2*I*c) + 6262071407737746651726828 0518836252815367722301461118298469646459 86*a*e^(265/2*I*c) + 841957703671377 547101115934348899568986163724166597446960696905670*a*e^(263/2*I*c) + 11053 6176601461446339362095696904713163296927687419549616666327675*a*e^(261/2*I* c) + 141633907759236988403499136962888050738189037485497709820996210 66*a*e^ (259/2*I*c) + 177042177197442162270914587846292551859305067054342450851116 0048*a*e^(257/2*I*c) + 21578525923787201686761867532227665174676191403492987 9374220636*a*e^(255/2*I*c) + 25631928039175694441559654718673739138804185560 774185672766170*a*e^(253/2*I*c) + 2965675360110120697249228947959169960721 15373504738440632779 4*a*e^(251/2*I*c) + 3340456313007058705883041585142571 55029610988873639068542876*a*e^(249/2*I*c) + 3660771974683332327017333510537 817068380688319428350257295 8*a*e^(247/2*I*c) + 3900820711972392395320770531 146704159375652160514958780466*a*e^(245/2*I*c) + 4038995260209810459155678 12551120267991387530283005216005*a*e^(243/2*I*c) + 4060944903010454199463398 191888662924984771679038975808 4*a*e^(241/2*I*c) + 3961896296989029006971841 445652283627926050438580538042*a*e^(239/2*I*c) + 3747738809914961000287614 2605955825284814311649123358 3*a*e^(237/2*I*c) + 34345847184427216697256393 27266274282823521060344771 7*a*e^(235/2*I*c) + 30468084970877944900221885697 50541728488343182667144*a*e^(233/2*I*c) + 2613883590661727412848063331363568 5

4326016097969610*a*e^(231/2*I*c) + 21665877472884315675187015601036054026439130732651*a*e^(229/2*I*c) + 17332700305179944900545415559145289469873995 07283*a*e^(227/2*I*c) + 13368305038058329275980727190245915522192132626 6*a*e^(225/2*I*c) + 992871398921800006723921714657713029743686030 4*a*e^(223/2*I*c) + 70919382049401994335434347041021500986183132 5*a*e^(221/2*I*c) + 4865181686831450633896657193486081282908439 1*a*e^(219/2*I*c) + 32007773246807386510286365586755563611559 78*a*e^(217/2*I*c) + 201623763544733613950600829151019284608876*a*e^(215/2*I*c) + 121396504560972541693158944928573583481 25*a*e^(213/2*I*c) + 697316726420326420226818605542124203670*a*e^(211/2*I*c) + 381345080685096513381617825302497908 46*a*e^(209/2*I*c) + 198101339056005854242269483288837238 8*a*e^(207/2*I*c) + 97511021259565231697992928696183262*a*e^(205/2*I*c) + 4535396319324144520768178591431614*a*e^(203/2*I*c) + 19871581755788084601981763563834 0*a*e^(201/2*I*c) + 8173401220846880695205758846440*a*e^(199/2*I*c) + 314361585027608802719103613974*a*e^(197/2*I*c) + 1125591352159113915461702609 1*a*e^(195/2*I*c) + 373282846202680826204100054*a*e^(193/2*I*c) + 11397949499281271404789090*a*e^(191/2*I*c) + 31821686414688967461412 1*a*e^(189/2*I*c) + 8056123142384105100019*a*e^(187/2*I*c) + 183093707775748726866*a*e^(185/2*I*c) + 3689545748587311444*a*e^(183/2*I*c) + 64891508140773561*a*e^(181/2*I*c) + 975812152492320*a*e^(179/2*I*c) + 12197651906154*a*e^(177/2*I*c) + 121672338216*a*e^(175/2*I*c) + 908002524*a*e^(173/2*I*c) + 4506216*a*e^(171/2*I*c) + 11154*a*e^(169/2*I*c))/(e^(531*I*c) + 432*e^(530*I*c) + 93096*e^(529*I*c) + 13343760*e^(528*I*c) + 1431118260*e^(527*I*c) + 122503723056*e^(526*I*c) + 8718181624155*e^(525*I*c) + 530563624556832*e^(524*I*c) + 28186192554792138*e^(523*I*c) + 1327882849274858880*e^(522*I*c) + 56169444526926562260*e^(521*I*c) + 2154864144781257856128*e^(520*I*c) + 75599817092670157806639*e^(519*I*c) + 2442455629894502983849104*e^(518*I*c) + 73099207817335597247098038*e^(517*I*c) + 2037031259470368160131922320*e^(516*I*c) + 53090127264630963470039804475*e^(515*I*c) + 1299146645993240318167826532288*e^(514*I*c) + 29952547749265499675257842032197*e^(513*I*c) + 652650253343206047453620559993840*e^(512*I*c) + 1347722779952470195657927421039532 6*e^(511*I*c) + 264410375780310742518099326419685040*e^(510*I*c) + 4939666610818025798809586352543471345*e^(509*I*c) + 8805492759894141114586995081338804025 6*e^(508*I*c) + 1500602747937397286405577818722691539392*e^(507*I*c) + 24489837337812338687718622491865013839488*e^(506*I*c) + 383360155801054824529764688213114368047154*e^(505*I*c) + 5764601046563151304213854710715346838447392*e^(504*I*c) + 8338083991183789445313630367378503905150680 5*e^(503*I*c) + 1161581413733971751533622511909046917188768400*e^(502*I*c) + 15603911277687607099721623771744933086920587272*e^(501*I*c) + 202347509724462171313966643580234078508179838320*e^(500*I*c) + 2535667460650279776834561566186591213109251642859*e^(499*I*c) + 3073536651283056216099116633849005730806276251849 6*e^(498*I*c) + 360688613036389349413809780004559963548775423325255*e^(497*I*c) + 4101545439937195793959956708442496709433800261224880*e^(496*I*c) + 45230940039830738332025694784646206844854827698075736*e^(495*I*c) + 484093410240488718655917025303662581091659126182344528*e^(494*I*c) + 5032024903401451824074213943766011922026507006311982753*e^(493*I*c) + 508

3636950817109943701934861084739194673618510801718313 6*e^(492*I*c) + 4994675
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+ 1334902100520261837796733138683323035303329061632471946278084103 04*e^(482
*I*c) + 102253643746829673729306586270524644969368741555986584430688870542 3
*e^(481*I*c) + 765901052018754965177711835767687192708189898913112575579820
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519055227368366*e^(479*I*c) + 402349692266121158934003582839428785116904903
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4*I*c) + 557255115732867112101621641630759616186195596901169722234092621011
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*I*c) + 470650446111351581084873533674842431026982488383126358762830994274 4
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*c) + 466682235482660178068545924681005702893559608696136508565757567581801
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(458*I*c) + 419154250065682614809333941454415914396447847249231593180917185
990211410900593994 2952*e^(457*I*c) + 200080068030300471372932782503215971 13
540716201983333126349281186679153199068045257216*e^(456*I*c) + 939869153130
681791490836060656814827808360605105301546184869498394671313788598859982 10*
e^(455*I*c) + 434546676780280045346344498763892540797175105756827515509297 0

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*c) + 7275210107183942292917740738446942557987386670675353797597327955679 42
5787513842507804763 10*e^(449*I*c) + 306797429643174736419815962396246367161
70064196268514261484186029348529073790216597619118 40*e^(448*I*c) + 12747219
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e^(445*I*c) + 8375792069234119324587864867653735339465452397089907694887248
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*c) + 1269349693296492056507367363718128008854868250888025533728006500656 61
3869604179735321658452864 0*e^(442*I*c) + 483794897564340998438577918165893 7
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 181834661406177901315330129677145381166449188413194141169344354754920969 03
4952610378945282257600*e^(440*I*c) + 674025530543133008894845775236625237 45
07431144735445378181704471346071025756766760566753289615 90*e^(439*I*c) + 24
6438219080743960907977422685567962936788570977643587663085171625396269619 23
4170623919287872816 0*e^(438*I*c) + 888829502875102466704420383760797610148 0
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2664467472554773117679568752765357130596998592368839211216491555324257326 94
9090898957024853328 0*e^(436*I*c) + 111034148797008819443143895644469242295 0
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8465584208066627445406307878483717499894905250097532216200339254995341359 24
6151936517790868207840 0*e^(434*I*c) + 131505212093069212210229710532762284 2
3358707434285308910729835358622800944466077234738004774539141 30*e^(433*I*c)
 + 4437210917843182347764349544443904699020056595069470847193617092114714 07
76330772349728253512269793 60*e^(432*I*c) + 147779550966171289987127451820 71
49536217650697318308165023360527405167762497046434024275584002567376 0*e^(43
1*I*c) + 4858425815314028044731483686877213139019541241904673277845870601 50
96881437076337910793584122475073760*e^(430*I*c) + 157685845528850918721462 8
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30*e^(429*I*c) + 5052936631230152588784830257388128132033977668453400653812
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663574829100*e^(427*I*c) + 4995241956279138180205186744401688024388272113 92
12556637349569469275713055331467768987878780596851084 80*e^(426*I*c) + 15413
1112114860239372949708207973767160813447881633865435224219397375079621258 54
9818818791683482603300 00*e^(425*I*c) + 469702247271172818264540450180706705
22559756627580347784535320014963482632359729444541885102274546002560*e^(424

*I*c) + 1413799382535568432805655058074033041306061307254347517457940798331
41361748917639986145377066437210546190*e^(423*I*c) + 420358024835146798583611210145942154684437949365647899088372524802156222884839580011688655664280691773600*e^(422*I*c) + 1234668041892409978780018081755440216012582476396941937965899631953079203974222138794604328498972144766900*e^(421*I*c) + 3582718002163296061414536703715109897107198252739284546149343102348456124089657428594946438660859773886240*e^(420*I*c) + 10271602530202889002497813516849452590971512809529060665197301097052210064576088348023234671975463677418470*e^(419*I*c) + 29097651061247453406647569781836910062165559852359052804259154165687125428752562385492373749486351714453120*e^(418*I*c) + 81452081413829111828875417564250054846037693312811480492909160758195989155768107022568350953861815940704090*e^(417*I*c) + 225320532593220657767941109289516248999794521015564134982827241710019675486694499689312466561907212627820000*e^(416*I*c) + 616003116022979584937125701757887212998354300989991362628038861093914561332071191909714949426587936910303300*e^(415*I*c) + 1664475034387211809394917743502937638978574937754764763987835872410449930690131572904279995484581013965001440*e^(414*I*c) + 4445412259295474625067659514198312966015416299968930393345630345914109720740573618884980520010028451496996210*e^(413*I*c) + 11735856926245118493113091002501604032341876985999082823520672241530200188223826392982302194084667538488665600*e^(412*I*c) + 30627581054221957378390547289277609129572813931082733520247387226000020043538279468776707958420892547870128680*e^(411*I*c) + 79019149558766569254783988487232388352909144982747171856772463223808993367091503402876467270176124342699654400*e^(410*I*c) + 201557947424794098026772478462040883395867512562930862943753568690084015585598010154781548625239409581907397500*e^(409*I*c) + 508324599301085460166978629683032661427654474082939048097939638391567298795788389433842285751054665210868287680*e^(408*I*c) + 1267597017294812913400146276042126929986480292870190399107554311079964227280196522475370108738477856311765699610*e^(407*I*c) + 3125683493178701743479704750307490178666292150720179363604335113528623329684606343185540756019935662148267863968*e^(406*I*c) + 7621788791912047062038840917799374600428892258194367636682944356096681400246312138001769285020661445991073249416*e^(405*I*c) + 18379807084003359766027649217621144116091735572216620788861535803449702273802588359076704241840733513439114113248*e^(404*I*c) + 43834972142919377685378692233021063744554033100928502737480438978976746989895784070951905237783490374305934542955*e^(403*I*c) + 103399755467257436489847837640753754718204394473055795001467604326419876555556873829531737211096115196005647730480*e^(402*I*c) + 241246021282440061792908317783032876194801597133206052091286997043729145345755805710081489006741839439573984832678*e^(401*I*c) + 556756388711182340341026192734219546113651768317380539005893679049394714017063698565272728813669054779077208977840*e^(400*I*c) + 1271033082938048950201360554831270342662343991277504612342300366025046741742856580445289401786656311685859023084716*e^(399*I*c) + 2870496131412314451834674715353589439553294430808531933466086288543709246230769151392180699413405623017247753532944*e^(398*I*c) + 641338189585592518475823145106255638032859493851100657701521811978653639021305728401820220163109443481958402511346

5*e^(397*I*c) + 14176483652875704957202013343241117904369977796653849959902
524421980635189011634815653279605497783382888932766730080*e^(396*I*c) + 310
043192060694170770693631414234874318280090981847446356786522841774394649416
51812564519144918003174108077634846014*e^(395*I*c) + 6709170613052966912501
989921002157658023784346222953538629508707618929784999593136064560529213096
1496106707521506432*e^(394*I*c) + 14365768713804479694294711970425953845881
819942351682467458629369105611920986635812363777224540953079923055376722225
2*e^(393*I*c) + 30438447110681333601028416012390637043388882849062742265255
1236966790916174520857759143930140187173492394981908258944*e^(392*I*c) + 63
821889291453374150580639966248855606678360049609187640837497487744897177803
6074996245581124283460438065182071976085*e^(391*I*c) + 13243113249840274283
552229381476823786728607088171617414487496895935880208608475087037023253203
04649883120684987556400*e^(390*I*c) + 2719589283483743926040805101080341921
244530311254607250929192773909331523226635035815672862569296693711643521070
331394*e^(389*I*c) + 552749884903117835586123000932666828392629008215846711
8000698502719379939045918344222192742145711257028040974074674736*e^(388*I*c
) + 11119499645363201080881062824886338492425375658448977935535846349290425
821570383090425411418521516670371372045206568345*e^(387*I*c) + 221407350017
086032709151807692413916620355787559039791489092136038225547927491835171602
55571915875356439553717130797888*e^(386*I*c) + 4363830007581517102594621146
446568961896577348866098585794565747985408510885185791122291198983761545260
8512356008400295*e^(385*I*c) + 85139533234786455779589959464900637760735729
705621221380005837208369157794673049675428799817875431430246332625899630160
*e^(384*I*c) + 164437500676906892741323260154394278503954561936020133596581
806449357240277349447927334517105809995300093549279931273178*e^(383*I*c) +
314409035808225861565595436938354945445473991043129722046747228813030925204
968503418566818838611866709807040793495364496*e^(382*I*c) + 595157615500431
514947479282336547053827926087916425263497187757029413385471835434198246807
096214536895441388306027237899*e^(381*I*c) + 111539828554560155053332804560
018431799389935921799672981834070422180119566741048584699617905673355851245
2238583160792512*e^(380*I*c) + 20696982895008606434616657623738079575130194
240411788719049605518294124493447224321256794179584030075511792983159473737
76*e^(379*I*c) + 3802604996705891106964620633848964807037098854510182263243
030597295630760353597531974324752266389193185760878274188013440*e^(378*I*c)
 + 691783894521484427849333045936139492337233385361987963737267318494285971
2431066345726870422099893124890777678037369988150*e^(377*I*c) + 12462140440
537258084928596709872066857757070943124868554500948154756863454308032925408
340311237850017814707896986969086816*e^(376*I*c) + 222313411318015353454063
990377216868402083979419525801355846459667467366567162715548264762829910660
76564921432614339399735*e^(375*I*c) + 3927420041432986116939794451622500108
122743339858500720639923121190715779535971964824159875426657984024455149147
6467899952*e^(374*I*c) + 68712466015985641512468586173659747734879591710098
354652786124936023073943141049573606648563005359411712764895683903806088*e^
(373*I*c) + 119060591849660546834765693227676449067584148248882678447504826
077236333444513454095126668750057295811191643356908972191440*e^(372*I*c) +

20432555726518600076740271023084789645976158392276369823543321283331307778З
041040074669379017394836761539649081690630811665*e^(371*I*c) + 347310053810
935290419455560555957314129569210735745983234369659976413374774078000173070
07524865452491717912895050744305820B*e^(370*I*c) + 584749573682304586179384
628844883327581498969886540380378896767999075614964007174600811092945356635
118795824799369716742109*e^(369*I*c) + 975210339444049318757282311763517786
673223175594457946383279264635085041004917300295904275433144848532459919875
479817581584*e^(368*I*c) + 161109254140006052595485937526419417834764347183
707820144626243561514294458733783351358602272984952335843649358604225299560
8*e^(367*I*c) + 26366624104307993404475222847782442837407510686581407265764
46671207798325606832295937705061686297930296382338892574900819440*e^(366*I*
c) + 4274826907720591752526711336820871500844345647922385471534359333606189
571832444641364132893108663576205133870672156264164115*e^(365*I*c) + 686642
533751866826266269375090895696573292457814218163062215780289988087468155103
1136314064199948604001529894566235238597088*e^(364*I*c) + 10927210603473544
810279792347844536074588896806230041110089544731605863146104181739039426674
855453466097402330688331845602302*e^(363*I*c) + 172295028243676473344007219
984175967039486573947388052093916365973703805723989647150800953668183220291
52193635869784095333760*e^(362*I*c) + 2691779470108661509789012023689050110
514679999602177519571086622622863898470345683269415323061160726344418350102
6198563419616*e^(361*I*c) + 41670440375390543643418219342271748040035071490
119080585281522498188818375906900368701234531304633163446319945130196476913
600*e^(360*I*c) + 639230194337619890906148012886350981231994451023031226165
44648208998767803944455777042886552738499747183713136069104651812215*e^(359
*I*c) + 9717305502474268005861672246136889266114129554026349301303274608353
6157324268333390400308958318370219154887169702257444756176*e^(358*I*c) + 14
639044845635118121823738274037412419166481999774698807659839186273362967014
2241546375533903130605297580105675355629160198162*e^(357*I*c) + 21856316665
964931224748364095627214921249911538382877102965428336397258511809047941369
6638108156385244646591328454425745117584*e^(356*I*c) + 32341317801484100371
415113824607915257636097603505845789040993773872317153703657304368199716374
5313602400139153046673668433091*e^(355*I*c) + 47432304356310054237733862993
196624812917597698233244601805600939115402043889590314082296776949401944616
6779954024655344116288*e^(354*I*c) + 68951844932879355990326041814997419025
357834005889503558960646824468059155611817030400503756366988005790876589894
9268614772285*e^(353*I*c) + 99355565364952112722644396082023364938648851008
189254586670044409666158279044124183085560957706203955562509094333226490178
0720*e^(352*I*c) + 14191644814221765738582340138989996288223223333095737307
16310743838935832201454293617293175086458389621425307051750612129761498*e^(
351*I*c) + 2009496110092687738152782085683737222727968824299058739215446083
499351467625334449670757764066690656150949014944043994822823920*e^(350*I*c)
 + 282081929856221595910752980728962844962138679898943636939311606989401878
1201000275633104498398959346631795568022519974400130281*e^(349*I*c) + 39256
976584157783527681039428560118402116427696217172179966143984738871860743914
82638547212826538270453912634540299792270321024*e^(348*I*c) + 5416662804052

436349585595982818357953866258461644354018205158917742576425344364964596750
6531776778034921868173051711750320115OO*e^(347*I*c) + 741037261289115222436
463329612804397165719328032775430438223567277378140302381412761035556250527
19690451777047260549071457849 60*e^(346*I*c) + 100522095243695818275881549 85
345549678031445744499985208259385435609740272400301454246872041775159838468
07738156233874563639 8374*e^(345*I*c) + 135212304119454369155588547068517965
415673998116568700215673529753268154678178465332891238716960561952316961461
62720992221760992*e^(344*I*c) + 180353273381774554711775685948516829779783 4
644977719357208768851039242688451927299156085132639385224196147004081979362
7127923997*e^(343*I*c) + 238563985655628020306952781742126408332821541740 06
459458292644060947924907313735921561690153939906017518647182491616573724049
744*e^(342*I*c) + 312952636881898383137727758733072603341172272586295019923
586956360926628660628198456890642358136229741501206689213918783989783 80*e^(
341*I*c) + 407159889637019189500203483367364234205133113590104852469190746 5
288339397080537447083015622970564731226547758425602721276294104 0*e^(340*I*c
) + 525392233467407711425870923702570695360603196443950166761048276795580 0
276052892432152798814607975110366224945081428121888473324*e^(339*I*c) + 672
440879690807038237032571996630476068906104820904946194928029351302159798194
699663833367886939001391155946468937840954184723 36*e^(338*I*c) + 8536811843
021531284823129173967373588774620185166629960039219941876475008682819871987
274404776778366732532628922188197498758 2215*e^(337*I*c) + 10750473740657691
612348039916975963332832140741940051001749884983059862156542826654631593392
08215275447263802016591149038346058 88*e^(336*I*c) + 1342977420234794299046 2
961610455961009607475872106802270446893806301705968802336343645897153496466
50363198891192298099738069096 80*e^(335*I*c) + 166432332922589195130558329 26
639875338982395573759852755609609306247355976954577232197896931890419257273
39978882309864690059708 80*e^(334*I*c) + 204622295535729109519829916789867 22
531942970516256008264884039496542311280933659192129030939239626383467436897
784052714703742690 8*e^(333*I*c) + 249593072282565866398389951509619202682 63
445548712871463146189177082320136752764579377020378878467734393497142431798
7895255031936*e^(332*I*c) + 302060638030868463461139442279360499718906917 48
252489448335622019613837705082891138305686042537016115720149369607371232259
5776808*e^(331*I*c) + 362706307563843231135699157418510732452420614013624 16
887931218764523345015392797579332683478074139120343015309371263535552396032
0*e^(330*I*c) + 432147856464086938023811561808678589594702047904674282297 95
9658800170984456799067751878044806619012452636891350731618278545690160*e^(3
29*I*c) + 510907615111134507452623846147137141450275722444316385531648429 23
085168663582771748846450033162338577740074495053841063773593600 0*e^(328*I*c
) + 599378484771733474809376142401554850207064972118137572949257503651444 54
19393090252768960496225156302631621845263943172854573683 00*e^(327*I*c) + 69
7789106925924614816713747684682785083659819027952244447043355869741368500 45
256116402463607340192969310580110552273840534902816 0*e^(326*I*c) + 80616967
132762553242457534008977573368199499157667444692235409971461519208544324566
385225700111564428666030497947602396607189 8200*e^(325*I*c) + 92432005286752
258403577749576107235122253442078486196000182102050946814635675643379524644

6491396141583854513687104334429566707520*e^(324*I*c) + 1051782100428834371944508170051219187116816349766953322637182149610875004223784784183284961906494422955462431208645690802526770780*e^(323*I*c) + 1187817943079390316108802324798110129020822782660087248599367643481200206046822166144285425922229375413676535071141005286431481600*e^(322*I*c) + 1331396114626723035802462123531582050339749996014152452835305956367425370222758621753922458727524856072950880960657564720475838500*e^(321*I*c) + 1481187117089246662466955694965677855524730313260552690821602657176218737426245522795329891464091005878304304075953693546767206080*e^(320*I*c) + 1635569744641421900657886381289076653227580172056677587451402069234355283687489659613913761959140773339736014790081814516625224440*e^(319*I*c) + 1792649078089632298936945728481969334964391597506285088488350622937252533420980803144316431701452190522716124797875257437516360640*e^(318*I*c) + 1950286550780181919244992961204487010056460362845218501674423766266321558791436917317878702232679213868287926294665202769722927380*e^(317*I*c) + 2106141903468344307112549761202484543402794252352482199817410424869677262715098288437646518683487945462774223656471345899082156800*e^(316*I*c) + 2257726219103856286812833012681573765496262241420612932076143151171960854554124144699023009842080515157923529357189869943515991200*e^(315*I*c) + 2402464595569686086120001803034211056739445588621946141384106162886246161815149763025030834875234067267774023433418269982431265280*e^(314*I*c) + 2537766415465030330815471746692988596069911894697225052928320452542175587154848096483331209807430113943015398362669673337957755720*e^(313*I*c) + 2661100647975783583828235139201441930178396643383423903583862547255880772382049201015537214900832745601519737141849802506685264000*e^(312*I*c) + 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^(274*I*c) + 52539223346740771142587092370257069536060319644439501667610482
767955800276052892432152798814607975110366224945081428121888473324*e^(273*I
*c) + 407159889637019189500203483367364234205133113590104852469190746528833
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*e^(264*I*c) + 282081929856221595910752980728962844962138679898943636939311
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I*c) + 20094961100926877381527820856837372227279688242990587392154460834993
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076598391862733629670142241546375533903130605297580105675355629160198162*e^
(255*I*c) + 971730550247426800586167224613688926611412955402634930130327460
83536157324268333390400308958318370219154887169702257444756176*e^(254*I*c)

+ 63923019433761989090614801288635098123199445102303122616544648208998767803944455777042886552738499747183713136069104651812215*e^(253*I*c) + 41670440375390543643418219342271748040035071490119080585281522498188818375906900368701234531304633163446319945130196476913600*e^(252*I*c) + 26917794701086615097890120236890501105146799996021775195710866226228638984703456832694153230611607263444183501026198563419616*e^(251*I*c) + 17229502824367647334400721998417596703948657394738805209391636597370380572398964715080095366818322029152193635869784095333760*e^(250*I*c) + 10927210603473544810279792347844536074588896806230041110089544731605863146104181739039426674855453466097402330688331845602302*e^(249*I*c) + 6866425337518668262662693750908956965732924578142181630622157802899880874681551031136314064199948604001529894566235238597088*e^(248*I*c) + 4274826907720591752526711336820871500844345647922385471534359333606189571832444641364132893108663576205133870672156264164115*e^(247*I*c) + 2636662410430799340447522284778244283740751068658140726576446671207798325606832295937705061686297930296382338892574900819440*e^(246*I*c) + 1611092541400060525954859375264194178347643471837078201446262435615142944587337833513586022729849523358436493586042252995608*e^(245*I*c) + 975210339444049318757282311763517786673223175594457946383279264635085041004917300295904275433144848532459919875479817581584*e^(244*I*c) + 584749573682304586179384628844883327581498969886540380378896767999075614964007174600811092945356635118795824799369716742109*e^(243*I*c) + 347310053810935290419455560555957314129569210735745983234369659976413374774078000173070075248654524917179128950507443058208*e^(242*I*c) + 204325557265186000767402710230847896459761583922763698235433212833313077783041040074669379017394836761539649081690630811665*e^(241*I*c) + 119060591849660546834765693227676449067584148248882678447504826077236333444513454095126668750057295811191643356908972191440*e^(240*I*c) + 68712466015985641512468586173659747734879591710098354652786124936023073943141049573606648563005359411712764895683903806088*e^(239*I*c) + 39274200414329861169397944516225001081227433398585007206399231211907157795359719648241598754266579840244551491476467899952*e^(238*I*c) + 22231341131801535345406399037721686840208397941952580135584645966746736656716271554826476282991066076564921432614339399735*e^(237*I*c) + 12462140440537258084928596709872066857757070943124868554500948154756863454308032925408340311237850017814707896986969086816*e^(236*I*c) + 6917838945214844278493330459361394923372333853619879637372673184942859712431066345726870422099893124890777678037369988150*e^(235*I*c) + 3802604996705891106964620633848964807037098854510182263243030597295630760353597531974324752266389193185760878274188013440*e^(234*I*c) + 2069698289500860643461665762373807957513019424041178871904960551829412449344722432125679417958403007551179298315947373776*e^(233*I*c) + 1115398285545601550533328045600184317993899359217996729818340704221801195667410485846996179056733558512452238583160792512*e^(232*I*c) + 595157615500431514947479282336547053827926087916425263497187757029413385471835434198246807096214536895441388306027237899*e^(231*I*c) + 314409035808225861565595436938354945445473991043129722046747228813030925204968503418566818838611866709807040793495364496*e^(230*I*c) + 16443750067690689274132326015439427850395456193602013359658180644

935724027734944792733451710580999530009354927993127317 8*e^(229*I*c) + 85139
53323478645577958995946490063776073572970562122138000583720836915779467304 9
675428799817875431430246332625899630160*e^(228*I*c) + 4363830007581517102 59
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20355787559039791489092136038225547927491835171602555719158753564395537171 3
0797888*e^(226*I*c) + 1111949964536320108088106282488633849242537565844897 7
93553584634929042582157038309042541141852151667037137204520656834 5*e^(225*I
*c) + 5527498849031178355861230009326668283926290082158467118000698502719 37
99390459183442221927421457112570280409740746747 36*e^(224*I*c) + 27195892834
83743926040805101080341921244530311254607250929192773909331523226635035815 6
7286256929669371164352107033139 4*e^(223*I*c) + 13243113249840274283552229 38
14768237867286070881716174144874968959358802086084750870370232532030464988 3
120684987556400*e^(222*I*c) + 63821889291453374150580639966248855606678360 0
496091876408374974877448971778036074996245581124283460438065182071976085*e^
(221*I*c) + 3043844711068133360102841601239063704338888284906274226525512 36
966790916174520857759143930140187173492394981908258944*e^(220*I*c) + 143657
68713804479694294711970425953845881819942351682467458629369105611920986635 8
1236377722454095307992305537672222 52*e^(219*I*c) + 67091706130529669125019 8
99210021576580237843462229535386295087076189297849995931360645605292130961 4
96106707521506432*e^(218*I*c) + 31004319206069417077069363141423487431828 00
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^(217*I*c) + 1417648365287570495720201334324111790436997779665384995990252 4
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4018202201631094434819584025113465*e^(215*I*c) + 2870496131412314451834674 7
15353589439553294430808531933466086288543709246230769151392180699413405623 0
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2775046123423003660250467417428565804452894017866563116858590230847 16*e^(21
3*I*c) + 55675638871118234034102619273421954611365176831738053900589367904 9
394714017063698565272728813669054779077208977840*e^(212*I*c) + 241246021282
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*c) + 1267597017294812913400146276042126929986480292870190399107554311079 96
42272801965224753701087384778563117656996 10*e^(205*I*c) + 50832459930108546
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5
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+ 4697022472711728182645404501807067052255975662758034778453532001496348263
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*e^(187*I*c) + 499524195627913818020518674440168802438827211392125566373495
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922705289996774447426856310062324561858449252201440023058781203808284839886
63574829100*e^(185*I*c) + 5052936631230152588784830257388128132033977668453
400653812610163534197223826203930325359606609219504OO*e^(184*I*c) + 1576858
455288509187214628778644350902575831494155613234273865628944475982779356298
00939237175625149830*e^(183*I*c) + 4858425815314028044731483686877213139019
5412419046732778458706015096881437076337910793584122475073760*e^(182*I*c) +
 14777955096617128998712745182071495362176506973183081650233605274051677624
97046434024275584002567376O*e^(181*I*c) + 443721091784318234776434954444390
4699020056595069470847193617092114714077633077234972825351226979360*e^(180*
I*c) + 13150521209306921221022971053276228423358707434285308910729835358622
80094446607723473800477453914130*e^(179*I*c) + 3846558420806662744540630787
848371749989490525009753221620033925499534135924615193651779086820784OO*e^(
178*I*c) + 1110341487970088194431438956444692422950498674643137109692576193
38899133799285616020069872611710850*e^(177*I*c) + 3162664467472554773117679
5687527653571305969985923688392112164915553242573269490908989570248533280*e
^(176*I*c) + 88882950287510246670442038376079761014800531344186144746207675

228248689119598843526664449174040000*e^(175*I*c) + 2464382190807439609079774
2268556796293678857097764358766308517162539626961923417062391928787281 60*e^
(174*I*c) + 67402553054313300889484577523662523745074311447354453781817044 7
1346071025756766760566753289615 90*e^(173*I*c) + 181834661406177901315330129
67714538116644918841319414116934435475492096903495261037894528225760 0*e^(17
2*I*c) + 483794897564340998438577918165893794068150426093403787475864371457
81646245422045101230417309900*e^(171*I*c) + 1269349693296492056507367363718
128008854868250888025533728006500656613869604179735321658452864 0*e^(170*I*c
) + 3283874760555818676726309480306734420155098583948074469014168171874442 1
701096485216275387559 20*e^(169*I*c) + 837579206923411932458786486765373533 9
46545239708990769488724813982189165104589895518909256320*e^(168*I*c) + 2105
943013856484711843290788803175049533618399541594274340098846617772597525426
47709150036990*e^(167*I*c) + 521909122076618242158122718542697480712928432 4
3227894769229690720010547141334131610989636000*e^(166*I*c) + 12747219616503
32054135634306256284736860162214085678602544581453203790411152324229823571 3
300*e^(165*I*c) + 306797429643174736419815962396246367161700641962685142614
8418602934852907379021659761911840*e^(164*I*c) + 727521010718394229291774 07
3844694255798738667067535379759732795567942578751384250780476310*e^(163*I*c
) + 169956327969929767773902096652629253283704505477127544556534417376686 54
0936706073847337600*e^(162*I*c) + 391080312556018094765375353696118444408 44
90375160564502351457235204524810426293359885073 0*e^(161*I*c) + 886275214275
6957285681340885764904597935349569355321815647721172537159186491471311666 40
0*e^(160*I*c) + 197779298066581813565130009432623915860544887080697086057 73
253850286099830345346723185 00*e^(159*I*c) + 434546676780280045346344498763 8
925407971751057568275155092970241876602993454849201924 80*e^(158*I*c) + 9398
691531306817914908360606568148278083606051053015461848694983946713137885988
5998210*e^(157*I*c) + 200080068030300471372932782503215971135407162019833 33
126349281186679153199068045257216*e^(156*I*c) + 419154250065682614809333941
45441591439644784724923159318091718599021141090059399429 52*e^(155*I*c) + 86
397993362233034955629682002839551319870806494050570212606865293680079482665
1264256*e^(154*I*c) + 175193170500618300241515632381912285157790097816049 22
067121721222001529713340063606 0*e^(153*I*c) + 349410716132767046494779430 43
33945020150407533516036186591602921386077860623062496 0*e^(152*I*c) + 685299
322314573668732888531161779543559294084143986635107965565231289472197279626
6*e^(151*I*c) + 132149805527130085142999386663161987442453442518818359204 97
276875710321564350772 80*e^(150*I*c) + 250501028608928332469340456829902067 7
1223364446460275315994572786848572239550695 2*e^(149*I*c) + 4666822354826601
780685459246810057028935596086961365085657575675818018222330876 8*e^(148*I*c
) + 854301344112621233483354066506962147247908583804136056455072203672365 42
97540205*e^(147*I*c) + 153633323844492758353273455601649467167491657890711 6
984548489078241693926940560*e^(146*I*c) + 271361207503266570734486517077181
0148017753221831810556386192578361432714723 58*e^(145*I*c) + 470650446111351
5810848735336748424310269824883831263587628309942744274586670 4*e^(144*I*c)
+ 80137295807907524343619649457615437614695207912107469726758704810586742 77
844*e^(143*I*c) + 133921437425424555356488440680194535338500025403065576595

3770237607180089968*e^(142*I*c) + 219601281339515561500261478844190024870555261281946058839614044697037963695*e^(141*I*c) + 35324447206779018115378052820789411687581004582367431006205879633729015200*e^(140*I*c) + 5572551157328671121016216416307596161861955969011697222340926210112854418*e^(139*I*c) + 861884851094991908764246805474672428603757315484453974713612812215428992*e^(138*I*c) + 130657660226560419335121434389938961884595434069984824307149332131747540*e^(137*I*c) + 19407979215594566593535008103303255257745408070082431338945184797463936*e^(136*I*c) + 2823905151936586678382525706564457280290098698638597987628380245881715*e^(135*I*c) + 402349692266121158934003582839428785116904903936409545602519219664720*e^(134*I*c) + 56117081076341175384087570185188538660375932013674735519055227368366*e^(133*I*c) + 7659010520187549651777118357676871927081898989131125755798204236112*e^(132*I*c) + 1022536437468296737293065862705246449693687415559865844306888705423*e^(131*I*c) + 133490210052026183779673313868332303530332906163247194627808410304*e^(130*I*c) + 17033886027390615741040977721655541665612162275485028584310890417*e^(129*I*c) + 2123702969188871318266718781223927067839949015727293884065388080*e^(128*I*c) + 258585348715977270155829115684193411072034541491364393985491350*e^(127*I*c) + 30736217404321009965231037419663053962881035281709221697785072*e^(126*I*c) + 3564764890628724017088487996688178929195787613958545474804845*e^(125*I*c) + 403212225957798188840846139960995624144491271694336796459584*e^(124*I*c) + 44456708175258821024400946210535004523775722190977468484496*e^(123*I*c) + 4775398607100853263534207733818266777478693412738731031680*e^(122*I*c) + 499467506558531733671585862910572702811545035730398749530*e^(121*I*c) + 50836369508171099437019348610847391946736185108017183136*e^(120*I*c) + 5032024903401451824074213943766011922026507006311982753*e^(119*I*c) + 484093410240488718655917025303662581091659126182344528*e^(118*I*c) + 45230940039830738332025694784646206844854827698075736*e^(117*I*c) + 4101545439937195793959956708442496709433800261224880*e^(116*I*c) + 360688613036389349413809780004559963548775423325255*e^(115*I*c) + 30735366512830562160991166338490057308062762518496*e^(114*I*c) + 2535667460650279776834561566186591213109251642859*e^(113*I*c) + 202347509724462171313966643580234078508179838320*e^(112*I*c) + 15603911277687607099721623771744933086920587272*e^(111*I*c) + 1161581413733971751533622511909046917188768400*e^(110*I*c) + 83380839911837894453136303673785039051506805*e^(109*I*c) + 5764601046563151304213854710715346838447392*e^(108*I*c) + 383360155801054824529764688213114368047154*e^(107*I*c) + 24489837337812338687718622491865013839488*e^(106*I*c) + 1500602747937397286405577818722691539392*e^(105*I*c) + 88054927598941411145869950813388040256*e^(104*I*c) + 4939666610818025798809586352543471345*e^(103*I*c) + 264410375780310742518099326419685040*e^(102*I*c) + 13477227799524701956579274210395326*e^(101*I*c) + 652650253343206047453620559993840*e^(100*I*c) + 29952547749265499675257842032197*e^(99*I*c) + 1299146645993240318167826532288*e^(98*I*c) + 53090127264630963470039804475*e^(97*I*c) + 2037031259470368160131922320*e^(96*I*c) + 73099207817335597247098038*e^(95*I*c) + 2442455629894502983849104*e^(94*I*c) + 75599817092670157806639*e^(93*I*c) + 2154864144781257856128*e^(92*I*c) + 56169444526926562260*e^(91*I*c) + 132788

2849274858880*e^(90*I*c) + 28186192554792138*e^(89*I*c) + 530563624556832*e
^(88*I*c) + 8718181624155*e^(87*I*c) + 122503723056*e^(86*I*c) + 1431118260
*e^(85*I*c) + 13343760*e^(84*I*c) + 93096*e^(83*I*c) + 432*e^(82*I*c) + e^(
81*I*c)))*tan(1/4*d*x + c) + 7*(-11154*I*a*e^(1055/2*I*c) - 4506216*I*a*e^(
1053/2*I*c) - 908002524*I*a*e^(1051/2*I*c) - 121672338216*I*a*e^(1049/2*I*c
) - 12197651906154*I*a*e^(1047/2*I*c) - 975812152492320*I*a*e^(1045/2*I*c)
- 64891508140773093*I*a*e^(1043/2*I*c) - 3689545748587122372*I*a*e^(1041/2*
I*c) - 183093707775710628858*I*a*e^(1039/2*I*c) - 8056123142378999966797*I*
a*e^(1037/2*I*c) - 318216864146377884963053*I*a*e^(1035/2*I*c) - 1139794949
9240328225340750*I*a*e^(1033/2*I*c) - 373282846199958103946548090*I*a*e^(10
31/2*I*c) - 11255913521436332875256492285*I*a*e^(1029/2*I*c) - 314361585019
926536123171779990*I*a*e^(1027/2*I*c) - 8173401220508860669709781109364*I*a
*e^(1025/2*I*c) - 198715817544529039864660110471376*I*a*e^(1023/2*I*c) - 45
35396318845906415166472261686554*I*a*e^(1021/2*I*c) - 975110212439029060343
67815029181218*I*a*e^(1019/2*I*c) - 198101339008778171143744488041442712*I
*a*e^(1017/2*I*c) - 38134508055319501480202851957227724462*I*a*e^(1015/2*I*
c) - 697316726077381488801524339658757026686*I*a*e^(1013/2*I*c) - 121396504
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89287604398*I*a*e^(1007/2*I*c) - 486518167851923908629493460643527485957893
41*I*a*e^(1005/2*I*c) - 709193818893909656677523349582328791900299617*I*a*e
^(1003/2*I*c) - 9928713959958644143611456276187690708075285068*I*a*e^(1001/
2*I*c) - 133683049871200685767730244065634086417919364482*I*a*e^(999/2*I*c)
 - 1733270022057743255812637849164901656684569946869*I*a*e^(997/2*I*c) - 21
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607718305457313571850609230094969421310836249109701091666*I*a*e^(977/2*I*c)
 - 334045615572410482684075553294675381058554260440184749831968*I*a*e^(975/
2*I*c) - 2965675193835710066559916582743095158371951788246043891048682*I*a*
e^(973/2*I*c) - 25631926334820519324289406607504181260913532669181012596611
058*I*a*e^(971/2*I*c) - 215785242285994868818528731430540812422314520336288
528460007864*I*a*e^(969/2*I*c) - 177042160825029715561159913029203743481410
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806825940375203939456957445830422*I*a*e^(965/2*I*c) - 110536162580123562634
802981277497355054368691566003022338877490451*I*a*e^(963/2*I*c) - 841957579
184928615664618341834644691840690166368399913404427216774*I*a*e^(961/2*I*c)
 - 6262070331779324000513806613163981009868362783949768253661316894658*I*a*
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568086839125819461058192072803053541017863820545144886949861837811696 4232*I
*a*e^(549/2*I*c) + 1986782813850402792435803837007843024336077185901900 7754
617092705894895482320390765205834653722079791333317381901945409007768*I*a*e
^(547/2*I*c) + 1665196199849233310680365148411120233236624753830362704976 90
976414641089291627408982243821376877252447710196870549239450466 40*I*a*e^(54
5/2*I*c) + 1384060449381404978097382854651104119113853431001396342784731283
332605984547134578368713658398587204481769360353035011 1267506*I*a*e^(543/2*
I*c) + 1140793644236414863961925322676715375573694014098823792666633979384 2
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+ 9324112878801649631385175141114434526382985328300222284538621938488443 75
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568505846794238406928197700312968115136312923495443302306747388603682594944
3243256784436599460895997842382826101210634 1304*I*a*e^(537/2*I*c) + 6072817
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2289831417791459544927554160865347860223 46*I*a*e^(535/2*I*c) + 483879963611
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6*I*a*e^(519/2*I*c) + 575205378364644196368345595852942776873401350912412 85
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e^(517/2*I*c) + 4235659046953039761802810524611964694862509364953667011213 5
976865303107013996765644320517944636520277650280960269327396865 4*I*a*e^(515
/2*I*c) + 30910198454139291491998334324383454757099934023351069019471767444
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) + 2235332657859688351438756002532632443354304532764235608921189588560028 4
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4535288980118554686908417 4*I*a*e^(503/2*I*c) + 38514520648760918228036755 78
892609748972449654694173201898220379776991748061989780574736627613727104873
973035363387772 0246*I*a*e^(501/2*I*c) + 263472249107452348376962559466916 56
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86188*I*a*e^(497/2*I*c) + 119846583945151653196348277875954496672372458524 2
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*a*e^(495/2*I*c) + 796820700441231679735742088944894430487588626523574245 83
048124999376297464809319355192060371605395815221719875557500976 61*I*a*e^(49
3/2*I*c) + 524717071193742875498237689590963416558841382097777033506021664
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 + 342213430231741923299046034890677108172505054199050489341462380323971911
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139162487533763554624610296871976607002050484827757589324253427818096011551
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a*e^(477/2*I*c) + 130513654565180659680857610751810330919182680451179814724
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2*I*c) + 786499297907510768672074582401143110998685640861404828533880308670
564283751695023513612591615262969463129881370215947 54*I*a*e^(473/2*I*c) + 4
691946888799982012079706643776735089639588797234066916841803318539958435985
691539760150710351646259379366266538832087 6*I*a*e^(471/2*I*c) + 27707613760
424321092809773488341710056091016299430822811850368205505386666892248077868
916795733514784560970590740995043*I*a*e^(469/2*I*c) + 161962868526188369395
506297658517359366716193400331886468163454591250571859476990086266494353692
573135520454945681598 14*I*a*e^(467/2*I*c) + 937089700242825726712331528372 1
797254447538815988223371846399458761076724136173352675976157625073367090808
727028817394*I*a*e^(465/2*I*c) + 536630510210073983098710632610745028843444
994323436838121765093582194265181931527120576673975855593641939493082669275
2*I*a*e^(463/2*I*c) + 304142566853240586400498135898699141795898114585235 60
366614353821228552900709817418612034296750356973234948071531056 98*I*a*e^(46
1/2*I*c) + 170594835775268368860938355661154497169893104539511683176321288 0
566314009847795209812264993457998814619114688074679466*I*a*e^(459/2*I*c) +
946935858248416137618817803374372741611141859282335132028137887552832387239
243837518791104798117018522060501489612616*I*a*e^(457/2*I*c) + 520140205211
740146146328886033919284277656267013037615975662868102063644941116116140374

194763868070844567225649530644*I*a*e^(455/2*I*c) + 282712238250490081689134
974773295862370101347118293726638809114306775532326665539002921023135199371
428068547769357902*I*a*e^(453/2*I*c) + 152045024741942021031843450138283677
864730151559178201233738634196057296634727643807511620634700215859987858540
208163*I*a*e^(451/2*I*c) + 809062879793839605960149642537205140747506339361
059008351912777079735013049055460658979356673547196839180923567629 82*I*a*e^
(449/2*I*c) + 425945226710688608838645612296555660374599881035996723635736 9
155151414603145094354620571836681171053190525542903949 0*I*a*e^(447/2*I*c) +
221853108490173761449405813350844882159317486575188462510237697250841307 17
621880836878455248575979783141226165618755*I*a*e^(445/2*I*c) + 114313182922
035384495360621046134469254143793530201476452184881941658506518375266759882
535820860955702431581715944 35*I*a*e^(443/2*I*c) + 582672845699839383874628 3
558785767736418444764516351018178688292977826358717393165474435299003815460
564340303035510*I*a*e^(441/2*I*c) + 293784842068651949168395289365236982083
567303020859128030946238072128348449074416954429153232081580840945010017944
4*I*a*e^(439/2*I*c) + 146517146645611822858332172737413341944831073458968 33
536390668727737003867657933821793400752776565083548599729111 31*I*a*e^(437/2
*I*c) + 722736724787787124132763159445766235279414024537115241684494028855 3
509148951519997850342061840401683172927865892 84*I*a*e^(435/2*I*c) + 3526000
276820029513665521958312929619043934520318396654347425813797737403380460427
379919516452212669753804983738 46*I*a*e^(433/2*I*c) + 1701268422971704202898
265446035138845467365321652732256636090859187877245041838388867762005096061
91937033678162224*I*a*e^(431/2*I*c) + 811762760388707353253308521882338889 2
946371828295175061384934598983550222296716629210771806208409114336118251716
0*I*a*e^(429/2*I*c) + 383026170719041601319991201099889918042102140724411 61
257260261374685373770005786150189477516514391979924577468172*I*a*e^(427/2*I
*c) + 178709569969992802875872825562267623650671756493247528499380693654045
515989819724316982248361961550957189474013 58*I*a*e^(425/2*I*c) + 8244492425
854132814040653088604670129631127112463111698869090178226433285329901659997
552076882534722621154663912*I*a*e^(423/2*I*c) + 376056594930356668642338563
622340820944654987928868748616558681600022085206958089939844642674955725350
2940018308*I*a*e^(421/2*I*c) + 169586694384839863762082875542402504079804 38
372549879064654087129317707573481129231642985649830189363013359352 12*I*a*e^
(419/2*I*c) + 756058495767730773659409931369268584451348889364804029349493 3
574263397509102436525614276083381245033458500135 60*I*a*e^(417/2*I*c) + 3332
111380052557612402008649109335923482943471792625473215198535894859035318525
625132955586871559525540665904 60*I*a*e^(415/2*I*c) + 145164084395384796858 8
074521691561933147577942834001737937604627534683083426265564070709060487582
73598047775980*I*a*e^(413/2*I*c) + 625099417847431209976638791585579821550 8
114938007054018144321271534944012295695467652120149021188396636782802 0*I*a*
e^(411/2*I*c) + 266050173832595994112548665338706307018468454411453853988 37
266537931369408595315781206468524649149866075877240*I*a*e^(409/2*I*c) + 111
911937372368801918281190224557235328802284114807569582104923956167042731806
465506982936734402851222015065 40*I*a*e^(407/2*I*c) + 465222961398019028109 2
438412966980324563941911273487870254673754078512908450865883806375186718602

486878389420*I*a*e^(405/2*I*c) + 1911132182502089187708166478685901935201352435559875705150907754538398903339566020664524492674910743672362870*I*a*e^(403/2*I*c) + 77577842500154404097242752774500834816804684020962178036963319225554266684373520182047073542988726249962080*I*a*e^(401/2*I*c) + 311153078124340689876821634129973174266884735777075069163110831590213226340122660492406303919452492168793820*I*a*e^(399/2*I*c) + 123302386319431737603012307885680461455533923426516862931630369896536810524338424946586678555712414838330710*I*a*e^(397/2*I*c) + 48272618755768242559018440406337959683133071353259753925530559371850844044523295745943249184433038391906550*I*a*e^(395/2*I*c) + 18669501315169056780285558577816377451573851854318495725461326689178551127951637356019031393026858408569620*I*a*e^(393/2*I*c) + 7132421149055578168006796797797943674026134220971516324623846545930681177797566466263020966077638684308780*I*a*e^(391/2*I*c) + 2691429384125009413060867151864117700072985313774039040518324378805237935344715836365700345548762139320230*I*a*e^(389/2*I*c) + 1003089065808723779876047460444356923791027890561520552679417056469828915431176758967907919151985703838720*I*a*e^(387/2*I*c) + 369210997610108799944611140506231611589949279646373920938134598886382202697574571710903344492696653736880*I*a*e^(385/2*I*c) + 134201038644703507385888818415634883722891759405213144807057882964953199405626071972925310751903480110440*I*a*e^(383/2*I*c) + 48167052524691460784860596000543126325082971121698814633620291249190839220221789221157407204913360887960*I*a*e^(381/2*I*c) + 17069600634708996917258224941647931382492115532252012641576292881810859853135265796592414892124832389000*I*a*e^(379/2*I*c) + 5972294127636259067415126050601159379166632061409821915273465659298542690836327817871412320220580305480*I*a*e^(377/2*I*c) + 2062852954920816186023915941251117527958500453683935875173392483952599009295139987985628233229731478980*I*a*e^(375/2*I*c) + 703345279898755583562127912601131791334107956711719030548547943555221102827637472553536460508801363920*I*a*e^(373/2*I*c) + 236703836252587779323701434388787465249427045104853012907439025264086299638762864112564049076655732830*I*a*e^(371/2*I*c) + 78621408619495274059980620283854146208984244064535407477261926286982916818434658466433148202509344800*I*a*e^(369/2*I*c) + 25771323015705925464502138277035617975672430492105429256456221829154887242352647174124493051808094580*I*a*e^(367/2*I*c) + 8335922921975339554874985740809951353130777120817181687184875795893464066876677629382653264393601630*I*a*e^(365/2*I*c) + 26604284293157110377467508361823506171669508516660881855525123590808329315051618495256897037944395590*I*a*e^(363/2*I*c) + 837701525654515943160919065652989402268629196598907039545164356949845716819867090707769561650988160*I*a*e^(361/2*I*c) + 260210521546648324710601552017336263001665484044998430835364683575217699721326919568028661098556620*I*a*e^(359/2*I*c) + 79728801300455544122096358134599530539313996522871876150671326770147866624403122038941020982112670*I*a*e^(357/2*I*c) + 24094419287902104220146364315256987563430323234468653857182722530873173656507620757370776234725250*I*a*e^(355/2*I*c) + 7180976708781564152011933079324066396941277979720732126305244304659930709704206531169354332309620*I*a*e^(353/2*I*c) + 2110426867016579011738159995452106449607094170693975505625410812127221737931023521427446997422880*I*a*e^(351/2

*I*c) + 611546710350755227094210555322738233573992238438880922442071495399840623270733748703638918730970*I*a*e^(349/2*I*c) + 174708148576954508133108566432138482752871314388735390819701558304621069749665356028799825469570*I*a*e^(347/2*I*c) + 492007098311708479797833179493938037470720276948913690559938806720070495939139296198331292715OO*I*a*e^(345/2*I*c) + 13656943537866316562345022885038770780812495797097516350805731913565888244243229131324182944640*I*a*e^(343/2*I*c) + 373600623051027567561006154412697155739342112194941088700365497572643198566106143161271496621O*I*a*e^(341/2*I*c) + 1007117837657373369468729725719820597008572465469753257215153626598733911453021524113695566720*I*a*e^(339/2*I*c) + 267495779341793686858892087186701348017864136095797204004377097030869586488588546928368741180*I*a*e^(337/2*I*c) + 699941038998544496880448144712017434184138066665836281830066331220341253848744429258817561 20*I*a*e^(335/2*I*c) + 18040822556182136896638713100892344358328053007173679628765657147450959398026341254411115720*I*a*e^(333/2*I*c) + 45797580440835338476480708866180632369011921620042339360783488548545536583796060340751338 80*I*a*e^(331/2*I*c) + 1144878665973345362880312804992922340263144413567571060896235650099922407159938671183630200*I*a*e^(329/2*I*c) + 281802543079970773764222747501103240510862783237481025696735711115713233601841503443789040*I*a*e^(327/2*I*c) + 68286519373700606662969518596072942990402829423660330718366006960865727616800960284438480*I*a*e^(325/2*I*c) + 16287860131873426297665954195872007340389448696155366782102817863363964748733518124937370*I*a*e^(323/2*I*c) + 382353104707450177390188261707972547464613720560863584085118450043338205544733422571618O*I*a*e^(321/2*I*c) + 8832169867202091518370224143326723281115150003150300456111684085385240324710813575791 80*I*a*e^(319/2*I*c) + 20072483864097435618425497602435711351463146370708337907155866674728785345716681732161O*I*a*e^(317/2*I*c) + 448737545372800864049109108788637218649668491609707098780393150796537435568511139624 10*I*a*e^(315/2*I*c) + 98665617992106740504226261681187997621874203873738525581870114278608719673421159818O*I*a*e^(313/2*I*c) + 213325987645378922642673873920426655936692279915502179304543513972950935879062476032O*I*a*e^(311/2*I*c) + 453467570647678726762830796324670748943540211918613115981382798996143666294810914890*I*a*e^(309/2*I*c) + 947525499371759344004997562709757106164911328438430080414847445222570683223025495 40*I*a*e^(307/2*I*c) + 194577644447285213526415554853884691975304722581892117964339384370834200100917333 96*I*a*e^(305/2*I*c) + 392613197522804737302143988361029394464744692867334429729474592470109616076088 8424*I*a*e^(303/2*I*c) + 778245462061092938241128952993007961165558304583117537979936583232925968316199836*I*a*e^(301/2*I*c) + 15151479395044286133635700687251245806444665347455352580219358369862001412164112 4*I*a*e^(299/2*I*c) + 289657140032578469215408589863889540081221116127123633543609818516874247241080 36*I*a*e^(297/2*I*c) + 543632108243814202941573988555391476755271820441117727741553625486323152318148 0*I*a*e^(295/2*I*c) + 10014177203446569152519249010097509399901491609651495409298898243884026264550 12*I*a*e^(293/2*I*c) + 18101267817994846518989118987684448352047956888017357091769633936062895853834 8*I*a*e^(291/2*I*c) + 32097922563848506943066473469340753662783076784232671471143949644558156480632*I*a*e^(289/2*I*c) + 55822074307217

674249109221691557119073985697219371140734803311644408624626 38*I*a*e^(287/2*I*c) + 95187318748914674623833800802223990631807189802801686409056803080368 7398612*I*a*e^(285/2*I*c) + 15910180762037245771023055462759738548560230403730971445274296625654 8901840*I*a*e^(283/2*I*c) + 26059644761295218063521552347914441867779264013071310596786890247411 087520*I*a*e^(281/2*I*c) + 41814710709073876126595986316067517882087887942015362828025424778782 83190*I*a*e^(279/2*I*c) + 65708562138551424136324130149512705810906501569930474566381771421155 6940*I*a*e^(277/2*I*c) + 10108972746777695652347555083620248957400406100801680794000279173869 8571*I*a*e^(275/2*I*c) + 15220847247394291084416636302914971818756836097657800823465735035857 764*I*a*e^(273/2*I*c) + 22421580417272351173649577394593428478193933458421162568455836552364 06*I*a*e^(271/2*I*c) + 3230219500315412278978014071715661701505192452023465403976135833556 67*I*a*e^(269/2*I*c) + 4549594753477955200809388843993310013936337270682517271000909158088 3*I*a*e^(267/2*I*c) + 62620703317793240005138066131639810098683627839497682536613168946 58*I*a*e^(265/2*I*c) + 84195757918492861566461834183464469184069016636839991340442721677 4*I*a*e^(263/2*I*c) + 11053616258012356263480298127749735505436869156600302233887749045 1*I*a*e^(261/2*I*c) + 14163389239388825902842073391400806825940375203939456957445830422*I*a*e^(259/2*I*c) + 1770421608250297155611599130292037434814100286157679816873050532*I*a*e^(257/2*I*c) + 21578524228599486881852873143054081242231452033628852846000 7864*I*a*e^(255/2*I*c) + 25631926334820519324289406607504181260913532669181012596611058*I*a*e^(253/2*I*c) + 2965675193835710066559916582743095158371951788246043891048682*I*a*e^(251/2*I*c) + 334045615572410482684075553294675381058554260440184749831968*I*a*e^(249/2*I*c) + 36607718305457313571850609230094969421310836249109701091666*I*a*e^(247/2*I*c) + 3900820584110953912072698502834368654421340467896495241550*I*a*e^(245/2*I*c) + 403899515051838803400194879806531247927007890538062521027*I*a*e^(243/2*I*c) + 40609448120913176083174637180877049405994150689208285948*I*a*e^(241/2*I*c) + 3961896224254872041251938157236050043036325552867100290*I*a*e^(239/2*I*c) + 374773875381762608573480596867444622808315521135770955*I*a*e^(237/2*I*c) + 34345846767794763840341317174417543493362860419944375*I*a*e^(235/2*I*c) + 3046808467328698391993011459852063034674399964693132*I*a*e^(233/2*I*c) + 261388357024674483234213954236474266534206934500718*I*a*e^(231/2*I*c) + 21665877338576587360651194480041798194029867090275*I*a*e^(229/2*I*c) + 17332700220577432558126378491649016566845699468 69*I*a*e^(227/2*I*c) + 13368304987120068576773024406563408641791936448 2*I*a*e^(225/2*I*c) + 99287139599586441436114562761876907080752850 68*I*a*e^(223/2*I*c) + 70919381889390965667752334958232879190029961 7*I*a*e^(221/2*I*c) + 4865181678519239086294934606435274859578934 1*I*a*e^(219/2*I*c) + 3200777320589257207465955323343789287604398*I*a*e^(217/2*I*c) + 2016237633544330371557667298464943832925 08*I*a*e^(215/2*I*c) + 121396504477593761832275846601704958695 89*I*a*e^(213/2*I*c) + 6973167260773814888015243396587570266 86*I*a*e^(211/2*I*c) + 3813450805531950148020285195722772446 2*I*a*e^(209/2*I*c) + 19810133900877781711437444880414427 12*I*a*e^(207/2*I*c) + 97511021243902906034367815029181218*I*a*e^(205/2*I*c) + 45353963188459064151664722616865 54*I*a*e^(203/2*I*c) + 198715817544529039864660110471 3

76*I*a*e^(201/2*I*c) + 8173401220508860669709781109364*I*a*e^(199/2*I*c) +
3143615850199265361231717799 90*I*a*e^(197/2*I*c) + 112559135214363328752564
92285*I*a*e^(195/2*I*c) + 37328284619995810394654809 0*I*a*e^(193/2*I*c) + 1
1397949499240328225340750*I*a*e^(191/2*I*c) + 318216864146377884963053*I*a*
e^(189/2*I*c) + 8056123142378999966797*I*a*e^(187/2*I*c) + 1830937077757106
28858*I*a*e^(185/2*I*c) + 3689545748587122372*I*a*e^(183/2*I*c) + 648915081
40773093*I*a*e^(181/2*I*c) + 975812152492320*I*a*e^(179/2*I*c) + 1219765190
6154*I*a*e^(177/2*I*c) + 121672338216*I*a*e^(175/2*I*c) + 908002524*I*a*e^(
173/2*I*c) + 4506216*I*a*e^(171/2*I*c) + 11154*I*a*e^(169/2*I*c))/(e^(531*I
*c) + 432*e^(530*I*c) + 93096*e^(529*I*c) + 13343760*e^(528*I*c) + 14311182
60*e^(527*I*c) + 122503723056*e^(526*I*c) + 8718181624155*e^(525*I*c) + 530
563624556832*e^(524*I*c) + 28186192554792138*e^(523*I*c) + 1327882849274858
880*e^(522*I*c) + 56169444526926562260*e^(521*I*c) + 2154864144781257856128
*e^(520*I*c) + 75599817092670157806639*e^(519*I*c) + 2442455629894502983849
104*e^(518*I*c) + 73099207817335597247098038*e^(517*I*c) + 2037031259470368
160131922320*e^(516*I*c) + 53090127264630963470039804475*e^(515*I*c) + 1299
146645993240318167826532288*e^(514*I*c) + 29952547749265499675257842032197*
e^(513*I*c) + 652650253343206047453620559993840*e^(512*I*c) + 1347722779952
4701956579274210395326*e^(511*I*c) + 264410375780310742518099326419685040*e
^(510*I*c) + 4939666610818025798809586352543471345*e^(509*I*c) + 8805492759
8941411145869950813388040256*e^(508*I*c) + 1500602747937397286405577818722 6
91539392*e^(507*I*c) + 24489837337812338687718622491865013839488*e^(506*I*c
) + 383360155801054824529764688213114368047154*e^(505*I*c) + 57646010465631
51304213854710715346838447392*e^(504*I*c) + 833808399118378944531363036737 8
5039051506805*e^(503*I*c) + 1161581413733971751533622511909046917188768400*
e^(502*I*c) + 15603911277687607099721623771744933086920587272*e^(501*I*c) +
 202347509724462171313966643580234078508179838320*e^(500*I*c) + 25356674606
50279776834561566186591213109251642859*e^(499*I*c) + 307353665128305621609 9
11663384900573080627625184 96*e^(498*I*c) + 360688613036389349413809780004 55
99635487754233252 55*e^(497*I*c) + 410154543993719579395995670844249670943 38
00261224880*e^(496*I*c) + 45230940039830738332025694784646206844854827698 07
5736*e^(495*I*c) + 484093410240488718655917025303662581091659126182344528*e
^(494*I*c) + 5032024903401451824074213943766011922026507006311982753*e^(493
*I*c) + 50836369508171099437019348610847391946736185108017183136*e^(492*I*c
) + 499467506558531733671585862910572702811545035730398749530*e^(491*I*c) +
 4775398607100853263534207733818266777478693412738731031680*e^(490*I*c) + 4
4456708175258821024400946210535004523775722190977468484496*e^(489*I*c) + 40
321222595779818884084613996099562414449127169433679645958 4*e^(488*I*c) + 35
6476489062872401708848799668817892919578761395854547480484 5*e^(487*I*c) + 3
073621740432100996523103741966305396288103528170922169778507 2*e^(486*I*c) +
 25858534871597727015582911568419341107203454149136439398549135 0*e^(485*I*c
) + 212370296918887131826671878122392706783994901572729388406538808 0*e^(484
*I*c) + 170338860273906157410409777216555416656121622754850285843108904 17*e
^(483*I*c) + 133490210052026183779673313868332303530332906163247194627808 41
0304*e^(482*I*c) + 10225364374682967372930658627052464496936874155598658443

06888705423*e^(481*I*c) + 7659010520187549651777118357676871927081898989131125755798204236112*e^(480*I*c) + 56117081076341175384087570185188538660375932013674735519055227368366*e^(479*I*c) + 402349692266121158934003582839428785116904903936409545602519219664720*e^(478*I*c) + 2823905151936586678382525706564457280290098698638597987628380245881715*e^(477*I*c) + 19407979215594566593535008103303255257745408070082431338945184797463936*e^(476*I*c) + 130657660226560419335121434389938961884595434069984824307149332131747540*e^(475*I*c) + 861884851094991908764246805474672428603757315484453974713612812215428992*e^(474*I*c) + 5572551157328671121016216416307596161861955969011697222340926210112854418*e^(473*I*c) + 35324447206779018115378052820789411687581004582367431006205879633729015200*e^(472*I*c) + 219601281339515561500261478844190024870555261281946058839614044697037963695*e^(471*I*c) + 1339214374254245553564884406801945353385000254030655765953770237607180089968*e^(470*I*c) + 8013729580790752434361964945761543761469520791210746972675870481058674277844*e^(469*I*c) + 47065044611135158108487353367484243102698248838312635876283099427442745866704*e^(468*I*c) + 271361207503266570734486517077181014801775322183181055638619257836143271472358*e^(467*I*c) + 1536333238444927583532734556016494671674916578907116984548489078241693926940560*e^(466*I*c) + 8543013441126212334833540665069621472479085838041360564550722036723654297540205*e^(465*I*c) + 46668223548266017806854592468100570289355960869613650856575756758180182223308768*e^(464*I*c) + 250501028608928332469340456829902067712233644464602753159945727868485722395506952*e^(463*I*c) + 1321498055271300851429993866631619874424534425188183592049727687571032156435077280*e^(462*I*c) + 6852993223145736687328885311617795435592940841439866351079655652312894721972796266*e^(461*I*c) + 34941071613276704649477943043339450201504075335160361865916029213860778606230624960*e^(460*I*c) + 175193170500618300241515632381912285157790097816049220671217212220015297133400636060*e^(459*I*c) + 863979933622330349556296820028395513198708064940505702126068652936800794826651264256*e^(458*I*c) + 4191542500656826148093339414544159143964478472492315931809171859902114109005939942952*e^(457*I*c) + 20008006803030047137293278250321597113540716201983333126349281186679153199068045257216*e^(456*I*c) + 93986915313068179149083606065681482780836060510530154618486949839467131378859885998210*e^(455*I*c) + 434546676780280045346344498763892540797175105756827515509297024187660299345484920192480*e^(454*I*c) + 1977792980665818135651300094326239158605448870806970860577325385028609983034534672318500*e^(453*I*c) + 8862752142756957285681340885764904597935349569355321815647721172537159186491471311666400*e^(452*I*c) + 39108031255601809476537535369611844440844903751605645023514572352045248104262933598850730*e^(451*I*c) + 169956327969929767773902096652629253283704505477127544556534417376686540936706073847337600*e^(450*I*c) + 727521010718394229291774073844694255798738667067535379759732795567942578751384250780476310*e^(449*I*c) + 3067974296431747364198159623962463671617006419626851426148418602934852907379021659761911840*e^(448*I*c) + 12747219616503320541356343062562847368601622140856786025445814532037904111523242298235713300*e^(447*I*c) + 52190912207661824215812271854269748071292843243227894769229690720010547141334131610989636000*e^(446*I*c) + 21059430

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*e^(416*I*c) + 616003116022979584937125701757887212998354300989991362628038
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413*I*c) + 117358569262451184931130910025016040323418769859990828235206722415
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957378390547289277609129572813931082733520247387226000020043538279468776707
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09144982747171856772463223808993367091503402876467270176124342699654400*e^(
410*I*c) + 201557947424794098026772478462040883395867512562930862943753568
6900840155855980101547815486252394095819073975OO*e^(409*I*c) + 5083245993010
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*e^(407*I*c) + 312568349317870174347970475030749017866629215072017936360433
5113528623329684606343185540756019935662148267863968*e^(406*I*c) + 76217887
91912047062038840917799374600428892258194367636682944356096681400246312138O
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114411609173557221662078886153580344970227380258835907670424184073351343911
4113248*e^(404*I*c) + 438349721429193776853786922330210637445540331009285O2
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1033997554672574364898478376407537547182043944730557950014676043264198765555
556873829531737211096115196005647730480*e^(402*I*c) + 241246021282440061792
9083177830328761948015971332060520912869970437291453457558057100814890067741
83943957398483267 8*e^(401*I*c) + 556756388711182340341026192734219546113651
76831738053900589367904939471401706369856527272881366905477907720897784O*e^
(400*I*c) + 1271033082938048950201360554831270342662343991277504612342300036
6025046741742856580445289401786656311685859023084716*e^(399*I*c) + 28704961
31412314451834674715353589439553294430808531933466086288543709246230769 1513
92180699413405623017247753532944*e^(398*I*c) + 641338189585592518475823145 1
062556380328594938511006577015218119786536390213057284018202201631094434819
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5384995990252442198063518901163481565327960549778338288893276673008 0*e^(396
*I*c) + 310043192060694170770693631414234874318280090981847446356786522841 7
7439464941651812564519144918003174108077634846014*e^(395*I*c) + 67091706130
529669125019899210021576580237843462229535386295087076189297849995931360645
6052921309614961067075215064 32*e^(394*I*c) + 143657687138044796942947119704
259538458818199423516824674586293691056119209866358123637772245409530799230
553767222252*e^(393*I*c) + 304384471106813336010284160123906370433888828490
627422652551236966790916174520857759143930140187173492394981908258944*e^(39
2*I*c) + 638218892914533741505806399662488556066783600496091876408374974877
44897177803607499624558112428346043806518207197608 5*e^(391*I*c) + 132431132
4984027428355222938147682378672860708817161741448749689593588020860847508 70

370232532030464988312068498755640 0*e^(390*I*c) + 27195892834837439260408051
0108034192124453031125460725092919277390933152322663503581567286256929669 37
11643521070331394*e^(389*I*c) + 552749884903117835586123000932666828392629 0
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*e^(388*I*c) + 1111949964536320108088106282488633849242537565844897793553 58
46349290425821570383090425411418521516670371372045206568345*e^(387*I*c) + 2
214073500170860327091518076924139166203557875590397914890921360382255479274
918351716025557191587535643955371713079 7888*e^(386*I*c) + 43638300075815171
0259462114644656896189657734886609858579456574798540851088518579112229119 89
837615452608512356008400295*e^(385*I*c) + 85139533234786455779589959464900 6
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25899630160*e^(384*I*c) + 16443750067690689274132326015439427850395456193 60
20133596581806449357240277349447927334517105809995300093549279931273178*e^(
383*I*c) + 3144090358082258615655954369383549454454739910431297220467472288
1303092520496850341856681883861186670980704079349536449 6*e^(382*I*c) + 5951
5761550043151494747928233654705382792608791642526349718775702941338547183 54
34198246807096214536895441388306027237899*e^(381*I*c) + 1115398285545601550
5333280456001843179938993592179967298183407042218011956674104858469961790 56
73355851245223858316079 2512*e^(380*I*c) + 206969828950086064346166576237380
7957513019424041178871904960551829412449344722432125679417958403007551179 29
8315947373776*e^(379*I*c) + 3802604996705891106964620633848964807037098854 5
1018226324303059729563076035359753197432475226638919318576087827418801344 0*
e^(378*I*c) + 691783894521484427849333045936139492337233385361987963737267 3
18494285971243106634572687042209989312489077767803736998815 0*e^(377*I*c) +
124621404405372580849285967098720668577570709431248685545009481547568634543
0803292540834031123785001781470789698696908681 6*e^(376*I*c) + 2223134113180
1535345406399037721686840208397941952580135584645966746736656716271554826 47
628299106607656492143261433939973 5*e^(375*I*c) + 392742004143298611693979 44
516225001081227433398585007206399231211907157795359719648241598754266579840
24455149147646789995 2*e^(374*I*c) + 687124660159856415124685861736597477348
7959171009835465278612493602307394314104957360664856300535941171276489568 39
03806088*e^(373*I*c) + 119060591849660546834765693227676449067584148248882 6
7844750482607723633344451345409512666875005729581119164335690897219144 0*e^(
372*I*c) + 2043255572651860007674027102308478964597615839227636982354332128
333130777830410400746693790173948367615396490816906308116 65*e^(371*I*c) + 3
473100538109352904194555605559573141295692107357459832343696599764133747740
780001730700752486545249171791289505074430582 08*e^(370*I*c) + 5847495736823
0458617938462884488332758149896988654038037889676799907561496400717460081 10
92945356635118795824799369716742109*e^(369*I*c) + 97521033944404931875728 23
1176351778667322317559445794638327926463508504100491730029590427543314484 85
32459919875479817581584*e^(368*I*c) + 16110925414000605259548593752641941 78
3476434718370782014462624356151429445873378335135860227298495233584364935 86
042252995608*e^(367*I*c) + 2636662410430799340447522284778244283740751068 65
8140726576446671207798325606832295937705061686297930296382338892574900819 44
0*e^(366*I*c) + 427482690772059175252671133682087150084434564792238547153 43

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00*e^(285*I*c) + 5109076151111345074526238461471371414502757224443163855316
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284*I*c) + 4321478564640869380238115618086785895947020479046742822979596588
00170984456799067751878044806619012452636891350731618278545690160*e^(283*I*
c) + 3627063075638432311356991574185107324524206140136241688793121876452334
50153927975793326834780741391203430153093712635355523960320*e^(282*I*c) + 3
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93770203788784677343934971424317987895255031936*e^(280*I*c) + 2046222955357
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24*e^(273*I*c) + 4071598896370191895002034833673642342051331135901048524691
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72*I*c) + 31295263688189838313772775873307260334117227258629501992358695636

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0926628660628198456890642358136229741501206689213918783989783 80*e^(271*I*c)
 + 238563985655628020306952781742126408332821541740064594582926440609479249
0731373592156169015393990601751864718249161657372404974 4*e^(270*I*c) + 1803
5327338177455471177568594851682977978346449777193572087688510392426884519 27
299156085132639385224196147004081979362712792399 7*e^(269*I*c) + 13521230411
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281*e^(263*I*c) + 2009496110092687738152782085683737222727968824299058739 21
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62*I*c) + 141916448142217657385823401389899962882232233330957373071631074 38
38935832201454293617293175086458389621425307051750612129761498*e^(261*I*c)
+ 9935556536495211272264439608202336493864885100818925458667004440966615827
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0400503756366988005790876589894926861477228 5*e^(259*I*c) + 47432304356310 05
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^(254*I*c) + 639230194337619890906148012886350981231994451023031226165446 48
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235238597088*e^(248*I*c) + 42748269077205917525267113368208715008443456479 2
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2385471534359333606189571832444641364132893108663576205133870672156264164115*e^(247*I*c) + 2636662410430799340447522284778244283740751068658140726576446671207798325606832295937705061686297930296382338892574900819440*e^(246*I*c) + 1611092541400060525954859375264194178347643471837078201446262435615142944587337833513586022729849523358436493586042252995608*e^(245*I*c) + 9752103394440493187572823117635177866732231755944579463832792646350850410049173002959042754331448485324599198754798175815 84*e^(244*I*c) + 584749573682304586179384628844883327581498969886540380378896767999075614964007174600811092945356635118795824799369716742109*e^(243*I*c) + 347310053810935290419455560555957314129569210735745983234369659976413374774078000173070075248654524917179128950507443058208*e^(242*I*c) + 204325557265186000767402710230847896459761583922763698235433212833313077783041040074669379017394836761539649081690630811665*e^(241*I*c) + 119060591849660546834765693227676449067584148248882678447504826077236333444513454095126668750057295811191643356908972191440*e^(240*I*c) + 687124660159856415124685861736597477348795917100983546527861249360230739431410495736066485630053594117127648956839038060 88*e^(239*I*c) + 392742004143298611693979445162250010812274333985850072063992312119071577953597196482415987542665798402445514914764678999 52*e^(238*I*c) + 222313411318015353454063990377216868402083979419525801355846459667467366567162715548264762829910660765649214326143393997 35*e^(237*I*c) + 124621404405372580849285967098720668577570709431248685545009481547568634543080329254083403112378500178147078969869690868 16*e^(236*I*c) + 691783894521484427849333045936139492337233385361987963737267318494285971243106634572687042209989312489077767803736998815 0*e^(235*I*c) + 380260499670589110696462063384896480703709885451018226324303059729563076035359753197432475226638919318576087827418801344 0*e^(234*I*c) + 206969828950086064346166576237380795751301942404117887190496055182941244934472243212567941795840300755117929831594737377 6*e^(233*I*c) + 1115398285545601550533328045600184317993899359217996729818340704221801195667410485846996179056733558512452238583160792512*e^(232*I*c) + 595157615500431514947479282336547053827926087916425263497187757029413385471835434198246807096214536895441388306027237899*e^(231*I*c) + 314409035808225861565595436938354945445473991043129722046747228813030925204968503418566818838611866709807040793495364496*e^(230*I*c) + 164437500676906892741323260154394278503954561936020133596581806449357240277349447927334517105809995300093549279931273178*e^(229*I*c) + 851395332347864557795899594649006377607357297056212213800058372083691577946730496754287998178754314302463326258996301 60*e^(228*I*c) + 4363830007581517102594621146446568961896577348866098585794565747985408510885185791122291198983761545260851235600840029 5*e^(227*I*c) + 221407350017086032709151807692413916620355787559039791489092136038225547927491835171602555719158753564395537171307978 88*e^(226*I*c) + 111194996453632010808810628248863384924253756584489779355358463492904258215703830904254114185215166703713720452065683 45*e^(225*I*c) + 552749884903117835586123000932666828392629008215846711800069850271937993904591834422219274214571125702804097407467473 6*e^(224*I*c) + 271958928348374392604080510108034192124453031125460725092919277390933152322663503581567286256929669371164352107033139 4*e^(223*I*c) + 13243113249840274

283552229381476823786728607088171617414487496895935880208608475087037023253
203046498831206849875564000*e^(222*I*c) + 6382188929145337415058063996624885
560667836004960918764083749748774489717780360749962455811242834604380651820
71976085*e^(221*I*c) + 3043844711068133360102841601239063704338888284906274
226525512369667909161745208577591439301401871734923949819082589444*e^(220*I*
c) + 14365768713804479694294711970425953845888181994235168246745862936910561
192098663581236377722454095307992305537672222522*e^(219*I*c) + 6709170613052
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5292130961496106707521506432*e^(218*I*c) + 31004319206069417077069363141423
487431828009098184744635678652284177439464941651812564519144918003174108077
634846014*e^(217*I*c) + 141764836528757049572020133432411179043699777966538
49959902524421980635189011634815653279605497783382888932766730080*e^(216*I*
c) + 6413381895855925184758231451062556380328594938511006577015218119786536
390213057284018202201631094434819584025113465*e^(215*I*c) + 287049613141231
445183467471535358943955329443080853193346608628854370924623076915139218069
9413405623017247753532944*e^(214*I*c) + 12710330829380489502013605548312703
426623439912775046123423003660250467417428565804452894017866563116858590230
84716*e^(213*I*c) + 5567563887111823403410261927342195461136517683173805390
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412460212824400617929083177830328761948015971332060520912869970437291453457
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15196005647730480*e^(210*I*c) + 4383497214291937768537869223302106374455403
3100928502737480438978976746989895784070951905237783490374305934542955*e^(2
09*I*c) + 18379807084003359766027649217621144116091735572216620788861535803
449702273802588359076704241840733513439114113248*e^(208*I*c) + 762178879191
204706203884091779937460042889225819436763668294435609668140024631213800176
9285020661445991073249416*e^(207*I*c) + 31256834931787017434797047503074901
786662921507201793636043351135286233296846063431855407560199356621482678639
68*e^(206*I*c) + 1267597017294812913400146276042126929986480292870190399107
554311079964227280196522475370108738477856311765699610*e^(205*I*c) + 508324
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040883395867512562930862943753568690084015585598010154781548625239409581907
397500*e^(203*I*c) + 790191495587665692547839884872323883529091449827471718
56772463223808993367091503402876467270176124342699654400*e^(202*I*c) + 3062
758105422195737839054728927760912957281393108273352024738722600002004353827
9468776707958420892547870128680*e^(201*I*c) + 11735856926245118493113091002
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665600*e^(200*I*c) + 444541225929547462506765951419831296601541629996893039
3345630345914109720740573618884980520010028451496996210*e^(199*I*c) + 16644
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72904279995484581013965001440*e^(198*I*c) + 6160031160229795849371257017578
872129983543009899913626280388610939145613320711919097149494265879369103033
00*e^(197*I*c) + 2253205325932206577679411092895162489997945210155641349828

272417100196754866944996893124665619072126278200000*e^(196*I*c) + 8145208141
382911182887541756425005484603769331281148049290916075819598915576810702256
835095386181594070409 0*e^(195*I*c) + 29097651061247453406647569781836910062
165559852359052804259154165687125428752562385492373749486351714453120*e^(19
4*I*c) + 102716025302028890024978135168494525909715128095290606651973010970
5221006457608834802323467197546367741847 0*e^(193*I*c) + 3582718002163296061
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859773886240*e^(192*I*c) + 123466804189240997878001808175544021601258247639
694193796589963195307920397422213879460432849897214476690 0*e^(191*I*c) + 42
035802483514679858361121014594215468443794936564789908837252480215622288483
958001168865566428069177360 0*e^(190*I*c) + 141379938253556843280565505807 40
330413060613072543475174579407983314136174891763998614537706643721054619 0*e
^(189*I*c) + 469702247271172818264540450180706705225597566275803477845353 20
01496348263235972944454188510227454600256 0*e^(188*I*c) + 15413111211486023 9
372949708207973767160813447881633865435224219397375079621258549818818791683
48260330000*e^(187*I*c) + 499524195627913818020518674440168802438827211392 1
255663734956946927571305533146776898787878059685108480*e^(186*I*c) + 159877
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339776684534006538126101635341972238262039303253596066092195040 0*e^(184*I*c
) + 157685845528850918721462877864435090257583149415561323427386562894447 59
827793562980093923717562514983 0*e^(183*I*c) + 485842581531402804473148368 68
772131390195412419046732778458706015096881437076337910793584122475073760*e^
(182*I*c) + 1477795509661712899871274518207149536217650697318308165023360 52
7405167762497046434024275584002567376 0*e^(181*I*c) + 443721091784318234776 4
349544443904699020056595069470847193617092114714077633077234972825351226979
360*e^(180*I*c) + 1315052120930692122102297105327622842335870743428530891 07
2983535862280094446607723473800477453914130*e^(179*I*c) + 3846558420806662 7
445406307878483717499894905250097532216200339254995341359246151936517790868
2078400*e^(178*I*c) + 111034148797008819443143895644469242295049867464313 71
09692576193388991337992856160200698726117108 50*e^(177*I*c) + 31626644674725
547731176795687527653571305969985923688392112164915553242573269490908989570
248533280*e^(176*I*c) + 888829502875102466704420383760797610148005313441861
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37818170447134607102575676676056675328961590*e^(173*I*c) + 1818346614061779
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57600*e^(172*I*c) + 483794897564340998438577918165893794068150426093403787 4
758643714578164624542204510123041730990 0*e^(171*I*c) + 12693496932964920565
073673637181280088548682508880255337280065006566138696041797353216584528640
*e^(170*I*c) + 328387476055581867672630948030673442015509858394807446901416
8171874442170109648521627538755920*e^(169*I*c) + 837579206923411932458786 48
676537353394654523970899076948872481398218916510458989551890925632 0*e^(168*
I*c) + 2105943013856484711843290788803175049533618399541594274340098846617 7

7259752542647709150036990*e^(167*I*c) + 52190912207661824215812271854269748071292843243227894769229690720010547141334131610989636000*e^(166*I*c) + 12747219616503320541356343062562847368601622140856786025445814532037904111523242298235713300*e^(165*I*c) + 3067974296431747364198159623962463671617006419626851426148418602934852907379021659761911840*e^(164*I*c) + 727521010718394229291774073844694255798738667067535379759732795567942578751384250780476310*e^(163*I*c) + 169956327969929767773902096652629253283704505477127544556534417376686540936706073847337600*e^(162*I*c) + 39108031255601809476537535369611844440844903751605645023514572352045248104262933598850730*e^(161*I*c) + 8862752142756957285681340885764904597935349569355321815647721172537159186491471311666400*e^(160*I*c) + 1977792980665818135651300094326239158605448870806970860577325385028609983034534672318500*e^(159*I*c) + 434546676780280045346344498763892540797175105756827515509297024187660299345484920192480*e^(158*I*c) + 93986915313068179149083606065681482780836060510530154618486949839467131378859885998210*e^(157*I*c) + 20008006803030047137293278250321597113540716201983333126349281186679153199068045257216*e^(156*I*c) + 4191542500656826148093339414544159143964478472492315931809171859902114109005939942952*e^(155*I*c) + 863979933622330349556296820028395513198708064940505702126068652936800794826651264256*e^(154*I*c) + 175193170500618300241515632381912285157790097816049220671217212220015297133400636060*e^(153*I*c) + 34941071613276704649477943043339450201504075335160361865916029213860778606230624960*e^(152*I*c) + 6852993223145736687328885311617795435592940841439866351079655652312894721972796266*e^(151*I*c) + 1321498055271300851429993866631619874424534425188183592049727687571032156435077280*e^(150*I*c) + 250501028608928332469340456829902067712233644464602753159945727868485722395506952*e^(149*I*c) + 46668223548266017806854592468100570289355960869613650856575756758180182223308768*e^(148*I*c) + 8543013441126212334833540665069621472479085838041360564550722036723654297540205*e^(147*I*c) + 1536333238444927583532734556016494671674916578907116984548489078241693926940560*e^(146*I*c) + 271361207503266570734486517077181014801775322183181055638619257836143271472358*e^(145*I*c) + 47065044611135158108487353367484243102698248838312635876283099427442745866704*e^(144*I*c) + 8013729580790752434361964945761543761469520791210746972675870481058674277844*e^(143*I*c) + 1339214374254245553564884406801945353385000254030655765953770237607180089968*e^(142*I*c) + 219601281339515561500261478844190024870555261281946058839614044697037963695*e^(141*I*c) + 35324447206779018115378052820789411687581004582367431006205879633729015200*e^(140*I*c) + 5572551157328671121016216416307596161861955969011697222340926210112854418*e^(139*I*c) + 861884851094991908764246805474672428603757315484453974713612812215428992*e^(138*I*c) + 130657660226560419335121434389938961884595434069984824307149332131747540*e^(137*I*c) + 19407979215594566593535008103303255257745408070082431338945184797463936*e^(136*I*c) + 2823905151936586678382525706564457280290098698638597987628380245881715*e^(135*I*c) + 402349692266121158934003582839428785116904903936409545602519219664720*e^(134*I*c) + 56117081076341175384087570185188538660375932013674735519055227368366*e^(133*I*c) + 7659010520187549651777118357676871927081898989131125755798204236112*e^(132*I

*c) + 1022536437468296737293065862705246449693687415559865844306888705423*e
^(131*I*c) + 133490210052026183779673313868332303530332906163247194627808410304*e^(130*I*c) + 17033886027390615741040977721655541665612162275485028584310890417*e^(129*I*c) + 212370296918887131826671878122392706783994901572729
3884065388080*e^(128*I*c) + 258585348715977270155829115684193411072034541491364393985491350*e^(127*I*c) + 30736217404321009965231037419663053962881035281709221697785072*e^(126*I*c) + 356476489062872401708848799668817892919578
7613958545474804845*e^(125*I*c) + 403212225957798188840846139960995624144491271694336796459584*e^(124*I*c) + 44456708175258821024400946210535004523775722190977468484496*e^(123*I*c) + 477539860710085326353420773381826677747869
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^(118*I*c) + 45230940039830738332025694784646206844854827698075736*e^(117*I
*c) + 4101545439937195793959956708442496709433800261224880*e^(116*I*c) + 36
0688613036389349413809780004559963548775423325255*e^(115*I*c) + 30735366512
830562160991166338490057308062762518496*e^(114*I*c) + 253566746065027977683
4561566186591213109251642859*e^(113*I*c) + 202347509724462171313966643580234078508179838320*e^(112*I*c) + 15603911277687607099721623771744933086920587272*e^(111*I*c) + 1161581413733971751533622511909046917188768400*e^(110*I*c
) + 83380839911837894453136303673785039051506805*e^(109*I*c) + 576460104656
3151304213854710715346838447392*e^(108*I*c) + 383360155801054824529764688213114368047154*e^(107*I*c) + 24489837337812338687718622491865013839488*e^(10
6*I*c) + 1500602747937397286405577818722691539392*e^(105*I*c) + 88054927598
941411145869950813388040256*e^(104*I*c) + 493966661081802579880958635254347
1345*e^(103*I*c) + 264410375780310742518099326419685040*e^(102*I*c) + 13477
227799524701956579274210395326*e^(101*I*c) + 652650253343206047453620559993
840*e^(100*I*c) + 29952547749265499675257842032197*e^(99*I*c) + 12991466459
93240318167826532288*e^(98*I*c) + 53090127264630963470039804475*e^(97*I*c)
+ 2037031259470368160131922320*e^(96*I*c) + 73099207817335597247098038*e^(9
5*I*c) + 2442455629894502983849104*e^(94*I*c) + 75599817092670157806639*e^(
93*I*c) + 2154864144781257856128*e^(92*I*c) + 56169444526926562260*e^(91*I*
c) + 1327882849274858880*e^(90*I*c) + 28186192554792138*e^(89*I*c) + 530563
624556832*e^(88*I*c) + 8718181624155*e^(87*I*c) + 122503723056*e^(86*I*c) +
1431118260*e^(85*I*c) + 13343760*e^(84*I*c) + 93096*e^(83*I*c) + 432*e^(82
*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) + 14*(3718*a*e^(1055/2*I*c) + 1502072
*a*e^(1053/2*I*c) + 302667508*a*e^(1051/2*I*c) + 40557446072*a*e^(1049/2*I*
c) + 4065883968718*a*e^(1047/2*I*c) + 325270717497440*a*e^(1045/2*I*c) + 21
630502713590667*a*e^(1043/2*I*c) + 1229848582862227068*a*e^(1041/2*I*c) + 6
1031235925207244502*a*e^(1039/2*I*c) + 2685374380789029329793*a*e^(1037/2*I
*c) + 106072288048394569716987*a*e^(1035/2*I*c) + 3799316499714931382700630
*a*e^(1033/2*I*c) + 124427615397868362145478058*a*e^(1031/2*I*c) + 37519711
73691706110924034857*a*e^(1029/2*I*c) + 104787195000667085382630850098*a*e^
(1027/2*I*c) + 2724467073240049286222217499520*a*e^(1025/2*I*c) + 662386058

3779161952704909146554O*a*e^(1023/2*I*c) + 1511798772576673047875435387479418*a*e^(1021/2*I*c) + 32503673735785850571258452122985714*a*e^(1019/2*I*c) + 660337796328597830395723099421064436*a*e^(1017/2*I*c) + 12711502674847529112148726218999140522*a*e^(1015/2*I*c) + 232438908425726665209807096498775079690*a*e^(1013/2*I*c) + 4046550142768142823441656912104576646575*a*e^(1011/2*I*c) + 67207920970133725538564726906882769461732*a*e^(1009/2*I*c) + 1066925770347513486390409808978976432165366*a*e^(1007/2*I*c) + 16217272197080856640086895687618882654237557*a*e^(1005/2*I*c) + 236397938386786552298680619962344215977635255*a*e^(1003/2*I*c) + 3309571297229229358438719595781123324700153528*a*e^(1001/2*I*c) + 44561016227553011590271450799436600978561400862*a*e^(999/2*I*c) + 577756667439166347317361298827893686038031023201*a*e^(997/2*I*c) + 7221959008399380670648524146893979780310767551977*a*e^(995/2*I*c) + 87129450753762477310055827412704326695373797670990*a*e^(993/2*I*c) + 1015602799297538681881502332438578214644838744212768*a*e^(991/2*I*c) + 11448615265227028920332020054872464737892837624091599*a*e^(989/2*I*c) + 124924620764273645058915750915973878220098322691297101*a*e^(987/2*I*c) + 1320632018182734050434490769597960546607943021209554374*a*e^(985/2*I*c) + 13536481999851915706958049067829203397030845591800979948*a*e^(983/2*I*c) + 134633163152791085906227518959644714629575426941345274855*a*e^(981/2*I*c) + 1300273428594384632178804915869348076492496040528026941982*a*e^(979/2*I*c) + 12202571647480368478947339347197542554373660129766305670026*a*e^(977/2*I*c) + 111348526291800411107246584226952800505326877479452354210332*a*e^(975/2*I*c) + 988558268629814228600928047340864800588772545018200620775758*a*e^(973/2*I*c) + 8543974119433407159975166243013026279990985549262801022565070*a*e^(971/2*I*c) + 71928400911660376402320318751672710160518473805095916511887372*a*e^(969/2*I*c) + 590140408754311076687013315279638319827311377295800031121209656*a*e^(967/2*I*c) + 4721128551501898134702349899679082580779514892160753741261926062*a*e^(965/2*I*c) + 36845376622432877842558414417003887278048975820601095126064678425*a*e^(963/2*I*c) + 280652429583871841898555612150376650333075795788342413441360641690*a*e^(961/2*I*c) + 2087355940512950608443105897698920410302162080067836820821771280502*a*e^(959/2*I*c) + 15165308800486166402472766122974437831930120746836471291819780637051*a*e^(957/2*I*c) + 107673925545674144588693096021112687136443322698905146090803710183409*a*e^(955/2*I*c) + 747385551508889800825728592465333469870510137536130275665450524715478*a*e^(953/2*I*c) + 5073612140276869022785810697789013952147928175584559508062569934520500*a*e^(951/2*I*c) + 33696548332879373510255581378537814235558502314864144954037409976543435*a*e^(949/2*I*c) + 219028335999286257776369634146613713106509647861704677410488454471041828*a*e^(947/2*I*c) + 1393822204759320545751155434910006366369348464487459381028813178904280462*a*e^(945/2*I*c) + 8686537705957015746874556647503611978485575286577500733201504080157038368*a*e^(943/2*I*c) + 53033862655943444530651471417311659093748967671410808199772545872566250240*a*e^(941/2*I*c) + 317290565438299295944227981890447073652423258243355469512774650547831808732*a*e^(939/2*I*c) + 1860732508857587132839919523366305804938874482315206088251791750125084597398*a*e^(937/2*I*c) + 1069928606114654174111403771891312216673912944378396092045113963786

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1871481943673924084228578119992726364314043020*a*e^(871/2*I*c) + 8031025392
884252064177450987879092832928608062990864461726329576684085419875495358549
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731110812497060241964047703698781976493241635614918587219564911585800789497
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*I*c) + 886740231925532664522771055553453849969744152256079998032209234008 0
196221168157852905767308281049 50*a*e^(861/2*I*c) + 2778405305214343634272 64
247811536876216851365717201706703008414345258345731388565609302905763144437
0*a*e^(859/2*I*c) + 858965006761491323319609660407459749256654782245376571 5
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) + 2344209058616675016735149514402754718218283199625957417371515387948235 8
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40*a*e^(849/2*I*c) + 199049069287552725866723649901746078436630792328029665
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880775065147099437120*a*e^(845/2*I*c) + 1605309814686536657061422698593617 5
14802846668574542867033494369104831413462797774748878288366833862772 0*a*e^(
843/2*I*c) + 447258913014794496180216536130218409258208310521650357249468 65
2198838166621230552028960184573336879005 60*a*e^(841/2*I*c) + 12304718259132
723929105983780313299023656095154142609150259213307988993082073673597693006
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2*I*c) + 8969464154494950217733056521325214891436833880846813774908909521 78
768366949153161001917497973558984634610*a*e^(835/2*I*c) + 2376911274978475 1
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527133636381325892810204723126970128774443575192567661946625438 0*a*e^(831/2
*I*c) + 1608644751608406316324368905021587976126759980980895818281687215507
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8023293113177890*a*e^(827/2*I*c) + 103684586953158052661761002194856220016 0
782021754366740224170307383160480592578653329898279331347374324254 20*a*e^(8
25/2*I*c) + 2585039414274187759834493582572271293271870310254053523049461 58
5966179477322416901801386090241796198965480 80*a*e^(823/2*I*c) + 63680845082
005250841339490337361369940898513179337822532263092681601027818866435487336
584940505080755959063 0*a*e^(821/2*I*c) + 1550126189251322091456566293321041
304661332373605301977703681149593242237032310585758452049979836332182019460
*a*e^(819/2*I*c) + 3728801747608926549551319037961429327447404631788357054 0
358136176654173880298483054802698223221150475630314 20*a*e^(817/2*I*c) + 886

425998214388706605224133949530251959265174370639560991810511424164234462615
490017814521898385663276228284O*a*e^(815/2*I*c) + 2082634813976572814550230
025023063352862536881103792628378918283781757233732328440331177037297030229
1071410100*a*e^(813/2*I*c) + 4836233601377550334331969315460087218020889366
532997225500746466903674552184371076190168866525622435899427170O*a*e^(811/2
*I*c) + 1110070511484021253452202837142711739826290353852231226468056365836
549358935277054999426934237151219894248189 40*a*e^(809/2*I*c) + 251865250484
281545894238180017093595610796911882271999250070181159518716093352404254337
261360592129286243867720*a*e^(807/2*I*c) + 564917706038037027885920007433 76
407605164806140939010812663502809191357241464734717803992357829937985993584
9404*a*e^(805/2*I*c) + 125263879584746691376612500666962587390732663784320 8
199173827808400459890232296094362170239873318861004896614156*a*e^(803/2*I*c
) + 274608771304596649275981974705753453729579485114252190135088406868697 27
033854628850909135636107420004269524311 44*a*e^(801/2*I*c) + 595216046678660
616565355624658983556184002104900636763429259656593528081819514137469523625
183696770859978017674 6*a*e^(799/2*I*c) + 127564556178413915139143847288988 4
004272566111366879184662192780806878599049007723894849271955293649990034423
0684*a*e^(797/2*I*c) + 270335925308800022267374653213591384648474841539826 8
769759469904473825745481913821073764174266158885657402534436 0*a*e^(795/2*I*
c) + 566524575090192173328098322533937654900264465231561310664671776406147 3
787854368374775427668967411279665258131841 6*a*e^(793/2*I*c) + 1174079820363
959646167751034288803005778116556386730609946055394264513936940767050575172
583634752347903587326178 74*a*e^(791/2*I*c) + 240637192176925995554769763822
196549695150106412767840246806015588785001466549798116731687549539743160206
690512276*a*e^(789/2*I*c) + 487793804004013825009296221609997616820891599 15
899901122667249012985724500743387378716262962633238330476053881350 9*a*e^(78
7/2*I*c) + 978002873261192283457582949969456052834946311148564091945480083 9
123757427500954967231880705789702971916918012225 56*a*e^(785/2*I*c) + 193952
786969132205721734701058954719411935238878819329036688072614042243591664951
440117179324269684955517439364385 0*a*e^(783/2*I*c) + 380474446496892135901 5
461873113836781159840428541963397786141899308945274545366930937702520484566
25717913802247855 9*a*e^(781/2*I*c) + 738328956991590596622744469611098349 21
500050098396932680395734577625972446412914068437922786635243511272776100685
01*a*e^(779/2*I*c) + 141739356433255984532024123966213171732858939160760735
728499708299582675917379072866192196247732008574531407463816 74*a*e^(777/2*I
*c) + 269195769225792606752145769442826156530587082608618056157594984212372
419771592881653578478039424102622651584654677 50*a*e^(775/2*I*c) + 505829522
181672507409706444229176144626319674426544321423479213230295152205283640183
971355110632284240917349926720 55*a*e^(773/2*I*c) + 940414097395855760889319
663270055553239711080741367215796434630893641710184566990485130268122231684
405765166286835 14*a*e^(771/2*I*c) + 1729951237565501066373781323570103064 87
566049978888205088265495332263303165503780066305408666868769892013997009453 8
712*a*e^(769/2*I*c) + 314897382989431583332680096827162919531673302471680 46
064002114776518538829900520788348822933344761535272728898394614 8*a*e^(767/2
*I*c) + 567211894570524721264934335244788478905608726318730689979939994574 0

6523592886164302978649905934746685407795490404746*a*e^(765/2*I*c) + 101107
480011495937671953662497709473896428560464306279911177894201538732570662427
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601917556451061887933853774354141392528926855412119981497793799270417127134
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39513112726*a*e^(759/2*I*c) + 538112224856716242115738356975663022032829339
7938837982011834598823639708711693916980646441642210742072277442692795738*a
*e^(757/2*I*c) + 9203715338102052013953994655272327701169506976135302561414
981599329671691132074752022832241424911916459710600587437561*a*e^(755/2*I*c
) + 15581815934260482853545078419219552128875182877110543730686320263425001
461567811411263192244527545355522679818707520580*a*e^(753/2*I*c) + 26113086
386424978619406272087483484311686778353469810280045602451813616101635095685
826358744734323495284346010214813114*a*e^(751/2*I*c) + 43321583189999820011
825513535961153632261709936204250859944426152513525897996934481741824822705
710882414313119272790131*a*e^(749/2*I*c) + 71150379803182330624998227186896
692406197859434054084482880670614321542424946546285172306349522048789631550
138215923153*a*e^(747/2*I*c) + 11569053075069444158976287555701878043931241
423534680572445064585687921237440396748349767763604157543927792054896822913
6*a*e^(745/2*I*c) + 1862460580514884075040356040303865547180668961186912013
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2*I*c) + 296869894312341025882614756881848801182548095718231901017442700510
970132207473697085843370374068409734287215730709535159*a*e^(741/2*I*c) + 46
855032529333593499967336909176711798578926338071141481498616019652012707926
0704512548045596385215149194149787362058847*a*e^(739/2*I*c) + 7322825730749
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27744954335864633099347774743778*a*e^(737/2*I*c) + 113332640724905667726518
235728304130268059656575339233035601373338626757880224910100905403393335818
4582360056565943982872*a*e^(735/2*I*c) + 1737027904730654746361321038484958
368225917557506862415168862004368924008956529402849910157768607834197363252
609518902089*a*e^(733/2*I*c) + 26366702936061117805877803641794482992232390
452297640939384776262098816360133643920580853229150024201995535497381313240
75*a*e^(731/2*I*c) + 396391207053641466510099371609095284662117086242866333
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9/2*I*c) + 5902464865781828746433759626115731299368628038776863537919286757
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52557277491441427340072720038453020094*a*e^(723/2*I*c) + 184090602589765024
977173302569641551086417497283354692011644278717217713467622411892121545870
72288919159051458074105345270*a*e^(721/2*I*c) + 263954641832889484740532868
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14429763618417822876*a*e^(719/2*I*c) + 374956249662893147770179909764712974
747825449021922176441858876940812711235132630691990752706912512822552398725

96210514278*a*e^(717/2*I*c) + 527725840025912026071527567068898957493075370
026298230158906309240214312430531353083821381541538970419159957716339842818
06*a*e^(715/2*I*c) + 735928399275644055040421275927628199319989286428969198
110113019273287438376278450501542242998512524254672819917510359643000*a*e^(7
13/2*I*c) + 101691644420950070025024011057452997381500283466574730634283893
254959188466627402946882962692076334471578743932496642334320*a*e^(711/2*I*c
) + 139245328018333880774364968800853142584728255513043416437870112469631555
066586960534302789635302317655769440020049946146726*a*e^(709/2*I*c) + 1889
491189020427563658877672346431137877974092858750283534102934644404036045542
6535865393641384458892336551851281215556426 3*a*e^(707/2*I*c) + 254098011526
686795017826888997862881107698178279803078370347724142537822230167040460676
758302527381200018338794267668213782*a*e^(705/2*I*c) + 338667207366064028 67
003586937597637011103498231618447975359283035558179670460082450921530821182
130019704178486167000668 0074*a*e^(703/2*I*c) + 447387531042524414883193986 4
392691122933941025699541899181965510160646569849499801211255527461657173027
2594857554980347176 5*a*e^(701/2*I*c) + 585810087840090638959352593115207493
330409388304333648586508726254966666272617271460912163699959246766169974995
865625894415*a*e^(699/2*I*c) + 760353361950885646641351976860893192022164 56
290233216169212648199277978799711837850220083492439189521567109153442746718
2154*a*e^(697/2*I*c) + 978325068291196614130480547884149187418948183584483 2
758515284364682797738671754728748237723016534707154959063107521139063 56*a*e
^(695/2*I*c) + 124791048985172481215347756168402974898532716676117664901789
376446274254095581035936034575249873743933817332894169321499686 9*a*e^(693/2
*I*c) + 157811889103642503017552977572861318482559349051118394199347762880 0
762057890918137098180588823348433951309822211104517241960*a*e^(691/2*I*c) +
 197868002648028501464643875406112310549856313023888300553555235946491695 28
028721957946899672366839930352751552248680848574 26*a*e^(689/2*I*c) + 245988
387972516529245242552206817888068970942084349298901961431008874096948577083
188963692811905595458826368919170817993986 4*a*e^(687/2*I*c) + 3032358651189
255296683913995058467176181044555965209522749027694372314500932020478507945
0324194893361816431239799951510201 96*a*e^(685/2*I*c) + 370678470774816993 94
769399274183061171378076612161855775293079519685348910541020225998758005210
288185917035072136513546017 44*a*e^(683/2*I*c) + 449354568331212718576070418
619678692686355841095393534736338730545539031827864669151759235114794216282
975728367273265471890 6*a*e^(681/2*I*c) + 540232208427635848639217080716045 2
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792416380394000*a*e^(679/2*I*c) + 644163742866156305750100053382079138921 27
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60395064*a*e^(677/2*I*c) + 761837187529411056419612165438425312451156615754
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6*a*e^(675/2*I*c) + 893726314795215763676240123736328390606017542376255907 9
710179111349891892147713199783099640876465513972490960354416509072464*a*e^(
673/2*I*c) + 104004189395688296926906727615593605261932142015822016802173 10
568760141362183204340317918999290500601587312837404209184604296*a*e^(671/2*
I*c) + 120068684703647859652235075257580740646953371619649147810007662906 25

851531335032822622641350671534071651460975302014909903304*a*e^(669/2*I*c) +
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660*a*e^(651/2*I*c) + 33159595315331473569721299752492007977292770764782508
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e^(649/2*I*c) + 35283966812630641149341159791961391292025523974077536888523
903291265231647954939454727506873690155653093593169057488857882680*a*e^(647
/2*I*c) + 37300521329459415731704251401002810979585734710978988333621496246
233856339027608860252310284690807173977430553976853710509180*a*e^(645/2*I*c
) + 39185413399202383622073627604329189089884179407279757971516867735898168
138035719962821736076912971225404759780285833325366160*a*e^(643/2*I*c) + 40
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*a*e^(625/2*I*c) + 48908180925332300251079156776454840287174312864705788555
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623/2*I*c) + 491213012261327783682727492196187387232015554784623882419943893437268687716366644924570400601884779187439653473394160574149400*a*e^(621/2*I*c) + 49264464542155705870038634542338788212438798530705434981837058559355123523321420453290054924412360694086356486267112390442900*a*e^(619/2*I*c) + 49355015869551095112590580563652333821487135029403204297871136385751177082668822483114895823989375806441500725710546732275120*a*e^(617/2*I*c) + 49407049724497857923646418122802418078663415974301089858309325233628714614313902610437654951417123467208217070390610584251240*a*e^(615/2*I*c) + 49430500293479459295429182210667241410154074816087128978164893559373471444466906250076413859410320538676562475573896009453900*a*e^(613/2*I*c) + 49430500293479459295429182210667241410154074816087128978164893559373471444466906250076413859410320538676562475573896009453900*a*e^(611/2*I*c) + 49407049724497857923646418122802418078663415974301089858309325233628714614313902610437654951417123467208217070390610584251240*a*e^(609/2*I*c) + 49355015869551095112590580563652333821487135029403204297871136385751177082668822483114895823989375806441500725710546732275120*a*e^(607/2*I*c) + 49264464542155705870038634542338788212438798530705434981837058559355123523321420453290054924412360694086356486267112390442900*a*e^(605/2*I*c) + 49121301226132778368272749219618738723201555478462388241994389343726868771636664492457040060188477918743965347339416057414940*a*e^(603/2*I*c) + 48908180925332300251079156776454840287174312864705788555225955731856750601356988070150266042825709040021440687898855883758920*a*e^(601/2*I*c) + 48605628647485221530448036568439365222083977681057836467545264634863498616835311749827432057497076186357697241560068425420480*a*e^(599/2*I*c) + 48193299659530236368965629162172353377208407430970686522594246262923397590490780745776073857916729329041495496560962652110580*a*e^(597/2*I*c) + 47651300820137584031981301306237132784818112406387340495482154916616947775309181410534964011766375876504387207320222180574240*a*e^(595/2*I*c) + 46961491881008674073571953258739449297631107256887184383362431636434691884722589930145727930608372648302523392227498002326040*a*e^(593/2*I*c) + 46108688698493969053979321920659577290639749185078038328437911559324575990868098570200478146083617100445871110853633600291520*a*e^(591/2*I*c) + 45081698448240753180262375692004927927506538345043673939468981741472441127727726396712184152830435376131283599596954371095120*a*e^(589/2*I*c) + 43874129455527739968579909886347568532862593497167618837681590989053474358012316788203258490840630555174376169174989395181280*a*e^(587/2*I*c) + 42484934110204653755860791506752384746500674496076673967800901085937786065818126999716652181441925069428597465940270175008320*a*e^(585/2*I*c) + 40918661287257157586516616110021423781180377032922238849800270673579553338073950681237233866877936152591013115793335322605360*a*e^(583/2*I*c) + 39185413399202383622073627604329189089884179407279757971516867735898168138035719962821736076912971225404759780285833325366160*a*e^(581/2*I*c) + 37300521329459415731704251401002810979585734710978988333621496246233856339027608860252310284690807173977430553976853710509180*a*e^(579/2*I*c) + 35283966812630641149341159791961391292025523974077536888523903291265231647954939454727506873690155653093593169057488857882680*a*e^(577/2*I*c) + 33159595315331473569721299752492007977292770764782

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*a*e^(575/2*I*c) + 309541723758949787639729442007704545593374268605511778803
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573/2*I*c) + 286963422399515266793870321725820883202198234986125200155003964
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I*c) + 264155493631498066850396614543926702061226581537018336267336841957552
2391115846996135434051991645372003156367319103971553412 0*a*e^(569/2*I*c) +
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58446852995951675880083747992895130646084645872903937594321885368013088680 0
6305102678878498157856811692292478005996537 80*a*e^(565/2*I*c) + 19720200401
778864584757183707826447178195559155063511504273138952837613637477930413174
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83568393767823870507177042348428327355293841284705274575168938654930213204 5
2396541505574547904693753129794 00*a*e^(561/2*I*c) + 15628195936569723039933
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6541563113244480439940184 80*a*e^(559/2*I*c) + 13752183046726574703388943144
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0154326770093142832 40*a*e^(557/2*I*c) + 12006868470364785965223507525758074
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62559079710179111349891892147713199783099640876465513972490960354416509072 4
64*a*e^(551/2*I*c) + 761837187529411056419612165438425312451156615754347209
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(549/2*I*c) + 6441637428661563057501000533820791389212722899725158982575438
6503387235900048656780793551028674230829691236385594583603950 64*a*e^(547/2*
I*c) + 5402322084276358486392170807160452492303736610543993756782397563451 1
8322037171941645553910984968514768383853379241638039400 0*a*e^(545/2*I*c) +
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86466915175923511479421628297572836727326547189 06*a*e^(543/2*I*c) + 3706784
70774816993947693992741830611713780766121618557752930795196853489105410202 2
5998758005210288185917035072136513546017 44*a*e^(541/2*I*c) + 30323586511892
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24255220681788806897094208434929890196143100887409694857708318896369281190 5
5954588263689191708179939864*a*e^(537/2*I*c) + 197868002648028501464643875 4
06112310549856313023888300553555235946491695280287219579468996723668399303 5
2751552248680848574 26*a*e^(535/2*I*c) + 15781188910364250301755297757286131
84825593490511183941993477628800762057890918137098180588823348433951309822 2
11104517241960*a*e^(533/2*I*c) + 124791048985172481215347756168402974898532
716676117664901789376446274254095581035936034575249873743933817332894169321
4996869*a*e^(531/2*I*c) + 97832506829119661413048054788414918741894818358 44
83275851528436468279773867175472874823772301653470715495906310752113906356*

a*e^(529/2*I*c) + 760353361950885646641351976860893192022164562902332161692126481992779787997118378502200834924391895215671091534427467182154*a*e^(527/2*I*c) + 585810087840090638959352593115207493330409388304333648586508726254966666272617271460912163699959246766169974995865625894415*a*e^(525/2*I*c) + 447387531042524414883193986439269112293394102569954189918196551016064656984949980121125552746165717302725948575549803471765*a*e^(523/2*I*c) + 338667207366064028670035869375976370111034982316184479753592830355581796704600824509215308211821300197041784861670006680074*a*e^(521/2*I*c) + 254098011526686795017826888997862881107698178279803078370347724142537822230167040460676758302527381200018338794267668213782*a*e^(519/2*I*c) + 188949118902042756365887767234643113787797409285875028353410293464440403604554265358653936413844588923365518512812155564263*a*e^(517/2*I*c) + 139245328018333880774364968800853142584728255513043416437870112469631550665869605343027896353023176557694400200499461146726*a*e^(515/2*I*c) + 101691644420950070025024011057452997381500283466574730634283893254959188466627402946882962692076334471578743932496642334320*a*e^(513/2*I*c) + 73592839927564405504042127592762819931998928642896919811011301927328743837627845050154224299851252425467281991751035964300*a*e^(511/2*I*c) + 52772584002591202607152756706889895749307537002629823015890630924021431243053135308382138154153897041915995771633984281806*a*e^(509/2*I*c) + 37495624966289314777017990976471297474782544902192217644185887694081271123513263069199075270691251282255239872596210514278*a*e^(507/2*I*c) + 26395464183288948474053286863120161200727884088708580750264073545101364060793692377715714056166397802814429763618417822876*a*e^(505/2*I*c) + 18409060258976502497717330256964155108641749728335469201164427871721771346762241189212154587072288919159051458074105345270*a*e^(503/2*I*c) + 12719346510829980167691769356005135310633717185977594866088135331067145022553996096352557277491441427340072720038453020094*a*e^(501/2*I*c) + 8705750656639962805019357547403610399215124329872130490106158502891057402404433904178771049787603257660231907442902723601*a*e^(499/2*I*c) + 5902464865781828746433759626115731299368628038776863537919286757121919619848756678585765961272292609235750043165001541228*a*e^(497/2*I*c) + 3963912070536414665100993716090952846621170862428663331960681129776400190663462118184042376205657205476237354164748568266*a*e^(495/2*I*c) + 2636670293606111780587780364179448299223239045229764093938477626209881636013364392058085322915002420199553549738131324075*a*e^(493/2*I*c) + 1737027904730654746361321038484958368225917557506862415168862004368924008956529402849910157768607834197363252609518902089*a*e^(491/2*I*c) + 1133326407249056677265182357283041302680596565753392330356013733386267578802249101009054033933358184582360056565943982872*a*e^(489/2*I*c) + 732282573074945415241191984024036255668279273758317972537870914592731850184818289172732027744954335864633099347774743778*a*e^(487/2*I*c) + 468550325293335934999673369091767117985789263380711414814986160196520127079260704512548045596385215149194149787362058847*a*e^(485/2*I*c) + 296869894312341025882614756881848801182548095718231901017442700510970132207473697085843370374068409734287215730709535159*a*e^(483/2*I*c) + 1862460580514884075040356040303865547180668961186912013863199265387592460098343218040258860349427752473896664168554122

10*a*e^(481/2*I*c) + 1156905307506944415897628755570187804393124142353468057244506458568792123744039674834976776360415754392779205489682291 36*a*e^(479/2*I*c) + 711503798031823306249982271868966924061978594340540844828806706143215424249465462851723063495220487896315501382159231 53*a*e^(477/2*I*c) + 43321583189999820011825513535961153632261709936204250859944426152513525897996934481741824822705710882414313119272790131*a*e^(475/2*I*c) + 26113086386424978619406272087483484311686778353469810280045602451813616101635095685826358744734323495284346010214813114*a*e^(473/2*I*c) + 15581815934260482853545078419219552128875182877110543730686320263425001461567811411263192244527545355522679818707520580*a*e^(471/2*I*c) + 920371533810205201395399465527232770116950697613530256141498159932967169113207475202283224142491191645971060058743 7561*a*e^(469/2*I*c) + 538112224856716242115738356975663022032829339793883798201183459882363970871169391698064644164221074207227744269279573 8*a*e^(467/2*I*c) + 311405651550129739902696800285085492813895466455247866716835158661279717661825298130844832082891577630780573951311272 6*a*e^(465/2*I*c) + 17836247386471450476019175564510618879338537743541413925289268554121199814977937992704171271349907534157463808397437 00*a*e^(463/2*I*c) + 101107480011495937671953662497709473896428560464306279911177894201538732570662427896449657527076860191248883329682857 0*a*e^(461/2*I*c) + 567211894570524721264934335244788478905608726318730689979939994574065235928861643029786499059347466854077954904040746*a*e^(459/2*I*c) + 314897382989431583332680096827162919531673302471680460640021147765185388299005207883488229333447615352727288983946148*a*e^(457/2*I*c) + 172995123756550106637378132357010306487566049978888205088265495332263303165503780066305408668687698920139970094538712*a*e^(455/2*I*c) + 940414097395855760889319663270055553239711080741367215796434630893641710184566990485130268122231684405765166286835 14*a*e^(453/2*I*c) + 505829522181672507409706444229176144626319674426544321423479213230295152205283640183971355110632284240917349926720 55*a*e^(451/2*I*c) + 269195769225792606752145769442826156530587082608618056157594984212372419771592881653578478039424102622651584654677 50*a*e^(449/2*I*c) + 141739356433255984532024123966213171732858939160760735728499708299582675917379072866192196247732008574531407463816 74*a*e^(447/2*I*c) + 738328956991590596622744469611098349215000500983969326803957345776259724464129140684379227866352435112727761006850 1*a*e^(445/2*I*c) + 380474446496892135901546187311383678115984042854196339778614189930894527454536693093770252048456625717913802247855 9*a*e^(443/2*I*c) + 193952786969132205721734701058954719411935238878819329036688072614042243591664951440117179324269684955517439364385 0*a*e^(441/2*I*c) + 978002873261192283457582949969456052834946311148564091945480083912375742750095496723188070578970297191691801222556*a*e^(439/2*I*c) + 487793804004013825009296221609997616820891599158999011226672490129857245007433873787162629626332383304760538813509*a*e^(437/2*I*c) + 240637192176925995554769763822196549695150106412767840246806015588785001466549798116731687549539743160206690512276*a*e^(435/2*I*c) + 117407982036395964616775103428880300577811655638673060994605539426451393694076705057517258363475234790358732617874*a*e^(433/2*I*c) + 5665245750901921733280983225339376549002644652315613106646717764061473787854368374775427668967 41

12796652581318416*a*e^(431/2*I*c) + 27033592530880002226737465321359138464 8
4748415398268769759469904473825745481913821073764174266158885657402534436 0*
a*e^(429/2*I*c) + 127564556178413915139143847288988400427256611136687918466
2192780806878599049007723894849271955293649990034 4230684*a*e^(427/2*I*c) +
5952160466786606165653556246589835561840021049006367634292596565935280818 19
514137469523625183696770859978017 6746*a*e^(425/2*I*c) + 2746087713045966492
759819747057534537295794851142521901350884068686972703385462885090913563610
742000426952431144*a*e^(423/2*I*c) + 125263879584746691376612500666962587 39
073266378432081991738278084004598902322960943621702398733188610048966141 56*
a*e^(421/2*I*c) + 564917706038037027885920007433764076051648061409390108126
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186525048428154589423818001709359561079691188227199925007018115951871609335
240425433726136059212928624386772 0*a*e^(417/2*I*c) + 111007051148402125345 2
202837142711739826290353852231226468056365836549358935277054999426934237151
21989424818940*a*e^(415/2*I*c) + 483623360137755033433196931546008721802088
936653299722550074646690367455218437107619016886652562243589942717 00*a*e^(4
13/2*I*c) + 208263481397657281455023002502306335286253688110379262837891828
378175723373232844033117703729703022910714 10100*a*e^(411/2*I*c) + 886425998
214388706605224133949530251959265174370639560991810511424164234462615490017
8145218983856632762282840*a*e^(409/2*I*c) + 37288017476089265495513190379 61
429327447404631788357054035813617665417388029848305480269822322115047563031
420*a*e^(407/2*I*c) + 15501261892513220914565662933210413046613323736053019
7770368114959324223703231058575845204997983633218201946 0*a*e^(405/2*I*c) +
636808450820052508413394903373613699408985131793378225322630926816010278188
6643548733658494050508075595906 30*a*e^(403/2*I*c) + 2585039414274187759834 4
935825722712932718703102540535230494615859661794773224169018013860902417961
9896548080*a*e^(401/2*I*c) + 103684586953158052661761002194856220016078202 1
754366740224170307383160480592578653329898279331347374324254 20*a*e^(399/2*I
*c) + 410886153084858983661724972688741143514787801131605768393365452405899
47982864125921136564058023293113177890*a*e^(397/2*I*c) + 160864475160840631
632436890502158797612675998098089581828168721550747217070333136571706786065
65171911318790*a*e^(395/2*I*c) + 622157939003660126190659135862285736586376
52713363638132589281020472312697012877444357519256766194662543 80*a*e^(393/2
*I*c) + 237691127497847517000373213623578818185938565329828084281410575462 4
4636203561833840215925564924511016861 80*a*e^(391/2*I*c) + 89694641544949502
177330565213252148914368338808468137749089095217876836694915316100191749797
3558984634610*a*e^(389/2*I*c) + 334295101291598394405385926974923341821234 4
39369994003970291001771339818244857969207842071054369602329440*a*e^(387/2*I
*c) + 123047182591327239291059837803132990236560951541426091502592133079889
930820736735976930062642304445760760*a*e^(385/2*I*c) + 44725891301479449618
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687900560*a*e^(383/2*I*c) + 1605309814686536657061422698593617514802846668 5
745428670334943691048314134627977747488782883668338627720*a*e^(381/2*I*c) +
568901947141022024606690860348400435132998267377354247661562524221692115 0
0635819888077506514709943712 0*a*e^(379/2*I*c) + 19904906928755272586672364 9

9017460784366307923280296654931735997954941147793207299041775080046145853840*a*e^(377/2*I*c) + 687530224472620092791173281345497074926271430076019616322085361144879429550058409565871621454060233940*a*e^(375/2*I*c) + 234420905861667501673514951440275471821828319962595741737151538794823588356166465622241503448244518760*a*e^(373/2*I*c) + 78892732475550629207160150619649518859671333059425363870727604426538820615197072859753978543934017670*a*e^(371/2*I*c) + 26204518312074558508652381319847496634719883744031651088258490824465738576863175200241054655253538000*a*e^(369/2*I*c) + 8589650067614913233196096604074597492566547822453765715081979725077156239293288377277499477542060060*a*e^(367/2*I*c) + 2778405305214343634272642478115368762168513657172017067030084143452583457313885656093029057631444370*a*e^(365/2*I*c) + 886740231925532664522771055553453849969744152256079998032209234008019622116815785290576730828104950*a*e^(363/2*I*c) + 279213781240837306263149239277741278504180764814216320768523126545112266943230869925045964255370200*a*e^(361/2*I*c) + 86731110812497060241964047703698781976493241635614918587219564911585800789497248326704733021564620*a*e^(359/2*I*c) + 26574653865772705945516884258966917928577399544926651101115471261281415662774645920805562286190810*a*e^(357/2*I*c) + 8031025392884252064177450987879092832928608062990864461726329576684085419875495358549722887030650*a*e^(355/2*I*c) + 2393536453190194297572521642609485841145372047569451871481943673924084228578119992726364314043020*a*e^(353/2*I*c) + 703442619798587327256518771953962641129807006145552665167689345204662084900828221826842429079160*a*e^(351/2*I*c) + 203840139420173350646599863519636205648295919156240767205893957321010048179259062568208312088790*a*e^(349/2*I*c) + 58233756699318390009909172367611895685773867826783550649200500869687498091353927199571718405490*a*e^(347/2*I*c) + 16399645740773051092975392309744789183304727620673733635277139746257521706440274686262794198620*a*e^(345/2*I*c) + 4552164541985701158364440833202197360445014839710956970770340240973634689769418208918160590320*a*e^(343/2*I*c) + 1245297925455426467685003679783202930885617600557716500473909654045354638798448652726086548710*a*e^(341/2*I*c) + 335696720738936570706713403614929944912226507516523422878616118942760950780230341688669154360*a*e^(339/2*I*c) + 89163024667528844365257556946977068950919875040439960342188615542362550926345388079651264340*a*e^(337/2*I*c) + 23330834917631715093466481420083833029947668880513498966378137598401377993510086729958534960*a*e^(335/2*I*c) + 6013482403942269781375895136192720321233266638905496214866132974340762298443025559536997680*a*e^(333/2*I*c) + 1526557117570036622571918876778252127468437541774623614619302679658497516840009278849352280*a*e^(331/2*I*c) + 381619655494220774667949833382475342723385533974486856243098750370767001096283055945502640*a*e^(329/2*I*c) + 93932713207395265486897880366664895741093700695924344009200350068922566762007052749646040*a*e^(327/2*I*c) + 22761850427041663890460996661405723193407183947233163896700853295630681434965577357299920*a*e^(325/2*I*c) + 5429216947618612587547123012480165658464605296922357528675368754249200100593150293185330*a*e^(323/2*I*c) + 1274495521071138744583215835633951280803025426238229370838062367497287195705487702727780*a*e^(321/2*I*c) + 294402564240592061894969396868156932057924803903695357306824322577258371768427288

287660*a*e^(319/2*I*c) + 669076434246598381845457739249088799547015256874103762271992145044022742272446301584470*a*e^(317/2*I*c) + 14957789836260035053720288689121945297194278508615355005723695241121674541179126990690*a*e^(315/2*I*c) + 3288828495006098780525142569296800128547751347678538502742954742586652543592821521100*a*e^(313/2*I*c) + 711081673436185451924040793669141298969626722796614395742802361266093633641264085200*a*e^(311/2*I*c) + 151154910257369434692596735808879851584404239307790047602041275902443495292459666790*a*e^(309/2*I*c) + 31584005662708604544701764762131792650967524020242941992643782185239861413590496020*a*e^(307/2*I*c) + 6485888759441894264481925452577319190375803293665331722248553541369888292250431868*a*e^(305/2*I*c) + 1308704744103233244942832711379475161653066000371260361064765494153774929304542712*a*e^(303/2*I*c) + 259414105343758614384429045574352903181961134382680334119395735344643117364969828*a*e^(301/2*I*c) + 50504748951674956594241719165020500739646130041511438767337766766404018721799652*a*e^(299/2*I*c) + 9655206906308981051087661502772471729668550920396172616931546671734191430604348*a*e^(297/2*I*c) + 1812101830425436300891720572628678363042354198555147726701275150075546643583080*a*e^(295/2*I*c) + 333805055593388567427808201926960940156572529198077839859476641115104007423532*a*e^(293/2*I*c) + 6033742282110890544218880523770538090215653857306777647643655256342216048188*a*e^(291/2*I*c) + 10699286061146541741114037718913122166739129443783960920451139637868310953672*a*e^(289/2*I*c) + 1860732508857587132839919523366305804938874482315206088251791750125084597398*a*e^(287/2*I*c) + 317290565438299295944227981890447073652423258243355469512774650547831808732*a*e^(285/2*I*c) + 53033862655943444530651471417311659093748967671410808199772545872566250240*a*e^(283/2*I*c) + 8686537705957015746874556647503611978485575286577500733201504080157038368*a*e^(281/2*I*c) + 1393822204759320545751155434910006366369348464487459381028813178904280462*a*e^(279/2*I*c) + 219028335999286257776369634146613713106509647861704677410488454471041828*a*e^(277/2*I*c) + 33696548332879373510255581378537814235558502314864144954037409976543435*a*e^(275/2*I*c) + 5073612140276869022785810697789013952147928175584559508062569934520500*a*e^(273/2*I*c) + 747385551508889800825728592465333469870510137536130275665450524715478*a*e^(271/2*I*c) + 107673925545674144588693096021112687136443322698905146090803710183409*a*e^(269/2*I*c) + 15165308800486166402472766122974437831930120746836471291819780637051*a*e^(267/2*I*c) + 2087355940512950608443105897698920410302162080067836820821771280502*a*e^(265/2*I*c) + 280652429583871841898555612150376650333075795788342413441360641690*a*e^(263/2*I*c) + 36845376622432877842558414417003887278048975820601095126064678425*a*e^(261/2*I*c) + 4721128551501898134702349899679082580779514892160753741261926062*a*e^(259/2*I*c) + 590140408754311076687013315279638319827311377295800031121209656*a*e^(257/2*I*c) + 71928400911660376402320318751672710160518473805095916511887372*a*e^(255/2*I*c) + 8543974119433407159975166243013026279990985549262801022565070*a*e^(253/2*I*c) + 988558268629814228600928047340864800588772545018200620775758*a*e^(251/2*I*c) + 111348526291800411107246584226952800505326877479452354210332*a*e^(249/2*I*c) + 12202571647480368478947339347197542554373660129766305670026*a*e^(247/2*I*c) + 13002734285943846321788049

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25/2*I*c) + 3309571297229229358438719595781123324700153528*a*e^(223/2*I*c)
+ 236397938386786552298680619962344215977635255*a*e^(221/2*I*c) + 162172721
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/2*I*c) + 232438908425726665209807096498775079690*a*e^(211/2*I*c) + 1271150
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2*I*c) + 1511798772576673047875435387479418*a*e^(203/2*I*c) + 6623860583779
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c) + 3799316499714931382700630*a*e^(191/2*I*c) + 106072288048394569716987*a
*e^(189/2*I*c) + 2685374380789029329793*a*e^(187/2*I*c) + 61031235925207244
502*a*e^(185/2*I*c) + 1229848582862227068*a*e^(183/2*I*c) + 216305027135906
67*a*e^(181/2*I*c) + 325270717497440*a*e^(179/2*I*c) + 4065883968718*a*e^(1
77/2*I*c) + 40557446072*a*e^(175/2*I*c) + 302667508*a*e^(173/2*I*c) + 15020
72*a*e^(171/2*I*c) + 3718*a*e^(169/2*I*c))/(e^(531*I*c) + 432*e^(530*I*c) +
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) + 28186192554792138*e^(523*I*c) + 1327882849274858880*e^(522*I*c) + 56169
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) + 53090127264630963470039804475*e^(515*I*c) + 129914664599324031816782653
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e^(511*I*c) + 264410375780310742518099326419685040*e^(510*I*c) + 4939666610
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c) + 1161581413733971751533622511909046917188768400*e^(502*I*c) + 156039112
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+ 434546676780280045346344498763892540797175105756827515509297024187660 2993
45484920192480*e^(454*I*c) + 197779298066581813565130009432623915860544887 0
806970860577325385028609983034534672318500*e^(453*I*c) + 886275214275695728
568134088576490459793534956935532181564772117253715918649147131166640 0*e^(4
52*I*c) + 391080312556018094765375353696118444408449037516056450235145723 52
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356343062562847368601622140856786025445814532037904111523242298235713300*e^
(447*I*c) + 521909122076618242158122718542697480712928432432278947692296907
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+ 837579206923411932458786486765373533946545239708990769488724813982189165 1
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453781817044713460710257567667605667532896159 0*e^(439*I*c) + 24643821908074
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474620767522824868911959884352666444917404000*e^(437*I*c) + 316266446747255
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109692576193388991337992856160200698726117108 50*e^(435*I*c) + 3846558420806
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2825351226979360*e^(432*I*c) + 147779550966171289987127451820714953621765 06
973183081650233605274051677624970464340242755840025673760*e^(431*I*c) + 485
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575831494155613234273865628944475982779356298009392371756251498 30*e^(429*I*
c) + 505293663123015258878483025738812813203397766845340065381261016353419 7

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95
694692757130553314677689878787805968510848O*e^(426*I*c) + 1541311121148602
3
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803477845353200149634826323597294445418851022745460025 60*e^(424*I*c) + 1413
799382535568432805655058074033041306061307254347517457940798331413617489176
39986145377066437210546190*e^(423*I*c) + 420358024835146798583611210145942
1
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422*I*c) + 1234668041892409978780018081755440216012582476396941937965899631
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6
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4090*e^(417*I*c) + 225320532593220657767941109289516248999794521015564134 98
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389785749377547647639878358724104499306901315729042799954845810139650014 40*
e^(414*I*c) + 444541225929547462506765951419831296601541629996893039334563 0
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249416*e^(405*I*c) + 183798070840033597660276492176211441160917355722166207
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5196005647730480*e^(402*I*c) + 241246021282440061792908317783032876194801 59
71332060520912869970437291453457558057100814890067418394395739848326 78*e^(4

01*I*c) + 556756388711182340341026192734219546113651768317380539005893679049394714017063698565272728813669054779077208977840*e^(400*I*c) + 12710330829380489502013605548312703426623439912775046123423003660250467417428565804452894017866563116858590230847 16*e^(399*I*c) + 287049613141231445183467471535358943955329443080853193346608628854370924623076915139218069941340562301724775353 2944*e^(398*I*c) + 641338189585592518475823145106255638032859493851100657701521811978653639021305728401820220163109443481958402511 3465*e^(397*I*c) + 141764836528757049572020133432411179043699777966538499599025244219806351890116348156532796054977833828889327667 30080*e^(396*I*c) + 310043192060694170770693631414234874318280090981847446356786522841774394649416518125645191449180031741080776348 46014*e^(395*I*c) + 670917061305296691250198992100215765802378434622295353862950870761892978499959313606456052921309614961067075215 06432*e^(394*I*c) + 143657687138044796942947119704259538458818199423516824674586293691056119209866358123637772245409530799230553767 222252*e^(393*I*c) + 304384471106813336010284160123906370433888828490627422652551236966790916174520857759143930140187173492394981908 258944*e^(392*I*c) + 638218892914533741505806399662488556066783600496091876408374974877448971778036074996245581124283460438065182071 976085*e^(391*I*c) + 132431132498402742835522293814768237867286070881716174144874968959358802086084750870370232532030464988312068498 7556400*e^(390*I*c) + 271958928348374392604080510108034192124453031125460725092919277390933152322663503581567286256929669371164352107 0331394*e^(389*I*c) + 552749884903117835586123000932666828392629008215846711800069850271937993904591834422219274214571125702804097407 4674736*e^(388*I*c) + 111194996453632010808810628248863384924253756584489779355358463492904258215703830904254114185215166703713720452 06568345*e^(387*I*c) + 221407350017086032709151807692413916620355787559039791489092136038225547927491835171602555719158753564395537171 30797888*e^(386*I*c) + 436383000758151710259462114644656896157734886609858579456574798540851088518579112229119898376154526085123560084 00295*e^(385*I*c) + 851395332347864557795899594649006377607357297056212213800058372083691577946730496754287998178754314302463326258 99630160*e^(384*I*c) + 164437500676906892741323260154394278503954561936020133596581806449357240277349447927334517105809995300093549279 931273178*e^(383*I*c) + 314409035808225861565595436938354945445473991043129722046747228813030925204968503418566818838611866709807040793 495364496*e^(382*I*c) + 595157615500431514947479282336547053827926087916425263497187757029413385471835434198246807096214536895441388306 027237899*e^(381*I*c) + 111539828554560155053332804560018431799389935921799672981834070422180119566741048584699617905673355851245223858 3160792512*e^(380*I*c) + 206969828950086064346166576237380795751301942404117887190496055182941244934472243212567941795840300755117929831 5947373776*e^(379*I*c) + 380260499670589110696462063384896480703709885451018226324303059729563076035359753197432475226638919318576087827 4188013440*e^(378*I*c) + 691783894521484427849333045936139492337233385361987963737267318494285971243106634572687042209989312489077767803 7369988150*e^(377*I*c) + 124621404405372580849285967098720668577570709431248685545009481547568634543080329254083403112378500178147078969 86969086816*e^(376*I*c) + 2223134113180153534540639903772168 68

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^(374*I*c) + 687124660159856415124685861736597477348795917100983546527861 24
936023073943141049573606648563005359411712764895683903806088*e^(373*I*c) +
119060591849660546834765693227676449067584148248882678447504826077236333444
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560555957314129569210735745983234369659976413374774078000173070075248654524
917179128950507443058208*e^(370*I*c) + 5847495736823045861793846288448833 27
581498969886540380378896767999075614964007174600811092945356635118795824799
369716742109*e^(369*I*c) + 975210339444049318757282311763517786673223175594
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*e^(368*I*c) + 161109254140006052595485937526419417834764347183707820144626
243561514294458733783351358602272984952335843649358604225299 5608*e^(367*I*c
) + 263666241043079934044752228477824428374075106865814072657644667120779 83
256068322959377050616862979302963823388925749008194 40*e^(366*I*c) + 4274826
907720591752526711336820871500844345647922385471534359333606189571832444641
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994860400152989456623523859708 8*e^(364*I*c) + 109272106034735448102797923 47
844536074588896806230041110089544731605863146104181739039426674855453466097
402330688331845602302*e^(363*I*c) + 172295028243676473344007219984175967039
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84095333760*e^(362*I*c) + 269177947010866150978901202368905011051467999960 2
177519571086622622863898470345683269415323061160726344418350102619856341961
6*e^(361*I*c) + 416704403753905436434182193422717480400350714901190805852 81
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*c) + 639230194337619890906148012886350981231994451023031226165446482089987
678039444557770428865527384997471837131360691046518122 15*e^(359*I*c) + 9717
305502474268005861672246136889266114129554026349301303274608353615732426833
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524464659132845442574511758 4*e^(356*I*c) + 323413178014841003714151138246 07
915257636097603505845789040993773872317153703657304368199716374531360240013
91530466736684330 91*e^(355*I*c) + 474323043563100542377338629931966248129 17
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5*e^(353*I*c) + 993555653649521127226443960820233649386488510081892545866 70
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I*c) + 141916448142217657385823401389899962882232233330957373071631074383 89

3583220145429361729317508645838962142530705175061212976149 8*e^(351*I*c) + 2
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85622159591075298072896284496213867989894363693931160698940187812010002756 3
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52768103942856011840211642769621717217996614398473887186074391482638547212 8
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49218681730517117503201150 0*e^(347*I*c) + 741037261289115222436463329612804
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60992*e^(344*I*c) + 180353273381774554711775685948516829779783464497771935 7
20876885103924268845192729915608513263938522419614700408197936271279239 97*e
^(343*I*c) + 23856398565562802030695278174212640833282154174006459458292644
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*c) + 31295263688189838313772775873307260334117227258629501992358695636092 6
62866062819845689064235813622974150120668921391878398978380*e^(341*I*c) + 4
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6*e^(332*I*c) + 30206063803086846346113944227936049971890691748252489448335
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31*I*c) + 36270630756384323113569915741851073245242061401362416887931218764
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) + 43214785646408693802381156180867858959470204790467428229795965880017098
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09076151111345074526238461471371414502757224443163855316484292308516866358 2
771748846450033162338577740074495053841063773593600 0*e^(328*I*c) + 59937848

4771733474809376142401554850207064972118137572949257503651444541939309025276896049622515630263162184526394317285457368300*e^(327*I*c) + 69778910692592461481671374768468278508365981902795224444704335586974136850045256116402463607340192969310580110552273840534902816 0*e^(326*I*c) + 80616967132762553242457534008977573368199499157667444692235409971461519208544324566385225700111564428666030497947602396607189820 0*e^(325*I*c) + 92432005286752258403577749576107235122253442078486196000182102050946814635675643379524644649139614158385451368710433442956670752 0*e^(324*I*c) + 10517821004288343719445081700512191871168163497669533226371821496108750042237847841832849619064944229554624312086456908025267707 80*e^(323*I*c) + 11878179430793903161088023247981101290208227826600872485993676434812002060468221661442854259222293754136765350711410052864314816 00*e^(322*I*c) + 13313961146267230358024621235315820503397499960141524528353059563674253702227586217539224587275248560729508809606575647204758385 00*e^(321*I*c) + 14811871170892466624669556949656778555247303132605526908216026571762187374262455227953298914640910058783043040759536935467672060 80*e^(320*I*c) + 16355697446414219006578863812890766532275801720566775874514020692343552836874896596139137619591407733397360147900818145166252244 40*e^(319*I*c) + 17926490780896322989369457284819693349643915975062850884883506229372525334209808031443164317014521905227161247978752574375163606 40*e^(318*I*c) + 19502865507801819192449929612044870100564603628452185016744237662663215587914369173178787022326792138682879262946652027697229273 80*e^(317*I*c) + 21061419034683443071125497612024845434027942523524821998174104248696772627150982884376465186834879454627742236564713458990821568 00*e^(316*I*c) + 22577262191038562868128330126815737654962622414206129320761431511719608545541241446990230098420805151579235293571898699435159912 00*e^(315*I*c) + 24024645955696860861200018030342110567394455886219461413841061628862461618151497630250308348752340672677740234334182699824312652 80*e^(314*I*c) + 25377664154650303308154717466929885960699118946972250529283204525421755871548480964833312098074301139430153983626696733379577557 20*e^(313*I*c) + 26611006479757835838282351392014419301783966433834239035838625472558807723820492010155372149008327456015197371418498025066852640 00*e^(312*I*c) + 27700732071507686455975072813820654979249684660545274141223398273337837700683058834873099793159837184037408728843457463806802042 60*e^(311*I*c) + 28625031263204617977706677807256441849912556231746261756790506721008489881193918414665734170192475905807352651434272893404508112 00*e^(310*I*c) + 29364942143518684987032394554267711043448273062675589165508774672324551532861405210895827339322025531307127238369834688662309088 00*e^(309*I*c) + 29904989496225436085381293802838663351900871151248588181437876191869571119037657239748996515185551449242903462425951672743830089 60*e^(308*I*c) + 30233716435082250271756031752129532190224850458507318453075190082773851547314612133880355791599175900623435274649772866011651006 20*e^(307*I*c) + 30344083555309570757877317453225679816846165501628454732576796742802169473567857838432056042023078368970735954104125756604657875 20*e^(306*I*c) + 30233716435082250271756031752129532190224850458507318453075190082773851547314612133880355791599175900623435274649772866011651006 20*e^(305*I*c) + 2990498949622543608538129380283866335190087115124858

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0877467232455153286140521089582733932202553130712723836983468866230908800*e
^(303*I*c) + 28625031263204617977706677807256441849912556231746261756790506
72100848988119391841466573417019247590580735265143427289340450811200*e^(302
*I*c) + 2770073207150768645597507281382065497924968466054527414122339827333
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 + 266110064797578358382823513920144193017839664338342390358386254725588077
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780*e^(289*I*c) + 924320052867522584035777495761072351222534420784861960001
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(288*I*c) + 806169671327625532424575340089775733681994991576674446922354099
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*c) + 697789106925924614816713747684682785083659819027952244447043355869741
368500452561164024636073401929693105801105522738405349028160*e^(286*I*c) +
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157201493696073712322595776808*e^(281*I*c) + 249593072282565866398389951509
619202682634455487128714631461891770823201367527645793770203788784677343934
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469005970880*e^(278*I*c) + 134297742023479429904629616104559610096074758721
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*e^(276*I*c) + 853681184302153128482312917396737358877462018516662996003921
994187647500868281987198727440477677836673253262892218819749875822 15*e^(275
*I*c) + 672440879690807038237032571996630476068906104820904946194928029 3513
021597981946996638333678869390013911559464689378409541847 2336*e^(274*I*c) +
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052892432152798814607975110366224945081428121888473324*e^(273*I*c) + 407159
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61470040819793627127923997*e^(269*I*c) + 135212304119454369155588547068517 9
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445744499985208259385435609740272400301454246872041775159838468077381562338
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051589177425764253443649645967506531776778034921868173051711750320115 00*e^(
265*I*c) + 392569765841577835276810394285601184021164276962171721799661439 8
47388718607439148263854721282653827045391263454029979227032102 4*e^(264*I*c)
+ 282081929856221595910752980728962844962138679898943636939311606989401878
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496707577640666906561509490149440439948228239 20*e^(262*I*c) + 1419164481422
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6542833639725851180904794136966381081563852446465913284544257451175 84*e^(25
6*I*c) + 146390448456351181218237382740374124191664819997746988076598391862
733629670142241546375533903130605297580105675355629160198162*e^(255*I*c) +
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683333904003089583183702191548871697022574447 56176*e^(254*I*c) + 6392301943
376198909061480128863509812319944510230312261654464820899876780394445577704
288655273849974718371313606910465181 2215*e^(253*I*c) + 4167044037539054364 3
418219342271748040035071490119080585281522498188818375906900368701234531304
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865739473880520939163659737038057239896471508009536681832202915219363586978
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*e^(249*I*c) + 686642533751866826266269375090895696573292457814218163062215
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) + 427482690772059175252671133682087150084434564792238547153435933360618 95
718324446413641328931086635762051338706721562641641 15*e^(247*I*c) + 2636662
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32343696599764133747740780001730700752486545249171791289505074430582 08*e^(2
42*I*c) + 204325557265186000767402710230847896459761583922763698235433212 83
331307778304104007466937901739483676153964908169063081166 5*e^(241*I*c) + 11
906059184966054683476569322767644906758414824888267844750482607723633344451
345409512666875005729581119164335690897219144 0*e^(240*I*c) + 68712466015985
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4455149147646789995 2*e^(238*I*c) + 222313411318015353454063990377216868402 0
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6*I*c) + 691783894521484427849333045936139492337233385361987963737267318494
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049967058911069646206338489648070370988545101822632430305972956307603535975
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16*e^(207*I*c) + 3125683493178701743479704750307490178666292150720179363604
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7017294812913400146276042126929986480292870190399107554311079964227280196 52
2475370108738477856311765699610*e^(205*I*c) + 5083245993010854601669786296 8
3032661427654474082939048097939638391567298795788389433842285751054665210 86
8287680*e^(204*I*c) + 2015579474247940980267724784620408833958675125629308 6
2943753568690084015585598010154781548625239409581907397500*e^(203*I*c) + 79
0191495587665692547839884872323883529091449827471718567724632238089933670 91
5034028764672701761243426996544 00*e^(202*I*c) + 3062758105422195737839054 72
8927760912957281393108273352024738722600002004353827946877670795842089254 78
70128680*e^(201*I*c) + 1173585692624511849311309100250160403234187698599908
2823520672241530200188223826392982302194084667538488665600*e^(200*I*c) + 44
4541225929547462506765951419831296601541629996893039334563034591410972074 05
7361888498052001002845149699621 0*e^(199*I*c) + 166447503438721180939491774 3
5029376389785749377547647639878358724104499306901315729042799954845810139 65
001440*e^(198*I*c) + 6160031160229795849371257017578872129983543009899913 62
628038861093914561332071191909714949426587936910303300*e^(197*I*c) + 225320
5325932206577679411092895162489997945210155641349828272417100196754866944 99
689312466561907212627820000*e^(196*I*c) + 8145208141382911182887541756425 00
548460376933128114804929091607581959891557681070225683509538618159407040 90*
e^(195*I*c) + 2909765106124745340664756978183691006216555985235905280425915
41656871254287525623854923737494863517144531 20*e^(194*I*c) + 10271602530202
8890024978135168494525909715128095290606651973010970522100645760883480232 34
671975463677418470*e^(193*I*c) + 3582718002163296061414536703715109897107 19
8252739284546149343102348456124089657428594946438660859773886240*e^(192*I*c
) + 1234668041892409978780018081755440216012582476396941937965899631953079 2
0397422213879460432849897214476 6900*e^(191*I*c) + 420358024835146798583611 2
1014594215468443794936564789908837252480215622288483958001168865566428069 17
73600*e^(190*I*c) + 1413799382535568432805655058074033041306061307254347517
457940798331413617489176399861453770664372105461 90*e^(189*I*c) + 4697022472
7117281826454045018070670522559756627580347784535320014963482632359729444 54
188510227454600256 0*e^(188*I*c) + 1541311121148602393729497082079737671608 1
3447881633865435224219397375079621258549818818791683482603300 00*e^(187*I*c)
+ 4995241956279138180205186744401688024388272113921255663734956946927571 30
5533146776898787878059685108480*e^(186*I*c) + 159877110105819269227052899 96
7744474268563100623245618584492522014400230587812038082848398866357482910 0*
e^(185*I*c) + 5052936631230152588784830257388128132033977668453400653812610
16353419722382620393032535960660921950400*e^(184*I*c) + 1576858455288509187
2146287786443509025758314941556132342738656289444759827793562980093923717 56
25149830*e^(183*I*c) + 4858425815314028044731483686877213139019541241904673
27784587060150968814370763379107935841224750737 60*e^(182*I*c) + 14777955096
6171289987127451820714953621765069731830816502336052740516776249704643402 42
755840025673760*e^(181*I*c) + 4437210917843182347764349544443904699020056 59
506947084719361709211471407763307723497282535122697936 0*e^(180*I*c) + 13150

521209306921221022971053276228423358707434285308910729835358622800944466077
23473800477453914130*e^(179*I*c) + 3846558420806662744540630787848371749989
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110341487970088194431438956444692422950498674643137109692576193388991337992
85616020069872611710850*e^(177*I*c) + 3162664467472554773117679568752765357
1305969985923688392112164915553242573269490908989570248533280*e^(176*I*c) +
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59884352666444917404000*e^(175*I*c) + 2464382190807439609079774226855679629
367885709776435876630851716253962696192341706239192878728160*e^(174*I*c) +
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676676056675328961590*e^(173*I*c) + 181834661406177901315330129677145381166
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794897564340998438577918165893794068150426093403787475864371457816462454220
45101230417309900*e^(171*I*c) + 1269349693296492056507367363718128008854868
2508880255337280065006566138696041797353216584528640*e^(170*I*c) + 32838747
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27538755920*e^(169*I*c) + 8375792069234119324587864867653735339465452397089
90769488724813982189165104589895518909256320*e^(168*I*c) + 2105943013856484
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90*e^(167*I*c) + 5219091220766182421581227185426974807129284324322789476922
9690720010547141334131610989636000*e^(166*I*c) + 12747219616503320541356343
062562847368601622140856786025445814532037904111523242298235713300*e^(165*I
*c) + 306797429643174736419815962396246367161700641962685142614841860293485
2907379021659761911840*e^(164*I*c) + 72752101071839422929177407384469425579
8738667067535379759732795567942578751384250780476310*e^(163*I*c) + 16995632
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7337600*e^(162*I*c) + 39108031255601809476537535369611844440844903751605645
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) + 19777929806658181356513000943262391586054488708069708605773253850286099
83034534672318500*e^(159*I*c) + 4345466767802800453463444987638925407971751
05756827515509297024187660299345484920192480*e^(158*I*c) + 9398691531306817
9149083606065681482780836060510530154618486949839467131378859885998210*e^(1
57*I*c) + 20008006803030047137293278250321597113540716201983333126349281186
679153199068045257216*e^(156*I*c) + 419154250065682614809333941454415914396
4478472492315931809171859902114109005939942952*e^(155*I*c) + 86397993362233
0349556296820028395513198708064940505702126068652936800794826651264256*e^(1
54*I*c) + 17519317050061830024151563238191228515779009781604922067121721222
0015297133400636060*e^(153*I*c) + 34941071613276704649477943043339450201504
075335160361865916029213860778606230624960*e^(152*I*c) + 685299322314573668
7328885311617795435592940841439866351079655652312894721972796266*e^(151*I*c
) + 13214980552713008514299938666316198744245344251881835920497276875710321
56435077280*e^(150*I*c) + 2505010286089283324693404568299020677122336444646
02753159945727868485722395506952*e^(149*I*c) + 4666822354826601780685459246
8100570289355960869613650856575756758180182223308768*e^(148*I*c) + 85430134

41126212334833540665069621472479085838041360564550722036723654297540205*e^(
147*I*c) + 15363332384449275835327345560164946716749165789071169845484890782
41693926940560*e^(146*I*c) + 27136120750326657073448651707718101480177532
2183181055638619257836143271472358*e^(145*I*c) + 470650446111351581084873533
674842431026982488383126358762830994274427458667O4*e^(144*I*c) + 8013729580
790752434361964945761543761469520791210746972675870481058674277844*e^(143*I
*c) + 133921437425424555356488440680194535338500025403065576595377023760718
0089968*e^(142*I*c) + 219601281339515561500261478844190024870555261281946O5
8839614044697037963695*e^(141*I*c) + 353244472067790181153780528207894116875
8100458236743100620587963372901520O*e^(140*I*c) + 557255115732867112101621
6416307596161861955969011697222340926210112854418*e^(139*I*c) + 86188485109
4991908764246805474672428603757315484453974713612812215428992*e^(138*I*c) +
 130657660226560419335121434389938961884595434069984824307149332131747540*e
^(137*I*c) + 19407979215594566593535008103303255257745408070082431338945184
797463936*e^(136*I*c) + 282390515193658667838252570656445728029009869863859
7987628380245881715*e^(135*I*c) + 40234969226612115893400358283942878511690
4903936409545602519219664720*e^(134*I*c) + 56117081076341175384087570185188
538660375932013674735519055227368366*e^(133*I*c) + 765901052018754965177711
8357676871927081898989131125755798204236112*e^(132*I*c) + 10225364374682967
37293065862705246449693687415559865844306888705423*e^(131*I*c) + 1334902100
52026183779673313868332303530332906163247194627808410304*e^(130*I*c) + 1703
3886027390615741040977721655541665612162275485028584310890417*e^(129*I*c) +
 2123702969188871318266718781223927067839949015727293884065388080*e^(128*I*
c) + 258585348715977270155829115684193411072034541491364393985491350*e^(127
*I*c) + 30736217404321009965231037419663053962881035281709221697785072*e^(1
26*I*c) + 3564764890628724017088487996688178929195787613958545474804845*e^(
125*I*c) + 403212225957798188840846139960995624144491271694336796459584*e^(
124*I*c) + 44456708175258821024400946210535004523775722190977468484496*e^(1
23*I*c) + 4775398607100853263534207733818266777478693412738731031680*e^(122
*I*c) + 499467506558531733671585862910572702811545035730398749530*e^(121*I*
c) + 50836369508171099437019348610847391946736185108017183136*e^(120*I*c) +
 5032024903401451824074213943766011922026507006311982753*e^(119*I*c) + 4840
93410240488718655917025303662581091659126182344528*e^(118*I*c) + 4523094003
9830738332025694784646206844854827698075736*e^(117*I*c) + 41015454399371957
93959956708442496709433800261224880*e^(116*I*c) + 3606886130363893494138097
80004559963548775423325255*e^(115*I*c) + 3073536651283056216099116633849005
7308062762518496*e^(114*I*c) + 25356674606502797768345615661865912131092516
42859*e^(113*I*c) + 202347509724462171313966643580234078508179838320*e^(112
*I*c) + 15603911277687607099721623771744933086920587272*e^(111*I*c) + 11615
81413733971751533622511909046917188768400*e^(110*I*c) + 8338083991183789445
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c) + 24489837337812338687718622491865013839488*e^(106*I*c) + 15006027479373
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0256*e^(104*I*c) + 4939666610818025798809586352543471345*e^(103*I*c) + 2644

1037578031074251809932641968504 0*e^(102*I*c) + 13477227799524701956579274210395326*e^(101*I*c) + 652650253343206047453620559993840*e^(100*I*c) + 29952547749265499675257842032197*e^(99*I*c) + 1299146645993240318167826532288*e^(98*I*c) + 53090127264630963470039804475*e^(97*I*c) + 2037031259470368160131922320*e^(96*I*c) + 73099207817335597247098038*e^(95*I*c) + 244245562989450 2983849104*e^(94*I*c) + 75599817092670157806639*e^(93*I*c) + 2154864144781257856128*e^(92*I*c) + 56169444526926562260*e^(91*I*c) + 1327882849274858880*e^(90*I*c) + 28186192554792138*e^(89*I*c) + 530563624556832*e^(88*I*c) + 8718181624155*e^(87*I*c) + 122503723056*e^(86*I*c) + 1431118260*e^(85*I*c) + 13343760*e^(84*I*c) + 93096*e^(83*I*c) + 432*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) + 7*(3718*I*a*e^(1055/2*I*c) + 1502072*I*a*e^(1053/2*I*c) + 302667508*I*a*e^(1051/2*I*c) + 40557446072*I*a*e^(1049/2*I*c) + 4065883968718*I*a*e^(1047/2*I*c) + 325270717497440*I*a*e^(1045/2*I*c) + 21630502713590407*I*a*e^(1043/2*I*c) + 1229848582862122028*I*a*e^(1041/2*I*c) + 61031235925186078942*I*a*e^(1039/2*I*c) + 2685374380786193144783*I*a*e^(1037/2*I*c) + 106072288048110242178847*I*a*e^(1035/2*I*c) + 3799316499692185181122010*I*a*e^(1033/2*I*c) + 124427615396355739905346318*I*a*e^(1031/2*I*c) + 3751971173605702746328148447*I*a*e^(1029/2*I*c) + 104787194996399169411032876338*I*a*e^(1027/2*I*c) + 2724467073052261042519716192524*I*a*e^(1025/2*I*c) + 66238605830373986929763608958656*I*a*e^(1023/2*I*c) + 1511798772310987071825034633753982*I*a*e^(1021/2*I*c) + 32503673727084640393745736284624870*I*a*e^(1019/2*I*c) + 660337796066223079759666054299242200*I*a*e^(1017/2*I*c) + 12711502667519783895793526074473028922*I*a*e^(1015/2*I*c) + 232438908235205496318447910669140546906*I*a*e^(1013/2*I*c) + 40465501381361027621739941482493307600 39*I*a*e^(1011/2*I*c) + 672079208644143772696713081071981469139 08*I*a*e^(1009/2*I*c) + 1066925768074551295828818005563441210737450*I*a*e^(1007/2*I*c) + 16217272150903922938701499630023289700137263*I*a*e^(1005/2*I*c) + 236397937497882482710239205369322834941776795*I*a*e^(1003/2*I*c) + 33095712809750225804649773985269089859263995 72*I*a*e^(1001/2*I*c) + 4456101594458280713128835150818854168836802523 8*I*a*e^(999/2*I*c) + 577756662739414343075056408130898651215560673415*I*a*e^(997/2*I*c) + 7221958933791063354338252758241260927009958649153*I*a*e^(995/2*I*c) + 87129449619720167774738382114174206125338079715514*I*a*e^(993/2*I*c) + 1015602782766756961606511195529506434692326161772148*I*a*e^(991/2*I*c) + 11448615033797091963830678407271581987220664774793965*I*a*e^(989/2*I*c) + 124924617648249630854756820327923512635952856544140745*I*a*e^(987/2*I*c) + 13206319777820792138551258325108244381849065532253448 70*I*a*e^(985/2*I*c) + 13536481494846551191615296983753871336900108337339193172*I*a*e^(983/2*I*c) + 134633157060182506966654568330522152247118398756303435361*I*a*e^(981/2*I*c) + 1300273357577878235630889983970871898843384241082917039402*I*a*e^(979/2*I*c) + 12202570846936266971537615599091003952667395073528912708550*I*a*e^(977/2*I*c) + 111348517556517214393482430347520024901285561594013324999952*I*a*e^(975/2*I*c) + 988558176286135607113625950318361683964799348363993276036638*I*a*e^(973/2*I*c) + 854397317291885171975646922292940844403707872415345487212039 0*I*a*e^(971/2*I*c) + 719283914977642771344899122028103409927212495925461216682254 32*I*a*e^(969/2*I*c)

+ 590140317836783451582400841140547729023595019680165231818378300*I*a*e^(9
67/2*I*c) + 472112769828475117988655875366120645311034456945741674598695992
2*I*a*e^(965/2*I*c) + 36845368836912452238557505487949108946286792376090329
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819236270425814926625403183922898905657641898587425*I*a*e^(957/2*I*c) + 107
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55/2*I*c) + 747385221429320013966356671106061647673665642790216192401997745
384178*I*a*e^(953/2*I*c) + 507360956426058871091645301670256403257182961855
0956017565632914253964*I*a*e^(951/2*I*c) + 33696528711624679729779900093828
724600659229836591195133199888046174281*I*a*e^(949/2*I*c) + 219028190068671
998320108302544300443107574826644022160996792142204598852*I*a*e^(947/2*I*c)
+ 139382114454752543408039015371282273892674605987137265975849195401323329
8*I*a*e^(945/2*I*c) + 86865301785929212547861748564018230685225010116560892
37471028876240107552*I*a*e^(943/2*I*c) + 5303381040819430221339665282353347
1045170883965946504040578005764694599600*I*a*e^(941/2*I*c) + 31729021076364
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I*c) + 18607301533322845281669011266356440294790601303432734303820986034786
77010682*I*a*e^(937/2*I*c) + 1069927075056886003621531104874832846231594041
0814407912532812583183629052968*I*a*e^(935/2*I*c) + 60337325392389346145064
651977945597823054838103742220792252383582775469810852*I*a*e^(933/2*I*c) +
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348*I*a*e^(931/2*I*c) + 181209812355209134122859319086377552282084081229556
2814006136853589089587942200*I*a*e^(929/2*I*c) + 96551847295473445261451790
60259293352161226916523506102065806057011468972500972*I*a*e^(927/2*I*c) + 5
050461890156366422569498902036204366640175781326103263638443513502027085836
2828*I*a*e^(925/2*I*c) + 25941335757606125914021211615794333861772719757999
9426945148843639870850445567092*I*a*e^(923/2*I*c) + 13087005273027426033328
30336012830403130678747327429168347765689867244859352037688*I*a*e^(921/2*I*
c) + 6485865431691803112160646709240463402571992800370597824291437072623168
391271067612*I*a*e^(919/2*I*c) + 315838790301413954589785078831270108407496
05603852763144372466905813381411392911500*I*a*e^(917/2*I*c) + 1511542355639
77220379337165749623108778682727639486653007034770480329113314879178190*I*a
*e^(915/2*I*c) + 7110781443821491119523461206295008615761718920341905984534
44253505004747647977121920*I*a*e^(913/2*I*c) + 3288810369087482330767112497
943810956913958488942225831844466822949439789604958354380*I*a*e^(911/2*I*c)
+ 1495769839808338364787283631673850411635744405046184462222202155412291218
89145127946510*I*a*e^(909/2*I*c) + 6690719028311938845951714357481243168602
2847054878088870420694345689435187958917420750*I*a*e^(907/2*I*c) + 29440035
771426987261240090861331027791142352406441607584926398059657246046789310155
1780*I*a*e^(905/2*I*c) + 12744849616363934710260475797795104848000108814414
52922706122811798463818843113785401980*I*a*e^(903/2*I*c) + 5429167275423972
41437011813815142606113556096196250085913601894114770264832855561732510*I*
a*e^(901/2*I*c) + 227616207014150998824942862057363907088639144103903695744

311032521892399941563646388002240*I*a*e^(899/2*I*c) + 9393166846586109729576
76693971939783481227937797580720335327624110993550527449647460767 20*I*a*e^(
897/2*I*c) + 381614982565049382985487723995475106325921254447944758076508 52
8236388846570076902279935560*I*a*e^(895/2*I*c) + 152653655744022772632359 25
863032479244864187094080539130974452266701377998814537098802883 60*I*a*e^(89
3/2*I*c) + 601339340351409082550343975633802324824311347262100489486073643 5
704687187297040948536876280*I*a*e^(891/2*I*c) + 233304558129349191097882697
1454644283908372281478095052979676445878280533632029051609278308 0*I*a*e^(88
9/2*I*c) + 891614354024715746833105670830055000797948846843614217708248442 1
221044135844035125795808002 0*I*a*e^(887/2*I*c) + 335690162745234406897229 52
306357800187992714315613796580609367280150561989873665145003393808 0*I*a*e^(
885/2*I*c) + 124527128456591689098616311211092805496806563010157154297643 93
548482120201392497441723861911 90*I*a*e^(883/2*I*c) + 4552057982199619540279
66989161116897266451246992227330435029563064906844994766165485985152064 0*I*
a*e^(881/2*I*c) + 163992260136891349729894299620340638416069451379678962703
1679099585811997955455079925728180522 0*I*a*e^(879/2*I*c) + 582321284151398 2
124122237392489397976319502585987471058025816607404370962195102151099211024
7670*I*a*e^(877/2*I*c) + 203833917249479010348969211162349235042121946911 97
22088673185810541223946965046600303202801307 50*I*a*e^(875/2*I*c) + 70341919
587773492725310001749344921533076170368888054865460547307543808507085678144
9196376998400*I*a*e^(873/2*I*c) + 239344956931123638090578121707109045258 42
77899938154423296264450695311329160730644154303696630780*I*a*e^(871/2*I*c)
+ 803070782591103975090175005660880931482571278326264685078862029556171986 6
426138714811018171607190*I*a*e^(869/2*I*c) + 265735099311760349618670131544
115731745198269463306465727402756230582911184472753753824374476502 50*I*a*e^
(867/2*I*c) + 867270492914981311948002649555955510933975288970545515623372 3
2229710003919599925462196648416340420*I*a*e^(865/2*I*c) + 279199566187607 73
479939843263385517087391181042116372426801045309405045403008286747750106379
9585760*I*a*e^(863/2*I*c) + 886691182947269589704768650597871289954494048 48
479690905773574060752253415308699408885709991030749 0*I*a*e^(861/2*I*c) + 27
782384340301503899120042899788923689395374534865525214744171599877957986345
730429592676846849563 30*I*a*e^(859/2*I*c) + 858909024593856905720549689453 7
381121736556805993399422069994412586113650715896554879518565545033500*I*a*e
^(857/2*I*c) + 262026661413661375338099973457430738047247625045775712054342
620577865059821687785945889988438430641 60*I*a*e^(855/2*I*c) + 788866885356 9
301772976372386996960872957847756217810018625170780365459522799553124515584
1610652335370*I*a*e^(853/2*I*c) + 234401451771836384905885411514199002779 89
260986134788228744397382430271359037999413957119674326952520 0*I*a*e^(851/2*
I*c) + 687468451828804461383475161107226172541378472469340108548453628584 35
675756411758260237637661975627390 0*I*a*e^(849/2*I*c) + 199029717646465954 83
323913003343478420699085784238326795342038763677234330924407660994509222940
77090680*I*a*e^(847/2*I*c) + 568842131239567528255897273246110583858679783 4
128682182058119235866037766500737528636435864135629276280*I*a*e^(845/2*I*c)
 + 160512736936774650149178398393766191845774391311876711661390849790898584
300968943529601152263089657707 60*I*a*e^(843/2*I*c) + 447203996229481968238 7

3997189864500160905696730195693098411725777718941421992979705222376960904470111160*I*a*e^(841/2*I*c) + 1230308681569227230567907583663183104721406047219794742522971352728225299313263681089943848501892692223 20*I*a*e^(839/2*I*c) + 3342472635295327867879679639440181533908952990806256501626250333013874150896702095192170324673216033260 80*I*a*e^(837/2*I*c) + 8968079510351144781405849221292016664142568920540244247793212952782701566318527057628719142722919038415 70*I*a*e^(835/2*I*c) + 2376515626265254391529004017289894121567531963746389965701709262550375668882879011912393122776372223417220*I*a*e^(833/2*I*c) + 6220463245033442486970965431823733752822029473563015032522697711385753292200817503166820643981171972227740*I*a*e^(831/2*I*c) + 1608333862845013203592048799562408252551671481681457581790051564857661546680776210700068582767687661504 7090*I*a*e^(829/2*I*c) + 4108006470987728373488758428687061518790918693849433575486340974774675875056117074551069275301945325623 0130*I*a*e^(827/2*I*c) + 1036613634386302978611085100021449663947095828207642709799823773144376222057548416303601526613027645146270 60*I*a*e^(825/2*I*c) + 2584416495444750810510861706726246023531809577055644946857672840291363089085838377972617930421117678294414 40*I*a*e^(823/2*I*c) + 6366434300683097077968230787104728343070984299491341306256440127835542106218143339286757932072710031100611 70*I*a*e^(821/2*I*c) + 1549694391768761128592967063621430958216779311092063070007956011152720640113716781139083032984676774287045 220*I*a*e^(819/2*I*c) + 3727685690743909795581760930725419308750587813165730468793831046647131796121280952242102308634280498612910 500*I*a*e^(817/2*I*c) + 8861410362893548513378543661666922979212879162546855368943021122572517216952715322579460798697748541783361 640*I*a*e^(815/2*I*c) + 2081916009657441298952351526902094940934436381403124863224816590166089265933322581676907490783064713110697 3820*I*a*e^(813/2*I*c) + 4834442227195716721152837803763163178580477152345267838303822492381652520800188361789095602857151741230025 7380*I*a*e^(811/2*I*c) + 1109629406830899391197849268090983501962672052930979339345063619934366713670928774398984623381132256232091 68660*I*a*e^(809/2*I*c) + 2517579247104576529840431568873409877749976584406880864919225501513367374236229043169905497285032885002420 1000*I*a*e^(807/2*I*c) + 5646596581438170762044322139447252853460437375986442388241838825462330101765332166919737680661470984187775 61124*I*a*e^(805/2*I*c) + 1252025659809341407225419006492626474816512541093036664002973216176119522637183550660057342417535420038395747756*I*a*e^(803/2*I*c) + 2744647922103967450665351528912445338508431734532977339258924354632418413755714066126762594816764534577943660024*I*a*e^(801/2*I*c) + 5948818874517551546477323998145990545303752046100553906871359525091394365290552015395275569402480394903253981466*I*a*e^(799/2*I*c) + 1274879005945457009494457535689118330635567251508011330253950418930158004493113195149267737144009192394740112 4164*I*a*e^(797/2*I*c) + 2701621072515344146131402425368020110690494127021479232055469033618750854315350522823645075427649551269274390028 0*I*a*e^(795/2*I*c) + 5661349645067130709246299781120077038786686136341846644822749132840904128723309609460767015859184299521231578081 6*I*a*e^(793/2*I*c) + 1173216494136888055414895357694946238706921985189388208419194553749465160307432733514887547024680324066990779527 54*I*a*e^(791/2*I*c) + 2404480664442

682761506575826002828067368822994750069297738676402780822094763851988328161
86325534733945931054736716*I*a*e^(789/2*I*c) + 4873841845455178280482923772
748897649246318640660545975185605943062960388546214085876153066103652693862
95410913209*I*a*e^(787/2*I*c) + 9771256963671587818799358030849281831105880
96954532024018846643158415313905036398953539486071073924163775202836156*I*a
*e^(785/2*I*c) + 1937670525270251509451678468483387984129872967538542952639
048449569636581336018975500784323892713878389595738475570*I*a*e^(783/2*I*c)
 + 380085564339950552006945359441097202809886841034624857583774647610675563
8552361174314174233599317030879593032072609*I*a*e^(781/2*I*c) + 73752379140
960757531627571651149329071427637153198268415895920043297735615803201899778
59708165438687906157904775921*I*a*e^(779/2*I*c) + 1415744965554083603782800
596978680017663186415185687663471354760534152053881202685002666696858454157
5064351905970774*I*a*e^(777/2*I*c) + 26886193720919073370988929546745045319
078132873757042641225271946983029782743313786423870951765027326861300318178
642*I*a*e^(775/2*I*c) + 505160955717702736706806587300544605277632593563199
78317789374345400938440125042061448809087158872073418586148121473*I*a*e^(77
3/2*I*c) + 9390898020895608111079154395177298537060051758626224909583298638
9557258513757169577939649993369495960643164181810586*I*a*e^(771/2*I*c) + 17
273566488445603306360601669285674942612864469412311812674186989450026951570
2878867401279635331386515415677529225100*I*a*e^(769/2*I*c) + 31439455994569
196942673011891429924377737090055813308324026642179471596698281030429147032
8806778764207633221621542600*I*a*e^(767/2*I*c) + 56624796774753920331645228
162081727228166630708266001409626784945725116717748737473906897305871977817
5038716340060846*I*a*e^(765/2*I*c) + 10092468082154467737864703510655041684
790076631314584516329625276213361160951940611927416365969707450817635456495
24358*I*a*e^(763/2*I*c) + 1780195287370357324046533363473674962784595946909
397017548451036643167283461157097955927272971697034280841666570691552*I*a*e
^(761/2*I*c) + 310769128909224508659422391428849640538991238991098383608782
8161704430807791962044864438637368112933607786892490134694*I*a*e^(759/2*I*c
) + 53694337037136505796575434219256212737798960954931240940583688970751921
79929265569591470701092735447407195008016032850*I*a*e^(757/2*I*c) + 9182478
844644152792789990874629586776827818503877874267474333149197309164002316988
444567545080601139568783596754328769*I*a*e^(755/2*I*c) + 155436391595087510
190621822992589087995698198761329851607046753571663443122575010692378303606
98174149396040851872785700*I*a*e^(753/2*I*c) + 2604517728791224117606722292
090185385131355463680913820822536427242714619704180385209039553363359558766
9906282640335206*I*a*e^(751/2*I*c) + 43202050357851481166487014480064062972
447184469570109898781666839150161921519823032876311654002974726935391777697
053449*I*a*e^(749/2*I*c) + 709421728625611640581601798688187324197887347397
52023491932850774923156332944622492598440157306713277485913625566923405*I*a
*e^(747/2*I*c) + 1153316333995452947841167158723660460399964394192173398102
53656785321781700967045714777723718363358804096119332434747204*I*a*e^(745/2
*I*c) + 1856338052193508151975063509039775571072522772272193617094599014377
19214218026047853241796305910447871730808241890424442*I*a*e^(743/2*I*c) + 2
958361919775553375165027590471463400880636838531233420021233011181805229533

1488014681618388811306152393871387294061404 9*I*a*e^(741/2*I*c) + 4668229636
77192661817331692307767055928258847749833780466192188737545805803679028894 4
2781737558383720511980904068701293 5*I*a*e^(739/2*I*c) + 7294255522218743274
86638200118763924277143204037696136287769063944888833152008172511657111399 0
79703659693540539407822870*I*a*e^(737/2*I*c) + 1128648994213736556251579671
17953517361089136762957252198888568870846400269859385355686354562861103598 3
085337507604532900*I*a*e^(735/2*I*c) + 1729447705921426376008863665438676 27
29080567200728007203192061357574554974641444591901300987660516243622052457 5
8670207771*I*a*e^(733/2*I*c) + 262450957650356159092094085930549010552929 17
19205556945813050948090098978078963007543424661010613712700954897972362495 1
83*I*a*e^(731/2*I*c) + 394459845579235584131438630869091688616597117378012 5
829080793206506479844522630226009379806916943877620012485276018469226*I*a*e
^(729/2*I*c) + 587209681439462756838122821830313672498025602075998707582373
490314126049618063678576418566834872106875511979192516934906 0*I*a*e^(727/2*
I*c) + 865847432074876885017637736012949316088401604335017906938799450933 92
40513007513825644052150379909781184428932642325725991*I*a*e^(725/2*I*c) + 1
26464728874003373368658042722413436818510114448218997812245396884510758090 0
3555323364506814180545559579259228045710226754*I*a*e^(723/2*I*c) + 18297829
56439305606836649875274920512367273492919051367157299055494399510522146451 7
636015940848250377045895323290805291610*I*a*e^(721/2*I*c) + 262273373681811
22629870644431505178710075760072638475630349956011587927854248611384364726 5
03701818181005210900229213259176*I*a*e^(719/2*I*c) + 37243949803734374379 89
76414117862306566829323429902993434882550972030299097519641652214481076340 4
0170424408865199063339150*I*a*e^(717/2*I*c) + 523994448097076664649350575 28
39643070619071693319360872460041164232215889290410408316872754499929098793 5
418056417609518886*I*a*e^(715/2*I*c) + 730448554447480590424433053403380466
58849426364699492056128256421114683299164503187828529907449597255183049531 0
17656578288*I*a*e^(713/2*I*c) + 100894427492465881820210044031354389458531 2
64949990986092717952767059066556238006964732168345689798172734718844455513 85
01852*I*a*e^(711/2*I*c) + 138096263303296549257873301446946161929200832100 7
30252243863138612640918600095174736177924532345923756979943811207087709274*
I*a*e^(709/2*I*c) + 187308050497359467244546032059914316902021455289947469 4
0721984766457549536142359784861129373935423638733238122031002710577 5*I*a*e^
(707/2*I*c) + 251775360161376084897377488801495137606634320723225849432463 8
9292456748698697294532093378059995386993802345742205203350731 0*I*a*e^(705/2
*I*c) + 335408954754216210698116053661748898877578992418661064723049500934 0
910869502048588189418918412284528263843962544035648580 74*I*a*e^(703/2*I*c)
+ 442856413396521685634819129417520745967270283601088862463141874230502485 1
1809955041742945404738378747902288373773814190164 7*I*a*e^(701/2*I*c) + 5795
62225293042134407748296189730817948676123423392101712466430684150787138154 3
70408270217791597537521052690534681094777663*I*a*e^(699/2*I*c) + 7518094061
82173515834474930999752929931175527190042528290750068342500184719150415256 8
910208720368633195667940063613957951 66*I*a*e^(697/2*I*c) + 9667347632003620
88911450996294781727509924930263355610929302899030544704282021262539760395 2
29496521149023170036904352367324*I*a*e^(695/2*I*c) + 12323092909488536424 78

779356200855608165835829939280659113065568855963832114039518667176894361073
1441525657378317713545675 11*I*a*e^(693/2*I*c) + 155727495436368849740809282
622962881511779901100968162403874164375317048415351692124603433127829224961
40572359948343091120 40*I*a*e^(691/2*I*c) + 195102942862552115914870227220 73
896999703240702954760965147071969958549176437705022689413012841379027206519
5608345951414065 4*I*a*e^(689/2*I*c) + 242345133480565914733311284208599537 8
215913508185525364517506002076374528501708818302719553446763078559382901836
261131889256*I*a*e^(687/2*I*c) + 2984660216071444351193200479418363747960 06
189952807806241426555429503350783653868741903462659160835147617535958410300
1344444*I*a*e^(685/2*I*c) + 364470798472632184488567136321081097906621014 08
135898119570975686541543655005563109602221104625941908636979666593578443373
76*I*a*e^(683/2*I*c) + 441320182176666215112684059021209690173516855092646 0
047580408375275922493840723935067411387358998419396880158733328711475814*I*
a*e^(681/2*I*c) + 5298862449543759597665069811780790519400401696878530875 24
745232464704103785843418781532545568922075288983670291261111147 3360*I*a*e^(
679/2*I*c) + 63090261753268113091232023004810885394848807487565510609416786
755744263262001097287540250770895322889106570778945437050087 76*I*a*e^(677/2
*I*c) + 744910389926207712507533930739305232743825202785942817072257714932 6
0263221735993181481570482863335198293566588943405947081 84*I*a*e^(675/2*I*c)
 + 87220151109116905494649970042987671375105193524769158117446698921794402 8
476841355922003843154241308862296699142382577710257 6*I*a*e^(673/2*I*c) + 10
127619431129011132568831044458030828342168964659395668911086917559825727413
834246532010534829987050611067023384522066422504*I*a*e^(671/2*I*c) + 116621
721287113775623081275464904387561265635691715398279728365116272190405650514
20359980715312969450565938144063714770162456*I*a*e^(669/2*I*c) + 1331783289
024115953719020194616289988274680832676196244032018659335347393024662993325
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852832003622428437181937942160447280*I*a*e^(665/2*I*c) + 169383108321788315
328224908911992318211090534603819353969400959615014870417348228553764658298
35686556578407011793714960124040*I*a*e^(663/2*I*c) + 1886390647561849904298
602158370940049324669107137148272999801953562407107456219365005342662739942
5629073637844277644750153560*I*a*e^(661/2*I*c) + 20832036685733290936554232
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867452727621615078639620*I*a*e^(659/2*I*c) + 228109728768832112861226947200
452801717005347578847484909274849172402001479999238145672925078059998608030
53865524582364804000*I*a*e^(657/2*I*c) + 247646717746537943274318671614025 8
350993645025128252023552546881311609225086246271968388102335533866049991665
9181180349795560*I*a*e^(655/2*I*c) + 266533825990726397239367472832051075 68
409577917833406937668499133744429065300055240571508425036429118321680964755
361170389060*I*a*e^(653/2*I*c) + 28434450046604756977423509538203693350662 2
815398038020363854447518908334625719628608969747499548724579999034376142343
19146820*I*a*e^(651/2*I*c) + 300632969035469927158522289443751171965033991 6
089933982796273775661839339678080681892441114527698849608048047142250189621
8680*I*a*e^(649/2*I*c) + 314945605489678884045694119243396033946454190667 27

6054959888073277519849632324319402072372653886947461799317626888368788OO840
*I*a*e^(647/2*I*c) + 32683348865778325383130633237123959605735110544382O865
277029467261982581844978689729188962666418107273682423898130540301332 20*I*a
*e^(645/2*I*c) + 33586573719970621049497373930899914380057884866044983148 88
2154444047223976314449935079172544297165302150135561996418042983120*I*a*e^(
643/2*I*c) + 341643146548968764888242340335859720123366149586146364443412O7
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2*I*c) + 34381162126696627622627472821856495333522147075887509654873323 5685
2594477249181011143021864933840062216754743446152382927976O*I*a*e^(639/2*I*
c) + 342074886829748944745010462946006975972275383016531947971600026826 8166
5876148402637025420428006347009046317545272979001609440*I*a*e^(637/2*I*c) +
 3362059800860642320065405835203109381204271641886196132548531623441364 0793
57132777983098647114206160213435065089984965127776O*I*a*e^(635/2*I*c) + 326
0570562493984368249519525323282852405382671584841665164588903592145893 55554
870289334181233736147717949313304643991942352 80*I*a*e^(633/2*I*c) + 3115671
098675850865478930894959500663968721006727579966185608726985147258975946778
7944734060267442519580376947726659750489880*I*a*e^(631/2*I*c) + 29276728416
1889205577684072460752936518203323962297535212206053726792277011045692381 38
367698160209738275122467287662716467440*I*a*e^(629/2*I*c) + 269783533054007
5204132238241105265397459178974674614460673424046094226008984226020795776 45
73547124064623860447428875078078740*I*a*e^(627/2*I*c) + 2428364982971821457
3184622819933357566640667465224584537983216949953990806998169501947418479 23
3595645585727784516401446933600*I*a*e^(625/2*I*c) + 2122385655536659350820 2
7651489126141273035838774029648360470058377667192803315575004118751092544 34
779078342142082375611830200*I*a*e^(623/2*I*c) + 1783881634763418399500878 97
8120980639708316604100584083836129752275423082727443111701233174486348265 27
46434258554498280368660*I*a*e^(621/2*I*c) + 1417614648880175020673955979043
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9668823221101795780*I*a*e^(619/2*I*c) + 102901735776079623158647454876539 37
0409934071882261894818254771841228289554144994773901247200610446847307138 65
172442389148000*I*a*e^(617/2*I*c) + 624066536020923017353937698209763856593
1505633307111317088860051758667202789082506902842938152720706278974386615 87
6935528840*I*a*e^(615/2*I*c) + 20913979700860537588126193141320743146337689
1500282663716445986837485783622971535371248779286981986318646310491771662 12
00020*I*a*e^(613/2*I*c) - 209139797008605375881261931413207431463376891500 2
8266371644598683748578362297153537124877928698198631864631049177166212000 20
*I*a*e^(611/2*I*c) - 62406653602092301735393769820976385659315056333071113 1
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e^(609/2*I*c) - 1029017357760796231586474548765393704099340718822618948182 5
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07/2*I*c) - 1417614648880175020673955979043846680820739337726522244522474 47
509405105716529542169443074862888638845492896688232211O1795780*I*a*e^(605/2
*I*c) - 178388163476341839950087897812098063970831660410058408383612975227 5
42308272744311170123317448634826527464342585544982 80368660*I*a*e^(603/2*I*c
) - 212238565553665935082027651489126141273035838774029648360470058377667 19

2803315575004118751092544347790783421420823756118302OO*I*a*e^(601/2*I*c) -
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981695019474184792335956455857277845164014469336OO*I*a*e^(599/2*I*c) - 2697
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80*I*a*e^(575/2*I*c) - 28434450046604756977423509538203693350662281539803 80
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*a*e^(573/2*I*c) - 2665338259907263972393674728320510756840957791783340693 7
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^(571/2*I*c) - 247646717746537943274318671614025835099364502512825202355254
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9/2*I*c) - 2281097287688321128612269472004528017170053475788474849092748491
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I*c) - 208320366857332909365542322845342561250116270997303023184192557002 97
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 - 188639064756184990429860215837094004932466910713714827299980195356240710
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376*I*a*e^(541/2*I*c) - 298466021607144435119320047941836374796006189952807
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*a*e^(539/2*I*c) - 24234513348056591473331128420859953782159135081855253645
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(537/2*I*c) - 1951029428625521159148702272207389699970324070295476096514707
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2*I*c) - 155727495436368849740809282622962881511779901100968162403874164375
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*c) - 372439498037343743798976414117862306566829323429902993434882550972030
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*I*a*e^(493/2*I*c) - 172944770592142637600886366543867627290805672007280072
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c) - 729425552221874327486638200118763924277143204037696136287769063944888 8
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229636771926618173316923077670559282588477498337804661921887375458058036790
288944278173755838372051198090406870129 35*I*a*e^(485/2*I*c) - 2958361919775
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^(475/2*I*c) - 260451772879122411760672229209018538513135546368091382082253
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c) - 155436391595087510190621822992589087995698198761329851607046753571663 4
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^(461/2*I*c) - 566247967747539203316452281620817272281666307082660014096267849457251167177487374739068973058719778175038716340060846*I*a*e^(459/2*I*c)
- 314394559945691969426730118914299243777370900558133083240266421794715966982810304291470328806778764207633221621542600*I*a*e^(457/2*I*c) - 172735664884456033063606016692856749426128644694123118126741869894500269515702878867401279635331386515415677529225100*I*a*e^(455/2*I*c) - 93908980208956081110791543951772985370600517586262249095832986389557258513757169577939649993369495960643164181810586*I*a*e^(453/2*I*c) - 50516095571770273670680658730054460527763259356319978317789374345400938440125042061448809087158872073418586148121473*I*a*e^(451/2*I*c) - 26886193720919073370988929546745045319078132873757042641225271946983029782743313786423870951765027326861300318178642*I*a*e
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- 7375237914096075753162757165114932907142763715319826841589592004329773561580320189977859708165438687906157904775921*I*a*e^(445/2*I*c) - 3800855643399505520069453594410972028098868410346248575837746476106755638552361174314174233599317030879593032072609*I*a*e^(443/2*I*c) - 1937670525270251509451678468483387984129872967538542952639048449569636581336018975500784323892713878389595738475570*I*a*e^(441/2*I*c) - 977125696367158781879935803084928183110588096954532024018846643158415313905036398953539486071073924163775202836156*
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c) - 240448066444268276150657582600282806736882299475006929773867640278082209476385198832816186325534733945931054736716*I*a*e^(435/2*I*c) - 117321649413688805541489535769494623870692198518938820841919455374946516030743273351488754702468032406699077952754*I*a*e^(433/2*I*c) - 56613496450671307092462997811200770387866861363418466448227491328409041287233096094607670158591842995212315780816*I*a*e^(431/2*I*c) - 27016210725153441461314024253680201106904941270214792320554690336187508543153505228236450754276495512692743900280*I*
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- 5948818874517551546477323998145990545303752046100553906871359525091394365290552015395275569402480394903253981466*I*a*e^(425/2*I*c) - 2744647922103967450665351528912445338508431734532977339258924354632418413755714066126762594816764534577943660024*I*a*e^(423/2*I*c) - 1252025659809341407225419006492626474816512541093036664002973216176119522637183550660057342417535420038395747756*I*a*e^(421/2*I*c) - 564659658143817076204432213944725285346043737598644238824183882546233010176533216691973768066147098418777561124*I*a*e^(419/2
*I*c) - 25175792471045765298404315688734098777499765844068808649192255015133673742362290431699054972850328850024201000*I*a*e^(417/2*I*c) - 110962940683089939119784926809098350196267205293097933934506361993436671367092877439898462338113225623209168660*I*a*e^(415/2*I*c) - 48344422271957167211528378037631631785804771523452678383038224923816525208001883617890956028571517412300257380*I*a*e^(413/2*I*c) - 20819160096574412989523515269020949409344363814031248632248165901660892659333225816769074907830647131106973820*I*a*e^(411/

2*I*c) - 886141036289354851337854366166692297921287916254685536894302112257
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439097955817609307254193087505878131657304687938310466471317961212809522421
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220*I*a*e^(405/2*I*c) - 636643430068309707796823078710472834307098429949134
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*I*a*e^(391/2*I*c) - 896807951035114478140584922129201666414256892054024424
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8998843843064160*I*a*e^(369/2*I*c) - 858909024593856905720549689453738112 17
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*I*c) - 277823843403015038991200428997889236893953745348655252147441715998 7
795798634573042959267684684956330*I*a*e^(365/2*I*c) - 886691182947269589704
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I*c) - 80307078259110397509017500566088093148257127832626468507886202955617
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 - 891614354024715746833105670830055000797948846843614217708248442122104413
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 - 381614982565049382985487723995475106325921254447944758076508528236388846
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*e^(317/2*I*c) - 149576983980833836478728363167385041163574440504618446222\2
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*a*e^(307/2*I*c) - 648586543169180311216064670924046340257199280037059782\42
914370726231683912710676\12*I*a*e^(305/2*I*c) - 130870052730274260333283033\6
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 - 181209812355209134122859319086377552282084081229556281400613685358908958

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68*I*a*e^(289/2*I*c) - 1860730153332284528166901126635644029479060130343273
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2*I*c) - 507360956426058871091645301670256403257182961855095601756563291425
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I*c) - 280652360464451397168371434304010585830771241743956318553252853554*I
*a*e^(263/2*I*c) - 36845368836912452238557505487949108946286792376090329160
029006801*I*a*e^(261/2*I*c) - 472112769828475117988655875366120645311034456
9457416745986959922*I*a*e^(259/2*I*c) - 59014031783678345158240084114054772
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8517556517214393482430347520024901285561594013324999952*I*a*e^(249/2*I*c) -
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*c) - 1300273357577878235630889983970871898843384241082917039402*I*a*e^(245
/2*I*c) - 134633157060182506966654568330522152247118398756303435361*I*a*e^(
243/2*I*c) - 13536481494846551191615296983753871336900108337339193172*I*a*e
^(241/2*I*c) - 1320631977782079213855125832510824438184906553225344870*I*a*
e^(239/2*I*c) - 124924617648249630854756820327923512635952856544140745*I*a*
e^(237/2*I*c) - 11448615033797091963830678407271581987220664774793965*I*a*e
^(235/2*I*c) - 1015602782766756961606511195529506434692326161772148*I*a*e^(
233/2*I*c) - 87129449619720167774738382114174206125338079715514*I*a*e^(231/
2*I*c) - 7221958933791063354338252758241260927009958649153*I*a*e^(229/2*I*c
) - 577756662739414343075056408130898651215560673415*I*a*e^(227/2*I*c) - 44
561015944582807131288351508188541688368025238*I*a*e^(225/2*I*c) - 330957128
0975022580464977398526908985926399572*I*a*e^(223/2*I*c) - 23639793749788248
2710239205369322834941776795*I*a*e^(221/2*I*c) - 16217272150903922938701499
630023289700137263*I*a*e^(219/2*I*c) - 106692576807455129582881800556344121
0737450*I*a*e^(217/2*I*c) - 67207920864414377269671308107198146913908*I*a*e
^(215/2*I*c) - 4046550138136102762173994148249330760039*I*a*e^(213/2*I*c) -

2324389082352054963184479106691405469 06*I*a*e^(211/2*I*c) - 12711502667519 78389579352607447302892 2*I*a*e^(209/2*I*c) - 660337796066223079759666054299 242200*I*a*e^(207/2*I*c) - 3250367372708464039374573628 4624870*I*a*e^(205/2 *I*c) - 1511798772310987071825034633753982*I*a*e^(203/2*I*c) - 662386058303 7398692976360895 8656*I*a*e^(201/2*I*c) - 2724467073052261042519716192524*I* a*e^(199/2*I*c) - 1047871949963991694110328763 38*I*a*e^(197/2*I*c) - 375197 1173605702746328148447*I*a*e^(195/2*I*c) - 1244276153963557399053 46318*I*a* e^(193/2*I*c) - 37993164996921851811220 10*I*a*e^(191/2*I*c) - 1060722880481 10242178847*I*a*e^(189/2*I*c) - 26853743807861931447 83*I*a*e^(187/2*I*c) - 6103123592518607894 2*I*a*e^(185/2*I*c) - 1229848582862122028*I*a*e^(183/2*I *c) - 21630502713590407*I*a*e^(181/2*I*c) - 325270717497440*I*a*e^(179/2*I* c) - 4065883968718*I*a*e^(177/2*I*c) - 40557446072*I*a*e^(175/2*I*c) - 3026 67508*I*a*e^(173/2*I*c) - 1502072*I*a*e^(171/2*I*c) - 3718*I*a*e^(169/2*I*c))/(e^(531*I*c) + 432*e^(530*I*c) + 93096*e^(529*I*c) + 13343760*e^(528*I*c) + 1431118260*e^(527*I*c) + 122503723056*e^(526*I*c) + 8718181624155*e^(52 5*I*c) + 530563624556832*e^(524*I*c) + 28186192554792138*e^(523*I*c) + 1327 882849274858880*e^(522*I*c) + 56169444526926562260*e^(521*I*c) + 2154864144 781257856128*e^(520*I*c) + 75599817092670157806639*e^(519*I*c) + 2442455629 894502983849104*e^(518*I*c) + 73099207817335597247098038*e^(517*I*c) + 2037 031259470368160131922320*e^(516*I*c) + 53090127264630963470039804475*e^(515 *I*c) + 1299146645993240318167826532288*e^(514*I*c) + 29952547749265499675 2 57842032197*e^(513*I*c) + 652650253343206047453620559993840*e^(512*I*c) + 1 34772277995247019565792742103953 26*e^(511*I*c) + 264410375780310742518099 32 6419685040*e^(510*I*c) + 49396661081802579880958635254347134 5*e^(509*I*c) + 880549275989414111458699508133880402 56*e^(508*I*c) + 15006027479373972864 05577818722691539392*e^(507*I*c) + 2448983733781233868771862249186501383948 8*e^(506*I*c) + 3833601558010548245297646882131143680471 54*e^(505*I*c) + 57 646010465631513042138547107153468384473 92*e^(504*I*c) + 8338083991183789445 3136303673785039051506805*e^(503*I*c) + 116158141373397175153362251190904 69 17188768400*e^(502*I*c) + 1560391127768760709972162377174493308692058727 2*e ^(501*I*c) + 20234750972446217131396664358023407850817983832 0*e^(500*I*c) + 253566746065027977683456156618659121310925164285 9*e^(499*I*c) + 3073536651 2830562160991166338490057308062762518496*e^(498*I*c) + 360688613036389349 41 3809780004559963548775423325255*e^(497*I*c) + 410154543993719579395995670 84 424967094338002612248 80*e^(496*I*c) + 45230940039830738332025694784646206 84 4854827698075736*e^(495*I*c) + 48409341024048871865591702530366258109165912 6182344528*e^(494*I*c) + 50320249034014518240742139437660119220265070063119 82753*e^(493*I*c) + 50836369508171099437019348610847391946736185108017183 13 6*e^(492*I*c) + 499467506558531733671585862910572702811545035730398749530*e ^(491*I*c) + 4775398607100853263534207733818266777478693412738731031680*e^(490*I*c) + 44456708175258821024400946210535004523775722190977468484496*e^(4 89*I*c) + 40321222595779818884084613996099562414449127169433679645958 4*e^(4 88*I*c) + 356476489062872401708848799668817892919578761395854547480484 5*e^(487*I*c) + 307362174043210099652310374196630539628810352817092216977850 72*e ^(486*I*c) + 2585853487159772701558291156841934110720345414913643939854913 5

0*e^(485*I*c) + 212370296918887131826671878122392706783994901572729388406538808 0*e^(484*I*c) + 17033886027390615741040977721655541665612162275485028584310890417*e^(483*I*c) + 13349021005202618377967331386833230353033290616324719462780841030 4*e^(482*I*c) + 10225364374682967372930658627052464496936874155598658443068887054 23*e^(481*I*c) + 76590105201875496517771183576768719270818989131125755798204236112*e^(480*I*c) + 56117081076341175384087570185188538660375932013674735519055227368366*e^(479*I*c) + 402349692266121158934003582839428785116904903936409545602519219664720*e^(478*I*c) + 28239051519365866783825257065644572802900986986385979876283802458817 15*e^(477*I*c) + 194079792155945665935350081033032552577454080700824313389451847974639 36*e^(476*I*c) + 130657660226560419335121434389938961884595434069984824307149332131747540*e^(475*I*c) + 861884851094991908764246805474672428603757315484453974713612812215428992*e^(474*I*c) + 557255115732867112101621641630759616186195596901169722234092621011285441 8*e^(473*I*c) + 353244472067790181153780528207894116875810045823674310062058796337290152 00*e^(472*I*c) + 219601281339515561500261478844190024870555261281946058839614044697037963695*e^(471*I*c) + 13392143742542455535648844068019453533850002540306557659537702376071800899 68*e^(470*I*c) + 80137295807907524343619649457615437614695207912107469726758704810586742778 44*e^(469*I*c) + 470650446111351581084873533674842431026982488383126358762830994274427458667 04*e^(468*I*c) + 271361207503266570734486517077181014801775322183181055638619257836143271472358*e^(467*I*c) + 153633323844492758353273455601649467167491657890711698454848907824169392694056 0*e^(466*I*c) + 854301344112621233483354066506962147247908583804136056455072203672365429754020 5*e^(465*I*c) + 466682235482660178068545924681005702893559608696136508565757567581801822233087 68*e^(464*I*c) + 250501028608928332469340456829902067712233644464602753159945727868485722395506952*e^(463*I*c) + 132149805527130085142999386663161987442453442518818359204972768757103215643507728 0*e^(462*I*c) + 685299322314573668732888531161779543559294084143986635107965565231289472197279626 6*e^(461*I*c) + 349410716132767046947794304333945020150407533516036186591602921386077860623062496 0*e^(460*I*c) + 175193170500618300241515632381912285157790097816049220671217212220015297133400636060*e^(459*I*c) + 863979933622330349556296820028395513198708064940505702126068652936800794826651264256*e^(458*I*c) + 419154250065682614809333941454415914396447847249231593180917185990211410900593994295 2*e^(457*I*c) + 200080068030300471372932782503215971135407162019833331263492811866791531990680452572 16*e^(456*I*c) + 939869153130681791490836060656814827808360605105301546184869498394671313788598859982 10*e^(455*I*c) + 434546676780280045346344498763892540797175105756827515550929702418766029934548492019248 0*e^(454*I*c) + 197779298066581813565130009432623915860544887080697086057732538502860998303453467231850 0*e^(453*I*c) + 886275214275695728568134088576490459793534956935532181564772117253715918649147131166640 0*e^(452*I*c) + 391080312556018094765375353696118444408449037516056450235145723520452481042629335988507 30*e^(451*I*c) + 169956327969929767773902096652629253283704505477127544556534417376686540936706073847337600*e^(450*I*c) + 727521010718394229291774073844694255798738667067535379759732795567942578751384250780476310*e^(449*I*c) + 3067974296431747

364198159623962463671617006419626851426148418602934852907379021659761911840
*e^(448*I*c) + 127472196165033205413563430625628473686016221408567860254458
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4269748071292843243227894769229690720010547141334131610989636000*e^(446*I*c
) + 21059430138564847118432907888031750495336183995415942743400988466177725
9752542647709150036990*e^(445*I*c) + 83757920692341193245878648676537353394
6545239708990769488724813982189165104589895518909256320*e^(444*I*c) + 32838
747605558186767263094803067344201550985839480744690141681718744421701096485
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417309900*e^(441*I*c) + 181834661406177901315330129677145381166449188413194
141169344354754920969034952610378945282257600*e^(440*I*c) + 674025530543133
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961590*e^(439*I*c) + 246438219080743960907977422685567962936788570977643587
6630851716253962696192341706239192878728160*e^(438*I*c) + 88882950287510246
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04000*e^(437*I*c) + 3162664467472554773117679568752765357130596998592368839
2112164915553242573269490908989570248533280*e^(436*I*c) + 11103414879700881
944314389564446924229504986746431371096925761933889913379928561602006987261
1710850*e^(435*I*c) + 38465584208066627445406307878483717499894905250097532
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77453914130*e^(433*I*c) + 4437210917843182347764349544443904699020056595069
470847193617092114714077633077234972825351226979360*e^(432*I*c) + 147779550
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2419046732778458706015096881437076337910793584122475073760*e^(430*I*c) + 15
768584552885091872146287786443509025758314941556132342738656289444759827793
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I*c) + 15987711010581926922705289996774447426856310062324561858449252201440
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480*e^(426*I*c) + 154131112114860239372949708207973767160813447881633865435
22421939737507962125854981881879168348260330000*e^(425*I*c) + 4697022472711
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0725434751745794079833141361748917639986145377066437210546190*e^(423*I*c) +
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4839580011688655664280691773600*e^(422*I*c) + 12346680418924099787800180817
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00*e^(421*I*c) + 3582718002163296061414536703715109897107198252739284546149
343102348456124089657428594946438660859773886240*e^(420*I*c) + 102716025302
028890024978135168494525909715128095290606651973010970522100645760883480232

3467197546367741847 0*e^(419*I*c) + 290976510612474534066475697818369100621 6
555985235905280425915416568712542875256238549237374948635171445312 0*e^(418*
I*c) + 814520814138291118288754175642500548460376933128114804929091607581 95
989155768107022568350953861815940704090*e^(417*I*c) + 2253205325932206577 67
941109289516248999794521015564134982827241710019675486694499689312466561907
212627820000*e^(416*I*c) + 616003116022979584937125701757887212998354300989
991362628038861093914561332071191909714949426587936910303300*e^(415*I*c) +
1664475034387211809394917743502937638978574937754764763987835872410449930 69
013157290427999548458101396500144 0*e^(414*I*c) + 44454122592954746250676595
141983129660154162999689303933456303459141097207405736188849805200100284514
96996210*e^(413*I*c) + 117358569262451184931130910025016040323418769859990 8
282352067224153020018822382639298230219408466753848866560 0*e^(412*I*c) + 30
627581054221957378390547289277609129572813931082733520247387226000020043538
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872323883529091449827471718567724632238089933670915034028764672701761243426
99654400*e^(410*I*c) + 201557947424794098026772478462040883395867512562930 8
629437535686900840155855980101547815486252394095819073975 00*e^(409*I*c) + 5
08324599301085460166978629683032661427654474082939048097939638391567298795 7
88389433842285751054665210868287680*e^(408*I*c) + 126759701729481291340014 6
276042126929986480292870190399107554311079964227280196522475370108738477856
311765699610*e^(407*I*c) + 312568349317870174347970475030749017866629215072
017936360433511352862332968460634318554075601993566214826786396 8*e^(406*I*c
) + 762178879191204706203884091779937460042889225819436763668294435609668 14
002463121380017692850206614459910732494 16*e^(405*I*c) + 183798070840033597 6
602764921762114411609173557221662078886153580344970227380258835907670424184
073351343911411324 8*e^(404*I*c) + 438349721429193776853786922330210637445 54
033100928502737480438978976746989895784070951905237783490374305934542955*e^
(403*I*c) + 103399755467257436489847837640753754718204394473055795001467604
326419876555556873829531737211096115196005647730480*e^(402*I*c) + 241246021
282440061792908317783032876194801597133206052091286997043729145345755805710
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219546113651768317380539005893679049394714017063698565272728813669054779077
208977840*e^(400*I*c) + 127103308293804895020136055483127034266234399127750
461234230036602504674174285658044528940178665631168585902308471 6*e^(399*I*c
) + 287049613141231445183467471535358943955329443080853193346086288543709 2
46230769151392180699413405623017247753532944*e^(398*I*c) + 641338189585592 5
184758231451062556380328594938511006577015218119786536390213057284018202201
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30080*e^(396*I*c) + 310043192060694170770693631414234874318280090981847446 3
567865228417743946494165181256451914491800317410807763484601 4*e^(395*I*c) +
670917061305296691250198992100215765802378434622295353862950870761892978 49
995931360645605292130961496106707521506432*e^(394*I*c) + 143657687138044796
942947119704259538458818199423516824674586293691056119209866358123637772245
409530799230553767222252*e^(393*I*c) + 304384471106813336010284160123906370

433888828490627422652551236966790916174520857759143930140187173492394981908
258944*e^(392*I*c) + 638218892914533741505806399662488556066783600496091876
408374974877448971778036074996245581124283460438065182071976085*e^(391*I*c)
 + 132431132498402742835522293814768237867286070881716174144874968959358802
0860847508703702325320304649883120684987556400*e^(390*I*c) + 27195892834837
439260408051010803419212445303112546072509291927739093315232266350358156728
62569296693711643521070331394*e^(389*I*c) + 5527498849031178355861230009326
668283926290082158467118000698502719379939045918344222192742145711257028040
974074674736*e^(388*I*c) + 111194996453632010808810628248863384924253756584
48977935535846349290425821570383090425411418521516670371372045206568345*e^(
387*I*c) + 2214073500170860327091518076924139166203557875590397914890921360
3822554792749183517160255571915875356439553717130797888*e^(386*I*c) + 43638
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899594649006377607357297056212213800058372083691577946730496754287998178754
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039545619360201335965818064493572402773494479273345171058099953000935492799
31273178*e^(383*I*c) + 3144090358082258615655954369383549454454739910431297
22046747228813030925204968503418566818838611866709807040793495364496*e^(382
*I*c) + 5951576155004315149474792823365470538279260879164252634971877570294
13385471835434198246807096214536895441388306027237899*e^(381*I*c) + 1115398
285545601550533328045600184317993899359217996729818340704221801195667410485
846996179056733558512452238583160792512*e^(380*I*c) + 206969828950086064346
166576237380795751301942404117887190496055182941244934472243212567941795840
3007551179298315947373776*e^(379*I*c) + 38026049967058911069646206338489648
070370988545101822632430305972956307603535975319743247522663891931857608782
74188013440*e^(378*I*c) + 6917838945214844278493330459361394923372333853619
879637372673184942859712431066345726870422099893124890777678037369988150*e^
(377*I*c) + 124621404405372580849285967098720668577570709431248685545009481
54756863454308032925408340311237850017814707896986969086816*e^(376*I*c) + 2
223134113180153534540639903772168684020839794195258013558464596674673665671
6271554826476282991066076564921432614339399735*e^(375*I*c) + 39274200414329
861169397944516225001081227433398585007206399231211907157795359719648241598
754266579840244551491476467899952*e^(374*I*c) + 687124660159856415124685861
736597477348795917100983546527861249360230739431410495736066485630053594117
12764895683903806088*e^(373*I*c) + 1190605918496605468347656932276764490675
841482488826784475048260772363334445134540951266687500572958111916433569089
72191440*e^(372*I*c) + 2043255572651860007674027102308478964597615839227636
98235433212833313077783041040074669379017394836761539649081690630811665*e^(
371*I*c) + 3473100538109352904194555605559573141295692107357459832343696599
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c) + 2691779470108661509789012023689050110514679999602177519571086622622863
8984703456832694153230611607263444183501026198563419616*e^(251*I*c) + 17229
502824367647334400721998417596703948657394738805209391636597370380572398964
715080095366818322029152193635869784095333760*e^(250*I*c) + 109272106034735

44810279792347844536074588896806230041110089544731605863146104181739039426674855545346609740233068833184560230 2*e^(249*I*c) + 68664253375186682626626937509089569657329245781421816306221578028998808746815510311363140641999486040015298945662352385970 88*e^(248*I*c) + 4274826907720591752526711336820871500844345647922385471534359333606189571832444641364132893108663576205133870672156264164115*e^(247*I*c) + 263666241043079934044752228477824428374075106865814072657644667120779832560683229593770506168629793029638233889257490081944 0*e^(246*I*c) + 1611092541400060525954859375264194178347643471837078201446262435615142944587337833513586022729849523358436493586042252995608*e^(245*I*c) + 975210339444049318757282311763517786673223175594457946383279264635085041004917300295904275433144848532459919875479817581584*e^(244*I*c) + 5847495736823045861793846288448833275814989698865403803788967679990756149640071746008110929453566351187958247993697167421 09*e^(243*I*c) + 3473100538109352904194555605559573141295692107357459832343696599764133747740780001730700752486545249171791289505074430582 08*e^(242*I*c) + 2043255572651860007674027102308478964597615839227636982354332128333130777830410400746693790173948367615396490816906308116 65*e^(241*I*c) + 1190605918496605468347656932276764490675841482488826784475048260772363334445134540951266687500572958111916433569089721914 40*e^(240*I*c) + 687124660159856415124685861736597477348795917100983546527861249360230739431410495736066485630053594117127648956839038060 88*e^(239*I*c) + 392742004143298611693979445162250010812274333985850072063992312119071577953597196482415987542665798402445514914764678999 52*e^(238*I*c) + 222313411318015353454063990377216868402083979419525801355846459667467366567162715548264762829910660765649214326143393997 35*e^(237*I*c) + 124621404405372580849285967098720668577570709431248685545009481547568634543080329254083403112378500178147078969869690868 16*e^(236*I*c) + 691783894521484427849333045936139492337233385361987963737267318494285971243106634572687042209989312489077767803736998815 0*e^(235*I*c) + 380260499670589110696462063384896480703709885451018226324303059729563076035359753197432475226638919318576087827418801344 0*e^(234*I*c) + 206969828950086064346166576237380795751301942404117887190496055182941244934472243212567941795840300755117929831594737377 6*e^(233*I*c) + 111539828554560155053332804560018431799389935921799672981834070422180119566741048584699617905673355851245223858316079251 2*e^(232*I*c) + 595157615500431514947479282336547053827926087916425263497187757029413385471835434198246807096214536895441388306027237899*e^(231*I*c) + 314409035808225861565595436938354945445473991043129722046747228813030925204968503418566818838611866709807040793495364496*e^(230*I*c) + 164437500676906892741323260154394278503954561936020133596581806449357240277349447927334517105809995300093549279931273178*e^(229*I*c) + 851395332347864557795899594649006377607357297056212213800058372083691577946730496754287998178754314302463326258996301 60*e^(228*I*c) + 436383000758151710259462114644656896189657734886609858579456574798540851088518579112229119898376154526085123560084002 95*e^(227*I*c) + 221407350017086032709151807692413916620355787559039791489092136038225547927491835171602555719158753564395537171307978 88*e^(226*I*c) + 1111949964536320108088106282488633849242537565844897793553584634929042582157038309042541141852151667037 13

72045206568345*e^(225*I*c) + 55274988490311783558612300093266682839262900821584671180006985027193799390459183442221927421457112570280409740746747 36*e^(224*I*c) + 27195892834837439260408051010803419212445303112546072509291927739093315232266350358156728625692966937116435210703313 94*e^(223*I*c) + 13243113249840274283552229381476823786728607088171617414487496895935880208608475087037023253203046498831206849875564 00*e^(222*I*c) + 63821889291453374150580639966248855606678360049609187640837497487744897177803607499624558112428346043806518207197608 5*e^(221*I*c) + 30438447110681333601028416012390637043388882849062742265255123696679091617452085775914393014018717349239498190825894 4*e^(220*I*c) + 14365768713804479694294711970425953845881819942351682467458629369105611920986635812363777224540953079923055376722225 2*e^(219*I*c) + 67091706130529669125019899210021576580237843462229535386295087076189297849995931360645605292130961496106707521506432*e^(218*I*c) + 31004319206069417077069363141423487431828009098184744635678652284177439464941651812564519144918003174108077634846014*e^(217*I*c) + 14176483652875704957202013343241117904369977796653849959902524421980635189011634815653279605497783382888932766730080*e^(216*I*c) + 64133818958559251847582314510625563803285949385110065770152181197865363902130572840182022016310944348195840251134 65*e^(215*I*c) + 28704961314123144518346747153535894395532944308085319334660862885437092462307691513921806994134056230172477535329 44*e^(214*I*c) + 12710330829380489502013605548312703426623439912775046123423003660250467417428565804452894017866563116858590230847 16*e^(213*I*c) + 55675638871118234034102619273421954611365176831738053900589367904939471401706369856527272881366905477907720897784 0*e^(212*I*c) + 24124602128244006179290831778303287619480159713320605209128699704372914534575580571008148900674183943957398483267 8*e^(211*I*c) + 10339975546725743648984783764075375471820439447305579500146760432641987655555687382953173721109611519600564773048 0*e^(210*I*c) + 43834972142919377685378692233021063744554033100928502737480438978976746989895784070951905237783490374305934542955*e^(209*I*c) + 18379807084003359766027649217621144116091735572216620788861535803449702273802588359076704241840733513439114113248*e^(208*I*c) + 76217887919120470620388409177993746004288922581943676366829443560966814002463121380017692850206614459910732494 16*e^(207*I*c) + 31256834931787017434797047503074901786662921507201793636043351135286233296846063431855407560199356621482678639 68*e^(206*I*c) + 12675970172948129134001462760421269299864802928701903991075543110799642272801965224753701087384778563117656996 10*e^(205*I*c) + 50832459930108546016697862968303266142765447408293904809793963839156729879578838943384228575105466521086828768 0*e^(204*I*c) + 20155794742479409802677247846204088339586751256293086294375356869008401558559801015478154862523940958190739750 0*e^(203*I*c) + 79019149558766569254783988487232388352909144982747171856772463223808993367091503402876467270176124342699654400*e^(202*I*c) + 30627581054221957378390547289277609129572813931082733520247387226000020043538279468776707958420892547870128680*e^(201*I*c) + 11735856926245118493113091002501604032341876985999082823520672241530200188223826392982302194084667538488665600*e^(200*I*c) + 44454122592954746250676595141983129660154162999689303933456303459141097207405736188849805200100284514969962 10*e^(199*

I*c) + 16644750343872118093949177435029376389785749377547647639878358724104
49930690131572904279995484581013965001440*e^(198*I*c) + 6160031160229795849
371257017578872129983543009899913626280388610939145613320711919097149494265
87936910303300*e^(197*I*c) + 2253205325932206577679411092895162489997945210
15564134982827241710019675486694499689312466561907212627820000*e^(196*I*c)
+ 8145208141382911182887541756425005484603769331281148049290916075819598915
5768107022568350953861815940704090*e^(195*I*c) + 29097651061247453406647569
781836910062165559852359052804259154165687125428752562385492373749486351714
453120*e^(194*I*c) + 102716025302028890024978135168494525909715128095290606
65197301097052210064576088348023234671975463677418470*e^(193*I*c) + 3582718
002163296061414536703715109897107198252739284546149343102348456124089657428
594946438660859773886240*e^(192*I*c) + 123466804189240997878001808175544021
6012582476396941937965899631953079203974222138794604328498972144766900*e^(1
91*I*c) + 42035802483514679858361121014594215468443794936564789908837252480
2156222884839580011688655664280691773600*e^(190*I*c) + 14137993825355684328
056550580740330413060613072543475174579407983314136174891763998614537706643
7210546190*e^(189*I*c) + 46970224727117281826454045018070670522559756627580
347784535320014963482632359729444541885102274546002560*e^(188*I*c) + 154131
112114860239372949708207973767160813447881633865435224219397375079621258549
81881879168348260330000*e^(187*I*c) + 4995241956279138180205186744401688024
388272113921255663734956946927571305533146776898787878059685108480*e^(186*I
*c) + 159877110105819269227052899967744474268563100623245618584492522014400
2305878120380828483988663574829100*e^(185*I*c) + 50529366312301525887848302
573881281320339776684534006538126101635341972238262039303253596066092195040
0*e^(184*I*c) + 15768584552885091872146287786443509025758314941556132342738
6562894447598277935629800939237175625149830*e^(183*I*c) + 48584258153140280
447314836868772131390195412419046732778458706015096881437076337910793584122
475073760*e^(182*I*c) + 147779550966171289987127451820714953621765069731830
81650233605274051677624970464340242755840025673760*e^(181*I*c) + 4437210917
843182347764349544443904699020056595069470847193617092114714077633077234972
825351226979360*e^(180*I*c) + 131505212093069212210229710532762284233587074
3428530891072983535862280094446607723473800477453914130*e^(179*I*c) + 38465
584208066627445406307878483717499894905250097532216200339254995341359246151
9365177908682078400*e^(178*I*c) + 11103414879700881944314389564446924229504
9867464313710969257619338899133799285616020069872611710850*e^(177*I*c) + 31
626644674725547731176795687527653571305969985923688392112164915553242573269
490908989570248533280*e^(176*I*c) + 888829502875102466704420383760797610148
0053134418614474620767522824868911959884352666444917404000*e^(175*I*c) + 24
643821908074396090797742268556796293678857097764358766308517162539626961923
41706239192878728160*e^(174*I*c) + 6740255305431330088948457752366252374507
43114473544537818170447134607102575676676056675328961590*e^(173*I*c) + 1818
346614061779013153301296771453811664491884131941411693443547549209690349526
10378945282257600*e^(172*I*c) + 4837948975643409984385779181658937940681504
2609340378747586437145781646245422045101230417309900*e^(171*I*c) + 12693496
932964920565073673637181280088548682508880255337280065006566138696041797353

216584528640*e^(170*I*c) + 32838747605558186767263094803067344201550985839480744690141681718744421701096485216275387559 20*e^(169*I*c) + 83757920692341193245878648676537353394654523970899076948872481398218916510458989551890925 6320*e^(168*I*c) + 21059430138564847118432907888031750495336183995415942743400988466177725975254264770915003699 0*e^(167*I*c) + 52190912207661824215812271854269748071292843243227894769229690720010547141334131610989636000*e^(16 6*I*c) + 12747219616503320541356343062562847368601622140856786025445814532037904111523242298235713300*e^(165*I*c) + 30679742964317473641981596239624636716170064196268514261484186029348529073790216597619118 40*e^(164*I*c) + 727521010718394229291774073844694255798738667067535379759732795567942578751384250780476310*e^(163*I*c) + 16995632796992976777390209665262925328370450547712754455653441737668654093670607384733760 0*e^(162*I*c) + 391080312556018094765375353696118444408449037516056450235145723520452481042629335988507 30*e^(161*I*c) + 88627521427569572856813408857649045979353495693553218156477211725371591864914713116664 00*e^(160*I*c) + 19777929806658181356513000943262391586054488708069708605773253850286099830345346723185 00*e^(159*I*c) + 43454667678028004534634449876389254079717510575682751550929702418766029934548492019 2480*e^(158*I*c) + 93986915313068179149083606065681482780836060510530154618486949839467131378859885998210*e^(157*I*c) + 20008006803030047137293278250321597113540716201983333126349281186679153199068045257216*e^(156*I*c) + 4191542500656826148093339414544159143964478472492315931809171859902114109005939942952*e^(155*I*c) + 863979933622330349556296820028395513198708064940505702126068652936800794826651264256*e^(154*I*c) + 175193170500618300241515632381912285157790097816049220671217212220015297133400636060*e^(153*I*c) + 349410716132767046494779430433394502015040753351603618659160292138607786062306249 60*e^(152*I*c) + 685299322314573668732888531161779543559294084143986635107965565231289472197279626 6*e^(151*I*c) + 13214980552713008514299938666316198744245344251881835920497276875710321564350772 80*e^(150*I*c) + 25050102860892833246934045682990206771223364464602753159945727868485722395506952*e^(149*I*c) + 4666822354826601780685459246810057028935596086961365085657575675818018222330876 8*e^(148*I*c) + 854301344112621233483354066506962147247908583804136056455072203672365429754020 5*e^(147*I*c) + 15363332384449275835327345560164946716749165789071169845484890782416939269405 60*e^(146*I*c) + 27136120750326657073448651707718101480177532218318105563861925783614327147235 8*e^(145*I*c) + 47065044611135158108487353367484243102698248838312635876283099427442745866704*e^(144*I*c) + 80137295807907524343619649457615437614695207912107469726758704810586742778 44*e^(143*I*c) + 13392143742542455535648844068019453533850002540306557659537702376071800899 68*e^(142*I*c) + 21960128133951556150026147884419002487055526128194605883961404469703796369 5*e^(141*I*c) + 3532444720677901811537805282078941168758100458236743100620587963372901520 0*e^(140*I*c) + 557255115732867112101621641630759616186195596901169722234092621011285441 8*e^(139*I*c) + 86188485109499190876424680547467242860375731548445397471361281221542899 2*e^(138*I*c) + 13065766022656041933512143438993896188459543406998482430714933213174754 0*e^(137*I*c) + 19407979215594566593535008103303255257745408070082431338945184797463936*e^(136*I*c) + 2823905151936586

6783825257065644572802900986986385979876283802458817 15*e^(135*I*c) + 402349
692266121158934003582839428785116904903936409545602519219664720*e^(134*I*c)
+ 5611708107634117538408757018518853866037593201367473551905522736836 6*e^(
133*I*c) + 765901052018754965177711835767687192708189898913112575579820423 6
112*e^(132*I*c) + 102253643746829673729306586270524644969368741555986584430
6888705423*e^(131*I*c) + 133490210052026183779673313868332303530332906163 24
7194627808410304*e^(130*I*c) + 170338860273906157410409777216555416656121 62
275485028584310890417*e^(129*I*c) + 212370296918887131826671878122392706783
994901572729388406538 8080*e^(128*I*c) + 258585348715977270155829115684193 41
107203454149136439398549135 0*e^(127*I*c) + 307362174043210099652310374196 63
053962881035281709221697785072*e^(126*I*c) + 356476489062872401708848799668
817892919578761395854547480 4845*e^(125*I*c) + 403212225957798188840846139 96
099562414449127169433679645958 4*e^(124*I*c) + 444567081752588210244009462 10
535004523775722190977468484496*e^(123*I*c) + 477539860710085326353420773381
826677747869341273873103168 0*e^(122*I*c) + 499467506558531733671585862910 57
270281154503573039874953 0*e^(121*I*c) + 508363695081710994370193486108473 91
9467361851080171831 36*e^(120*I*c) + 50320249034014518240742139437660119220 2
6507006311982753*e^(119*I*c) + 484093410240488718655917025303662581091659 12
6182344528*e^(118*I*c) + 45230940039830738332025694784646206844854827698075
736*e^(117*I*c) + 410154543993719579395995670844249670943380026122488 0*e^(1
16*I*c) + 360688613036389349413809780004559963548775423325255*e^(115*I*c) +
307353665128305621609911663384900573080627625184 96*e^(114*I*c) + 253566746
065027977683456156618659121310925164285 9*e^(113*I*c) + 20234750972446217131
396664358023407850817983832 0*e^(112*I*c) + 1560391127768760709972162377174 4
933086920587272*e^(111*I*c) + 116158141373397175153362251190904691718876840
0*e^(110*I*c) + 833808399118378944531363036737850390515068 05*e^(109*I*c) +
5764601046563151304213854710715346838447392*e^(108*I*c) + 383360155801054 82
4529764688213114368047154*e^(107*I*c) + 2448983733781233868771862249186501 3
839488*e^(106*I*c) + 1500602747937397286405577818722691539392*e^(105*I*c) +
88054927598941411145869950813388040256*e^(104*I*c) + 4939666610818025798 80
9586352543471345*e^(103*I*c) + 26441037578031074251809932641968504 0*e^(102*
I*c) + 1347722779952470195657927421039532 6*e^(101*I*c) + 652650253343206047
453620559993840*e^(100*I*c) + 29952547749265499675257842032197*e^(99*I*c) +
1299146645993240318167826532288*e^(98*I*c) + 5309012726463096347003980447 5
*e^(97*I*c) + 2037031259470368160131922320*e^(96*I*c) + 730992078173355972 4
7098038*e^(95*I*c) + 244245562989450298384910 4*e^(94*I*c) + 755998170926701
57806639*e^(93*I*c) + 2154864144781257856128*e^(92*I*c) + 5616944452692656 2
260*e^(91*I*c) + 1327882849274858880*e^(90*I*c) + 28186192554792138*e^(89*I
*c) + 530563624556832*e^(88*I*c) + 8718181624155*e^(87*I*c) + 122503723056*
e^(86*I*c) + 1431118260*e^(85*I*c) + 13343760*e^(84*I*c) + 93096*e^(83*I*c)
+ 432*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) - 28*(338*a*e^(1055/2*I*c
) + 136552*a*e^(1053/2*I*c) + 27515228*a*e^(1051/2*I*c) + 3687040552*a*e^(1
049/2*I*c) + 369625815338*a*e^(1047/2*I*c) + 29570065227040*a*e^(1045/2*I*c
) + 1966409337599161*a*e^(1043/2*I*c) + 111804416623842644*a*e^(1041/2*I*c)
+ 5548294175019610066*a*e^(1039/2*I*c) + 244124943708196709459*a*e^(1037/2

*I*c) + 964293527713711825764l*a*e^(1035/2*I*c) + 345392409065820898531490*
a*e^(1033/2*I*c) + 1131160139986121943549535O*a*e^(1031/2*I*c) + 3410882885
2055524839468327 5*a*e^(1029/2*I*c) + 95261086365794794379649367 90*a*e^(1027
/2*I*c) + 247678824846833277253335834952*a*e^(1025/2*I*c) + 602169144006897
7811219750309348*a*e^(1023/2*I*c) + 13743625206208650681080140882 8862*a*e^(
1021/2*I*c) + 29548794308424106049320112654423 02*a*e^(1019/2*I*c) + 6003070
876668681092297982360113382 8*a*e^(1017/2*I*c) + 1155591152525353155901693 95
1332528574*a*e^(1015/2*I*c) + 21130809863813051497818215704863434230*a*e^(1
013/2*I*c) + 367868194965564832606935721682843410685*a*e^(1011/2*I*c) + 610
9811001129869767843196320577458616044*a*e^(1009/2*I*c) + 969932519324439120
18716975689508023006378*a*e^(1007/2*I*c) + 147429747414146545058015207169 48
90996247655*a*e^(1005/2*I*c) + 2149072170385915050147759568176343572077 8909
*a*e^(1003/2*I*c) + 30087011852119230244408516213566272345850545 6*a*e^(1001
/2*I*c) + 4051001485525986829845147001535913818302067194*a*e^(999/2*I*c) +
52523333574538984648429489695519406526756976563*a*e^(997/2*I*c) + 656541730
750769495168952644914474242735369097675*a*e^(995/2*I*c) + 79208592006957928
0700645440633220732927681213210 6*a*e^(993/2*I*c) + 923275278104006907737330
44860754764248910029932264*a*e^(991/2*I*c) + 104078321435193965518519619444
904065339785667930307 7*a*e^(989/2*I*c) + 11356783819252976784499704281554 89
5724049545296747183*a*e^(987/2*I*c) + 1200574576690021691574063809519765414
04817260989994202*a*e^(985/2*I*c) + 1230589291098041959151565198792286611 16
4919449523155204*a*e^(983/2*I*c) + 1223937869025964067609819069865193762558
4285361664235941*a*e^(981/2*I*c) + 1182066779127422653081510686327798536126
19007457778914450*a*e^(979/2*I*c) + 1109324724380705292283449093231952034 90
72131532300663787 18*a*e^(977/2*I*c) + 1012259361743842145487294577447161125
6945529490238801736444*a*e^(975/2*I*c) + 8986893687601512413808893975591804
79101648579500596266715 06*a*e^(973/2*I*c) + 7767249544377961523865765269609
811188656512254840761406174 34*a*e^(971/2*I*c) + 6538945880517523468866323 42
0234290611269386227470050003903740*a*e^(969/2*I*c) + 5364913138281010497780
2029620946554089637208561026255904068048*a*e^(967/2*I*c) + 4291935357915568
4706813832799476483172776909995710836864395815 4*a*e^(965/2*I*c) + 334957997
688872289553472544984862754325662301092345935309903663 5*a*e^(963/2*I*c) + 2
5513859756352077572322437078487111620320963476059001013262542630*a*e^(961/2
*I*c) + 189759652753983560479873697200916127533963528143615261433871315234*
a*e^(959/2*I*c) + 137866461996963580632562696727707874967717301165639385819
5336896873*a*e^(957/2*I*c) + 978854019245425632125517108315576091925157810 9
4323140111591591600 67*a*e^(955/2*I*c) + 6794415310188737841679053774529171 1
484709226979885783161630835768882*a*e^(953/2*I*c) + 4612375614152010703640 5
7977767537275375289232929441981287451225816828*a*e^(951/2*I*c) + 3063323292
859702877329490930028863711679805587445419775185809699425497*a*e^(949/2*I*c
) + 1991167224474414510598158720752001324149743842367282442612221394169630 0
*a*e^(947/2*I*c) + 1267111483042675142419080918386930495944734106838385556 9
6089694914431850*a*e^(945/2*I*c) + 789685521451876769155582812528911180433 6
2363027816645808365997718118112 0*a*e^(943/2*I*c) + 4821262154262488189638 34
598790591998443232656507971207966962845013884592 0*a*e^(941/2*I*c) + 2884460

98489911419277985760894919758081626505257138446366948170735542058 76*a*e^(939/2*I*c) + 16915758712613441712465074792030898222500107145747568880252606333 5881435874*a*e^(937/2*I*c) + 97266293056331072459665119282239509043784690476802833817962846115 6644761176*a*e^(935/2*I*c) + 54852238306960748702326704307050035472433362344978025748475559671 96592940404*a*e^(933/2*I*c) + 30345936432342208649816880117958528700783259643810281015011805920593868190276*a*e^(931/2*I*c) + 16473666618893540435142242686630633144833793127884003909086764751511502 8970040*a*e^(929/2*I*c) + 87774689744357912123607537749035506840400970904275581701034957342573786990 0308*a*e^(927/2*I*c) + 45913455966455716820928177167561427183292380224569005106080054438360338796 00972*a*e^(925/2*I*c) + 23583128005676152220406987675206877200271990892523657833812442225642 61342679308*a*e^(923/2*I*c) + 11897331385794653105655715724616432599593579578912435085803333068441982775202 8872*a*e^(921/2*I*c) + 58962711066691395067675754627703313240993647585074960288651941051528148983543294 8*a*e^(919/2*I*c) + 28712779131862414195841335338276232982778357103549971287303165296794828265954608 60*a*e^(917/2*I*c) + 13741380386275892220936955428884365279657568364963495869127376859464108093967124930*a*e^(915/2*I*c) + 64643918893425950177388154847859391478782846138908883463204853647802214592593258800*a*e^(913/2*I*c) + 29898507900269692408923793667457065368702389247967265528162209303261560833181019850 0*a*e^(911/2*I*c) + 13598024609686162702318682998143380760250755557155449200092112656792483874758027122 30*a*e^(909/2*I*c) + 60825298300431024154835691072077923487801633182127113659132393327779704055995813166 10*a*e^(907/2*I*c) + 26763951325033666954800413916765668459687382409352116237121465028288206531963685595620*a*e^(905/2*I*c) + 11586362130015229843964752594511148992037040399277430431135505227794538682670881429126 0*a*e^(903/2*I*c) + 49356702364086764029997288950294474894310688112511150980546427665201758679314820957599 0*a*e^(901/2*I*c) + 20692676798459301303811753340564576882852676499890231347872014109293933968366956895781 60*a*e^(899/2*I*c) + 85393764955921532889458592844632368727921627023914493546129812342099201970536097195482 80*a*e^(897/2*I*c) + 34692870306362831030990051675345388059171005150015300151358457747567034555085057721123200*a*e^(895/2*I*c) + 13877868790994660086536738876108796267807903732788250853878860927246423229174112017564756 0*a*e^(893/2*I*c) + 54668354816232031875560754306354085914245366871425253510554306348109808822307574227469104 0*a*e^(891/2*I*c) + 21209991954745209623438103576371222822014080394973161156751578345117155258411119032878212 80*a*e^(889/2*I*c) + 81057891441839307976610991290380915545455878020748177150944417461735332626848060466906570 20*a*e^(887/2*I*c) + 30518130135951809799990437898771229881249172761806983346196310869995337802376609717118084280*a*e^(885/2*I*c) + 11320990500529498520396461573817530853760676272061503574259383886375255914996603096136443253 0*a*e^(883/2*I*c) + 41383715743997151395747534710612209041809610312109350338458642259708854838700764277868939272 0*a*e^(881/2*I*c) + 14908927362396438263492981941723477308593931847293483909557686028450458951813298081556230881 00*a*e^(879/2*I*c) + 52940394824274988423621015252224339762845321369798999653176734581985547286008981823208420479 10*a*e^(877/2*I*c) + 1853115759569154919039363567123754798620409583563677145739902259 5

077629357340612025141454239410*a*e^(875/2*I*c) + 639502185792610192892198743153344773370298585574856438019092724321074768545481194030023450660 40*a*e^(873/2*I*c) + 2175975289313732717556558179281138686319163301505500780038018922626463506292714690084734157466 60*a*e^(871/2*I*c) + 7301053258029150884730688664234465343847051881872988293426640684966211370955893288743740348380 30*a*e^(869/2*I*c) + 2415921333551524990268389104618889650799105367832328831867199400393567997657263303511921645584 430*a*e^(867/2*I*c) + 7884801970520811955441008837645862835212712516344520632689690055398622920399678675555578908055 40*a*e^(865/2*I*c) + 2538361662549334851188209821136747276917501435480724130009508266675937908123879408185094123692 2200*a*e^(863/2*I*c) + 8061463543129887062443950403309304382415805276884579238661642543005467021429301510695202122510 6450*a*e^(861/2*I*c) + 2525887363443550550324328455696833710718332821151662439010856980050806776748479421910339765164 38790*a*e^(859/2*I*c)
+ 7808989249976823509861102578177599880223773357744944470211283389223941687393380594834020918171581 80*a*e^(857/2*I*c) + 2382300742453358079505817090919571011220019979440937399265243279675473364667112224683580742416 880880*a*e^(855/2*I*c) + 7172301539423620517935286383902428659740254815627164523216102592820676307371873206856996395387 197810*a*e^(853/2*I*c) + 2131174983032621220698667413947866789125714774584406288147909013353452109485200236197643482649 9389640*a*e^(851/2*I*c) + 6250516282424714429257104873341558147705308882264209533346236663182955828130311097678357841069 2040060*a*e^(849/2*I*c) + 18096128817673420902243731326658110262186894735996902828934125907564597716209411579334253349542 0437760*a*e^(847/2*I*c) + 5172071186252742393371517081238540018962905953487692749512430226882577966105723149873401861994 89059600*a*e^(845/2*I*c) + 1459444560745512684204677392868982903207097170274091924589689734580305663102531694189766409440 027416920*a*e^(843/2*I*c) + 4066207570750493677205733542471897525965552077860291195993097382317471471408387205631440905418 660098080*a*e^(841/2*I*c) + 1118675573598211962919883064843772610131227857350645716834913820637252919903709490001444302170 5886779480*a*e^(839/2*I*c) + 3039237129038547978545375775633824894441801783369328767608982430107639809721866030402408932431 4169620320*a*e^(837/2*I*c) + 8154612486147939753961450172387416038040673187870338376416899499805543285699382977085027856880 9909050230*a*e^(835/2*I*c) + 2160987381911956910738848388851300516069416606328145932818076430784530444614258598411334873984 85483388540*a*e^(833/2*I*c)
+ 5656431434448800485913346705394141177144265844329919969195747793339596940626184540049980700398551007 93060*a*e^(831/2*I*c) + 1462530218978002981214579686179196234895642459370576507150726645426795532204892523476949341669543643800 450*a*e^(829/2*I*c) + 3735676388192217805929887543749126915271400393432261055053439624614357833258756735586551631642468395069 030*a*e^(827/2*I*c) +
942682005728444778196310755751381759067350544069564584573475358564363307751592443477199150298313445946 5060*a*e^(825/2*I*c) + 2350291388414583187433121250509539022598335395261617304489120785691712272664473423019867143699665268210 9840*a*e^(823/2*I*c) + 5789847874548404866954317068245529292730188272321513952449528244196894384174589566247623093618880995136 9410*a*e^(821/2*I*c)
+ 1409384442983762699168937114336324967714380857089225416554060183539432 69

1645647455977068184005432865011710 20*a*e^(819/2*I*c) + 3390284229878333978558706614105802727832419445203049929169612721423237938658782648305980398192033825213854 60*a*e^(817/2*I*c) + 80596100957913925945111236549855602442049297404176384842308042398321863605332592288792671695920641604014628 0*a*e^(815/2*I*c) + 189360661343136444565311334986545864078433719641996809934840706070804654856839755101768793561054880357891750 0*a*e^(813/2*I*c) + 43973333030386009091653033607968159002906500495742365171786730492219552389828696640085966674333434500227270300*a*e^(811/2*I*c) + 10093425291042252925802036863801242163211606474338252255663632238745912220583468344066577703311911110184928980*a*e^(809/2*I*c) + 22901429802924746989983398990978348636420948713161325757783624831891169692007204195378391317610973058655935960*a*e^(807/2*I*c) + 513672538957285383949905581668971446228052831255870390485416050290803105089628295590657607907603490125145743 24*a*e^(805/2*I*c) + 11390278738034513725317554017689546615643594278632039917779354918446196998225488813223531681316776629361121507 6*a*e^(803/2*I*c) + 24970703838266908715955524234509458143854697844302578334009195027744760044974013600717240698439882120674007666 4*a*e^(801/2*I*c) + 54125196887775233211881366024921592828360243529141573153793120569152149454342894568734386876109189929976344892 6*a*e^(799/2*I*c) + 11600160509032076678418985247311644870425619185091180078775066124292023740134865005426754757465848710224643432 84*a*e^(797/2*I*c) + 24583716780135997924866452996384075028744179369978549868249109645938147148918994182064168469401474838172028041 20*a*e^(795/2*I*c) + 51519670409967739886114822874423495999554963399688711960157152409688729297264125600396680370886804417790849144 48*a*e^(793/2*I*c) + 10677345120611501031691517702515755622203852633360648841958791107152970141386266895230517166551174392300030788 342*a*e^(791/2*I*c) + 21884699869744594822797651399921996353213538304567148159730761256766296942857944789316336187135948566011636746 108*a*e^(789/2*I*c) + 44363645431253792866444490367306074812309865170491117708512232599286173512025194047460621336633494994931616185 367*a*e^(787/2*I*c) + 88949838473151210126202868097375450026734887640385861323252487035231744983449961665197741276037196752019899934 708*a*e^(785/2*I*c) + 17640715787024818867503982283797345377954122047597100386165612621579516336562656603643306191259307481694566067 5950*a*e^(783/2*I*c) + 34606840858170005542670863991251388916277002843247539209630343476541757123535495845015076455256584416375031220 1645*a*e^(781/2*I*c) + 67158945814902234233818758731031355994010697920299548893095481693941080554243117667793104925342287678442481701 6775*a*e^(779/2*I*c) + 12893275062558872663245039240055328071481718108400557314757429343750965479800062386001016971377511351713344279 11230*a*e^(777/2*I*c) + 24488447835141159402049949527588439039030661372002181527576127240234510603889053757686753288047872289000933986 81626*a*e^(775/2*I*c) + 46017069769727428834674047753392005152720786506232128950745672499408164515126163676745511276070813332701815269 98549*a*e^(773/2*I*c) + 85557347948303069427606265864203901730138173493861541872552893514421311575888808180865476781203509309679868196 36206*a*e^(771/2*I*c) + 15739727197897184186431978260176363192263662344435599920720343357873782760635197723475350184525299985472022233 368096*a*e^(769/2*I*c) + 2865229670974996507625784570864717780384 18

18654181291497797896498566113487726904281960443070225181805904476964093204*
a*e^(767/2*I*c) + 516136775752603751140573550542127606248289560668750323211
87800557785476426719305739365978657330215320031862318328782*a*e^(765/2*I*c)
 + 920097899653368630008601707170195208321797974720498870784306102175254834
42688425464817079510726308915387248081319590*a*e^(763/2*I*c) + 162325921367
114920125342502623302414608326044873352001855642072426178071258568253753649
777482260604487791662279095380*a*e^(761/2*I*c) + 28343080674123172076750664
845238157997916706469192193526652246599903915191375493757037983217621968347
5585745980384642*a*e^(759/2*I*c) + 4898152757642156305233916949785199236759
455790302875169372878926136847341285899647819636510958725979738665128196888
54*a*e^(757/2*I*c) + 837846552383396082937854578077113369184974325971396778
753442236264006537694747924055527939607057424809294856490727675*a*e^(755/2*
I*c) + 14186144634747459319395806906257964356209274023267257071289786111832
25665658663115625141407985113241273578748581984652*a*e^(753/2*I*c) + 237767
738528145078027653500363210695783831543229498007404472144469700065885043391
3097456261486621128187350479818244518*a*e^(751/2*I*c) + 3945037288827419478
018677680594182145933168831784555276684612092094611158471077576449964287503
346809348891265398259857*a*e^(749/2*I*c) + 64800749661966448729596639489157
406799996435834290035746087168182010593604461394112623297260126288718439583
39023337019*a*e^(747/2*I*c) + 105380651642538996809340809249110493758483069
86850557084580551955642451251771191418581692424478501246323800746129573800*
a*e^(745/2*I*c) + 169673877114962244778234439415913787832396202935047404923
14898728896897745532993133409667857013503734512617665480477878*a*e^(743/2*I
*c) + 270497838117680633439558433289313889225603009659722001048486751021014
01505754650642355872221358066002741301627025812757*a*e^(741/2*I*c) + 427001
033010337778650535577086941480668033029900987358407118657168845872190459140
23413725085698021434756439677135383181*a*e^(739/2*I*c) + 667470571270742686
190239734042444467288578965846913400860477188328172379373790177434493796234
61239962563329874824019974*a*e^(737/2*I*c) + 103322596182279139344692583372
921792481340062327412457604573055278086602887748185048531214610304639645383
482596676893056*a*e^(735/2*I*c) + 15839467685091204058294114034244145346344
067656555726133155715460206950476685791052069202729893821895403211920311041
4947*a*e^(733/2*I*c) + 2404862281568673909647552378625268280708050423054651
56788364442627761972364982396289899653761051586004176156357053438713*a*e^(7
31/2*I*c) + 361631832412353361979158598436439573362393207038652296132511637
528660854756889993338874388973764737310559108721961804950*a*e^(729/2*I*c) +
 53863249400189950382316139684456646689486298248079524165666385843111592719
3564638280643271545140293504620018648806033924*a*e^(727/2*I*c) + 7946771715
905578344319659816833686638649262206648373372795785872193249295888569107797
05968796220532402758676260405879107*a*e^(725/2*I*c) + 116140646968151468693
023105716928281090103625805562253235991399731320411755388739321232882227360
2211299474414691345126818*a*e^(723/2*I*c) + 1681497695671000636215144582963
607157017178521461687498309132637123908932777244895367507216314619532694155
538887238368802*a*e^(721/2*I*c) + 24118497504933326647870055501061178327305
669830479171072315653703779731534904944652998910925512834761816251519841277

53260*a*e^(719/2*I*c) + 342743913293696221896504555669042475509741891833232
401914516216065431105806289828209750053685655344355337741182982028 3274*a*e^
(717/2*I*c) + 482590262746676269882380777332120323160126349321782853218945 0
537425528946780148114383027368752159205150948205408147495002*a*e^(715/2*I*c
) + 673287592148262938582698346865379444871928897581859702922193508032583 78
396531801670350725437383699360723074038358291175 80*a*e^(713/2*I*c) + 930807
856378404378101767113061024818208704691325291699688038676560862699334328112
319093971239495876961457294444616923924 0*a*e^(711/2*I*c) + 1275208290398042
485997378225158036439217768534153708660430531822786965665706426267958018116
237155774279108189435584158744 2*a*e^(709/2*I*c) + 1731363730722245001288168
669518610842373580752871815689957811120050997466618301189423521969937258122
75610128428038455077 49*a*e^(707/2*I*c) + 2329733252724133486576008434346785
015247728714899590860668051459575561332078543062356207977438953237441387317
012317991098 6*a*e^(705/2*I*c) + 3107130663886788714548646424310283071956307
515154972608466605068175799307542670857056904029472475784338893329516232083
3726*a*e^(703/2*I*c) + 410745821603884552946321320801968111333918505998842 2
456008409621050003677268332417726387186564502838057564327671248438227 9*a*e^
(701/2*I*c) + 538235247024853186016562819976638826837884766479861935550360 4
497813877499202006371850014845727852665928567372360269420342 1*a*e^(699/2*I*
c) + 699168134613346504156785968243581294918159566308278537579615429059619 3
29868503951339311247240660027037311153919196633029 90*a*e^(697/2*I*c) + 9003
822979902911781825190342242898340865743154211020276769385829603914951367506
465538615020467162535580420637114087131910 0*a*e^(695/2*I*c) + 1149565121648
042888135663204917688817683029075460344301231799098934384270779597701528959
782036289789304197231389665011194 15*a*e^(693/2*I*c) + 1455215056428878225 47
402879630656245710055774793637312274910793201300321281257473947648611370199
879573400230644017226525880*a*e^(691/2*I*c) + 182655864263565676185586987 57
069183245221201406507042910760948672195583226326816200018039326617638546448
061754331002586731 8*a*e^(689/2*I*c) + 227341654369538963836513500844598119 0
454238798028219407996159060808328004693063580088180738355445853616490704526
44644673032*a*e^(687/2*I*c) + 280601365636611572910535258329456756850440149
892624666211811853985826030746961947811258965778308897372914648649596408103
468*a*e^(685/2*I*c) + 343473066630504003957461711079255275849509437970035 16
083387048110272003453549085113764495714544534303277947437718384295435 2*a*e^
(683/2*I*c) + 416979742542504399053267046556927818315819256101629554940265 3
876256781269528947871423421024372708560023371289661253670354 38*a*e^(681/2*I
*c) + 502093216108411100751308736946549255326079321825250649068631607319287
11125699429878460142321707129564334674815066781574712 0*a*e^(679/2*I*c) + 59
969346376928518201678941452400286647919025612128164360913087795177260473427
968415998389408932015400603699711452038127850 4*a*e^(677/2*I*c) + 7105245758
470710442517459931302957565489757529524758790166567800889124101220139945179
282553643001137962411858851468923530 96*a*e^(675/2*I*c) + 835149043316362104
631899593048750305868037185668945816167610720358206827717921729336701823612
277340955328663616780414165744*a*e^(673/2*I*c) + 9739024508921589655577826 9
304218994521664405462061030012960430945041058869530488356374179932290858600

7062103356708940279896*a*e^(671/2*I*c) + 11268509797513965651407826291173959
444409650356633676640287812794283033557922557964365952327747046148433663086
57035222636184*a*e^(669/2*I*c) + 129375433604327610763551982574380675237083
215776590283681600987892159353110715973908198332664853499096395244710463706
3475320*a*e^(667/2*I*c) + 147403678911314512551158602765451942976784711541
874878030161967756912464481716292555681407152865081422082647584171197039816
0*a*e^(665/2*I*c) + 166676889819198732299914423573743887087955756775775148281
13208026480816927001456076331784426018383079408299295422193948166 00*a*e^(
663/2*I*c) + 187066221020888088529998809098955509325203817865681910497590287
277487884734303575272263127913613463619019462002877706277100 0*a*e^(661/2*I
*c) + 208407871933677540917899940456096383454677914237869374731808161997221
064406209816031325427641825129411357648711890171113 5260*a*e^(659/2*I*c) + 2
305056201085645773403211503495815406053507086905620072615040978473923133843
65081192510128367961898615128909409657966942 4320*a*e^(657/2*I*c) + 25313496
968308509890284231267179302514210679382841376178663527198815284677620706152
24279447864998980982885764701335750299640*a*e^(655/2*I*c) + 276048847146553
607900165140742040618677360592610819558290806380573776619017848400674978875
365643131819967512129061937561 4420*a*e^(653/2*I*c) + 2989846754795630884517
426116993270025675068873256970760955974916573169745655550814846206617487155
64758983923646470179627958 0*a*e^(651/2*I*c) + 321672557507420652882892410005
858474866554248955010598380892000356880845989548491941765585710862416327421
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8078597847560*a*e^(647/2*I*c) + 365242195411312022531084117567914139896304362
3550797204205304789758747261524665291514179819649437844381518984788554724
814900*a*e^(645/2*I*c) + 385629012761269004523983508968714311032763185387401
71282577797471238642750947196192171293929474842754352489466279830543711 20*
a*e^(643/2*I*c) + 404795452293663586301595872787961053774872040614739375472
850428532596575934312865005993738836041286643104911964561963684408 0*a*e^(64
1/2*I*c) + 422567795892632749399376347225596580682829367588163316714951015247
37232818312661778458989626625470882831534108115407639377 60*a*e^(639/2*I*c
) + 438813356691874296623589709553772672914984549164820834699073213918440500
08155907080924884206472084685733264489799932389198 40*a*e^(637/2*I*c) + 453
443997633345931051148250499011965067283942984759027862012615398218816207060
40030030674650342710786766822984525748852237 60*a*e^(635/2*I*c) + 4664173597
156401175633352539083741017902415354471984347164039208649991585553846020213
682464029641764522414226537622903667360*a*e^(633/2*I*c) + 477735667572291477
242788068085209794733382474511349117627392160272442581969204328281047970893
97323762204925672158467638216 40*a*e^(631/2*I*c) + 487442130425961717527650
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537408708886369443575520 0*a*e^(629/2*I*c) + 495615112514236503966923498388797
623512188087820720497989002471517228132783667683162018090926271749711139672
60010760967954 20*a*e^(627/2*I*c) + 502360397556685133411332704356697506265
365584465606240891406574370079536006792629619460725611027426204850287152413
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8158033347603995255820206564757369117044034349799048501173752875181190997850680*a*e^(623/2*I*c) + 5120721253551683019502884820787496119098955245751439749047492279319103337844456766689416423308503828722941122090578157783220*a*e^(621/2*I*c) + 5153008003173357195789061945736317915267127659146027577937446882680816453705847341473856934451889447842664418960798801389660*a*e^(619/2*I*c) + 5176060246095054646746769762022552048272184715565679198279004129835648608965961963638205672345664098844084476717934767765360*a*e^(617/2*I*c) + 5190848994420407665005744645452103615055627990337999053339203475748827740596926190664008371199178877128179934687123252625080*a*e^(615/2*I*c) + 5198064280862874211656886139517564161479956414121768727208920751520508406216499432758187510936276181271178602086681965044900*a*e^(613/2*I*c) + 5198064280862874211656886139517564161479956414121768727208920751520508406216499432758187510936276181271178602086681965044900*a*e^(611/2*I*c) + 5190848994420407665005744645452103615055627990337999053339203475748827740596926190664008371199178877128179934687123252625080*a*e^(609/2*I*c) + 5176060246095054646746769762022552048272184715565679198279004129835648608965961963638205672345664098844084476717934767765360*a*e^(607/2*I*c) + 5153008003173357195789061945736317915267127659146027577937446882680816453705847341473856934451889447842664418960798801389660*a*e^(605/2*I*c) + 5120721253551683019502884820787496119098955245751439749047492279319103337844456766689416423308503828722941122090578157783220*a*e^(603/2*I*c) + 5078020054192365588204904825615019548624349688158033347603995255820206564757369117044034349799048501173752875181190997850680*a*e^(601/2*I*c) + 5023603975566851334113327043566975062653655844656062408914065743700795360067926296194607256110274262048502871524134363430720*a*e^(599/2*I*c) + 4956151125142365039669234983887976235121880878207204979890024715172281327836676831620180909262717497111396726001076096795420*a*e^(597/2*I*c) + 4874421304259617175276500599203042973459961166296204262993568026484810127299386149073158190948249765374087088863694435755200*a*e^(595/2*I*c) + 4777356675722914772427880680852097947333824745113491176273921602724425819692043282810479708939732376220492567215846763821640*a*e^(593/2*I*c) + 4664173597156401175633352539083741017902415354471984347164039208649991585553846020213682464029641764522414226537622903667360*a*e^(591/2*I*c) + 4534439976333459310511482504990119650672839429847590278620126153982188162070604003003067465034271078676682298452574885223760*a*e^(589/2*I*c) + 4388133566918742966235897095537726729149845491648208346990732139184405000815590708092488420647208468573326448979993238919840*a*e^(587/2*I*c) + 4225677958926327493993763472255965806828293675881633167149510152473723281831266177845898962662547088283153410811540763937760*a*e^(585/2*I*c) + 4047954522936635863015958727879610537748720406147393754728504285325965759343128650059937388360412866431049119645619636844080*a*e^(583/2*I*c) + 3856290127612690045239835089687143110327631853874017128257779747123864275094719619217129392947484275435248946627983054371120*a*e^(581/2*I*c) + 3652421954113120225310841175679141398963043623550797204205304789758747261524665291514179819649437844381518984788554724814900*a*e^(579/2*I*c) + 3438442076114507565828227629767657465219062203634063167744669216259140625679987917913352910725024380172392492408078597847560*a*e^(5

77/2*I*c) + 321672557507420652882892410005858474866554248955010598380892000
3568808459895484919417655857108624163274212339927440740825720*a*e^(575/2*I*
c) + 2989846754795630884517426116993270025675068873256970760955974916573169
745655550814846206617487155647589839236464701796279580*a*e^(573/2*I*c) + 27
604884714655360790016514074204061867736059261081955829080638057377661901784
84006749788753656431318199675121290619375614420*a*e^(571/2*I*c) + 253134969
683085098902842312671793025142106793828413761786635271988152846776207061522
4279447864998980982885764701335750299640*a*e^(569/2*I*c) + 2305056201085645
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994045609638345467791423786937473180816199722106440620981603132542764182512
94113576487118901711135260*a*e^(565/2*I*c) + 187066221020888088529998809098
955509325203817865681910497590287277487884734303575272263127913613463619019
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879557567757751482811320802648081692700145607633178442601838307940829929542
219394816600*a*e^(561/2*I*c) + 14740367891131451255115860276545194297678471
154187487803016196775691246448171629255568140715286508142208264758417119703
98160*a*e^(559/2*I*c) + 129375433604327610763551982574380675237083215776590
2836816009878921593531107159739081983326648534990963952447104637063475320*a
*e^(557/2*I*c) + 1126850979751396565140782629117395944440965035663367664028
781279428303355792255796436595232774704614843366308657035222636184*a*e^(555
/2*I*c) + 97390245089215896555778269304218994521664405462061030012960430945
0410588695304883563741799322908586007062103356708940279896*a*e^(553/2*I*c)
+ 8351490433163621046318995930487503058680371856689458161676107203582068277
17921729336701823612277340955328663616780414165744*a*e^(551/2*I*c) + 710524
575847071044251745993130295756548975752952475879016656780088912410122013994
517928255364300113796241185885146892353096*a*e^(549/2*I*c) + 59969346376928
518201678941452400286647919025612128164360913087795177260473427968415998389
4089320154006036997114520381278504*a*e^(547/2*I*c) + 5020932161084111007513
087369465492553260793218252506490686316073192871112569942987846014232170712
95643346748150667815747120*a*e^(545/2*I*c) + 416979742542504399053267046556
927818315819256101629554940265387625678126952894787142342102437270856002337
128966125367035438*a*e^(543/2*I*c) + 34347306663050400395746171107925527584
950943797003516083387048110272003453549085113764495714544534303277947437718
3842954352*a*e^(541/2*I*c) + 2806013656366115729105352583294567568504401498
926246662118118539858260307469619478112589657783088973729146486495964081034
68*a*e^(539/2*I*c) + 227341654369538963836513500844598119045423879802821940
799615906080832800469306358008818073835544585361649070452644644673032*a*e^(
537/2*I*c) + 18265586426356567618558698757069183245221201406507042910760948
6721955832263268162000180393266176385464480617543310025867318*a*e^(535/2*I*
c) + 1455215056428878225474028796306562457100557747936373122749107932013003
21281257473947648611370199879573400230644017226525880*a*e^(533/2*I*c) + 114
956512164804288813566320491768881768302907546034430123179909893438427077959
770152895978203628978930419723138966501119415*a*e^(531/2*I*c) + 90038229799
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150204671625355804206371140871319100*a*e^(529/2*I*c) + 69916813461334650415
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673723602694203421*a*e^(525/2*I*c) + 41074582160388455294632132080196811133
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*a*e^(521/2*I*c) + 23297332527241334865760084343467850152477287148995908606
680514595755613320785430623562079774389532374413873170123179910986*a*e^(519
/2*I*c) + 17313637307222450012881686695186108423735807528718156899578111200
509974666183011894235219699372581227561012842803845507749*a*e^(517/2*I*c) +
 12752082903980424859973782251580364392177685341537086604305318227869656657
064262679580181162371557742791081894355841587442*a*e^(515/2*I*c) + 93080785
637840437810176711306102481820870469132529169968803867656086269933432811231
9093971239495876961457294446169239240*a*e^(513/2*I*c) + 673287592148262938
582698346865379444871928897581859702922193508032583783965318016703507254373
8369936072307403835829117580*a*e^(511/2*I*c) + 4825902627466762698823807773
321203231601263493217828532189450537425528946780148114383027368752159205150
948205408147495002*a*e^(509/2*I*c) + 34274391329369622189650455566904247550
974189183323240191451621606543110580628982820975005368565534435533774118298
20283274*a*e^(507/2*I*c) + 241184975049333266478700555010611783273056698304
7917107231565370377973153490494465299891092551283476181625151984127753260*a
*e^(505/2*I*c) + 1681497695671000636215144582963607157017178521461687498309
132637123908932777244895367507216314619532694155538887238368802*a*e^(503/2*
I*c) + 11614064696815146869302310571692828109010362580556225323599139973132
04117553887393212328822273602211299474414691345126818*a*e^(501/2*I*c) + 794
6771715905578344319659816833686638649262220664837337279578587219324929588856
910779705968796220532402758676260405879107*a*e^(499/2*I*c) + 53863249400189
950382316139684456646689486298248079524165666385843111592719356463828064327
1545140293504620018648806033924*a*e^(497/2*I*c) + 3616318324123533619791585
984364395733623932070386522961325116375286608547568899933388743889737647373
10559108721961804950*a*e^(495/2*I*c) + 240486228156867390964755237862526828
070805042305465156788364442627761972364982396289899653761051586004176156357
053438713*a*e^(493/2*I*c) + 15839467685091204058294114034244145346344067656
5557261331557154602069504766857910520692027298938218954032119203110414947*a
*e^(491/2*I*c) + 1033225961822791393446925833729217924813400623274124576045
73055278086602887748185048531214610304639645383482596676893056*a*e^(489/2*I
*c) + 667470571270742686190239734042444467288578965846913400860477188328172
37937379017743449379623461239962563329874824019974*a*e^(487/2*I*c) + 427001
03301033778650535577086941480668033029900987358407118657168845872190459140
23413725085698021434756439677135383181*a*e^(485/2*I*c) + 270497838117680633
439558433289313889225603009659722001048486751021014015057546506423558722213
58066002741301627025812757*a*e^(483/2*I*c) + 16967387711496224478234439415
913787832396202935047404923148987288968977455329931334096678570135037345126

17665480477878*a*e^(481/2*I*c) + 105380651642538996809340809249110493758483
069868505570845805519556424512517711914185816924244785012463238007461295738
00*a*e^(479/2*I*c) + 648007496619664487295966394891574067999964358342900357
460871681820105936044613941126232972601262887184395833902333 7019*a*e^(477/2
*I*c) + 394503728882741947801867768059418214593316883178455527668461209209 4
611158471077576449964287503346809348891265398259857*a*e^(475/2*I*c) + 23776
773852814507802765350036321069578383154322949800740447214446970006588504339
13097456261486621128187350479818244518*a*e^(473/2*I*c) + 141861446347474593
193958069062579643562092740232672570712897861118322566565866311562514140798
511324127357874858198465 2*a*e^(471/2*I*c) + 837846552383396082937854578077 1
133691849743259713967787534422362640065376947479240555279396070574248092948
56490727675*a*e^(469/2*I*c) + 489815275764215630523391694978519923675945579
030287516937287892613684734128589964781963651095872597973866512819688854*a*
e^(467/2*I*c) + 283430806741231720767506648452381579979167064691921935266 52
24659990391519137549375703798321762196834755857459803846 42*a*e^(465/2*I*c)
+ 162325921367114920125342502623302414608326044873352001855642072426178071 2
585682537536497774822606044877916622790953 80*a*e^(463/2*I*c) + 920097899653
368630008601707170195208321797974720498870784306102175254834426884254648170
795107263089153872480813195 90*a*e^(461/2*I*c) + 516136775752603751140573550
542127606248289560668750323211878005577854764267193057393659786573302153200
31862318328782*a*e^(459/2*I*c) + 286522967097499650762578457086471778038418
186541812914977978964985661134877269042819604430702251818059044769640932 04*
a*e^(457/2*I*c) + 157397271978971841864319782601763631922636623444355999207
203433578737827606351977234753501845252999854720222333680 96*a*e^(455/2*I*c)
+ 855573479483030694276062658642039017301381734938615418725528935144213115
758888081808654767812035093096798681963620 6*a*e^(453/2*I*c) + 4601706976972
742883467404775339200515272078650623212895074567249940816451512616367674551
127607081333270181526998549*a*e^(451/2*I*c) + 244884478351411594020499495 27
588439039030661372002181527576127240234510603889053757686753288047872289000
93398681626*a*e^(449/2*I*c) + 128932750625588726632450392400553280714817181
084005573147574293437509654798000623860010169713775113517133442791123 0*a*e^
(447/2*I*c) + 671589458149022342338187587310313559940106979202995488930954 8
169394108055424311766779310492534228767844248170167 75*a*e^(445/2*I*c) + 346
068408581700055426708639912513889162770028432475392096303434765417571235354
958450150764552565844163750312201645*a*e^(443/2*I*c) + 1764071578702481886 7
503982283797345377954122047597100386165612621579516336562656603643306191259
307481694566067595 0*a*e^(441/2*I*c) + 889498384731512101262028680973754500 2
673488764038586132325248703523174498344996166519774127603719675201989993470
8*a*e^(439/2*I*c) + 443636454312537928664444903673060748123098651704911177 0
851223259928617351202519404746062133663349499493161618536 7*a*e^(437/2*I*c)
+ 218846998697445948227976513999219963532135383045671481597307612567662969 4
285794478931633618713594856601163674610 8*a*e^(435/2*I*c) + 1067734512061150
103169151770251575562220385263336064884195879110715297014138626689523051716
655117439230003078834 2*a*e^(433/2*I*c) + 515196704099677398861148228744234 9
599955496339968871196015715240968872929726412560039668037088680441779084914

448*a*e^(431/2*I*c) + 2458371678013599792486645299638407502874417936997854986824910964593814714891899418206416846940147483817202804120*a*e^(429/2*I*c) + 1160016050903207667841898524731164487042561918509118007877506612429202374013486500542675475746584871022464343284*a*e^(427/2*I*c) + 541251968877752332118813660249215928283602435291415731537931205691521494543428945687343868761091899299763448926*a*e^(425/2*I*c) + 2497070383826690871595555242345094581438546978443025783340091950277447600449740136007172406984398821206740076664*a*e^(423/2*I*c) + 113902787380345137253175540176895466156435942786320399177793549184461969982254888132235316813167766293611215076*a*e^(421/2*I*c) + 51367253895728538394990558166897144622805283125587039048541605029080310508962829559065760790760349012514574324*a*e^(419/2*I*c) + 22901429802924746989983398990978348636420948713161325757783624831891169692007204195378391317610973058655935960*a*e^(417/2*I*c) + 10093425291042252925802036863801242163211606474338252255663632238745912220583468344066577703311911110184928980*a*e^(415/2*I*c) + 4397333303038600909165303360796815900290650049574236517178673049221955238982869664008596667433434500227270300*a*e^(413/2*I*c) + 1893606613431364445653113349865458640784337196419968099348407060708046548568397551017687935610548803578917500*a*e^(411/2*I*c) + 805961009579139259451112365498556024420492974041763848423080423983218636053325922887926716959206416040146280*a*e^(409/2*I*c) + 339028422987833397855870661410580272783241944520304992916961272142323793865878264830598039819203382521385460*a*e^(407/2*I*c) + 140938444298376269916893711433632496771438085708922541655406018353943269164564745597706818400543286501171020*a*e^(405/2*I*c) + 57898478745484048669543170682455292927301882723215139524495282441968943841745895662476230936188809951369410*a*e^(403/2*I*c) + 23502913884145831874331212505095390225983353952616173044891207856917122726644734230198671436996652682109840*a*e^(401/2*I*c) + 9426820057284447781963107557513817590673505440695645845734753585643633077515924434771991502983134459465060*a*e^(399/2*I*c) + 3735676388192217805929887543749126915271400393432261055053439624614357833258756735586551631642468395069030*a*e^(397/2*I*c) + 1462530218978002981214579686179196234895642459370576507150726645426795532204892523476949341669543643800450*a*e^(395/2*I*c) + 565643143444880048591334670539414117714426584432991996919574779333959694062618454004998070039855100793060*a*e^(393/2*I*c) + 216098738191195691073884838885130051606941660632814593281807643078453044461425859841133487398485483388540*a*e^(391/2*I*c) + 81546124861479397539614501723874160380406731878703383764168994998055432856993829770850278568809909050230*a*e^(389/2*I*c) + 30392371290385479785453757756338248944418017833693287676089824301076398097218660304024089324314169620320*a*e^(387/2*I*c) + 11186755735982119629198830648437726101312278573506457168349138206372529199037094900014443021705886779480*a*e^(385/2*I*c) + 4066207570750493677205733542471897525965552077860291195993097382317471471408387205631440905418660098080*a*e^(383/2*I*c) + 1459444560745512684204677392868982903207097170274091924589689734580305663102531694189766409440027416920*a*e^(381/2*I*c) + 517207118625274239337151708123854001896290595348769274951243022688257796610572314987340186199489059600*a*e^(379/2*I*c) + 18096128817673420902243731326658110262186894735996902828934125907564

5977162094115793342533495420437760*a*e^(377/2*I*c) + 62505162824247144292571048733415581477053088822642095333462366631829558281303110976783578410692040060*a*e^(375/2*I*c) + 21311749830326212206986674139478667891257147745844062881479090133534521094852002361976434826499389640*a*e^(373/2*I*c) + 7172301539423620517935286383902428659740254815627164523216102592820676307371873206856996395387197810*a*e^(371/2*I*c) + 2382300742453358079505817090919571011220019979440937399265243279675473364667112224683580742416880880*a*e^(369/2*I*c) + 780898924997682350986110257817759988022377335774494447021128338922394168739338059483402091817158180*a*e^(367/2*I*c) + 252588736344355055032432845569683371071833282115166243901085698005080677674847942191033976516438790*a*e^(365/2*I*c) + 80614635431298870624439504033093043824158052768845792386616425430054670214293015106952021225106450*a*e^(363/2*I*c) + 25383616625493348511882098211367472769175014354807241300095082666759379081238794081850941236922200*a*e^(361/2*I*c) + 7884801970520811955441008837645862835212712516344520632689690055398622920399678675555557890805540*a*e^(359/2*I*c) + 2415921333551524990268389104618889650799105367832328831867199400393567997657263303511921645584430*a*e^(357/2*I*c) + 730105325802915088473068866423446534384705188187298829342664068496621137095589328874374034838030*a*e^(355/2*I*c) + 217597528931373271755655817928113868631916330150550078003801892262646350629271469008473415746660*a*e^(353/2*I*c) + 63950218579261019289219874315334477337029858557485643801909272432107476854548119403002345066040*a*e^(351/2*I*c) + 18531157595691549190393635671237547986204095835636771457399022595077629357340612025141454239410*a*e^(349/2*I*c) + 5294039482427498842362101525222433976284532136979899965317673458198554728600898182320842047910*a*e^(347/2*I*c) + 1490892736239643826349298194172347730859393184729348390955768602845045895181329808155623088100*a*e^(345/2*I*c) + 413837157439971513957475347106122090418096103121093503384586422597088548387007642778689392720*a*e^(343/2*I*c) + 113209905005294985203964615738175308537606762720615035742593838863752559149966030961364432530*a*e^(341/2*I*c) + 30518130135951809799990437898771229881249172761806983346196310869995337802376609717118084280*a*e^(339/2*I*c) + 8105789144183930797661099129038091554545587802074817715094441746173533262684806046690657020*a*e^(337/2*I*c) + 2120999195474520962343810357637122282201408039497316115675157834511715525841111903287821280*a*e^(335/2*I*c) + 546683548162320318755607543063540859142453668714252535105543063481098088223075742274691040*a*e^(333/2*I*c) + 138778687909946600865367388761087962678079037327882508538788609272464232291741120175647560*a*e^(331/2*I*c) + 34692870306362831030990051675345388059171005150015300151358457747567034555085057721123200*a*e^(329/2*I*c) + 8539376495592153288945859284463236872792162702391449354612981234209920197053609719548280*a*e^(327/2*I*c) + 2069267679845930130381175334056457688285267649989023134787201410929393396836695689578160*a*e^(325/2*I*c) + 493567023640867640299972889502944748943106881125111509805464276652017586793148209575990*a*e^(323/2*I*c) + 115863621300152298439647525945111489920370403992774304311355052277945386826708814291260*a*e^(321/2*I*c) + 26763951325033666954800413916765668459687382409352116237121465028288206531963685595620*a*e^(319/2*I*c) + 6082529830043102415483569107207792348780163318

2127113659132393327779704055995813166 10*a*e^(317/2*I*c) + 13598024609686162
70231868299814338076025075555715544920009211265679248387475802712230*a*e^(3
15/2*I*c) + 298985079002696924089237936674570653687023892479672655281622093
032615608331810198500*a*e^(313/2*I*c) + 64643918893425950177388154847859391
478782846138908883463204853647802214592593258800*a*e^(311/2*I*c) + 13741380
386275892220936955428884365279657568364963495869127376859464108093967124930
*a*e^(309/2*I*c) + 28712779131862414195841335338276232982778357103549971287
30316529679482826595460860*a*e^(307/2*I*c) + 589627110666913950676757546277
033132409936475850749602886519410515281489835432948*a*e^(305/2*I*c) + 11897
331385794653105655715724616432599593579578912435085803333068441982775202887
2*a*e^(303/2*I*c) + 2358312800567615222040698767520687772002719908925236578
3381244222564261342679308*a*e^(301/2*I*c) + 4591345596645571682092817716756
142718329238022456900510608005443836033879600972*a*e^(299/2*I*c) + 87774689
7443579121236075377490355068404009709042755817010349573425737869900308*a*e^
(297/2*I*c) + 1647366661889354043514224268663063314483379312788400390908676
47515115028970040*a*e^(295/2*I*c) + 303459364323422086498168801179585287007
83259643810281015011805920593868190276*a*e^(293/2*I*c) + 548522383069607487
0232670430705003547243336234497802574847555967196592940404*a*e^(291/2*I*c)
+ 9726629305633107245966511928223950904378469047680283381796284611566447611
76*a*e^(289/2*I*c) + 169157587126134417124650747920308982225001071457475688
802526063335881435874*a*e^(287/2*I*c) + 28844609848991141927798576089491975
808162650525713844636694817073554205876*a*e^(285/2*I*c) + 48212621542624881
89638345987905919984432326565079712079669628450138845920*a*e^(283/2*I*c) +
789685521451876769155582812528911180433623630278166458083659977181181120*a*
e^(281/2*I*c) + 12671114830426751424190809183869304959447341068383855569608
9694914431850*a*e^(279/2*I*c) + 1991167224474414510598158720752001324149743
8423672824426122213941696300*a*e^(277/2*I*c) + 3063323292859702877329490930
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1070364057977767537275375289232929441981287451225816828*a*e^(273/2*I*c) + 6
7944153101887378416790537745291711484709226979885783161630835768882*a*e^(27
1/2*I*c) + 9788540192454256321255171083155760919251578109432314011159159160
067*a*e^(269/2*I*c) + 13786646199696358063256269672770787496771730116563938
58195336896873*a*e^(267/2*I*c) + 189759652753983560479873697200916127533963
528143615261433871315234*a*e^(265/2*I*c) + 25513859756352077572322437078487
111620320963476059001013262542630*a*e^(263/2*I*c) + 33495799768887228955347
25449848627543256623010923459353099036635*a*e^(261/2*I*c) + 429193535791556
847068138327994764831727769099957108368643958154*a*e^(259/2*I*c) + 53649131
382810104977802029620946554089637208561026255904068048*a*e^(257/2*I*c) + 65
38945880517523468866323420234290611269386227470050003903740*a*e^(255/2*I*c)
 + 776724954437796152386576526960981118865651225484076140617434*a*e^(253/2*
I*c) + 89868936876015124138088939755918047910164857950059626671506*a*e^(251
/2*I*c) + 10122593617438421454872945774471611256945529490238801736444*a*e^(
249/2*I*c) + 1109324724380705292283449093231952034907213153230066378718*a*e
^(247/2*I*c) + 118206677912742265308151068632779853612619007457778914450*a*
e^(245/2*I*c) + 12239378690259640676098190698651937625584285361664235941*a*

e^(243/2*I*c) + 1230589291098041959151565198792286611164919449523155204*a*e
^(241/2*I*c) + 120057457669002169157406380951976541404817260989994202*a*e^(
239/2*I*c) + 11356783819252976784499704281554895724049545296747183*a*e^(237
/2*I*c) + 1040783214351939655185196194449040653397856679303077*a*e^(235/2*I
*c) + 92327527810400690773733044860754764248910029932264*a*e^(233/2*I*c) +
7920859200695792807006454406332207329276812132106*a*e^(231/2*I*c) + 6565417
30750769495168952644914474242735369097675*a*e^(229/2*I*c) + 525233335745389
84648429489695519406526756976563*a*e^(227/2*I*c) + 405100148552598682984514
7001535913818302067194*a*e^(225/2*I*c) + 3008701185211923024440851621356627
23458505456*a*e^(223/2*I*c) + 21490721703859150501477595681763435720778909*
a*e^(221/2*I*c) + 1474297474141465450580152071694890996247655*a*e^(219/2*I*
c) + 96993251932443912018716975689508023006378*a*e^(217/2*I*c) + 6109811001
129869767843196320577458616044*a*e^(215/2*I*c) + 36786819496556483260693572
1682843410685*a*e^(213/2*I*c) + 21130809863813051497818215704863434230*a*e^
(211/2*I*c) + 1155591152525353155901693951332528574*a*e^(209/2*I*c) + 60030
708766686810922979823601133828*a*e^(207/2*I*c) + 29548794308424106049320112
65442302*a*e^(205/2*I*c) + 137436252062086506810801408828862*a*e^(203/2*I*c
) + 6021691440068977811219750309348*a*e^(201/2*I*c) + 247678824846833277253
335834952*a*e^(199/2*I*c) + 9526108636579479437964936790*a*e^(197/2*I*c) +
341088288520555248394683275*a*e^(195/2*I*c) + 11311601399861219435495350*a*
e^(193/2*I*c) + 345392409065820898531490*a*e^(191/2*I*c) + 9642935277137118
257641*a*e^(189/2*I*c) + 244124943708196709459*a*e^(187/2*I*c) + 5548294175
019610066*a*e^(185/2*I*c) + 111804416623842644*a*e^(183/2*I*c) + 1966409337
599161*a*e^(181/2*I*c) + 29570065227040*a*e^(179/2*I*c) + 369625815338*a*e^
(177/2*I*c) + 3687040552*a*e^(175/2*I*c) + 27515228*a*e^(173/2*I*c) + 13655
2*a*e^(171/2*I*c) + 338*a*e^(169/2*I*c))/(e^(531*I*c) + 432*e^(530*I*c) + 9
3096*e^(529*I*c) + 13343760*e^(528*I*c) + 1431118260*e^(527*I*c) + 12250372
3056*e^(526*I*c) + 8718181624155*e^(525*I*c) + 530563624556832*e^(524*I*c)
+ 28186192554792138*e^(523*I*c) + 1327882849274858880*e^(522*I*c) + 5616944
4526926562260*e^(521*I*c) + 2154864144781257856128*e^(520*I*c) + 7559981709
2670157806639*e^(519*I*c) + 2442455629894502983849104*e^(518*I*c) + 7309920
7817335597247098038*e^(517*I*c) + 2037031259470368160131922320*e^(516*I*c)
+ 53090127264630963470039804475*e^(515*I*c) + 12991466459932403181678265322
88*e^(514*I*c) + 29952547749265499675257842032197*e^(513*I*c) + 65265025334
3206047453620559993840*e^(512*I*c) + 13477227799524701956579274210395326*e^
(511*I*c) + 264410375780310742518099326419685040*e^(510*I*c) + 493966661081
8025798809586352543471345*e^(509*I*c) + 88054927598941411145869950813388040
256*e^(508*I*c) + 1500602747937397286405577818722691539392*e^(507*I*c) + 24
489837337812338687718622491865013839488*e^(506*I*c) + 383360155801054824529
764688213114368047154*e^(505*I*c) + 576460104656315130421385471071534683844
7392*e^(504*I*c) + 83380839911837894453136303673785039051506805*e^(503*I*c)
 + 1161581413733971751533622511909046917188768400*e^(502*I*c) + 15603911277
687607099721623771744933086920587272*e^(501*I*c) + 202347509724462171313966
643580234078508179838320*e^(500*I*c) + 253566746065027977683456156618659121
3109251642859*e^(499*I*c) + 30735366512830562160991166338490057308062762518

496*e^(498*I*c) + 3606886130363893494138097800045599635487754233252555*e^(49
7*I*c) + 410154543993719579395995670844249670943380026122488 0*e^(496*I*c) +
 4523094003983073833202569478464620684485482769807573 6*e^(495*I*c) + 484093
41024048871865591702530366258109165912618234452 8*e^(494*I*c) + 503202490340
14518240742139437660119220265070063119827 53*e^(493*I*c) + 50836369508171099
437019348610847391946736185108017183136*e^(492*I*c) + 499467506558531733671
585862910572702811545035730398749530*e^(491*I*c) + 477539860710085326353420
773381826677747869341273873103168 0*e^(490*I*c) + 444567081752588210244009 46
21053500452377572219097746848449 6*e^(489*I*c) + 403212225957798188840846139
96099562414449127169433679645958 4*e^(488*I*c) + 356476489062872401708848799
668817892919578761395854547480484 5*e^(487*I*c) + 307362174043210099652310 37
41966305396288103528170922169778507 2*e^(486*I*c) + 258585348715977270155829
115684193411072034541491364393985491350*e^(485*I*c) + 212370296918887131826
67187812239270678399490157272938840653880 80*e^(484*I*c) + 17033886027390615
741040977721655541665612162275485028584310890417*e^(483*I*c) + 133490210052
026183779673313868332303530332906163247194627808410304*e^(482*I*c) + 102253
643746829673729306586270524644969368741555986584430688870542 3*e^(481*I*c) +
 76590105201875496517771183576768719270818989891311257557982042361 12*e^(480
*I*c) + 5611708107634117538408757018518853866037593201367473551905522736836
6*e^(479*I*c) + 402349692266121158934003582839428785116904903936409545602 51
9219664720*e^(478*I*c) + 2823905151936586678382525706564457280290098698638 5
97987628380245881715*e^(477*I*c) + 194079792155945665935350081033032552577 4
540807008243133894518479746393 6*e^(476*I*c) + 130657660226560419335121434 38
9938961884595434069984824307149332131747540*e^(475*I*c) + 86188485109499190
876424680547467242860375731548445397471361281221542899 2*e^(474*I*c) + 55725
511157328671121016216416307596161861955969011697222340926210112854418*e^(473
*I*c) + 3532444720677901811537805282078941168758100458236743100620587963372
9015200*e^(472*I*c) + 21960128133951556150026147884419002487055526128194605
88396140446970379636 95*e^(471*I*c) + 13392143742542455535648844068019453533
8500025403065576595377023760718008996 8*e^(470*I*c) + 801372958079075243436 1
96494576154376146952079121074697267587048105867427784 4*e^(469*I*c) + 470650
446111351581084873533674842431026982488383126358762830994274427458667 04*e^(
468*I*c) + 2713612075032665707344865170771810148017753221831810556386192578
36143271472358*e^(467*I*c) + 1536333238444927583532734556016494671674916578
907116984548489078241693926940560*e^(466*I*c) + 854301344112621233483354066
5069621472479085838041360564550722036723654297540205*e^(465*I*c) + 46668223
5482660178068545924681005702893559608696136508565757567581801822233087 68*e^
(464*I*c) + 2505010286089283324693404568299020677122336444646027531599457 27
868485722395506952*e^(463*I*c) + 13214980552713008514299938666316198744245 3
44251881835920497276875710321564350772 80*e^(462*I*c) + 685299322314573668 73
28885311617795435592940841439866351079655652312894721972796266*e^(461*I*c)
+ 349410716132767046494779430433394502015040753351603618659160292138607786 0
6230624960*e^(460*I*c) + 175193170500618300241515632381912285157790097816 04
922067121721222001529713340063606 0*e^(459*I*c) + 86397993362233034955629682
002839551319870806494050570212606865293680079482665126425 6*e^(458*I*c) + 41

915425006568261480933394145441591439644784724923159318091718599021141090059
39942952*e^(457*I*c) + 20008006803030047137293278250321597113540716201983333
312634928118667915319906804525 7216*e^(456*I*c) + 939869153130681791490836060
656814827808360605105301546184869498394671313788598859982 10*e^(455*I*c) +
434546676780280045346344498763892540797175105756827515509297024187660299345
484920192480*e^(454*I*c) + 1977792980665818135651300094326239158605448870 80
697086057732538502860998303453467231850 0*e^(453*I*c) + 886275214275695728 56
813408857649045979353495693553218156477211725371591864914713116664 00*e^(452
*I*c) + 391080312556018094765375353696118444408449037516056450235145723520 4
524810426293359885073 0*e^(451*I*c) + 169956327969929767773902096652629253 28
370450547712754455653441737668654093670607384733760 0*e^(450*I*c) + 72752101
071839422929177407384469425579873866706753537975973279556794257875138425078
0476310*e^(449*I*c) + 306797429643174736419815962396246367161700641962685 14
261484186029348529073790216597619118 40*e^(448*I*c) + 127472196165033205413 5
634306256284736860162214085678602544581453203790411152324229823571330 0*e^(4
47*I*c) + 521909122076618242158122718542697480712928432432278947692296907 20
010547141334131610989636000*e^(446*I*c) + 210594301385648471184329078880317
504953361839954159427434009884661777259752542647709150036990*e^(445*I*c) +
837579206923411932458786486765373533946545239708990769488724813982189165104
589895518909256320*e^(444*I*c) + 328387476055581867672630948030673442015509
858394807446901416817187444217010964852162753875592 0*e^(443*I*c) + 12693496
932964920565073673637181280088548682508880255337280065006566138696041797353
216584528640*e^(442*I*c) + 483794897564340998438577918165893794068150426093
403787475864371457816462454220451012304173099 00*e^(441*I*c) + 1818346614061
779013153301296771453811664491884131941411693443547549209690349526103789452
82257600*e^(440*I*c) + 674025530543133008894845775236625237450743114473544 5
378181704471346071025756766760566753289615 90*e^(439*I*c) + 2464382190807439
609079774226855679629367885709776435876630851716253962696192341706239192878
728160*e^(438*I*c) + 888829502875102466704420383760797610148005313441861447
462076752282486891195988435266644491740 4000*e^(437*I*c) + 31626644674725547
731176795687527653571305969985923688392112164915553242573269490908989570248
533280*e^(436*I*c) + 111034148797008819443143895644469242295049867464313710
96925761933889913379928561602006987261171085 0*e^(435*I*c) + 384655842080666
274454063078784837174998949052500975322162003392549953413592461519365177908
682078400*e^(434*I*c) + 131505212093069212210229710532762284233587074342853
089107298353586228009444660772347380047745391413 0*e^(433*I*c) + 44372109178
431823477643495444439046990200565950694708471936170921147140776330772349728
25351226979360*e^(432*I*c) + 147779550966171289987127451820714953621765069 7
318308165023360527405167762497046434024275584002567376 0*e^(431*I*c) + 48584
258153140280447314836868772131390195412419046732778458706015096881437076337
910793584122475073760*e^(430*I*c) + 157685845528850918721462877864435090257
5831494155613234273865628944759827793562980093923717562514983 0*e^(429*I*c)
 + 505293663123015258878484830257388128132033977668453400653812610163534197 22
382620393032535960660921950400*e^(428*I*c) + 159877110105819269227052899967
744474268563100623245618584492522014400230587812038082848398866357482910 0*e

^(427*I*c) + 49952419562791381802051867444016880243882721139212556637349569
46927571305533146776898787878059685108480*e^(426*I*c) + 1541311121148602393
729497082079737671608134478816338654352242193973750796212585498188187916834
8260330000*e^(425*I*c) + 46970224727117281826454045018070670522559756627580
347784535320014963482632359729444541885102274546002560*e^(424*I*c) + 141379
938253556843280565505807403304130606130725434751745794079833141361748917639
986145377066437210546190*e^(423*I*c) + 420358024835146798583611210145942154
684437949365647899088372524802156222884839580011688655664280691773600*e^(42
2*I*c) + 123466804189240997878001808175544021601258247639694193796589963195
3079203974222138794604328498972144766900*e^(421*I*c) + 35827180021632960614
145367037151098971071982527392845461493431023484561240896574285949464386608
59773886240*e^(420*I*c) + 1027160253020288900249781351684945259097151280952
9060665197301097052210064576088348023234671975463677418470*e^(419*I*c) + 29
097651061247453406647569781836910062165559852359052804259154165687125428752
562385492373749486351714453120*e^(418*I*c) + 814520814138291118288754175642
500548460376933128114804929091607581959891557681070225683509538618159407040
90*e^(417*I*c) + 2253205325932206577679411092895162489997945210155641349828
27241710019675486694499689312466561907212627820000*e^(416*I*c) + 6160031160
229795849371257017578872129983543009899913626280388610939145613320711919097
14949426587936910303300*e^(415*I*c) + 1664475034387211809394917743502937638
978574937754764763987835872410449930690131572904279995484581013965001440*e^
(414*I*c) + 444541225929547462506765951419831296601541629996893039334563034
5914109720740573618884980520010028451496996210*e^(413*I*c) + 11735856926245
118493113091002501604032341876985999082823520672241530200188223826392982302
194084667538488665600*e^(412*I*c) + 306275810542219573783905472892776091295
72813931082733520247387226000020043538279468776707958420892547870128680*e^(
411*I*c) + 7901914955876656925478398848723238835290914498274717185677246322
3808993367091503402876467270176124342699654400*e^(410*I*c) + 20155794742479
409802677247846204088339586751256293086294375356869008401558559801015478154
8625239409581907397500*e^(409*I*c) + 50832459930108546016697862968303266142
7654474082939048097939638391567298795788389433842285751054665210868287680*e
^(408*I*c) + 12675970172948129134001462760421269299864802928701903991075543
11079964227280196522475370108738477856311765699610*e^(407*I*c) + 3125683493
178701743479704750307490178666292150720179363604335113528623329684606343185
540756019935662148267863968*e^(406*I*c) + 762178879191204706203884091779937
460042889225819436763668294435609668140024631213800176928502066144599107324
9416*e^(405*I*c) + 18379807084003359766027649217621144116091735572216620788
861535803449702273802588359076704241840733513439114113248*e^(404*I*c) + 438
349721429193776853786922330210637445540331009285027374804389789767469898957
84070951905237783490374305934542955*e^(403*I*c) + 1033997554672574364898478
376407537547182043944730557950014676043264198765555568738295317372110961151
96005647730480*e^(402*I*c) + 2412460212824400617929083177830328761948015971
33206052091286997043729145345755805710081489006741839439573984832678*e^(401
*I*c) + 5567563887111823403410261927342195461136517683173805390058936790493
94714017063698565272728813669054779077208977840*e^(400*I*c) + 1271033082938

0489502013605548312703426623439912775046123423003660250467417428565804452894017866563116858590230847 16*e^(399*I*c) + 2870496131412314451834674715353589439553294430808531933466086288543709246230769151392180699413405623017247753532944*e^(398*I*c) + 6413381895855925184758231451062556380328594938511006577015218119786536390213057284018202201631094434819584025113465*e^(397*I*c) + 1417648365287570495720201334324111790436997779665384995990252442198063518901163481565327960549778338288893276673008 0*e^(396*I*c) + 3100431920606941707706936314142348743182800909818474463567865228417743946494165181256451914491800317410807763484601 4*e^(395*I*c) + 6709170613052966912501989921002157658023784346222953538629508707618929784999593136064560529213096149610670752150643 2*e^(394*I*c) + 1436576871380447969429471197042595384588181994235168246745862936910561192098663581236377722454095307992305537672222 52*e^(393*I*c) + 3043844711068133360102841601239063704338888284906274226525512369667909161745208577591439301401871734923949819082589 44*e^(392*I*c) + 6382188929145337415058063996624885560667836004960918764083749748774489717780360749962455811242834604380651820719760 85*e^(391*I*c) + 1324311324984027428355222938147682378672860708817161741448749689593588020860847508703702325320304649883120684987556400*e^(390*I*c) + 2719589283483743926040805101080341921244530311254607250929192773909331523226635035815672862569296693711643521070331394*e^(389*I*c) + 5527498849031178355861230009326668283926290082158467118000698502719379939045918344222192742145711257028040974074674736*e^(388*I*c) + 1111949964536320108088106282488633849242537565844897793553584634929042582157038309042541141852151667037137204520656834 5*e^(387*I*c) + 2214073500170860327091518076924139166203557875590397914890921360382255479274918351716025557191587535643955371713079788 8*e^(386*I*c) + 4363830007581517102594621146446568961896577348866098585794565747985408510885185791122291198983761545260851235600840029 5*e^(385*I*c) + 8513953323478645577958995946490063776073572970562122138000583720836915779467304967542879981787543143024633262589963016 0*e^(384*I*c) + 1644375006769068927413232601543942785039545619360201335965818064493572402773494479273345171058099953000935492799312731 78*e^(383*I*c) + 3144090358082258615655954369383549454454739910431297220467472288130309252049685034185668188386118667098070407934953644 96*e^(382*I*c) + 5951576155004315149474792823365470538279260879164252634971877570294133854718354341982468070962145368954413883060272378 99*e^(381*I*c) + 1115398285545601550533328045600184317993899359217996729818340704221801195667410485846996179056733558512452238583160792512*e^(380*I*c) + 2069698289500860643461665762373807957513019424041178871904960551829412449344722432125679417958403007551179298315947373776*e^(379*I*c) + 3802604996705891106964620633848964807037098854510182263243030597295630760353597531974324752266389193185760878274188013440*e^(378*I*c) + 6917838945214844278493330459361394923372333853619879637372673184942859712431066345726870422099893124890777678037369988150*e^(377*I*c) + 1246214044053725808492859670987206685775707094312486855450094815475686345430803292540834031123785001781470789698696908681 6*e^(376*I*c) + 2223134113180153534540639903772168684020839794195258013558464596674673665671627155482647628299106607656492143261433939973 5*e^(375*I*c) + 3927420041432986116939794451622500108122743339858 50

072063992312119071577953597196482415987542665798402445514914764678999552*e^(
374*I*c) + 6871246601598564151246858617365974773487959171009835465278612493
6023073943141049573606648563005359411712764895683903806088*e^(373*I*c) + 11
906059184966054683476569322767644906758414824888267844750482607723633344451
3454095126668750057295811191643356908972191440*e^(372*I*c) + 20432555726518
600076740271023084789645976158392276369823543321283331307778304104007466937
9017394836761539649081690630811665*e^(371*I*c) + 347310053810935290419455556
055595731412956921073574598323436965997641337477407800017307007524865452491
7179128950507443058208*e^(370*I*c) + 58474957368230458617938462884488332758
149896988654038037889676799907561496400717460081109294535663511879582479936
9716742109*e^(369*I*c) + 97521033944404931875728231176351778667322317559445
7946383279264635085041004917300295904275433144848532459919875479817581584*e
^(368*I*c) + 16110925414000605259548593752641941783476434718370782014462624
35615142944587337833513586022729849523358436493586042252995608*e^(367*I*c)
+ 2636662410430799340447522284778244283740751068658140726576446671207798325
606832295937705061686297930296382338892574900819440*e^(366*I*c) + 427482690
772059175252671133682087150084434564792238547153435933360618957183244464136
4132893108663576205133870672156264164115*e^(365*I*c) + 68664253375186682626
626937509089569657329245781421816306221578028998808746815510311363140641999
48604001529894566235238597088*e^(364*I*c) + 1092721060347354481027979234784
453607458889680623004111008954473160586314610418173903942667485545346609740
2330688331845602302*e^(363*I*c) + 17229502824367647334400721998417596703948
657394738805209391636597370380572398964715080095366818322029152193635869784
095333760*e^(362*I*c) + 269177947010866150978901202368905011051467999960217
75195710866226228638984703456832694153230611607263444183501026198563419616*
e^(361*I*c) + 4167044037539054364341821934227174804003507149011908058528152
2498188818375906900368701234531304633163446319945130196476913600*e^(360*I*c
) + 63923019433761989090614801288635098123199445102303122616544648208998767
803944455777042886552738499747183713136069104651812215*e^(359*I*c) + 971730
550247426800586167224613688926611412955402634930130327460835361573242683333
90400308958318370219154887169702257444756176*e^(358*I*c) + 1463904484563511
812182373827403741241916648199977469880765983918627336296701422415463755339
03130605297580105675355629160198162*e^(357*I*c) + 2185631666596493122474836
409562721492124991153838287710296542833639725851180904794136966381081563852
446465913284544257745117584*e^(356*I*c) + 3234131780148410037141511382460791
525763609760350584578904099377387231715370365730436819971637453136024001391
53046673668433091*e^(355*I*c) + 4743230435631005423773386299319662481291759
769823324460180560093911540204388959031408229677694940194461667799540246553
44116288*e^(354*I*c) + 6895184493287935599032604181499741902535783400588950
35589606468244680591556118170304005037563669880057908765898949268614772285*
e^(353*I*c) + 9935556536495211272264439608202336493864885100818925458667004
44096661582790441241830855609577062039555625090943332264901780720*e^(352*I*
c) + 1419164481422176573858234013898999628822322333309573730716310743838935
832201454293617293175086458389621425307051750612129761498*e^(351*I*c) + 200
949611009268773815278208568373722272796882429905873921544608349935146762533

4449670757764066690656150949014944043994822823920*e^(350*I*c) + 28208192985
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4498398959346631795568022519974400130281*e^(349*I*c) + 3925697658415778352
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8183579538662584616443540182051589177425764253443649645967506531776778034921
86817305171175032011500*e^(347*I*c) + 7410372612891152224364633296128043971
6571932803277543043822356727737814030238141276103555625052719690451777047260
54907145784960*e^(346*I*c) + 1005220952436958182758815498534554967803144574
4499985208259385435609740272400301454246872041775159838468077381562338745636
398374*e^(345*I*c) + 1352123041194543691555885470685179654156739981165687002
1567352975326815467817846533289123871696056195231696146162720992221760992*e^
(344*I*c) + 18035327338177455471177568594851682977978346449777193572087688510
392426884519272991560851326393852241961470040819793627127923997*e^(343*I*c)
+ 23856398565562802030695278174212640833282154174006459458292644060947924907
313735921561690153939906017518647182491616573724049744*e^(342*I*c) + 312952
6368818983831377277587330726033411722725862950199235869563609266286606281984
5689064235813622974150120668921391878398978380*e^(341*I*c) + 4071598896370
1918950020348336736423420513311359010485246919074652883393970805374470830156
229705647312265477584256027212762941040*e^(340*I*c) + 525392233467407711425
8709237025706953606031964443950166761048276795580027605289243215279881460797
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9966304760689061048209049461949280293513021597981946996638333678869390013911
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1881974987582215*e^(337*I*c) + 107504737406576916123480399169759633328321407
4194005100174988498305986215654282665463159339208215275447263802016591149038
34605888*e^(336*I*c) + 1342977420234794299046296161045596100960747587210680
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0*e^(335*I*c) + 166432332922589195130558329266398753389823955737598527556096
093062473559769545772321978969318904192572733997888230986469005970880*e^(334
*I*c) + 2046222955357291095198299167898672253194297051625600826488403949654
23112809336591921290309392396263834674368977840527147037426908*e^(333*I*c) +
2495930722825658663983899515096192026826344554871287146314618917708232013675
27645793770203788784677343934971424317987895255031936*e^(332*I*c) + 3020606
3803086846346113944227936049971890691748252489448335622019613837705082891138
3056860425370161157201493696073712322595776808*e^(331*I*c) + 3627063075638
4323113569915741851073245242061401362416887931218764523345015392797579332683
4780741391203430153093712635355523960320*e^(330*I*c) + 43214785646408693802
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012452636891350731618278545690160*e^(329*I*c) + 510907615111134507452623846
1471371414502757222444316385531648429230851686635827717488464500331623385777
400744950538410637735936000*e^(328*I*c) + 5993784847717334748093761424015548
5020706497211813757294925750365144454193930902527689604962251563026316218452
6394317285457368300*e^(327*I*c) + 6977891069259246

1481671374768468278508365981902795224444704335586974136850045256116402463607340192969310580110552273840534902816 0*e^(326*I*c) + 806169671327625532424575340089775733681994991576674446922354099714615192085443245663852257001115644286660304979476023966071898200*e^(325*I*c) + 924320052867522584035777495761072351222534420784861960001821020509468146356756433795246446491396141583854513687104334429566707520*e^(324*I*c) + 105178210042883437194450817005121918711681634976695332263718214961087500422378478418328496190649442295546243120864569080252677078 0*e^(323*I*c) + 118781794307939031610880232479811012902082278266008724859936764348120020604682216614428542592222937541367653507114100528643148160 0*e^(322*I*c) + 133139611462672303580246212353158205033974999601415245283530595636742537022275862175392245872752485607295088096065756472047583850 0*e^(321*I*c) + 148118711708924666246695569496567785552473031326055269082160265717621873742624552279532989146409100587830430407595369354676720608 0*e^(320*I*c) + 163556974464142190065788638128907665322758017205667758745140206923435528368748965961391376195914077333973601479008181451662522444 0*e^(319*I*c) + 179264907808963229893694572848196933496439159750628508848835062293725253342098080314431643170145219052271612479787525743751636064 0*e^(318*I*c) + 195028655078018191924499296120448701005646036284521850167442376626632155879143691731787870223267921386828792629466520276972292738 0*e^(317*I*c) + 210614190346834430711254976120248454340279425235248219981741042486967726271509828843764651868348794546277422365647134589908215680 0*e^(316*I*c) + 225772621910385628681283301268157376549626224142061293207614315117196085455412414469902300984208051515792352935718986994351599120 0*e^(315*I*c) + 240246459556968608612000180303421105673944558862194614138410616288624616181514976302503083487523406726777402343341826998243126528 0*e^(314*I*c) + 253776641546503033081547174669298859606991189469722505292832045254217558715484809648333120980743011394301539836266967333795775572 0*e^(313*I*c) + 266110064797578358382823513920144193017839664338342390358386254725588077238204920101553721490083274560151973714184980250668526400 0*e^(312*I*c) + 277007320715076864559750728138206549792496846605452741412233982733378377006830588348730997931598371840374087288434574638068020426 0*e^(311*I*c) + 286250312632046179777066778072564418499125562317462617567905067210084898811939184146657341701924759058073526514342728934045081120 0*e^(310*I*c) + 293649421435186849870323945542677110434482730626755891655087746723245515328614052108958273393220255313071272383698346886623090880 0*e^(309*I*c) + 299049894962254360853812938028386633519008711151248588181437876191869571119037657239748996515185551449242903462425951672743830089 60*e^(308*I*c) + 302337164350822502717560317521295321902248504585073184530751900827738515473146121338803557915991759006234352746497728660116510062 0*e^(307*I*c) + 303440835553095707578773174532256798168461655016284547325767967428021694735678578384320560420230783689707359541041257566046578752 0*e^(306*I*c) + 302337164350822502717560317521295321902248504585073184530751900827738515473146121338803557915991759006234352746497728660116510062 0*e^(305*I*c) + 299049894962254360853812938028386633519008711151248588181437876191869571119037657239748996515185551449242903462425951672743830089 60*e^(304*I*c) + 2936494214351868498703239455426771104344827306267558916 5508

774672324551532861405210895827339322025531307127238369834688662309088800*e^(
303*I*c) + 2862503126320461797770667780725644184991255623174626175679050672
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*c) + 277007320715076864559750728138206549792496846605452741412233982733378
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820492010155372149008327456015197371418498025066852640000*e^(300*I*c) + 2537
766415465030330815471746692988596069911894697225052928320452542175587154848
0964833312098074301139430153983626696733379577557 20*e^(299*I*c) + 240246459
556968608612000180303421105673944558862194614138410616288624616181514976302
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386828792629466520276972292738 0*e^(295*I*c) + 17926490780896322989369457284
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1612479787525743751636064 0*e^(294*I*c) + 1635569744641421900657886381289076
653227580172056677587451402069234355283687489659613913761959140773339736014
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369354676720608 0*e^(292*I*c) + 13313961146267230358024621235315820503397499
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0*e^(289*I*c) + 92432005286752258403577749576107235122253442078486196000182
102050946814635675643379524644649139614158385451368710433442956670752 0*e^(2
88*I*c) + 80616967132762553242457534008977573368199499157667444692235409971
461519208544324566385225700111564428666030497947602396607189820 0*e^(287*I*c
) + 69778910692592461481671374768468278508365981902795224444704335586974136
850045256116402463607340192969310580110552273840534902816 0*e^(286*I*c) + 59
937848477173347480937614240155485020706497211813757294925750365144454193930
902527689604962251563026316218452639431728545736830 0*e^(285*I*c) + 51090761
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480661901245263689135073161827854569016 0*e^(283*I*c) + 36270630756384323113
569915741851073245242061401362416887931218764523345015392797579332683478074
139120343015309371263535552396032 0*e^(282*I*c) + 30206063803086846346113944
227936049971890691748252489448335622019613837705082891138305686042537016115
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1424317987895255031936*e^(280*I*c) + 2046222955357291095198299167898672253l
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80*e^(277*I*c) + 107504737406576916123480399169759633328321407419400510017
4988498305986215654282665463159339208215275447263802016591149038346058888*e
^(276*I*c) + 853681184302153128482312917396737358877462018516662996003921994
187647500868281987198727440477677836673253262892218819749875822l5*e^(275*I
*c) + 67244087969080703823703257199663047606890610482090494619492802935130215
9798194699663833367886939001391155946468937840954184723 36*e^(274*I*c) + 5
2539223346740771142587092370257069536060319644439501667610482767955800276052
89243215279881460797511036622494508142812188847332 4*e^(273*I*c) + 40715988
9637019189500203483367364234205133113590104852469190746528833939708053744708
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3831377277587330726033411722725862950199235869563609266286606281984568906423
58136229741501206689213918783989 78380*e^(271*I*c) + 238563985655628020306952
7817421264083328215417400645945829264406094792490731373592156169015393990
6017518647182491616573724049744*e^(270*I*c) + 180353273381774554711775685948
5168297797834644977719357208768851039242688451927299156085132639385224196l
4700408197936271279 23997*e^(269*I*c) + 135212304119454369155588547068517965
4156739981165687002156735297532681546781784653328912387169605619523169614616
2720992221760992*e^(268*I*c) + 100522095243695818275881549853455496780314457
4449998520825938543560974027240030145424687204177515983846807738156233874
5636398374*e^(267*I*c) + 741037261289115222436463329612804397165719328032775
4304382235672773781403023814127610355562505271969045177704726054907145784960
*e^(266*I*c) + 541666280405243634958559598281835795386625846164435401820515
891774257642534436496459675065317767780349218681730517117503 2011500*e^(26
5*I*c) + 392569765841577835276810394285601184021164276962171721799661439847
3887186074391482638547212826538270453912634540299792270321024*e^(264*I*c) +
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1100926877381527820856837372227279688242990587392154460834993514676253344496
707577640666906561509490149440439948228 23920*e^(262*I*c) + 141916448142217
6573858234013898999628822322333309573730716310743838935832201454293617293175
08645838962142530705175061212976l498*e^(261*I*c) + 993555653649521127226443
9608202336493864885100818925458667004440966615827904412418308556095770620395
5562509094333226490178 0720*e^(260*I*c) + 689518449328793559903260418149974
1902535783400588950355896064682446805915561181703040050375636698800579087658
9894926861477 2285*e^(259*I*c) + 474323043563100542377338629931966248129175
9769823324460180560093911540204388959031408229677694940194461667799540246553
44116288*e^(258*I*c) + 323413178014841003714151138246079152576360976035058
4578904099377387231715370365730436819971637453136024001391530466736684330 91
*e^(257*I*c) + 2185631666596493122474836409562721492124991153838287710296 5

4283363972585118090479413696638108156385244646591328454425745117584*e^(256*
I*c) + 14639044845635118121823738274037412419166481999774698807659839186273
3629670142241546375533903130605297580105675355629160198162*e^(255*I*c) + 97
17305502474268005861672246136889266114129554026349301303274608353615732426 8
33339040030895831837021915488716970225744475 6176*e^(254*I*c) + 639230194337
61989090614801288635098123199445102303122616544648208998767803944455777042 8
86552738499747183713136069104651812215*e^(253*I*c) + 4167044037539054364341
82193422717480400350714901190805852815224981888183759069003687012345313046 3
3163446319945130196476913600*e^(252*I*c) + 269177947010866150978901202368 90
50110514679999602177519571086622622863898470345683269415323061160726344418 3
501026198563419616*e^(251*I*c) + 172295028243676473344007219984175967039486
57394738805209391636597370380572398964715080095366818322029152193635869784 0
95333760*e^(250*I*c) + 109272106034735448102797923478445360745888968062300 4
11100895447316058631461041817390394266748554534660974023306883318456023 02*e
^(249*I*c) + 686642533751866826266269375090895696573292457814218163062215 78
0289988087468155103113631406419994860400152989456623523859708 8*e^(248*I*c)
+ 427482690772059175252671133682087150084434564792238547153435933360618957 1
832444641364132893108663576205133870672156264164115*e^(247*I*c) + 263666241
04307993404475222847782442837407510686581407265764466712077983256068322959 3
7705061686297930296382338892574900819440*e^(246*I*c) + 1611092541400060525 9
54859375264194178347643471837078201446262435615142944587337833513586022729 8
4952335843649358604225299560 8*e^(245*I*c) + 9752103394440493187572823117635
17786673223175594457946383279264635085041004917300295904275433144848532459 9
19875479817581584*e^(244*I*c) + 584749573682304586179384628844883327581498 9
69886540380378896767999075614964007174600811092945356635118795824799369716 7
42109*e^(243*I*c) + 347310053810935290419455560555957314129569210735745983 2
3436965997641337477407800017307007524865452491717912895050744305820 8*e^(242
*I*c) + 204325557265186000767402710230847896459761583922763698235433212833 3
1307778304104007466937901739483676153964908169063081166 5*e^(241*I*c) + 1190
60591849660546834765693227676449067584148248882678447504826077236333444513 4
540951266687500572958111916433569089721914 40*e^(240*I*c) + 6871246601598564
15124685861736597477348795917100983546527861249360230739431410495736066485 6
300535941171276489568390380608 8*e^(239*I*c) + 392742004143298611693979445 16
22500108122743339858500720639923121190715779535971964824159875426657984024 4
5514914764678999 52*e^(238*I*c) + 222313411318015353454063990377216868402083
97941952580135584645966746736656716271554826476282991066076564921432614339 3
99735*e^(237*I*c) + 124621404405372580849285967098720668577570709431248685 5
4500948154756863454308032925408340311237850017814707896986969086816*e^(236*
I*c) + 69178389452148442784933304593613949233723338536198796373726731849428
5971243106634572687042209989312489077767803736998815 0*e^(235*I*c) + 3802604
99670589110696462063384896480703709885451018226324303059729563076035359753 1
974324752266389193185760878274188013440*e^(234*I*c) + 206969828950086064346
16657623738079575130194240411788719049605518294124493447224321256794179584 0
3007551179298315947373776*e^(233*I*c) + 1115398285545601550533328045600184 3
17993899359217996729818340704221801195667410485846996179056733558512452238 5

83160792512*e^(232*I*c) + 5951576155004315149474792823365470538279260879164
25263497187757029413385471835434198246807096214536895441388306027237899*e^(
231*I*c) + 3144090358082258615655954369383549454454739910431297220467472288
13030925204968503418566818838611866709807040793495364496*e^(230*I*c) + 1644
375006769068927413232601543942785039545619360201335965818064493572402773494
47927334517105809995300093549279931273178*e^(229*I*c) + 8513953323478645577
958995946490063776073572970562122138000583720836915779467304967542879981787
5431430246332625899630160*e^(228*I*c) + 43638300075815171025946211464465689
618965773488660985857945657479854085108851857911222911989837615452608512356
008400295*e^(227*I*c) + 221407350017086032709151807692413916620355787559039
79148909213603822554792749183517160255571915875356439553717130797888*e^(226
*I*c) + 1111949964536320108088106282488633849242537565844897793553584634929
0425821570383090425411418521516670371372045206568345*e^(225*I*c) + 55274988
490311783558612300093266682839262900821584671180006985027193799390459183442
22192742145711257028040974074674736*e^(224*I*c) + 2719589283483743926040805
101080341921244530311254607250929192773909331523226635035815672862569296693
711643521070331394*e^(223*I*c) + 132431132498402742835522293814768237867286
070881716174144874968959358802086084750870370232532030464988312068498755640
0*e^(222*I*c) + 63821889291453374150580639966248855606678360049609187640837
4974877448971778036074996245581124283460438065182071976085*e^(221*I*c) + 30
438447110681333601028416012390637043388882849062742265255123696679091617452
0857759143930140187173492394981908258944*e^(220*I*c) + 14365768713804479694
294711970425953845881819942351682467458629369105611920986635812363777224540
9530799230553767222252*e^(219*I*c) + 67091706130529669125019899210021576580
237843462229535386295087076189297849995931360645605292130961496106707521506
432*e^(218*I*c) + 310043192060694170770693631414234874318280090981847446356
78652284177439464941651812564519144918003174108077634846014*e^(217*I*c) + 1
417648365287570495720201334324111790436997779665384995990252442198063518901
1634815653279605497783382888932766730080*e^(216*I*c) + 64133818958559251847
582314510625563803285949385110065770152181197865363902130572840182022016310
94434819584025113465*e^(215*I*c) + 2870496131412314451834674715353589439553
294430808531933466086288543709246230769151392180699413405623017247753532944
*e^(214*I*c) + 127103308293804895020136055483127034266234399127750461234230
0366025046741742856580445289401786656311685859023084716*e^(213*I*c) + 55675
638871118234034102619273421954611365176831738053900589367904939471401706369
8565272728813669054779077208977840*e^(212*I*c) + 24124602128244006179290831
778303287619480159713320605209128699704372914534575580571008148900674183943
9573984832678*e^(211*I*c) + 10339975546725743648984783764075375471820439447
3055795001467604326419876555556873829531737211096115196005647730480*e^(210*
I*c) + 43834972142919377685378692233021063744554033100928502737480438978976
746989895784070951905237783490374305934542955*e^(209*I*c) + 183798070840033
597660276492176211441160917355722166207888615358034497022738025883590767042
41840733513439114113248*e^(208*I*c) + 7621788791912047062038840917799374600
428892258194367636682944356096681400246312138001769285020661445991073249416
*e^(207*I*c) + 312568349317870174347970475030749017866629215072017936360433

511352862332968460634318554075601993566214826786396 8*e^(206*I*c) + 12675970
172948129134001462760421269299864802928701903991075543110799642272801965224
7537010873847785631176569961 0*e^(205*I*c) + 508324599301085460166978629683 0
326614276544740829390480979396383915672987957883894338422857510546652108682
87680*e^(204*I*c) + 2015579474247940980267724784620408833958675125629308629
437535686900840155855980101547815486252394095819073975 00*e^(203*I*c) + 7901
914955876656925478398848723238835290914498274717185677246322380899336709150
34028764672701761243426996544 00*e^(202*I*c) + 3062758105422195737839054728 9
277609129572813931082733520247387226000020043538279468776707958420892547870
128680*e^(201*I*c) + 1173585692624511849311309100250160403234187698599908 28
2352067224153020018822382639298230219408466753848866560 0*e^(200*I*c) + 4445
412259295474625067659514198312966015416299968930393345630345914109720740573
61888498052001002845149699621 0*e^(199*I*c) + 16644750343872118093949177435 0
293763897857493775476476398783587241044993069013157290427999548458101396500
1440*e^(198*I*c) + 616003116022979584937125701757887212998354300989991362 62
8038861093914561332071191909714949426587936910303300*e^(197*I*c) + 22532053
259322065776794110928951624899979452101556413498282724171001967548669449968
93124665619072126278200 00*e^(196*I*c) + 814520814138291118288754175642500 54
846037693312811480492909160758195989155768107022568350953861815940704090*e^
(195*I*c) + 290976510612474534066475697818369100621655598523590528042591541
65687125428752562385492373749486351714453120*e^(194*I*c) + 1027160253020288
900249781351684945259097151280952906066519730109705221006457608834802323467
1975463677418470*e^(193*I*c) + 358271800216329606141453670371510989710719 82
5273928454614934310234845612408965742859494643866085977388624 0*e^(192*I*c)
+ 123466804189240997878001808175544021601258247639694193796589963195307920 3
97422213879460432849897214476690 0*e^(191*I*c) + 420358024835146798583611210
145942154684437949365647899088372524802156222884839580011688655664280691773
600*e^(190*I*c) + 1413799382535568432805655058074033041306061307254347517 45
79407983314136174891763998614537706643721054619 0*e^(189*I*c) + 469702247271
172818264540450180706705225597566275803477845353200149634826323597294445418
85102274546002560*e^(188*I*c) + 154131112114860239372949708207973767160813 4
478816338654352242193973750796212585498188187916834826033000 0*e^(187*I*c) +
4995241956279138180205186744401688024388272113921255663734956946927571305 5
33146776898787878059685108480*e^(186*I*c) + 159877110105819269227052899967 7
444742685631006232456185844925220144002305878120380828483988663574829100*e^
(185*I*c) + 505293663123015258878483025738812813203397766845340065381261016
3534197223826203930325359606609219504 00*e^(184*I*c) + 1576858455288509187 21
462877864435090257583149415561323427386562894447598277935629800939237175625
149830*e^(183*I*c) + 485842581531402804473148368687721313901954124190467327
78458706015096881437076337910793584122475073760*e^(182*I*c) + 1477795509661
712899871274518207149536217650697318308165023360527405167762497046434024275
5840025673760*e^(181*I*c) + 443721091784318234776434954444390469902005659 50
69470847193617092114714077633077234972825351226979360*e^(180*I*c) + 1315052
120930692122102297105327622842335870743428530891072983535862280094446607723
47380047745391413 0*e^(179*I*c) + 3846558420806662744540630787848371749989 49

052500975322162003392549953413592461519365177908682078400*e^(178*I*c) + 111
034148797008819443143895644469242295049867464313710969257619338899133799285
616020069872611710850*e^(177*I*c) + 316266446747255477311767956875276535713
05969985923688392112164915553242573269490908989570248533280*e^(176*I*c) + 8
888295028751024667044203837607976101480053134418614474620767522824868911959
884352666444917404000*e^(175*I*c) + 246438219080743960907977422685567962936
7885709776435876630851716253962696192341706239192878728160*e^(174*I*c) + 67
402553054313300889484577523662523745074311447354453781817044713460710257567
6676056675328961590*e^(173*I*c) + 18183466140617790131533012967714538116644
9188413194141169344354754920969034952610378945282257600*e^(172*I*c) + 48379
489756434099843857791816589379406815042609340378747586437145781646245422045
101230417309900*e^(171*I*c) + 126934969329649205650736736371812800885486825
08880255337280065006566138696041797353216584528640*e^(170*I*c) + 3283874760
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538755920*e^(169*I*c) + 837579206923411932458786486765373533946545239708990
769488724813982189165104589895518909256320*e^(168*I*c) + 210594301385648471
184329078880317504953361839954159427434009884661777259752542647709150036990
*e^(167*I*c) + 521909122076618242158122718542697480712928432432278947692296
90720010547141334131610989636000*e^(166*I*c) + 1274721961650332054135634306
2562847368601622140856786025445814532037904111523242298235713300*e^(165*I*c
) + 30679742964317473641981596239624636716170064196268514261484186029348529
07379021659761911840*e^(164*I*c) + 7275210107183942292917740738446942557987
38667067535379759732795567942578751384250780476310*e^(163*I*c) + 1699563279
699297677739020966526292532837045054771275445565344173766865409367060738473
37600*e^(162*I*c) + 3910803125560180947653753536961184444084490375160564502
3514572352045248104262933598850730*e^(161*I*c) + 88627521427569572856813408
85764904597935349569355321815647721172537159186491471311666400*e^(160*I*c)
+ 1977792980665818135651300094326239158605448870806970860577325385028609983
034534672318500*e^(159*I*c) + 434546676780280045346344498763892540797175105
756827515509297024187660299345484920192480*e^(158*I*c) + 939869153130681791
49083606065681482780836060510530154618486949839467131378859885998210*e^(157
*I*c) + 2000800680303004713729327825032159711354071620198333312634928118667
9153199068045257216*e^(156*I*c) + 41915425006568261480933394145441591439644
78472492315931809171859902114109005939942952*e^(155*I*c) + 8639799336223303
49556296820028395513198708064940505702126068652936800794826651264256*e^(154
*I*c) + 1751931705006183002415156323819122851577900978160492206712172122200
15297133400636060*e^(153*I*c) + 3494107161327670464947794304333945020150407
5335160361865916029213860778606230624960*e^(152*I*c) + 68529932231457366873
28885311617795435592940841439866351079655652312894721972796266*e^(151*I*c)
+ 1321498055271300851429993866631619874424534425188183592049727687571032156
435077280*e^(150*I*c) + 250501028608928332469340456829902067712233644464602
753159945727868485722395506952*e^(149*I*c) + 466682235482660178068545924681
00570289355960869613650856575756758180182223308768*e^(148*I*c) + 8543013441
126212334833540665069621472479085838041360564550722036723654297540205*e^(14
7*I*c) + 153633323844492758353273455601649467167491657890711698454848907824

1693926940560*e^(146*I*c) + 271361207503266570734486517077181014801775322183181055638619257836143271472358*e^(145*I*c) + 4706504461113515810848735336748424310269824883831263587628309942744274586 6704*e^(144*I*c) + 801372958079075243436196494576154376146952079121074697267587048105867427 7844*e^(143*I*c) + 133921437425424555356488440680194535338500025403065576595377023760718008 9968*e^(142*I*c) + 219601281339515561500261478844190024870555261281946058839614044697037963695*e^(141*I*c) + 353244472067790181153780528207894116875810045823674310062058796337290152 00*e^(140*I*c) + 557255115732867112101621641630759616186195596901169722234092621011285441 8*e^(139*I*c) + 861884851094991908764246805474672428603757315484453974713612812215428992*e^(138*I*c) + 1306576602265604193351214343899389618845954340699848243071493321317475 40*e^(137*I*c) + 194079792155945665935350081033032552577454080700824313389451847974 63936*e^(136*I*c) + 282390515193658667838252570656445728029009869863859798762838024588171 5*e^(135*I*c) + 402349692266121158934003582839428785116904903936409545602519219664720*e^(134*I*c) + 561170810763411753840875701851885386603759320136747355190552273683 66*e^(133*I*c) + 765901052018754965177711835767687192708189898913112575579820423611 2*e^(132*I*c) + 102253643746829673729306586270524644969368741555986584430688870542 3*e^(131*I*c) + 133490210052026183779673313868332303530332906163247194627808410304*e^(130*I*c) + 170338860273906157410409777216555416656121622754850285843108904 17*e^(129*I*c) + 212370296918887131826671878122392706783994901572729388406538808 0*e^(128*I*c) + 2585853487159772701558291156841934110720345414913643939854913 50*e^(127*I*c) + 30736217404321009965231037419663053962881035281709221697785072*e^(126*I*c) + 35647648906287240170884879966881789291957876139585454748048 45*e^(125*I*c) + 403212225957798188840846139960995624144491271694336796459584*e^(124*I*c) + 444567081752588210244009462105350045237757221909774684844 96*e^(123*I*c) + 477539860710085326353420773381826677747869341273873103168 0*e^(122*I*c) + 49946750655853173367158586291057270281154503573039874953 0*e^(121*I*c) + 508363695081710994370193486108473919467361851080171831 36*e^(120*I*c) + 503202490340145182407421394376601192202650700631198275 3*e^(119*I*c) + 484093410240488718655917025303662581091659126182344528*e^(118*I*c) + 4523094003983073833202569478464620684485482769807573 6*e^(117*I*c) + 410154543993719579395995670844249670943380026122488 0*e^(116*I*c) + 360688613036389349413809780004559963548775423325255*e^(115*I*c) + 3073536651283056216099116633849005730806276251849 6*e^(114*I*c) + 2535667460650279776834561566186591213109251642859*e^(113*I*c) + 20234750972446217131396664358023407850817983832 0*e^(112*I*c) + 15603911277687607099721623771744933086920587272*e^(111*I*c) + 1161581413733971751533622511909046917188768400*e^(110*I*c) + 833808399118378944531363036737850390515068 05*e^(109*I*c) + 576460104656315130421385471071534683844739 2*e^(108*I*c) + 3833601558010548245297646882131143680471 54*e^(107*I*c) + 244898373378123386877186224918650138394 88*e^(106*I*c) + 1500602747937397286405577818722691539392*e^(105*I*c) + 880549275989414111458699508133880402 56*e^(104*I*c) + 4939666610818025798809586352543471345*e^(103*I*c) + 264410375780310742518099326419685040*e^(102*I*c) + 1347722779952470195657927421039532 6*e^(101*I*c) + 652650253343206047453620559993840*e^(100*I*c) + 2995254

7749265499675257842032197*e^(99*I*c) + 1299146645993240318167826532288*e^(9
8*I*c) + 5309012726463096347003980447 5*e^(97*I*c) + 203703125947036816013 19
22320*e^(96*I*c) + 7309920781733559724709803 8*e^(95*I*c) + 2442455629894502
983849104*e^(94*I*c) + 75599817092670157806639*e^(93*I*c) + 215486414478125
7856128*e^(92*I*c) + 56169444526926562260*e^(91*I*c) + 1327882849274858880*
e^(90*I*c) + 28186192554792138*e^(89*I*c) + 530563624556832*e^(88*I*c) + 87
18181624155*e^(87*I*c) + 122503723056*e^(86*I*c) + 1431118260*e^(85*I*c) +
13343760*e^(84*I*c) + 93096*e^(83*I*c) + 432*e^(82*I*c) + e^(81*I*c)))*tan(
1/4*d*x + c) + 7*(-338*I*a*e^(1055/2*I*c) - 136552*I*a*e^(1053/2*I*c) - 275
15228*I*a*e^(1051/2*I*c) - 3687040552*I*a*e^(1049/2*I*c) - 369625815338*I*a
*e^(1047/2*I*c) - 29570065227040*I*a*e^(1045/2*I*c) - 1966409337599317*I*a*
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*c) - 6109811064562267906978585057956580355548*I*a*e^(1009/2*I*c) - 9699325
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0*I*a*e^(585/2*I*c) + 410736991435895460891381503873310576186892582307966 04
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60820289680*I*a*e^(559/2*I*c) + 146397694096391244765136551546718540576250 1
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975000*I*a*e^(557/2*I*c) + 127307503650565828933577222568587247771537450472
661286183065045653730586205981295386924448144095387587157752292462787859949
6*I*a*e^(555/2*I*c) + 109797755820963888178127205348435487247165418262903 76
9157172660389764200902221523637457788073902604574129495927361555737106 4*I*a
*e^(553/2*I*c) + 939200230533694163569508797061901464826518892456171897778 4
187465583789825920011209890021532898884366240077323951766497840 16*I*a*e^(55
1/2*I*c) + 796800960938061420567296985439828502401638873253959462072849963 0

4416930665591573306710637119425968634864420233548613921114 4*I*a*e^(549/2*I*
c) + 670450434518367673310598723205770260142877601963255249446103714768964 3
886841173405658870829596573039036895736242095784434 16*I*a*e^(547/2*I*c) + 5
5950489456628936181328513436757968951281224404226215158677269908410733965 86
1600449997360276788315849695745359657341724376 0*I*a*e^(545/2*I*c) + 4630778
8715934598524006636504876965396189949672214764800670616089243082859926053 65
3239849802915298424965942975707351425483 4*I*a*e^(543/2*I*c) + 3801082850399
1546845097885864648572701610474607701813805105588105646917724902254074931 71
4291753497204346128367715644977705 6*I*a*e^(541/2*I*c) + 30942249862040077 50
7145463847684911755789792701741804137937964542391023253739935341721615744 90
7761411895263784851762246136 4*I*a*e^(539/2*I*c) + 24978938856413587258460 56
7630030239450938213231873792787710527572999694113475466782090426304298048 48
915343200444067132659 76*I*a*e^(537/2*I*c) + 19996697873758253478791803025 47
7365047841762977654296009508003567638618863518258529128525287135779555501 95
300308461463466 34*I*a*e^(535/2*I*c) + 15874060091792775680684246134619769 80
1863338791486600109326597761845567259029639939839140732462701156145993492 84
606254954 80*I*a*e^(533/2*I*c) + 12495256178957261184534067290198496356888 47
1113299103332412406599140764409667153112852151624290707937248724040189482 09
113 01*I*a*e^(531/2*I*c) + 975237948816934370707484474213043343565605344549 4
4874598301077916325487914962129843509415087293500937741240715003092219284*I
*a*e^(529/2*I*c) + 754682393287011943952954293375997486251358104750882203 75
983654843051673205382870237001690667166243440408007001704577025946*I*a*e^(5
27/2*I*c) + 579008746767270585768451007780664586553146539732308445153172 147
345172454032245121379194169105852526629016291862327596442 53*I*a*e^(525/2*I*
c) + 440404430293682732799218188852765452833925575055190361329277852676039 7
27531565720116474685237880049994045425695175815173 57*I*a*e^(523/2*I*c) + 33
2079174054798249717723168438274555044030503995354429426135394115093505470 92
434970208286776394915006932929394522500297294*I*a*e^(521/2*I*c) + 248217417
0349510346508273872376556820835675070148101124746641879720040245092085096 86
39227625439549849474276227435039858410*I*a*e^(519/2*I*c) + 1839078777785271
1402811233434183425152417220026075511506882808089209223235028530568167961 78
617883164127699349887405350052 5*I*a*e^(517/2*I*c) + 135058634355458842650 40
0260598485982958999604837160335859868184383816099521263324209118135360221 55
58250547480219482951969 4*I*a*e^(515/2*I*c) + 98304751991270654066101070302 3
2842271782203181947667537837890742584851498713948410077557227465475091937 71
02497693237674 12*I*a*e^(513/2*I*c) + 7091413215035935108404716868304566603 5
5600325275476682344989682912218724940528811036840580613971249581289084106 42
3121092 8*I*a*e^(511/2*I*c) + 5069592243524225405652688460326152875966709816
0502758784603577174408767932023548672433228807377005346682032002002237452 66
*I*a*e^(509/2*I*c) + 3591459375159178715272874299831165518783361740591922 98
0345591047441517817805559536236082673985676829650893577170263379850*I*a*e^(
507/2*I*c) + 252117074822840814497403707614675960285810411663855353744002 02
1745697040909473065379323753684636690650569658137888205461 6*I*a*e^(505/2*I*
c) + 175364872162194834466532303534450092816924673103715603023704974517465 8
0969903609601497506292877274937161422819989541087 50*I*a*e^(503/2*I*c) + 120

855851252056186798141005629046878883306224549740503887230386435237287160951
867834275637990687578536880843021853192733 4*I*a*e^(501/2*I*c) + 82518864671
237129917668538300374154515196623739664827393661440706519199996122029297148
289413011474352196451600171417986 1*I*a*e^(499/2*I*c) + 55818109155457679534
086754423714982536666008344943283832937403953779746190285486392335757708024
010734000871842202459182 0*I*a*e^(497/2*I*c) + 374032418751198811720228463 85
732487428813284882744325815756034266411597497467396971732361062007898502816
7266946798247966*I*a*e^(495/2*I*c) + 248274248932561617945703697663525200 61
007857443406140981388900138235391030810939089972770658040659664048257407408
9879213*I*a*e^(493/2*I*c) + 1632370015300641523675560612255800974379804404 0
551757218392703576723018130996281464206087944437728594836218549515408616 1*I
*a*e^(491/2*I*c) + 106303211582360290790936880607620902869189699089065072 28
226986583823766209641521560821346530915231741733580325477764654 0*I*a*e^(489
/2*I*c) + 685632677248015258355300911856323421533702194419680931994934395 85
399279900993027594546478734905346362251571732607984770*I*a*e^(487/2*I*c) +
437956160097493579765068474053492147508352811690398993662144001844139449912
928813473902845331911549108666500177149410 45*I*a*e^(485/2*I*c) + 2770388065
879741801414179836976730800452585042929964859696910647886915813981208233371
7388082946821508766049481077973059*I*a*e^(483/2*I*c) + 1735395255611804409 1
866250043904279524876639737013840121333225227870238823195868916660184536540
709110237107927786882862*I*a*e^(481/2*I*c) + 1076418588017531424745541378 06
023873166880496795733541361846183879500257001189713176124123961781803519004
35222112093164*I*a*e^(479/2*I*c) + 661098649072206465880090899659497008914 8
031698056312546893974727551725296838192813109416462543781169819141205979640
295*I*a*e^(477/2*I*c) + 402004684403232580660668695877853944299076458232 80
533620874832281062815458076465290663534546672061117052129908769557 9*I*a*e^(
475/2*I*c) + 242021155405915375047953074533158882160450744844571122745730 37
44601668400557213178896517376949590952343768990797772626*I*a*e^(473/2*I*c)
+ 144248286052702172702599867899041110732102138783554237730758028751205157 3
989107700940225360216432991175352627674951660*I*a*e^(471/2*I*c) + 851100755
495948167311967384799382325393908473708133536744004690162732128381564701822
3786847403399049537648533116573 79*I*a*e^(469/2*I*c) + 4970982705744169777 93
999901022268912612414553253938578661999730743751218491838334678754461337804
8611753919877456321 50*I*a*e^(467/2*I*c) + 2873906059262755425755484216228 39
871210234972126160885732249644221593342784630319023739202442479202690546380
883489714*I*a*e^(465/2*I*c) + 164456137643484023027839220727810183979810742
984557443986573106465730160243136051096488426970563221576065210083954112*I*
a*e^(463/2*I*c) + 931436044993931263445166225811972204036547143672127723996
445360856060800463349334285456267386377122170679550724500 98*I*a*e^(461/2*I*
c) + 522107243333471608015017731658198129449938481275656387417927993359590 5
538878992181977147929620494372470112719207002 6*I*a*e^(459/2*I*c) + 28963327
006745382557260523392521002766162424431473143306015072868867675529419511652
966969349719029403862600773620600*I*a*e^(457/2*I*c) + 159000166293990983770
633365148321190576578131487708291203552320705026303848044448897674861797561
134015758436967929 00*I*a*e^(455/2*I*c) + 863744842941260314523229548697057 9

1645732883590436087798253341055878734853067820053105840323349233344690529924
71566*I*a*e^(453/2*I*c) + 464291207891568301035808600708701702397396571313
1459328351978225710653086945801498275683194647474013409696663828963*I*a*e^(
451/2*I*c) + 246939675213444454420928792091871436788268416425362146048269276
656983377978163385746162394741883067618259686863010 2*I*a*e^(449/2*I*c) + 1
299466170334480341543135560982800973046388591632081102321927761098390304943
5311080628978902915283798239140888257 94*I*a*e^(447/2*I*c) + 676536112375453
533535322327435304762507116008362988186332586271393372786322039392090789530
327993045045404821029011*I*a*e^(445/2*I*c) + 348455253838688201360505783941
113732251527445477363057406188342672634063934554405286663592501040628860183
543905219*I*a*e^(443/2*I*c) + 177546087676039487653207030476854772666243541
156745740575127122721103812917448459499475796154210708959328249028630*I*a*e
^(441/2*I*c) + 894872505724728370624201553901098068070796612063573577599972
562878494813596597998948793919117434278496116975242 76*I*a*e^(439/2*I*c) + 4
461439096362842937887432990987855060523083096318356202050421428010872979698
4369361375912054446637154294300258539*I*a*e^(437/2*I*c) + 22000378044285344
028734825732866676658762934871965249674527380850469340847187834791650053923
5377698402304937641 96*I*a*e^(435/2*I*c) + 107301092713177499323083813829105
498651961301555042478503350150672469877026772333775321254702023915671511176
68374*I*a*e^(433/2*I*c) + 517576130507282369604019669896553345099732774479 3
152831047341015798393926092260966184527256512322695767910061296*I*a*e^(431/
2*I*c) + 246897953212028922726884061682000445045811742376948064434322797188
9566876733150004369035355668553948933308821480*I*a*e^(429/2*I*c) + 11646910
388540405650688259647550737097079196384362555665675551484081208763099688642
2262545815546431690236495 2524*I*a*e^(427/2*I*c) + 543288572546872620415741 1
487558285774676320340064008281503831338668372142706641114379637167983506121
56148456206*I*a*e^(425/2*I*c) + 250583999994178547973769655475783365474416 9
271009597352196282969984112869725849173126074925277531312181810413 84*I*a*e^
(423/2*I*c) + 114276017965510704536422999678624463235888712139759411494933 3
94918036613892504103005096855020042456078555128196*I*a*e^(421/2*I*c) + 5152
424337990311470345247509676244138577580823892844726637538647583705473808459
2021134353327686946496437282284*I*a*e^(419/2*I*c) + 229666878772454570257 94
102073377677357995629076173854095854698682796300148885688222697251615914395
078685755000*I*a*e^(417/2*I*c) + 101202318762952166047217781137436284619629
964897559405277691717525951814998806078062909622822369741627048064 60*I*a*e^
(415/2*I*c) + 440821420748076802971697314985978040432443894760783642549937 5
750084309188687239341140052519808074207080308780*I*a*e^(413/2*I*c) + 189797
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4441976268438153636677378420*I*a*e^(411/2*I*c) + 807690225035659484831707 79
513278182902665161792021013282953291691617090536488162475060828002976266044
8742840*I*a*e^(409/2*I*c) + 339705366726558738369140105963864517735275234 14
340051373935767448448366505976532073655790225683251588226 7500*I*a*e^(407/2*
I*c) + 141200237267633382241038296294808993573915159549661817646553617437 35
91337008811576150516971633284364556950 20*I*a*e^(405/2*I*c) + 57998486887243
431995720681004163175448573494680504990319637888579588763738426026942298616

787064620503722070*I*a*e^(403/2*I*c) + 23540649736421230886609582418870399205206129846961712523581794766425027191000252567464229588210547056463840*I*a*e^(401/2*I*c) + 9440883227662672550065366923781042631437653007247333510037128999390205650430820323780125609508653387501660*I*a*e^(399/2*I*c) + 3740852346865048796409411782153220433524759994780065112544112920800396613415405338362337137549877683070230*I*a*e^(397/2*I*c) + 146441145990259158305146533104978388890275336672209564306551623036491156422842953732683402693987815861519 0*I*a*e^(395/2*I*c) + 5663183101129734221900744632066053326419477514483473074303146789729245977501575028277271690116471987555 40*I*a*e^(393/2*I*c) + 21633799083254291646394636703074138108830632138301643955502082831835231687709001785496903127256359967022 0*I*a*e^(391/2*I*c) + 81629829044671572879258630168605666151289808623903865249335836814408606538176579973692550178994519263270*I*a*e^(389/2*I*c) + 3042128121962949457071547645652476485619314620152367555522897979398723961297037460465791687688483381568 0*I*a*e^(387/2*I*c) + 1119661218211419644420378381235632958731802416844790765703579580081707258568131238270519963377290765512 0*I*a*e^(385/2*I*c) + 406952445540012891492846208627140000717341084883315550626992685614201358029071669693342717786164555476 0*I*a*e^(383/2*I*c) + 14605462002593652074486957173582431842768148914859289752956162795465010155732518001643409147963900687 60*I*a*e^(381/2*I*c) + 517568203553129544108043861097054532329808137141512218550020340601981346633003923694388693344112445480*I*a*e^(379/2*I*c) + 18107807683744905331264387812935563056139984311930680824984749925337461704160453834409464953801340868 0*I*a*e^(377/2*I*c) + 62542434019027418485094848248484541133380826803451715912076716281169753247585230468246410100921183300*I*a*e^(375/2*I*c) + 2132348491470172151695388601946597815134978542632212952559655102691391014950356759165892738118527480 0*I*a*e^(373/2*I*c) + 71759465381989352991555290269968423526675228578659389940040261824781242256559172260244639895688598 70*I*a*e^(371/2*I*c) + 2383417512756522383022982275947364463822451926520969640914674528214045561036716921751876861448214560*I*a*e^(369/2*I*c) + 78123640003492233583452583227307482260660777887580718451355979473369099196889018503824649448195 6500*I*a*e^(367/2*I*c) + 25268931035482758388494149738730795207903213724380640051561109730300983802527788680547401806625523 0*I*a*e^(365/2*I*c) + 80644191734889967765592161669041761214694338439517250809770511678016755719669133078696159918617190*I*a*e^(363/2*I*c) + 25392180839620717558707343495120793497317456412001059973856406433299476018286356454215210996398560*I*a*e^(361/2*I*c) + 78872484953700519356091137011255468973944316523574144447868106650294255028515138844349890244190 20*I*a*e^(359/2*I*c) + 24166102823474984668967410783637906253892006902730453072342071067917143604728531416667953317747 50*I*a*e^(357/2*I*c) + 7302965525869634422559708706578391462304934508382511780475876658666387894107360400629555330682 90*I*a*e^(355/2*I*c) + 2176498387187341198518697848586893786031066798479868050418726900657353475387531241466809744497 80*I*a*e^(353/2*I*c) + 6396431913830536683852424390350391246093878486472172857619258907137976008670738305417180573280 0*I*a*e^(351/2*I*c) + 1853490261604490052325734099862896894814958467782951537545688101848765417428895879889693396985 0*I*a*e^(349/2*I*c) + 5295019379440696397366776161064889279568

7122852752292420100571239765691667150411717971378911 70*I*a*e^(347/2*I*c) + 14911452921628698997872885605312811427061256238619820681184275150456005991955605435053524310 20*I*a*e^(345/2*I*c) + 41390126754989055823435182991213105576849191069489002127889405055369599620111544891837878464 0*I*a*e^(343/2*I*c) + 11322593106386724431761639455345559749498779183914297547250657025816357699203276327292307309 0*I*a*e^(341/2*I*c) + 305220746722192387885420585934385348525863642734183712000552148264821274033128259869432372 80*I*a*e^(339/2*I *c) + 81067449514020403556506738911560136863838278415815015109161253038514118903021268550540474 20*I*a*e^(337/2*I*c) + 21212271688547753093292205568433019574592562153276952501963671561121614849568286648321818 80*I*a*e^(335/2*I* c) + 54673706248032255290461311979464947373926057827768367534929337413458139361046415597268228 0*I*a*e^(333/2*I*c) + 13879104905021866439837332690554723279214305329968265930279266714780510105226249068190956 0*I*a*e^(331/2*I*c) + 34695679479197391254672720198579891366138778568280423896803407887950191615247559195575960*I*a*e^(329/2*I*c) + 85400044909551978365430585685649087381270553514816526205333017620113646045950269523271 20*I*a*e^(327/2*I*c) + 20694057554695177686068453037439594429075341109496551046083385766420708162067128505946 40*I*a*e^(325/2*I*c) + 49359687626621481076264188224548187345736788690540299435024380784066912136044029920361 0*I*a*e^(323/2*I*c) + 11586996690512485300971274323058168005004063597603664041953691881603891604440405839058 0*I*a*e^(321/2*I*c) + 26765277210985824688116078913627360928358220223598495094833068710253849363218567711980*I*a*e^(319/2*I*c) + 60828020983503590257687107156759564957026503052997544005724925693430984530096525662 50*I*a*e^(317/ 2*I*c) + 13598573971342772024370692045568229995410159161039292343627525172235883680002493048 10*I*a*e^(315/2*I*c) + 29899596829739071545656839188275994608759453512170090365350364591685949769039509578 0*I*a*e^(313/2*I*c) + 64646038856482836130145301041965583999891241698291024005815352807403014487811899520*I*a*e^(311/2*I*c) + 13741785659560557589886699944853875416799649106399820566514814463893361892904950890*I*a*e^(309/2*I*c) + 28713539737776983423672343124862866877629346186126686423808116776503947119661425 00*I*a*e^(307/2*I *c) + 58964112140771763515895119723235112929738498142787380630362308547009542719327669 2*I*a*e^(305/2*I*c) + 11897584634017291315924872555581820692896261511744630484304432616298482605072720 8*I*a*e^(303/2*I*c) + 23583577067639210318661600390456214302440996107182761770233626717895694882382172*I*a*e^(30 1/2*I*c) + 45914236924294685158850161399260715950505278483779983599652297083972465464085 48*I*a*e^(299/2*I*c) + 87776021404232934124198580097328515987365505819033642351120680153977772333485 2*I*a*e^(297/2*I*c) + 16473889196904419858921281414282524565473102213863732226889843571910313284420 0*I*a*e^(295/ 2*I*c) + 30346300992218791211061232895918330755427695817262812270205461788254462121188*I*a*e^(293/2*I*c) + 54852823262705691683437449311600984433797635766622710673199289893605135000 12*I*a*e^(291/2*I*c) + 97267212255680561809123381244954081550825573702669812375158982368262660440 8*I*a*e^(289/2*I*c) + 16915900125466782179136078478538907333326537705264269818673586049421156702 2*I*a*e^(287/2*I*c) + 28844822768314953579212671908500707950725178423613479919214905815452892948*I*a*e^(285/2*I*c) + 4821293518673085167363493338203848

847844190253193965493680746373955080080*I*a*e^(283/2*I*c) + 789690039989072
858764397361560374790810333801284467329771776351321048032*I*a*e^(281/2*I*c)
 + 126711784709453338605660778068542544022643349256399659726946153656233718
*I*a*e^(279/2*I*c) + 199117598387417926031189003205662174209347861727303761
27765302242075212*I*a*e^(277/2*I*c) + 3063335070065447315308133852848066992
101021248688567743307391113472411*I*a*e^(275/2*I*c) + 461239107567627147326
076654057456658457043425511345276082020328203684*I*a*e^(273/2*I*c) + 679443
51214079532127966887502579811300811007213403186988581793087318*I*a*e^(271/2
*I*c) + 9788564956238722791049897452775743960339323004999489860937041472915
*I*a*e^(269/2*I*c) + 137866763824290683390948722444836789168248639232046002
3203024208675*I*a*e^(267/2*I*c) + 18976001127512012080908245217116426083644
4479917200503452767697538*I*a*e^(265/2*I*c) + 25513901237808068333261288925
342131996483836670215495252968765174*I*a*e^(263/2*I*c) + 334958464921597406
4494562288169726260989776567520122206199301331*I*a*e^(261/2*I*c) + 42919404
7823886492115016704404554514518112725730803903112532182*I*a*e^(259/2*I*c) +
 53649185943281059583991832533828279475735386275724477961967700*I*a*e^(257/
2*I*c) + 6538951529796735469911010316324282233950224197184638863745512*I*a*
e^(255/2*I*c) + 77672552243281059007302851736593724035945400283098129034197
0*I*a*e^(253/2*I*c) + 89868992289875724477547529577630120615631448882291724
117498*I*a*e^(251/2*I*c) + 101225988592648902717939158690840034207108263106
16818118992*I*a*e^(249/2*I*c) + 1109325204761582846669749366309189735990268
133663930730770*I*a*e^(247/2*I*c) + 118206720526999189093597542167372456853
664293435038820382*I*a*e^(245/2*I*c) + 122393823461605138922406012384550471
25011028691886256771*I*a*e^(243/2*I*c) + 1230589594126194023203320811726992
132021299197471177852*I*a*e^(241/2*I*c) + 120057481911175947127117391278335
425038727525157415250*I*a*e^(239/2*I*c) + 113567856889895513439085155111988
87233162301712666395*I*a*e^(237/2*I*c) + 1040783353217938776411028748013653
576556213918915335*I*a*e^(235/2*I*c) + 923275377293759706647808962879230340
91445656319868*I*a*e^(233/2*I*c) + 7920859881151658505680929024974848479434
840259054*I*a*e^(231/2*I*c) + 656541775517510646234544280431980818352772409
123*I*a*e^(229/2*I*c) + 52523336394485929659233288472451790119792705845*I*a
*e^(227/2*I*c) + 4051001655313083033785087944018198318088989698*I*a*e^(225/
2*I*c) + 300870128273961175599469606519345892299669212*I*a*e^(223/2*I*c) +
21490722237212978408403217414663518345362065*I*a*e^(221/2*I*c) + 1474297501
848124542057148378045565788918733*I*a*e^(219/2*I*c) + 969932532962417451992
99054522607239475550*I*a*e^(217/2*I*c) + 6109811064562267906978585057956580
355548*I*a*e^(215/2*I*c) + 367868197744817126115132997049285770709*I*a*e^(2
13/2*I*c) + 21130809978126689911485296435923679086*I*a*e^(211/2*I*c) + 1155
591156922028898629041321537843182*I*a*e^(209/2*I*c) + 600307089241124601382
40147528356200*I*a*e^(207/2*I*c) + 2954879436063156934993931067226770*I*a*e
^(205/2*I*c) + 137436252221498552065844084546042*I*a*e^(203/2*I*c) + 602169
1444519566631530369807136*I*a*e^(201/2*I*c) + 24767882495950638637300063744
4*I*a*e^(199/2*I*c) + 9526108639140231470517528278*I*a*e^(197/2*I*c) + 3410
88288572157297772118077*I*a*e^(195/2*I*c) + 11311601400768793085009738*I*a*
e^(193/2*I*c) + 345392409079468621758030*I*a*e^(191/2*I*c) + 96429352773077

14791837*I*a*e^(189/2*I*c) + 244124943709898420493*I*a*e^(187/2*I*c) + 5548
294175032309402*I*a*e^(185/2*I*c) + 111804416623905668*I*a*e^(183/2*I*c) +
1966409337599317*I*a*e^(181/2*I*c) + 29570065227040*I*a*e^(179/2*I*c) + 369
625815338*I*a*e^(177/2*I*c) + 3687040552*I*a*e^(175/2*I*c) + 27515228*I*a*e
^(173/2*I*c) + 136552*I*a*e^(171/2*I*c) + 338*I*a*e^(169/2*I*c))/(e^(531*I*
c) + 432*e^(530*I*c) + 93096*e^(529*I*c) + 13343760*e^(528*I*c) + 143111826
0*e^(527*I*c) + 122503723056*e^(526*I*c) + 8718181624155*e^(525*I*c) + 5305
63624556832*e^(524*I*c) + 28186192554792138*e^(523*I*c) + 13278828492748588
80*e^(522*I*c) + 56169444526926562260*e^(521*I*c) + 2154864144781257856128*
e^(520*I*c) + 75599817092670157806639*e^(519*I*c) + 24424556298945029838491
04*e^(518*I*c) + 73099207817335597247098038*e^(517*I*c) + 20370312594703681
60131922320*e^(516*I*c) + 53090127264630963470039804475*e^(515*I*c) + 12991
46645993240318167826532288*e^(514*I*c) + 29952547749265499675257842032197*e
^(513*I*c) + 652650253343206047453620559993840*e^(512*I*c) + 13477227799524
701956579274210395326*e^(511*I*c) + 264410375780310742518099326419685040*e^
(510*I*c) + 4939666610818025798809586352543471345*e^(509*I*c) + 88054927598
941411145869950813388040256*e^(508*I*c) + 150060274793739728640557781872269
1539392*e^(507*I*c) + 24489837337812338687718622491865013839488*e^(506*I*c)
 + 383360155801054824529764688213114368047154*e^(505*I*c) + 576460104656315
1304213854710715346838447392*e^(504*I*c) + 83380839911837894453136303673785
039051506805*e^(503*I*c) + 1161581413733971751533622511909046917188768400*e
^(502*I*c) + 15603911277687607099721623771744933086920587272*e^(501*I*c) +
202347509724462171313966643580234078508179838320*e^(500*I*c) + 253566746065
0279776834561566186591213109251642859*e^(499*I*c) + 30735366512830562160991
166338490057308062762518496*e^(498*I*c) + 360688613036389349413809780004559
963548775423325255*e^(497*I*c) + 410154543993719579395995670844249670943380
0261224880*e^(496*I*c) + 45230940039830738332025694784646206844854827698075
736*e^(495*I*c) + 484093410240488718655917025303662581091659126182344528*e^
(494*I*c) + 5032024903401451824074213943766011922026507006311982753*e^(493*
I*c) + 50836369508171099437019348610847391946736185108017183136*e^(492*I*c)
 + 499467506558531733671585862910572702811545035730398749530*e^(491*I*c) +
4775398607100853263534207733818266777478693412738731031680*e^(490*I*c) + 44
456708175258821024400946210535004523775722190977468484496*e^(489*I*c) + 403
212225957798188840846139960995624144491271694336796459584*e^(488*I*c) + 356
4764890628724017088487996688178929195787613958545474804845*e^(487*I*c) + 30
736217404321009965231037419663053962881035281709221697785072*e^(486*I*c) +
258585348715977270155829115684193411072034541491364393985491350*e^(485*I*c)
 + 2123702969188871318266718781223927067839949015727293884065388080*e^(484*
I*c) + 17033886027390615741040977721655541665612162275485028584310890417*e^
(483*I*c) + 133490210052026183779673313868332303530332906163247194627808410
304*e^(482*I*c) + 102253643746829673729306586270524644969368741555986584430
6888705423*e^(481*I*c) + 76590105201875496517771183576768719270818989891311
25755798204236112*e^(480*I*c) + 5611708107634117538408757018518853866037593
2013674735519055227368366*e^(479*I*c) + 40234969226612115893400358283942878
5116904903936409545602519219664720*e^(478*I*c) + 28239051519365866783825257

0656445728029009869863859798762838024588l715*e^(477*I*c) + 1940797921559456
6593535008103303255257745408070082431338945184797463936*e^(476*I*c) + 13065
76602265604193351214343899389618845954340699848243071493321317475 40*e^(475*
I*c) + 8618848510949919087642468054746724286037573154844539747136128l221542
8992*e^(474*I*c) + 5572551157328671121016216416307596161861955969011697222 3
40926210112854418*e^(473*I*c) + 3532444720677901811537805282078941168758100
4582367431006205879633729015200*e^(472*I*c) + 2196012813395155615002614788 4
41900248705552612819460588396140446970379636 95*e^(471*I*c) + 13392143742542
4555356488440680194535338500025403065576595377023760718008996 8*e^(470*I*c)
+ 801372958079075243436196494576154376146952079121074697267587048105867427 7
844*e^(469*I*c) + 4706504461113515810848735336748424310269824883831263587 62
8309942744274586670 4*e^(468*I*c) + 2713612075032665707344865170771810148017
753221831810556386192578361432714723 58*e^(467*I*c) + 1536333238444927583532
734556016494671674916578907116984548489078241693926940560*e^(466*I*c) + 854
3013441126212334833540665069621472479085838041360564550722036723654297540 20
5*e^(465*I*c) + 466682235482660178068545924681005702893559608696136508565 75
756758180182223308768*e^(464*I*c) + 2505010286089283324693404568299020677 12
2336444646027531599457278684857223955069 52*e^(463*I*c) + 132149805527130085
1429993866631619874424534425188183592049727687571032156435077280*e^(462*I*c
) + 6852993223145736687328885311617795435592940841439866351079655652312894 7
21972796266*e^(461*I*c) + 349410716132767046494779430433394502015040753351 6
036186591602921386077860623062496 0*e^(460*I*c) + 1751931705006183002415156 3
2381912285157790097816049220671217212220015297133400636060*e^(459*I*c) + 86
3979933622330349556296820028395513198708064940505702126068652936800794826 65
1264256*e^(458*I*c) + 4191542500656826148093339414544159143964478472492315 9
3180917185990211410900593994295 2*e^(457*I*c) + 2000800680303004713729327825
032159711354071620198333312634928118667915319906804525721 6*e^(456*I*c) + 93
9869153130681791490836060656814827808360605105301546184869498394671313788 59
885998210*e^(455*I*c) + 4345466767802800453463444987638925407971751057568 27
51550929702418766029934548492019248 0*e^(454*I*c) + 1977792980665818135651 30
00943262391586054488708069708605773253850286099830345346723185 00*e^(453*I*c
) + 8862752142756957285681340885764904597935349569355321815647721172537159 1
86491471311666400*e^(452*I*c) + 3910803125560180947653753536961184444084490
375160564502351457235204524810426293359885073 0*e^(451*I*c) + 16995632796992
97677739020966526292532837045054771275445565344173766865409367060738473376 0
0*e^(450*I*c) + 7275210107183942292917740738446942557987386670675353797597 3
27955679425787513842507804763 10*e^(449*I*c) + 3067974296431747364198159623 9
624636716170064196268514261484186029348529073790216597619118 40*e^(448*I*c)
+ 127472196165033205413563430625628473686016221408567860254458145320379041 1
15232422982357133 00*e^(447*I*c) + 52190912207661824215812271854269748071292
843243227894769229690720010547141334131610989636000*e^(446*I*c) + 210594301
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769488724813982189165104589895518909256320*e^(444*I*c) + 328387476055581867
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0*e^(443*I*c) + 12693496932964920565073673637181280088548682508880255337280065006566138696041797353216584528640*e^(442*I*c) + 48379489756434099843857791816589379406815042609340378747586437145781646245422045101230417309900*e^(441*I*c) + 181834661406177901315330129677145381166449188413194141169344354754920969034952610378945282257600*e^(440*I*c) + 67402553054313300889484577523662523745074311447354453781817044713460710257567676056675328961590*e^(439*I*c) + 2464382190807439609079774226855679629367885709776435876630851716253962696192341706239192878728160*e^(438*I*c) + 8888295028751024667044203837607976101480053134418614474620767522824868911959884352666444917404000*e^(437*I*c) + 31626644674725547731176795687527653571305969985923688392112164915553242573269490908989570248533280*e^(436*I*c) + 111034148797008819443143895644469242295049867464313710969257619338899133799285616020069872611710850*e^(435*I*c) + 384655842080666274454063078784837174998949052500975322162003392549953413592461519365177908682078400*e^(434*I*c) + 1315052120930692122102297105327622842335870743428530891072983535862280094446607723473800477453914130*e^(433*I*c) + 4437210917843182347764349544443904699020056595069470847193617092114714077633077234972825351226979360*e^(432*I*c) + 14777955096617128998712745182071495362176506973183081650233605274051677624970464340242755840025673760*e^(431*I*c) + 48584258153140280447314836868772131390195412419046732778458706015096881437076337910793584122475073760*e^(430*I*c) + 157685845528850918721462877864435090257583149415561323427386562894447598277935629800939237175625149830*e^(429*I*c) + 505293663123015258878483025738812813203397766845340065381261016353419722382620393032535960660921950400*e^(428*I*c) + 1598771101058192692270528999677444742685631006232456185844925220144002305878120380828483988663574829100*e^(427*I*c) + 4995241956279138180205186744401688024388272113921255663734956946927571305533146776898787878059685108480*e^(426*I*c) + 15413111211486023937294970820797376716081344788163386543522421939737507962125854981881879168348260330000*e^(425*I*c) + 46970224727117281826454045018070670522559756627580347784535320014963482632359729444541885102274546002560*e^(424*I*c) + 141379938253556843280565505807403304130606130725434751745794079833141361748917639986145377066437210546190*e^(423*I*c) + 420358024835146798583611210145942154684437949365647899088372524802156222884839580011688655664280691773600*e^(422*I*c) + 1234668041892409978780018081755440216012582476396941937965899631953079203974222138794604328498972144766900*e^(421*I*c) + 3582718002163296061414536703715109897107198252739284546149343102348456124089657428594946438660859773886240*e^(420*I*c) + 10271602530202889002497813516849452590971512809529060665197301097052210064576088348023234671975463677418470*e^(419*I*c) + 29097651061247453406647569781836910062165559852359052804259154165687125428752562385492373749486351714453120*e^(418*I*c) + 81452081413829111828875417564250054846037693312811480492909160758195989155768107022568350953861815940704090*e^(417*I*c) + 225320532593220657767941109289516248999794521015564134982827241710019675486694499689312466561907212627820000*e^(416*I*c) + 616003116022979584937125701757887212998354300989991362628038861093914561332071191909714949426587936910303300*e^(415*I*c) + 1664475034387211809394917743502937638978574937754764763987835872410449930690131572904279

995484581013965001440*e^(414*I*c) + 444541225929547462506765951419831296601
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13*I*c) + 11735856926245118493113091002501604032341876985999082823520672241
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9144982747171856772463223808993367091503402876467270176124342699654400*e^(4
10*I*c) + 20155794742479409802677247846204088339586751256293086294375356869
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86480292870190399107554311079964227280196522475370108738477856311765699610*
e^(407*I*c) + 3125683493178701743479704750307490178666292150720179363604335
113528623329684606343185540756019935662148267863968*e^(406*I*c) + 762178879
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1769285020661445991073249416*e^(405*I*c) + 18379807084003359766027649217621
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113248*e^(404*I*c) + 438349721429193776853786922330210637445540331009285027
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56873829531737211096115196005647730480*e^(402*I*c) + 2412460212824400617929
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68317380539005893679049394714017063698565272728813669054779077208977840*e^(
400*I*c) + 1271033082938048950201360554831270342662343991277504612342300366
025046741742856580445289401786656311685859023084716*e^(399*I*c) + 287049613
141231445183467471535358943955329443080853193346608628854370924623076915139
2180699413405623017247753532944*e^(398*I*c) + 64133818958559251847582314510
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3849959902524421980635189011634815653279605497783382888932766730080*e^(396*
I*c) + 31004319206069417077069363141423487431828009098184744635678652284177
439464941651812564519144918003174108077634846014*e^(395*I*c) + 670917061305
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05292130961496106707521506432*e^(394*I*c) + 1436576871380447969429471197042
595384588181994235168246745862936910561192098663581236377722454095307992305
53767222252*e^(393*I*c) + 3043844711068133360102841601239063704338888284906
27422652551236966790916174520857759143930140187173492394981908258944*e^(392
*I*c) + 6382188929145337415058063996624885560667836004960918764083749748774
48971778036074996245581124283460438065182071976085*e^(391*I*c) + 1324311324
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702325320304649883120684987556400*e^(390*I*c) + 271958928348374392604080510
108034192124453031125460725092919277390933152322663503581567286256929669371
1643521070331394*e^(389*I*c) + 55274988490311783558612300093266682839262900
82158467118000698502719379939045918344222192742145711257028040974074674736*

e^(388*I*c) + 1111949964536320108088106282488633849242537565844897793553584
6349290425821570383090425411418521516670371372045206568345*e^(387*I*c) + 22
140735001708603270915180769241391662035578755903979148909213603822554792749
183517160255571915875356439553717130797888*e^(386*I*c) + 436383000758151710
259462114644656896189657734886609858579456574798540851088518579112229119898
37615452608512356008400295*e^(385*I*c) + 8513953323478645577958995946490063
776073572970562122138000583720836915779467304967542879981787543143024633262
5899630160*e^(384*I*c) + 16443750067690689274132326015439427850395456193602
0133596581806449357240277349447927334517105809995300093549279931273178*e^(3
83*I*c) + 31440903580822586156559543693835494544547399104312972204674722881
3030925204968503418566818838611866709807040793495364496*e^(382*I*c) + 59515
761550043151494747928233654705382792608791642526349718775702941338547183543
4198246807096214536895441388306027237899*e^(381*I*c) + 11153982855456015505
333280456001843179938993592179967298183407042218011956674104858469961790567
33558512452238583160792512*e^(380*I*c) + 2069698289500860643461665762373807
957513019424041178871904960551829412449344722432125679417958403007551179298
315947373776*e^(379*I*c) + 380260499670589110696462063384896480703709885451
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^(378*I*c) + 69178389452148442784933304593613949233723338536198796373726731
84942859712431066345726870422099893124890777678037369988150*e^(377*I*c) + 1
246214044053725808492859670987206685775707094312486855450094815475686345430
8032925408340311237850017814707896986969086816*e^(376*I*c) + 22231341131801
535345406399037721686840208397941952580135584645966746736656716271554826476
282991066076564921432614339399735*e^(375*I*c) + 392742004143298611693979445
162250010812274333985850072063992312119071577953597196482415987542665798402
44551491476467899952*e^(374*I*c) + 6871246601598564151246858617365974773487
959171009835465278612493602307394314104957360664856300535941171276489568390
3806088*e^(373*I*c) + 11906059184966054683476569322767644906758414824888267
8447504826077236333444513454095126668750057295811191643356908972191440*e^(3
72*I*c) + 20432555726518600076740271023084789645976158392276369823543321283
3313077783041040074669379017394836761539649081690630811665*e^(371*I*c) + 34
731005381093529041945556055595731412956921073574598323436965997641337477407
8000173070075248654524917179128950507443058208*e^(370*I*c) + 58474957368230
458617938462884488332758149896988654038037889676799907561496400717460081109
2945356635118795824799369716742109*e^(369*I*c) + 97521033944404931875728231
176351778667322317559445794638327926463508504100491730029590427543314484853
2459919875479817581584*e^(368*I*c) + 16110925414000605259548593752641941783
476434718370782014462624356151429445873378335135860227298495233584364935860
42252995608*e^(367*I*c) + 2636662410430799340447522284778244283740751068658
140726576446671207798325606832295937705061686297930296382338892574900819440
*e^(366*I*c) + 427482690772059175252671133682087150084434564792238547153435
9333606189571832444641364132893108663576205133870672156264164115*e^(365*I*c
) + 68664253375186682626626937509089569657329245781421816306221578028998808
74681551031136314064199948604001529894566235238597088*e^(364*I*c) + 1092721
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903942667485545346609740233068833184560 2302*e^(363*I*c) + 17229502824367647
334400721998417596703948657394738805209391636597370380572398964715080095366
818322029152193635869784095333760*e^(362*I*c) + 26917794701086615097890 1202
368905011051467999960217751957108662262286389847034568326941532306116072634
44183501026198563419616*e^(361*I*c) + 416704403753905436434182193422717480 4
003507149011908058528152249818881837590690036870123453130463316344631994513
0196476913600*e^(360*I*c) + 639230194337619890906148012886350981231994451 02
303122616544648208998767803944455777042886552738499747183713136069104651812
215*e^(359*I*c) + 971730550247426800586167224613688926611412955402634930130
327460835361573242683333904003089583183702191548871697022574447561 76*e^(358
*I*c) + 146390448456351181218237382740374124191664819997746988076598391862 7
336296701422415463755339031306052975801056753556291601981 62*e^(357*I*c) + 2
185631666596493122474836409562721492124991153838287710296542833639725851180
904794136966381081563852446465913284544257451175 84*e^(356*I*c) + 3234131780
148410037141511382460791525763609760350584578904099377387231715370365730436
81997163745313602400139153046673668433091*e^(355*I*c) + 4743230435631005423
773386299319662481291759769823324460180560093911540204388959031408229677694
940194461667799540246553441162 88*e^(354*I*c) + 689518449328793559903260418 1
499741902535783400588950355896064682446805915561181703040050375636698800579
0876589894926861477228 5*e^(353*I*c) + 993555653649521127226443960820233649 3
864885100818925458667004440966615827904412418308556095770620395556250909433
32264901780720*e^(352*I*c) + 141916448142217657385823401389899962882232233 3
309573730716310743838935832201454293617293175086458389621425307051750612129
761498*e^(351*I*c) + 200949611009268773815278208568373722272796882429905873
921544608349935146762533444967075776406669065615094901494404399482282392 0*e
^(350*I*c) + 282081929856221595910752980728962844962138679898943636939311 60
698940187812010002756331044983989593466317955680225199744001302 81*e^(349*I*
c) + 392569765841577835276810394285601184021164276962171721799661439847388 7
186074391482638547212826538270453912634540299792270321024*e^(348*I*c) + 541
666280405243634958559598281835795386625846164435401820515891774257642534436
496459675065317767780349218681730517117503201150 0*e^(347*I*c) + 74103726128
911522243646332961280439716571932803277543043822356727737814030238141276103
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758815498534554967803144574449998520825938543560974027240030145424687204177
515983846807738156233874563639837 4*e^(345*I*c) + 135212304119454369155588 54
706851796541567399811656870021567352975326815467817846533289123871696056195
23169614616272099222176099 2*e^(344*I*c) + 18035327338177455471177568594851 6
829777978346449777193572087688510392426884519272991560851326393852241961470 0
4081979362712792399 7*e^(343*I*c) + 2385639856556280203069527817421264083328
215417400645945829264406094792490731373592156169015393990601751864718249161
6573724049744*e^(342*I*c) + 312952636881898383137727758733072603341172272 58
629501992358695636092662866062819845689064235813622974150120668921391878398
978380*e^(341*I*c) + 407159889637019189500203483367364234205133113590104852
469190746528833939708053744708301562297056473122654775842560272127629410 40*
e^(340*I*c) + 5253922334674077114258709237025706953606031964443950166761048

2767955800276052892432152798814607975110366224945081428121888473324*e^(339*
I*c) + 67244087969080703823703257199663047606890610482090494619492802935130
215979819469966383336788693900139115594646893784095418472336*e^(338*I*c) +
853681184302153128482312917396737358877462018516662996003921994187647500868
28198719872744047767783667325326289221881974987582215*e^(337*I*c) + 1075047
374065769161234803991697596333283214074194005100174988498305986215654282665
463159339208215275447263802016591149038346058888*e^(336*I*c) + 1342977420234
794299046296161045596100960747587210680227044689380630170596880233634364589
715349646650363198891192298099738069096080*e^(335*I*c) + 1664323329225891951
305583292663987533898239557375985275560960930624735597695457723219789693189
041925727339978882309864690059708880*e^(334*I*c) + 2046222955357291095198299
167898672253194297051625600826488403949654231128093365919212903093923962638
346743689778405271470374269088*e^(333*I*c) + 2495930722825658663983899515096
192026826344554871287146314618917708232013675276457937702037887846773439349
714243179878952550319366*e^(332*I*c) + 3020606380308684634611394422793604997
189069174825248944833562201961383770508289113830568604253701611572014936960
73712322595776808*e^(331*I*c) + 3627063075638432311356991574185107324524206
140136241688793121876452334501539279757933268347807413912034301530937126353
55523960320*e^(330*I*c) + 4321478564640869380238115618086785895947020479046
742822979596588001709844567990677518780448066190124526368913507316182785456
90160*e^(329*I*c) + 5109076151111345074526238461471371414502757224443163855
316484292308516866358277174884645003316233857774007449505384106377359360000*
e^(328*I*c) + 5993784847717334748093761424015548502070649721181375729492575
036514445419393090252768960496225156302631621845263943172854573683000*e^(327
*I*c) + 6977891069259246148167137476846827850836598190279522444470433558697
413685004525611640246360734019296931058011055227384053490281600*e^(326*I*c)
+ 8061696713276255324245753400897757336819949915766744469223540997146151920
854432456638522570011156442866603049794760239660718982000*e^(325*I*c) + 9243
200528675225840357774957610723512225344207848619600018210205094681463567564
337952464464913961415838545136871043344295667075200*e^(324*I*c) + 1051782100
428834371944508170051219187116816349766953322637182149610875004223784784183
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0*e^(285*I*c) + 510907615111134507452623846147137141450275722444316385531 64
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84*I*c) + 432147856464086938023811561808678589594702047904674282297959658 80
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) + 362706307563843231135699157418510732452420614013624168879312187645233 45
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4*e^(273*I*c) + 407159889637019189500203483367364234205133113590104852469 19
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2*I*c) + 312952636881898383137727758733072603341172272586295019923586956360
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+ 2385639856556280203069527817421264083328215417400645945829264406094792490
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446083499351467625334449670757764066690656150949014944043994822823920*e^(26
2*I*c) + 1419164481422176573858234013898999628822322333095737307163107438 3
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932879355990326041814997419025357834005889503558960646824468059155611817030
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237733862993196624812917597698233244601805600939115402043889590314082296776
9494019446166779954024655344116288*e^(258*I*c) + 32341317801484100371415113
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240013915304667366843309 1*e^(257*I*c) + 218563166659649312247483640956272 14
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013032746083536157324268333390400308958318370219154887169702257444756176*e^
(254*I*c) + 639230194337619890906148012886350981231994451023031226165446482
0899876780394445577704288655273849974718371313606910465181221 5*e^(253*I*c)
+ 41670440375390543643418219342271748040035071490119080585281522498188818 37
590690036870123453130463316344631994513019647691360 0*e^(252*I*c) + 26917794
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35238597088*e^(248*I*c) + 4274826907720591752526711336820871500843456479 22
385471534359333606189571832444641364132893108663576205133870672156264164115
*e^(247*I*c) + 2636662410430799340447522284778244283740751068658140726576 44
667120779832560683229593770506168629793029638233889257490081944 0*e^(246*I*c
) + 1611092541400060525954859375264194178347643471837078201446262435615142 9

4458733783351358602272984952335843649358604225299 5608*e^(245*I*c) + 9752103
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83922763698235433212833313077783041040074669379017394836761539649081690630 8
11665*e^(241*I*c) + 11906059184966054683476569322767644906758414824882678 4
47504826077236333444513454095126668750057295811191643356908972191440*e^(240
*I*c) + 6871246601598564151246858617365974773487959171009835465278612493602
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910660765649214326143393997 35*e^(237*I*c) + 124621404405372580849285967098 7
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50*e^(235*I*c) + 38026049967058911069646206338489648070370988545101822632 43
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 + 2069698289500860643461665762373807957513019424041178871904960551829412 44
934472243212567941795840300755117929831594737377 6*e^(233*I*c) + 11153982855
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96581806449357240277349447927334517105809995300093549279931273178*e^(229*I*
c) + 851395332347864557795899594649006377607357297056212213800058372083691 5
77946730496754287998178754314302463326258996301 60*e^(228*I*c) + 43638300075
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5*e^(225*I*c) + 5527498849031178355861230009326668283926290082158467118000 6
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60667836004960918764083749748774489717780360749962455811242834604380651820 7
1976085*e^(221*I*c) + 3043844711068133360102841601239063704338888284906274 2

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) + 1436576871380447969429471197042595384588181994235168246745862936910561l
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29213096149610670752150643 2*e^(218*I*c) + 3100431920606941707706936314142 34
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34846014*e^(217*I*c) + 1417648365287570495720201334324111790436997779665384
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) + 6413381895855925184758231451062556380328594938511006577015218119786536 3
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5196005647730480*e^(210*I*c) + 4383497214291937768537869223302106374455403 3
1009285027374804389789767469898957840709519052377834903743059345429 55*e^(20
9*I*c) + 1837980708400335976602764921762114411609173557221662078886153580 34
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8*e^(206*I*c) + 1267597017294812913400146276042126929986480292870190399107 5
5431107996422728019652247537010873847785631176569961 0*e^(205*I*c) + 5083245
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33842285751054665210868287680*e^(204*I*c) + 20155794742479409802677247846 20
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97500*e^(203*I*c) + 7901914955876656925478398848723238835290914498274717185
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46877670795842089254787012868 0*e^(201*I*c) + 11735856926245118493113091002 5
0160403234187698599908282352067224153020018822382639298230219408466753848 86
65600*e^(200*I*c) + 4445412259295474625067659514198312966015416299968930393
345630345914109720740573618884980520010028451496996210*e^(199*I*c) + 166447
5034387211809394917743502937638978574937754764763987835872410449930690131 57
29042799954845810139650014 40*e^(198*I*c) + 6160031160229795849371257017578 8
7212998354300989991362628038861093914561332071191909714949426587936910303 30
0*e^(197*I*c) + 225320532593220657767941109289516248999794521015564134982 82
724171001967548669449968931246656190721262782000 0*e^(196*I*c) + 81452081413
8291118288754175642500548460376933128114804929091607581959891557681070225 68
3509538618159407040 90*e^(195*I*c) + 290976510612474534066475697818369100621
65559852359052804259154165687125428752562385492373749486351714453120*e^(194

*I*c) + 1027160253020288900249781351684945259097151280952906066519730109705
2210064576088348023234671975463677418470*e^(193*I*c) + 35827180021632960614
1453670371510989710719825273928454614934310234845612408965742859494643866608
59773886240*e^(192*I*c) + 12346680418924099787800180817554402160125824763 96
9419379658996319530792039742221387946043284989721447669 00*e^(191*I*c) + 420
3580248351467985836112101459421546844379493656478990883725248021562228848 39
58001168865566428069177 3600*e^(190*I*c) + 141379938253556843280565505807403
3041306061307254347517457940798331413617489176399861453770664372105461 90*e^
(189*I*c) + 469702247271172818264540450180706705225597566275803477845353200
149634826323597294445418851022745460025 60*e^(188*I*c) + 1541311121148602393
7294970820797376716081344788163386543522421939737507962125854981881879168 34
8260330000*e^(187*I*c) + 49952419562791381802051867444016880243882721139212
556637349569469275713055331467768987878780596851084 80*e^(186*I*c) + 1598771
1010581926922705289996774447426856310062324561858449252201440023058781203 80
828483988663574829100*e^(185*I*c) + 505293663123015258878483025738812813203
3977668453400653812610163534197223826203930325359606609219504 00*e^(184*I*c)
 + 157685845528850918721462877864435090257583149415561323427386562894447598
277935629800939237175625149830*e^(183*I*c) + 485842581531402804473148368687
7213139019541241904673277845870601509688143707633791079358412247507 3760*e^(
182*I*c) + 14777955096617128998712745182071495362176506973183081650233605 27
405167762497046434024275584002567 3760*e^(181*I*c) + 443721091784318234776 43
4954444390469902005659506947084719361709211471407763307723497282535122697 93
60*e^(180*I*c) + 131505212093069212210229710532762284233587074342853089107 2
9835358622800944466077234738004774539141 30*e^(179*I*c) + 38465584208066627 4
4540630787848371749989490525009753221620033925499534135924615193651779086 82
078400*e^(178*I*c) + 111034148797008819443143895644469242295049867464313710
969257619338899133799285616020069872611710850*e^(177*I*c) + 316266446747255
4773117679568752765357130596998592368839211216491555324257326949090898957 02
48533280*e^(176*I*c) + 888829502875102466704420383760797610148005313441861 4
474620767522824868911959884352666444917404000*e^(175*I*c) + 246438219080743
9609079774226855679629367885709776435876630851716253962696192341706239192 87
8728160*e^(174*I*c) + 674025530543133008894845775236625237450743114473544 53
781817044713460710257567667605667532896159 0*e^(173*I*c) + 18183466140617790
1315330129677145381166449188413194141169344354754920969034952610378945282 25
7600*e^(172*I*c) + 483794897564340998438577918165893794068150426093403787 47
5864371457816462454220451012304173099 00*e^(171*I*c) + 126934969329649205650
73673637181280088548682508880255337280065006566138696041797353216584528640*
e^(170*I*c) + 32838747605558186767263094803067344201550985839480744690141 68
171874442170109648521627538755920*e^(169*I*c) + 837579206923411932458786486
7653735339465452397089907694887248139821891651045898955189092563 20*e^(168*I
*c) + 21059430138564847118432907888031750495336183995415942743400988466177 7
2597525426477091500369 90*e^(167*I*c) + 5219091220766182421581227185426974 80
7129284324322789476922969072001054714133413161098963 6000*e^(166*I*c) + 1274
7219616503320541356343062562847368601622140856786025445814532037904111523 24
2298235713300*e^(165*I*c) + 306797429643174736419815962396246367161700641 96

26851426148418602934852907379021659761911840*e^(164*I*c) + 7275210107183942
29291774073844694255798738667067535379759732795567942578751384250780476310*
e^(163*I*c) + 1699563279699297677739020966526292532837045054771275445565344
17376686540936706073847337600*e^(162*I*c) + 3910803125560180947653753536961
1844440844903751605645023514572352045248104262933598850730*e^(161*I*c) + 88
627521427569572856813408857649045979353495693553218156477211725371591864914
71311666400*e^(160*I*c) + 1977792980665818135651300094326239158605448870806
970860577325385028609983034534672318500*e^(159*I*c) + 434546676780280045346
344498763892540797175105756827515509297024187660299345484920192480*e^(158*I
*c) + 939869153130681791490836060656814827808360605105301546184869498394671
31378859885998210*e^(157*I*c) + 2000800680303004713729327825032159711354071
6201983333126349281186679153199068045257216*e^(156*I*c) + 41915425006568261
48093339414544159143964478472492315931809171859902114109005939942952*e^(155
*I*c) + 8639799336223303495562968200283955131987080649405057021260686529368
00794826651264256*e^(154*I*c) + 1751931705006183002415156323819122851577900
97816049220671217212220015297133400636060*e^(153*I*c) + 3494107161327670464
9477943043339450201504075335160361865916029213860778606230624960*e^(152*I*c
) + 68529932231457366873288853116177954355929408414398663510796556523128947
21972796266*e^(151*I*c) + 1321498055271300851429993866631619874424534425188
183592049727687571032156435077280*e^(150*I*c) + 250501028608928332469340456
829902067712233644464602753159945727868485722395506952*e^(149*I*c) + 466682
23548266017806854592468100570289355960869613650856575756758180182223308768*
e^(148*I*c) + 8543013441126212334833540665069621472479085838041360564550722
036723654297540205*e^(147*I*c) + 153633323844492758353273455601649467167491
6578907116984548489078241693926940560*e^(146*I*c) + 27136120750326657073448
6517077181014801775322183181055638619257836143271472358*e^(145*I*c) + 47065
044611135158108487353367484243102698248838312635876283099427442745866704*e^
(144*I*c) + 801372958079075243436196494576154376146952079121074697267587048
1058674277844*e^(143*I*c) + 13392143742542455535648844068019453533850002540
30655765953770237607180089968*e^(142*I*c) + 2196012813395155615002614788441
90024870555261281946058839614044697037963695*e^(141*I*c) + 3532444720677901
8115378052820789411687581004582367431006205879633729015200*e^(140*I*c) + 55
72551157328671121016216416307596161861955969011697222340926210112854418*e^(
139*I*c) + 8618848510949919087642468054746724286037573154844539747136128122
15428992*e^(138*I*c) + 1306576602265604193351214343899389618845954340699848
24307149332131747540*e^(137*I*c) + 1940797921559456659353500810330325525774
5408070082431338945184797463936*e^(136*I*c) + 28239051519365866783825257065
64457280290098698638597987628380245881715*e^(135*I*c) + 4023496922661211589
34003582839428785116904903936409545602519219664720*e^(134*I*c) + 5611708107
6341175384087570185188538660375932013674735519055227368366*e^(133*I*c) + 76
59010520187549651777118357676871927081898989131125755798204236112*e^(132*I*
c) + 1022536437468296737293065862705246449693687415559865844306888705423*e^
(131*I*c) + 133490210052026183779673313868332303530332906163247194627808410
304*e^(130*I*c) + 170338860273906157410409777216555416656121622754850285843
10890417*e^(129*I*c) + 2123702969188871318266718781223927067839949015727293

884065388080*e^(128*I*c) + 2585853487159772701558291156841934110720345414913643939854913 50*e^(127*I*c) + 307362174043210099652310374196630539628810352817092216977850 72*e^(126*I*c) + 356476489062872401708848799668817892919578761395854547480484 5*e^(125*I*c) + 403212225957798188840846139960995624144491271694336796459584*e^(124*I*c) + 44456708175258821024400946210535004523775722190977468484496*e^(123*I*c) + 4775398607100853263534207733818266777478693412738731031680*e^(122*I*c) + 4994675065585317336715858629105727028115450357303987495 30*e^(121*I*c) + 50836369508171099437019348610847391946736185108017183136*e^(120*I*c) + 5032024903401451824074213943766011922026507006311982753*e^(119*I*c) + 484093410240488718655917025303662581091659126182344528*e^(118*I*c) + 45230940039830738332025694784646206844854827698075736*e^(117*I*c) + 4101545439937195793959956708442496709433800261224880*e^(116*I*c) + 360688613036389349413809780004559963548775423325255*e^(115*I*c) + 30735366512830562160991166338490057308062762518496*e^(114*I*c) + 2535667460650279776834561566186591213109251642859*e^(113*I*c) + 202347509724462171313966643580234078508179838320*e^(112*I*c) + 1560391127768760709972162377174493308692058727 2*e^(111*I*c) + 1161581413733971751533622511909046917188768400*e^(110*I*c) + 83380839911837894453136303673785039051506805*e^(109*I*c) + 57646010465631513042138547107153468384473 92*e^(108*I*c) + 383360155801054824529764688213114368047154*e^(107*I*c) + 24489837337812338687718622491865013839488*e^(106*I*c) + 1500602747937397286405577818722691539392*e^(105*I*c) + 880549275989414111458699508133880402 56*e^(104*I*c) + 4939666610818025798809586352543471345*e^(103*I*c) + 264410375780310742518099326419685040*e^(102*I*c) + 13477227799524701956579274210395326*e^(101*I*c) + 65265025334320604745362055999384 0*e^(100*I*c) + 29952547749265499675257842032197*e^(99*I*c) + 1299146645993240318167826532288*e^(98*I*c) + 53090127264630963470039804475*e^(97*I*c) + 2037031259470368160131922320*e^(96*I*c) + 73099207817335597247098038*e^(95*I*c) + 2442455629894502983849104*e^(94*I*c) + 75599817092670157806639*e^(93*I*c) + 2154864144781257856128*e^(92*I*c) + 56169444526926562260*e^(91*I*c) + 1327882849274858880*e^(90*I*c) + 28186192554792138*e^(89*I*c) + 530563624556832*e^(88*I*c) + 8718181624155*e^(87*I*c) + 122503723056*e^(86*I*c) + 1431118260*e^(85*I*c) + 13343760*e^(84*I*c) + 93096*e^(83*I*c) + 432*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) + 14*(26*a*e^(1055/2*I*c) + 10504*a*e^(1053/2*I*c) + 2116556*a*e^(1051/2*I*c) + 283618504*a*e^(1049/2*I*c) + 28432755026*a*e^(1047/2*I*c) + 2274620402080*a*e^(1045/2*I*c) + 151262256738437*a*e^(1043/2*I*c) + 8600339740311748*a*e^(1041/2*I*c) + 426791859620149322*a*e^(1039/2*I*c) + 18778841824143775343*a*e^(1037/2*I*c) + 741764252131213332757*a*e^(1035/2*I*c) + 26568646854716407696970*a*e^(1033/2*I*c) + 870123184837420284430070*a*e^(1031/2*I*c) + 26237560668658611978090055*a*e^(1029/2*I*c) + 732777588085793048574300590*a*e^(1027/2*I*c) + 19052217324800742177269360704*a*e^(1025/2*I*c) + 463207034992633568486133297596*a*e^(1023/2*I*c) + 10572019430266010048013097752934*a*e^(1021/2*I*c) + 22729841909575511658656679995 7934*a*e^(1019/2*I*c) + 4617746868571980127702698250753676*a*e^(1017/2*I*c) + 88891628244678704139848327305754038*a*e^(1015/2*I*c) + 1625446941911901543891066605266178710*a*e^(1013/2*I*c) + 2829755417150959822835916

9068737992545*a*e^(1011/2*I*c) + 46998547788984636877657100563512106 0828*a*e^(1009/2*I*c) + 74610197291041263804771465214882329 20426*a*e^(1007/2*I*c) + 11340750511499820782828683995935681833 1515*a*e^(1005/2*I*c) + 16531325755122432205557928733832925801 08953*a*e^(1003/2*I*c) + 23143857771494702366699332162923093803 819912*a*e^(1001/2*I*c) + 31161554242021896057054989121055413154 1198338*a*e^(999/2*I*c) + 40402571518442061595422665880799058707 52602511*a*e^(997/2*I*c) + 5050322153585809109658268937622178670 4600600455*a*e^(995/2*I*c) + 609297036058359460142063362206138699 89504487122*a*e^(993/2*I*c) + 7102120067046396299634193292688723536 713017300128*a*e^(991/2*I*c) + 80060282862006487921860873353861357 672073071040769*a*e^(989/2*I*c) + 87359923470876485805572134039073 601959554839159 7091*a*e^(987/2*I*c) + 9235195266849469317521124217042763676973766253104794*a*e^(985/2*I*c) + 94660792391616466534333151235841916067978700197242708*a*e^(983/2*I*c) + 941491605787522647999978018615368308830544085253128617*a*e^(981/2*I*c) + 909283230328133681623358022746257787119781396327607533 0*a*e^(979/2*I*c) + 8533279426386174534195194156863380104429920918919046984 6*a*e^(977/2*I*c) + 7786623913490808819340683704304761031787480885520876315 88*a*e^(975/2*I*c) + 69130093506103224460474286274088111591583388857474901277 62*a*e^(973/2*I*c) + 59748219031202678520235643789006093143612681508950204493 778*a*e^(971/2*I*c) + 502997285203192059840013244325631734915939121404020646790 260*a*e^(969/2*I*c) + 4126870246985029536018107086136692505798915934457479856887 816*a*e^(967/2*I*c) + 33015018627194726039854786048619784314920578570513381395990 898*a*e^(965/2*I*c) + 2576611959392903086066077612980640290109804462779236377279 40695*a*e^(963/2*I*c) + 1962615229865836518270067732662567794203130442183114304875477 510*a*e^(961/2*I*c) + 145969882655902257079517745541926734780493226622095964181321 88458*a*e^(959/2*I*c) + 10605189826833375691056489755868863808080691523810858185486825 7941*a*e^(957/2*I*c) + 752970977560607563719398585207010863604321557616289473063991767 039*a*e^(955/2*I*c) + 5226524093507646193682839275968943608626786700142487822871933708 874*a*e^(953/2*I*c) + 35480208697362076008873709776702294541967395718297832569250047180 556*a*e^(951/2*I*c) + 235643271710602776985976812503397918723360707843190238666454384153 669*a*e^(949/2*I*c) + 1531689544688533128267835220826660575517763556541402057407422275055 260*a*e^(947/2*I*c) + 97471745025241392484421887397750175625676495407868878393581870409 12530*a*e^(945/2*I*c) + 607461980535619195835294948202520064328801684025929065943630596 56788960*a*e^(943/2*I*c) + 370874356826170622561211031579288522536503760739536119117445103 487930880*a*e^(941/2*I*c) + 2218870701411021049789421436850301976335757207676690062759443158 094615652*a*e^(939/2*I*c) + 130124844315334923787462420792031934352476316829766587775009459507 58604298*a*e^(937/2*I*c) + 748225805992854809332407047961969129851422645611568263487171740432 01630392*a*e^(935/2*I*c) + 421955281655057070938611937183522587192086313169152717515130361078 410110468*a*e^(933/2*I*c) + 233439620049209021698057776731074465058041760658959867438959177562 4513302292*a*e^(931/2*I*c) + 126726214454400676234867072943057897067822095584575862839483742169 39117542680*a*e^(929/2*I*c) + 675224033612120791362914479989110827038453618491082543684386865846 00219974916*a*e^(927/2*I*c) + 3532004347423079615370447529901

2452865364993104081072377717578262861596469884 4*a*e^(925/2*I*c) + 181420178966324750368399086912625354231807142187887044707667156939252328242671 6*a*e^(923/2*I*c) + 915244198576107944544371609198480077086176609875536500157821502781402563782234 4*a*e^(921/2*I*c) + 453595197346122507399962961061483761548849942920391554027606491065661392777985 96*a*e^(919/2*I*c) + 220887009474485548410918212534797139518487225151752041095525819264180469636552620*a*e^(917/2*I*c) + 1057133035608080334517467842102247001229173401193395800195028598793946241985524410*a*e^(915/2*I*c) + 4973151945437818333207978519812229283990687681266209867827402557241427416724759600*a*e^(913/2*I*c) + 230016401216572533166516937056848373725132785208363319914076155441877442224212850 0*a*e^(911/2*I*c) + 104614252934905612199658590379588736548577356327149679159709209471984279805545840510*a*e^(909/2*I*c) + 467956604371240831564637674844157127750964967487710258048711564849492193413275081370*a*e^(907/2*I*c) + 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69955179468459594063403111005645295143293416947144682345206374550051700907623571000874184381488493815415*a*e^(755/2*I*c) + 115078679074156921003896211506744040757448129755518072610974597692499116476780735959201587866777427373854139852271484*a*e^(753/2*I*c) + 1935057048301810541891597216428871301384755825279340177324205631572757103840387805190163410832217175381604100716292866*a*e^(751/2*I*c) + 32216520514514236357011840392108122317210367042882743490321736789840875279168679621644558220898770721666127075234818 9*a*e^(749/2*I*c) + 53109708622600277684482250368502644062996550346245466227176766453817507679350199049608943012406599232788507912142934 3*a*e^(747/2*I*c) + 866970458937740800599100110052272334086336166813485215823374714091680381820801848615843383573129277135387631125832240*a*e^(745/2*I*c) + 14015050228648217599905149117743586554649209806429186270329791652696012999281501618300219368308137368714173903739286 86*a*e^(743/2*I*c) + 22437274442601993561690753071153304749782099134550029336700431895279027708625136468016040067582424263135720298 51100889*a*e^(741/2*I*c) + 3557590523647443375782485089297662929228827542861566734110641737329597784391653357883472975676999315605445384252967857*a*e^(739/2*I*c) + 5586988939674645914325363555071628268483019312293467595456665060150126510199336854750199776926144674020027271745487999 8*a*e^(737/2*I*c) + 869083442874626408206356668709227690319173788941840934462519882657594458869706119930593244062148510236674576104803063 2*a*e^(735/2*I*c) + 1339161714338134156179738224750385847869465148697624113017219215504155359839349433807246833361878579762785504787953571 9*a*e^(733/2*I*c) + 2044178350199612598013590737357295985587188727779005645626436742403679533833148298244109873957783239464438189955697418 1*a*e^(731/2*I*c) + 309132980920478453984687001663630696239627341410546638371233948289257131780166068100757728741033115735840681003 11403990*a*e^(729/2*I*c) + 463169064421787428773107530128748877142514289777958793153580120909470200672823314958039316051513419832893758193034974 28*a*e^(727/2*I*c) + 687588340824290493941730231472874639260477373072581343050011943174958579815785773697014919831698299888764640820238814 39*a*e^(725/2*I*c) + 1011438762009077014581455894336504522673284190696402820119090996933488272290877748147017464251640978498366945421259883 86*a*e^(723/2*I*c) + 14743495097122257892001302754560741045764055468918914770666990802436741262512060095882016917065278931689868346343469943 4*a*e^(721/2*I*c) + 212980072887213248427695741184161155985508108281896593768588904956983197495607916465914403589016442699445092549476690660*a*e^(719/2*I*c) + 3049181785340667859900073481092514118311474102062802507059966081012031389030426986018136970134637811016584446849092496 58*a*e^(717/2*I*c) + 432675100311478232681920379445423307009664359868176731174023649559638171040661252577006509195005627113792068208970590674*a*e^(715/2*I*c) + 6085600003789944462454360725994938388425387255926195914009725963943273686384386501149939378187614970307178961382413630 60*a*e^(713/2*I*c) + 8484704989460016345675819568743938340161467897648342753927204752914291466611384026729910328563751259978018879915149344 80*a*e^(711/2*I*c) + 117271131265849395364983883698491541179040146140456348400538432887770203716296712007058597079995784587460415335469270175 4*a*e^(709/2*I*c) + 160692624306626054554481901005007128427431243975148175968419123604564153261042308353

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79987655695844499369899279954 80*a*e^(655/2*I*c) + 397225911325958618362932 5
664274897110088063706955062184972890026109827136705312561541269284123968426
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647234218039660*a*e^(651/2*I*c) + 486346493778889602208649541941000028553 46
9329267154564970460920051534539777476491195602329540975276021922112919361 53
6876440*a*e^(649/2*I*c) + 5332228934934298858594093264598308973341326947698
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a*e^(647/2*I*c) + 581134524659849570516520835583290845326108734568414348508
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/2*I*c) + 6296503042442827813628681276165559097838049487844154370486278 3087
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+ 678308554005074900817733933728713694643911068994805169147351517503405026 5
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00*a*e^(629/2*I*c) + 98177616351945925614396420923262476601654382675446395 5
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627/2*I*c) + 101419296885365662579146201278575823349302457101093495353763 53
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*c) + 104265810628987872856563640672132080919144434896624853275387262442621
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611452085869654933016755006318121476925560468071807193006264263829657909591
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5/2*I*c) + 1066862354734951629341085781295112245624204034159509029552678063
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) + 10426581062898787285656364067213208091914443489662485327538726244262135
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*e^(587/2*I*c) + 7266255240548743967295489044299897546346491838461350217790
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2*I*c) + 678308554005074900817733933728713694643911068994805169147351517503
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0*a*e^(569/2*I*c) + 3163488842636163620428425439010805462815012119876560047
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67/2*I*c) + 279578067821774001544429837120309276532260516704930830717667421
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) + 2454491325294387865714602825691473166238408273898216850915274636488813635289100372248776352352508869638224682756209467350000*a*e^(563/2*I*c) + 2140414401268248423527085110778456188788662231517813616335468747740382040265676920119714052214787903058627269982720632222 00*a*e^(561/2*I*c) + 185382876570012174114774314485921619537568838158478822294899038884738131663676924882800088555461036440639784323290982435920*a*e^(559/2*I*c) + 159453936074225441087444435445597322638010349959140938824355029415044951858795370137083023423725977662050522985425476876440*a*e^(557/2*I*c) + 136192832394833900835393035860717631858240644738806126199965701046979626441751102715242872161933462105757019809834502589368*a*e^(555/2*I*c) + 115501366010049680683270239800168602972769128293070900256170512177998242491871324570579538346381414929314168762720397958392*a*e^(553/2*I*c) + 972512635828845126947332615836673911920499453460476804755845384109671739394545832204012571316348452698722089019829005062 88*a*e^(551/2*I*c) + 812907101820435661670137917328026717295496739038306764463579877148393390541755857017226068842685481874026870955535108123 92*a*e^(549/2*I*c) + 674508134711267069354905185682023908492216402754946052066506679070515183292949519988799787834632646360891370564910065232 08*a*e^(547/2*I*c) + 555517698205165428114192188469265797730870997539789916967567161573689502536781595273406710566993872816347431816379813634 40*a*e^(545/2*I*c) + 454085418853661438727887172187637730540394006020579830363333768165227744953349261693257543907803480943168622666659659918 46*a*e^(543/2*I*c) + 368359022018406490591492271492757687297979105033892875201004668647754635784667697245983770438725101038177017938204757759 84*a*e^(541/2*I*c) + 296527443956335801331589598067011638542702103751712672085186333321613647494052832616268250453588283997423185165686274849 56*a*e^(539/2*I*c) + 236856095744015338757322377685535978875049675700020973144989490070007809633532458510446095219460972810451607316281952794 64*a*e^(537/2*I*c) + 187714177759385410101658117096558912541740475243755458558411328903722587432006578793684826182883346846158186993924183422 86*a*e^(535/2*I*c) + 147594309664163726602639158413536403898056686554944952358909830945819427493606808505608053536558956264853942134266596610 80*a*e^(533/2*I*c) + 115125037011872293232175462429279693184486848040277203085308862724341061174142879808769273547817218046644735588997613935 15*a*e^(531/2*I*c) + 890769951839117842912980641402497841569803028507622901399151629297555758814354914277871788186631971255010554345199492174 0*a*e^(529/2*I*c) + 683636539073439354900837400605268896230520858887268921617240025435451099060708754551094631194241546331586897561287558043 10*a*e^(527/2*I*c) + 520376358800769655586644194453821532724356361213928324417538402962534123958245429341784588873774839324667539820006670361 7*a*e^(525/2*I*c) + 392836097149201063465198049040617150440014024676010743447318264062075917380066973102851810619473316703925248564260153788 3*a*e^(523/2*I*c) + 294087118247175053123855033288460269591782358222491088806119099430489310936386360299682540179041858897127490076791714338 2*a*e^(521/2*I*c) + 218313666367323887430623118615202527468813024501252803264640677507599545740427209646006310983434012899711344226331946836 2*a*e^(519/2*I*c) + 16069262430662605455448190100500712842743124397514817596841912360456415326104230835302271517965107753051521516699534450 33*a*e^(5

17/2*I*c) + 117271131265849395364983883698491541179040146140456348400538432
88777020371629671200705859707999578458746041533546927017 54*a*e^(515/2*I*c)
+ 848470498946001634567581956874393834016146789764834275392720475291429146 6
611384026729910328563751259978018879915149344480*a*e^(513/2*I*c) + 608560000
378994446245436072599493838842538725592619591400972596394327368638438650114
993937818761497030717896138241363060*a*e^(511/2*I*c) + 4326751003114782326 8
192037944542330700966435986817673117402364955963817104066125257700650919500
5627113792068208970590674*a*e^(509/2*I*c) + 304918178534066785990007348109 2
514118311474102062802507059966081012031389030426986018136970134637811016584
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660*a*e^(505/2*I*c) + 147434950971222578920013027545607410457640554689189 14
770666990802436741262512060095882016917065278931689868346343469943 4*a*e^(50
3/2*I*c) + 101143876200907701458145589433650452267328419069640282011909099 6
933488272290877748147017464251640978498366945421259883 86*a*e^(501/2*I*c) +
687588340824290493941730231472874639260477373072581343050011943174958579815
785773697014919831698299888764640820238814 39*a*e^(499/2*I*c) + 463169064421
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^(491/2*I*c) + 869083442874626408206356668709227690319173788941840934462519
882657594458869706119930593244062148510236674576104803063 2*a*e^(489/2*I*c)
+ 558698893967464591432536355071628268483019312293467595456665060150126510 1
99336854750199776926144674020027271745487999 8*a*e^(487/2*I*c) + 35575905236
474433757824850892976629292288275428615667341106417373295977843916533578834
7297567699931560544538425296785 7*a*e^(485/2*I*c) + 2243727444260199356169 07
530711533047497820991345500293367004318952790277086251364680160400675824242
631357202985110088 9*a*e^(483/2*I*c) + 140150502286482175999051491177435865 5
464920980642918627032979165269601299928150161830021936830813736871417390373
928686*a*e^(481/2*I*c) + 866970458937740800599100110052272334086336166813 48
521582337471409168038182080184861584338357312927713538763112583224 0*a*e^(47
9/2*I*c) + 531097086226002776844822503685026440629965503462454662271767664 5
381750767935019904960894301240659923278850791214293 43*a*e^(477/2*I*c) + 322
165205145142363570118403921081223172103670428827434903217367898408752791686
796216445582208987707216661270752348189*a*e^(475/2*I*c) + 1935057048301810 5
418915972164288713013847558252793401773242056315727571038403878051901634108
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951432934169471446823452063745500517009076235710008741843814884938154 15*a*e
^(469/2*I*c) + 394964421757197854804800626261040141950619117362572826461311

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76217835695868053181917944549900719484592250444702640838005937750892315190 9
5699686223878870489390366 0*a*e^(463/2*I*c) + 7361150547229088358078769274 03
96109097532014264372074343776475669425303448966351717988617006043301044168 3
4668519430*a*e^(461/2*I*c) + 41196306759939728831632002006271808641369244 78
78874383690701298939492621533099654902609067113219217028961499595333 4*a*e^(
459/2*I*c) + 228186549100043532565208157119295931459955274509410039814758 57
68901371932672555405076513220299715006918296079490268*a*e^(457/2*I*c) + 125
08856412562750179042237925459335912703372679853519227298923602703730296102 7
7920725182173946163411522304315334632*a*e^(455/2*I*c) + 67860598510872742 17
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938253100099373799 42*a*e^(453/2*I*c) + 364306588259529933001212011349678703
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673*a*e^(451/2*I*c) + 193527374937761551069754495840517381895404530171462 22
1063749937229104247233763126606164713214930951706536170129402*a*e^(449/2*I*
c) + 10172334164253402785632580232662592310083456812357378428361196529482 90
261685985168255081026995582650121555052863 90*a*e^(447/2*I*c) + 529027743018
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45880625*a*e^(443/2*I*c) + 13856066102330026991570351445245813097151994914 9
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2*I*c) + 69774539909700958938705179903395862097896076997538737829421306949 4
594652822074437204671594167744190710319373251 6*a*e^(439/2*I*c) + 3475684327
72555419824643724607416359896220457912291800905153429680364894690454196004 7
7767097898225781691052092 59*a*e^(437/2*I*c) + 1712562563794892988351758253 7
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53902636*a*e^(435/2*I*c) + 834625577862473027286669700032071163132688047363
142695162058602775713578941078276791942737285481618912831112014*a*e^(433/2*
I*c) + 40230206688627611091580537050825344058292667366383467679120937981707
37084028478827763633228045241022369981176 16*a*e^(431/2*I*c) + 1917803983125
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985944026101410544615947498155373189933506722988832133 02*a*e^(425/2*I*c) +
19429697876176621891234206551727574008855070689503228700662784554532194008 9
8283222301264501961753831208287112 8*a*e^(423/2*I*c) + 885605196595303487966
23406573386029650837375976968689856569793878807694949548643042873094061596 8
9433401344052*a*e^(421/2*I*c) + 399101019620433293721258685199883437531187 7
876034549525880121307974429565165949974007981491960685666506428548*a*e^(419
/2*I*c) + 17781516067927356931845763051710065545917308898014634708345715696
494566329250270580498832895432948596153393 20*a*e^(417/2*I*c) + 783199511028

604830305265171241783073558871641563886451764214478656600184324031802959178677178450742159624260*a*e^(415/2*I*c) + 341010532750508401010512572574256433550588192252263514909935663911418354657799482940339817517181660633925100*a*e^(413/2*I*c) + 146767097463970982808607791792512370924531634905313051233506563629059084334858680054056774768242705313471500*a*e^(411/2*I*c) + 62435063460388886294427508605018345445377196593151678464550029733503722062639199339939077739315562684600360*a*e^(409/2*I*c) + 26250670059823787087132431304084965595712376732082437956137868649452446349005779019249872289146157988186820*a*e^(407/2*I*c) + 10907792551328601262223619496641755337904777369851587593737697263911418412361493183977361964833748319598140*a*e^(405/2*I*c) + 4479094605312455940131187899198675736490178790099745194145235324134619699772544528969129449757743039635770*a*e^(403/2*I*c) + 1817491183507803277646434154563247687916502767732579734578654547931596925444779173074576528904820222193680*a*e^(401/2*I*c) + 728709577013049306851455830045786258395785594957055604204925387842039994625652269962227400682354338997620*a*e^(399/2*I*c) + 288673978616124351576066193803621410940049987233564354069965128114229512608260120320153840315109513240510*a*e^(397/2*I*c) + 112980168249357900386494611302233425325484148661095936167081471345600663852911028639756655134829221364250*a*e^(395/2*I*c) + 43682564876241300877496357570751883228264483234185897920495921251684596213376975639862720078190049382420*a*e^(393/2*I*c) + 16683791974708972185869156311826821170155297607333534880763775663291322286056634684196941640082885613980*a*e^(391/2*I*c) + 6294061225067864477648035328196143525983759755951003547140744854431151267086143332034072457898773808110*a*e^(389/2*I*c) + 2345227572063023263376434305578606169091104336081297871356722744639904016570907272826407742463307924640*a*e^(387/2*I*c) + 863027290376938136286146320587382966922778739244634235519200955649593051035611434988433819531197898760*a*e^(385/2*I*c) + 313629308802071546273320757016507452761381047676711392941636867620998743852945422691370541694930187760*a*e^(383/2*I*c) + 112545401762021785967538906145102629749822804820131541462936025973893544847020246173693665097678958840*a*e^(381/2*I*c) + 39877107005816808842474290443185467296349332073686639497504608960180007893671571725169560655925320000*a*e^(379/2*I*c) + 13949845316042293786528514094535620274951482636695793685790781893931237847288558891416636782386235120*a*e^(377/2*I*c) + 4817584949915740964852355271716409235848785641998844676677492209743884414375678304126912661883888620*a*e^(375/2*I*c) + 1642355850523694081781659875487479706487599125909388975178926280703865441617578142680863389145680280*a*e^(373/2*I*c) + 552644594394330981404683589085114642280906553679728598394985334382381190569025961084792025986226970*a*e^(371/2*I*c) + 183538629866030645516929289398516242583510847808790824780933371253504023929536299207100681758720560*a*e^(369/2*I*c) + 60155208943075208721970485637459885199389358781088969898509767201637525536232949225931564636017060*a*e^(367/2*I*c) + 1945556288210142197792399701441683457177993888604394571936075981048677773457499402098681541345230*a*e^(365/2*I*c) + 6208666376133327662787020371327223738306905395229403481688606039769774018193877054980125219300650*a*e^(363/2*I*c) + 19547713009872346842991572365025448786468695388384136314224499795486470414353725493083383

23983400*a*e^(361/2*I*c) + 607147655811784618052593406867529437392538681078
1848667804435379321003361680222951566524795249 80*a*e^(359/2*I*c) + 18601597
745255025509215791744032430081813501925479907053679687254926325009108609057
9550703698310*a*e^(357/2*I*c) + 562107737084046939123077874109892295809692 1
619988799154965809735930671602857093288389774553 1110*a*e^(355/2*I*c) + 1675
163004358564804546609710507623366341398041317735377445682230518764384123684
8558981932298420*a*e^(353/2*I*c) + 492284913919076197191274451855093683175 0
16755516546897043991109124219704130530765258882616308 0*a*e^(351/2*I*c) + 14
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119225268410*a*e^(341/2*I*c) + 234855692258423706200419810716707127388721 79
331564011824239768938344254800178465644391003 60*a*e^(339/2*I*c) + 623766634
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619384219141690973894852561988525940115959235982868929601579186382579848 0*a
*e^(333/2*I*c) + 106784455368254113767466804631520550348728670367347050522 7
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I*c) + 657035786703317073872276183466655536833294806445692036603437064145 86
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339460164195870110384089786769506496601420223263 20*a*e^(325/2*I*c) + 379743
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I*c) + 467956604371240831564637674844157127750964967487710258048711564849 49
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^(313/2*I*c) + 497315194543781833320797851981222928399068768126620986782740
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001229173401193395800195028598793946241985524410*a*e^(309/2*I*c) + 22088700
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*e^(307/2*I*c) + 453595197346122507399962961061483761548849942920391554027 6
064910656613927779859 6*a*e^(305/2*I*c) + 915244198576107944544371609198480 0
7708617660987553650015782150278140256378223 44*a*e^(303/2*I*c) + 18142017896
632475036839908691262535423180714218788704470766715693925232824267 16*a*e^(3
01/2*I*c) + 353200434742307961537044752990124528653649931040810723777175782
628615964698844*a*e^(299/2*I*c) + 675224033612120791362914479989110827038 45

361849108254368438686584600219974916*a*e^(297/2*I*c) + 12672621445440067623
486707294305789706782209558457586283948374216939117542680*a*e^(295/2*I*c) +
 23343962004920902169805777673107446505804176065895986743895917756245133022
92*a*e^(293/2*I*c) + 421955281655057070938611937183522587192086313169152717
515130361078410110468*a*e^(291/2*I*c) + 74822580599285480933240704796196912
985142264561156826348717174043201630392*a*e^(289/2*I*c) + 13012484431533492
378746242079203193435247631682976658777500945950758604298*a*e^(287/2*I*c) +
 2218870701411021049789421436850301976335757207676690062759443158094615652*
a*e^(285/2*I*c) + 370874356826170622561211031579288522536503760739536119117
445103487930880*a*e^(283/2*I*c) + 60746198053561919583529494820252006432880
168402592906594363059656788960*a*e^(281/2*I*c) + 97471745025241392484421887
39775017562567649540786887839358187040912530*a*e^(279/2*I*c) + 153168954468
8533128267835220826660575517763556541402057407422275055260*a*e^(277/2*I*c)
+ 235643271710602776985976812503397918723360707843190238666454384153669*a*e
^(275/2*I*c) + 354802086973620760088737097767022945419673957182978325692500
47180556*a*e^(273/2*I*c) + 522652409350764619368283927596894360862678670014
2487822871933708874*a*e^(271/2*I*c) + 7529709775606075637193985852070108636
04321557616289473063991767039*a*e^(269/2*I*c) + 106051898268333756910564897
558688638080806915238108581854868257941*a*e^(267/2*I*c) + 14596988265590225
707951774554192673478049322662209596418132188458*a*e^(265/2*I*c) + 19626152
29865836518270067732662567794203130442183114304875477510*a*e^(263/2*I*c) +
257661195939290308606607761298064029010980446277923637727940695*a*e^(261/2*
I*c) + 33015018627194726039854786048619784314920578570513381395990898*a*e^(
259/2*I*c) + 4126870246985029536018107086136692505798915934457479856887816*
a*e^(257/2*I*c) + 502997285203192059840013244325631734915939121404020646790
260*a*e^(255/2*I*c) + 59748219031202678520235643789006093143612681508950204
493778*a*e^(253/2*I*c) + 69130093506103224460474286274088111591583388857474
90127762*a*e^(251/2*I*c) + 778662391349080881934068370430476103178748088552
087631588*a*e^(249/2*I*c) + 85332794263861745341951941568633801044299209189
190469846*a*e^(247/2*I*c) + 90928323032813368162335802274625778711978139632
76075330*a*e^(245/2*I*c) + 941491605787522647999978018615368308830544085253
128617*a*e^(243/2*I*c) + 94660792391616466534333151235841916067978700197242
708*a*e^(241/2*I*c) + 9235195266849469317521124217042763676973766253104794*
a*e^(239/2*I*c) + 873599234708764858055721340390736019595548391597091*a*e^(
237/2*I*c) + 80060282862006487921860873353861357672073071040769*a*e^(235/2*
I*c) + 7102120067046396299634193292688723536713017300128*a*e^(233/2*I*c) +
609297036058359460142063362206138699889504487122*a*e^(231/2*I*c) + 50503221
535858091096582689376221786704600600455*a*e^(229/2*I*c) + 40402571518442061
59542266588079905870752602511*a*e^(227/2*I*c) + 311615542420218960570549891
210554131541198338*a*e^(225/2*I*c) + 23143857771494702366699332162923093803
819912*a*e^(223/2*I*c) + 1653132575512243220555792873383292580108953*a*e^(2
21/2*I*c) + 113407505114998207828286839959356818331515*a*e^(219/2*I*c) + 74
61019729104126380477146521488232920426*a*e^(217/2*I*c) + 469985477889846368
776571005635121060828*a*e^(215/2*I*c) + 28297554171509598228359169068737992
545*a*e^(213/2*I*c) + 1625446941911901543891066605266178710*a*e^(211/2*I*c)

+ 888916282446787041398483273057540 38*a*e^(209/2*I*c) + 461774686857198012 7702698250753676*a*e^(207/2*I*c) + 2272984190957551165865667999579 34*a*e^(205/2*I*c) + 1057201943026601004801309775293 4*a*e^(203/2*I*c) + 463207034992 633568486133297596*a*e^(201/2*I*c) + 1905221732480074217726936070 4*a*e^(199/2*I*c) + 7327775880857930485743005 90*a*e^(197/2*I*c) + 2623756066865861197 8090055*a*e^(195/2*I*c) + 870123184837420284430070*a*e^(193/2*I*c) + 265686 4685471640769 6970*a*e^(191/2*I*c) + 7417642521312133327 57*a*e^(189/2*I*c) + 18778841824143775343*a*e^(187/2*I*c) + 426791859620149322*a*e^(185/2*I*c) + 8600339740311748*a*e^(183/2*I*c) + 151262256738437*a*e^(181/2*I*c) + 2274 620402080*a*e^(179/2*I*c) + 28432755026*a*e^(177/2*I*c) + 283618504*a*e^(17 5/2*I*c) + 2116556*a*e^(173/2*I*c) + 10504*a*e^(171/2*I*c) + 26*a*e^(169/2* I*c))/(e^(531*I*c) + 432*e^(530*I*c) + 93096*e^(529*I*c) + 13343760*e^(528* I*c) + 1431118260*e^(527*I*c) + 122503723056*e^(526*I*c) + 8718181624155*e^ (525*I*c) + 530563624556832*e^(524*I*c) + 28186192554792138*e^(523*I*c) + 1 327882849274858880*e^(522*I*c) + 56169444526926562260*e^(521*I*c) + 2154864 144781257856128*e^(520*I*c) + 75599817092670157806639*e^(519*I*c) + 2442455 629894502983849104*e^(518*I*c) + 73099207817335597247098038*e^(517*I*c) + 2 037031259470368160131922320*e^(516*I*c) + 53090127264630963470039804475*e^(515*I*c) + 1299146645993240318167826532288*e^(514*I*c) + 299525477492654996 75257842032197*e^(513*I*c) + 652650253343206047453620559993840*e^(512*I*c) + 13477227799524701956579274210395326*e^(511*I*c) + 264410375780310742518099 326419685040*e^(510*I*c) + 4939666610818025798809586352543471345*e^(509*I* c) + 88054927598941411145869950813388040256*e^(508*I*c) + 15006027479373972 86405577818722691539392*e^(507*I*c) + 244898373378123386877186224918650138 39488*e^(506*I*c) + 383360155801054824529764688213114368047154*e^(505*I*c) + 5764601046563151304213854710715346838447392*e^(504*I*c) + 8338083991183789 4453136303673785039051506805*e^(503*I*c) + 116158141373397175153362251190 9046917188768400*e^(502*I*c) + 156039112776876070997216237717449330869205872 72*e^(501*I*c) + 2023475097244621713139666435802340785081798383 20*e^(500*I*c) + 253566746065027977683456156618659121310925164285 9*e^(499*I*c) + 3073536 651283056216099116633849005730806276251849 6*e^(498*I*c) + 36068861303638934 94138097800045599635487754233252 55*e^(497*I*c) + 410154543993719579395995 67 0844249670943380026122488 0*e^(496*I*c) + 45230940039830738332025694784 64620 684485482769807573 6*e^(495*I*c) + 48409341024048871865591702530366258109165 9126182344528*e^(494*I*c) + 50320249034014518240742139437660119220265070063 11982753*e^(493*I*c) + 50836369508171099437019348610847391946736185108017 18 3136*e^(492*I*c) + 49946750655853173367158586291057270281154503573039874953 0*e^(491*I*c) + 47753986071008532635342077338182667774786934127387310316 80* e^(490*I*c) + 44456708175258821024400946210535004523775722190977468484496*e ^(489*I*c) + 40321222595779818884084613996099562414449127169433679645958 4*e ^(488*I*c) + 35647648906287240170884879966881789291957876139585454748048 45* e^(487*I*c) + 30736217404321009965231037419663053962881035281709221697785 07 2*e^(486*I*c) + 25858534871597727015582911568419341107203454149136439398549 1350*e^(485*I*c) + 21237029691888713182667187812239270678399490157272938840 65388080*e^(484*I*c) + 17033886027390615741040977721655541665612162275485 02

8584310890417*e^(483*I*c) + 133490210052026183779673313868332303530332906163247194627808410304*e^(482*I*c) + 1022536437468296737293065862705246449693687415559865844306888705423*e^(481*I*c) + 7659010520187549651777118357676871927081898989131125755798204236112*e^(480*I*c) + 5611708107634117538408757018518853866037593201367473551905522736836б*e^(479*I*c) + 402349692266121158934003582839428785116904903936409545602519219664720*e^(478*I*c) + 28239051519365866783825257065644572802900986986385979876283802458817155*e^(477*I*c) + 19407979215594566593535008103303255257745408070082431338945184797463936*e^(476*I*c) + 130657660226560419335121434389938961884595434069984824307149332131747540*e^(475*I*c) + 861884851094991908764246805474672428603757315484453974713612812215428992*e^(474*I*c) + 5572551157328671121016216416307596161861955969011697222340926210112854418*e^(473*I*c) + 35324447206779018115378052820789411687581004582367431006205879633729015200*e^(472*I*c) + 219601281339515561500261478844190024870555261281946058839614044697037963695*e^(471*I*c) + 1339214374254245553564884406801945353385000254030655765953770237607180089968*e^(470*I*c) + 80137295807907524343619649457615437614695207912107469726758704810586742778444*e^(469*I*c) + 47065044611135158108487353367484243102698248838312635876283099427442745866704*e^(468*I*c) + 271361207503266570734486517077181014801775322183181055638619257836143271472358*e^(467*I*c) + 1536333238444927583532734556016494671674916578907116984548489078241693926940560*e^(466*I*c) + 85430134411262123348335406650696214724790858380413605645507220367236542975402205*e^(465*I*c) + 466682235482660178068545924681005702893559608696136508565757567581801822233087б8*e^(464*I*c) + 2505010286089283324693404568299020677122336444646027531599457278684857223955069522*e^(463*I*c) + 1321498055271300851429993866631619874424534425188183592049727687571032156435077280*e^(462*I*c) + 68529932231457366873288853116177954355929408414398663510796556523128947219727962266*e^(461*I*c) + 349410716132767046494779430433394502015040753351603618659160292138607786062306249бO*e^(460*I*c) + 1751931705006183002415156323819122851577900978160492206712172122200152971334006360б0*e^(459*I*c) + 8639799336223303495562968200283955131987080649405057021260686529368007948266512642566*e^(458*I*c) + 4191542500656826148093339414544159143964478472492315931809171859902114109005939942952*e^(457*I*c) + 200080068030300471372932782503215971135407162019833312634928118667915319906804525721б*e^(456*I*c) + 939869153130681791490836060656814827808360605105301546184869498394671313788598859982102*e^(455*I*c) + 434546676780280045346344498763892540797175105756827515509297024187660299345484920192480*e^(454*I*c) + 1977792980665818135651300094326239158605448870806970860577325385028609983034534672318500*e^(453*I*c) + 886275214275695728568134088576490459793534956935532181564772117253715918649147131166б400*e^(452*I*c) + 391080312556018094765375353696118444408449037516056450235145723520452481042629335988507З0*e^(451*I*c) + 169956327969929767773902096652629253283704505477127544556534417376686540936706073847337600*e^(450*I*c) + 727521010718394229291774073844694255798738667067535379759732795567942578751384250780476310*e^(449*I*c) + 3067974296431747364198159623962463671617006419626851426148418602934852907379021659761911840*e^(448*I*c) + 127472196165033205413563430625628473686016221408567860254

45814532037904111523242298235713300*e^(447*I*c) + 5219091220766182421581227
1854269748071292843243227894769229690720010547141334131610989636000*e^(446*
I*c) + 21059430138564847118432907888031750495336183995415942743400988466177
7259752542647709150036990*e^(445*I*c) + 83757920692341193245878648676537353
3946545239708990769488724813982189165104589895518909256320*e^(444*I*c) + 32
838747605558186767263094803067344201550985839480744690141681718744421701096
48521627538755920*e^(443*I*c) + 1269349693296492056507367363718128008854868
2508880255337280065006566138696041797353216584528640*e^(442*I*c) + 48379489
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230417309900*e^(441*I*c) + 181834661406177901315330129677145381166449188413
194141169344354754920969034952610378945282257600*e^(440*I*c) + 674025530543
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328961590*e^(439*I*c) + 246438219080743960907977422685567962936788570977643
5876630851716253962696192341706239192878728160*e^(438*I*c) + 88882950287510
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17404000*e^(437*I*c) + 3162664467472554773117679568752765357130596998592368
8392112164915553242573269490908989570248533280*e^(436*I*c) + 11103414879700
88194431438956444692422950498674643137109692576193388913379928561602006987
2611710850*e^(435*I*c) + 38465584208066627445406307878483717499894905250097
5322162003392549953413592461519365177908682078400*e^(434*I*c) + 13150521209
306921221022971053276228423358707434285308910729835358622800944466077234738
00477453914130*e^(433*I*c) + 4437210917843182347764349544443904699020056595
069470847193617092114714077633077234972825351226979360*e^(432*I*c) + 147779
550966171289987127451820714953621765069731830816502336052740516776249704643
40242755840025673760*e^(431*I*c) + 4858425815314028044731483686877213139019
5412419046732778458706015096881437076337910793584122475073760*e^(430*I*c) +
15768584552885091872146287786443509025758314941556132342738656289444759827
7935629800939237175625149830*e^(429*I*c) + 50529366312301525887848302573881
2813203397766845340065381261016353419722382620393032535960660921950400*e^(4
28*I*c) + 15987711010581926922705289996774447426856310062324561858449252201
44002305878120380828483988663574829100*e^(427*I*c) + 4995241956279138180205
186744401688024388272113921255663734956946927571305533146776898787878059685
108480*e^(426*I*c) + 154131112114860239372949708207973767160813447881633865
43522421939737507962125854981881879168348260330000*e^(425*I*c) + 4697022472
711728182645404501807067052255975662758034778453532001496348263235972944454
1885102274546002560*e^(424*I*c) + 14137993825355684328056550580740330413060
6130725434751745794079833141361748917639986145377066437210546190*e^(423*I*c
) + 42035802483514679858361121014594215468443794936564789908837252480215622
2884839580011688655664280691773600*e^(422*I*c) + 12346680418924099787800180
817554402160125824763969419379658996319530792039742221387946043284989721447
66900*e^(421*I*c) + 3582718002163296061414536703715109897107198252739284546
149343102348456124089657428594946438660859773886240*e^(420*I*c) + 102716025
302028890024978135168494525909715128095290606651973010970522100645760883480
23234671975463677418470*e^(419*I*c) + 2909765106124745340664756978183691006
2165559852359052804259154165687125428752562385492373749486351714453120*e^(4

18*I*c) + 81452081413829111828875417564250054846037693312811480492909160758195989155768107022568350953861815940704090*e^(417*I*c) + 225320532593220657767941109289516248999794521015564134982827241710019675486694499689312466561907212627820000*e^(416*I*c) + 616003116022979584937125701757887212998354300989991362628038861093914561332071191909714949426587936910303300*e^(415*I*c) + 1664475034387211809394917743502937638978574937754764763987835872410449930690131572904279995484581013965001440*e^(414*I*c) + 4445412259295474625067659514198312966015416299968930393345630345914109720740573618884980520010028451496996210*e^(413*I*c) + 11735856926245118493113091002501604032341876985999082823520672241530200188223826392982302194084667538488665600*e^(412*I*c) + 30627581054221957378390547289277609129572813931082733520247387226000020043538279468776707958420892547870128680*e^(411*I*c) + 79019149558766569254783988487232388352909144982747171856772463223808993367091503402876467270176124342699654400*e^(410*I*c) + 201557947424794098026772478462040883395867512562930862943753568690084015585598010154781548625239409581907397500*e^(409*I*c) + 508324599301085460166978629683032661427654474082939048097939638391567298795788389433842285751054665210868287680*e^(408*I*c) + 1267597017294812913400146276042126929986480292870190399107554311079964227280196522475370108738477856311765699610*e^(407*I*c) + 3125683493178701743479704750307490178666292150720179363604335113528623329684606343185540756019935662148267863968*e^(406*I*c) + 7621788791912047062038840917799374600428892258194367636682944356096681400246312138001769285020661445991073249416*e^(405*I*c) + 18379807084003359766027649217621144116091735572216620788861535803449702273802588359076704241840733513439114113248*e^(404*I*c) + 43834972142919377685378692233021063744554033100928502737480438978976746989895784070951905237783490374305934542955*e^(403*I*c) + 103399755467257436489847837640753754718204394473055795001467604326419876555556873829531737211096115196005647730480*e^(402*I*c) + 241246021282440061792908317783032876194801597133206052091286997043729145345755805710081489006741839439573984832678*e^(401*I*c) + 556756388711182340341026192734219546113651768317380539005893679049394714017063698565272728813669054779077208977840*e^(400*I*c) + 1271033082938048950201360554831270342662343991277504612342300366025046741742856580445289401786656311685859023084716*e^(399*I*c) + 2870496131412314451834674715353589439553294430808531933466086288543709246230769151392180699413405623017247753532944*e^(398*I*c) + 6413381895855925184758231451062556380328594938511006577015218119786536390213057284018202201631094434819584025113465*e^(397*I*c) + 14176483652875704957202013343241117904369977796653849959902524421980635189011634815653279605497783382888932766730080*e^(396*I*c) + 31004319206069417077069363141423487431828009098184744635678652284177439464941651812564519144918003174108077634846014*e^(395*I*c) + 67091706130529669125019899210021576580237843462229535386295087076189297849995931360645605292130961496106707521506432*e^(394*I*c) + 143657687138044796942947119704259538458818199423516824674586293691056119209866358123637772245409530799230553767222252*e^(393*I*c) + 304384471106813336010284160123906370433888828490627422652551236966790916174520857759143930140187173492394981908258944*e^(392*I*c) + 638218892914533741505806399662488556066783600496091

876408374974877448971778036074996245581124283460438065182071976085*e^(391*I
*c) + 132431132498402742835522293814768237867286070881716174144874968959358
8020860847508703702325320304649883120684987556400*e^(390*I*c) + 27195892834
837439260408051010803419212445303112546072509291927739093315232266350358156
72862569296693711643521070331394*e^(389*I*c) + 5527498849031178355861230009
326668283926290082158467118000698502719379939045918344222192742145711257028
040974074674736*e^(388*I*c) + 111194996453632010808810628248863384924253756
58448977935535846349290425821570383090425411418521516670371372045206568345*
e^(387*I*c) + 2214073500170860327091518076924139166203557875590397914890921
3603822554792749183517160255571915875356439553717130797888*e^(386*I*c) + 43
638300075815171025946211464465689618965773488660985857945657479854085108851
857911222911989837615452608512356008400295*e^(385*I*c) + 851395332347864557
795899594649006377607357297056212213800058372083691577946730496754287998178
75431430246332625899630160*e^(384*I*c) + 1644375006769068927413232601543942
785039545619360201335965818064493572402773494479273345171058099953000935492
79931273178*e^(383*I*c) + 3144090358082258615655954369383549454454739910431
29722046747228813030925204968503418566818838611866709807040793495364496*e^(
382*I*c) + 5951576155004315149474792823365470538279260879164252634971877570
29413385471835434198246807096214536895441388306027237899*e^(381*I*c) + 1115
398285545601550533328045600184317993899359217996729818340704221801195667410
485846996179056733558512452238583160792512*e^(380*I*c) + 206969828950086064
346166576237380795751301942404117887190496055182941244934472243212567941795
8403007551179298315947373776*e^(379*I*c) + 38026049967058911069646206338489
648070370988545101822632430305972956307603535975319743247522663891931857608
78274188013440*e^(378*I*c) + 6917838945214844278493330459361394923372333853
619879637372673184942859712431066345726870422099893124890777678037369988150
*e^(377*I*c) + 124621404405372580849285967098720668577570709431248685545009
48154756863454308032925408340311237850017814707896986969086816*e^(376*I*c)
+ 2223134113180153534540639903772168684020839794195258013558464596674673665
6716271554826476282991066076564921432614339399735*e^(375*I*c) + 39274200414
329861169397944516225001081227433398585007206399231211907157795359719648241
598754266579840244551491476467899952*e^(374*I*c) + 687124660159856415124685
861736597477348795917100983546527861249360230739431410495736066485630053594
11712764895683903806088*e^(373*I*c) + 1190605918496605468347656932276764490
675841482488826784475048260772363334445134540951266687500572958111916433569
08972191440*e^(372*I*c) + 2043255572651860007674027102308478964597615839227
63698235433212833313077783041040074669379017394836761539649081690630811665*
e^(371*I*c) + 3473100538109352904194555605559573141295692107357459832343696
59976413374774078000173070075248654524917179128950507443058208*e^(370*I*c)
+ 5847495736823045861793846288448833275814989698865403803788967679990756149
64007174600811092945356635118795824799369716742109*e^(369*I*c) + 9752103394
440493187572823117635177866732231755944579463832792646350850410049173002959
04275433144848532459919875479817581584*e^(368*I*c) + 1611092541400060525954
859375264194178347643471837078201446262435615142944587337833513586022729849
523358436493586042252995608*e^(367*I*c) + 263666241043079934044752228477824

428374075106865814072657644667120779832560683229593770506168629793029638233
8892574900819440*e^(366*I*c) + 427482690772059175252671133682087150084434456
479223854715343593336061895718324446413641328931086635762051338706721562641
64115*e^(365*I*c) + 686642533751866826266269375090895696573292457814218163O
622157802899880874681551031136314064199948604001529894566235238597088*e^(36
4*I*c) + 109272106034735448102797923478445360745888968062300411100895447316
058631461041817390394266748554534660974023306883318456023O2*e^(363*I*c) + 1
722950282436764733440072199841759670394865739473880520939163659737038057239
896471508009536681832202915219363586978409533376O*e^(362*I*c) + 26917794701
086615097890120236890501105146799996021775195710866226228638984703456832694
153230611607263444183501026198563419616*e^(361*I*c) + 416704403753905436434
182193422717480400350714901190805852815224981888183759069003687012345313046
331634463199451301964769136OO*e^(360*I*c) + 639230194337619890906148012886З
509812319944510230312261654464820899876780394445577704288655273849974718371
3136069104651812215*e^(359*I*c) + 971730550247426800586167224613688926611141
295540263493013032746083536157324268333390400308958318370219154887169702257
444756176*e^(358*I*c) + 146390448456351181218237382740374124191664819997746
988076598391862733629670142241546375533903130605297580105675355629160198162
*e^(357*I*c) + 218563166659649312247483640956272149212499115383828771029654
283363972585118090479413696638108156385244646591328454425745117584*e^(356*I
*c) + 323413178014841003714151138246079152576360976035058457890409937738723
171537036573043681997163745313602400139153046673668433091*e^(355*I*c) + 474
323043563100542377338629931966248129175976982332446018056009391154020438895
903140822967769494019446166779954024655344116288*e^(354*I*c) + 689518449328
793559903260418149974190253578340058895035589606468244680591556118170304005
037563669880057908765898949268614772285*e^(353*I*c) + 993555653649521127226
443960820233649386488510081892545866700444096661582790441241830855609577062
039555625090943332264901780720*e^(352*I*c) + 141916448142217657385823401389
899962882232233330957373071631074383893583220145429361729317508645838962142
530705175061212976149З*e^(351*I*c) + 200949611009268773815278208568373722227
279688242990587392154460834993514676253344496707577640666906561509490149440
43994822823920*e^(350*I*c) + 282081929856221595910752980728962844962138679З
989436369393116069894018781201000275633104498398959346631795568022519974400
130281*e^(349*I*c) + 392569765841577835276810394285601184021164276962171721
79966143984738871860743914826385472128265382704539126345402997922703210024*e
^(348*I*c) + 541666280405243634958559598281835795386625846164435401820515589
177425764253443649645967506531776778034921868173051711750320115OO*e^(347*I*
c) + 741037261289115222436463329612804397165719328032775430438223567277378І
40302381412761035556250527196904517770472605490714578496O*e^(346*I*c) + 100
522095243695818275881549853455496780314457444999852082593854356097402724003
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912387169605619523169614616272099222176099З*e^(344*I*c) + 18035327338177455
471177568594851682977978346449777193572087688510392426884519272991560851326
393852241961470040819793627127923997*e^(343*I*c) + 238563985655628020306952

781742126408332821541740064594582926440609479249073137359215616901539399060
1751864718249161657372404974 4*e^(342*I*c) + 312952636881898383137727758733 0
726033411722725862950199235869563609266286606281984568906423581362297415012
066892139187839897838 0*e^(341*I*c) + 407159889637019189500203483367364234 20
513311359010485246919074652883393970805374470830156229705647312265477584256
027212762941040*e^(340*I*c) + 525392233467407711425870923702570695360603196
444395016676104827679558002760528924321527988146079751103662249450814281218
88473324*e^(339*I*c) + 672440879690807038237032571996630476068906104820904 9
461949280293513021597981946996638333678869390013911559464689378409541847233
6*e^(338*I*c) + 853681184302153128482312917396737358877462018516662996003 92
199418764750086828198719872744047767783667325326289221881974987582215*e^(33
7*I*c) + 107504737406576916123480399169759633328321407419400510017498849830
598621565428266546315933920821527544726380201659114903834605888*e^(336*I*c)
 + 134297742023479429904629616104559610096074758721068022704468938063017059
688023363436458971534964665036319889119229809973806909680*e^(335*I*c) + 166
432332922589195130558329266398753389823955737598527556096093062473559769545
772321978969318904192572733997888230986469005970880*e^(334*I*c) + 204622295
535729109519829916789867225319429705162560082648840394965423112809336591921
290309392396263834674368977840527147037426908*e^(333*I*c) + 249593072282565
866398389951509619202682634455487128714631461891770823201367527645793770203
788784677343934971424317987895255031936*e^(332*I*c) + 302060638030868463461
139442279360499718906917482524894483356220196138377050828911383056860425370
161115720149369607371232259577 6808*e^(331*I*c) + 362706307563843231135699157
418510732452420614013624168879312187645233450153927975793326834780741391203
430153093712635355523960320*e^(330*I*c) + 432147856464086938023811561808678
589594702047904674282297959658800170984456799067751878044806619012452636891
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410637735936000*e^(328*I*c) + 599378484771733474809376142401554850207064972
118137572949257503651444541939309025276896049622515630263162184526394317285
457368300*e^(327*I*c) + 697789106925924614816713747684682785083659819027952
244447043355869741368500452561164024636073401929693105801105522738405349028
160*e^(326*I*c) + 806169671327625532424575340089775733681994991576674446922
354099714615192085443245663852257001115644286660304979476023966071898200*e^
(325*I*c) + 924320052867522584035777495761072351222534420784861960001821020
509468146356756433795246446491396141583854513687104334429566707520*e^(324*I
*c) + 105178210042883437194450817005121918711681634976695332263718214961087
500422378478418328496190649442295546243120864569080252677078 0*e^(323*I*c) +
 118781794307939031610880232479811012902082278266008724859936764348120020 60
468221661442854259222293754136765350711410052864314816 00*e^(322*I*c) + 1331
396114626723035802462123531582050339749996014152452835305956367425370222758
621753922458727524856072950880960657564720475838500*e^(321*I*c) + 148118711
708924666246695569496567785552473031326055269082160265717621873742624552279
532989146409100587830430407595369354676720608 0*e^(320*I*c) + 16355697446414
219006578863812890766532275801720566775874514020692343552836874896596139137

61959140773339736014790081814516625224440*e^(319*I*c) + 1792649078089632298
936945728481969334964391597506285088488350622937252533420980803144316431701
452190522716124797875257437516360640*e^(318*I*c) + 195028655078018191924499
296120448701005646036284521850167442376626632155879143691731787870223267921
3868287926294665202769722927380*e^(317*I*c) + 21061419034683443071125497612
024845434027942523524821998174104248696772627150982884376465186834879454627
74223656471345899082156800*e^(316*I*c) + 2257726219103856286812833012681573
7654962622241420612932076143151171960854554124144699023009842080515157923529
357189869943515991200*e^(315*I*c) + 240246459556968608612000180303421105673
944558862194614138410616288624616181514976302503083487523406726777402343341
8269982431265280*e^(314*I*c) + 25377664154650303308154717466929885960699118
946972250529283204525421755871548480964833312098074301139430153983626696733
37957755720*e^(313*I*c) + 2661100647975783583828235139201441930178396643383
423903583862547255880772382049201015537214900832745601519737141849802506685
264000*e^(312*I*c) + 277007320715076864559750728138206549792496846605452741
412233982733378377006830588348730997931598371840374087288434574638068020426
0*e^(311*I*c) + 28625031263204617977706677807256441849912556231746261756790
50672100848988119391841466573417019247590580735265143427289340450811200*e^(
310*I*c) + 2936494214351868498703239455426771104344827306267558916550877467
232455153286140521089582733932202553130712723836983468866230908800*e^(309*I
*c) + 299049894962254360853812938028386633519008711512485881814378761918695
7111903765723974899651518555144924290346242595167274383008960*e^(308*I*c) +
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31461213388035579159917590062343527464977286601165100620*e^(307*I*c) + 3034
408355530957075787731745322567981684616550162845473257679674280216947356785
783843205604202307836897073595410412575660465787520*e^(306*I*c) + 302337164
350822502717560317521295321902248504585073184530751900827738515473146121338
8035579159917590062343527464977286601165100620*e^(305*I*c) + 29904989496225
436085381293802838663351900871151248588181437876191869571119037657239748996
51518555144924290346242595167274383008960*e^(304*I*c) + 2936494214351868498
703239455426771104344827306267558916550877467232455153286140521089582733932
202553130712723836983468866230908800*e^(303*I*c) + 286250312632046179777066
778072564418499125562317462617567905067210084898811939184146657341701924759
0580735265143427289340450811200*e^(302*I*c) + 27700732071507686455975072813
820654979249684660545274141223398273337837700683058834873099793159837184037
40872884345746380680204260*e^(301*I*c) + 2661100647975783583828235139201441
930178396643383423903583862547255880772382049201015537214900832745601519737
141849802506685264000*e^(300*I*c) + 253776641546503033081547174669298859606
991189469722505292832045254217558715484809648333120980743011394301539836266
9673337957755720*e^(299*I*c) + 24024645955696860861200018030342110567394455
886219461413841061628862461618151497630250308348752340672677740234334182699
82431265280*e^(298*I*c) + 2257726219103856286812833012681573765496262241420
612932076143151171960854554124144699023009842080515157923529357189869943515
991200*e^(297*I*c) + 210614190346834430711254976120248454340279425235248219
981741042486967726271509828843764651868348794546277422365647134589908215680

0*e^(296*I*c) + 195028655078018191924499296120448701005646036284521850167442376626632155879143691731787870223267921386828792629466520276972292738O*e^(295*I*c) + 179264907808963229893694572848196933496439159750628508848835062293725253342098080314431643170145219052271612479787525743751636064O*e^(294*I*c) + 163556974464142190065788638128907665322758017205667758745140206923435528368748965961391376195914077333973601479008181451662522444O*e^(293*I*c) + 148118711708924666246695569496567785552473031326055269082160265717621873742624552279532989146409100587830430407595369354676720608O*e^(292*I*c) + 133139611462672303580246212353158205033974999601415245283530595636742537022275862175392245872752485607295088096065756472047583850O*e^(291*I*c) + 118781794307939031610880232479811012902082278266008724859936764348120020604682216614428542592222937541367653507114100528643148160O*e^(290*I*c) + 105178210042883437194450817005121918711681634976695332263718214961087500422378478418328496190649442295546243120864569080252677078O*e^(289*I*c) + 924320052867522584035777495761072351222534420784861960001821020509468146356756433795246446491396141583854513687104334429566707520*e^(288*I*c) + 806169671327625532424575340089775733681994991576674446922354099714615192085443245663852257001115644286660304979476023966071898200*e^(287*I*c) + 697789106925924614816713747684682785083659819027952244447043355869741368500452561164024636073401929693105801105522738405349028160*e^(286*I*c) + 599378484771733474809376142401554850207064972118137572949257503651444541939309025276896049622515630263162184526394317285457368300*e^(285*I*c) + 510907615111134507452623846147137141450275722444316385531648429230851686635827717488464500331623385777400744950538410637735936000*e^(284*I*c) + 432147856464086938023811561808678589594702047904674282297959658800170984456799067751878044806619012452636891350731618278545690160*e^(283*I*c) + 362706307563843231135699157418510732452420614013624168879312187645233450153927975793326834780741391203430153093712635355523960320*e^(282*I*c) + 302060638030868463461139442279360499718906917482524894483356220196138377050828911383056860425370161157201493696073712322595776808*e^(281*I*c) + 249593072282565866398389951509619202682634455487128714631461891770823201367527645793770203788784677343934971424317987895255031936*e^(280*I*c) + 204622295535729109519829916789867225319429705162560082648840394965423112809336591921290309392396263834674368977840527147037426908*e^(279*I*c) + 166432332922589195130558329266398753389823955737598527556096093062473559769545772321978969318904192572733997888230986469005970880*e^(278*I*c) + 134297742023479429904629616104559610096074758721068022704468938063017059688023363436458971534964665036319889119229809973806909680*e^(277*I*c) + 107504737406576916123480399169759633328321407419400510017498849830598621565428266546315933920821527544726380201659114903834605888*e^(276*I*c) + 853681184302153128482312917396737358877462018516662996003921994187647500868281987198727440477677836673253262892218819749875822l5*e^(275*I*c) + 672440879690807038237032571996630476068906104820904946194928029351302159798194699663833367886939001391155946468937840954184723 36*e^(274*I*c) + 525392233467407711425870923702570695360603196444395016676104827679558002760528924321527988146079751103662249450814281218884733 24*e^(273*I*c) + 4071598896370191895002034833673642342051331

1359010485246919074652883393970805374470830156229705647312265477584256027212762941040*e^(272*I*c) + 3129526368818983831377277587330726033411722725862950199235869563609266286606281984568906423581362297415012066892139187839897838380*e^(271*I*c) + 2385639856556280203069527817421264083328215417400645945829264406094792490731373592156169015393990601751864718249161657372404974 4*e^(270*I*c) + 1803532733817745547117756859485168297797834644977719357208768851039242688451927299156085132639385224196147004081979362712792399 7*e^(269*I*c) + 1352123041194543691555885470685179654156739981165687002156735297532681546781784653328912387169605619523169614616272099222176099 2*e^(268*I*c) + 1005220952436958182758815498534554967803144574449998520825938543560974027240030145424687204177515983846807738156233874563639837 4*e^(267*I*c) + 7410372612891152224364633296128043971657193280327754304382235672773781403023814127610355562505271969045177704726054907145784960*e^(266*I*c) + 5416662804052436349585595982818357953866258461644354018205158917742576425344364964596750653177677803492186817305171175032011500*e^(265*I*c) + 3925697658415778352768103942856011840211642769621717217996614398473887186074391482638547212826538270453912634540299792270321024*e^(264*I*c) + 2820819298562215959107529807289628449621386798989436369393116069894018781201000275633104498398959346631795568022519974400130281*e^(263*I*c) + 2009496110092687738152782085683737222727968824299058739215446083499351467625334496707577640666906561509490149440439948228239 20*e^(262*I*c) + 1419164481422176573858234013898999628822322333309573730716310743838935832201454293617293175086458389621425307051750612129761498*e^(261*I*c) + 993555653649521127226443960820233649386488510081892545866700444096661582790441241830855609577062039555625090943332264901780720*e^(260*I*c) + 6895184493287935599032604181499741902535783400588950355896064682446805915561181703040050375636698800579087658989492686147722 85*e^(259*I*c) + 4743230435631005423773386299319662481291759769823324460180560093911540204388959031408229677694940194461667799540246553441162 88*e^(258*I*c) + 3234131780148410037141511382460791525763609760350584578904099377387231715370365730436819971637453136024001391530466736684330 91*e^(257*I*c) + 2185631666596493122474836409562721492124991153838287710296542833639725851180904794136966381081563852446465913284544257451175 84*e^(256*I*c) + 1463904484563511812182373827403741241916648199977469880765983918627336296701422415463755339031306052975801056753556291601981 62*e^(255*I*c) + 9717305502474268005861672246136889266114129554026349301303274608353615732426833339040030895831837021915488716970225744475617 6*e^(254*I*c) + 6392301943376198909061480128863509812319944510230312261654464820899876780394445577704288655273849974718371313606910465181221 5*e^(253*I*c) + 4167044037539054364341821934227174804003507149011908058528152249818881837590690036870123453130463316344631994513019647691360 0*e^(252*I*c) + 2691779470108661509789012023689050110514679999602177519571086622622863898470345683269415323061160726344418350102619856341961 6*e^(251*I*c) + 1722950282436764733440072199841759670394865739473880520939163659737038057239896471508009536681832202915219363586978409533376 0*e^(250*I*c) + 1092721060347354481027979234784453607458889680623004111008954473160586314610418173903942667485545346609740233068833184560230 2*e^(249*I*c) + 686642533751866826266 2

693750908956965732924578142181630622157802899880874681551031136314064199948604001529894566235238597088*e^(248*I*c) + 4274826907720591752526711336820871500844345647922385471534359333606189571832444641364132893108663576205133870672156264164115*e^(247*I*c) + 2636662410430799340447522284778244283740751068658140726576446671207798325606832295937705061686297930296382338892574900819440*e^(246*I*c) + 1611092541400060525954859375264194178347643471837078201446262435615142944587337833513586022729849523358436493586042252995608*e^(245*I*c) + 975210339444049318757282311763517786673223175594457946383279264635085041004917300295904275433144848532459919875479817581584*e^(244*I*c) + 584749573682304586179384628844883327581498969886540380378896767999075614964007174600811092945356635118795824799369716742109*e^(243*I*c) + 347310053810935290419455560555957314129569210735745983234369659976413374774078000173070075248654524917179128950507443058208*e^(242*I*c) + 204325557265186000767402710230847896459761583922763698235433212833313077783041040074669379017394836761539649081690630811665*e^(241*I*c) + 119060591849660546834765693227676449067584148248882678447504826077236333444513454095126668750057295811191643356908972191440*e^(240*I*c) + 68712466015985641512468586173659747734879591710098354652786124936023073943141049573606648563005359411712764895683903806088*e^(239*I*c) + 39274200414329861169397944516225001081227433398585007206399231211907157795359719648241598754266579840244551491476467899952*e^(238*I*c) + 22231341131801535345406399037721686840208397941952580135584645966746736656716271554826476282991066076564921432614339399735*e^(237*I*c) + 12462140440537258084928596709872066857757070943124868554500948154756863454308032925408340311237850017814707896986969086816*e^(236*I*c) + 6917838945214844278493330459361394923372333853619879637372673184942859712431066345726870422099893124890777678037369988150*e^(235*I*c) + 3802604996705891106964620633848964807037098854510182263243030597295630760353597531974324752266389193185760878274188013440*e^(234*I*c) + 2069698289500860643461665762373807957513019424041178871904960551829412449344722432125679417958403007551179298315947373776*e^(233*I*c) + 1115398285545601550533328045600184317993899359217996729818340704221801195667410485846996179056733558512452238583160792512*e^(232*I*c) + 595157615500431514947479282336547053827926087916425263497187757029413385471835434198246807096214536895441388306027237899*e^(231*I*c) + 314409035808225861565595436938354945445473991043129722046747228813030925204968503418566818838611866709807040793495364496*e^(230*I*c) + 164437500676906892741323260154394278503954561936020133596581806449357240277349447927334517105809995300093549279931273178*e^(229*I*c) + 85139533234786455779589959464900637760735729705621221380005837208369157794673049675428799817875431430246332625899630160*e^(228*I*c) + 43638300075815171025946211464465689618965773488660985857945657479854085108851857911222911989837615452608512356008400295*e^(227*I*c) + 22140735001708603270915180769241391662035578755903979148909213603822554792749183517160255571915875356439553717130797888*e^(226*I*c) + 11119499645363201080881062824886338492425375658448977935535846349290425821570383090425411418521516670371372045206568345*e^(225*I*c) + 5527498849031178355861230009326668283926290082158467118000698502719379939045918344222192742145711257028040974074674736

*e^(224*I*c) + 271958928348374392604080510108034192124453031125460725092919
27739093315232266350358156728625692966937116435210703313394*e^(223*I*c) + 13
243113249840274283552229381476823786728607088171617414487496895935880208608
47508703702325320304649883120684987556400*e^(222*I*c) + 6382188929145337415
058063996624885560667836004960918764083749748774489717780360749962455811242
83460438065182071976085*e^(221*I*c) + 3043844711068133360102841601239063704
338888284906274226525512369667909161745208577591439301401871734923949819082
58944*e^(220*I*c) + 1436576871380447969429471197042595384588181994235168246
74586293691056119209866358123637772245409530799230553767222252*e^(219*I*c)
+ 6709170613052966912501989921002157658023784346222953538629508707618929784
9995931360645605292130961496106707521506432*e^(218*I*c) + 31004319206069417
077069363141423487431828009098184744635678652284177439464941651812564519144
918003174108077634846014*e^(217*I*c) + 141764836528757049572020133432411179
043699777966538499599025244219806351890116348156532796054977833828889327667
30080*e^(216*I*c) + 6413381895855925184758231451062556380328594938511006577
015218119786536390213057284018202201631094434819584025113465*e^(215*I*c) +
287049613141231445183467471535358943955329443080853193346608628854370924623
0769151392180699413405623017247753532944*e^(214*I*c) + 12710330829380489502
013605548312703426623439912775046123423003660250467417428565804452894017866
56311685859023084716*e^(213*I*c) + 5567563887111823403410261927342195461136
51768317380539005893679049394714017063698565272728813669054779077208977840*
e^(212*I*c) + 2412460212824400617929083177830328761948015971332060520912869
97043729145345755805710081489006741839439573984832678*e^(211*I*c) + 1033997
554672574364898478376407537547182043944730557950014676043264198765555568738
29531737211096115196005647730480*e^(210*I*c) + 4383497214291937768537869223
302106374455403310092850273748043897897674698989578407095190523778349037430
5934542955*e^(209*I*c) + 18379807084003359766027649217621144116091735572216
620788861535803449702273802588359076704241840733513439114113248*e^(208*I*c)
 + 762178879191204706203884091779937460042889225819436763668294435609668140
0246312138001769285020661445991073249416*e^(207*I*c) + 31256834931787017434
797047503074901786662921507201793636043351135286233296846063431855407560199
35662148267863968*e^(206*I*c) + 1267597017294812913400146276042126929986480
292870190399107554311079964227280196522475370108738477856311765699610*e^(20
5*I*c) + 508324599301085460166978629683032661427654474082939048097939638391
567298795788389433842285751054665210868287680*e^(204*I*c) + 201557947424794
098026772478462040883395867512562930862943753568690084015585598010154781548
625239409581907397500*e^(203*I*c) + 790191495587665692547839884872323883529
09144982747171856772463223808993367091503402876467270176124342699654400*e^(
202*I*c) + 3062758105422195737839054728927760912957281393108273352024738722
6000020043538279468776707958420892547870128680*e^(201*I*c) + 11735856926245
118493113091002501604032341876985999082823520672241530200188223826392982302
194084667538488665600*e^(200*I*c) + 444541225929547462506765951419831296601
5416299968930393345630345914109720740573618884980520010028451496996210*e^(1
99*I*c) + 16644750343872118093949177435029376389785749377547647639878358724
10449930690131572904279995484581013965001440*e^(198*I*c) + 6160031160229795

849371257017578872129983543009899913626280388610939145613320711919097149494
26587936910303300*e^(197*I*c) + 2253205325932206577679411092895162489997945
2101556413498282724171001967548669449968931246656190721262782000 0*e^(196*I*
c) + 8145208141382911182887541756425005484603769331281148049290916075819598
915576810702256835095386181594070409 0*e^(195*I*c) + 29097651061247453406647
569781836910062165559852359052804259154165687125428752562385492373749486351
714453120*e^(194*I*c) + 102716025302028890024978135168494525909715128095290
606651973010970522100645760883480232346719754636774184 70*e^(193*I*c) + 3582
718002163296061414536703715109897107198252739284546149343102348456124089657
4285949464386608597738862 40*e^(192*I*c) + 123466804189240997878001808175544
021601258247639694193796589963195307920397422213879460432849897214476690 0*e
^(191*I*c) + 42035802483514679858361121014594215468443794936564789908837252
480215622288483958001168865566428069177360 0*e^(190*I*c) + 14137993825355684
328056550580740330413060613072543475174579407983314136174891763998614537706
6437210546190*e^(189*I*c) + 46970224727117281826454045018070670522559756627
580347784535320014963482632359729444541885102274546002560*e^(188*I*c) + 154
131112114860239372949708207973767160813447881633865435224219397375079621258
549818818791683482603300 00*e^(187*I*c) + 4995241956279138180205186744401688
024388272113921255663734956946927571305533146776898787878059685108480*e^(18
6*I*c) + 159877110105819269227052899967744474268563100623245618584492522014
400230587812038082848398866357482910 0*e^(185*I*c) + 50529366312301525887848
302573881281320339776684534006538126101635341972238262039303253596066092195
0400*e^(184*I*c) + 15768584552885091872146287786443509025758314941556132342
738656289444759827793562980093923717562514983 0*e^(183*I*c) + 48584258153140
280447314836868772131390195412419046732778458706015096881437076337910793584
122475073760*e^(182*I*c) + 147779550966171289987127451820714953621765069731
830816502336052740516776249704643402427558400256737 60*e^(181*I*c) + 4437210
917843182347764349544443904699020056595069470847193617092114714077633077234
97282535122697936 0*e^(180*I*c) + 131505212093069212210229710532762284233587
074342853089107298353586228009444660772347380047745391413 0*e^(179*I*c) + 38
465584208066627445406307878483717499894905250097532216200339254995341359246
15193651779086820784 00*e^(178*I*c) + 11103414879700881944314389564446924229
504986746431371096925761933889913379928561602006987261171085 0*e^(177*I*c) +
31626644674725547731176795687527653571305969985923688392112164915553242573
2694909089895702485332 80*e^(176*I*c) + 888829502875102466704420383760797610
148005313441861447462076752282486891195988435266644491740400 0*e^(175*I*c) +
24643821908074396090797742268556796293678857097764358766308517162539626961
92341706239192878728160*e^(174*I*c) + 6740255305431330088948457752366252374
50743114473544537818170447134607102575676676056675328961590*e^(173*I*c) + 1
818346614061779013153301296771453811664491884131941411693443547549209690349
52610378945282257600*e^(172*I*c) + 4837948975643409984385779181658937940681
504260934037874758643714578164624542204510123041730990 0*e^(171*I*c) + 12693
496932964920565073673637181280088548682508880255337280065006566138696041797
353216584528640*e^(170*I*c) + 328387476055581867672630948030673442015509858
394807446901416817187444217010964852162753875592 0*e^(169*I*c) + 83757920692

34119324587864867653735339465452397089907694887248139821891651045898955189O
9256320*e^(168*I*c) + 21059430138564847118432907888031750495336183995415942
743400988466177725975254264770915003699O*e^(167*I*c) + 52190912207661824215
812271854269748071292843243227894769229690720010547141334131610989636000*e^
(166*I*c) + 127472196165033205413563430625628473686016221408567860254458145
3203790411152324229823571330O*e^(165*I*c) + 3067974296431747364198159623962
463671617006419626851426148418602934852907379021659761911840*e^(164*I*c) +
727521010718394229291774073844694255798738667067535379759732795567942578751
384250780476310*e^(163*I*c) + 1699563279699297677739020966526292532837045O5
477127544556534417376686540936706073847337600*e^(162*I*c) + 391080312556018
0947653753536961184444084490375160564502351457235204524810426293359885073O*
e^(161*I*c) + 8862752142756957285681340885764904597935349569355321815647721
17253715918649147131166640O*e^(160*I*c) + 197779298066581813565130009432623
9158605448870806970860577325385028609983034534672318500*e^(159*I*c) + 43454
667678028004534634449876389254079717510575682751550929702418766029934548492
0192480*e^(158*I*c) + 9398691531306817914908360606568148278083606051053O154
618486949839467131378859885998210*e^(157*I*c) + 200080068030300471372932782
50321597113540716201983333126349281186679153199068045257216*e^(156*I*c) + 4
191542500656826148093339414544159143964478472492315931809171859902114109005
939942952*e^(155*I*c) + 863979933622330349556296820028395513198708064940505
702126068652936800794826651264256*e^(154*I*c) + 175193170500618300241515632
381912285157790097816049220671217212220015297133400636060*e^(153*I*c) + 349
410716132767046494779430433394502015040753351603618659160292138607786062306
24960*e^(152*I*c) + 6852993223145736687328885311617795435592940841439866351
079655652312894721972796266*e^(151*I*c) + 132149805527130085142999386663161
9874424534425188183592049727687571032156435077280*e^(150*I*c) + 25050102860
8928332469340456829902067712233644464602753159945727868485722395506952*e^(1
49*I*c) + 46668223548266017806854592468100570289355960869613650856575756758
180182223308768*e^(148*I*c) + 854301344112621233483354066506962147247908583
8041360564550722036723654297540205*e^(147*I*c) + 15363332384449275835327345
56016494671674916578907116984548489078241693926940560*e^(146*I*c) + 2713612
07503266570734486517077181014801775322183181055638619257836143271472358*e^(
145*I*c) + 4706504461113515810848735336748424310269824883831263587628309942
7442745866704*e^(144*I*c) + 80137295807907524343619649457615437614695207912
10746972675870481058674277844*e^(143*I*c) + 1339214374254245553564884406801
945353385000254030655765953770237607180089968*e^(142*I*c) + 219601281339515
561500261478844190024870555261281946058839614044697037963695*e^(141*I*c) +
35324447206779018115378052820789411687581004582367431006205879633729015200*
e^(140*I*c) + 5572551157328671121016216416307596161861955969011697222340926
210112854418*e^(139*I*c) + 861884851094991908764246805474672428603757315484
453974713612812215428992*e^(138*I*c) + 130657660226560419335121434389938961
884595434069984824307149332131747540*e^(137*I*c) + 194079792155945665935350
08103303255257745408070082431338945184797463936*e^(136*I*c) + 2823905151936
586678382525706564457280290098698638597987628380245881715*e^(135*I*c) + 402
349692266121158934003582839428785116904903936409545602519219664720*e^(134*I

c) + 561170810763411753840875701851885386603759320136747355190552273683666
e^(133*I*c) + 7659010520187549651777118357676871927081898989131125755798204
236112*e^(132*I*c) + 102253643746829673729306586270524644969368741555986584
4306888705423*e^(131*I*c) + 13349021005202618377967331386833230353033290616
3247194627808410304*e^(130*I*c) + 17033886027390615741040977721655541665612
162275485028584310890417*e^(129*I*c) + 212370296918887131826671878122392706
7839949015727293884065388080*e^(128*I*c) + 25858534871597727015582911568419
3411072034541491364393985491350*e^(127*I*c) + 30736217404321009965231037419
663053962881035281709221697785072*e^(126*I*c) + 356476489062872401708848799
6688178929195787613958545474804845*e^(125*I*c) + 40321222595779818884084613
9960995624144491271694336796459584*e^(124*I*c) + 44456708175258821024400946
210535004523775722190977468484496*e^(123*I*c) + 477539860710085326353420773
3818266777478693412738731031680*e^(122*I*c) + 49946750655853173367158586291
0572702811545035730398749530*e^(121*I*c) + 50836369508171099437019348610847
391946736185108017183136*e^(120*I*c) + 503202490340145182407421394376601192
2026507006311982753*e^(119*I*c) + 48409341024048871865591702530366258109165
9126182344528*e^(118*I*c) + 45230940039830738332025694784646206844854827698
075736*e^(117*I*c) + 4101545439937195793959956708442496709433800261224880*e
^(116*I*c) + 360688613036389349413809780004559963548775423325255*e^(115*I*c
) + 30735366512830562160991166338490057308062762518496*e^(114*I*c) + 253566
7460650279776834561566186591213109251642859*e^(113*I*c) + 20234750972446217
1313966643580234078508179838320*e^(112*I*c) + 15603911277687607099721623771
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8400*e^(110*I*c) + 83380839911837894453136303673785039051506805*e^(109*I*c)
+ 5764601046563151304213854710715346838447392*e^(108*I*c) + 38336015580105
4824529764688213114368047154*e^(107*I*c) + 24489837337812338687718622491865
013839488*e^(106*I*c) + 1500602747937397286405577818722691539392*e^(105*I*c
) + 88054927598941411145869950813388040256*e^(104*I*c) + 493966661081802579
8809586352543471345*e^(103*I*c) + 264410375780310742518099326419685040*e^(1
02*I*c) + 13477227799524701956579274210395326*e^(101*I*c) + 652650253343206
047453620559993840*e^(100*I*c) + 29952547749265499675257842032197*e^(99*I*c
) + 1299146645993240318167826532288*e^(98*I*c) + 53090127264630963470039804
475*e^(97*I*c) + 2037031259470368160131922320*e^(96*I*c) + 7309920781733559
7247098038*e^(95*I*c) + 2442455629894502983849104*e^(94*I*c) + 755998170926
70157806639*e^(93*I*c) + 2154864144781257856128*e^(92*I*c) + 56169444526926
562260*e^(91*I*c) + 1327882849274858880*e^(90*I*c) + 28186192554792138*e^(8
9*I*c) + 530563624556832*e^(88*I*c) + 8718181624155*e^(87*I*c) + 1225037230
56*e^(86*I*c) + 1431118260*e^(85*I*c) + 13343760*e^(84*I*c) + 93096*e^(83*I
*c) + 432*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) + (26*I*a*e^(1055/2*I*
c) + 10504*I*a*e^(1053/2*I*c) + 2116556*I*a*e^(1051/2*I*c) + 283618504*I*a*
e^(1049/2*I*c) + 28432755026*I*a*e^(1047/2*I*c) + 2274620402080*I*a*e^(1045
/2*I*c) + 151262256738489*I*a*e^(1043/2*I*c) + 8600339740332756*I*a*e^(1041
/2*I*c) + 426791859624382434*I*a*e^(1039/2*I*c) + 18778841824711012321*I*a*
e^(1037/2*I*c) + 741764252188078830689*I*a*e^(1035/2*I*c) + 265686468592656
46058950*I*a*e^(1033/2*I*c) + 870123185139944470654786*I*a*e^(1031/2*I*c) +

 26237560685859258651673169*I*a*e^(1029/2*I*c) + 73277758893937414324950340
6*I*a*e^(1027/2*I*c) + 19052217362358251291769232228*I*a*e^(1025/2*I*c) + 4
63207036476152149238073238832*I*a*e^(1023/2*I*c) + 105720194834028113019757
46281474*I*a*e^(1021/2*I*c) + 227298420835979818145918471098570*I*a*e^(1019
/2*I*c) + 4617746921046245570620730707402520*I*a*e^(1017/2*I*c) + 888916297
10203223556668933908311334*I*a*e^(1015/2*I*c) + 162544698001533217775591801
4501608982*I*a*e^(1013/2*I*c) + 28297555097893393021020676691580988233*I*a*
e^(1011/2*I*c) + 469985499033039677874623273935334240076*I*a*e^(1009/2*I*c)
 + 7461020183678979972532247003767832497030*I*a*e^(1007/2*I*c) + 1134075143
49957436967142625811402104148561*I*a*e^(1005/2*I*c) + 165313275328330015489
5933847581652791644965*I*a*e^(1003/2*I*c) + 2314386102212629093579514744696
7794330788764*I*a*e^(1001/2*I*c) + 3116155990099984570554286265626112184401
52906*I*a*e^(999/2*I*c) + 4040258091712579222349027082245857300045844265*I*
a*e^(997/2*I*c) + 50503236456021701342291384690765044913121286031*I*a*e^(99
5/2*I*c) + 609297262840711915743663065579736975124435730278*I*a*e^(993/2*I*
c) + 7102123372769126439065816004234917371096063247516*I*a*e^(991/2*I*c) +
80060329141110785684222094424093216574599312586835*I*a*e^(989/2*I*c) + 8735
99857808953513616291826808640309239785388357815*I*a*e^(987/2*I*c) + 9235203
345455625183635292584058316806336315160604010*I*a*e^(985/2*I*c) + 946608933
71344177720163398371692357473361249542281324*I*a*e^(983/2*I*c) + 9414928240
21872538571407241795810657020217893835828847*I*a*e^(981/2*I*c) + 9092846502
857218261462182868864364624762389989516884454*I*a*e^(979/2*I*c) + 853329543
26120674272311677629126536894715822244726480090*I*a*e^(977/2*I*c) + 7786641
37844059492687126944618806483697276408481076541824*I*a*e^(975/2*I*c) + 6913
027812800192462704129875030929367293369791365329368306*I*a*e^(973/2*I*c) +
59748408260336333152741949120162468054098096806527992694330*I*a*e^(971/2*I*
c) + 502999167177513108237013793834321163983016591115064062192504*I*a*e^(96
9/2*I*c) + 4126888421983249887687507689195856719564200342340690922960020*I*
a*e^(967/2*I*c) + 330151891834421057317309521026860785545568114800871344256
69934*I*a*e^(965/2*I*c) + 2576627521764579828166282791344882800098730222812
48928269109247*I*a*e^(963/2*I*c) + 1962629045379290087751577541491949170474
015064554905158361368638*I*a*e^(961/2*I*c) + 145971076634287904419124491510
55569782655551054988172538106007306*I*a*e^(959/2*I*c) + 1060529033630690131
35578220340114498079609654804470793711887113055*I*a*e^(957/2*I*c) + 7529792
23311236135673287737101570895147168873416246633317325038975*I*a*e^(955/2*I*
c) + 5226590054479657822483780963008017596290103718605086715148151861646*I*
a*e^(953/2*I*c) + 354807234382317128446847851058475709108605682492800809676
79923825908*I*a*e^(951/2*I*c) + 2356471921691593101191613443407382001865279
34151729251738259408174007*I*a*e^(949/2*I*c) + 1531718700483241796992497361
8444851327831244614221060296959000799843324*I*a*e^(947/2*I*c) + 974738630828
1902182329846941952263067390253415184368339278176002138446*I*a*e^(945/2*I*c
) + 60747701724909506776211674773541506177265806300575091658980807046860704
*I*a*e^(943/2*I*c) + 370884792983254000550721425873326574910124282599731660
698821060848882320*I*a*e^(941/2*I*c) + 221894153908280997998580146226159783
9684351348912275577377603658269150756*I*a*e^(939/2*I*c) + 13012954846383921

3607834390011342353379058432804558931668407063605975241 34*I*a*e^(937/2*I*c) + 748256379263409799262224519339923201219263623120654612723421068783014485 36*I*a*e^(935/2*I*c) + 4219747349096187780741342759182006525742147279404438 4453450237308558032860 4*I*a*e^(933/2*I*c) + 2334517419885966874350965488026 81667946620831025985573250743510517531345739 6*I*a*e^(931/2*I*c) + 126733614 19138834940617178471273655660069856526406967342118703762672110480200*I*a*e^ (929/2*I*c) + 675268298037140882078412174800985609438380368937525721614730 8 9623117139971604*I*a*e^(927/2*I*c) + 3532263892728349243141893170583639542 0 317184204941081017186573436888382081899 6*I*a*e^(925/2*I*c) + 18143510046388 30535450974649080451232909962840518095183307668250502738979794444*I*a*e^(92 3/2*I*c) + 9153283321740997122951578693088645450336613285754578953646231535 187679288519816*I*a*e^(921/2*I*c) + 4536417342314724750813554956201153842 86 835604208391726083147470267803367050788 84*I*a*e^(919/2*I*c) + 2209122678371 764024572399387362389431079856904992226151501295775670133439728149 00*I*a*e^ (917/2*I*c) + 105726759027232563663977390375253117152354953719385480533803 8 28843719412426697893 0*I*a*e^(915/2*I*c) + 4973855633580303620126032637869 47 7500107676182499873076094518413397303603804906240*I*a*e^(913/2*I*c) + 23005 253792558757618650193250261667174892446545331020900285683620126145948425151 860*I*a*e^(911/2*I*c) + 104632479285330168704567624173205774202975142869561 65139814201570262132151141863797 0*I*a*e^(909/2*I*c) + 468046912422543827579 36461729097613166861829260526758142680888093094205683622574085 0*I*a*e^(907/ 2*I*c) + 205954451320666914305466797161323566250098209629523881816279242995 4428814629558400860*I*a*e^(905/2*I*c) + 891631388090861606194167299299998 44 829860757859708858806526202533949907733111521818 60*I*a*e^(903/2*I*c) + 3798 42269427844667280669633183561131376349050142887852618449803391214316928651 2 1528770*I*a*e^(901/2*I*c) + 159255512903666965947392050482627777652855525 62 86475980714877103567656193381644476784 80*I*a*e^(899/2*I*c) + 65724378186986 85843321427452377973065769080381811748793758610223065064947251343124642 40*I *a*e^(897/2*I*c) + 267033108043813673925169942118847715281698388264651831 36 183000551904987748617219560841 20*I*a*e^(895/2*I*c) + 106825368781355138115 9 8686678158308084092593434324791253827853349664088304211712490029720*I*a*e^(893/2*I*c) + 4208397350783197136595107950565682232137015162284202002619768 1 28586446189340747164035396 0*I*a*e^(891/2*I*c) + 1632874843255999947228170 42 441220130107697316248983794524997603902832643977337412661872760*I*a*e^(889/ 2*I*c) + 624082643961029037312709284672126976697873212538908890262985442647 874324392878156690829740*I*a*e^(887/2*I*c) + 234986055260470027437041195245 292043865000683648143850818180727987509692588868747534963936 0*I*a*e^(885/2* I*c) + 871784512153854396500065550892757615645450996512457822766611186159 95 30470473165494741121930*I*a*e^(883/2*I*c) + 3187118311465183573627822548071 998513136074280479265316792026591390464885722331920555848128 0*I*a*e^(881/2* I*c) + 114831957097719192706111697057632872409256933134212105953255327587 31 557146619122589272245894 0*I*a*e^(879/2*I*c) + 4078074617141970711788726200 8 2184411365896862940021562248885259817851441393751779677614254090*I*a*e^(877 /2*I*c) + 142766534765971531787121468360030135662981807815701180963132320 06 83665015207096525546411654850*I*a*e^(875/2*I*c) + 4927496729283083450012099

76784020335205572028531978185770096359515077462671350306668245663200*I*a*e
^(873/2*I*c) + 167688628137425704973593276857456712573650589092714891128297
60986508383352816248603242238251460*I*a*e^(871/2*I*c) + 5627373794228121721
583257810007323585827362849302717470711690545549860055299447701735333569313
0*I*a*e^(869/2*I*c) + 18624270141530015026036766190979622193201973253702463
4010976646542647178366376613371237978468950*I*a*e^(867/2*I*c) + 60795232506
538055223176587897936433792261856200178968194469267330870452834002467117504
9604847740*I*a*e^(865/2*I*c) + 19575864696310598451382153078727701034973417
41976050146298563390984316998623891058083233354950720*I*a*e^(863/2*I*c) + 6
218376119870852927756620966644089546420244007571780243876369631090631048335
601455624785708312030*I*a*e^(861/2*I*c) + 194885761759582598684920866636691
35993891670326935036733424079659395654947395041671226077968039510*I*a*e^(85
9/2*I*c) + 6026593628490055787427805827112924362891485407231105426369995644
4497953786622754638704751947767300*I*a*e^(857/2*I*c) + 18390480722449191984
653021156617286527564614860938919747705723738915839721060770433508066830767
6320*I*a*e^(855/2*I*c) + 55383894059703720980142009333903146592834534246696
8134327170356436277614050695088234925854972461590*I*a*e^(853/2*I*c) + 16461
983593387429705294567317256050448984847501474521523234085808828867857964631
37774250844390402000*I*a*e^(851/2*I*c) + 4829780128388681541713419953174190
238612578362193415201128746557290101817249355474415799153209807700*I*a*e^(8
49/2*I*c) + 139880302353639240750491684435137322249209761735967189805879375
80972858259676577959002425056421304360*I*a*e^(847/2*I*c) + 3999507572369123
703819527876878059983261935298150260058394447451097584068838826531558201087
1954211560*I*a*e^(845/2*I*c) + 11290502937326806460867891716679720547384498
7041134184835386265805093053876406216627623784532569846520*I*a*e^(843/2*I*c
) + 31471121452937142499278871384574742584918973031441639870412126582700441
7977443472234197727267055736520*I*a*e^(841/2*I*c) + 86623957642181530750728
127464111311550190054206425835868194515351762023530664437686576191224355985
1440*I*a*e^(839/2*I*c) + 23546413672838444747557085543861571414604520196309
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321293101377705534598501434563578869433768111389255715203589457357528663969
729197548539465525802001790*I*a*e^(835/2*I*c) + 167615577354420865588650781
906925881608190526290450076565027095315479927354840332703932411636818598565
40*I*a*e^(833/2*I*c) + 4390181120150456850569009393359897486332167308618300
3850263648062593209407109355666758585680043907834980*I*a*e^(831/2*I*c) + 11
359046846756325605798652651416795478177684709910176760999437070925021737758
6572896526050715752951812430*I*a*e^(829/2*I*c) + 29035145179318989889949274
155669704377722161796952473194288358946558861451206284482579042928487292316
1710*I*a*e^(827/2*I*c) + 73326261594425025070029099259126214159993758041023
2623396266193728726497598828508117264547235381193884620*I*a*e^(825/2*I*c) +
 18296954886447219366136705626726114716446217590419862915929740000765974011
10348056876443996820050899846880*I*a*e^(823/2*I*c) + 4511403508274736689214
557264253227256924552084399115779078878703890873777350251660642170480830307
883930190*I*a*e^(821/2*I*c) + 109922736874110426596082787940287968274450210
55329801721849776762014980912735003773441507133726549972274140*I*a*e^(819/2

*I*c) + 264688706737974967590923321425254619636800803395790418098415740101749239230179605504887057831186110252319 00*I*a*e^(817/2*I*c) + 62991788302738889334378246177490929980502834395575555703321916458754517369753884106316753560824690112805080*I*a*e^(815/2*I*c) + 1481703724817526814126058563907081575569291059707504840582520833834028072404762751647079940062842317334735 40*I*a*e^(813/2*I*c) + 34450508182477843764578899906634304184504691629880311222374479628726687012005927457936581367365273465252086 0*I*a*e^(811/2*I*c) + 79179783319962783694874390489308351677874066251769389491960774292564062510577115823717919848803014759426302 0*I*a*e^(809/2*I*c) + 179905602323577179718681091771937925464884402029134811419999527730672592178065188326666288499614699965356860 0*I*a*e^(807/2*I*c) + 404123187109010904668715342825862196887525526276382098514455678379210162008167502315416793053368458102487426 8*I*a*e^(805/2*I*c) + 897528585370135827470231719363830039291514018541380250100713235293962415086223157787973856100546428572895029 2*I*a*e^(803/2*I*c) + 197094604905649653855618030405974776279198936239645498502512476341445027319617021654807432872983915666621753 68*I*a*e^(801/2*I*c) + 427975958298316729853061080790220766066483290186488972029936380571861356211717844085117765557242163034276610 62*I*a*e^(799/2*I*c) + 918984642151373321265965492056748564383175571973515843047607238123300518813706248426955227727679314922909243 48*I*a*e^(797/2*I*c) + 195149410499491059972295971340541623205014478485259218183564112297195495432447981697623978433168097927188489 160*I*a*e^(795/2*I*c) + 409847262333561884793176079911000774943237907896725050192873946316017656875993526712458367191600832293291122 032*I*a*e^(793/2*I*c) + 851330476367280675931975863605407903147652289552972334476403837141273395148705506900158560196262319780442037 58*I*a*e^(791/2*I*c) + 174912593443959921315268323941947738188912530507648037732682497289758567741891659409543555867072819270239306 90932*I*a*e^(789/2*I*c) + 355480698799019777644586928631553900351364898499407912380666249650539424290796414567444502561993699156887949 1783*I*a*e^(787/2*I*c) + 714674375211683569664645788868595363519005020536444258923975449894779007945762028866995866286911374710925201 1972*I*a*e^(785/2*I*c) + 142142105345772785134655638543704332319345315321319820871878648165896494954210260296992075052433965603872064 39630*I*a*e^(783/2*I*c) + 279694975815029898780440211598962947052818535204148018008562306716674219942939257814474510225571900424903936 34543*I*a*e^(781/2*I*c) + 544526429142727306072090599569287933294118507282803065640097621444703537598606334409130499197209547527681977 93167*I*a*e^(779/2*I*c) + 104893986154804101296916258335583569488825031337940879705887720891017009057737287233126607468682692414623104 616138*I*a*e^(777/2*I*c) + 199942201925298499861324281146334926533714538945870178594046781580871260287770985229020625257582980635730225 596574*I*a*e^(775/2*I*c) + 377142540527901948948638950467507037490336862439884119528845344255236737968714764289755834224007993516760655 927631*I*a*e^(773/2*I*c) + 704009729937813921690706496710889899788434054131439662107181131420712162600554109916450181425438322392204166 968902*I*a*e^(771/2*I*c) + 130061517427101052448113664695315832473694446405293294683683020301555026817367560772730708470632509888479972 8006340*I*a*e^(769/2*I*c) + 23781592730321211106042463797053005815111645937589678722392818969981

73201558987639246325006007724766172710488108360*I*a*e^(767/2*I*c) + 4304076
708196868623182033776806377443199259967769349066155975950428294505280637590
876357992866456385230699336439762*I*a*e^(765/2*I*c) + 771065067832387504303
985863253313532066682438658369247383646577680905625502860759679978431131374
3491088689654262026*I*a*e^(763/2*I*c) + 13674110058458123094352164694691456
954602488602500355510203822923728942351461390874202410489991829018224022172
756144*I*a*e^(761/2*I*c) + 240065213305186194101177870502624116083503068842
59736598396370271394691940783119373097697849962988467299495366349818*I*a*e^
(759/2*I*c) + 4172599134954602125985964954763710995733952767863225515182161
5832066888874425029726202125176968278133786685507865790*I*a*e^(757/2*I*c) +
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267026007081349149718882656641899769699343*I*a*e^(755/2*I*c) + 122350052518
531164014106438492390774762115503639398988470214202703839744840033391227823
927738136823467053920486003100*I*a*e^(753/2*I*c) + 206430920167470779129078
232414834138915376857125870091984391255439368652648269437789361363756117101
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779545029739787329071887057800090344123223642583873423162351462269773310642
073463*I*a*e^(749/2*I*c) + 570671487070895844624376668699871118872005188740
963481132840070150675796254780502758777604671643556111867698875355315*I*a*e
^(747/2*I*c) + 935142309058644648996306800248685199060934241266676135556650
246097289205034092387373949739321723050371978110125781708*I*a*e^(745/2*I*c)
+ 151772675772323885245833852336431135734569046757961595531551453905021540
0801547691758586164717780698532261211210676134*I*a*e^(743/2*I*c) + 24398277
418473876406488597345779264755429792109177032067023126683130955186856176073
72855661697190253696743286780667183*I*a*e^(741/2*I*c) + 3885077898135324755
861645497801928788835406962443757329897190841925861451659303725355539278317
874676713417912602151785*I*a*e^(739/2*I*c) + 612830727974489757665370637383
400835846202652485602861930650162676637289161428815346565423045111826183623
4442144927690*I*a*e^(737/2*I*c) + 95764982457308878595876534947130519638685
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60*I*a*e^(735/2*I*c) + 1482597913528423746226719438636827970156048051160166
4623844483834931515122932857057720991188592107170607681823985077157*I*a*e^(
733/2*I*c) + 22741305878635147307038153488672825947987978019457328121790385
481218602329797137379235963979112570181508105761299864241*I*a*e^(731/2*I*c)
+ 345626886583356492112358151163225379977564500741633872843777815593138933
78880959669959729851744028098328487235184728902*I*a*e^(729/2*I*c) + 5205042
453660871068507693566203030807490703686374070277936847572552205529179649231
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214086969807897418659931017*I*a*e^(725/2*I*c) + 114875803385901547035330733
037349925264590791175334294610155096056593848065467484845287083746515024420
618289251515633198*I*a*e^(723/2*I*c) + 168369630997561227559333636030680505
097931214578041180941450461063477255836777741106503139414783875934618403506
189272070*I*a*e^(721/2*I*c) + 244578820412941222413395448190925169184058675
448514568342704435560427553614905283048112187005746964090261842716041958472

*I*a*e^(719/2*I*c) + 3521410779227367305468981107120095393721755365824816803382234172102223493073646842637276118608032223441281983523276950 10*I*a*e^(717/2*I*c) + 502550470992195878626411838079850006659777919581454351822399978129428805689682441109820547072773261835688637084770870 8442*I*a*e^(715/2*I*c) + 710934676236178199315293629653949575146187423228339879602954615038356642192952138658369772402012030511506524366087182336*I*a*e^(713/2*I*c) + 996983594413543237951663813404787394193696145753482819044943532904006038513638159184208380334024402798975173818169325844*I*a*e^(711/2*I*c) + 138603841629113966677521737046806457587286373607779128668239428274584755056608200145082656362062788523071150737005659187 8*I*a*e^(709/2*I*c) + 191034322343078860237219914890531668391002194241500838927042988970517713925508110127321894642486608192481612997541107846 5*I*a*e^(707/2*I*c) + 261045124392398126010453433012454822867217387710003030499823036205412647365935916860347664321159595817846291131742859133 0*I*a*e^(705/2*I*c) + 353676461326065445325819276169145836984896738655835870701106999280831997418448425789700221226148531872501461065980658771 8*I*a*e^(703/2*I*c) + 475116973790145739620717671196793317936367747858118161284607038728128000757129577641826784358070259730216727235818690609*I*a*e^(701/2*I*c) + 632871018908270980134393952923530191424197568353384990631057447492432774827104371221016710478421098470585546796191630616 1*I*a*e^(699/2*I*c) + 835921585525270059274636632763640027045000249563752770351589923039914836784921459256499739935434449504043584915765769584 2*I*a*e^(697/2*I*c) + 109487816404097555366536188780202275860965311532529182597609117697007757526070912110599326595980539747905707367514990789 48*I*a*e^(695/2*I*c) + 142209625593650747633143084901254747868167601051690380654084614802880470310216636145688542836606707388086927950021947346 97*I*a*e^(693/2*I*c) + 183175263910895824505565576225483261015979145299235796538887920991533615712328245731954598352334025811376246239864341436 40*I*a*e^(691/2*I*c) + 233985823405215842196927399186026295767370638678096677363480812909477222836660668200996554847559718208281363221719216660 98*I*a*e^(689/2*I*c) + 296418870982327739739856543305793794838212447693239802111754473132194627045318804008018024008069296463793430151307238836 72*I*a*e^(687/2*I*c) + 372411212727020742867785367281276422588180680725597659094510647668238594209452592717403098304203348491058356450383541347 88*I*a*e^(685/2*I*c) + 464029325472952123816761705167662882510680826676862896621709868144232969555830801650761118315567462408230526368959140883 52*I*a*e^(683/2*I*c) + 573425601373144520885417340865419166341645485251082885818236246323558588723509662923863264405230221528792916946902782419 78*I*a*e^(681/2*I*c) + 702778908561436462870175933201068691827609640028479309917143519681905864654184793580358274490940097459787845064031198111 20*I*a*e^(679/2*I*c) + 854218522796465591599401113270812381789564749502308751188106433146399315372077819539809887200215162146697989868257243750 32*I*a*e^(677/2*I*c) + 102973123976091249841486572077221888501123401210539358250850710575960244576128548550903800052937848163824888063710773611 688*I*a*e^(675/2*I*c) + 123105242970350923938651678117286443754910359407420767699678173998603913981285412874706049223826034210909894133154305711 632*I*a*e^(673/2*I*c) + 145954292246109699719912222123781738335390625966506127269098354886794694991875

083928883625876737543812581750368360348693528*I*a*e^(671/2*I*c) + 171605486
957459662750676535846047739137214911399784738960265764988070463454234816351
437243248376883372505719428491381980392*I*a*e^(669/2*I*c) + 200079105947663
271955632509515980999406183444585533117797849122654482023351610633374676069
055506407150129677270455507223800*I*a*e^(667/2*I*c) + 23131634811694770274З
937847858556087111914188372627836780990986990309150303501014036898617069788
744248382411616930060590160*I*a*e^(665/2*I*c) + 265165814533423959664985597
822349856950188516226578299292400272539208068973637723841893399770487082840
158358266555486981880*I*a*e^(663/2*I*c) + 301371417263542762474942803033428
113198447518244218355398012742691434651542769453942299897409407388624108299
633805109409320*I*a*e^(661/2*I*c) + 339562583656041705384495512461799490148
091494844161116673933307762871742676972723303982143114815055600538598674333
818006140*I*a*e^(659/2*I*c) + 379247649666166689932538744439842684315020161
725910584926467825646640883618440200155492765803014212451201418879737084175
200*I*a*e^(657/2*I*c) + 419811308608661332767758302246251767306850733653256
595228909948287744169176955320554102884264686683175846620329681501389720*I*
a*e^(655/2*I*c) + 460516895758104311450607127871317475876181781180615971932
371325200463116468437759451218270512614846167126411504887103639420*I*a*e^(6
53/2*I*c) + 500514141116875694467964701453317062463709842637219399054983606
548122976960401801645044637308666501943921790160591726142140*I*a*e^(651/2*I
*c) + 538852813238202598104514114397598537283154717840682848350121553631835
881042049299653608342888243843496016154319713358492360*I*a*e^(649/2*I*c) +
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129402448537468149317355804595816458074515452280*I*a*e^(647/2*I*c) + 606377
755149130644685483641133783894074517633951559003505177038260609373787904347
095041198589577627025869566789105127854940*I*a*e^(645/2*I*c) + 633369970466
231151639593498633052500816992588222289708061904408614478071012324018301393
989621376114495936107929638109352240*I*a*e^(643/2*I*c) + 654382036818887115
292417789242500921067425262240728690563625955515997936064156892229191882650
976483089469657316496979497920*I*a*e^(641/2*I*c) + 668367696536351754028217
381429124369355105991706596728061963354863236879295944678255966593383757885
721698666786195936988720*I*a*e^(639/2*I*c) + 674372239032754395378205038535
525134413991821067808642593147982202493843652677927082541781810369810638842
234476194328917280*I*a*e^(637/2*I*c) + 671573416376600344255476890840084107
068748497197932624701404034109653368013046774679359731432461763294766813316
740570321920*I*a*e^(635/2*I*c) + 659320582553919912075191619269245382876605
084236933842646778081417120118613397607349078853158222767507670564574204234
442160*I*a*e^(633/2*I*c) + 637170080700014936844214998715409219682319023159
649705213690092322129022799756117985062386207907676879268835925347571814760
*I*a*e^(631/2*I*c) + 604914946234938282221086113012403617143413939275335944
189009476407229605663075886937693800533384123491506489579681833036880*I*a*e
^(629/2*I*c) + 562607154534249611414703842333518335752632730873777259062662
265415265197318757342578842160394845870139211686607258163271980*I*a*e^(627/
2*I*c) + 510570917219603298930927086412148133828632499451055506210033280538
039998585805570450486684217149260136863823464698025514400*I*a*e^(625/2*I*c)

+ 449405910836006748962393603823185186535716033707509621536220013769001652160266321868773593038071461031867255150268333080200*I*a*e^(623/2*I*c) + 379979787117931179687380662746570800769009286292103738378140902975891504813248606746718458290904172947709059780815722352620*I*a*e^(621/2*I*c) + 303409839775241340348800685971884147465797827674549775052181699893605576672194645212093459076166299568495347142098625376060*I*a*e^(619/2*I*c) + 221034257892392428506776513729559457247579927221728582941832739190163959979535188907184118401352847011402341171183153330400*I*a*e^(617/2*I*c) + 134373946463544483939193158440319190954779730332932854832052915711911612344383418766608011863070070271134159756438724511480*I*a*e^(615/2*I*c) + 45086405250627352833392134726161811467434689831954182659107158600796867449347314722414235075713987768252905857943168960940*I*a*e^(613/2*I*c) - 45086405250627352833392134726161811467434689831954182659107158600796867449347314722414235075713987768252905857943168960940*I*a*e^(611/2*I*c) - 134373946463544483939193158440319190954779730332932854832052915711911612344383418766608011863070070271134159756438724511480*I*a*e^(609/2*I*c) - 221034257892392428506776513729559457247579927221728582941832739190163959979535188907184118401352847011402341171183153330400*I*a*e^(607/2*I*c) - 303409839775241340348800685971884147465797827674549775052181699893605576672194645212093459076166299568495347142098625376060*I*a*e^(605/2*I*c) - 379979787117931179687380662746570800769009286292103738378140902975891504813248606746718458290904172947709059780815722352620*I*a*e^(603/2*I*c) - 449405910836006748962393603823185186535716033707509621536220013769001652160266321868773593038071461031867255150268333080200*I*a*e^(601/2*I*c) - 510570917219603298930927086412148133828632499451055506210033280538039998585805570450486684217149260136863823464698025514400*I*a*e^(599/2*I*c) - 562607154534249611414703842333518335752632730873777259062662265415265197318757342578842160394845870139211686607258163271980*I*a*e^(597/2*I*c) - 604914946234938282221086113012403617143413939275335944189009476407229605663075886937693800533384123491506489579681833036880*I*a*e^(595/2*I*c) - 637170080700014936844214998715409219682319023159649705213690092322129022799756117985062386207907676879268835925347571814760*I*a*e^(593/2*I*c) - 659320582553919912075191619269245382876605084236933842646778081417120118613397607349078853158222767507670564574204234442160*I*a*e^(591/2*I*c) - 671573416376600344255476890840084107068748497197932624701404034109653368013046774679359731432461763294766813316740570321920*I*a*e^(589/2*I*c) - 674372239032754395378205038535525134413991821067808642593147982202493843652677927082541781810369810638842234476194328917280*I*a*e^(587/2*I*c) - 668367696536351754028217381429124369355105991706596728061963354863236879295944678255966593383757885721698666786195936988720*I*a*e^(585/2*I*c) - 654382036818887115292417789242500921067425262240728690563625955515997936064156892229191882650976483089469657316496979497920*I*a*e^(583/2*I*c) - 633369970466231151639593498633052500816992588222289708061904408614478071012324018301393989621376114495936107929638109352240*I*a*e^(581/2*I*c) - 606377755149130644685483641133783894074517633951559003505177038260609373787904347095041198589577627025869566789105127854940*I*a*e^(579/2*I*c) - 57450241170903365426020832853871513572899855105089906678617222

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I*c) - 53885281323820259810451411439759853728315471784068284835012155363183
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e^(555/2*I*c) - 14595429224610969971991222212378173833539062596650612726909
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/2*I*c) - 12310524297035092393865167811728644375491035940742076769967817399
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) - 10297312397609124984148657207722188850112340121053935825085071057596024
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098*I*a*e^(535/2*I*c) - 183175263910895824505565576225483261015979145299235
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*e^(533/2*I*c) - 1422096255936507476331430849012547478681676010516903806540
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/2*I*c) - 10948781640409755536653618878020227586096531153252918259760911769700775752607091211059932659598053974790570736751499078948*I*a*e^(529/2*I*c) - 8359215855252700592746366327636400270450002495637527703515899230399148367849214592564997399354344495040435849157657695842*I*a*e^(527/2*I*c) - 6328710189082709801343939529235301914241975683533849906310574474924327748271043712210167104784210984705855467961916306161*I*a*e^(525/2*I*c) - 4751169737901457396207176711967933179363677478581181612846070387281280000757129577641826784358070259730216727235818690609*I*a*e^(523/2*I*c) - 3536764613260654453258192761691458369848967386558358707011069992808319974184484257897002212261485318725014610659806587718*I*a*e^(521/2*I*c) - 2610451243923981260104534330124548228672173877100030304998230362054126473659359168603476643211595958178462911317428591330*I*a*e^(519/2*I*c) - 1910343223430788602372199148905316683910021942415008389270429889705177139255081101273218946424866081924816129975411078465*I*a*e^(517/2*I*c) - 1386038416291139666775217370468064575872863736077791286682394282745847550566082001450826563620627885230711507370056591878*I*a*e^(515/2*I*c) - 996983594413543237951663813404787394193696145753482819044943532904006038513638159184208380334024402798975173818169325844*I*a*e^(513/2*I*c) - 710934676236178199315293629653949575146187423228339879602954615038356642192952138658369772402012030511506524366087182336*I*a*e^(511/2*I*c) - 502550470992195878626411838079850006659779195814543518223999781294288056896824411098205470727732618356886370847708708442*I*a*e^(509/2*I*c) - 352141077922736730546898110712009539372175536582481680338223417210222349307364684263727611860803222344128198352327695010*I*a*e^(507/2*I*c) - 244578820412941222413395448190925169184058675448514568342704435560427553614905283048112187005746964090261842716041958472*I*a*e^(505/2*I*c) - 168369630997561227559333636030680505097931214578041180941450461063477255836777741106503139414783875934618403506189272070*I*a*e^(503/2*I*c) - 114875803385901547035330733037349925264590791175334294610155096056593848065467484845287083746515024420618289251515633198*I*a*e^(501/2*I*c) - 77676555142903920918742869451767200086404378777218239528959225606553643216179633134107155344214086969807897418659931017*I*a*e^(499/2*I*c) - 52050424536608710685076935662030308074907036863740702779368475725522055291796492310303721502418829383396474602416972540*I*a*e^(497/2*I*c) - 34562688658335649211235815116322537997756450074163387284377781559313893378880959669959729851744028098328487235184728902*I*a*e^(495/2*I*c) - 22741305878635147307038153488672825947987978019457328121790385481218602329797137379235963979112570181508105761299864241*I*a*e^(493/2*I*c) - 14825979135284237462267194386368279701560480511601664623844483834931515122932857057720991188592107170607681823985077157*I*a*e^(491/2*I*c) - 9576498245730887859587653494713051963868508092109893619828631489328621274896472800096828116619256422203001427328938060*I*a*e^(489/2*I*c) - 6128307279744897576653706373834008358462026524856028619306501626766372891614288153465654230451118261836234442144927690*I*a*e^(487/2*I*c) - 3885077898135324755861645497801928788835406962443757329897190841925861451659303725355539278317874676713417912602151785*I*a*e^(485/2*I*c) - 2439827741847387640648859734577926475542979210917703206702312668313095518685617607372855661697190253696743286780667183*I*a*e

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/2*I*c) - 3445050818247784376457889990663430418450469162988031122237447962 8
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*c) - 733262615944250250700290992591262141599937580410232623396266193728726
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2*I*c) - 43901811201504568505690093933598974863321673086183003850263648062 5
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*I*c) - 2354641367283844474755708554386157141460452019630966364104906530187
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5072812746411131155019005420642583586819451535176202353066443768657619122 43
559851440*I*a*e^(385/2*I*c) - 314711214529371424992788713845747425849189730
3144163987041212658270044179774434722341977272670557365 20*I*a*e^(383/2*I*c)
 - 1129050293732680646086789171667972054738449870411341848353862658050930 53
87640621662762378453256984652 0*I*a*e^(381/2*I*c) - 3999507572369123703819 52

787687805998326193529815026005839444745109758406883882653155820108719542115
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73/2*I*c) - 553838940597037209801420093339031465928345342466968134327170356
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*I*c) - 1957586469631059845138215307872770103497341741976050146298563390984
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669633183561131376349050142887852618449803391214316928651215287 70*I*a*e^(32
3/2*I*c) - 8916313880908616061941672992999984482986075785970885880652620253

394990773311152181860*I*a*e^(321/2*I*c) - 2059544513206669143054667971613235662500982096295238818162792429954428814629558400860*I*a*e^(319/2*I*c) - 468046912422543827579364617290976131668618292605267581426808880930942056836225740850*I*a*e^(317/2*I*c) - 1046324792853301687045676241732057742029751428695616513981420157026213215114186379 70*I*a*e^(315/2*I*c) - 23005253792558757618650193250261667174892446545331020900285683620126145948425151860*I*a*e^(313/2*I*c) - 4973855633580303620126032637869477500107676182499873076094518413397303603804906240*I*a*e^(311/2*I*c) - 1057267590272325636639773903752531171523549537193854805338038288437194124266978930*I*a*e^(309/2*I*c) - 220912267837176402457239938736238943107985690499222615150129577567013343972814900*I*a*e^(307/2*I*c) - 45364173423147247508135549562011538428683560420839172608314747026780336705078884*I*a*e^(305/2*I*c) - 915328332174099712295157869308864545033661328575457895364623153518767928851981 6*I*a*e^(303/2*I*c) - 18143510046388305354509746490804512329099628405180951833076682505027389797944 44*I*a*e^(301/2*I*c) - 353226389272834924314189317058363954203171842049410810171865734368883820818996*I*a*e^(299/2*I*c) - 675268298037140882078412174800985609438380368937525721614730896231171399716 04*I*a*e^(297/2*I*c) - 1267336141913883494061717847127365566006985652640696734211870376267211048020 0*I*a*e^(295/2*I*c) - 23345174198859668743509654880268166794662083102598557325074351051753134573 96*I*a*e^(293/2*I*c) - 421974734909618778074134275918200652574214727940443844534502373085580328604*I*a*e^(291/2*I*c) - 748256379263409799262224519339923201219263623120654612723421068783014485 36*I*a*e^(289/2*I*c) - 1301295484638392136078343900113423533790584328045589316684070636059752413 4*I*a*e^(287/2*I*c) - 221894153908280997998580146226159783968435134891227557737760365826915075 6*I*a*e^(285/2*I*c) - 3708847929832540005507214258733265749101242825997316606988210608488823 20*I*a*e^(283/2*I*c) - 607477017249095067762116747735415061772658063005750916589808070468607 04*I*a*e^(281/2*I*c) - 974738630828190218232984694195226306739025341518436833927817600213844 6*I*a*e^(279/2*I*c) - 153171870048324179699249736184485132783124461422106029695900079984332 4*I*a*e^(277/2*I*c) - 2356471921691593101191613443407382001865279341517292517382594081740 07*I*a*e^(275/2*I*c) - 354807234382317128446847851058475709108605682492800809676799238259 08*I*a*e^(273/2*I*c) - 522659005447965782248378096300801759629010371860508671514815186164 6*I*a*e^(271/2*I*c) - 752979223311236135673287737101570895147168873416246633317325038975*I*a*e^(269/2*I*c) - 10605290336306901313557822034011449807960965480447079371188711305 5*I*a*e^(267/2*I*c) - 14597107663428790441912449151055569782655551054988172538106007306*I*a*e^(265/2*I*c) - 1962629045379290087751577541491949170474015064554905158361368638*I*a*e^(263/2*I*c) - 257662752176457982816628279134488280009873022281248928269109247*I*a*e^(261/2*I*c) - 33015189183442105731730952102686078554556811480087134425669934*I*a*e^(259/2*I*c) - 41268884219832498876875076891958567195642003423406909229600 20*I*a*e^(257/2*I*c) - 5029991671775131082370137938343211639830165911150640621925 04*I*a*e^(255/2*I*c) - 5974840826033633315274194912016246805409809680652799269433 0*I*a*e^(253/2*I*c) - 6913027812800192462704129875030929367293369791365329368306*I*a*e^(251/2*I*c) - 778664137844059492687126944618806483697276408481076541824*I*a*e^

(249/2*I*c) - 853329543261206742723116776291265368947158222447264800090*I*a*e^(247/2*I*c) - 909284650285721826146218286886436462476238998951688445 4*I*a*e^(245/2*I*c) - 941492824021872538571407241795810657020217893835828847*I*a*e^(243/2*I*c) - 946608933713441777201633983716923574733612495422813 24*I*a*e^(241/2*I*c) - 923520334545562518363529258405831680633631516060401 0*I*a*e^(239/2*I*c) - 873599857808953513616291826808640309239785388357815*I*a*e^(237/2*I*c) - 800603291411107856842220944240932165745993125868 35*I*a*e^(235/2*I*c) - 710212337276912643906581600423491737109606324751 6*I*a*e^(233/2*I*c) - 609297262840711915743663065579736975124435730278*I*a*e^(231/2*I*c) - 505032364560217013422913846907650449131212860 31*I*a*e^(229/2*I*c) - 404025809171257922234902708224585730004584426 5*I*a*e^(227/2*I*c) - 311615599009998457055428626562611218440152906*I*a*e^(225/2*I*c) - 231438610221262909357951474469677943307887 64*I*a*e^(223/2*I*c) - 165313275328330015489593384758165279164496 5*I*a*e^(221/2*I*c) - 113407514349957436967142625811402104148561*I*a*e^(219/2*I*c) - 746102018367897997253224700376783249703 0*I*a*e^(217/2*I*c) - 469985499033039677874623273935334240076*I*a*e^(215/2*I*c) - 282975550978933930210206766915809882 33*I*a*e^(213/2*I*c) - 162544698001533217775591801450160898 2*I*a*e^(211/2*I*c) - 888916297102032235566689339083113 34*I*a*e^(209/2*I*c) - 461774692104624557062073070740252 0*I*a*e^(207/2*I*c) - 227298420835979818145918471098570*I*a*e^(205/2*I*c) - 105720194834028113019757462814 74*I*a*e^(203/2*I*c) - 46320703647615214923807323883 2*I*a*e^(201/2*I*c) - 190522173623582512917692322 28*I*a*e^(199/2*I*c) - 732777588939374143249503406*I*a*e^(197/2*I*c) - 262375606858592586516731 69*I*a*e^(195/2*I*c) - 870123185139944470654786*I*a*e^(193/2*I*c) - 265686468592656460589 50*I*a*e^(191/2*I*c) - 741764252188078830689*I*a*e^(189/2*I*c) - 187788418247110123 21*I*a*e^(187/2*I*c) - 426791859624382434*I*a*e^(185/2*I*c) - 8600339740332756*I*a*e^(183/2*I*c) - 151262256738489*I*a*e^(181/2*I*c) - 2274620402080*I*a*e^(179/2*I*c) - 28432755026*I*a*e^(177/2*I*c) - 283618504*I*a*e^(175/2*I*c) - 2116556*I*a*e^(173/2*I*c) - 10504*I*a*e^(171/2*I*c) - 26*I*a*e^(169/2*I*c))/(e^(531*I*c) + 432*e^(530*I*c) + 93096*e^(529*I*c) + 13343760*e^(528*I*c) + 1431118260*e^(527*I*c) + 122503723056*e^(526*I*c) + 8718181624155*e^(525*I*c) + 530563624556832*e^(524*I*c) + 28186192554792138*e^(523*I*c) + 1327882849274858880*e^(522*I*c) + 56169444526926562260*e^(521*I*c) + 2154864144781257856128*e^(520*I*c) + 75599817092670157806639*e^(519*I*c) + 2442455629894502983849104*e^(518*I*c) + 73099207817335597247098038*e^(517*I*c) + 203703125947036816013192232 0*e^(516*I*c) + 53090127264630963470039804475*e^(515*I*c) + 1299146645993240318167826532288*e^(514*I*c) + 2995254774926549967525784 2032197*e^(513*I*c) + 652650253343206047453620559993840*e^(512*I*c) + 13477227799524701956579274210395326*e^(511*I*c) + 2644103757803107425180993264196 85040*e^(510*I*c) + 4939666610818025798809586352543471345*e^(509*I*c) + 88054927598941411145869950813388040256*e^(508*I*c) + 1500602747937397286405577818722691539392*e^(507*I*c) + 24489837337812338687718622491865013839488*e^(506*I*c) + 383360155801054824529764688213114368047154*e^(505*I*c) + 5764601046563151304213854710715346838447392*e^(504*I*c) + 833808399118378944531363036737850390515068 05*e^(503*I*c) + 1161581413733971751533622511909046917188 7

68400*e^(502*I*c) + 1560391127768760709972162377174493308692058727 2*e^(501*I*c) + 202347509724462171313966643580234078508179838320*e^(500*I*c) + 25356674606502797768345615661865912131092516428 59*e^(499*I*c) + 30735366512830562160991166338490057308062762518496*e^(498*I*c) + 36068861303638934941380978000455996354877542332525 5*e^(497*I*c) + 41015454399371957939599567084424967094338002612248 80*e^(496*I*c) + 452309400398307383320256947846462068448548276980757 36*e^(495*I*c) + 484093410240488718655917025303662581091659126182344528*e^(494*I*c) + 503202490340145182407421394376601192202650700631198275 3*e^(493*I*c) + 508363695081710994370193486108473919467361851080171831 36*e^(492*I*c) + 499467506558531733671585862910572702811545035730398749530*e^(491*I*c) + 47753986071008532635342077338182667774786934127387310316 80*e^(490*I*c) + 4445670817525882102440094621053500452377572219097746848 4496*e^(489*I*c) + 40321222595779818884084613996099562414449127169433679645 9584*e^(488*I*c) + 356476489062872401708848799668817892919578761395854547480 4845*e^(487*I*c) + 3073621740432100996523103741966305396288103528170922169778 5072*e^(486*I*c) + 2585853487159772701558291156841934110720345414913643939854 91350*e^(485*I*c) + 21237029691888713182667187812239270678399490157272938840653 88080*e^(484*I*c) + 17033886027390615741040977721655541665612162275485028584310890417*e^(483*I*c) + 133490210052026183779673313868332303530332906163247194627808410304*e^(482*I*c) + 102253643746829673729306586270524644969368741555986584430688870542 3*e^(481*I*c) + 765901052018754965177711835767687192708189898913112575579820423611 2*e^(480*I*c) + 561170810763411753840875701851885386603759320136747355190552273683 66*e^(479*I*c) + 402349692266121158934003582839428785116904903936409545602519219664720*e^(478*I*c) + 282390515193658667838252570656445728029009869863859798762838024588171 5*e^(477*I*c) + 194079792155945665935350081033032552577454080700824313389451847974639 36*e^(476*I*c) + 130657660226560419335121434389938961884595434069984824307149332131747540*e^(475*I*c) + 86188485109499190876424680547467242860375731548445397471361281221542899 2*e^(474*I*c) + 557255115732867112101621641630759616186195596901169722234092621011285441 8*e^(473*I*c) + 353244472067790181153780528207894116875810045823674310062058796337290152 00*e^(472*I*c) + 219601281339515561500261478844190024870555261281946058839614044697037963695*e^(471*I*c) + 1339214374254245553564884406801945353385000254030655765953770237607180089968*e^(470*I*c) + 801372958079075243436196494576154376146952079121074697267587048105867427784 4*e^(469*I*c) + 4706504461113515810848735336748424310269824883831263587628309942744274586670 4*e^(468*I*c) + 2713612075032665707344865170771810148017753221831810556386192578361432714723 58*e^(467*I*c) + 1536333238444927583532734556016494671674916578907116984548489078241693926940560*e^(466*I*c) + 854301344112621233483354066506962147247908583804136056455072203672365429754020 5*e^(465*I*c) + 466682235482660178068545924681005702893559608696136508565757567581801822233087 68*e^(464*I*c) + 250501028608928332469340456829902067712233644464602753159945727868485722395506952*e^(463*I*c) + 1321498055271300851429993866631619874424534425188183592049727687571032156435077280*e^(462*I*c) + 685299322314573668732888531161779543559294084143986635107965565231289472197279626 6*e^(461*I*c) + 3494107161327670464947794304333945020150 40

75335160361865916029213860778606230624960*e^(460*I*c) + 175193170500618300241515632381912285157790097816049220671217212220015297133400636060*e^(459*I*c) + 86397993622330349556296820028395513198708064940505702126068652936800794826651264256*e^(458*I*c) + 419154250065682614809333941454415914396447847249231593180917185990211410900593994 2952*e^(457*I*c) + 2000800680303004713729327825032159711354071620198333312634928118667915319906804525 7216*e^(456*I*c) + 939869153130681791490836060656814827808360605105301546184869498394671313788598859982 10*e^(455*I*c) + 434546676780280045346344498763892540797175105756827515509297024187660299345484920192480*e^(454*I*c) + 19777929806658181356513000943262391586054488708069708605773253850286099830345346723185 00*e^(453*I*c) + 8862752142756957285681340885764904597935349569355321815647721172537159186491471311666400*e^(452*I*c) + 391080312556018094765375353696118444408449037516056450235145723520452481042629335988507 30*e^(451*I*c) + 169956327969929767773902096652629253283704505477127544556534417376686540936706073847337600*e^(450*I*c) + 72752101071839422929177407384469425579873866706753537975973279556794257875138425078047631 0*e^(449*I*c) + 30679742964317473641981596239624636716170064196268514261484186029348529073790216597619118 40*e^(448*I*c) + 12747219616503320541356343062562847368601622140856786025445814532037904111523242298235713300*e^(447*I*c) + 521909122076618242158122718542697480712928432432278947692296907200105471413341316109896360 00*e^(446*I*c) + 210594301385648471184329078880317504953361839954159427434009884661777259752542647709150036990*e^(445*I*c) + 837579206923411932458786486765373533946545239708990769488724813982189165104589895518909256320*e^(444*I*c) + 328387476055581867672630948030673442015509858394807446901416817187444217010964852162753 8755920*e^(443*I*c) + 1269349693296492056507367363718128008854868250888025533728006500656613869604179735321658452864 0*e^(442*I*c) + 48379489756434099843857791816589379406815042609340378747586437145781646245422045101230417309900*e^(441*I*c) + 181834661406177901315330129677145381166449188413194141169344354754920969034952610378945282257600*e^(440*I*c) + 674025530543133008894845775236625237450743114473544537818170447134607102575676676056675328961590*e^(439*I*c) + 246438219080743960907977422685567962936788570977643587663085171625396269619234170623919287872816 0*e^(438*I*c) + 888829502875102466704420383760797610148005313441861447462076752282486891195988435266644491740400 0*e^(437*I*c) + 316266446747255477311767956875276535713059699859236883921121649155532425732694909089895702485332 80*e^(436*I*c) + 111034148797008819443143895644469242295049867464313710969257619338899133799285616020069872611710850*e^(435*I*c) + 384655842080666274454063078784837174998949052500975322162003392549953413592461519365177908682078400*e^(434*I*c) + 131505212093069212210229710532762284233587074342853089107298353586228009444660772347380047745391413 0*e^(433*I*c) + 443721091784318234776434954444390469902005659506947084719361709211471407763307723497282535122697936 0*e^(432*I*c) + 147779550966171289987127451820714953621765069731830816502336052740516776249704643402427558400256737 60*e^(431*I*c) + 485842581531402804473148368687721313901954124190467327784587060150968814370763379107935841224750737 60*e^(430*I*c) + 15768584552885091872146287786443509025758314941556132342738656289444759827793562980

0939237175625149830*e^(429*I*c) + 5052936631230152588784830257388128132033977668453400653812610163534197223826203930325359606609219504 00*e^(428*I*c) + 15987711010581926922705289996774447426856310062324561858449252201440023058781203808284839886635748291 00*e^(427*I*c) + 49952419562791381802051867444016880243882721139212556637349569469275713055331467768987878780596851084 80*e^(426*I*c) + 154131112114860239372949708207973767160813447881633865435224219397375079621258549818818791683482603300 00*e^(425*I*c) + 469702247271172818264540450180706705225597566275803477845353200149634826323597294445418851022745460025 60*e^(424*I*c) + 141379938253556843280565505807403304130606130725434751745794079833141361748917639986145377066437210546190*e^(423*I*c) + 420358024835146798583611210145942154684437949365647899088372524802156222884839580011688655664280691773600*e^(422*I*c) + 1234668041892409978780018081755440216012582476396941937965899631953079203974222138794604328498972144766900*e^(421*I*c) + 3582718002163296061414536703715109897107198252739284546149343102348456124089657428594946438660859773886240*e^(420*I*c) + 1027160253020288900249781351684945259097151280952906066519730109705221006457608834802323467197546367741847 0*e^(419*I*c) + 2909765106124745340664756978183691006216555985235905280425915416568712542875256238549237374948635171445312 0*e^(418*I*c) + 8145208141382911182887541756425005484603769331281148049290916075819598915576810702256835095386181594070409 0*e^(417*I*c) + 2253205325932206577679411092895162489997945210155641349828272417100196754866944996893124665619072126278200 00*e^(416*I*c) + 6160031160229795849371257017578872129983543009899913626280388610939145613320711919097149494265879369103033 00*e^(415*I*c) + 1664475034387211809394917743502937638978574937754764763987835872410449930690131572904279995484581013965001440*e^(414*I*c) + 444541225929547462506765951419831296601541629996893039334563034591410972074057361888498052001002845149696210*e^(413*I*c) + 117358569262451184931130910025016040323418769859990828235206722415302001882238263929823021940846675384886656 00*e^(412*I*c) + 306275810542219573783905472892776091295728139310827335202473872260000200435382794687767079584208925478701286 80*e^(411*I*c) + 790191495587665692547839884872323883529091449827471718567724632238089933670915034028764672701761243426996544 00*e^(410*I*c) + 201557947424794098026772478462040883395867512562930862943753568690084015585598010154781548625239409558190739750 0*e^(409*I*c) + 5083245993010854601669786296830326614276544740829390480979396383915672987957883894338422857510546652108682876 80*e^(408*I*c) + 1267597017294812913400146276042126929986480292870190399107554311079964227280196522475370108738477856311765699610*e^(407*I*c) + 312568349317870174347970475030749017866629215072017936360433511352862332968460634318554075601993566214826786396 8*e^(406*I*c) + 762178879191204706203884091779937460042889225819436763668294435609668140024631213800176928502066144599107324941 6*e^(405*I*c) + 183798070840033597660276492176211441160917355722166207888615358034497022738025883590767042418407335134391141132 48*e^(404*I*c) + 438349721429193776853786922330210637445540331009285027374804389789767469898957840709519052377834903743059345429 55*e^(403*I*c) + 103399755467257436489847837640753754718204394473055795001467604326419876555556873829531737211096115196005647730480*e^(402*I*c) + 241246021282440

06179290831778303287619480159713320605209128699704372914534575580571008148900674183943957398483267 8*e^(401*I*c) + 5567563887111823403410261927342195461136517683173805390058936790493947140170636985652727288136690547907720897 7840*e^(400*I*c) + 12710330829380489502013605548312703426623439912775046123423003660250467417428565804452894017866563116858590230847 16*e^(399*I*c) + 28704961314123144518346747153535894395532944308085319334660862885437092462307691513921806994134056230172477535329 44*e^(398*I*c) + 64133818958559251847582314510625563803285949385110065770152181197865363902130572840182022016310944348195840251134 65*e^(397*I*c) + 14176483652875704957202013343241117904369977796653849959902524421980635189011634815653279605497783382888932766730080*e^(396*I*c) + 31004319206069417077069363141423487431828009098184744635678652284177439464941651812564519144918003174108077634846014*e^(395*I*c) + 67091706130529669125019899210021576580237843462229535386295087076189297849995931360645605292130961496106707521506432*e^(394*I*c) + 14365768713804479694294711970425953845881819942351682467458629369105611920986635812363777224540953079923055376722225 2*e^(393*I*c) + 30438447110681333601028416012390637043388882849062742265255123696679091617452085775914393014018717349239498190825894 4*e^(392*I*c) + 63821889291453374150580639966248855606678360049609187640837497487744897177803607499624558112428346043806518207197608 5*e^(391*I*c) + 13243113249840274283552229381476823786728607088171617414487496895935880208608475087037023253203046498831206849875564 00*e^(390*I*c) + 27195892834837439260408051010803419212445303112546072509291927739093315232266350358156728625692966937116435210703313 94*e^(389*I*c) + 55274988490311783558612300093266682839262900821584671180006985027193799390459183442221927421457112570280409740746747 36*e^(388*I*c) + 11119499645363201080881062824886338492425375658448977935535846349290425821570383090425411418521516670371372045206568345*e^(387*I*c) + 22140735001708603270915180769241391662035578755903979148909213603822554792749183517160255571915875356439553717130797888*e^(386*I*c) + 43638300075815171025946211464465689618965773488660985857945657479854085108851857911222911989837615452608512356008400295*e^(385*I*c) + 85139533234786455779589959464900637760735729705621221380005837208369157794673049675428799817875431430246332625899630160*e^(384*I*c) + 16443750067690689274132326015439427850395456193602013359658180644935724027734944792733451710580999530009354927993127317 8*e^(383*I*c) + 31440903580822586156559543693835494544547399104312972204674722881303092520496850341856681883861186670980704079349536449 6*e^(382*I*c) + 59515761550043151494747928233654705382792608791642526349718775702941338547183543419824680709621453689544138830602723789 9*e^(381*I*c) + 11153982855456015505333280456001843179938993592179967298183407042218011956674104858469961790567335585124522385831607925 12*e^(380*I*c) + 20696982895008606434616657623738079575130194240411788719049605518294124493447224321256794179584030075511792983159473737 76*e^(379*I*c) + 38026049967058911069646206338489648070370988545101822632430305972956307603535975319743247522663891931857608782741880 13440*e^(378*I*c) + 69178389452148442784933304593613949233723338536198796373726731849428597124310663457268704220998931248907776780373699881 50*e^(377*I*c) + 1246214044053725808492859670987206685775707094312486855450094815475 68

634543080329254083403112378500178147078969869690868 16*e^(376*I*c) + 2223134
1131801535345406399037721686840208397941952580135584645966746736656716271 55
482647628299106607656492143261433939973 5*e^(375*I*c) + 392742004143298611 69
3979445162250010812274333985850072063992312119071577953597196482415987542 66
5798402445514914764678999 52*e^(374*I*c) + 687124660159856415124685861736597
4773487959171009835465278612493602307394314104957360664856300535941171276 48
95683903806088*e^(373*I*c) + 119060591849660546834765693227676449067584148 2
4888267844750482607723633344451345409512666875005729581119164335690897219 14
40*e^(372*I*c) + 20432555726518600076740271023084789645976158392276369823 54
3321283331307778304104007466937901739483676153964908169063081166 5*e^(371*I*
c) + 3473100538109352904194555605559573141295692107357459832343696599764133
747740780001730700752486545249171791289505074430582 08*e^(370*I*c) + 5847495
7368230458617938462884488332758149896988654038037889676799907561496400717 46
00811092945356635118795824799369716742109*e^(369*I*c) + 975210339444049318 7
5728231176351778667322317559445794638327926463508504100491730029590427543 31
4484853245991987547981758158 4*e^(368*I*c) + 1611092541400060525954859375264
1941783476434718370782014462624356151429445873378335135860227298495233584 36
493586042252995608*e^(367*I*c) + 26366624104307993404475222847782442837407 5
1068658140726576446671207798325606832295937705061686297930296382338892574 90
0819440*e^(366*I*c) + 4274826907720591752526711336820871500844345647922385 4
71534359333606189571832444641364132893108663576205133870672156264164115*e^(
365*I*c) + 686642533751866826266269375090895696573292457814218163062215780 2
899880874681551031136314064199948604001529894566235238597088*e^(364*I*c) +
1092721060347354481027979234784453607458889680623004111008954473160586314 61
0418173903942667485545346609740233068833184560230 2*e^(363*I*c) + 1722950282
4367647334400721998417596703948657394738805209391636597370380572398964715 08
009536681832202915219363586978409533376 0*e^(362*I*c) + 269177947010866150 97
8901202368905011051467999960217751957108662262286389847034568326941532306 11
607263444183501026198563419616*e^(361*I*c) + 41670440375390543643418219342 2
7174804003507149011908058528152249818881837590690036870123453130463316344 63
19945130196476913600*e^(360*I*c) + 6392301943376198909061480128863509812319
9445102303122616544648208998767803944455777042886552738499747183713136069 10
4651812215*e^(359*I*c) + 9717305502474268005861672246136889266114129554026 3
4930130327460835361573242683333904003089583183702191548871697022574447561 76
*e^(358*I*c) + 1463904484563511812182373827403741241916648199977469880765 98
3918627336296701422415463755339031306052975801056753556291601981 62*e^(357*I
*c) + 2185631666596493122474836409562721492124991153838287710296542833639 72
5851180904794136966381081563852446465913284544257451175 84*e^(356*I*c) + 323
4131780148410037141511382460791525763609760350584578904099377387231715370 36
573043681997163745313602400139153046673668433091*e^(355*I*c) + 474323043563
1005423773386299319662481291759769823324460180560093911540204388959031408 22
967769494019446166779954024655344116288*e^(354*I*c) + 68951844932879355990 3
2604181499741902535783400588950355896064682446805915561181703040050375636 69
880057908765898949268614772285*e^(353*I*c) + 993555653649521127226443960820
2336493864885100818925458667004440966615827904412418308556095770620395556 25

0909433322649017807 20*e^(352*I*c) + 14191644814221765738582340138989996288 2
2322333309573730716310743838935832201454293617293175086458389621425307051 75
0612129761498*e^(351*I*c) + 20094961100926877381527820856837372227279688242
990587392154460834993514676253344496707577640666906561509490149440439948228
23920*e^(350*I*c) + 2820819298562215959107529807289628449621386798989436369
393116069894018781201000275633104498398959346631795568022519974400130281*e^
(349*I*c) + 3925697658415778352768103942856011840211642769621717217996614 39
847388718607439148263854721282653827045391263454029979227032102 4*e^(348*I*c
) + 541666280405243634958559598281835795386625846164435401820515891774257 64
2534436496459675065317767780349218681730517117503201150 0*e^(347*I*c) + 7410
372612891152224364633296128043971657193280327754304382235672773781403023814
12761035556250527196904517770472605490714578496 0*e^(346*I*c) + 100522095243
695818275881549853455496780314457444999852082593854356097402724003014542468
72041775159838468077381562338745636398374*e^(345*I*c) + 1352123041194543691
5558854706851796541567399811656870021567352975326815467817846533289123871 69
60561952316961461627209922217609 92*e^(344*I*c) + 180353273381774554711775 68
594851682977978346449777193572087688510392426884519272991560851326393852241
961470040819793627127923997*e^(343*I*c) + 2385639856556280203069527817421 26
4083328215417400645945829264406094792490731373592156169015393990601751864 71
824916165737240497 44*e^(342*I*c) + 312952636881898383137727758733072603341 1
722725862950199235869563609266286606281984568906423581362297415012066892139
1878398978380*e^(341*I*c) + 407159889637019189500203483367364234205133113 59
0104852469190746528833939708053744708301562297056473122654775842560272127 62
941040*e^(340*I*c) + 525392233467407711425870923702570695360603196444395016
676104827679558002760528924321527988146079751103662249450814281218884733 24*
e^(339*I*c) + 672440879690807038237032571996630476068906104820904946194928 0
293513021597981946996638333678869390013911559464689378409541847233 6*e^(338*
I*c) + 853681184302153128482312917396737358877462018516662996003921994187 64
750086828198719872744047767783667325326289221881974987582215*e^(337*I*c) +
107504737406576916123480399169759633328321407419400510017498849830598621565
428266546315933920821527544726380201659114903834605888*e^(336*I*c) + 134297
742023479429904629616104559610096074758721068022704468938063017059688023363
436458971534964665036319889119229809973806909680*e^(335*I*c) + 166432332922
589195130558329266398753389823955737598527556096093062473559769545772321978
9693189041925727339978882309864690059708 80*e^(334*I*c) + 2046222955357291 09
519829916789867225319429705162560082648840394965423112809336591921290309392
396263834674368977840527147037426908*e^(333*I*c) + 2495930722825658663983 89
951509619202682634455487128714631461891770823201367527645793770203788784677
343934971424317987895255031936*e^(332*I*c) + 3020606380308684634611394422 79
360499718906917482524894483356220196138377050828911383056860425370161157201
493696073712322595776808*e^(331*I*c) + 3627063075638432311356991574185107 32
452420614013624168879312187645233450153927975793326834780741391203430153093
712635355523960320*e^(330*I*c) + 4321478564640869380238115618086785895947 02
047904674282297959658800170984456799067751878044806619012452636891350731618
278545690160*e^(329*I*c) + 510907615111134507452623846147137141450275722444

316385531648429230851686635827717488464500331623385777400744950538410637735
936000*e^(328*I*c) + 599378484771733474809376142401554850207064972118137572
949257503651444541939309025276896049622515630263162184526394317285457368300
*e^(327*I*c) + 697789106925924614816713747684682785083659819027952244447043
355869741368500452561164024636073401929693105801105522738405349028160*e^(32
6*I*c) + 806169671327625532424575340089775733681994991576674446922354099714
615192085443245663852257001115644286660304979476023966071898200*e^(325*I*c)
 + 924320052867522584035777495761072351222534420784861960001821020509468146
356756433795246446491396141583854513687104334429566707520*e^(324*I*c) + 105
178210042883437194450817005121918711681634976695332263718214961087500422378
4784183284961906494422955462431208645690802526770780*e^(323*I*c) + 11878179
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458727524856072950880960657564720475838500*e^(321*I*c) + 148118711708924666
246695569496567785552473031326055269082160265717621873742624552279532989146
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7333973601479008181451662522440*e^(319*I*c) + 17926490780896322989369457288
481969334964391597506285088488350622937252533420980803144316431701452190522
716124797875257437516360640*e^(318*I*c) + 1950286550780181919244992961204484
701005646036284521850167442376626632155879143691731787870223267921386828792
629466520276972292738O*e^(317*I*c) + 210614190346834430711254976120248454344
027942523524821998174104248696772627150982884376465186834879454627742236564
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241420612932076143151171960854554124144699023009842080515157923529357189869
943515991200*e^(315*I*c) + 240246459556968608612000180303421105673944558862
194614138410616288624616181514976302503083487523406726777402343341826998243
1265280*e^(314*I*c) + 253776641546503033081547174669298859606991189469722505
529283204525421755871548480964833312098074301139430153983626696733379577557
20*e^(313*I*c) + 266110064797578358382823513920144193017839664338342390358383
862547255880772382049201015537214900832745601519737141849802506685264000*e^
(312*I*c) + 277007320715076864559750728138206549792496846605452741412233982
733378377006830588348730997931598371840374087288434574638068020426O*e^(311*
I*c) + 286250312632046179777066778072564418499125562317462617567905067210088
489881193918414665734170192475905807352651434272893404508112000*e^(310*I*c)
+ 293649421435186849870323945542677110434482730626755891655087746723245515 3
286140521089582733932202553130712723836983468866230908800*e^(309*I*c) + 299
049894962254360853812938028386633519008711512485881814378761918695711190376
572397489965151855514492429034624259516727438300896O*e^(308*I*c) + 30233716
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880355791599175900623435274649772866011651006200*e^(307*I*c) + 3034408355530
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9917590062343527464977286601165100620*e^(305*I*c) + 29904989496225436085381
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426771104344827306267558916550877467232455153286140521089582733932202553130
712723836983468866230908800*e^(303*I*c) + 286250312632046179777066778072564
418499125562317462617567905067210084898811939184146657341701924759058073526
5143427289340450811200*e^(302*I*c) + 27700732071507686455975072813820654979
249684660545274141223398273337837700683058834873099793159837184037408728843
45746380680204260*e^(301*I*c) + 2661100647975783583828235139201441930178396
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7755720*e^(299*I*c) + 24024645955696860861200018030342110567394455886219461
413841061628862461618151497630250308348752340672677740234334182699824312652
80*e^(298*I*c) + 2257726219103856286812833012681573765496262241420612932076
143151171960854554124144699023009842080515157923529357189869943515991200*e^
(297*I*c) + 210614190346834430711254976120248454340279425235248219981741042
4869677262715098288437646518683487945462774223656471345899082156800*e^(296*
I*c) + 19502865507801819192449929612044870100564603628452185016744237662663
21558791436917317878702232679213868287926294665202769722927380*e^(295*I*c)
+ 1792649078089632298936945728481969334964391597506285088488350622937252533
420980803144316431701452190522716124797875257437516360640*e^(294*I*c) + 163
556974464142190065788638128907665322758017205667758745140206923435528368748
9659613913761959140773339736014790081814516625224440*e^(293*I*c) + 14811871
170892466624669556949656778555247303132605526908216026571762187374262455227
95329891464091005878304304075953693546767206080*e^(292*I*c) + 1331396114626
723035802462123531582050339749996014152452835305956367425370222758621753922
458727524856072950880960657564720475838500*e^(291*I*c) + 118781794307939031
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2229375413676535071141005286431481600*e^(290*I*c) + 10517821004288343719445
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57368300*e^(285*I*c) + 5109076151111345074526238461471371414502757224443163
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00*e^(284*I*c) + 4321478564640869380238115618086785895947020479046742822979
59658800170984456799067751878044806619012452636891350731618278545690160*e^(
283*I*c) + 3627063075638432311356991574185107324524206140136241688793121876
45233450153927975793326834780741391203430153093712635355523960320*e^(282*I*

c) + 30206063803086846346113944227936049971890691748252489448335622019613837705082891138305686042537016115720149369607371232259577680 8*e^(281*I*c) + 24959307228256586639838995150961920268263445548712871463146189177082320136752764579377020378878467734393497142431798789525503193 6*e^(280*I*c) + 20462229553572910951982991678986722531942970516256008264884039496542311280933659192129030939239626383467436897784052714703742690 8*e^(279*I*c) + 16643233292258919513055832926639875338982395573759852755609609306247355976954577232197896931890419257273399788823098646900597088 0*e^(278*I*c) + 13429774202347942990462961610455961009607475872106802270446893806301705968802336343645897153496466503631988911922980997380690968 0*e^(277*I*c) + 10750473740657691612348039916975963332832140741940051001749884983059862156542826654631593392082152754472638020165911490383460588 8*e^(276*I*c) + 85368118430215312848231291739673735887746201851666299600392199418764750086828198719872744047767783667325326289221881974987582215*e^(275*I*c) + 672440879690807038237032571996630476068906104820904946194928029351302159798194699663833367886939001391155946468937840954184723 36*e^(274*I*c) + 525392233467407711425870923702570695360603196444395016676104827679558002760528924321527988146079751103662249450814281218884733 24*e^(273*I*c) + 4071598896370191895002034833673642342051331135901048524691907465288339397080537447083015622970564731226547758425602721276294104 0*e^(272*I*c) + 31295263688189838313772775873307260334117227258629501992358695636092662866062819845689064235813622974150120668921391878398978380*e^(271*I*c) + 238563985655628020306952781742126408332821541740064594582926440609479249073137359215616901539399060175186471824916165737240497 44*e^(270*I*c) + 180353273381774554711775685948516829779783464497771935720876885103924268845192729915608513263938522419614700408197936271279239 97*e^(269*I*c) + 135212304119454369155588547068517965415673998116568700215673529753268154678178465332891238716960561952316961461627209922217609 92*e^(268*I*c) + 100522095243695818275881549853455496780314457444999852082593854356097402724003014542468720417751598384680773815623387456363983 74*e^(267*I*c) + 741037261289115222436463329612804397165719328032775430438223567277378140302381412761035556250527196904517770472605490714578496 0*e^(266*I*c) + 541666280405243634958559598281835795386625846164435401820515891774257642534436496459675065317767780349218681730517117503201150 0*e^(265*I*c) + 392569765841577835276810394285601184021164276962171721799661439847388718607439148263854721282653827045391263454029979227032102 4*e^(264*I*c) + 282081929856221595910752980728962844962138679898943636939311606989401878120100027563310449839895934663179556802251997440013028 1*e^(263*I*c) + 200949611009268773815278208568373722272796882429905873921544608349935146762533444967075776406669065615094901494404399482282392 0*e^(262*I*c) + 141916448142217657385823401389899962882232233330957373071631074383893583220145429361729317508645838962142530705175061212976149 8*e^(261*I*c) + 993555653649521127226443960820233649386488510081892545866700444096661582790441241830855609577062039555625090943332264901780720*e^(260*I*c) + 689518449328793559903260418149974190253578340058895035589606468244680591556118170304005037563669880057908765898949268614772285*e^(259*I*c) + 4743230435631005423773386299319662481291759769823324460180560093911540204388959031408

2296776949401944616677995402465534411628 8*e^(258*I*c) + 3234131780148410037
1415113824607915257636097603505845789040993773872317153703657304368199716 37
4531360240013915304667366843309 1*e^(257*I*c) + 218563166659649312247483640 9
562721492124991153838287710296542833639725851180904794136966381081563852446
4659132845442574511758 4*e^(256*I*c) + 1463904484563511812182373827403741241
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55629160198162*e^(255*I*c) + 9717305502474268005861672246136889266114129554
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5446482089987678039444557770428865527384997471837131360691046518122 15*e^(25
3*I*c) + 4167044037539054364341821934227174804003507149011908058528152249 81
8881837590690036870123453130463316344631994513019647691360 0*e^(252*I*c) + 2
691779470108661509789012023689050110514679999602177519571086622622863898470
345683269415323061160726344418350102619856341961 6*e^(251*I*c) + 17229502824
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095366818322029152193635869784095333760*e^(250*I*c) + 109272106034735448102
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534660974023306883318456023 02*e^(249*I*c) + 68664253375186682626626937509 08
956965732924578142181630622157802899880874681551031136314064199948604001529
89456623523859708 8*e^(248*I*c) + 4274826907720591752526711336820871500844 34
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4164115*e^(247*I*c) + 2636662410430799340447522284778244283740751068658140 7
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246*I*c) + 1611092541400060525954859375264194178347643471837078201446262435
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+ 392742004143298611693979445162250010812274333985850072063992312119071577 9
5359719648241598754266579840244551491476467899952*e^(238*I*c) + 22231341131
801535345406399037721686840208397941952580135584645966746736656716271554826
47628299106607656492143261433939973 5*e^(237*I*c) + 124621404405372580849285
967098720668577570709431248685545009481547568634543080329254083403112378500
178147078969869690868 16*e^(236*I*c) + 691783894521484427849333045936139492 3
372333853619879637372673184942859712431066345726870422099893124890777678037
369988150*e^(235*I*c) + 380260499670589110696462063384896480703709885451018
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34*I*c) + 206969828950086064346166576237380795751301942404117887190496055182941244934472243212567941795840300755117929831594737377 6*e^(233*I*c) + 1115398285545601550533328045600184317993899359217996729818340704221801195667410485846996179056733558512452238583160792512*e^(232*I*c) + 5951576155004315149474792823365470538279260879164252634971877570294133854718354341982468070962145368954413883060272378 99*e^(231*I*c) + 314409035808225861565595436938354945445473991043129722046747228813030925204968503418566818838611866709807040793495364496*e^(230*I*c) + 1644375006769068927413232601543942785039545619360201335965818064493572402773494479273345171058099953000935492799312731 78*e^(229*I*c) + 851395332347864557795899594649006377607357297056212213800058372083691577946730496754287998178754314302463326258996301 60*e^(228*I*c) + 436383000758151710259462114644656896189657734886609858579456574798540851088518579112229119898376154526085123560084002 95*e^(227*I*c) + 221407350017086032709151807692413916620355787559039791489092136038225547927491835171602555719158753564395537171307978 88*e^(226*I*c) + 111194996453632010808810628248863384924253756584489779355358463492904258215703830904254114185215166703713720452 06568345*e^(225*I*c) + 552749884903117835586123000932666828392629008215846711800069850271937993904591834422219274214571125702804097407467473 6*e^(224*I*c) + 271958928348374392604080510108034192124453031125460725092919277390933152322663503581567286256929669371164352107033139 4*e^(223*I*c) + 132431132498402742835522293814768237867286070881716174144874968959358802086084750870370232532030464988312068498755640 0*e^(222*I*c) + 638218892914533741505806399662488556066783600496091876408374974877448971778036074996245581124283460438065182071976085*e^(221*I*c) + 3043844711068133360102841601239063704338888284906274226525512369667909161745208577591439301401871734923949819082589 44*e^(220*I*c) + 143657687138044796942947119704259538458818199423516824674586293691056119209866358123637772245409530799230553767222252*e^(219*I*c) + 670917061305296691250198992100215765802378434622295353862950870761892978499959313606456052921309614961067075215064 32*e^(218*I*c) + 310043192060694170770693631414234874318280090981847446356786522841774394649416518125645191449180031741080776348460 14*e^(217*I*c) + 141764836528757049572020133432411179043699777966538499599025244219806351890116348156532796054977833828889327667300 80*e^(216*I*c) + 641338189585592518475823145106255638032859493851100657701521811978653639021305728401820220163109443481958402511346 5*e^(215*I*c) + 287049613141231445183467471535358943955329443080853193346608628854370924623076915139218069941340562301724775353294 4*e^(214*I*c) + 127103308293804895020136055483127034266234399127750461234230036602504674174285658044528940178665631168585902308471 6*e^(213*I*c) + 556756388711182340341026192734219546113651768317380539005893679049394714017063698565272728813669054779077208977840*e^(212*I*c) + 241246021282440061792908317783032876194801597133206052091286997043729145345755805710081489006741839439573984832678*e^(211*I*c) + 1033997554672574364898478376407537547182043944730557950014676043264198765555568738295317372110961151960056477304 80*e^(210*I*c) + 438349721429193776853786922330210637445540331009285027374804389789767469898957840709519052377834903743059345429 55*e^(209*I*c) + 183798070840033597660276492176211441160917355722166207888 61

535803449702273802588359076704241840733513439114113248*e^(208*I*c) + 762178
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67863968*e^(206*I*c) + 126759701729481291340014627604212692998648029287019O
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10303300*e^(197*I*c) + 225320532593220657767941109289516248999794521015564 1
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*e^(194*I*c) + 102716025302028890024978135168494525909715128095290606651973
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) + 420358024835146798583611210145942154684437949365647899088372524802156 22
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760*e^(182*I*c) + 147779550966171289987127451820714953621765069731830816502
336052740516776249704643402427558400256737 60*e^(181*I*c) + 4437210917843182

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45282257600*e^(172*I*c) + 483794897564340998438577918165893794068150426093403787475864371457816462454220451012304173099 00*e^(171*I*c) + 12693496932964
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528640*e^(170*I*c) + 328387476055581867672630948030673442015509858394807446
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^(168*I*c) + 210594301385648471184329078880317504953361839954159427434009884661777259752542647709150036990*e^(167*I*c) + 521909122076618242158122718542697480712928432432278947692296907200105471413341316109896360 00*e^(166*I*c)
 + 127472196165033205413563430625628473686016221408567860254458145320379041
115232422982357133 00*e^(165*I*c) + 306797429643174736419815962396246367161700641962685142614841860293485290737902165976191184 0*e^(164*I*c) + 727521010
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c) + 886275214275695728568134088576490459793534956935532181564772117253715918649147131166640 0*e^(160*I*c) + 197779298066581813565130009432623915860544
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*e^(155*I*c) + 863979933622330349556296820028395513198708064940505702126068
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157790097816049220671217212220015297133400636060*e^(153*I*c) + 349410716132
767046494779430433394502015040753351603618659160292138607786062306249 60*e^(
152*I*c) + 685299322314573668732888531161779543559294084143986635107965565231289472197279626 6*e^(151*I*c) + 132149805527130085142999386663161987442453
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46668223548266017806854592468100570289355960869613650856575756758180182223 308768*e^(148*I*c) + 854301344112621233483354066506962147247908583804136056 4550722036723654297540205*e^(147*I*c) + 15363332384449275835327345560164946 71674916578907116984548489078241693926940560*e^(146*I*c) + 2713612075032665 70734486517077181014801775322183181055638619257836143271472358*e^(145*I*c) + 4706504461113515810848735336748424310269824883831263587628309942744274586 6704*e^(144*I*c) + 80137295807907524343619649457615437614695207912107469726 75870481058674277844*e^(143*I*c) + 1339214374254245553564884406801945353385 000254030655765953770237607180089968*e^(142*I*c) + 219601281339515561500261 478844190024870555261281946058839614044697037963695*e^(141*I*c) + 353244472 06779018115378052820789411687581004582367431006205879633729015200*e^(140*I* c) + 5572551157328671121016216416307596161861955969011697222340926210112854 418*e^(139*I*c) + 861884851094991908764246805474672428603757315484453974713 612812215428992*e^(138*I*c) + 130657660226560419335121434389938961884595434 069984824307149332131747540*e^(137*I*c) + 194079792155945665935350081033032 55257745408070082431338945184797463936*e^(136*I*c) + 2823905151936586678382 525706564457280290098698638597987628380245881715*e^(135*I*c) + 402349692266 121158934003582839428785116904903936409545602519219664720*e^(134*I*c) + 561 17081076341175384087570185188538660375932013674735519055227368366*e^(133*I* c) + 7659010520187549651777118357676871927081898989131125755798204236112*e^ (132*I*c) + 102253643746829673729306586270524644969368741555986584430688870 5423*e^(131*I*c) + 13349021005202618377967331386833230353033290616324719462 7808410304*e^(130*I*c) + 17033886027390615741040977721655541665612162275485 028584310890417*e^(129*I*c) + 212370296918887131826671878122392706783994901 5727293884065388080*e^(128*I*c) + 25858534871597727015582911568419341107203 4541491364393985491350*e^(127*I*c) + 30736217404321009965231037419663053962 881035281709221697785072*e^(126*I*c) + 356476489062872401708848799668817892 9195787613958545474804845*e^(125*I*c) + 40321222595779818884084613996099562 4144491271694336796459584*e^(124*I*c) + 44456708175258821024400946210535004 523775722190977468484496*e^(123*I*c) + 477539860710085326353420773381826677 7478693412738731031680*e^(122*I*c) + 49946750655853173367158586291057270281 1545035730398749530*e^(121*I*c) + 50836369508171099437019348610847391946736 185108017183136*e^(120*I*c) + 503202490340145182407421394376601192202650700 6311982753*e^(119*I*c) + 48409341024048871865591702530366258109165912618234 4528*e^(118*I*c) + 45230940039830738332025694784646206844854827698075736*e^ (117*I*c) + 4101545439937195793959956708442496709433800261224880*e^(116*I*c) + 360688613036389349413809780004559963548775423325255*e^(115*I*c) + 30735 366512830562160991166338490057308062762518496*e^(114*I*c) + 253566746065027 9776834561566186591213109251642859*e^(113*I*c) + 20234750972446217131396664 3580234078508179838320*e^(112*I*c) + 15603911277687607099721623771744933086 920587272*e^(111*I*c) + 1161581413733971751533622511909046917188768400*e^(1 10*I*c) + 83380839911837894453136303673785039051506805*e^(109*I*c) + 576460 1046563151304213854710715346838447392*e^(108*I*c) + 38336015580105482452976 4688213114368047154*e^(107*I*c) + 24489837337812338687718622491865013839488 *e^(106*I*c) + 1500602747937397286405577818722691539392*e^(105*I*c) + 88054

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927598941411145869950813388040256*e^(104*I*c) + 4939666610818025798809586352543471345*e^(103*I*c) + 264410375780310742518099326419685040*e^(102*I*c) + 134772277995247019565792742103953 26*e^(101*I*c) + 652650253343206047453620559993840*e^(100*I*c) + 2995254774926549967525784203219 7*e^(99*I*c) + 129914664599324031816782653228 8*e^(98*I*c) + 530901272646309634700398044 75*e^(97*I*c) + 20370312594703681601319223 20*e^(96*I*c) + 730992078173355972470980 38*e^(95*I*c) + 24424556298945029838491 04*e^(94*I*c) + 755998170926701578066 39*e^(93*I*c) + 21548641447812578561 28*e^(92*I*c) + 5616944452692656226 0*e^(91*I*c) + 1327882849274858880*e^(90*I*c) + 28186192554792138*e^(89*I*c) + 530563624556832*e^(88*I*c) + 8718181624155*e^(87*I*c) + 122503723056*e^(86*I*c) + 1431118260*e^(85*I*c) + 13343760*e^(84*I*c) + 93096*e^(83*I*c) + 432*e^(82*I*c) + e^(81*I*c)))*sqrt(a)*sgn(cos(1/2*d*x + 1/2*c))/((tan(1/4*d*x + c)^4*tan(1/2*c)^8 - 14*tan(1/4*d*x + c)^4*tan(1/2*c)^6 + 24*tan(1/4*d*x + c)^3*tan(1/2*c)^7 - 6*tan(1/4*d*x + c)^2*tan(1/2*c)^8 - 56*tan(1/4*d*x + c)^3*tan(1/2*c)^5 + 84*tan(1/4*d*x + c)^2*tan(1/2*c)^6 - 24*tan(1/4*d*x + c)*tan(1/2*c)^7 + tan(1/2*c)^8 + 14*tan(1/4*d*x + c)^4*tan(1/2*c)^2 - 56*tan(1/4*d*x + c)^3*tan(1/2*c)^3 + 56*tan(1/4*d*x + c)*tan(1/2*c)^5 - 14*tan(1/2*c)^6 - tan(1/4*d*x + c)^4 + 24*tan(1/4*d*x + c)^3*tan(1/2*c) - 84*tan(1/4*d*x + c)^2*tan(1/2*c)^2 + 56*tan(1/4*d*x + c)*tan(1/2*c)^3 + 6*tan(1/4*d*x + c)^2 - 24*tan(1/4*d*x + c)*tan(1/2*c) + 14*tan(1/2*c)^2 - 1)^4*d)
```

Mupad [B] (verification not implemented)

Time = 19.64 (sec) , antiderivative size = 157, normalized size of antiderivative = 0.98

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{91\,a\,\sin\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)\,\sqrt{a+a\,\cos\left(c+d\,x\right)}-35\,a\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\sqrt{a+a\,\cos\left(c\right.}}{\frac{315\,d\,\sqrt{\cos(c+d\,x)}\,\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{8}+\frac{315\,d\,\sqrt{\cos(c+d\,x)}\,\cos\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)}{8}+\frac{105\,d\,\sqrt{\cos(c+d\,x}}{8}}$$

```
[In] int((a + a*cos(c + d*x))^(3/2)/cos(c + d*x)^(9/2),x)
```

```
[Out] (91*a*sin((3*c)/2 + (3*d*x)/2)*(a + a*cos(c + d*x))^(1/2) - 35*a*sin(c/2 + (d*x)/2)*(a + a*cos(c + d*x))^(1/2) + 26*a*sin((7*c)/2 + (7*d*x)/2)*(a + a*cos(c + d*x))^(1/2))/((315*d*cos(c + d*x)^(1/2)*cos(c/2 + (d*x)/2))/8 + (315*d*cos(c + d*x)^(1/2)*cos((3*c)/2 + (3*d*x)/2))/8 + (105*d*cos(c + d*x)^(1/2)*cos((5*c)/2 + (5*d*x)/2))/8 + (105*d*cos(c + d*x)^(1/2)*cos((7*c)/2 + (7*d*x)/2))/8)
```

3.213 $\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 200

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{163a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{64d} + \frac{163a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{64d\sqrt{a+a\cos(c+dx)}} + \frac{163a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{96d\sqrt{a+a\cos(c+dx)}} + \frac{17a^3\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{24d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{4d}$$

```
[Out] 163/64*a^(5/2)*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d+163/96*a
^3*cos(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+17/24*a^3*cos(d*x+c
)^(5/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+163/64*a^3*sin(d*x+c)*cos(d*x+c
)^(1/2)/d/(a+a*cos(d*x+c))^(1/2)+1/4*a^2*cos(d*x+c)^(5/2)*sin(d*x+c)*(a+a*c
os(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 200, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2842, 3060, 2849, 2853, 222}

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{163a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{64d} + \frac{17a^3\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{24d\sqrt{a\cos(c+dx)+a}} + \frac{163a^3\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{96d\sqrt{a\cos(c+dx)+a}} + \frac{163a^3\sin(c+dx)\sqrt{\cos(c+dx)}}{64d\sqrt{a\cos(c+dx)+a}} + \frac{a^2\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}}{4d}$$

```
[In] Int[Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (163*a^(5/2)*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(64*d
) + (163*a^3*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(64*d*Sqrt[a + a*Cos[c + d*x]
]) + (163*a^3*Cos[c + d*x]^(3/2)*Sin[c + d*x])/(96*d*Sqrt[a + a*Cos[c + d*x
]]) + (17*a^3*Cos[c + d*x]^(5/2)*Sin[c + d*x])/(24*d*Sqrt[a + a*Cos[c + d*x
]]) + (a^2*Cos[c + d*x]^(5/2)*Sqrt[a + a*Cos[c + d*x]]*Sin[c + d*x])/(4*d)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2842

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
+ n)), Int[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^n*Simp[a*b*c*(
m - 2) + b^2*d*(n + 1) + a^2*d*(m + n) - b*(b*c*(m - 1) - a*d*(3*m + 2*n -
2))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c
- a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1] &&  !LtQ[n
, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] || (IntegerQ[m] && EqQ[c
, 0]))
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 3060

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[-2*b*B*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(2*n + 3)*Sqrt[a +
b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*c - 2*a*d*(n + 1)))/(b
```

```
*d*(2*n + 3)), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
b^2, 0] && NeQ[c^2 - d^2, 0] && !LtQ[n, -1]
```

Rubi steps

$$\text{integral} = \frac{a^2\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{4d} + \frac{1}{4}\int\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\left(\frac{13a^2}{2}+\frac{17}{2}a^2\cos(c+dx)\right)dx$$

$$= \frac{17a^3\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{24d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{4d} + \frac{1}{48}(163a^2)\int\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$$

$$= \frac{163a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{96d\sqrt{a+a\cos(c+dx)}} + \frac{17a^3\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{24d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{4d} + \frac{1}{64}(163a^2)\int\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx$$

$$= \frac{163a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{64d\sqrt{a+a\cos(c+dx)}} + \frac{163a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{96d\sqrt{a+a\cos(c+dx)}} + \frac{17a^3\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{24d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{4d} + \frac{1}{128}(163a^2)\int\frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{163a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{64d\sqrt{a+a\cos(c+dx)}} + \frac{163a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{96d\sqrt{a+a\cos(c+dx)}} + \frac{17a^3\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{24d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{4d} - \frac{(163a^2)\,\text{Subst}\left(\int\frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{64d}$$

$$= \frac{163a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{64d} + \frac{163a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{64d\sqrt{a+a\cos(c+dx)}} + \frac{163a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{96d\sqrt{a+a\cos(c+dx)}} + \frac{17a^3\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{24d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{4d}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 2.99 (sec) , antiderivative size = 182, normalized size of antiderivative = 0.91

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{(a(1+\cos(c+dx)))^{5/2}\sec^4\left(\frac{1}{2}(c+dx)\right)\left(7(89+28\cos(c+dx)+3\cos(2(c+dx)))\,\text{Hypergeo}\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] ((a*(1 + Cos[c + d*x]))^(5/2)*Sec[(c + d*x)/2]^4*(7*(89 + 28*Cos[c + d*x] +
 3*Cos[2*(c + d*x)])*Hypergeometric2F1[-3/2, 1/2, 7/2, 2*Sin[(c + d*x)/2]^2
] - 24*(3 + Cos[c + d*x])*Hypergeometric2F1[-1/2, 3/2, 9/2, 2*Sin[(c + d*x)
/2]^2]*Sin[c + d*x]^2 - 6*Csc[(c + d*x)/2]^2*HypergeometricPFQ[{-1/2, 3/2,
2}, {1, 9/2}, 2*Sin[(c + d*x)/2]^2]*Sin[c + d*x]^4)*Tan[(c + d*x)/2])/(420*
d)
```

Maple [A] (verified)

Time = 12.29 (sec) , antiderivative size = 218, normalized size of antiderivative = 1.09

method	result
default	$\frac{\left(48\sin(dx+c)\left(\cos^3(dx+c)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+184\sin(dx+c)\left(\cos^2(dx+c)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+326\sin(dx+c)\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+48}{192d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+}{1+\cos(dx}}}$

```
[In] int(cos(d*x+c)^(3/2)*(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/192/d*(48*sin(d*x+c)*cos(d*x+c)^3*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+184*s
in(d*x+c)*cos(d*x+c)^2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+326*sin(d*x+c)*cos
(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+489*sin(d*x+c)*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)+489*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)))*(
a*(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^(1/2)/(1+cos(d*x+c))/(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)*a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 137, normalized size of antiderivative = 0.68

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \frac{\left(48\,a^2\cos\left(dx+c\right)^3+184\,a^2\cos\left(dx+c\right)^2+326\,a^2\cos\left(dx+c\right)+489\,a^2\right)\sqrt{a\cos\left(dx+c\right)+a}\sqrt{}}{192\left(d\cos\left(dx\right.\right.}$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/192*((48*a^2*cos(d*x + c)^3 + 184*a^2*cos(d*x + c)^2 + 326*a^2*cos(d*x +
c) + 489*a^2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*sin(d*x + c) - 48
9*(a^2*cos(d*x + c) + a^2)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(cos
(d*x + c))/(sqrt(a)*sin(d*x + c))))/(d*cos(d*x + c) + d)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(3/2)*(a+a*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 7450 vs. $2(168) = 336$.

Time = 0.76 (sec) , antiderivative size = 7450, normalized size of antiderivative = 37.25

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 1/768*(10*(cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2
*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d
*x + 4*c), cos(4*d*x + 4*c))) + 1)^(3/4)*((3*a^2*cos(4*d*x + 4*c)^2*sin(4*d
*x + 4*c) + 3*a^2*sin(4*d*x + 4*c)^3 + 12*(a^2*sin(4*d*x + 4*c)^3 + (a^2*co
s(4*d*x + 4*c)^2 - 2*a^2*cos(4*d*x + 4*c) + a^2)*sin(4*d*x + 4*c))*cos(1/2*
arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 12*(a^2*sin(4*d*x + 4*c)^3
 + (a^2*cos(4*d*x + 4*c)^2 + 2*a^2*cos(4*d*x + 4*c) + a^2)*sin(4*d*x + 4*c)
```

)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 3*(2*a^2*cos(1/2
*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + a^2*sin(4*
d*x + 4*c) - 2*(a^2*cos(4*d*x + 4*c) + a^2)*sin(1/2*arctan2(sin(4*d*x + 4*c
), cos(4*d*x + 4*c))))*cos(3/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))
 + 12*(a^2*sin(4*d*x + 4*c)^3 + (a^2*cos(4*d*x + 4*c)^2 - a^2*cos(4*d*x + 4
*c))*sin(4*d*x + 4*c))*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))
 + (8*a^2*cos(4*d*x + 4*c)^2 + 8*a^2*sin(4*d*x + 4*c)^2 - 3*a^2*cos(4*d*x +
 4*c) + 32*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - 2*a^2*cos(4*d
*x + 4*c) + a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 3
2*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 + 2*a^2*cos(4*d*x + 4*c)
 + a^2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*(16*a^2*
cos(4*d*x + 4*c)^2 + 16*a^2*sin(4*d*x + 4*c)^2 - 19*a^2*cos(4*d*x + 4*c) +
3*a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 2*(64*a^2*cos
(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + 19*a^2
*sin(4*d*x + 4*c))*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*si
n(3/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 12*(4*a^2*cos(1/2*arct
an2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c)^2 + a^2*sin(4*d*x
 + 4*c)^2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*cos(3/2*ar
ctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2
(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)) - (3*a^2*cos(4*d*x + 4*c)^3 - 8
*a^2*cos(4*d*x + 4*c)^2 + 4*(3*a^2*cos(4*d*x + 4*c)^3 - 14*a^2*cos(4*d*x +
4*c)^2 + 19*a^2*cos(4*d*x + 4*c) + (3*a^2*cos(4*d*x + 4*c) - 8*a^2)*sin(4*d
*x + 4*c)^2 - 8*a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2
 + (3*a^2*cos(4*d*x + 4*c) - 8*a^2)*sin(4*d*x + 4*c)^2 + 4*(3*a^2*cos(4*d*x
 + 4*c)^3 - 2*a^2*cos(4*d*x + 4*c)^2 - 13*a^2*cos(4*d*x + 4*c) + (3*a^2*cos
(4*d*x + 4*c) - 8*a^2)*sin(4*d*x + 4*c)^2 - 8*a^2)*sin(1/2*arctan2(sin(4*d*
x + 4*c), cos(4*d*x + 4*c)))^2 + (8*a^2*cos(4*d*x + 4*c)^2 + 8*a^2*sin(4*d*
x + 4*c)^2 - 3*a^2*cos(4*d*x + 4*c) + 32*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(
4*d*x + 4*c)^2 - 2*a^2*cos(4*d*x + 4*c) + a^2)*cos(1/2*arctan2(sin(4*d*x +
4*c), cos(4*d*x + 4*c)))^2 + 32*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4
*c)^2 + 2*a^2*cos(4*d*x + 4*c) + a^2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos
(4*d*x + 4*c)))^2 + 2*(16*a^2*cos(4*d*x + 4*c)^2 + 16*a^2*sin(4*d*x + 4*c)^
2 - 19*a^2*cos(4*d*x + 4*c) + 3*a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(
4*d*x + 4*c))) - 2*(64*a^2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*
c)))*sin(4*d*x + 4*c) + 19*a^2*sin(4*d*x + 4*c))*sin(1/2*arctan2(sin(4*d*x
+ 4*c), cos(4*d*x + 4*c))))*cos(3/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4
c))) + 4(3*a^2*cos(4*d*x + 4*c)^3 - 11*a^2*cos(4*d*x + 4*c)^2 + 8*a^2*cos
(4*d*x + 4*c) + (3*a^2*cos(4*d*x + 4*c) - 8*a^2)*sin(4*d*x + 4*c)^2)*cos(1/
2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 3*(2*a^2*cos(1/2*arctan2(s
in(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + a^2*sin(4*d*x + 4*c)
 - 2*(a^2*cos(4*d*x + 4*c) + a^2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d
*x + 4*c))))*sin(3/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 4*(4*(3
*a^2*cos(4*d*x + 4*c) - 8*a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x
+ 4*c)))*sin(4*d*x + 4*c) + (3*a^2*cos(4*d*x + 4*c) - 8*a^2)*sin(4*d*x + 4*
c))*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*sin(3/2*arctan2(s

in(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)))*sqrt(a) - 6*(cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*((3*a^2*cos(4*d*x + 4*c)^2*sin(4*d*x + 4*c) + 3*a^2*sin(4*d*x + 4*c)^3 + 3*a^2*cos(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) - 160*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 + 2*a^2*cos(4*d*x + 4*c) + a^2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^3 + 4*(3*a^2*sin(4*d*x + 4*c)^3 + 3*(a^2*cos(4*d*x + 4*c)^2 - 2*a^2*cos(4*d*x + 4*c) + a^2)*sin(4*d*x + 4*c) - 160*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - 2*a^2*cos(4*d*x + 4*c) + a^2)*sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 4*(3*a^2*sin(4*d*x + 4*c)^3 + 160*a^2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + (3*a^2*cos(4*d*x + 4*c)^2 + 6*a^2*cos(4*d*x + 4*c) + 43*a^2)*sin(4*d*x + 4*c) - 160*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 + 2*a^2*cos(4*d*x + 4*c) + a^2)*sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*(6*a^2*sin(4*d*x + 4*c)^3 + 3*a^2*cos(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + 6*(a^2*cos(4*d*x + 4*c)^2 - a^2*cos(4*d*x + 4*c))*sin(4*d*x + 4*c) - (320*a^2*cos(4*d*x + 4*c)^2 + 320*a^2*sin(4*d*x + 4*c)^2 - 317*a^2*cos(4*d*x + 4*c) - 3*a^2)*sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 2*(20*a^2*cos(4*d*x + 4*c)^2 + 26*a^2*sin(4*d*x + 4*c)^2 - 317*a^2*sin(4*d*x + 4*c)*sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 80*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - 2*a^2*cos(4*d*x + 4*c) + a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 8*(10*a^2*cos(4*d*x + 4*c)^2 + 13*a^2*sin(4*d*x + 4*c)^2 - 160*a^2*sin(4*d*x + 4*c)*sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 10*a^2*cos(4*d*x + 4*c))*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 3*(a^2*cos(4*d*x + 4*c) + a^2)*cos(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - (160*a^2*cos(4*d*x + 4*c)^2 + 160*a^2*sin(4*d*x + 4*c)^2 + 3*a^2*cos(4*d*x + 4*c))*sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)) - (3*a^2*cos(4*d*x + 4*c)^3 + 120*a^2*cos(4*d*x + 4*c)^2 - 160*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - 2*a^2*cos(4*d*x + 4*c) + a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^3 - 3*a^2*sin(4*d*x + 4*c)*sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 4*(3*a^2*cos(4*d*x + 4*c)^3 + 74*a^2*cos(4*d*x + 4*c)^2 - 197*a^2*cos(4*d*x + 4*c) + (3*a^2*cos(4*d*x + 4*c) + 80*a^2)*sin(4*d*x + 4*c)^2 + 120*a^2 - 80*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - 2*a^2*cos(4*d*x + 4*c) + a^2)*cos(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 3*(a^2*cos(4*d*x + 4*c) + 40*a^2)*sin(4*d*x + 4*c)^2 + 4*(3*a^2*cos(4*d*x + 4*c)^3 + 126*a^2*cos(4*d*x + 4*c)^2 + 243*a^2*cos(4*d*x + 4*c) + 3*(a^2*cos(4*d*x + 4*c) + 40*a^2)*sin(

4*d*x + 4*c)^2 + 120*a^2 - 40*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c
)^2 + 2*a^2*cos(4*d*x + 4*c) + a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4
*d*x + 4*c))) - 80*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 + 2*a^2
*cos(4*d*x + 4*c) + a^2)*cos(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)
)))*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*(6*a^2*cos(4
*d*x + 4*c)^3 + 214*a^2*cos(4*d*x + 4*c)^2 - 3*a^2*sin(4*d*x + 4*c)*sin(1/4
*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 240*a^2*cos(4*d*x + 4*c) +
2*(3*a^2*cos(4*d*x + 4*c) + 110*a^2)*sin(4*d*x + 4*c)^2 - (160*a^2*cos(4*d*
x + 4*c)^2 + 160*a^2*sin(4*d*x + 4*c)^2 - 157*a^2*cos(4*d*x + 4*c) - 3*a^2)
*cos(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*cos(1/2*arctan2(sin(
4*d*x + 4*c), cos(4*d*x + 4*c))) - (80*a^2*cos(4*d*x + 4*c)^2 + 80*a^2*sin(
4*d*x + 4*c)^2 + 3*a^2*cos(4*d*x + 4*c))*cos(1/4*arctan2(sin(4*d*x + 4*c),
cos(4*d*x + 4*c))) + 2*(320*a^2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x
 + 4*c)))^2*sin(4*d*x + 4*c) + 157*a^2*cos(1/4*arctan2(sin(4*d*x + 4*c), co
s(4*d*x + 4*c)))*sin(4*d*x + 4*c) + 8*(80*a^2*cos(1/4*arctan2(sin(4*d*x + 4
*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) - (3*a^2*cos(4*d*x + 4*c) + 110*a^
2)*sin(4*d*x + 4*c))*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) -
 6*(a^2*cos(4*d*x + 4*c) + 40*a^2)*sin(4*d*x + 4*c) + 3*(a^2*cos(4*d*x + 4*
c) + a^2)*sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*sin(1/2*arc
tan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*sin(1/2*arctan2(sin(1/2*arctan2(
sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos
(4*d*x + 4*c))) + 1)))*sqrt(a) + 489*((a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d
*x + 4*c)^2 + 4*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - 2*a^2*co
s(4*d*x + 4*c) + a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^
2 + 4*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 + 2*a^2*cos(4*d*x +
4*c) + a^2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 4*(a^2
*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - a^2*cos(4*d*x + 4*c))*cos(1/
2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 4*(4*a^2*cos(1/2*arctan2(s
in(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + a^2*sin(4*d*x + 4*c)
)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*arctan2(-(cos(1/2*a
rctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x +
 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x
 + 4*c))) + 1)^(1/4)*(cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos
(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1))
*sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - cos(1/4*arctan2(sin
(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x
 + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x +
4*c))) + 1))), (cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + si
n(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(si
n(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*(cos(1/4*arctan2(sin(4*d*x +
4*c), cos(4*d*x + 4*c)))*cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c),
cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) +
1)) + sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(1/2*arctan2(
sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4
*d*x + 4*c), cos(4*d*x + 4*c))) + 1))) + 1) - (a^2*cos(4*d*x + 4*c)^2 + a^2

```
*sin(4*d*x + 4*c)^2 + 4*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 -
2*a^2*cos(4*d*x + 4*c) + a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x +
 4*c)))^2 + 4*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 + 2*a^2*cos(
4*d*x + 4*c) + a^2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2
+ 4*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - a^2*cos(4*d*x + 4*c)
)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 4*(4*a^2*cos(1/2*a
rctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + a^2*sin(4*d*
x + 4*c))*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*arctan2(-(c
os(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin
(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), c
os(4*d*x + 4*c))) + 1)^(1/4)*(cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4
*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)
)) + 1))*sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - cos(1/4*arc
tan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(1/2*arctan2(sin(1/2*arctan2(s
in(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(
4*d*x + 4*c))) + 1))), (cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))
)^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*ar
ctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*(cos(1/4*arctan2(sin(
4*d*x + 4*c), cos(4*d*x + 4*c)))*cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x
+ 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4
*c))) + 1)) + sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(1/2*
arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arcta
n2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1))) - 1) - (a^2*cos(4*d*x + 4*c)
^2 + a^2*sin(4*d*x + 4*c)^2 + 4*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4
*c)^2 - 2*a^2*cos(4*d*x + 4*c) + a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos
(4*d*x + 4*c)))^2 + 4*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 + 2*
a^2*cos(4*d*x + 4*c) + a^2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4
*c)))^2 + 4*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - a^2*cos(4*d*
x + 4*c))*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 4*(4*a^2*c
os(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + a^2*
sin(4*d*x + 4*c))*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*arc
tan2((cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arct
an2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x +
4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*sin(1/2*arctan2(sin(1/2*arctan2(sin(4*d
*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x
+ 4*c))) + 1)), (cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + s
in(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(s
in(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1/2*arct
an2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c),
 cos(4*d*x + 4*c))) + 1)) + 1) + (a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x +
4*c)^2 + 4*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - 2*a^2*cos(4*d
*x + 4*c) + a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 4
*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 + 2*a^2*cos(4*d*x + 4*c)
+ a^2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 4*(a^2*cos(
4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - a^2*cos(4*d*x + 4*c))*cos(1/2*arc
```

```
tan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 4*(4*a^2*cos(1/2*arctan2(sin(4*
d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + a^2*sin(4*d*x + 4*c))*sin
(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*arctan2((cos(1/2*arctan2
(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c),
 cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c
))) + 1)^(1/4)*sin(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x
+ 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)), (cos(
1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*
d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(
4*d*x + 4*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c),
 cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) +
 1)) - 1))*sqrt(a))/((4*(cos(4*d*x + 4*c)^2 + sin(4*d*x + 4*c)^2 - 2*cos(4*
d*x + 4*c) + 1)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 4*
(cos(4*d*x + 4*c)^2 + sin(4*d*x + 4*c)^2 + 2*cos(4*d*x + 4*c) + 1)*sin(1/2*
arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + cos(4*d*x + 4*c)^2 + 4*(co
s(4*d*x + 4*c)^2 + sin(4*d*x + 4*c)^2 - cos(4*d*x + 4*c))*cos(1/2*arctan2(s
in(4*d*x + 4*c), cos(4*d*x + 4*c))) + sin(4*d*x + 4*c)^2 - 4*(4*cos(1/2*arc
tan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + sin(4*d*x + 4*
c))*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*d)
```

Giac [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}\,dx=\int (a\cos\left(dx+c\right)+a)^{\frac{5}{2}}\cos\left(dx+c\right)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^(5/2)*cos(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}\,dx=\int \cos\left(c+d\,x\right)^{3/2}\,{\left(a+a\,\cos\left(c+d\,x\right)\right)}^{5/2}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^(5/2), x)
```

3.214 $\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 160

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}\,dx = \frac{25a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d} + \frac{25a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} + \frac{13a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d}$$

```
[Out] 25/8*a^(5/2)*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d+13/12*a^3*
cos(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+25/8*a^3*sin(d*x+c)*co
s(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^(1/2)+1/3*a^2*cos(d*x+c)^(3/2)*sin(d*x+c)
*(a+a*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 160, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2842, 3060, 2849, 2853, 222}

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}\,dx = \frac{25a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{8d} + \frac{13a^3\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{12d\sqrt{a\cos(c+dx)+a}} + \frac{25a^3\sin(c+dx)\sqrt{\cos(c+dx)}}{8d\sqrt{a\cos(c+dx)+a}} + \frac{a^2\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}}{3d}$$

```
[In] Int[Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (25*a^(5/2)*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(8*d)
+ (25*a^3*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(8*d*Sqrt[a + a*Cos[c + d*x]]) +
 (13*a^3*Cos[c + d*x]^(3/2)*Sin[c + d*x])/(12*d*Sqrt[a + a*Cos[c + d*x]]) +
 (a^2*Cos[c + d*x]^(3/2)*Sqrt[a + a*Cos[c + d*x]]*Sin[c + d*x])/(3*d)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2842

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
+ n)), Int[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^n*Simp[a*b*c*(
m - 2) + b^2*d*(n + 1) + a^2*d*(m + n) - b*(b*c*(m - 1) - a*d*(3*m + 2*n -
2))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c
- a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1] &&  !LtQ[n
, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] || (IntegerQ[m] && EqQ[c
, 0]))
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 3060

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[-2*b*B*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(2*n + 3)*Sqrt[a +
b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*c - 2*a*d*(n + 1)))/(b
*d*(2*n + 3)), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^n, x], x]
```

```
/; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
b^2, 0] && NeQ[c^2 - d^2, 0] &&  !LtQ[n, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{a^2\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d} \\
&\quad+\frac{1}{3}\int\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\left(\frac{9a^2}{2}+\frac{13}{2}a^2\cos(c+dx)\right)\,dx \\
&= \frac{13a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}}+\frac{a^2\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d} \\
&\quad+\frac{1}{8}\left(25a^2\right)\int\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx \\
&= \frac{25a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}}+\frac{13a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} \\
&\quad+\frac{a^2\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d} \\
&\quad+\frac{1}{16}\left(25a^2\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{25a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}}+\frac{13a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}} \\
&\quad+\frac{a^2\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d} \\
&\quad-\frac{\left(25a^2\right)\operatorname{Subst}\left(\int\frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d} \\
&= \frac{25a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d}+\frac{25a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}} \\
&\quad+\frac{13a^3\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}}+\frac{a^2\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d}
\end{aligned}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 2.87 (sec) , antiderivative size = 182, normalized size of antiderivative = 1.14

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}\,dx = \frac{(a(1+\cos(c+dx)))^{5/2}\sec^4\left(\frac{1}{2}(c+dx)\right)\left(7(89+28\cos(c+dx)+3\cos(2(c+dx)))\,\text{Hypergeo}\right.}{}$$

[In] Integrate[Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^(5/2),x]

[Out] ((a*(1 + Cos[c + d*x]))^(5/2)*Sec[(c + d*x)/2]^4*(7*(89 + 28*Cos[c + d*x] + 3*Cos[2*(c + d*x)])*Hypergeometric2F1[-1/2, 1/2, 7/2, 2*Sin[(c + d*x)/2]^2] - 8*(3 + Cos[c + d*x])*Hypergeometric2F1[1/2, 3/2, 9/2, 2*Sin[(c + d*x)/2]^2]*Sin[c + d*x]^2 - 2*Csc[(c + d*x)/2]^2*HypergeometricPFQ[{1/2, 3/2, 2}, {1, 9/2}, 2*Sin[(c + d*x)/2]^2]*Sin[c + d*x]^4)*Tan[(c + d*x)/2])/(420*d)

Maple [A] (verified)

Time = 12.50 (sec) , antiderivative size = 183, normalized size of antiderivative = 1.14

method	result
default	$\frac{\left(8\sin(dx+c)(\cos^2(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+34\sin(dx+c)\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+75\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+75\arctan\left(\tan(dx+\right.\right.}{24d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$

[In] int(cos(d*x+c)^(1/2)*(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)

[Out] 1/24/d*(8*sin(d*x+c)*cos(d*x+c)^2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+34*sin(d*x+c)*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+75*sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+75*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)))*(a*(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^(1/2)/(1+cos(d*x+c))/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 124, normalized size of antiderivative = 0.78

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}\,dx = \frac{\left(8\,a^2\cos\left(dx+c\right)^2+34\,a^2\cos\left(dx+c\right)+75\,a^2\right)\sqrt{a\cos\left(dx+c\right)+a}\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)}{24\left(d\cos\left(dx+c\right)+d\right)}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/24*((8*a^2*cos(d*x + c)^2 + 34*a^2*cos(d*x + c) + 75*a^2)*sqrt(a*cos(d*x
+ c) + a)*sqrt(cos(d*x + c))*sin(d*x + c) - 75*(a^2*cos(d*x + c) + a^2)*sqr
t(a)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x +
c))))/(d*cos(d*x + c) + d)
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(1/2)*(a+a*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1964 vs. $2(134) = 268$.

Time = 0.56 (sec) , antiderivative size = 1964, normalized size of antiderivative = 12.28

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 1/96*(4*(a^2*cos(3/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x +
3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1))*sin(3*d*
x + 3*c) - (a^2*cos(3*d*x + 3*c) - a^2)*sin(3/2*arctan2(sin(2/3*arctan2(sin
(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*
d*x + 3*c))) + 1)))*(cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2
 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arcta
n2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(3/4)*sqrt(a) + 30*(cos(2/3*ar
ctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x +
3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x
+ 3*c))) + 1)^(1/4)*((a^2*sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c
))) + 5*a^2*sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))))*cos(1/2*a
rctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan
2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)) - (a^2*cos(2/3*arctan2(sin(3*d
*x + 3*c), cos(3*d*x + 3*c))) + 3*a^2*cos(1/3*arctan2(sin(3*d*x + 3*c), cos
(3*d*x + 3*c))) - 4*a^2)*sin(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c),
cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) +
1)))*sqrt(a) + 75*(a^2*arctan2(-(cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*
x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*c
```

os(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*(cos(1/2*arc
tan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(
sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1))*sin(1/3*arctan2(sin(3*d*x + 3*c)
, cos(3*d*x + 3*c))) - cos(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))
*sin(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(
2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1))), (cos(2/3*arctan2(s
in(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), c
os(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))
) + 1)^(1/4)*(cos(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))*cos(1/2*
arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arcta
n2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)) + sin(1/3*arctan2(sin(3*d*x +
 3*c), cos(3*d*x + 3*c)))*sin(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c),
 cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) +
 1))) + 1) - a^2*arctan2(-(cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*
c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3
*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*(cos(1/2*arctan2(s
in(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*
d*x + 3*c), cos(3*d*x + 3*c))) + 1))*sin(1/3*arctan2(sin(3*d*x + 3*c), cos(
3*d*x + 3*c))) - cos(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))*sin(1
/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*ar
ctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1))), (cos(2/3*arctan2(sin(3*d
*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d
*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)
^(1/4)*(cos(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))*cos(1/2*arctan
2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin
(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)) + sin(1/3*arctan2(sin(3*d*x + 3*c),
 cos(3*d*x + 3*c)))*sin(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3
*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)))
- 1) - a^2*arctan2((cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2
+ sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan
2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*sin(1/2*arctan2(sin(2/3*a
rctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*
c), cos(3*d*x + 3*c))) + 1)), (cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x
+ 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos
(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*cos(1/2*arctan
2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin
(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)) + 1) + a^2*arctan2((cos(2/3*arctan2
(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c),
 cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c
))) + 1)^(1/4)*sin(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x
+ 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)), (cos(
2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*
d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(
3*d*x + 3*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c),
 cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) +

```
1)) - 1))*sqrt(a))/d
```

Giac [F]

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}\,dx=\int (a\cos(dx+c)+a)^{\frac{5}{2}}\sqrt{\cos(dx+c)}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^(5/2)*sqrt(cos(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}\,dx=\int \sqrt{\cos(c+d\,x)}\,(a+a\,\cos(c+d\,x))^{5/2}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^(5/2), x)
```

3.215 $\int \frac{(a+a\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 120

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx = \frac{19a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d} + \frac{9a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{2d}$$

```
[Out] 19/4*a^(5/2)*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d+9/4*a^3*si
n(d*x+c)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^(1/2)+1/2*a^2*sin(d*x+c)*cos(d
*x+c)^(1/2)*(a+a*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 120, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2842, 3060, 2853, 222}

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx = \frac{19a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{4d} + \frac{9a^3\sin(c+dx)\sqrt{\cos(c+dx)}}{4d\sqrt{a\cos(c+dx)+a}} + \frac{a^2\sin(c+dx)\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}{2d}$$

```
[In] Int[(a + a*Cos[c + d*x])^(5/2)/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (19*a^(5/2)*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(4*d)
+ (9*a^3*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(4*d*Sqrt[a + a*Cos[c + d*x]]) +
(a^2*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]]*Sin[c + d*x])/(2*d)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2842

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
+ n)), Int[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^n*Simp[a*b*c*(
m - 2) + b^2*d*(n + 1) + a^2*d*(m + n) - b*(b*c*(m - 1) - a*d*(3*m + 2*n -
2))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c
- a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1] &&  !LtQ[n
, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] || (IntegerQ[m] && EqQ[c
, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 3060

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[-2*b*B*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(2*n + 3)*Sqrt[a +
b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*c - 2*a*d*(n + 1)))/(b
*d*(2*n + 3)), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
b^2, 0] && NeQ[c^2 - d^2, 0] &&  !LtQ[n, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{a^2\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{2d} \\
&\quad + \frac{1}{2}\int \frac{\sqrt{a+a\cos(c+dx)}\left(\frac{5a^2}{2}+\frac{9}{2}a^2\cos(c+dx)\right)}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{9a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{2d} \\
&\quad + \frac{1}{8}\left(19a^2\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx
\end{aligned}
$$

$$= \frac{9a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{2d} - \frac{(19a^2)\,\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d}$$

$$= \frac{19a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d} + \frac{9a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{a^2\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{2d}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 2.80 (sec) , antiderivative size = 182, normalized size of antiderivative = 1.52

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx = \frac{(a(1+\cos(c+dx)))^{5/2}\sec^4\left(\frac{1}{2}(c+dx)\right)\left(7(89+28\cos(c+dx)+3\cos(2(c+\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(5/2)/Sqrt[Cos[c + d*x]],x]
```

```
[Out] ((a*(1 + Cos[c + d*x]))^(5/2)*Sec[(c + d*x)/2]^4*(7*(89 + 28*Cos[c + d*x] +
 3*Cos[2*(c + d*x)])*Hypergeometric2F1[1/2, 1/2, 7/2, 2*Sin[(c + d*x)/2]^2]
 + 8*(3 + Cos[c + d*x])*Hypergeometric2F1[3/2, 3/2, 9/2, 2*Sin[(c + d*x)/2]
^2]*Sin[c + d*x]^2 + 2*Csc[(c + d*x)/2]^2*HypergeometricPFQ[{3/2, 3/2, 2},
{1, 9/2}, 2*Sin[(c + d*x)/2]^2]*Sin[c + d*x]^4)*Tan[(c + d*x)/2])/(420*d)
```

Maple [A] (verified)

Time = 13.84 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.43

method	result
default	$\frac{\left(2\left(\cos^2(dx+c)\right)\sin(dx+c)+19\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)+11\cos(dx+c)\sin(dx+c)+19\sqrt{\frac{\cos(dx-}{1+\cos(dx}}\right.}{4d\sqrt{\cos(dx+c)}\,(1+\cos(dx+c))}$

```
[In] int((a+cos(d*x+c)*a)^(5/2)/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/d*(2*cos(d*x+c)^2*sin(d*x+c)+19*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))+11*cos(d*x+c)*si
n(d*x+c)+19*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)))*(a*(1+cos(d*x+c)))^(1/2)/cos(d*x+c)^(1/2)/(1+cos(d
*x+c))*a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.92

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx = \frac{(2\,a^2\cos{(dx+c)}+11\,a^2)\sqrt{a\cos{(dx+c)}+a}\sqrt{\cos{(dx+c)}}\sin{(dx+c)}-19}{4\,(d\cos{(dx+c)}+d)}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/4*((2*a^2*cos(d*x + c) + 11*a^2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x +
c))*sin(d*x + c) - 19*(a^2*cos(d*x + c) + a^2)*sqrt(a)*arctan(sqrt(a*cos(d*
x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))))/(d*cos(d*x + c) + d
)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(5/2)/cos(d*x+c)**(1/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1106 vs. $2(100) = 200$.

Time = 0.47 (sec) , antiderivative size = 1106, normalized size of antiderivative = 9.22

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/16*(2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^
(1/4)*((a^2*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(2*d*x
+ 2*c) + a^2*sin(2*d*x + 2*c) - (a^2*cos(2*d*x + 2*c) - 10*a^2)*sin(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))))*cos(1/2*arctan2(sin(2*d*x + 2*c)
, cos(2*d*x + 2*c) + 1)) + (a^2*sin(2*d*x + 2*c)*sin(1/2*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c))) - a^2*cos(2*d*x + 2*c) + 10*a^2 + (a^2*cos(2*d*x
 + 2*c) - 10*a^2)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))))*sin
(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)))*sqrt(a) + 19*(a^2*ar
```

```
ctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1
/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/2*arctan2(s
in(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - cos(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4
)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*cos(1/2*arctan2
(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), c
os(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))))
 + 1) - a^2*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x
+ 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin
(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - cos(1/2*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c)))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x +
2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*c
os(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c)))) - 1) - a^2*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2
+ 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c
) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1)
+ a^2*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c)
 + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (cos(
2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1))*sqrt(a))/d
```

Giac [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx=\text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(1/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx=\int \frac{(a+a\,\cos\left(c+d\,x\right))^{5/2}}{\sqrt{\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(5/2)/cos(c + d*x)^(1/2),x)
[Out] int((a + a*cos(c + d*x))^(5/2)/cos(c + d*x)^(1/2), x)
```

3.216 $\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 114

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{5a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} - \frac{a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[Out] 5*a^(5/2)*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d-a^3*sin(d*x+c
)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^(1/2)+2*a^2*sin(d*x+c)*(a+a*cos(d*x+c
))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2841, 3060, 2853, 222}

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{5a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{d} - \frac{a^3\sin(c+dx)\sqrt{\cos(c+dx)}}{d\sqrt{a\cos(c+dx)+a}} + \frac{2a^2\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(3/2),x]
```

```
[Out] (5*a^(5/2)*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/d - (a^
3*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(d*Sqrt[a + a*Cos[c + d*x]]) + (2*a^2*Sq
rt[a + a*Cos[c + d*x]]*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 3060

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[-2*b*B*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(2*n + 3)*Sqrt[a +
b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*c - 2*a*d*(n + 1)))/(b
*d*(2*n + 3)), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
b^2, 0] && NeQ[c^2 - d^2, 0] &&  !LtQ[n, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} \\
&\quad -(2a)\int\frac{\left(-\frac{3a}{2}+\frac{1}{2}a\cos(c+dx)\right)\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx \\
&= -\frac{a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} \\
&\quad +\frac{1}{2}\left(5a^2\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx
\end{aligned}$$

$$= -\frac{a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} - \frac{(5a^2)\,\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

$$= \frac{5a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} - \frac{a^3\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 2.78 (sec) , antiderivative size = 182, normalized size of antiderivative = 1.60

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{(a(1+\cos(c+dx)))^{5/2}\sec^4\left(\frac{1}{2}(c+dx)\right)\left(7(89+28\cos(c+dx)+3\cos(2(c+d\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(3/2),x]
```

```
[Out] ((a*(1 + Cos[c + d*x]))^(5/2)*Sec[(c + d*x)/2]^4*(7*(89 + 28*Cos[c + d*x] +
 3*Cos[2*(c + d*x)])*Hypergeometric2F1[1/2, 3/2, 7/2, 2*Sin[(c + d*x)/2]^2]
 + 24*(3 + Cos[c + d*x])*Hypergeometric2F1[3/2, 5/2, 9/2, 2*Sin[(c + d*x)/2
]^2]*Sin[c + d*x]^2 + 6*Csc[(c + d*x)/2]^2*HypergeometricPFQ[{3/2, 2, 5/2},
 {1, 9/2}, 2*Sin[(c + d*x)/2]^2]*Sin[c + d*x]^4)*Tan[(c + d*x)/2])/(420*d)
```

Maple [A] (verified)

Time = 13.94 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.42

method	result
default	$\frac{\left(5\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)+\cos(dx+c)\sin(dx+c)+5\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right.\right.}{d(1+\cos(dx+c))\sqrt{\cos(dx+c)}}$

```
[In] int((a+cos(d*x+c)*a)^(5/2)/cos(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(5*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(tan(d*x+c)*(cos(
d*x+c)/(1+cos(d*x+c)))^(1/2))+cos(d*x+c)*sin(d*x+c)+5*(cos(d*x+c)/(1+cos(d*
x+c)))^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))+2*sin(d*x
+c))*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))/cos(d*x+c)^(1/2)*a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 127, normalized size of antiderivative = 1.11

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{\left(a^2\cos\left(dx+c\right)+2\,a^2\right)\sqrt{a\cos\left(dx+c\right)+a}\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-5\,(a^2}{d\cos\left(dx+c\right)^2+d\,c}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] ((a^2*cos(d*x + c) + 2*a^2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*sin
(d*x + c) - 5*(a^2*cos(d*x + c)^2 + a^2*cos(d*x + c))*sqrt(a)*arctan(sqrt(a
*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))))/(d*cos(d*x +
 c)^2 + d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(5/2)/cos(d*x+c)**(3/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 973 vs. 2(100) = 200.

Time = 0.50 (sec) , antiderivative size = 973, normalized size of antiderivative = 8.54

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/4*(2*(a^2*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*
x + c) - (a^2*cos(d*x + c) - a^2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c) + 1)))*sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x
 + 2*c) + 1)*sqrt(a) + 5*(a^2*arctan2(-(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*
c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c) + 1))*sin(d*x + c) - cos(d*x + c)*sin(1/2*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c) + 1))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 +
2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(d*x + c)*cos(1/2*arctan2(sin(2*d*x + 2*c
```

```
), cos(2*d*x + 2*c) + 1)) + sin(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c),
cos(2*d*x + 2*c) + 1))) + 1) - a^2*arctan2(-(cos(2*d*x + 2*c)^2 + sin(2*d*x
 + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c)
, cos(2*d*x + 2*c) + 1))*sin(d*x + c) - cos(d*x + c)*sin(1/2*arctan2(sin(2*
d*x + 2*c), cos(2*d*x + 2*c) + 1))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)
^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(d*x + c)*cos(1/2*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c) + 1)) + sin(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c) + 1))) - 1) - a^2*arctan2((cos(2*d*x + 2*c)^2 + sin(2
*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*c
os(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c) + 1)) + 1) + a^2*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*co
s(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c
) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)
^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1))*(cos(
2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sqrt(a)
 + 8*(a^2*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x
+ c) - (a^2*cos(d*x + c) - a^2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c) + 1)))*sqrt(a))/((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2
*d*x + 2*c) + 1)^(1/4)*d)
```

Giac [F(-1)]

Timed out.

$$\int \frac{(a + a\cos(c + dx))^{5/2}}{\cos^{\frac{3}{2}}(c + dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(3/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a + a\cos(c + dx))^{5/2}}{\cos^{\frac{3}{2}}(c + dx)}\,dx = \int \frac{(a + a\,\cos(c + d\,x))^{5/2}}{\cos(c + d\,x)^{3/2}}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(5/2)/cos(c + d*x)^(3/2),x)
[Out] int((a + a*cos(c + d*x))^(5/2)/cos(c + d*x)^(3/2), x)
```

3.217 $\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 118

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} + \frac{14a^3\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 2*a^(5/2)*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d+14/3*a^3*sin(
d*x+c)/d/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2)+2/3*a^2*sin(d*x+c)*(a+a*co
s(d*x+c))^(1/2)/d/cos(d*x+c)^(3/2)
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2841, 3059, 2853, 222}

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{d} + \frac{14a^3\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}} + \frac{2a^2\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{3d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Int[(a + a*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(5/2),x]
```

```
[Out] (2*a^(5/2)*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/d + (14
*a^3*Sin[c + d*x])/(3*d*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]]) + (2*a
^2*Sqrt[a + a*Cos[c + d*x]]*Sin[c + d*x])/(3*d*Cos[c + d*x]^(3/2))
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 3059

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[(-b^2)*(B*c - A*d)*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)
*(b*c + a*d)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*
c - 2*a*d*(n + 1)))/(2*d*(n + 1)*(b*c + a*d)), Int[Sqrt[a + b*Sin[e + f*x]]
*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} \\ &\quad -\frac{1}{3}(2a)\int\frac{\left(-\frac{7a}{2}-\frac{3}{2}a\cos(c+dx)\right)\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\ &= \frac{14a^3\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} \\ &\quad +\frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+a^2\int\frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx\end{aligned}$$

$$= \frac{14a^3\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} - \frac{(2a^2)\operatorname{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

$$= \frac{2a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} + \frac{14a^3\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 8.94 (sec) , antiderivative size = 356, normalized size of antiderivative = 3.02

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{(a(1+\cos(c+dx)))^{5/2}\csc^3\left(\frac{c}{2}+\frac{dx}{2}\right)\sec^5\left(\frac{c}{2}+\frac{dx}{2}\right)\left(256\cos^4\left(\frac{1}{2}(c+dx)\right)\ {}_3F\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(5/2),x]
```

```
[Out] ((a*(1 + Cos[c + d*x]))^(5/2)*Csc[c/2 + (d*x)/2]^3*Sec[c/2 + (d*x)/2]^5*(25
6*Cos[(c + d*x)/2]^4*HypergeometricPFQ[{3/2, 2, 7/2}, {1, 9/2}, 2*Sin[c/2 +
 (d*x)/2]^2]*Sin[c/2 + (d*x)/2]^6 + 512*Hypergeometric2F1[3/2, 7/2, 9/2, 2*
Sin[c/2 + (d*x)/2]^2]*Sin[c/2 + (d*x)/2]^6*(2 - 3*Sin[c/2 + (d*x)/2]^2 + Si
n[c/2 + (d*x)/2]^4) + (21*Sqrt[2]*ArcSin[Sqrt[2]*Sqrt[Sin[c/2 + (d*x)/2]^2]
]*(15 - 10*Sin[c/2 + (d*x)/2]^2 + 3*Sin[c/2 + (d*x)/2]^4))/Sqrt[Sin[c/2 + (
d*x)/2]^2] - 14*Sqrt[1 - 2*Sin[c/2 + (d*x)/2]^2]*(45 + 30*Sin[c/2 + (d*x)/2
]^2 - 31*Sin[c/2 + (d*x)/2]^4 + 12*Sin[c/2 + (d*x)/2]^6)))/(672*d)
```

Maple [A] (verified)

Time = 5.56 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.44

method	result
default	$\frac{2\left(3\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,(\cos^2(dx+c))\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)+3\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\right.}{3d(1+\cos(dx+c))\cos(dx+c)^{\frac{3}{2}}}$

```
[In] int((a+cos(d*x+c)*a)^(5/2)/cos(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3/d*(3*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*arctan(tan(d*x+c)*(
cos(d*x+c)/(1+cos(d*x+c)))^(1/2))+3*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))+8*cos(d*x+c)*sin
(d*x+c)+sin(d*x+c))*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))/cos(d*x+c)^(3/2
)*a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.11

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2\left(\left(8\,a^2\cos\left(dx+c\right)+a^2\right)\sqrt{a\cos\left(dx+c\right)+a}\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-3\,(\cdots}{3\,\left(d\cos\left(dx+c\right)^3+\cdots\right.}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 2/3*((8*a^2*cos(d*x + c) + a^2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))
*sin(d*x + c) - 3*(a^2*cos(d*x + c)^3 + a^2*cos(d*x + c)^2)*sqrt(a)*arctan(
sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))))/(d*cos
(d*x + c)^3 + d*cos(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(5/2)/cos(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1395 vs. 2(100) = 200.

Time = 0.48 (sec) , antiderivative size = 1395, normalized size of antiderivative = 11.82

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/6*(30*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^
(3/4)*a^(5/2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 2*
```

```
(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*((
12*a^2*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(2*d*x + 2*c
) - 3*a^2*sin(2*d*x + 2*c) - 4*(3*a^2*cos(2*d*x + 2*c) + 4*a^2)*sin(3/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))))*cos(3/2*arctan2(sin(2*d*x + 2*c)
, cos(2*d*x + 2*c) + 1)) + (12*a^2*sin(2*d*x + 2*c)*sin(3/2*arctan2(sin(2*d
*x + 2*c), cos(2*d*x + 2*c))) + 3*a^2*cos(2*d*x + 2*c) - a^2 + 4*(3*a^2*cos
(2*d*x + 2*c) + 4*a^2)*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
)*sin(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)))*sqrt(a) + 3*((a
^2*cos(2*d*x + 2*c)^2 + a^2*sin(2*d*x + 2*c)^2 + 2*a^2*cos(2*d*x + 2*c) + a
^2)*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) +
 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - cos(1/2*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c)))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1
)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*cos(1/2*a
rctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c)))) + 1) - (a^2*cos(2*d*x + 2*c)^2 + a^2*sin(2*d*x + 2*c)^2 + 2*a^2*cos(
2*d*x + 2*c) + a^2)*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*co
s(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c)))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - cos(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c)))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(
2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
 + 1))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c)))) - 1) - (a^2*cos(2*d*x + 2*c)^2 + a^2*sin(2*d*x + 2*c
)^2 + 2*a^2*cos(2*d*x + 2*c) + a^2)*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x
 + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2
*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
 1)) + 1) + (a^2*cos(2*d*x + 2*c)^2 + a^2*sin(2*d*x + 2*c)^2 + 2*a^2*cos(2*
d*x + 2*c) + a^2)*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(
2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
+ 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(
1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1))*sqrt(a)
)/((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*d)
```

Giac [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(5/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{\left(a+a\,\cos\left(c+d\,x\right)\right)^{5/2}}{\cos\left(c+d\,x\right)^{5/2}}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(5/2)/cos(c + d*x)^(5/2),x)
[Out] int((a + a*cos(c + d*x))^(5/2)/cos(c + d*x)^(5/2), x)
```

3.218 $\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)} dx$

Optimal result

Integrand size = 25, antiderivative size = 121

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)} dx = \frac{22a^3\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{86a^3\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}$$

```
[Out] 22/15*a^3*sin(d*x+c)/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2)+86/15*a^3*si
n(d*x+c)/d/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2)+2/5*a^2*sin(d*x+c)*(a+a*
cos(d*x+c))^(1/2)/d/cos(d*x+c)^(5/2)
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.120$, Rules used = {2841, 3059, 2850}

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)} dx = \frac{22a^3\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{86a^3\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}} + \frac{2a^2\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{5d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Int[(a + a*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(7/2),x]
```

```
[Out] (22*a^3*Sin[c + d*x])/(15*d*Cos[c + d*x]^(3/2)*Sqrt[a + a*Cos[c + d*x]]) +
(86*a^3*Sin[c + d*x])/(15*d*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]]) +
(2*a^2*Sqrt[a + a*Cos[c + d*x]]*Sin[c + d*x])/(5*d*Cos[c + d*x]^(5/2))
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3059

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[(-b^2)*(B*c - A*d)*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)
*(b*c + a*d)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*
c - 2*a*d*(n + 1)))/(2*d*(n + 1)*(b*c + a*d)), Int[Sqrt[a + b*Sin[e + f*x]]
*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} \\
&\quad -\frac{1}{5}(2a)\int\frac{\left(-\frac{11a}{2}-\frac{7}{2}a\cos(c+dx)\right)\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{22a^3\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} \\
&\quad +\frac{1}{15}\left(43a^2\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx
\end{aligned}
$$

$$= \frac{22a^3\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{86a^3\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.53

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{a^2\sqrt{a(1+\cos(c+dx))}(49+28\cos(c+dx)+43\cos(2(c+dx)))\tan\left(\frac{1}{2}(c+\right.}{15d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(7/2),x]
[Out] (a^2*Sqrt[a*(1 + Cos[c + d*x])]*(49 + 28*Cos[c + d*x] + 43*Cos[2*(c + d*x)]
)*Tan[(c + d*x)/2])/(15*d*Cos[c + d*x]^(5/2))
```

Maple [A] (verified)

Time = 5.09 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.54

method	result	size
default	$\frac{2\sin(dx+c)\left(43\left(\cos^2(dx+c)\right)+14\cos(dx+c)+3\right)\sqrt{a(1+\cos(dx+c))}\,a^2}{15d(1+\cos(dx+c))\cos(dx+c)^{\frac{5}{2}}}$	65

```
[In] int((a+cos(d*x+c)*a)^(5/2)/cos(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
[Out] 2/15/d*sin(d*x+c)*(43*cos(d*x+c)^2+14*cos(d*x+c)+3)*(a*(1+cos(d*x+c)))^(1/2
)/(1+cos(d*x+c))/cos(d*x+c)^(5/2)*a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.67

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2\left(43\,a^2\cos(dx+c)^2+14\,a^2\cos(dx+c)+3\,a^2\right)\sqrt{a\cos(dx+c)+a}\sqrt{\cos(c}}{15\left(d\cos(dx+c)^4+d\cos(dx+c)^3\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(7/2),x, algorithm="fricas")
[Out] 2/15*(43*a^2*cos(d*x + c)^2 + 14*a^2*cos(d*x + c) + 3*a^2)*sqrt(a*cos(d*x +
 c) + a)*sqrt(cos(d*x + c))*sin(d*x + c)/(d*cos(d*x + c)^4 + d*cos(d*x + c)
^3)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(5/2)/cos(d*x+c)**(7/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.25

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{8\left(\frac{15\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)}{\cos(dx+c)+1} - \frac{35\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^3}{(\cos(dx+c)+1)^3} + \frac{28\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^5}{(\cos(dx+c)+1)^5} - \frac{8\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^7}{(\cos(dx+c)+1)^7}\right)}{15\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{7}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{7}{2}}}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(7/2),x, algorithm="maxima")
```

```
[Out] 8/15*(15*sqrt(2)*a^(5/2)*sin(d*x + c)/(cos(d*x + c) + 1) - 35*sqrt(2)*a^(5/
2)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 28*sqrt(2)*a^(5/2)*sin(d*x + c)^5/
(cos(d*x + c) + 1)^5 - 8*sqrt(2)*a^(5/2)*sin(d*x + c)^7/(cos(d*x + c) + 1)^
7)/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(7/2)*(-sin(d*x + c)/(cos(d*x +
 c) + 1) + 1)^(7/2))
```

Giac [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(7/2),x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [B] (verification not implemented)

Time = 16.35 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.12

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2\,a^2\,\sqrt{a\,\left(\cos\left(c+d\,x\right)+1\right)}\,\left(98\,\sin\left(c+d\,x\right)+56\,\sin\left(2\,c+2\,d\,x\right)+141\,\sin\left(3\right.\right.}{15\,d\,\sqrt{\cos\left(c+d\,x\right)}\,\left(10\,\cos\left(c+d\,x\right)+8\,\cos\left(2\,c+2\,d\,x\right)+5\,\cos\left(3\,c+\right.\right.}$$

```
[In] int((a + a*cos(c + d*x))^(5/2)/cos(c + d*x)^(7/2),x)
```

```
[Out] (2*a^2*(a*(cos(c + d*x) + 1))^(1/2)*(98*sin(c + d*x) + 56*sin(2*c + 2*d*x)
+ 141*sin(3*c + 3*d*x) + 28*sin(4*c + 4*d*x) + 43*sin(5*c + 5*d*x)))/(15*d*
cos(c + d*x)^(1/2)*(10*cos(c + d*x) + 8*cos(2*c + 2*d*x) + 5*cos(3*c + 3*d*
x) + 2*cos(4*c + 4*d*x) + cos(5*c + 5*d*x) + 6))
```

3.219 $\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 161

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{6a^3\sin(c+dx)}{7d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{46a^3\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{92a^3\sin(c+dx)}{21d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)}$$

```
[Out] 6/7*a^3*sin(d*x+c)/d/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(1/2)+46/21*a^3*sin(
d*x+c)/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2)+92/21*a^3*sin(d*x+c)/d/cos
(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2)+2/7*a^2*sin(d*x+c)*(a+a*cos(d*x+c))^(1
/2)/d/cos(d*x+c)^(7/2)
```

Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2841, 3059, 2851, 2850}

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{46a^3\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{6a^3\sin(c+dx)}{7d\cos^{\frac{5}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{92a^3\sin(c+dx)}{21d\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}} + \frac{2a^2\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{7d\cos^{\frac{7}{2}}(c+dx)}$$

```
[In] Int[(a + a*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(9/2),x]
```

```
[Out] (6*a^3*Sin[c + d*x])/(7*d*Cos[c + d*x]^(5/2)*Sqrt[a + a*Cos[c + d*x]]) + (4
6*a^3*Sin[c + d*x])/(21*d*Cos[c + d*x]^(3/2)*Sqrt[a + a*Cos[c + d*x]]) + (9
2*a^3*Sin[c + d*x])/(21*d*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]]) + (2
*a^2*Sqrt[a + a*Cos[c + d*x]]*Sin[c + d*x])/(7*d*Cos[c + d*x]^(7/2))
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rule 3059

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[(-b^2)*(B*c - A*d)*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)
*(b*c + a*d)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*
c - 2*a*d*(n + 1)))/(2*d*(n + 1)*(b*c + a*d)), Int[Sqrt[a + b*Sin[e + f*x]]
*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} \\
&\quad -\frac{1}{7}(2a)\int\frac{\left(-\frac{15a}{2}-\frac{11}{2}a\cos(c+dx)\right)\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx \\
&= \frac{6a^3\sin(c+dx)}{7d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} \\
&\quad +\frac{1}{7}\left(23a^2\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{6a^3\sin(c+dx)}{7d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}+\frac{46a^3\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} \\
&\quad +\frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)}+\frac{1}{21}\left(46a^2\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{6a^3\sin(c+dx)}{7d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}+\frac{46a^3\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} \\
&\quad +\frac{92a^3\sin(c+dx)}{21d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 5.18 (sec) , antiderivative size = 74, normalized size of antiderivative = 0.46

$$
\int\frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx=\frac{a^2\sqrt{a(1+\cos(c+dx))}(29+93\cos(c+dx)+23\cos(2(c+dx))+23\cos(3(c-
}{21d\cos^{\frac{7}{2}}(c+dx)}
$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(9/2),x]

[Out] (a^2*Sqrt[a*(1 + Cos[c + d*x])]*(29 + 93*Cos[c + d*x] + 23*Cos[2*(c + d*x)]
 + 23*Cos[3*(c + d*x)])*Tan[(c + d*x)/2])/(21*d*Cos[c + d*x]^(7/2))
```

Maple [A] (verified)

Time = 5.49 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.47

method	result	size
default	$\frac{2\sin(dx+c)\left(46\left(\cos^{3}(dx+c)\right)+23\left(\cos^{2}(dx+c)\right)+12\cos(dx+c)+3\right)\sqrt{a(1+\cos(dx+c))}\,a^{2}}{21d(1+\cos(dx+c))\cos(dx+c)^{\frac{7}{2}}}$	75

```
[In] int((a+cos(d*x+c)*a)^(5/2)/cos(d*x+c)^(9/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/21/d*sin(d*x+c)*(46*cos(d*x+c)^3+23*cos(d*x+c)^2+12*cos(d*x+c)+3)*(a*(1+c
os(d*x+c)))^(1/2)/(1+cos(d*x+c))/cos(d*x+c)^(7/2)*a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.58

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{2\left(46\,a^{2}\cos\left(dx+c\right)^{3}+23\,a^{2}\cos\left(dx+c\right)^{2}+12\,a^{2}\cos\left(dx+c\right)+3\,a^{2}\right)\sqrt{a\cos}}{21\left(d\cos\left(dx+c\right)^{5}+d\cos\left(dx+c\right)^{4}\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(9/2),x, algorithm="fricas")
```

```
[Out] 2/21*(46*a^2*cos(d*x + c)^3 + 23*a^2*cos(d*x + c)^2 + 12*a^2*cos(d*x + c) +
 3*a^2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*sin(d*x + c)/(d*cos(d*x
 + c)^5 + d*cos(d*x + c)^4)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(5/2)/cos(d*x+c)**(9/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 243, normalized size of antiderivative = 1.51

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{8\left(\frac{21\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)}{\cos(dx+c)+1} - \frac{56\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^3}{(\cos(dx+c)+1)^3} + \frac{63\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^5}{(\cos(dx+c)+1)^5} - \frac{36\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^7}{(\cos(dx+c)+1)^7} + \cdots\right.}{21\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{9}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{9}{2}}\left(\frac{2\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\cdots\right.}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(9/2),x, algorithm="maxima")
```

```
[Out] 8/21*(21*sqrt(2)*a^(5/2)*sin(d*x + c)/(cos(d*x + c) + 1) - 56*sqrt(2)*a^(5/
2)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 63*sqrt(2)*a^(5/2)*sin(d*x + c)^5/
(cos(d*x + c) + 1)^5 - 36*sqrt(2)*a^(5/2)*sin(d*x + c)^7/(cos(d*x + c) + 1)
^7 + 8*sqrt(2)*a^(5/2)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9)*(sin(d*x + c)^2
/(cos(d*x + c) + 1)^2 + 1)^2/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(9/2)
*(-sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(9/2)*(2*sin(d*x + c)^2/(cos(d*x +
c) + 1)^2 + sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + 1))
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 237.10 (sec) , antiderivative size = 98101, normalized size of antiderivative = 609.32

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(9/2),x, algorithm="giac")
```

```
[Out] -67108864/21*sqrt(2)*sqrt(-tan(1/4*d*x + c)^4*tan(1/2*c)^8 + 14*tan(1/4*d*x
 + c)^4*tan(1/2*c)^6 - 24*tan(1/4*d*x + c)^3*tan(1/2*c)^7 + 6*tan(1/4*d*x +
 c)^2*tan(1/2*c)^8 + 56*tan(1/4*d*x + c)^3*tan(1/2*c)^5 - 84*tan(1/4*d*x +
c)^2*tan(1/2*c)^6 + 24*tan(1/4*d*x + c)*tan(1/2*c)^7 - tan(1/2*c)^8 - 14*ta
n(1/4*d*x + c)^4*tan(1/2*c)^2 + 56*tan(1/4*d*x + c)^3*tan(1/2*c)^3 - 56*tan
(1/4*d*x + c)*tan(1/2*c)^5 + 14*tan(1/2*c)^6 + tan(1/4*d*x + c)^4 - 24*tan(
1/4*d*x + c)^3*tan(1/2*c) + 84*tan(1/4*d*x + c)^2*tan(1/2*c)^2 - 56*tan(1/4
*d*x + c)*tan(1/2*c)^3 - 6*tan(1/4*d*x + c)^2 + 24*tan(1/4*d*x + c)*tan(1/2
*c) - 14*tan(1/2*c)^2 + 1)*(((((((((((((((23*I*a^2*e^(1027/2*I*c) + 8970*I*
a^2*e^(1025/2*I*c) + 1744665*I*a^2*e^(1023/2*I*c) + 225643340*I*a^2*e^(1021
/2*I*c) + 21830993145*I*a^2*e^(1019/2*I*c) + 1685352670794*I*a^2*e^(1017/2*
I*c) + 108143463042754*I*a^2*e^(1015/2*I*c) + 5932441401249090*I*a^2*e^(101
3/2*I*c) + 284015632092748725*I*a^2*e^(1011/2*I*c) + 12054885718630588825*I
*a^2*e^(1009/2*I*c) + 459291145959804703779*I*a^2*e^(1007/2*I*c) + 15866421
```

411511793416437*I*a^2*e^(1005/2*I*c) + 5011144765787879126410449*I*a^2*e^(1003/2*I*c) + 1457086710506295298150081 5*I*a^2*e^(1001/2*I*c) + 392372636365891369041933300*I*a^2*e^(999/2*I*c) + 983547411473286286843958283 8*I*a^2*e^(997/2*I*c) + 23051892563225986371688150405 2*I*a^2*e^(995/2*I*c) + 507141639873210303020152150562 7*I*a^2*e^(993/2*I*c) + 1050910186373934635902235506847 28*I*a^2*e^(991/2*I*c) + 2057571551559319523757433019101275*I*a^2*e^(989/2*I*c) + 3816795301922046178837787847170814 0*I*a^2*e^(987/2*I*c) + 672482999427386036344407124264639911*I*a^2*e^(985/2*I*c) + 112793743410890245169503897038228114 42*I*a^2*e^(983/2*I*c) + 180469978159987827171020625789037043 34*I*a^2*e^(981/2*I*c) + 2759687216371547310850322318637953260785*I*a^2*e^(979/2*I*c) + 40401823984348761731551610542858793511300*I*a^2*e^(977/2*I*c) + 567179508185660065903323118694229252909501*I*a^2*e^(975/2*I*c) + 7646420990625646107842349221267149768725400*I*a^2*e^(973/2*I*c) + 99130401891150616227034640375461310347846749*I*a^2*e^(971/2*I*c) + 1237421118518768552107714053055438083342617820*I*a^2*e^(969/2*I*c) + 1489030434627312568230693584602910824411464865 0*I*a^2*e^(967/2*I*c) + 17291971385704661381306525573004218622934795887 6*I*a^2*e^(965/2*I*c) + 193994372823371289858261550999658330105555483193 3*I*a^2*e^(963/2*I*c) + 2104545916665632993420313123422841067625636894723 9*I*a^2*e^(961/2*I*c) + 2209774351095579638973481945914193495960750846711 35*I*a^2*e^(959/2*I*c) + 2247657581576890158328281459463053249136155142818 885*I*a^2*e^(957/2*I*c) + 221644173931247842567801070554974270573942880219 10427*I*a^2*e^(955/2*I*c) + 2120597450231346294118674966814274599390180606598 23083*I*a^2*e^(953/2*I*c) + 1969925436555096263303543513345030378604353635783 621398*I*a^2*e^(951/2*I*c) + 177798612029937479756178056569168927717178748096 73606262*I*a^2*e^(949/2*I*c) + 156018501390833014924028933522645581091836687267 573447170*I*a^2*e^(947/2*I*c) + 133186743835690094739408533396330887566993379552 7159861115*I*a^2*e^(945/2*I*c) + 110672052589031643118494748728371489474029111023 21523307256*I*a^2*e^(943/2*I*c) + 895673469754664164365609590127466723163791465736 14093235883*I*a^2*e^(941/2*I*c) + 706362465619102268226202879462703285306437535601 820801093746*I*a^2*e^(939/2*I*c) + 543115842028969569026762821641788320150678164482 5673663895125*I*a^2*e^(937/2*I*c) + 407338250838796920846779121592735043305969272224 66270616023040*I*a^2*e^(935/2*I*c) + 298138079805795516636721746713666338776134639093 4173084580836 40*I*a^2*e^(933/2*I*c) + 213045438963978410253928109646589963305287562547075 4655905397856*I*a^2*e^(931/2*I*c) + 148697764889784913094443074525946856098332022768099941411745459 56*I*a^2*e^(929/2*I*c) + 101412452467011514987960508445679910794713086096737145187354675120*I*a^2*e^(927/2*I*c) + 676087376857312474146771786049384206737469239071720613980492039300*I*a^2*e^(925/2*I*c) + 4407601795177120237389113481959743264257864428283490771370053462560*I*a^2*e^(923/2*I*c) + 2810908836937320815570778574400014872249686588947031786736251230674 0*I*a^2*e^(921/2*I*c) + 1754231621964961239400909311813064226670584405691704228513407450501 52*I*a^2*e^(919/2*I*c) + 1071687241879183608204834854430988172125784220926155326017366664031320*I*a^2*e^(917/2*I*c) + 641106138998571262583904593456062866353896041671437881259963023838326 0*I*a^2*e^(915/2*I*c) + 375670642714870903983781671889666877915127767039192690108854011

42609920*I*a^2*e^(913/2*I*c) + 215689939758874013967187220833533731643242074212236222605165544572554060*I*a^2*e^(911/2*I*c) + 1213732838510510306428982602384538617690483226714330573193357678961518000*I*a^2*e^(909/2*I*c) + 669588231701349522234536829847683836851199444390046026453447108589048382 0*I*a^2*e^(907/2*I*c) + 362243658255481769079439605579958387100105565618941470113231351735814022 40*I*a^2*e^(905/2*I*c) + 192227213480904948872034321154910920985425803997803298273976235657509933640*I*a^2*e^(903/2*I*c) + 100082726787870890175736427378135391140977975288922626001061259918570776432 0*I*a^2*e^(901/2*I*c) + 511374503991778257094228867244440476224017707247445734826860865899835364333 0*I*a^2*e^(899/2*I*c) + 256481940130631614458139173236114739489676613089088783363876557363334791328 40*I*a^2*e^(897/2*I*c) + 126302261366970813190120863068164729403993511960131743155255365483034776033710*I*a^2*e^(895/2*I*c) + 610798290612478058634809110185506816479817707018034933796191469491921071289700*I*a^2*e^(893/2*I*c) + 2901413407805046277699928806426570164361980656563461341652112845236338748650110*I*a^2*e^(891/2*I*c) + 135405546050877023103933964772763674004441129840775430193420634649297673228860 40*I*a^2*e^(889/2*I*c) + 6209627351631859357796111730578398291490893256524106567007139367573576717664510 0*I*a^2*e^(887/2*I*c) + 279886193974641740375672626642653063855265114960677901721413367956114946541063180*I*a^2*e^(885/2*I*c) + 12401276244087905859142816180490999921497752601403556968529034196925302271774492 10*I*a^2*e^(883/2*I*c) + 540256474462854504612952008124460438123572687338459558380408863712284886643983 0910*I*a^2*e^(881/2*I*c) + 231451344052759630839547627482310251642576280276339778040930141887013642898649157 90*I*a^2*e^(879/2*I*c) + 975260870034870226325822902898250359479013323657233660395623443070897985673465767 90*I*a^2*e^(877/2*I*c) + 404255916197314410205903631345838918131518622031814368289391512007823341054252319330*I*a^2*e^(875/2*I*c) + 164868452557812619850408539131640702218771181974669689727261902177456658374817349845 0*I*a^2*e^(873/2*I*c) + 661657871755268626935239803550388761267460908426096012835692790204684148160535316652 0*I*a^2*e^(871/2*I*c) + 26134333584281766199506203706665359796711411159203716561602842513749476935891574081580*I*a^2*e^(869/2*I*c) + 101610100398813728244802148232520096631517489501850198195876637177700803300250750696120*I*a^2*e^(867/2*I*c) + 388931914119632954840130149086140789452373855787807910212844151796049289004605406967150*I*a^2*e^(865/2*I*c) + 1465830016742535124519131469010652577571975918756440541603851467254363529939075434269440*I*a^2*e^(863/2*I*c) + 5440357551230374902439985027394698228560509433313958273980496531279067808247723147105870*I*a^2*e^(861/2*I*c) + 198867587799113605322612027213532735821605971082743528597158857825056313731827361132242 00*I*a^2*e^(859/2*I*c) + 716062179458509947174306826027645592286227222278082368247999623391032951213876016821736 70*I*a^2*e^(857/2*I*c) + 254005801287017540347401034978022085833970670738098147773886519381628953611819486811955620*I*a^2*e^(855/2*I*c) + 887763577421062474940232214817331913856875978988239568134264776314007646535947673652724060*I*a^2*e^(853/2*I*c) + 305749026252213047211126953990398197866952487201346411234840998553359052477852387723694009 0*I*a^2*e^(851/2*I*c) + 103776474298111268920821296539685875165453416594719110175099266389481283166180086952156183

60*I*a^2*e^(849/2*I*c) + 347175898571376724069230085660787903481912988729001369287693773247835371770531885793913486 90*I*a^2*e^(847/2*I*c) + 114489751326591781601587296582666933164906419123301856728368547861073543833187799753283463360*I*a^2*e^(845/2*I*c) + 37221892415037889443572040902664005989095539259061628257216438012853025373390118462612890629 0*I*a^2*e^(843/2*I*c) + 1193142657505826707248344406249501852936406309110355942396943490095434416696698542207244495880*I*a^2*e^(841/2*I*c) + 37713305615095125246158505966403412943579672995962710455987674180910135622712640184627714889 80*I*a^2*e^(839/2*I*c) + 11755749238984942962210062966175741219276938429754098150077681519311875621804705720370211969800*I*a^2*e^(837/2*I*c) + 36141293667864514706613710081812463630711904602288654112421060177161306607694059860383771279230*I*a^2*e^(835/2*I*c) + 10959682143632428417265121520355099279636900948325071067734539680585149820755990826655299186051 0*I*a^2*e^(833/2*I*c) + 327850156338250725648721922189820828488017102267633591589243777562363927243394356202432140538650*I*a^2*e^(831/2*I*c) + 967558857573420421200844825745019691984965901119321858915203967518001948679909749229811961456530*I*a^2*e^(829/2*I*c) + 28173738427399681436868976846067277182864146168429216505290464163186308668946113749551429035219 70*I*a^2*e^(827/2*I*c) + 8094990486752031102862847380062157212388106523544569804503299552643657151717648240648270653869830*I*a^2*e^(825/2*I*c) + 229525993650309514246547402995818670887831371533554177380391600159306974521676810874796908133933 00*I*a^2*e^(823/2*I*c) + 64228709360409812420586138356564211085008288762762209697005815481413905982724399323193964745568820*I*a^2*e^(821/2*I*c) + 177396755428949413112532676704816100363457372470857284075358267979222962448762703682130780576952760*I*a^2*e^(819/2*I*c) + 483635269585920480609387707945457876743335983922410816057000799690442279864698695936197638579602610*I*a^2*e^(817/2*I*c) + 1301613491181268974287090549535283627357435997753232042703656582610084719317446750492963887848291340*I*a^2*e^(815/2*I*c) + 3458383981160096213819834986181221606030887703758892748920536238488574632981453327231642336638145090*I*a^2*e^(813/2*I*c) + 90724826785314223906784821166674475956778674383723568247838872567636628542051313816851971497101117 20*I*a^2*e^(811/2*I*c) + 23500381807335365823718129066801316443196720042966976789038657507310743872020449940329840767115547150*I*a^2*e^(809/2*I*c) + 60110869062284374159448209854726838711429891271925437784821736413864552441235504659113309232113779360*I*a^2*e^(807/2*I*c) + 15184249844321680132979221701134989863470387416943076510333347856618440977436539297273379065418907004 0*I*a^2*e^(805/2*I*c) + 3788160021289206163698559296121608745807687237113922519158425055251885623424708255204164228180825920 00*I*a^2*e^(803/2*I*c) + 933447336859281843224355397342058494668698292444028252934915487603996507357110331502736639692759358340*I*a^2*e^(801/2*I*c) + 2272004881162093590046650356128448211953273004752054294794204025999975189073335046466698628779651401360*I*a^2*e^(799/2*I*c) + 5462828667822158672736164721012938562781809091770363563687018271454099131199171596676490634462439229220*I*a^2*e^(797/2*I*c) + 1297613308912261692764137306767176062844869033330575993188397305227802635326701236733929930187399546688 0*I*a^2*e^(795/2*I*c) + 3045246785608650155466937068633484708402407505066968240527155699757540924494810

7709378067847213898960660*I*a^2*e^(793/2*I*c) + 706120625711697868994464587
97376311651332630936204874511242735563516386888084909599619786580787711236З
60*I*a^2*e^(791/2*I*c) + 16178708438189461126289696260126574890420941225938
9006374551841288165005493773030958210956760612646492280*I*a^2*e^(789/2*I*c)
 + 366307954798320205128798936155351391554335176467391622039978284149371380
873241652456477113543820574273500*I*a^2*e^(787/2*I*c) + 819624789517113019l
642817095414875203682334368894408831281121859152636556514559828805773471134
10414307040*I*a^2*e^(785/2*I*c) + 18125017737117436736993992115331571295088
23845114002513848872710211505465235145932640002862720411729752780*I*a^2*e^(
783/2*I*c) + 39615443892690555191826925561670874009158112607811540466428348
32166886887365224821817220970795789343876240*I*a^2*e^(781/2*I*c) + 85585699
131774977720413736285672113976827764195153726973137506812103604497173350946
87818153095679360516780*I*a^2*e^(779/2*I*c) + 18277470691534917701563233602
298403971199737084099495749012388579821538776969597068131015951749218506666
144*I*a^2*e^(777/2*I*c) + 3858660998287657496223400479535149465741817808337
5590488901031957266204930635139096439961363048441151269800*I*a^2*e^(775/2*I
*c) + 805359935544168628569903856943178293750286803058910337542718545982378
50137678037212744640081812890524571520*I*a^2*e^(773/2*I*c) + 16618941002251
115567274793379648778017515414556569019749473008667024648037226698449778484
7689078576576553405*I*a^2*e^(771/2*I*c) + 339081049398958631695033084312249
444034247861955469658173982280143780778138876895429955188412068983435311370
*I*a^2*e^(769/2*I*c) + 6840964393238201555734771754472551627703517728713097
06432815320177180262386714126080576227107839963492633507*I*a^2*e^(767/2*I*c
) + 13648077061320324179712693353613780904653490228983600018030481420618939
27200900333187448316673412979345898752*I*a^2*e^(765/2*I*c) + 26927282448425
364461722623574956155733196639443211460545174612226257404076090636468048967
71692589250685909715*I*a^2*e^(763/2*I*c) + 52542053315628400861248402353101
698809320987341776979631277027119955905761956900693691812471722966160542508
10*I*a^2*e^(761/2*I*c) + 10140082596804607404376090989361337712629273671384
446340003481136225061610661712978027889222103814938027534150*I*a^2*e^(759/2
*I*c) + 1935629938092629464044933432048123474309129215431160763159842314939
6817585242619148155405769562070657818017062*I*a^2*e^(757/2*I*c) + 365490412
121312297832746648031039823017060530166350998938749984756716538698774385724
22373857662116557803137691*I*a^2*e^(755/2*I*c) + 68269842357184501611988226
541759877359893560816980579165757639885910403041554476683238744066404341119
496497267*I*a^2*e^(753/2*I*c) + 1261558844450858809909057230508638945302599
92110425146130569149222574918984083710347803558027793365144729446565*I*a^2*
e^(751/2*I*c) + 23064195048734977698461337735625152416912708100691513109693
2922360748741606056582939291771085884519360184891255*I*a^2*e^(749/2*I*c) +
417203346852342786088688963220640917780075877592046434007891157690273764588
009873939937985168264211297805134039*I*a^2*e^(747/2*I*c) + 7467281492243362
913374727882275078265152540554796342982961634192168809916584030065162729746
57126602569667620581*I*a^2*e^(745/2*I*c) + 13225410027687245271645902870752
516183035559216180833489217915827253696179198591565450687109111482198342228
62396*I*a^2*e^(743/2*I*c) + 23180048596133418845744953509005175801585656213

36318788947052214662319719223377004078504331647589087640360974954*I*a^2*e^(
741/2*I*c) + 40207296927287520725475279644145838807209599718985673780881907
21921140689114594980080070716969583769101530510140*I*a^2*e^(739/2*I*c) + 69
025186656360372837629802427849099678839353716623572378212215283291749068007
92394732946367748505381533617607645*I*a^2*e^(737/2*I*c) + 11728686977201016
518903777818063543264965656103575795886869624447931763565472352750662022559
534093518133411921208*I*a^2*e^(735/2*I*c) + 1972682929919065151030155855601
200340219105234862278242443532532936069557635228499947879203251665438534409
7576701*I*a^2*e^(733/2*I*c) + 328441725889849239257452481701006143358104612
84005739525160956863811444851393714424782905768489580238852810233892*I*a^2*
e^(731/2*I*c) + 54135187069361775047519937605426565923507613794999731786828
276683538558771749832815251100592417685414948864684145*I*a^2*e^(729/2*I*c)
+ 8833817464098123754018525939231247589033551445179560816263317963445774962
3643887095574804755049991966929176222830*I*a^2*e^(727/2*I*c) + 142722318968
673080123248059644214027010647362985060273998965493470580757388030700770801
323590848378479588489351378*I*a^2*e^(725/2*I*c) + 2283165111834663576007403
393978926517247635811131248588142323986997225083242497256577379703719652093
98196125904775*I*a^2*e^(723/2*I*c) + 36166957083407726067731633129296551496
029436983618740343555336280220113925047507274348575365288563540847099684737
2*I*a^2*e^(721/2*I*c) + 567339614895630128342983728404200845089288305505097
140213560633981062751336174336795809192566239776955199921505915*I*a^2*e^(71
9/2*I*c) + 8813693903152742201742418843817961522650552642497193087915022648
14434849100759337832840344343735714440306099566040*I*a^2*e^(717/2*I*c) + 13
560749642327922110221227763130856201316159165113971814228074160573966852453
59582689147794647531935558283601984443*I*a^2*e^(715/2*I*c) + 20665569821602
512673114857611921723223404768298078377841268861201489011910889679265211355
64808688182641911560667924*I*a^2*e^(713/2*I*c) + 31194351823904045785264754
002935552154841366001694466773595073129947614111315094715884141888136767047
68199883865942*I*a^2*e^(711/2*I*c) + 46644046194423261614083371806148988132
314961825934722594050803959540003674570959946015217822930142778327090546153
80*I*a^2*e^(709/2*I*c) + 69093103807838607892815109268897036078418535879007
16586154411151501397449721115415129140419091270756538802453583895*I*a^2*e^(
707/2*I*c) + 10139527875816467343220793498549170075839065604546707385281954
497494579711245464375474258366636437333914967133476201*I*a^2*e^(705/2*I*c)
+ 1474250608159172064872411391157795097287526449591218016644304211649997124
6321838780169739234187025835012002839150189*I*a^2*e^(703/2*I*c) + 212383658
452315855559185319616446902350000158261700455127289505546457755956981709740
68108854741604809260562872043619*I*a^2*e^(701/2*I*c) + 30317425197511637627
728384831280057192585747834820863225726317028293946239909800510901728400285
7400011888506446492561*I*a^2*e^(699/2*I*c) + 4288542606290519837613611568777
949831319762493941724102371210731156016608065113664271150767733226331492942
1901176965*I*a^2*e^(697/2*I*c) + 601170368095319545347741753285424329177854
71258270317443583066712344018654100343282519010777886383221363137483769490*
I*a^2*e^(695/2*I*c) + 83517876975248044258519777946946588944585187567768264
892079917516487130082429368116942958987653732471395054399139538*I*a^2*e^(69

3/2*I*c) + 114994829854008544800604050526736129068662170812340682385679020827942329161254533974586296625609880932042763111506754*I*a^2*e^(691/2*I*c) + 15693375545189563385847170380611690734635789954797344262825130014540666798973864045763035785690000005836055807916171 3*I*a^2*e^(689/2*I*c) + 212282878705188354649502352775941442121310160088506940041461217611549577446696222647786382828325447861991528982057300*I*a^2*e^(687/2*I*c) + 2846391060871606800731623460533476496613870616498866470992523092743038931742924481992332004821799692893195995837827 05*I*a^2*e^(685/2*I*c) + 3783333346885029059048026143031103999432654861157851787405147285864242374913240291146324417822093818453339385232658 90*I*a^2*e^(683/2*I*c) + 4985094991532584037291448909802045890974339232641318414305999015926538731520727175126608047532877169285760786634619 83*I*a^2*e^(681/2*I*c) + 6511907152788140899870344218335142853224331708738436883692464497089753797494252939549799785332844708546148449714663 68*I*a^2*e^(679/2*I*c) + 8433245127019147445434029097206161079624159921545952393999254097076303951899540296080708983526898187052099845083695 20*I*a^2*e^(677/2*I*c) + 1082797917311589213367556660052710598214901649852587681350797657654387598767948898248611815354945578372200449025175360*I*a^2*e^(675/2*I*c) + 1378412185112807868212655886727510995606226409519843637641551742037668539116041066140052440183078269143615845581155080*I*a^2*e^(673/2*I*c) + 1739806459662674556992867763179599429842093891548125321011280666982199891892856492664415622347650053752088149727624160*I*a^2*e^(671/2*I*c) + 2177319690482826547717112293043048619928285927038310216927854685140177477854762032123070408699283792898254962886739656*I*a^2*e^(669/2*I*c) + 2701780972199876886785754211080926664096228871020710457482488324723670365135550692459168767272049066762300379877743040*I*a^2*e^(667/2*I*c) + 3324220186820494005166240621364244403852934961801328621031245367970100658499892606876336284620902405991453408165588520*I*a^2*e^(665/2*I*c) + 4055493561012635024553893300441354935010847129835154524985690016794545113963136786023289013915905378564692143643458640*I*a^2*e^(663/2*I*c) + 4905822537534029661350191373485738872824428838056731930906121670753804220745738659870244363280999523327382897200441520*I*a^2*e^(661/2*I*c) + 5884249182432251390797621599156215151608555552527392878727529033511932657541339616490316199475103405475041577880587000*I*a^2*e^(659/2*I*c) + 6998017095771435376057459958050124746801234194620229525750507285124859821010861715153517826996821338842938734860615040*I*a^2*e^(657/2*I*c) + 8251893252328617917134965008156780896071640246109540703311686461626974697776290689348607898858162877878927869163809880*I*a^2*e^(655/2*I*c) + 9647453055735341956744109660981872243803141830016361146898234401219614120958244978337409906070346233171019358264000480*I*a^2*e^(653/2*I*c) + 1118235773275730578860612521983272425570018568669769575077345692574571846967667166533238337545878198440307786732695644 0*I*a^2*e^(651/2*I*c) + 1284965952891729544888783838972182166642965228083971723087207097652728574313145411250047295985822040494390900197715136 0*I*a^2*e^(649/2*I*c) + 1463717544059678626631832947276075907600136800889205562092713379905928249019089749450221782811925304884222407131239848 0*I*a^2*e^(647/2*I*c) + 1652697385897486163910802331037113605435737465719873221275554650289263272259153631481346077820489460688124423941671712 0*I*a^2* e^(645/2*I*c) + 18495019957411734279807585585659028619914871376370221914181336130221442716020270657023135022033488496344464969637878700*I*a^2*e^(643/2*I*c) + 20511024448438726700374940847256500448733879253231614117614891842506419291498065951049807036183243121806802376265432320*I*a^2*e^(641/2*I*c) + 22538536115685128509739061738013766406006974581099364247180428351985546405904602601376439227176730279973640942509792180*I*a^2*e^(639/2*I*c) + 24535311108873854631583838561781463173989229567453522895600654095852502781216398579180366741352217131290346900784364200*I*a^2*e^(637/2*I*c) + 26453981409069187791293667181282082531400078325225323259430722934037359301487220690991524114248730187335763372429125460*I*a^2*e^(635/2*I*c) + 28243031401014840124425274237238214049920918764612211921380512977912889729546855568669109978541653583678458630428337120*I*a^2*e^(633/2*I*c) + 29848075656762410777392478417988562936605721803803630324956331103418688840889616409755917532127762470680082194173437320*I*a^2*e^(631/2*I*c) + 31213413610325898656229507527316661207791254071653774910526924611586090854615810972507366138529383452875185539371668680*I*a^2*e^(629/2*I*c) + 32283818769163751932162219150477395164746106490996239768011287301357561433297548231267227036903834777286313642263284780*I*a^2*e^(627/2*I*c) + 33006502605828069111234833523837274488458321604918549594915598999328301351391942676314725618514347956768945927684338260*I*a^2*e^(625/2*I*c) + 33333177528923572325846611828060392550761860424963580406040284553026862034226333729553143376429959067700689886330788900*I*a^2*e^(623/2*I*c) + 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50473469385817621308920*I*a^2*e^(597/2*I*c) - 66755444804312177590827259183
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06716718924980*I*a^2*e^(595/2*I*c) - 10979360994735976044916403144755976966
196040761705204903749576879937216168834924149129784251472577056488047960350
809520*I*a^2*e^(593/2*I*c) - 1506834767209077602337603303019631330294176309
7125409435494978420582792711773103135974244949606016312505788823825840740*I
*a^2*e^(591/2*I*c) - 188663229624029833328251189140138132478996655611126342
87480400676793104541824749963087292981195024846572209729639189440*I*a^2*e^(
589/2*I*c) - 22306333733644730379455210266251557215600572197223122288850891
726285188766620799206359532978080306708567111158747156900*I*a^2*e^(587/2*I*
c) - 2533257934363435577954448716720210150053448362865394632903578214912387
1587278642890878402071278332969173493767458002640*I*a^2*e^(585/2*I*c) - 279
018566539194845793436849026051066349908356932242779027729935090468166975549
15822060373656496697112008237858612984680*I*a^2*e^(583/2*I*c) - 29984476440
326408930099353119756129754981691666091874855159302741526182406540842843017
443090755422103979691036978946000*I*a^2*e^(581/2*I*c) - 3156462971757990011
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2468474599065924339139340*I*a^2*e^(579/2*I*c) - 326402107851377503955143444
668244489071446081306461589189417377477973414376981893711845959827353054254
35824684283776860*I*a^2*e^(577/2*I*c) - 33222130571589904982454825531015220
070841443137376200930234001169834164297597217642962832109496476768915007520
638843940*I*a^2*e^(575/2*I*c) - 3333317752892357232584661182806039255076186
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0*I*a^2*e^(573/2*I*c) - 330065026058280691112348335238372744884583216049185
49594915598999328301351391942676314725618514347956768945927684338260*I*a^2*
e^(571/2*I*c) - 32283818769163751932162219150477395164746106490996239768011
287301357561433297548231267227036903834777286313642263284780*I*a^2*e^(569/2
*I*c) - 3121341361032589865622950752731666120779125407165377491052692461158
6090854615810972507366138529383452875185539371668680*I*a^2*e^(567/2*I*c) -
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89616409755917532127762470680082194173437320*I*a^2*e^(565/2*I*c) - 28243031
401014840124425274237238214049920918764612211921380512977912889729546855568
669109978541653583678458630428337120*I*a^2*e^(563/2*I*c) - 2645398140906918
779129366718128208253140007832522532325943072293403735930148722069099152411
4248730187335763372429125460*I*a^2*e^(561/2*I*c) - 245353111088738546315838
385617814631739892295674535228956006540958525027812163985791803667413522171
31290346900784364200*I*a^2*e^(559/2*I*c) - 22538536115685128509739061738013
766406006974581099364247180428351985546405904602601376439227176730279973640
942509792180*I*a^2*e^(557/2*I*c) - 2051102444843872670037494084725650044873
387925323161411761489184250641929149806595104980703618324312180680237626543
2320*I*a^2*e^(555/2*I*c) - 184950199574117342798075855856590286199148713763
70221914181336130221442716020270657023135022033488496344464969637878700*I*a
^2*e^(553/2*I*c) - 16526973858974861639108023310371136054357374657198732212
755546502892632722591536314813460778204894606881244239416717120*I*a^2*e^(55
1/2*I*c) - 1463717544059678626631832947276075907600136800889205562092713379

9059282490190897494502217828119253048842224071312398480*I*a^2*e^(549/2*I*c)
 - 12849659528917295448887838389721821666429652280839717230872070976527285743131454112500472959858220404943909001977151360*I*a^2*e^(547/2*I*c) - 111823577327573057886061252198327242557001856866976957507734569257457184696766716653323833754587819844030778673269564 40*I*a^2*e^(545/2*I*c) - 96474530557353419567441096609818722438031418300163611468982344012196141209582449783374099060703462331710193582640004 80*I*a^2*e^(543/2*I*c) - 825189325232861791713496500815678089607164024610954070331168646162697469777629068934860789885816287787892786916380988 0*I*a^2*e^(541/2*I*c) - 69980170957714353760574599580501247468012341946202295257505072851248598210108617151535178269968213388429387348606150 40*I*a^2*e^(539/2*I*c) - 58842491824322513907976215991562151516085555252739287872752903351193265754133961649031619947510340547504157788058700 0*I*a^2*e^(537/2*I*c) - 49058225375340296613501913734857388728244288380567319309061216707538042207457386598702443632809995233273828972004415 20*I*a^2*e^(535/2*I*c) - 40554935610126350245538933004413549350108471298351545249856900167945451139631367860232890139159053785646921436434586 40*I*a^2*e^(533/2*I*c) - 33242201868204940051662406213642444038529349618013286210312453679701006584998926068763362846209024059914534081655885 20*I*a^2*e^(531/2*I*c) - 27017809721998768867857542110809266640962288710207104574824883247236703651355506924591687672720490667623003798777430 40*I*a^2*e^(529/2*I*c) - 21773196904828265477171122930430486199282859270383102169278546851401774778547620321230704086992837928982549628867396 56*I*a^2*e^(527/2*I*c) - 17398064596626745569928677631795994298420938915481253210112806669821998918928564926644156223476500537520881497276241 60*I*a^2*e^(525/2*I*c) - 13784121851128078682126558867275109956062264095198436376415517420376685391160410661400524401830782691436158455811550 80*I*a^2*e^(523/2*I*c) - 10827979173115892133675566600527105982149016498525876813507976576543875987679488982486118153549455783722004490251753 60*I*a^2*e^(521/2*I*c) - 84332451270191474454340290972061610796241599215459523939992540970763039518995402960807089835268981870520998450836952 0*I*a^2*e^(519/2*I*c) - 65119071527881408998703442183351428532243317087384368836924644970897537974942529395497997853328447085461484497146636 8*I*a^2*e^(517/2*I*c) - 49850949915325840372914489098020458909743392326413184143059990159265387315207271751266080475328771692857607866346198 3*I*a^2*e^(515/2*I*c) - 37833334688502905904802614303110399943265486115785178740514728586424237491324029114632441782209381845333938523265890*I*a^2*e^(513/2*I*c) - 28463910608716068007316234605334764966138706164988664709925230927430389317429244819923320048217996928931959958378270 5*I*a^2*e^(511/2*I*c) - 21228287870518835464950235277594144212131016008850694004146121761154957744669622264778638282832544786199152898205730 0*I*a^2*e^(509/2*I*c) - 15693375545189563385847170380611690734635789954797344262825130014540666798973864045763035785690000005836055807916171 3*I*a^2*e^(507/2*I*c) - 11499482985400854480060405052673612906866217081234068238567902082794232916125453397458629662560988093204276311150675 4*I*a^2*e^(505/2*I*c) - 83517876975248044258519777946946588944585187567768264892079917516487130082429368116942958987653732471395054399139538*I*a^2*e^(503/2*I*c) - 6011703680953195453477417532854243291778547125827031744358306 6

7123440186541003432825190107778863832213631374837694 90*I*a^2*e^(501/2*I*c) - 428854260629051983761361156877794983131976249394172410237121073115601660806511366427115076773322633149294219011769 65*I*a^2*e^(499/2*I*c) - 303174251975116376277283848312800571925857478348208632257263170282939462399098005109017284002857400118885064464925 61*I*a^2*e^(497/2*I*c) - 212383658452315855559185319616446902350000158261700455127289505546457755956981709740681088547416048092605628720436 19*I*a^2*e^(495/2*I*c) - 147425060815917206487241139115779509728752644959121801664430421164999712463218387801697392341870258350120028391501 89*I*a^2*e^(493/2*I*c) - 101395278758164673432207934985491700758390656045467073852819544974945797112454643754742583666364373339149671334762 01*I*a^2*e^(491/2*I*c) - 690931038078386078928151092688970360784185358790071658615441115150139744972111541512914041909127075653880245358389 5*I*a^2*e^(489/2*I*c) - 466440461944232616140833718061489881323149618259347225940508039595400036745709599460152178229301427783270905461538 0*I*a^2*e^(487/2*I*c) - 311943518239040457852647540029355521548413660016944667735950731299476141113150947158841418881367670476819988386594 2*I*a^2*e^(485/2*I*c) - 206655698216025126731148576119217232234047682980783778412688612014890119108896792652113556480868818264191156066792 4*I*a^2*e^(483/2*I*c) - 135607496423279221102212277631308562013161591651139718142280741605739668524535958268914779464753193555828360198444 3*I*a^2*e^(481/2*I*c) - 881369390315274220174241884381796152265055264249719308791502264814434849100759337832840344343735714440306099566040*I*a^2*e^(479/2*I*c) - 567339614895630128342983728404200845089288305505097140213560633981062751336174336795809192566239776955199921505915*I*a^2*e^(477/2*I*c) - 361669570834077260677316331292965514960294369836187403435553362802201139250475072743485753652885635408470996847372*I*a^2*e^(475/2*I*c) - 228316511183466357600740339397892651724763581113124858814232398699722508324249725657737970371965209398196125904775*I*a^2*e^(473/2*I*c) - 142722318968673080123248059644214027010647362985060273998965493470580757388030700770801323590848378479588489351378*I*a^2*e^(471/2*I*c) - 883381746409812375401852593923124758903355144517956081626331796344577496236438870955748047550499919669291762228 30*I*a^2*e^(469/2*I*c) - 541351870693617750475199376054265659235076137949997317868282766835385587717498328152511005924176854149488646841 45*I*a^2*e^(467/2*I*c) - 328441725889849239257452481701006143358104612840057395251609568638114448513937144247829057684895802388528102338 92*I*a^2*e^(465/2*I*c) - 197268292991906515103015585560120034021910523486227824244353253293606955763522849994787920325166543853440975767 01*I*a^2*e^(463/2*I*c) - 117286869772010165189037778180635432649656561035757958868696244479317635654723527506620225595340935181334119212 08*I*a^2*e^(461/2*I*c) - 690251866563603728376298024278490996788393537166235723782122152832917490680079239473294636774850538153361760764 5*I*a^2*e^(459/2*I*c) - 402072969272875207254752796441458388072095997189856737808819072192114068911459498008007071696958376910153051014 0*I*a^2*e^(457/2*I*c) - 231800485961334188457449535090051758015856562133631878894705221466231971922337700407850433164758908764036097495 4*I*a^2*e^(455/2*I*c) - 132254100276872452716459028707525161830355592161808334892179158272536961791985915654506871091114821983422286239 6*I*a^2*e^(453/2*I*c) - 74672814

9224336291337472788227507826515254055479634298296163419216880991658403006516272974657126602569667620581*I*a^2*e^(451/2*I*c) - 417203346852342786088688963220640917780075877592046434007891157690273764588009873939937985168264211297805134039*I*a^2*e^(449/2*I*c) - 230641950487349776984613377356251524169127081006915131096932922360748741606056582939291771085884519360184891255*I*a^2*e^(447/2*I*c) - 126155884445085880990905723050863894530259992110425146130569149222574918984083710347803558027793365144729446565*I*a^2*e^(445/2*I*c) - 682698423571845016119882265417598773598935608169805791657576398859104030415544766832387440664043411194964972 67*I*a^2*e^(443/2*I*c) - 365490412121312297832746648031039823017060530166350998938749984756716538698774385724223738576621165578031376 91*I*a^2*e^(441/2*I*c) - 193562993809262946404493343204812347430912921543116076315984231493968175852426191481554057695620706578180170 62*I*a^2*e^(439/2*I*c) - 101400825968046074043760909893613377126292736713844463400034811362250616106617129780278892221038149380275341 50*I*a^2*e^(437/2*I*c) - 525420533156284008612484023531016988093209873417769796312770271199559057619569006936918124717229661605425081 0*I*a^2*e^(435/2*I*c) - 269272824484253644617226235749561557331966394432114605451746122262574040760906364680489677169258925068590971 5*I*a^2*e^(433/2*I*c) - 136480770613203241797126933536137809046534902289836000180304814206189392720090033318744831667341297934589875 2*I*a^2*e^(431/2*I*c) - 684096439323820155573477175447255162770351772871309706432815320177180262386714126080576227107839963492633507*I*a^2*e^(429/2*I*c) - 339081049398958631695033084312249444034247861955469658173982280143780778138876895429955188412068983435311370*I*a^2*e^(427/2*I*c) - 166189410022511155672747933796487780175154145565690197494730086670246480372266984497784847689078576576553405*I*a^2*e^(425/2*I*c) - 805359935544168628569903856943178293750286803058910337542718545982378501376780372127446400818128905245715 20*I*a^2*e^(423/2*I*c) - 385866099828765749622340047953514946574181780833755904889010319572662049306351390964399613630484411512698 00*I*a^2*e^(421/2*I*c) - 182774706915349177015632336022984039711997370840994957490123885798215387769695970681310159517492185066661 44*I*a^2*e^(419/2*I*c) - 855856991317749777204137362856721139768277641951537269731375068121036044971733509468781815309567936051678 0*I*a^2*e^(417/2*I*c) - 396154438926905551918269255616708740091581126078115404664283483216688688736522482181722097079578934387624 0*I*a^2*e^(415/2*I*c) - 181250177371174367369939921153315712950882384511400251384887271021150546523514593264000286272041172975278 0*I*a^2*e^(413/2*I*c) - 819624789517113019164281709541487520368233436889440883128112185915263655651455982880577347113410414307040*I*a^2*e^(411/2*I*c) - 366307954798320205128798936155351391554335176467391622039978284149371380873241652456477113543820574273500*I*a^2*e^(409/2*I*c) - 161787084381894611262896962601265748904209412259389006374551841288165005493773030958210956760612646492280*I*a^2*e^(407/2*I*c) - 706120625711697868994464587973763116513326309362048745112427355635163868880849095996197865807877112363 60*I*a^2*e^(405/2*I*c) - 304524678560865015546693706863348470840240750506696824052715569975754092449481077093780678472138989606 60*I*a^2*e^(403/2*I*c) - 129761330891226169276413730676717606284486903333057599318839730522780263532670123673392993018739954668 80*I*a^2*

e^(401/2*I*c) - 54628286678221586727361647210129385627818090917703635636870
18271454099131199171596676490634462439229220*I*a^2*e^(399/2*I*c) - 22720048
811620935900466503561284482119532730047520542947942040259999751890733350464
66698628779651401360*I*a^2*e^(397/2*I*c) - 93344733685928184322435539734205
8494668698292444028252934915487603996507357110331502736639692759358340*I*a^
2*e^(395/2*I*c) - 378816002128920616369855929612160874580768723711392251915
8425055525188562342470825520416422818082592000*I*a^2*e^(393/2*I*c) - 1518424
984432168013297922170113498986347038741694307651033334785661844097743653929
72733790654189070040*I*a^2*e^(391/2*I*c) - 60110869062284374159448209854726
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*e^(389/2*I*c) - 2350038180733536582371812906680131644319672004296697678903
8657507310743872020449940329840767115547150*I*a^2*e^(387/2*I*c) - 907248267
853142239067848211666744759567786743837235682478388725676366285420513138168
5197149710111720*I*a^2*e^(385/2*I*c) - 345838398116009621381983498618122160
6030887703758892748920536238488574632981453327231642336638145090*I*a^2*e^(3
83/2*I*c) - 130161349118126897428709054953528362735743599775323204270365658
2610084719317446750492963887848291340*I*a^2*e^(381/2*I*c) - 483635269585920
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579602610*I*a^2*e^(379/2*I*c) - 1773967554289494131125326767048161003634573
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) - 64228709360409812420586138356564211085008288762762209697005815481413905
982724399323193964745568820*I*a^2*e^(375/2*I*c) - 2295259936503095142465474
0299581867088783137153355417738039160015930697452167681087479690813393300*I
*a^2*e^(373/2*I*c) - 809499048675203110286284738006215721238810652354456980
4503299552643657151717648240648270653869830*I*a^2*e^(371/2*I*c) - 281737384
273996814368689768460672771828641461684292165052904641631863086689461137495
5142903521970*I*a^2*e^(369/2*I*c) - 967558857573420421200844825745019691984
965901119321858915203967518001948679909749229811961456530*I*a^2*e^(367/2*I*
c) - 3278501563382507256487219221898208284880171022676335915892437775623639
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2*e^(363/2*I*c) - 361412936678645147066137100818124636307119046022886541124
21060177161306607694059860383771279230*I*a^2*e^(361/2*I*c) - 11755749238984
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969800*I*a^2*e^(359/2*I*c) - 3771330561509512524615850596640341294357967299
596271045598767418091013562271264018462771488980*I*a^2*e^(357/2*I*c) - 1193
142657505826707248344406249501852936406309110355942396943490095434416696698
542207244495880*I*a^2*e^(355/2*I*c) - 3722189241503788944357204090266400598
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) - 11448975132659178160158729658266693316490641912330185672836854786107354
3833187799753283463360*I*a^2*e^(351/2*I*c) - 347175898571376724069230085660
78790348191298872900136928769377324783537177053188579391348690*I*a^2*e^(349
/2*I*c) - 10377647429811126892082129653968587516545341659471911017509926638
948128316618008695215618360*I*a^2*e^(347/2*I*c) - 3057490262522130472111269
539903981978669524872013464112348409985533590524778523877236940090*I*a^2*e^

(345/2*I*c) - 887763577421062474940232214817331913856875978988239568134264776314007646535947673652724060*I*a^2*e^(343/2*I*c) - 254005801287017540347401034978022085833970670738098147773886519381628953611819486811955620*I*a^2*e^(341/2*I*c) - 71606217945850994717430682602764559228622722227808236824799962339103295121387601682173670*I*a^2*e^(339/2*I*c) - 19886758779911360532261202721353273582160597108274352859715885782505631373182736113224200*I*a^2*e^(337/2*I*c) - 5440357551230374902439985027394698228560509433313958273980496531279067808247723147105870*I*a^2*e^(335/2*I*c) - 1465830016742535124519131469010652577571975918756440541603851467254363529939075434269440*I*a^2*e^(333/2*I*c) - 388931914119632954840130149086140789452373855787807910212844151796049289004605406967150*I*a^2*e^(331/2*I*c) - 101610100398813728244802148232520096631517489501850198195876637177700803300250750696120*I*a^2*e^(329/2*I*c) - 26134333584281766199506203706665359796711411159203716561602842513749476935891574081580*I*a^2*e^(327/2*I*c) - 6616578717552686269352398035503887612674609084260960128356927902046841481605353166520*I*a^2*e^(325/2*I*c) - 1648684525578126198504085391316407022187711819746696897272619021774566583748173498450*I*a^2*e^(323/2*I*c) - 404255916197314410205903631345838918131518622031814368289391512007823341054252319330*I*a^2*e^(321/2*I*c) - 97526087003487022632582290289825035947901332365723366039562344307089798567346576790*I*a^2*e^(319/2*I*c) - 23145134405275963083954762748231025164257628027633977804093014188701364289864915790*I*a^2*e^(317/2*I*c) - 5402564744628545046129520081244604381235726873384595583804088637122848866439830910*I*a^2*e^(315/2*I*c) - 1240127624408790585914281618049099992149775260140355696852903419692530227177449210*I*a^2*e^(313/2*I*c) - 279886193974641740375672626642653063855265114960677901721413367956114946541063180*I*a^2*e^(311/2*I*c) - 62096273516318593577961117305783982914908932565241065670071393675735767176645100*I*a^2*e^(309/2*I*c) - 13540554605087702310393396477276367400444112984077543019342063464929767322886040*I*a^2*e^(307/2*I*c) - 2901413407805046277699928806426570164361980656563461341652112845236338748650110*I*a^2*e^(305/2*I*c) - 610798290612478058634809110185506816479817707018034933796191469491921071289700*I*a^2*e^(303/2*I*c) - 126302261366970813190120863068164729403993511960131743155255365483034776033710*I*a^2*e^(301/2*I*c) - 25648194013063161445813917323611473948967661308908878336387655736333479132840*I*a^2*e^(299/2*I*c) - 5113745039917782570942288672444404762240177072474457348268608658998353643330*I*a^2*e^(297/2*I*c) - 1000827267878708901757364273781353911409779752889226260010612599185707764320*I*a^2*e^(295/2*I*c) - 192227213480904948872034321154910920985425803997803298273976235657509933640*I*a^2*e^(293/2*I*c) - 36224365825548176907943960557995838710010556561894147011323135173581402240*I*a^2*e^(291/2*I*c) - 6695882317013495222345368298476838368511994443900460264534471085890483820*I*a^2*e^(289/2*I*c) - 1213732838510510306428982602384538617690483226714330573193357678961518000*I*a^2*e^(287/2*I*c) - 215689939758874013967187220833533731643242074212236222605165544572554060*I*a^2*e^(285/2*I*c) - 37567064271487090398378167188966687791512776703919269010885401142609920*I*a^2*e^(283/2*I*c) - 6411061389985712625839045934560628663538960416714378812599630238383260*I*a^2*e^(281/2*I*c) - 1071687241879183608204834854430988

1721257842209261553260173666640313 20*I*a^2*e^(279/2*I*c) - 1754231621964961 2394009093118130642266705844056917042285134074505 0152*I*a^2*e^(277/2*I*c) -
 28109088369373208155707785744000148722496865889470317867362512306740*I*a^2
*e^(275/2*I*c) - 4407601795177120237389113481959743264257864428283490771370
053462560*I*a^2*e^(273/2*I*c) - 676087376857312474146771786049384206737469 2
390717206139804920393 00*I*a^2*e^(271/2*I*c) - 101412452467011514987960508 44
567991079471308609673714518735467512 0*I*a^2*e^(269/2*I*c) - 148697764889784
913094443074525946856098332022768099941411745459 56*I*a^2*e^(267/2*I*c) - 21
3045438963978410253928109646589963305287562547075465590539785 6*I*a^2*e^(265
/2*I*c) - 29813807980579551663672174671366633877613463909341730845808364 0*I
*a^2*e^(263/2*I*c) - 40733825083879692084677912159273504330596927222466270 6
16023040*I*a^2*e^(261/2*I*c) - 54311584202896956902676282164178832015067816
44825673663895125*I*a^2*e^(259/2*I*c) - 70636246561910226822620287946270328
530643753560182080109374 6*I*a^2*e^(257/2*I*c) - 89567346975466416436560959 0
127466723163791465736140932358 83*I*a^2*e^(255/2*I*c) - 11067205258903164311
849474872837148947402911102321523307256*I*a^2*e^(253/2*I*c) - 1331867438356
900947394085333963308875669933795527159861115*I*a^2*e^(251/2*I*c) - 1560185
013908330149240289335226455810918366872675734471 70*I*a^2*e^(249/2*I*c) - 17
7798612029937479756178056569168927717178748096736062 62*I*a^2*e^(247/2*I*c)
- 196992543655509626330354351334503037860435363578362139 8*I*a^2*e^(245/2*I*
c) - 212059745023134629411867496681427459939018060659823083*I*a^2*e^(243/2*
I*c) - 221644173931247842567801070554974270573942880219104 27*I*a^2*e^(241/2
*I*c) - 224765758157689015832828145946305324913615514281888 5*I*a^2*e^(239/2
*I*c) - 220977435109557963897348194591419349596075084671135*I*a^2*e^(237/2*
I*c) - 210454591666563299342031312342284106762563689472 39*I*a^2*e^(235/2*I*
c) - 193994372823371289858261550999658330105555483193 3*I*a^2*e^(233/2*I*c)
- 172919713857046613813065255730042186229347958876*I*a^2*e^(231/2*I*c) - 14
8903043462731256823069358460291082441146486 50*I*a^2*e^(229/2*I*c) - 1237421
1185187685521077140530554380833426178 20*I*a^2*e^(227/2*I*c) - 9913040189115
061622703464037546131034784674 9*I*a^2*e^(225/2*I*c) - 764642099062564610784
234922126714976872540 0*I*a^2*e^(223/2*I*c) - 567179508185660065903323118694
229252909501*I*a^2*e^(221/2*I*c) - 404018239843487617315516105428587935113 0
0*I*a^2*e^(219/2*I*c) - 2759687216371547310850322318637953260785*I*a^2*e^(2
17/2*I*c) - 1804699978159987827171020625789037043 34*I*a^2*e^(215/2*I*c) - 1
127937434108902451695038970382281144 2*I*a^2*e^(213/2*I*c) - 672482999427386
036344407124264639911*I*a^2*e^(211/2*I*c) - 381679530192204617883778784717 0
8140*I*a^2*e^(209/2*I*c) - 205757155155931952375743301910127 5*I*a^2*e^(207/
2*I*c) - 105091018637393463590223550684728*I*a^2*e^(205/2*I*c) - 5071416398
732103030201521505627*I*a^2*e^(203/2*I*c) - 2305189256322598637168815040 52*
I*a^2*e^(201/2*I*c) - 9835474114732862868439582838*I*a^2*e^(199/2*I*c) - 39
237263636589136904193330 0*I*a^2*e^(197/2*I*c) - 1457086710506295298150081 5*
I*a^2*e^(195/2*I*c) - 501114476578787912641049*I*a^2*e^(193/2*I*c) - 158664
21411511793416437*I*a^2*e^(191/2*I*c) - 459291145959804703779*I*a^2*e^(189/
2*I*c) - 12054885718630588825*I*a^2*e^(187/2*I*c) - 284015632092748725*I*a^
2*e^(185/2*I*c) - 5932441401249090*I*a^2*e^(183/2*I*c) - 108143463042754*I*

a^2*e^(181/2*I*c) - 1685352670794*I*a^2*e^(179/2*I*c) - 21830993145*I*a^2*e^(177/2*I*c) - 225643340*I*a^2*e^(175/2*I*c) - 1744665*I*a^2*e^(173/2*I*c) - 8970*I*a^2*e^(171/2*I*c) - 23*I*a^2*e^(169/2*I*c))*tan(1/4*d*x + c)/(e^(517*I*c) + 418*e^(516*I*c) + 87153*e^(515*I*c) + 12085216*e^(514*I*c) + 1253841160*e^(513*I*c) + 103818048048*e^(512*I*c) + 7146142307307*e^(511*I*c) + 420601518659718*e^(510*I*c) + 21608403021340047*e^(509*I*c) + 984382804329835768*e^(508*I*c) + 40261256699368950388*e^(507*I*c) + 1493326612293984160368*e^(506*I*c) + 50648660944512569972179*e^(505*I*c) + 1581796642397812408161814*e^(504*I*c) + 45759117183402579073139583*e^(503*I*c) + 1232445557346832245176696904*e^(502*I*c) + 31042222522074681615625020522*e^(501*I*c) + 734057263616388449968842366924*e^(500*I*c) + 163531646471515302405291376181 1*e^(499*I*c) + 344277152012875134140739302960914*e^(498*I*c) + 6868329225263681349501997341320517*e^(497*I*c) + 130171193079172823835151430773360024*e^(496*I*c) + 2348998374244347079532766203075607598*e^(495*I*c) + 40443624781415311581857832389099634564*e^(494*I*c) + 665634670676210063754191847109971141414*e^(493*I*c) + 10490402669510897424624643766470754045064*e^(492*I*c) + 158566476113257562566117432227203884298856*e^(491*I*c) + 2302150411226234925855222345201500900533576*e^(490*I*c) + 32147887693375338817454482515377350383950278*e^(489*I*c) + 432333688644261557547944179250800440604964868*e^(488*I*c) + 5605927253067558551780452883689835514455118670*e^(487*I*c) + 70164515322544462906873548813748091084561870680*e^(486*I*c) + 848552202276512356496200136959676295361696315113*e^(485*I*c) + 9925490738534402272939987038714580495445431374618*e^(484*I*c) + 112391604542246650966429162063124338952554575234051*e^(483*I*c) + 1233096700139723365181997220750932590655287625342156*e^(482*I*c) + 13118781801172174729679339894318153694964675368481194*e^(481*I*c) + 135442594916636116191574650625331646238501101627937224*e^(480*I*c) + 1357990663161479842850642848032544982878359839580349899*e^(479*I*c) + 13231708870104896973800056733779919089340836756009580718*e^(478*I*c) + 125370496586921272662198050851269323171167338854081782959*e^(477*I*c) + 1155855412893594260345544966642687823630035899363232371472*e^(476*I*c) + 10375184499871175501909398956596684116802997082526660323524*e^(475*I*c) + 90722605722208814918642284639487187764607589706493970774776*e^(474*I*c) + 773204636991145775061462731028098506094432675788136295011259*e^(473*I*c) + 6426195485535248576425068136870465530087114003875716691383902*e^(472*I*c) + 52108117629177048660492400985175830987505700566877818954141639*e^(471*I*c) + 412430698299915190848067222327219435067747934091894670488982928*e^(470*I*c) + 3187749929744346497211536044751776582320958627923816470590659024*e^(469*I*c) + 24070801913529757101858022914372045864746991786182039740274325264*e^(468*I*c) + 177642829135119348577194437675802830239905460092687136494961404333*e^(467*I*c) + 1281817464914970810859604189828359000790789921169405304612211251818*e^(466*I*c) + 9046693523825682979044338963104263167672586826367911338826483549173*e^(465*I*c) + 62473550781053295317710774690247114124125187565731848441781904032672*e^(464*I*c) + 422276126632003687547754746555709988710527133086660161366353656787288*e^(463*I*c) + 2794709104475686611842790694973699164482254723977210209725661304403472*e^(462*I*c) + 181157684956157580767

10303055505625589254293659193314153418333944596408*e^(461*I*c) + 1150514818 52080848873700388354521315567640365124003103691176697194292320*e^(460*I*c) + 716099497599058079895633338552940229192858196481597830078819711862600096*e^(459*I*c) + 4369442482910113914565353136069595862669338858053419381214131 241925047008*e^(458*I*c) + 261439762799020214434719456650802545630568101835 20401889800285493144867448*e^(457*I*c) + 1534360887450562541273272394615770 71933130157764595997113973513183188399376*e^(456*I*c) + 8835009688217912026 00774541927769200737689393513734789368397093333311961880*e^(455*I*c) + 4992 519712457043983505377976607953988397368297591114957991804893688371867680*e^(454*I*c) + 276931165383432592259833826376479361226640338596151334898466646 94361471028310*e^(453*I*c) + 1508223814314124137735664742100117468522974375 97059186295243989481140398152780*e^(452*I*c) + 8066795436075891407593050107 96189568269842021613388955218916278823182639488190*e^(451*I*c) + 4238125846 763232586394188569858685826755328005548627437019301405851325887594480*e^(450*I*c) + 218764828927139099280403456125787058051215087562266963170876518242 52241418663320*e^(449*I*c) + 1109691996873209747499222595952504443412192185 35349655762591192576535872151766080*e^(448*I*c) + 5532691288195286125029188 69558947829098021956309349843584044631512291778800081490*e^(447*I*c) + 2711 843239670717527605640490148833507130242448403978318523237721944200392830108 580*e^(446*I*c) + 130698172034882898861932055083758183921249913823401603168 86507181296548981014818410*e^(445*I*c) + 6194859665303550287956433881523431 0660410902037882473161804774492916216575880077680*e^(444*I*c) + 28882075526 4730654469968572021047109427318619508995802020689904590319476295408324280*e^(443*I*c) + 13247564123678374731574728211624836911209665019489539264922416 43788264284546437221120*e^(442*I*c) + 5978992172944143218459161149299819706 321732111578494525245228742976468409105395536290*e^(441*I*c) + 265568063890 43407534496702369101545795994861757741414789944652712127566910185274123140*e^(440*I*c) + 1161045516835550437629115017121163993137330211326774811128240 47246361794049635726479850*e^(439*I*c) + 4997075672538590843575963148137947 68069337190915967491907488904933922677579665354338960*e^(438*I*c) + 2117589 733466855707101501429210414722401838837940752841618541440888545729943138209 036820*e^(437*I*c) + 883672064086047030569451402154796955129679409226698304 4118375790025854584036796364768280*e^(436*I*c) + 36318369652302591732197444 409798122022640824604130552506742586795183267354382847875885730*e^(435*I*c) + 147030816732276833163041582099592047512043725225353339238819165193000407 629544745753221740*e^(434*I*c) + 586403466972683242741643328921560909375197 453864243299571990964608857245771134145204174990*e^(433*I*c) + 230435107337 384035737917859767306635201668278168913984209737666311848880384113193531364 1840*e^(432*I*c) + 89232094473432967633318818816384717934996186706010260597 30895962653291770229493028162575100*e^(431*I*c) + 3405405385129556915435234 6722177172655187548910782008504718324168725029438589162349211628040*e^(430*I*c) + 12809891460168853967248054183040984770736750043860153680320449770111 9911289087105659482783340*e^(429*I*c) + 47501057885760151927231661793842522 2421786597241671026894318515408511467140969393115768793680*e^(428*I*c) + 17 365742188181910718741974724501581238835642099506586391023371481227690806116

80719741726053840*e^(427*I*c) + 6259872156822252843650960708235034710201362
77605717664722632308975144656528885010389815385992 0*e^(426*I*c) + 222519591
76795777757167366036007480222211364232146399803864370963391491223687245823 4
57351580140*e^(425*I*c) + 780098073680242398756137330588514171253271146810 7
08896407942492826334705807565570839232033771 60*e^(424*I*c) + 26974580144021
12969726836018638789543579623085200765951771282276292732402152097082184973 6
3414140*e^(423*I*c) + 920089393029589032874601850027159322612526368444771 48
97819743610788475288914688310384360649519 20*e^(422*I*c) + 30961319716215201
62380301554241465451782362086810287537748902904985934020179565706177131421 6
14590*e^(421*I*c) + 102793647306638408447395778624692626046488619142979725 8
91652435306512306907262444624791998942551 80*e^(420*I*c) + 33675398872021568
37590238459398275336255980105810418462734541113626243194324077826072175699 1
027090*e^(419*I*c) + 108867995731829472826732905192034886797284621356445627
53090910442948674125782263347689835682645404 0*e^(418*I*c) + 347351473214713
78087435208312956660123876576277594236676273334995210388975398263640385755 6
867777300*e^(417*I*c) + 109385321448622035867403243450086667849977001130587
41724889759516120314567346082870955195010419754 40*e^(416*I*c) + 34002325606
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82081152636090*e^(415*I*c) + 104341175165703959666536931555824021094603480 9
54730278074123214273468169285671977703764961702518039 40*e^(414*I*c) + 31610
93933128469275069430644361841465609596952094521574300404456038689524180157 9
15654345194071335173 0*e^(413*I*c) + 945561802589319869193343034663656528268
58091314329189160736277175873841732196453379953705679466826880*e^(412*I*c)
+ 279285755800035206679835368898165477644864987794665387827488933863633745 0
47373109049265172681702585720*e^(411*I*c) + 814608187736530579670210025271 9
21415597183369881214299823291969785549876175969866367976653244974728560*e^(
410*I*c) + 234651821923910514223814163307346476889915570893502577804763741 2
68178157576542221912740926015943871225 0*e^(409*I*c) + 667586629037114735850
37668656692890108935438698305387087249452915809511791882966061581112577069 6
8604740*e^(408*I*c) + 187599882188655635641636357359860732782557372574057 06
27910889136637842846741455993048117286353859819389 0*e^(407*I*c) + 520751785
18793270386429263351544306951104993542500582938155241689408138675254608030 8
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c) + 386876218234277165632451723049979889263115282374607541692443176673997 5
13742813591736171169652250611186480*e^(404*I*c) + 103556198259200293522638 4
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258510*e^(403*I*c) + 273889562479526560335522764656600088628077830508482570
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00*I*c) + 471882208434662076950995069535737803571088974914225678980481990 18
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+ 1470931146618934345515038362300100160482127749581443929904746910224777470
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*I*c) + 1518963421490880039641791172264375474804852010973481245910987881049
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8*I*c) + 2414966516810338503289076549202740511710059011795447138773464205699
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c) + 3463765717267169016765734453719708704888235485399327047206394307877360
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*c) + 4208463426089493872775590214579245865781209661485610226470084995294684
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366*I*c) + 434390969660193217335735968778157929370129568194082711421543317533
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) + 641751006932600668062380648860045971707408433000868393686161391645291080
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 + 742228640908173124916937049462525617334148919679118270489831005497781951
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I*c) + 675848043788852437256293594896385762669485554719551948612287756798 17
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*e^(319*I*c) + 481331176781840292165037485491103744789247190946356038928293
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e^(303*I*c) + 1814081687709220598203685533166973216399848626282988285695602
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c) + 1848311519837489418176678501747082571381281721582694132877653585322407
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07093452964351257962696133511725652320*e^(299*I*c) + 1869154744365675149263
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99177848064220150818355261280*e^(298*I*c) + 18483115198374894181766785017470825713812817215826941328776535853224077324433619190081855782990589568449488941045192152421284O*e^(297*I*c) + 18140816877092205982036855331669732163998486262829882856956027329563089762682934526359221903456085353073371052984214853790168O*e^(296*I*c) + 17672092997055464200457577005309570059533465987068273203197591553238757705241486632351114011768049292935451755947989922094036O*e^(295*I*c) + 17086984886895310117686030605310399434053039034726008843267684250555514129383083896127597426892866649484572346254470910284368O*e^(294*I*c) + 16397781605960772537526455981650584789418778510145536039189742448299841538578760576531550920833774159014307857224350513270658O*e^(293*I*c) + 15618596295355119616973821883217369650985255158921073057836572747625947647446595542850233667374368649917569867787569361124340O*e^(292*I*c) + 14764892080554533341862312176785377739978292474830122879392434257499993795542176537010123512293955746754854920217455000960478O*e^(291*I*c) + 13852979454915108945135276957654340312633074724368003083246720589581904356815523926487676286717275433868402784985538545321608O*e^(290*I*c) + 12899507601159190341076386342709732994858617357459586270584915928094304645874266316345401849146385539564945395221289963219868O*e^(289*I*c) + 11920971370203392705575539782368844444464742432450218532862634704659963472114657383068154049533354314677681091191041046862896O*e^(288*I*c) + 10933253734996622320393267850342635707986370700172829401104207653040392386265401897867651641731422108944992249561273287016966O*e^(287*I*c) + 99512206472057965951340341738023548515336403371717898040850470954657532977279113491506880290726111154101941386019689567958040*e^(286*I*c) + 89883815801382382213973270477954602744792877018051963347146307372464315121274929402347942874802899499538953561056667668891020*e^(285*I*c) + 80566249130682684181876201882623511206363790337218011954110210642927765997644903820595421936873565314654415769070472655401600*e^(284*I*c) + 71660329861173395524441943889284109134091157844655245672084237402434944696464927131812190659629511140639501743303863582092880*e^(283*I*c) + 63247774101012179051794946075175569924076981338138483158042406747453874729387631710544995247152912205118500597511052824347680*e^(282*I*c) + 55390913044972086219432689146331566081427959896969900214434296817731150863867056620768608187679709720152974148474907904177340*e^(281*I*c) + 48133117678184029216503748549110374478924719094635603892829364863916553792278822957368285106328164715910598370871149079494360*e^(280*I*c) + 41499832121963708043788523787401345541780088930538206918853579026749273364671640037563488607716092887686471542838602788559660*e^(279*I*c) + 35500103106019649876272376796949482209581372371036005012877806027481672807059943445240136315568500732379966585005678181937920*e^(278*I*c) + 30128482414552703264559018953088177156013437493438201078413769835448366148121754549197591129967170764969700180348699207838960*e^(277*I*c) + 25367176439119353621532260335983348154904982606125761711300683492963390816491583025705268737539982149639300226512657426118880*e^(276*I*c) + 21188321405882887539610198374706862695894049226077093764132512513336190523978949694387686059124526755048042957954264706637460*e^(275*I*c) + 1755627327122429239688729140312571621349148626114547857137675169010565606783804215103827138130037275

7755676325408026834544840*e^(274*I*c) + 1442981628520843120453297837537569 1
965063154224649747551295851507389524083226976789688601369628399900747658579
201929300744260*e^(273*I*c) + 117642122748764840800109007146734744933712781
605578119837244558265660556176580864793686418649081196434124136448037721316
57280*e^(272*I*c) + 951303227401952295420911319126822664229991201352566594 0
298381064797885690904993128948035227412144035633851779511219335277360*e^(27
1*I*c) + 762973181562782158046899242420700836643889673633302466186383810511
0445148946962328297631547032543419811821015837863013682720*e^(270*I*c) + 60
689498031567122483318711053298954717228061430088780149865596536872606948165
504701958900045119655275674327229697075772021 60*e^(269*I*c) + 4787527442780
945685145204846971596165304169419328244073211459592129649255048876854059844
720661078151288179612574986359194560*e^(268*I*c) + 374525759487665120465733
498842622638814395450198683066422234922636107960954682227606750489938670308
898230818571714340721 1328*e^(267*I*c) + 290538572232005700195334527448948 27
908566925299598237495326959634141648333667731282186078993285886089161765937
72088622582464*e^(266*I*c) + 223489127639843946447862257830643484072461048 4
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944*e^(265*I*c) + 170458299670782280820467821816769300269866114771277235502
145654381093006963718808588282475750060524696321081035170640534940 8*e^(264*
I*c) + 128904351529293395648063433049967704018104393562010691426731106790 00
300583988397876923769540905452785545449977100587547724 00*e^(263*I*c) + 9664
582753690377187477391307981516434835906841668322346880982911641606364181594
521198157288093721251688362393644423973440 64*e^(262*I*c) + 7183615963820582
492091135444879010888683887440337132103324919713759067383415515404572648043
040396642559156073498019119665 51*e^(261*I*c) + 529329252764113926003934836 9
582435576725492389975607392144065991850478319555725837653586343954087715280
09745467548382950094*e^(260*I*c) + 386642673050380049457382562818316962651 9
755509907792770487402386298587950182473561628886310156876647801012052873330
82748791*e^(259*I*c) + 279945244475039804822966730462960884492119874857791 1
471240090794769204359417352933093054304386873331299124541967740701 07264*e^(
258*I*c) + 200906587153578804380300469501441610174521851259541929209840688 9
608594549085197748359058957576667708578886117387518584604 24*e^(257*I*c) + 1
429063191230555242465469284789542383713159258020223892364986521368398225020
35155676970917419039834587967055588431566416784*e^(256*I*c) + 1007449618518
537446117543009829801669624045538362229218684846942699661206076989070463437
310111609488281002767293701328193 57*e^(255*I*c) + 70386349760594831567048 22
406139502569850120229696630037676422033669770296159109985405541137629487143
746814952852479600 2762*e^(254*I*c) + 487332535059749234008522555630521014 02
196469313659554492725674754339375283010407167744366955828922837488705858532
439654489*e^(253*I*c) + 334358978279365813011711754596108294542981679620174
198100729367333785065844280242010724531934581553340466935167423907178 32*e^(
252*I*c) + 227316035661288411004195019470513676668366524180772609139448107 4
847308489189041018128541260485487662591956563952122722327 6*e^(251*I*c) + 15
312837206662775379347353212807682965712535652942631518286142403097738200270
7111953965821590285135327796821544519962085 92*e^(250*I*c) + 102204237794346

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c) + 1847505856462451533445284300571326323781162553304565971887670758091079
306794821834928170773126364639722071570131703785334*e^(245*I*c) + 117660072
097578696518987505089023109220461269697027743301453589578895677123079352038
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2299102*e^(242*I*c) + 28699294363123149655727801085157694089682649746606632
752880156067700711283743192673508812097486176051136700881572878264З*e^(241*
I*c) + 17589625826275598575710681261397930126580103159548435361490467286516
9442232075776580447184134141375995770091499246759528*e^(240*I*c) + 10676483
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088840347241496099644*e^(238*I*c) + 381990158675860879760029987566276749947
954406679036250293223462501332864891208750050136381281138939603496702807071
61530*e^(237*I*c) + 2251467574130806996150616558650287243042193021067326439
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) + 13139771494104933881856681151418293112242551521535686871181266579813877
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905493027145639238827192254886349361126991457692409851120873307487457468*e^
(232*I*c) + 137967652979621207401710618806658944835544650121089019510716486
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+ 7158124686842941475473807363679839718172745581538409044503383852693596921
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2380*e^(196*I*c) + 10355619825920029352263845779086115486121114950801935736
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c) + 5207517851879327038642926335154430695110499354250058293815524168940813
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890*e^(191*I*c) + 667586629037114735850376686566928901089354386983053870872
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6858091314329189160736277175873841732196453379953705679466826880*e^(186*I*c
) + 31610939331284692750694306443618414656095969520945215743004044560386895
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184*I*c) + 3400232560601651617521694680847089844198028831694417424794868779
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0*e^(182*I*c) + 34735147321471378087435208312956660123876576277594236676273
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447395778624692626046488619142979725891652435306512306907262444624791998942
55180*e^(178*I*c) + 3096131971621520162380301554241465451782362086810287537
74890290498593402017956570617713142161459O*e^(177*I*c) + 920089393029589032
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920*e^(176*I*c) + 269745801440211296972683601863878954357962308520076595177
12822762927324021520970821849736341414O*e^(175*I*c) + 780098073680242398756
1373305885141712532711468107088964079424928263347058075655708392320337716O*
e^(174*I*c) + 2225195917679577775716736603600748022221136423214639980386437
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*I*c) + 1736574218818191071874197472450158123883564209950658639102337148122
76908061168071974172605384O*e^(171*I*c) + 475010578857601519272316617938425
22242178659724167102689431851540851146714096939311576879368O*e^(170*I*c) +
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4891078200850471832416872502943858916234921162804O*e^(168*I*c) + 8923209447
343296763331881881638471793499618670601026059730895962653291770229493028162
575100*e^(167*I*c) + 230435107337384035737917859767306635201668278168913984
2097376663118488803841131935313641840*e^(166*I*c) + 58640346697268324274164
3328921560909375197453864243299571990964608857245771134145204174990*e^(165*
I*c) + 14703081673227683316304158209959204751204372522535333923881916519300
0407629544745753221740*e^(164*I*c) + 36318369652302591732197444409798122022
640824604130552506742586795183267354382847875885730*e^(163*I*c) + 883672064
086047030569451402154796955129679409226698304411837579002585458403679636476
8280*e^(162*I*c) + 21175897334668557071015014292104147224018388379407528416
18541440888545729943138209036820*e^(161*I*c) + 4997075672538590843575963148
13794768069337190915967491907488904933922677579665354338960*e^(160*I*c) + 1
161045516835550437629115017121163993137330211326774811128240472463617940496
35726479850*e^(159*I*c) + 2655680638904340753449670236910154579599486175774
1414789944652712127566910185274123140*e^(158*I*c) + 59789921729441432184591
61149299819706321732111578494525245228742976468409105395536290*e^(157*I*c)
+ 1324756412367837473157472821162483691120966501948953926492241643788264284
546437221120*e^(156*I*c) + 288820755264730654469968572021047109427318619508
995802020689904590319476295408324280*e^(155*I*c) + 619485966530355028795643
38815234310660410902037882473161804774492916216575880077680*e^(154*I*c) + 1
306981720348828988619320550837581839212499138234016031688650718129654898101
4818410*e^(153*I*c) + 27118432396707175276056404901488335071302424484039783
18523237721944200392830108580*e^(152*I*c) + 5532691288195286125029188695589
47829098021956309349843584044631512291778800081490*e^(151*I*c) + 1109691996
87320974749922259595250444341219218535349655762591192576535872151766080*e^(
150*I*c) + 2187648289271390992804034561257870580512150875622669631708765182
4252241418663320*e^(149*I*c) + 42381258467632325863941885698586858267553280
05548627437019301405851325887594480*e^(148*I*c) + 8066795436075891407593050
10796189568269842021613388955218916278823182639488190*e^(147*I*c) + 1508223
81431412413773566474210011746852297437597059186295243989481140398152780*e^(
146*I*c) + 2769311653834325922598338263764793612266403385961513348984666469
4361471028310*e^(145*I*c) + 49925197124570439835053779766079539883973682975
91114957991804893688371867680*e^(144*I*c) + 8835009688217912026007745419277
69200737689393513734789368397093333311961880*e^(143*I*c) + 1534360887450562
54127327239461577071933130157764595997113973513183188399376*e^(142*I*c) + 2
6143976279902021443471945665080254563056810183520401889800285493144867448*e
^(141*I*c) + 43694424829101139145653531360695958626693388580534193812141312
41925047008*e^(140*I*c) + 7160994975990580798956333385529402291928581964815
97830078819711862600096*e^(139*I*c) + 1150514818520808488737003883545213155
67640365124003103691176697194292320*e^(138*I*c) + 18111576849561575807671030
3055505625589254293659193314153418333944596408*e^(137*I*c) + 27947091044756
86611842790694973699164482254723977210209725661304403472*e^(136*I*c) + 4222
76126632003687547754746555709988710527133086660161366353656787288*e^(135*I*
c) + 62473550781053295317710774690247114124125187565731848441781904032672*e
^(134*I*c) + 90466935238256829790443389631042631676725868263679113388264835

49173*e^(133*I*c) + 1281817464914970810859604189828359000790789921169405304
612211251818*e^(132*I*c) + 177642829135119348577194437675802830239905460092
687136494961404333*e^(131*I*c) + 240708019135297571018580229143720458647469
91786182039740274325264*e^(130*I*c) + 3187749929744346497211536044751776582
320958627923816470590659024*e^(129*I*c) + 412430698299915190848067222327219
435067747934091894670488982928*e^(128*I*c) + 521081176291770486604924009851
75830987505700566877818954141639*e^(127*I*c) + 6426195485535248576425068136
870465530087114003875716691383902*e^(126*I*c) + 773204636991145775061462731
028098506094432675788136295011259*e^(125*I*c) + 907226057222088149186422846
39487187764607589706493970774776*e^(124*I*c) + 1037518449987117550190939895
6596684116802997082526660323524*e^(123*I*c) + 11558554128935942603455449666
42687823630035899363232371472*e^(122*I*c) + 1253704965869212726621980508512
69323171167338854081782959*e^(121*I*c) + 1323170887010489697380005673377991
9089340836756009580718*e^(120*I*c) + 13579906631614798428506428480325449828
78359839580349899*e^(119*I*c) + 1354425949166361161915746506253316462385011
01627937224*e^(118*I*c) + 1311878180117217472967933989431815369496467536848
1194*e^(117*I*c) + 1233096700139723365181997220750932590655287625342156*e^(
116*I*c) + 112391604542246650966429162063124338952554575234051*e^(115*I*c)
+ 9925490738534402272939987038714580495445431374618*e^(114*I*c) + 848552202
276512356496200136959676295361696315113*e^(113*I*c) + 701645153225444629068
73548813748091084561870680*e^(112*I*c) + 5605927253067558551780452883689835
514455118670*e^(111*I*c) + 432333688644261557547944179250800440604964868*e^
(110*I*c) + 32147887693375338817454482515377350383950278*e^(109*I*c) + 2302
150411226234925855222345201500900533576*e^(108*I*c) + 158566476113257562566
117432227203884298856*e^(107*I*c) + 104904026695108974246246437664707540450
64*e^(106*I*c) + 665634670676210063754191847109971141414*e^(105*I*c) + 4044
3624781415311581857832389099634564*e^(104*I*c) + 23489983742443470795327662
03075607598*e^(103*I*c) + 130171193079172823835151430773360024*e^(102*I*c)
+ 6868329225263681349501997341320517*e^(101*I*c) + 344277152012875134140739
302960914*e^(100*I*c) + 16353164647151530240529137618111*e^(99*I*c) + 73405
7263616388449968842366924*e^(98*I*c) + 31042222522074681615625020522*e^(97*
I*c) + 1232445557346832245176696904*e^(96*I*c) + 45759117183402579073139583
*e^(95*I*c) + 1581796642397812408161814*e^(94*I*c) + 5064866094451256997217
9*e^(93*I*c) + 1493326612293984160368*e^(92*I*c) + 40261256699368950388*e^(
91*I*c) + 984382804329835768*e^(90*I*c) + 21608403021340047*e^(89*I*c) + 42
0601518659718*e^(88*I*c) + 7146142307307*e^(87*I*c) + 103818048048*e^(86*I*
c) + 1253841160*e^(85*I*c) + 12085216*e^(84*I*c) + 87153*e^(83*I*c) + 418*e
^(82*I*c) + e^(81*I*c)) - 14*(23*a^2*e^(1027/2*I*c) + 8970*a^2*e^(1025/2*I*
c) + 1744665*a^2*e^(1023/2*I*c) + 225643340*a^2*e^(1021/2*I*c) + 2183099314
5*a^2*e^(1019/2*I*c) + 1685352670794*a^2*e^(1017/2*I*c) + 108143463042714*a
^2*e^(1015/2*I*c) + 5932441401233490*a^2*e^(1013/2*I*c) + 28401563208971452
5*a^2*e^(1011/2*I*c) + 12054885718238165655*a^2*e^(1009/2*I*c) + 4592911459
21837770879*a^2*e^(1007/2*I*c) + 15866421408580747568967*a^2*e^(1005/2*I*c)
 + 501114476390712619058089*a^2*e^(1003/2*I*c) + 14570867094745692063264465
*a^2*e^(1001/2*I*c) + 392372635871953337607706440*a^2*e^(999/2*I*c) + 98354

7409376798528483574017 8*a^2*e^(997/2*I*c) + 230518924833500391396633471432*
a^2*e^(995/2*I*c) + 5071416371138697123516748312797*a^2*e^(993/2*I*c) + 105
091017765905750210205432017088*a^2*e^(991/2*I*c) + 20575715262192801766605 6
9426269565*a^2*e^(989/2*I*c) + 381679523368539644501949853229 99760*a^2*e^(9
87/2*I*c) + 672482982322867333315410721290945657*a^2*e^(985/2*I*c) + 112793
739402055522675811160201787 94202*a^2*e^(983/2*I*c) + 180469988996656023008 3
8581802100518559 4*a^2*e^(981/2*I*c) + 275968703361738903640406319541699982 3
985*a^2*e^(979/2*I*c) + 404018204062641833133876902838922016481 60*a^2*e^(97
7/2*I*c) + 567179441813227622186529241088113209451509*a^2*e^(975/2*I*c) + 7
646419821227105124391700712517502747187088*a^2*e^(973/2*I*c) + 991303822775
320225158191778816293250758595 09*a^2*e^(971/2*I*c) + 12374208047077050939 91
102638839493330163931640*a^2*e^(969/2*I*c) + 148902995476946224064887889156
48999996474069170*a^2*e^(967/2*I*c) + 172919643607724441133173354565998605 4
01103776504*a^2*e^(965/2*I*c) + 193994274207009950983114349324950737397996 3
303677*a^2*e^(963/2*I*c) + 210454458721348496801378614981824081260145633264
57*a^2*e^(961/2*I*c) + 220977262761597134870041878241189142663942444889435*
a^2*e^(959/2*I*c) + 2247655430280602939346801439987511004122770572057975*a^
2*e^(957/2*I*c) + 22164391506926711131826332938481074378353565258441643*a^2
*e^(955/2*I*c) + 212059444422641568370505689613891761234929288751535757*a^2
*e^(953/2*I*c) + 1969922064355959547894504865149532487975181829580265482*a^
2*e^(951/2*I*c) + 17779824621644501534677987130821297785034706339145224178*
a^2*e^(949/2*I*c) + 156018117308149873911753787065575404463673778724880411 5
10*a^2*e^(947/2*I*c) + 133186353192195159434949744805150114460455517763291 0
228645*a^2*e^(945/2*I*c) + 110671667395938065379944325322023238925593588248
14410948544*a^2*e^(943/2*I*c) + 895669784647556015313864262324492173530870 6
0101994516952837*a^2*e^(941/2*I*c) + 706359042600440090623627368646803874 66
3354915637996034416454*a^2*e^(939/2*I*c) + 543112752777682010778982301823 11
221465488454663249103144381 55*a^2*e^(937/2*I*c) + 40733554024740134900859 59
435064795421256740764895774705848168 0*a^2*e^(935/2*I*c) + 2981357660920498 2
126550856575985975726890197740477616769484052 0*a^2*e^(933/2*I*c) + 21304351
6559613540804755219936850307133182604202194987124713182 4*a^2*e^(931/2*I*c)
+ 148696209239349281958601718266982716135450692658125469789302988 44*a^2*e^(
929/2*I*c) + 101411225754763725160776093014569051984766366679386214896417 03
2560*a^2*e^(927/2*I*c) + 676077945863029742736783795661095141326065268116 57
7325076514243900*a^2*e^(925/2*I*c) + 4407531071123153946915575442407867368 2
7320443644168232595205888056 0*a^2*e^(923/2*I*c) + 281085707944360048898681 5
5095425291975524337124542327266338411863980*a^2*e^(921/2*I*c) + 17541946418
18378612067054904914996117618974940308428735970943261374 48*a^2*e^(919/2*I*c
) + 10716614348473653564025004901165851994917410896239637509476622090221 20*
a^2*e^(917/2*I*c) + 641088541188620822723561436924428409477385073288034158 4
569571247989180*a^2*e^(915/2*I*c) + 375658912654834216259223272376633939730
617913440758172955655456415504 80*a^2*e^(913/2*I*c) + 215682293904367048229 4
525665251701654510863458477760555672865267242071 80*a^2*e^(911/2*I*c) + 1213
684086474480030032963524903872036826200642910143657468007690377301200*a^2*e
^(909/2*I*c) + 669557812266523430522687007446585031832114379850814811985238

0345744581420*a^2*e^(907/2*I*c) + 36222507823447452094316152383681805847086822685973455693062020799131961680*a^2*e^(905/2*I*c) + 192216100832677211425583919374607410256140382963064998218563326540739057800*a^2*e^(903/2*I*c) + 1000762165064573065580039704950705594622141532403147100702228104518209922480*a^2*e^(901/2*I*c) + 5113371340462080188470579216332247051199800933775813472986030153667768479970*a^2*e^(899/2*I*c) + 25646091635262306663775989907048193693026481072707785982065347970437174552640*a^2*e^(897/2*I*c) + 126290665976649423752795293300558365078090948368244878972263607020367969724510*a^2*e^(895/2*I*c) + 610735576848646913229035316690015481201283216147648837631072938937795953569020*a^2*e^(893/2*I*c) + 2901080705457201223480807515950562690696054942137423459448133177752600175055070*a^2*e^(891/2*I*c) + 13538822902792275748563604516064479211324364455610559665374956958057411438898160*a^2*e^(889/2*I*c) + 62087428059933702144851939557816743050943015221536726159024340696975430971481900*a^2*e^(887/2*I*c) + 27984184344972332902256022542885182491449861432225949373308219431658133659304060*a^2*e^(885/2*I*c) + 1239909297438968458498020421044704877786634944232208108330855107855869727352550810*a^2*e^(883/2*I*c) + 5401509285075055663844862882138729276809816929299978333470094669272025087067952130*a^2*e^(881/2*I*c) + 23140122603439479772392844447344267578241288491282693326820133793119469871909054310*a^2*e^(879/2*I*c) + 97502706496344518739819416482817785708749119763377367851251579953471302421416590690*a^2*e^(877/2*I*c) + 404148737461691129448272381486081487215931511785097115337433651585897523208487479570*a^2*e^(875/2*I*c) + 1648201642139146705633894149783476374765855031698399268829056921671864832034920363790*a^2*e^(873/2*I*c) + 6614440082002051045347921924412787836337662112455399887745116058097858565172028583520*a^2*e^(871/2*I*c) + 26125020973526102824190682571375956088092948345240408465888776831062032840805359036420*a^2*e^(869/2*I*c) + 101570223312000889889955269913274747383718323298377402360165758159408055448033759362720*a^2*e^(867/2*I*c) + 388763968920102374583905883275133570373138295169848377636334256622974927805402558286690*a^2*e^(865/2*I*c) + 1465134229064300830348210233782702338437177567650054898553731358964520863696142827138160*a^2*e^(863/2*I*c) + 5437521451042031455370282099308345101312396580420987248763253424089743393247174970193410*a^2*e^(861/2*I*c) + 19875383270198123016398073954782048143086744479176706215294931939285231552377668666774800*a^2*e^(859/2*I*c) + 71561313276686059543420409883222534473352439855772274727763362387210317509376711352805370*a^2*e^(857/2*I*c) + 253831320129265488677268040912482249188903710351278672972032718591405876131400102115746900*a^2*e^(855/2*I*c) + 887096148111783819792698075211637937350128251820639471668845531985819368043596429487700180*a^2*e^(853/2*I*c) + 3054976505229053186358196512899823679196539270073164577798894149381563584247883834020602010*a^2*e^(851/2*I*c) + 10368324278336947066455348036556544494726913476560521689641087749606367891595175422870841040*a^2*e^(849/2*I*c) + 34683534777882172855590247839161459711508478268599595143978937459065098062910312662980093090*a^2*e^(847/2*I*c) + 114367222654004146039785488306144607682565282217212089722715844480032864714063018623336102960*a^2*e^(845/2*I*c) + 371784628277848407873740730843158415533102422282317148023178730401149797296961025637580441

730*a^2*e^(843/2*I*c) + 11916260267120045202285359629167111819646810329793550809906409737347745088097651935945673080000*a^2*e^(841/2*I*c) + 37661117341863148447457366228609850041109045082888101894089219697224576875890481518758808892200*a^2*e^(839/2*I*c) + 11738051562239442910436658686616952931621359163901525749755059400912331209404508874859876592800*a^2*e^(837/2*I*c) + 36082142955789372921795326276163720115936669443430427894923821823835712395825018234933157302110*a^2*e^(835/2*I*c) + 109401947851812253736939736757431402194995906470393287332344122103685909885397712947473326518610*a^2*e^(833/2*I*c) + 327217244888055084262892186197327446953686436737681340634739093336235382375514336377928793244690*a^2*e^(831/2*I*c) + 965532218209251264607039716473737729829357676534904149014904268128459659120470520755736939192070*a^2*e^(829/2*I*c) + 2810975036067791526020783161414349035430610964164391290128775005718676199562281038906617666401970*a^2*e^(827/2*I*c) + 8075067480170920856802695458519559272622342102035297526669820326780584006158874417298884536622170*a^2*e^(825/2*I*c) + 22891422462276005970897699495175827432991422754209646711791861074723763534400400991756009136093340*a^2*e^(823/2*I*c) + 64043424833900148962660564937308584792588410556135883392172200976630674826538314163343570582742220*a^2*e^(821/2*I*c) + 176843212577304640940434087070526800206912147942357555568484158874194832893725593513293339771528640*a^2*e^(819/2*I*c) + 482003855527359842058748938929565762498717173867153381418816829773057750173701195879408932882129710*a^2*e^(817/2*I*c) + 1296869787700945503527478186253438429283866993105679751956812206964316306426908093383593771068875180*a^2*e^(815/2*I*c) + 3444774239264490631017394635045282867661444173647280134489449067279690770880154195712638143690670510*a^2*e^(813/2*I*c) + 9033952674591972024099323322407009219478763876009237692789450947388612631864264679797961473529847760*a^2*e^(811/2*I*c) + 23392734792358449986470914988641685348168613137145022740977224897697160854430483589336483946581829650*a^2*e^(809/2*I*c) + 59814047894924395116715176262926258735827009585441667308321325957072358824867958015638415996637992560*a^2*e^(807/2*I*c) + 151034681275961781670081880741865931451570808839279104804123701285639063747843522793214727666247721320*a^2*e^(805/2*I*c) + 376645844573615546184166510990416154645940002848766465441678202978044480377315238707708815985878943120*a^2*e^(803/2*I*c) + 927692098027065483765752065317996252674826674534631116047718959743097855192680766331861590769408198460*a^2*e^(801/2*I*c) + 2256936640197646172409588754483391048238912559719597692916098711340142755437285078061404880797678311440*a^2*e^(799/2*I*c) + 5423877415356140734240076530281376392307183648754518352919070721950593841907858843558278519237201933020*a^2*e^(797/2*I*c) + 12876713525916989223366823193023054088090488752457893124234397628679992437662682878994494276660041769680*a^2*e^(795/2*I*c) + 30201888617895119234147767797086586812217490454601051236525729423437716476833896661754018658154022389900*a^2*e^(793/2*I*c) + 69988368274664388580883736712738303159327351505142299304675566880142922981296353915575157471652388092680*a^2*e^(791/2*I*c) + 160253943840621057078138437984495917828994512049873464602063929877936771758934087025740251939283794149320*a^2*e^(789/2*I*c) + 362585708102908727461692262308497693854332721503869703743775437736913882412243026230183024991966728

272700*a^2*e^(787/2*I*c) + 810698514587734599341419926912945883958489502890
417749835477031467724072007792742636256985473924406832880*a^2*e^(785/2*I*c)
 + 179135687128617945307626189529754871427562763762032201846805627904310478
5643232974994540293493766790807180*a^2*e^(783/2*I*c) + 3912063292298370671 8
236562651806275103810426889069614510874217109674609809742431592402937733282
59061298480*a^2*e^(781/2*I*c) + 844417714938119303347880124874317013490279 2
413015392319772244917564145947358160863746469962582546517551020*a^2*e^(779/
2*I*c) + 180161882031611515955708476802609030852814845475689392743272128585
688425147118320679929810219456684324537 44*a^2*e^(777/2*I*c) + 3799695085003
403823385083030620582717001776425358694149802829312074251648466449921908403
69330620001587693 20*a^2*e^(775/2*I*c) + 792210813736582642728798486708339 63
158393802618546130507463440333508958081178065157747031476513568516431440*a^
2*e^(773/2*I*c) + 163291912624014896869889921756370257404344116207519220566
929295476847426915494195734247976197944827166856605*a^2*e^(771/2*I*c) + 332
771401353095630876781482769166072007566368785944639929752492013340507467607
203423204297878103391257399650*a^2*e^(769/2*I*c) + 670517439437730975214058
382921475629655071200139334454271221441426048415295599199783168621980211682
925980307*a^2*e^(767/2*I*c) + 133592516338887898994288754323787357347735407
807804038483834072623902958751488985719168875372738620682453 6152*a^2*e^(765
/2*I*c) + 263200819554360112688656725867108008279317933094393295264808673 62
575752921947868957894171361058324669498970 75*a^2*e^(763/2*I*c) + 5128027932
104560135559026593192544604592901120537915741822852980300115191592803605514
077707054780313193678930*a^2*e^(761/2*I*c) + 988089919880856328723361351985
533201055999294177279451042419781976783115995510733928889251646631740223323
8590*a^2*e^(759/2*I*c) + 188300010367427394010071984622268846044353279420 40
227457903683414392625117454825138218461037881756069460095462*a^2*e^(757/2*I
*c) + 354925185722847832617907210910079842132689358672913810999435476589968
666122819894515319139161630094331574855 71*a^2*e^(755/2*I*c) + 6617297932881
809399215054642382035162752852372860854002119931270260080224075665893897413
823318345715397706079 7*a^2*e^(753/2*I*c) + 122041281268575439834479883029 90
699194420160067581866401325623015491396458064340669238189760339409304370344
2025*a^2*e^(751/2*I*c) + 222658798242792334181002206109280104097850168579 78
952736759938769504628288902140101202554874582809766677823156 5*a^2*e^(749/2*
I*c) + 401887850175045080150313889910072694528009447016468072611453193966 63
248746567607461705605177391981962200132315 9*a^2*e^(747/2*I*c) + 71767324920
670553943767575873920097462584452902452927707470260940478945808166620375787
523398677784333943177897 1*a^2*e^(745/2*I*c) + 126803297440488499580090665 3
423684542730040005610160238536791866755170095503645042488461800763709111728
08894376*a^2*e^(743/2*I*c) + 221687596232449256065647525206945961628074801 9
821115392295053079963518361922106809558395835470562396612703910894*a^2*e^(7
41/2*I*c) + 383516964831217741295575895704558807255981323477748813823772353
785390692179569004031240446530849866596380773188 0*a^2*e^(739/2*I*c) + 65657
679593071530228829834619744537570730217235007718128652478013026176517587654
9833785568475466604733210934695 5*a^2*e^(737/2*I*c) + 111242268824128981064 3
238399018764325994794191948692614355578299900846301535590589525141555426051

1452162767106896*a^2*e^(735/2*I*c) + 18653626462850532803035140588104717514
0854310988488694196891866543573543835555408048328577488681543918124795283 31
*a^2*e^(733/2*I*c) + 30959348642576562860165299817366165862922648668425796 4
7550485120786878534785731743960086739464887905409107011859 2*a^2*e^(731/2*I*
c) + 5086061865420950083533559153160520120167735286246615994357148142901870
5622891681452604178883809245979957523278415*a^2*e^(729/2*I*c) + 82710216196
1927446592859468136034747447939482963463317531062070637037540124443643287 00
85997945910922286711361751 0*a^2*e^(727/2*I*c) + 1331530184413951960340147 70
3587636910000986369607395487685523178763848747686815865316482881172658859 68
911213464902*a^2*e^(725/2*I*c) + 2122189281886733858255854868756262179529 05
3583719746131193056437295146310879503071701605938930097493202934141376 39*a^
2*e^(723/2*I*c) + 33487722937735508942656050260928439349261401050182550442 6
6668616742189916252172282362627550435728637664646175391 52*a^2*e^(721/2*I*c)
 + 5232183263989094412281383865696617891232831748439800472620403194119585 19
7852422637489263477488675882736694187901 15*a^2*e^(719/2*I*c) + 809475688654
593052224501094178917252980035293905898453796392919564557037778617746976730
9487249023481152244866456 00*a^2*e^(717/2*I*c) + 1240155640575226832112461 44
658763515180020658900739017222936903158267886075275533279331003594413534113
0684921794627*a^2*e^(715/2*I*c) + 18816046186806990270245435156986520031264
2651000462991963767076785106375254909391376433590964492404142336445756405 6*
a^2*e^(713/2*I*c) + 28274107629176573460652929267033462730001720531624481 80
906376970875870523643742229301867770298371409250162486706446*a^2*e^(711/2*I
*c) + 4208105879900965671044811603186871788137050268249716642908852922450 16
6735904108996538151632302993343796013355257880*a^2*e^(709/2*I*c) + 62036998
076732947111872108021144212850853086945744288084100595853011031037228772905
2260514084704374579430302677541 5*a^2*e^(707/2*I*c) + 905963489471626610604 1
25011465485981917077095899489064382326729497161271325211266792503418048439 1
2055626215575001 99*a^2*e^(705/2*I*c) + 131067843765579140601235842829739716
168027656278860131867281252997375039972447886767293507155233679089682020168
14961*a^2*e^(703/2*I*c) + 187861234561218024604447776337413486622749892957 7
4122327946041136799723934764027545573154102942013646829238996755521*a^2*e^(
701/2*I*c) + 266786626041668418480957889241293019794489328404101843291537 79
3407940098728903614668213904364833458422949417473334 09*a^2*e^(699/2*I*c) +
3754113453093129499070762831188789664173800124873604554422547275812861247 94
3553964853993626724550359418113279007563 5*a^2*e^(697/2*I*c) + 5234775479141
456200969042474636259615597005932613387746572682372750616929974976286787233
7382933080302575832354312830*a^2*e^(695/2*I*c) + 72338117658183544125339619
278704570070398062503968469165923503150270252549867503793649405257860558789
674577875168502*a^2*e^(693/2*I*c) + 9907093334142971976029700454574688705 51
580177755061961507795918979669303216746380846295952488464392179861861676915
66*a^2*e^(691/2*I*c) + 13448285460457216264288409674469529571350049873864 52
006510355485923549332394834302319516825747713780152475147073422 87*a^2*e^(68
9/2*I*c) + 18095108246181918186958133049887925724287257181157189204838298 17
8697056972139098725724590592410834217924749626239734 0*a^2*e^(687/2*I*c) + 2
413577937113473282327609590718728464284134012731389363008530096007019884060

64584259031019225114956173896476656268335*a^2*e^(685/2*I*c) + 3191537208183
049874320021715335408800739785633976845781847779169877992931630884082047360
76370214921003117423047033230*a^2*e^(683/2*I*c) + 4184174731371814572412385
090873293252824089396877216062965991125177653395872555871837976644605971129
39981628640119137*a^2*e^(681/2*I*c) + 5439064667128123519049147559829178351
094822133364936621624653100349346061889628675519683252520558836292548902152
35232*a^2*e^(679/2*I*c) + 7010946890196828914166239682921267169075994030537
12158434755550345947349948295539046888909742638931217537474025975440*a^2*e^
(677/2*I*c) + 8961920355975037209271807078077066028702648087726047622951692
18466556192230960167844078573413391828541761332410051040*a^2*e^(675/2*I*c)
+ 1136139693561537155978568944899860990716224618498598331698010751957196904
760729746742387960564144749497838935456211960*a^2*e^(673/2*I*c) + 142857608
790754115407016752894453517980762876865018136822572838041989915471907902387
6946406819487778508438319784170080*a^2*e^(671/2*I*c) + 17817683182949669352
805978484140547237298363548717084325768592352016467647943896189509505874913
53081375055442537775544*a^2*e^(669/2*I*c) + 2204504848819271258577686647437
802673860228777835066862747405782838776390348098557012295819426306998948329
682289436640*a^2*e^(667/2*I*c) + 270594649944996307730421914875997577613545
365348393733791756619433689219556830563155471311684966044174625838545572316
0*a^2*e^(665/2*I*c) + 32954345219222178101235110820882370320399432856468780
34300290289132360253350516006721630787778671059075241422781406160*a^2*e^(66
3/2*I*c) + 3982256683723412940987002608432103465539772199439132030360365812
174562265353125356974005033580943527632143017811668560*a^2*e^(661/2*I*c) +
47753747487912315054596839966527814610204346354866288991622477572359598824
4933194330547948361773890650352555746361400*a^2*e^(659/2*I*c) + 56831194084
038593110007516240036231488608208471207766480066528273851195374220703844734
08108830451035508393726980174240*a^2*e^(657/2*I*c) + 6712861418522615724988
858473795623314248057954884136819874564233080140888033656717736078828058598
240124888994298326360*a^2*e^(655/2*I*c) + 787067024908872037443069512725257
813818390760011548448756778960258982976295273259765824685217552123912881884
8207047200*a^2*e^(653/2*I*c) + 91609737380630587614977376948117073446973469
19589075093557382262079852822162643836169596839715953389931229146306843160*
a^2*e^(651/2*I*c) + 1058623385911710506650733480513866864889318683528870371
4430991946260066278599752585501637968876434411898083966268318240*a^2*e^(649
/2*I*c) + 12146654565504797783672415623355290385431521572754643028081311118
774641507895483012327171848886038795599157607589336080*a^2*e^(647/2*I*c) +
138399376099471873989204752380174900209956108648629891563231150082467766771
66646686425137922972069544356469424336874720*a^2*e^(645/2*I*c) + 1566110116
368601184782458239234044886066938476679972162717922203521376820514126055609
5060384752632361819327032020892140*a^2*e^(643/2*I*c) + 17602373941334170158
602804303413344263296373051657482244301069046136457777485221759920683874338
340816767315010883070640*a^2*e^(641/2*I*c) + 196531744382527267525417924777
777619934650225271457413465791247041112701698526103162375302138370767319391
55254031315220*a^2*e^(639/2*I*c) + 2180018094657529251098759558153408779545
501567139438439807556810202379312678969165525747256028630827603152258911614

7800*a^2*e^(637/2*I*c) + 2402749345941052987834239331459670120369231513951937477626389007091265403880357210876019449823154101894648450011076482 0*a^2*e^(635/2*I*c) + 263168836945024245212481243876288800464809215795717366607784396111020491267193928674919783616056723550385633704904343 20*a^2*e^(633/2*I*c) + 286481246122006060137200240543277793152403108708212416514202406055456881449005370891982132638514538282345889175477115 60*a^2*e^(631/2*I*c) + 30999386333592884159610215585305952854889407725459965085076104937976196911732638644879528970536122548468911408679508520*a^2*e^(629/2*I*c) + 3334768163931371327764896679101754666414786277442561218564689977453122139338692571410754722528527305429031459659497758 0*a^2*e^(627/2*I*c) + 3566934156165823421939301591416525880023144723499217512011162195375877388035613051502633901375966408780199029004554654 0*a^2*e^(625/2*I*c) + 379405002121705379064219274397400743295372769685079435761248824859837054922511077610600398194209131291604566001662353 80*a^2*e^(623/2*I*c) + 4013756805364661437543334266852790189782225830628939717727761398702502102400919292657567905210843871160069227704111294 0*a^2*e^(621/2*I*c) + 42237674350927497308167607912770495384410509906999294359254608598393831908627007418402687181252824823543923401086446140*a^2*e^(619/2*I*c) + 44219062414309796885036555682850910798132641174189091355070247306856269259520267158532714171765231548167835085083759540*a^2*e^(617/2*I*c) + 460614252564034938067668169663307994388334771809988593995473930967657173021186924595282786976542841878908652641984908 80*a^2*e^(615/2*I*c) + 47746174085981291320260362228300183459282794406776461449086142952243162382524646625588139446166635147049927542868878520*a^2*e^(613/2*I*c) + 49256637251142339677939547027108976858345467610518344678311703270141917623803626587961704546454017361035725620405883520*a^2*e^(611/2*I*c) + 50578192367864269597146035002564905622322184914642694528702415269515000703383395370399380435548931455046604860814615100*a^2*e^(609/2*I*c) + 516983389779920970119491087635182786091572912056331651875042295664202679382674135986726666816056068513938113127654718 40*a^2*e^(607/2*I*c) + 526067227656051632452333852752003396449395303421583708917408064223475566220424603581835250293395073105939114822258999 00*a^2*e^(605/2*I*c) + 532951247986600196698491744108009210277692661226623298727506854636000929695489986274679432466633969731579342529634721 60*a^2*e^(603/2*I*c) + 537574302461117464874812442196755362012959615093852812346034320605597567888564442107335191600943229868258032243647342 20*a^2*e^(601/2*I*c) + 53989590479579880111809597901378922286527227175566547926860482497477539014851169842250286594884676270110583739674489880*a^2*e^(599/2*I*c) + 53989590479579880111809597901378922286527227175566547926860482497477539014851169842250286594884676270110583739674489880*a^2*e^(597/2*I*c) + 537574302461117464874812442196755362012959615093852812346034320605597567888564442107335191600943229868258032243647342 20*a^2*e^(595/2*I*c) + 532951247986600196698491744108009210277692661226623298727506854636000929695489986274679432466633969731579342529634721 60*a^2*e^(593/2*I*c) + 526067227656051632452333852752003396449395303421583708917408064223475566220424603581835250293395073105939114822258999 00*a^2*e^(591/2*I*c) + 516983389779920970119491087635182786091572912056331651875042295664202679382674135986726666816056068513938113127654718 40*a^2*e^(589

/2*I*c) + 5057819236786426959714603500256490562232218491464269452870241526951500070338339537039938043554893145504660486081461510 0*a^2*e^(587/2*I*c) + 4925663725114233967793954702710897685834546761051834467831170327014191762380362658796170454645401736103572562040588352 0*a^2*e^(585/2*I*c) + 4774617408598129132026036222830018345928279440677646144908614295224316238252464662558813944616663514704992754286887852 0*a^2*e^(583/2*I*c) + 4606142525640349380676681696633079943883347718099885939954739309676571730211869245952827869765428418789086526419849088 0*a^2*e^(581/2*I*c) + 4421906241430979688503655568285091079813264117418909135507024730685626925952026715853271417176523154816783508508375954 0*a^2*e^(579/2*I*c) + 4223767435092749730816760791277049538441050990699929435925460859839383190862700741840268718125282482354392340108644614 0*a^2*e^(577/2*I*c) + 4013756805364661437543334266852790189782225830628939717727761398702502102400919292657567905210843871160069227704111294 0*a^2*e^(575/2*I*c) + 3794050021217053790642192743974007432953727696850794357612488248598370549225110776106003981942091312916045660016623538 0*a^2*e^(573/2*I*c) + 3566934156165823421939301591416525880023144723499217512011162195375877388035613051502633901375966408780199029004554654 0*a^2*e^(571/2*I*c) + 3334768163931371327764896679101754666414786277442561218564689977453122139338692571410754722528527305429031459659497758 0*a^2*e^(569/2*I*c) + 3099938633359288415961021558530595285488940772545996508507610493797619691173263864487952897053612254846891140867950852 0*a^2*e^(567/2*I*c) + 2864812461220060601372002405432777931524031087082124165142024060554568814490053708919821326385145382823458891754771156 0*a^2*e^(565/2*I*c) + 2631688369450242452124812438762888004648092157957173666077843961110204912671939286749197836160567235503856337049043432 0*a^2*e^(563/2*I*c) + 2402749345941052987834239331459670120369231513951937477626389007091265403880357210876019449823154101894648450011076482 0*a^2*e^(561/2*I*c) + 2180018094657529251098759558153408779545501567139438439807556810202379312678969165525747256028630827603152258911614780 0*a^2*e^(559/2*I*c) + 1965317443825272675254179247777761993465022527145741346579124704111270169852610316237530213837076731939155254031315220*a^2*e^(557/2*I*c) + 1760237394133417015860280430341334426329637305165748224430106904613645777748522175992068387433834081676731501088307064 0*a^2*e^(555/2*I*c) + 1566110116368601184782458239234044886066938476679972162717922203521376820514126055609506038475263236181932703202089214 0*a^2*e^(553/2*I*c) + 1383993760994718739892047523801749002099561086486298915632311500824677667716664668642513792297206954435646942433687472 0*a^2*e^(551/2*I*c) + 1214665456550479778367241562335529038543152157275464302808131111877464150789548301232717184888603879559915760758933608 0*a^2*e^(549/2*I*c) + 1058623385911710506650733480513866864889318683528870371443099194626006627859975258550163796887643441189808396626831824 0*a^2*e^(547/2*I*c) + 9160973738063058761497737694811707344697346919589075093557382262079852822162643836169596839715953389931229146306843160*a^2*e^(545/2*I*c) + 7870670249088720374430695127252578138183907600115484487567789602589829762952732597658246852175521239128818848207047200*a^2*e^(543/2*I*c) + 6712861418522615724988858473795623314248057954884136819874564233080140888033656717736078828058598240124888994298326360*a^2*e^(541/2*I*c) + 56831194

0840385931100075162400362314886082084712077664800665282738511953742207038447340810883045103550839372698017424\0*a^2*e^(539/2*I*c) + 4775374748791231505459683996665278146102043463548662889916224775723595988244933194330547948361773890650352555746361400*a^2*e^(537/2*I*c) + 3982256683723412940987002608432103465539772199439132030360365812174562265353125356974005033580943527632143017811668560*a^2*e^(535/2*I*c) + 3295434521922217810123511082088237032039943285646878034300290289132360253350516006721630787778671059075241422781406160*a^2*e^(533/2*I*c) + 2705946499449963077304219148759975776135453653483937337917566194336892195568305631554713116849660441746258385455723160*a^2*e^(531/2*I*c) + 2204504848819271258577686647437802673860228777835066862747405782838776390348098557012295819426306998948329682289436640*a^2*e^(529/2*I*c) + 1781768318294966935280597848414054723729836354871708432576859235201646764794389618950950587491353081375055442537775544*a^2*e^(527/2*I*c) + 1428576087907541154070167528944535179807628768650181368225728380419899154719079023876946406819487778508438319784170080*a^2*e^(525/2*I*c) + 1136139693561537155978568944899860990716224618498598331698010751957196904760729746742387960564144749497838935456211960*a^2*e^(523/2*I*c) + 8961920355975037209271807078077066028702648087726047622951692184665561922309601678440785734133918285417613324100510 40*a^2*e^(521/2*I*c) + 7010946890196828914166239682921267169075994030537121584347555503459473499482955390468889097426389312175374740259754 40*a^2*e^(519/2*I*c) + 5439064667128123519049147559829178351094822133364936621624653100349346061889628675519683252520558836292548902152352 32*a^2*e^(517/2*I*c) + 4184174731371814572412385090873293252824089396877216062965991125177653395872555871837976644605971129399816286401191 37*a^2*e^(515/2*I*c) + 3191537208183049874320021715335408800739785633976845781847779169877992931630884082047360763702149210031174230470332 30*a^2*e^(513/2*I*c) + 2413577937113473282327609590718728464284134012731389363008530096007019884060645842590310192251149561738964766562683 35*a^2*e^(511/2*I*c) + 1809510824618191818695813304988792572428725718115718920483829817869705697213909872572459059241083421792474962623973 40*a^2*e^(509/2*I*c) + 1344828546045721626428840967446952957135004987386452006510355485923549332394834302319516825747713780152475147073422 87*a^2*e^(507/2*I*c) + 9907093334142971976029700454574688705515801777550619615077959189796693032167463808462959524884643921798618616769156 6*a^2*e^(505/2*I*c) + 7233811765818354412533961927870457007039806250396846916592350315027025254986750379364940525786055878967457787516850 2*a^2*e^(503/2*I*c) + 5234775479141456200969042474636259615597005932613387746572682372750616929974976286787233738293308030257583235431283 0*a^2*e^(501/2*I*c) + 3754113453093129499070762831188789664173800124873604554422547275812861247943553964853993626724550359418113279007563 5*a^2*e^(499/2*I*c) + 2667866260416684184809578892412930197944893284041018432915377934079400987289036146682139043648334584229494174733340 9*a^2*e^(497/2*I*c) + 1878612345612180246044477633741348662274989295774122327946041136799723934764027545573154102942013646829238996755521*a^2*e^(495/2*I*c) + 1310678437655791406012358428297397161680276562788601318672812529973750399724478867672935071552336790896820201681496 1*a^2*e^(493/2*I*c) + 905963489471626610604125011465485981917077095899489064382326729497161

271325211266792503418048439120556262155750019 9*a^2*e^(491/2*I*c) + 62036998
0767329471118721080211442128508530869457442880841005958530110310372287729 05
226051408470437457943030267754 15*a^2*e^(489/2*I*c) + 420810587990096567104 4
811603186871788137050268249716642908852922450166735904108996538151632302993
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300017205316244818090637697087587052364374222930186777029837140925016248670
6446*a^2*e^(485/2*I*c) + 188160461868069902702454351569865200312642651000 46
299196376707678510637525490939137643359096449240414233644575640 56*a^2*e^(48
3/2*I*c) + 124015564057522683211246144658763515180020658900739017222936903 1
582678860752755332793310035944135341130684921794627*a^2*e^(481/2*I*c) + 809
475688654593052224501094178917252980035293905898453796392919564557037778617
7469767309487249023481152244866456 00*a^2*e^(479/2*I*c) + 523218326398909441
228138386569661789123283174843980047262040319411958519785242263748926347748
86758827366941879011 5*a^2*e^(477/2*I*c) + 334877229377355089426560502609284
393492614010501825504426666861674218991625217228236262755043572863766464617
539152*a^2*e^(475/2*I*c) + 212218928188673385825585486875626217952905358371
974613119305643729514631087950307170160593893009749320293414137639*a^2*e^(4
73/2*I*c) + 133153018441395196034014770358763691000098636960739548768552317
876384874768681586531648288117265885968911213464902*a^2*e^(471/2*I*c) + 827
102161961927446592859468136034747447939482963463317531062070637037540124443
643287008599794591092228671136175 10*a^2*e^(469/2*I*c) + 5086061865420950083
533559153160520120167735286246615994357148142901870562289168145260417888380
924597995752327841 5*a^2*e^(467/2*I*c) + 309593486425765628601652998173661 65
862922648668425796475504851207868785347857317439600867394648879054091070118
592*a^2*e^(465/2*I*c) + 186536264628505328030351405881047175140854310988488
694196891866543573543835555408048328577488681543918124795283 31*a^2*e^(463/2
*I*c) + 111242268824128981064323839901876432599479419194869261435557829990 0
846301535590589525141555426051145216276710689 6*a^2*e^(461/2*I*c) + 65657679
593071530228829834619744537570730217235007718128652478013026176517587654983
378556847546660473321093469 55*a^2*e^(459/2*I*c) + 383516964831217741295575 8
957045588072559813234777488138237723537853906921795690040312404465308498665
963807731880*a^2*e^(457/2*I*c) + 221687596232449256065647525206945961628074
801982111539229505307996351836192210680955839583547056239661270391089 4*a^2*
e^(455/2*I*c) + 126803297440488499588009066534236845427300400056101602385 36
791866755170095503645042488461800763709111728088943 76*a^2*e^(453/2*I*c) + 7
176732492067055394376757587392009746258445290245292770747026094047894580816
662037578752339867778433394317789 71*a^2*e^(451/2*I*c) + 401887850175045080 1
503138899100726945280094470164680726114531939666324874656760746170560517739
19819622001323159*a^2*e^(449/2*I*c) + 222658798242792334181002206109280104 0
978501685797895273675993876950462828890214010120255487458280976667782315 65*
a^2*e^(447/2*I*c) + 122041281268575439834479883029906991944201600675818664 0
132562301549139645806434066923818976033940930437034420 25*a^2*e^(445/2*I*c)
+ 661729793288180939921505464238203516275285237286085400211993127026008022 4
075665893897413823318345715397706 0797*a^2*e^(443/2*I*c) + 354925185722847 83
261790721091007984213268935867291381099943547658996866612281989451531913916

163009433157485571*a^2*e^(441/2*I*c) + 1883000103674273940100719846222688460443532794204022745790368341439262511745482513821846103788175606946009 5462*a^2*e^(439/2*I*c) + 98808991988085632872336135198553320105599929417727945104241978197678311599551073392888925164663174022332385 90*a^2*e^(437/2*I*c) + 51280279321045601355590265931925446045929011205379157418228529803001151915928036055140777070547803131936789 30*a^2*e^(435/2*I*c) + 2632008195543601126886567258671080082793179330943932952648086736257575292194786895789417136105832466949897075*a^2*e^(433/2*I*c) + 13359251633888789899428875432378735734773540780780403848383407262390295875148898571916887537273862068245361 52*a^2*e^(431/2*I*c) + 6705174394377309752140583829214756296550712001393344542712214414260484152955991997831686219802116829259803 07*a^2*e^(429/2*I*c) + 33277140135309563087678148276916607200756636878594463992975249201334050746760720342320429787810339125739965 0*a^2*e^(427/2*I*c) + 1632919126240148968698899217563702574043441162075192205669292954768474269154941957342479761979448271668566 05*a^2*e^(425/2*I*c) + 79221081373658264272879848670833963158393802618546130507463440333508958081178065157747031476513568516431440*a^2*e^(423/2*I*c) + 37996950850034038233850830306205827170017764253586941498028293120742516484664499219084036933062000158769320*a^2*e^(421/2*I*c) + 18016188203161151595570847680260903085281484547568939274327212858568842514711832067992981021945668432453744*a^2*e^(419/2*I*c) + 84441771493811930334788012487431701349027924130153923197722449175641459473581608637464699625825465175510 20*a^2*e^(417/2*I*c) + 39120632922983706718236562651806275103810426889069614510874217109674609809742431592402937733282590612984 80*a^2*e^(415/2*I*c) + 17913568712861794530762618952975487142756276376203220184680562790431047856432329749945402934937667908071 80*a^2*e^(413/2*I*c) + 81069851458773459934141992691294588395848950289041774983547703146772407200779274263625698547392440683288 0*a^2*e^(411/2*I*c) + 3625857081029087274616922623084976938543327215038697037437754377369138824122430262301830249919667282727 00*a^2*e^(409/2*I*c) + 16025394384062105707813843798449591782899451204987346460206392987793677175893408702574025193928379414932 0*a^2*e^(407/2*I*c) + 69988368274664388580883736712738303159327351505142299304675566880142922981296353915575157471652388092680*a^2*e^(405/2*I*c) + 30201888617895119234147767797086586812217490454601051236525729423437716476833896661754018658154022389900*a^2*e^(403/2*I*c) + 128767135259169892233668231930230540880904887524578931242343976286799924376626828789944942766600417696 80*a^2*e^(401/2*I*c) + 54238774153561407342400765302813763923071836487545183529190707219505938419078588435582785192372019330 20*a^2*e^(399/2*I*c) + 22569366401976461724095887544833910482389125597195976929160987113401427554372850780614048807976783114 40*a^2*e^(397/2*I*c) + 92769209802706548376575206531799625267482667453463111604771895974309785519268076633186159076940819846 0*a^2*e^(395/2*I*c) + 37664584457361554618416651099041615464594000284876646544167820297804448037731523870770881598587894312 0*a^2*e^(393/2*I*c) + 15103468127596178167008188074186593145157080883927910480412370128563906374784352279321472766624772132 0*a^2*e^(391/2*I*c) + 59814047894924395116715176262926258735827009585441667308321325957072358824867958015638415996637992560*a^2*e^(389/2*I*c) + 2339273479235844998647091498864168534816 8

61313714502274097722489769716085443048358933648394658182965 0*a^2*e^(387/2*I*c) + 9033952674591972024099323322407009219478763876009237692789450947388612631864264679797961473529847760*a^2*e^(385/2*I*c) + 344477423926449063101739463504528286766144417364728013448944906727969077088015419571263814369067051 0*a^2*e^(383/2*I*c) + 12968697877009455035274781862534384292838669931056797519568122069643163064269080933835937710688751 80*a^2*e^(381/2*I*c) + 4820038555273598420587489389295657624987171738671533814188168297730577501737011958794089328821297 10*a^2*e^(379/2*I*c) + 17684321257730464094043408707052680020691214794235755556848415887419483289372559351329333977152864 0*a^2*e^(377/2*I*c) + 6404342483390014896266056493730858479258841055613588339217220097663067482653831416334357058274222 0*a^2*e^(375/2*I*c) + 228914224622760059708976994951758274329914227542096467117918610747237635344004009917560091360933 40*a^2*e^(373/2*I*c) + 807506748017092085680269545851955927262234210203529752666982032678058400615887441729888453662217 0*a^2*e^(371/2*I*c) + 28109750360677915260207831614143490354306109641643912901287750057186761995622810389066176664019 70*a^2*e^(369/2*I*c) + 965532218209251264607039716473737729829357676534904149014904268128459659120470520755736939192070*a^2*e^(367/2*I*c) + 3272172448880550842628921861973274469536864367376813406347390933362353823755143363779287932446 90*a^2*e^(365/2*I*c) + 1094019478518122537369397367574314021949959064703932873323441221036859098853977129474733265186 10*a^2*e^(363/2*I*c) + 36082142955789372921795326276163720115936669443430427894923821823835712395825018234933157302110*a^2*e^(361/2*I*c) + 11738051562239442910436658686616952931621359163901525749755059400912331209404508874859876592800*a^2*e^(359/2*I*c) + 37661117341863148447457366228609850041109045082888101894089219697224576875890481518758808892 20*a^2*e^(357/2*I*c) + 11916260267120045202285359629167111819646810329793550809906409737347745088097651935945673080 00*a^2*e^(355/2*I*c) + 37178462827784840787374073084315841553310242228231714802317873040114979729696102563758044173 0*a^2*e^(353/2*I*c) + 1143672226540041460397854883061446076825652822172120897227158444800328647140630186233361029 60*a^2*e^(351/2*I*c) + 346835347778821728555902478391614597115084782685995951439789374590650980629103126629800930 90*a^2*e^(349/2*I*c) + 10368324278336947066455348036556544494726913476560521689641087749606367891595175422870841040*a^2*e^(347/2*I*c) + 305497650522905318635819651289982367919653927007316457779889414938156358424788383402060201 0*a^2*e^(345/2*I*c) + 8870961481117838197926980752116379373501282518206394716688455319858193680435964294877001 80*a^2*e^(343/2*I*c) + 25383132012926548867726804091248224918890371035127867297203271859140587613140010211574690 0*a^2*e^(341/2*I*c) + 715613132766860595434204098832225344733524398557722747277633623872103175093767113528053 70*a^2*e^(339/2*I*c) + 198753832701981230163980739547820481430867444791767062152949319392852315523776686667748 00*a^2*e^(337/2*I*c) + 543752145104203145537028209930834510131239658042098724876325342408974339324717497019341 0*a^2*e^(335/2*I*c) + 146513422906430083034821023378270233843717756765005489855373135896452086369614282713816 0*a^2*e^(333/2*I*c) + 3887639689201023745839058832751335703731382951698483776363342566229749278054025582866 90*a^2*e^(331/2*I*c) + 1015702233120008898899552699132747473837183232983774023601657581594080

55448033759362720*a^2*e^(329/2*I*c) + 26125020973526102824190682571375956088092948345240408465888776831062032840805359036420*a^2*e^(327/2*I*c) + 66144400820020510453479219244127878363376621124553998877451160580978585651720285 83520*a^2*e^(325/2*I*c) + 16482016421391467056338941497834763747658550316983992688290569216718648320349203637 90*a^2*e^(323/2*I*c) + 404148737461691129448272381486081487215931511785097115337433651585897523208487479570*a^2*e^(321/2*I*c) + 97502706496344518739819416482817785708749119763377367851251579953471302421416590690*a^2*e^(319/2*I*c) + 231401226034394797723928444473442675782412884912826933268201337931194698719090543 10*a^2*e^(317/2*I*c) + 54015092850750556638448628821387292768098169292999783334700946692720250870679521 30*a^2*e^(315/2*I*c) + 1239909297438968458498020421044704877786634944232208108330855107855869727352550810*a^2*e^(313/2*I*c) + 27984184344972332902225602254288518249144986143222594937330821943165813365930406 0*a^2*e^(311/2*I*c) + 620874280599337021448519395578167430509430152215367261590243406969754309 71481900*a^2*e^(309/2*I*c) + 135388229027922757485636045160644792113243644556105596653749569580574114388981 60*a^2*e^(307/2*I*c) + 29010807054572012234808075159505626906960549421374234594481331777526001750550 70*a^2*e^(305/2*I*c) + 61073557684864691322903531669001548120128321614764883763107293893779595356902 0*a^2*e^(303/2*I*c) + 126290665976649423752795293300558365078090948368244878972263607020367969724510*a^2*e^(301/2*I*c) + 256460916352623066637759899070481936930264810727077859820653479704371745526 40*a^2*e^(299/2*I*c) + 51133713404620801884705792163322470511998009337758134729860301536677684799 70*a^2*e^(297/2*I*c) + 10007621650645730655800397049507055946221415324031471007022281045182099224 80*a^2*e^(295/2*I*c) + 19221610083267721142558391937460741025614038296306499821856332654073905780 0*a^2*e^(293/2*I*c) + 36222507823447452094316152383681805847086822685973455693062020799131961680*a^2*e^(291/2*I*c) + 6695578122665234305226870074465850318321143798508148119852380345744581420*a^2*e^(289/2*I*c) + 12136840864744800300329635249038720368262006429101436574680076903773012 00*a^2*e^(287/2*I*c) + 21568229390436704822945256652517016545108634584777605556728652672420718 0*a^2*e^(285/2*I*c) + 3756589126548342162592232723766339397306179134407581729556554564155048 0*a^2*e^(283/2*I*c) + 64108854118862082272356143692442840947738507328803415845695712479891 80*a^2*e^(281/2*I*c) + 1071661434847365356402500490116585199491741089623963750947662209022120*a^2*e^(279/2*I*c) + 17541946418183786120670549049149961176189749403084287359709432613744 8*a^2*e^(277/2*I*c) + 28108570794436004889868155095425291975524337124542327266338411863980*a^2*e^(275/2*I*c) + 4407531071123153946915575442407867368273204436441682325952058880560*a^2*e^(273/2*I*c) + 6760779458630297427367837956610951413260652681165773250765142439 00*a^2*e^(271/2*I*c) + 1014112257547637251607760930145690519847663666793862148964170325 60*a^2*e^(269/2*I*c) + 14869620923934928195860171826698271613545069265812546978930298844*a^2*e^(267/2*I*c) + 21304351655961354080475521993685030713318260420219498712471318 24*a^2*e^(265/2*I*c) + 2981357660920498212655085657598597572689019774047761676948405 20*a^2*e^(263/2*I*c) + 407335540247401349008595943506479542125674076489577470584816 80*a^2*e^(261/2*I*c) + 5431127527776820107789823018231122146548845466324910314438155*a^2*e^(259/2*I*c)

+ 706359042600440090623627368646803874663354915637996034416454*a^2*e^(257/2*I*c) + 895669784647556015313864262324492173530870601019945169528 37*a^2*e^(255/2*I*c) + 11067166739593806537994432532202323892559358824814410948544*a^2*e^(253/2*I*c) + 133186353192195159434949744805150114460455517763291022864 5*a^2*e^(251/2*I*c) + 156018117308149873911753787065575404463673778724880411510*a^2*e^(249/2*I*c) + 177798246216445015346779871308212977850347063391452 24178*a^2*e^(247/2*I*c) + 196992206435595954789450486514953248797518182958 0265482*a^2*e^(245/2*I*c) + 212059444422641568370505689613891761234929288751535757*a^2*e^(243/2*I*c) + 2216439150692671113182633293848107437835356525844 1643*a^2*e^(241/2*I*c) + 2247655430280602939346801439987511004122770572057975*a^2*e^(239/2*I*c) + 22097726276159713487004187824118914266394244488943 5*a^2*e^(237/2*I*c) + 21045445872134849680137861498182408126014563326457*a^2*e^(235/2*I*c) + 1939942742070099509831143493249507373979963303677*a^2*e^(233/2*I*c) + 172919643607724441133173354565998605401103776504*a^2*e^(231/2*I*c) + 14890299547694622406488788915648999996474069170*a^2*e^(229/2*I*c) + 1237420804707705093991102638839493330163931640*a^2*e^(227/2*I*c) + 99130382277532022515819177881629325075859509*a^2*e^(225/2*I*c) + 764641982122710512439170071251750274718 7088*a^2*e^(223/2*I*c) + 5671794418132276221865292410881132094515 09*a^2*e^(221/2*I*c) + 40401820406264183313387690283892201648160*a^2*e^(219/2*I*c) + 2759687033617389036404063195416999823985*a^2*e^(217/2*I*c) + 180469988996656023008385818021005185594*a^2*e^(215/2*I*c) + 11279373940205552267581116020178794202*a^2*e^(213/2*I*c) + 672482982322867333315410721290945657*a^2*e^(211/2*I*c) + 38167952336853964450194985322999760*a^2*e^(209/2*I*c) + 2057571526219280176660569426269565*a^2*e^(207/2*I*c) + 105091017765905750210205432017088*a^2*e^(205/2*I*c) + 50714163711386971235167483127 97*a^2*e^(203/2*I*c) + 230518924833500391396633471432*a^2*e^(201/2*I*c) + 9835474093767985284835740178*a^2*e^(199/2*I*c) + 39237263587195333760770644 0*a^2*e^(197/2*I*c) + 14570867094745692063264465*a^2*e^(195/2*I*c) + 50111447639071261905808 9*a^2*e^(193/2*I*c) + 15866421408580747568967*a^2*e^(191/2*I*c) + 459291145921837770879*a^2*e^(189/2*I*c) + 12054885718238165655*a^2*e^(187/2*I*c) + 284015632089714525*a^2*e^(185/2*I*c) + 5932441401233490*a^2*e^(183/2*I*c) + 108143463042714*a^2*e^(181/2*I*c) + 1685352670794*a^2*e^(179/2*I*c) + 21830993145*a^2*e^(177/2*I*c) + 225643340*a^2*e^(175/2*I*c) + 1744665*a^2*e^(173/2*I*c) + 8970*a^2*e^(171/2*I*c) + 23*a^2*e^(169/2*I*c))/(e^(517*I*c) + 418*e^(516*I*c) + 87153*e^(515*I*c) + 12085216*e^(514*I*c) + 1253841160*e^(513*I*c) + 103818048048*e^(512*I*c) + 7146142307307*e^(511*I*c) + 420601518659718*e^(510*I*c) + 21608403021340047*e^(509*I*c) + 984382804329835768*e^(508*I*c) + 40261256699368950388*e^(507*I*c) + 1493326612293984160368*e^(506*I*c) + 50648660944512569972179*e^(505*I*c) + 158179664239781240816181 4*e^(504*I*c) + 45759117183402579073139583*e^(503*I*c) + 123244555734683224517669690 4*e^(502*I*c) + 31042222522074681615625020522*e^(501*I*c) + 734057263616388449968842366924*e^(500*I*c) + 16353164647151530240529137618111*e^(499*I*c) + 344277152012875134140739302960914*e^(498*I*c) + 6868329225263681349501997341320517*e^(497*I*c) + 130171193079172823835151430773360024*e^(496*I*c) + 2348998374244347079532766203075607598*e^(495*I*c) + 4044

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2*I*c) + 1585664761132575625661174322272038842988 56*e^(491*I*c) + 230215041
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515377350383950278*e^(489*I*c) + 43233368864426155754794417925080044060496 4
868*e^(488*I*c) + 5605927253067558551780452883689835514455118670*e^(487*I*c
) + 7016451532254446290687354881374809108456187068 0*e^(486*I*c) + 848552202
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4338952554575234051*e^(483*I*c) + 12330967001397233651819972207509325906552
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1194*e^(481*I*c) + 1354425949166361161915746506253316462385011016279372 24*e
^(480*I*c) + 1357990663161479842850642848032544982878359839580349899*e^(479
*I*c) + 13231708870104896973800056733779919089340836756009580718*e^(478*I*c
) + 12537049658692127266219805085126932317116733885408178 2959*e^(477*I*c) +
 115585541289359426034554496664268782363003589936323237147 2*e^(476*I*c) + 1
0375184499871175501909398956596684116802997082526660323524*e^(475*I*c) + 90
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20463699114577506146273102809850609443267578813629501 1259*e^(473*I*c) + 642
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1081176291770486604924009851758309875057005668778189541416 39*e^(471*I*c) +
41243069829991519084806722232721943506774793409189467048898 2928*e^(470*I*c)
 + 31877499297443464972115360447517765823209586279238164705906590 24*e^(469*
I*c) + 2407080191352975710185802291437204586474699178618203974027432526 4*e^
(468*I*c) + 177642829135119348577194437675802830239905460092687136494961404
333*e^(467*I*c) + 1281817464914970810859604189828359000790789921169405304 61
2211251818*e^(466*I*c) + 904669352382568297904433896310426316767258682636 79
11338826483549173*e^(465*I*c) + 624735507810532953177107746902471141241251 8
7565731848441781904032672*e^(464*I*c) + 4222761266320036875477547465557099 8
871052713308666016136635365678 7288*e^(463*I*c) + 279470910447568661184279 06
94973699164482254723977210209725661304403472*e^(462*I*c) + 1811576849561575
8076710303055505625589254293659193314153418333944596408*e^(461*I*c) + 11505
14818520808488737003883545213155676403651240031036911766971942923 20*e^(460*
I*c) + 716099497599058079895633338552940229192858196481597830078819711862 60
0096*e^(459*I*c) + 436944248291011391456535313606959586266933885805341938 12
14131241925047008*e^(458*I*c) + 261439762799020214434719456650802545630568 1
018352040188980028549314486744 8*e^(457*I*c) + 153436088745056254127327239 46
157707193313015776459599711397351318318839937 6*e^(456*I*c) + 88350096882179
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80*e^(454*I*c) + 2769311653834325922598338263764793612266403385961513348984
6664694361471028310*e^(453*I*c) + 150822381431412413773566474210011746852 29
74375970591862952439894811403981527 80*e^(452*I*c) + 80667954360758914075930
501079618956826984202161338895521891627882318263948819 0*e^(451*I*c) + 42381
2584676323258639418856985868582675532800554862743701930140585132588759448 0*

e^(450*I*c) + 21876482892713909928040345612578705805121508756226696317087651824252241418663320*e^(449*I*c) + 11096919968732097474992225959525044434121921853534965576259119257653587215176608 0*e^(448*I*c) + 55326912881952861250291886955894782909802195630934984358404463151229177880008149 0*e^(447*I*c) + 27118432396707175276056404901488335071302424484039783185232377219442003928 30108580*e^(446*I*c) + 13069817203488289886193205508375818392124991382340160316886507181296548981014818410*e^(445*I*c) + 61948596653035502879564338815234310660410902037882473161804774492916216575880077680*e^(444*I*c) + 288820755264730654469968572021047109427318619508995802020689904590319476295408324280*e^(443*I*c) + 132475641236783747315747282116248369112096650194895392649224164378826428454643722112 0*e^(442*I*c) + 59789921729441432184591611492998197063217321115784945252452287429764684091053955362 90*e^(441*I*c) + 26556806389043407534496702369101545795994861757741414789944652712127566910185274123140*e^(440*I*c) + 11610455168355504376291150171211639931373302113267748111282404724636179404963572647985 0*e^(439*I*c) + 49970756725385908435759631481379476806933719091596749190748890493392267757966535433896 0*e^(438*I*c) + 2117589733466855707101501429210414722401838837940752841618541440888545729943138209036820*e^(437*I*c) + 88367206408604703056945140215479695512967940922669830441183757900258545840367963647682 80*e^(436*I*c) + 36318369652302591732197444409798122022640824604130552506742586795183267354382847875885730*e^(435*I*c) + 14703081673227683316304158209959204751204372522535333923881916519300040762954474575322174 0*e^(434*I*c) + 58640346697268324274164332892156090937519745386424329957199096460885724577113414520417499 0*e^(433*I*c) + 2304351073373840357379178597673066352016682781689139842097376663118488803841131935313641840*e^(432*I*c) + 89232094473432967633318818816384717934996186706010260597308959626532917702294930281625751 00*e^(431*I*c) + 34054053851295569154352346722177172655187548910782008504718324168725029438589162349211628040*e^(430*I*c) + 128098914601688539672480541830409847707367500438601536803204497701119911289087105659482783340*e^(429*I*c) + 475010578857601519272316617938425222421786597241671026894318515408511467140969393115768793680*e^(428*I*c) + 1736574218818191071874197472450158123883564209950658639102337148122769080611680719741726053840*e^(427*I*c) + 62598721568222528436509607082350347102013627760571766472263230897514465652888501038981538599 20*e^(426*I*c) + 22251959176795777757167366036007480222211364232146399803864370963391491223687245823457351580140*e^(425*I*c) + 78009807368024239875613733058851417125327114681070889640794249282633470580756557083923203377160*e^(424*I*c) + 269745801440211296972683601863878954357962308520076595177128227629273240215209708218497363414140*e^(423*I*c) + 920089393029589032874601850027159322612526368444771489781974361078847528891468831038436064951920*e^(422*I*c) + 3096131971621520162380301554241465451782362086810287537748902904985934020179565706177131421614590*e^(421*I*c) + 10279364730663840844739577862469262604648861914297972589165243530651230690726244462479199894255180*e^(420*I*c) + 33675398872021568375902384593982753362559801058104184627345411136262431943240778260721756991027090*e^(419*I*c) + 108867995731829472826732905192034886797284621356445627530909104429486741257822633476898356826454040*e^(418*I*c) + 3473514732

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818566811514182931122425515215356868711812665798138776063481602617472013177
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1*I*c) + 641751006932600668062380648860045971707408433000868393686161391645
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28782643*e^(357*I*c) + 4637582884573671545449376782550056887333281455680493
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*I*c) + 7422286409081731249169370494625256173341489196791182704898310054977
81951221069955839623452499748653124658873553401442137*e^(355*I*c) + 1176600
720975786965189875050890231092204612696970277433014535895788956771230793520
381993106606880564628599822341722801012*e^(354*I*c) + 184750585646245153344
528430057132632378116255330456597188767075809107930679482183492817077312636
4639722071570131703785334*e^(353*I*c) + 28736105359223401870808354355829122
772719679773947201597910702749277142768695314671826889810410613817038854034
97544001592*e^(352*I*c) + 4427673079105425318524316112985693656584851936100
192457044455134483305045321452516347118488133224823670465103483954805161*e^
(351*I*c) + 675848043788852437256293594896385762669485554719551948612287756
7981718587262362871994967079401831957927901682582941234362*e^(350*I*c) + 10
220423779434634851339975295163399641702122249663666193053008302026096932158
568338309418237395541351819026907953220681013*e^(349*I*c) + 153128372066627
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717832*e^(346*I*c) + 487332535059749234008522555630521014021964693136595544
92725674754339375283010407167744366955828922837488705858532439654489*e^(345
*I*c) + 7038634976059483156704822406139502569850120229696630037676422033669
77029615910998540555411376294871437468149528524796002762*e^(344*I*c) + 10074
496185185374461175430098298016696240455383622292186848469426996612060769890
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987485779114712400907947692043594173529330930543043868733312991245419677407
0107264*e^(340*I*c) + 38664267305038004945738256281831696265197555099077927
7048740238629858795018247356162888631015687664780101205287333082748791*e^(3

39*I*c) + 529329252764113926003934836958243557672549238997560739214406599185047831955572583765358634395408771528009745467548382950094*e^(338*I*c) + 71836159638205824920911354448790108886838874403371321033249197137590673834155154045726480430403966425591560734980191196655 1*e^(337*I*c) + 96645827536903771874773913079815164348359068416683223468809829116416063641815945211981572880937212516883623936444239734406 4*e^(336*I*c) + 1289043515292933956480634330499677040181043935620106914267311067900030058398839787692376954090545278554544997710058754772400*e^(335*I*c) + 1704582996707822808204678218167693002698661147712772355021456543810930069637188085882824757500605246963210810351706405349408*e^(334*I*c) + 2234891276398439464478622578306434840724610484468177859822620658691921478645266653062563823553001228001009093606751066168944*e^(333*I*c) + 2905385722320057001953345274489482790856692529959823749532695963414164833366773128218607899328588608916176593772088622582464*e^(332*I*c) + 3745257594876651204657334988426226388143954501986830664222349226361079609546822276067504899386703088982308185717143407211328*e^(331*I*c) + 4787527442780945685145204846971596165304169419328244073211459592129649255048876854059844720661078151288179612574986359194560*e^(330*I*c) + 6068949803156712248331871105329895471722806143008878014986559653687260694816550470195890004511965527567432722969707577202160*e^(329*I*c) + 7629731815627821580468992424207008366438896736333024661863838105110445148946962328297631547032543419811821015837863013682720*e^(328*I*c) + 9513032274019522954209113191268226642299912013525665940298381064797885690904993128948035227412144035633851779511219335277360*e^(327*I*c) + 11764212274876484080010900714673474493371278160557811983724455826566055617658086479368641864908119643412413644803772131657280*e^(326*I*c) + 14429816285208431204532978375375691965063154224649747551295851507389524083226976789688601369628399900747658579201929300744260*e^(325*I*c) + 17556273271224292396887291403125716213491486261145478571376751690105656067838042151038271381300372757755676325408026834544840*e^(324*I*c) + 21188321405882887539610198374706862695894049226077093764132512513336190523978949694387686059124526755048042957954264706637460*e^(323*I*c) + 253671764391193536215322603359833481549049826061257617113006834929633908164915830257052687375399821496393002265126574261188 80*e^(322*I*c) + 3012848241455270326455901895308817715601343749343820107841376983544836614812175454919759112996717076496970018034869920783896 0*e^(321*I*c) + 3550010310601964987627237679694948220958137237103600501287780602748167280705994344524013631556850073237996658500567818193792 0*e^(320*I*c) + 4149983212196370804378852378740134554178008893053820691885357902674927336467164003756348860771609288768647154283860278855 9660*e^(319*I*c) + 4813311767818402921650374854911037447892471909463560389282936486391655379227882295736828510632816471591059837087114907949436 0*e^(318*I*c) + 5539091304497208621943268914633156608142795989696990021443429681773115086386705662076860818767970972015297414847490790417734 0*e^(317*I*c) + 6324777410101217905179494607517556992407698133813848315804240674745387472938763171054499524715291220511850059751105282434768 0*e^(316*I*c) + 7166032986117339552444194388928410913409115784465524567208423740243494469646492713181219065962951114063950174330386358209288 0*e^(315*I*c) + 80566249130682684181

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I*c) + 1289950760115919034107638634270973299485861735745958627058491592809 4
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02*I*c) + 184831151983748941817667850174708257138128172158269413287765358 53
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^(294*I*c) + 163977816059607725375264559816505847894187785101455360391897 42
44829984153857876057653155092083377415901430785722435051327065 80*e^(293*I*c
) + 156185962953551196169738218832173696509852551589210730578365727476259 47
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c) + 80566249130682684181876201882623511206363790337218011954110210642927 76
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287780602748167280705994344524013631556850073237996658500567818193792 0*e^(2
78*I*c) + 30128482414552703264559018953088177156013437493438201078413769835
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e^(271*I*c) + 76297318156278215804689924242070083664388967363330246618638 38
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 + 606894980315671224833187110532989547172280614300887801498655965368726069
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35*I*c) + 624735507810532953177107746902471141241251875657318484417819040 32
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085126932317116733885408178295 9*e^(121*I*c) + 1323170887010489697380005673 3
7799190893408367560095807 18*e^(120*I*c) + 1357990663161479842850642848032 54

4982878359839580349899*e^(119*I*c) + 135442594916636116191574650625331646238501101627937224*e^(118*I*c) + 13118781801172174729679339894318153694964675368481194*e^(117*I*c) + 1233096700139723365181997220750932590655287625342156*e^(116*I*c) + 112391604542246650966429162063124338952554575234051*e^(115*I*c) + 9925490738534402272939987038714580495445431374618*e^(114*I*c) + 848552202276512356496200136959676295361696315113*e^(113*I*c) + 70164515322544462906873548813748091084561870680*e^(112*I*c) + 5605927253067558551780452883689835514455118670*e^(111*I*c) + 432333688644261557547944179250800440604964868*e^(110*I*c) + 32147887693375338817454482515377350383950278*e^(109*I*c) + 2302150411226234925855222345201500900533576*e^(108*I*c) + 158566476113257562566117432227203884298856*e^(107*I*c) + 10490402669510897424624643766470754045064*e^(106*I*c) + 665634670676210063754191847109971141414*e^(105*I*c) + 40443624781415311581857832389099634564*e^(104*I*c) + 2348998374244347079532766203075607598*e^(103*I*c) + 130171193079172823835151430773360024*e^(102*I*c) + 6868329225263681349501997341320517*e^(101*I*c) + 344277152012875134140739302960914*e^(100*I*c) + 16353164647151530240529137618111*e^(99*I*c) + 734057263616388449968842366924*e^(98*I*c) + 31042222522074681615625020522*e^(97*I*c) + 1232445557346832245176696904*e^(96*I*c) + 45759117183402579073139583*e^(95*I*c) + 1581796642397812408161814*e^(94*I*c) + 50648660944512569972179*e^(93*I*c) + 1493326612293984160368*e^(92*I*c) + 40261256699368950388*e^(91*I*c) + 984382804329835768*e^(90*I*c) + 21608403021340047*e^(89*I*c) + 420601518659718*e^(88*I*c) + 7146142307307*e^(87*I*c) + 103818048048*e^(86*I*c) + 1253841160*e^(85*I*c) + 12085216*e^(84*I*c) + 87153*e^(83*I*c) + 418*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) + 7*(-299*I*a^2*e^(1027/2*I*c) - 116610*I*a^2*e^(1025/2*I*c) - 22680645*I*a^2*e^(1023/2*I*c) - 2933363420*I*a^2*e^(1021/2*I*c) - 283802910885*I*a^2*e^(1019/2*I*c) - 21909584720322*I*a^2*e^(1017/2*I*c) - 1405865019555002*I*a^2*e^(1015/2*I*c) - 77121738215926170*I*a^2*e^(1013/2*I*c) - 3692203217145049425*I*a^2*e^(1011/2*I*c) - 156713514334349191205*I*a^2*e^(1009/2*I*c) - 5970784896718122444327*I*a^2*e^(1007/2*I*c) - 206263478291032388361681*I*a^2*e^(1005/2*I*c) - 6514488191762735815405157*I*a^2*e^(1003/2*I*c) - 189421272159473056494074595*I*a^2*e^(1001/2*I*c) - 5100844262877818375740499940*I*a^2*e^(999/2*I*c) - 127861163072229101394013407134*I*a^2*e^(997/2*I*c) - 2996746017244157830350053701476*I*a^2*e^(995/2*I*c) - 65928412631647739461683457820511*I*a^2*e^(993/2*I*c) - 1366183224856297865521217009020824*I*a^2*e^(991/2*I*c) - 26748429663467970647815785552181215*I*a^2*e^(989/2*I*c) - 496183375602453279107611685390767740*I*a^2*e^(987/2*I*c) - 8742278650463030069301003637232429883*I*a^2*e^(985/2*I*c) - 146631858416411858207561193721288320906*I*a^2*e^(983/2*I*c) - 2346109795219082040306865029327652810422*I*a^2*e^(981/2*I*c) - 35875930157695641006598626271371876133245*I*a^2*e^(979/2*I*c) - 525223640233639829417248502076803689088820*I*a^2*e^(977/2*I*c) - 7373332278938477877109516190844163180831833*I*a^2*e^(975/2*I*c) - 99403449489614415589324261326783015782654200*I*a^2*e^(973/2*I*c) - 1288694832301854187496925699385880912905767417*I*a^2*e^(971/2*I*c) - 16086468264323655413475747304585608493929925740*I*a^2*e^(969/2*I*c) - 193573860526473423179001809134869735140502053410*I*a^2*e^(967/2*

I*c) - 22479548750963422350813918435797706588472587313O8*I*a^2*e^(965/2*I*c
) - 252192487428249481575472714845892558118169308949 69*I*a^2*e^(963/2*I*c)
- 27359070326171366844836585939655919973828333761506 7*I*a^2*e^(961/2*I*c) -
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 29219505531617139745995198456026235957224788107224865*I*a^2*e^(957/2*I*c)
- 28813690834680473368843683438409005168703325235506 4191*I*a^2*e^(955/2*I*c
) - 275677067277424856755018403180557710770384395401009 3519*I*a^2*e^(953/2*
I*c) - 256089632247852915722879520387707774791182665945444 17374*I*a^2*e^(95
1/2*I*c) - 231137463934351535240227752765265592838813655877917 32766*I*a^2*
e^(949/2*I*c) - 20282328355263543009833698928209700814235314030405830 23770*
I*a^2*e^(947/2*I*c) - 1731419855983647541565139336513364245374510046106 2396
834495*I*a^2*e^(945/2*I*c) - 1438728978699584767118418083689734186092541395
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5249062706556972588087 9*I*a^2*e^(941/2*I*c) - 918264358097512239448201994 95
579811116516135571253508565770 98*I*a^2*e^(939/2*I*c) - 70604441498160359313
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933/2*I*c) - 2769552249198733612229785465627906770414393257931797169789465 2
128*I*a^2*e^(931/2*I*c) - 193303982244781919691500896347164102540863253211 8
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408391078324425844220711696016060458004240084890338934689925280*I*a^2*e^(92
3/2*I*c) - 365407793636196973379878926946921993102971243732578054647123414 2
14820*I*a^2*e^(921/2*I*c) - 22804271200781377193255138478742651480195418540
314868485582484427271 76*I*a^2*e^(919/2*I*c) - 139314177925091981614687974 23
752544838678599539275212332380442651357560*I*a^2*e^(917/2*I*c) - 8334027696
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2*I*c) - 488348364369005961261801502808542403226214848682295131186689348564
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023111951344537764678183988560488329674058667160 0*I*a^2*e^(909/2*I*c) - 870
4038273624124504811313552891743577253139986151704861170617699772884006 0*I*a
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e^(901/2*I*c) - 664712059991868481178900726621930213276773877709344148127 26
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37/2*I*c) - 468649433876940374716415334540852022756419671685290819126536222
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03011816371890977417311631021846058599301668085 0*I*a^2*e^(831/2*I*c) - 1253

7562836732599179767010355152461056807191951005009796451823391079000655762189067741192305394090*I*a^2*e^(829/2*I*c) - 36497326353315963605420298190687465001055100758074304234792272161886339957870164613698417616283210*I*a^2*e^(827/2*I*c) - 104834609086572625907289346225890252429283565041460323851402795840051940483234866884215706838405390*I*a^2*e^(825/2*I*c) - 297154478443352847298744293536373570367631258373197290869967778261660884898898610815793932187264900*I*a^2*e^(823/2*I*c) - 83124933312427092974956512337021935716565456874262003990342923167154743611337138643071626675996106 0*I*a^2*e^(821/2*I*c) - 22950304190171440151107977321553753464773390795325750065806758694788583212287658479194678235026162 80*I*a^2*e^(819/2*I*c) - 62544569577108570849907775078801967958260483428773913101155061676802330243540898930726814064752467 30*I*a^2*e^(817/2*I*c) - 16825577675009653410652812996723598120483470175375332001250964015555125236873581387468224926998037020*I*a^2*e^(815/2*I*c) - 44685235946986673791925225525992813797485854939304559125279366181549713351572630218142149059140721370*I*a^2*e^(813/2*I*c) - 117167084483123710863969807938772155169956785317523090174862697344141293246236717353854714751253177160*I*a^2*e^(811/2*I*c) - 303338706350755487279057170882513474743360201200362327954737042233540329160364416313115387680520970550*I*a^2*e^(809/2*I*c) - 775466756780053803300487429447750888237325797624757919706744628478203937255833604141877857656968392480*I*a^2*e^(807/2*I*c) - 19576884771781648238441845365656477945755329267554673600558209378517045959708776084190454828850659137 20*I*a^2*e^(805/2*I*c) - 48809048126294925781827497042657233583761668673480039271037026838448709301646404463264142624663778240 00*I*a^2*e^(803/2*I*c) - 120188852274055085277789182447130770488546641340585826414101184645320012379950126089365794511335425064 20*I*a^2*e^(801/2*I*c) - 29232457847784347194232755870686399315171809346248346594946497316944533356199777722113539614776201632080*I*a^2*e^(799/2*I*c) - 70231742836691486232401821435646690204765370170934364279337989127944150596825723542271716872404327490260*I*a^2*e^(797/2*I*c) - 166685454178675867308847881643025971737125688220303037968682349925679089331312174778117366039026285869440*I*a^2*e^(795/2*I*c) - 390829013458478713762005868531749550511348363755402425375475219863201042469027671720992324263291992741380*I*a^2*e^(793/2*I*c) - 905375964480293043221568717617222804352981478608148290290910134804446811145030581376444150025327895167080*I*a^2*e^(791/2*I*c) - 207229696847272763858236676321480935013103617973389480388160186786731890036023509020815242386938081719324 0*I*a^2*e^(789/2*I*c) - 468687387315610187119076797456159860951344367020175746091423231250548462720987195797610432877164916204190 0*I*a^2*e^(787/2*I*c) - 104748971102058073678463750667233366222445365231765611762172458395877791266303914821951105110432244350 73120*I*a^2*e^(785/2*I*c) - 231354575556672420151095626967247592694421472166873974898194890719416969466452628694005764019920019282965 40*I*a^2*e^(783/2*I*c) - 505003625041568594783538404728382579857204302168748830862303028969968867949973978599357408484109754884263 20*I*a^2*e^(781/2*I*c) - 108949410506024382921420575473869228515942872496860505620768573056175175693027104049195507535238812688471740*I*a^2*e^(779/2*I*c) - 23232441719723506208102256523595997332912970401651251149268440722844755400536247553118117725737542815857 66

72*I*a^2*e^(777/2*I*c) - 4896995571552986763985557066901701032889622015870620384570477833092808980070164626953255198667763496687122OO*I*a^2*e^(775/2*I*c) - 1020362468343075226131935473747821355290052152417646455220161102238032449230964279115841386608493376970117760*I*a^2*e^(773/2*I*c) - 2101812264182065730411859582938002660622402353730581510169623059960820290526673615762476646904104925062205465*I*a^2*e^(771/2*I*c) - 42802840247288373381955793778304895251677711273651550559058964722604077492704292467867066436789548846331630 10*I*a^2*e^(769/2*I*c) - 861816491878892520390205950670276873300422354456408646106958120884897647576078713171583962110911754744684999 1*I*a^2*e^(767/2*I*c) - 171571319853592779976394979501546747627791903510875678191956995177846663333833783366871138586922040440777941 76*I*a^2*e^(765/2*I*c) - 337742897479789814249267399311608247971611122373629256191595663875737308086324642927177079406887731873987238 95*I*a^2*e^(763/2*I*c) - 657450726185505121898734473152208586239312233101425298398081218568506657185233766696918360427788466307374109 30*I*a^2*e^(761/2*I*c) - 126560833582905534125457118283479588254886734066422681322743067453094955423272892820673108496357191409969596590*I*a^2*e^(759/2*I*c) - 240945127276766227320339940089298232681048239144248789324968088048819421447003749816077955279624100315116789806*I*a^2*e^(757/2*I*c) - 453673232394267043949605922569329980940549626999382599843505662311686257301966537920360838324667729133482235583*I*a^2*e^(755/2*I*c) - 844885322059161932368993517117208111183944355764632182261257568921304529568367117463318791743206771210437760631*I*a^2*e^(753/2*I*c) - 1556343096968573764756475235411933016733786313107239004864800578666621277030123112055440836769200504575169913345*I*a^2*e^(751/2*I*c) - 2835889022716793311093267108913411484117430817040975928639654911368211514698112927408762873660302882359781905835*I*a^2*e^(749/2*I*c) - 5111787155098231966381444413998413769738039840629789986636135861377096437110535352261196444661635160446805767627*I*a^2*e^(747/2*I*c) - 9115474553683826281436142305910668402582581988856745851085574498026708677442826803383401266387813162062594525953*I*a^2*e^(745/2*I*c) - 1608170803711723936488542495308324493651572492129938677860022595117949813117158952421904513851643581085020734042 8*I*a^2*e^(743/2*I*c) - 280708048160262098107656410952750421279481280413894356297204856430240954064869242205425224481435633245184019644 82*I*a^2*e^(741/2*I*c) - 4848092066051426686753515724572870067245346536590134444783005329826730084909821476286421209270563913290579368174 0*I*a^2*e^(739/2*I*c) - 8285214296686085143161142011759637225646673944870189720446044142649863254890021696833741164098690745852292132594 5*I*a^2*e^(737/2*I*c) - 140112609715644490114299623620223732634461647512701806908240383878654745399087836858804711629400762515425955916824*I*a^2*e^(735/2*I*c) - 2344850209804124673417431991453520294680763522663798546087735225937995659586211761414727616867686537541357501415 93*I*a^2*e^(733/2*I*c) - 388366130772936514035045226101528726099976343067435024084898656054932162774966074464370430510444616487043887402836*I*a^2*e^(731/2*I*c) - 6366196753590080176222160089204077247084401076299878481343671810431067804125143991154236056607607886976516343790 05*I*a^2*e^(729/2*I*c) - 1032893390108623451662629921902059825520150456341148954819241245986827172746045153810766991498955787562750756646550*I*a^2*e^

(727/2*I*c) - 1658792694072871479101869942544704973168924575943071103309570774086262029542461228753343283112620767567415651784874*I*a^2*e^(725/2*I*c)
- 2637026704940057541717603416099047901577339805399244480403700320734657027382051540741428399462562160665232399986075*I*a^2*e^(723/2*I*c) - 4149994810365900522807468213278193091656141731116367453829137630709191482537488782374639033936237089896768763566876*I*a^2*e^(721/2*I*c) - 6465709656300067812786267514447106687902581433310919178038542426426780363215033938034518725151681639996365849163135*I*a^2*e^(719/2*I*c) - 9973455781668332100482619120779044796198884570518850362675620400800380525655955470978275300874201998244732697737400*I*a^2*e^(717/2*I*c) - 15232155197244469983477235120489934255399594332170569196782170361245875795753404131530065929326205229838601927955519*I*a^2*e^(715/2*I*c) - 23035033976607861848764777813625859138663747527131798877008816594078301950324404686986975822232657903821541105390532*I*a^2*e^(713/2*I*c) - 34494824856566822280833509701479402995499365014417407042892623384294837884168792240702005587755169596414970227728126*I*a^2*e^(711/2*I*c) - 51154349273662615909216231190623364827611251722641045147869080165842930085677025925218103510278265118135145553584580*I*a^2*e^(709/2*I*c) - 75127826321115910220085795823510908814588387718755712029825386842788704037764840837864988871197826414756226327584715*I*a^2*e^(707/2*I*c) - 109278560723550930958638148152377305018874412559953150839397105157171522052107943777228097015723239016040062510748533*I*a^2*e^(705/2*I*c) - 157438648683134146474225508822869634510407589789880501589161153804500657734549235665125080321402913947303819424223977*I*a^2*e^(703/2*I*c) - 224675870137816967448574290906572012353624572247889623771866556695527535849562092439004233144825309318376200907596647*I*a^2*e^(701/2*I*c) - 317611854590359842624867588299694397092051295753012234334896647966925083208128923978657573859261411691474063180579773*I*a^2*e^(699/2*I*c) - 444793756576556805226598557121881255891420660178954005606190859767907900375526699087281079775401935479298706556678625*I*a^2*e^(697/2*I*c) - 617118907415491882008893689992374986026058614595180636934596331413170379780487585714587047788469214113451795516499370*I*a^2*e^(695/2*I*c) - 848308102584636362484162825743572316210570041224952064440187703108373794290161871693531289023220368566861588408740234*I*a^2*e^(693/2*I*c) - 1155418271261525364764099832556015695656671742148397430770621919769591262069324891797346089718216295419176001175584602*I*a^2*e^(691/2*I*c) - 1559379265746722157601116633770545905680845286466195068047437750582100850218558934063441346166219284236292591756007869*I*a^2*e^(689/2*I*c) - 2085532515622353289775297137684356044555717847895905712020991677926353632697196135336156922652753946110662598182357060*I*a^2*e^(687/2*I*c) - 2764141551913183823232240538311434861698053782540087737778740958755195255197468794265331998300489529793104153836938365*I*a^2*e^(685/2*I*c) - 3630836299606049901259711668223783516359548315616426099543877893492461453478630388967263756039510415511889625376389370*I*a^2*e^(683/2*I*c) - 4726945091253225709284701620253529588027362773911267160094581860855616546226572637107723406479754761335508976269914579*I*a^2*e^(681/2*I*c) -
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704215677064427541900442321556982842761256699474406159545507180383867270904
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e^(667/2*I*c) - 284718276522237485491067080889253342674583103628338435078 03
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*I*c) - 342832578250993614696290296469979870163574103931333787686078421859
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47/2*I*c) - 124536920158622880437723357410492491627484725712145537940168633
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c) - 137711319077587336593949747709220793928082528831217845339057830380687 2
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25497960*I*a^2*e^(631/2*I*c) - 21571078886203198613131476087661950972269766
9102804696344437524165882302085220441314010414559115310505632713041800563240*I*a^2*e^(629/2*I*c) - 22110257838286266957405534950193357161285499861486795395123009528650828921357393433997661752958189127616112835577044934 0*I*a^2*e^(627/2*I*c) - 22412795796157893172920975099679649222146391969926682954770169868208546365760842198312918062204102283307034955461403258 0*I*a^2*e^(625/2*I*c) - 22453304535759074004336020741906348037449644508622430697289895272749200044336718938408438701400832000733684825244235170 0*I*a^2*e^(623/2*I*c) - 22210946796043728036602006287025814391097856194046142336193071984348329690576302789946397795816688610461626799990480802 0*I*a^2*e^(621/2*I*c) - 21670387335018916188925391097041103119472484764883594965696672868367256398560906116425852512709414712811608491686349598 0*I*a^2*e^(619/2*I*c) - 20822608470830635809364977157946585243436376677295277795951915747954625254498251389737041318732434206207306711918859702 0*I*a^2*e^(617/2*I*c) - 19665549411209435685983748554968821671897187380803253917521827054648675028666044999608795187616705336377243650319866920 0*I*a^2*e^(615/2*I*c) - 18204534611310199302537561756714747231076635768733444561983566082277261787284311229566167306727916439835682516890085524 0*I*a^2*e^(613/2*I*c) - 16452464294988338678087961173942563021667855512013685642442293393096887487465485642255833021631746677184972621199735592 0*I*a^2*e^(611/2*I*c) - 14429749775086952427191078285199212799395501006852918111848089218773825055482983351446643743397430322172330800674770013 00*I*a^2*e^(609/2*I*c) - 12163986863193385677201729219033200834481661392547996802886757267082345014793858526624764965255494427567788427041332832 0*I*a^2*e^(607/2*I*c) - 96893719441596910044889117012440950291020439770151527577177611508808188500572872477073629458560345895007381079831424020*I*a^2*e^(605/2*I*c) - 70458766374210588223159026861223445333341753439960632221750998997297048156150655074881354085103291330810095125378469360*I*a^2*e^(603/2*I*c) - 42782077961669277675640862330375110601819532686365819109825348265088913439588364246424948792319286916984200949647432740*I*a^2*e^(601/2*I*c) - 14345893481329936950121653593657325353238574049422623814263012969352846730780039535900084812106747735276310173764055960*I*a^2*e^(599/2*I*c) + 14345893481329936950121653593657325353238574049422623814263012969352846730780039535900084812106747735276310173764055960*I*a^2*e^(597/2*I*c) + 42782077961669277675640862330375110601819532686365819109825348265088913439588364246424948792319286916984200949647432740*I*a^2*e^(595/2*I*c) + 70458766374210588223159026861223445333341753439960632221750998997297048156150655074881354085103291330810095125378469360*I*a^2*e^(593/2*I*c) + 96893719441596910044889117012440950291020439770151527577177611508808188500572872477073629458560345895007381079831424020*I*a^2*e^(591/2*I*c) + 12163986863193385677201729219033200834481661392547996802886757267082345014793858526624764965255494427567788427041332832 0*I*a^2*e^(589/2*I*c) + 14429749775086952427191078285199212799395501006852918111848089218773825055482983351446643743397430322172330800674770013 00*I*a^2*e^(587/2*I*c) + 16452464294988338678087961173942563021667855512013685642442293393096887487465485642255833021631746677184972621199735592 0*I*a^2*e^(585/2*I*c) + 182045346113101993025375617567147472310766357687334445619835660

822772617872843112295661673067279164398356825168900855240*I*a^2*e^(583/2*I*c) + 196655494112094356859837485549688216718971873808032539175218270546486750286660449996087951876167053363772436503198669200*I*a^2*e^(581/2*I*c) + 2082260847083063580936497715794658524343637667729527779595191574795462525449825138973704131873243420620730671191885970 20*I*a^2*e^(579/2*I*c) + 2167038733501891618892539109704110311947248476488359496569667286836725639856090611642585251270941471281160849168634959 80*I*a^2*e^(577/2*I*c) + 2221094679604372803660200628702581439109785619404614233619307198434832969057630278994639779581668861046162679999048080 20*I*a^2*e^(575/2*I*c) + 2245330453575907400433602074190634803744964450862243069728989527274920004433671893840843870140083200073368482524423517 00*I*a^2*e^(573/2*I*c) + 2241279579615789317292097509967964922214639196992668295477016986820854636576084219831291806220410228330703495546140325 80*I*a^2*e^(571/2*I*c) + 2211025783828626695740553495019335716128549986148679539512300952865082892135739343399766175295818912761611283557 70449340*I*a^2*e^(569/2*I*c) + 2157107888620319861313147608766195097226976691028046963444375241658823020852204413140104145591153105056327130418005632 40*I*a^2*e^(567/2*I*c) + 208241559958526005577553654579539804295556729766813024214854064170793656725481586279526287325763568906607290452125497960*I*a^2*e^(565/2*I*c) + 199008077323035875418810143012602047032565549819093659928410024126213956651006647088382356775180926199506332461163896160*I*a^2*e^(563/2*I*c) + 188336867093755763287399456292591578241527924733164764702870711365091789132541972304352146740778900143326958742782477380*I*a^2*e^(561/2*I*c) + 176557340972345000110050704121475326025260088023872962060596666821011054235305398302353921234166369742208455804477035400*I*a^2*e^(559/2*I*c) + 163992134042938389389225651587309049983478009502030995092591343379847364505252550567737506346576435363268511946307432740*I*a^2*e^(557/2*I*c) + 150948545513948896128558440622825450599113182826877373160132263862850745383456730881605090985571977587756201763874677760*I*a^2*e^(555/2*I*c) + 137711319077587336593949747709220793928082528831217845339057830380687221501394694136422854469574552691588871302472423100*I*a^2*e^(553/2*I*c) + 124536920158622880437723357410492491627484725712145537940168633192047594624217812945579030363502701898045319958355946560*I*a^2*e^(551/2*I*c) + 111649386683169175905340386817436347581012040347378979113869960210757779770685735228549707336610684327510689931586511440*I*a^2*e^(549/2*I*c) + 992377526151663889268259748362999901775488277659521767616434701925599742397632177704792323501081900162100974089479 46880*I*a^2*e^(547/2*I*c) + 874549733383650204930408912754470292375320171050889386573410300701410815865430852972069835444923903938692719986021137 20*I*a^2*e^(545/2*I*c) + 764182222193923150876837562784057752836506762015726045537927059213114804351706169144057929518577488126493273034906046 40*I*a^2*e^(543/2*I*c) + 662103806898148887211572021781565247253004285579497310960300184699919224146809856652759478738246439206891856218171956 40*I*a^2*e^(541/2*I*c) + 568825112693732878705391958224371520046801043218502293967089260050126938436758033509451964639739206284122562838322323 20*I*a^2*e^(539/2*I*c) + 484570844705692062028835940300589468351722766518437992672347958848344224971557014613764251403472927696222870092534422 00*I*a^2*e^(537/2*I*c) + 409317259082

598900650106764128980599350021675414437149684224475067236578143624236160274
677960379565942494702079111605600*I*a^2*e^(535/2*I*c) + 3428325782509936146962902964699798701635741039313333787686078421859423134494113424079839941897620008937437293733627752 0*I*a^2*e^(533/2*I*c) + 28471827652223748549106708088925334267458310362833843507803706954155729623190563034227809794821598285838730011875428360*I*a^2*e^(531/2*I*c) + 2344494275310972061619099448239626334477546731486566463392537771134367647914380142313178228692898264158490673065233632 0*I*a^2*e^(529/2*I*c) + 191412625380361555448186099533297098949384353960427781743611038925671068941470060885326580598084819446574444646678139 28*I*a^2*e^(527/2*I*c) + 154940340739378891189078604664064752867270400483777892795074774249507146277344986723696846144161308848999485064969764 80*I*a^2*e^(525/2*I*c) + 1243409271248787660618086383964100720378208694205271972753248844995428991548176800730036771699843029802551521526324004 0*I*a^2*e^(523/2*I*c) + 989238300147813523003253928973088080293094948398241346146580458789389657623927099439810176311767228540091230325818528 0*I*a^2*e^(521/2*I*c) + 78019855370421567706442754190044232155698284276125669947440615954550718038386727090403263285943066556996154226709413 60*I*a^2*e^(519/2*I*c) + 60996612417295200498779730183232995941499625082038419357626403994288775260998019269944216708290507537007971338642499 84*I*a^2*e^(517/2*I*c) + 47269450912532257092847016202535295880273627739112671600945818608556165462265726371077234064797547613355089762699145 79*I*a^2*e^(515/2*I*c) + 36308362996060499012597116682237835163595483156164260995438778934924614534786303889672637560395104155118896253763893 70*I*a^2*e^(513/2*I*c) + 27641415519131838232322405383114348616980537825400877377787409587551952551974687942653319983004895297931041538369383 65*I*a^2*e^(511/2*I*c) + 208553251562235328977529713768435604455571784789590571202099167792635363269719613533615692265275394611066259818235706 0*I*a^2*e^(509/2*I*c) + 155937926574672215760111663377054590568084528646619506804743775058210085021855893406344134616621928423629259175600786 9*I*a^2*e^(507/2*I*c) + 115541827126152536476409983255601569565667174214839743077062191976959126206932489179734608971821629541917600117558460 2*I*a^2*e^(505/2*I*c) + 848308102584636362484162825743572316210570041224952064440187703108373794290161871693531289023220368566861588408740234*I*a^2*e^(503/2*I*c) + 617118907415491882008893689992374986026058614595180636934596331413170379780487585714587047788469214113451795516499370*I*a^2*e^(501/2*I*c) + 444793756576556805226598557121881255891420660178954005606190859767907900375526699087281079775401935479298706556678625*I*a^2*e^(499/2*I*c) + 317611854590359842624867588299694397092051295753012234334896647966925083208128923978657573859261411691474063180579773*I*a^2*e^(497/2*I*c) + 224675870137816967448574290906572012353624572247889623771866556695527535849562092439004233144825309318376200907596647*I*a^2*e^(495/2*I*c) + 157438648683134146474225508822869634510407589789880501589161153804500657734549235665125080321402913947303819424223977*I*a^2*e^(493/2*I*c) + 109278560723550930958638148152377305018874412559953150839397105157171522052107943777228097015723239016040062510748533*I*a^2*e^(491/2*I*c) + 751278263211159102200857958235109088145883877187557120298253868427887040377648408378649888711978264147562263275847 15*I*a^2*e^(489/2*I*c) + 51154

349273662615909216231190623364827611251722641045147869080165842930085677025
925218103510278265118135145553584580*I*a^2*e^(487/2*I*c) + 3449482485656682
228083350970147940299549936501441740704289262338429483788416879224070200558
7755169596414970227728126*I*a^2*e^(485/2*I*c) + 230350339766078618487647778
136258591386637475271317988770088165940783019503244046869869758222326579038
21541105390532*I*a^2*e^(483/2*I*c) + 152321551972444699834772351204899342555
399594332170569196782170361245875795753404131530065929326205229838601927955
519*I*a^2*e^(481/2*I*c) + 997345578166833210048261912077904479619888457051 8
850362675620400800380525655955470978275300874201998244732697737400*I*a^2*e^
(479/2*I*c) + 646570965630006781278626751444710668790258143331091917803854 2
426426780363215033938034518725151681639996365849163135*I*a^2*e^(477/2*I*c)
+ 414999481036590052280746821327819309165614173111636745382913763070919148 2
537488782374639033936237089896768763566876*I*a^2*e^(475/2*I*c) + 2637026704
940057541717603416099047901577339805399244480403700320734657027382051540741
428399462562160665232399986075*I*a^2*e^(473/2*I*c) + 165879269407287147910 1
869942544704973168924575943071103309570774086262029542461228753343283112620
767567415651784874*I*a^2*e^(471/2*I*c) + 103289339010862345166262992190205 9
825520150456341148954819241245986827172746045153810766991498955787562750756
646550*I*a^2*e^(469/2*I*c) + 636619675359008017622216008920407724708440107 6
299878481343671810431067804125143991154236056607607886976516343790 05*I*a^2*
e^(467/2*I*c) + 388366130772936514035045226101528726099976343067435024084 89
865605493216277496607446437043051044461648704388 7402836*I*a^2*e^(465/2*I*c)
 + 234485020980412467341743199145352029468076352266379854608773522593799565
958621176141472761686768653754135750141593*I*a^2*e^(463/2*I*c) + 1401126097
156444901142996236202237326344616475127018069082403838786547453990878368588
047116294007625154259559168 24*I*a^2*e^(461/2*I*c) + 828521429668608514316 11
420117596372256466739448701897204460441426498632548900216968337411640986907
458522921325945*I*a^2*e^(459/2*I*c) + 484809206605142668675351572457287006 7
245346536590134444783005329826730084909821476286421209270563913290579368174
0*I*a^2*e^(457/2*I*c) + 280708048160262098107656410952750421279481280413894
356297204856430240954064869242205425224481435633245184019644 82*I*a^2*e^(455
/2*I*c) + 160817080371172393648854249530832449365157249212993867786002259 51
179498131171589524219045138516435810850207340428*I*a^2*e^(453/2*I*c) + 9115
474553683826281436142305910668402582581988856745851085574498026708677442826
803383401266387813162062594525953*I*a^2*e^(451/2*I*c) + 511178715509823196 6
381444413998413769738039840629789986636135861377096437110535352261196444661
635160446805767627*I*a^2*e^(449/2*I*c) + 283588902271679331109326710891341 1
484117430817040975928639654911368211514698112927408762873660302882359781905
835*I*a^2*e^(447/2*I*c) + 155634309696857376475647523541193301673378631310 7
239004864800578666621277030123112055440836769200504575169913345*I*a^2*e^(44
5/2*I*c) + 844885322059161932368993517117208111183944355764632182261257568 9
213045295683671174633187917432067712104377606 31*I*a^2*e^(443/2*I*c) + 45367
323239426704394960592256932998094054962699938259984350566231168625730196653
792036083832466772913348223558 3*I*a^2*e^(441/2*I*c) + 2409451272767662273 20
339940089298232681048239144248789324968088048819421447003749816077955279624

100315116789806*I*a^2*e^(439/2*I*c) + 126560833582905534125457118283479588254886734066422681322743067453094955423272892820673108496357191409969596590*I*a^2*e^(437/2*I*c) + 65745072618550512189873447315220858623931223310142529839808121856850665718523376669691836042778846630737410930*I*a^2*e^(435/2*I*c) + 33774289747978981424926739931160824797161112237362925619159566387573730808632464292717707940688773187398723895*I*a^2*e^(433/2*I*c) + 1715713198535927799763949795015467476277919035108756781919569951778466633338378336687113858692204044077794176*I*a^2*e^(431/2*I*c) + 8618164918788925203902059506702768733004223544564086461069581208848976475760787131715839621109117547446849991*I*a^2*e^(429/2*I*c) + 4280284024728837338195579377830489525167771127365155055905896472260407749270429246786706643678954884633163010*I*a^2*e^(427/2*I*c) + 2101812264182065730411859582938002660622402353730581510169623059960820290526673615762476646904104925062205465*I*a^2*e^(425/2*I*c) + 1020362468343075226131935473747821355290052152417646455220161102238032449230964279115841386608493376970117760*I*a^2*e^(423/2*I*c) + 489699557155298676398555706690170103288962201587062038457047783309280898007016462695325519866776349668712200*I*a^2*e^(421/2*I*c) + 232324417197235062081022565235959973329129704016512511492684407228447554005362475531181177257375428158576672*I*a^2*e^(419/2*I*c) + 108949410506024382921420575473869228515942872496860505620768573056175175693027104049195507535238812688471740*I*a^2*e^(417/2*I*c) + 50500362504156859478353840472838257985720430216874883086230302896996886794997397859935740848410975488426320*I*a^2*e^(415/2*I*c) + 23135457555667242015109562696724759269442147216687397489819489071941696946645262869400576401992001928296540*I*a^2*e^(413/2*I*c) + 10474897110205807367846375066723336622244536523176561176217245839587779126630391482195110511043224435073120*I*a^2*e^(411/2*I*c) + 4686873873156101871190767974561598609513443670201757460914232312505484627209871957976104328771649162041900*I*a^2*e^(409/2*I*c) + 2072296968472727638582366763214809350131036179733894803881601867867318900360235090208152423869380817193240*I*a^2*e^(407/2*I*c) + 905375964480293043221568717617222804352981478608148290290910134804446811145030581376444150025327895167080*I*a^2*e^(405/2*I*c) + 390829013458478713762005868531749550511348363755402425375475219863201042469027671720992324263291992741380*I*a^2*e^(403/2*I*c) + 166685454178675867308847881643025971737125688220303037968682349925679089331312174778117366039026285869440*I*a^2*e^(401/2*I*c) + 70231742836691486232401821435646690204765370170934364279337989127944150596825723542271716872404327490260*I*a^2*e^(399/2*I*c) + 2923245784778434719423275587068639931517180934624834659494649731694453335619977722113539614776201632080*I*a^2*e^(397/2*I*c) + 12018885227405508527778918244713077048854664134058582641410118464532001237995012608936579451133542506420*I*a^2*e^(395/2*I*c) + 4880904812629492578182749704265723358376166867348003927103702683844870930164640446326414262466377824000*I*a^2*e^(393/2*I*c) + 1957688477178164823844184536565647794575532926755467360055820937851704595970877608419045482885065913720*I*a^2*e^(391/2*I*c) + 775466756780053803300487429447750888237325797624757919706744628478203937255833604141877857656968392480*I*a^2*e^(389/2*I*c) + 303338706350755487279057170882513474743360201200362327954737042233540329160364416313115387680

520970550*I*a^2*e^(387/2*I*c) + 11716708448312371086396980793877215516995678531752309017486269734414129324623671735385471475125317716O*I*a^2*e^(385/2*I*c) + 4468523594698667379192522552599281379748585493930455912527936618154971335157263021814214905914O721370*I*a^2*e^(383/2*I*c) + 16825577675009653410652812996723598120483470175375332001250964015555125236873581387468224926998037020*I*a^2*e^(381/2*I*c) + 625445695771085708499077750788019679582604834287739131011550616768023302435408989307268140647524673O*I*a^2*e^(379/2*I*c) + 2295030419017144015110797732155375346477339079532575006580675869478858321228765847919467823502616280*I*a^2*e^(377/2*I*c) + 831249333124270929749565123370219357165654568742620039903429231671547436113371386430716266759961060*I*a^2*e^(375/2*I*c) + 29715447844335284729874429353637357036763125837319729086996777826166088489889861081579393218726490O*I*a^2*e^(373/2*I*c) + 104834609086572625907289346225890252429283565041460323851402795840051940483234866884215706838405390*I*a^2*e^(371/2*I*c) + 36497326353315963605420298190687465001055100758074304234792272161886339957870164613698417616283210*I*a^2*e^(369/2*I*c) + 1253756283673259917976701035515246105680719195100500979645182339107900065576218906774119230539409O*I*a^2*e^(367/2*I*c) + 4249342990738608701078109187168768367693341231356030118163718909774173116310218460585993016680850*I*a^2*e^(365/2*I*c) + 1420846196643578803733575330926970974464675704020481618027446077982380731097941167611657029967430*I*a^2*e^(363/2*I*c) + 468649433876940374716415334540852022756419671685290819126536222202383329230675172080843145521190*I*a^2*e^(361/2*I*c) + 15246953324765761349401422316907960394760712903109723909033573467633017781484186820115534586660O*I*a^2*e^(359/2*I*c) + 48922566581328827996243369288346270469307859644664802730085010597182346996542663202606651415940*I*a^2*e^(357/2*I*c) + 15480423340995881584740416023332877545588024374995660159497444149878426588554491651581857867240*I*a^2*e^(355/2*I*c) + 4830133064761265676098823275890322270506766918770002889169425396499013319534724628237025832970*I*a^2*e^(353/2*I*c) + 1485908894655409129727579697390217111877691246727000929093187863829367925384373668136922959680*I*a^2*e^(351/2*I*c) + 45064562580373888296088587103056614395310898823853000505361579579976664205719692805608636970*I*a^2*e^(349/2*I*c) + 134722445502792775389537013386891372826155603628085240383959392418361487884840921793997982680*I*a^2*e^(347/2*I*c) + 39696967339164674484698605925414889836548997086240408750738793856030209166162894182626765170*I*a^2*e^(345/2*I*c) + 11527544710214127291959320966284738345019810955968385265683600912288138678711188667077969580*I*a^2*e^(343/2*I*c) + 3298577503461372465605345536869123261456392605454980840206045785661659654642478147158578260*I*a^2*e^(341/2*I*c) + 929980703633600952321625692946644952639044210651468835121797966088502026440103109950142510*I*a^2*e^(339/2*I*c) + 258299861869070319215539511486716381312735629658913082894934911762706535490482149535095400*I*a^2*e^(337/2*I*c) + 70667809192496838965532281733119872286671303574373760629554934333798898169280995448949110*I*a^2*e^(335/2*I*c) + 19041847118319726293265803273951207945593799588235034178026656550799568684461605603777920*I*a^2*e^(333/2*I*c) + 5052749693090074250020711633864893162784543894410325996308296849332368152124619583542550*I*a^2*e^(331/2*I*c) + 1320132342599574776582487491686

376011020731128338564644972136377885389653577953327654360*I*a^2*e^(329/2*I*c) + 339559768710652597013282888173129506684379492517210783951942750593256924300958872349 40*I*a^2*e^(327/2*I*c) + 859726816913913549797131970913343700552010003729371526331729476018163132601997069791 60*I*a^2*e^(325/2*I*c) + 2142322637573414749329411197982703704059061442657481751124150172303756732526374572785 0*I*a^2*e^(323/2*I*c) + 525318021890119037052330796129201500498936014569711671382606949205989634922543247289 0*I*a^2*e^(321/2*I*c) + 126737087561381648317237671513461191515502353237594752736881659052212108959184119587 0*I*a^2*e^(319/2*I*c) + 300786380045287143628954499629136562193246097877509863055826252064326569743630828470*I*a^2*e^(317/2*I*c) + 702122063048016783325133455999109492462648029240170648330249799178942648908847442 30*I*a^2*e^(315/2*I*c) + 161172874479982061427980838947631758408488571143435430472421389530881375099887485 30*I*a^2*e^(313/2*I*c) + 363763252490000796124964602502497070783755961261959744273749332209574315475403254 0*I*a^2*e^(311/2*I*c) + 807074460549539210003558596515532129897902975140321070941315505466030633289504700*I*a^2*e^(309/2*I*c) + 175992541401464872591758301499834898740699910060781393774843202513062630336753720*I*a^2*e^(307/2*I*c) + 377117140101616328512751948735862319229675664519554097468433744164399975982722 30*I*a^2*e^(305/2*I*c) + 793912239209648981957602336578090909591097204342621477154578124683291082041410 0*I*a^2*e^(303/2*I*c) + 164169729637814329912873364094099880544138419848923681927546342336005041671023 0*I*a^2*e^(301/2*I*c) + 333384441552175348575863851685280079397515408127201392843010509098144064832520*I*a^2*e^(299/2*I*c) + 664712059991868481178900726621930213276773877709344148127269977048446636128 90*I*a^2*e^(297/2*I*c) + 130094515202180544279877269093063880267282184300951971516261902045291998161 60*I*a^2*e^(295/2*I*c) + 249873137703119593902009900676777560703678414718847588932333154107259198852 0*I*a^2*e^(293/2*I*c) + 470879572899329452986316253534868514992585355812719048085012389615234670720*I*a^2*e^(291/2*I*c) + 870403827362412450481131355289174357725313998615170486117061769977288400 60*I*a^2*e^(289/2*I*c) + 157775513349298847415589802311195134453776467818398856048832967405866716 00*I*a^2*e^(287/2*I*c) + 280381622275725313347267227979258622027202980643890549476681998951722518 0*I*a^2*e^(285/2*I*c) + 488348364369005961261801502808542403226214848682295131186689348564834560*I*a^2*e^(283/2*I*c) + 833402769621003639645666404958645163938548030172361844704429893940351 80*I*a^2*e^(281/2*I*c) + 139314177925091981614687974237525448386785995392752123323804426513575 60*I*a^2*e^(279/2*I*c) + 228042712007813771932551384787426514801954185403148684855824844272717 6*I*a^2*e^(277/2*I*c) + 365407793636196973379878926946921993102971243732578054647123414214820*I*a^2*e^(275/2*I*c) + 572974083910783244258442207116960160604580042400848903389346899252 80*I*a^2*e^(273/2*I*c) + 878894722176403352444688879370312534478409467919461266296973226770 0*I*a^2*e^(271/2*I*c) + 131833734090464628919796188629234500940145661854341001986735606936 0*I*a^2*e^(269/2*I*c) + 193303982244781919691500896347164102540863253211817387366117379028*I*a^2*e^(267/2*I*c) + 276955224919873361222978546562790677041439325793179716978946521 28*I*a^2*e^(265/2*I*c) + 387574875295375725139232180409811038973871922403380266829414972 0*I*a^2*e^(263/2*I*c) + 529534303804314371317

279287031587399342898319070257744555877120*I*a^2*e^(261/2*I*c) + 7060444149 8160359313241260895971702149956086380303936468404945*I*a^2*e^(259/2*I*c) + 9182643580975122394482019949557981111651613557125350856577098*I*a^2*e^(257/ 2*I*c) + 1164368139316323606713195496495533903452490627065569725880879*I*a^ 2*e^(255/2*I*c) + 143872897869958476711841808368973418609254139596808263965 208*I*a^2*e^(253/2*I*c) + 1731419855983647541565139336513364245374510046106 2396834495*I*a^2*e^(251/2*I*c) + 202823283552635430098336989282097008142353 1403040583023770*I*a^2*e^(249/2*I*c) + 231137463934351535240227752765265592 838813655877791732766*I*a^2*e^(247/2*I*c) + 2560896322478529157228795203877 0777479118266594544417374*I*a^2*e^(245/2*I*c) + 275677067277424856755018403 1805577107703843954010093519*I*a^2*e^(243/2*I*c) + 288136908346804733688436 834384090051687033252355064191*I*a^2*e^(241/2*I*c) + 2921950553161713974599 5198456026235957224788107224865*I*a^2*e^(239/2*I*c) + 287270320925440168071 8347285883520097429919909434035*I*a^2*e^(237/2*I*c) + 273590703261713668448 365859396559199738283337615067*I*a^2*e^(235/2*I*c) + 2521924874282494815754 7271484589255811816930894969*I*a^2*e^(233/2*I*c) + 224795487509634223508139 1843579770658847258731308*I*a^2*e^(231/2*I*c) + 193573860526473423179001809 134869735140502053410*I*a^2*e^(229/2*I*c) + 1608646826432365541347574730458 5608493929925740*I*a^2*e^(227/2*I*c) + 128869483230185418749692569938588091 2905767417*I*a^2*e^(225/2*I*c) + 994034494896144155893242613267830157826542 00*I*a^2*e^(223/2*I*c) + 7373332278938477877109516190844163180831833*I*a^2* e^(221/2*I*c) + 525223640233639829417248502076803689088820*I*a^2*e^(219/2*I *c) + 35875930157695641006598626271371876133245*I*a^2*e^(217/2*I*c) + 23461 09795219082040306865029327652810422*I*a^2*e^(215/2*I*c) + 14663185841641185 8207561193721288320906*I*a^2*e^(213/2*I*c) + 874227865046303006930100363723 2429883*I*a^2*e^(211/2*I*c) + 496183375602453279107611685390767740*I*a^2*e^ (209/2*I*c) + 26748429663467970647815785552181215*I*a^2*e^(207/2*I*c) + 136 6183224856297865521217009020824*I*a^2*e^(205/2*I*c) + 659284126316477394616 83457820511*I*a^2*e^(203/2*I*c) + 2996746017244157830350053701476*I*a^2*e^(201/2*I*c) + 127861163072229101394013407134*I*a^2*e^(199/2*I*c) + 510084426 2877818375740499940*I*a^2*e^(197/2*I*c) + 189421272159473056494074595*I*a^2 *e^(195/2*I*c) + 6514488191762735815405157*I*a^2*e^(193/2*I*c) + 2062634782 91032388361681*I*a^2*e^(191/2*I*c) + 5970784896718122444327*I*a^2*e^(189/2* I*c) + 156713514334349191205*I*a^2*e^(187/2*I*c) + 3692203217145049425*I*a^ 2*e^(185/2*I*c) + 77121738215926170*I*a^2*e^(183/2*I*c) + 1405865019555002* I*a^2*e^(181/2*I*c) + 21909584720322*I*a^2*e^(179/2*I*c) + 283802910885*I*a ^2*e^(177/2*I*c) + 2933363420*I*a^2*e^(175/2*I*c) + 22680645*I*a^2*e^(173/2 *I*c) + 116610*I*a^2*e^(171/2*I*c) + 299*I*a^2*e^(169/2*I*c))/(e^(517*I*c) + 418*e^(516*I*c) + 87153*e^(515*I*c) + 12085216*e^(514*I*c) + 1253841160*e ^(513*I*c) + 103818048048*e^(512*I*c) + 7146142307307*e^(511*I*c) + 4206015 18659718*e^(510*I*c) + 21608403021340047*e^(509*I*c) + 984382804329835768*e ^(508*I*c) + 40261256699368950388*e^(507*I*c) + 1493326612293984160368*e^(5 06*I*c) + 50648660944512569972179*e^(505*I*c) + 1581796642397812408161814*e ^(504*I*c) + 45759117183402579073139583*e^(503*I*c) + 123244555734683224517 6696904*e^(502*I*c) + 31042222522074681615625020522*e^(501*I*c) + 734057263

6163884499688423669 24*e^(500*I*c) + 16353164647151530240529137618111*e^(499
*I*c) + 3442771520128751341407393029609 14*e^(498*I*c) + 6868329225263681349
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*c) + 2348998374244347079532766203075607598*e^(495*I*c) + 40443624781415311
581857832389099634564*e^(494*I*c) + 665634670676210063754191847109971141414
*e^(493*I*c) + 10490402669510897424624643766470754045064*e^(492*I*c) + 1585
66476113257562566117432227203884298856*e^(491*I*c) + 230215041122623492585 5
2223452015009005335 76*e^(490*I*c) + 32147887693375338817454482515377350383 9
50278*e^(489*I*c) + 432333688644261557547944179250800440604964868*e^(488*I*
c) + 5605927253067558551780452883689835514455118670*e^(487*I*c) + 701645153
22544462906873548813748091084561870680*e^(486*I*c) + 848552202276512356496 2
001369596762953616963151 13*e^(485*I*c) + 992549073853440227293998703871458 0
495445431374618*e^(484*I*c) + 112391604542246650966429162063124338952554575
234051*e^(483*I*c) + 1233096700139723365181997220750932590655287625342156*e
^(482*I*c) + 131187818011721747296793398943181536949646753684811 94*e^(481*I
*c) + 1354425949166361161915746506253316462385011016279372 24*e^(480*I*c) +
1357990663161479842850642848032544982878359839580349899*e^(479*I*c) + 13231
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586921272662198050851269323171167338854081782959*e^(477*I*c) + 115585541289
359426034554496664268782363003589936323237 1472*e^(476*I*c) + 10375184499871
175501909398956596684116802997082526660323524*e^(475*I*c) + 907226057222088
149186422846394871877646075897064939707747 76*e^(474*I*c) + 7732046369911457
75061462731028098506094432675788136295011259*e^(473*I*c) + 6426195485535248
5764250681368704655300871140038757166913839 02*e^(472*I*c) + 521081176291770
486604924009851758309875057005668778189541416 39*e^(471*I*c) + 4124306982999
1519084806722232721943506774793409189467048898 2928*e^(470*I*c) + 3187749929
744346497211536044751776582320958627923816470590659024*e^(469*I*c) + 240708
019135297571018580229143720458647469917861820397402743 25264*e^(468*I*c) + 1
776428291351193485771944376758028302399054600926871364949614 04333*e^(467*I*
c) + 12818174649149708108596041898283590007907899211694053046122112 51818*e^
(466*I*c) + 904669352382568297904433896310426316767258682636791133882648354
9173*e^(465*I*c) + 624735507810532953177107746902471141241251875657318484 41
781904032672*e^(464*I*c) + 4222761266320036875477547465557099887105271330 86
66016136635365 6787288*e^(463*I*c) + 279470910447568661184279069497369916448
2254723977210209725661304403472*e^(462*I*c) + 181157684956157580767103030 55
50562558925429365919331415341833394459 6408*e^(461*I*c) + 115051481852080848
8737003883545213155676403651240031036911766971942923 20*e^(460*I*c) + 716099
49759905807989563333855294022919285819648159783007881971186260009 6*e^(459*I
*c) + 436944248291011391456535313606959586266933885805341938121413124192504
7008*e^(458*I*c) + 261439762799020214434719456650802545630568101835204018 89
8002854931448674 48*e^(457*I*c) + 153436088745056254127327239461577071933130
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) + 276931165383432592259833826376479361226640338596151334898466646943614 71

028310*e^(453*I*c) + 150822381431412413773566474210011746852297437597059186295243989481140398152780*e^(452*I*c) + 806679543607589140759305010796189568269842021613388955218916278823182639488190*e^(451*I*c) + 4238125846763232586394188569858685826755328005548627437019301405851325887594480*e^(450*I*c) + 21876482892713909928040345612578705805121508756226696317087651824252241418663320*e^(449*I*c) + 110969199687320974749922259595250444341219218535349655762591192576535872151766080*e^(448*I*c) + 553269128819528612502918869558947829098021956309349843584044631512291778800081490*e^(447*I*c) + 2711843239670717527605640490148833507130242448403978318523237721944200392830108580*e^(446*I*c) + 13069817203488289886193205508375818392124991382340160316886507181296548981014818410*e^(445*I*c) + 61948596653035502879564338815234310660410902037882473161804774492916216575880077680*e^(444*I*c) + 288820755264730654469968572021047109427318619508995802020689904590319476295408324280*e^(443*I*c) + 1324756412367837473157472821162483691120966501948953926492241643788264284546437221120*e^(442*I*c) + 5978992172944143218459161149299819706321732111578494525245228742976468409105395536290*e^(441*I*c) + 26556806389043407534496702369101545795994861757741414789944652712127566910185274123140*e^(440*I*c) + 116104551683555043762911501712116399313733021132677481112824047246361794049635726479850*e^(439*I*c) + 499707567253859084357596314813794768069337190915967491907488904933922677579665354338960*e^(438*I*c) + 2117589733466855707101501429210414722401838837940752841618541440888545729943138209036820*e^(437*I*c) + 8836720640860470305694514021547969551296794092266983044118375790025854584036796364768280*e^(436*I*c) + 36318369652302591732197444409798122022640824604130552506742586795183267354382847875885730*e^(435*I*c) + 147030816732276833163041582099592047512043725225353339238819165193000407629544745753221740*e^(434*I*c) + 586403466972683242741643328921560909375197453864243299571990964608857245771134145204174990*e^(433*I*c) + 2304351073373840357379178597673066352016682781689139842097376663118488803841131935313641840*e^(432*I*c) + 8923209447343296763331881881638471793499618670601026059730895962653291770229493028162575100*e^(431*I*c) + 34054053851295569154352346722177172655187548910782008504718324168725029438589162349211628040*e^(430*I*c) + 128098914601688539672480541830409847707367500438601536803204497701119911289087105659482783340*e^(429*I*c) + 475010578857601519272316617938425222421786597241671026894318515408511467140969393115768793680*e^(428*I*c) + 1736574218818191071874197472450158123883564209950658639102337148122769080611680719741726053840*e^(427*I*c) + 6259872156822252843650960708235034710201362776057176647226323089751446565288850103898153859920*e^(426*I*c) + 22251959176795777757167366036007480222211364232146399803864370963391491223687245823457351580140*e^(425*I*c) + 78009807368024239875613733058851417125327114681070889640794249282633470580756557083923203377160*e^(424*I*c) + 269745801440211296972683601863878954357962308520076595177128227629273240215209708218497363414140*e^(423*I*c) + 920089393029589032874601850027159322612526368444771489781974361078847528891468831038436064951920*e^(422*I*c) + 3096131971621520162380301554241465451782362086810287537748902904985934020179565706177131421614590*e^(421*I*c) + 102793647306638408447395778624692626046488619142979725891652435

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 + 2346518219239105142238141633073464768899155708935025778047637412681781575765422219127409260159438712250*e^(409*I*c) + 6675866290371147358503766865669289010893543869830538708724945291580951179188296606158111257706968604740*
e^(408*I*c) + 18759988218865563564163635735986073278255737257405706279108891366378428467414559930481172863538598193890*e^(407*I*c) + 52075178518793270386429263351544306951104993542500582938155241689408138675254608030847907167748571734720*e^(406*I*c) + 142801792450221762483180874918825274134305133275417780084795034644763509333503150517345864659667189417080*e^(405*I*c) + 386876218234277165632451723049979889263115282374607541692443176673997513742813591736171169652250611186480*e^(404*I*c) + 1035561982592002935226384577908611548612111495080193573691339864706029186482466241805664949381049856258510*e
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+ 47188220843466207695099506953573780357108897491422567898048199018207708997005333860148836479527456156014520*e^(399*I*c) + 119041855403877964948229577948370465600606623183045529526900430209270473212773847794935586074714329479939280*e^(398*I*c) + 296825515282669589685318273280239050084555032203415941511962659596881615713799937680026497408305672297618840*e^(397*I*c) + 731584972206818362874729621403974444280010446301161527339760544815300951787985538419764656214582667219914080*e^(396*I*c) + 1782446114931751850556354856638421901174412322298249496591658053939787198246565945975595575734193348887952160*e^(395*I*c) + 4293206478008022126017488908851826494790620720660151451468181910917240027863968724539127659633517053002976480*e^(394*I*c) + 10223182025954860767217390305186451923562145473674293619918063490411487496121804590274592702770571515456414680*e^(393*I*c) + 2406878513970527716119346564450614328524136103776821681892218440014104846021094469664775272337193287459459732

8*e^(392*I*c) + 56028683424903517658495013858534516167162591034367972498174660907450666778154353271630344650777885683547624184*e^(391*I*c) + 128967080084754712246023680866488384983286259025533132044636109049545144029547003347761521666283977931640178464*e^(390*I*c) + 293550743554342709808129453576562313299705982699187416862934373964255615967138676253276302591561523515603264403*e^(389*I*c) + 660764473105869097691475973850837934511089033149586707982764263394766756649565279879146173318386505740391093990*e^(388*I*c) + 1470931146618934345515038362300100160482127749581443929904746910224777470198899052379114493999887003199419829579*e^(387*I*c) + 3238491931361851476423321933539579098377735539207641467346235665823887048326949305609231585143748690203615957136*e^(386*I*c) + 7052132414162197992602326524580143060985353054572933905524633121681021037340298366342203324325307072413739061024*e^(385*I*c) + 15189634214908800396417911722643754748048520109734812459109878810493844381062650818971199637121458749456243274416*e^(384*I*c) + 32362731322419549410330088943640247460378328561316422931292427145902887913071643679502909055891236755143207382609*e^(383*I*c) + 68208033096793615683784409619244210818614991640041553424405527876893272496608324231098148502466453967157728078994*e^(382*I*c) + 142213115964814517682386667276769909482271681318790889840501039441748635545362467679832449103520321953011780083069*e^(381*I*c) + 293344920034300720287042383448342866313806285455040067823080445597545970023446231563554135133105493516316320059272*e^(380*I*c) + 598650141112241858911676505180520150364003226841328081453597093587790338609212439085554466861582623350303061961052*e^(379*I*c) + 1208770358493658393089442222056935063283704108140593750226539846117737648216609559734831601248698274330296158612144*e^(378*I*c) + 2414966516810338503289076549202740511710059011795447138773464205696455026442712426409599662771080264826008985061097*e^(377*I*c) + 4774141111066098970221845330594962016472714230374234060663956846950926642685946929064114194400360936223590725470146*e^(376*I*c) + 9339341958053494225251750965715057300707302083814774770306218224241022648247419956042957363055823830898547303219757*e^(375*I*c) + 18079820068028859970349938623007230676563314206708848499900139641237334763266479346963237936039328113185041591793848*e^(374*I*c) + 34637657172671690167657344537197087048882354853993270472063943078773600446542963548348101269390443464480754513928502*e^(373*I*c) + 65674859268867300098827375812875225610654551686261103681664007007537115778097293533565243828873383722980353200611956*e^(372*I*c) + 123243941519332384741960072588103506596406339253616391082062969960682419011745775738921817753391954462609323881489157*e^(371*I*c) + 228911311738592780091492649162346834405867740776456326108410928857257174707289268074347550225793244741923354395308214*e^(370*I*c) + 420846342608949387277559021457924586578120966148561022647008499529468452005980175119410628956210497609566002969884927*e^(369*I*c) + 765867795513962781012558444628751418710940895281304790836743661582071650032154891482866406314834433199455459798934952*e^(368*I*c) + 1379676529796212074017106188066589448355446501210890195107164860350228928586815539003062875026711931941947738690360722*e^(367*I*c) + 2460442375845422663927081630983260714734968091905493027145639238827192254886349361126991457692409851120873307487457468*e^(366*I*c)

+ 4343909696601932173357359687781579293701295681940827114215433175336093967845908766740738240037114570667410936998017178*e^(365*I*c) + 7592752700146678961153095073585015473197029746533633331549793961473285760935801904155116764831560875947581048693527224*e^(364*I*c) + 13139771494104933881856681151418293112242551521535686871181266579813877606348160261747201317735782566021306798298336024*e^(363*I*c) + 22514675741308069961506165586502872430421930210673264392997286485600640103867253604847715547060592967690653795951142520*e^(362*I*c) + 38199015867586087976002998756627674994795440667903625029322346250133286489120875005013638128113893960349670280707161530*e^(361*I*c) + 64175100693260066806238064886004597170740843300086839368616139164529108049844675353111842725798658088840347241496099644*e^(360*I*c) + 106764832017165594838085234189333528733587673329972530092661085186789939252915937090760282232346919090426243399409323314*e^(359*I*c) + 175896258262755985757106812613979301265801031595484353614904672865169442232075776580447184134141375995770091499246759528*e^(358*I*c) + 286992943631231496557278010851576940896826497466066327528801560677007112837431926735088120974861760511367008815728782643*e^(357*I*c) + 463758288457367154544937678255005688733328145568049310423995599886012800638619904022368378591108842602342094543682299102*e^(356*I*c) + 742228640908173124916937049462525617334148919679118270489831005497781951221069955839623452499748653124658873553401442137*e^(355*I*c) + 1176600720975786965189875050890231092204612696970277433014535895788956771230793520381993106606880564628599822341722801012*e^(354*I*c) + 1847505856462451533445284300571326323781162553304565971887670758091079306794821834928170773126364639722071570131703785334*e^(353*I*c) + 2873610535922340187080835435582912277271967977394720159791070274927714276869531467182688981041061381703885403497544001592*e^(352*I*c) + 4427673079105425318524316112985693656584851936100192457044455134483305045321452516347118488133224823670465103483954805161*e^(351*I*c) + 6758480437888524372562935948963857626694855547195519486122877567981718587262362871994967079401831957927901682582941234362*e^(350*I*c) + 10220423779434634851339975295163399641702122249663666193053008302026096932158568338309418237395541351819026907953220681013*e^(349*I*c) + 15312837206662775379347353212807682965712535652942631518286142403097738200270711195396582159028513532779682154451996208592*e^(348*I*c) + 22731603566128841100419501947051367666836652418077260913944810748473084891890410181285412604854876625919565639521227223276*e^(347*I*c) + 33435897827936581301171175459610829454298167962017419810072936733378506584428024201072453193458155334046693516742390717832*e^(346*I*c) + 48733253505974923400852255563052101402196469313659554492725674754339375283010407167744366955828922837488705858532439654489*e^(345*I*c) + 70386349760594831567048224061395025698501202296966300376764220336697702961591099854055411376294871437468149528524796002762*e^(344*I*c) + 100744961851853744611754300982980166962404553836222921868484694269966120607698907046343731011160948828100276729370132819357*e^(343*I*c) + 142906319123055524246546928478954238371315925802022389236498652136839822502035155676970917419039834587967055588431566416784*e^(342*I*c) + 200906587153578804380300469501441610174521851259541929209840688960859454908519774835905895757666770857888611738751858

460424*e^(341*I*c) + 2799452444750398048229667304629608844921198748577911471240090794769204359417352933093054304386873331299124541967740701072 64*e^(340*I*c) + 3866426730503800494573825628183169626519755509907792770487402386298587950182473561628886310156876647801012052873330827487 91*e^(339*I*c) + 5293292527641139260039348369582435576725492389975607392144065991850478319555725837653586343954087715280097454675483829500 94*e^(338*I*c) + 7183615963820582492091135444879010888683887440337132103324919713759067383415515404572648043040396642559156073498019119665 51*e^(337*I*c) + 9664582753690377187477391307981516434835906841668322346880982911641606364181594521198157288093721251688362393644423973440 64*e^(336*I*c) + 1289043515292933956480634330499677040181043935620106914267311067900030058398839787692376954090545278554544997710058754772400*e^(335*I*c) + 1704582996707822808204678218167693002698661147712772355021456543810930069637188085882824757500605246963210810351706405349408*e^(334*I*c) + 2234891276398439464478622578306434840724610484468177859822620658691921478645266653062563823553001228001009093606751066168944*e^(333*I*c) + 2905385722320057001953345274489482790856692529959823749532695963414164833366773128218607899328588608916176593772088622582464*e^(332*I*c) + 3745257594876651204657334988426226388143954501986830664222349226361079609546822276067504899386703088982308185717143407211328*e^(331*I*c) + 4787527442780945685145204846971596165304169419328244073211459592129649255048876854059844720661078151288179612574986359194560*e^(330*I*c) + 6068949803156712248331871105329895471722806143008878014986559653687260694816550470195890004511965527567432722969707577202160*e^(329*I*c) + 7629731815627821580468992424207008366438896736333024661863838105110445148946962328297631547032543419811821015837863013682720*e^(328*I*c) + 9513032274019522954209113191268226642299912013525665940298381064797885690904993128948035227412144035633851779511219335277360*e^(327*I*c) + 1176421227487648408001090071467347449337127816055781198372445582656605561765808647936864186490811964341241364480377213165728 0*e^(326*I*c) + 1442981628520843120453297837537569196506315422464974755129585150738952408322697678968860136962839990074765857920192930074426 0*e^(325*I*c) + 1755627327122429239688729140312571621349148626114547857137675169010565606783804215103827138130037275775567632540802683454484 0*e^(324*I*c) + 2118832140588288753961019837470686269589404922607709376413251251333619052397894969438768605912452675504804295795426470663746 0*e^(323*I*c) + 2536717643911935362153226033598334815490498260612576171130068349296339081649158302570526873753998214963930022651265742611888 0*e^(322*I*c) + 3012848241455270326455901895308817715601343749343820107841376983544836614812175454919759112996717076496970018034869920783896 0*e^(321*I*c) + 3550010310601964987627237679694948220958137237103600501287780602748167280705994344524013631556850073237996658500567818193792 0*e^(320*I*c) + 4149983212196370804378852378740134554178008893053820691885357902674927336467164003756348860771609288768647154283860278855966 0*e^(319*I*c) + 4813311767818402921650374854911037447892471909463560389282936486391655379227882295736828510632816471591059837087114907949436 0*e^(318*I*c) + 5539091304497208621943268914633156608142795989696990021443429681773115086386705662076860818767970972015297414847490790417734 0*e^(317*I*c) + 6324777410101

2179051794946075175569924076981338138483158042406747453874729387631710544995247152912205118500597511052824347680*e^(316*I*c) + 71660329861173395524441943889284109134091157844655245672084237402434944696464927131812190659629511140639501743303863582092880*e^(315*I*c) + 80566249130682684181876201882623511206363790337218011954110210642927765997644903820595421936873565314654415769070472655401600*e^(314*I*c) + 89883815801382382213973270477954602744792877018051963347146307372464315121274929402347942874802899499538953561056667668891020*e^(313*I*c) + 99512206472057965951340341738023548515336403371717898040850470954657532977279113491506880290726111154101941386019689567958040*e^(312*I*c) + 109332537349966223203932678503426357079863707001728294011042076530403923862654018978676516417314221089449922495612732870169660*e^(311*I*c) + 119209713702033927055755397823688444444647424324502185328626347046599634721146573830681540495333543146776810911910410468628960*e^(310*I*c) + 128995076011591903410763863427097329948586173574595862705849159280943046458742663163454018491463855395649453952212899632198680*e^(309*I*c) + 138529794549151089451352769576543403126330747243680030832467205895819043568155239264876762867172754338684027849855385453216080*e^(308*I*c) + 147648920805545333418623121767853777399782924748301228793924342574999937955421765370101235122939557467548549202174550009604780*e^(307*I*c) + 156185962953551196169738218832173696509852551589210730578365727476259476474465955428502336673743686499175698677875693611243400*e^(306*I*c) + 163977816059607725375264559816505847894187785101455360391897424482998415385787605765315509208337741590143078572243505132706580*e^(305*I*c) + 170869848868953101176860306053103994340530390347260088432676842505555141293830838961275974268928666494845723462544709102843680*e^(304*I*c) + 176720929970554642004575770053095700595334659870682732031975915532387577052414866323511140117680492929354517559479899220940360*e^(303*I*c) + 181408168770922059820368553316697321639984862628298828569560273295630897626829345263592219034560853530733710529842148537901680*e^(302*I*c) + 184831151983748941817667850174708257138128172158269413287765358532240773244336191900818557829905895684494889410451921524212840*e^(301*I*c) + 186915474436567514926351405623117503261987508351930083824566444435689139233683411704641828762178799177848064220150818355261280*e^(300*I*c) + 187615393168510050071497280564603510912403132920312024370835062679037644990286285346673507093452964351257962696133511725652320*e^(299*I*c) + 186915474436567514926351405623117503261987508351930083824566444435689139233683411704641828762178799177848064220150818355261280*e^(298*I*c) + 184831151983748941817667850174708257138128172158269413287765358532240773244336191900818557829905895684494889410451921524212840*e^(297*I*c) + 181408168770922059820368553316697321639984862628298828569560273295630897626829345263592219034560853530733710529842148537901680*e^(296*I*c) + 176720929970554642004575770053095700595334659870682732031975915532387577052414866323511140117680492929354517559479899220940360*e^(295*I*c) + 170869848868953101176860306053103994340530390347260088432676842505555141293830838961275974268928666494845723462544709102843680*e^(294*I*c) + 163977816059607725375264559816505847894187785101455360391897424482998415385787605765315509208337741590143078572243505132706580*e^(293*I*c) + 156185962

953551196169738218832173696509852551589210730578365727476259476474465955428
502336673743686499175698677875693611243400*e^(292*I*c) + 147648920805545333
418623121767853777399782924748301228793924342574999937955421765370101235122
939557467548549202174550009604780*e^(291*I*c) + 138529794549151089451352769
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684027849855385453216080*e^(290*I*c) + 128995076011591903410763863427097329
948586173574595862705849159280943046458742663163454018491463855395649453952
212899632198680*e^(289*I*c) + 119209713702033927055755397823688444444647424
324502185328626347046599634721146573830681540495333543146776810911910410468
628960*e^(288*I*c) + 109332537349966223203932678503426357079863707001728294
011042076530403923862654018978676516417314221089449922495612732870169660*e^
(287*I*c) + 995122064720579659513403417380235485153364033717178980408504709
54657532977279113491506880290726111154101941386019689567958040*e^(286*I*c)
+ 8988381580138238221397327047795460274479287701805196334714630737246431512
1274929402347942874802899499538953561056667668891020*e^(285*I*c) + 80566249
130682684181876201882623511206363790337218011954110210642927765997644903820
595421936873565314654415769070472655401600*e^(284*I*c) + 716603298611733955
244419438892841091340911578446552456720842374024349446964649271318121906596
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8500597511052824347680*e^(282*I*c) + 55390913044972086219432689146331566081
427959896969900214434296817731150863867056620768608187679709720152974148474
907904177340*e^(281*I*c) + 481331176781840292165037485491103744789247190946
356038928293648639165537922788229573682851063281647159105983708711490794943
60*e^(280*I*c) + 4149983212196370804378852378740134554178008893053820691885
3579026749273364671640037563488607716092887686471542838602788559660*e^(279*
I*c) + 35500103106019649876272376796949482209581372371036005012877806027481
672807059943445240136315568500732379966585005678181937920*e^(278*I*c) + 301
284824145527032645590189530881771560134374934382010784137698354483661481217
54549197591129967170764969700180348699207838960*e^(277*I*c) + 2536717643911
935362153226033598334815490498260612576171130068349296339081649158302570526
8737539982149639300226512657426118880*e^(276*I*c) + 21188321405882887539610
198374706862695894049226077093764132512513336190523978949694387686059124526
755048042957954264706637460*e^(275*I*c) + 175562732712242923968872914031257
162134914862611454785713767516901056560678380421510382713813003727577556763
25408026834544840*e^(274*I*c) + 1442981628520843120453297837537569196506315
422464974755129585150738952408322697678968860136962839990074765857920192930
0744260*e^(273*I*c) + 11764212274876484080010900714673474493371278160557811
983724455826566055617658086479368641864908119643412413644803772131657280*e^
(272*I*c) + 951303227401952295420911319126822664229991201352566594029838106
4797885690904993128948035227412144035633851779511219335277360*e^(271*I*c) +
76297318156278215804689924242070083664388967363330246618638381051104451489
46962328297631547032543419811821015837863013682720*e^(270*I*c) + 6068949803
156712248331871105329895471722806143008878014986559653687260694816550470195
890004511965527567432722969707577202160*e^(269*I*c) + 478752744278094568514

520484697159616530416941932824407321145959212964925504887685405984472066107
8151288179612574986359194560*e^(268*I*c) + 37452575948766512046573349884262
263881439545019868306642223492263610796095468222760675048993867030889823081
85717143407211328*e^(267*I*c) + 2905385722320057001953345274489482790856692
529959823749532695963414164833366773128218607899328588608916176593772088622
582464*e^(266*I*c) + 223489127639843946447862257830643484072461048446817785
9822620658691921478645266653062563823553001228001009093606751066168944*e^(2
65*I*c) + 17045829967078228082046782181676930026986611477127723550214565438
10930069637188085882824757500605246963210810351706405349408*e^(264*I*c) + 1
289043515292933956480634330499677040181043935620106914267311067900030058398
839787692376954090545278554544997710058754772400*e^(263*I*c) + 966458275369
037718747739130798151643483590684166832234688098291164160636418159452119815
728809372125168836239364442397344064*e^(262*I*c) + 718361596382058249209113
544487901088868388744033713210332491971375906738341551540457264804304039664
255915607349801911966551*e^(261*I*c) + 529329252764113926003934836958243557
672549238997560739214406599185047831955572583765358634395408771528009745467
548382950094*e^(260*I*c) + 386642673050380049457382562818316962651975550990
779277048740238629858795018247356162888631015687664780101205287333082748791
*e^(259*I*c) + 279945244475039804822966730462960884492119874857791147124009
079476920435941735293309305430438687333129912454196774070107264*e^(258*I*c)
 + 200906587153578804380300469501441610174521851259541929209840688960859454
908519774835905895757666770857888611738751858460424*e^(257*I*c) + 142906319
123055524246546928478954238371315925802022389236498652136839822502035155676
970917419039834587967055588431566416784*e^(256*I*c) + 100744961851853744611
754300982980166962404553836222921868484694269966120607698907046343731011160
948828100276729370132819357*e^(255*I*c) + 703863497605948315670482240613950
256985012022969663003767642203366977029615910998540554113762948714374681495
28524796002762*e^(254*I*c) + 4873325350597492340085225556305210140219646931
365955449272567475433937528301040716774436695582892283748870585853243965448
9*e^(253*I*c) + 33435897827936581301171175459610829454298167962017419810072
936733378506584428024201072453193458155334046693516742390717832*e^(252*I*c)
 + 227316035661288411004195019470513676668366524180772609139448107484730848
91890410181285412604854876625919565639521227223276*e^(251*I*c) + 1531283720
666277537934735321280768296571253565294263151828614240309773820027071119539
6582159028513532779682154451996208592*e^(250*I*c) + 10220423779434634851339
975295163399641702122249663666193053008302026096932158568338309418237395541
351819026907953220681013*e^(249*I*c) + 675848043788852437256293594896385762
669485554719551948612287756798171858726236287199496707940183195792790168258
2941234362*e^(248*I*c) + 44276730791054253185243161129856936565848519361001
92457044455134483305045321452516347118488133224823670465103483954805161*e^(
247*I*c) + 2873610535922340187080835435582912277271967977394720159791070274
927714276869531467182688981041061381703885403497544001592*e^(246*I*c) + 184
750585646245153344528430057132632378116255330456597188767075809107930679482
1834928170773126364639722071570131703785334*e^(245*I*c) + 11766007209757869
651898750508902310922046126969702774330145358957889567712307935203819931066

06880564628599822341722801012*e^(244*I*c) + 7422286409081731249169370494625
256173341489196791182704898310054977819512210699558396234524997486531246588
73553401442137*e^(243*I*c) + 4637582884573671545449376782550056887333281455
68049310423995599886012800638619904022368378591108842602342094543682299102*
e^(242*I*c) + 2869929436312314965572780108515769408968264974660663275288015
60677007112837431926735088120974861760511367008815728782643*e^(241*I*c) + 1
758962582627559857571068126139793012658010315954843536149046728651694422320
75776580447184134141375995770091499246759528*e^(240*I*c) + 1067648320171655
948380852341893335287335876733299725300926610851867899392529159370907602822
32346919090426243399409323314*e^(239*I*c) + 6417510069326006680623806488600
459717074084330008683936861613916452910804984467535311184272579865808884034
7241496099644*e^(238*I*c) + 38199015867586087976002998756627674994795440667
903625029322346250133286489120875005013638128113893960349670280707161530*e^
(237*I*c) + 225146757413080699615061655865028724304219302106732643929972864
85600640103867253604847715547060592967690653795951142520*e^(236*I*c) + 1313
977149410493388185668115141829311224255152153568687118126657981387760634816
0261747201317735782566021306798298336024*e^(235*I*c) + 75927527001466789611
530950735850154731970297465336333315497939614732857609358019041551167648315
60875947581048693527224*e^(234*I*c) + 4343909696601932173357359687781579293
701295681940827114215433175336093967845908766740738240037114570667410936998
017178*e^(233*I*c) + 246044237584542266392708163098326071473496809190549302
7145639238827192254886349361126991457692409851120873307487457468*e^(232*I*c
) + 13796765297962120740171061880665894483554465012108901951071648603502289
28586815539003062875026711931941947738690360722*e^(231*I*c) + 7658677955139
627810125584446287514187109408952813047908367436615820716500321548914828664
06314834433199455459798934952*e^(230*I*c) + 4208463426089493872775590214579
245865781209661485610226470084995294684520059801751194106289562104976095660
02969884927*e^(229*I*c) + 2289113117385927800914926491623468344058677407764
56326108410928857257174707289268074347550225793244741923354395308214*e^(228
*I*c) + 1232439415193323847419600725881035065964063392536163910820629699606
82419011745775738921817753391954462609323881489157*e^(227*I*c) + 6567485926
886730009882737581287522561065455168626110368166400700753711577809729353356
5243828873383722980353200611956*e^(226*I*c) + 34637657172671690167657344537
197087048882354853993270472063943078773600446542963548348101269390443464480
754513928502*e^(225*I*c) + 180798200680288599703499386230072306765633142067
08848499900139641237334763266479346963237936039328113185041591793848*e^(224
*I*c) + 9339341958053494225251750965715057300707302083814774770306218224241
022648247419956042957363055823830898547303219757*e^(223*I*c) + 477414111106
609897022184533059496201647271423037423406066395684695092664268594692906411
4194400360936223590725470146*e^(222*I*c) + 24149665168103385032890765492027
405117100590117954471387734642056964550264427124264095996627710802648260089
85061097*e^(221*I*c) + 1208770358493658393089442222056935063283704108140593
750226539846117737648216609559734831601248698274330296158612144*e^(220*I*c)
 + 598650141112241858911676505180520150364003226841328081453597093587790338
609212439085554466861582623350303061961052*e^(219*I*c) + 293344920034300720

287042383448342866313806285455040067823080445597545970023446231563554135133
105493516316320059272*e^(218*I*c) + 14221311159648145176823866672767699094822
271681318790889840501039441748635545362467679832449103520321953011780083069
*e^(217*I*c) + 682080330967936156837844096192442108186149916400415534244055
2787689327249660832423109814850246645396715772807899 4*e^(216*I*c) + 3236273
132241954941033008894364024746037832856131642293129242714590288791307164367
9502909055891236755143207382609*e^(215*I*c) + 1518963421490880039641791172 2
643754748048520109734812459109878810493844381062650818971199637121458749456
243274416*e^(214*I*c) + 705213241416219799260232652458014306098535305457293
390552463312168102103734029836634220332432530707241373906 1024*e^(213*I*c) +
3238491931361851476423321933539579098377735539207641467346235665823887048 3
269493056092315851437486902036159571 36*e^(212*I*c) + 1470931146618934345515
038362300100160482127749581443929904746910224777470198899052379114493999887
003199419829579*e^(211*I*c) + 660764473105869097691475973850837934511089033
1495867079827642633947667566495652798791461733183865057403910939 90*e^(210*I
*c) + 293550743554342709808129453576562313299705982699187416862934373964255
615967138676253276302591561523515603264403*e^(209*I*c) + 128967080084754712
246023680866488384983286259025533132044636109049545144029547003347761521666
283977931640178464*e^(208*I*c) + 560286834249035176584950138585345161671625
910343679724981746609074506667781543532716303446507778856835476241 84*e^(207
*I*c) + 240687851397052771611934656445061432852413610377682168189221844001 4
104846021094469664775272337193287459459732 8*e^(206*I*c) + 10223182025954860
767217390305186451923562145473674293619918063490411487496121804590274592702
770571515456414680*e^(205*I*c) + 429320647800802212601748890885182649479062
072066015145146818191091724002786396872453912765963351705300297648 0*e^(204*
I*c) + 178244611493175185055635485663842190117441232229824949659165805393 97
871982465659459755955757341933488879521 60*e^(203*I*c) + 7315849722068183628
747296214039744442800104463011615273397605448153009517879855384197646562145
82667219914080*e^(202*I*c) + 296825515282669589685318273280239050084555032 2
034159415119626595968816157137999376800264974083056722976188 40*e^(201*I*c)
+ 11904185540387796494822957794837046560060662318304552952690043020927047 32
1277384779493558607471432947993928 0*e^(200*I*c) + 471882208434662076950995 0
695357378035710889749142256789804819901820770899700533386014883647952745615
6014520*e^(199*I*c) + 184874052990057326937527286118764908908583570219748 82
3715706238001862451377226609436417529768529244398708 80*e^(198*I*c) + 715812
468684294147547380736367983971817274558153840904450338385269359692162242669
674045394471814302524839 0*e^(197*I*c) + 273889562479526560335522764656600 08
862807783050848257029119389036561620042627361826577004063019140700623 80*e^(
196*I*c) + 103556198259200293522638457790861154861211149508019357369133986 4
7060291864824662418056649493810498562585 10*e^(195*I*c) + 386876218234277165
632451723049979889263115282374607541692443176673997513742813591736171169652
250611186480*e^(194*I*c) + 142801792450221762483180874918825274134305133275
4177800847950346447635093335031505173458646596671894170 80*e^(193*I*c) + 520
751785187932703864292633515443069511049935425005829381552416894081386752546
080308479071677485717347 20*e^(192*I*c) + 18759988218865563564163635735986 07

327825573725740570627910889136637842846741455993048117286353859819389O*e^(1
91*I*c) + 66758662903711473585037668656692890108935438698305387087249452915
8095117918829660615811125770696860474O*e^(190*I*c) + 2346518219239105142238
141633073464768899155708935025778047637412681781575765422219127409260159438
712250*e^(189*I*c) + 814608187736530579670210025271921415597183369881214299
823291969785549876175969866367976653244974728560*e^(188*I*c) + 279285755800
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172681702585720*e^(187*I*c) + 945561802589319869193343034663656528268580913
1432918916073627717587384173219645337995370567946682688O*e^(186*I*c) + 3161
093933128469275069430644361841465609596952094521574300404456038689524180157
915654345194071335173O*e^(185*I*c) + 10434117516570395966653693155582402109
460348095473027807412321427346816928567197770376496170251803940*e^(184*I*c)
 + 340023256060165161752169468084708984419802883169441742479486877932895054
841812560544688208115263609O*e^(183*I*c) + 10938532144862203586740324345008
66678499770011305874172488975951612031456734608287095519501041975440*e^(182
*I*c) + 3473514732147137808743520831295666012387657627759423667627333499521
038897539826364038575568677773OO*e^(181*I*c) + 1088679957318294728267329051
92034886797284621356445627530909104429486741257822633476898356826454040*e^(
180*I*c) + 3367539887202156837590238459398275336255980105810418462734541113
6262431943240778260721756991027090*e^(179*I*c) + 10279364730663840844739577
86246926260464886191429797258916524353065123069072624446247919989425518O*e^
(178*I*c) + 309613197162152016238030155424146545178236208681028753774890290
4985934020179565706177131421614590*e^(177*I*c) + 92008939302958903287460185
002715932261252636844477148978197436107884752889146883103843606495192O*e^(1
76*I*c) + 26974580144021129697268360186387895435796230852007659517712822762
9273240215209708218497363414140*e^(175*I*c) + 78009807368024239875613733058
851417125327114681070889640794249282633470580756557083923203377160*e^(174*I
*c) + 222519591767957777571673660360074802222113642321463998038643709633914
91223687245823457351580140*e^(173*I*c) + 6259872156822252843650960708235034
710201362776057176647226323089751446565288850103898153859920*e^(172*I*c) +
173657421881819107187419747245015812388356420995065863910233714812276908061
1680719741726053840*e^(171*I*c) + 47501057885760151927231661793842522242178
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948278334O*e^(169*I*c) + 34054053851295569154352346722177172655187548910782
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33318818816384717934996186706010260597308959626532917702294930281625751OO*e
^(167*I*c) + 23043510733738403573791785976730663520166827816891398420973766
6311848880384113193531364184O*e^(166*I*c) + 5864034669726832427416433289215
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470308167322768331630415820995920475120437252253533392388191651930004076295
44745753221740*e^(164*I*c) + 3631836965230259173219744440979812202264082460
4130552506742586795183267354382847875885730*e^(163*I*c) + 88367206408604703
05694514021547969551296794092266983044118375790025854584036796364768280*e^(
162*I*c) + 2117589733466855707101501429210414722401838837940752841618541440

888545729943138209036820*e^(161*I*c) + 499707567253859084357596314813794768
069337190915967491907488904933922677579665354338960*e^(160*I*c) + 116104551
683555043762911501712116399313733021132677481112824047246361794049635726479
850*e^(159*I*c) + 265568063890434075344967023691015457959948617577414147899
446527121275669101852741231 40*e^(158*I*c) + 597899217294414321845916114929 9
819706321732111578494525245228742976468409105395536290*e^(157*I*c) + 132475
641236783747315747282116248369112096650194895392649224164378826428454643722
1120*e^(156*I*c) + 288820755264730654469968572021047109427318619508995802 02
068990459031947629540832428 0*e^(155*I*c) + 619485966530355028795643388152 34
310660410902037882473161804774492916216575880077680*e^(154*I*c) + 130698172
034882898861932055083758183921249913823401603168865071812965489810148184 10*
e^(153*I*c) + 271184323967071752760564049014883350713024244840397831852 3237
721944200392830108580*e^(152*I*c) + 553269128819528612502918869558947829098
021956309349843584044631512291778800081490*e^(151*I*c) + 110969199687320974
749922259595250444341219218535349655762591192576535872151766080*e^(150*I*c)
 + 218764828927139099280403456125787058051215087562266963170876518242522414
18663320*e^(149*I*c) + 423812584676323258639418856985868582675532800554862 7
437019301405851325887594480*e^(148*I*c) + 806679543607589140759305010796189
568269842021613388955218916278823182639488190*e^(147*I*c) + 150822381431412
413773566474210011746852297437597059186295243989481140398152780*e^(146*I*c)
 + 276931165383432592259833826376479361226640338596151334898466646943614710
28310*e^(145*I*c) + 499251971245704398350537797660795398839736829759111495 7
991804893688371867680*e^(144*I*c) + 883500968821791202600774541927769200737
689393513734789368397093333311961880*e^(143*I*c) + 153436088745056254127327
239461577071933130157764595997113973513183188399376*e^(142*I*c) + 261439762
799020214434719456650802545630568101835204018898002854931448674 48*e^(141*I*
c) + 436944248291011391456535313606959586266933885805341938121413124192504 7
008*e^(140*I*c) + 716099497599058079895633338552940229192858196481597830078
819711862600096*e^(139*I*c) + 115051481852080848873700388354521315567640365
124003103691176697194292320*e^(138*I*c) + 181157684956157580767103030555056
255892542936591933141534183339445964 08*e^(137*I*c) + 279470910447568661184 2
790694973699164482254723977210209725661304403472*e^(136*I*c) + 422276126632
003687547754746555709988710527133086660161366353656787288*e^(135*I*c) + 624
735507810532953177107746902471141241251875657318484417819040326 72*e^(134*I*
c) + 904669352382568297904433896310426316767258682636791133882648354917 3*e^
(133*I*c) + 128181746491497081085960418982835900079078992116940530461221125
1818*e^(132*I*c) + 177642829135119348577194437675802830239905460092687136 49
4961404333*e^(131*I*c) + 240708019135297571018580229143720458647469917861 82
039740274325264*e^(130*I*c) + 318774992974434649721153604475177658232095862
792381647059065902 4*e^(129*I*c) + 412430698299915190848067222327219435067 74
793409189467048898292 8*e^(128*I*c) + 521081176291770486604924009851758309 87
505700566877818954141639*e^(127*I*c) + 642619548553524857642506813687046553
008711400387571669138390 2*e^(126*I*c) + 773204636991145775061462731028098 50
609443267578813629501125 9*e^(125*I*c) + 907226057222088149186422846394871 87
764607589706493970774776*e^(124*I*c) + 103751844998711755019093989565966841

168029970825266603235524*e^(123*I*c) + 115585541289359426034554496664268782363003558993632323714722*e^(122*I*c) + 125370496586921272662198050851269323171167338854081782959*e^(121*I*c) + 132317088701048969738000567337799190893408367560095807118*e^(120*I*c) + 135799066316147984285064284803254498287835983958034989 9*e^(119*I*c) + 135442594916636116191574650625331646238501101627937224*e^(118*I*c) + 131187818011721747296793398943181536949646753684811 94*e^(117*I*c) + 123309670013972336518199722075093259065528762534215 6*e^(116*I*c) + 112391604542246650966429162063124338952554575234051*e^(115*I*c) + 992549073853440227293998703871458049544543137461 8*e^(114*I*c) + 848552202276512356496200136959676295361696315113*e^(113*I*c) + 701645153225444629068735488137480910845618706 80*e^(112*I*c) + 5605927253067558551780452883689835514455118670*e^(111*I*c) + 432333688644261557547944179250800440604964868*e^(110*I*c) + 321478876933753388174544825153773503839502 78*e^(109*I*c) + 230215041122623492585522234520150090053357 6*e^(108*I*c) + 15856647611325756256611743222720388429885 6*e^(107*I*c) + 1049040266951089742462464376647075404506 4*e^(106*I*c) + 66563467067621006375419184710997114141 4*e^(105*I*c) + 40443624781415311581857832389099634564*e^(104*I*c) + 234899837424434707953276620307560759 8*e^(103*I*c) + 130171193079172823835151430773360024*e^(102*I*c) + 68683292252636813495019973413205 17*e^(101*I*c) + 34427715201287513414073930296091 4*e^(100*I*c) + 1635316464715153024052913761811 1*e^(99*I*c) + 734057263616388449968842366924*e^(98*I*c) + 31042222522074681615625020522*e^(97*I*c) + 1232445557346832245176696904*e^(96*I*c) + 45759117183402579073139583*e^(95*I*c) + 1581796642397812408161814*e^(94*I*c) + 50648660944512569972179*e^(93*I*c) + 1493326612293984160368*e^(92*I*c) + 40261256699368950388*e^(91*I*c) + 984382804329835768*e^(90*I*c) + 21608403021340047*e^(89*I*c) + 420601518659718*e^(88*I*c) + 7146142307307*e^(87*I*c) + 103818048048*e^(86*I*c) + 1253841160*e^(85*I*c) + 12085216*e^(84*I*c) + 87153*e^(83*I*c) + 418*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) + 28*(299*a^2*e^(1027/2*I*c) + 116610*a^2*e^(1025/2*I*c) + 22680645*a^2*e^(1023/2*I*c) + 2933363420*a^2*e^(1021/2*I*c) + 283802910885*a^2*e^(1019/2*I*c) + 21909584720322*a^2*e^(1017/2*I*c) + 1405865019554882*a^2*e^(1015/2*I*c) + 77121738215879370*a^2*e^(1013/2*I*c) + 3692203217135946825*a^2*e^(1011/2*I*c) + 156713514333171921595*a^2*e^(1009/2*I*c) + 5970784896604221606627*a^2*e^(1007/2*I*c) + 206263478282239243233771*a^2*e^(1005/2*I*c) + 6514488191198508953598437*a^2*e^(1003/2*I*c) + 189421272128521178822066445*a^2*e^(1001/2*I*c) + 5100844261395996953829648360*a^2*e^(999/2*I*c) + 127861163009333998455801820954*a^2*e^(997/2*I*c) + 2996746014847853620317693731016*a^2*e^(995/2*I*c) + 65928412548866286902779022351001*a^2*e^(993/2*I*c) + 1366183222241782313586863286641184*a^2*e^(991/2*I*c) + 26748429587445855729768539197182585*a^2*e^(989/2*I*c) + 4961833735552848046279119545216196 00*a^2*e^(987/2*I*c) + 87422785991472952854807588013847653 81*a^2*e^(985/2*I*c) + 146631857213698093058440158830415565266*a^2*e^(983/2*I*c) + 2346109768759347903572910732245570209842*a^2*e^(981/2*I*c) + 35875929609390406738394666219971221205725*a^2*e^(979/2*I*c) + 525223629498383939328992961505581135597600*a^2*e^(977/2*I*c) + 73733320797991336390636586145276458945651 37*a^2*e^(975/2*I*c) + 99403445980961943589598468520732983 54

8550704*a^2*e^(973/2*I*c) + 12886947734520540467716407889504728075429011137*
a^2*e^(971/2*I*c) + 16086467322724552698501340975783163797842534840*a^2*e^(
969/2*I*c) + 19357384612781480533616621402633429049700691513O*a^2*e^(967/2*
I*c) + 224795466429934927362363715589497559910875366 7672*a^2*e^(965/2*I*c)
+ 252192457835497213660677991141589788643999240584 41*a^2*e^(963/2*I*c) + 27
359066336615526623410427216945268826300748451378 1*a^2*e^(961/2*I*c) + 28727
026920349375638979714965750748312467391856145 75*a^2*e^(959/2*I*c) + 2921949
90752635358438588623776480730712853109746579 15*a^2*e^(957/2*I*c) + 28813683
065498440653083778733770043932818365805964639 9*a^2*e^(955/2*I*c) + 27567697
705420487443559113823803965556563589320788586 81*a^2*e^(953/2*I*c) + 2560895
310281173602069967198140053159165208235345670 1666*a^2*e^(951/2*I*c) + 23113
735412561654723344314299112489882547077066031 7194554*a^2*e^(949/2*I*c) + 20
282316825271698208696984310685462246306616741354 01655870*a^2*e^(947/2*I*c)
+ 1731418683210570012278793710630839948449009352569541685 8785*a^2*e^(945/2*
I*c) + 143872782220632026353482783145282086606314049235674031853952*a^2*e^(
943/2*I*c) + 116436703282462307336668513825130991204009306014192871608 7681*
a^2*e^(941/2*I*c) + 91826333021602124529189686038068280368232489959813531 66
570702*a^2*e^(939/2*I*c) + 70604348724401170958829605205937063913034447082 3
49890348162895*a^2*e^(937/2*I*c) + 52953348970643482445125018859273949819 74
6249176428304401857544O*a^2*e^(935/2*I*c) + 38757418032632716085780481259 55
0661527854938971516727160994403 60*a^2*e^(933/2*I*c) + 276954647427069279961
5789127534264343104090604769674294023435 2112*a^2*e^(931/2*I*c) + 1933035148
7278611592337971662825341931894417643587605680258986 5772*a^2*e^(929/2*I*c)
+ 1318333654990888889941774652037428864925722313357312790508646754 8080*a^2*e
^(927/2*I*c) + 878891888078668755926755541379619931498159578978707490100693
3535500*a^2*e^(925/2*I*c) + 572971958305794798809052837598873100156922559 67
3687095155028185256 80*a^2*e^(923/2*I*c) + 365406237849518248372060960463581
6509956518425496900713526788510125 40*a^2*e^(921/2*I*c) + 228041600249749997
2330270356628053500702221025770502602102780787687624*a^2*e^(919/2*I*c) + 13
9313401949339352280134662941799874450687582195654368623491565088043 60*a^2*e
^(917/2*I*c) + 833397477364691435324280733107621635251137893440431836029166
13227872140*a^2*e^(915/2*I*c) + 488344836125981471048169163657616516954158 7
92795618978221198980949925840*a^2*e^(913/2*I*c) + 2803793220826297874163429
6821311025033065490052653992192772409174135029 40*a^2*e^(911/2*I*c) + 157774
0463997525927245493384353947454466523681911756699731867230466656680 0*a^2*e^
(909/2*I*c) + 870394672285310137054091912714523833893353568849218086414924 2
3363762400060*a^2*e^(907/2*I*c) + 470873979833165454444627659803101969430 86
7153471663329279188629910819335440*a^2*e^(905/2*I*c) + 2498697917579895977 9
787235885762839331372965187434811047769325663915794554 00*a^2*e^(903/2*I*c)
+ 1300925545377897751491750113223690776735688769106836858941133890824555236
8240*a^2*e^(901/2*I*c) + 664700802720379036821982198354889449499967490701 87
078822650198449544212324410*a^2*e^(899/2*I*c) + 333378106740586138251610124
9587967145769350996198350731723076965516482598291 20*a^2*e^(897/2*I*c) + 164
1662348095460363514356729639026504243315309578757871628322407537121464954 63
0*a^2*e^(895/2*I*c) + 7938933320497449635918969680758326307339116239071846 3

302483117950387230757236660*a^2*e^(893/2*I*c) + 3771071067074220374698026793
60762145217845506499125755188205522200318144452151110*a^2*e^(891/2*I*c) + 17
598731744416001266512340274583125217315543205239553488481060367552361202279
1280*a^2*e^(889/2*I*c) + 807047768188333538846684803460779790931055555100012
05899907581275361688612462335000*a^2*e^(887/2*I*c) + 363749864602642559874452
79228803679517140090350241314216371570468174738174921307980*a^2*e^(885/2*I*
c) + 161166281624114646798965028363247713896205848565748779224682826856642 8
3130175327730*a^2*e^(883/2*I*c) + 702090179454115912009616517300588635557722
4588770983814869386411004834559117959672290*a^2*e^(881/2*I*c) + 300771234468
452520266562607329665922159115381500087728345930006292005623202669775630*a^
2*e^(879/2*I*c) + 126730019194373732411932059934968365449334885021700732115
0739273112190995849189116570*a^2*e^(877/2*I*c) + 525285606278183393820149 08
694224449304647464233745888717654466903240099411986009120100*a^2*e^(875/2*I*
c) + 214217652898370574038695961699414756786455064924718641687045180827975 1
3207707602578070*a^2*e^(873/2*I*c) + 859662077957427711631100840830793261 98
69205078119881831903736271678521536933272322727360*a^2*e^(871/2*I*c) + 339531
5651658181574881115462365147392451724847364827297411967325487150772746212 71
815060*a^2*e^(869/2*I*c) + 132001151473743564403925218561453784232553131778
41019066397273002330203721374280502289600*a^2*e^(867/2*I*c) + 50522405603727
72252508411884469329618226376927979062996145236110491773700805441539104570*
a^2*e^(865/2*I*c) + 190397367004770341919144178744086951556554059861297262 8
37963911826028769378261581747432800*a^2*e^(863/2*I*c) + 706592022204022196 99
327142472480242287876653764953302133360376448287226187487345644845530*a^2*e
^(861/2*I*c) + 258265319998385920800570589348242938126445962121695949028377
96360373871451566292085791240 0*a^2*e^(859/2*I*c) + 929844269839618243277627
786923243414623663776261220314871679199722455584698434216819569010*a^2*e^(8
57/2*I*c) + 329804705399395014662084250372152905831848535666007501658224801
7786240344190976379491032900*a^2*e^(855/2*I*c) + 115255143382481221158069 01
2236314088656650608739923317312167175458396413954935434785553919 40*a^2*e^(8
53/2*I*c) + 396893152747629625983440995776573121457424082278264312824228248
4408995717469433224524020 2130*a^2*e^(851/2*I*c) + 134694045831733084831574 1
70523497510104128836035403576353015982048577081438406747258639643920*a^2*e^
(849/2*I*c) + 450541815994350416329563482655909244979320334438405914968411 4
0615625295831700197728967932057 0*a^2*e^(847/2*I*c) + 148553511895313894886 5
97833171791059949745629617779237478559051623347465590643954934297011448 0*a^
2*e^(845/2*I*c) + 482880723711149517085020202679552656003275504569154165385
069508941264025206116670337364100 8090*a^2*e^(843/2*I*c) + 154757897173974 60
2762348431110439506950134710306254279251753537971128762419589745873385584 71
200*a^2*e^(841/2*I*c) + 489066090725200576110713705079963402247766813797750
3492586820092379466421485454066818473522306 0*a^2*e^(839/2*I*c) + 1524153741
06074622939224284153659601550627109436325926621014480229333534862467810217 1
19890170400*a^2*e^(837/2*I*c) + 468468261824774958091791071955357916616933 3
20342602739423768916749249443401418804336754943102630*a^2*e^(835/2*I*c) + 1
420248786518187466718023048901731118377946854300811977671072304411278973969
44000158322128201313 0*a^2*e^(833/2*I*c) + 4247400925077373176113486312190 14

547218168642299393394244763284663309564444003200333927116869057 0*a^2*e^(831/2*I*c) + 125313382279208564920745903266740993744531228689135168618545652497796427445784910594120409603825 10*a^2*e^(829/2*I*c) + 36477653706042245944688820604696494219081334767121057912331914137804415307973337793902177294599210*a^2*e^(827/2*I*c) + 104773294919708181426456318246707841758575517441039866971803838079319268269378919589734008354661810*a^2*e^(825/2*I*c) + 296966005156563531105971074940050295210952963342292128773450715502535457684406378925697100618058220*a^2*e^(823/2*I*c) + 830677890823405593881048028041375542333955283073962626784718312376094416760253547591206118659958460*a^2*e^(821/2*I*c) + 2293321308015586917932799317024982339168604649369171514848750864257523843794511936002538498981041920*a^2*e^(819/2*I*c) + 62494140129289622860610104035290027536073423609060861920331851034284009130708890522929404847123 27830*a^2*e^(817/2*I*c) + 168108967282259618741944983402223145182232766316361938481877007744785097760741867567408320220636189 40*a^2*e^(815/2*I*c) + 446430644715917174797040202765636425707178838266681451692476117610657225228549882047932689509620078 30*a^2*e^(813/2*I*c) + 117047543581815187062673321422303561789600917165284254959414932144762194096889890432439125557135120080*a^2*e^(811/2*I*c) + 30300429227176309474572003993633457101689542531469354649589380538610553644840035686338871215438641425 0*a^2*e^(809/2*I*c) + 774543421614203495600971615466077979652368881218933510424294240021409386956035526159745861544320722480*a^2*e^(807/2*I*c) + 195517209429326916446620980331710255259502164758115121787784229705912700249511381077265478464458506036 0*a^2*e^(805/2*I*c) + 487413507913275541434737569088780271179410565093886397040023000270942209399252547216536479729679013896 0*a^2*e^(803/2*I*c) + 1200090570376819817495428203463175720949741191407348280470551589768996999757655749150885478115688699598 0*a^2*e^(801/2*I*c) + 29185313448653917441464890487323189533233580558386026734570615029457027933491512738753237134630607181520*a^2*e^(799/2*I*c) + 70109686530806379548962065855267314803677176495241796951534731669884594114550121278447472661295579702060*a^2*e^(797/2*I*c) + 16637342101596006574494683160512963808544116807135262064048346380029164027801434252046974131760033726184 0*a^2*e^(795/2*I*c) + 39004127275497477700562769915484224698872602460416243802409528559485248785585037207054647273412602268470 0*a^2*e^(793/2*I*c) + 90341197663448354263528999846283396366969515218525999665486805199147357237287024866284792461274426406244 0*a^2*e^(791/2*I*c) + 20674608418735299991184202651342837639644452126560315573995791853905721435236059086124686662207452285267 60*a^2*e^(789/2*I*c) + 46751116425487460919156707540760323711761364540363599820752214772978099252044766666662239031601034545996300*a^2*e^(787/2*I*c) + 10446638933612964407336872560377957165244351995018446220321535598596368046659626683803611150049940561221040*a^2*e^(785/2*I*c) + 2306839351528818606448446560311796191128467375408418434749124204341353644953089486128335936346482500752694 0*a^2*e^(783/2*I*c) + 50343125546713237985623313646329330647858349495627492925205161566693001610650569967429902726126062669565040*a^2*e^(781/2*I*c) + 10858518815771394212107785178989572242259468901872045507056347612130118472781157432346621429183420185467206 0*a^2*e^(779/2*I*c) + 2314908265850057878077532735085387653932377948915894807342885768658 23

3498581443805809053319578505092825514472*a^2*e^(777/2*I*c) + 487814432521111
4975854067195068020556369220879498886270252084544473001000387910122978591311
5262973559049339960*a^2*e^(775/2*I*c) + 10161498252249284152824301164924261 7
1242192567909037312010368898174633451476277701838680759316125015139743120*a
^2*e^(773/2*I*c) + 20925092752473397254575539038059299937349385477218044541
97071999505511719948252419379343549397905586122452665*a^2*e^(771/2*I*c) + 4
259980611481175181529614616968079288266998347286916867765191606402809238614
4819853336758318060879567688722250*a^2*e^(769/2*I*c) + 8574370436061278588 32
332973198205223244571782879175596317046623803379829879817966509635534643144
4695120516791*a^2*e^(767/2*I*c) + 1706376394381920125715454600794419048480 0
4835412196255703347731392002582189336345287645900829744652327190195 76*a^2*e
^(765/2*I*c) + 3357753286250861240493214356205675816951254317872344278444 44
1324241699460761824079884037220465490112495272 7575*a^2*e^(763/2*I*c) + 6533
5209855139745225460458167882643715464174702379903424415436335141712932934 84
7111707604519947532103535939690*a^2*e^(761/2*I*c) + 1257168237970056423173 4
7526498401790837531685611023648804925465449065255408041032308439566500708 70
0602697766710*a^2*e^(759/2*I*c) + 2392269010863511125019134201766413881418 3
4680717243149148240541912365024035242396630141827067823768453577792206*a^2*
e^(757/2*I*c) + 450214953158482436877449323534443636424987689673176576808 63
72774913077974476798340390224956712465393611232416 23*a^2*e^(755/2*I*c) + 83
8003405633226261698002475165028859961836560477445660978330588882054803408 79
2968277041826209840110522910353801*a^2*e^(753/2*I*c) + 1542802094651848674 3
8692967750633613530145175778216248102935419137838565530983959034229578207 02
67248163797079525*a^2*e^(751/2*I*c) + 2809543518668204266823796801627118763
645888741191307504647885398224587315004606447902339962521984923603337579865
*a^2*e^(749/2*I*c) + 506109993897069624544009746293650406009823419486789109
98000678794666066919270344735654916434397345865752435625 87*a^2*e^(747/2*I*c
) + 90190365310541393641450361987298751815027889967211657109128538197992440
3521169676004642165566246672874123237 1823*a^2*e^(745/2*I*c) + 1590024943779
1405935404298689959721296914556453023635621602157015426400883311961742504 00
326923875011295934968800 8*a^2*e^(743/2*I*c) + 27733123170528060665047793029
1879810693365658345015913554859194601763595704569769266926773566556921049 01
055424742*a^2*e^(741/2*I*c) + 4785939505147857748577714882562266491844189 9
896712871488953127500310630895970392803422778913136482826595067651 60*a^2*e^
(739/2*I*c) + 8172064679848532501937431778432275995784492227356990384764293
3003662634138916360473885905820817778748179763625775*a^2*e^(737/2*I*c) + 13
8075050472911460011366856295168555289257189097324670311033951735099801993 84
630077420606120940970445440257517316 8*a^2*e^(735/2*I*c) + 2308554866726267 0
9723535927872568854471077332500022366798083306901537948948135371592062382 97
20288326528925215302 23*a^2*e^(733/2*I*c) + 38197032488897113782426041711935
5880508011405306507252717319111638967573708192814947593237962837516587367 08
3029056*a^2*e^(731/2*I*c) + 625469971082512052221445939226339313157527561 68
645329438560772112500600573787852815482917681417407360930478313315 5*a^2*e^(
729/2*I*c) + 1013663583381382315526119900385793780592897362259521880870256 6
8957886456673193704533455376611942678059586061785419 0*a^2*e^(727/2*I*c) + 1

625979420531105682414675218243753902020818169524222534201660329925485571915
41901497419909412683746416918208222228 6*a^2*e^(725/2*I*c) + 258162710700990
073452206474459755120980230440691093473667883589900827910048538655151298617
12474344436175299518249 87*a^2*e^(723/2*I*c) + 405744720573650872049401506 25
708426775052741486448816168113267026281070947745142656809407130142563516596
07202219536*a^2*e^(721/2*I*c) + 631272632749341932117100321300692602258769 7
863019991394721190170435857084298246006024922226846516328771260784350055*a^
2*e^(719/2*I*c) + 972321278368853764330445117379093235276339211787819409971
321240782792457177965626540636936513785897399554266817856 0*a^2*e^(717/2*I*c
) + 148270788409582044237265467055125273579573616473965086329359889332412 13
590716537429203049741620280852461278755893511*a^2*e^(715/2*I*c) + 223861204
043000044228760073517616478835216103343997859390380117904490678686278432262
398243395194088309102252091146 48*a^2*e^(713/2*I*c) + 334660288086423004254 5
312921309164181546635502663665294708326117788745948786647037069070866851406
108521321502076531 8*a^2*e^(711/2*I*c) + 495400606505030630373822802586990 49
436351964733180929934117445080596631561896216015780970984005090516521389882
187000*a^2*e^(709/2*I*c) + 726207992189165652178758713813393428748038401335
313762033098057750677977846026209886348083439988664152517670996571 15*a^2*e^
(707/2*I*c) + 105424853787028754469673960861051848077064379179201408687509 1
670132955883383849454250672684919680390069680565819217 07*a^2*e^(705/2*I*c)
+ 151575170355739209946373876370057650549318320584509041952034589942144397 2
070496630954450232558557993204068281529048 13*a^2*e^(703/2*I*c) + 2158450037
768053028611846925659270013831448502780905776912601373554991349743613134480
264443808829598043662462879149 73*a^2*e^(701/2*I*c) + 304446393227146814613 9
835397274447981735648583749804130804882711352566619133843133421838724023325
787529123214800974 37*a^2*e^(699/2*I*c) + 425364061290972864599381605241976 9
130262428923523341151858544049566443138054303154686859024852809072826580898
81714375*a^2*e^(697/2*I*c) + 588732911424652432036475218676267391833829587 0
717335815526535995691150626559586344361801056422685275761182765358579 90*a^2
*e^(695/2*I*c) + 807253658137342307900160595544078420189813338397513951459 5
806495515938167180944360444500169241993496271553060925035 66*a^2*e^(693/2*I*
c) + 109663657845944491637672328606982963424082904028307198468211496550719 2
13882978626664085798017146534567041213729880315 8*a^2*e^(691/2*I*c) + 147605
799556939063722335269724248321056986186278058992331714091490618616504496604
1302091938311768459791677885305942531*a^2*e^(689/2*I*c) + 196860807418766 24
109603861249218077608394199124491180880794404793788306967638375921128173216
485166781922502262518892 60*a^2*e^(687/2*I*c) + 260170212239664514134593103 3
404570995027466204284274488653750753761498675668863970880304480234793529924
712351195427555*a^2*e^(685/2*I*c) + 340742128545569404647432079815909007579
872992486208020965032843806750401688159806770784439624253189019554430142698
7190*a^2*e^(683/2*I*c) + 442274283952382676264547995705724354154012205495 17
037878621139379040485680482868509690564602181253570893492960085471 81*a^2*e^
(681/2*I*c) + 568961590997030152010831964036397313447019081774961820154104 0
554671725803726189842972146004682392121289650040476771616*a^2*e^(679/2*I*c)
+ 725483608490846840464667844698960066507970803851351004856353722566938646

336380337414862215762535486129134712290524232O*a^2*e^(677/2*I*c) + 91696728
229777439771113208045411119046602732215064516519497072120559594660125051912
205727732896557017924532304231051 20*a^2*e^(675/2*I*c) + 1148920746745549934
448241874547815556301476112681612608053738346053162938630952263424011753683
776336504395416672724828O*a^2*e^(673/2*I*c) + 1427134764574922616571445237 7
611116721623327963230348323460525493356318465738007926444717352691455157582
924190074684640*a^2*e^(671/2*I*c) + 1757549620213874323744070248931841334 86
916710882090509569636135113669061260825212723946071155159361725255528913953
95672*a^2*e^(669/2*I*c) + 214608696226037983738622953759919798442615270205 9
495820103475808077368566012912760286126420446999048664851518584766192O*a^2*
e^(667/2*I*c) + 259844818219287902290195332203528103640536514281394054210 11
946723503931316803858639430225998735288638633019702866058680*a^2*e^(665/2*I
*c) + 311988333994649835518980708243099585623900143132018775476726166507416
087589238204021912044592368622314823462279334032 80*a^2*e^(663/2*I*c) + 3714
937280284471372854337396169851190966768613631268053254500725448394335264764
788130878899535198417508490173067881448O*a^2*e^(661/2*I*c) + 43871822610861
004795016564148131246645253380769718394461842295211859774351397481825053002
1457905516853750562145648806 00*a^2*e^(659/2*I*c) + 513894893405801540744982
433433368737174296059038429613694759362607497318493136542768834775174834900
16178128812433612320*a^2*e^(657/2*I*c) + 597106965421409973349982246393495 4
037172606730532701585861325559900383461690575046424945947145442892976765968
0543253880*a^2*e^(655/2*I*c) + 688264961339292593339463496887561071818270 94
760687431541236793707609567157393356980015874728986445505375939321119773600
*a^2*e^(653/2*I*c) + 787088197407479900045877912467552903619923334159985208
20275403809147240788340833226353369635194374316050644673527393080*a^2*e^(65
1/2*I*c) + 893092283625100248886502042740184796232789318292227516518692719 9
71429409359396224994649413020238927832430365319398747 20*a^2*e^(649/2*I*c) +
 100558403722268040642511429344587236375943339865583446768413235470390109 36
7198695944619840576272225434857726514180226640*a^2*e^(647/2*I*c) + 11236649
759080445936801422982106157414808468612499049009642615813161923929281935665
23547551912705590618666322066181233 60*a^2*e^(645/2*I*c) + 12462441665884060
650876497209124758205675601440438158967894681087078534979153332713768691858
274659258080451849502020262O*a^2*e^(643/2*I*c) + 137206071545450383442708 87
404879438390091451812909804275801017418553270717230931330494545677429537124
607447154355306072O*a^2*e^(641/2*I*c) + 1499715617391943099958472856511082 1
891121203463153131574047159901379426073295280466523230232892799172576152277
0551792260*a^2*e^(639/2*I*c) + 1627712070552029105749343454087735203172177 7
289667694933591906272895139614138882801239915060213291933844861367859453900
0*a^2*e^(637/2*I*c) + 175450274701932039519067286725080403588984926777237 48
842142804808217554186246285243625022125361994093963511255373695706O*a^2*e^(
635/2*I*c) + 187854193910793808031824107617460059143682787150838921015095 03
06265464591466280065402343775284301501285757569951693645 60*a^2*e^(633/2*I*c
) + 199834002044982669165221847294687522204304595088347219902036647597391 74
087812846339240404074122258496174720653978546148O*a^2*e^(631/2*I*c) + 21125
173165589950328088911626057042795396260205184728323664763967057947249888119

5477410930866524432145488946958371101960*a^2*e^(629/2*I*c) + 22198543089973
567155340415906156873742212153996951840077939879427635377855440500118614320
649204217232900411960257849574O*a^2*e^(627/2*I*c) + 23193351279523436375472
696826360991233102884214078718404407880905464893342408711586756776943726149
952014680199802277222O*a^2*e^(625/2*I*c) + 24101815333263099088298949586644
564555630423082321126973108730787391177181463118017236056346056223133354877
4668344293540*a^2*e^(623/2*I*c) + 24918750414819434725909868038356555997935
585867179616168647279674842644285963344362604891662152069336530849490595486
3420*a^2*e^(621/2*I*c) + 25641655035571186813578152461621262215024659683390
884884451319515695514399546492973848605181815258936468197841913619502O*a^2*
e^(619/2*I*c) + 26270652450562973290005264246376104689736012808149252071960
206287462117309735511308839555386151284282852981871675405322O*a^2*e^(617/2*
I*c) + 26808287839028304188417404539860545935372851851755842090932439522551
257631359529072222585644231704953426275040815924864O*a^2*e^(615/2*I*c) + 27
259190927757826416604429945939383077223969694779872067129066148813406385032
404896948696981058135404003617207132189916O*a^2*e^(613/2*I*c) + 27629622923
023628717938300412394666859690541421012540515142680436801496772953432553495
278774228086943106210110671705216O*a^2*e^(611/2*I*c) + 27926934844149146717
871461767007852072485044101499583790483891868945612576508612585857864549684
956720171917771857750030O*a^2*e^(609/2*I*c) + 28158970945497466772186667262
401107988729716139977730660882276932284913638029650255132578719913962620739
2754615890356320*a^2*e^(607/2*I*c) + 28333455324151133802032867104842078622
362525789288688458981537285116646961980068595574307376808759628667556270992
1649100*a^2*e^(605/2*I*c) + 28457401642077142070419359974824258973200896044
152003703968040273746815373344291210335092697110809043301534025917597328O*a
^2*e^(603/2*I*c) + 28536584939830721528882658066297886584159551927919722832
546988242629859803498814304965464400234898861627722199083589686O*a^2*e^(601
/2*I*c) + 28575110793326195218584481986699360496526973375720612020384053489
867751172061481262755315945795633325632688742937970924O*a^2*e^(599/2*I*c) +
 28575110793326195218584481986699360496526973375720612020384053489867751172
061481262755315945795633325632688742937970924O*a^2*e^(597/2*I*c) + 28536584
939830721528882658066297886584159551927919722832546988242629859803498814304
965464400234898861627722199083589686O*a^2*e^(595/2*I*c) + 28457401642077142
070419359974824258973200896044152003703968040273746815373344291210335092697
110809043301534025917597328O*a^2*e^(593/2*I*c) + 28333455324151133802032867
104842078622362525789288688458981537285116646961980068595574307376808759628
667556270992164910O*a^2*e^(591/2*I*c) + 28158970945497466772186667262401107
988729716139977730660882276932284913638029650255132578719913962620739275461
5890356320*a^2*e^(589/2*I*c) + 27926934844149146717871461767007852072485044
101499583790483891868945612576508612585857864549684956720171917771857750030
0*a^2*e^(587/2*I*c) + 27629622923023628717938300412394666859690541421012540
515142680436801496772953432553495278774228086943106210110671705216O*a^2*e^(
585/2*I*c) + 27259190927757826416604429945939383077223969694779872067129066
148813406385032404896948696981058135404003617207132189916O*a^2*e^(583/2*I*c
) + 26808287839028304188417404539860545935372851851755842090932439522551257

6313595290722225856442317049534262750408159248640*a^2*e^(581/2*I*c) + 26270
652450562973290005264246376104689736012808149252071960206287462117309735511
3088395553861512842828529818716754053220*a^2*e^(579/2*I*c) + 25641655035571
1868135781524616212622215024659683390884884451319515695514399546492973848605
1818152589364681978419136195020*a^2*e^(577/2*I*c) + 24918750414819434725909
868038356555997935585867179616168647279674842644285963344362604891662152069
3365308494905954863420*a^2*e^(575/2*I*c) + 24101815333263099088298949586644
564555630423082321126973108730787391177181463118017236056346056223133354877
4668344293540*a^2*e^(573/2*I*c) + 23193351279523436375472696826360991233102
884214078718404407880905464893342408711586756776943726149952014680199802277
2220*a^2*e^(571/2*I*c) + 22198543089973567155340415906156873742212153996951
8400779398794276353778554405001186143206492042172329004119602578495740*a^2*
e^(569/2*I*c) + 21125173165589950328088911626057042795396260205184728323664
7639670579472498881195477410930866524432145488946958371101960*a^2*e^(567/2*
I*c) + 19983400204498266916522184729468752220430459508834721990203664759739
1740878128463392404040741222584961747206539785461480*a^2*e^(565/2*I*c) + 18
785419391079380803182410761746005914368278715083892101509503062654645914662
8006540234377528430150128575756995169364560*a^2*e^(563/2*I*c) + 17545027470
193203951906728672508040358898492677723748842142804808217554186246285243625
0221253619940939635112553736957060*a^2*e^(561/2*I*c) + 16277120705520291057
493434540877352031721777289667694933591906272895139614138882801239915060213
2919338448613678594539000*a^2*e^(559/2*I*c) + 14997156173919430999584728565
110821891121203463153131574047159901379426073295280466523230232892799172576
1522770551792260*a^2*e^(557/2*I*c) + 13720607154545038344270887404879438390
091451812909804275801017418553270717230931330494545677429537124607447154355
3060720*a^2*e^(555/2*I*c) + 12462441665884060650876497209124758205675601440
4381589678946810870785349791533327137686918582746592580804518495020202620*a
^2*e^(553/2*I*c) + 11236649759080445936801422982106157414808468612499049009
6426158131619239292819356652354755191270559061866632206618123360*a^2*e^(551
/2*I*c) + 10055840372226804064251142934458723637594333986558344676841323547
0390109367198695944619840576272225434857726514180226640*a^2*e^(549/2*I*c) +
89309228362510024888650204274018479623278931829222751651869271997142940935
939622499464941302023892783243036531939874720*a^2*e^(547/2*I*c) + 787088197
407479900045877912467552903619923334159985208202754038091472407883408332263
53369635194374316050644673527393080*a^2*e^(545/2*I*c) + 6882649613392925933
394634968875610718182709476068743154123679370760956715739335698001587472898
6445505375939321119773600*a^2*e^(543/2*I*c) + 59710696542140997334998224639
349540371726067305327015858613255599003834616905750464249459471454428929767
659680543253880*a^2*e^(541/2*I*c) + 513894893405801540744982433433368737174
296059038429613694759362607497318493136542768834775174834900161781288124336
12320*a^2*e^(539/2*I*c) + 4387182261086100479501656414813124664525338076971
8394461842295211859774351397481825053002145790551685375056214564880600*a^2*
e^(537/2*I*c) + 37149372802844713728543373961698511909667686136312680532545
007254483943352647647881308788995351984175084901730678814480*a^2*e^(535/2*I
*c) + 311988333994649835518980708243099585623900143132018775476726166507416

08758923820402191204459236862231482346227933403280*a^2*e^(533/2*I*c) + 2598
448182192879022901953322035281036405365142813940542101194672350393131680385
8639430225998735288638633019702866058680*a^2*e^(531/2*I*c) + 21460869622603
798373862295375991979844261527020594958201034758080773685660129127602861264
204469990486648515185847661920*a^2*e^(529/2*I*c) + 175754962021387432374407
024893184133486916710882090509569636135113669061260825212723946071155159361
72525552891395395672*a^2*e^(527/2*I*c) + 1427134764574922616571445237761111
672162332796323034832346052549335631846573800792644471735269145515758292419
0074684640*a^2*e^(525/2*I*c) + 11489207467455499344482418745478155563014761
126816126080537383460531629386309522634240117536837763365043954166727248280
*a^2*e^(523/2*I*c) + 916967282297774397711132080454111190466027322150645165
1949707212055959466012505191220572773289655701792453230423105120*a^2*e^(521
/2*I*c) + 72548360849084684046466784469896006650797080385135100485635372256
69386463363803374148622157625354861291347122905242320*a^2*e^(519/2*I*c) + 5
689615909970301520108319640363973134470190817749618201541040554671725803726
189842972146004682392121289650040476771616*a^2*e^(517/2*I*c) + 442274283952
382676264547995705724354154012205495170378786211393790404856804828685096905
6460218125357089349296008547181*a^2*e^(515/2*I*c) + 34074212854556940464743
207981590900757987299248620802096503284380675040168815980677078443962425318
90195544301426987190*a^2*e^(513/2*I*c) + 2601702122396645141345931033404570
995027466204284274488653750753761498675668863970880304480234793529924712351
195427555*a^2*e^(511/2*I*c) + 196860807418766241096038612492180776083941991
2449118088079440479378830696763837592112817321648516678192250226251889260*a
^2*e^(509/2*I*c) + 14760579955693906372233526972424832105698618627805899233
17140914906186165044966041302091938311768459791677885305942531*a^2*e^(507/2
*I*c) + 1096636578459444916376723286069829634240829040283071984682114965507
192138829786266640857980171465345670412137298803158*a^2*e^(505/2*I*c) + 807
253658137342307900160595544078420189813338397513951459580649551593816718094
436044450016924199349627155306092503566*a^2*e^(503/2*I*c) + 588732911424652
432036475218676267391833829587071733581552653599569115062655958634436180105
642268527576118276535857990*a^2*e^(501/2*I*c) + 425364061290972864599381605
241976913026242892352334115185854404956644313805430315468685902485280907282
658089881714375*a^2*e^(499/2*I*c) + 304446393227146814613983539727444798173
564858374980413080488271135256661913384313342183872402332578752912321480097
437*a^2*e^(497/2*I*c) + 215845003776805302861184692565927001383144850278090
577691260137355499134974361313448026444380882959804366246287914973*a^2*e^(4
95/2*I*c) + 151575170355739209946373876370057650549318320584509041952034589
942144397207049663095445023255855799320406828152904813*a^2*e^(493/2*I*c) +
105424853787028754469673960861051848077064379179201408687509167013295588338
384945425067268491968039006968056581921707*a^2*e^(491/2*I*c) + 726207992189
165652178758713813393428748038401335313762033098057750677977846026209886348
08343998866415251767099657115*a^2*e^(489/2*I*c) + 4954006065050306303738228
025869904943635196473318092993411744508059663156189621601578097098400509051
6521389882187000*a^2*e^(487/2*I*c) + 33466028808642300425453129213091641815
466355026636652947083261177887459487866470370690708668514061085213215020765

318*a^2*e^(485/2*I*c) + 223861204043000044228760073517616478835216103343997
859390380117904490678686278432262398243395194088309102252091146 48*a^2*e^(48
3/2*I*c) + 148270788409582044237265467055125273579573616473965086329359889 3
324121359071653742920304974162028085246127875589351 1*a^2*e^(481/2*I*c) + 97
232127836885376433044511737909323527633921178781940997132124078279245717796
562654063693651378589739955426681785 60*a^2*e^(479/2*I*c) + 6312726327493419
321171003213006926022587697863019991394721190170435857084298246006024922226
846516328771260784350055*a^2*e^(477/2*I*c) + 405744720573650872049401506257
084267750527414864488161681132670262810709477451426568094071301425635165960
7202219536*a^2*e^(475/2*I*c) + 258162710700990073452206474459755120980230 44
069109347366788358990082791004853865515129861712474344436175299518249 87*a^2
*e^(473/2*I*c) + 162597942053110568241467521824375390202081816952422253420 1
660329925485571915419014974199094126837464169182082222286*a^2*e^(471/2*I*c)
 + 101366358338138231552611990038579378059289736225952188087025668957886456
6731937045334553766119426780595860617854190*a^2*e^(469/2*I*c) + 62546997108
251205222144593922633931315752756168645329438560772112500600573787852815482
917681417407360930478313315 5*a^2*e^(467/2*I*c) + 381970324888971137824260 41
711935588050801140530650725271731911163896757370819281494759323796283751658
7367083029056*a^2*e^(465/2*I*c) + 230855486672626709723535927872568854471 07
733250002236679808330690153794894813537159206238297202883265289252153022 3*a
^2*e^(463/2*I*c) + 138075050472911460011366856295168555289257189097324670 31
103395173509980199384630077420606120940970445440257517316 8*a^2*e^(461/2*I*c
) + 817206467984853250193743177843227599578449222735699038476429330036626 34
138916360473885905820817778748179763625775*a^2*e^(459/2*I*c) + 478593950514
785774857771488256226664918441899896712871488953127500310630895970392803422
778913136482826595067651 60*a^2*e^(457/2*I*c) + 277331231705280606650477930 2
918798106933656583450159135548591946017635957045697692669267735665569210490
1055424742*a^2*e^(455/2*I*c) + 159002494377914059354042986899597212969145 56
453023635621602157015426400883311961742504003269238750112959349688008*a^2*e
^(453/2*I*c) + 901903653105413936414503619872987518150278899672116571091285
381979924403521169676004642165566246672874123237182 3*a^2*e^(451/2*I*c) + 50
610999389706962454400974629365040600982341948678910998000678794666066919270
344735654916434397345865752435625 87*a^2*e^(449/2*I*c) + 280954351866820426 6
823796801627118763645888741191307504647885398224587315004606447902339962521
984923603337579865*a^2*e^(447/2*I*c) + 154280209465184867438692967750633613
530145175778216248102935419137838565530983959034229578207026724816379707952
5*a^2*e^(445/2*I*c) + 838003405633226261698002475165028859961836560477445 66
097833058888205480340879296827704182620984011052291035380 1*a^2*e^(443/2*I*c
) + 450214953158482436877449323534443636424987689673176576808637277491307 79
744767983403902249567124653936112324162 3*a^2*e^(441/2*I*c) + 23922690108635
111250191342017664138814183468071724314914824054191236502403524239663014182
706782376845357779220 6*a^2*e^(439/2*I*c) + 125716823797005642317347526498 40
179083753168561102364880492546544906525540804103230843956650070870060269776
6710*a^2*e^(437/2*I*c) + 653352098551397452254604581678826437154641747023 79
903424415436335141712932934847111707604519947532103535939690*a^2*e^(435/2*I

*c) + 33577532862508612404932143562056758169512543178723442784444413242416994607618240798840372204654901124952727575*a^2*e^(433/2*I*c) + 17063763943819201257154546007944190484800483541219625570334773139200258218933634528764590082974465232719019576*a^2*e^(431/2*I*c) + 857437043606127858832332973198205223244571782879175596317046623803379829879817966509635534643144469512051679l*a^2*e^(429/2*I*c) + 42599806114811751815296146169680792882669983472869168677651916064028092386144819853336758318060879567688722250*a^2*e^(427/2*I*c) + 209250927524733972545755390380592999373493854772180445419707199950551171994825241937934354939790558612245266 5*a^2*e^(425/2*I*c) + 1016149825224928415282430116492426171242192567909037312010368898174633451476277701838680759316125015139743120*a^2*e^(423/2*I*c) + 48781443252111149758540671950680205563692208794988862702520845444730010003879101229785913152629735590493396 0*a^2*e^(421/2*I*c) + 23149082658500578780775327350853876539323779489158948073428857686582334985814438058090533195785050928255147 2*a^2*e^(419/2*I*c) + 10858518815771394212107785178989572242259468901872045507056347612130118472781157432346621429183420185467206 0*a^2*e^(417/2*I*c) + 50343125546713237985623313646329330647858349495627492925205161566693001610650569967429902726126062669565040*a^2*e^(415/2*I*c) + 23068393515288186064484465603117961911284673754084184347491242043413536449530894861283359363464825007526940*a^2*e^(413/2*I*c) + 10446638933612964407336872560377957165244351995018446220321535598596368046659626683803611150049940561221040*a^2*e^(411/2*I*c) + 46751116425487460919156707540760323711761364540363599820752214772978099252044766666622390316010345459963 00*a^2*e^(409/2*I*c) + 20674608418735299991184202651342837639644452126560315573995791853905721435236059086124686662207452285267 60*a^2*e^(407/2*I*c) + 90341197663448354263528999846283396366969515218525999665486805199147357237287024866284792461274426406244 0*a^2*e^(405/2*I*c) + 39004127275497477700562769915484224698872602460416243802409528559485248785585037207054647273412602268470 0*a^2*e^(403/2*I*c) + 16637342101596006574494683160512963808544116807135262064048346380029164027801434252046974131760033726184 0*a^2*e^(401/2*I*c) + 70109686530806379548962065855267314803677176495241796951534731669884594114550121278447472661295579702060*a^2*e^(399/2*I*c) + 29185313448653917441464890487323189533233580558386026734570615029457027933491512738753237134630607181520*a^2*e^(397/2*I*c) + 12000905703768198174954282034631757209497411914073482804705515897689969997576557491508854781156886995980*a^2*e^(395/2*I*c) + 48741350791327554143473756908878027117941056509388639704002300027094220939925254721653647972967901389 60*a^2*e^(393/2*I*c) + 19551720942932691644662098033171025525950216475811512178778422970591270024951138107726547846445850603 60*a^2*e^(391/2*I*c) + 77454342161420349560097161546607797965236888121893351042429424002140938695603552615974586154432072248 0*a^2*e^(389/2*I*c) + 30300429227176309474572003993633457101689542531469354649589380538610553644840035686338871215438641425 0*a^2*e^(387/2*I*c) + 11704754358181518706267332142230356178960091716528425495941493214476219409688989043243912555713512008 0*a^2*e^(385/2*I*c) + 44643064471591717479704020276563642570717883826668145169247611761065722522854988204793268950962007830*a^2*e^(383/2*I*c) + 16810896728225961874194498340222314518223276631636193848187700774478 50

9776074186756740832022063618940*a^2*e^(381/2*I*c) + 62494140129289622860610
104035290027536073423609060861920331851034284009130708890522929404847123278
30*a^2*e^(379/2*I*c) + 2293321308015586917932799317024982339168604649369171
514848750864257523843794511936002538498981041920*a^2*e^(377/2*I*c) + 830677
890823405593881048028041375542333955283073962626784718312376094416760253547
591206118659958460*a^2*e^(375/2*I*c) + 296966005156563531105971074940050295
210952963342292128773450715502535457684406378925697100618058220*a^2*e^(373/
2*I*c) + 104773294919708181426456318246707841758575517441039866971803838079
319268269378919589734008354661810*a^2*e^(371/2*I*c) + 364776537060422459446
888206046964942190813347671210579123319141378044153079733377939021772945992
10*a^2*e^(369/2*I*c) + 1253133822792085649207459032667409937445312286891351
6861854565249779642744578491059412040960382510*a^2*e^(367/2*I*c) + 42474009
250773731761134863121901454721816864229939339424476328466330956444400320033
39271168690570*a^2*e^(365/2*I*c) + 1420248786518187466718023048901731118377
946854300811977671072304411278973969440001583221282013130*a^2*e^(363/2*I*c)
 + 468468261824774958091791071955357916616933320342602739423768916749249443
401418804336754943102630*a^2*e^(361/2*I*c) + 152415374106074622939224284153
659601550627109436325926621014480229333534862467810217119890170400*a^2*e^(3
59/2*I*c) + 489066090725200576110713705079963402247766813797750349258682009
23794664214854540668184735223060*a^2*e^(357/2*I*c) + 1547578971739746027623
4843111043950695013471030625427925175353797112876241958974587338558471200*a
^2*e^(355/2*I*c) + 48288072371114951708502020267955265600327550456915416538
50695089412640252061166703373641008090*a^2*e^(353/2*I*c) + 1485535118953138
948865978331717910599497456296177792374785590516233474655906439549342970114
480*a^2*e^(351/2*I*c) + 450541815994350416329563482655909244979320334438405
914968411406156252958317001977289679320570*a^2*e^(349/2*I*c) + 134694045831
733084831574170523497510104128836035403576353015982048577081438406747258639
643920*a^2*e^(347/2*I*c) + 396893152747629625983440995776573121457424082278
26431282422824844089957174694332245240202130*a^2*e^(345/2*I*c) + 1152551433
824812211580690122363140886566506087399233173121671754583964139549354347855
5391940*a^2*e^(343/2*I*c) + 32980470539939501466208425037215290583184853566
60075016582248017786240344190976379491032900*a^2*e^(341/2*I*c) + 9298442698
396182432776277869232434146236637762612203148716791997224555846984342168195
69010*a^2*e^(339/2*I*c) + 2582653199983859208005705893482429381264459621216
95949028377963603738714515662920857912400*a^2*e^(337/2*I*c) + 7065920222040
221969932714247248024228787665376495330213336037644828722618748734564484553
0*a^2*e^(335/2*I*c) + 19039736700477034191914417874408695155655405986129726
283796391182602876937826158174743280*a^2*e^(333/2*I*c) + 505224056037277225
2508411884469329618226376927979062996145236110491773700805441539104570*a^2*
e^(331/2*I*c) + 13200115147374356440392521856145378423255313177841019066397
27300233020372137428050228960*a^2*e^(329/2*I*c) + 3395315651658181574881115
46236514739245172484736482729741196732548715077274621271815060*a^2*e^(327/2
*I*c) + 8596620779574277116311008408307932619869205078119881831903736271678
5215369332723227360*a^2*e^(325/2*I*c) + 21421765289837057403869596169941475
678645506492471864168704518082797513207707602578070*a^2*e^(323/2*I*c) + 525

2856062781833938201490869422444930464746423374588871765446690324009941198600912010*a^2*e^(321/2*I*c) + 1267300191943737324119320599349683654493348850217007321150739273112190995849189116570*a^2*e^(319/2*I*c) + 300771234468452520266562607329665922159115381500087728345930006292005623202669775630*a^2*e^(317/2*I*c) + 7020901794541159120096165173005886355772245887709838148693864110048345591179596729 0*a^2*e^(315/2*I*c) + 161166281624114646798965028363247713896205848565748779224682826856642831301753277 30*a^2*e^(313/2*I*c) + 36374986460264255987452792288036795171400903502413142163715704681747381749213079 80*a^2*e^(311/2*I*c) + 807047768188333538846684803460779790931055555100120589990758127536168861246233500*a^2*e^(309/2*I*c) + 17598731744416001266512340274583125217315543205239553488481060367552361202279128 0*a^2*e^(307/2*I*c
) + 377107106707422037469802679360762145217845506499125755188205522200318144452151 10*a^2*e^(305/2*I*c) + 793893332049744963591896968075832630733911623907184633024831179503872307572366 0*a^2*e^(303/2*I*c) + 16416623480954603635143567296390265042433153095787578716283224075371214649546 30*a^2*e^(301/2*I*
c) + 33337810674058613825161012495879671457693509961983507317230769655164825982912 0*a^2*e^(299/2*I*c) + 66470080272037903682198219835488944949996749070187078822650198449544212324410*a^2*e^(297/2*I*c) + 130092554537789775149175011322369077673568876910683685894113389082455523682 40*a^2*e^(295/2*I*c) +
24986979175798959779787235885762839331372965187434811047769325663915794554 00*a^2*e^(293/2*I*c) + 47087397983316545444462765980310196943086715347166332927918862991081933544 0*a^2*e^(291/2*I*c) + 870394672285310137054091912714523833893353568849218086414924233637624000 60*a^2*e^(289/2*I*c) + 1577740463997525927245493384353947454466523681911756699731867230466656680 0*a^2*e^(287/2
*I*c) + 28037932208262978741634296821311025033065490052653992192772409174135029 40*a^2*e^(285/2*I*c) + 488344836125981471048169163657616516954158792795618978221198980949925840*a^2*e^(283/2*I*c) + 8333974773646914353242807331076216352511378934404318360291661322787214 0*a^2*e^(281/2*I*c) + 13931340194933935228013466294179987445068758219565436862349156508804360*a^2*e^(279/2*I*c
) + 2280416002497499972330270356628053500702221025770502602102780787687624*
a^2*e^(277/2*I*c) + 36540623784951824837206096046358165099565184254969007135267885101254 0*a^2*e^(275/2*I*c) + 572971958305794798809052837598873100156922559673687095155028185256 80*a^2*e^(273/2*I*c) + 878891888078668755926755541379619931498159578978707490100693353550 0*a^2*e^(271/2*I*c) + 13183336549908888994177465203742886492572231335731279050864675480 80*a^2*e^(269/2*I*c) +
1933035148727861159233797166282534193189441764358760568025898657 72*a^2*e^(2
67/2*I*c) + 27695464742706927996157891275342643431040906047696742940234352112*a^2*e^(265/2*I*c) + 387574180326327160857804812595506615278549389715167271609944036 0*a^2*e^(263/2*I*c) + 52953348970643482445125018859273949819746249176428304401857544 0*a^2*e^(261/2*I*c) + 70604348724401170958829605205937063913034447082349890348162895*a^2*e^(259/2*I*c) + 918263330216021245291896860380682803682324899598135316657070 2*a^2*e^(257/2*I*c) + 11643670328246230733666851382513099120400930601419287160876 81*a^2*e^(255/2*I*c) + 1438727822206320263534827831452820866063140492356740318539 52*a^2*e^(253/2*I*c) + 1731418683210570012278793710630839948449009352569541685878 5*a^2*e^(251/2*I*c) +

2028231682527169820869698431068546224630661674135401655870*a^2*e^(249/2*I*c
) + 2311373541256165472334431429911248988254707706603171945554*a^2*e^(247/2*
I*c) + 2560895310281173602069967198140053159165208235345670166 6*a^2*e^(245/
2*I*c) + 2756769770542048744355911382380396555656358932078858681*a^2*e^(243
/2*I*c) + 2881368306549844065308377873377004393281836580596463 99*a^2*e^(241
/2*I*c) + 2921949907526353584385886237764807307128531097465791 5*a^2*e^(239/
2*I*c) + 2872702692034937563897971496575074831246739185614575*a^2*e^(237/2*
I*c) + 2735906633661552662341042721694526882630074845137 81*a^2*e^(235/2*I*c
) + 252192457835497213660677991141589788643999240584 41*a^2*e^(233/2*I*c) +
2247954664299349273623637155894975599108753667672*a^2*e^(231/2*I*c) + 19357
38461278148053361662140263342904970069151 30*a^2*e^(229/2*I*c) + 16086467322
724552698501340975783163797842534840*a^2*e^(227/2*I*c) + 128869477345205404
67716407889504728075429011 37*a^2*e^(225/2*I*c) + 9940344598096194358959846 8
520732983548550704*a^2*e^(223/2*I*c) + 737333207979913363906365861452764589
4565137*a^2*e^(221/2*I*c) + 52522362949838393932899296150558113559760 0*a^2*
e^(219/2*I*c) + 3587592960939040673839466621997122120572 5*a^2*e^(217/2*I*c)
 + 234610976875934790357291073224557020984 2*a^2*e^(215/2*I*c) + 14663185721
369809305844015883041556526 6*a^2*e^(213/2*I*c) + 874227859914729528548075 88
01384765381*a^2*e^(211/2*I*c) + 4961833735552848046279119545216196 00*a^2*e^
(209/2*I*c) + 267484295874458557297685391971825 85*a^2*e^(207/2*I*c) + 13661
832222417823135868632866411 84*a^2*e^(205/2*I*c) + 6592841254886628690277902
2351001*a^2*e^(203/2*I*c) + 299674601484785362031769373101 6*a^2*e^(201/2*I*
c) + 127861163009333998455801820954*a^2*e^(199/2*I*c) + 5100844261395996953
829648360*a^2*e^(197/2*I*c) + 18942127212852117882206644 5*a^2*e^(195/2*I*c)
 + 651448819119850895359843 7*a^2*e^(193/2*I*c) + 206263478282239243233771*a
^2*e^(191/2*I*c) + 5970784896604221606627*a^2*e^(189/2*I*c) + 1567135143331
71921595*a^2*e^(187/2*I*c) + 3692203217135946825*a^2*e^(185/2*I*c) + 771217
38215879370*a^2*e^(183/2*I*c) + 1405865019554882*a^2*e^(181/2*I*c) + 219095
84720322*a^2*e^(179/2*I*c) + 283802910885*a^2*e^(177/2*I*c) + 2933363420*a^
2*e^(175/2*I*c) + 22680645*a^2*e^(173/2*I*c) + 116610*a^2*e^(171/2*I*c) + 2
99*a^2*e^(169/2*I*c))/(e^(517*I*c) + 418*e^(516*I*c) + 87153*e^(515*I*c) +
12085216*e^(514*I*c) + 1253841160*e^(513*I*c) + 103818048048*e^(512*I*c) +
7146142307307*e^(511*I*c) + 420601518659718*e^(510*I*c) + 21608403021340047
*e^(509*I*c) + 984382804329835768*e^(508*I*c) + 40261256699368950388*e^(507
*I*c) + 1493326612293984160368*e^(506*I*c) + 50648660944512569972179*e^(505
*I*c) + 1581796642397812408161814*e^(504*I*c) + 45759117183402579073139583*
e^(503*I*c) + 1232445557346832245176696904*e^(502*I*c) + 310422225220746816
15625020522*e^(501*I*c) + 734057263616388449968842366924*e^(500*I*c) + 1635
3164647151530240529137618111*e^(499*I*c) + 344277152012875134140739302960 91
4*e^(498*I*c) + 6868329225263681349501997341320517*e^(497*I*c) + 1301711930
79172823835151430773360024*e^(496*I*c) + 234899837424434707953276620307560 7
598*e^(495*I*c) + 40443624781415311581857832389099634564*e^(494*I*c) + 6656
3467067621006375419184710997114141 4*e^(493*I*c) + 104904026695108974246246 4
376647075404506 4*e^(492*I*c) + 158566476113257562566117432227203884298856*e
^(491*I*c) + 2302150411226234925855222345201500900533576*e^(490*I*c) + 3214

78876933753388174544825153773503839502780*e^(489*I*c) + 43233368864426155754
79441792508004406049648680*e^(488*I*c) + 56059272530675585517804528836898355
14455118670*e^(487*I*c) + 70164515322544462906873548813748091084561870680*e
^(486*I*c) + 84855220227651235649620013695967629536169631511з*e^(485*I*c) +
 99254907385344022729399870387145804954454313746l8*e^(484*I*c) + 1123916045
4224665096642916206312433895255457523405l*e^(483*I*c) + 1233096700139723365
181997220750932590655287625342156*e^(482*I*c) + 131187818011721747296793398
943181536949646753684811 94*e^(481*I*c) + 135442594916636116191574650625331б
462385011016279372 24*e^(480*I*c) + 135799066316147984285064284803254498287 8
359839580349899*e^(479*I*c) + 132317088701048969738000567337799190893408367
56009580718*e^(478*I*c) + 125370496586921272662198050851269323171167338854 0
81782959*e^(477*I*c) + 115585541289359426034554496664268782363003589936323 2
371472*e^(476*I*c) + 10375184499871175501909398956596684116802997082526660 3
23524*e^(475*I*c) + 90722605722208814918642284639487187764607589706493970 77
4776*e^(474*I*c) + 77320463699114577506146273102809850609443267578813629501
1259*e^(473*I*c) + 64261954855352485764250681368704655300871140038757166913
83902*e^(472*I*c) + 52108117629177048660492400985175830987505700566877818 95
4141639*e^(471*I*c) + 41243069829991519084806722232721943506774793409189467
0488982928*e^(470*I*c) + 31877499297443464972115360447517765823209586279238
16470590659024*e^(469*I*c) + 240708019135297571018580229143720458647469917 8
6182039740274325264*e^(468*I*c) + 177642829135119348577194437675802830239 90
5460092687136494961404333*e^(467*I*c) + 128181746491497081085960418982835 90
0079078992116940530461221125 1818*e^(466*I*c) + 904669352382568297904433896 3
1042631676725868263679113388264835 49173*e^(465*I*c) + 624735507810532953177
1077469024711412412518756573184844178190 4032672*e^(464*I*c) + 4222761266320
0368754775474655570998871052713308666016136635365678 7288*e^(463*I*c) + 2794
7091044756866118427906949736991644822547239772102097256613044034 72*e^(462*I
*c) + 18115768495615758076710303055505625589254293659193314153418333944596 4
08*e^(461*I*c) + 1150514818520808488737003883545213155676403651240031036911
76697194292320*e^(460*I*c) + 716099497599058079895633338552940229192858196 4
8159783007881971186260009 6*e^(459*I*c) + 4369442482910113914565353136069595
8626693388580534193812141312419250 47008*e^(458*I*c) + 26143976279902021443 4
71945665080254563056810183520401889800285493144867448*e^(457*I*c) + 1534360
887450562541273272394615770719331301577645959971139735131831883993 76*e^(456
*I*c) + 883500968821791202600774541927769200737689393513734789368397093333 3
11961880*e^(455*I*c) + 49925197124570439835053779766079539883973682975911 14
957991804893688371867680*e^(454*I*c) + 27693116538343259225983382637647936 1
2266403385961513348984666469436147102831 0*e^(453*I*c) + 1508223814314124137
73566474210011746852297437597059186295243989481140398152780*e^(452*I*c) + 8
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90*e^(451*I*c) + 4238125846763232586394188569858685826755328005548627437019
3014058513258875944 80*e^(450*I*c) + 21876482892713909928040345612578705805 1
215087562266963170876518242522414186633 20*e^(449*I*c) + 1109691996873209747
4992225959525044434121921853534965576259119257653587215176608 0*e^(448*I*c)
+ 5532691288195286125029188695589478290980219563093498435840446315122917788

00081490*e^(447*I*c) + 2711843239670717527605640490148833507130242448403978
3185232377219442003928301085 80*e^(446*I*c) + 130698172034882898861932055083
7581839212499138234016031688650718129654898101481 8410*e^(445*I*c) + 6194859
6653035502879564338815234310660410902037882473161804774492916216575880077 68
0*e^(444*I*c) + 28882075526473065446996857202104710942731861950899580202068
990459031947629540832428 0*e^(443*I*c) + 132475641236783747315747282116248 36
9112096650194895392649224164378826428454643722112 0*e^(442*I*c) + 5978992172
944143218459161149299819706321732111578494525245228742976468409105395536290
*e^(441*I*c) + 2655680638904340753449670236910154579599486175774141478994 46
52712127566910185274123140*e^(440*I*c) + 116104551683555043762911501712116 3
99313733021132677481112824047246361794049635726479850*e^(439*I*c) + 4997075
672538590843575963148137947680693371909159674919074889049339226775796653543
38960*e^(438*I*c) + 211758973346685570710150142921041472240183883794075284 1
6185414408885457299431382090368 20*e^(437*I*c) + 88367206408604703056945140 2
154796955129679409226698304411837579002585458403679636476828 0*e^(436*I*c) +
 363183696523025917321974444097981220226408246041305525067425867951832673 54
38284787588573 0*e^(435*I*c) + 14703081673227683316304158209959204751204372 5
22535333923881916519300040762954474575322174 0*e^(434*I*c) + 586403466972683
242741643328921560909375197453864243299571990964608857245771134145204174990
*e^(433*I*c) + 23043510733738403573791785976730663520166827816891398420973 7
66631184888038411319353136418 40*e^(432*I*c) + 892320944734329676333188188 16
384717934996186706010260597308959626532917702294930281625751 00*e^(431*I*c)
+ 340540538512955691543523467221771726551875489107820085047183241687250294 3
8589162349211628040*e^(430*I*c) + 1280989146016885396724805418304098477073 6
75004386015368032044977011199112890871056594827833 40*e^(429*I*c) + 47501057
885760151927231661793842522242178659724167102689431851540851146714096939311
5768793680*e^(428*I*c) + 17365742188181910718741974724501581238835642099506
58639102337148122769080611680719741726053840*e^(427*I*c) + 6259872156822252
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920*e^(426*I*c) + 222519591767957777571673660360074802222113642321463998038
64370963391491223687245823457351580140*e^(425*I*c) + 780098073680242398756 1
373305885141712532711468107088964079424928263347058075655708392320337716 0*e
^(424*I*c) + 2697458014402112969726836018638789543579623085200765951771282 2
762927324021520970821849736341414 0*e^(423*I*c) + 920089393029589032874601 85
0027159322612526368444771489781974361078847528891468831038436064951920*e^(4
22*I*c) + 309613197162152016238030155424146545178236208681028753774890290 49
85934020179565706177131421614590*e^(421*I*c) + 102793647306638408447395778 6
24692626046488619142979725891652435306512306907262444624791998942551 80*e^(4
20*I*c) + 336753988720215683759023845939827533625598010581041846273454111 36
26243194324077826072175699102709 0*e^(419*I*c) + 1088679957318294728267329 05
1920348867972846213564456275309091044294867412578226334768983568264540 40*e^
(418*I*c) + 347351473214713780874352083129566601238765762775942366762733349
952103889753982636403857556867777300*e^(417*I*c) + 109385321448622035867403
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0*e^(416*I*c) + 340023256060165161752169468084708984419802883169441742479 48

68779328950548418125605446882081152636090*e^(415*I*c) + 1043411751657039596
665369315558240210946034809547302780741232142734681692856719777037649617025
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743004044560386895241801579156543451940713351730*e^(413*I*c) + 945561802589
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899155708935025778047637412681781575765422219127409260159438712250*e^(409*I
*c) + 667586629037114735850376686566928901089354386983053870872494529158095
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890*e^(407*I*c) + 520751785187932703864292633515443069511049935425005829381
55241689408138675254608030847907167748571734720*e^(406*I*c) + 1428017924502
217624831808749188252741343051332754177800847950346447635093335031505173458
64659667189417080*e^(405*I*c) + 3868762182342771656324517230499798892631152
82374607541692443176673997513742813591736171169652250611186480*e^(404*I*c)
+ 1035561982592002935226384577908611548612111495080193573691339864706029186
482466241805664949381049856258510*e^(403*I*c) + 273889562479526560335522764
656600088628077830508482570291193890365616200426273618265770040630191407006
2380*e^(402*I*c) + 71581246868429414754738073636798397181727455815384090445
03383852693596921622426696740453944718143025248390*e^(401*I*c) + 1848740529
900573269375272861187649089085835702197488237157062380018624513772266094364
1752976852924439870880*e^(400*I*c) + 47188220843466207695099506953573780357
108897491422567898048199018207708997005333860148836479527456156014520*e^(39
9*I*c) + 119041855403877964948229577948370465600606623183045529526900430209
270473212773847794935586074714329479939280*e^(398*I*c) + 296825515282669589
685318273280239050084555032203415941511962659596881615713799937680026497408
305672297618840*e^(397*I*c) + 731584972206818362874729621403974444280010446
301161527339760544815300951787985538419764656214582667219914080*e^(396*I*c)
 + 178244611493175185055635485663842190117441232229824949659165805393978719
8246565945975595575734193348887952160*e^(395*I*c) + 42932064780080221260174
889088518264947906207206601514514681819109172400278639687245391276596335170
53002976480*e^(394*I*c) + 1022318202595486076721739030518645192356214547367
4293619918063490411487496121804590274592702770571515456414680*e^(393*I*c) +
 24068785139705277161193465644506143285241361037768216818922184400141048460
210944696647752723371932874594597328*e^(392*I*c) + 560286834249035176584950
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83547624184*e^(391*I*c) + 1289670800847547122460236808664883849832862590255
33132044636109049545144029547003347761521666283977931640178464*e^(390*I*c)
+ 2935507435543427098081294535765623132997059826991874168629343739642556159
67138676253276302591561523515603264403*e^(389*I*c) + 6607644731058690976914
759738508379345110890331495867079827642633947667566495652798791461733183865
05740391093990*e^(388*I*c) + 1470931146618934345515038362300100160482127749

581443929904746910224777470198899052379114493999887003199419829579*e^(387*I*c) + 3238491931361851476423321933539579098377735539207641467346235665823887048326949305609231585143748690203615957136*e^(386*I*c) + 7052132414162197992602326524580143060985353054572933905524633121681021037340298366342203324325307072413739061024*e^(385*I*c) + 151896342149088003964179117226437547480485201097348124591098788104938443810626508189711996371214587494562432744l6*e^(384*I*c) + 32362731322419549410330088943640247460378328561316422931292427145902887913071643679502909055891236755143207382609*e^(383*I*c) + 68208033096793615683784409619244210818614991640041553424405527876893272496608324231098148502466453967157728078994*e^(382*I*c) + 142213115964814517682386667276769909482271681318790889840501039441748635545362467679832449103520321953011780083069*e^(381*I*c) + 293344920034300720287042383448342866313806285455040067823080445597545970023446231563554135133105493516316320059272*e^(380*I*c) + 598650141112241858911676505180520150364003226841328081453597093587790338609212439085554466861582623350303061961052*e^(379*I*c) + 120877035849365839308944222205693506328370410814059375022653984611773764821660955973483160124869827433029615861214 4*e^(378*I*c) + 2414966516810338503289076549202740511710059011795447138773464205696455026442712426409599662771080264826008985061097*e^(377*I*c) + 4774141111066098970221845330594962016472714230374234060663956846950926642685946929064114194400360936223590725470146*e^(376*I*c) + 93393419580534942252517509657150573007073020838147747703062182242410226482474199560429573630558238308985473032197 57*e^(375*I*c) + 180798200680288599703499386230072306765633142067088484999001396412373347632664793469632379360393281131850415917938 48*e^(374*I*c) + 34637657172671690167657344537197087048882354853993270472063943078773600446542963548348101269390443464480754513928502*e^(373*I*c) + 656748592688673000988273758128752256106545516862611036816640070075371157780972935335652438288733837229803532006119 56*e^(372*I*c) + 1232439415193323847419600725881035065964063392536163910820629699606824190117457757389218177533919544626093238814891 57*e^(371*I*c) + 228911311738592780091492649162346834405867740776456326108410928857257174707289268074347550225793244741923354395308214*e^(370*I*c) + 420846342608949387277559021457924586578120966148561022647008499529468452005980175119410628956210497609566002969884927*e^(369*I*c) + 765867795513962781012558444628751418710940895281304790836743661582071650032154891482866406314834433199455459798934952*e^(368*I*c) + 137967652979621207401710618806658944835544650121089019510716486035022892858681553900306287502671193194194773869036072 2*e^(367*I*c) + 246044237584542266392708163098326071473496809190549302714563923882719225488634936112699145769240985112087330748745746 8*e^(366*I*c) + 434390969660193217335735968778157929370129568194082711421543317533609396784590876674073824003711457066741093699801717 8*e^(365*I*c) + 759275270014667896115309507358501547319702974653363333154979396147328576093580190415511676483156087594758104869352722 4*e^(364*I*c) + 131397714941049338818566811514182931122425515215356868711812665798138776063481602617472013177357825660213067982983360 24*e^(363*I*c) + 225146757413080699615061655865028724304219302106732643929972864856006401038672536048477155470605929676906537959511425 20*e^(362*I*c) + 3819901586758608797600299875

66276749947954406679036250293223462501332864891208750050136381281138939603496702807071615 30*e^(361*I*c) + 6417510069326006680623806488600459717074084330008683936861613916452910804984467535311184272579865808884034724149609964 4*e^(360*I*c) + 1067648320171655948380852341893335287335876733299725300926610851867899392529159370907602822323469190904262433994093233 14*e^(359*I*c) + 1758962582627559857571068126139793012658010315954843536149046728651694422320757765804471841341413759957700914992467595 28*e^(358*I*c) + 2869929436312314965572780108515769408968264974660663275288015606770071128374319267350881209748617605113670088157287826 43*e^(357*I*c) + 4637582884573671545449376782550056887333281455680493104239955998860128006386199040223683785911088426023420945436822991 02*e^(356*I*c) + 7422286409081731249169370494625256173341489196791182704898310054977819512210699558396234524997486531246588735534014421 37*e^(355*I*c) + 1176600720975786965189875050890231092204612696970277433014535895788956771230793520381993106606880564628599822341722801 012*e^(354*I*c) + 1847505856462451533445284300571326323781162553304565971887670758091079306794821834928170773126364639722071570131703785 334*e^(353*I*c) + 2873610535922340187080835435582912277271967977394720159791070274927714276869531467182688981041061381703885403497544001 592*e^(352*I*c) + 4427673079105425318524316112985693656584851936100192457044455134483305045321452516347118488133224823670465103483954805 161*e^(351*I*c) + 6758480437888524372562935948963857626694855547195519486122877567981718587262362871994967079401831957927901682582941234 362*e^(350*I*c) + 1022042377943463485133997529516339964170212224966366619305300830202609693215856833830941823739554135181902690795322068101 3*e^(349*I*c) + 1531283720666277537934735321280768296571253565294263151828614240309773820027071119539658215902851353277968215445199620859 2*e^(348*I*c) + 2273160356612884110041950194705136766683665241807726091394481074847308489189041018128541260485487662591956563952122722327 6*e^(347*I*c) + 3343589782793658130117111754596108294542981679620174198100729367333785065844280242010724531934581553340466935167423907178 32*e^(346*I*c) + 4873325350597492340085225556305210140219646931365955449272567475433937528301040716774436695582892283748870585853243965448 9*e^(345*I*c) + 7038634976059483156704822406139502569850120229696630037676422033669770296159109985405541137629487143746814952852479600276 2*e^(344*I*c) + 1007449618518537446117543009829801669624045538362229218684846942699661206076989070463437310111609488281002767293701328193 57*e^(343*I*c) + 1429063191230555242465469284789542383713159258020223892364986521368398225020351556769709174190398345879670555884315664167 84*e^(342*I*c) + 2009065871535788043803004695014416101745218512595419292098406889608594549085197748359058957576667708578886117387518584604 24*e^(341*I*c) + 2799452444750398048229667304629608844921198748577911471240090794769204359417352933093054304386873331299124541967740701072 64*e^(340*I*c) + 3866426730503800494573825628183169626519755509907792770487402386298587950182473561628886310156876647801012052873330827487 91*e^(339*I*c) + 5293292527641139260039348369582435576725492389975607392144065991850478319555725837653586343954087715280097454675483829500 94*e^(338*I*c) + 7183615963820582492091135444879010888683887440337132103324919713759067383415515404572648043040396642559156073498019119665 51*e^(337

*I*c) + 966458275369037718747739130798151643483590684166832234688098291164160636418159452119815728809372125168836239364442397344064*e^(336*I*c) + 1289043515292933956480634330499677040181043935620106914267311067900030058398839787692376954090545278554544997710058754772400*e^(335*I*c) + 170458299670782280820467821816769300269866114771277235502145654381093006963718808588282475750060524696321081035170640534940 8*e^(334*I*c) + 223489127639843946447862257830643484072461048446817785982262065869192147864526665306256382355300122800100909360675106616894 4*e^(333*I*c) + 290538572232005700195334527448948279085669252995982374953269596341416483336677312821860789932858860891617659377208862258246 4*e^(332*I*c) + 374525759487665120465733498842622638814395450198683066422234922636107960954682227606750489938670308898230818571714340721132 8*e^(331*I*c) + 478752744278094568514520484697159616530416941932824407321145959212964925504887685405984472066107815128817961257498635919456 0*e^(330*I*c) + 606894980315671224833187110532989547172280614300887801498655965368726069481655047019589000451196552756743272296970757720216 0*e^(329*I*c) + 762973181562782158046899242420700836643889673633302466186383810511044514894696232829763154703254341981182101583786301368272 0*e^(328*I*c) + 951303227401952295420911319126822664229991201352566594029838106479788569090499312894803522741214403563385177951121933527736 0*e^(327*I*c) + 117642122748764840800109007146734744933712781605578119837244558265660556176580864793686418649081196434124136448037721316572 80*e^(326*I*c) + 144298162852084312045329783753756919650631542246497475512958515073895240832269767896886013696283999007476585792019293007442 60*e^(325*I*c) + 175562732712242923968872914031257162134914862611454785713767516901056560678380421510382713813003727577556763254080268345448 40*e^(324*I*c) + 211883214058828875396101983747068626958940492260770937641325125133361905239789496943876860591245267550480429579542647066374 60*e^(323*I*c) + 253671764391193536215322603359833481549049826061257617113006834929633908164915830257052687375399821496393002265126574261188 80*e^(322*I*c) + 301284824145527032645590189530881771560134374934382010784137698354483661481217545491975911299671707649697001803486992078389 60*e^(321*I*c) + 355001031060196498762723767969494822095813723710360050128778060274816728070599434452401363155685007323799665850056781819379 20*e^(320*I*c) + 414998321219637080437885237874013455417800889305382069188535790267492733646716400375634886077160928876864715428386027885596 60*e^(319*I*c) + 481331176781840292165037485491103744789247190946356038928293648639165537922788229573682851063281647159105983708711490794943 60*e^(318*I*c) + 553909130449720862194326891463315660814279598969699002144342968177311508638670566207686081876797097201529741484749079041773 40*e^(317*I*c) + 632477741010121790517949460751755699240769813381384831580424067474538747293876317105449952471529122051185005975110528243476 80*e^(316*I*c) + 716603298611733955244419438892841091340911578446552456720842374024349446964649271318121906596295111406395017433038635820928 80*e^(315*I*c) + 805662491306826841818762018826235112063637903372180119541102106429277659976449038205954219368735653146544157690704726554016 00*e^(314*I*c) + 898838158013823822139732704779546027447928770180519633471463073724643151212749294023479428748028994995389535610566676688910 20*e^(313*I*c) + 995122064720579659

513403417380235485153364033717178980408504709546575329772791134915068802907
26111154101941386019689567958040*e^(312*I*c) + 1093325373499662232039326785
034263570798637070017282940110420765304039238626540189786765164173142210894
49922495612732870169660*e^(311*I*c) + 1192097137020339270557553978236884444
446474243245021853286263470465996347211465738306815404953335431467768109119
10410468628960*e^(310*I*c) + 1289950760115919034107638634270973299485861735
745958627058491592809430464587426631634540184914638553956494539522128996321
98680*e^(309*I*c) + 1385297945491510894513527695765434031263307472436800308
32467205895819043568155239264876762867172754338684027849855385453216080*e^(
308*I*c) + 1476489208055453334186231217678537773997829247483012287939243425
74999937955421765370101235122939557467548549202174550009604780*e^(307*I*c)
+ 1561859629535511961697382188321736965098525515892107305783657274762594764
74465955428502336673743686499175698677875693611243400*e^(306*I*c) + 1639778
160596077253752645598165058478941877851014553603918974244829984153857876057
65315509208337741590143078572243505132706580*e^(305*I*c) + 1708698488689531
011768603060531039943405303903472600884326768425055551412938308389612759742
68928666494845723462544709102843680*e^(304*I*c) + 1767209299705546420045757
700530957005953346598706827320319759155323875770524148663235111401176804929
29354517559479899220940360*e^(303*I*c) + 1814081687709220598203685533166973
216399848626282988285695602732956308976268293452635922190345608535307337105
29842148537901680*e^(302*I*c) + 1848311519837489418176678501747082571381281
721582694132877653585322407732443361919008185578299058956844948894104519215
24212840*e^(301*I*c) + 1869154744365675149263514056231175032619875083519300
83824566444435689139233683411704641828762178799177848064220150818355261280*
e^(300*I*c) + 1876153931685100500714972805646035109124031329203120243708350
62679037644990286285346673507093452964351257962696133511725652320*e^(299*I*
c) + 1869154744365675149263514056231175032619875083519300838245664444356891
39233683411704641828762178799177848064220150818355261280*e^(298*I*c) + 1848
311519837489418176678501747082571381281721582694132877653585322407732443361
91900818557829905895684494889410451921524212840*e^(297*I*c) + 1814081687709
220598203685533166973216399848626282988285695602732956308976268293452635922
19034560853530733710529842148537901680*e^(296*I*c) + 1767209299705546420045
757700530957005953346598706827320319759155323875770524148663235111401176804
92929354517559479899220940360*e^(295*I*c) + 1708698488689531011768603060531
039943405303903472600884326768425055551412938308389612759742689286664948457
23462544709102843680*e^(294*I*c) + 1639778160596077253752645598165058478941
877851014553603918974244829984153857876057653155092083377415901430785722435
05132706580*e^(293*I*c) + 1561859629535511961697382188321736965098525515892
107305783657274762594764744659554285023366737436864991756986778756936112434
00*e^(292*I*c) + 1476489208055453334186231217678537773997829247483012287939
24342574999937955421765370101235122939557467548549202174550009604780*e^(291
*I*c) + 1385297945491510894513527695765434031263307472436800308324672058958
19043568155239264876762867172754338684027849855385453216080*e^(290*I*c) + 1
289950760115919034107638634270973299485861735745958627058491592809430464587
42663163454018491463855395649453952212899632198680*e^(289*I*c) + 1192097137

020339270557553978236884444446474243245021853286263470465996347211465738306
81540495333543146776810911910410468628960*e^(288*I*c) + 1093325373499662232
039326785034263570798637070017282940110420765304039238626540189786765164173
14221089449922495612732870169660*e^(287*I*c) + 9951220647205796595134034173
802354851533640337171789804085047095465753297727911349150688029072611115410
1941386019689567958040*e^(286*I*c) + 89883815801382382213973270477954602744
792877018051963347146307372464315121274929402347942874802899499538953561056
667668891020*e^(285*I*c) + 805662491306826841818762018826235112063637903372
180119541102106429277659976449038205954219368735653146544157690704726554016
00*e^(284*I*c) + 7166032986117339552444194388928410913409115784465524567208
4237402434944696464927131812190659629511140639501743303863582092880*e^(283*
I*c) + 63247774101012179051794946075175569924076981338138483158042406747453
874729387631710544995247152912205118500597511052824347680*e^(282*I*c) + 553
909130449720862194326891463315660814279598969699002144342968177311508638670
56620768608187679709720152974148474907904177340*e^(281*I*c) + 4813311767818
402921650374854911037447892471909463560389282936486391655379227882295736828
5106328164715910598370871149079494360*e^(280*I*c) + 41499832121963708043788
523787401345541780088930538206918853579026749273364671640037563488607716092
887686471542838602788559660*e^(279*I*c) + 355001031060196498762723767969494
822095813723710360050128778060274816728070599434452401363155685007323799665
85005678181937920*e^(278*I*c) + 3012848241455270326455901895308817715601343
749343820107841376983544836614812175454919759112996717076496970018034869920
7838960*e^(277*I*c) + 25367176439119353621532260335983348154904982606125761
711300683492963390816491583025705268737539982149639300226512657426118880*e^
(276*I*c) + 211883214058828875396101983747068626958940492260770937641325125
13336190523978949694387686059124526755048042957954264706637460*e^(275*I*c)
+ 1755627327122429239688729140312571621349148626114547857137675169010565606
7838042151038271381300372757755676325408026834544840*e^(274*I*c) + 14429816
285208431204532978375375691965063154224649747551295851507389524083226976789
688601369628399900747658579201929300744260*e^(273*I*c) + 117642122748764840
800109007146734744933712781605578119837244558265660556176580864793686418649
08119643412413644803772131657280*e^(272*I*c) + 9513032274019522954209113191
268226642299912013525665940298381064797885690904993128948035227412144035633
851779511219335277360*e^(271*I*c) + 762973181562782158046899242420700836643
889673633302466186383810511044514894696232829763154703254341981182101583786
3013682720*e^(270*I*c) + 60689498031567122483318711053298954717228061430088
78014986559653687260694816550470195890004511965527567432722969707577202160*
e^(269*I*c) + 4787527442780945685145204846971596165304169419328244073211459
592129649255048876854059844720661078151288179612574986359194560*e^(268*I*c)
 + 374525759487665120465733498842622638814395450198683066422234922636107960
9546822276067504899386703088982308185717143407211328*e^(267*I*c) + 29053857
223200570019533452744894827908566925299598237495326959634141648333667731282
18607899328588608916176593772088622582464*e^(266*I*c) + 2234891276398439464
478622578306434840724610484468177859822620658691921478645266653062563823553
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+ 181157684956157580767103030555056255892542936591933141534183339445964 08*e
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*c) + 70164515322544462906873548813748091084561870680*e^(112*I*c) + 5605927
253067558551780452883689835514455118670*e^(111*I*c) + 432333688644261557547
944179250800440604964868*e^(110*I*c) + 3214788769337533881745448251537735O3
83950278*e^(109*I*c) + 2302150411226234925855222345201500900533576*e^(108*I
*c) + 158566476113257562566117432227203884298856*e^(107*I*c) + 104904026695
10897424624643766470754045064*e^(106*I*c) + 665634670676210063754191847l099
71141414*e^(105*I*c) + 40443624781415311581857832389099634564*e^(104*I*c) +
 23489983742443470795327662030756O7598*e^(103*I*c) + 130171193079172823835l
51430773360024*e^(102*I*c) + 68683292252636813495019973413205l7*e^(101*I*c)
 + 34427715201287513414073930296O914*e^(100*I*c) + 163531646471515302405291
37618111*e^(99*I*c) + 734057263616388449968842366924*e^(98*I*c) + 310422225
22074681615625020522*e^(97*I*c) + 1232445557346832245176696904*e^(96*I*c) +
 45759117183402579073139583*e^(95*I*c) + 1581796642397812408161814*e^(94*I*
c) + 50648660944512569972179*e^(93*I*c) + 1493326612293984160368*e^(92*I*c)
 + 40261256699368950388*e^(91*I*c) + 984382804329835768*e^(90*I*c) + 216084
03021340047*e^(89*I*c) + 420601518659718*e^(88*I*c) + 7146142307307*e^(87*I
*c) + 103818048048*e^(86*I*c) + 1253841160*e^(85*I*c) + 12085216*e^(84*I*c)
 + 87153*e^(83*I*c) + 418*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) + 7*(3
289*I*a^2*e^(1027/2*I*c) + 1282710*I*a^2*e^(1025/2*I*c) + 249487095*I*a^2*e
^(1023/2*I*c) + 32266997620*I*a^2*e^(1021/2*I*c) + 3121832019735*I*a^2*e^(1
019/2*I*c) + 241005431923542*I*a^2*e^(1017/2*I*c) + 15464515215103422*I*a^2
*e^(1015/2*I*c) + 848339120374563870*I*a^2*e^(1013/2*I*c) + 406142353884741
75675*I*a^2*e^(1011/2*I*c) + 1723848657662144174935*I*a^2*e^(1009/2*I*c) +
65678633862380668978797*I*a^2*e^(1007/2*I*c) + 2268898261084114322780091*I*
a^2*e^(1005/2*I*c) + 71659370101867067314058647*I*a^2*e^(1003/2*I*c) + 2083
633993341511741962220545*I*a^2*e^(1001/2*I*c) + 561092868718983694960933879
80*I*a^2*e^(999/2*I*c) + 1406472792955917865136489871114*I*a^2*e^(997/2*I*c
) + 32964206157734965185866131506636*I*a^2*e^(995/2*I*c) + 7252125378443701
28223087979340181*I*a^2*e^(993/2*I*c) + 15028015438558971323851950737244424
*I*a^2*e^(991/2*I*c) + 294232725284515750583337235833091605*I*a^2*e^(989/2*
I*c) + 5458017104331277636863728788108882260*I*a^2*e^(987/2*I*c) + 96165064
470879466516856468979981298953*I*a^2*e^(985/2*I*c) + 1612950426544228644388
946118660228217326*I*a^2*e^(983/2*I*c) + 258072073946102626661957866259O249
9776722*I*a^2*e^(981/2*I*c) + 394635224423835765377875194556169798413535*I*
a^2*e^(979/2*I*c) + 5777459899431421909042575858969918573070140*I*a^2*e^(97
7/2*I*c) + 81106652413090837180607129215519047725478483*I*a^2*e^(975/2*I*c)
 + 1093437897602872607661796947121707741043900200*I*a^2*e^(973/2*I*c) + 141
75642370639692917078404160115322319156841267*I*a^2*e^(971/2*I*c) + 17695113
835259569076285557490608492129752010602O*I*a^2*e^(969/2*I*c) + 212931227380
3633942958758817457586335895472623670*I*a^2*e^(967/2*I*c) + 247275008153416
29941828329931180779105649314030308*I*a^2*e^(965/2*I*c) + 27741169671260636
7968860766543182757632328151469299*I*a^2*e^(963/2*I*c) + 300949720391566796
1566616687959439264027968787987497*I*a^2*e^(961/2*I*c) + 315997284052108935

2337381463242323312885403217275646 5*I*a^2*e^(959/2*I*c) + 32141447475846894 996309751904644239749045565890023927 5*I*a^2*e^(957/2*I*c) + 316950495586183 089295956179530881176784209731658880274 1*I*a^2*e^(955/2*I*c) + 303244653699 491590065969305618425611765817035268516709 49*I*a^2*e^(953/2*I*c) + 28169846 050294270763262164722315596813536626330134088871 4*I*a^2*e^(951/2*I*c) + 254 25106390404807108651338181422423686517120538118824533 86*I*a^2*e^(949/2*I*c) + 2231054581606311319879937318202593099885485870152905960643 0*I*a^2*e^(947 /2*I*c) + 190456027772701631222167952225792270942344905110743699547445*I*a^ 2*e^(945/2*I*c) + 15826003344075823437505596955922079127429943735260056972 05768*I*a^2*e^(943/2*I*c) + 128080347774618455483945008302899308595078582601 54054185630469*I*a^2*e^(941/2*I*c) + 101008942321601073058743812539394339550 24047656166059710043447 8*I*a^2*e^(939/2*I*c) + 776647619316228317354588546 587427508115665747952666669113195515*I*a^2*e^(937/2*I*c) + 5824866485485956 160870802202075534098780512067011784177572657920*I*a^2*e^(935/2*I*c) + 4263 3143603942943140960289773464948350711612149585795367207109320*I*a^2*e^(933/ 2*I*c) + 3046499772769501139302840524760863989906393256035330224324483420 8*I*a^2*e^(931/2*I*c) + 2126337571797794379046038412612976575112869060832179 063823545402908*I*a^2*e^(929/2*I*c) + 145016615936067949006796448972457610 52226002310796800725001239143760*I*a^2*e^(927/2*I*c) + 966780414697215163903 195446908306004789162984925007159254875785415 00*I*a^2*e^(925/2*I*c) + 63026 86574335141509959590992615026489824355882181769465853507503300 80*I*a^2*e^(9 23/2*I*c) + 4019464980430704864646368121098631727141859823429991139565731831 230220*I*a^2*e^(921/2*I*c) + 250845500422700380518750411245971355879039847 888050487946929540258261 36*I*a^2*e^(919/2*I*c) + 1532445607518458740098623 7 4935321310982256761779852307795222356568491560*I*a^2*e^(917/2*I*c) + 916735 98781517962795368688557365414713659035709524636175023931519289578 0*I*a^2*e^ (915/2*I*c) + 537178494747812070904441950420395677378524800864619084951602 7804337557760*I*a^2*e^(913/2*I*c) + 3084167163686023594025629181950034538258 681367264163167467247711115025138 0*I*a^2*e^(911/2*I*c) + 173551107925703126 2153418391660396635185944170698555041465076615602255732 00*I*a^2*e^(909/2*I* c) + 957431997822534541730101183991336666779272312332587320282649934086537 087060*I*a^2*e^(907/2*I*c) + 517960069176882056183957964121554034024032637 40978925827740730424431619475 20*I*a^2*e^(905/2*I*c) + 27485598792264285077359 588674910772175227041673233676962838136429637468948920*I*a^2*e^(903/2*I*c) + 14310135107329314200928393322744086315084207259642318859791923952541865 1353760*I*a^2*e^(901/2*I*c) + 731168247557642740954546447803172304438120782 922849282615551880122607710743390*I*a^2*e^(899/2*I*c) + 3667144340630566629 952111359806942570024766504496043462982986858382541115071320*I*a^2*e^(897/2*I *c) + 180582039765624777920702824868131545497202755214229132567687359197264 39041572530*I*a^2*e^(895/2*I*c) + 873278235981003749943170773874102490715866 43589864753197028556930729086578763100*I*a^2*e^(893/2*I*c) + 4148154663438 23656661064248622633682876622904026735200531896157088593130927151330*I*a^2* e^(891/2*I*c) + 193584824796658467270245398097009014869676056846556322974360 26173950819587318941 20*I*a^2*e^(889/2*I*c) + 887746287193902688630299031343 74141848834995107825108462673989666121989234153581 00*I*a^2*e^(887/2*I*c) +

40012171151122678514041860836408151256588288243462089966844126253521402025
344585140*I*a^2*e^(885/2*I*c) + 17728136327009352771901612956277015227116l6
98446488654079612113477246381397761958630*I*a^2*e^(883/2*I*c) + 77229171606
3274992440312252346975737223667501767420222475960558356343854661390320930*I
*a^2*e^(881/2*I*c) + 330844802957560533379192984154489131546772530613357810
804078622771497062347120686O370*I*a^2*e^(879/2*I*c) + 1394013614871626799 56
07572857020772155406626631585810450884412302964119799649057708170*I*a^2*e^(
877/2*I*c) + 577806553230040116611059501868014698166807783088814376692427 70
005565033316643354683390*I*a^2*e^(875/2*I*c) + 235635985209174973386390401 6
7583647055068468867444157908647101635298045818037699521 4350*I*a^2*e^(873/2*
I*c) + 9456130689672156761112053659663101183612541357423858990367043963263 7
866125524617034516O*I*a^2*e^(871/2*I*c) + 373478089910366692489689117273418
3450725814252830409400966717277658895882383641210262740*I*a^2*e^(869/2*I*c)
 + 145198424329150757899071995292829628727523094108456259824807069742661564
471452329072187 60*I*a^2*e^(867/2*I*c) + 555734480019596122399368263240229 72
697759730966309101308647950811663281594543780392273650*I*a^2*e^(865/2*I*c)
+ 2094321349963134896477553415451998346478224385044127277546599443877082 40
0711216670301632 0*I*a^2*e^(863/2*I*c) + 777230951154547586594905586759083 41
8923490516228159852999058710437580204374586904243317010*I*a^2*e^(861/2*I*c)
 + 284083711975827938987199833034861027134073142157853888485619458708184061
4185808628164270200*I*a^2*e^(859/2*I*c) + 10227965293949311655493133309531 6
79349667296556076415563536820773718188117601532107888284410*I*a^2*e^(857/2*
I*c) + 362772662933946680165798951001054897492568449357497888227397685605 69
7399147924179419506840 60*I*a^2*e^(855/2*I*c) + 1267758656269502633093199438
385549548514983436765763554138936975646040567329974234894957 58180*I*a^2*e^(
853/2*I*c) + 436564397547890123843522035766730185021502894107522026965503 38
594202689135795327144286443287 0*I*a^2*e^(851/2*I*c) + 1481567399139257220 74
29848568108173372768854740195762666300356158657011223126384987165010094 80*I
*a^2*e^(849/2*I*c) + 495571453868242674634106948466054832300323257913018010
668272882734753354775257635770795225467 0*I*a^2*e^(847/2*I*c) + 163400020409
1210100590797125421570995776255824418623935682301379145403318430057504976 72
79180480*I*a^2*e^(845/2*I*c) + 531137409743579240772619244249540269676320 12
0134376141267966739592578921048850228555378428378 70*I*a^2*e^(843/2*I*c) + 1
70222710336837610306807757193860228120987512824907093714928636744016809901 9
483466471612901524 40*I*a^2*e^(841/2*I*c) + 53793487181496539165714918185626
678636202144891590273417058960043175924486145773145709925316254 0*I*a^2*e^(8
39/2*I*c) + 16764406355823040334250228767681225776355206387140905644236329 0
413562388212436456451338526839180 0*I*a^2*e^(837/2*I*c) + 515272076996083 24
5578376716126106022684268106522315494316716125362986122359504287481709712 64
0290*I*a^2*e^(835/2*I*c) + 1562131726958516297435003770166207390383206605 30
37757389465930231456447027071754543682438008358530*I*a^2*e^(833/2*I*c) + 46
716792307241842863573677106083383910064862209310631692655943363496941035047
44375235288933535175 0*I*a^2*e^(831/2*I*c) + 13782990714455520413264945567 80
33264359071427275235571619960841318324458723810685070899479318058190*I*a^2*
e^(829/2*I*c) + 40120733298154037019072011843782949228393545866397197866634

6363722054305243088217239312307931028910*I*a^2*e^(827/2*I*c) + 115236006982
2687343926968717100258398548040389465088546211865774860214546247592676728884
8874609796890*I*a^2*e^(825/2*I*c) + 32661763125835208177139051639350845317
4232486921186787623770196293150093328600688718035861316410590 0*I*a^2*e^(823/
2*I*c) + 91360918752907492922523432891090914381778613753187243736232513547 0
1581584015968521795430968115978060*I*a^2*e^(821/2*I*c) + 252224479792507085
5508755512528284721015817964178184919185591315573809227332815226920458440 70
17233480*I*a^2*e^(819/2*I*c) + 68731484148635694613385798142456583980432634
5601504383954155552620114204227468987836793695309926228 30*I*a^2*e^(817/2*I*
c) + 18488468817719678544983991709427978555464915831737250649878709581237 83
85154076443311386842899167584820*I*a^2*e^(815/2*I*c) + 49097255278454453591
1512963964502667546666352962707817110492155631344301953639158569622404376 53
6434270*I*a^2*e^(813/2*I*c) + 128723590620437935187166578688363744192559416
78628982189623576526771166876931176774676597758459015375 60*I*a^2*e^(811/2*I
*c) + 33322431705753872778973745658477817386812092577337748008662132629038 4
5566248518176236173736361200045650*I*a^2*e^(809/2*I*c) + 851775487746162175
9210417588818371506968729108804601331731430678777356891192908584411369617 45
7579050080*I*a^2*e^(807/2*I*c) + 21500827535518186504932611299301899347949 9
255866679289481284717519355330410512453037990070695462624781 20*I*a^2*e^(805
/2*I*c) + 53599146402224802194955307591891208395245153076777159512871130579
3688363144431435602218655486095731520 00*I*a^2*e^(803/2*I*c) + 1319665076093
2284734410125944585905299321803599280979966449679604976847591450553987389 84
6940240641397062 0*I*a^2*e^(801/2*I*c) + 32092434143259237408969311139904211
29507755356587260813434258259337528680562102947665310992212368558792 80*I*a^
2*e^(799/2*I*c) + 77091069649717521549831816316530964542702202376033120168 0
94418664242118437397683992802319166217676883126 0*I*a^2*e^(797/2*I*c) + 1829
3501339632766443945532790262844261778484422754576862101588579449438190747 98
78316132404249899731742784 0*I*a^2*e^(795/2*I*c) + 428853865290988784913058 9
8473516376430298484507783019644947145920525911974817319124714265895202435 16
263980*I*a^2*e^(793/2*I*c) + 993274862975458243738222636588642931824145911 0
941837582719271408317025926367392879382082082371215951644280*I*a^2*e^(791/2
*I*c) + 22730271448253866436128571775414833413708248224531663198648199827 17
98650504341746125813848792036508683832 40*I*a^2*e^(789/2*I*c) + 513974838431
9518996364905073658378182514140436383413544728268708912254880303684703641 53
43525663901500899300*I*a^2*e^(787/2*I*c) + 114843847074590657631454363871 04
0863902989618519194699666927573281569036469561814440348196035699469668453 92
0*I*a^2*e^(785/2*I*c) + 25358783719080902176724800908666865141518002646977 9
51644478599118390764819819215042345749940902415525002034 0*I*a^2*e^(783/2*I*
c) + 55338797340131164244782307761660787627812715207184367067878601723278 04
19838284554774403815733341601209348720*I*a^2*e^(781/2*I*c) + 11935402122039
7014942135234141956609023749592497738182697151332343431032629306594684349 33
632253502011348147 40*I*a^2*e^(779/2*I*c) + 2544342231694517514161680716829 6
9232871943805193934623293742276813310269382248781513333283180878236087862 81
92*I*a^2*e^(777/2*I*c) + 53612973438697171084667990993019942224648313925343
1740706135245576015523272756107308230258781209064374339900 0*I*a^2*e^(775/2*

I*c) + 11167208352144019218695116437660885213882258119098031252190023761494
0167917167791540907427929390911739677433 60*I*a^2*e^(773/2*I*c) + 2299449489
73854262209732284944371841205064362506764494005110125405598608370459161596 3
29114641555265493814313 15*I*a^2*e^(771/2*I*c) + 4680923744177608807704545 67
77905215867470570850449000893912280817571182977850837876372230244610062044 4
42700310*I*a^2*e^(769/2*I*c) + 94208774273445933221381421063663460535074325
778510459824107482126170497962647591802858889673576512075885532301*I*a^2*e^
(767/2*I*c) + 18746779224890892995613305742194609608790340706831759147677 14
47547750719179954808764060229352667984915509463936*I*a^2*e^(765/2*I*c) + 36
88592850476133350192918636007388554862660831641907600593561496904171642535 1
9144904038488540679789464913316445*I*a^2*e^(763/2*I*c) + 717656376155907065
75993621201897435613997302459565768782917263735539633696807091745008916598 8
836269386494950630*I*a^2*e^(761/2*I*c) + 13807562091068083963048454315958 86
38849741545601625200997596754800339156594182192727676206460145540300425889 2
730*I*a^2*e^(759/2*I*c) + 262714955331732776996937324430787244448668913714 3
16009980896477820182244220568490625620122915460498214666575986 6*I*a^2*e^(75
7/2*I*c) + 494359054885747041326424059607666490704640083492999176385680937 4
01888141983036472792261158520108962013602631781 3*I*a^2*e^(755/2*I*c) + 9200
52381638436744254578543846985038761040130729716544440870038146259625460404 3
289564337709717004801142921086301*I*a^2*e^(753/2*I*c) + 1693625331579961235
69834492593271983021749834450013363088002001496289631737640730425866037121 3
0511291927885438795*I*a^2*e^(751/2*I*c) + 3083749848683136795739515185475 65
75713960143102205258573546485344350017752690692420574468301659995665557849 2
52505*I*a^2*e^(749/2*I*c) + 55541830059974544592261992151514835449978278080
976148376085630868939554780159003409328213277398065169847689092217*I*a^2*e^
(747/2*I*c) + 98960678773813324779073314105327289904799166585670602821693 08
73585939217450231222001527759561393798466733972686 83*I*a^2*e^(745/2*I*c) +
17443304191582619751150289026376308365648606434003211128181112257204791302 4
5546381572787948720906519832448708195 88*I*a^2*e^(743/2*I*c) + 3041869819363
76843785877821011229471645115593422740196358066172545425512140368656569425 0
6381573722692618338446338 2*I*a^2*e^(741/2*I*c) + 524832187724682925583215 78
81667627824890935336768694834984095165643527820241984729598824546407896260 6
8104536529860*I*a^2*e^(739/2*I*c) + 89596385995815249354741286458491339573 4
89600555738979566027994138815083021855487062221945399170727960433413606955 5
*I*a^2*e^(737/2*I*c) + 15134671091887847229269187320752666283642824119286 29
64843821852426223068717704466663954740949682836395315908652378 4*I*a^2*e^(73
5/2*I*c) + 25298238884991355892821131913253755249659555212119888415014985472
650667601219344135752131106253007866458697018787603*I*a^2*e^(733/2*I*c) + 4
18470475505282616597452730095042080706298301459964727212371979735850661470 5
996884999995742988258778935888841569436*I*a^2*e^(731/2*I*c) + 6850450138887
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84499805233405257763454857 5*I*a^2*e^(729/2*I*c) + 110987938527300499004674 7
76201902535882154653907851326766060453591775405326296398360077204553326040 3
3960540691735410*I*a^2*e^(727/2*I*c) + 17797442845524838953370802687166119 5
80730736872218590980608472358385298518927411763760232529180518492429027751 8

50574*I*a^2*e^(725/2*I*c) + 282479847294799923017954803631530774151264080604268676905388806880723175616348614898305442604902284061474270385508255*I*a^2*e^(723/2*I*c) + 443801139783859724656446823619250517026966277909604986097724207533119350970961358577684375007279052588381677747466676*I*a^2*e^(721/2*I*c) + 690213788319592291004146400087880699724418947841938490437682218370873698850984477317198087413755636822267211721871255*I*a^2*e^(719/2*I*c) + 10626652434334321766459036135723116162292100113522303870748347369043788287269069720529681610816049229680267998871588880*I*a^2*e^(717/2*I*c) + 161975924681252579129431400371746487242592407971142243019930752714928435249070757766463734847432577359619977355420469*I*a^2*e^(715/2*I*c) + 244438320189285770758072209569819199911939772156217049270750129458305503233074093209191113768334682284550770545377772*I*a^2*e^(713/2*I*c) + 365238706137359616600070699619082139713753640264690466720702053560311601516116895520683068293669417046374470910362666*I*a^2*e^(711/2*I*c) + 540377176751496499428418826628855415406366794419862095248202798863714210847135333597884562826909393930942090796205420*I*a^2*e^(709/2*I*c) + 791688014108601034196938571902557001504845712196126073563496646347934496907150906085300660569889896692451445978865145*I*a^2*e^(707/2*I*c) + 114860931018421184347532224687086442580311388303908132774332447216680617304783610999034334551040241487996672647029178 3*I*a^2*e^(705/2*I*c) + 1650350698805938712642664838416272826987109207941606600565610490821766363203204649976483902793933869670965683695305667*I*a^2*e^(703/2*I*c) + 234849896924574057189558006491888732976955249553022253433577431382685457997162651232470672691565288715390666445716791 7*I*a^2*e^(701/2*I*c) + 331008697591622174183153895990834913625550955973233843790010058701225396750102044096046461766466151960204735872883478 3*I*a^2*e^(699/2*I*c) + 462112894333759536408849281744322264217611058625067976858055827538677708192611061558542717489800705734478779181173015 5*I*a^2*e^(697/2*I*c) + 639059381238672274690176185605654449852208047118165458611805086921344998723336140222214498323497550520326833840406907 0*I*a^2*e^(695/2*I*c) + 875474694138014080876719396593223537696370308846563407735446524300917634089580857705723275087251797204997746064089361 4*I*a^2*e^(693/2*I*c) + 118817392003719339723430585761058535199243991458482295045064526172323144917169951597187258083471599990453661939291266 22*I*a^2*e^(691/2*I*c) + 159762621405412190663910739051968522660967095555416803601179381870799961112986300465386664650227903998822734800953121 59*I*a^2*e^(689/2*I*c) + 212840204947745811406822158568352116473795328945261225223981686063833105296594297394507322896417421114319904375169702 20*I*a^2*e^(687/2*I*c) + 280957021041118522598744644724249791347012037766997432412309430918895925154477673324353510599672424676384909560396532 15*I*a^2*e^(685/2*I*c) + 367500552007064933329079576591406661210881823897004729959895322413813884810410417370538451027521647592250769768534478 70*I*a^2*e^(683/2*I*c) + 476356198918911917256834232268343221988791178397961063806977497695505656758649254888840194473399570479671642089470315 69*I*a^2*e^(681/2*I*c) + 611906118965037637892720728786420532096243751120063245517042845318091285849297344426195732340484752667721271080927210 24*I*a^2*e^(679/2*I*c) + 779004300384723884935232975431911048967136999667144514252374561025240310302823321338814039617775837396480963 8

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2471719654306955806539749713942241017532879502301920494398612936404469594040*I*a^2*e^(629/2*I*c) + 18970209723889902073090231199158617114497313785893918818304530224685404433480392508658601835348622399969836618314711219 40*I*a^2*e^(627/2*I*c) + 19122308081138584788668707537127145552895338163947353072431952183595188031298875605934499416868822938385590499403383135 80*I*a^2*e^(625/2*I*c) + 19054575974587767099308274728664472619871765635831290025680225923891159832551223964908818655213249312023622996712438847 00*I*a^2*e^(623/2*I*c) + 18753485524035545493129726408878859026570896801025971012904827035555579206035044140356958538224537580495094308796462450 20*I*a^2*e^(621/2*I*c) + 18210035854032737025744328514509142916588147868776217401985755121790926026929292253634528839453136031522848868384271405 80*I*a^2*e^(619/2*I*c) + 17420216157597704881980592173187783479260478704271822432208642788940531555651244703514636568751987195239157914264983048 20*I*a^2*e^(617/2*I*c) + 16385327819346536052239396713240760402726605340919849179325753692600550549519632112132141421909966085106751750783916844 00*I*a^2*e^(615/2*I*c) + 15112151322272361544648034651845615639774729754642433583118483824319425286621504814636959977487661983184651355712719 10040*I*a^2*e^(613/2*I*c) + 13612949543759629642088450056290782394016690393701279011576123197073802655475683195076517108758877257733740763684657247 20*I*a^2*e^(611/2*I*c) + 11905305121575296175086866386442896318840701055904591578584092699930653205140563462415594252233469595452131461689324159 00*I*a^2*e^(609/2*I*c) + 10011795560041776349963765861584492654345810660623359826739205495298200946823533529187955948032308867116111535654663811 20*I*a^2*e^(607/2*I*c) + 79595154084496436210576536979994290756854921044563232272047519922198232421627874722412925126132131455441931385797853462 0*I*a^2*e^(605/2*I*c) + 57794599842887400171112143476924282413532375068565558999758340355996298184904841816223547091239816029854234000089682056 0*I*a^2*e^(603/2*I*c) + 35057895912017819591634733445330903856400507887727722468230952148880070663783881278322621419430755379138925305910755214 0*I*a^2*e^(601/2*I*c) + 11749969028424879445352846142617711601060131299184434339774574004970179814189310291131965444345301062465138193066656756 0*I*a^2*e^(599/2*I*c) - 11749969028424879445352846142617711601060131299184434339774574004970179814189310291131965444345301062465138193066656756 0*I*a^2*e^(597/2*I*c) - 35057895912017819591634733445330903856400507887727722468230952148880070663783881278322621419430755379138925305910755214 0*I*a^2*e^(595/2*I*c) - 57794599842887400171112143476924282413532375068565558999758340355996298184904841816223547091239816029854234000089682056 0*I*a^2*e^(593/2*I*c) - 79595154084496436210576536979994290756854921044563232272047519922198232421627874722412925126132131455441931385797853462 0*I*a^2*e^(591/2*I*c) - 10011795560041776349963765861584492654345810660623359826739205495298200946823533529187955948032308867116111535654663811 20*I*a^2*e^(589/2*I*c) - 11905305121575296175086866386442896318840701055904591578584092699930653205140563462415594252233469595452131461689324159 00*I*a^2*e^(587/2*I*c) - 13612949543759629642088450056290782394016690393701279011576123197073802655475683195076517108758877257733740763684657247 20*I*a^2*e^(585/2*I*c) - 15112151322272361544648034651845615639774729754642433583118483824319425286621504814636959977487661983184651355712719

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^2*e^(555/2*I*c) - 12427138578892099447946268890822760759771418438584651594
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I*c) - 10209493077610466854838516945991767441594519203111144829196413299151
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531/2*I*c) - 22808682197921316199415479789836114095676782453865285024692419
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*c) - 187247524619750552433254678023898305056473020604518334425544613285283
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2*I*c) - 114860931018421184347532224687086442580311388303908132774332447216
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^(479/2*I*c) - 690213788319592291004146400087880699724418947841938490437682
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5/2*I*c) - 252982388849913558928211319132537552496595521211988841501498547 2
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/2*I*c) - 989606787738133247790733141053272899047991665856706028216930873 58
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(443/2*I*c) - 494359054885747041326424059607666490704640083492999176385680 9
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a^2*e^(425/2*I*c) - 1116720835214401921869511643766088521388225811909803125
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 - 5361297343869717108466799099301994222464831392534317407061352455760155232
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c) - 253558783719080902176724800908666865141518002646977951644478599118390764
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- 99327486297545824373822263658864293182414591109418375827192714083170259263
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c) - 687314841486356946133857981424565839804326345601504383954155552620114 2
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65/2*I*c) - 156213172695851629743500377016620739038320660530377573894659302
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5/2*I*c) - 531137409743579240772619244249540269676320120134376141267966739 5
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423489495758180*I*a^2*e^(343/2*I*c) - 362772662933946680165798951001054897 4
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- 1022796529394931165549313330953167934966729655607641556353682077371818 81
1760153210788828441 0*I*a^2*e^(339/2*I*c) - 284083711975827938987199833034 86
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I*c) - 777230951154547586594905586759083418923490516228159852999058710437 58
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*I*c) - 555734480019596122399368263240229726977597309663091013086479508116 6

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 - 235635985209174973386390401675836470550684688674441579086471016352980458
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*a^2*e^(315/2*I*c) - 177281363270093527719016129562770152271161698446488654
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2*I*c) - 887746287193902688630299031343741418488349951078251084626739896661
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*I*a^2*e^(305/2*I*c) - 8732782359810037499431707738741024907158664358986475
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) - 36671443406305666299521113598069425700247665044960434629829868583825411
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*I*c) - 2748559879226428507735958867491077217522704167323367696283813642963
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c) - 1735511079257031262153418391660396635185944170698555041465076615602255
73200*I*a^2*e^(287/2*I*c) - 30841671636860235940256291819500345382586813672
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e^(281/2*I*c) - 15324456075184587400986237493532131098225676177985230779522
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^(273/2*I*c) - 966780414697215163903195446908306004789162984925007159254875
78541500*I*a^2*e^(271/2*I*c) - 14501661593606794900679644897245761052226002
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612976575112869060832179063823545402908*I*a^2*e^(267/2*I*c) - 3046499772769
50113930284052476086398990639325603533022243244834208*I*a^2*e^(265/2*I*c) -

4263314360394294314096028977346494835071161214958579536720710932O*I*a^2*e^(263/2*I*c) - 5824866485485956160870802202075534098780512067011784177572657920*I*a^2*e^(261/2*I*c) - 776647619316228317354588546587427508115665747952666669113195515*I*a^2*e^(259/2*I*c) - 1010089423216010730587438125393943395502404765616605971004344 78*I*a^2*e^(257/2*I*c) - 128080347774618455483945008302899308595078582601540541856304 69*I*a^2*e^(255/2*I*c) - 158260033440758234375055969559220791274299437352600569720576 8*I*a^2*e^(253/2*I*c) - 190456027772701631222167952225792270942344905110743699547445*I*a^2*e^(251/2*I*c) - 223105458160631131987993731820259309988548587015290596064 30*I*a^2*e^(249/2*I*c) - 254251063904048071086513381814224236865171205381188245338 6*I*a^2*e^(247/2*I*c) - 281698460502942707632621647223155968135366263301340888714*I*a^2*e^(245/2*I*c) - 30324465369949159006596930561842561176581703526851670949*I*a^2*e^(243/2*I*c) - 3169504955861830892959561795308811767842097316588802741*I*a^2*e^(241/2*I*c) - 32141447475846894996309751904644239749045565890023 9275*I*a^2*e^(239/2*I*c) - 3159972840521089352337381463242323312885403217275 6465*I*a^2*e^(237/2*I*c) - 3009497203915667961566616687959439264027968787987497*I*a^2*e^(235/2*I*c) - 277411696712606367968860766543182757632328151469299*I*a^2*e^(233/2*I*c) - 24727500815341629941828329931180779105649314030308*I*a^2*e^(231/2*I*c) - 2129312273803633942958758817457586335895472623670*I*a^2*e^(229/2*I*c) - 176951138352595690762855574906084921297520106020*I*a^2*e^(227/2*I*c) - 14175642370639692917078404160115322319156841267*I*a^2*e^(225/2*I*c) - 1093437897602872607661796947121707741043900200*I*a^2*e^(223/2*I*c) - 81106652413090837180607129215519047725478483*I*a^2*e^(221/2*I*c) - 57774598994314219090425758589699185730701 40*I*a^2*e^(219/2*I*c) - 39463522442383576537787519455616979841353 5*I*a^2*e^(217/2*I*c) - 258072073946102626661957866259024997767 22*I*a^2*e^(215/2*I*c) - 161295042654422864438894611866022821732 6*I*a^2*e^(213/2*I*c) - 96165064470879466516856468979981298953*I*a^2*e^(211/2*I*c) - 5458017104331277636863728788108882260*I*a^2*e^(209/2*I*c) - 294232725284515750583337235833091605*I*a^2*e^(207/2*I*c) - 15028015438558971323851950737244424*I*a^2*e^(205/2*I*c) - 725212537844370128223087979340181*I*a^2*e^(203/2*I*c) - 32964206157734965185866131506636*I*a^2*e^(201/2*I*c) - 1406472792955917865136489871114*I*a^2*e^(199/2*I*c) - 56109286871898369496093387980*I*a^2*e^(197/2*I*c) - 2083633993341511741962220545*I*a^2*e^(195/2*I*c) - 71659370101867067314058647*I*a^2*e^(193/2*I*c) - 2268898261084114322780091*I*a^2*e^(191/2*I*c) - 65678633862380668978797*I*a^2*e^(189/2*I*c) - 1723848657662144174935*I*a^2*e^(187/2*I*c) - 40614235388474175675*I*a^2*e^(185/2*I*c) - 848339120374563870*I*a^2*e^(183/2*I*c) - 1546451521510342 2*I*a^2*e^(181/2*I*c) - 241005431923542*I*a^2*e^(179/2*I*c) - 3121832019735*I*a^2*e^(177/2*I*c) - 32266997620*I*a^2*e^(175/2*I*c) - 249487095*I*a^2*e^(173/2*I*c) - 1282710*I*a^2*e^(171/2*I*c) - 3289*I*a^2*e^(169/2*I*c))/(e^(517*I*c) + 418*e^(516*I*c) + 87153*e^(515*I*c) + 12085216*e^(514*I*c) + 1253841160*e^(513*I*c) + 103818048048*e^(512*I*c) + 7146142307307*e^(511*I*c) + 420601518659718*e^(510*I*c) + 21608403021340047*e^(509*I*c) + 984382804329835768*e^(508*I*c) + 40261256699368950388*e^(507*I*c) + 1493326612293984160368*e^(506*I*c) + 50648660944512569972179*e^(505*I*c) + 15817966423978124 0

8161814*e^(504*I*c) + 4575911718340257907313958З*e^(503*I*c) + 123244555734
6832245176696904*e^(502*I*c) + 3104222252207468161562502052*e^(501*I*c) +
7340572636163884499688423669247*e^(500*I*c) + 163531646471515302405291376181
11*e^(499*I*c) + 344277152012875134140739302960914*e^(498*I*c) + 6868329225
2636813495019973413205177*e^(497*I*c) + 130171193079172823835151430773360024
*e^(496*I*c) + 2348998374244347079532766203075607598*e^(495*I*c) + 40443624
7814153115818578323890996345644*e^(494*I*c) + 665634670676210063754191847109
971141414*e^(493*I*c) + 10490402669510897424624643766470754045064*e^(492*I*
c) + 158566476113257562566117432227203884298856*e^(491*I*c) + 2302150411226
234925855222345201500900533576*e^(490*I*c) + 321478876933753388174544825153
77350383950278*e^(489*I*c) + 432333688644261557547944179250800440604964868*
e^(488*I*c) + 5605927253067558551780452883689835514455118670*e^(487*I*c) +
70164515322544462906873548813748091084561870680*e^(486*I*c) + 8485522022765
1235649620013695967629536169631511З*e^(485*I*c) + 9925490738534402272939987
038714580495445431374618*e^(484*I*c) + 112391604542246650966429162063124338
952554575234051*e^(483*I*c) + 123309670013972336518199722075093259065528762
5342156*e^(482*I*c) + 13118781801172174729679339894318153694964675368481194
*e^(481*I*c) + 135442594916636116191574650625331646238501101627937224*e^(48
0*I*c) + 1357990663161479842850642848032544982878359839580349899*e^(479*I*c
) + 13231708870104896973800056733779919089340836756009580718*e^(478*I*c) +
125370496586921272662198050851269323171167338854081782959*e^(477*I*c) + 115
5855412893594260345544966642687823630035899363232371472*e^(476*I*c) + 10375
184499871175501909398956596684116802997082526660323524*e^(475*I*c) + 907226
05722208814918642284639487187764607589706493970774776*e^(474*I*c) + 7732046
36991145775061462731028098506094432675788136295011259*e^(473*I*c) + 6426195
485535248576425068136870465530087114003875716691383902*e^(472*I*c) + 521081
17629177048660492400985175830987505700566877818954141639*e^(471*I*c) + 4124
30698299915190848067222327219435067747934091894670488982928*e^(470*I*c) + 3
187749929744346497211536044751776582320958627923816470590659024*e^(469*I*c)
 + 24070801913529757101858022914372045864746991786182039740274325264*e^(468
*I*c) + 177642829135119348577194437675802830239905460092687136494961404333*
e^(467*I*c) + 1281817464914970810859604189828359000790789921169405304612211
251818*e^(466*I*c) + 904669352382568297904433896310426316767258682636791133
8826483549173*e^(465*I*c) + 62473550781053295317710774690247114124125187565
731848441781904032672*e^(464*I*c) + 422276126632003687547754746555709988710
527133086660161366353656787288*e^(463*I*c) + 279470910447568661184279069497
3699164482254723977210209725661304403472*e^(462*I*c) + 18115768495615758076
710303055505625589254293659193314153418333944596408*e^(461*I*c) + 115051481
852080848873700388354521315567640365124003103691176697194292320*e^(460*I*c)
 + 716099497599058079895633338552940229192858196481597830078819711862600096
*e^(459*I*c) + 436944248291011391456535313606959586266933885805341938121413
1241925047008*e^(458*I*c) + 26143976279902021443471945665080254563056810183
520401889800285493144867448*e^(457*I*c) + 153436088745056254127327239461577
071933130157764595997113973513183188399376*e^(456*I*c) + 883500968821791202
600774541927769200737689393513734789368397093333311961880*e^(455*I*c) + 499

2519712457043983505377976607953988397368297591114957991804893688371867680*e
^(454*I*c) + 276931165383432592259833826376479361226640338596151334898466664
694361471028310*e^(453*I*c) + 150822381431412413773566474210011746852297437
597059186295243989481140398152780*e^(452*I*c) + 806679543607589140759305010
796189568269842021613388955218916278823182639488190*e^(451*I*c) + 423812584
676323258639418856985868582675532800554862743701930140585132588759448O*e^(4
50*I*c) + 218764828927139099280403456125787058051215087562266963170876518 24
252241418663320*e^(449*I*c) + 110969199687320974749922259595250444341219218
5353496557625911925765358721517660 80*e^(448*I*c) + 553269128819528612502918
869558947829098021956309349843584044631512291778800081490*e^(447*I*c) + 271
184323967071752760564049014883350713024244840397831852323772194420039283010
8580*e^(446*I*c) + 130698172034882898861932055083758183921249913823401603 16
886507181296548981014818410*e^(445*I*c) + 619485966530355028795643388152343
106604109020378824731618047744929162165758800776 80*e^(444*I*c) + 2888207552
647306544699685720210471094273186195089958020206899045903194762954083242 80*
e^(443*I*c) + 132475641236783747315747282116248369112096650194895392649 2241
6437882642845464372211 20*e^(442*I*c) + 597899217294414321845916114929981970
632173211157849452524522874297646840910539553629 0*e^(441*I*c) + 26556806389
043407534496702369101545795994861757741414789944652712127566910185274123140
*e^(440*I*c) + 116104551683555043762911501712116399313733021132677481112824
047246361794049635726479850*e^(439*I*c) + 499707567253859084357596314813794
76806933719091596749190748890493392267757966535433896 0*e^(438*I*c) + 211758
973346685570710150142921041472240183883794075284161854144088854572994313820
9036820*e^(437*I*c) + 883672064086047030569451402154796955129679409226698 30
441183757900258545840367963647682 80*e^(436*I*c) + 363183696523025917321974 4
4409798122022640824604130552506742586795183267354382847875885730*e^(435*I*c
) + 147030816732276833163041582099592047512043725225353339238819165193000 40
7629544745753221740*e^(434*I*c) + 586403466972683242741643328921560909375 19
7453864243299571990964608857245771134145204174990*e^(433*I*c) + 23043510733
738403573791785976730663520166827816891398420973766631184888038411319353136
41840*e^(432*I*c) + 892320944734329676333188188163847179349961867060102605 9
730895962653291770229493028162575100*e^(431*I*c) + 340540538512955691543523
467221771726551875489107820085047183241687250294385891623492116280 40*e^(430
*I*c) + 128098914601688539672480541830409847707367500438601536803204497701 1
1991128908710565948278334 0*e^(429*I*c) + 475010578857601519272316617938425 2
2242178659724167102689431851540851146714096939311576879368 0*e^(428*I*c) + 1
736574218818191071874197472450158123883564209950658639102337148122769080611
680719741726053840*e^(427*I*c) + 625987215682225284365096070823503471020136
2776057176647226323089751446565288850103898153859920*e^(426*I*c) + 22251959
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457351580140*e^(425*I*c) + 780098073680242398756137330588514171253271146810
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63414140*e^(423*I*c) + 920089393029589032874601850027159322612526368444771 4
8978197436107884752889146883103843606495192 0*e^(422*I*c) + 3096131971621520

1623803015542414654517823620868102875377489029049859340201795657061771314216
14590*e^(421*I*c) + 1027936473066384084473957786246926260464886191429797258
9165243530651230690726244462479199894255180*e^(420*I*c) + 3367539887202156
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027090*e^(419*I*c) + 1088679957318294728267329051920348867972846213564456275
3090910442948674125782263347689835682645404 0*e^(418*I*c) + 34735147321471
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867777300*e^(417*I*c) + 109385321448622035867403243450086667849977001130587
41724889759516120314567346082870955195010419754 40*e^(416*I*c) + 3400232560
6016516175216946808470898441980288316944174247948687793289505484181256054468
82081152636090*e^(415*I*c) + 1043411751657039596665369315558240210946034809
54730278074123214273468169285671977703764961702518039 40*e^(414*I*c) + 3161
0939331284692750694306443618414656095969520945215743004044560386895241801579
15654345194071335 1730*e^(413*I*c) + 945561802589319869193343034663656528268
58091314329189160736277175873841732196453379953705679466826880*e^(412*I*c)
 + 27928575580003520667983536889816547764486498779466538782748893386363374504
73731090492651726817025 85720*e^(411*I*c) + 814608187736530579670210025271
92141559718336988121429982329196978554987617596986636797665324497472856 0*e^
(410*I*c) + 2346518219239105142238141633073464768899155708935025778047637412
6817815757654222191274092601594387122 50*e^(409*I*c) + 6675866290371147358 5
0376686566928901089354386983053870872494529158095117918829660615811125770696
8604740*e^(408*I*c) + 1875998821886556356416363573598607327825573725740570
6279108891366378428467414559930481172863538598193890*e^(407*I*c) + 52075178
5187932703864292633515443069511049935425005829381552416894081386752546080308
47907167748571734720*e^(406*I*c) + 1428017924502217624831808749188252741343
0513327541778008479503464476350933350315051734586465966718941708 0*e^(405*I
*c) + 3868762182342771656324517230499798892631152823746075416924431766739975
137428135917361711696522506111864 80*e^(404*I*c) + 103556198259200293522638
4577908611548612111495080193573691339864706029186482466241805664949381049856
258510*e^(403*I*c) + 273889562479526560335522764656600088628077830508482570
2911938903656162004262736182657700406301914070062380*e^(402*I*c) + 7158124
6868429414754738073636798397181727455815384090445033838526935969216224266967
40453944718143025248390*e^(401*I*c) + 184874052990057326937527286118764908
908583570219748823715706238001862451377226609436417529768529244398708 80*e^(
400*I*c) + 471882208434662076950995069535737803571088974914225678980481990 1
820770899700533386014883647952745615601452 0*e^(399*I*c) + 11904185540387796
4948229577948370465600606623183045529526900430209270473212773847794935586074
714329479939280*e^(398*I*c) + 296825515282669589685318273280239050084555033
220341594151196265959688161571379993768002649740830567229761884 0*e^(397*I*c
) + 7315849722068183628747296214039744442800104463011615273397605448153009 5
178798553841976465621458266721991408 0*e^(395*I*c) + 1782446114931751850556 3
5485663842190117441232229824949659165805393978719824656594597559557573419334
8887952160*e^(395*I*c) + 4293206478008022126017488908851826494790620720660
151451468181910917240027863968724539127659633517053002976480*e^(394*I*c) +
1022318202595486076721739030518645192356214547367429361991806349041148749 61

21804590274592702770571515456414680*e^(393*I*c) + 2406878513970527716119346
564450614328524136103776821681892218440014104846021094469664775272337193287
4594597328*e^(392*I*c) + 56028683424903517658495013858534516167162591034367
972498174660907450666778154353271630344650777885683547624184*e^(391*I*c) +
128967080084754712246023680866488384983286259025533132044636109049545144029
547003347761521666283977931640178464*e^(390*I*c) + 293550743554342709808129
453576562313299705982699187416862934373964255615967138676253276302591561523
515603264403*e^(389*I*c) + 660764473105869097691475973850837934511089033149
586707982764263394766756649565279879146173318386505740391093990*e^(388*I*c)
 + 147093114661893434551503836230010016048212774958144392990474691022477747
0198899052379114493999887003199419829579*e^(387*I*c) + 32384919313618514764
233219335395790983777355392076414673462356658238870483269493056092315851437
48690203615957136*e^(386*I*c) + 7052132414162197992602326524580143060985353
054572933905524633121681021037340298366342203324325307072413739061024*e^(38
5*I*c) + 151896342149088003964179117226437547480485201097348124591098788104
93844381062650818971199637121458749456243274416*e^(384*I*c) + 3236273132241
954941033008894364024746037832856131642293129242714590288791307164367950290
9055891236755143207382609*e^(383*I*c) + 68208033096793615683784409619244210
818614991640041553424405527876893272496608324231098148502466453967157728078
994*e^(382*I*c) + 142213115964814517682386667276769909482271681318790889840
501039441748635545362467679832449103520321953011780083069*e^(381*I*c) + 293
344920034300720287042383448342866313806285455040067823080445597545970023446
231563554135133105493516316320059272*e^(380*I*c) + 598650141112241858911676
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350303061961052*e^(379*I*c) + 120877035849365839308944222205693506328370410
8140593750226539846117737648216609559734831601248698274330296158612144*e^(3
78*I*c) + 24149665168103385032890765492027405117100590117954471387734642056
96455026442712426409599662771080264826008985061097*e^(377*I*c) + 4774141111
066098970221845330594962016472714230374234060663956846950926642685946929064
114194400360936223590725470146*e^(376*I*c) + 933934195805349422525175096571
505730070730208381477477030621822424102264824741995604295736305582383089854
7303219757*e^(375*I*c) + 18079820068028859970349938623007230676563314206708
848499900139641237334763266479346963237936039328113185041591793848*e^(374*I
*c) + 346376571726716901676573445371970870488823548539932704720639430787736
00446542963548348101269390443464480754513928502*e^(373*I*c) + 6567485926886
730009882737581287522561065455168626110368166400700753711577809729353356524
3828873383722980353200611956*e^(372*I*c) + 12324394151933238474196007258810
350659640633925361639108206296996068241901174577573892181775339195446260932
3881489157*e^(371*I*c) + 22891131173859278009149264916234683440586774077645
6326108410928857257174707289268074347550225793244741923354395308214*e^(370*
I*c) + 42084634260894938727755902145792458657812096614856102264700849952946
8452005980175119410628956210497609566002969884927*e^(369*I*c) + 76586779551
396278101255844462875141871094089528130479083674366158207165003215489148286
6406314834433199455459798934952*e^(368*I*c) + 13796765297962120740171061880
665894483554465012108901951071648603502289285868155390030628750267119319419

47738690360722*e^(367*I*c) + 24604423758454226639270816309832607147349680919054930271456392388271922548863493611269914576924098511208733074874574 68*e^(366*I*c) + 43439096966019321733573596877815792937012956819408271142154331753360939678459087667407382400371145706674109369980171 78*e^(365*I*c) + 75927527001466789611530950735850154731970297465336333315497939614732857609358019041551167648315608759475810486935272 24*e^(364*I*c) + 13139771494104933881856681151418293112242551521535686871181266579813877606348160261747201317735782566021306798298336024*e^(363*I*c) + 22514675741308069961506165586502872430421930210673264392997286485600640103867253604847715547060592967690653795951142520*e^(362*I*c) + 38199015867586087976002998756627674994795440667903625029322346250133286489120875005013638128113893960349670280707161530*e^(361*I*c) + 64175100693260066806238064886004597170740843300086839368616139164529108049844675353111842725798658088840347241496099644*e^(360*I*c) + 10676483201716559483808523418933352873358767332997253009266108518678993925291593709076028223234691909042624339940932331 4*e^(359*I*c) + 17589625826275598575710681261397930126580103159548435361490467286516944223207577658044718413414137599577009149924675952 8*e^(358*I*c) + 28699294363123149655727801085157694089682649746606632752880156067700711283743192673508812097486176051136700881572878 2643*e^(357*I*c) + 46375828845736715454493767825500568873332814556804931042399559988601280063861990402236837859110884260234209454368229910 2*e^(356*I*c) + 74222864090817312491693704946252561733414891967911827048983100549778195122106995583962345249974865312465887355340144213 7*e^(355*I*c) + 11766007209757869651898750508902310922046126969702774330145358957889567712307935203819931066068805646285998223417228010 12*e^(354*I*c) + 18475058564624515334452843005713263237811625533045659718876707580910793067948218349281707731263646397220715701317037853 34*e^(353*I*c) + 28736105359223401870808354355829122772719679773947201597910702749277142768695314671826889810410613817038854034975440015 92*e^(352*I*c) + 44276730791054253185243161129856936565848519361001924570444551344833050453214525163471184881332248236704651034839548051 61*e^(351*I*c) + 67584804378885243725629359489638576266948555471955194861228775679817185872623628719949670794018319579279016825829412343 62*e^(350*I*c) + 10220423779434634851339975295163399641702122249663666193053008302026096932158568338309418237395541351819026907953220681013*e^(349*I*c) + 15312837206662775379347353212807682965712535652942631518286142403097738200270711195396582159028513532779682154451996208592*e^(348*I*c) + 22731603566128841100419501947051367666836652418077260913944810748473084891890410181285412604854876625919565639521227223276*e^(347*I*c) + 33435897827936581301171175459610829454298167962017419810072936733378506584428024201072453193458155334046693516742390717832*e^(346*I*c) + 48733253505974923400852255563052101402196469313659554492725674754339375283010407167744366955828922837488705858532439654489*e^(345*I*c) + 70386349760594831567048224061395025698501202296966300376764220336697702961591099854055411376294871437468149528524796002762*e^(344*I*c) + 10074496185185374461175430098298016696240455383622292186848469426996612060769890704634373101116094882810027672937013281935 7*e^(343*I*c) + 142906319123055524246546928478954238371315925802022389236498652136839822502035155676970917419039

834587967055588431566416784*e^(342*I*c) + 200906587153578804380300469501441610174521851259541929209840688960859454908519774835905895757666770857888611738751858460424*e^(341*I*c) + 279945244475039804822966730462960884492119874857791147124009079476920435941735293309305430438687333129912454196774070107264*e^(340*I*c) + 386642673050380049457382562818316962651975550990779277048740238629858795018247356162888631015687664780101205287333082748791*e^(339*I*c) + 529329252764113926003934836958243557672549238997560739214406599185047831955572583765358634395408771528009745467548382950094*e^(338*I*c) + 718361596382058249209113544487901088868388744033713210332491971375906738341551540457264804304039664255915607349801911966551*e^(337*I*c) + 966458275369037718747739130798151643483590684166832234688098291164160636418159452119815728809372125168836239364442397344064*e^(336*I*c) + 1289043515292933956480634330499677040181043935620106914267311067900030058398839787692376954090545278554544997710058754772400*e^(335*I*c) + 1704582996707822808204678218167693002698661147712772355021456543810930069637188085882824757500605246963210810351706405349408*e^(334*I*c) + 2234891276398439464478622578306434840724610484468177859822620658691921478645266653062563823553001228001009093606751066168944*e^(333*I*c) + 2905385722320057001953345274489482790856692529959823749532695963414164833366773128218607899328588608916176593772088622582464*e^(332*I*c) + 3745257594876651204657334988426226388143954501986830664222349226361079609546822276067504899386703088982308185717143407211328*e^(331*I*c) + 4787527442780945685145204846971596165304169419328244073211459592129649255048876854059844720661078151288179612574986359194560*e^(330*I*c) + 6068949803156712248331871105329895471722806143008878014986559653687260694816550470195890004511965527567432722969707577202160*e^(329*I*c) + 7629731815627821580468992424207008366438896736333024661863838105110445148946962328297631547032543419811821015837863013682720*e^(328*I*c) + 9513032274019522954209113191268226642299912013525665940298381064797885690904993128948035227412144035633851779511219335277360*e^(327*I*c) + 11764212274876484080010900714673474493371278160557811983724455826566055617658086479368641864908119643412413644803772131657280*e^(326*I*c) + 14429816285208431204532978375375691965063154224649747551295851507389524083226976789688601369628399900747658579201929300744260*e^(325*I*c) + 17556273271224292396887291403125716213491486261145478571376751690105656067838042151038271381300372757755676325408026834544840*e^(324*I*c) + 21188321405882887539610198374706862695894049226077093764132512513336190523978949694387686059124526755048042957954264706637460*e^(323*I*c) + 25367176439119353621532260335983348154904982606125761711300683492963390816491583025705268737539982149639300226512657426118880*e^(322*I*c) + 30128482414552703264559018953088177156013437493438201078413769835448366148121754549197591129967170764969700180348699207838960*e^(321*I*c) + 35500103106019649876272376796949482209581372371036005012877806027481672807059943445240136315568500732379966585005678181937920*e^(320*I*c) + 41499832121963708043788523787401345541780088930538206918853579026749273364671640037563488607716092887686471542838602788559660*e^(319*I*c) + 48133117678184029216503748549110374478924719094635603892829364863916553792278822957368285106328164715910598370871149079494360*e^(318*I

*c) + 553909130449720862194326891463315660814279598969699002144342968177311
508638670566207686081876797097201529741484749079041773 40*e^(317*I*c) + 6324
777410101217905179494607517556992407698133813848315804240674745387472938763
17105449952471529122051185005975110528243476 80*e^(316*I*c) + 71660329861173
395524441943889284109134091157844655245672084237402434944696464927131812190
65962951114063950174330386358209288 0*e^(315*I*c) + 805662491306826841818762
018826235112063637903372180119541102106429277659976449038205954219368735653
146544157690704726554016 00*e^(314*I*c) + 898838158013823822139732704779546 0
274479287701805196334714630737246431512127492940234794287480289949953895356
105666766889102 0*e^(313*I*c) + 995122064720579659513403417380235485153364 03
371717898040850470954657532977279113491506880290726111154101941386019689567
958040*e^(312*I*c) + 109332537349966223203932678503426357079863707001728294
011042076530403923862654018978676516417314221089449922495612732870169660*e^
(311*I*c) + 119209713702033927055755397823688444446474243245021853286263 47
046599634721146573830681540495333543146776810911910410468628960*e^(310*I*c)
 + 128995076011591903410763863427097329948586173574595862705849159280943046
458742663163454018491463855395649453952212899632198680*e^(309*I*c) + 138529
794549151089451352769576543403126330747243680030832467205895819043568155239
264876762867172754338684027849855385453216080*e^(308*I*c) + 147648920805545
333418623121767853777399782924748301228793924342574999937955421765370101235
122939557467548549202174550009604780*e^(307*I*c) + 156185962953551196169738
218832173696509852551589210730578365727476259476474465955428502336673743686
499175698677875693611243400*e^(306*I*c) + 163977816059607725375264559816505
847894187785101455360391897424482998415385787605765315509208337741590143078
572243505132706580*e^(305*I*c) + 170869848868953101176860306053103994340530
390347260088432676842505555141293830838961275974268928666494845723462544709
102843680*e^(304*I*c) + 176720929970554642004575770053095700595334659870682
732031975915532387577052414866323511140117680492929354517559479899220940360
*e^(303*I*c) + 181408168770922059820368553316697321639984862628298828569560
273295630897626829345263592219034560853530733710529842148537901680*e^(302*I
*c) + 184831151983748941817667850174708257138128172158269413287765358532240
773244336191900818557829905895684494889410451921524212840*e^(301*I*c) + 186
915474436567514926351405623117503261987508351930083824566444435689139233683
411704641828762178799177848064220150818355261280*e^(300*I*c) + 187615393168
510050071497280564603510912403132920312024370835062679037644990286285346673
507093452964351257962696133511725652320*e^(299*I*c) + 186915474436567514926
351405623117503261987508351930083824566444435689139233683411704641828762178
799177848064220150818355261280*e^(298*I*c) + 184831151983748941817667850174
708257138128172158269413287765358532240773244336191900818557829905895684494
889410451921524212840*e^(297*I*c) + 181408168770922059820368553316697321639
984862628298828569560273295630897626829345263592219034560853530733710529842
148537901680*e^(296*I*c) + 176720929970554642004575770053095700595334659870
682732031975915532387577052414866323511140117680492929354517559479899220940
360*e^(295*I*c) + 170869848868953101176860306053103994340530390347260088432
676842505555141293830838961275974268928666494845723462544709102843680*e^(29

4*I*c) + 163977816059607725375264559816505847894187785101455360391897424482 998415385787605765315509208337741590143078572243505132706580*e^(293*I*c) + 156185962953551196169738218832173696509852551589210730578365727476259476474 465955428502336673743686499175698677875693611243400*e^(292*I*c) + 147648920 805545333418623121767853777399782924748301228793924342574999937955421765370 101235122939557467548549202174550009604780*e^(291*I*c) + 138529794549151089 451352769576543403126330747243680030832467205895819043568155239264876762867 172754338684027849855385453216080*e^(290*I*c) + 128995076011591903410763863 427097329948586173574595862705849159280943046458742663163454018491463855395 649453952212899632198680*e^(289*I*c) + 119209713702033927055755397823688444 444647424324502185328626347046599634721146573830681540495333543146776810911 910410468628960*e^(288*I*c) + 109332537349966223203932678503426357079863707 001728294011042076530403923862654018978676516417314221089449922495612732870 169660*e^(287*I*c) + 995122064720579659513403417380235485153364033717178980 408504709546575329772791134915068802907261111541019413860196895679580 40*e^(286*I*c) + 898838158013823822139732704779546027447928770180519633471463073 7246431512127492940234794287480289949953895356105666766889102 0*e^(285*I*c) + 805662491306826841818762018826235112063637903372180119541102106429277659976449038205954219368735653146544157690704726554016 00*e^(284*I*c) + 716603298 611733955244419438892841091340911578446552456720842374024349446964649271318 121906596295111406395017433038635820928 80*e^(283*I*c) + 6324777410101217905 179494607517556992407698133813848315804240674745387472938763171054499524715 291220511850059751105282434768 0*e^(282*I*c) + 553909130449720862194326891463315660814279598969699002144342968177311508638670566207686081876797097201529741484749079041773 40*e^(281*I*c) + 481331176781840292165037485491103744789 247190946356038928293648639165537922788229573682851063281647159105983708711 49079494360*e^(280*I*c) + 414998321219637080437885237874013455417800889305382069188535790267492733646716400375634886077160928876864715428386027885596 60*e^(279*I*c) + 355001031060196498762723767969494822095813723710360050128778060274816728070599434452401363155685007323799665850056781819379 20*e^(278*I *c) + 301284824145527032645590189530881771560134374934382010784137698354483 661481217545491975911299671707649697001803486992078389 60*e^(277*I*c) + 2536 717643911935362153226033598334815490498260612576171130068349296339081649158 302570526873753998214963930022651265742611888 0*e^(276*I*c) + 21188321405882 887539610198374706862695894049226077093764132512513336190523978949694387686 0591245267550480429579542647066374 60*e^(275*I*c) + 1755627327122429239688729140312571621349148626114547857137675169010565606783804215103827138130037275775567632540802683454484 0*e^(274*I*c) + 1442981628520843120453297837537569 196506315422464974755129585150738952408322697678968860136962839990074765857 920192930074426 0*e^(273*I*c) + 1176421227487648408001090071467347449337127816055781198372445582656605561765808647936864186490811964341241364480377213165728 0*e^(272*I*c) + 951303227401952295420911319126822664229991201352566594 029838106479788569090499312894803522741214403563385177951121933527736 0*e^(2 71*I*c) + 762973181562782158046899242420700836643889673633302466186383810511044514894696232829763154703254341981182101583786301368272 0*e^(270*I*c) + 6

0689498031567122483318711053298954717228061430088780149865596536872606948165504701958900045119655275674327229697075772021 60*e^(269*I*c) + 478752744278
094568514520484697159616530416941932824407321145959212964925504887685405984
4720661078151288179612574986359194560*e^(268*I*c) + 3745257594876651204657 3
349884262263881439545019868306642223492263610796095468222760675048993867030
88982308185717143407211328*e^(267*I*c) + 2905385722320057001953345274489482
790856692529959823749532695963414164833366773128218607899328588608916176593
772088622582464*e^(266*I*c) + 22348912763984394644786225783064348407246104 8
446817785982262065869192147864526665306256382355300122800100909360675106616
8944*e^(265*I*c) + 1704582996707822808204678218167693002698661147712772355 0
21456543810930069637188085882824757500605246963210810351706405349408*e^(264
*I*c) + 128904351529293395648063433049967704018104393562010691426731106790 0
030058398839787692376954090545278554544997710058754772400*e^(263*I*c) + 966
458275369037718747739130798151643483590684166832234688098291164160636418159
4521198157288093721251688362393644423973440 64*e^(262*I*c) + 718361596382058
249209113544487901088868388744033713210332491971375906738341551540457264804
304039664255915607349801911966551*e^(261*I*c) + 52932925276411392600393483 6
958243557672549238997560739214406599185047831955572583765358634395408771528
009745467548382950094*e^(260*I*c) + 386642673050380049457382562818316962651
975550990779277048740238629858795018247356162888631015687664780101205287333
082748791*e^(259*I*c) + 279945244475039804822966730462960884492119874857791
147124009079476920435941735293309305430438687333129912454196774070107264*e^
(258*I*c) + 200906587153578804380300469501441610174521851259541929209840688
960859454908519774835905895757666770857888611738751858460424*e^(257*I*c) +
142906319123055524246546928478954238371315925802022389236498652136839822502
035155676970917419039834587967055588431566416784*e^(256*I*c) + 100744961851
853744611754300982980166962404553836222921868484694269966120607698907046343
731011160948828100276729370132819357*e^(255*I*c) + 703863497605948315670482
240613950256985012022969663003767642203366977029615910998540554113762948714
374681495285247960027 62*e^(254*I*c) + 487332535059749234008522555630521014 0
219646931365955449272567475433937528301040716774436695582892283748870585853
2439654489*e^(253*I*c) + 334358978279365813011711754596108294542981679620 17
419810072936733378506584428024201072453193458155334046693516742390717832*e^
(252*I*c) + 227316035661288411004195019470513676668366524180772609139448107
484730848918904101812854126048548766259195656395212272232 76*e^(251*I*c) + 1
531283720666277537934735321280768296571253565294263151828614240309773820027
071119539658215902851353277968215445199620 8592*e^(250*I*c) + 10220423779434
634851339975295163399641702122249663666193053008302026096932158568338309418
2373955413518190269079532206810 13*e^(249*I*c) + 675848043788852437256293594
896385762669485554719551948612287756798171858726236287199496707940183195792
790168258294123436 2*e^(248*I*c) + 442767307910542531852431611298569365658 48
519361001924570444551344833050453214525163471184881332248236704651034839548
05161*e^(247*I*c) + 287361053592234018708083543558291227727196797739472015 9
791070274927714276869531467182688981041061381703885403497544001592*e^(246*I
*c) + 184750585646245153344528430057132632378116255330456597188767075809107

9306794821834928170773126364639722071570131703785334*e^(245*I*c) + 11766007
209757869651898750508902310922046126969702774330145358957889567712307935203
81993106606880564628599822341722801012*e^(244*I*c) + 7422286409081731249169
370494625256173341489196791182704898310054977819512210699558396234524997486
53124658873553401442137*e^(243*I*c) + 4637582884573671545449376782550056887
333281455680493104239955998860128006386199040223683785911088426023420945436
82299102*e^(242*I*c) + 2869929436312314965572780108515769408968264974660663
27528801560677007112837431926735088120974861760511367008815728782643*e^(241
*I*c) + 1758962582627559857571068126139793012658010315954843536149046728651
69442232075776580447184134141375995770091499246759528*e^(240*I*c) + 1067648
320171655948380852341893335287335876733299725300926610851867899392529159370
90760282232346919090426243399409323314*e^(239*I*c) + 6417510069326006680623
806488600459717074084330008683936861613916452910804984467535311184272579865
8088840347241496099644*e^(238*I*c) + 38199015867586087976002998756627674994
795440667903625029322346250133286489120875005013638128113893960349670280707
161530*e^(237*I*c) + 225146757413080699615061655865028724304219302106732643
92997286485600640103867253604847715547060592967690653795951142520*e^(236*I*
c) + 1313977149410493388185668115141829311224255152153568687118126657981387
7606348160261747201317735782566021306798298336024*e^(235*I*c) + 75927527001
466789611530950735850154731970297465336333315497939614732857609358019041551
16764831560875947581048693527224*e^(234*I*c) + 4343909696601932173357359687
781579293701295681940827114215433175336093967845908766740738240037114570667
410936998017178*e^(233*I*c) + 246044237584542266392708163098326071473496809
1905493027145639238827192254886349361126991457692409851120873307487457468*e
^(232*I*c) + 13796765297962120740171061880665894483554465012108901951071648
60350228928586815539003062875026711931941947738690360722*e^(231*I*c) + 7658
677955139627810125584446287514187109408952813047908367436615820716500321548
91482866406314834433199455459798934952*e^(230*I*c) + 4208463426089493872775
590214579245865781209661485610226470084995294684520059801751194106289562104
97609566002969884927*e^(229*I*c) + 2289113117385927800914926491623468344058
677407764563261084109288572571747072892680743475502257932447419233543953082
14*e^(228*I*c) + 1232439415193323847419600725881035065964063392536163910820
62969960682419011745775738921817753391954462609323881489157*e^(227*I*c) + 6
567485926886730009882737581287522561065455168626110368166400700753711577809
7293533565243828873383722980353200611956*e^(226*I*c) + 34637657172671690167
657344537197087048882354853993270472063943078773600446542963548348101269390
443464480754513928502*e^(225*I*c) + 180798200680288599703499386230072306765
633142067088484999001396412373347632664793469632379360393281131850415917938
48*e^(224*I*c) + 9339341958053494225251750965715057300707302083814774770306
218224241022648247419956042957363055823830898547303219757*e^(223*I*c) + 477
414111106609897022184533059496201647271423037423406066395684695092664268594
6929064114194400360936223590725470146*e^(222*I*c) + 24149665168103385032890
765492027405117100590117954471387734642056964550264427124264095996627710802
64826008985061097*e^(221*I*c) + 1208770358493658393089442222056935063283704
108140593750226539846117737648216609559734831601248698274330296158612144*e^

(220*I*c) + 59865014111224185891167650518052015036400322684132808145359709358779033860921243908555446686158262335030306196105 2*e^(219*I*c) + 293344920034300720287042383448342866313806285455040067823080445597545970023446231563554135133105493516316320059272*e^(218*I*c) + 1422131159648145176823866672767699094822716813187908898405010394417486355453624676798324491035203219530117800830 69*e^(217*I*c) + 682080330967936156837844096192442108186149916400415534244055278768932724966083242310981485024664539671577280789 94*e^(216*I*c) + 323627313224195494103300889436402474603783285613164229312924271459028879130716436795029090558912367551432073826 09*e^(215*I*c) + 151896342149088003964179117226437547480485201097348124591098788104938443810626508189711996371214587494562432744 16*e^(214*I*c) + 705213241416219799260232652458014306098535305457293390552463312168102103734029836634220332432530707241373906102 4*e^(213*I*c) + 323849193136185147642332193353957909837773553920764146734623566582388704832694930560923158514374869020361595713 6*e^(212*I*c) + 147093114661893434551503836230010016048212774958144392990474691022477747019889905237911449399988700319941982957 9*e^(211*I*c) + 660764473105869097691475973850837934511089033149586707982764263394766756649565279879146173318386505740391093990*e^(210*I*c) + 293550743554342709808129453576562313299705982699187416862934373964255615967138676253276302591561523515603264403*e^(209*I*c) + 128967080084754712246023680866488384983286259025533132044636109049545144029547003347761521666283977931640178464*e^(208*I*c) + 560286834249035176584950138585345161671625910343679724981746609074506667781543532716303446507778856835476241 84*e^(207*I*c) + 240687851397052771611934656445061432852413610377682168189221844001410484602109446966477527233719328745945973 28*e^(206*I*c) + 102231820259548607672173903051864519235621454736742936199180634904114874961218045902745927027705715154564146 80*e^(205*I*c) + 429320647800802212601748890885182649479062072066015145146818191091724002786396872453912765963351705300297648 0*e^(204*I*c) + 178244611493175185055635485663842190117441232229824949659165805393978719824656594597559557573419334888795216 0*e^(203*I*c) + 731584972206818362874729621403974444280010446301161527339760544815300951787985538419764656214582667219914080*e^(202*I*c) + 296825515282669589685318273280239050084555032203415941511962659596881615713799937680026497408305672297618840*e^(201*I*c) + 119041855403877964948229577948370465600606623183045529526900430209270473212773847794935586074714329479939280*e^(200*I*c) + 471882208434662076950995069535737803571088974914225678980481990182077089970053338601488364795274561560145 20*e^(199*I*c) + 184874052990057326937527286118764908908583570219748823715706238001862451377226609436417529768529244398708 80*e^(198*I*c) + 715812468684294147547380736367983971817274558153840904450338385269359692162242669674045394471814302524839 0*e^(197*I*c) + 273889562479526560335522764656600088628077830508482570291193890365616200426273618265770040630191407006238 0*e^(196*I*c) + 103556198259200293522638457790861154861211149508019357369133986470602918648246624180566494938104985625851 0*e^(195*I*c) + 386876218234277165632451723049979889263115282374607541692443176673997513742813591736171169652250611186480*e^(194*I*c) + 142801792450221762483180874918825274134305133275417780084795034644763509333503150517345864659667189417080*e^(193*I

*c) + 520751785187932703864292633515443069511049935425005829381552416894081
386752546080308479071677485717347 20*e^(192*I*c) + 1875998821886556356416363
573598607327825573725740570627910889136637842846741455993048117286353859819
3890*e^(191*I*c) + 667586629037114735850376686566928901089354386983053870 87
249452915809511791882966061581112577069686047 40*e^(190*I*c) + 2346518219239
105142238141633073464768899155708935025778047637412681781575765422219127409
260159438712250*e^(189*I*c) + 814608187736530579670210025271921415597183369
881214299823291969785549876175969866367976653244974728560*e^(188*I*c) + 279
285755800035206679835368898165477644864987794665387827488933863633745047373
109049265172681702585720*e^(187*I*c) + 945561802589319869193343034663656528
268580913143291891607362771758738417321964533799537056794668268 80*e^(186*I*
c) + 316109393312846927506943064436184146560959695209452157430040445603868 9
524180157915654345194071335173 0*e^(185*I*c) + 104341175165703959666536931 55
582402109460348095473027807412321427346816928567197770376496170251803940*e^
(184*I*c) + 340023256060165161752169468084708984419802883169441742479486877
932895054841812560544688208115263609 0*e^(183*I*c) + 109385321448622035867 40
324345008666784997700113058741724889759516120314567346082870955195010419754
40*e^(182*I*c) + 347351473214713780874352083129566601238765762775942366762 7
333499521038897539826364038575568677773 00*e^(181*I*c) + 108867995731829472 8
267329051920348867972846213564456275309091044294867412578226334768983568264
54040*e^(180*I*c) + 336753988720215683759023845939827533625598010581041846 2
734541113626243194324077826072175699102709 0*e^(179*I*c) + 10279364730663840
844739577862469262604648861914297972589165243530651230690726244462479199894
255180*e^(178*I*c) + 309613197162152016238030155424146545178236208681028753
774890290498593402017956570617713142161459 0*e^(177*I*c) + 920089393029589 03
287460185002715932261252636844477148978197436107884752889146883103843606495
1920*e^(176*I*c) + 269745801440211296972683601863878954357962308520076595 17
71282276292732402152097082184973634141 40*e^(175*I*c) + 780098073680242398 75
613733058851417125327114681070889640794249282633470580756557083923203377160
*e^(174*I*c) + 222519591767957777571673660360074802222113642321463998038643
7096339149122368724582345735158014 0*e^(173*I*c) + 625987215682225284365096 0
708235034710201362776057176647226323089751446565288850103898153859920*e^(17
2*I*c) + 173657421881819107187419747245015812388356420995065863910233714812
27690806116807197417260538 40*e^(171*I*c) + 475010578857601519272316617938 42
522242178659724167102689431851540851146714096939311576879368 0*e^(170*I*c) +
 128098914601688539672480541830409847707367500438601536803204497701119911 28
908710565948278334 0*e^(169*I*c) + 340540538512955691543523467221771726551 87
548910782008504718324168725029438589162349211628040*e^(168*I*c) + 892320944
734329676333188188163847179349961867060102605973089596265329177022949302816
2575100*e^(167*I*c) + 230435107337384035737917859767306635201668278168913 98
4209737666311848880384113193531364184 0*e^(166*I*c) + 586403466972683242741 6
433289215609093751974538642432995719909646088572457711341452041749 90*e^(165
*I*c) + 147030816732276833163041582099592047512043725225353339238819165193 0
004076295447457532217 40*e^(164*I*c) + 363183696523025917321974444097981220 2
264082460413055250674258679518326735438284787588573 0*e^(163*I*c) + 88367206

4086047030569451402154796955129679409226698304411837579002585458403679636476 8280*e^(162*I*c) + 2117589733466855707101501429210414722401838837940752841 618541440888545729943138209036820*e^(161*I*c) + 4997075672538590843575963148 13794768069337190915967491907488904933922677579665354338960*e^(160*I*c) + 11610455168355504376291150171211639931373302113267748111282404724636179404963 5726479850*e^(159*I*c) + 2655680638904340753449670236910154579599486175774 14147899446527121275669101852741231 40*e^(158*I*c) + 5978992172944143218459 16114929981970632173211157849452524522874297646840910539553629 0*e^(157*I*c) + 13247564123678374731574728211624836911209665019489539264922416437882642 84546437221120*e^(156*I*c) + 28882075526473065446996857202104710942731861950 8995802020689904590319476295408324280*e^(155*I*c) + 619485966530355028795643 38815234310660410902037882473161804774492916216575880077680*e^(154*I*c) + 13069817203488289886193205508375818392124991382340160316886507181296548981014 818410*e^(153*I*c) + 271184323967071752760564049014883350713024244840397831 85232377219442003928301085 80*e^(152*I*c) + 5532691288195286125029188695589 478290980219563093498435840446315122917788000814 90*e^(151*I*c) + 110969199 68732097474992225959525044434121921853534965576259119257653587215176608 0*e^ (150*I*c) + 21876482892713909928040345612578705805121508756226696317087651824 25224141866332 0*e^(149*I*c) + 4238125846763232586394188569858685826755328 00554862743701930140585132588759448 0*e^(148*I*c) + 8066795436075891407593050 10796189568269842021613388955218916278823182639488190*e^(147*I*c) + 150822 381431412413773566474210011746852297437597059186295243989481140398152780*e^ (146*I*c) + 276931165383432592259833826376479361226640338596151334898466646 94361471028310*e^(145*I*c) + 4992519712457043983505377976607953988397368297 5911149579918048936883718676 80*e^(144*I*c) + 883500968821791202600774541927 76920073768939351373478936839709333331196188 0*e^(143*I*c) + 153436088745056 25412732723946157707193313015776459599711397351318318839937 6*e^(142*I*c) + 26143976279902021443471945665080254563056810183520401889800285493144867448* e^(141*I*c) + 4369442482910113914565353136069595862669338858053419381214131 241925047008*e^(140*I*c) + 716099497599058079895633338552940229192858196481 597830078819711862600096*e^(139*I*c) + 115051481852080848873700388354521315 56764036512400310369117669719429232 0*e^(138*I*c) + 181157684956157580767103 0305550562558925429365919331415341833394459640 8*e^(137*I*c) + 2794709104475 686611842790694973699164482254723977210209725661304403472*e^(136*I*c) + 422 276126632003687547754746555709988710527133086660161366353656787288*e^(135*I *c) + 624735507810532953177107746902471141241251875657318484417819040326 72* e^(134*I*c) + 904669352382568297904433896310426316767258682636791133882648 3549173*e^(133*I*c) + 128181746491497081085960418982835900079078992116940530 4612211251818*e^(132*I*c) + 177642829135119348577194437675802830239905460 09 2687136494961404333*e^(131*I*c) + 24070801913529757101858022914372045864746 99178618203974027432526 4*e^(130*I*c) + 318774992974434649721153604475177658 2320958627923816470590659024*e^(129*I*c) + 412430698299915190848067222327 21 943506774793409189467048898292 8*e^(128*I*c) + 5210811762917704866049240098 5 1758309875057005668778189541416 39*e^(127*I*c) + 642619548553524857642506813 6870465530087114003875716691383902*e^(126*I*c) + 773204636991145775061462 73

1028098506094432675788136295011259*e^(125*I*c) + 90722605722208814918642284
639487187764607589706493970774776*e^(124*I*c) + 103751844998711755019093989
565966841168029970825266603235 24*e^(123*I*c) + 1155855412893594260345544966
642687823630035899363232371472*e^(122*I*c) + 125370496586921272662198050851
269323171167338854081782959*e^(121*I*c) + 132317088701048969738000567337799
19089340836756009580718*e^(120*I*c) + 1357990663161479842850642848032544982
878359839580349899*e^(119*I*c) + 135442594916636116191574650625331646238501
101627937224*e^(118*I*c) + 131187818011721747296793398943181536949646753684
81194*e^(117*I*c) + 1233096700139723365181997220750932590655287625342156*e^
(116*I*c) + 112391604542246650966429162063124338952554575234051*e^(115*I*c)
 + 9925490738534402272939987038714580495445431374618*e^(114*I*c) + 84855220
2276512356496200136959676295361696315113*e^(113*I*c) + 70164515322544462906
873548813748091084561870680*e^(112*I*c) + 560592725306755855178045288368983
5514455118670*e^(111*I*c) + 432333688644261557547944179250800440604964868*e
^(110*I*c) + 32147887693375338817454482515377350383950278*e^(109*I*c) + 230
2150411226234925855222345201500900533576*e^(108*I*c) + 15856647611325756256
6117432227203884298856*e^(107*I*c) + 104904026695108974246246437664707540045
064*e^(106*I*c) + 665634670676210063754191847109971141414*e^(105*I*c) + 404
43624781415311581857832389099634564*e^(104*I*c) + 2348998374244347079532766
203075607598*e^(103*I*c) + 130171193079172823835151430773360024*e^(102*I*c)
 + 6868329225263681349501997341320517*e^(101*I*c) + 34427715201287513414073
9302960914*e^(100*I*c) + 16353164647151530240529137618111*e^(99*I*c) + 7340
57263616388449968842366924*e^(98*I*c) + 31042222522074681615625020522*e^(97
*I*c) + 1232445557346832245176696904*e^(96*I*c) + 4575911718340257907313958
3*e^(95*I*c) + 1581796642397812408161814*e^(94*I*c) + 506486609445125699721
79*e^(93*I*c) + 1493326612293984160368*e^(92*I*c) + 40261256699368950388*e^
(91*I*c) + 984382804329835768*e^(90*I*c) + 21608403021340047*e^(89*I*c) + 4
20601518659718*e^(88*I*c) + 7146142307307*e^(87*I*c) + 103818048048*e^(86*I
*c) + 1253841160*e^(85*I*c) + 12085216*e^(84*I*c) + 87153*e^(83*I*c) + 418*
e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) - 14*(3289*a^2*e^(1027/2*I*c) +
1282710*a^2*e^(1025/2*I*c) + 249487095*a^2*e^(1023/2*I*c) + 32266997620*a^2
*e^(1021/2*I*c) + 3121832019735*a^2*e^(1019/2*I*c) + 241005431923542*a^2*e^
(1017/2*I*c) + 15464515215103622*a^2*e^(1015/2*I*c) + 848339120374641870*a^
2*e^(1013/2*I*c) + 40614235388489346675*a^2*e^(1011/2*I*c) + 17238486576641
06290905*a^2*e^(1009/2*I*c) + 65678633862570503690097*a^2*e^(1007/2*I*c) +
2268898261098769561120041*a^2*e^(1005/2*I*c) + 71659370102807444959242727*a
^2*e^(1003/2*I*c) + 2083633993393098160454111295*a^2*e^(1001/2*I*c) + 56109
286874368068446384618040*a^2*e^(999/2*I*c) + 140647279306074281727813339969
4*a^2*e^(997/2*I*c) + 32964206161728793499031816369336*a^2*e^(995/2*I*c) +
725212537982338639553752606105971*a^2*e^(993/2*I*c) + 150280154429164727843
03355549568064*a^2*e^(991/2*I*c) + 294232725411218343537913910694524115*a^2
*e^(989/2*I*c) + 5458017107743192900932192332079754800*a^2*e^(987/2*I*c) +
96165064556404674374591793494770969751*a^2*e^(985/2*I*c) + 1612950428548722
021160870732573388748486*a^2*e^(983/2*I*c) + 258072074387090234055646986543
81610855782*a^2*e^(981/2*I*c) + 394635225337657865294965990982357902779935*

a^2*e^(979/2*I*c) + 5777459917323047305837478939343390617560800*a^2*e^(977/
2*I*c) + 81106652744979453503605904560553941804516827*a^2*e^(975/2*I*c) + 1
093437903450413476694775388085248143435843184*a^2*e^(973/2*I*c) + 141756424
68718517834053796420531668264840828827*a^2*e^(971/2*I*c) + 1769511399218500
74633194549001040224465598018440*a^2*e^(969/2*I*c) + 2129312297800033603965
109459542894851379636241390*a^2*e^(967/2*I*c) + 247275011666470610832895287
50467452594464413496712*a^2*e^(965/2*I*c) + 2774117016443654863793800757788
16997842958595635411*a^2*e^(963/2*I*c) + 3009497270402664372603369055821186
361937123336960151*a^2*e^(961/2*I*c) + 315997292671613328234030755031256616
23124842474211925*a^2*e^(959/2*I*c) + 3214144855179070718665183868454024045
65806226718602745*a^2*e^(957/2*I*c) + 3169505085332677220309823086926906379
156042673077997829*a^2*e^(955/2*I*c) + 303244668734682640780589924763017321
81384084447966749251*a^2*e^(953/2*I*c) + 2816984773703866067085986338188910
39165559192659067598486*a^2*e^(951/2*I*c) + 2542510822024809049111292052295
925694458486937681586168494*a^2*e^(949/2*I*c) + 223105477373773387281957926
69384697517889412712723300156650*a^2*e^(947/2*I*c) + 1904560473149805962622
14455758830176412490479327548630395435*a^2*e^(945/2*I*c) + 1582600527113724
210945270692154487384537712932377861494537792*a^2*e^(943/2*I*c) + 128080366
21165917614961411495703359665564662395820821879432651*a^2*e^(941/2*I*c) + 1
01008959448394278622065270281354488236767429874129774402372122*a^2*e^(939/2
*I*c) + 776647773894140039601026125724635184851400081828079008519495205*a^2
*e^(937/2*I*c) + 5824867841884974805556257455805728440177379367311530786366
553840*a^2*e^(935/2*I*c) + 426331551827582342134326571053595070391577582167
10091608150751160*a^2*e^(933/2*I*c) + 3046500734896240695013196668409727533
56711517554147295115707791952*a^2*e^(931/2*I*c) + 2126338350434067101841066
179986723736309721747170637151333282385892*a^2*e^(929/2*I*c) + 145016677340
89456372413097720073331427769744768582734443920820884880*a^2*e^(927/2*I*c)
+ 96678088682187070566952755698159384671499301435475363946248645511300*a^2*
e^(925/2*I*c) + 63026901151891709378680778361983213199140036310310505948555
6854864080*a^2*e^(923/2*I*c) + 40194675719721919184952054312232644375459509
53166839320312436248766740*a^2*e^(921/2*I*c) + 2508456856052548652379307576
5839786939668166684250998147267060999843864*a^2*e^(919/2*I*c) + 15324468999
8280106303232133486628958245019231358231317009398623103014360*a^2*e^(917/2*
I*c) + 91673686925132684178360202318300523433080925051568539229599517430263
1940*a^2*e^(915/2*I*c) + 53717908235477759867693116721780606662943581725403
26849409957986665686640*a^2*e^(913/2*I*c) + 3084170994314575597490646630687
1090919705337121093845564611475205831834740*a^2*e^(911/2*I*c) + 17355135221
0830111542403729997736548659579690262161334684378354693653143600*a^2*e^(909
/2*I*c) + 95743352229194257260397206117476893138007871495459824516074754620
4280979860*a^2*e^(907/2*I*c) + 51796100045678396768827343720759395584038843
80512473251576883045496625080240*a^2*e^(905/2*I*c) + 2748565450074484594608
6864693951416729958544421088007484546058264731062865400*a^2*e^(903/2*I*c) +
14310167749316770604946900133383941155649616835743309812152146335937525280
9040*a^2*e^(901/2*I*c) + 73117012158472403322096448677308864979249597255972
7457509380085597040672846910*a^2*e^(899/2*I*c) + 36671548855755560353542103

70922300362357210115667534077868226474380300702979520*a^2*e^(897/2*I*c) + 1
805826214706251079990263321103674819022743994744768011661354696943158714965
7730*a^2*e^(895/2*I*c) + 87328138277263357453687393632829255820603582731737
822656013656737314066270769860*a^2*e^(893/2*I*c) + 414817136098345744491539
277362007380513271882803145751297848219367978399846839810*a^2*e^(891/2*I*c)
 + 193585694088706675715864869610835837558634179385085506203995989160459324
8887646480*a^2*e^(889/2*I*c) + 88775072851962206182416554647787324999352216
64373951650797658698877398128936202900*a^2*e^(887/2*I*c) + 4001239388966249
0616271399213614257399774009402473996666416480625157884768764896580*a^2*e^(
885/2*I*c) + 17728246003277186589209994770321940050940172812087015693900726
4944328352108674765830*a^2*e^(883/2*I*c) + 77229701953334031851476725644580
2696297496337802921019409004020665598966438156162590*a^2*e^(881/2*I*c) + 33
084732197038235375562437697635708153491799435857062717116045714440947701529
19124730*a^2*e^(879/2*I*c) + 1394025369616807940206425969265350761294521105
2614130496704459947954824765033193710270*a^2*e^(877/2*I*c) + 57781194331618
050184075872423561791421849035243571600320288706532981609331680804189710*a^
2*e^(875/2*I*c) + 235638414403676636374964618535168235461531651215096600123
550185747704196738532598229970*a^2*e^(873/2*I*c) + 945623831015067465565761
737751781712729579043386050190772281518980746360423316243590560*a^2*e^(871/
2*I*c) + 373482777754284296282094449715876412045906669724039458982566434651
3551225394202631289660*a^2*e^(869/2*I*c) + 14520043237771024867578892274833
151999983805655774942432102559165991274651263356626027360*a^2*e^(867/2*I*c)
 + 555742940074056571594107022251101282474230803333614786203427309125910893
36970706714049470*a^2*e^(865/2*I*c) + 2094356412464963422883748629580564387
53891068972196618627904344080420177337078104676468880*a^2*e^(863/2*I*c) + 7
772452484638321644435794643177404249461896284949424535085804418007448285098
67291417081630*a^2*e^(861/2*I*c) + 2840894488629222010773847634980756855554
160286708024741922802485707803328368153641110473200*a^2*e^(859/2*I*c) + 102
281918501206789312019757504315186539799825367591653596402987256155988989618
78198815353510*a^2*e^(857/2*I*c) + 3627814697373286004523746845042808477689
0532748926686396879733480311191302936923550162289900*a^2*e^(855/2*I*c) + 12
677923591460860327846708769846048364283452347327321785486745897733577555808
3027540308805740*a^2*e^(853/2*I*c) + 43657709696171185576928771470335738988
5645132886579731206499384230924672871218525038020148230*a^2*e^(851/2*I*c) +
 14816145216650511407916681110461741561613773326596625530887987775226384369
65972191593890153520*a^2*e^(849/2*I*c) + 4955886749410854283637836408922370
908861423693236555100736486744859805066952581996944150188670*a^2*e^(847/2*I
*c) + 163406219609422063383294877692249713526624644487836015598004157632318
73879690981091170280400080*a^2*e^(845/2*I*c) + 5311593939382952910273717641
1367113005497399315270309341108454768136564764298294135564858847390*a^2*e^(
843/2*I*c) + 17023039171380937558022108035506702691245677274619472930083614
4395351294968707996644726411879200*a^2*e^(841/2*I*c) + 53796131867127191193
581204749764207246106941584902744735646183027124994216431926716790493201606
0*a^2*e^(839/2*I*c) + 16765303716452633937145844225799787825635321495142088
00221991656698632081178644609104890307855200*a^2*e^(837/2*I*c) + 5153020871

486711873416491815131975951900434246025142352516552818224273483297543776745
652059545730*a^2*e^(835/2*I*c) + 156223065664409210263436639434624267415625
14861595325201248149059018047548245480491740664747553230*a^2*e^(833/2*I*c)
+ 467200073750788489600390002175638519829255671038924203679790036373688463 6
902371795109024685515547 0*a^2*e^(831/2*I*c) + 1378402087618779604363496521 2
5396975133098136018690719338924949225993395730744805382442729064152410*a^2*
e^(829/2*I*c) + 401239880509795846865762218014970016621860421334029285134 28
32860909129846971754491161647705684353 10*a^2*e^(827/2*I*c) + 11524614778722
545432398884845151494358758349066560138411327899216487643850548107464116964
06101981510*a^2*e^(825/2*I*c) + 326648792310303813099926514082694062405040 8
40445634019582858603362648534582534223736418439876291562 0*a^2*e^(823/2*I*c)
+ 913703632641901208311759228155356567277588504710020963574542295442139835
6217178283444278671884412660*a^2*e^(821/2*I*c) + 252252716628002121429694 23
542567302484417429310194035755111310742077579689215072021281081661345709120
*a^2*e^(819/2*I*c) + 687398125609725309215114971069632517451775270564920953
0160197323579330967008828229695444456003143493 0*a^2*e^(817/2*I*c) + 1849089
239940393578550118977040296033236373497300831262371548539751029049877855639
33490666771915454740*a^2*e^(815/2*I*c) + 491042141856878350715681756058445 1
38552698769297425826668396199882849855448274647622775780304699322930*a^2*e^
(813/2*I*c) + 128743308045757357230667360505210675848691769420345943762969 7
82174358235065326556550829133272987408568 0*a^2*e^(811/2*I*c) + 333279451390
535968218626910840162366988772482405087981563250144139260512541568656551874
2717075933147150*a^2*e^(809/2*I*c) + 851927645113425377853617163074607829 98
733243163805904144535375550438549679955099035755779299951032976 80*a^2*e^(80
7/2*I*c) + 215049722839205503586128293099745679467390063138336342646712139 8
959767764326476947811059471421252585756 0*a^2*e^(805/2*I*c) + 53610291202997
129243387227510746438880417396133990475401200151836824511033359061830417818
144623930466160*a^2*e^(803/2*I*c) + 131996091090182003447057411825399119687
07125290875280387576522114186357813282793049956301611077345360858 0*a^2*e^(8
01/2*I*c) + 321001870082230626552157935960255206975703259672220019809311160
664723949929848535867562171221207552583920*a^2*e^(799/2*I*c) + 771111302353
098224996612507872558890266159399819221015025614890733856653497550312410883
732182309081849060*a^2*e^(797/2*I*c) + 182986267094803131328901419808732126
35564354008538908485649418065035465017522167327656849313376367668946 40*a^2*
e^(795/2*I*c) + 428983177087691560462062160525031195867712888756953067992 34
7600739718172440354514549195469145491494255570 0*a^2*e^(793/2*I*c) + 9935970
535949030878133346983171428555968257799381106714215413905033872603148050425
2230253511541304102772 40*a^2*e^(791/2*I*c) + 227381997341336530780277767348
923448083647508497915370273788561098000912781759166376916355824336395002615
60*a^2*e^(789/2*I*c) + 514167531737321398666542394549591195897558854790098 3
523789478003889583555882925941346834560267573863016410 0*a^2*e^(787/2*I*c) +
114890106851238291551335728265562364765121005119591497024634815615328060 98
98661886276828393232905530079498 40*a^2*e^(785/2*I*c) + 253697540092154924 80
341260321336842031022521543381219390657970943834020256465972472182252505523
2970075634740*a^2*e^(783/2*I*c) + 553644976238504268760736932908203908959 51

7626284011218937645206254241531004929708538056155465373941573477840*a^2*e^(
781/2*I*c) + 119413503821823189278921418161014870843766468871925302453933169
00890167463121908225555258023037557664752550060*a^2*e^(779/2*I*c) + 2545702
42524891909244474523190339270693780626351542068606228623253312504063393294
401364747678282575191686619*a^2*e^(777/2*I*c) + 536437058177643067602336686
502662821685972963172417926385596859861894285657204297738586913679757410111
2934360*a^2*e^(775/2*I*c) + 11174069580281343172329449999299750628302547624
765899734171290717678737916201127059517927335920301363381599920*a^2*e^(773/
2*I*c) + 23009632000715685724501189026111050742267523553057578732719843669636
96047616752601475639353195916219792503215*a^2*e^(771/2*I*c) + 4684223968
78371342691023644392364884509351945660376600521193617965104119032199143692 3
1181221570261150235170750*a^2*e^(769/2*I*c) + 942798838602234979277058133727
614086602728476369889354672576345987996355484700938703306109589257937690774
43101*a^2*e^(767/2*I*c) + 187619225221186892362954324173464256888580245686
654501161811526819167428547859856880414713989939337716707545896*a^2*e^(765/
2*I*c) + 369178030253342447121644615776637010615775278423789324847337963965
26469695738711005334592324833097316911250412 5*a^2*e^(763/2*I*c) + 718319539
770367264276023193923607996369471257717391142715655747378128411474061415600
7446313537426539474749797 90*a^2*e^(761/2*I*c) + 1382120082453709333872510587
412059524149979254964511066161605009479514122231452777976669355954779387326
179193890*a^2*e^(759/2*I*c) + 262992240003590928860559322898474810674609733
464852970269492493648387452399111696001657949595197260062318261106 6*a^2*e^
(757/2*I*c) + 49491636630998958438131625064538202328529198852533459767048211
7177510622697140700606474432153237316894213845713 3*a^2*e^(755/2*I*c) + 921
159800087095861287271096006116330239579693186410364236421685386849465435222
362953426053317465476459352806197 1*a^2*e^(753/2*I*c) + 1695800978604748431986463767395616856892560764741946442111118701741821444897623387983347759758533504551801755037 5*a^2*e^(751/2*I*c) + 3087976037035177269303573082758444309472599238704849628278513758034954002506832434298122437962124981707735120275 5*a^2*e^(749/2*I*c) + 556230034286025324330268884138982338642306180832447633659016314958297387894329355497371750857342597984220542632 57*a^2*e^(747/2*I*c) + 991148498584213443894052367589553084320172585783259893134933139278092418582430751042494891426284980037933328965 33*a^2*e^(745/2*I*c) + 174722600888404804978530590100460003278180658978831905330154370982763984646513813160761146082864787793974499383768*a^2*e^(743/2*I*c) + 3047248004784247398258111579561682706454584857597709047020746598038504684619529199860710579809176928162704587656 82*a^2*e^(741/2*I*c) + 525820101170441091857872327398452496414525760936913287583911529580580538586559649846585541562686976417582636323800*a^2*e^(739/2*I*c) + 897758618407588265406502003227323745918017671431846078493905129440539575848523829309505570503467433698687391599525*a^2*e^(737/2*I*c) + 1516692011867012115321043946651658946449294899763438015725740120744131654354391550015561531757951384128294098404528*a^2*e^(735/2*I*c) + 25355554133458355415663215796713320822307450379883912694516752439648444683306792410349302065788967118791554181961 33*a^2*e^(733/2*I*c) + 4194780709047280483224815833940022555816707903442864843083388983235625506900033313228628940959072

838355592388518976*a^2*e^(731/2*I*c) + 6867972157551236921759647848323040789653661241470014722668084616115674752655075386898879908209190965790105909303585*a^2*e^(729/2*I*c) + 1112893666308044610733008947654429677798331979214489736985725687075446996965179147715920254935980263997141969660569 0*a^2*e^(727/2*I*c) + 1784874137037851279915330474290318342586466836725673522939236266922698083267320135429031922779941087436067128142210 6*a^2*e^(725/2*I*c) + 2833435569095910075856346783902184507634209486006385880783671350359538756924662880197422094362959333392221087875117 7*a^2*e^(723/2*I*c) + 4452399152064658607690678656446592306060494198518377581854646147867751951028883239471536625621706371358909977200785 6*a^2*e^(721/2*I*c) + 6925851720828843665159179333096626104786171731928385299840340845945981999931935655408743707585853831543779903020820 5*a^2*e^(719/2*I*c) + 1066532617297247229322755125788473457605740958481386860472093607351888672979230548927882794820156294486734562372110 40*a^2*e^(717/2*I*c) + 1626000312605035796776398697495577220992594081439694831384703627844171244381632901112585604625749935428276375240927 81*a^2*e^(715/2*I*c) + 2454349951719685029766850797579166546323520211218782365529260313649072802876675386628286872939575793305389134557368 08*a^2*e^(713/2*I*c) + 3668138702309215941431086549921542994120102019062944908064128698399563928602710215217452940860862338377649814734761 78*a^2*e^(711/2*I*c) + 5428409594024610830965653999053400760902549927897609443377744890862992358415570398824305910187394426363848602042154 00*a^2*e^(709/2*I*c) + 7955022907770981714081348695604512368434695645955161493365050851052422904247586076929456899240074360946377032030853 05*a^2*e^(707/2*I*c) + 1154454335904857364247982557912578718102746849691770314220186712706034099207927530450655444722398232085044436220634697*a^2*e^(705/2*I*c) + 1659217340078990366295623422038456618088548686457548538185410690033650573056920057414962831294588203107486826119787423*a^2*e^(703/2*I*c) + 2361814782592409073140151717952055120156499375236619814260403866479477744294234718960967782715041717115313047558623183*a^2*e^(701/2*I*c) + 3329886438974832992528101094207114478285955872618100718692457613200121080012023835679244861800931812439160323444845807*a^2*e^(699/2*I*c) + 4650280530057130827843153624560981667840741811626179819584824809783591908945012506423661839456267739976826873672738365*a^2*e^(697/2*I*c) + 6433099335269195808717020639661849459986196085635968727776564625849932639280982496034596946007808758161920095325761890*a^2*e^(695/2*I*c) + 8816131688931211814057208115533917355801787029335575600410977242399829559924610051615513646540527419139301483310423786*a^2*e^(693/2*I*c) + 1196955493256756559317799140148766319114994726375865088813242519623788139045789400958890453453029617832403098507257 3618*a^2*e^(691/2*I*c) + 1610072907829930926448116373437511521483953182188018802392446777870780979205139797156426835667768070328557751315143184 1*a^2*e^(689/2*I*c) + 2145883924963638487853370673479192521284790142721052519786488697386345873488634225957687279290904779852391592936569194 0*a^2*e^(687/2*I*c) + 2833907237523901565780131679753606966878890973260138903246533371285062026472028365898897536267602626682275393842116870 5*a^2*e^(685/2*I*c) + 3708594553993260963723097865204034276410360777816453731587009464079035003417707172319389206757754051041582732120207829 0*a^2*e^(683/2*I*c) + 48095342669966

056020726545704006199266666160630361013755158878063661343210637596725104903
4397699998476242531619317783 51*a^2*e^(681/2*I*c) + 618147708540153199824482
447394874356055527851229789104813784350420903665006327266287934972907658379
7727256355960958857 6*a^2*e^(679/2*I*c) + 787413258554607106990679209859661 3
272993668909384846081647513493184683001031856523986637858985635651761887673
5439697520*a^2*e^(677/2*I*c) + 994168666894028682059531007228162611012718 08
450248252257981611335676431923025899234859866205857872672547668167325989920
*a^2*e^(675/2*I*c) + 124419949314487403216172588535238853667583569695346393
000362307045710566468085416110994554478758231547427229315129958280*a^2*e^(6
73/2*I*c) + 154354165743697402995415216121916387446315508628912131928600309
585745568868263338383595893423751250560255188896660980640*a^2*e^(671/2*I*c)
 + 189832680846992441750979398054550765983447380706582698086505079016572222
835305196482037082520548635494540196474773032392*a^2*e^(669/2*I*c) + 231458
954877865680481711467581492320475708179284410834307431449083296993015735283
99253315378363005782389446646638678992 0*a^2*e^(667/2*I*c) + 279803880980823
081151507855346299192278245341814031460411506106372469276985146379946315124
170832410518829080258705986280*a^2*e^(665/2*I*c) + 335379844326285592736695
463857018418432413188766484881111912395059240855249328246830729779350439108
234296749061439256880*a^2*e^(663/2*I*c) + 398612508602184099797618213464893
583100423327557993330634195015291012852305358265371442241359113106146519054
690230460080*a^2*e^(661/2*I*c) + 469811437014079749298372016621303751653441
794274933681143305269482262555422078791132625827649344909492073035868314640
200*a^2*e^(659/2*I*c) + 549140935306437649109502279093298286642071151104653
437705824618506516690970915485474849970804454250926034882525081421920*a^2*e
^(657/2*I*c) + 636592737563033962038907595159410207630226126748551544972393
205357335273235966560353474541619072109609425303261030333480*a^2*e^(655/2*I
*c) + 731962314882746930932643298184913142623544929508542538052238437217139
684503440864983481224441799145110101150208078149600*a^2*e^(653/2*I*c) + 834
830647252737130370352256191399634154462308618312283624738448826183345582990
700043901989251342801050174088405942776680*a^2*e^(651/2*I*c) + 944553238998
322012684234360243733605735140889390389676408061822904814729681532931792335
624967472663525610160924422346720*a^2*e^(649/2*I*c) + 106025796374953633514
781711862919397290428499069890974784826574010293877175837317687855132853273
364249012490319764177944 0*a^2*e^(647/2*I*c) + 118085299066113967882675297 39
649004013694888958024539109846840243868929535966239993555593680555049576275
360594000588065 60*a^2*e^(645/2*I*c) + 130504557526466671962244573856964648 6
643942005634721936316646042608535115485389960589294914491574041407279419512
731576020*a^2*e^(643/2*I*c) + 143137191334499328625814579465878959112813573
154334449563267522698427043075293835337740680975480964484566886833882197512
0*a^2*e^(641/2*I*c) + 155823758412354074750515278242654043386492996901829 02
394457588718153265943228528548527186644264778518317559255556717276 60*a^2*e^
(639/2*I*c) + 168396739021853566943248119227362402641388949862053436879077 4
587302981877714639969367635542513279277621696310502074133800*a^2*e^(637/2*I
*c) + 180686268547401406135899278150063842182410552617971181977297359635900
583824746228227036498030778436300423559307552564126 0*a^2*e^(635/2*I*c) + 19

252636223728394750051188080130802855312516229284947971945519780347026927574
767180251081864547831854692676262761903477760*a^2*e^(633/2*I*c) + 2037613204
234302788388872974263559802922485435801951718645182637071550371893197987545
075984445655085553689119461288385080*a^2*e^(631/2*I*c) + 214251964619046711
623814746757926022312992451440425137554782870765570734842808056050738631135
7900526669458781794087683160*a^2*e^(629/2*I*c) + 22388133772086363214562711
695531110839152740444990636033971999650339788664043245120079613369281542808
085735798784694291 40*a^2*e^(627/2*I*c) + 232559508450689666304119972963001 9
144950321875545686061358679706618715723878421925212744802710528140695848048
863263401620*a^2*e^(625/2*I*c) + 240227152626534500276407910147939754731649
929031350785060489649742719688634225636482917330715633964895939957471168583
5340*a^2*e^(623/2*I*c) + 24685764139519560439420221434147612346331971979438
06791819033461685747350263950586286250114393171484165699859371683668820*a^2
*e^(621/2*I*c) + 2524574466857996282393547747052223049971409325335770864930
047451730298883199815748273420062646212064128261863603173113220*a^2*e^(619/
2*I*c) + 257064772383156388117355397683416885685254388955293074358989631221
3425786028231311572055034657555701798516652461881179020*a^2*e^(617/2*I*c) +
 26074642986772057436868337639434634440619010300129655886691393588320605098
97548972026199493982403179852911793212914653440*a^2*e^(615/2*I*c) + 2635930
911076402644000121905925952148375148833390373058411708254060533702084460459
096459271430090085171142785221034332360*a^2*e^(613/2*I*c) + 265713163140556
016230055392391322532989750689206902391066833032058176330388888172691591252
9432751510232297721132883711360*a^2*e^(611/2*I*c) + 26722562616403225679443
657002462972657661599238234570150540782027602632669337097067668448077540895
75759625548721880960900*a^2*e^(609/2*I*c) + 2682522557658080650589233969123
672190643044432210056127292023865687852378234863360381336201324629095652385
752662511996320*a^2*e^(607/2*I*c) + 268909701530234476933529149937972078112
372732443614330857038266000225227119669039337313386144764268854277967640925
3164100*a^2*e^(605/2*I*c) + 26930191466678412020042146362259063768904225037
79253729585442498782172066792698483998400631873111003925178781908847878880*
a^2*e^(603/2*I*c) + 2695134040310534956999355762470654940028932561435586408
556892140495393036120495504431025989594669805132478153565562971060*a^2*e^(6
01/2*I*c) + 269603753121606409480357913437607430375456968923646477143498642
2320946498560245047737297861595509112192278615431723054440*a^2*e^(599/2*I*c
) + 26960375312160640948035791343760743037545696892364647714349864223209464
98560245047737297861595509112192278615431723054440*a^2*e^(597/2*I*c) + 2695
134040310534956999355762470654940028932561435586408556892140495393036120495
504431025989594669805132478153565562971060*a^2*e^(595/2*I*c) + 269301914666
784120200421463622590637689042250377925372958544249878217206679269848399840
0631873111003925178781908847878880*a^2*e^(593/2*I*c) + 26890970153023447693
352914993797207811237273244361433085703826600022522711966903933731338614476
42688542779676409253164100*a^2*e^(591/2*I*c) + 2682522557658080650589233969
123672190643044432210056127292023865687852378234863360381336201324629095652
385752662511996320*a^2*e^(589/2*I*c) + 267225626164032256794436570024629726
576615992382345701505407820276026326693370970676684480775408957575962554872

1880960900*a^2*e^(587/2*I*c) + 26571316314055601623005539239132253298975068
92069023910668330320581763303888881726915912529432751510232297721132883711З
60*a^2*e^(585/2*I*c) + 26359309110764026440001219059259521483751488333903733
05841170825406053370208446045909645927143009008517114278522103433236О*a^2*e
^(583/2*I*c) + 26074642986772057436868337639434634440619010300129655886691З
9358832060509897548972026199493982403179852911793212914653440*a^2*e^(581/2*
I*c) + 2570647723831563881173553976834168856852543889552930743589896312213З4
2578602823131157205503465755570179851665246188117902О*a^2*e^(579/2*I*c) + 2
52457446685799628239354774705222304997140932533577086493004745173029888319З9
81574827342006264621206412826186360317311322О*a^2*e^(577/2*I*c) + 246857641
395195604394202214341476123463319719794380679181903346168574735026395058628
625011439317148416569985937168366882О*a^2*e^(575/2*I*c) + 24022715262653450
02764079101479397547316499290313507850604896497427196886342256364829173307１
5633964895939957471168583534О*a^2*e^(573/2*I*c) + 232559508450689666304119９
729630019144950321875545686061358679706618715723878421925212744802710528140
695848048863263401620*a^2*e^(571/2*I*c) + 223881337720863632145627116955311
1083915274044499063603397199965033978866404324512007961336928154280808573５7
9878469429140*a^2*e^(569/2*I*c) + 2142519646190467116238147467579260223129９
2451440425137554782870765570734842808056050738631135790052666945878179408７6
83160*a^2*e^(567/2*I*c) + 2037613204234302788388872974263559802922485435801
95171864518263707155037189319798754507598445655085553689119461288385080*a^
2*e^(565/2*I*c) + 192526362237283947500511880801308028553125162292849479719
45519780347026927574767180251081864547831854692676262761903477６0*a^2*e^(563
/2*I*c) + 180686268547401406135899278150063842182410552617971181977297359６3
59005838247462282270364980307784363004235593075525641260*a^2*e^(561/2*I*c)
+ 168396739021853566943248119227362402641388949862053436879077458730298187７
71463996936763554251327927762169631050207413380０*a^2*e^(559/2*I*c) + 155823
75841235407475051527824265404338649299690182902394457588718153265943228528５
48527186644264778518317559255556717276６0*a^2*e^(557/2*I*c) + 14313719133449
93286258145794658789591128135731543344495632675226984270430752938353377406８
097548096448456688683388219751２0*a^2*e^(555/2*I*c) + 130504557526466671962２
445738569646486643942005634721936316646042608535115485389960589294914491574
041407279419512731576020*a^2*e^(553/2*I*c) + 1180852990661139678826752973９6
490040136948889580245391098468402438689295359662399935559368055504957627５3
6059400058806560*a^2*e^(551/2*I*c) + 1060257963749536335147817118629193972９
042849906989097478482657401029387717583731768785513285327336424901249031976
41779440*a^2*e^(549/2*I*c) + 9445532389983220126842343602437336057351408893
903896764080618229048147296815329317923356249674726635256101609244223467２0*
a^2*e^(547/2*I*c) + 8348306472527371303703522561913996341544623086183122836
24738448826183345582990700043901989251342801050174088405942776680*a^2*e^(54
5/2*I*c) + 7319623148827469309326432981849131426235449295085425380522384372
171396845034408649834812244417991451101011502080781496００*a^2*e^(543/2*I*c)
+ 6365927375630339620389075951594102076302261267485515449723932053573352732
359665603534745416190721096094253032610303334８0*a^2*e^(541/2*I*c) + 5491409
353064376491095022790932982866420711511046534377058246185065166909709154854

74849970804454250926034882525081421920*a^2*e^(539/2*I*c) + 4698114370140797
492983720166213037516534417942749336811433052694822625554220787911326258276
49344909492073035868314640200*a^2*e^(537/2*I*c) + 3986125086021840997976182
134648935831004233275579933306341950152910128523053582653714422413591131061
46519054690230460080*a^2*e^(535/2*I*c) + 3353798443262855927366954638570184
184324131887664848811119123950592408552493282468307297793504391082342967490
61439256880*a^2*e^(533/2*I*c) + 2798038809808230811515078553462991922782453
418140314604115061063724692769851463799463151241708324105188290802587059862
80*a^2*e^(531/2*I*c) + 2314589548778656804817114675814923204757081792844108
34307431449083296993015735283992533153783630057823894466466386789920*a^2*e^
(529/2*I*c) + 1898326808469924417509793980545507659834473807065826980865050
79016572222835305196482037082520548635494540196474773032392*a^2*e^(527/2*I*
c) + 1543541657436974029954152161219163874463155086289121319286003095857455
68868263338383595893423751250560255188896660980640*a^2*e^(525/2*I*c) + 1244
199493144874032161725885352388536675835696953463930003623070457105664680854
16110994554478758231547427229315129958280*a^2*e^(523/2*I*c) + 9941686668940
286820595310072281626110127180845024825225798161133567643192302589923485986
6205857872672547668167325989920*a^2*e^(521/2*I*c) + 78741325855460710699067
920985966132729936689093848460816475134931846830010318565239866378589856356
517618876735439697520*a^2*e^(519/2*I*c) + 618147708540153199824482447394874
356055527851229789104813784350420903665006327266287934972907658379772725635
59609588576*a^2*e^(517/2*I*c) + 4809534266996605602072654570400619926666616
063036101375515887806366134321063759672510490343976999984762425316193177835
1*a^2*e^(515/2*I*c) + 37085945539932609637230978652040342764103607778164537
315870094640790350034177071723193892067577540510415827321202078290*a^2*e^(5
13/2*I*c) + 283390723752390156578013167975360696687889097326013890324653337
12850620264720283658988975362676026266822753938421168705*a^2*e^(511/2*I*c)
+ 2145883924963638487853370673479192521284790142721052519786488697386345873
4886342259576872792909047798523915929365691940*a^2*e^(509/2*I*c) + 16100729
078299309264481163734375115214839531821880188023924467778707809792051397971
564268356677680703285577513151431841*a^2*e^(507/2*I*c) + 119695549325675655
931779914014876631911499472637586508881324251962378813904578940095889045345
30296178324030985072573618*a^2*e^(505/2*I*c) + 8816131688931211814057208115
533917355801787029335575600410977242399829559924610051615513646540527419139
301483310423786*a^2*e^(503/2*I*c) + 643309933526919580871702063966184945998
619608563596872777656462584993263928098249603459694600780875816192009532576
1890*a^2*e^(501/2*I*c) + 46502805300571308278431536245609816678407418116261
79819584824809783591908945012506423661839456267739976826873672738365*a^2*e^
(499/2*I*c) + 3329886438974832992528101094207114478285955872618100718692457
613200121080012023835679244861800931812439160323444845807*a^2*e^(497/2*I*c)
+ 236181478259240907314015171795205512015649937523661981426040386647947774
4294234718960967782715041717115313047558623183*a^2*e^(495/2*I*c) + 16592173
400789903662956234220384566180885486864575485381854106900336505730569200574
14962831294588203107486826119787423*a^2*e^(493/2*I*c) + 1154454335904857364
247982557912578718102746849691770314220186712706034099207927530450655444722

398232085044436220634697*a^2*e^(491/2*I*c) + 795502290777098171408134869560451236843469564595516149336505085105242290424758607692945689924007436094637703203085305*a^2*e^(489/2*I*c) + 542840959402461083096565399905340076090254992789760944337774489086299235841557039882430591018739442636384860204215400*a^2*e^(487/2*I*c) + 366813870230921594143108654992154299412010201906294490806412869839956392860271021521745294086086233837764981473476178*a^2*e^(485/2*I*c) + 245434995171968502976685079757916654632352021121878236552926031364907280287667538662828687293957579330538913455736808*a^2*e^(483/2*I*c) + 162600031260503579677639869749557722099259408143969483138470362784417124438163290111258560462574993542827637524092781*a^2*e^(481/2*I*c) + 106653261729724722932275512578847345760574095848138686047209360735188867297923054892788279482015629448673456237211040*a^2*e^(479/2*I*c) + 69258517208288436651591793330966261047861717319283852998403408459459819999319356554087437075858538315437799030208205*a^2*e^(477/2*I*c) + 44523991520646586076906786564465923060604941985183775818546461478677519510288832394715366256217063713589099772007856*a^2*e^(475/2*I*c) + 28334355690959100758563467839021845076342094860063858807836713503595387569246628801974220943629593333922210878751177*a^2*e^(473/2*I*c) + 17848741370378512799153304742903183425864668367256735229392362669226980832673201354290319227799410874360671281422106*a^2*e^(471/2*I*c) + 11128936663080446107330089476544296777983319792144897369857256870754469969651791477159202549359802639971419696605690*a^2*e^(469/2*I*c) + 6867972157551236921759647848323040789653661241470014722668084616115674752655075386898879908209190965790105909303585*a^2*e^(467/2*I*c) + 4194780709047280483224815833940022555816707903442864843083388983235625506900033313228628940959072838355592388518976*a^2*e^(465/2*I*c) + 2535555413345835541566321579671332082230745037988391269451675243964844468330679241034930206578896711879155418196133*a^2*e^(463/2*I*c) + 1516692011867012115321043946651658946449294899763438015725740120744131654354391550015561531757951384128294098404528*a^2*e^(461/2*I*c) + 897758618407588265406502003227323745918017671431846078493905129440539575848523829309505570503467433698687391599525*a^2*e^(459/2*I*c) + 525820101170441091857872327398452496414525760936913287583911529580580538586559649846585541562686976417582636323800*a^2*e^(457/2*I*c) + 304724800478424739825811157956168270645458485759770904702074659803850468461952919986071057980917692816270458765682*a^2*e^(455/2*I*c) + 174722600888404804978530590100460003278180658978831905330154370982763984646513813160761146082864787793974499383768*a^2*e^(453/2*I*c) + 99114849858421344389405236758955308432017258578325989313493313927809241858243075104249489142628498003793332896533*a^2*e^(451/2*I*c) + 55623003428602532433026888413898233864230618083244763365901631495829738789432935549737175085734259798422054263257*a^2*e^(449/2*I*c) + 30879760370351772693035730827584443094725992387048496282785137580349540025068324342981224379621249817077351202755*a^2*e^(447/2*I*c) + 16958009786047484319864637673956168568925607647419464421111187017418214448976233879833477597585335045518017550375*a^2*e^(445/2*I*c) + 9211598000870958612872710960061163302395796931864103642364216853868494654352223629534260533174654764593528061971*a^2*e^(443/2*I*c) + 4949163663099895843813162506453820232852919885253345976704821171

775106226971407006064744321532373168942138457133*a^2*e^(441/2*I*c) + 262992
240003590928860559322898474810674609733464852970269492493648387452399111696
0016579495951972600623182611066*a^2*e^(439/2*I*c) + 13821200824537093338725
105874120595241499792549645110661616050094795141222314527779766693559547793
87326179193890*a^2*e^(437/2*I*c) + 7183195397703672642760231939236079963694
7125771739114271565574737812841147406141560074463135374265394747474979790*a^2
*e^(435/2*I*c) + 3691780302533424471216446157766370106157752784237893248473
37963965264696957387110053345923248330973169112504125*a^2*e^(433/2*I*c) + 1
876192252211868923629543241734642568885802456866545011618115268191674285478
59856880414713989939337716707545896*a^2*e^(431/2*I*c) + 9427988386022349792
770581337276140866027284763698893546725763459879963554847009387033061095892
5793769077443101*a^2*e^(429/2*I*c) + 46842239687837134269102364439236488450
935194566037660052119361796510411903219914369231181221570261150235170750*a^
2*e^(427/2*I*c) + 230096320007156857245011890261110507422675235530575787327
19843669636960476167526014756393531959162197925032115*a^2*e^(425/2*I*c) + 1
117406958028134317232944999929975062830254762476589973417129071767873791620
1127059517927335920301363381599920*a^2*e^(423/2*I*c) + 53643705817764306760
233668650266282168597296317241792638559685986189428565720429773858691367975
74101112934360*a^2*e^(421/2*I*c) + 2545702425248919092444745231903392706937
806263515420686062286232533125040633932944013647476782825751916866192*a^2*e
^(419/2*I*c) + 119413503821823189278921418161014870843766468871925302453933
1690089016746312190822555525802303755766475255060*a^2*e^(417/2*I*c) + 55364
497623850426876073693290820390895951762628401121893764520625424153100492970
8538056155465373941573477840*a^2*e^(415/2*I*c) + 25369754009215492480341260
321336842031022521543381219390657970943834020256465972472182252505523297007
5634740*a^2*e^(413/2*I*c) + 11489010685123829155133572826556236476512100511
9591497024634815615328060989866188627682839323290553007949840*a^2*e^(411/2*
I*c) + 51416753173732139866654239454959119589755885479009835237894780038895
835558829259413468345602675738630164100*a^2*e^(409/2*I*c) + 227381997341336
530780277767348923448083647508497915370273788561098000912781759166376916355
82433639500261560*a^2*e^(407/2*I*c) + 9935970535949030878133346983171428555
968257799381106714215413905033872603148050425223025351154130410277240*a^2*e
^(405/2*I*c) + 428983177087691560462062160525031195867712888756953067992347
6007397181724403545145491954691454914942555700*a^2*e^(403/2*I*c) + 18298626
709480313132890141980873212635564354008538908485649418065035465017522167327
65684931337636766894640*a^2*e^(401/2*I*c) + 7711113023530982249966125078725
58890266159399819221015025614890733856653497550312410883732182309081849060*
a^2*e^(399/2*I*c) + 3210018700822306265521579359602552069757032596722200198
093111606664723949929848535867562171221207552583920*a^2*e^(397/2*I*c) + 1319
960910901820034470574118253991196870712529087528038757652211418635781328279
30499563016110773453608580*a^2*e^(395/2*I*c) + 5361029120299712924338722751
074643888041739613399047540120015183682451103335906183041781814462393046616
0*a^2*e^(393/2*I*c) + 21504972283920550358612829309974567946739006313833634
264671213989597677643264769478110594714212525857560*a^2*e^(391/2*I*c) + 851
927645113425377853617163074607829987332431638059041445353755504385496799550

9903575577929995103297680*a^2*e^(389/2*I*c) + 33327945139053596821862691084
01623669887724824050879815632501441392605125415686565518742717075933147150*
a^2*e^(387/2*I*c) + 1287433080457573572306673605052106758486917694203459437
629697821743582350653265565508291332729874085680*a^2*e^(385/2*I*c) + 491042
141856878350715681756058445138552698769297425826668396199882849855448274647
622775780304699322930*a^2*e^(383/2*I*c) + 184908923994039357855011897704029
603323637349730083126237154853975102904987785563933490666771915454740*a^2*e
^(381/2*I*c) + 687398125609725309215114971069632517451775270564920953016019
73235793309670088282296954444560031434930*a^2*e^(379/2*I*c) + 2522527166280
021214296942354256730248441742931019403575511131074207757968921507202128108
1661345709120*a^2*e^(377/2*I*c) + 91370363264190120831175922815535656727758
85047100209635745422954421398356217178283444278671884412660*a^2*e^(375/2*I*
c) + 3266487923103038130999265140826940624050408404456340195828586033626485
345825342237364184398762915620*a^2*e^(373/2*I*c) + 115246147787225454323988
848451514943587583490665601384113278992164876438505481074641169640610198151
0*a^2*e^(371/2*I*c) + 40123988050979584686576221801497001662186042133402928
5134283286090912984697175449116164770568435310*a^2*e^(369/2*I*c) + 13784020
876187796043634965212539697513309813601869071933892494922599339573074480538
2442729064152410*a^2*e^(367/2*I*c) + 46720007375078848960039000217563851982
925567103892420367979003637368846369023717951090246855155470*a^2*e^(365/2*I
*c) + 156223065664409210263436639434624267415625148615953252012481490590180
47548245480491740664747553230*a^2*e^(363/2*I*c) + 5153020871486711873416491
815131975951900434246025142352516552818224273483297543776745652059545730*a^
2*e^(361/2*I*c) + 167653037164526339371458442257997878256353214951420880022
1991656698632081178644609104890307855200*a^2*e^(359/2*I*c) + 53796131867127
191193581204749764207246106941584902744735646183027124994216431926716790493
2016060*a^2*e^(357/2*I*c) + 17023039171380937558022108035506702691245677274
6194729300836144395351294968707996644726411879200*a^2*e^(355/2*I*c) + 53115
939393829529102737176411367113005497399315270309341108454768136564764298294
135564858847390*a^2*e^(353/2*I*c) + 163406219609422063383294877692249713526
62464448783601559800415763231873879690981091170280400080*a^2*e^(351/2*I*c)
+ 4955886749410854283637836408922370908861423693236555100736486744859805066
952581996944150188670*a^2*e^(349/2*I*c) + 148161452166505114079166811104617
415616137733265966255308879877522638436965972191593890153520*a^2*e^(347/2*
I*c) + 43657709696171185576928771470335738988564513288657973120649938423092
4672871218525038020148230*a^2*e^(345/2*I*c) + 12677923591460860327846708769
8460483642834523473273217854867458977335775558083027540308805740*a^2*e^(343
/2*I*c) + 36278146973732860045237468450428084776890532748926686396879733480
311191302936923550162289900*a^2*e^(341/2*I*c) + 102281918501206789312019757
50431518653979982536759165359640298725615598898961878198815353510*a^2*e^(33
9/2*I*c) + 2840894488629222010773847634980756855554160286708024741922802485
707803328368153641110473200*a^2*e^(337/2*I*c) + 777245248463832164443579464
317740424946189628494942453508580441800744828509867291417081630*a^2*e^(335/
2*I*c) + 209435641246496342288374862958056438753891068972196618627904344080
420177337078104676468880*a^2*e^(333/2*I*c) + 555742940074056571594107022251

1012824742308033336147862034273091259108933697070671404947O*a^2*e^(331/2*I*c) + 145200432377710248675788922748331519999838056557749424321025591659912746512633566260273 60*a^2*e^(329/2*I*c) + 37348277775428429628209444971587641204590666972403945898256643465135512253942026312896 60*a^2*e^(327/2*I*c) + 945623831015067465565761737751781712729579043386050190772281518980746360423316243590560*a^2*e^(325/2*I*c) + 23563841440367663637496461853516823546153165121509660012355018574770419673853259822997 0*a^2*e^(323/2*I*c) + 577811943316180501840758724235617914218490352435716003202887065329816093316808041897 10*a^2*e^(321/2*I*c) + 13940253696168079402064259692653507612945211052614130496704459947954824765033193710270*a^2*e^(319/2*I*c) + 330847321970382353755624376976357081534917994358570627171160457144409477015291912473 0*a^2*e^(317/2*I*c) + 772297019533340318514767256445802696297496337802921019409004020665598966438156162590*a^2*e^(315/2*I*c) + 1772824600327718658920999477032194005094017281208701569390072649443283521086747658 30*a^2*e^(313/2*I*c) + 4001239388966249061627139921361425739977400940247399666641648062515788476876489658 0*a^2*e^(311/2*I*c) + 887750728519622061824165546477873249993522166437395165079765869887739812893620290 0*a^2*e^(309/2*I*c) + 19358569408870667571586486961083583755863417938508550620399598916045932488876464 80*a^2*e^(307/2*I*c) + 41481713609834574449153927736200738051327188280314575129784821936797839984683981 0*a^2*e^(305/2*I*c) + 873281382772633574536873936328292558206035827317378226560136567373140662707698 60*a^2*e^(303/2*I*c) + 1805826214706251079990263321103674819022743994744768011661354696943158714965773 0*a^2*e^(301/2*I*c) + 366715488557555603535421037092230036235721011566753407786822647438030070297952 0*a^2*e^(299/2*I*c) + 73117012158472403322096448677308864979249597255972745750938008559704067284691 0*a^2*e^(297/2*I*c) + 14310167749316770604946900133383941155649616835743309812152146335937525280904 0*a^2*e^(295/2*I*c) + 274856545007448459460868646939514167299585444210880074845460582647310628654 00*a^2*e^(293/2*I*c) + 517961000456783967688273437207593955840388438051247325157688304549662508024 0*a^2*e^(291/2*I*c) + 957433522291942572603972061174768931380078714954598245160747546204280979 860*a^2*e^(289/2*I*c) + 17355135221083011154240372999773654865957969026216133468437835469365314360 0*a^2*e^(287/2*I*c) + 30841709943145755974906466306871090919705337121093845564611475205831834740*a^2*e^(285/2*I*c) + 53717908235477759867693116721780606662943581725403268494099579866656866 40*a^2*e^(283/2*I*c) + 916736869251326841783602023183005234330809250515685392295995174302631940*a^2*e^(281/2*I*c) + 153244689998280106303232133486628958245019231358231317009398623103014360*a^2*e^(279/2*I*c) + 250845685605254865237930757658397869396681666842509981472670609998438 64*a^2*e^(277/2*I*c) + 40194675719721919184952054312232644375459509531668393203124362487667 40*a^2*e^(275/2*I*c) + 63026901151891709378680778361983213199140036310310505948555685486408 0*a^2*e^(273/2*I*c) + 966780886821870705669527556981593846714993014354753639462486455113 00*a^2*e^(271/2*I*c) + 14501667734089456372413097720073331427769744768582734443920820884880*a^2*e^(269/2*I*c) + 212633835043406710184106617998672373630972174717063715133328238589 2*a^2*e^(267/2*I*c) + 3046500734896240695013196668409727533567115175541472951157077919 52*a^2*e^(265/2*I*c) + 4263315518275823421343265710 53

5950703915775821671009160815075116 0*a^2*e^(263/2*I*c) + 5824867841884974805
556257455805728440177379367311530786366553840*a^2*e^(261/2*I*c) + 776647773
894140039601026125724635184851400081828079008519495205*a^2*e^(259/2*I*c) +
101008959448394278622065270281354488236767429874129774402372122*a^2*e^(257/
2*I*c) + 12808036621165917614961411495703359665564662395820821879432651*a^2
*e^(255/2*I*c) + 1582600527113724210945270692154487384537712932377861494537
792*a^2*e^(253/2*I*c) + 19045604731498059626221445575883017641249047932754 8
630395435*a^2*e^(251/2*I*c) + 2231054773737733872819579266938469751788941 27
12723300156650*a^2*e^(249/2*I*c) + 254251082202480904911129205229592569445 8
486937681586168494*a^2*e^(247/2*I*c) + 281698477370386606708598633818891039
1655591926590675984 86*a^2*e^(245/2*I*c) + 30324466873468264078058992476301 7
3218138408444796674925 1*a^2*e^(243/2*I*c) + 316950508533267722030982308692 6
906379156042673077997829*a^2*e^(241/2*I*c) + 32141448551790707186651838684 5
402404565806226718602745*a^2*e^(239/2*I*c) + 315997292671613328234030755031
256616231248424742119 25*a^2*e^(237/2*I*c) + 300949727040266437260336905582 1
186361937123336960151*a^2*e^(235/2*I*c) + 277411701644365486379380075778816
997842958595635411*a^2*e^(233/2*I*c) + 247275011666470610832895287504674525
94464413496712*a^2*e^(231/2*I*c) + 212931229780003360396510945954289485137 9
636241390*a^2*e^(229/2*I*c) + 176951139921850074633194549001040224465598018
440*a^2*e^(227/2*I*c) + 14175642468718517834053796420531668264840828827*a^2
*e^(225/2*I*c) + 10934379034504134766947753880852481434358431 84*a^2*e^(223/
2*I*c) + 811066527449794535036059045605539418045168 27*a^2*e^(221/2*I*c) + 5
777459917323047305837478939343390617560800*a^2*e^(219/2*I*c) + 394635225337
65786529496599098235790277993 5*a^2*e^(217/2*I*c) + 258072074387090234055646
98654381610855782*a^2*e^(215/2*I*c) + 161295042854872202116087073257338874 8
486*a^2*e^(213/2*I*c) + 96165064556404674374591793494770969751*a^2*e^(211/2
*I*c) + 5458017107743192900932192332079754800*a^2*e^(209/2*I*c) + 294232725
4112183435379139106945241 15*a^2*e^(207/2*I*c) + 150280154429164727843033555
49568064*a^2*e^(205/2*I*c) + 7252125379823386395537526061059 71*a^2*e^(203/2
*I*c) + 329642061617287934990318163693 36*a^2*e^(201/2*I*c) + 14064727930607
42817278133399694*a^2*e^(199/2*I*c) + 56109286874368068446384618040*a^2*e^(
197/2*I*c) + 2083633993393098160454111295*a^2*e^(195/2*I*c) + 7165937010280
7444959242727*a^2*e^(193/2*I*c) + 2268898261098769561120041*a^2*e^(191/2*I*
c) + 65678633862570503690097*a^2*e^(189/2*I*c) + 1723848657664106290905*a^2
*e^(187/2*I*c) + 40614235388489346675*a^2*e^(185/2*I*c) + 84833912037464187
0*a^2*e^(183/2*I*c) + 15464515215103622*a^2*e^(181/2*I*c) + 241005431923542
*a^2*e^(179/2*I*c) + 3121832019735*a^2*e^(177/2*I*c) + 32266997620*a^2*e^(1
75/2*I*c) + 249487095*a^2*e^(173/2*I*c) + 1282710*a^2*e^(171/2*I*c) + 3289*
a^2*e^(169/2*I*c))/(e^(517*I*c) + 418*e^(516*I*c) + 87153*e^(515*I*c) + 120
85216*e^(514*I*c) + 1253841160*e^(513*I*c) + 103818048048*e^(512*I*c) + 714
6142307307*e^(511*I*c) + 420601518659718*e^(510*I*c) + 21608403021340047*e^
(509*I*c) + 984382804329835768*e^(508*I*c) + 40261256699368950388*e^(507*I*
c) + 1493326612293984160368*e^(506*I*c) + 50648660944512569972179*e^(505*I*
c) + 1581796642397812408161814*e^(504*I*c) + 45759117183402579073139583*e^(
503*I*c) + 1232445557346832245176696904*e^(502*I*c) + 31042222522074681615 6

25020522*e^(501*I*c) + 7340572636163884499688423669 24*e^(500*I*c) + 1635316
464715153024052913761811 1*e^(499*I*c) + 344277152012875134140739302960914*e
^(498*I*c) + 686832922526368134950199734132051 7*e^(497*I*c) + 1301711930791
728238351514307733600 24*e^(496*I*c) + 2348998374244347079532766203075607598
*e^(495*I*c) + 404436247814153115818578323890996345 64*e^(494*I*c) + 6656346
706762100637541918471099711414 14*e^(493*I*c) + 1049040266951089742462464376
6470754045064*e^(492*I*c) + 1585664761132575625661174322272038842988 56*e^(4
91*I*c) + 230215041122623492585522234520150090053357 6*e^(490*I*c) + 3214788
76933753388174544825153773503839502 78*e^(489*I*c) + 432333688644261557547 94
4179250800440604964868*e^(488*I*c) + 560592725306755855178045288368983551 44
55118670*e^(487*I*c) + 7016451532254446290687354881374809108456187068 0*e^(4
86*I*c) + 8485522022765123564962001369596762953616963151 13*e^(485*I*c) + 99
25490738534402272939987038714580495445431374618*e^(484*I*c) + 1123916045422
466509664291620631243389525545752340 51*e^(483*I*c) + 123309670013972336518 1
9972207509325906552876253421 56*e^(482*I*c) + 1311878180117217472967933989 43
18153694964675368481194*e^(481*I*c) + 1354425949166361161915746506253316462
3850110162793722 4*e^(480*I*c) + 1357990663161479842850642848032544982878359
839580349899*e^(479*I*c) + 1323170887010489697380005673377991908934083675 60
09580718*e^(478*I*c) + 1253704965869212726621980508512693231711673388540817
82959*e^(477*I*c) + 1155855412893594260345544966642687823630035899363232371
472*e^(476*I*c) + 1037518449987117550190939895659668411680299708252666032 35
24*e^(475*I*c) + 9072260572220881491864228463948718776460758970649397077477
6*e^(474*I*c) + 7732046369911457750614627310280985060944326757881362950112 5
9*e^(473*I*c) + 6426195485535248576425068136870465530087114003875716691383 9
02*e^(472*I*c) + 52108117629177048660492400985175830987505700566877818954 14
1639*e^(471*I*c) + 41243069829991519084806722232721943506774793409189467048
8982928*e^(470*I*c) + 3187749929744346497211536044751776582320958627923816 4
70590659024*e^(469*I*c) + 2407080191352975710185802291437204586474699178618
2039740274325264*e^(468*I*c) + 17764282913511934857719443767580283023990546
0092687136494961404333*e^(467*I*c) + 12818174649149708108596041898283590007
9078992116940530461221125181 8*e^(466*I*c) + 904669352382568297904433896310 4
26316767258682636791133882648354917 3*e^(465*I*c) + 624735507810532953177107
7469024711412412518756573184844178190403267 2*e^(464*I*c) + 4222761266320036
87547754746555709988710527133086660161366353656787288*e^(463*I*c) + 2794709
104475686611842790694973699164482254723977210209725661304403472*e^(462*I*c)
 + 1811576849561575807671030305550562558925429365919331415341833394459640 8*
e^(461*I*c) + 1150514818520808488737003883545213155676403651240031036911766
97194292320*e^(460*I*c) + 7160994975990580798956333385529402291928581964815
978300788197118626000 96*e^(459*I*c) + 4369442482910113914565353136069595862
669338858053419381214131241925047008*e^(458*I*c) + 2614397627990202144347 19
456650802545630568101835204018898002854931448674 48*e^(457*I*c) + 1534360887
450562541273272394615770719331301577645959971139735131831883993 76*e^(456*I*
c) + 8835009688217912026007745419277692007376893935137347893683970933331 19
61880*e^(455*I*c) + 4992519712457043983505377976607953988397368297591114957
991804893688371867680*e^(454*I*c) + 2769311653834325922598338263764793612 26

64033859615133489846664694361471028310*e^(453*I*c) + 150822381431412413773566474210011746852297437597059186295243989481140398152780*e^(452*I*c) + 80667954360758914075930501079618956826984202161338895521891627882318263948819 0*e^(451*I*c) + 423812584676323258639418856985868582675532800554862743701930140585132588759448 0*e^(450*I*c) + 21876482892713909928040345612578705805121508756226696317087651824252241418663320*e^(449*I*c) + 1109691996873209747499222595952504443412192185353496557625911925765358721517660 80*e^(448*I*c) + 55326912881952861250291886955894782909802195630934984358404463151229177880008149 0*e^(447*I*c) + 27118432396707175276056404901488335071302424484039783185232377219442003928301085 80*e^(446*I*c) + 13069817203488289886193205508375818392124991382340160316886507181296548981014818410*e^(445*I*c) + 619485966530355028795643388152343106604109020378824731618047744929162165758800776 80*e^(444*I*c) + 28882075526473065446996857202104710942731861950899580202068990459031947629540832428 0*e^(443*I*c) + 13247564123678374731574728211624836911209665019489539264922416437882642845464372211 20*e^(442*I*c) + 59789921729441432184591611492998197063217321115784945252452287429764684091053955362 90*e^(441*I*c) + 26556806389043407534496702369101545795994861757741414789944652712127566910185274123140*e^(440*I*c) + 1161045516835550437629115017121163993137330211326774811128240472463617940496357264798 50*e^(439*I*c) + 49970756725385908435759631481379476806933719091596749190748890493392267757966535433896 0*e^(438*I*c) + 21175897334668557071015014292104147224018388379407528416185414408885457299431382090368 20*e^(437*I*c) + 88367206408604703056945140215479695512967940922669830441183757900258545840367963647682 80*e^(436*I*c) + 363183696523025917321974444097981220226408246041305525067425867951832673543828478758857 30*e^(435*I*c) + 14703081673227683316304158209959204751204372522535333923881916519300040762954474575322174 0*e^(434*I*c) + 58640346697268324274164332892156090937519745386424329957199096460885724577113414520417499 0*e^(433*I*c) + 23043510733738403573791785976730663520166827816891398420973766631184888038411319353136418 40*e^(432*I*c) + 89232094473432967633318818816384717934996186706010260597308959626532917702294930281625751 00*e^(431*I*c) + 34054053851295569154352346722177172655187548910782008504718324168725029438589162349211628 040*e^(430*I*c) + 12809891460168853967248054183040984770736750043860153680320449770111991128908710565948278334 0*e^(429*I*c) + 47501057885760151927231661793842522242178659724167102689431851540851146714096939311576879368 0*e^(428*I*c) + 17365742188181910718741974724501581238835642099506586391023371481227690806116807197417260538 40*e^(427*I*c) + 62598721568222528436509607082350347102013627760571766472263230897514465652888501038981538599 20*e^(426*I*c) + 22251959176795777757167366036007480222211364232146399803864370963391491223687245823457351580140*e^(425*I*c) + 780098073680242398756137330588514171253271146810708896407942492826334705807565570839232033771 60*e^(424*I*c) + 269745801440211296972683601863878954357962308520076595177128227629273240215209708218497363414140*e^(423*I*c) + 920089393029589032874601850027159322612526368444771489781974361078847528891468831038436064951920*e^(422*I*c) + 309613197162152016238030155424146545178236208681028753774890290498593402017956570617713142161459 0*e^(421*I*c) + 1027936473066384084473957786246

926260464886191429797258916524353065123069072624446247919989425518O*e^(420*I*c) + 33675398872021568375902384593982753362559801058104184627345411136262431943240778260721756991027090*e^(419*I*c) + 10886799573182947282673290519203488679728462135644562753090910442948674125782263347689835682645404O*e^(418*I*c) + 34735147321471378087435208312956660123876576277594236676273334995210388975398263640385755686777730O*e^(417*I*c) + 10938532144862203586740324345008666784997700113058741724889759516120314567346082870955195010419754 40*e^(416*I*c) + 34002325606016516175216946808470898441980288316944174247948687793289505484181256054468820811526360 90*e^(415*I*c) + 10434117516570395966653693155582402109460348095473027807412321427346816928567197770376496170251803940*e^(414*I*c) + 31610939331284692750694306443618414656095969520945215743004044560386895241801579156543451940713351730*e^(413*I*c) + 94556180258931986919334303466365652826858091314329189160736277175873841732196453379953705679466826880*e^(412*I*c) + 27928575580003520667983536889816547764486498779466538782748893386363374504737310904926517268170258572O*e^(411*I*c) + 8146081877365305796702100252719214155971833698812142998232919697855498761759698663679766532449747285 60*e^(410*I*c) + 23465182192391051422381416330734647688991557089350257780476374126817815757654222191274092601594387122 50*e^(409*I*c) + 66758662903711473585037668656692890108935438698305387087249452915809511791882966061581112577069686047 40*e^(408*I*c) + 18759988218865563564163635735986073278255737257405706279108891366378428467414559930481172863538598193890*e^(407*I*c) + 52075178518793270386429263351544306951104993542500582938155241689408138675254608030847907167748571734720*e^(406*I*c) + 14280179245022176248318087491882527413430513327541778008479503464476350933350315051734586465966718941708 0*e^(405*I*c) + 38687621823427716563245172304997988926311528237460754169244317667399751374281359173617116965225061118648 0*e^(404*I*c) + 103556198259200293522638457790861154861211149508019357369133986470602918648246624180566494938104985625851 0*e^(403*I*c) + 27388956247952656033552276465660008862807783050848257029111938903656162004262736182657700406301914070062380*e^(402*I*c) + 71581246868429414754738073636798397181727455815384090445033838526935969216224266967404539447181430252483 90*e^(401*I*c) + 18487405299005732693752728611876490890858357021974882371570623800186245137722660943641752976852924439870880*e^(400*I*c) + 47188220843466207695099506953573780357108897491422567898048199018207708997005333860148836479527456156014520*e^(399*I*c) + 11904185540387796494822957794837046560060662318304552952690043020927047321277384779493558607471432947993928 0*e^(398*I*c) + 29682551528266958968531827328023905008455503220341594151196265959688161571379993768002649740830567229761884 0*e^(397*I*c) + 73158497220681836287472962140397444428001044630116152733976054481530095178798553841976465621458266721991408 0*e^(396*I*c) + 17824461149317518505563548566384219011744123222982494965916580539397871982465659459755955757341933488879521 60*e^(395*I*c) + 42932064780080221260174889088518264947906207206601514514681819109172400278639687245391276596335170530 02976480*e^(394*I*c) + 1022318202595486076721739030518645192356214547367429361991806349041148749612180459027459270277057151545641468 0*e^(393*I*c) + 24068785139705277161193465644506143285241361037768216818922184400141048460210

944696647752723371932874594597328*e^(392*I*c) + 5602868342490351765849501385853451616716259103436797249817466090745066677815435327163034465077788568354762418 4*e^(391*I*c) + 128967080084754712246023680866488384983286259025533132044636109049545144029547003347761521666283977931640178464*e^(390*I*c) + 2935507435543427098081294535765623132997059826991874168629343739642556159671386762532763025915615235156032644 03*e^(389*I*c) + 660764473105869097691475973850837934511089033149586707982764263394766756649565279879146173318386505740391093990*e^(388*I*c) + 147093114661893434551503836230010016048212774958144392990474691022477747019889905237911449399988700319941982957 9*e^(387*I*c) + 323849193136185147642332193353957909837773553920764146734623566582388704832694930560923158514374869020361595713 6*e^(386*I*c) + 705213241416219799260232652458014306098535305457293390552463312168102103734029836634220332432530707241373906102 4*e^(385*I*c) + 151896342149088003964179117226437547480485201097348124591098788104938443810626508189711996371214587494562432744 16*e^(384*I*c) + 323627313224195494103300889436402474603783285613164229312924271459028879130716436795029090558912367551432073826 09*e^(383*I*c) + 682080330967936156837844096192442108186149916400415534244055278768932724966083242310981485024664539671577280789 94*e^(382*I*c) + 142213115964814517682386667276769909482271681318790889840501039441748635545362467679832449103520321953011780083069*e^(381*I*c) + 293344920034300720287042383448342866313806285455040067823080445597545970023446231563554135133105493516316320059272*e^(380*I*c) + 5986501411122418589116765051805201503640032268413280814535970935877903386092124390855544668615826233503030619610 52*e^(379*I*c) + 120877035849365839308944422205693506328370410814059375022653984611773764821660955973483160124869827433029615861214 4*e^(378*I*c) + 241496651681033850328907654920274051171005901179544713877346420569645502644271242640959966277108026482600898506109 7*e^(377*I*c) + 477414111106609897022184533059496201647271423037423406066395684695092664268594692906411419440036093622359072547014 6*e^(376*I*c) + 933934195805349422525175096571505730070730208381477477030621822424102264824741995604295736305582383089854730321975 7*e^(375*I*c) + 180798200680288599703499386230072306765633142067088484999001396412373347632664793469632379360393281131850415917938 48*e^(374*I*c) + 346376571726716901676573445371970870488823548539932704720639430787736004465429635483481012693904434644807545139285 02*e^(373*I*c) + 656748592688673000988273758128752256106545516862611036816640070075371157780972935335652438288733837229803532006119 56*e^(372*I*c) + 123243941519332384741960072588103506596406339253616391082062969960682419011745775738921817753391954462609323881489157*e^(371*I*c) + 228911311738592780091492649162346834405867740776456326108410928857257174707289268074347550225793244741923354395308214*e^(370*I*c) + 420846342608949387277559021457924586578120966148561022647008499529468452005980175119410628956210497609566002969884927*e^(369*I*c) + 765867795513962781012558444628751418710940895281304790836743661582071650032154891482866406314834433199455459798934952*e^(368*I*c) + 137967652979621207401710618806658944835544650121089019510716486035022892858681553900306287502671193194194773869036072 2*e^(367*I*c) + 246044237584542266392708163098326071473496809190549302714563923882719225488634936112699145769240 98

5112087330748745468*e^(366*I*c) + 4343909696601932173357359687781579293701
2956819408271142154331753360939678459087667407382400371145706674109369980017
178*e^(365*I*c) + 7592752700146678961153095073585015473197029746533633331154
979396147328576093580190415511676483156087594758104869352722**e^(364*I*c) +
1313977149410493388185668115141829311224255152153568687118126657981387760
6348160261747201317735782566021306798298336024*e^(363*I*c) + 225146757413080
6996150616558650287243042193021067326439299728648560064010386725360484771555
4706059296769065379595114252O*e^(362*I*c) + 381990158675860879760029987566
2767499479544066790362502932234625013328648912087500501363812811389396034967
0280707161530*e^(361*I*c) + 641751006932600668062380648860045971707408433000
0868393686161391645291080498446753531118427257986580888403472414960996444*e^
(360*I*c) + 1067648320171655948380852341893335287335876733299725300926610851
8678993925291593709076028223234691909042624339940932331**4*e^(359*I*c) + 175
8962582627559857571068126139793012658010315954843536149046728651694422320757
765804471841341413759957700914992467595228*e^(358*I*c) + 286992943631231496
5572780108515769408968264974660663275288015606770071128374319267350881209748
617605113670088157287826433*e^(357*I*c) + 463758288457367154544937678255005
6887333281455680493104239955998860128006386199040223683785911088426023420945
43682299102*e^(356*I*c) + 742228640908173124916937049462525617334148919679
1182704898310054977819512210699558396234524997486531246588735534014421377*e^
(355*I*c) + 1176600720975786965189875050890231092204612696970277433014535895
7889567712307935203819931066068805646285998223417228010122*e^(354*I*c) + 18
4750585646245153344528430057132632378116255330456597188767075809107930679482
18349281707731263646397220715701317037853342*e^(353*I*c) + 2873610535922340
1870808354355829122772719679773947201597910702749277142768695314671826889810
4106138170388540349754400159**2*e^(352*I*c) + 442767307910542531852431611298
5693656584851936100192457044455134483305045321452516347118488133224823670465
103483954805161*e^(351*I*c) + 675848043788852437256293594896385762669485554
7195519486122877567981718587262362871994967079401831957927901682582941234362*e^(350*I*c) + 1022042377943463485133997529516339964170212224966366619305
3008302026096932158568338309418237395541351819026907953220681013*e^(349*I*c
) + 1531283720666277537934735321280768296571253565294263151828614240309773882
00270711195396582159028513532779682154451996208592*e^(348*I*c) + 227316035
6612884110041950194705136766683665241807726091394481074847308489189041018122
854126048548766259195656395212272232766*e^(347*I*c) + 334358978279365813011711
7545961082945429816796201741981007293673337850658442802420107245319345815
5334046693516742390717832*e^(346*I*c) + 487332535059749234008522555630521014
0219646931365955449272567475433937528301040716774436695582892283748870585858
532439654489*e^(345*I*c) + 70386349760594831567048224061395025698501202296966
630037676422033669770296159109985405541137629487143746814952852479600276 2*
e^(344*I*c) + 10074496185185374461175430098298016696240455383622292186848469
42699661206076989070463437310111609488281002767293701328193577*e^(343*I*c)
+ 1429063191230555242465469284789542383713159258020223892364986521368398225
020351556769709174190398345879670555884315664167844*e^(342*I*c) + 2009065871
5357880438030046950144161017452185125954192920984068896085945490851977483595

05895757666770857888611738751858460424*e^(341*I*c) + 2799452444750398048229
667304629608844921198748577911471240090794769204359417352933093054304386873
33129912454196774070107264*e^(340*I*c) + 3866426730503800494573825628183169
626519755509907792770487402386298587950182473561628886310156876647801012052
87333082748791*e^(339*I*c) + 5293292527641139260039348369582435576725492389
975607392144065991850478319555725837653586343954087715280097454675483829500
94*e^(338*I*c) + 7183615963820582492091135444879010888683887440337132103324
91971375906738341551540457264804304039664255915607349801911966551*e^(337*I*
c) + 9664582753690377187477391307981516434835906841668322346880982911641606
36418159452119815728809372125168836239364442397344064*e^(336*I*c) + 1289043
515292933956480634330499677040181043935620106914267311067900030058398839787
692376954090545278554544997710058754772400*e^(335*I*c) + 170458299670782280
820467821816769300269866114771277235502145654381093006963718808588282475750
0605246963210810351706405349408*e^(334*I*c) + 22348912763984394644786225783
064348407246104844681778598226206586919214786452666530625638235530012280010
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692529959823749532695963414164833366773128218607899328588608916176593772088
622582464*e^(332*I*c) + 374525759487665120465733498842622638814395450198683
0664222349226361079609546822276067504899386703088982308185717143407211328*e
^(331*I*c) + 47875274427809456851452048469715961653041694193282440732114595
92129649255048876854059844720661078151288179612574986359194560*e^(330*I*c)
+ 6068949803156712248331871105329895471722806143008878014986559653687260694
816550470195890004511965527567432722969707577202160*e^(329*I*c) + 762973181
562782158046899242420700836643889673633302466186383810511044514894696232829
7631547032543419811821015837863013682720*e^(328*I*c) + 95130322740195229542
091131912682266422999120135256659402983810647978856909049931289480352274121
44035633851779511219335277360*e^(327*I*c) + 1176421227487648408001090071467
347449337127816055781198372445582656605561765808647936864186490811964341241
3644803772131657280*e^(326*I*c) + 14429816285208431204532978375375691965063
1542246497475512958515073895240832269767896888601369628399900747658579201929
300744260*e^(325*I*c) + 175562732712242923968872914031257162134914862611454
78571376751690105656067838042151038271381300372757755676325408026834544840*
e^(324*I*c) + 2118832140588288753961019837470686269589404922607709376413251
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) + 25367176439119353621532260335983348154904982606125761711300683492963390
816491583025705268737539982149639300226512657426118880*e^(322*I*c) + 301284
824145527032645590189530881771560134374934382010784137698354483661481217545
49197591129967170764969700180348699207838960*e^(321*I*c) + 3550010310601964
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5568500732379966585005678181937920*e^(320*I*c) + 41499832121963708043788523
787401345541780088930538206918853579026749273364671640037563488607716092887
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789247190946356038928293648639165537922788229573682851063281647159105983708
71149079494360*e^(318*I*c) + 5539091304497208621943268914633156608142795989
696990021443429681773115086386705662076860818767970972015297414847490790417

7340*e^(317*I*c) + 63247774101012179051794946075175569924076981338138483158
04240674745387472938763171054499524715291220511850059751105282434768 0*e^(31
6*I*c) + 71660329861173395524441943889284109134091157844655245672084237402 4
349446964649271318121906596295111406395017433038635820928 80*e^(315*I*c) + 8
05662491306826841818762018826235112063637903372180119541102106429277659976 4
4903820595421936873565314654415769070472655401600*e^(314*I*c) + 89883815801
382382213973270477954602744792877018051963347146307372464315121274929402347
942874802899499538953561056667668891020*e^(313*I*c) + 995122064720579659513
403417380235485153364033717178980408504709546575329772791134915068802907261
111541019413860196895679580 40*e^(312*I*c) + 109332537349966223203932678503 4
263570798637070017282940110420765304039238626540189786765164173142210894499
224956127328701696 60*e^(311*I*c) + 119209713702033927055755397823688444444 6
474243245021853286263470465996347211465738306815404953335431467768109119104
10468628960*e^(310*I*c) + 128995076011591903410763863427097329948586173574 5
958627058491592809430464587426631634540184914638553956494539522128996321986
80*e^(309*I*c) + 13852979454915108945135276957654340312633074724368003083 24
672058958190435681552392648767628671727543386840278498553854532160 80*e^(308
*I*c) + 147648920805545333418623121767853777399782924748301228793924342574 9
9993795542176537010123512293955746754854920217455000960478 0*e^(307*I*c) + 1
561859629535511961697382188321736965098525515892107305783657274762594764744
6595542850233667374368649917569867787569361124340 0*e^(306*I*c) + 1639778160
596077253752645598165058478941877851014553603918974244829984153857876057653
1550920833774159014307857224350513270658 0*e^(305*I*c) + 170869848868953101 1
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2866649484572346254470910284368 0*e^(304*I*c) + 176720929970554642004575770 0
530957005953346598706827320319759155323875770524148663235111401176804929293
5451755947989922094036 0*e^(303*I*c) + 1814081687709220598203685533166973216
399848626282988285695602732956308976268293452635922190345608535307337105298
42148537901680*e^(302*I*c) + 184831151983748941817667850174708257138128172 1
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12840*e^(301*I*c) + 18691547443656751492635140562311750326198750835193008 38
245664444356891392336834117046418287621787991778480642201508183552612 80*e^(
300*I*c) + 187615393168510050071497280564603510912403132920312024370835062 6
790376449902862853466735070934529643512579626961335117256523 20*e^(299*I*c)
+ 18691547443656751492635140562311750326198750835193008382456644443568913 92
336834117046418287621787991778480642201508183552612 80*e^(298*I*c) + 1848311
519837489418176678501747082571381281721582694132877653585322407732443361919
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34560853530733710529842148537901680*e^(296*I*c) + 176720929970554642004575 7
700530957005953346598706827320319759155323875770524148663235111401176804929
2935451755947989922094036 0*e^(295*I*c) + 170869848868953101176860306053103 9
943405303903472600884326768425055551412938308389612759742689286664948457234
6254470910284368 0*e^(294*I*c) + 16397781605960772537526455981650584789418 77
85101455360391897424482998415385787605765315509208337741590143078572243505 1

32706580*e^(293*I*c) + 1561859629535511961697382188321736965098525515892107
3057836572747625947647446595542850233667374368649917569867787569361124340 0*
e^(292*I*c) + 1476489208055453334186231217678537773997829247483012287939243
425749999379554217653701012351229395574675485492021745500096047 80*e^(291*I*
c) + 1385297945491510894513527695765434031263307472436800308324672058958190
43568155239264876762867172754338684027849855385453216080*e^(290*I*c) + 1289
9507601159190341076386342709732994858617357459586270584915928094304645874 26
631634540184914638553956494539522128996321986 80*e^(289*I*c) + 1192097137020
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40495333543146776810911910410468628960*e^(288*I*c) + 1093325373499662232039
3267850342635707986370700172829401104207653040392386265401897867651641731 42
210894499224956127328701696 60*e^(287*I*c) + 9951220647205796595134034173802
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1386019689567958040*e^(286*I*c) + 8988381580138238221397327047795460274479 2
8770180519633471463073724643151212749294023479428748028994995389535610566 67
668891020*e^(285*I*c) + 8056624913068268418187620188262351120636379033721 80
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e^(284*I*c) + 7166032986117339552444194388928410913409115784465524567208423
740243494469646492713181219065962951114063950174330386358209288 0*e^(283*I*c
) + 6324777410101217905179494607517556992407698133813848315804240674745387 4
7293876317105449952471529122051185005975110528243476 80*e^(282*I*c) + 553909
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20768608187679709720152974148474907904177340*e^(281*I*c) + 4813311767818402
9216503748549110374478924719094635603892829364863916553792278822957368285 10
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7874013455417800889305382069188535790267492733646716400375634886077160928 87
6864715428386027885596 60*e^(279*I*c) + 3550010310601964987627237679694948 22
0958137237103600501287780602748167280705994344524013631556850073237996658 50
05678181937920*e^(278*I*c) + 3012848241455270326455901895308817715601343749
3438201078413769835448366148121754549197591129967170764969700180348699207 83
8960*e^(277*I*c) + 2536717643911935362153226033598334815490498260612576171 1
3006834929633908164915830257052687375399821496393002265126574261188 80*e^(27
6*I*c) + 2118832140588288753961019837470686269589404922607709376413251251 33
361905239789496943876860591245267550480429579542647066374 60*e^(275*I*c) + 1
7556273271224292396887291403125716213491486261145478571376751690105656067 83
8042151038271381300372757755676325408026834544840*e^(274*I*c) + 14429816285
2084312045329783753756919650631542246497475512958515073895240832269767896 88
601369628399900747658579201929300744260*e^(273*I*c) + 117642122748764840800
1090071467347449337127816055781198372445582656605561765808647936864186490 81
1964341241364480377213165728 0*e^(272*I*c) + 951303227401952295420911319126 8
2266422999120135256659402983810647978856909049931289480352274121440356338 51
779511219335277360*e^(271*I*c) + 7629731815627821580468992424207008366438 89
6736333024661863838105110445148946962328297631547032543419811821015837863 01
3682720*e^(270*I*c) + 606894980315671224833187110532989547172280614300887 80
14986559653687260694816550470195890004511965527567432722969707577202160*e^(

269*I*c) + 4787527442780945685145204846971596165304169419328244073211459592129649255048876854059844720661078151288179612574986359194560*e^(268*I*c) + 3745257594876651204657334988426226388143954501986830664222349226361079609546822276067504899386703088982308185717143407211328*e^(267*I*c) + 2905385722320057001953345274489482790856692529959823749532695963414164833366773128218607899328588608916176593772088622582464*e^(266*I*c) + 2234891276398439464478622578306434840724610484468177859822620658691921478645266653062563823553001228001009093606751066168944*e^(265*I*c) + 1704582996707822808204678218167693002698661147712772355021456543810930069637188085882824757500605246963210810351706405349408*e^(264*I*c) + 1289043515292933956480634330499677040181043935620106914267311067900030058398839787692376954090545278554544997710058754772400*e^(263*I*c) + 966458275369037718747739130798151643483590684166832234688098291164160636418159452119815728809372125168836239364442397344064*e^(262*I*c) + 718361596382058249209113544487901088868388744033713210332491971375906738341551540457264804304039664255915607349801911966551*e^(261*I*c) + 529329252764113926003934836958243557672549238997560739214406599185047831955572583765358634395408771528009745467548382950094*e^(260*I*c) + 386642673050380049457382562818316962651975550990779277048740238629858795018247356162888631015687664780101205287333082748791*e^(259*I*c) + 279945244475039804822966730462960884492119874857791147124009079476920435941735293309305430438687333129912454196774070107264*e^(258*I*c) + 200906587153578804380300469501441610174521851259541929209840688960859454908519774835905895757666770857888611738751858460424*e^(257*I*c) + 142906319123055524246546928478954238371315925802022389236498652136839822502035155676970917419039834587967055588431566416784*e^(256*I*c) + 100744961851853744611754300982980166962404553836222921868484694269966120607698907046343731011160948828100276729370132819357*e^(255*I*c) + 70386349760594831567048224061395025698501202296966300376764220336697702961591099854055411376294871437468149528524796002762*e^(254*I*c) + 48733253505974923400852255563052101402196469313659554492725674754339375283010407167744366955828922837488705858532439654489*e^(253*I*c) + 33435897827936581301171175459610829454298167962017419810072936733378506584428024201072453193458155334046693516742390717832*e^(252*I*c) + 22731603566128841100419501947051367666836652418077260913944810748473084891890410181285412604854876625919565639521227223276*e^(251*I*c) + 15312837206662775379347353212807682965712535652942631518286142403097738200270711195396582159028513532779682154451996208592*e^(250*I*c) + 10220423779434634851339975295163399641702122249663666193053008302026096932158568338309418237395541351819026907953220681013*e^(249*I*c) + 6758480437888524372562935948963857626694855547195519486122877567981718587262362871994967079401831957927901682582941234362*e^(248*I*c) + 4427673079105425318524316112985693656584851936100192457044455134483305045321452516347118488133224823670465103483954805161*e^(247*I*c) + 2873610535922340187080835435582912277271967977394720159791070274927714276869531467182688981041061381703885403497544001592*e^(246*I*c) + 1847505856462451533445284300571326323781162553304565971887670758091079306794821834928170773126364639722071570131703785334*e^(245*I*c) + 117660072097578696518987505089023109220461269697027743301453

5895788956771230793520381993106606880564628599822341722801012*e^(244*I*c) +
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59110884260234209454368229910 2*e^(242*I*c) + 28699294363123149655727801085
1576940896826497466066327528801560677007112837431926735088120974861760511367
008815728782643*e^(241*I*c) + 17589625826275598575710681261397930126580103
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 641751006932600668062380648860045971707408433000868393686161391645291080498
446753531118427257986580888403472414960996 44*e^(238*I*c) + 381990158675860
8797600299875662767499479544066790362502932234625013328648912087500501363812
81138939603496702807071615 30*e^(237*I*c) + 225146757413080699615061655865 0
2872430421930210673264392997286485600640103867253604847715547060592967690653
795951142520*e^(236*I*c) + 1313977149410493388185668115141829311224255152 1
535686871181266579813877606348160261747201317735782566021306798298336024*e^
(235*I*c) + 759275270014667896115309507358501547319702974653363333154979396
14732857609358019041551167648315608759475810486935272 24*e^(234*I*c) + 43439
0969660193217335735968778157929370129568194082711421543317533609396784590876
674073824003711457066741093699801717 8*e^(233*I*c) + 2460442375845422663927
0816309832607147349680919054930271456392388271922548863493611269914576924098
5112087330748745746 8*e^(232*I*c) + 137967652979621207401710618806658944835
5446501210890195107164860350228928586815539003062875026711931941947738690360
722*e^(231*I*c) + 765867795513962781012558444628751418710940895281304790836
743661582071650032154891482866406314834433199455459798934952*e^(230*I*c) +
 420846342608949387277559021457924586578120966148561022647008499529468452005
98017511941062895621049760956600296988492 7*e^(229*I*c) + 22891131173859278
0091492649162346834405867740776456326108410928857257174707289268074347550225
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5964063392536163910820629699606824190117457757389218177533919544626093238814
89157*e^(227*I*c) + 656748592688673000988273758128752256106545516862611036
816640070075371157780972935335652438288733837229803532006119 56*e^(226*I*c)
 + 346376571726716901676573445371970870488823548539932704720639430787736004
654296354834810126939044346448075451392850 2*e^(225*I*c) + 1807982006802885
9970349938623007230676563314206708848499900139641237334763266479346963237936
039328113185041591793848*e^(224*I*c) + 933934195805349422525175096571505730
0707302083814774770306218224241022648247419956042957363055823830898547303219
757*e^(223*I*c) + 477414111106609897022184533059496201647271423037423406 0
663956846950926642685946929064114194400360936223590725470146*e^(222*I*c) +
2414966516810338503289076549202740511710059011795447138773464205696455026442
71242640959966277108026482600898506109 7*e^(221*I*c) + 120877035849365839308
944222205693506328370410814059375022653984611773764821660955973483160124869
827433029615861214 4*e^(220*I*c) + 598650141112241858911676505180520150364 0
032268413280814535970935877903386092124390855544668615826233503030619610 52*

e^(219*I*c) + 29334492003430072028704238344834286631380628545504006782308044559754597002344623156355413513310549351631632005 9272*e^(218*I*c) + 14221311596481451768238666727676990948227168131879088984050103944174863554536246767983244910352032195301178008306 9*e^(217*I*c) + 68208033096793615683784409619244210818614991640041553424405527876893272496608324231098148502466453967157728078994*e^(216*I*c) + 32362731322419549410330088943640247460378328561316422931292427145902887913071643679502909055891236755143207382609*e^(215*I*c) + 15189634214908800396417911722643754748048520109734812459109878810493844381062650818971199637121458749456243274416*e^(214*I*c) + 70521324141621979926023265245801430609853530545729339055246331216810210373402983663422033243253070724137390610 24*e^(213*I*c) + 32384919313618514764233219335395790983777355392076414673462356658238870483269493056092315851437486902036159571 36*e^(212*I*c) + 14709311466189343455150383623001001604821277495814439299047469102247774701988990523791144939998870031994198295 79*e^(211*I*c) + 66076447310586909769147597385083793451108903314958670798276426339476675664956527987914617331838650574039109399 0*e^(210*I*c) + 29355074355434270980812945357656231329970598269918741686293437396425561596713867625327630259156152351560326440 3*e^(209*I*c) + 12896708008475471224602368086648838498328625902555331320446361090495451440295470033477615216662839779316401784 64*e^(208*I*c) + 56028683424903517658495013858534516167162591034367972498174660907450666778154353271630344650777885683547624184*e^(207*I*c) + 24068785139705277161193465644506143285241361037768216818922184400141048460210944696647752723371932874594597328*e^(206*I*c) + 10223182025954860767217390305186451923562145473674293619918063490411487496121804590274592702770571515456414680*e^(205*I*c) + 42932064780080221260174889088518264947906207206601514514681819109172400278639687245391276596335170530029764 80*e^(204*I*c) + 17824461149317518505563548566384219011744123222982494965916580539397871982465659459755955757341933488879521 60*e^(203*I*c) + 73158497220681836287472962140397444428001044630116152733976054481530095178798553841976465621458266721991408 0*e^(202*I*c) + 29682551528266958968531827328023905008455503220341594151196265959688161571379993768002649740830567229761884 0*e^(201*I*c) + 11904185540387796494822957794837046560060662318304552952690043020927047321277384779493558607471432947993928 0*e^(200*I*c) + 47188220843466207695099506953573780357108897491422567898048199018207708997005333860148836479527456156014520*e^(199*I*c) + 18487405299005732693752728611876490890858357021974882371570623800186245137722660943641752976852924439870880*e^(198*I*c) + 71581246868429414754738073636798397181727455815384090445033838526935969216224266967404539447181430252483 90*e^(197*I*c) + 27388956247952656033552276465660008862807783050848257029119389036561620042627361826577004063019140700623 80*e^(196*I*c) + 10355619825920029352263845779086115486121114950801935736913398647060291864824662418056649493810498562585 10*e^(195*I*c) + 38687621823427716563245172304997988926311528237460754169244317667399751374281359173617116965225061118648 0*e^(194*I*c) + 14280179245022176248318087491882527413430513327541778008479503464476350933350315051734586465966718941708 0*e^(193*I*c) + 52075178518793270386429263351544306951104993542500582938155241689408138675254608030847907167748571734720*e^(192*I*c) + 18

75998821886556356416363573598607327825573725740570627910889136637842846741455993048117286353859819389 0*e^(191*I*c) + 66758662903711473585037668656692890108935438698305387087249452915809511791882966061581112577069686047 40*e^(190*I*c) + 23465182192391051422381416330734647688991557089350257780476374126817815757654222191274092601594387122 50*e^(189*I*c) + 81460818773653057967021002527192141559718336988121429982329196978554987617596986636797665324497472856 0*e^(188*I*c) + 27928575580003520667983536889816547764486498779466538782748893386363374504737310904926517268170258572 0*e^(187*I*c) + 94556180258931986919334303466365652826858091314329189160736277175873841732196453379953705679466826880*e^(186*I*c) + 31610939331284692750694306443618414656095969520945215743004044560386895241801579156543451940713351730*e^(185*I*c) + 10434117516570395966653693155582402109460348095473027807412321427346816928567197770376496170251803940*e^(184*I*c) + 34002325606016516175216946808470898441980288316944174247948687793289505484181256054468820811526360 90*e^(183*I*c) + 10938532144862203586740324345008666784997700113058741724889759516120314567346082870955195010419754 40*e^(182*I*c) + 34735147321471378087435208312956660123876576277594236676273334995210388975398263640385755686777730 0*e^(181*I*c) + 10886799573182947282673290519203488679728462135644562753090910442948674125782263347689835682645404 0*e^(180*I*c) + 33675398872021568375902384593982753362559801058104184627345411136262431943240778260721756991027090*e^(179*I*c) + 10279364730663840844739577862469262604648861914297972589165243530651230690726244462479199894255180*e^(178*I*c) + 30961319716215201623803015542414654517823620868102875377489029049859340201795657061771314216145 90*e^(177*I*c) + 92008939302958903287460185002715932261252636844477148978197436107884752889146883103843606495192 0*e^(176*I*c) + 26974580144021129697268360186387895435796230852007659517712822762927324021520970821849736341414 0*e^(175*I*c) + 78009807368024239875613733058851417125327114681070889640794249282633470580756557083923203377160*e^(174*I*c) + 22251959176795777757167366036007480222211364232146399803864370963391491223687245823457351580140*e^(173*I*c) + 6259872156822252843650960708235034710201362776057176647226323089751446565288850103898153859920*e^(172*I*c) + 17365742188181910718741974724501581238835642099506586391023371481227690806116807197417260538 40*e^(171*I*c) + 475010578857601519272316617938425222421786597241671026894318515408511467140969393115768793680*e^(170*I*c) + 12809891460168853967248054183040984770736750043860153680320449770111991128908710565948278334 0*e^(169*I*c) + 34054053851295569154352346722177172655187548910782008504718324168725029438589162349211628040*e^(168*I*c) + 89232094473432967633318818816384717934996186706010260597308959626532917702294930281625751 00*e^(167*I*c) + 23043510733738403573791785976730663520166827816891398420973766631184888038411319353136418 40*e^(166*I*c) + 586403466972683242741643328921560909375197453864243299571990964608857245771134145204174990*e^(165*I*c) + 14703081673227683316304158209959204751204372522535333923881916519300040762954474575322174 0*e^(164*I*c) + 3631836965230259173219744440979812202264082460413055250674258679518326735438284787588573 0*e^(163*I*c) + 88367206408604703056945140215479695512967940922669830441183757900258545840367963647682 80*e^(162*I*c) + 2117589733466855707101501429210 4

1472240183883794075284161854144088854572994313820903682 0*e^(161*I*c) + 4997
0756725385908435759631481379476806933719091596749190748890493392267757966 53
54338960*e^(160*I*c) + 1161045516835550437629115017121163993137330211326774
81112824047246361794049635726479850*e^(159*I*c) + 265568063890434075344967 0
23691015457959948617577414147899446527121275669101852741231 40*e^(158*I*c) +
597899217294414321845916114929981970632173211157849452524522874297646840 91
05395536290*e^(157*I*c) + 1324756412367837473157472821162483691120966501948
95392649224164378826428454643722112 0*e^(156*I*c) + 2888207552647306544699 68
57202104710942731861950899580202068990459031947629540832428 0*e^(155*I*c) +
619485966530355028795643388152343106604109020378824731618047744929162165758
80077680*e^(154*I*c) + 1306981720348828988619320550837581839212499138234016
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488335071302424484039783185232377219442003928301085 80*e^(152*I*c) + 5532691
288195286125029188695589478290980219563093498435840446315122917788000814 90*
e^(151*I*c) + 1109691996873209747499222595952504443412192185353496557625911
925765358721517660 80*e^(150*I*c) + 2187648289271390992804034561257870580512
15087562266963170876518242522414186633 20*e^(149*I*c) + 4238125846763232586 3
94188569858685826755328005548627437019301405851325887594480*e^(148*I*c) + 8
066795436075891407593050107961895682698420216133889552189162788231826394881
90*e^(147*I*c) + 1508223814314124137735664742100117468522974375970591862952
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40338596151334898466646943614710283 10*e^(145*I*c) + 4992519712457043983505 3
7797660795398839736829759111495799180489368837186768 0*e^(144*I*c) + 8835009
688217912026007745419277692007376893935137347893683970933333119618 80*e^(143
*I*c) + 1534360887450562541273272394615770719331301577645959971139735131831
88399376*e^(142*I*c) + 2614397627990202144347194566508025456305681018352040
18898002854931448674 48*e^(141*I*c) + 4369442482910113914565353136069595862 6
69338858053419381214131241925047008*e^(140*I*c) + 716099497599058079895633 3
38552940229192858196481597830078819711862600096*e^(139*I*c) + 1150514818520
808488737003883545213155676403651240031036911766971942923 20*e^(138*I*c) + 1
811576849561575807671030305550562558925429365919331415341833394459640 8*e^(1
37*I*c) + 279470910447568661184279069497369916448225472397721020972566130 44
03472*e^(136*I*c) + 4222761266320036875477547465557099887105271330866601613
66353656787288*e^(135*I*c) + 6247355078105329531771077469024711412412518756
573184844178190403267 2*e^(134*I*c) + 904669352382568297904433896310426316 76
72586826367911338826483549173*e^(133*I*c) + 12818174649149708108596041898 28
35900079078992116940530461221125181 8*e^(132*I*c) + 17764282913511934857719 4
43767580283023990546009268713649496140433 3*e^(131*I*c) + 24070801913529757 1
01858022914372045864746991786182039740274325264*e^(130*I*c) + 3187749929744
34649721153604475177658232095862792381647059065902 4*e^(129*I*c) + 412430698
2999151908480672223272194350677479340918946704889829 28*e^(128*I*c) + 521081
17629177048660492400985175830987505700566877818954141639*e^(127*I*c) + 6426
19548553524857642506813687046553008711400387571669138390 2*e^(126*I*c) + 773
20463699114577506146273102809850609443267578813629501125 9*e^(125*I*c) + 907
22605722208814918642284639487187764607589706493970774776*e^(124*I*c) + 1037

518449987117550190939895659668411680299708252666O323524*e^(123*I*c) + 11558
554128935942603455449666426878236300358993632323714 72*e^(122*I*c) + 1253704
965869212726621980508512693231711673388540817829 59*e^(121*I*c) + 1323170887
010489697380005673377991908934083675600958O718*e^(120*I*c) + 13579906631614
79842850642848032544982878359839580349899*e^(119*I*c) + 135442594916636116 1
915746506253316462385011016279372 24*e^(118*I*c) + 1311878180117217472967933
98943181536949646753684811 94*e^(117*I*c) + 123309670013972336518199722075 09
3259065528762534215 6*e^(116*I*c) + 112391604542246650966429162063124338952 5
54575234051*e^(115*I*c) + 992549073853440227293998703871458049544543137461 8
*e^(114*I*c) + 8485522022765123564962001369596762953616963151 13*e^(113*I*c)
 + 70164515322544462906873548813748091084561870680*e^(112*I*c) + 5605927253
067558551780452883689835514455118670*e^(111*I*c) + 4323336886442615575479 44
179250800440604964868*e^(110*I*c) + 3214788769337533881745448251537735038 39
50278*e^(109*I*c) + 23021504112262349258552223452015009005335 76*e^(108*I*c)
 + 15856647611325756256611743222720388429885 6*e^(107*I*c) + 104904026695108
974246246437664707540450 64*e^(106*I*c) + 66563467067621006375419184710997 11
41414*e^(105*I*c) + 40443624781415311581857832389099634564*e^(104*I*c) + 23
489983742443470795327662030756075 98*e^(103*I*c) + 1301711930791728238351514
30773360024*e^(102*I*c) + 6868329225263681349501997341320517*e^(101*I*c) +
344277152012875134140739302960914*e^(100*I*c) + 1635316464715153024052913 76
18111*e^(99*I*c) + 7340572636163884499688423669 24*e^(98*I*c) + 310422225220
74681615625020522*e^(97*I*c) + 12324455573468322451766969 04*e^(96*I*c) + 45
75911718340257907313958 3*e^(95*I*c) + 1581796642397812408161814*e^(94*I*c)
+ 50648660944512569972179*e^(93*I*c) + 1493326612293984160368*e^(92*I*c) +
40261256699368950388*e^(91*I*c) + 984382804329835768*e^(90*I*c) + 216084030
21340047*e^(89*I*c) + 420601518659718*e^(88*I*c) + 7146142307307*e^(87*I*c)
 + 103818048048*e^(86*I*c) + 1253841160*e^(85*I*c) + 12085216*e^(84*I*c) +
87153*e^(83*I*c) + 418*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) + 7*(-986
7*I*a^2*e^(1027/2*I*c) - 3848130*I*a^2*e^(1025/2*I*c) - 748461285*I*a^2*e^(
1023/2*I*c) - 96800992860*I*a^2*e^(1021/2*I*c) - 9365496059205*I*a^2*e^(101
9/2*I*c) - 723016295770626*I*a^2*e^(1017/2*I*c) - 46393545645311706*I*a^2*e
^(1015/2*I*c) - 2545017361124253210*I*a^2*e^(1013/2*I*c) - 1218427061655317
58225*I*a^2*e^(1011/2*I*c) - 5171545973000559760165*I*a^2*e^(1009/2*I*c) -
197035901588508817004391*I*a^2*e^(1007/2*I*c) - 6806694783357860712909393*I
*a^2*e^(1005/2*I*c) - 214978110312371924676280101*I*a^2*e^(1003/2*I*c) - 62
50901980395957795917828835*I*a^2*e^(1001/2*I*c) - 168327860633476968482282 7
79620*I*a^2*e^(999/2*I*c) - 4219418379622495018746735933182*I*a^2*e^(997/2*
I*c) - 98892618501960556395579843057828*I*a^2*e^(995/2*I*c) - 2175637614526
488309339795247719423*I*a^2*e^(993/2*I*c) - 4508404634705112156129133913129
7112*I*a^2*e^(991/2*I*c) - 882698176765813429616327000431223295*I*a^2*e^(98
9/2*I*c) - 16374051337559882202075446312226584700*I*a^2*e^(987/2*I*c) - 288
495194028428088627568321559245818459*I*a^2*e^(985/2*I*c) - 4838851294065276
461984778740285520947658*I*a^2*e^(983/2*I*c) - 774216225013482802473342351 9
1908463309686*I*a^2*e^(981/2*I*c) - 118390567985118721949628445198583036973
3725*I*a^2*e^(979/2*I*c) - 17332379827117737513384038195005765450047540*I*a

^2*e^(977/2*I*c) - 2433199596289534677118261636240067044087711129*I*a^2*e^(9
75/2*I*c) - 3280313734912630390804532039053385555426092600*I*a^2*e^(973/2*I
*c) - 4252692781812026203223634023194848436003905212 1*I*a^2*e^(971/2*I*c) -
 530853426357042754469653748150767198919032400940*I*a^2*e^(969/2*I*c) - 638
7936994195976240622682990166245342613055517890*I*a^2*e^(967/2*I*c) - 741825
0497560845028963626536828185138271122064 9004*I*a^2*e^(965/2*I*c) - 83223512
5649436217222715021488460783355491981492217*I*a^2*e^(963/2*I*c) - 902849209
049851352193143124553016936636903459632 4891*I*a^2*e^(961/2*I*c) - 947991914
2233667091173328415586707603032597722134 1875*I*a^2*e^(959/2*I*c) - 96424350
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5799900673113299221003726853644110325215605885183*I*a^2*e^(955/2*I*c) - 909
7340693680683753191568540095330911057425272127602 0367*I*a^2*e^(953/2*I*c) -
 8450955029746707145980332245590688952025941914290693 60222*I*a^2*e^(951/2*I
*c) - 7627533234852264511705859368402201230654030433440301675518*I*a^2*e^(9
49/2*I*c) - 66931651284481661864618077305876269408561834596408636101210*I*a
^2*e^(947/2*I*c) - 571368224054265219726596099705196924252108483077143367 41
9935*I*a^2*e^(945/2*I*c) - 474780239105147228318387951694540539533742079115
5799564552344*I*a^2*e^(943/2*I*c) - 384241176106726559069364415899325808086
31293346194215493375887*I*a^2*e^(941/2*I*c) - 303026950314518079219169886 63
946921311252966261949606507036 2634*I*a^2*e^(939/2*I*c) - 232994397127263459
7068665479560383652668004620643027277203439985*I*a^2*e^(937/2*I*c) - 174746
0922600429434666452928465193776292560410220855409744205 0560*I*a^2*e^(935/2*
I*c) - 127899514211571855615342081558322168204136482117422337757176345560*I
*a^2*e^(933/2*I*c) - 913950624853444779964988596342201399080981813136131167
642386677984*I*a^2*e^(931/2*I*c) - 637901832413161622065274741571090592968 5
3022373721294565274631655 24*I*a^2*e^(929/2*I*c) - 43505029014129136807566 38
831801360916381598602707780434334 9110468080*I*a^2*e^(927/2*I*c) - 290034464
5203870368017278485894025979562764909461617175339616495957 00*I*a^2*e^(925/2
*I*c) - 18908085231844652348705820115489868983683675780582564154081721230 86
240*I*a^2*e^(923/2*I*c) - 120584136119792150144938088810949193270761361589 5
877460346501392295146 0*I*a^2*e^(921/2*I*c) - 752537835473769580225687459869
0377526529117842552173734533892140140160 8*I*a^2*e^(919/2*I*c) - 45973461349
85259043916614533234993390211278709278499070556061445788378 80*I*a^2*e^(917/
2*I*c) - 275021431468142116442056577595633159921285138864123056720909524083
2869740*I*a^2*e^(915/2*I*c) - 161153971851311832617849990680934829583309265
3711954809656909161017099008 0*I*a^2*e^(913/2*I*c) - 925252909601779684527 43
5103832841890383028758081379911180475319702673301 40*I*a^2*e^(911/2*I*c) - 5
206550842970712132478746309191148757771507362669623848146159373668415836 00*
I*a^2*e^(909/2*I*c) - 287230698076548578679809352790567039431630031149487 99
1937029260199416487398 0*I*a^2*e^(907/2*I*c) - 155388691999720637916900492 88
524847158110979530065672277863507395517286098560*I*a^2*e^(905/2*I*c) - 8245
719794050006511283123577800933740057794243732927054193688961113624861636 0*I
*a^2*e^(903/2*I*c) - 429306406331604823645688251632236356131380665568461698
695435155472754991584480*I*a^2*e^(901/2*I*c) - 219351825332360715859830676 0
61019450556371571764873797824916469904479679017897 0*I*a^2*e^(899/2*I*c) - 1

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1856011191917686754755796153099081679265022946497934343332346116036200*I*a^2*e^(837/2*I*c) - 15460338188803518101070796298741473051050449962808545632677281743199685497754720467992010224616870*I*a^2*e^(835/2*I*c) - 46871127019956579394527723949157745550097315795915660019622180811547871642339809799054651854945990*I*a^2*e^(833/2*I*c) - 14017370320276354101582050564072838671837427591604109607818309184541330528820508034234222004662965 0*I*a^2*e^(831/2*I*c) - 41356448914361269513294728809292139787765990212707157864657906237914001989850609848655061942590417 0*I*a^2*e^(829/2*I*c) - 12038583111890300185997847589831145741012765535839689657765510614631704354264034831791768404974563 30*I*a^2*e^(827/2*I*c) - 34578167670199920203094629583513862564497365931409694682798773277537921984949896294334081066519010 70*I*a^2*e^(825/2*I*c) - 98007931606456607594438946098489115294255796908743301153235690275410054767353791756400639618863337 00*I*a^2*e^(823/2*I*c) - 27415141034845443951094939256750954584436945867670907710352859492970463590965208109494412332329295780*I*a^2*e^(821/2*I*c) - 75687878722014265825238066731591013702998100464324442217272752916887964266256104313931049007060490840*I*a^2*e^(819/2*I*c) - 2062550466642352923299538505218323676805884853392747978586557766976702788671365670139537869241778588 90*I*a^2*e^(817/2*I*c) - 55483047707198724665440844480803020948751532540060577281911940843579274464630633676855949485875736246 0*I*a^2*e^(815/2*I*c) - 14734244436210996237718170312095152434367246370257495272676786857703552931672825473799940416122495364 10*I*a^2*e^(813/2*I*c) - 3863144375168680185763569132920778270446697978368842784965444139916857358263428001264383566311006996680*I*a^2*e^(811/2*I*c) - 10000748842581421153115782850028419130643869569449134721967908251115915010593127137857232140041620869750*I*a^2*e^(809/2*I*c) - 25564363098285969951461675934273364734821923616250047177527687812898786857371780193438857338260097911840*I*a^2*e^(807/2*I*c) - 64532731977824591479369191637158259335289649533606982971631364964054911681075637122490714561514235891960*I*a^2*e^(805/2*I*c) - 16087882507904339460383494957583749762548437050975220455638952087004282015328124781724834956347892496000 0*I*a^2*e^(803/2*I*c) - 39611569277203177028830479171851173129136840629743984343565075037223624857779778302133833122824375062226 0*I*a^2*e^(801/2*I*c) - 96333990133367005220184783649172964795326224863928850083854162444757923207857140801735827540862351061384 0*I*a^2*e^(799/2*I*c) - 23141998752256698682440696515848763959636633393813671217659701646194269584965681164565466624090684498409 80*I*a^2*e^(797/2*I*c) - 54918031466875398805359765659637956721645140865672080120159160267756394387323362582018044196182925450323 20*I*a^2*e^(795/2*I*c) - 12875090968570495110482688497331119551481725115140466354371165041532925663730313264282055462011603010654340*I*a^2*e^(793/2*I*c) - 29821871642675642979884949769331439027860315600536250652213455370080842219764548099437011716544543041268840*I*a^2*e^(791/2*I*c) - 68248997534416889840574744172323284868436001711555565766981650470803874668337015803960506067102299819184920*I*a^2*e^(789/2*I*c) - 15433398044664752654560339343571798167516797662298543036518825302240514075095639061509509347911069958864990 0*I*a^2*e^(787/2*I*c) - 34487160316461388400250555853491846309083758177745931167884206712328646622675114407113348277600543048942576 0*I*a^2*e^(785/2*I*c) - 76

1570681410168662769506297132490171367321466294322961126983855669845333986783371033315463200057428630752220*I*a^2*e^(783/2*I*c) - 1662056674430734149248928799468980773731456543701211070556181213389924055988353226635860540433754964155111760*I*a^2*e^(781/2*I*c) - 3585005678974805516058499671632595513393574957113980336688954791609736165974043249124955091096872997954793020*I*a^2*e^(779/2*I*c) - 7643064321422150851076556045420554744138398485227228000246848202365010891675711435238630995867297844214073376*I*a^2*e^(777/2*I*c) - 1610659553400442535055634550846776406381699126024100836153672902222104936768062730161160906358480197037970420 0*I*a^2*e^(775/2*I*c) - 33552369185708773069292076239890437482410490941602744957472544576489334415521169836149006133511757140035934080*I*a^2*e^(773/2*I*c) - 69095566712272231972432239728899496174922220772041984182069284130237389188998302806443944988509065063273154745*I*a^2*e^(771/2*I*c) - 1406723757130126873203890735799455333793671320074123565586500813884699392181586147785024671636525278625509521 30*I*a^2*e^(769/2*I*c) - 2831541724454077422450878787538662877042027538054395604149601789061369618915729280268552762138871213800719281 03*I*a^2*e^(767/2*I*c) - 563528978057632720969917708971551197388498440029187520498668125627360636873719973842729049383973395339489187328*I*a^2*e^(765/2*I*c) - 11089504123739591720568599454590971758160020744577758121971011994308787713717648771879496946858197182862216869 35*I*a^2*e^(763/2*I*c) - 215791258592459333372869589796444940936417263128653468455066167720197620200716585192990582638598584487637167749 0*I*a^2*e^(761/2*I*c) - 41524510435996580446009690033212139917391760277525890418067280366582632218998755720095377871693436515739796834 70*I*a^2*e^(759/2*I*c) - 790218349026871901495271289147853538925976831795670198761660396945228812301836985196711717454575960714299590839 8*I*a^2*e^(757/2*I*c) - 1487251651322867268458445437395297098557524436688392349886320431475878723648539596783314686906446113789749328319 9*I*a^2*e^(755/2*I*c) - 2768466775588308069616524160085023629006052759375375025097692579564429776232489408660250530494164008183488202418 3*I*a^2*e^(753/2*I*c) - 509723132282461048528456302749947063344742018512123007011372050936953567540986371042716086137745119309641057811 85*I*a^2*e^(751/2*I*c) - 9283081133766054140183142599824605929696195026202194118895532559347460481049904161662134958195389500285787346295 5*I*a^2*e^(749/2*I*c) - 1672381243676048842576873959980926627959275516893030410408796733295047616634292372022121973958032927028817389529 71*I*a^2*e^(747/2*I*c) - 2980480676520534948917895441119433064017080321368903897026307577619002130433710271663756677285503580231009227278 09*I*a^2*e^(745/2*I*c) - 52549398794122457683394894792319034470589382126745238782314307095373505358868750766131431555820976770801947837300 4*I*a^2*e^(743/2*I*c) - 91664709431284914960140940755641154562802047730145200725460409188806537847457937296000494471094027545632664124886 6*I*a^2*e^(741/2*I*c) - 1582020627875819886732500658987622865348980072162800701130868690683669873547179234420581808071126591692483785355020*I*a^2*e^(739/2*I*c) - 2701595469953592505053950263729379037938883403451415995229310843295475921159044641522890199450389533264819628536025*I*a^2*e^(737/2*I*c) - 4565090669910591648371347796026475895546702180721517835280809078297960907491881780744446079560657601476760082232152*I*a^2*e^(735/2*I*c) - 763

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e^(725/2*I*c) - 85417618996417490452483371059823103161327605370266736083574
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c) - 1342665470057644847983235502917892846730721653892879442933623480246710
26925485137604645521152950533194618205062920988*I*a^2*e^(721/2*I*c) - 20892
721947321952554456586633742979365256651844601362539197681055721328802433993
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920764933095415393034588280*I*a^2*e^(717/2*I*c) - 4908693639020633756913108
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3926276*I*a^2*e^(713/2*I*c) - 110829117874288088003949255863546681669181130
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*a^2*e^(711/2*I*c) - 164088464461734084358144268349244158832586560261315262
5692173455955900863555908606458185685041555583786399895054479300*I*a^2*e^(7
09/2*I*c) - 240577714439055714117813463067773244849650952054131834842019241
7807342381289784524672636122635696383857297613950049995*I*a^2*e^(707/2*I*c)
 - 349309887710492687698237108032257440212635206127339745745586202481213457
7602605965839150066211359905342050250374117429*I*a^2*e^(705/2*I*c) - 502307
443186015730117888471656258174869062121735387850334388091202949158080461043
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730067340322771834762634518685264638245830985114944269590079262756662236828
7282262184380707453078413991*I*a^2*e^(701/2*I*c) - 100924786020063127364353
407717370680634544851192575840230472208882160787043159191976578217878926464
07702091249317303229*I*a^2*e^(699/2*I*c) - 14103212089664651841721385690411
495309067974792132984765752121078864973955276665921709606990805136055899318
515316302625*I*a^2*e^(697/2*I*c) - 1952283328672880331025077467311303310215
892334738969639245055633587494968652624921456871700212028594919841994338864
7210*I*a^2*e^(695/2*I*c) - 267730394333998274117237784491077008799869706368
35180213084845566895069119080487323194332830887134412610587215162894762*I*a
^2*e^(693/2*I*c) - 36375409931287795092607557958784126662059576747454408588
744309722082226791392845209172297521166997828928030420844023706*I*a^2*e^(69
1/2*I*c) - 4896646615878742114946199207175567373336856102462570532830088204
6960116093509913400520500730507564724324855396317174877*I*a^2*e^(689/2*I*c)
 - 653123602074898065236571363863403753569295522760923767167642985299999533
07808042369566805167379162746143255282258954180*I*a^2*e^(687/2*I*c) - 86322

22365132607361971131256855199779606551719887389495806330305156497285093648012735763383856581130517760678520274204 5*I*a^2*e^(685/2*I*c) - 1130589802883564220385835139940220907469386070355433465119796591093989261756839556423349718766282964364952883674750 25210*I*a^2*e^(683/2*I*c) - 1467462162447368347460477417497643952262227073036750744020680132405104468546467498202041821722323445170274362601297 35987*I*a^2*e^(681/2*I*c) - 1887695287109070693993154177873600307127016290612389482510681741743117655986522181101980354282230216929475335859623486 72*I*a^2*e^(679/2*I*c) - 2406706654362267812491048707637320723073729459838418169127611392117063248071275964692668794775387149948760506308489112 80*I*a^2*e^(677/2*I*c) - 3041327466045366622597921750955593900734451665528393037131317355648689485269390321464488437314863951710910967937988214 40*I*a^2*e^(675/2*I*c) - 3809549534954876002929555042877030995676661984054945481885107834302340852649932373492228976133462014323804487479644253 20*I*a^2*e^(673/2*I*c) - 4730152954843393553865160495107424893668782016894758200570340501140953231340078358073931431293091594776561526917555646 40*I*a^2*e^(671/2*I*c) - 5822204431858175020626648292131237026325247331462078345997160648850657892775908293602464603499559473943450541824419812 24*I*a^2*e^(669/2*I*c) - 7104421465587322335920260688738127841966084279575348335844459572077236928203129979798542922704611553744059481976595913 60*I*a^2*e^(667/2*I*c) - 8594404367040659964920655309206627501878563640804789340222353178580696799516488891727895957060068142193680108155326814 80*I*a^2*e^(665/2*I*c) - 1030774619776542758151026721954085608996661126865830135510680049965310137664141431154997979496639299345832099582375161 360*I*a^2*e^(663/2*I*c) - 1225703977652826279115625218956602244551114447592406065362942222074085211001715038181853646506187045033600876523451824 880*I*a^2*e^(661/2*I*c) - 1445081045803166813792264689037973866166202881538425312329021401301390889284254565543949311378309541723432902867052706 200*I*a^2*e^(659/2*I*c) - 1689241285267088112071474170349009418105431780227320693934784248229130313628706876020545030435533246445961071068493810 560*I*a^2*e^(657/2*I*c) - 1957893834972358477905928999095419556405711958988853024935075157754339419656153188117144093625692196108598042281972985 720*I*a^2*e^(655/2*I*c) - 2250018750681289401874467652562891487203326525709899095523732366806542477845141215360711007405272102207680817427742759 520*I*a^2*e^(653/2*I*c) - 2563776636439977703029604566982955668595380960160133353889974265239086029092155773519578351942456055091409678154086303160*I*a^2*e^(651/2*I*c) - 2896436789436624938470299068330946258001309969984703873411472869737850504382055706419008342552332959944508775701784058240*I*a^2*e^(649/2*I*c) - 3244329858695109265142828711377319399945101328495030427416903131503319022305572237606283736559593675791505521680740151120*I*a^2*e^(647/2*I*c) - 3602830529840752956518193931274523396114944031976825437061429976090308245501632173258267215963247319966703044426706223680*I*a^2*e^(645/2*I*c) - 3966374883312783482383646708803019669343000470015659397777772491610719951251704477398336756202715565781802459813301802300*I*a^2*e^(643/2*I*c) - 4328515848979025885689054474944368688597856212595758710745631586717058940809165508440803025209005356313475936021116327680*I*a^2*e^(641/2*I*c) - 46820186401352114025441934476753157785221638924891221314114838076383675741536713

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e^(623/2*I*c) - 612228577923371437259069489701820859566420068107085998617 02
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/2*I*c) - 595472574674018708893967320315128987708260220205043700867602851 16
1786086393869751417729961032781138634295822550870359454 0*I*a^2*e^(619/2*I*c
) - 570525992042863749394052426005979074206833195253891053538476253785025 38
234011482704337835079431209427204006897665999672 60*I*a^2*e^(617/2*I*c) - 53
739690083650980637055279707516518897459636880832855309819571261998752476166
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374620878666425545 60*I*a^2*e^(607/2*I*c) - 262355708100409104067950790574 53
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39946480*I*a^2*e^(603/2*I*c) - 115655599618386898520009063922608955402134 19
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20*I*a^2*e^(601/2*I*c) - 387697952015455728679418229358049128449423830419 66
842808188286623765836533907423901266418051800580512862971086765273308 0*I*a^
2*e^(599/2*I*c) + 3876979520154557286794182293580491284494238304196684280 81
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7/2*I*c) + 11565559961838689852000906392260895540213419321581926219232469 57
977122810089035413564479870427981333952548182360473741220*I*a^2*e^(595/2*I*
c) + 1905972925948047400200417435675221383076561037072537267851490979096509
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623557081004091040679507905745376983741232629056220311681059841157626795431
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2601839339977758010448497118081958608252277368750290974253606539667119249172
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540*I*a^2*e^(577/2*I*c) + 612228577923371437259069489701820859566420068107 0
8599861702745415177526058910245166856244523343243278077996722880640822660*I*
a^2*e^(575/2*I*c) + 6209657166059790414267919414863086928224438704729318154
6722854365503562082632155686799040052461042942843157479522008221000*I*a^2*e^
(573/2*I*c) + 6220225123095220446067530083902398768411555741654900638992044
6464551299378548041133189191116688311474968341754504042495400*I*a^2*e^(571/2
*I*c) + 6158866242148223169440348639322765708488301897861116767404404815878
2899223289958126299861048270511633892941753587468730200*I*a^2*e^(569/2*I*c)
+ 6031732977884812260173929453427232799792945222308203442804835486204161004
82782714240134362223279315500286527465168428932 0*I*a^2*e^(567/2*I*c) + 5846
0087337172550342558283443647869505776357487028017821034693281056146781069558
3693352772019734245822730028395671983190 80*I*a^2*e^(565/2*I*c) + 5609643858
1971821615416482750117525255863897331137996079555574670366614762459888018777
0659346581194758350501024011030948 80*I*a^2*e^(563/2*I*c) + 5331083262965327
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*I*a^2*e^(551/2*I*c) + 3244329858695109265142828711377319399945101328495030
4274169031315033190223055722376062837365595936757915055216807401511 20*I*a^2
*e^(549/2*I*c) + 2896436789436624938470299068330946258001309969984703873411
4728697378505043820557064190083425523329599445087757017840582 40*I*a^2*e^(54
7/2*I*c) + 2563776636439977703029604566982955668595380960160133353889974265

2390860290921557735195783519424560550914096781540863031 60*I*a^2*e^(545/2*I*
c) + 2250018750681289401874467652562891487203326525709899095523732366806542
4778451412153607110074052721022076808174277427595 20*I*a^2*e^(543/2*I*c) + 1
957893834972358477905928999095419556405711958988853024935075157754339419656
15318811714409362569219610859804228197298 5720*I*a^2*e^(541/2*I*c) + 1689241
285267088112071474170349009418105431780227320693934784248229130313628706876
02054503043553324644596107106849381 0560*I*a^2*e^(539/2*I*c) + 1445081045803
166813792264689037973866166202881538425312329021401301390889284254565543949
311378309541723432902867052706200*I*a^2*e^(537/2*I*c) + 1225703977652826279
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18704503360087652345182488 0*I*a^2*e^(535/2*I*c) + 1030774619776542758151026
721954085608996661126865830135510680049965310137664141431154997979496639299
345832099582375161360*I*a^2*e^(533/2*I*c) + 859440436704065996492065530920 6
627501878563640804789340222353178580696799516488891727895957060068142193680
10815532681480*I*a^2*e^(531/2*I*c) + 710442146558732233592026068873812784 19
660842795753483358444595720772369282031299797985429227046115537440594819765
9591360*I*a^2*e^(529/2*I*c) + 58222044318581750206266482921312370263252473 3
146207834599716064885065789277590829360246460349955947394345054182441981224
*I*a^2*e^(527/2*I*c) + 4730152954843393553865160495107424893668782016894758
200570340501140953231340078358073931431293091594776561526917555646 40*I*a^2*
e^(525/2*I*c) + 380954953495487600292955504287703099567666198405494548188 51
07834302340852649932373492228976133462014323804487479644253 20*I*a^2*e^(523/
2*I*c) + 3041327466045366622597921750955593900734451665528393037131317355 64
868948526939032146448843731486395171091096793798821440*I*a^2*e^(521/2*I*c)
+ 240670665436226781249104870763732072307372945983841816912761139211706324 8
0712759646926687947753871499487605063084891128 0*I*a^2*e^(519/2*I*c) + 18876
952871090706939931541778736003071270162906123894825106817417431176559865221
81101980354282230216929475335859623486 72*I*a^2*e^(517/2*I*c) + 146746216244
736834746047741749764395226222707303675074402068013240510446854646749820204
182172232344517027436260129735987*I*a^2*e^(515/2*I*c) + 113058980288356422 0
385835139940220907469386070355433465119796591093989261756839556423349718766
282964364952883674750252 10*I*a^2*e^(513/2*I*c) + 863222236513260736197113 12
568551997796065517198873894958063303051564972850936480127357633838565811305
177606785202742045*I*a^2*e^(511/2*I*c) + 653123602074898065236571363863403 7
535692955227609237671676429852999995330780804236956680516737916274614325528
2258954180*I*a^2*e^(509/2*I*c) + 4896646615878742114946199207175567373336 85
610246257053283008820469601160935099134005205007305075647243248553963171748
77*I*a^2*e^(507/2*I*c) + 363754099312877950926075579587841266620595767474 54
408588744309722082226791392845209172297521166997828928030420844023706*I*a^2
*e^(505/2*I*c) + 2677303943339982741172377844910770087998697063683518021308
484556689506911908048732319433283088713441261058721516289476 2*I*a^2*e^(503/
2*I*c) + 1952283328672880331025077467311303310215892334738969639245055633 58
7494968652624921456871700212028594919841994338864721 0*I*a^2*e^(501/2*I*c) +
 141032120896646518417213856904114953090679747921329847657521210788649739 55
276665921709606990805136055899318515316302625*I*a^2*e^(499/2*I*c) + 1009247

8602006312736435340771737068063454485119257584023047220888216078704315919197657821787892646407702091249317303229*I*a^2*e^(497/2*I*c) + 7154129966723457300673403227718347626345186852646382458309851149442695900792627566622368287282262184380707453078413991*I*a^2*e^(495/2*I*c) + 5023074431860157301178884716562581748690621217353878503343880912029491580804610437496781598919605840393968558559789161*I*a^2*e^(493/2*I*c) + 3493098877104926876982371080322574402126352061273397457455862024812134577602605965839150066211359905342050250374117429*I*a^2*e^(491/2*I*c) + 2405777144390557141178134630677732448496509520541318348420192417807342381289784524672636122635696383857297613950049995*I*a^2*e^(489/2*I*c) + 16408846444617340843581442683492441588325865602613152625692173455955900863555908606458185685041555583786399895054479300*I*a^2*e^(487/2*I*c) + 1108291178742880880039492558635466816691811302866749288715555797951407508808250708041669875191682735463589899659311198*I*a^2*e^(485/2*I*c) + 741238644768872960862145813229884276436860967234511356976656011429732646982384201977263394830039748273745918763926276*I*a^2*e^(483/2*I*c) + 490869363902063375691310822072469729142482010176109462407873620361306320773072877532370567922640618200227464127502047*I*a^2*e^(481/2*I*c) + 321849633692522447898702348324001010813625753491002068478331883454364145448222725180431547920764933095415393034588280*I*a^2*e^(479/2*I*c) + 208927219473219525544565866337429793652566518446013625391976810557213288024339930152549544168002925624951052677530015*I*a^2*e^(477/2*I*c) + 134266547005764484798323550291789284673072165389287944293362348024671026925485137604645521152950533194618205062920988*I*a^2*e^(475/2*I*c) + 85417618996417490452483371059823103161327605370266736083574364508696427592725387814713600331423646619680648052044475*I*a^2*e^(473/2*I*c) + 53791069458499890426012292372724882317088055615752468358198258128613020164914352269555347240301885068470565731734762*I*a^2*e^(471/2*I*c) + 33529908885006822682931549767196284830862190121835841481201620772726893006422670068438075620985878626866861887157590*I*a^2*e^(469/2*I*c) + 20686671000021215968489830509311959418929183582885216898379036970362110971705665038962014129218543899794341899845085*I*a^2*e^(467/2*I*c) + 12631694034494832388052286651806334417271466381837580128567730484107040908831525044898011891962065924068550189725268*I*a^2*e^(465/2*I*c) + 763347349130754120948642458581148481719625483226104049697195217999448279842521515446999043547371029896595546249849*I*a^2*e^(463/2*I*c) + 4565090669910591648371347796026475895546702180721517835280809078297960907491881780744446079560657601476760082232152*I*a^2*e^(461/2*I*c) + 2701595469953592505053950263729379037938883403451415995229310843295475921159044641522890199450389533264819628536025*I*a^2*e^(459/2*I*c) + 1582020627875819886732500658987622865348980072162800701130868690683669873547179234420581808071126591692483785355020*I*a^2*e^(457/2*I*c) + 916647094312849149601409407556411545628020477301452007254604091888065378474579372960004944710940275456326641248866*I*a^2*e^(455/2*I*c) + 525493987941224576833948947923190344705893821267452387823143070953735053588687507661314315558209767708019478373004*I*a^2*e^(453/2*I*c) + 298048067652053494891789544111943306401708032136890389702630757761900213043371027166375667728550358023100922727809*I*a^2*e^(451/2*I*c) + 167238124367604884257687395998092662

795927551689303041040879673329504761663429237202212197395803292702881738952
971*I*a^2*e^(449/2*I*c) + 9283081133766054140183142599824605929696195026202
1941188955325593474604810499041616621349581953895002857873462955*I*a^2*e^(4
47/2*I*c) + 509723132282461048528456302749947063344742018512123007011372050
93695356754098637104271608613774511930964105781185*I*a^2*e^(445/2*I*c) + 27
684667755883080696165241600850236290060527593753750250976925795644297762324
894086602505304941640081834882024183*I*a^2*e^(443/2*I*c) + 1487251651322867
268458445437395297098557524436688392349886320431475878723648539596783314686
9064461137897493283199*I*a^2*e^(441/2*I*c) + 790218349026871901495271289147
853538925976831795670198761660396945228812301836985196711717454575960714299
5908398*I*a^2*e^(439/2*I*c) + 415245104359965804460096900332121399173917602
7752589041806728036658263221899875572009537787169343651573979683470*I*a^2*e
^(437/2*I*c) + 215791258592459333372869589796444940936417263128653468455066
1677201976202007165851929905826385985844876371677490*I*a^2*e^(435/2*I*c) +
110895041237395917205685994545909717581600207445777581219710119943087877137
1764877187949694685819718286221686935*I*a^2*e^(433/2*I*c) + 563528978057632
720969917708971551197388498440029187520498668125627360636873719973842729049
383973395339489187328*I*a^2*e^(431/2*I*c) + 2831541724454077422450878787538
662877042027538054395604149601789061369618915729280268552762138871213800719
28103*I*a^2*e^(429/2*I*c) + 14067237571301268732038907357994553337936713200
7412356558650081388469939218158614778502467163652527862550952130*I*a^2*e^(4
27/2*I*c) + 690955667122722319724322397288994961749222207720419841820692841
30237389188998302806443944988509065063273154745*I*a^2*e^(425/2*I*c) + 33552
369185708773069292076239890437482410490941602744957472544576489334415521169
836149006133511757140035934080*I*a^2*e^(423/2*I*c) + 1610659553400442535055
634550846776406381699126024100836153672902222104936768062730161160906358480
1970379704200*I*a^2*e^(421/2*I*c) + 764306432142215085107655604542055474413
8398485227228000246848202365010891675711435238630995867297844214073376*I*a^
2*e^(419/2*I*c) + 358500567897480551605849967163259551339357495711398033668
8954791609736165974043249124955091096872997954793020*I*a^2*e^(417/2*I*c) +
166205667443073414924892879946898077373145654370121107055618121338992405598
8353226635860540433754964155111760*I*a^2*e^(415/2*I*c) + 761570681410168662
769506297132490171367321466294322961126983855669845333986783371033315463200
057428630752220*I*a^2*e^(413/2*I*c) + 3448716031646138840025055585349184630
90837581777459311678842067123286466226751144071133482776005430489425760*I*a
^2*e^(411/2*I*c) + 15433398044664752654560339343571798167516797662298543036
5188253022405140750956390615095093479110699588649900*I*a^2*e^(409/2*I*c) +
682489975344168898405747441723232848684360017115555657669816504708038746683
37015803960506067102299819184920*I*a^2*e^(407/2*I*c) + 29821871642675642979
884949769331439027860315600536250652213455370080842219764548099437011716544
543041268840*I*a^2*e^(405/2*I*c) + 1287509096857049511048268849733111955148
1725115140466354371165041532925663730313264282055462011603010654340*I*a^2*e
^(403/2*I*c) + 549180314668753988053597656596379567216451408656720801201591
6026775639438732336258201804419618292545032320*I*a^2*e^(401/2*I*c) + 231419
987522566986824406965158487639596366333938136712176597016461942695849656811

6456546662409068449840980*I*a^2*e^(399/2*I*c) + 963339901333670052201847836
491729647953262248639288500838541624447579232078571408017358275408623510613
840*I*a^2*e^(397/2*I*c) + 3961156927720317702883047917185117312913684062974
39843435650750372236248577797783021338331228243750622260*I*a^2*e^(395/2*I*c
) + 16087882507904339460383494957583749762548437050975220455638952087004282
0153281247817248349563478924960000*I*a^2*e^(393/2*I*c) + 645327319778245914
793691916371582593352896495336069829716313649640549116810756371224907145615
14235891960*I*a^2*e^(391/2*I*c) + 25564363098285969951461675934273364734821
923616250047177527687812898786857371780193438857338260097911840*I*a^2*e^(38
9/2*I*c) + 1000074884258142115311578285002841913064386956944913472196790825
1115915010593127137857232140041620869750*I*a^2*e^(387/2*I*c) + 386314437516
868018576356913292077827044669797836884278496544413991685735826342800126438
3566311006996680*I*a^2*e^(385/2*I*c) + 147342444362109962377181703120951524
3436724637025749527267678685770355293167282547379994041612249536410*I*a^2*e
^(383/2*I*c) + 554830477071987246654408444808030209487515325400605772819119
408435792744646306336768559494858757362460*I*a^2*e^(381/2*I*c) + 2062550466
642352923299538505218323676805884853392747978586557766976702788671365670139
53786924177858890*I*a^2*e^(379/2*I*c) + 75687878722014265825238066731591013
702998100464324442217272752916887964266256104313931049007060490840*I*a^2*e^
(377/2*I*c) + 2741514103484544395109493925675095458443694586767090771035285
9492970463590965208109494412332329295780*I*a^2*e^(375/2*I*c) + 980079316064
566075944389460984891152942557969087433011532356902754100547673537917564006
3961886333700*I*a^2*e^(373/2*I*c) + 345781676701999202030946295835138625644
9736593140969468279877327753792198494989629433408106651901070*I*a^2*e^(371/
2*I*c) + 120385831118903001859978475898311457410127655358396896577655106146
3170435426403483179176840497456330*I*a^2*e^(369/2*I*c) + 413564489143612695
132947288092921397877659902127071578646579062379140019898506098486550619425
904170*I*a^2*e^(367/2*I*c) + 1401737032027635410158205056407283867183742759
16041096078183091845413305288205080342342220046629650*I*a^2*e^(365/2*I*c) +
 46871127019956579394527723949157745550097315795915660019622180811547871642
339809799054651854945990*I*a^2*e^(363/2*I*c) + 1546033818880351810107079629
8741473051050449962808545632677281743199685497754720467992010224616870*I*a^
2*e^(361/2*I*c) + 502997233223228520128531881185601119191768675475579615309
9081679265022946497934343332346116036200*I*a^2*e^(359/2*I*c) + 161399625005
227651497742238751482974339782549553805362337258500737267515812737919919603
8765006020*I*a^2*e^(357/2*I*c) + 510723774383122473742590339083403953575864
194243445208994753073600039579929266407037097651682920*I*a^2*e^(355/2*I*c)
+ 1593571437033253029099589869710248950108651059517203782604973685085930558
38453825165049611563210*I*a^2*e^(353/2*I*c) + 49024494337492279360818849127
945363095454529548782519402705804194570228377733166934824088655040*I*a^2*e^
(351/2*I*c) + 1486839010064205118367197117938788000350914635000729463417789
9645088810313885195635392146744810*I*a^2*e^(349/2*I*c) + 444504319274789268
390399853721138227585710412235922782253365493896371639852064344721224547964
0*I*a^2*e^(347/2*I*c) + 130978506840473201225164579044912481278616850664545
0981272566942196706295180922249225707977010*I*a^2*e^(345/2*I*c) + 380351974

188426836426198640513394713416494607855165518072594190906223337330504018165
258288940*I*a^2*e^(343/2*I*c) + 108838167458582318445584983528249394920058З
59009481425820011589540335936121859362203566362580*I*a^2*e^(341/2*I*c) + 30
685533864596666418316194015078029015958251712763047637572948112622799853423
865147299102830*I*a^2*e^(339/2*I*c) + 8522926048369988940355915252628221987
552753095020951377015329635773840197997200581857597800*I*a^2*e^(337/2*I*c)
+ 2331796181228676480358713874846040638691309670968182309524450889214672550
181351830378735030*I*a^2*e^(335/2*I*c) + 6283217402529699146708974013748477
21259003178557296040399451247917033448679858171068226560*I*a^2*e^(333/2*I*c
) + 16672645594159683116062347635171258718759465764285712701383023948458731
3767680019339582550*I*a^2*e^(331/2*I*c) + 435609777598064255098417169783299
04266075313880276843623527207449861917293070562965518680*I*a^2*e^(329/2*I*c
) + 11204681256258812161206109553481424902816807388805631619385616166895520
536176153385410620*I*a^2*e^(327/2*I*c) + 2836916918939477124570501535003667
950662441685459586986859765033838975136651432973013080*I*a^2*e^(325/2*I*c)
+ 7069254940580017380084988687307754120182736498836563165198219602512939601
11842853827050*I*a^2*e^(323/2*I*c) + 17334585697527208030746888831957374382
6748157949817083968790709575178522586695155600570*I*a^2*e^(321/2*I*c) + 418
212568836636776044638139903569063056923244320728124790203918402097384059928
62342110*I*a^2*e^(319/2*I*c) + 99255258829095186735695367313547359943179819
48112305002260477305616767418585528998710*I*a^2*e^(317/2*I*c) + 23169134178
96533634148238479533816756801158698905671195529018686134366565369411066790*
I*a^2*e^(315/2*I*c) + 53185200307045318933327613873998530720744532344199443
3993246593537700600251640914290*I*a^2*e^(313/2*I*c) + 120038120350944029722
615798484583578817920936103042898479075195084456374447649531420*I*a^2*e^(31
1/2*I*c) + 2663270899013432469919988152459092587944442773459791184262577669
7111614072462805500*I*a^2*e^(309/2*I*c) + 580760744355231221024154298187369
7011544047170905560703749866664890336325145752760*I*a^2*e^(307/2*I*c) + 124
445844130409520749732783777934477929343261005269896448132005897390334813136
4390*I*a^2*e^(305/2*I*c) + 261985740043443080388301874884500683905172501509
414794896626641791046018314193300*I*a^2*e^(303/2*I*c) + 5417503137684360762
9356045027058758032630893385234188342863868414550489892855190*I*a^2*e^(301/
2*I*c) + 110015090511699188034061903011100721691404347391883906806870693716
00096456461960*I*a^2*e^(299/2*I*c) + 21935182533236071585983067606101945055
63715717648737978249164699044796790178970*I*a^2*e^(297/2*I*c) + 42930640633
1604823645688251632236356131380665568461698695435155472754991584480*I*a^2*e
^(295/2*I*c) + 824571979405000651128312357780093374005779424373292705419368
89611136248616360*I*a^2*e^(293/2*I*c) + 15538869199972063791690049288524847
158110979530065672277863507395517286098560*I*a^2*e^(291/2*I*c) + 2872306980
765485786798093527905670394316300311494879919370292601994164873980*I*a^2*e^
(289/2*I*c) + 5206550842970712132478746309191148757771507362669623848146159
37366841583600*I*a^2*e^(287/2*I*c) + 92525290960177968452743510383284189038
302875808137991118047531970267330140*I*a^2*e^(285/2*I*c) + 1611539718513118
3261784999068093482958330926537119548096569091610170990080*I*a^2*e^(283/2*I
*c) + 275021431468142116442056577595633159921285138864123056720909524083286

9740*I*a^2*e^(281/2*I*c) + 459734613498525904391661453323499339021127870927849907055606144578837880*I*a^2*e^(279/2*I*c) + 75253783547376958022568745986903775265291178425521737345338921401401608*I*a^2*e^(277/2*I*c) + 12058413611979215014493808881094919327076136158958774603465013922951460*I*a^2*e^(275/2*I*c) + 1890808523184465234870582011548986898368367578058256415408172123086240*I*a^2*e^(273/2*I*c) + 290034464520387036801727848589402597956276490946161717533961649595700*I*a^2*e^(271/2*I*c) + 43505029014129136807566388318013609163815986027077804343349110468080*I*a^2*e^(269/2*I*c) + 6379018324131616220652747415710905929685302237372129456527463165524*I*a^2*e^(267/2*I*c) + 913950624853444779964988596342201399080981813136131167642386677984*I*a^2*e^(265/2*I*c) + 127899514211571855615342081558322168204136482117422337757176345560*I*a^2*e^(263/2*I*c) + 17474609226004294346664529284651937762925604102208554097442050560*I*a^2*e^(261/2*I*c) + 2329943971272634597068665479560383652668004620643027277203439985*I*a^2*e^(259/2*I*c) + 303026950314518079219169886639469213112529662619496065070362634*I*a^2*e^(257/2*I*c) + 38424117610672655906936441589932580808631293346194215493375887*I*a^2*e^(255/2*I*c) + 4747802391051472283183879516945405395337420791155799564552344*I*a^2*e^(253/2*I*c) + 571368224054265219726596099705196924252108483077143367419935*I*a^2*e^(251/2*I*c) + 66931651284481661864618077305876269408561834596408636101210*I*a^2*e^(249/2*I*c) + 7627533234852264511705859368402201230654030433440301675518*I*a^2*e^(247/2*I*c) + 845095502974670714598033224559068895202594191429069360222*I*a^2*e^(245/2*I*c) + 90973406936806837531915685400953309110574252721276020367*I*a^2*e^(243/2*I*c) + 9508515799900673113299221003726853644110325215605885183*I*a^2*e^(241/2*I*c) + 964243501752639006146026780418602842158889630673989345*I*a^2*e^(239/2*I*c) + 94799191422336670911733284155867076030325977221341875*I*a^2*e^(237/2*I*c) + 9028492090498513521931431245530169366369034596324891*I*a^2*e^(235/2*I*c) + 832235125649436217222715021488460783355491981492217*I*a^2*e^(233/2*I*c) + 74182504975608450289636265368281851382711220649004*I*a^2*e^(231/2*I*c) + 6387936994195976240622682990166245342613055517890*I*a^2*e^(229/2*I*c) + 530853426357042754469653748150767198919032400940*I*a^2*e^(227/2*I*c) + 42526927818120262032236340231948484360039052121*I*a^2*e^(225/2*I*c) + 3280313734912630390804532039053385555426092600*I*a^2*e^(223/2*I*c) + 243319959628953467711826163624006704408771129*I*a^2*e^(221/2*I*c) + 17332379827117737513384038195005765450047540*I*a^2*e^(219/2*I*c) + 1183905679851187219496284451985830369733725*I*a^2*e^(217/2*I*c) + 77421622501348280247334235191908463309686*I*a^2*e^(215/2*I*c) + 4838851294065276461984778740285520947658*I*a^2*e^(213/2*I*c) + 288495194028428088627568321559245818459*I*a^2*e^(211/2*I*c) + 16374051337559882202075446312226584700*I*a^2*e^(209/2*I*c) + 882698176765813429616327000431223295*I*a^2*e^(207/2*I*c) + 45084046347051121561291339131297112*I*a^2*e^(205/2*I*c) + 2175637614526488309339795247719423*I*a^2*e^(203/2*I*c) + 98892618501960556395579843057828*I*a^2*e^(201/2*I*c) + 4219418379622495018746735933182*I*a^2*e^(199/2*I*c) + 168327860633476968482282779620*I*a^2*e^(197/2*I*c) + 6250901980395957795917828835*I*a^2*e^(195/2*I*c) + 214978110312371924676280101*I*a^2*e^(193/2*I*c) + 6806694783357860712909393*I*a^2*e^(191/2*I*c) + 197035901588508

817004391*I*a^2*e^(189/2*I*c) + 5171545973000559760165*I*a^2*e^(187/2*I*c)
+ 121842706165531758225*I*a^2*e^(185/2*I*c) + 2545017361124253210*I*a^2*e^(
183/2*I*c) + 46393545645311706*I*a^2*e^(181/2*I*c) + 723016295770626*I*a^2*
e^(179/2*I*c) + 9365496059205*I*a^2*e^(177/2*I*c) + 96800992860*I*a^2*e^(17
5/2*I*c) + 748461285*I*a^2*e^(173/2*I*c) + 3848130*I*a^2*e^(171/2*I*c) + 98
67*I*a^2*e^(169/2*I*c))/(e^(517*I*c) + 418*e^(516*I*c) + 87153*e^(515*I*c)
+ 12085216*e^(514*I*c) + 1253841160*e^(513*I*c) + 103818048048*e^(512*I*c)
+ 7146142307307*e^(511*I*c) + 420601518659718*e^(510*I*c) + 216084030213400
47*e^(509*I*c) + 984382804329835768*e^(508*I*c) + 40261256699368950388*e^(5
07*I*c) + 1493326612293984160368*e^(506*I*c) + 50648660944512569972179*e^(5
05*I*c) + 1581796642397812408161814*e^(504*I*c) + 4575911718340257907313958
3*e^(503*I*c) + 1232445557346832245176696904*e^(502*I*c) + 3104222252207468
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353164647151530240529137618111*e^(499*I*c) + 344277152012875134140739302960
914*e^(498*I*c) + 6868329225263681349501997341320517*e^(497*I*c) + 13017119
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*e^(491*I*c) + 2302150411226234925855222345201500900533576*e^(490*I*c) + 32
147887693375338817454482515377350383950278*e^(489*I*c) + 432333688644261557
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*e^(486*I*c) + 848552202276512356496200136959676295361696315113*e^(485*I*c)
 + 9925490738534402272939987038714580495445431374618*e^(484*I*c) + 11239160
4542246650966429162063124338952554575234051*e^(483*I*c) + 12330967001397233
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9894318153694964675368481194*e^(481*I*c) + 13544259491663611619157465062533
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78359839580349899*e^(479*I*c) + 1323170887010489697380005673377991908934083
6756009580718*e^(478*I*c) + 12537049658692127266219805085126932317116733885
4081782959*e^(477*I*c) + 11558554128935942603455449666426878236300358993632
32371472*e^(476*I*c) + 1037518449987117550190939895659668411680299708252666
0323524*e^(475*I*c) + 90722605722208814918642284639487187764607589706493970
774776*e^(474*I*c) + 7732046369911457750614627310280985060944326757881362 95
011259*e^(473*I*c) + 642619548553524857642506813687046553008711400387571669
1383902*e^(472*I*c) + 52108117629177048660492400985175830987505700566877818
954141639*e^(471*I*c) + 412430698299915190848067222327219435067747934091894
670488982928*e^(470*I*c) + 318774992974434649721153604475177658232095862792
3816470590659024*e^(469*I*c) + 24070801913529757101858022914372045864746991
786182039740274325264*e^(468*I*c) + 177642829135119348577194437675802830239
905460092687136494961404333*e^(467*I*c) + 128181746491497081085960418982835
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63104263167672586826367911338826483549173*e^(465*I*c) + 6247355078105329531
7710774690247114124125187565731848441781904032672*e^(464*I*c) + 42227612663

2003687547754746555709988710527133086660161366353656787288*e^(463*I*c) + 27947091044756866118427906949736991644822547239772102097256613044 03472*e^(462*I*c) + 18115768495615758076710303055505625589254293659193314153418333944596408*e^(461*I*c) + 1150514818520808488737003883545213155676403651240031036911766971942 92320*e^(460*I*c) + 716099497599058079895633338552940229192858196481597830078819711862600096*e^(459*I*c) + 4369442482910113914565353136069595862669338858053419381214131241925047008*e^(458*I*c) + 261439762799020214434719456650802545630568101835204018898002854931448674 48*e^(457*I*c) + 15343608874505625412732723946157707193313015776459599711397351318318839 9376*e^(456*I*c) + 88350096882179120260077454192776920073768939351373478936839709333 3311961880*e^(455*I*c) + 49925197124570439835053779766079539883973682975911149579918048936883718676 80*e^(454*I*c) + 27693116538343259225983382637647936122664033859615133489846664694361471028310*e^(453*I*c) + 15082238143141241377356647421001174685229743759705918629524398948114039815278 0*e^(452*I*c) + 80667954360758914075930501079618956826984202161338895521891627882318263948 8190*e^(451*I*c) + 42381258467632325863941885698586858267553280055486274370193014058513258875944 80*e^(450*I*c) + 21876482892713909928040345612578705805121508756226696317087651824252241418663320*e^(449*I*c) + 11096919968732097474992225959525044434121921853534965576259119257653587215176608 0*e^(448*I*c) + 55326912881952861250291886955894782909802195630934984358404463151229177 8800081490*e^(447*I*c) + 27118432396707175276056404901488335071302424484039 78318523237721944200392830108580*e^(446*I*c) + 13069817203488289886193205508375818392124991382340160316886507181296548981014818410*e^(445*I*c) + 61948596653035502879564338815234310660410902037882473161804774492916216575880077680*e^(444*I*c) + 28882075526473065446996857202104710942731861950899580202068990459031947629540832428 0*e^(443*I*c) + 13247564123678374731574728211624836911209665019489539264922416437882642845464372211 20*e^(442*I*c) + 5978992172944143218459161149299819706321732111578494525245228742976468409105395536290*e^(441*I*c) + 26556806389043407534496702369101545795994861757741414789944652712127566910185274123140*e^(440*I*c) + 1161045516835550437629115017121163993137330211326774811128240472463617940496357264798 50*e^(439*I*c) + 49970756725385908435759631481379476806933719091596749190748890493392267757966535 4338960*e^(438*I*c) + 211758973346685570710150142921041472240183883794075284161854144088854572994313820903682 0*e^(437*I*c) + 88367206408604703056945140215479695512967940922669830441183757900258545840367963647682 80*e^(436*I*c) + 36318369652302591732197444409798122022640824604130552506742586795183267354382847875885730*e^(435*I*c) + 14703081673227683316304158209959204751204372522253533392388191651930004076295447457532217 40*e^(434*I*c) + 5864034669726832427416433289215609093751974538642432995719909646088572457711341452041749 90*e^(433*I*c) + 23043510733738403573791785976730663520166827816891398420973766631184888038411319353136418 40*e^(432*I*c) + 8923209447343296763331881881638471793499618670601026059730895962653291770229493028162575100*e^(431*I*c) + 34054053851295569154352346722177172655187548910782008504718324168725029438589162349211628040*e^(430*I*c) + 12809891460168853967248054183040984770736750043860153680320449770111991128908710565948278334 0*e^(429*I*c) + 475010

578857601519272316617938425222421786597241671026894318515408511467140969393
115768793680*e^(428*I*c) + 173657421881819107187419747245015812388356420995
06586391023371481227690806116807197417260538 40*e^(427*I*c) + 62598721568222
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59920*e^(426*I*c) + 222519591767957777571673660360074802222113642321463998 0
386437096339149122368724582345735158014 0*e^(425*I*c) + 780098073680242398 75
613733058851417125327114681070889640794249282633470580756557083923203377160
*e^(424*I*c) + 269745801440211296972683601863878954357962308520076595177128
227629273240215209708218497363414140*e^(423*I*c) + 9200893930295890328746 01
85002715932261252636844477148978197436107884752889146883103843606495 1920*e^
(422*I*c) + 309613197162152016238030155424146545178236208681028753774890290
498593402017956570617713142161459 0*e^(421*I*c) + 102793647306638408447395 77
8624692626046488619142979725891652435306512306907262444624791998942551 80*e^
(420*I*c) + 336753988720215683759023845939827533625598010581041846273454111
362624319432407782607217569910270 90*e^(419*I*c) + 108867995731829472826732 9
051920348867972846213564456275309091044294867412578226334768983568264540 40*
e^(418*I*c) + 347351473214713780874352083129566601238765762775942366762733 3
499521038897539826364038575568677773 00*e^(417*I*c) + 109385321448622035867 4
032434500866678499770011305874172488975951612031456734608287095519501041975
440*e^(416*I*c) + 340023256060165161752169468084708984419802883169441742479
486877932895054841812560544688208115263609 0*e^(415*I*c) + 104341175165703 95
966653693155582402109460348095473027807412321427346816928567197770376496170
251803940*e^(414*I*c) + 316109393312846927506943064436184146560959695209452
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460818773653057967021002527192141559718336988121429982329196978554987617596
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688991557089350257780476374126817815757654222191274092601594387122 50*e^(409
*I*c) + 667586629037114735850376686566928901089354386983053870872494529158 0
9511791882966061581112577069686047 40*e^(408*I*c) + 187599882188655635641636
357359860732782557372574057062791088913663784284674145599304811728635385981
93890*e^(407*I*c) + 520751785187932703864292633515443069511049935425005829 3
815524168940813867525460803084790716774857173472 0*e^(406*I*c) + 14280179245
022176248318087491882527413430513327541778008479503464476350933350315051734
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528237460754169244317667399751374281359173617116965225061118648 0*e^(404*I*c
) + 103556198259200293522638457790861154861211149508019357369133986470602 91
86482466241805664949381049856258510*e^(403*I*c) + 273889562479526560335522 7
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399*I*c) + 11904185540387796494822957794837046560060662318304552952690043 02
0927047321277384779493558607471432947993 9280*e^(398*I*c) + 2968255152826695
8968531827328023905008455503220341594151196265959688161571379993768002649 74
08305672297618840*e^(397*I*c) + 73158497220681836287472962140397444428001 04
46301161527339760544815300951787985538419764656214582667219914080*e^(396*I*
c) + 17824461149317518505563548566384219011744123222982494965916580539397 87
19824656594597559557573419334888 7952160*e^(395*I*c) + 42932064780080221260 1
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7053002976480*e^(394*I*c) + 10223182025954860767217390305186451923562145473
67429361991806349041148749612180459027459270277057151545641 4680*e^(393*I*c)
 + 24068785139705277161193465644506143285241361037768216818922184400141048 4
60210944696647752723371932874594597328*e^(392*I*c) + 56028683424903517658 49
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5683547624184*e^(391*I*c) + 12896708008475471224602368086648838498328625902
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) + 29355074355434270980812945357656231329970598269918741686293437396425561
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*I*c) + 32384919313618514764233219335395790983777355392076414673462356658 23
88704832694930560923158514374869020361595 7136*e^(386*I*c) + 705213241416219
79926023265245801430609853530545729339055246331216810210373402983663422033 2
43253070724137390610 24*e^(385*I*c) + 15189634214908800396417911722643754748
04852010973481245910987881049384438106265081897119963712145874945624327441 6
*e^(384*I*c) + 32362731322419549410330088943640247460378328561316422931292 4
27145902887913071643679502909055891236755143207382609*e^(383*I*c) + 6820803
30967936156837844096192442108186149916400415534244055278768932724966083242 3
10981485024664539671577280789 94*e^(382*I*c) + 14221311596481451768238666727
67699094822716813187908898405010394417486355453624676798324491035203219530 1
1780083069*e^(381*I*c) + 29334492003430072028704238344834286631380628545504
00678230804455975459700234462315635541351331054935163163200592 72*e^(380*I*c
) + 59865014111224185891167650518052015036400322684132808145359709358779033
86092124390855544668615826233503030619610 52*e^(379*I*c) + 12087703584936583
93089442222056935063283704108140593750226539846117737648216609559734831601 2
48698274330296158612144*e^(378*I*c) + 24149665168103385032890765492027405 11
71005901179544713877346420569645502644271242640959966277108026482600898506 1
097*e^(377*I*c) + 47741411110660989702218453305949620164727142303742340606 6
39568469509266426859469290641141944003609362235907254701 46*e^(376*I*c) + 93
39341958053494225251750965715057300707302083814774770306218224241022648247 4
19956042957363055823830898547303219757*e^(375*I*c) + 180798200680288599703 4
99386230072306765633142067088484999001396412373347632664793469632379360393 2
81131850415917938 48*e^(374*I*c) + 34637657172671690167657344537197087048882
35485399327047206394307877360044654296354834810126939044346448075451392850 2

*e^(373*I*c) + 65674859268867300098827375812875225610654551686261103681664007007537115778097293533565243828873383722980353200611956*e^(372*I*c) + 12324394151933238474196007258810350659640633925361639108206296996068241901174577573892181775339195446260932388148915 7*e^(371*I*c) + 228911311738592780091492649162346834405867740776456326108410928857257174707289268074347550225793244741923354395308214*e^(370*I*c) + 42084634260894938727755902145792458657812096614856102264700849952946845200598017511941062895621049760956600296988492 7*e^(369*I*c) + 76586779551396278101255844462875141871094089528130479083674366158207165003215489148286640631483443319945545979893495 2*e^(368*I*c) + 137967652979621207401710618806658944835544650121089019510716486035022892858681553900306287502671193194194773869036072 2*e^(367*I*c) + 24604423758454226639270816309832607147349680919054930271456392388271922548863493611269914576924098511208733074874574 68*e^(366*I*c) + 43439096966019321733573596877815792937012956819408271142154331753360939678459087667407382400371145706674109369980171 78*e^(365*I*c) + 75927527001466789611530950735850154731970297465336333315497939614732857609358019041551167648315608759475810486935272 24*e^(364*I*c) + 13139771494104933881856681151418293112242551521535686871181266579813877606348160261747201317735782566021306798298336024*e^(363*I*c) + 22514675741308069961506165586502872430421930210673264392997286485600640103867253604847715547060592967690653795951142520*e^(362*I*c) + 38199015867586087976002998756627674994795440667903625029322346250133286489120875005013638128113893960349670280707161530*e^(361*I*c) + 64175100693260066806238064886004597170740843300086839368616139164529108049844675353111842725798658088840347241496099644*e^(360*I*c) + 10676483201716559483808523418933352873358767332997253009266108518678993925291593709076028223234691909042624339940932331 4*e^(359*I*c) + 17589625826275598575710681261397930126580103159548435361490467286516944223207577658044718413414137599577009149924675952 8*e^(358*I*c) + 28699294363123149655727801085157694089682649746606632752880156067700711283743192673508812097486176051136700881572878264 3*e^(357*I*c) + 46375828845736715454493767825500568873332814556804931042399559988601280063861990402236837859110884260234209454368229910 2*e^(356*I*c) + 74222864090817312491693704946252561733414891967911827048983100549778195122106995583962345249974865312465887355340144213 7*e^(355*I*c) + 11766007209757869651898750508902310922046126969702774330145358957889567712307935203819931066068805646285998223417228010 12*e^(354*I*c) + 18475058564624515334452843005713263237811625533045659718876707580910793067948218349281707731263646397220715701317037853 34*e^(353*I*c) + 28736105359223401870808354355829122772719679773947201597910702749277142768695314671826889810410613817038854034975440015 92*e^(352*I*c) + 44276730791054253185243161129856936565848519361001924570444551344833050453214525163471184881332248236704651034839548051 61*e^(351*I*c) + 67584804378885243725629359489638576266948555471955194861228775679817185872623628719949670794018319579279016825829412343 62*e^(350*I*c) + 10220423779434634851339975295163399641702122249663666193053008302026096932158568338309418237395541351819026907953220681013*e^(349*I*c) + 15312837206662775379347353212807682965712535652942631518286142403097738200270711195396582159028513532779682154451996208592*e^(348*I*c) + 2273

1603566128841100419501947051367666836652418077260913944810748473084891890410181285412604854876625919565639521227223276*e^(347*I*c) + 33435897827936581301171175459610829454298167962017419810072936733378506584428024201072453193458155334046693516742390717832*e^(346*I*c) + 48733253505974923400852255563052101402196469313659554492725674754339375283010407167744366955828922837488705858532439654489*e^(345*I*c) + 70386349760594831567048224061395025698501202296966300376764220336697702961591099854055411376294871437468149528524796002762*e^(344*I*c) + 10074496185185374461175430098298016696240455383622292186848469426996612060769890704634373101116094882810027672937013281935 7*e^(343*I*c) + 14290631912305552424654692847895423837131592580202238923649865213683982250203515567697091741903983458796705558843156641 6784*e^(342*I*c) + 20090658715357880438030046950144161017452185125954192920984068896085945490851977483590589575766677085788861173875185846 0424*e^(341*I*c) + 27994524447503980482296673046296088449211987485779114712400907947692043594173529330930543043868733312991245419677407010 7264*e^(340*I*c) + 38664267305038004945738256281831696265197555099077927704874023862985879501824735616288863101568766478010120528733308274 8791*e^(339*I*c) + 52932925276411392600393483695824355767254923899756073921440659918504783195557258376535863439540877152800974546754838 2950094*e^(338*I*c) + 71836159638205824920911354448790108886838874403371321033249197137590673834155154045726480430403966425591560734980191196 6551*e^(337*I*c) + 96645827536903771874773913079815164348359068416683223468809829116416063641815945211981572880937212516883623936444239734 4064*e^(336*I*c) + 128904351529293395648063433049967704018104393562010691426731106790003005839883978769237695409054527855454499771005875477 2400*e^(335*I*c) + 170458299670782280820467821816769300269866114771277235502145654381093006963718808588282475750060524696321081035170640534 9408*e^(334*I*c) + 223489127639843946447862257830643484072461048446817785982262065869192147864526665306256382355300122800100909360675106616 8944*e^(333*I*c) + 290538572232005700195334527448948279085669252995982374953269596341416483336677312821860789932858860891617659377208862258 2464*e^(332*I*c) + 374525759487665120465733498842622638814395450198683066422234922636107960954682227606750489938670308898230818571714340721 1328*e^(331*I*c) + 478752744278094568514520484697159616530416941932824407321145959212964925504887685405984472066107815128817961257498635919 4560*e^(330*I*c) + 606894980315671224833187110532989547172280614300887801498655965368726069481655047019589000451196552756743272296970757720 2160*e^(329*I*c) + 762973181562782158046899242420700836643889673633302466186383810511044514894696232829763154703254341981182101583786301368 2720*e^(328*I*c) + 951303227401952295420911319126822664229991201352566594029838106479788569090499312894803522741214403563385177951121933527 7360*e^(327*I*c) + 117642122748764840800109007146734744933712781605578119837244558265660556176580864793686418649081196434124136448037721316 57280*e^(326*I*c) + 144298162852084312045329783753756919650631542246497475512958515073895240832269767896886013696283999007476585792019293007 44260*e^(325*I*c) + 175562732712242923968872914031257162134914862611454785713767516901056560678380421510382713813003727577556763254080268345 44840*e^(324*I*c) + 2118832140588288753961019837470686269589404922607709376 4

132512513336190523978949694387686059124526755048042957954264706637460*e^(32
3*I*c) + 253671764391193536215322603359833481549049826061257617113006834929
633908164915830257052687375399821496393002265126574261188 80*e^(322*I*c) + 3
012848241455270326455901895308817715601343749343820107841376983544836614812
175454919759112996717076496970018034869920783896 0*e^(321*I*c) + 35500103106
019649876272376796949482209581372371036005012877806027481672807059943445240
13631556850073237996658500567818193792 0*e^(320*I*c) + 4149983212196370804 37
885237874013455417800889305382069188535790267492733646716400375634886077160
92887686471542838602788559660*e^(319*I*c) + 481331176781840292165037485491 1
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83708711490794943 60*e^(318*I*c) + 5539091304497208621943268914633156608142 7
959896969900214434296817731150863867056620768608187679709720152974148474907
904177340*e^(317*I*c) + 632477741010121790517949460751755699240769813381384
831580424067474538747293876317105449952471529122051185005975110528243476 80*
e^(316*I*c) + 716603298611733955244419438892841091340911578446552456720842 3
740243494469646492713181219065962951114063950174330386358209288 0*e^(315*I*c
) + 805662491306826841818762018826235112063637903372180119541102106429277 65
9976449038205954219368735653146544157690704726554016 00*e^(314*I*c) + 898838
158013823822139732704779546027447928770180519633471463073724643151212749294
023479428748028994995389535610566676688910 20*e^(313*I*c) + 9951220647205796
595134034173802354851533640337171789804085047095465753297727911349150688029
0726111154101941386019689567958040*e^(312*I*c) + 109332537349966223203932 67
850342635707986370700172829401104207653040392386265401897867651641731422108
944992249561273287016966 0*e^(311*I*c) + 119209713702033927055755397823688 44
444464742432450218532862634704659963472114657383068154049533354314677681091
191041046862896 0*e^(310*I*c) + 12899507601159190341076386342709732994858617
357459586270584915928094304645874266316345401849146385539564945395221289963
2198680*e^(309*I*c) + 138529794549151089451352769576543403126330747243680 03
083246720589581904356815523926487676286717275433868402784985538545321608 0*e
^(308*I*c) + 147648920805545333418623121767853777399782924748301228793924 34
25749999379554217653701012351229395574675485492021745500096047 80*e^(307*I*c
) + 156185962953551196169738218832173696509852551589210730578365727476259 47
647446595542850233667374368649917569867787569361124340 0*e^(306*I*c) + 16397
781605960772537526455981650584789418778510145536039189742448299841538578760
5765315509208337741590143078572243505132706580*e^(305*I*c) + 17086984886895
310117686030605310399434053039034726008843267684250555514129383083896127597
426892866649484572346254470910284368 0*e^(304*I*c) + 176720929970554642004 57
577005309570059533465987068273203197591553238757705241486632351114011768049
29293545175594789922094036 0*e^(303*I*c) + 181408168770922059820368553316 69
732163998486262829882856956027329563089762682934526359221903456085353073371
0529842148537901680*e^(302*I*c) + 184831151983748941817667850174708257138 12
817215826941328776535853224077324433619190081855782990589568449488941045192
1524212840*e^(301*I*c) + 186915474436567514926351405623117503261987508351 93
008382456644443568913923368341170464182876217879917784806422015081835526128
0*e^(300*I*c) + 187615393168510050071497280564603510912403132920312024370 83

50626790376449902862853466735070934529643512579626961335117256523200*e^(299*
I*c) + 1869154744365675149263514056231175032619875083519300838245664444356 8
91392336834117046418287621787991778480642201508183552612800*e^(298*I*c) + 18
48311519837489418176678501747082571381281721582694132877653585322407732443 3
61919008185578299058956844948894104519215242128400*e^(297*I*c) + 18140816877
09220598203685533166973216399848626282988285695602732956308976268293452635 9
22190345608535307337105298421485379016800*e^(296*I*c) + 1767209299705546420 0
45757700530957005953346598706827320319759155323875770524148663235111401176 8
04929293545175594798992209403600*e^(295*I*c) + 1708698488689531011768603060 5
31039943405303903472600884326768425055551412938308389612759742689286664948 4
5723462544709102843680*e^(294*I*c) + 1639778160596077253752645598165058478 9
41877851014553603918974244829984153857876057653155092083377415901430785722 4
3505132706580*e^(293*I*c) + 1561859629535511961697382188321736965098525515 8
92107305783657274762594764744659554285023366737436864991756986778756936112 4
3400*e^(292*I*c) + 1476489208055453334186231217678537773997829247483012287 9
39243425749999379554217653701012351229395574675485492021745500096047800*e^(2
91*I*c) + 1385297945491510894513527695765434031263307472436800308324672058 9
58190435681552392648767628671727543386840278498553854532160800*e^(290*I*c) +
 128995076011591903410763863427097329948586173574595862705849159280943046 45
874266316345401849146385539564945395221289963219868 0*e^(289*I*c) + 11920971
37020339270557553978236884444446474243245021853286263470465996347211465738 3
06815404953335431467768109119104104686289600*e^(288*I*c) + 10933253734996622
32039326785034263570798637070017282940110420765304039238626540189786765164 1
73142210894499224956127328701696600*e^(287*I*c) + 995122064720579659513403 41
73802354851533640337171789804085047095465753297727911349150688029072611115 4
101941386019689567958040*e^(286*I*c) + 89883815801382382213973270477954602 7
44792877018051963347146307372464315121274929402347942874802899499538953561 0
56667668891020*e^(285*I*c) + 80566249130682684181876201882623511206363790 33
72180119541102106429277659976449038205954219368735653146544157690704726554 0
1600*e^(284*I*c) + 716603298611733955244419438892841091340911578446552456 72
08423740243494469646492713181219065962951114063950174330386358209288 0*e^(28
3*I*c) + 6324777410101217905179494607517556992407698133813848315804240674 74
53874729387631710544995247152912205118500597511052824347680*e^(282*I*c) + 5
53909130449720862194326891463315660814279598969699002144342968177311508638 6
70566207686081876797097201529741484749079041773400*e^(281*I*c) + 48133117678
18402921650374854911037447892471909463560389282936486391655379227882295736 8
28510632816471591059837087114907949436 0*e^(280*I*c) + 4149983212196370804 37
88523787401345541780088930538206918853579026749273364671640037563488607716 0
9288768647154283860278855966 0*e^(279*I*c) + 3550010310601964987627237679694
94822095813723710360050128778060274816728070599434452401363155685007323799 6
6585005678181937920*e^(278*I*c) + 3012848241455270326455901895308817715601 3
43749343820107841376983544836614812175454919759112996717076496970018034869 9
207838960*e^(277*I*c) + 253671764391193536215322603359833481549049826061257
617113006834929633908164915830257052687375399821496393002265126574261188800*
e^(276*I*c) + 2118832140588288753961019837470686269589404922607709376413251

2513336190523978949694387686059124526755048042957954264706637460*e^(275*I*c
) + 17556273271224292396887291403125716213491486261145478571376751690105656
0678380421510382713813003727577556763254080268345448 40*e^(274*I*c) + 144298
1628520843120453297837537569196506315422464974755129585150738952408322697 67
8968860136962839990074765857920192930074 4260*e^(273*I*c) + 1176421227487648
4080010900714673474493371278160557811983724455826566055617658086479368641 86
4908119643412413644803772131657280*e^(272*I*c) + 951303227401952295420911 31
9126822664229991201352566594029838106479788569090499312894803522741214403 56
3385177951121933527736 0*e^(271*I*c) + 762973181562782158046899242420700836 6
438896736333024661863838105110445148946962328297631547032543419811821015837
863013682720*e^(270*I*c) + 606894980315671224833187110532989547172280614300
8878014986559653687260694816550470195890004511965527567432722969707577202 16
0*e^(269*I*c) + 4787527442780945685145204846971596165304169419328244073211 4
5959212964925504887685405984472066107815128817961257498635919456 0*e^(268*I*
c) + 3745257594876651204657334988426226388143954501986830664222349226361079
6095468222760675048993867030889823081857171434072113 28*e^(267*I*c) + 290538
5722320057001953345274489482790856692529959823749532695963414164833366773 12
821860789932858860891617659377208862258246 4*e^(266*I*c) + 22348912763984394
6447862257830643484072461048446817785982262065869192147864526665306256382 35
5300122800100909360675106616894 4*e^(265*I*c) + 17045829967078228082046782 18
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2108103517064053494 08*e^(264*I*c) + 128904351529293395648063433049967704018
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8754772400*e^(263*I*c) + 966458275369037718747739130798151643483590684166 83
223468809829116416063641815945211981572880937212516883623936444239734406 4*e
^(262*I*c) + 7183615963820582492091135444879010888683887440337132103324919 7
1375906738341551540457264804304039664255915607349801911966551*e^(261*I*c) +
 529329252764113926003934836958243557672549238997560739214406599185047831 95
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86310156876647801012052873330827487 91*e^(259*I*c) + 279945244475039804822 96
6730462960884492119874857791147124009079476920435941735293309305430438687 33
312991245419677407010726 4*e^(258*I*c) + 2009065871535788043803004695014416 1
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8751858460424*e^(257*I*c) + 14290631912305552424654692847895423837131592580
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4*e^(256*I*c) + 10074496185185374461175430098298016696240455383622292186848
4694269966120607698907046343731011160948828100276729370132819357*e^(255*I*c
) + 70386349760594831567048224061395025698501202296966300376764220336697702
961591099854055411376294871437468149528524796002762*e^(254*I*c) + 487332535
0597492340085225556305210140219646931365955449272567475433937528301040716 77
4436695582892283748870585853243965448 9*e^(253*I*c) + 33435897827936581301 17
1175459610829454298167962017419810072936733378506584428024201072453193458 15
5334046693516742390717832*e^(252*I*c) + 227316035661288411004195019470513 67
6668366524180772609139448107484730848918904101812854126048548766259195656 39

521227223276*e^(251*I*c) + 15312837206662775379347353212807682965712535652942631518286142403097738200270711195396582159028513532779682154451996208592*
e^(250*I*c) + 10220423779434634851339975295163399641702122249663666193053008302026096932158568338309418237395541351819026907953220681013*e^(249*I*c) +
 6758480437888524372562935948963857626694855547195519486122877567981718587262362871994967079401831957927901682582941234362*e^(248*I*c) + 4427673079105425318524316112985693656584851936100192457044455134483305045321452516347118488133224823670465103483954805161*e^(247*I*c) + 2873610535922340187080835435582912277271967977394720159791070274927714276869531467182688981041061381703885403497544001592*e^(246*I*c) + 18475058564624515334452843005713263237811625533045659718876707580910793067948218349281707731263646397220715701317037
85334*e^(245*I*c) + 1176600720975786965189875050890231092204612696970277433014535895788956771230793520381993106606880564628599822341722801012*e^(244*I
*c) + 742228640908173124916937049462525617334148919679118270489831005497781951221069955839623452499748653124658873553401442137*e^(243*I*c) + 463758288457367154544937678255005688733328145568049310423995599886012800638619904022368378591108842602342094543682299102*e^(242*I*c) + 286992943631231496557278010851576940896826497466066327528801560677007112837431926735088120974861760511367008815728782643*e^(241*I*c) + 175896258262755985757106812613979301265801031595484353614904672865169442232075776580447184134141375995770091499246
759528*e^(240*I*c) + 106764832017165594838085234189333528733587673329972530092661085186789939252915937090760282232346919090426243399409323314*e^(239*I
*c) + 64175100693260066806238064886004597170740843300086839368616139164529108049844675353111842725798658088840347241496099644*e^(238*I*c) + 38199015867586087976002998756627674994795440667903625029322346250133286489120875005013638128113893960349670280707161530*e^(237*I*c) + 22514675741308069961506165586502872430421930210673264392997286485600640103867253604847715547060592967690653795951142520*e^(236*I*c) + 131397714941049338818566811514182931122425515215356868711812665798138776063481602617472013177357825660213067982983360
24*e^(235*I*c) + 7592752700146678961153095073585015473197029746533633331549793961473285760935801904155116764831560875947581048693527224*e^(234*I*c) +
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*c) + 420846342608949387277559021457924586578120966148561022647008499529468452005980175119410628956210497609566002969884927*e^(229*I*c) + 228911311738592780091492649162346834405867740776456326108410928857257174707289268074347550225793244741923354395308214*e^(228*I*c) + 12324394151933238474196007258810350659640633925361639108206299960682419011745775738921817753391954462609
323881489157*e^(227*I*c) + 65674859268867300098827375812875225610654551686261103681664007007537115778097293533565243828873383722980353200611956*e^(226

*I*c) + 346376571726716901676573445371970870488823548539932704720639430787736004465429635483481012693904434644807545139285O2*e^(225*I*c) + 180798200680288599703499386230072306765633142067088484999001396412373347632664793469632379360393281131850415917938 48*e^(224*I*c) + 9339341958053494225251750965715057300707302083814774770306218224241022648247419956042957363055823830898547303219757*e^(223*I*c) + 4774141111066098970221845330594962016472714230374234060663956846950926642685946929064114194400360936223590725470146*e^(222*I*c) + 2414966516810338503289076549202740511710059011795447138773464205696455026442712426409599662771080264826008985061097*e^(221*I*c) + 120877035849365839308944222205693506328370410814059375022653984611773764821660955973483160124869827433029615861214 4*e^(220*I*c) + 5986501411122418589116765051805201503640032268413280814535970935877903386092124390855544668615826233503030619610 52*e^(219*I*c) + 2933449200343007202870423834483428663138062854550400678230804455975459700234462315635541351331054935163163200592 72*e^(218*I*c) + 14221311596481451768238666727676990948227168131879088984050103944174863554536246767983244910352032195301178008306 9*e^(217*I*c) + 682080330967936156837844096192442108186149916400415534244055278768932724966083242310981485024664539671577280789 94*e^(216*I*c) + 3236273132241954941033008894364024746037832856131642293129242714590288791307164367950290905589123675514320738260 9*e^(215*I*c) + 1518963421490880039641791172264375474804852010973481245910987881049384438106265081897119963712145874945624327441 6*e^(214*I*c) + 705213241416219799260232652458014306098535305457293390552463312168102103734029836634220332432530707241373906102 4*e^(213*I*c) + 3238491931361851476423321933539579098377735539207641467346235665823887048326949305609231585143748690203615957136*e^(212*I*c) + 1470931146618934345515038362300100160482127749581443929904746910224777470198899052379114493999887003199419829579*e^(211*I*c) + 660764473105869097691475973850837934511089033149586707982764263394766756649565279879146173318386505740391093990*e^(210*I*c) + 293550743554342709808129453576562313299705982699187416862934373964255615967138676253276302591561523515603264403*e^(209*I*c) + 128967080084754712246023680866488384983286259025533132044636109049545144029547003347761521666283977931640178464*e^(208*I*c) + 560286834249035176584950138585345161671625910343679724981746609074506667781543532716303446507778856835476241 84*e^(207*I*c) + 2406878513970527716119346564450614328524136103776821681892218440014104846021094469664775272337193287459459732 8*e^(206*I*c) + 1022318202595486076721739030518645192356214547367429361991806349041148749612180459027459270277057151545641468 0*e^(205*I*c) + 42932064780080221260174889088518264947906207206601514514681819109172400278639687245391276596335170530029764 80*e^(204*I*c) + 17824461149317518505563548566384219011744123222982494965916580539397871982465659459755955757341933488879521 60*e^(203*I*c) + 7315849722068183628747296214039744442800104463011615273397605448153009517879855384197646562145826672199140 80*e^(202*I*c) + 2968255152826695896853182732802390500845550322034159415119626595968816157137999376800264974083056722976188 40*e^(201*I*c) + 11904185540387796494822957794837046560060662318304552952690043020927047321277384779493558607471432947993928 0*e^(200*I*c) + 4718822084346620769509950695357378035710889749142256789804819 90

182077089970053338601488364795274561560145 20*e^(199*I*c) + 1848740529900573
2693752728611876490890858357021974882371570623800186245137722660943641752976852924439870880*e^(198*I*c) + 715812468684294147547380736367983971817274558153840904450338385269359692162242669674045394471814302524839 0*e^(197*I*c)
+ 2738895624795265603355227646566000886280778305084825702911938903656162004262736182657700406301914070062380*e^(196*I*c) + 10355619825920029352263845779086115486121114950801935736913398647060291864824662418056649493810498562585 10*e^(195*I*c) + 38687621823427716563245172304997988926311528237460754169244317667399751374281359173617116965225061118648 0*e^(194*I*c) + 14280179245022176248318087491882527413430513327541778008479503464476350933350315051734586465966718941708 0*e^(193*I*c) + 5207517851879327038642926335154430695110499354250058293815524168940813867525460803084790716774857173472 0*e^(192*I*c)
+ 1875998821886556356416363573598607327825573725740570627910889136637842846741455993048117286353859819389 0*e^(191*I*c) + 667586629037114735850376686566928901089354386983053870872494529158095117918829660615811125770696860474 0
*e^(190*I*c) + 234651821923910514223814163307346476889915570893502577804763741268178157576542221912740926015943871225 0*e^(189*I*c) + 814608187736530579670210025271921415597183369881214299823291969785549876175969866367976653244974728560*e^(188*I*c) + 279285755800035206679835368898165477644864987794665387827488933863633745047373109049265172681702585720*e^(187*I*c) + 945561802589319869193343034663656528268580913143291891607362771758738417321964533799537056794668268 80*e^(186*I*c) + 316109393312846927506943064436184146560959695209452157430040445603868952418015791565434519407133517 30*e^(185*I*c) + 1043411751657039596665369315558240210946034809547302780741232142734681692856719777037649617025180394 0*e^(184*I*c) + 34002325606016516175216946808470898441980288316944174247948687793289505484181256054468820811526360 90*e^(183*I*
c) + 109385321448622035867403243450086667849977001130587417248897595161203145673460828709551950104197544 0*e^(182*I*c) + 34735147321471378087435208312956660123876576277594236676273334995210388975398263640385755686777730 0*e^(18
1*I*c) + 108867995731829472826732905192034886797284621356445627530909104429486741257822633476898356826454040*e^(180*I*c) + 33675398872021568375902384593982753362559801058104184627345411136262431943240778260721756991027090*e^(
179*I*c) + 1027936473066384084473957786246926260464886191429797258916524353065123069072624446247919989425518 0*e^(178*I*c) + 3096131971621520162380301554241465451782362086810287537748902904985934020179565706177131421614590*e^(
177*I*c) + 920089393029589032874601850027159322612526368444771489781974361078847528891468831038436064951920*e^(176*I*c) + 26974580144021129697268360186387895435796230852007659517712822762927324021520970821849736341414 0*e^(175
*I*c) + 780098073680242398756137330588514171253271146810708896407942492826334705807565570839232033771 60*e^(174*I*c) + 2225195917679577775716736603600748022221136423214639980386437096339149122368724582345735158014 0*e^(173*I*c)
+ 625987215682225284365096070823503471020136277605717664722632308975144656528885010389815385992 0*e^(172*I*c) + 17365742188181910718741974724501581238835642099506586391023371481227690806116807197417260538 40*e^(171*I*c) + 4750
1057885760151927231661793842522242178659724167102689431851540851146714096 93

93115768793680*e^(170*I*c) + 1280989146016885396724805418304098477073675004
3860153680320449770111991128908710565948278340*e^(169*I*c) + 3405405385129
556915435234672217717265518754891078200850471832416872502943858916234921162
8040*e^(168*I*c) + 892320944734329676333188188163847179349961867060102605973
3089596265329177022949302816257510O*e^(167*I*c) + 230435107337384035737917
859767306635201668278168913984209737666311848880384113193531364184O*e^(166*I
*c) + 5864034669726832427416433289215609093751974538642432995719909646088577
245771134145204174990*e^(165*I*c) + 147030816732276833163041582099592047512
043725225353339238819165193000407629544745753221740*e^(164*I*c) + 363183696
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85730*e^(163*I*c) + 883672064086047030569451402154796955129679409226698304
4118375790025854584036796364768280*e^(162*I*c) + 2117589733466855707101501429
2104147224018388379407528416185414408885457299431382090368 20*e^(161*I*c) +
4997075672538590843575963148137947680693371909159674919074889049339226775 7
9665354338960*e^(160*I*c) + 1161045516835550437629115017121163993137330211 3
2677481112824047246361794049635726479850*e^(159*I*c) + 2655680638904340753 4
4967023691015457959948617577414147899446527121275669101852741231 40*e^(158*I
*c) + 597899217294414321845916114929981970632173211157849452524522874297646
8409105395536290*e^(157*I*c) + 132475641236783747315747282116248369112096650
1948953926492241643788264284546437221120*e^(156*I*c) + 2888207552647306544
69968572021047109427318619508995802020689904590319476295408324280*e^(155*I*
c) + 619485966530355028795643388152343106604109020378824731618047744929162 1
6575880077680*e^(154*I*c) + 1306981720348828988619320550837581839212499138 2
340160316886507181296548981014818410*e^(153*I*c) + 2711843239670717527605640
490148833507130242448403978318523237721944200392830108580*e^(152*I*c) + 55
326912881952861250291886955894782909802195630934984358404463151229177880008
1490*e^(151*I*c) + 110969199687320974749922259595250444341219218535349655762
5911925765358721517660 80*e^(150*I*c) + 21876482892713909928040345612578705
805121508756226696317087651824252241418663320*e^(149*I*c) + 423812584676323
258639418856985868582675532800554862743701930140585132588759448 0*e^(148*I*c
) + 806679543607589140759305010796189568269842021613388955218916278823182639
488190*e^(147*I*c) + 15082238143141241377356647421001174685229743759705918
6295243989481140398152780*e^(146*I*c) + 2769311653834325922598338263764793 6
122664033859615133489846664694361471028310*e^(145*I*c) + 499251971245704398
3505377976607953988397368297591114957991804893688371867680*e^(144*I*c) + 88
35009688217912026007745419277692007376893935137347893683970933331196188 0*e
^(143*I*c) + 15343608874505625412732723946157707193313015776459599711397351
3183188399376*e^(142*I*c) + 2614397627990202144347194566508025456305681018 3
520401889800285493144867448*e^(141*I*c) + 436944248291011391456535313606959
586266933885805341938121413124192504700 8*e^(140*I*c) + 7160994975990580798 9
56333385529402291928581964815978300788197118626000 96*e^(139*I*c) + 11505148
185208084887370038835452131556764036512400310369117669719429232 0*e^(138*I*c
) + 18115768495615758076710303055505625589254293659193314153418333944596408
*e^(137*I*c) + 2794709104475686611842790694973699164482254723977210209725 66
1304403472*e^(136*I*c) + 4222761266320036875477547465557099887105271330866 6

0161366353656787288*e^(135*I*c) + 6247355078105329531771077469024711412412518756573184844178190403267 2*e^(134*I*c) + 9046693523825682979044338963104263167672586826367911338826483549173*e^(133*I*c) + 12818174649149708108596041898283590007907899211694053046122112518 18*e^(132*I*c) + 1776428291351193485771944376758028302399054600926871364949614043 33*e^(131*I*c) + 24070801913529757101858022914372045864746991786182039740274325264*e^(130*I*c) + 318774992974434649721153604475177658232095862792381647059065902 4*e^(129*I*c) + 41243069829991519084806722232721943506774793409189467048898292 8*e^(128*I*c) + 521081176291770486604924009851758309875057005668778189541416 39*e^(127*I*c) + 64261954855352485764250681368704655300871140038757166913839 02*e^(126*I*c) + 773204636991145775061462731028098506094432675788136295011259*e^(125*I*c) + 90722605722208814918642284639487187764607589706493970774776*e^(124*I*c) + 1037518449987117550190939895659668411680299708252666032352 4*e^(123*I*c) + 1155855412893594260345544966642687823630035899363232371472*e^(122*I*c) + 125370496586921272662198050851269323171167338854081782959*e^(121*I*c) + 13231708870104896973800056733779919089340836756009580718*e^(120*I*c) + 1357990663161479842850642848032544982878359839580349899*e^(119*I*c) + 135442594916636116191574650625331646238501101627937224*e^(118*I*c) + 131187818011721747296793398943181536949646753684811 94*e^(117*I*c) + 1233096700139723365181997220750932590655287625342156*e^(116*I*c) + 1123916045422466509664291620631243389525545752340 51*e^(115*I*c) + 992549073853440227293998703871458049544543137461 8*e^(114*I*c) + 848552202276512356496200136959676295361696315113*e^(113*I*c) + 7016451532254446290687354881374809108456187068 0*e^(112*I*c) + 5605927253067558551780452883689835514455118670*e^(111*I*c) + 432333688644261557547944179250800440604964868*e^(110*I*c) + 321478876933753388174544825153773503839502 78*e^(109*I*c) + 2302150411226234925855222345201500900533576*e^(108*I*c) + 158566476113257562566117432227203884298856*e^(107*I*c) + 10490402669510897424624643766470754045064*e^(106*I*c) + 66563467067621006375419184710997114141 4*e^(105*I*c) + 40443624781415311581857832389099634564*e^(104*I*c) + 2348998374244347079532766203075607598*e^(103*I*c) + 1301711930791728238351514307733600 24*e^(102*I*c) + 6868329225263681349501997341320517*e^(101*I*c) + 344277152012875134140739302960914*e^(100*I*c) + 163531646471515302405291376181 11*e^(99*I*c) + 734057263616388449968842366924*e^(98*I*c) + 31042222522074681615625020522*e^(97*I*c) + 1232445557346832245176696904*e^(96*I*c) + 45759117183402579073139583*e^(95*I*c) + 1581796642397812408161814*e^(94*I*c) + 50648660944512569972179*e^(93*I*c) + 1493326612293984160368*e^(92*I*c) + 40261256699368950388*e^(91*I*c) + 984382804329835768*e^(90*I*c) + 21608403021340047*e^(89*I*c) + 420601518659718*e^(88*I*c) + 7146142307307*e^(87*I*c) + 103818048048*e^(86*I*c) + 1253841160*e^(85*I*c) + 12085216*e^(84*I*c) + 87153*e^(83*I*c) + 418*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) + 8*(9867*a^2*e^(1027/2*I*c) + 3848130*a^2*e^(1025/2*I*c) + 748461285*a^2*e^(1023/2*I*c) + 96800992860*a^2*e^(1021/2*I*c) + 9365496059205*a^2*e^(1019/2*I*c) + 723016295770626*a^2*e^(1017/2*I*c) + 46393545645312066*a^2*e^(1015/2*I*c) + 2545017361124393610*a^2*e^(1013/2*I*c) + 121842706165559066025*a^2*e^(1011/2*I*c) + 5171545973004091569115*a^2*e^(1009/2*I*c) + 1970359015888505

19564291*a^2*e^(1007/2*I*c) + 6806694783384240157395723*a^2*e^(1005/2*I*c) + 2149781103140646064389701181*a^2*e^(1003/2*I*c) + 625090198048881354283481 1885*a^2*e^(1001/2*I*c) + 16832786063792244154118397732O*a^2*e^(999/2*I*c) + 42194183798111808917912737794 82*a^2*e^(997/2*I*c) + 988926185091494999778 48839281608*a^2*e^(995/2*I*c) + 2175637614774834148860646181993913*a^2*e^(9 93/2*I*c) + 4508404635489473111365493648136899 2*a^2*e^(991/2*I*c) + 8826981 769938821707546389416305875 45*a^2*e^(989/2*I*c) + 1637405134370147041079523 2052077859600*a^2*e^(987/2*I*c) + 2884951941823779076570657152239603532 53*a ^2*e^(985/2*I*c) + 48388512976734937857378256077028943174 58*a^2*e^(983/2*I* c) + 774216225807295300398776567190127292057 46*a^2*e^(981/2*I*c) + 11839056 81496154244790481704841511975812605*a^2*e^(979/2*I*c) + 1733237985932470809 38286634415377202522856 00*a^2*e^(977/2*I*c) + 243319960226397965449456617 97 8831797573560881*a^2*e^(975/2*I*c) + 32803137454391362446300796802177674997 15269552*a^2*e^(973/2*I*c) + 42526927994680400818082041215180607385958376 88 1*a^2*e^(971/2*I*c) + 5308534291820392703338416346573827404091901585 20*a^2* e^(969/2*I*c) + 63879370373954621635975957201883971880003982469 70*a^2*e^(96 7/2*I*c) + 741825056080583067190638272960030709504869211765 36*a^2*e^(965/2* I*c) + 832235134528204011410897179273991960185826206648233*a^2*e^(963/2*I*c) + 902849221019959645675877183083783865163922208943445 3*a^2*e^(961/2*I*c) + 9479919297420601239242718620877834872930903033637697 5*a^2*e^(959/2*I*c) + 964243521124661527558501799663497136699025931317633435*a^2*e^(957/2*I*c) + 950851603301606688521021204740659909007910365892951228 7*a^2*e^(955/2*I*c) + 909734096440212016199687157101122622223621741037975375 3*a^2*e^(953/2*I*c) + 8450955333470553891783625245618186152332750646273099690 58*a^2*e^(951/2* I*c) + 76275335643562645052687591826777774958796406913709427338 82*a^2*e^(94 9/2*I*c) + 669316547443827857879723551910372050197806460183053048491 50*a^2* e^(947/2*I*c) + 57136825924759622801716432259879886251814562107922931909830 5*a^2*e^(945/2*I*c) + 474780273810946147679452398200587138393488685888724 98 99445376*a^2*e^(943/2*I*c) + 38424120931303092691417893056689027197759987 15 4773450642875553*a^2*e^(941/2*I*c) + 303026981162716753579274739716869070 96 552397459483358748398836 6*a^2*e^(939/2*I*c) + 23299442497098459472744224411 03255660014398695628346348183060015*a^2*e^(937/2*I*c) + 1747461166940741239 833732025911741018693369272635396827304831752 0*a^2*e^(935/2*I*c) + 12789953 50709525265122965600887518494504555408028020891566437014 80*a^2*e^(933/2*I*c) + 913950798194359635416152561783528812272662756335205591879244483056*a^2* e^(931/2*I*c) + 637901972706457161537048159006739117856868003562112777254 66 22549676*a^2*e^(929/2*I*c) + 43505040078846771739375434892367376134820357 64 0699616833255652702640*a^2*e^(927/2*I*c) + 290034549601309190904110736552 97 0267303386666676203317563284374069900*a^2*e^(925/2*I*c) + 18908091613354480 4719079218768535450585688572492012494322379080419224 0*a^2*e^(923/2*I*c) + 1 205841828304322232746984176780249548286881249687329708012918778527622 0*a^2* e^(921/2*I*c) + 752538169286099730593712252395949683696512775423904575181 08 615791579592*a^2*e^(919/2*I*c) + 459734846505027807935033990026603184232710 15658103040196922724606483508 0*a^2*e^(917/2*I*c) + 27502159039236937765876 6 03113609959383733995076775333877194239834077678 20*a^2*e^(915/2*I*c) + 16115

407781051635972431360562753503561125657124843101942340833750431379920*a^2*e
^(913/2*I*c) + 925253600441222539089961836187811384196766999322346250701735
72656790224220*a^2*e^(911/2*I*c) + 5206555249152171385586465256467309791432
72286503599511142866234900753030800*a^2*e^(909/2*I*c) + 2872309730845866743
857089089793834185768860453051859152512886718432899387580*a^2*e^(907/2*I*c)
 + 155388860023750983926223336335851777050039427643419571677926729464905846
80720*a^2*e^(905/2*I*c) + 8245729846693183179384299944105754752673624762543
0643803799651404729037196200*a^2*e^(903/2*I*c) + 42930699545565691552902331
9383740331787389876258528044568866617782668258091120*a^2*e^(901/2*I*c) + 21
935216361583272147907315638045659778101602433822546371929909840313281201327
30*a^2*e^(899/2*I*c) + 1100152808944845644054007798141013434062534318319264
6912658929460020565020178560*a^2*e^(897/2*I*c) + 54175136420158870759776081
878762183566234558535160745415613400901305789214741190*a^2*e^(895/2*I*c) +
261986308398648944304761586627798288732821401867463656807224493760103478519
469580*a^2*e^(893/2*I*c) + 124446145774508700568340258135130234074887149326
8853526051502243461744066743087430*a^2*e^(891/2*I*c) + 58076231508882826570
35726563472056066490098543042659092264931138827252796777795440*a^2*e^(889/2
*I*c) + 2663278925925429409999563585453790517239964770438993417533607361049
4622102197100700*a^2*e^(887/2*I*c) + 12003852300760789346999100105954288505
9361383953817197097130019148476286101342529740*a^2*e^(885/2*I*c) + 53185398
624343902484464820844368189352328112116235379005196349061908702044767847749
0*a^2*e^(883/2*I*c) + 23169230101668992483563829651438816385881286910311693
42715746114596226696343685707770*a^2*e^(881/2*I*c) + 9925571456175007868044
954512662122157945316385261733877625706791298570735980248218190*a^2*e^(879/
2*I*c) + 418214696078086696630592758657604232043406731740420127322863881502
70004607442363966810*a^2*e^(877/2*I*c) + 1733468327028598352541440603456396
67307060952339166178202747114201132722700081267981130*a^2*e^(875/2*I*c) + 7
069298928172870212173237733840839918767937764495428805163323948981255356030
91275389910*a^2*e^(873/2*I*c) + 2836936413066169670834440433496289616013064
809877796049713791099298183967813067131443680*a^2*e^(871/2*I*c) + 112047661
995564737603994580880619691142218662882525788135841357339841686118888072797
04980*a^2*e^(869/2*I*c) + 4356134174496143245619429704996145134810103127968
7284458749849229001908431128476748026080*a^2*e^(867/2*I*c) + 16672799000292
546206639258943073014561649795795917738648698313155883657234229697497895641
0*a^2*e^(865/2*I*c) + 62832810057976380292836471093718342426753895508796825
0611858220771628940184317648588806640*a^2*e^(863/2*I*c) + 23318221269008375
97004502462198397485462664047234985865673105368390469729222650473360964890*
a^2*e^(861/2*I*c) + 8523030200555698023434125954726868445588548391969654048
667935620974139552527924073673227600*a^2*e^(859/2*I*c) + 306859453525430924
82702845869501577062965539970222689480264438633453524385996537638863076530*
a^2*e^(857/2*I*c) + 1088397677409163120701510081479079419450467708773817754
84587130539032295230513374581118741700*a^2*e^(855/2*I*c) + 3803581012271403
286776687618843936964269229517706156850370891479241980521277969846923894572
20*a^2*e^(853/2*I*c) + 1309808166769874221399887733462355768160270298416328
496442284373072612082291023793255684692690*a^2*e^(851/2*I*c) + 444512894567

18034708449871297986125267625342552031376402831342918379532109199979785062385085 60*a^2*e^(849/2*I*c) + 14868703654845358167864688325631664019537745751307912266757843993755842178445925592260911134010*a^2*e^(847/2*I*c) + 490256236905547116371072305475099504134510113008960030655282357330538714407135273844178164082 40*a^2*e^(845/2*I*c) + 159361151043732217078520212627974369008393404524099003327574913357421657095829547985344818982170*a^2*e^(843/2*I*c) + 5107377846599813416034090367484253942454172957105621029119977487718777250696457317976506052296 00*a^2*e^(841/2*I*c) + 1614044517509692628698926726691711554483556138938275927980725902246471451300167215224536975484180*a^2*e^(839/2*I*c) + 503013621424727916492709072244653040032513798349205215250339726461230517645666409841338839745360 0*a^2*e^(837/2*I*c) + 15460886627425884508961370810425256795141491888489128568437523537118033479548555089427027219657190*a^2*e^(835/2*I*c) + 46872936251359045427572949638891011901567295748605743880702066108160790194634165956243747535959690*a^2*e^(833/2*I*c) + 140179587273335544121400653964948704821999753320769202315809343517939464222716874991309588425294410*a^2*e^(831/2*I*c) + 413583357170761058619768375014947448147331264219567666058810994571662705401249971101083839065381230*a^2*e^(829/2*I*c) + 1203917971578157296645777076870863707439458436180383807304624684176423851533695303170101891807261930*a^2*e^(827/2*I*c) + 345800280503438673512743980082715643826253150767015076447826007342773287946204178151141215935775 6530*a^2*e^(825/2*I*c) + 980136532048957753720308467750794208387124952529728683538379638930515142989084362405659001175594686 0*a^2*e^(823/2*I*c) + 2741687674089640072987146520227370040049594794347358669773626581835355652897742304181095834638028998 0*a^2*e^(821/2*I*c) + 756930729405521798503688025267003307281484756974529263047501621408882180085164161998860368477735833 60*a^2*e^(819/2*I*c) + 2062703819083495174791903491569175819939806307015806873477421611712310545424616563218815247164931287 90*a^2*e^(817/2*I*c) + 554875148302949454647011448410809413569126267931881001261866343075854476854621963920232931497286644220*a^2*e^(815/2*I*c) + 1473552845494328057858506710582285326743293415958953146936295488654657940849117040291880353596346648790*a^2*e^(813/2*I*c) + 3863508591698405553503397846061870223616541602204136317815879370280975938284468645658557553183035097040*a^2*e^(811/2*I*c) + 10001768444498406834296440289740030884181727971849991809295355664524098701686842920997524890661536393450*a^2*e^(809/2*I*c) + 25567180322507257120585619430570092050160262000190487155354567871662013819706851741289684023496304469040*a^2*e^(807/2*I*c) + 64540415640760762195239320862025490560421095633722168485415684713060283455815144499151145622373940380680*a^2*e^(805/2*I*c) + 160899512528459955231363417634756812261054389433051747087460367582934253478755412977343565524272784358480*a^2*e^(803/2*I*c) + 396170681325175584319772698901328368292902791228588983327071374204831719299590027443288379284314668153740*a^2*e^(801/2*I*c) + 963484212063886749916012864683917550886455801986647603288694164187342312853923851439607672602293500951760*a^2*e^(799/2*I*c) + 2314573830445783175085160387552107047974992580875177277771045535577437479474533600582272734498753096299180*a^2*e^(797/2*I*c) + 549276005046531945002759964294515084177718778666564246683217542119116401205050412296190706260027817250792 0*a^2*

e^(795/2*I*c) + 12877509084394418602560805734901526225453783498663360455751
206349831628844095133516016644770470613766067100*a^2*e^(793/2*I*c) + 298279
066527631966338276448963205582224046466282391780008813641759084206077879129
31438903408724374419711720*a^2*e^(791/2*I*c) + 6826387408872526087201389423
029938383273582738291744504824598541069729430934346386249409263476217377315
2680*a^2*e^(789/2*I*c) + 15437020316392925587372388710440654412454716753928
9682542500628678342867087924444725771096903602651633852300*a^2*e^(787/2*I*c
) + 34495872849004463043768582576690085274232021127919548089000880129527426
4001677025544610050440796333756569520*a^2*e^(785/2*I*c) + 76177770624508294
623879645328180359115118734979167117124078273487340941805400730558031780615
2784530927224220*a^2*e^(783/2*I*c) + 16625426837867801308552201362307056147
63601437922169179759292847900888287650392006130085193519006957018065520*a^2
*e^(781/2*I*c) + 3586132980406853273009614426136620444168040323250638139426
350707897872734640524997436178532231665691424837180*a^2*e^(779/2*I*c) + 764
564799385234166827225700327364483857149625184343788780399195581563364849871
0528739228920550909832076966576*a^2*e^(777/2*I*c) + 16112447006542109020247
003405135054882378494352850880906244115186916105715007393020759644056880735
953339819080*a^2*e^(775/2*I*c) + 335654655654077755570940729937626333978538
86595211631908837429624044246382645793193352761173849967036968399760*a^2*e^
(773/2*I*c) + 6912453504182182014696086456528580858014840924631827538971192
3925453814611543634853224844727360427634946672345*a^2*e^(771/2*I*c) + 14073
570567492355467628694583381812377238846295073495251790642704875900340966924
0929211626086975689710204880250*a^2*e^(769/2*I*c) + 28329101961336997036639
304743087996810506918354281673657670517009659134874129651255552716935460589
3957646001303*a^2*e^(767/2*I*c) + 56382127901621204478348465744056778170231
6218911354202346521165492358631341504712018051993565471351398126687288*a^2*
e^(765/2*I*c) + 11095676030445535703079393328465475622364795469356585529958
42131971428410665480149110838323663977569884246096375*a^2*e^(763/2*I*c) + 2
159200924057075467180191415437627790720609282835675418577456503927360772787
168002772269954154839989740930547370*a^2*e^(761/2*I*c) + 415510986011327403
170503589556137282335648153836546257479272557010884295901529318522621284728
0262524303114018870*a^2*e^(759/2*I*c) + 79076087608708714873833660689307825
065630638433716509724353457270188231791939002127539354084027375839084892131
98*a^2*e^(757/2*I*c) + 1488346251411126429985101277704576051398239260014305
7294316507822087646214576864011182721754822647875076768550199*a^2*e^(755/2*
I*c) + 27706505969452723903631310117930464578138489499047970896329350811820
143485220527437209835414411792502873777351913*a^2*e^(753/2*I*c) + 510153989
005486608142261569731084649051856497902279008167202757732034524561050174159
76545022659656750774297629125*a^2*e^(751/2*I*c) + 9291487909477174387799535
715302179402169034520215009539703668384587845708154251890193994158709966117
2792407623865*a^2*e^(749/2*I*c) + 16740035531925763745740108220243908100673
1470941354871537824741538495592535526802039060200311512888701307159198971*a
^2*e^(747/2*I*c) + 29835771880478208633005298550674856542891830140048933893
4495837264541379197068108175416231067446197128959008560399*a^2*e^(745/2*I*c
) + 52607860805714631324047570892285000882582687083323986398037568444399631

721644279653106815562488320133408728095930 4*a^2*e^(743/2*I*c) + 91773894827
795989476043585040004109958526769938661148648777454150514857025486935447100
0327559644426920574492105446*a^2*e^(741/2*I*c) + 15840379404423307489944270
504437745228615615603405071870070645985213188214915657332420028631867109019
19102738577000*a^2*e^(739/2*I*c) + 2705282937843409731431305908735900619010
005098568945719356146443354170715079330805197880740526704832092131340220175
*a^2*e^(737/2*I*c) + 4571759641434711746403745860386141761404385289698160 86
53042818012173359250224202359586033016276849256195013595055 84*a^2*e^(735/2*
I*c) + 764540773353122782997020105576329072210008234220734306081781886078 74
849753342789864760925544283841899957963320243 99*a^2*e^(733/2*I*c) + 1265282
730763165698017429058901830868115362516610795212492857994684773761996019984
709117360987656290311993304884 0128*a^2*e^(731/2*I*c) + 20723705462100228543
564379129597172262819533630926489919140308482626095452518480544529805188182
7478174762920395291 55*a^2*e^(729/2*I*c) + 335941399424510451432448355193591
058330198972721917514886609974044192211585287637126262233769979918846254064
87226670*a^2*e^(727/2*I*c) + 539013292978122423310490128642052592209559941 2
295796630471563991373313814420422761377870633088178333539950213387751 8*a^2*
e^(725/2*I*c) + 856049706868589537816648808579075548666980817498944727472 66
6876482138968071163631718419840545234746103088901944735 31*a^2*e^(723/2*I*c)
 + 1345816858585000514571669861813057712564442800500232572234230713094535 54
35232683275705974049238105872069483001151476 8*a^2*e^(721/2*I*c) + 209452012
399444258194985474554170289235130008417571062903247768871514989000136201999
5068805109303739958946752345342 15*a^2*e^(719/2*I*c) + 3227149103383500767 46
045321195011792421222997922965895264817760449140651671258010858297129703013
6153879700906390515 20*a^2*e^(717/2*I*c) + 492282044972901772475638599526690
187432070459399637637990089398249675964961459629101488099939978916669693047
617709543*a^2*e^(715/2*I*c) + 7435226578006070804385403879332057145058251 30
496084239140637610398839908817375402184750869198424041784284431826566424*a^
2*e^(713/2*I*c) + 111194850512634217145500457794122694896516956834684313495
974521592063047564521889248045106629059171484984314707383053 4*a^2*e^(711/2*
I*c) + 164668543706058850179179608352371960706838074844251951141636109153 76
958258850674627232294981593442679045976112026638 00*a^2*e^(709/2*I*c) + 2414
891369610845294264548570382427882057103318209711416024324623451601940698438
340504327720639504300166927877463171515*a^2*e^(707/2*I*c) + 350728664670642
619231218092920886850510103296049325432022207871877198417124428106255957304
55261428053975088332771164 91*a^2*e^(705/2*I*c) + 5044958421171107638761175 1
094673236503233222407477957464622341658119040966151572380873108952981985416
05380682429000269*a^2*e^(703/2*I*c) + 7187581498040295688064148446220796426
180808096683233325069951704073208274385981090912272509225210297188762948371
740349*a^2*e^(701/2*I*c) + 101431595848015092216767521803238795078141897129
968916770559334135572824087095564990659144301444891149169738055131946 21*a^2
*e^(699/2*I*c) + 141793286695581541161041148634662703004329282552053642696 2
6100393447083705189919178506526410545635418865752499556686695*a^2*e^(697/2*
I*c) + 196361744839718819705853295909943939009078646477106749203407440732 96
7933882813244021276520790059426783176315125744976 70*a^2*e^(695/2*I*c) + 269

403961217901287886061565729268177099341640059846118345875187123735434057853
598002126129172557156109129571749107773 58*a^2*e^(693/2*I*c) + 3662049726136
637159821673050022634628088833521666007643601942347248266940142802940856636
361713929100550686997545634 1654*a^2*e^(691/2*I*c) + 49322507203033015848718
132442452234982355078689460811116049412091260094352433061500872862319813121
6319302801172129035 23*a^2*e^(689/2*I*c) + 658255316595188761240378997316547
324878028071087093012924909023794790403024843180184693613802009619748937572
49507991020*a^2*e^(687/2*I*c) + 870562175431544245301136654037181772190045 4
551478457216235415851248559164727884008992060781202408745718082124042499411
5*a^2*e^(685/2*I*c) + 114101000832953568072013579854837501879424355321059 02
269019854057418625246692886082094697842188405244269783744530429887 0*a^2*e^(
683/2*I*c) + 148214810200037094436840523323772391243514422228824053778771 75
863625925934311177622025228732030754002159526191198344065 3*a^2*e^(681/2*I*c
) + 190824743344431599430841842948287875805589334938665954299495353963973 70
304461240258413936933313453823882831672371922972 8*a^2*e^(679/2*I*c) + 24352
714244358175943674120063721720129145802610900762677145555349390136546257397
199267263280219781505566308434619510856 0*a^2*e^(677/2*I*c) + 30807649507606
390446089294347868639276042634104789507220232648556940027885933178485287680
607110556330869240814756728176 0*a^2*e^(675/2*I*c) + 386364701384381142789 45
025361381879810743811311928079429380108947475491729650449068062782437865790
4258492234228073074840*a^2*e^(673/2*I*c) + 480389496872574443147849362191 93
350510748888837634566851814946449042746860595193562891663875079535702122494
4593183133920*a^2*e^(671/2*I*c) + 592211215821551227208126691333692495230 23
514909184814702609080243651228442553329266678961324164169720509822240474911
3176*a^2*e^(669/2*I*c) + 723897625590654115491187934232274243244849700436 71
904521887536450325087069740903517069779613491976854398082755379163376 0*a^2*
e^(667/2*I*c) + 877457247270755096313629380516669067964866200348728829213 37
262258978191776863958898444138835141238558199343022831546284 0*a^2*e^(665/2*
I*c) + 1054762379112239463994813612704125876817255108996812915362531048194 9
623548316514036885980017589479193241523764694504106 40*a^2*e^(663/2*I*c) + 1
257463916593220813694471040548952951921946413668585469617434577903278283592
846903820096009154736822098426718690964820240*a^2*e^(661/2*I*c) + 148690096
311428001845203984190555458170637182894575824603998732024864250611393677000
83807757911938983265493813600360806 00*a^2*e^(659/2*I*c) + 17440090819408481
040247316509101887385947524006798259941500269326620180266845163871548976868
7630403452149345770023668176 0*a^2*e^(657/2*I*c) + 202923177843702692545654 7
313961801370821326629541185615597451330228868080901720885109396319507801220
852963035958792120440*a^2*e^(655/2*I*c) + 234244034388498836098397798294706
804034842683077521030340299222338297848848251816641603050314126515046113567
0698762448800*a^2*e^(653/2*I*c) + 268286746363211772504854738434596256482 97
032645957641028598692431593679092203021053562971327962992435991181082961286
18040*a^2*e^(651/2*I*c) + 304905992898321754321986066813933552453857231257 2
646500219769949634433042293748987411594579022817769730568722664428384160*a^
2*e^(649/2*I*c) + 343885534831037511160604780068832483337725044310356694154
710636817139796906575718495540476376196871797347823669997997832 0*a^2*e^(647

/2*I*c) + 38493869074239649140786476777445579800692189541340363554834972032
5194770112671193329546554630610871555201909115643091568O*a^2*e^(645/2*I*c)
+ 4277118991923143907584646099317077382712626367847891663015318009218348769
198119126809909884318912386982880800672549848060*a^2*e^(643/2*I*c) + 471791
489840211675935138588841018808164406294317799148970637671212988777245247171
650976205015078518011963396061193730136O*a^2*e^(641/2*I*c) + 51671360047848
417431063667880187529545003790824296646069984909641361360960054563793348866
22386143712847938577797648414980*a^2*e^(639/2*I*c) + 5619769752253037605696
696087756007874489677081047508410730819825191049119012705663789664394519267
64124308798136217534540O*a^2*e^(637/2*I*c) + 607058174771615023970230634160
172208975667617455517280065076442753855272194641854557614434268691578810875
6356634786603780*a^2*e^(635/2*I*c) + 65142853790275937352387261370409802228
683254415713018654499510420418294216628187907119028281903296974877810475582
68403280*a^2*e^(633/2*I*c) + 6945720703138237818770883451264620784314167698
411346710544665328150803572609078033981580941828564416238148863045581355240
*a^2*e^(631/2*I*c) + 736003317033448987532863364682633427819793305957575663
3955078756076566886317380923147551118884485049797192685638405417480*a^2*e^(
629/2*I*c) + 77528421143754056310868309820238442440954810616563242172170940
82098098592347362371366056115586902822893825004393033879420*a^2*e^(627/2*I*
c) + 8120388962888200037519047088615628291758404026429768323184937793172741
348652963101033922655233990641205158758808681268860*a^2*e^(625/2*I*c) + 845
965585334398975541548958919239232827581691721354383480368962635586316703506
8688958052034223405284516133993569852906020*a^2*e^(623/2*I*c) + 87684467724
243516706500617180236764284797184607212128463328591041318479299031101539080
57541928127334342584801338549590460*a^2*e^(621/2*I*c) + 9045425408726938507
106759246096468178735211155493083720253628384236827578516908858696948660167
637572946357902815300931660*a^2*e^(619/2*I*c) + 929010650302159366185178110
970376520179958598497492385882478276544507097138240216564822957444896894692
7958434415014105060*a^2*e^(617/2*I*c) + 95028004299287924676676895683426191
876362514863279062475529698356987304751075142590034152157228920643894777778
96889496320*a^2*e^(615/2*I*c) + 9684513845272049894059630211867577805920257
658610389543083420310181521224732382469117018412979994535865598339536803197
080*a^2*e^(613/2*I*c) + 983681225712081330016788734343632112776761649862949
3286164965625770868167956416865940531356033153055126362470897559374080*a^2*
e^(611/2*I*c) + 99616530938130367253472944294584710837298119970125120273308
40564875772300453968349385868405453624240211806875301852978700*a^2*e^(609/2
*I*c) + 1006120003198815017122962983497645714730156321528253859746046862682
3813306618535185930674447792987425681310609393392740960*a^2*e^(607/2*I*c) +
10137630828571123640645947547344391084613029845660390823012151860006583466
309742307221108338379545239032581029125009556300*a^2*e^(605/2*I*c) + 101929
515398096567578770454801700478651479364119141535116491285953947928982427644
99975681645730818164415605760655136116640*a^2*e^(603/2*I*c) + 1022882973811
157962156348283494925404259647301175274555253980467287335356457278576530571
8467559125115045008231345532769180*a^2*e^(601/2*I*c) + 10246458154525926955
681721995657692250321163071754298198436472264795431060278155859430612231580

414866282905464989775179320*a^2*e^(599/2*I*c) + 10246458154525926955681721995657692250321163071754298198436472264795431060278155859430612231580414866282905464989775179320*a^2*e^(597/2*I*c) + 10228829738111579621563482834949254042596473011752745552539804672873353564572785765305718467559125115045008231345532769180*a^2*e^(595/2*I*c) + 10192951539809656757877045480170047865147936411914153511649128595394792898242764499975681645730818164415605760655136116640*a^2*e^(593/2*I*c) + 10137630828571123640645947547344391084613029845660390823012151860006583466309742307221108338379545239032581029125009556300*a^2*e^(591/2*I*c) + 10061200031988150171229629834976457147301563215282538597460468626823813306618535185930674447792987425681310609393392740960*a^2*e^(589/2*I*c) + 9961653093813036725347294429458471083729811997012512027330840564875772300453968349385868405453624240211806875301852978700*a^2*e^(587/2*I*c) + 9836812257120813300167887343436321127767616498629493286164965625770868167956416865940531356033153055126362470897559374080*a^2*e^(585/2*I*c) + 9684513845272049894059630211867577805920257658610389543083420310181521224732382469117018412979994535865598339536803197080*a^2*e^(583/2*I*c) + 9502800429928792467667689568342619187636251486327906247552969835698730475107514259003415215722892064389477777896889496320*a^2*e^(581/2*I*c) + 9290106503021593661851781109703765201799585984974923858824782765445070971382402165648229574448968946927958434415014105060*a^2*e^(579/2*I*c) + 9045425408726938507106759246096468178735211155493083720253628384236827578516908858696948660167637572946357902815300931660*a^2*e^(577/2*I*c) + 8768446772424351670650061718023676428479718460721212846332859104131847929903110153908057541928127334342584801338549590460*a^2*e^(575/2*I*c) + 8459655853343989755415489589192392328275816917213543834803689626355863167035068688958052034223405284516133993569852906020*a^2*e^(573/2*I*c) + 8120388962888200037519047088615628291758404026429768323184937793172741348652963101033922655233990641205158758808681268860*a^2*e^(571/2*I*c) + 7752842114375405631086830982023844244095481061656324217217094082098098592347362371366056115586902822893825004393033879420*a^2*e^(569/2*I*c) + 7360033170334489875328633646826334278197933059575756633955078756076566886317380923147551118884485049797192685638405417480*a^2*e^(567/2*I*c) + 6945720703138237818770883451264620784314167698411346710544665328150803572609078033981580941828564416238148863045581355240*a^2*e^(565/2*I*c) + 6514285379027593735238726137040980222868325441571301865449951042041829421662818790711902828190329697487781047558268403280*a^2*e^(563/2*I*c) + 6070581747716150239702306341601722089756676174555172800650764427538552721946418545576144342686915788108756356634786603780*a^2*e^(561/2*I*c) + 5619769752253037605696696087756007874489677081047508410730819825191049119012705663789664394519267641243087981362175345400*a^2*e^(559/2*I*c) + 5167136004784841743106366788018752954500379082429664606998490964136136096005456379334886622386143712847938577797648414980*a^2*e^(557/2*I*c) + 4717914898402116759351385888410188081644062943177991489706376712129887772452471716509762050150785180119633960611937301360*a^2*e^(555/2*I*c) + 4277118991923143907584646099317077382712626367847891663015318009218348769198119126809909884318912386982880800672549848060*a^2*e^(553/2*I*c) + 38493869074239649140786476777445579800692189541340363554

83497203251947701126711933295465546306108715552019091156430915680*a^2*e^(55
1/2*I*c) + 343885534831037511160604780068832483337725044310356694154710636
8171397969065757184955404763761968717973478236699979978320*a^2*e^(549/2*I*c)
 + 30490599289832175432198606681393355245385723125726465002197699496344330
42293748987411594579022817769730568722664428384160*a^2*e^(547/2*I*c) + 26828
67463632117725048547384345962564829703264595764102859869243159367909220302
10535629713279629924359911810829612861804 0*a^2*e^(545/2*I*c) + 2342440343884
98836098397798294706804034842683077521030340299222338297848848251816641603
05031412651504611356706987624488 00*a^2*e^(543/2*I*c) + 202923177843702692545
65473139618013708213266295411856155974513302288680809017208851093963195078
0122085296303595879212044 0*a^2*e^(541/2*I*c) + 17440090819408481040247316509
10188738594752400679825994150026932662018026684516387154897686876304034521
493457700236681760*a^2*e^(539/2*I*c) + 14869009631142800184520398419055545 81
70637182894575824603998732024864250611393677000838077579119389832654938136 0
036080600*a^2*e^(537/2*I*c) + 125746391659322081369447104054895295192194641
36685854696174345779032782835928469038200960091547368220984267186909648202 4
0*a^2*e^(535/2*I*c) + 10547623791122394639948136127041258768172551089968129
15362531048194962354831651403688598001758947919324152376469450410640*a^2*e^
(533/2*I*c) + 877457247270755096313629380516669067964866200348728829213372 6
2258978191776863958898444138835141238558199343022831546284 0*a^2*e^(531/2*I*
c) + 72389762559065411549118793423227424324484970043671904521887536450325 08
70697409035170697796134919768543980827553791633760*a^2*e^(529/2*I*c) + 5922
11215821551227208126691333692495230235149091848147026090802436512284425533 2
92666789613241641697205098222404749113176*a^2*e^(527/2*I*c) + 4803894968725
74443147849362191933505107488888376345668518149464490427468605951935628916 6
387507953570212249445931831339 20*a^2*e^(525/2*I*c) + 3863647013843811427894
50253613818798107438113119280794293801089474754917296504490680627824378657 9
042584922342280730748 40*a^2*e^(523/2*I*c) + 30807649507606390446089294347 86
86392760426341047895072202326485569400278859331784852876806071105563308692 4
08147567281760*a^2*e^(521/2*I*c) + 24352714244358175943674120063721720129 14
58026109007626771455553493901365462573971992672632802197815055663084346195 1
08560*a^2*e^(519/2*I*c) + 190824743344431599430841842948287875805589334938 6
65954299495353963973703044612402584139369333134538238828316723719229728*a^2
*e^(517/2*I*c) + 14821481020003709443684052332377239124351442222882405377 87
71758636259259343111776220252287320307540021595261911983440653*a^2*e^(515/2
*I*c) + 114101000832953568072013579854837501879424355321059022690198540574 1
8625246692886082094697842188405244269783744530429887 0*a^2*e^(513/2*I*c) + 8
70562175431544245301136654037181772190045455147845721623541585124855916472 7
884008992060781202408745718082124042499411 5*a^2*e^(511/2*I*c) + 65825531659
51888761240378997316547324878028071087093012924909023794790403024843180184 69
36138020096197489375724950799102 0*a^2*e^(509/2*I*c) + 4932250720303301584 87
18132442452234982355078689460811116049412091260094352433061500872862319813 1
216319302801172129035 23*a^2*e^(507/2*I*c) + 366204972613663715982167305002 2
63462808883352166600764360194234724826694014280294085663636171392910055068 6
9975456341654*a^2*e^(505/2*I*c) + 269403961217901287886061565729268177099 34

164005984611834587518712373543405785359800212612917255715610912957174910777
358*a^2*e^(503/2*I*c) + 196361744839718819705853295909943939009078646477106
749203407440732967933882813244021276520790059426783176315125744976 70*a^2*e^
(501/2*I*c) + 141793286695581541161041148634662703004329282552053642696261 0
039344708370518991917850652641054563541886575249955668669 5*a^2*e^(499/2*I*c
) + 101431595848015092216767521803238795078141897129968916770559334135572 82
408709556499065914430144489114916973805513194621*a^2*e^(497/2*I*c) + 718758
149804029568806414844622079642618080809668323332506995170407320827438598109
091227250922521029718876294837174034 9*a^2*e^(495/2*I*c) + 50449584211711076
387611751094673236503233222407477957464622341658119040966151572380873108952
981985416053806824290002 69*a^2*e^(493/2*I*c) + 3507286646706426192312180929
208868505101032960493254320222078718771984171244281062559573045526142805397
508833277116491*a^2*e^(491/2*I*c) + 241489136961084529426454857038242788205
710331820971141602432462345160194069843834050432772063950430016692787746317
1515*a^2*e^(489/2*I*c) + 164668543706058850179179608352371960706838074844 25
195114163610915376958258850674627232294981593442679045976112026638 00*a^2*e^
(487/2*I*c) + 111194850512634217145500457794122694896516956834684313495974 5
215920630475645218892480451066290591714849843147073830534*a^2*e^(485/2*I*c)
 + 743522657800607080438540387933205714505825130496084239140637610398839908
817375402184750869198424041784284431826566424*a^2*e^(483/2*I*c) + 492282044
972901772475638599526690187432070459399637637990089398249675964961459629101
488099939978916669693047617709543*a^2*e^(481/2*I*c) + 32271491033835007674 6
045321195011792421222997922965895264817760449140651671258010858297129703013
615387970090639051520*a^2*e^(479/2*I*c) + 209452012399444258194985474554170
289235130008417571062903247768871514989000136201999506880510930373995894675
234534215*a^2*e^(477/2*I*c) + 134581685858500051457166986181305771256444280
050023257223423071309453554352326832757059740492381058720694830011514768*a^
2*e^(475/2*I*c) + 856049706868589537816648808579075548666980817498944727472
666876482138968071163631718419840545234746103088901944735 31*a^2*e^(473/2*I*
c) + 539013292978122423310490128642052592209559941229579663047156399137331 3
8144204227613778706330881783335399502133877518*a^2*e^(471/2*I*c) + 33594139
942451045143244835519359105833019897272191751488660997404419221158528763712
626223376997991884625406487226670*a^2*e^(469/2*I*c) + 20723705462100228543 5
643791295971722628195336309264899191403084826260954525184805445298051881827
478174762920395291 55*a^2*e^(467/2*I*c) + 126528273076316569801742905890183 0
868115362516610795212492857994684773761996019984709117360987656290311993304
8840128*a^2*e^(465/2*I*c) + 764540773353122782997020105576329072210008234 22
073430608178188607874849753342789864760925544283841899957963320243 99*a^2*e^
(463/2*I*c) + 457175964143471174640374586038614176140438528969816086530428 1
801217335925022420235958603301627684925619501359505584*a^2*e^(461/2*I*c) +
270528293784340973143130590873590061901000509856894571935614644335417071507
933080519788074052670483209213134022017 5*a^2*e^(459/2*I*c) + 15840379404423
307489944270504437745228615615603405071870070645985213188214915657332420028
631867109019191027385770 00*a^2*e^(457/2*I*c) + 9177389482779598947604358504
000410995852676993866114864877745415051485702548693544710003275596444269205

74492105446*a^2*e^(455/2*I*c) + 52607860805714631324047570892285000882582687083323986398037568444399631721644279653106815562488320133408728095 9304*a^2*e^(453/2*I*c) + 29835771880478208633005298550674856542891830140048933893449583726454137919706810817541623106744619712895900856039 9*a^2*e^(451/2*I*c) + 16740035531925763745740108220243908100673147094135487153782474153849559253552680203906020031151288870130715919897 1*a^2*e^(449/2*I*c) + 92914879094771743877995357153021794021690345202150095397036683845878457081542518901939941587099661172792407623865*a^2*e^(447/2*I*c) + 51015398900548660814226156973108464905185649790227900816720275773203452456105017415976545022659656750774297629125*a^2*e^(445/2*I*c) + 27706505969452723903631310117930464578138489499047970896329350811820143485220527437209835414411792502873777351913*a^2*e^(443/2*I*c) + 14883462514111264299851012777045760513982392600143057294316507822087646214576864011182721754822647875076768550199*a^2*e^(441/2*I*c) + 79076087608708714873833660689307825065630638433716509724353457270188231791939002127539354084027375839084892131 98*a^2*e^(439/2*I*c) + 41551098601132740317050358955613728233564815383654625747927255701088429590152931852262128472802625243031140188 70*a^2*e^(437/2*I*c) + 21592009240570754671801914154376277907206092828356754185774565039273607727871680027722699541548399897409305473 70*a^2*e^(435/2*I*c) + 11095676030445535703079393328465475622364795469356585529958421319714284106654801491108383236639775698842460963 75*a^2*e^(433/2*I*c) + 56382127901621204478348465744056778170231621891135420234652116549235863134150471201805199356547135139812668728 8*a^2*e^(431/2*I*c) + 28329101961336997036639304743087996810506918354281673657670517009659134874129651255552716935460589395764600130 3*a^2*e^(429/2*I*c) + 14073570567492355467628694583381812377238846295073495251790642704875900340966924092921162608697568971020488025 0*a^2*e^(427/2*I*c) + 69124535041821820146960864565285808580148409246318275389711923925453814611543634853224844727360427634946672345*a^2*e^(425/2*I*c) + 33565465565407775557094072993762633397853886595211631908837429624044246382645793193352761173849967036968399760*a^2*e^(423/2*I*c) + 16112447006542109020247003405135054882378494352850880906244115186916105715007393020759644056880735953339819080*a^2*e^(421/2*I*c) + 76456479938523416682722570032736448385714962518434378878039919558156336484987105287392289205509098320769665 76*a^2*e^(419/2*I*c) + 35861329804068532730096144261366204441680403232506381394263507078978727346405249974361785322316656914248371 80*a^2*e^(417/2*I*c) + 16625426837867801308552201362307056147636014379221691797592928479008882876503920061300851935190069570180655 20*a^2*e^(415/2*I*c) + 76177770624508294623879645328180359115118734979167117124078273487340941805400730558031780615278453092722422 0*a^2*e^(413/2*I*c) + 34495872849004463043768582576690085274232021127919548089000880129527426400167702554461005044079633375656952 0*a^2*e^(411/2*I*c) + 15437020316392925587372388710440654412454716753928968254250062867834286708792444472577109690360265163385230 0*a^2*e^(409/2*I*c) + 68263874088725260872013894230299383832735827382917445048245985410697294309343463862494092634762173773152680*a^2*e^(407/2*I*c) + 29827906652763196633827644896320558222404646628239178000881364175908420607787912931438903408724374419711720*a^2*e^(405/2*I*c) + 128775090843944186025608057349015262254537834986

63360455751206349831628844095133516016644770470613766067100*a^2*e^(403/2*I*c) + 5492760050465319450027599642945150841777187786665642466832175421191164012050504122961907062600278172507920*a^2*e^(401/2*I*c) + 2314573830445783175085160387552107047974992580875177277771045535577437479474533600582272734498753096299180*a^2*e^(399/2*I*c) + 963484212063886749916012864683917550886455801986647603288694164187342312853923851439607672602293500951760*a^2*e^(397/2*I*c) + 396170681325175584319772698901328368292902791228588983327071374204831719299590027443288379284314668153740*a^2*e^(395/2*I*c) + 160899512528459955231363417634756812261054389433051747087460367582934253478755412977343565524272784358480*a^2*e^(393/2*I*c) + 64540415640760762195239320862025490560421095633722168485415684713060283455815144499151145622373940380680*a^2*e^(391/2*I*c) + 25567180322507257120585619430570092050160262000190487155354567871662013819706851741289684023496304469040*a^2*e^(389/2*I*c) + 10001768444498406834296440289740030884181727971849991809295355664524098701686842920997524890661536393450*a^2*e^(387/2*I*c) + 3863508591698405553503397846061870223616541602204136317815879370280975938284468645658557553183035097040*a^2*e^(385/2*I*c) + 1473552845494328057858506710582285326743293415958953146936295488654657940849117040291880353596346648790*a^2*e^(383/2*I*c) + 554875148302949454647011448410809413569126267931881001261866343075854476854621963920232931497286644220*a^2*e^(381/2*I*c) + 206270381908349517479190349156917581993980630701580687347742161171231054542461656321881524716493128790*a^2*e^(379/2*I*c) + 75693072940552179850368802526700330728148475697452926304750162140888218008516416199886036847773583360*a^2*e^(377/2*I*c) + 27416876740896400729871465202273700400495947943473586697736265818353556528977423041810958346380289980*a^2*e^(375/2*I*c) + 9801365320489577537203084677507942083871249525297286835383796389305151429890843624056590011755946860*a^2*e^(373/2*I*c) + 3458002805034386735127439800827156438262531507670150764478260073427732879462041781511412159357756530*a^2*e^(371/2*I*c) + 1203917971578157296645777076870863707439458436180383807304624684176423851533695303170101891807261930*a^2*e^(369/2*I*c) + 413583357170761058619768375014947448147331264219567666058810994571662705401249971101083839065381230*a^2*e^(367/2*I*c) + 140179587273335544121400653964948704821999753320769202315809343517939464222716874991309588425294410*a^2*e^(365/2*I*c) + 46872936251359045427572949638891011901567295748605743880702066108160790194634165956243747535959690*a^2*e^(363/2*I*c) + 15460886627425884508961370810425256795141491888489128568437523537118033479548555089427027219657190*a^2*e^(361/2*I*c) + 5030136214247279164927090722446530400325137983492052152503397264612305176456664098413388397453600*a^2*e^(359/2*I*c) + 1614044517509692628698926726691711554483556138938275927980725902246471451300167215224536975484180*a^2*e^(357/2*I*c) + 510737784659981341603409036748425394245417295710562102911997748771877725069645731797650605229600*a^2*e^(355/2*I*c) + 159361151043732217078520212627974369008393404524099003327574913357421657095829547985344818982170*a^2*e^(353/2*I*c) + 49025623690554711637107230547509950413451011300896003065528235733053871440713527384417816408240*a^2*e^(351/2*I*c) + 14868703654845358167864688325631664019537745751307912266757843993755842178445925592260911134010*a^2*e^(349/2*I*c) + 4445128

945671803470844987129798612526762534255203137640283134291837953210919997978
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0298416328496442284373072612082291023793255684692690*a^2*e^(345/2*I*c) + 38
035810122714032867766876188439369642692295177061568503708914792419805212779
6984692389457220*a^2*e^(343/2*I*c) + 108839767740916312070151008147907941 94
50467708773817754845871305390322952305133745811187417 00*a^2*e^(341/2*I*c) +
3068594535254309248270284586950157706296553997022268948026443863345352438 5
996537638863076530*a^2*e^(339/2*I*c) + 852303020055569802343412595472686844
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233182212690083759700450246219839748546266404723498586567310536839046972 92
22650473360964890*a^2*e^(335/2*I*c) + 628328100579763802928364710937183424 2
675389550879682506118582207716289401843176485888066 40*a^2*e^(333/2*I*c) + 1
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279704980*a^2*e^(327/2*I*c) + 2836936413066169670834440433496289616013064 80
98777960497137910992981839678130671314436 80*a^2*e^(325/2*I*c) + 70692989281
728702121732377338408399187679377644954288051633239489812553560309127538991
0*a^2*e^(323/2*I*c) + 1733468327028598352541440603456396673070609523391661 7
820274711420113272270008126798113 0*a^2*e^(321/2*I*c) + 4182146960780866966 3
059275865760423204340673174042012732286388150270004607442363966810*a^2*e^(3
19/2*I*c) + 992557145617500786804495451266212215794531638526173387762570679
12985707359802482181 90*a^2*e^(317/2*I*c) + 231692301016689924835638296514 38
816385881286910311693427157461145962266963436857077 70*a^2*e^(315/2*I*c) + 5
318539862434390248446482084436818935232811211623537900519634906190870204476
78477490*a^2*e^(313/2*I*c) + 120038523007607893469991001059542885059361383 9
5381719709713001914847628610134252974 0*a^2*e^(311/2*I*c) + 2663278925925429
409999563585453790517239964770438993417533607361049462210219710070 0*a^2*e^(
309/2*I*c) + 580762315088828265703572656347205606649009854304265909226493 11
3882725279677779544 0*a^2*e^(307/2*I*c) + 124446145774508700568340258135130 2
34074887149326885352605150224346174406674308743 0*a^2*e^(305/2*I*c) + 261986
308398648944304761586627798288732821401867463656807224493760103478519469580
*a^2*e^(303/2*I*c) + 541751364201588707597760818787621835662345585351607454
15613400901305789214741190*a^2*e^(301/2*I*c) + 1100152808944845644054007798
14101343406253431831926469126589294600205650201785 60*a^2*e^(299/2*I*c) + 21
935216361583272147907315638045659778101602433822546371929909840313281201327
30*a^2*e^(297/2*I*c) + 4293069954556569155290233193837403317873898762585280
4456886661778266825809112 0*a^2*e^(295/2*I*c) + 824572984669318317938429994 4
105754752673624762543064380379965140472903719620 0*a^2*e^(293/2*I*c) + 15538
886002375098392622333633585177705003942764341957167792672946490584680720*a^
2*e^(291/2*I*c) + 287230973084586674385708908979383418576886045305185915251
288671843289938758 0*a^2*e^(289/2*I*c) + 520655524915217138558646525646730 97
914327228650359951114286623490075303080 0*a^2*e^(287/2*I*c) + 92525360044122
253908996183618781138419676699932234625070173572656790224220*a^2*e^(285/2*I

*c) + 161154077810516359724313605627535035611256571248431019423408337504313 79920*a^2*e^(283/2*I*c) + 275021590392369377658766031136099593837339950767 7533387719423983407767820*a^2*e^(281/2*I*c) + 4597348465050278079350339900 26603184232710156581030401969227246064835080*a^2*e^(279/2*I*c) + 752538169286 099730593712252395949683696512775423904575181086157915795 92*a^2*e^(277/2*I*c) + 120584182830432223274698417678024954828688124968732970801291877852762 20*a^2*e^(275/2*I*c) + 189080916133544804719079218768535450585688572492012494 3223790804192240*a^2*e^(273/2*I*c) + 290034549601309190904110736552970267303 38666667620331756328437406990 0*a^2*e^(271/2*I*c) + 435050400788467717393754348923673761348203576406996168332556527026 40*a^2*e^(269/2*I*c) + 63790197 27064571615370481590067391178568680035621127772546622549676*a^2*e^(267/2*I*c) + 913950798194359635416152561783528812272662756335205591879244483056*a^2 *e^(265/2*I*c) + 127899535070952526512296560088751849450455540802802089156643701480*a^2*e^(263/2*I*c) + 174746116694074123983373202591174101869336927263539682730483175 20*a^2*e^(261/2*I*c) + 232994424970984594727442244110325566001439869562834634818306001 5*a^2*e^(259/2*I*c) + 303026981162716753579274739716869070965523974594833587483988366*a^2*e^(257/2*I*c) + 3842412093130309269141789305668902719775998715477345064287555 3*a^2*e^(255/2*I*c) + 47478027 381094614767945239820058713839348868588872498994453 76*a^2*e^(253/2*I*c) + 5 71368259247596228017164322598798862518145621079229319098305*a^2*e^(251/2*I*c) + 66931654744382785787972355191037205019780646018305304849150*a^2*e^(249/2*I*c) + 76275335643562645052687591826777774958796406913709427338 82*a^2*e^(247/2*I*c) + 845095533347055389178362524561818615233275064627309969058*a^2 *e^(245/2*I*c) + 909734096440212016199687157101122622222362174103797537 53*a ^2*e^(243/2*I*c) + 950851603301606688521021204740659909007910365892951228 7*a^2*e^(241/2*I*c) + 96424352112466152755850179966349713669902593131763343 5*a^2*e^(239/2*I*c) + 947991929742060123924271862087783487293090303363769 75*a ^2*e^(237/2*I*c) + 902849221019959645675877183083783865163922208943445 3*a^2 *e^(235/2*I*c) + 8322351345282040114108971792739919601858262066482 33*a^2*e^(233/2*I*c) + 741825056080583067190638272960030709504869211765 36*a^2*e^(231/2*I*c) + 638793703739546216359759572018839718800039824697 0*a^2*e^(229/2*I*c) + 53085342918203927033384163465738274040919015852 0*a^2*e^(227/2*I*c) + 4 252692799468040081808204121518060738595837688 1*a^2*e^(225/2*I*c) + 32803137 45439136244630079680217767499715269552*a^2*e^(223/2*I*c) + 2433199602263979 654494566179788317975735608 81*a^2*e^(221/2*I*c) + 17332379859324708093828663441537720252285600*a^2*e^(219/2*I*c) + 118390568149615424479048170484151197581260 5*a^2*e^(217/2*I*c) + 774216225807295300398776567190127292057 46*a^2*e^(215/2*I*c) + 483885129767349378573782560770289431745 8*a^2*e^(213/2*I*c) + 28849519418237790765706571522396035325 3*a^2*e^(211/2*I*c) + 1637405134370147041079523205207785960 0*a^2*e^(209/2*I*c) + 88269817699388217075463894163 0587545*a^2*e^(207/2*I*c) + 45084046354894731113654936481368992*a^2*e^(205/2*I*c) + 2175637614774834148860646181993913*a^2*e^(203/2*I*c) + 98892618509 149499977848839281608*a^2*e^(201/2*I*c) + 4219418379811180891791273779482*a ^2*e^(199/2*I*c) + 168327860637922441541183977320*a^2*e^(197/2*I*c) + 62509 019804888135428348118 85*a^2*e^(195/2*I*c) + 2149781103140646064389701 81*a^2 *e^(193/2*I*c) + 680669478338424015739572З*a^2*e^(191/2*I*c) + 197035901588850519564291*a^2*e^(189/2*I*c) + 5171545973004091569115*a^2*e^(187/2*I*c) + 121842706165559066025*a^2*e^(185/2*I*c) + 2545017361124393610*a^2*e^(183/2*I*c) + 46393545645312066*a^2*e^(181/2*I*c) + 723016295770626*a^2*e^(179/2*I*c) + 9365496059205*a^2*e^(177/2*I*c) + 96800992860*a^2*e^(175/2*I*c) + 748461285*a^2*e^(173/2*I*c) + 3848130*a^2*e^(171/2*I*c) + 9867*a^2*e^(169/2*I*c))/(e^(517*I*c) + 418*e^(516*I*c) + 87153*e^(515*I*c) + 12085216*e^(514*I*c) + 1253841160*e^(513*I*c) + 103818048048*e^(512*I*c) + 7146142307307*e^(511*I*c) + 420601518659718*e^(510*I*c) + 21608403021340047*e^(509*I*c) + 984382804329835768*e^(508*I*c) + 40261256699368950388*e^(507*I*c) + 1493326612293984160368*e^(506*I*c) + 50648660944512569972179*e^(505*I*c) + 1581796642397812408161814*e^(504*I*c) + 45759117183402579073139583*e^(503*I*c) + 1232445557346832245176696904*e^(502*I*c) + 31042222522074681615625020522*e^(501*I*c) + 734057263616388449968842366924*e^(500*I*c) + 16353164647151530240529137618111*e^(499*I*c) + 344277152012875134140739302960914*e^(498*I*c) + 6868329225263681349501997341320517*e^(497*I*c) + 130171193079172823835151430773360024*e^(496*I*c) + 2348998374244347079532766203075607598*e^(495*I*c) + 40443624781415311581857832389099634564*e^(494*I*c) + 665634670676210063754191847109971141414*e^(493*I*c) + 10490402669510897424624643766470754045064*e^(492*I*c) + 158566476113257562566117432227203884298856*e^(491*I*c) + 2302150411226234925855222345201500900533576*e^(490*I*c) + 32147887693375338817454482515377350383950278*e^(489*I*c) + 43233368864426155754794417925080044060 4964868*e^(488*I*c) + 5605927253067558551780452883689835514455118670*e^(487*I*c) + 70164515322544462906873548813748091084561870680*e^(486*I*c) + 848552202276512356496200136959676295361696315113*e^(485*I*c) + 9925490738534402272939987038714580495445431374618*e^(484*I*c) + 112391604542246650966429162063124338952554575234051*e^(483*I*c) + 1233096700139723365181997220750932590655287625342156*e^(482*I*c) + 13118781801172174729679339894318153694964675368481194*e^(481*I*c) + 135442594916636116191574650625331646238501101627937224*e^(480*I*c) + 1357990663161479842850642848032544982878359839580349899*e^(479*I*c) + 13231708870104896973800056733779919089340836756009580718*e^(478*I*c) + 125370496586921272662198050851269323171167338854081782959*e^(477*I*c) + 1155855412893594260345544966642687823630035899363232371472*e^(476*I*c) + 10375184499871175501909398956596684116802997082526660323524*e^(475*I*c) + 90722605722208814918642284639487187764607589706493970774776*e^(474*I*c) + 773204636991145775061462731028098506094432675788136295011259*e^(473*I*c) + 6426195485535248576425068136870465530087114003875716691383902*e^(472*I*c) + 52108117629177048660492400985175830987505700566877818954141639*e^(471*I*c) + 412430698299915190848067222327219435067747934091894670488982928*e^(470*I*c) + 3187749929744346497211536044751776582320958627923816470590659024*e^(469*I*c) + 24070801913529757101858022914372045864746991786182039740274325264*e^(468*I*c) + 17764282913511934857719443767580283023990546009268713649496 1404333*e^(467*I*c) + 1281817464914970810859604189828359000790789921169405304612211251818*e^(466*I*c) + 9046693523825682979044338963104263167672586826367911338826483549173*e^(465*I*c) + 6247355078105329531771077469024711412 4

1251875657318484417819040326 72*e^(464*I*c) + 4222761266320036875477547465557099887105271330866601613663536567872 88*e^(463*I*c) + 27947091044756866118427906949736991644822547239772102097256613044034 72*e^(462*I*c) + 1811576849561575807671030305550562558925429365919331415341833394459640 8*e^(461*I*c) + 115051481852080848873700388354521315567640365124003103691176697194292320*e^(460*I*c) + 7160994975990580798956333385529402291928581964815978300788197118626000 96*e^(459*I*c) + 436944248291011391456535313606959586626693388580534193812141312419250470 08*e^(458*I*c) + 2614397627990202144347194566508025456305681018352040188980028549314486 7448*e^(457*I*c) + 1534360887450562541273272394615770719331301577645959971139735131831883993 76*e^(456*I*c) + 8835009688217912026007745419277692007376893935137347893683970933333119618 80*e^(455*I*c) + 4992519712457043983505377976607953988397368297591114957991804893688371867680*e^(454*I*c) + 2769311653834325922598338263764793612266403385961513348984666469436147102831 0*e^(453*I*c) + 1508223814314124137735664742100117468522974375970591862952439894811403981527 80*e^(452*I*c) + 80667954360758914075930501079618956826984202161338895521891627882318263948819 0*e^(451*I*c) + 4238125846763232586394188569858685826755328005548627437019301405851325887594480*e^(450*I*c) + 218764828927139099280403456125787058051215087562266963170876518242522414186633 20*e^(449*I*c) + 110969199687320974749922259595250444341219218535349655762591192576535872151766080*e^(448*I*c) + 55326912881952861250291886955894782909802195630934984358404463151229177880008149 0*e^(447*I*c) + 2711843239670717527605640490148833507130242448403978318523237721944200392830108580*e^(446*I*c) + 1306981720348828988619320550837581839212499138234016031688650718129654898101481841 0*e^(445*I*c) + 6194859665303550287956433881523431066041090203788247316180477449291621657588007768 0*e^(444*I*c) + 2888207552647306544699685720210471094273186195089958020206899045903194762954 08324280*e^(443*I*c) + 132475641236783747315747282116248369112096650194895392649224164378826428454643722112 0*e^(442*I*c) + 5978992172944143218459161149299819706321732111578494525245228742976468409105395536290*e^(441*I*c) + 265568063890434075344967023691015457959948617577414147899446527121275669101852741231 40*e^(440*I*c) + 116104551683555043762911501712116399313733021132677481112824047246361794049635726479850*e^(439*I*c) + 4997075672538590843575963148137947680693371909159674919074889049339226775796653543389 60*e^(438*I*c) + 2117589733466855707101501429210414722401838837940752841618541440888545729943138209036820*e^(437*I*c) + 8836720640860470305694514021547969551296794092266983044118375790025854584036796364768280*e^(436*I*c) + 36318369652302591732197444409798122022640824604130552506742586795183267354382847875885730*e^(435*I*c) + 147030816732276833163041582099592047512043725225353339238819165193000407629544745753221740*e^(434*I*c) + 586403466972683242741643328921560909375197453864243299571990964608857245771134145204174990*e^(433*I*c) + 2304351073373840357379178597673066352016682781689139842097376663118488803841131935313641840*e^(432*I*c) + 8923209447343296763331881881638471793499618670601026059730895962653291770229493028162575100*e^(431*I*c) + 34054053851295569154352346722177172655187548910782008504718324168725029438589162349211628040*e^(430*I*c) + 1280989146016885396724805418304098477073675004386015368032

0449770111991128908710565948278334O*e^(429*I*c) + 4750105788576015192723166
179384252224217865972416710268943185154085114671409693931157687936 80*e^(428
*I*c) + 1736574218818191071874197472450158123883564209950658639102337148122
769080611680719741726053840*e^(427*I*c) + 625987215682225284365096070823503
47102013627760571766472263230897514465652888501038981538599 20*e^(426*I*c) +
 22251959176795777757167366036007480222211364232146399803864370963391491223
6872458234573515801 40*e^(425*I*c) + 780098073680242398756137330588514171253
27114681070889640794249282633470580756557083923203377160*e^(424*I*c) + 2697
4580144021129697268360186387895435796230852007659517712822762927324021520 97
0821849736341414 0*e^(423*I*c) + 920089393029589032874601850027159322612526 3
68444771489781974361078847528891468831038436064951920*e^(422*I*c) + 3096131
9716215201623803015542414654517823620868102875377489029049859340201795657 06
177131421614590*e^(421*I*c) + 1027936473066384084473957786246926260464886 19
142979725891652435306512306907262444624791998942551 80*e^(420*I*c) + 3367539
8872021568375902384593982753362559801058104184627345411136262431943240778 26
0721756991027090*e^(419*I*c) + 1088679957318294728267329051920348867972846 2
1356445627530909104429486741257822633476898356826454040*e^(418*I*c) + 34735
147321471378087435208312956660123876576277594236676273334995210388975398263
64038575568677773 00*e^(417*I*c) + 109385321448622035867403243450086667849 97
700113058741724889759516120314567346082870955195010419754 40*e^(416*I*c) + 3
400232560601651617521694680847089844198028831694417424794868779328950548418
125605446882081152636090*e^(415*I*c) + 104341175165703959666536931555824021
0946034809547302780741232142734681692856719777037649617025180394 0*e^(414*I*
c) + 3161093933128469275069430644361841465609596952094521574300404456038689
5241801579156543451940713351730*e^(413*I*c) + 945561802589319869193343034 66
365652826858091314329189160736277175873841732196453379953705679466826880*e^
(412*I*c) + 279285755800035206679835368898165477644864987794665387827488933
86363374504737310904926517268170258572 0*e^(411*I*c) + 814608187736530579670
2100252719214155971833698812142998232919697855498761759698663679766532449 74
728560*e^(410*I*c) + 234651821923910514223814163307346476889915570893502577
80476374126817815757654222191274092601594387122 50*e^(409*I*c) + 66758662903
711473585037668656692890108935438698305387087249452915809511791882966061581
112577069686047 40*e^(408*I*c) + 187599882188655635641636357359860732782557 3
7257405706279108891366378428467414559930481172863538598193890*e^(407*I*c) +
 520751785187932703864292633515443069511049935425005829381552416894081386 75
2546080308479071677485717347 20*e^(406*I*c) + 1428017924502217624831808749 18
825274134305133275417780084795034644763509333503150517345864659667189417080
*e^(405*I*c) + 386876218234277165632451723049979889263115282374607541692443
17667399751374281359173617116965225061118648 0*e^(404*I*c) + 103556198259200
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0508482570291193890365616200426273618265770040630191407006238 0*e^(402*I*c)
+ 715812468684294147547380736367983971817274558153840904450333838526935969 21
6224266967404539447181430252483 90*e^(401*I*c) + 1848740529900573269375272 86
118764908908583570219748823715706238001862451377226609436417529768529244398

70880*e^(400*I*c) + 471882208434662076950995069535737803571088974914225678980481990182077089970053338601488364795274561560145 20*e^(399*I*c) + 11904185540387796494822957794837046560060662318304552952690043020927047321277384779493558607471432947993928 0*e^(398*I*c) + 2968255152826695896853182732802390500845550322034159415119626595968816157137999376800264974083056722976188 40*e^(397*I*c) + 731584972206818362874729621403974444280010446301161527339760544815300951787985538419764656214582667219914080*e^(396*I*c) + 17824461149317518505563548566384219011744123222982494965916580539397871982465659459755955757341933488879521 60*e^(395*I*c) + 4293206478008022126017488908851826494790620720660151451468181910917240027863968724539127659633517053002976480*e^(394*I*c) + 10223182025954860767217390305186451923562145473674293619918063490411487496121804590274592702770571515456414680*e^(393*I*c) + 2406878513970527716119346564450614328524136103776821681892218440014104846021094469664775272337193287459459732 8*e^(392*I*c) + 5602868342490351765849501385853451616716259103436797249817466090745066677815435327163034465077788568354762418 4*e^(391*I*c) + 128967080084754712246023680866488384983286259025533132044636109049545144029547003347761521666283977931640178464*e^(390*I*c) + 293550743554342709808129453576562313299705982699187416862934373964255615967138676253276302591561523515603264403*e^(389*I*c) + 660764473105869097691475973850837934511089033149586707982764263394766756649565279879146173318386505740391093990*e^(388*I*c) + 1470931146618934345515038362300100160482127749581443929904746910224777470198899052379114493999887003199419829579*e^(387*I*c) + 32384919313618514764233219335395790983777355392076414673462356658238870483269493056092315851437486902036159571 36*e^(386*I*c) + 705213241416219799260232652458014306098535305457293390552463312168102103734029836634220332432530707241373906102 4*e^(385*I*c) + 15189634214908800396417911722643754748048520109734812459109878810493844381062650818971199637121458749456243274416*e^(384*I*c) + 3236273132241954941033008894364024746037832856131642293129242714590288791307164367950290905589123675514320738260 9*e^(383*I*c) + 68208033096793615683784096192442108186149916400415534244055278768932724966083242310981485024664539671577280789 94*e^(382*I*c) + 1422131159648145176823866672767699094822716813187908898405010394417486355453624676798324491035203219530117800830 69*e^(381*I*c) + 293344920034300720287042383448342866313806285455040067823080445597545970023446231563554135133105493516316320059272*e^(380*I*c) + 59865014111224185891167650518052015036400322684132808145359709358779033860921243908555446686158262335030306196105 2*e^(379*I*c) + 120877035849365839308944222205693506328370410814059375022653984611773764821660955973483160124869827433029615861 2144*e^(378*I*c) + 2414966516810338503289076549202740511710059011795447138773464205696455026442712426409599662771080264826008985061097*e^(377*I*c) + 4774141111066098970221845330594962016472714230374234060663956846950926642685946929064114194400360936223590725470146*e^(376*I*c) + 9339341958053494225251750965715057300707302083814774770306218224241022648247419956042957363055823830898547303219757*e^(375*I*c) + 18079820068028859970349938623007230676563314206708848499900139641237334763266479346963237936039328113185041591793848*e^(374*I*c) + 34637657172671690167657344537197087048882354853993270472063 9

43078773600446542963548348101269390443464480754513928502*e^(373*I*c) + 6567
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4*e^(370*I*c) + 42084634260894938727755902145792458657812096614856102264700
8499529468452005980175119410628956210497609566002969884927*e^(369*I*c) + 76
586779551396278101255844462875141871094089528130479083674366158207165003215
4891482866406314834433199455459798934952*e^(368*I*c) + 13796765297962120740
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11931941947738690360722*e^(367*I*c) + 2460442375845422663927081630983260714
734968091905493027145639238827192254886349361126991457692409851120873307487
457468*e^(366*I*c) + 434390969660193217335735968778157929370129568194082711
4215433175336093967845908766740738240037114570667410936998017178*e^(365*I*c
) + 7592752700146678961153095073585015473197029746533633315497939614732857
60935801904155116764831560875947581048693527224*e^(364*I*c) + 1313977149410
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502872430421930210673264392997286485600640103867253604847715547060592967690
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67903625029322346250133286489120875005013638128113893960349670280707161530*
e^(361*I*c) + 6417510069326006680623806488600459717074084330008683936861613
9164529108049844675353111842725798658088840347241496099644*e^(360*I*c) + 10
676483201716559483808523418933352873358767332997253009266108518678993925291
5937090760282232346919090426243399409323314*e^(359*I*c) + 17589625826275598
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4141375995770091499246759528*e^(358*I*c) + 28699294363123149655727801085157
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8815728782643*e^(357*I*c) + 46375828845736715454493767825500568873332814556
8049310423995599886012800638619904022368378591108842602342094543682299102*e
^(356*I*c) + 74222864090817312491693704946252561733414891967911827048983100
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766007209757869651898750508902310922046126969702774330145358957889567712307
93520381993106606880564628599822341722801012*e^(354*I*c) + 1847505856462451
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291227727196797739472015979107027492771427686953146718268898104106138170388
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61*e^(351*I*c) + 6758480437888524372562935948963857626694855547195519486122
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 + 102204237794346348513399752951633996417021222496636661930530083020260969
32158568338309418237395541351819026907953220681013*e^(349*I*c) + 1531283720
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658215902851353277968215445199620859 2*e^(348*I*c) + 2273160356612884110041 9
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625919565639521227223276*e^(347*I*c) + 334358978279365813011711754596108294
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42390717832*e^(346*I*c) + 487332535059749234008522555630521014021964693136 5
955449272567475433937528301040716774436695582892283748870585853243965448 9*e
^(345*I*c) + 703863497605948315670482240613950256985012022969663003767642 20
3366977029615910998540554113762948714374681495285247960027 62*e^(344*I*c) +
100744961851853744611754300982980166962404553836222921868484694269966120607
698907046343731011160948828100276729370132819357*e^(343*I*c) + 142906319123
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917419039834587967055588431566416784*e^(342*I*c) + 200906587153578804380300
469501441610174521851259541929209840688960859454908519774835905895757666770
857888611738751858460424*e^(341*I*c) + 279945244475039804822966730462960884
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774070107264*e^(340*I*c) + 386642673050380049457382562818316962651975550990
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*e^(339*I*c) + 529329252764113926003934836958243557672549238997560739214406
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 + 718361596382058249209113544487901088868388744033713210332491971375906738
341551540457264804304039664255915607349801911966551*e^(337*I*c) + 966458275
369037718747739130798151643483590684166832234688098291164160636418159452119
815728809372125168836239364442397344064*e^(336*I*c) + 1289043515292933956 48
063433049967704018104393562010691426731106790003005839883978769237695409054
527855454499771005875477240 0*e^(335*I*c) + 170458299670782280820467821816 76
930026986611477127723550214565438109300696371880858828247575006052469632108
10351706405349408*e^(334*I*c) + 223489127639843946447862257830643484072461 0
484468177859822620658691921478645266653062563823553001228001009093606751066
168944*e^(333*I*c) + 290538572232005700195334527448948279085669252995982374
953269596341416483336677312821860789932858860891617659377208862258246 4*e^(3
32*I*c) + 374525759487665120465733498842622638814395450198683066422234922 63
610796095468222760675048993867030889823081857171434072113 28*e^(331*I*c) + 4
787527442780945685145204846971596165304169419328244073211459592129649255048
876854059844720661078151288179612574986359194560*e^(330*I*c) + 606894980315
671224833187110532989547172280614300887801498655965368726069481655047019589
000451196552756743272296970757720216 0*e^(329*I*c) + 762973181562782158046 89
924242070008366438896736333024661863838105110445148946962328297631547032543 4
198118210158378630136827 20*e^(328*I*c) + 951303227401952295420911319126822 6
642299912013525665940298381064797885690904993128948035227412144035633851779
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605578119837244558265660556176580864793686418649081196434124136448037721316
57280*e^(326*I*c) + 144298162852084312045329783753756919650631542246497475 5
129585150738952408322697678968860136962839990074765857920192930074426 0*e^(3
25*I*c) + 175562732712242923968872914031257162134914862611454785713767516 90
105656067838042151038271381300372757755676325408026834544840*e^(324*I*c) +

2118832140588288753961019837470686269589404922607709376413251251333619052397894969438768605912452675504804295795426470663746O*e^(323*I*c) + 2536717643
911935362153226033598334815490498260612576171130068349296339081649158302570
526873753998214963930022651265742611888O*e^(322*I*c) + 30128482414552703264
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170764969700180348699207838960*e^(321*I*c) + 355001031060196498762723767969
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66585005678181937920*e^(320*I*c) + 4149983212196370804378852378740134554178
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2788559660*e^(319*I*c) + 48133117678184029216503748549110374478924719094635
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*e^(318*I*c) + 553909130449720862194326891463315660814279598969699002144342
96817731150863867056620768608187679709720152974148474907904177340*e^(317*I*
c) + 6324777410101217905179494607517556992407698133813848315804240674745387
4729387631710544995247152912205118500597511052824347680*e^(316*I*c) + 71660
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131812190659629511140639501743303863582092880*e^(315*I*c) + 805662491306826
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9538953561056667668891020*e^(313*I*c) + 99512206472057965951340341738023548
515336403371717898040850470954657532977279113491506880290726111154101941386
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169660*e^(311*I*c) + 119209713702033927055755397823688444444647424324502185
328626347046599634721146573830681540495333543146776810911910410468628960*e^
(310*I*c) + 128995076011591903410763863427097329948586173574595862705849159
280943046458742663163454018491463855395649453952212899632198680*e^(309*I*c)
 + 138529794549151089451352769576543403126330747243680030832467205895819043
568155239264876762867172754338684027849855385453216080*e^(308*I*c) + 147648
920805545333418623121767853777399782924748301228793924342574999937955421765
370101235122939557467548549202174550009604780*e^(307*I*c) + 156185962953551
196169738218832173696509852551589210730578365727476259476474465955428502336
673743686499175698677875693611243400*e^(306*I*c) + 163977816059607725375264
559816505847894187785101455360391897424482998415385787605765315509208337741
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994340530390347260088432676842505555141293830838961275974268928666494845723
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659870682732031975915532387577052414866323511140117680492929354517559479899
220940360*e^(303*I*c) + 181408168770922059820368553316697321639984862628298
828569560273295630897626829345263592219034560853530733710529842148537901680
*e^(302*I*c) + 184831151983748941817667850174708257138128172158269413287765
358532240773244336191900818557829905895684494889410451921524212840*e^(301*I
*c) + 186915474436567514926351405623117503261987508351930083824566444435689
139233683411704641828762178799177848064220150818355261280*e^(300*I*c) + 187

615393168510050071497280564603510912403132920312024370835062679037644990286
285346673507093452964351257962696133511725652320*e^(299*I*c) + 186915474436
567514926351405623117503261987508351930083824566444435689139233683411704641
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680*e^(294*I*c) + 163977816059607725375264559816505847894187785101455360391
897424482998415385787605765315509208337741590143078572243505132706580*e^(29
3*I*c) + 156185962953551196169738218832173696509852551589210730578365727476
259476474465955428502336673743686499175698677875693611243400*e^(292*I*c) +
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421765370101235122939557467548549202174550009604780*e^(291*I*c) + 138529794
549151089451352769576543403126330747243680030832467205895819043568155239264
876762867172754338684027849855385453216080*e^(290*I*c) + 128995076011591903
410763863427097329948586173574595862705849159280943046458742663163454018491
463855395649453952212899632198680*e^(289*I*c) + 119209713702033927055755397
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776810911910410468628960*e^(288*I*c) + 109332537349966223203932678503426357
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612732870169660*e^(287*I*c) + 995122064720579659513403417380235485153364033
717178980408504709546575329772791134915068802907261111541019413860196895679
58040*e^(286*I*c) + 8988381580138238221397327047795460274479287701805196334
7146307372464315121274929402347942874802899499538953561056667668891020*e^(2
85*I*c) + 80566249130682684181876201882623511206363790337218011954110210642
927765997644903820595421936873565314654415769070472655401600*e^(284*I*c) +
716603298611733955244419438892841091340911578446552456720842374024349446964
64927131812190659629511140639501743303863582092880*e^(283*I*c) + 6324777410
101217905179494607517556992407698133813848315804240674745387472938763171054
4995247152912205118500597511052824347680*e^(282*I*c) + 55390913044972086219
432689146331566081427959896969900214434296817731150863867056620768608187679
709720152974148474907904177340*e^(281*I*c) + 481331176781840292165037485491
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98370871149079494360*e^(280*I*c) + 4149983212196370804378852378740134554178
008893053820691885357902674927336467164003756348860771609288768647154283860
2788559660*e^(279*I*c) + 35500103106019649876272376796949482209581372371036
005012877806027481672807059943445240136315568500732379966585005678181937920
*e^(278*I*c) + 301284824145527032645590189530881771560134374934382010784137
69835448366148121754549197591129967170764969700180348699207838960*e^(277*I*
c) + 2536717643911935362153226033598334815490498260612576171130068349296339
0816491583025705268737539982149639300226512657426118880*e^(276*I*c) + 21188

32140588288753961019837470686269589404922607709376413251251333619052397894969438768605912452675504804295795426470663746 0*e^(275*I*c) + 175562732712242
92396887291403125716213491486261145478571376751690105656067838042151038271381300372757755676325408026834544840*e^(274*I*c) + 144298162852084312045329783753756919650631542246497475512958515073895240832269767896886013696283999007476585792019293007442 60*e^(273*I*c) + 117642122748764840800109007146734744933712781605578119837244558265660556176580864793686418649081196434124136448037721316572 80*e^(272*I*c) + 951303227401952295420911319126822664229991201
352566594029838106479788569090499312894803522741214403563385177951121933527
7360*e^(271*I*c) + 762973181562782158046899242420700836643889673633302466186383810511044514894696232829763154703254341981182101583786301368272 0*e^(270
*I*c) + 606894980315671224833187110532989547172280614300887801498655965368726069481655047019589000451196552756743272296970757720216 0*e^(269*I*c) + 478
752744278094568514520484697159616530416941932824407321145959212964925504887
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08*e^(264*I*c) + 128904351529293395648063433049967704018104393562010691426731106790003005839883978769237695409054527855454499771005875477240 0*e^(263*I
*c) + 966458275369037718747739130798151643483590684166832234688098291164160
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596382058249209113544487901088868388744033713210332491971375906738341551540
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107264*e^(258*I*c) + 2009065871535788043803004695014416101745218512595419292098406889608594549085197748359058957576667708578886117387518584604 24*e^(25
7*I*c) + 142906319123055524246546928478954238371315925802022389236498652136
8398225020351556769709174190398345879670555884315664167 84*e^(256*I*c) + 100
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305210140219646931365955449272567475433937528301040716774436695582892283748
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717832*e^(252*I*c) + 2273160356612884110041950194705136766683665241807726 09

139448107484730848918904101812854126048548766259195656395212272232 76*e^(251
*I*c) + 15312837206662775379347353212807682965712535652942631518286142403O9
7738200270711195396582159028513532779682154451996208592*e^(250*I*c) + 10220
4237794346348513399752951633996417021222496636661930530083020260969321585 68
338309418237395541351819026907953220681013*e^(249*I*c) + 675848043788852437
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183195792790168258294123 4362*e^(248*I*c) + 4427673079105425318524316112985 6
9365658485193610019245704445513448330504532145251634711848813322482367O4651
03483954805161*e^(247*I*c) + 287361053592234018708083543558291227727196797 7
3947201597910702749277142768695314671826889810410613817038854034975440O1592
*e^(246*I*c) + 18475058564624515334452843005713263237811625533045659718876 7
075809107930679482183492817077312636463972207157013170378533 4*e^(245*I*c) +
 11766007209757869651898750508902310922046126969702774330145358957889567712
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524997486531246588735534014 42137*e^(243*I*c) + 4637582884573671545449376782
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4209454368229910 2*e^(242*I*c) + 2869929436312314965572780108515769408968264
9746606632752880156067700711283743192673508812097486176051136700881572878 26
43*e^(241*I*c) + 17589625826275598575710681261397930126580103159548435361 49
046728651694422320757765804471841341413759957700914992467595 28*e^(240*I*c)
+ 1067648320171655948380852341893335287335876733299725300926610851867899392
529159370907602822323469190904262433994093233 14*e^(239*I*c) + 6417510069326
0066806238064886004597170740843300086839368616139164529108049844675353111 84
272579865808884034724149609964 4*e^(238*I*c) + 381990158675860879760029987 56
6276749947954406679036250293223462501332864891208750050136381281138939603 49
670280707161530*e^(237*I*c) + 2251467574130806996150616558650287243042193 02
10673264392997286485600640103867253604847715547060592967690653795951142520*
e^(236*I*c) + 1313977149410493388185668115141829311224255152153568687118126
65798138776063481602617472013177357825660213067982983360 24*e^(235*I*c) + 75
9275270014667896115309507358501547319702974653363333154979396147328576093 58
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7457468*e^(232*I*c) + 1379676529796212074017106188066589448355446501210890 1
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c) + 76586779551396278101255844462875141871094089528130479083674366158207 16
5003215489148286640631483443319945545979893495 2*e^(230*I*c) + 4208463426089
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28956210497609566002969884927*e^(229*I*c) + 22891131173859278009149264916 23
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54395308214*e^(228*I*c) + 12324394151933238474196007258810350659640633925 36
16391082062969960682419011745775738921817753391954462609323881489157*e^(227
*I*c) + 65674859268867300098827375812875225610654551686261103681664007007 53

711577809729353356524382887338372298035320061195 6*e^(226*I*c) + 34637657172
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1012693904434644807545139285 02*e^(225*I*c) + 1807982006802885997034993862 30
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41591793848*e^(224*I*c) + 933934195805349422525175096571505730070730208381 4
774770306218224241022648247419956042957363055823830898547303219757*e^(223*I
*c) + 477414111106609897022184533059496201647271423037423406066395684695092
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612144*e^(220*I*c) + 598650141112241858911676505180520150364003226841328081
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916400415534244055278768932724966083242310981485024664539671577280789 94*e^(
216*I*c) + 323627313224195494103300889436402474603783285613164229312924271 4
590288791307164367950290905589123675514320738260 9*e^(215*I*c) + 15189634214
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931146618934345515038362300100160482127749581443929904746910224777470198899
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850837934511089033149586707982764263394766756649565279879146173318386505740
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726551875489107820085047183241687250294385891623492116280 40*e^(168*I*c) +
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9493028162575100*e^(167*I*c) + 2304351073373840357379178597673066352016682 7
816891398420973766631184888038411319353136418 40*e^(166*I*c) + 5864034669726
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90*e^(165*I*c) + 147030816732276833163041582099592047512043725225353339238 8
19165193000407629544745753221740*e^(164*I*c) + 3631836965230259173219744440
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36796364768280*e^(162*I*c) + 21175897334668557071015014292104147224018388 37
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0*I*c) + 1161045516835550437629115017121163993137330211326774811128240472 46
361794049635726479850*e^(159*I*c) + 26556806389043407534496702369101545795 9
948617577414147899446527121275669101852741231 40*e^(158*I*c) + 5978992172944
143218459161149299819706321732111578494525245228742976468409105395536290*e^
(157*I*c) + 1324756412367837473157472821162483691120966501948953926492241 64
378826428454643722112 0*e^(156*I*c) + 2888207552647306544699685720210471094 2
731861950899580202068990459031947629540832428 0*e^(155*I*c) + 61948596653035
502879564338815234310660410902037882473161804774492916216575880077680*e^(15
4*I*c) + 1306981720348828988619320550837581839212499138234016031688650718 12
96548981014818410*e^(153*I*c) + 2711843239670717527605640490148833507130242
448403978318523237721944200392830108580*e^(152*I*c) + 553269128819528612502
918869558947829098021956309349843584044631512291778800081490*e^(151*I*c) +
1109691996873209747499222595952504443412192185353496557625911925765358721 51
766080*e^(150*I*c) + 2187648289271390992804034561257870580512150875622669 63
1708765182425224141866332 0*e^(149*I*c) + 423812584676323258639418856985868 5
82675532800554862743701930140585132588759448 0*e^(148*I*c) + 806679543607589
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 + 150822381431412413773566474210011746852297437597059186295243989481140398
152780*e^(146*I*c) + 2769311653834325922598338263764793612266403385961513 34
898466646943614710283 10*e^(145*I*c) + 49925197124570439835053779766079539 88
397368297591114957991804893688371867680*e^(144*I*c) + 88350096882179120260 0
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0887450562541273272394615770719331301577645959971139735131831883993 76*e^(14
2*I*c) + 2614397627990202144347194566508025456305681018352040188980028549 31
44867448*e^(141*I*c) + 4369442482910113914565353136069595862669338858053419
381214131241925047008*e^(140*I*c) + 716099497599058079895633338552940229192
858196481597830078819711862600096*e^(139*I*c) + 11505148185208084887370038 8
354521315556764036512400310369117669719429232 0*e^(138*I*c) + 181157684956157
58076710303055505625589254293659193314153418333944596408*e^(137*I*c) + 2794
709104475686611842790694973699164482254723977210209725661304403472*e^(136*I

*c) + 4222761266320036875477547465557099887105271330866601613663536567872888
*e^(135*I*c) + 6247355078105329531771077469024711412412518756573184844178190
04032672*e^(134*I*c) + 9046693523825682979044338963104263167672586826367911
338826483549173*e^(133*I*c) + 128181746491497081085960418982835900079078992
1169405304612211251818*e^(132*I*c) + 177642829135119348577194437675802830233
99054600926871364949614043333*e^(131*I*c) + 240708019135297571018580229143722
0458647469917861820397402743252644*e^(130*I*c) + 318774992974434649721153604
4751776582320958627923816470590659024*e^(129*I*c) + 412430698299915190848067
2222327219435067747934091894670488982928*e^(128*I*c) + 521081176291770486604
92400985175830987505700566877818954141639*e^(127*I*c) + 642619548553524857
642506813687046553008711400387571669138390 2*e^(126*I*c) + 77320463699114577
506146273102809850609443267578813629501125 9*e^(125*I*c) + 90722605722208814
918642284639487187764607589706493970774776*e^(124*I*c) + 103751844998711755
019093989565966841168029970825266603235 24*e^(123*I*c) + 1155855412893594260
345544966642687823630035899363232371472*e^(122*I*c) + 125370496586921272662
198050851269323171167338854081782959*e^(121*I*c) + 132317088701048969738000
567337799190893408367560095807 18*e^(120*I*c) + 135799066316147984285064284 8
032544982878359839580349899*e^(119*I*c) + 135442594916636116191574650625331
646238501101627937224*e^(118*I*c) + 131187818011721747296793398943181536949
64675368481194*e^(117*I*c) + 123309670013972336518199722075093259065528762 5
342156*e^(116*I*c) + 112391604542246650966429162063124338952554575234051*e^
(115*I*c) + 99254907385344022729399870387145804954454313746 18*e^(114*I*c) +
 848552202276512356496200136959676295361696315113*e^(113*I*c) + 70164515322
544462906873548813748091084561870680*e^(112*I*c) + 560592725306755855178045
288368983551445511867 0*e^(111*I*c) + 432333688644261557547944179250800440 60
4964868*e^(110*I*c) + 321478876933753388174544825153773503839502 78*e^(109*I
*c) + 230215041122623492585522234520150090053357 6*e^(108*I*c) + 15856647611
325756256611743222720388429885 6*e^(107*I*c) + 104904026695108974246246437 66
470754045064*e^(106*I*c) + 665634670676210063754191847109971141414*e^(105*I
*c) + 40443624781415311581857832389099634564*e^(104*I*c) + 2348998374244347
079532766203075607598*e^(103*I*c) + 130171193079172823835151430773360024*e^
(102*I*c) + 6868329225263681349501997341320517*e^(101*I*c) + 34427715201287
5134140739302960914*e^(100*I*c) + 16353164647151530240529137618111*e^(99*I*
c) + 734057263616388449968842366924*e^(98*I*c) + 310422225220746816156250 20
522*e^(97*I*c) + 1232445557346832245176696904*e^(96*I*c) + 4575911718340257
9073139583*e^(95*I*c) + 1581796642397812408161814*e^(94*I*c) + 506486609445
12569972179*e^(93*I*c) + 1493326612293984160368*e^(92*I*c) + 40261256699368
950388*e^(91*I*c) + 984382804329835768*e^(90*I*c) + 21608403021340047*e^(89
*I*c) + 420601518659718*e^(88*I*c) + 7146142307307*e^(87*I*c) + 10381804804
8*e^(86*I*c) + 1253841160*e^(85*I*c) + 12085216*e^(84*I*c) + 87153*e^(83*I*
c) + 418*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) + 7*(9867*I*a^2*e^(1027
/2*I*c) + 3848130*I*a^2*e^(1025/2*I*c) + 748461285*I*a^2*e^(1023/2*I*c) + 9
6800992860*I*a^2*e^(1021/2*I*c) + 9365496059205*I*a^2*e^(1019/2*I*c) + 7230
16295770626*I*a^2*e^(1017/2*I*c) + 46393545645311706*I*a^2*e^(1015/2*I*c) +
 2545017361124253210*I*a^2*e^(1013/2*I*c) + 121842706165531758225*I*a^2*e^(

1011/2*I*c) + 5171545973000559760165*I*a^2*e^(1009/2*I*c) + 197035901588508
817004391*I*a^2*e^(1007/2*I*c) + 6806694783357860712909393*I*a^2*e^(1005/2*
I*c) + 214978110312371924676280101*I*a^2*e^(1003/2*I*c) + 62509019803959577
95917828835*I*a^2*e^(1001/2*I*c) + 168327860633476968482282779620*I*a^2*e^(
999/2*I*c) + 4219418379622495018746735933182*I*a^2*e^(997/2*I*c) + 98892618
501960556395579843057828*I*a^2*e^(995/2*I*c) + 2175637614526488309339795247
719423*I*a^2*e^(993/2*I*c) + 45084046347051121561291339131297112*I*a^2*e^(9
91/2*I*c) + 882698176765813429616327000431223295*I*a^2*e^(989/2*I*c) + 1637
4051337559882202075446312226584700*I*a^2*e^(987/2*I*c) + 288495194028428088
627568321559245818459*I*a^2*e^(985/2*I*c) + 4838851294065276461984778740285
520947658*I*a^2*e^(983/2*I*c) + 77421622501348280247334235191908463309686*I
*a^2*e^(981/2*I*c) + 1183905679851187219496284451985830369733725*I*a^2*e^(9
79/2*I*c) + 17332379827117737513384038195005765450047540*I*a^2*e^(977/2*I*c
) + 243319959628953467711826163624006704408771129*I*a^2*e^(975/2*I*c) + 328
0313734912630390804532039053385555426092600*I*a^2*e^(973/2*I*c) + 425269278
18120262032236340231948484360039052121*I*a^2*e^(971/2*I*c) + 53085342635704
2754469653748150767198919032400940*I*a^2*e^(969/2*I*c) + 638793699419597624
0622682990166245342613055517890*I*a^2*e^(967/2*I*c) + 741825049756084502896
36265368281851382711220649004*I*a^2*e^(965/2*I*c) + 83223512564943621722271
5021488460783355491981492217*I*a^2*e^(963/2*I*c) + 902849209049851352193143
1245530169366369034596324891*I*a^2*e^(961/2*I*c) + 947991914223366709117332
8415586707603032597722134187 5*I*a^2*e^(959/2*I*c) + 964243501752639006146 02
6780418602842158889630673989345*I*a^2*e^(957/2*I*c) + 950851579990067311329
92210037268536441103252156058851 83*I*a^2*e^(955/2*I*c) + 909734069368068375
31915685400953309110574252721276020367*I*a^2*e^(953/2*I*c) + 84509550297467
0714598033224559068895202594191429069360222*I*a^2*e^(951/2*I*c) + 762753323
48522645117058593684022012306540304334403016755 18*I*a^2*e^(949/2*I*c) + 669
316512844816618646180773058762694085618345964086361 01210*I*a^2*e^(947/2*I*c
) + 571368224054265219726596099705196924252108483077143367419935*I*a^2*e^(9
45/2*I*c) + 4747802391051472283183879516945405395337420791155799564552344*I
*a^2*e^(943/2*I*c) + 384241176106726559069364415899325808086312933461942154
93375887*I*a^2*e^(941/2*I*c) + 30302695031451807921916988663946921311252966
2619496065070362634*I*a^2*e^(939/2*I*c) + 2329943971272634597068665479560 38
3652668004620643027277203439985*I*a^2*e^(937/2*I*c) + 174746092260042943466
6452928465193776292560410220855409744205 0560*I*a^2*e^(935/2*I*c) + 12789951
4211571855615342081558322168204136482117422337757176345560*I*a^2*e^(933/2*I
*c) + 913950624853444779964988596342201399080981813136131167642386677984*I*
a^2*e^(931/2*I*c) + 637901832413161622065274741571090592968530223737212945 6
527463165524*I*a^2*e^(929/2*I*c) + 435050290141291368075663883180136091638 1
598602707780434334911046808 0*I*a^2*e^(927/2*I*c) + 290034464520387036801727
8485894025979562764909461617175339616495957 00*I*a^2*e^(925/2*I*c) + 1890808
5231844652348705820115489868983683675780582564154081721230862 40*I*a^2*e^(92
3/2*I*c) + 1205841361197921501449380888109491932707613615895877460346501392
2951460*I*a^2*e^(921/2*I*c) + 752537835473769580225687459869037752652911784
2552173734533892140140160 8*I*a^2*e^(919/2*I*c) + 4597346134985259043916614 5

3323499339021127870927849907055606144578837880*I*a^2*e^(917/2*I*c) + 275021
4314681421164420565775956331599212851388641230567209095240832869740*I*a^2*e
^(915/2*I*c) + 161153971851311832617849990680934829583309265371195480965690
91610170990080*I*a^2*e^(913/2*I*c) + 92525290960177968452743510383284189038
302875808137991118047531970267330140*I*a^2*e^(911/2*I*c) + 5206550842970712
13247874630919114875777150736266962384814615937366841583600*I*a^2*e^(909/2*
I*c) + 28723069807654857867980935279056703943163003114948799193702926019941
64873980*I*a^2*e^(907/2*I*c) + 15538869199972063791690049288524847158110979
530065672277863507395517286098560*I*a^2*e^(905/2*I*c) + 8245719794050006511
2831235778009337400577942437329270541936889611136248616360*I*a^2*e^(903/2*I
*c) + 429306406331604823645688251632236356131380665568461698695435155472754
991584480*I*a^2*e^(901/2*I*c) + 2193518253323607158598306760610194505563715
717648737978249164699044796790178970*I*a^2*e^(899/2*I*c) + 1100150905116991
8803406190301110072169140434739188390680687069371600096456461960*I*a^2*e^(8
97/2*I*c) + 541750313768436076293560450270587580326308933852341883428638684
14550489892855190*I*a^2*e^(895/2*I*c) + 26198574004344308038830187488450068
3905172501509414794896626641791046018314193300*I*a^2*e^(893/2*I*c) + 124445
844130409520749732783777934477929343261005269896448132005897390334813136439
0*I*a^2*e^(891/2*I*c) + 580760744355231221024154298187369701154404717090556
0703749866664890336325145752760*I*a^2*e^(889/2*I*c) + 266327089901343246991
99881524590925879444427734597911842625776697111614072462805500*I*a^2*e^(887
/2*I*c) + 12003812035094402972261579848458357881792093610304289847907519508
4456374447649531420*I*a^2*e^(885/2*I*c) + 531852003070453189333276138739985
307207445323441994433993246593537700600251640914290*I*a^2*e^(883/2*I*c) + 2
316913417896533634148238479533816756801158698905671195529018686134366565369
411066790*I*a^2*e^(881/2*I*c) + 9925525882909518673569536731354735994317981
948112305002260477305616767418585528998710*I*a^2*e^(879/2*I*c) + 4182125688
366367760446381399035690630569232443207281247902039184020973840599286234211
0*I*a^2*e^(877/2*I*c) + 173345856975272080307468888319573743826748157949817
083968790709575178522586695155600570*I*a^2*e^(875/2*I*c) + 7069254940580017
38008498868730775412018273649883656316519821960251293960111842853827050*I*a
^2*e^(873/2*I*c) + 28369169189394771245705015350036679506624416854595869868
59765033838975136651432973013080*I*a^2*e^(871/2*I*c) + 11204681256258812161
206109553481424902816807388805631619385616166895520536176153385410620*I*a^2
*e^(869/2*I*c) + 4356097775980642550984171697832990426607531388027684362352
7207449861917293070562965518680*I*a^2*e^(867/2*I*c) + 166726455941596831160
623476351712587187594657642857127013830239484587313767680019339582550*I*a^2
*e^(865/2*I*c) + 6283217402529699146708974013748477212590031785572960403994
51247917033448679858171068226560*I*a^2*e^(863/2*I*c) + 23317961812286764803
58713874846040638691309670968182309524450889214672550181351830378735030*I*a
^2*e^(861/2*I*c) + 85229260483699889403559152526282219875527530950209513770
15329635773840197997200581857597800*I*a^2*e^(859/2*I*c) + 30685533864596666
418316194015078029015958251712763047637572948112622799853423865147299102830
*I*a^2*e^(857/2*I*c) + 1088381674585823184455849835282493949200583590094814
25820011589540335936121859362203566362580*I*a^2*e^(855/2*I*c) + 38035197418

842683642619864051339471341649460785516551807259419090622333733050401816525
8288940*I*a^2*e^(853/2*I*c) + 130978506840473201225164579044912481278616850
6645450981272566942196706295180922249225707977010*I*a^2*e^(851/2*I*c) + 444
504319274789268390399853721138227585710412235922782253365493896371639852064
3447212245479640*I*a^2*e^(849/2*I*c) + 148683901006420511836719711793878800
0350914635000729463417789964508881031388519563539214674 4810*I*a^2*e^(847/2*
I*c) + 490244943374922793608188491279453630954545295487825194027058041945 70
2283777331669348240886550 40*I*a^2*e^(845/2*I*c) + 159357143703325302909958 9
869710248950108651059517203782604973685085930558384538251650496115632 10*I*a
^2*e^(843/2*I*c) + 510723774383122473742590339083403953575864194243445208 99
475307360003957992926640703709765168292 0*I*a^2*e^(841/2*I*c) + 161399625005
227651497742238751482974339782549553805362337258500737267515812737919919603
8765006020*I*a^2*e^(839/2*I*c) + 502997233223228520128531881185601119191768
675475579615309908167926502294649793434333234611603620 0*I*a^2*e^(837/2*I*c)
 + 154603381888035181010707962987414730510504499628085456326772817431996854
977547204679920102246168 70*I*a^2*e^(835/2*I*c) + 468711270199565793945277 23
949157745550097315795915660019622180811547871642339809799054651854945990*I*
a^2*e^(833/2*I*c) + 140173703202763541015820505640728386718374275916041096 0
781830918454133052882050803423422200466296 50*I*a^2*e^(831/2*I*c) + 41356448
914361269513294728809292139787765990212707157864657906237914001989850609848
6550619425904170*I*a^2*e^(829/2*I*c) + 120385831118903001859978475898311457
41012765535839689657765510614631704354264034831791768404974563 30*I*a^2*e^(8
27/2*I*c) + 345781676701999202030946295835138625644973659314096946827987732
775379219849498962943340810665190107 0*I*a^2*e^(825/2*I*c) + 980079316064566
075944389460984891152942557969087433011532356902754100547673537917564006396
1886333700*I*a^2*e^(823/2*I*c) + 274151410348454439510949392567509545844369
45867670907710352859492970463590965208109494412332329295780*I*a^2*e^(821/2*
I*c) + 756878787220142658252380667315910137029981004643244422172727529168 87
964266256104313931049007060490840*I*a^2*e^(819/2*I*c) + 2062550466642352923
299538505218323676805884853392747978586557766976702788671365670139537869241
77858890*I*a^2*e^(817/2*I*c) + 554830477071987246654408444808030209487515 32
540060577281911940843579274464630633676855949485875736246 0*I*a^2*e^(815/2*I
*c) + 147342444362109962377181703120951524343672463702574952726767868577035
529316728254737999404161224953641 0*I*a^2*e^(813/2*I*c) + 386314437516868018
576356913292077827044669797836884278496544413991685735826342800126438356631
1006996680*I*a^2*e^(811/2*I*c) + 100007488425814211531157828500284191306438
69569449134721967908251115915010593127137857232140041620869750*I*a^2*e^(809
/2*I*c) + 255643630982859699514616759342733647348219236162500471775276878 12
8987868573717801934388573382600979118 40*I*a^2*e^(807/2*I*c) + 6453273197782
459147936919163715825933528964953360698297163136496405491168107563712249071
4561514235891960*I*a^2*e^(805/2*I*c) + 160878825079043394603834949575837497
625484370509752204556389520870042820153281247817248349563478924960000*I*a^2
*e^(803/2*I*c) + 396115692772031770288304791718511731291368406297439843435 6
507503722362485777977830213383312282437506222 60*I*a^2*e^(801/2*I*c) + 96333
990133367005220184783649172964795326224863928850083854162444757923207857140

801735827540862351061384O*I*a^2*e^(799/2*I*c) + 23141998752256698682440696 5
1584876395963663339381367121765970164619426958496568116456546662409068449 84
0980*I*a^2*e^(797/2*I*c) + 5491803146687539880535976565963795672164514086 56
72080120159160267756394387323362582018044196182925450323 20*I*a^2*e^(795/2*I
*c) + 128750909685704951104826884973311195514817251151404663543711650415329
256637303132642820554620116030106543 40*I*a^2*e^(793/2*I*c) + 29821871642675
642979884949769331439027860315600536250652213455370080842219764548099437011
716544543041268840*I*a^2*e^(791/2*I*c) + 682489975344168898405747441723232 8
4868436001711555565766981650470803874668337015803960506067102299819184920*I
*a^2*e^(789/2*I*c) + 1543339804466475265456033934357179816751679766229854 30
3651882530224051407509563906150950934791106995886499 00*I*a^2*e^(787/2*I*c)
+ 3448716031646138840025055585349184630908375817774593116788420671232864662
267511440711334827760054304894257 60*I*a^2*e^(785/2*I*c) + 76157068141016866
276950629713249017136732146629432296112698385566984533398678337103331546320
005742863075222 0*I*a^2*e^(783/2*I*c) + 1662056674430734149248928799468980 77
37314565437012110705561812133899240559883532266358605404337549641551117 60*I
*a^2*e^(781/2*I*c) + 358500567897480551605849967163259551339357495711398033
668895479160973616597404324912495509109687299795479302 0*I*a^2*e^(779/2*I*c)
 + 764306432142215085107655604542055474413839848522722800024684820236501089
167571143523863099586729784421407337 6*I*a^2*e^(777/2*I*c) + 161065955340044
253505563455084677640638169912602410083615367290222210493676806273016116090
635848019703797042 00*I*a^2*e^(775/2*I*c) + 3355236918570877306929207623989 0
437482410490941602744957472544576489334415521169836149006133511757140035934
080*I*a^2*e^(773/2*I*c) + 690955667122722319724322397288994961749222207720 4
19841820692841302373891889983028064439449885090650632731547 45*I*a^2*e^(771/
2*I*c) + 1406723757130126873203890735799455333793671320074123565586500813 88
4699392181586147785024671636525278625509521 30*I*a^2*e^(769/2*I*c) + 2831541
724454077422450878787538662877042027538054395604149601789061369618915729280
268552762138871213800719281 03*I*a^2*e^(767/2*I*c) + 563528978057632720969 91
770897155119738849844002918752049866812562736063687371997384272904938397339
53394891873 28*I*a^2*e^(765/2*I*c) + 110895041237395917205685994545909717581
600207445777581219710119943087877137176487718794969468581971828622168693 5*I
*a^2*e^(763/2*I*c) + 21579125859245933337286958979644494093641726312865346 8
4550661677201976202007165851929905826385985844876371677490*I*a^2*e^(761/2*I
*c) + 415245104359965804460096900332121399173917602775258904180672803665826
32218998755720095377871693436515739796834 70*I*a^2*e^(759/2*I*c) + 790218349
026871901495271289147853538925976831795670198761660396945228812301836985196
71171745457596071429959083 98*I*a^2*e^(757/2*I*c) + 1487251651322867268458 44
543739529709855752443668839234988632043147587872364853959678331468690644611
378974932831 99*I*a^2*e^(755/2*I*c) + 276846677558830806961652416008502362 90
060527593753750250976925795644297762324894086602505304941640081834882024183
*I*a^2*e^(753/2*I*c) + 509723132282461048528456302749947063344742018512123 0
070113720509369535675409863710427160861377451193096410578118 5*I*a^2*e^(751/
2*I*c) + 928308113376605414018314259982460592969619502620219411889553255934
7460481049904161662134958195389500285787346295 5*I*a^2*e^(749/2*I*c) + 16723

8124367604884257687395998092662795927551689303041040879673329504761663429237202212197395803292702881738952971*I*a^2*e^(747/2*I*c) + 298048067652053494891789544111943306401708032136890389702630757761900213043371027166375667728550358023100922727809*I*a^2*e^(745/2*I*c) + 525493987941224576833948947923190344705893821267452387823143070953735053588687507661314315558209767708019478373004*I*a^2*e^(743/2*I*c) + 916647094312849149601409407556411545628020477301452007254604091888065378474579372960004944710940275456326641248866*I*a^2*e^(741/2*I*c) + 1582020627875819886732500658987622865348980072162800701130868690683669873547179234420581808071126591692483785355020*I*a^2*e^(739/2*I*c) + 2701595469953592505053950263729379037938883403451415995229310843295475921159044641522890199450389533264819628536025*I*a^2*e^(737/2*I*c) + 4565090669910591648371347796026475895546702180721517835280809078297960907491881780744446079560657601476760082232152*I*a^2*e^(735/2*I*c) + 7633473491307541209486424585811484817196254832261040496971952179994482798425215154469999043547371029896595546249849*I*a^2*e^(733/2*I*c) + 12631694034494832388052286651806334417271466381837580128567730484107040908831525044898011891962065924068550189725268*I*a^2*e^(731/2*I*c) + 20686671000021215968489830509311959418929183582885216898379036970362110971705665038962014129218543899794341899845085*I*a^2*e^(729/2*I*c) + 33529908885006822682931549767196284830862190121835841481201620772726893006422670068438075620985878626866861887157590*I*a^2*e^(727/2*I*c) + 53791069458499890426012292372724882317088055615752468358198258128613020164914352269555347240301885068470565731734762*I*a^2*e^(725/2*I*c) + 85417618996417490452483371059823103161327605370266736083574364508696427592725387814713600331423646619680648052044475*I*a^2*e^(723/2*I*c) + 134266547005764484798323550291789284673072165389287944293362348024671026925485137604645521152950533194618205062920988*I*a^2*e^(721/2*I*c) + 208927219473219525544565866337429793652566518446013625391976810557213288024339930152549544168002925624951052677530015*I*a^2*e^(719/2*I*c) + 321849633692522447898702348324001010813625753491002068478331883454364145448222725180431547920764933095415393034588280*I*a^2*e^(717/2*I*c) + 490869363902063375691310822072469729142482010176109462407873620361306320773072877532370567922640618200227464127502047*I*a^2*e^(715/2*I*c) + 741238644768872960862145813229884276436860967234511356976656011429732646982384201977263394830039748273745918763926276*I*a^2*e^(713/2*I*c) + 1108291178742880880039492558635466816691811302866749288715555797951407508808250708041669875191682735463589899659311198*I*a^2*e^(711/2*I*c) + 1640884644617340843581442683492441588325865602613152625692173455955900863555908606458185685041555583786399895054479300*I*a^2*e^(709/2*I*c) + 2405777144390557141178134630677732448496509520541318348420192417807342381289784524672636122635696383857297613950049995*I*a^2*e^(707/2*I*c) + 3493098877104926876982371080322574402126352061273397457455862024812134577602605965839150066211359905342050250374117429*I*a^2*e^(705/2*I*c) + 5023074431860157301178884716562581748690621217353878503343880912029491580804610437496781598919605840393968558559789161*I*a^2*e^(703/2*I*c) + 7154129966723457300673403227718347626345186852646382458309851149442695900792627566622368287282262184380707453078413991*I*a^2*e^(701/2*I*c) + 100924786020063127364353407717370680634

544851192575840230472208882160787043159191976578217878926464077020912493173
03229*I*a^2*e^(699/2*I*c) + 141032120896646518417213856904114953090679747 92
13298476575212107886497395527666592170960699080513605589931851531630 2625*I*
a^2*e^(697/2*I*c) + 195228332867288033102507746731130331021589233473896963 9
245055633587494968652624921456871700212028594919841994338864721 0*I*a^2*e^(6
95/2*I*c) + 267730394333998274117237784491077008799869706368351802130848455
66895069119080487323194332830887134412610587215162894762*I*a^2*e^(693/2*I*c
) + 363754099312877950926075579587841266620595767474544085887443097220822 26
791392845209172297521166997828928030420844023706*I*a^2*e^(691/2*I*c) + 4896
646615878742114946199207175567373336856102462570532830088204696011609350991
340052050073050756472432485539631717487 7*I*a^2*e^(689/2*I*c) + 653123602074
898065236571363863403753569295522760923767167642985299999533078080423695668
0516737916274614325528225895418 0*I*a^2*e^(687/2*I*c) + 8632222365132607361 9
711312568551997796065517198873894958063303051564972850936480127357633838565
81130517760678520274204 5*I*a^2*e^(685/2*I*c) + 113058980288356422038583513 9
940220907469386070355433465119796591093989261756839556423349718766282964364
952883674750252 10*I*a^2*e^(683/2*I*c) + 146746216244736834746047741749764 39
522622270730367507440206801324051044685464674982020418217223234451702743626
0129735987*I*a^2*e^(681/2*I*c) + 188769528710907069399315417787360030712701
629061238948251068174174311765598652218110198035428223021692947533585962348
672*I*a^2*e^(679/2*I*c) + 240670665436226781249104870763732072307372945983 8
418169127611392117063248071275964692668794775387149948760506308489112 80*I*a
^2*e^(677/2*I*c) + 304132746604536662259792175095559390073445166552839303 71
313173556486894852693903214644884373148639517109109679379882144 0*I*a^2*e^(6
75/2*I*c) + 380954953495487600292955504287703099567666198405494548188510783
4302340852649932373492228976133462014323804487479644253 20*I*a^2*e^(673/2*I*
c) + 473015295484339355386516049510742489366878201689475820057034050114095 3
2313400783580739314312930915947765615269175556464 0*I*a^2*e^(671/2*I*c) + 58
222044318581750206266482921312370263252473314620783459971606488506578927759
08293602464603499559473943450541824419812 24*I*a^2*e^(669/2*I*c) + 710442146
558732233592026068873812784196608427957534833584445957207723692820312997979
854292270461155374405948197659591360*I*a^2*e^(667/2*I*c) + 8594404367040659
964920655309206627501878563640804789340222353178580696799516488891727895957
0600681421936801081553268148 0*I*a^2*e^(665/2*I*c) + 103077461977654275815 10
267219540856089966611268658301355106800499653101376641414311549979794966392
993458320995823751613 60*I*a^2*e^(663/2*I*c) + 122570397765282627911562521 89
566022445511144475924060653629422220740852110017150381818536465061870450336
00876523451824880*I*a^2*e^(661/2*I*c) + 144508104580316681379226468903797 38
661662028815384253123290214013013908892842545655439493113783095417234329028
67052706200*I*a^2*e^(659/2*I*c) + 168924128526708811207147417034900941810 54
317802273206939347842482291303136287068760205450304355332464459610710684938
10560*I*a^2*e^(657/2*I*c) + 195789383497235847790592899909541955640571195 89
888530249350751577543394196561531881171440936256921961085980422819729857 20*
I*a^2*e^(655/2*I*c) + 225001875068128940187446765256289148720332652570989 90
955237323668065424778451412153607110074052721022076808174277427595 20*I*a^2*

e^(653/2*I*c) + 25637766364399777030296045669829556685953809601601333538899
74265239086029092155773519578351942456055091409678154086303160*I*a^2*e^(651
/2*I*c) + 28964367894366249384702990683309462580013099699847038734114728697
37850504382055706419008342552332959944508775701784058240*I*a^2*e^(649/2*I*c
) + 32443298586951092651428287113773193999451013284950304274169031315033190
22305572237606283736559593675791505521680740151120*I*a^2*e^(647/2*I*c) + 36
028305298407529565181939312745233961149440319768254370614299760903082455016
32173258267215963247319966703044426706223680*I*a^2*e^(645/2*I*c) + 39663748
833127834823836467088030196693430004700156593977777724916107199512517044773
98336756202715565781802459813301802300*I*a^2*e^(643/2*I*c) + 43285158489790
258856890544749443686885978562125957587107456315867170589408091655084408030
25209005356313475936021116327680*I*a^2*e^(641/2*I*c) + 46820186401352114025
441934476753157785221638924891221314114838076383675741536713397080122815979
05204951327596457959200420*I*a^2*e^(639/2*I*c) + 50189962637768623023679837
160841205582895837859254979735993461981724426689831143392606930153662124944
49899447639497797000*I*a^2*e^(637/2*I*c) + 53310832629653276988259859512126
816741393962441161710231957252053274044936955416162439524334709419918835207
91988803340740*I*a^2*e^(635/2*I*c) + 56096438581971821615416482750117525255
863897331137996079555574670366614762459888018770659346581194758350501024011
03094880*I*a^2*e^(633/2*I*c) + 58460087337172550342558283443647869505776357
487028017821034693281056146781069583693352772019734245822730028395671983190
80*I*a^2*e^(631/2*I*c) + 60317329778848122601739294534272327997929452223082
03442804835486204161004827827142401343622232793155002865274651684289320*I*a
^2*e^(629/2*I*c) + 61588662421482231694403486393227657084883018978611167674
04404815878289922328995812629986104827051163389294175358746873020*I*a^2*e^(
627/2*I*c) + 62202251230952204460675300839023987684115557416549006389920446
46455129937854804113318919111668831147496834175450404249540*I*a^2*e^(625/2*
I*c) + 62096571660597904142679194148630869282244387047293181546722854365503
56208263215568679904005246104294284315747952200822100*I*a^2*e^(623/2*I*c) +
61222857792337143725906948970182085956642006810708599861702745415177526058
91024516685624452334324327807799672288064082260*I*a^2*e^(621/2*I*c) + 59547
257467401870889396732031512898770826022020504370086760285116178608639386975
14177299610327811386342958225508703594540*I*a^2*e^(619/2*I*c) + 57052599204
286374939405242600597907420683319525389105353847625378502538234011482704337
83507943120942720400689766599967260*I*a^2*e^(617/2*I*c) + 53739690083650980
637055279707516518897459636880832855309819571261998752476166051260272728509
91193295122275535796115520400*I*a^2*e^(615/2*I*c) + 49628080947727873397470
915152302769798740073949347947431638629075496398001768246061001785549327778
62617713413141739317320*I*a^2*e^(613/2*I*c) + 44756255352895649726018393399
777580104484971180819586082522773687502909742536065396671192491726068766591
81697229192662160*I*a^2*e^(611/2*I*c) + 39181220751115193662441268842368235
396535288066011412234288694406185747436395037219120791405561621855099478991
64696134100*I*a^2*e^(609/2*I*c) + 32977503331460697218967225115618795701660
403555551597360783353756943479513821935596151070573301875361374620878666425
54560*I*a^2*e^(607/2*I*c) + 26235570810040910406795079057453769837412326290

56220311681059841157626795431350015349450602987501509129301018716050208660*
I*a^2*e^(605/2*I*c) + 19059729259480474002004174356752213830765610370725372
67851490979096509936249772956388635120192992958448628890777139946480*I*a^2*
e^(603/2*I*c) + 11565559961838689852000906392260895540213419321581926219232
46957977122810089035413564479870427981333952548182360473741220*I*a^2*e^(601
/2*I*c) + 38769795201545572867941822935804912844942383041966842808188286623
7658365339074239012664180518005805128629710867652733080*I*a^2*e^(599/2*I*c)
 - 387697952015455728679418229358049128449423830419668428081882866237658365
339074239012664180518005805128629710867652733080*I*a^2*e^(597/2*I*c) - 1156
555996183868985200090639226089554021341932158192621923246957977122810089035
413564479870427981333952548182360473741220*I*a^2*e^(595/2*I*c) - 1905972925
948047400200417435675221383076561037072537267851490979096509936249772956388
6351201929992958448628890777139946480*I*a^2*e^(593/2*I*c) - 2623557081004091
040679507905745376983741232629056220311681059841157626795431350015349450602
987501509129301018716050208660*I*a^2*e^(591/2*I*c) - 3297750333146069721896
722511561879570166040355555159736078335375694347951382193559615107057330187
536137462087866642554560*I*a^2*e^(589/2*I*c) - 3918122075111519366244126884
236823539653528806601141223428869440618574743639503721912079140556162185509
947899164696134100*I*a^2*e^(587/2*I*c) - 4475625535289564972601839339977758
010448497118081958608252277368750290974253606539667119249172606876659181697
229192662160*I*a^2*e^(585/2*I*c) - 4962808094772787339747091515230276979874
007394934794743163862907549639800176824606100178554932777862617713413141739
317320*I*a^2*e^(583/2*I*c) - 5373969008365098063705527970751651889745963688
083285530981957126199875247616605126027272850991193295122275535796115520400
*I*a^2*e^(581/2*I*c) - 5705259920428637493940524260059790742068331952538910
535384762537850253823401148270433783507943120942720400689766599967260*I*a^2
*e^(579/2*I*c) - 5954725746740187088939673203151289877082602202050437008676
028511617860863938697514177299610327811386342958225508703594540*I*a^2*e^(57
7/2*I*c) - 6122285779233714372590694897018208595664200681070859986170274541
517752605891024516685624452334324327807799672288064082260*I*a^2*e^(575/2*I*
c) - 6209657166059790414267919414863086928224438704729318154672285436550356
208263215568679904005246104294284315747952200822100*I*a^2*e^(573/2*I*c) - 6
220225123095220446067530083902398768411555741654900638992044646455129937854
804113318919111668831147496834175450404249540*I*a^2*e^(571/2*I*c) - 6158866
242148223169440348639322765708488301897861116767404404815878289922328995812
629986104827051163389294175358746873020*I*a^2*e^(569/2*I*c) - 6031732977884
812260173929453427232799792945222308203442804835486204161004827827142401343
622232793155002865274651684289320*I*a^2*e^(567/2*I*c) - 5846008733717255034
255828344364786950577635748702801782103469328105614678106958369335277201973
424582273002839567198319080*I*a^2*e^(565/2*I*c) - 5609643858197182161541648
275011752525586389733113799607955557467036661476245988801877065934658119475
835050102401103094880*I*a^2*e^(563/2*I*c) - 5331083262965327698825985951212
681674139396244116171023195725205327404493695541616243952433470941991883520
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c) - 5379106945849989042601229237272488231708805561575246835819825812861302
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*I*a^2*e^(413/2*I*c) - 34487160316461388400250555853491846309083758177774593
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) - 15433398044664752654560339343571798167516797662298543036518825302240514
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7/2*I*c) - 3961156927720317702883047917185117312913684062974398434356507503
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0*I*a^2*e^(385/2*I*c) - 147342444362109962377181703120951524343672463702574
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397877659902127071578646579062379140019898506098486550619425904170*I*a^2*e^
(367/2*I*c) - 1401737032027635410158205056407283867183742759160410960781830
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- 5029972332232285201285318811856011191917686754755796153099081679265022946497934343332346116036200*I*a^2*e^(359/2*I*c) - 1613996250052276514977422387514829743397825495538053623372585007372675158127379199196038765006020*I*a^2*e^(357/2*I*c) - 51072377438312247374259033908340395357586419424344520899475307360003957992926640703709765168292O*I*a^2*e^(355/2*I*c) - 159357143703325302909958986971024895010865105951720378260497368508593055838453825165049611563210*I*a^2*e^(353/2*I*c) - 4902449433749227936081884912794536309545452954878251940270580419457022837773316693482408865504O*I*a^2*e^(351/2*I*c) - 1486839010064205118367197117938788000350914635000729463417789964508881031388519563539214674481O*I*a^2*e^(349/2*I*c) - 44450431927478926839039985372113822758571041223592278225336549389637163985206434472122454796 40*I*a^2*e^(347/2*I*c) - 13097850684047320122516457904491248127861685066454509812725669421967062951809222492257079770 10*I*a^2*e^(345/2*I*c) - 38035197418842683642619864051339471341649460785516551807259419090622333733050401816525828894 0*I*a^2*e^(343/2*I*c) - 108838167458582318445584983528249394920058359009481425820011589540335936121859362203566362580*I*a^2*e^(341/2*I*c) - 30685533864596666418316194015078029015958251712763047637572948112622799853423865147299102830*I*a^2*e^(339/2*I*c) - 85229260483699889403559152526282219875527530950209513770153296357738401979972005818575978 00*I*a^2*e^(337/2*I*c) - 23317961812286764803587138748460406386913096709681823095244508892146725501813518303787350 30*I*a^2*e^(335/2*I*c) - 62832174025296991467089740137484772125900317855729604039945124791703344867985817106822656 0*I*a^2*e^(333/2*I*c) - 166726455941596831160623476351712587187594657642857127013830239484587313767680019339582550*I*a^2*e^(331/2*I*c) - 4356097775980642550984171697832990426607531388027684362352720744986191729307056296551868 0*I*a^2*e^(329/2*I*c) - 112046812562588121612061095534814249028168073888056316193856161668955205361761533854106 20*I*a^2*e^(327/2*I*c) - 28369169189394771245705015350036679506624416854595869868597650338389751366514329730130 80*I*a^2*e^(325/2*I*c) - 706925494058001738008498868730775412018273649883656316519821960251293960111842853827050*I*a^2*e^(323/2*I*c) - 17334585697527208030746888831957374382674815794981708396879070957517852258669515560057 0*I*a^2*e^(321/2*I*c) - 41821256883663677604463813990356906305692324432072812479020391840209738405992862342110*I*a^2*e^(319/2*I*c) - 9925525882909518673569536731354735994317981948112305002260477305616767418585528998710*I*a^2*e^(317/2*I*c) - 23169134178965336341482384795338167568011586989056711955290186861343665653694110667 90*I*a^2*e^(315/2*I*c) - 53185200307045318933327613873998530720744532344199443399324659353770060025164091429 0*I*a^2*e^(313/2*I*c) - 1200381203509440297226157984845835788179209361030428984790751950844563744476495314 20*I*a^2*e^(311/2*I*c) - 26632708990134324699199881524590925879444427734597911842625776697111614072462805500*I*a^2*e^(309/2*I*c) - 580760744355231221024154298187369701154404717090556070374986666489033632514575276 0*I*a^2*e^(307/2*I*c) - 1244458441304095207497327837779344779293432610052698964481320058973903348131364390*I*a^2*e^(305/2*I*c) - 261985740043443080388301874884500683905172501509414794896626641791046018314193300*I*a^2*e^(303/2*I*c) - 54175031376843607629356045027058758032630893385234188342863868414550489892855190*I*a^2*e^(301/2*I*c) - 110015

09051169918803406190301110072169140434739188390680687069371600096456461960*
I*a^2*e^(299/2*I*c) - 21935182533236071585983067606101945055637157176487379
78249164699044796790178970*I*a^2*e^(297/2*I*c) - 42930640633160482364568825
1632236356131380665568461698695435155472754991584480*I*a^2*e^(295/2*I*c) -
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60*I*a^2*e^(293/2*I*c) - 15538869199972063791690049288524847158110979530065
6722277863507395517286098560*I*a^2*e^(291/2*I*c) - 2872306980765485786798093
527905670394316300311494879919370292601994164873980*I*a^2*e^(289/2*I*c) - 5
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I*a^2*e^(287/2*I*c) - 92525290960177968452743510383284189038302875808137991
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81/2*I*c) - 459734613498525904391661453323499339021127870927849907055606144
578837880*I*a^2*e^(279/2*I*c) - 7525378354737695802256874598690377526529117
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273/2*I*c) - 29003446452038703680172784858940259795627649094616171753396164
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127899514211571855615342081558322168204136482117422337757176345560*I*a^2*e^
(263/2*I*c) - 1747460922600429434666452928465193776292560410220855409744205
0560*I*a^2*e^(261/2*I*c) - 232994397127263459706866547956038365266800462064
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112529662619496065070362634*I*a^2*e^(257/2*I*c) - 3842411761067265590693644
1589932580808631293346194215493375887*I*a^2*e^(255/2*I*c) - 474780239105147
2283183879516945405395337420791155799564552344*I*a^2*e^(253/2*I*c) - 571368
224054265219726596099705196924252108483077143367419935*I*a^2*e^(251/2*I*c)
- 66931651284481661864618077305876269408561834596408636101210*I*a^2*e^(249/
2*I*c) - 7627533234852264511705859368402201230654030433440301675518*I*a^2*e
^(247/2*I*c) - 845095502974670714598033224559068895202594191429069360222*I*
a^2*e^(245/2*I*c) - 9097340693680683753191568540095330911057425272127602036
7*I*a^2*e^(243/2*I*c) - 950851579990067311329922100372685364411032521560588
5183*I*a^2*e^(241/2*I*c) - 964243501752639006146026780418602842158889630673
989345*I*a^2*e^(239/2*I*c) - 9479919142233667091173328415586707603032597722
1341875*I*a^2*e^(237/2*I*c) - 902849209049851352193143124553016936636903459
6324891*I*a^2*e^(235/2*I*c) - 832235125649436217222715021488460783355491981
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9004*I*a^2*e^(231/2*I*c) - 638793699419597624062268299016624534261305551789
0*I*a^2*e^(229/2*I*c) - 530853426357042754469653748150767198919032400940*I*
a^2*e^(227/2*I*c) - 42526927818120262032236340231948484360039052121*I*a^2*e
^(225/2*I*c) - 3280313734912630390804532039053385555426092600*I*a^2*e^(223/

2*I*c) - 24331995962895346771182616362400670440877 1129*I*a^2*e^(221/2*I*c) - 173323798271177375133840381950057654500475 40*I*a^2*e^(219/2*I*c) - 118390567985118721949628445198583036973372 5*I*a^2*e^(217/2*I*c) - 774216225013482802473342351919084633096 86*I*a^2*e^(215/2*I*c) - 483885129406527646198477874028552094765 8*I*a^2*e^(213/2*I*c) - 288495194028428088627568321559245818459*I*a^2*e^(211/2*I*c) - 16374051337559882202075446312226584700*I*a^2*e^(209/2*I*c) - 882698176765813429616327000431223295*I*a^2*e^(207/2*I*c) - 450840463470511215612913391312971 12*I*a^2*e^(205/2*I*c) - 217563761452648830933979524771942 3*I*a^2*e^(203/2*I*c) - 9889261850196055639557984305782 8*I*a^2*e^(201/2*I*c) - 421941837962249501874673593318 2*I*a^2*e^(199/2*I*c) - 16832786063347696848228277962 0*I*a^2*e^(197/2*I*c) - 625090198039595779591782883 5*I*a^2*e^(195/2*I*c) - 21497811031237192467628010 1*I*a^2*e^(193/2*I*c) - 68066947833578607129093 93*I*a^2*e^(191/2*I*c) - 1970359015885088170043 91*I*a^2*e^(189/2*I*c) - 51715459730005597601 65*I*a^2*e^(187/2*I*c) - 121842706165531758225*I*a^2*e^(185/2*I*c) - 2545017361124253210*I*a^2*e^(183/2*I*c) - 46393545645311706*I*a^2*e^(181/2*I*c) - 723016295770626*I*a^2*e^(179/2*I*c) - 9365496059205*I*a^2*e^(177/2*I*c) - 96800992860*I*a^2*e^(175/2*I*c) - 748461285*I*a^2*e^(173/2*I*c) - 3848130*I*a^2*e^(171/2*I*c) - 9867*I*a^2*e^(169/2*I*c))/(e^(517*I*c) + 418*e^(516*I*c) + 87153*e^(515*I*c) + 12085216*e^(514*I*c) + 1253841160*e^(513*I*c) + 103818048048*e^(512*I*c) + 7146142307307*e^(511*I*c) + 420601518659718*e^(510*I*c) + 21608403021340047*e^(509*I*c) + 984382804329835768*e^(508*I*c) + 40261256699368950388*e^(507*I*c) + 1493326612293984160368*e^(506*I*c) + 50648660944512569972179*e^(505*I*c) + 1581796642397812408161814*e^(504*I*c) + 45759117183402579073139583*e^(503*I*c) + 1232445557346832245176696904*e^(502*I*c) + 31042222522074681615625020522*e^(501*I*c) + 734057263616388449968842366924*e^(500*I*c) + 16353164647151530240529137618111*e^(499*I*c) + 344277152012875134140739302960914*e^(498*I*c) + 6868329225263681349501997341320517*e^(497*I*c) + 130171193079172823835151430773360024*e^(496*I*c) + 2348998374244347079532766203075607598*e^(495*I*c) + 40443624781415311581857832389099634564*e^(494*I*c) + 665634670676210063754191847109971141414*e^(493*I*c) + 10490402669510897424624643766470754045064*e^(492*I*c) + 158566476113257562566117432227203884298856*e^(491*I*c) + 2302150411226234925855222345201500900533576*e^(490*I*c) + 32147887693375338817454482515377350383950278*e^(489*I*c) + 432333688644261557547944179250800440604964868*e^(488*I*c) + 5605927253067558551780452883689835514455118670*e^(487*I*c) + 70164515322544462906873548813748091084561870680*e^(486*I*c) + 848552202276512356496200136959676295361696315113*e^(485*I*c) + 9925490738534402272939987038714580495445431374618*e^(484*I*c) + 112391604542246650966429162063124338952554575234051*e^(483*I*c) + 1233096700139723365181997220750932590655287625342156*e^(482*I*c) + 13118781801172174729679339894318153694964675368481194*e^(481*I*c) + 135442594916636116191574650625331646238501101627937224*e^(480*I*c) + 1357990663161479842850642848032544982878359839580349899*e^(479*I*c) + 13231708870104896973800056733779919089340836756009580718*e^(478*I*c) + 125370496586921272662198050851269323171167338854081782959*e^(477*I*c) + 1155855412893594260345544966642687823630035899363232371472*e^(476

*I*c) + 1037518449987117550190939895659668411680299708252666032352 4*e^(475*I*c) + 907226057222088149186422846394871877646075897064939707747 76*e^(474*I*c) + 773204636991145775061462731028098506094432675788136295011 259*e^(473*I*c) + 642619548553524857642506813687046553008711400387571669138 3902*e^(472*I*c) + 521081176291770486604924009851758309875057005668778189541 41639*e^(471*I*c) + 412430698299915190848067222327219435067747934091894670488 982928*e^(470*I*c) + 318774992974434649721153604475177658232095862792381647059 0659024*e^(469*I*c) + 240708019135297571018580229143720458647469917861820397402 74325264*e^(468*I*c) + 177642829135119348577194437675802830239905460092687136 494961404333*e^(467*I*c) + 128181746491497081085960418982835900079078992116 940530461221 1251818*e^(466*I*c) + 904669352382568297904433896310426316767258 68263679113388264835491 73*e^(465*I*c) + 624735507810532953177107746902471141241251875657318484417819 04032672*e^(464*I*c) + 422276126632003687547754746555709988710527133086660161366 353656787288*e^(463*I*c) + 279470910447568661184279069497369916448225472397721020 97256613044 03472*e^(462*I*c) + 181157684956157580767103030555056255892542936591933141534 18333944596408*e^(461*I*c) + 115051481852080848873700388354521315567640365124003103 691176697194292320*e^(460*I*c) + 716099497599058079895633338552940229192858196481597830 078819711862600096*e^(459*I*c) + 436944248291011391456535313606959586266933885805341938 12141312419250470 08*e^(458*I*c) + 261439762799020214434719456650802545630568101835204018898002 85493144867448*e^(457*I*c) + 153436088745056254127327239461577071933130157764595997113 97351318318839937 6*e^(456*I*c) + 883500968821791202600774541927769200737689393513734789368397093333311961 880*e^(455*I*c) + 499251971245704398350537797660795398839736829759111495799180489368837186 7680*e^(454*I*c) + 276931165383432592259833826376479361226640338596151334898466646943614710 28310*e^(453*I*c) + 150822381431412413773566474210011746852297437597059186295243989481140398 152780*e^(452*I*c) + 806679543607589140759305010796189568269842021613388955218916278823182639 488190*e^(451*I*c) + 423812584676323258639418856985868582675532800554862743701930140585132588 7594480*e^(450*I*c) + 218764828927139099280403456125787058051215087562266963170876518242522414 18663320*e^(449*I*c) + 110969199687320974749922259595250444341219218535349655762591192576535872 151766080*e^(448*I*c) + 553269128819528612502918869558947829098021956309349843584044631512291778800081 490*e^(447*I*c) + 271184323967071752760564049014883350713024244840397831852323772194420039283010 8580*e^(446*I*c) + 130698172034882898861932055083758183921249913823401603168865071812965489810148 18410*e^(445*I*c) + 619485966530355028795643388152343106604109020378824731618047744929162165758800 77680*e^(444*I*c) + 288820755264730654469968572021047109427318619508995802020689904590319476 295408324280*e^(443*I*c) + 132475641236783747315747282116248369112096650194 8953926492241643788264284546437221120*e^(442*I*c) + 5978992172944143218459161149299819706321732111578494525245228742976468409105395536290*e^(441*I*c) + 2655680638904340753449670236910154579599486175774141478994465271212756691 0185274123140*e^(440*I*c) + 1161045516835550437629115017121163993137330211326774811128240472463617940496357264798 50*e^(439*I*c) + 499707567253859084357596314813794768069337190915967491907488904933922677579665354338960*e^(438*

I*c) + 21175897334668557071015014292104147224018388379407528416185414408885 4572994313820903682O*e^(437*I*c) + 8836720640860470305694514021547969551296 794092266983044118375790025854584036796364768280*e^(436*I*c) + 363183696523 025917321974444097981220226408246041305525067425867951832673543828478758857 30*e^(435*I*c) + 1470308167322768331630415820995920475120437252253533392388 1916519300040762954474575322174O*e^(434*I*c) + 5864034669726832427416433289 21560909375197453864243299571990964608857245771134145204174990*e^(433*I*c) + 2304351073373840357379178597673066352016682781689139842097376663118488803 841131935313641840*e^(432*I*c) + 892320944734329676333188188163847179349961 8670601026059730895962653291770229493028162575100*e^(431*I*c) + 34054053851 295569154352346722177172655187548910782008504718324168725029438589162349211 628040*e^(430*I*c) + 128098914601688539672480541830409847707367500438601536 80320449770111991128908710565948278334O*e^(429*I*c) + 475010578857601519272 316617938425222421786597241671026894318515408511467140969393115768793680*e^ (428*I*c) + 173657421881819107187419747245015812388356420995065863910233714 8122769080611680719741726053840*e^(427*I*c) + 62598721568222528436509607082 35034710201362776057176647226323089751446565288850103898153859920*e^(426*I* c) + 2225195917679577775716736603600748022221136423214639980386437096339149 1223687245823457351580140*e^(425*I*c) + 78009807368024239875613733058851417 125327114681070889640794249282633470580756557083923203377160*e^(424*I*c) + 269745801440211296972683601863878954357962308520076595177128227629273240215 209708218497363414140*e^(423*I*c) + 920089393029589032874601850027159322612 526368444771489781974361078847528891468831038436064951920*e^(422*I*c) + 309 613197162152016238030155424146545178236208681028753774890290498593402017956 5706177131421614590*e^(421*I*c) + 10279364730663840844739577862469262604648 861914297972589165243530651230690726244462479199894255180*e^(420*I*c) + 336 753988720215683759023845939827533625598010581041846273454111362624319432407 78260721756991027090*e^(419*I*c) + 1088679957318294728267329051920348867972 84621356445627530909104429486741257822633476898356826454040*e^(418*I*c) + 3 473514732147137808743520831295666012387657627759423667627333499521038897539 82636403857556867777300*e^(417*I*c) + 1093853214486220358674032434500866678 499770011305874172488975951612031456734608287095519501041975440*e^(416*I*c) + 340023256060165161752169468084708984419802883169441742479486877932895054 8418125605446882081152636090*e^(415*I*c) + 10434117516570395966653693155582 402109460348095473027807412321427346816928567197770376496170251803940*e^(41 4*I*c) + 316109393312846927506943064436184146560959695209452157430040445603 86895241801579156543451940713351730*e^(413*I*c) + 9455618025893198691933430 346636565282685809131432918916073627717587384173219645337995370567946682688 0*e^(412*I*c) + 27928575580003520667983536889816547764486498779466538782748 8933863633745047373109049265172681702585720*e^(411*I*c) + 81460818773653057 967021002527192141559718336988121429982329196978554987617596986636797665324 4974728560*e^(410*I*c) + 23465182192391051422381416330734647688991557089350 25778047637412681781575765422219127409260159438712250*e^(409*I*c) + 6675866 290371147358503766865669289010893543869830538708724945291580951179188296606 158111257706968604740*e^(408*I*c) + 187599882188655635641636357359860732782

557372574057062791088913663784284674145599304811728635385981938 90*e^(407*I*c) + 520751785187932703864292633515443069511049935425005829381552416894081386752546080308479071677485717347 20*e^(406*I*c) + 1428017924502217624831808749188252741343051332754177800847950346447635093335031505173458646596671894170 80*e^(405*I*c) + 38687621823427716563245172304997988926311528237460754169244317667399751374281359173617116965225061118648 0*e^(404*I*c) + 10355619825920029352263845779086115486121114950801935736913398647060291864824662418056649493810498562585 10*e^(403*I*c) + 27388956247952656033552276465660008862807783050848257029119389036561620042627361826577004063019140700623 80*e^(402*I*c) + 71581246868429414754738073636798397181727455815384090445033838526935969216224266967404539447181430252483 90*e^(401*I*c) + 18487405299005732693752728611876490890858357021974882371570623800186245137722660943641752976852924439870880*e^(400*I*c) + 47188220843466207695099506953573780357108897491422567898048199018207708997005333860148836479527456156014520*e^(399*I*c) + 1190418554038779649482295779483704656006066231830455295269004302092704732127738477949355860747143294799392 80*e^(398*I*c) + 2968255152826695896853182732802390500845550322034159415119626595968816157137999376800264974083056722976188 40*e^(397*I*c) + 7315849722068183628747296214039744442800104463011615273397605448153009517879855384197646562145826672199140 80*e^(396*I*c) + 1782446114931751850556354856638421901174412322298249496591658053939787198246565945975955757341933488879521 60*e^(395*I*c) + 4293206478008022126017488908851826494790620720660151451468181910917240027863968724539127659633517053002976480*e^(394*I*c) + 1022318202595486076721739030518645192356214547367429361991806349041148749612180459027459270277057151545641 4680*e^(393*I*c) + 2406878513970527716119346564450614328524136103776821681892218440014104846021094469664775272337193287459459 7328*e^(392*I*c) + 5602868342490351765849501385853451616716259103436797249817466090745066677815435327163034465077788568354762 4184*e^(391*I*c) + 1289670800847547122460236808664883849832862590255331320446361090495451440295470033477615216662839779316401 78464*e^(390*I*c) + 2935507435543427098081294535765623132997059826991874168629343739642556159671386762532763025915615235156032644 03*e^(389*I*c) + 660764473105869097691475973850837934511089033149586707982764263394766756649565279879146173318386505740391093990*e^(388*I*c) + 147093114661893434551503836230010016048212774958144392990474691022477747019889905237911449399988700319941982957 9*e^(387*I*c) + 3238491931361851476423321933539579098377735539207641467346235665823887048326949305609231585143748690203615957136*e^(386*I*c) + 705213241416219799260232652458014306098535305457293390552463312168102103734029836634220332432530707241373 9061024*e^(385*I*c) + 1518963421490880039641791172264375474804852010973481245910987881049384438106265081897119963712145874945624327441 6*e^(384*I*c) + 323627313224195494103300889436402474603783285613164229312924271459028879130716436795029090558912367551432073826 09*e^(383*I*c) + 68208033096793615683784409619244210818614991640041553424405527876893272496608324231098148502466453967157728078994*e^(382*I*c) + 142213115964814517682386667276769909482271681318790889840501039441748635545362467679832449103520321953011780083069*e^(381*I*c) + 29334492003430072028704238344834286631380628545504006782308044559

7545970023446231563554135133105493516316320059272*e^(380*I*c) + 59865014111
224185891167650518052015036400322684132808145359709358779033860921243908555
4466861582623350303061961052*e^(379*I*c) + 12087703584936583930894422220569
350632837041081405937502265398461177376482166095597348316012486982743302961
58612144*e^(378*I*c) + 2414966516810338503289076549202740511710059011795447
138773464205696455026442712426409599662771080264826008985061097*e^(377*I*c)
 + 477414111106609897022184533059496201647271423037423406066395684695092664
2685946929064114194400360936223590725470146*e^(376*I*c) + 93393419580534942
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3848*e^(374*I*c) + 34637657172671690167657344537197087048882354853993270472
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91954462609323881489157*e^(371*I*c) + 2289113117385927800914926491623468344
058677407764563261084109288572571747072892680743475502257932447419233543953
08214*e^(370*I*c) + 4208463426089493872775590214579245865781209661485610226
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+ 7658677955139627810125584446287514187109408952813047908367436615820716500
32154891482866406314834433199455459798934952*e^(368*I*c) + 1379676529796212
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026711931941947738690360722*e^(367*I*c) + 246044237584542266392708163098326
071473496809190549302714563923882719225488634936112699145769240985112087330
7487457468*e^(366*I*c) + 43439096966019321733573596877815792937012956819408
27114215433175336093967845908766740738240037114570667410936998017178*e^(365
*I*c) + 7592752700146678961153095073585015473197029746533633331549793961473
285760935801904155116764831560875947581048693527224*e^(364*I*c) + 131397714
941049338818566811514182931122425515215356868711812665798138776063481602617
47201317735782566021306798298336024*e^(363*I*c) + 2251467574130806996150616
558650287243042193021067326439299728648560064010386725360484771554706059296
7690653795951142520*e^(362*I*c) + 38199015867586087976002998756627674994795
440667903625029322346250133286489120875005013638128113893960349670280707161
530*e^(361*I*c) + 641751006932600668062380648860045971707408433000868393686
16139164529108049844675353111842725798658088840347241496099644*e^(360*I*c)
+ 1067648320171655948380852341893335287335876733299725300926610851867899392
52915937090760282232346919090426243399409323314*e^(359*I*c) + 1758962582627
559857571068126139793012658010315954843536149046728651694422320757765804471
84134141375995770091499246759528*e^(358*I*c) + 2869929436312314965572780108
515769408968264974660663275288015606770071128374319267350881209748617605113
67008815728782643*e^(357*I*c) + 4637582884573671545449376782550056887333281
455680493104239955998860128006386199040223683785911088426023420945436822991
02*e^(356*I*c) + 7422286409081731249169370494625256173341489196791182704898
31005497781951221069955839623452499748653124658873553401442137*e^(355*I*c)

+ 11766007209757869651898750508902310922046126969702774330145358957889567712307935203819931066068805646285998223417228010124*e^(354*I*c) + 184750585646245153344528430057132632378116255330456597188767075809107930679482183492817077312636463972207157013170378534*e^(353*I*c) + 287361053592234018708083543558291227727196797739472015979107027492771427686953146718268898104106138170388540349754400159 2*e^(352*I*c) + 442767307910542531852431611298569365658485193610019245704445513448330504532145251634711848813322482367046510348395480516 1*e^(351*I*c) + 675848043788852437256293594896385762669485554719551948612287756798171858726236287199496707940183195792790168258294123436 2*e^(350*I*c) + 10220423779434634851339975295163399641702122249663666193053008302026096932158568338309418237395541351819026907953220681013*e^(349*I*c) + 153128372066627753793473532128076829657125356529426315182861424030977382002707111953965821590285135327796821544519962085 92*e^(348*I*c) + 227316035661288411004195019470513676668366524180772609139448107484730848918904101812854126048548766259195656395212272232 76*e^(347*I*c) + 334358978279365813011711754596108294542981679620174198100729367333785065844280242010724531934581553340466935167423907178 32*e^(346*I*c) + 487332535059749234008522555630521014021964693136595544927256747543393752830104071677443669558289228374887058585324396544 89*e^(345*I*c) + 703863497605948315670482240613950256985012022969663003767642203366977029615910998540554113762948714374681495285247960027 62*e^(344*I*c) + 100744961851853744611754300982980166962404553836222921868484694269966120607698907046343731011160948828100276729370132819357*e^(343*I*c) + 142906319123055524246546928478954238371315925802022389236498652136839822502035155676970917419039834587967055588431566416784*e^(342*I*c) + 200906587153578804380300469501441610174521851259541929209840688960859454908519774835905895757666770857888611738751858460424*e^(341*I*c) + 279945244475039804822966730462960884492119874857791147124009079476920435941735293309305430438687333129912454196774070107264*e^(340*I*c) + 386642673050380049457382562818316962651975550990779277048740238629858795018247356162888631015687664780101205287333082748791*e^(339*I*c) + 529329252764113926003934836958243557672549238997560739214406599185047831955572583765358634395408771528009745467548382950094*e^(338*I*c) + 718361596382058249209113544487901088868388744033713210332491971375906738341551540457264804304039664255915607349801911966551*e^(337*I*c) + 966458275369037718747739130798151643483590684166832234688098291164160636418159452119815728809372125168836239364442397344064*e^(336*I*c) + 128904351529293395648063433049967704018104393562010691426731106790003005839883978769237695409054527855454499771005875477240 0*e^(335*I*c) + 170458299670782280820467821816769300269866114771277235502145654381093006963718808588282475750060524696321081035170640534940 8*e^(334*I*c) + 223489127639843946447862257830643484072461048446817785982262065869192147864526665306256382355300122800100909360675106616894 4*e^(333*I*c) + 290538572232005700195334527448948279085669252995982374953269596341416483336677312821860789932858860891617659377208862258246 4*e^(332*I*c) + 374525759487665120465733498842622638814395450198683066422234922636107960954682227606750489938670308898230818571714340721132 8*e^(331*I*c) + 4787527442780945685145204846971596165304169419328244073211459592129649 25

504887685405984472066107815128817961257498635919456O*e^(330*I*c) + 60689498
0315671224833187110532989547172280614300887801498655965368726069481655O4701
95890004511965527567432722969707577202160*e^(329*I*c) + 7629731815627821580
468992424207008366438896736333024661863838105110445148946962328297631547032
543419811821015837863013682720*e^(328*I*c) + 951303227401952295420911319126
822664229991201352566594029838106479788569090499312894803522741214403563385
177951121933527736O*e^(327*I*c) + 11764212274876484080010900714673474493371
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131657280*e^(326*I*c) + 144298162852084312045329783753756919650631542246497
4755129585150738952408322697678968860136962839990074765857920192930074426O*
e^(325*I*c) + 1755627327122429239688729140312571621349148626114547857137675
169010565606783804215103827138130037275775567632540802683454484O*e^(324*I*c
) + 2118832140588288753961019837470686269589404922607709376413251251333619O
523978949694387686059124526755048042957954264706637460*e^(323*I*c) + 253671
764391193536215322603359833481549049826061257617113006834929633908164915830
2570526873753998214963930022651265742611888O*e^(322*I*c) + 3012848241455270
326455901895308817715601343749343820107841376983544836614812175454919759112
9967170764969700180348699207838960*e^(321*I*c) + 35500103106019649876272376
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463560389282936486391655379227882295736828510632816471591059837087114907949
4360*e^(318*I*c) + 55390913044972086219432689146331566081427959896969900214
434296817731150863867056620768608187679709720152974148474907904177340*e^(31
7*I*c) + 632477741010121790517949460751755699240769813381384831580424067474
53874729387631710544995247152912205118500597511052824347680*e^(316*I*c) + 7
166032986117339552444194388928410913409115784465524567208423740243494469646
4927131812190659629511140639501743303863582092880*e^(315*I*c) + 80566249130
682684181876201882623511206363790337218011954110210642927765997644903820595
421936873565314654415769070472655401600*e^(314*I*c) + 898838158013823822139
732704779546027447928770180519633471463073724643151212749294023479428748028
99499538953561056667668891020*e^(313*I*c) + 9951220647205796595134034173802
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218532862634704659963472114657383068154049533354314677681091191041046862896
0*e^(310*I*c) + 12899507601159190341076386342709732994858617357459586270584
915928094304645874266316345401849146385539564945395221289963219868O*e^(309*
I*c) + 13852979454915108945135276957654340312633074724368003083246720589581
904356815523926487676286717275433868402784985538545321608O*e^(308*I*c) + 14
764892080554533341862312176785377739978292474830122879392434257499993795542
1765370101235122939557467548549202174550009604780*e^(307*I*c) + 15618596295
355119616973821883217369650985255158921073057836572747625947647446595542850

2336673743686499175698677875693611243400*e^(306*I*c) + 1639778160596077253752645598165058478941877851014553603918974244829984153857876057653155092083377415901430785722435051327065 80*e^(305*I*c) + 1708698488689531011768603060531039943405303903472600884326768425055551412938308389612759742689286664948457234625447091028436 80*e^(304*I*c) + 1767209299705546420045757700530957005953346598706827320319759155323875770524148663235111401176804929293545175594798992209403 60*e^(303*I*c) + 1814081687709220598203685533166973216399848626282988285695602732956308976268293452635922190345608535307337105298421485379016 80*e^(302*I*c) + 1848311519837489418176678501747082571381281721582694132877653585322407732443361919008185578299058956844948894104519215242128 40*e^(301*I*c) + 1869154744365675149263514056231175032619875083519300838245664444356891392336834117046418287621787991778480642201508183552612 80*e^(300*I*c) + 1876153931685100500714972805646035109124031329203120243708350626790376449902862853466735070934529643512579626961335117256523 20*e^(299*I*c) + 1869154744365675149263514056231175032619875083519300838245664444356891392336834117046418287621787991778480642201508183552612 80*e^(298*I*c) + 1848311519837489418176678501747082571381281721582694132877653585322407732443361919008185578299058956844948894104519215242128 40*e^(297*I*c) + 1814081687709220598203685533166973216399848626282988285695602732956308976268293452635922190345608535307337105298421485379016 80*e^(296*I*c) + 1767209299705546420045757700530957005953346598706827320319759155323875770524148663235111401176804929293545175594798992209403 60*e^(295*I*c) + 1708698488689531011768603060531039943405303903472600884326768425055551412938308389612759742689286664948457234625447091028436 80*e^(294*I*c) + 1639778160596077253752645598165058478941877851014553603918974244829984153857876057653155092083377415901430785722435051327065 80*e^(293*I*c) + 1561859629535511961697382188321736965098525515892107305783657274762594764744659554285023366737436864991756986778756936112434 00*e^(292*I*c) + 1476489208055453334186231217678537773997829247483012287939243425749999379554217653701012351229395574675485492021745500096047 80*e^(291*I*c) + 1385297945491510894513527695765434031263307472436800308324672058958190435681552392648767628671727543386840278498553854532160 80*e^(290*I*c) + 1289950760115919034107638634270973299485861735745958627058491592809430464587426631634540184914638553956494539522128996321986 80*e^(289*I*c) + 1192097137020339270557553978236884444446474243245021853286263470465996347211465738306815404953335431467768109119104104686289 60*e^(288*I*c) + 1093325373499662232039326785034263570798637070017282940110420765304039238626540189786765164173142210894499224956127328701696 60*e^(287*I*c) + 9951220647205796595134034173802354851533640337171789804085047095465753297727911349150688029072611115410194138601968956795804 0*e^(286*I*c) + 8988381580138238221397327047795460274479287701805196334714630737246431512127492940234794287480289949953895356105666766889102 0*e^(285*I*c) + 8056624913068268418187620188262351120636379033721801195411021064292776599764490382059542193687356531465441576907047265540160 0*e^(284*I*c) + 7166032986117339552444194388928410913409115784465524567208423740243494469646492713181219065962951114063950174330386358209288 0*e^(283*I*c) + 632477741010121790517949460751755699240769813381384831580424067474538747293876317

10544995247152912205118500597511052824347680*e^(282*I*c) + 5539091304497208
621943268914633156608142795989696990021443429681773115086386705662076860818
7679709720152974148474907904177340*e^(281*I*c) + 48133117678184029216503748
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417800889305382069188535790267492733646716400375634886077160928876864715428
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103600501287780602748167280705994344524013631556850073237996658500567818193
7920*e^(278*I*c) + 30128482414552703264559018953088177156013437493438201078
413769835448366148121754549197591129967170764969700180348699207838960*e^(27
7*I*c) + 253671764391193536215322603359833481549049826061257617113006834929
63390816491583025705268737539982149639300226512657426118880*e^(276*I*c) + 2
118832140588288753961019837470686269589404922607709376413251251333619052397
8949694387686059124526755048042957954264706637460*e^(275*I*c) + 17556273271
224292396887291403125716213491486261145478571376751690105656067838042151038
271381300372757755676325408026834544840*e^(274*I*c) + 144298162852084312045
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347449337127816055781198372445582656605561765808647936864186490811964341241
3644803772131657280*e^(272*I*c) + 95130322740195229542091131912682266422999
120135256659402983810647978856909049931289480352274121440356338517795112193
35277360*e^(271*I*c) + 7629731815627821580468992424207008366438896736333024
661863838105110445148946962328297631547032543419811821015837863013682720*e^
(270*I*c) + 606894980315671224833187110532989547172280614300887801498655965
3687260694816550470195890004511965527567432722969707577202160*e^(269*I*c) +
 47875274427809456851452048469715961653041694193282440732114595921296492550
48876854059844720661078151288179612574986359194560*e^(268*I*c) + 3745257594
876651204657334988426226388143954501986830664222349226361079609546822276067
504899386703088982308185717143407211328*e^(267*I*c) + 290538572232005700195
334527448948279085669252995982374953269596341416483336677312821860789932858
8608916176593772088622582464*e^(266*I*c) + 22348912763984394644786225783064
348407246104844681778598226206586919214786452666530625638235530012280010090
93606751066168944*e^(265*I*c) + 1704582996707822808204678218167693002698661
147712772355021456543810930069637188085882824757500605246963210810351706405
349408*e^(264*I*c) + 128904351529293395648063433049967704018104393562010691
4267311067900030058398839787692376954090545278554544997710058754772400*e^(2
63*I*c) + 96645827536903771874773913079815164348359068416683223468809829116
4160636418159452119815728809372125168836239364442397344064*e^(262*I*c) + 71
836159638205824920911354448790108886838874403371321033249197137590673834155
1540457264804304039664255915607349801911966551*e^(261*I*c) + 52932925276411
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4395408771528009745467548382950094*e^(260*I*c) + 38664267305038004945738256
281831696265197555099077927704874023862985879501824735616288863101568766478
0101205287333082748791*e^(259*I*c) + 27994524447503980482296673046296088449
211987485779114712400907947692043594173529330930543043868733312991245419677

4070107264*e^(258*I*c) + 200906587153578804380300469501441610174521851259541929209840688960859454908519774835905895757666770857888611738751858460424*e^(257*I*c) + 142906319123055524246546928478954238371315925802022389236498652136839822502035155676970917419039834587967055588431566416784*e^(256*I*c) + 100744961851853744611754300982980166962404553836222921868484694269966120607698907046343731011160948828100276729370132819357*e^(255*I*c) + 70386349760594831567048224061395025698501202296966300376764220336697702961591099854055411376294871437468149528524796002762*e^(254*I*c) + 48733253505974923400852255563052101402196469313659554492725674754339375283010407167744366955828922837488705858532439654489*e^(253*I*c) + 33435897827936581301171175459610829454298167962017419810072936733378506584428024201072453193458155334046693516742390717832*e^(252*I*c) + 22731603566128841100419501947051367666836652418077260913944810748473084891890410181285412604854876625919565639521227223276*e^(251*I*c) + 15312837206662775379347353212807682965712535652942631518286142403097738200270711195396582159028513532779682154451996208592*e^(250*I*c) + 10220423779434634851339975295163399641702122249663666193053008302026096932158568338309418237395541351819026907953220681013*e^(249*I*c) + 6758480437888524372562935948963857626694855547195519486122877567981718587262362871994967079401831957927901682582941234362*e^(248*I*c) + 4427673079105425318524316112985693656584851936100192457044455134483305045321452516347118488133224823670465103483954805161*e^(247*I*c) + 2873610535922340187080835435582912277271967977394720159791070274927714276869531467182688981041061381703885403497544001592*e^(246*I*c) + 1847505856462451533445284300571326323781162553304565971887670758091079306794821834928170773126364639722071570131703785334*e^(245*I*c) + 1176600720975786965189875050890231092204612696970277433014535895788956771230793520381993106606880564628599822341722801012*e^(244*I*c) + 742228640908173124916937049462525617334148919679118270489831005497781951221069955839623452499748653124658873553401442137*e^(243*I*c) + 463758288457367154544937678255005688733328145568049310423995599886012800638619904022368378591108842602342094543682299102*e^(242*I*c) + 286992943631231496557278010851576940896826497466066327528801560677007112837431926735088120974861760511367008815728782643*e^(241*I*c) + 175896258262755985757106812613979301265801031595484353614904672865169442232075776580447184134141375995770091499246759528*e^(240*I*c) + 106764832017165594838085234189333528733587673329972530092661085186789939252915937090760282232346919090426243399409323314*e^(239*I*c) + 64175100693260066806238064886004597170740843300086839368616139164529108049844675353111842725798658088840347241496099644*e^(238*I*c) + 38199015867586087976002998756627674994795440667903625029322346250133286489120875005013638128113893960349670280707161530*e^(237*I*c) + 22514675741308069961506165586502872430421930210673264392997286485600640103867253604847715547060592967690653795951142520*e^(236*I*c) + 13139771494104933881856681151418293112242551521535686871181266579813877606348160261747201317735782566021306798298336024*e^(235*I*c) + 7592752700146678961153095073585015473197029746533633331549793961473285760935801904155116764831560875947581048693527224*e^(234*I*c) + 434390969660193217335735968778157929370129568194082711421543317533609396784590876674073824

0037114570667410936998017178*e^(233*I*c) + 2460442375845422663927081630983260714734968091905493027145639238827192254886349361126991457692409851120873307487457468*e^(232*I*c) + 13796765297962120740171061880665894483554465012108901951071648603502289285868155390030628750267119319419477386903607 22*e^(231*I*c) + 76586779551396278101255844462875141871094089528130479083674366158207165003215489148286640631483443319945545979893495 2*e^(230*I*c) + 42084634260894938727755902145792458657812096614856102264700849952946845200598017511941062895621049760956600296988492 7*e^(229*I*c) + 22891131173859278009149264916234683440586774077645632610841092885725717470728926807434755022579324474192335439530821 4*e^(228*I*c) + 12324394151933238474196007258810350659640633925361639108206296996068241901174577573892181775339195446260932388148915 7*e^(227*I*c) + 65674859268867300098827375812875225610654551686261103681664007007537115778097293533565243828873383722980353200611956*e^(226*I*c) + 34637657172671690167657344537197087048882354853993270472063943078773600446542963548348101269390443464480754513928502*e^(225*I*c) + 18079820068028859970349938623007230676563314206708848499900139641237334763266479346963237936039328113185041591793848*e^(224*I*c) + 93393419580534942252517509657150573007073020838147747703062182242410226482474199560429573630558238308985473032197 57*e^(223*I*c) + 47741411110660989702218453305949620164727142303742340606639568469509266426859469290641141944003609362235907254701 46*e^(222*I*c) + 24149665168103385032890765492027405117100590117954471387734642056964550264427124264095996627710802648260089850610 97*e^(221*I*c) + 12087703584936583930894422220569350632837041081405937502265398461177376482166095597348316012486982743302961586121 44*e^(220*I*c) + 59865014111224185891167650518052015036400322684132808145359709358779033860921243908555446686158262335030306196105 2*e^(219*I*c) + 29334492003430072028704238344834286631380628545504006782308044559754597002344623156355413513310549351631632005927 2*e^(218*I*c) + 14221311596481451768238666727676990948227168131879088984050103944174863554536246767983244910352032195301178008306 9*e^(217*I*c) + 68208033096793615683784409619244210818614991640041553424405527876893272496608324231098148502466453967157728078994*e^(216*I*c) + 32362731322419549410330088943640247460378328561316422931292427145902887913071643679502909055891236755143207382609*e^(215*I*c) + 15189634214908800396417911722643754748048520109734812459109878810493844381062650818971199637121458749456243274416*e^(214*I*c) + 7052132414162197992602326524580143060985353054572933905524633121681021037340298366342203324325307072413739061024*e^(213*I*c) + 323849193136185147642332193353957909837773553920764146734623566582388704832694930560923158514374869020361595713 6*e^(212*I*c) + 147093114661893434551503836230010016048212774958144392990474691022477747019889905237911449399988700319941982957 9*e^(211*I*c) + 660764473105869097691475973850837934511089033149586707982764263394766756649565279879146173318386505740391093990*e^(210*I*c) + 29355074355434270980812945357656231329970598269918741686293437396425561596713867625327630259156152351560326440 3*e^(209*I*c) + 12896708008475471224602368086648838498328625902553313204463610904954514402954700334776152166628397793164017846 4*e^(208*I*c) + 56028683424903517658495013858534516167162591034367972498174660907450666778154353271630344650777

885683547624184*e^(207*I*c) + 2406878513970527716119346564450614328524136103776821681892218440014104846021094469664775272337193287459459732 8*e^(206*I*c) + 10223182025954860767217390305186451923562145473674293619918063490411487496121804590274592702770571515456414680*e^(205*I*c) + 4293206478008022126017488908851826494790620720660151451468181910917240027863968724539127659633517053002976480*e^(204*I*c) + 17824461149317518505563548566384219011744123222982494965916580539397871982465659459755955757341933488879521 60*e^(203*I*c) + 7315849722068183628747296214039744442800104463011615273397605448153009517879855384197646562145826672199140 80*e^(202*I*c) + 2968255152826695896853182732802390500845550322034159415119626595968816157137999376800264974083056722976188 40*e^(201*I*c) + 1190418554038779649482295779483704656006066231830455295269004302092704732127738477949355860747143294799392 80*e^(200*I*c) + 4718822084346620769509950695357378035710889749142256789804819901820770899700533386014883647952745615601452 0*e^(199*I*c) + 1848740529900573269375272861187649089085835702197488237157062380018624513772266094364175297685292443987088 0*e^(198*I*c) + 7158124686842941475473807363679839718172745581538409044503383852693596921622426696740453944718143025248390*e^(197*I*c) + 2738895624795265603355227646566000886280778305084825702911938903656162004262736182657700406301914070062380*e^(196*I*c) + 10355619825920029352263845779086115486121114950801935736913398647060291864824662418056649493810498562585 10*e^(195*I*c) + 38687621823427716563245172304997988926311528237460754169244317667399751374281359173617116965225061118648 0*e^(194*I*c) + 1428017924502217624831808749188252741343051332754177800847950346447635093335031505173458646596671894170 80*e^(193*I*c) + 5207517851879327038642926335154430695110499354250058293815524168940813867525460803084790716774857173472 0*e^(192*I*c) + 18759988218865563564163635735986073278255737257405706279108891366378428467414559930481172863538598193890*e^(191*I*c) + 6675866290371147358503766865669289010893543869830538708724945291580951179188296606158111257706968604740*e^(190*I*c) + 2346518219239105142238141633073464768899155708935025778047637412681781575765422219127409260159438712250*e^(189*I*c) + 8146081877365305796702100252719214155971833698812142998232919697855498761759698663679766532449747285 60*e^(188*I*c) + 2792857558000352066798353688981654776448649877946653878274889338636337450473731090492651726817025857 20*e^(187*I*c) + 9455618025893198691933430346636565282685809131432918916073627717587384173219645337995370567946682688 0*e^(186*I*c) + 3161093933128469275069430644361841465609596952094521574300404456038689524180157915654345194071335173 0*e^(185*I*c) + 1043411751657039596665369315558240210946034809547302780741232142734681692856719777037649617025180394 0*e^(184*I*c) + 3400232560601651617521694680847089844198028831694417424794868779328950548418125605446882081152636090*e^(183*I*c) + 109385321448622035867403243450086667849977001130587417248897595161203145673460828709551950104197544 0*e^(182*I*c) + 34735147321471378087435208312956660123876576277594236676273334995210388975398263640385755686777730 0*e^(181*I*c) + 10886799573182947282673290519203488679728462135644562753090910442948674125782263347689835682645404 0*e^(180*I*c) + 33675398872021568375902384593982753362559801058104184627345411136262431943240778260721756991027090*e^(179*I*c) + 1027

9364730663840844739577862469262604648861914297972589165243530651230690726244462479199894255180*e^(178*I*c) + 3096131971621520162380301554241465451782362086810287537748902904985934020179565706177131421614590*e^(177*I*c) + 920089393029589032874601850027159322612526368444771489781974361078847528891468831038436064951920*e^(176*I*c) + 2697458014402112969726836018638789543579623085200765951771282276292732402152097082184973634141 40*e^(175*I*c) + 78009807368024239875613733058851417125327114681070889640794249282633470580756557083923203377160*e^(174*I*c) + 22251959176795777757167366036007480222211364232146399803864370963391491223687245823457351580140*e^(173*I*c) + 62598721568222528436509607082350347102013627760571766472263230897514465652888501038981538599 20*e^(172*I*c) + 1736574218818191071874197472450158123883564209950658639102337148122769080611680719741726053840*e^(171*I*c) + 47501057885760151927231661793842522242178659724167102689431851540851146714096939311576879368 0*e^(170*I*c) + 12809891460168853967248054183040984770736750043860153680320449770111991128908710565948278 3340*e^(169*I*c) + 34054053851295569154352346722177172655187548910782008504718324168725029438589162349211628040*e^(168*I*c) + 8923209447343296763331881881638471793499618670601026059730895962653291770229493028162575100*e^(167*I*c) + 23043510733738403573791785976730663520166827816891398420973766631184888038411319353136418 40*e^(166*I*c) + 5864034669726832427416433289215609093751974538642432995719909646088572457711341452041749 90*e^(165*I*c) + 14703081673227683316304158209959204751204372522535333923881916519300040762954474575322174 0*e^(164*I*c) + 3631836965230259173219744440979812202264082460413055250674258679518326735438284787588573 0*e^(163*I*c) + 8836720640860470305694514021547969551296794092266983044118375790025854584036796364768280*e^(162*I*c) + 21175897334668557071015014292104147224018388379407528416185414408885457299431382090368 20*e^(161*I*c) + 49970756725385908435759631481379476806933719091596749190748890493392267757966535433896 0*e^(160*I*c) + 11610455168355504376291150171211639931373302113267748111282404724636179404963572647985 0*e^(159*I*c) + 26556806389043407534496702369101545795994861757741414789944652712127566910185274123140*e^(158*I*c) + 5978992172944143218459161149299819706321732111578494525245228742976468409105395536290*e^(157*I*c) + 13247564123678374731574728211624836911209665019489539264922416437882642845464372211 20*e^(156*I*c) + 28882075526473065446996857202104710942731861950899580202068990459031947629540832428 0*e^(155*I*c) + 61948596653035502879564338815234310660410902037882473161804774492916216575880077680*e^(154*I*c) + 130698172034882898861932055083758183921249913823401603168865071812965489810148184 10*e^(153*I*c) + 271184323967071752760564049014883350713024244840397831852323772194420039283010858 0*e^(152*I*c) + 55326912881952861250291886955894782909802195630934984358404463151229177880008149 0*e^(151*I*c) + 1109691996873209747499222595952504443412192185353496557625911925765358721517660 80*e^(150*I*c) + 218764828927139099280403456125787058051215087562266963170876518242522414186633 20*e^(149*I*c) + 42381258467632325863941885698586858267553280055486274370193014058513258875944 80*e^(148*I*c) + 806679543607589140759305010796189568269842021613388955218916278823182639488190*e^(147*I*c) + 1508223814314124137735664742100117468522974375970591862952439894811 4

0398152780*e^(146*I*c) + 27693116538343259225983382637647936122664033859615
13348984666469436147102831O*e^(145*I*c) + 49925197124570439835053779766O795
3988397368297591114957991804893688371867680*e^(144*I*c) + 88350096882179120
2600774541927769200737689393513734789368397093333311961880*e^(143*I*c) + 15
343608874505625412732723946157707193313015776459599711397351318318839937б*e
^(142*I*c) + 26143976279902021443471945665080254563056810183520401889800285
493144867448*e^(141*I*c) + 43694424829101139145653531360695958626693388580５
341938121413124192504700８*e^(140*I*c) + 71609949759905807989563333855294022
9192858196481597830078819711862600096*e^(139*I*c) + 115051481852080848873７0
0388354521315567640365124003103691176697194292320*e^(138*I*c) + 18115768495
615758076710303055505625589254293659193314153418333944596408*e^(137*I*c) +
279470910447568661184279069497369916448225472397721020972566130440347２*e^(1
36*I*c) + 422276126632003687547754746555709988710527133086660161366353656７8
7288*e^(135*I*c) + 624735507810532953177107746902471141241251875657318484４1
781904032672*e^(134*I*c) + 904669352382568297904433896310426316767258682636
7911338826483549173*e^(133*I*c) + 128181746491497081085960418982835900079O7
899211694053046122112518１8*e^(132*I*c) + 177642829135119348577194437675802８
302399054600926871364949614043３3*e^(131*I*c) + 240708019135297571018580229１
437204586474699178618203974027432526４*e^(130*I*c) + 31877499297443464972115
360447517765823209586279238164705906590２4*e^(129*I*c) + 412430698299915190８
4806722232721943506774793409189467048898292８*e^(128*I*c) + 5210811762917704
866049240098517583098750570056687781895414163９*e^(127*I*c) + 64261954855352
4857642506813687046553008711400387571669138390２*e^(126*I*c) + 7732046369911
457750614627310280985060944326757881362950112５9*e^(125*I*c) + 9072260572220
881491864228463948718776460758970649397077477６*e^(124*I*c) + 10375184499871
1755019093989565966841168029970825266603235２4*e^(123*I*c) + 115585541289359
4260345544966642687823630035899363232371472*e^(122*I*c) + 12537049658692127
2662198050851269323171167338854081782959*e^(121*I*c) + 13231708870104896973
800056733779919089340836756009580718*e^(120*I*c) + 135799066316147984285064
2848032544982878359839580349899*e^(119*I*c) + 1354425949166361161915746506２
5331646238501101627937224*e^(118*I*c) + 131187818011721747296793398943181５3
694964675368481194*e^(117*I*c) + 1233096700139723365181997220750932590655２8
7625342156*e^(116*I*c) + 112391604542246650966429162063124338952554575234O5
1*e^(115*I*c) + 99254907385344022729399870387145804954454313746１8*e^(114*I*
c) + 84855220227651235649620013695967629536169631511３*e^(113*I*c) + 7016451
532254446290687354881374809108456187068０*e^(112*I*c) + 560592725306755855１7
80452883689835514455118670*e^(111*I*c) + 43233368864426155754794417925080０4
40604964868*e^(110*I*c) + 3214788769337533881745448251537735038395027８*e^(1
09*I*c) + 2302150411226234925855222345201500900533576*e^(108*I*c) + 1585664
76113257562566117432227203884298856*e^(107*I*c) + 104904026695108974246246４
3766470754045064*e^(106*I*c) + 665634670676210063754191847109971141414*e^(1
05*I*c) + 4044362478141531158185783238909963456４*e^(104*I*c) + 234899837424
4347079532766203075607598*e^(103*I*c) + 1301711930791728238351514307733600２
4*e^(102*I*c) + 686832922526368134950199734132051７*e^(101*I*c) + 3442771520
128751341407393029609１4*e^(100*I*c) + 163531646471515302405291376181１1*e^(9

9*I*c) + 734057263616388449968842366924*e^(98*I*c) + 3104222252207468161562
5020522*e^(97*I*c) + 123244555734683224517669690 4*e^(96*I*c) + 457591171834
02579073139583*e^(95*I*c) + 1581796642397812408161814*e^(94*I*c) + 50648660
944512569972179*e^(93*I*c) + 1493326612293984160368*e^(92*I*c) + 4026125669
9368950388*e^(91*I*c) + 984382804329835768*e^(90*I*c) + 21608403021340047*e
^(89*I*c) + 420601518659718*e^(88*I*c) + 7146142307307*e^(87*I*c) + 1038180
48048*e^(86*I*c) + 1253841160*e^(85*I*c) + 12085216*e^(84*I*c) + 87153*e^(8
3*I*c) + 418*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) - 14*(3289*a^2*e^(1
027/2*I*c) + 1282710*a^2*e^(1025/2*I*c) + 249487095*a^2*e^(1023/2*I*c) + 32
266997620*a^2*e^(1021/2*I*c) + 3121832019735*a^2*e^(1019/2*I*c) + 241005431
923542*a^2*e^(1017/2*I*c) + 15464515215103622*a^2*e^(1015/2*I*c) + 84833912
0374641870*a^2*e^(1013/2*I*c) + 40614235388489346675*a^2*e^(1011/2*I*c) + 1
723848657664106290905*a^2*e^(1009/2*I*c) + 65678633862570503690097*a^2*e^(1
007/2*I*c) + 2268898261098769561120041*a^2*e^(1005/2*I*c) + 716593701028074
44959242727*a^2*e^(1003/2*I*c) + 2083633993393098160454111295*a^2*e^(1001/2
*I*c) + 56109286874368068446384618040*a^2*e^(999/2*I*c) + 1406472793060742817278133399694*a^2*e^(997/2*I*c) + 32964206161728793499031816369336*a^2*e^(
995/2*I*c) + 725212537982338639553752606105971*a^2*e^(993/2*I*c) + 15028015
442916472784303355549568064*a^2*e^(991/2*I*c) + 294232725411218343537913910
694524115*a^2*e^(989/2*I*c) + 5458017107743192900932192332079754800*a^2*e^(
987/2*I*c) + 96165064556404674374591793494770969751*a^2*e^(985/2*I*c) + 161
2950428548722021160870732573388748486*a^2*e^(983/2*I*c) + 25807207438709023
405564698654381610855782*a^2*e^(981/2*I*c) + 394635225337657865294965990982
357902779935*a^2*e^(979/2*I*c) + 577745991732304730583747893934339061756080
0*a^2*e^(977/2*I*c) + 81106652744979453503605904560553941804516827*a^2*e^(9
75/2*I*c) + 1093437903450413476694775388085248143435843184*a^2*e^(973/2*I*c
) + 14175642468718517834053796420531668264840828827*a^2*e^(971/2*I*c) + 176
951139921850074633194549001040224465598018440*a^2*e^(969/2*I*c) + 212931229
7800033603965109459542894851379636241390*a^2*e^(967/2*I*c) + 24727501166647
061083289528750467452594464413496712*a^2*e^(965/2*I*c) + 277411701644365486
379380075778816997842958595635411*a^2*e^(963/2*I*c) + 3009497270402664372600
336905582118636193712333696015 1*a^2*e^(961/2*I*c) + 3159972926716133282340307550312566162312484247421192 5*a^2*e^(959/2*I*c) + 321414485517907071866518
386845402404565806226718602745*a^2*e^(957/2*I*c) + 316950508533267722030982
308692690637915604267307799782 9*a^2*e^(955/2*I*c) + 303244668734682640780589924763017321813840844479667492 51*a^2*e^(953/2*I*c) + 2816984773703866067085986338188910391655591926590675984 86*a^2*e^(951/2*I*c) + 254251082202480904
911129205229592569445848693768158616849 4*a^2*e^(949/2*I*c) + 22310547737377
338728195792669384697517889412712723300156650*a^2*e^(947/2*I*c) + 190456047
3149805962622144557588301764124904793275486303954 35*a^2*e^(945/2*I*c) + 158
2600527113724210945270692154487384537712932377861494537792*a^2*e^(943/2*I*c
) + 128080366211659176149614114957033596655646623958208218794326 51*a^2*e^(9
41/2*I*c) + 1010089594483942786220652702813544882367674298741297744023721 22
*a^2*e^(939/2*I*c) + 776647773894140039601026125724635184851400081828079008
519495205*a^2*e^(937/2*I*c) + 5824867841884974805556257455805728440177379 36

7311530786366553840*a^2*e^(935/2*I*c) + 4263315518275823421343265710535950703915775821671009160815075116 0*a^2*e^(933/2*I*c) + 304650073489624069501319666840972753356711517554147295115707791952*a^2*e^(931/2*I*c) + 212633835043406710184106617998672373630972174717063715133328238589 2*a^2*e^(929/2*I*c) + 14501667734089456372413097720073331427769744768582734443920820884880*a^2*e^(927/2*I*c) + 966780886821870705669527556981593846714993014354753639462486455113 00*a^2*e^(925/2*I*c) + 630269011518917093786807783619832131991400363103105059485556854864080*a^2*e^(923/2*I*c) + 40194675719721919184952054312232644375459509531668393203124362487667 40*a^2*e^(921/2*I*c) + 250845685605254865237930757658397869396681666842509981472670609998438 64*a^2*e^(919/2*I*c) + 15324468999828010630323213348662895824501923135823131700939862310301436 0*a^2*e^(917/2*I*c) + 9167368692513268417836020231830052343308092505156853922959951743026319 40*a^2*e^(915/2*I*c) + 53717908235477759867693116721780606662943581725403268494099579866656866 40*a^2*e^(913/2*I*c) + 30841709943145755974906466306871090919705337121093845564611475205831834 740*a^2*e^(911/2*I*c) + 17355135221083011154240372999773654865957969026216133468437835469365314 3600*a^2*e^(909/2*I*c) + 957433522291942572603972061174768931380078714954598245160747546204280979860*a^2*e^(907/2*I*c) + 51796100045678396768827343720759395584038843805124732515768830454966250802 40*a^2*e^(905/2*I*c) + 274856545007448459460868646939514167299585444210880074845460582647310628654 00*a^2*e^(903/2*I*c) + 143101677493167706049469001333839411556496168357433098121521463359375252809040*a^2*e^(901/2*I*c) + 731170121584724033220964486773088649792495972559727457509380085597040672846910*a^2*e^(899/2*I*c) + 3667154885575556035354210370922300362357210115667534077868226474380300702979520*a^2*e^(897/2*I*c) + 18058262147062510799902633211036748190227439947447680116613546969431587149657730*a^2*e^(895/2*I*c) + 87328138277263357453687393632829255820603582731737822656013656737314066270769860*a^2*e^(893/2*I*c) + 41481713609834574449153927736200738051327188280314575129784821936797839984683981 0*a^2*e^(891/2*I*c) + 19358569408870667571586486961083583755863417938508550620399598916045932488876464 80*a^2*e^(889/2*I*c) + 88775072851962206182416554647787324999352216643739516507976586988773981289362029 00*a^2*e^(887/2*I*c) + 40012393889662490616271399213614257399774009402473996666416480625157884768764896580*a^2*e^(885/2*I*c) + 17728246003277186589209994770321940050940172812087015693900726494432835210867476583 0*a^2*e^(883/2*I*c) + 77229701953334031851476725644580269629749633780292101940900402066559896643815616259 0*a^2*e^(881/2*I*c) + 33084732197038235375562437697635708153491799435857062717116045714440947701529191247 30*a^2*e^(879/2*I*c) + 13940253696168079402064259692653507612945211052614130496704459947954824765033193710270*a^2*e^(877/2*I*c) + 57781194331618050184075872423561791421849035243571600320288706532981609331680804189710*a^2*e^(875/2*I*c) + 23563841440367663637496461853516823546153165121509660012355018574770419673853259822997 0*a^2*e^(873/2*I*c) + 945623831015067465565761737751781712729579043386050190772281518980746360423316243590560*a^2*e^(871/2*I*c) + 37348277775428429628209444971587641204590666972403945898256643465135512253942026312896 60*a^2*e^(869/2*I*c) + 14520043237771024867578892274833151999983805655774942432102559165991274651263356626027360*a^2* e^(867/2*I*c) + 55574294007405657159410702225110128247423080333361478620342730912591089336970706714049470*a^2*e^(865/2*I*c) + 209435641246496342288374862958056438753891068972196618627904344080420177337078104676468880*a^2*e^(863/2*I*c) + 777245248463832164443579464317740424946189628494942453508580441800744828509867291417081630*a^2*e^(861/2*I*c) + 2840894488629222010773847634980756855554160286708024741922802485707803328368153641110473200*a^2*e^(859/2*I*c) + 10228191850120678931201975750431518653979982536759165359640298725615598898961878198815353510*a^2*e^(857/2*I*c) + 36278146973732860045237468450428084776890532748926686396879733480311191302936923550162289900*a^2*e^(855/2*I*c) + 126779235914608603278467087698460483642834523473273217854867458977335775558083027540308805740*a^2*e^(853/2*I*c) + 436577096961711855769287714703357389885645132886579731206499384230924672871218525038020148230*a^2*e^(851/2*I*c) + 1481614521665051140791668111046174156161377332659662553088798777522638436965972191593890153520*a^2*e^(849/2*I*c) + 4955886749410854283637836408922370908861423693236555100736486744859805066952581996944150188670*a^2*e^(847/2*I*c) + 16340621960942206338329487769224971352662464448783601559800415763231873879690981091170280400080*a^2*e^(845/2*I*c) + 53115939393829529102737176411367113005497399315270309341108454768136564764298294135564858847390*a^2*e^(843/2*I*c) + 170230391713809375580221080355067026912456772746194729300836144395351294968707996644726411879200*a^2*e^(841/2*I*c) + 5379613186712719111935812047497642072461069415849027447356461830271249942164319267167904932016060*a^2*e^(839/2*I*c) + 1676530371645263393714584422579978782563532149514208800221991656698632081178644609104890307855200*a^2*e^(837/2*I*c) + 5153020871486711873416491815131975951900434246025142352516552818224273483297543776745652059545730*a^2*e^(835/2*I*c) + 15622306566440921026343663943462426741562514861595325201248149059018047548245480491740664747553230*a^2*e^(833/2*I*c) + 46720007375078848960039000217563851982925567103892420367979003637368846369023717951090246855155470*a^2*e^(831/2*I*c) + 137840208761877960436349652125396975133098136018690719338924949225993395730744805382442729064152410*a^2*e^(829/2*I*c) + 401239880509795846865762218014970016621860421334029285134283286090912984697175449116164770568435310*a^2*e^(827/2*I*c) + 1152461477872254543239888484515149435875834906656013841132789921648764385054810746411696406101981510*a^2*e^(825/2*I*c) + 326648792310303813099265140826940624050408404456340195828586033626485345825342237364184398762915620*a^2*e^(823/2*I*c) + 9137036326419012083117592281553565672775885047100209635745422954421398356217178283444278671884412660*a^2*e^(821/2*I*c) + 25225271662800212142969423542567302484417429310194035755111310742077579689215072021281081661345709120*a^2*e^(819/2*I*c) + 68739812560972530921511497106963251745177527056492095301601973235793309670088282296954444560031434930*a^2*e^(817/2*I*c) + 184908923994039357855011897704029603323637349730083126237154853975102904987785563933490666771915454740*a^2*e^(815/2*I*c) + 491042141856878350715681756058445138552698769297425826668396199882849855448274647622775780304699322930*a^2*e^(813/2*I*c) + 1287433080457573572306673605052106758486917694203459437629697821743582350653265565508291332729874085680*a^2*e^(811/2*I*c) + 33327945139053596821862691084016236698877248240508798156325014413926051254

15686565518742717075933147150*a^2*e^(809/2*I*c) + 8519276451134253778536171
630746078299873324316380590414453537555043854967995509903575577929995103297
680*a^2*e^(807/2*I*c) + 215049722839205503586128293099745679467390063138336
34264671213989597677643264769478110594714212525857560*a^2*e^(805/2*I*c) + 5
361029120299712924338722751074643888041739613399047540120015183682451103335
9061830417818144623930466160*a^2*e^(803/2*I*c) + 13199609109018200344705741
182539911968707125290875280387576522114186357813282793049956301611077345360
8580*a^2*e^(801/2*I*c) + 32100187008223062655215793596025520697570325967222
0019809311160664723949929848535867562171221207552583920*a^2*e^(799/2*I*c) +
77111130235309822499661250787255889026615939981922101502561489073385665349
7550312410883732182309081849060*a^2*e^(797/2*I*c) + 18298626709480313132890
141980873212635564354008538908485649418065035465017522167327656849313376367
66894640*a^2*e^(795/2*I*c) + 4289831770876915604620621605250311958677128887
569530679923476007397181724403545145491954691454914942555700*a^2*e^(793/2*I
*c) + 993597053594903087813334698317142855596825779938110671421541390503387
2603148050425223025351154130410277240*a^2*e^(791/2*I*c) + 22738199734133653
078027776734892344808364750849791537027378856109800091278175916637691635582
433639500261560*a^2*e^(789/2*I*c) + 514167531737321398666542394549591195897
55885479009835237894780038895835558829259413468345602675738630164100*a^2*e^
(787/2*I*c) + 1148901068512382915513357282655623647651210051195914970246348
15615328060989866188627682839323290553007949840*a^2*e^(785/2*I*c) + 2536975
400921549248034126032133684203102252154338121939065797094383402025646597247
21822525055232970075634740*a^2*e^(783/2*I*c) + 5536449762385042687607369329
082039089595176262840112189376452062542415310049297085380561554653739415734
77840*a^2*e^(781/2*I*c) + 1194135038218231892789214181610148708437664688719
253024539331690089016746312190822555525802303755766475255060*a^2*e^(779/2*I
*c) + 254570242524891909244474523190339270693780626351542068606228623253312
5040633932944013647476782825751916866192*a^2*e^(777/2*I*c) + 53643705817764
306760233668650266282168597296317241792638559685986189428565720429773858691
36797574101112934360*a^2*e^(775/2*I*c) + 1117406958028134317232944999929975
062830254762476589973417129071767873791620112705951792733592030136338159992
0*a^2*e^(773/2*I*c) + 23009632000715685724501189026111050742267523553057578
732719843669636960476167526014756393531959162197925032115*a^2*e^(771/2*I*c)
 + 468422396878371342691023644392364884509351945660376600521193617965104119
03219914369231181221570261150235170750*a^2*e^(769/2*I*c) + 9427988386022349
792770581337276140866027284763698893546725763459879963554847009387033061095
8925793769077443101*a^2*e^(767/2*I*c) + 18761922522118689236295432417346425
688858024568665450116181152681916742854785985688041471398993933771670754589
6*a^2*e^(765/2*I*c) + 36917803025334244712164461577663701061577527842378932
4847337963965264696957387110053345923248330973169112504125*a^2*e^(763/2*I*c
) + 71831953977036726427602319392360799636947125771739114271565574737812841
1474061415600744631353742653947474979790*a^2*e^(761/2*I*c) + 13821200824537
093338725105874120595241499792549645110661616050094795141222314527779766693
55954779387326179193890*a^2*e^(759/2*I*c) + 2629922400035909288605593228984
748106746097334648529702694924936483874523991116960016579495951972600623182

611066*a^2*e^(757/2*I*c) + 4949163663099895843813162506453820232852919885253345976704821171775106226971407006064744321532373168942138457133*a^2*e^(755/2*I*c) + 9211598000870958612872710960061163302395796931864103642364216853868494654352223629534260533174654764593528061971*a^2*e^(753/2*I*c) + 16958009786047484319864637673956168568925607647419464421111187017418214448976233879833477597585335045518017550375*a^2*e^(751/2*I*c) + 30879760370351772693035730827584443094725992387048496282785137580349540025068324342981224379621249817077351202755*a^2*e^(749/2*I*c) + 55623003428602532433026888413898233864230618083244763365901631495829738789432935549737175085734259798422054263257*a^2*e^(747/2*I*c) + 99114849858421344389405236758955308432017258578325989313493313927809241858243075104249489142628498003793332896533*a^2*e^(745/2*I*c) + 174722600888404804978530590100460003278180658978831905330154370982763984646513813160761146082864787793974499383768*a^2*e^(743/2*I*c) + 304724800478424739825811157956168270645458485759770904702074659803850468461952919986071057980917692816270458765682*a^2*e^(741/2*I*c) + 525820101170441091857872327398452496414525760936913287583911529580580538586559649846585541562686976417582636323800*a^2*e^(739/2*I*c) + 897758618407588265406502003227323745918017671431846078493905129440539575848523829309505570503467433698687391599525*a^2*e^(737/2*I*c) + 1516692011867012115321043946651658946449294899763438015725740120744131654354391550015561531757951384128294098404528*a^2*e^(735/2*I*c) + 2535555413345835541566321579671332082230745037988391269451675243964844468330679241034930206578896711879155418196133*a^2*e^(733/2*I*c) + 4194780709047280483224815833940022555816707903442864843083388983235625506900033313228628940959072838355592388518976*a^2*e^(731/2*I*c) + 6867972157551236921759647848323040789653661241470014722668084616115674752655075386898879908209190965790105909303585*a^2*e^(729/2*I*c) + 11128936663080446107330089476544296777983319792144897369857256870754469969651791477159202549359802639971419696605690*a^2*e^(727/2*I*c) + 17848741370378512799153304742903183425864668367256735229392362669226980832673201354290319227799410874360671281422106*a^2*e^(725/2*I*c) + 28334355690959100758563467839021845076342094860063858807836713503595387569246628801974220943629593333922210878751177*a^2*e^(723/2*I*c) + 44523991520646586076906786564465923060604941985183775818546461478677519510288832394715366256217063713589099772007856*a^2*e^(721/2*I*c) + 69258517208288436651591793330966261047861717319283852998403408459459819999319356554087437075858538315437799030208205*a^2*e^(719/2*I*c) + 106653261729724722932275512578847345760574095848138686047209360735188867297923054892788279482015629448673456237211040*a^2*e^(717/2*I*c) + 162600031260503579677639869749557722099259408143969483138470362784417124438163290111258560462574993542827637524092781*a^2*e^(715/2*I*c) + 245434995171968502976685079757916654632352021121878236552926031364907280287667538662828687293957579330538913455736808*a^2*e^(713/2*I*c) + 366813870230921594143108654992154299412010201906294490806412869839956392860271021521745294086086233837764981473476178*a^2*e^(711/2*I*c) + 542840959402461083096565399905340076090254992789760944337774489086299235841557039882430591018739442636384860204215400*a^2*e^(709/2*I*c) + 795502290777098171408134869560451236843469564595516149336505085105242290424758607692945

6899240074360946377032030853O5*a^2*e^(707/2*I*c) + 115445433590485736424798
2557912578718102746849691770314220186712706034099207927530450655444722398 23
2085044436220634697*a^2*e^(705/2*I*c) + 165921734007899036629562342203845 66
1808854868645754853818541069003365057305692005741496283129458820310748682 61
19787423*a^2*e^(703/2*I*c) + 236181478259240907314015171795205512015649937 5
2366198142604038664794777442942347189609677827150417171153130475586231 83*a^
2*e^(701/2*I*c) + 332988643897483299252810109420711447828595587261810071869
245761320012108001202383567924486180093181243916032344484 5807*a^2*e^(699/2*
I*c) + 465028053005713082784315362456098166784074181162617981958482480978 35
9190894501250642366183945626773997682687367273836 5*a^2*e^(697/2*I*c) + 6433
0993352691958087170206396618494599861960856359687277765646258499326392809 82
4960345969460078087581619200953257618 90*a^2*e^(695/2*I*c) + 881613168893121
1814057208115533917355801787029335575600410977242399829559924610051615513 64
6540527419139301483310423786*a^2*e^(693/2*I*c) + 119695549325675655931779 91
4014876631911499472637586508881324251962378813904578940095889045345302961 78
324030985072573618*a^2*e^(691/2*I*c) + 161007290782993092644811637343751152
1483953182188018802392446777870780979205139797156426835667768070328557751 31
51431841*a^2*e^(689/2*I*c) + 214588392496363848785337067347919252128479014 2
7210525197864886973863458734886342259576872792909047798523915929365691940*a
^2*e^(687/2*I*c) + 283390723752390156578013167975360696687889097326013890 32
46533371285062026472028365898897536267602626682275393842116870 5*a^2*e^(685/
2*I*c) + 370859455399326096372309786520403427641036077781645373158700946407
903500341770717231938920675775405104158273212020782 90*a^2*e^(683/2*I*c) + 4
8095342669966056020726545704006199266661606303610137551588780636613432106 3
7596725104903439769999847624253161931778351*a^2*e^(681/2*I*c) + 618147708 54
0153199824482447394874356055527851229789104813784350420903665006327266287 93
4972907658379772725635596095885 76*a^2*e^(679/2*I*c) + 787413258554607106990
6792098596613272993668909384846081647513493184683001031856523986637858985 63
5651761887673543969752 0*a^2*e^(677/2*I*c) + 994168666894028682059531007228 1
6261101271808450248252225798161133567643192302589923485986620585787267254766
8167325989920*a^2*e^(675/2*I*c) + 124419949314487403216172588535238853667 58
3569695346393000362307045710566468085416110994554478758231547427229315129 95
8280*a^2*e^(673/2*I*c) + 154354165743697402995415216121916387446315508628 91
2131928600309585745568868263338383595893423751250560255188896660980640*a^2*
e^(671/2*I*c) + 189832680846992441750979398054550765983447380706582698086 50
5079016572222835305196482037082520548635494540196474773032392*a^2*e^(669/2*
I*c) + 231458954877865680481711467581492320475708179284410834307431449083 29
699301573528399253315378363005782389446646638678992 0*a^2*e^(667/2*I*c) + 27
9803880980823081151507855346299192278245341814031460411506106372469276985 14
6379946315124170832410518829080258705986280*a^2*e^(665/2*I*c) + 335379844 32
6285592736695463857018418432413188766484881111912395059240855249328246830 72
977935043910823429674906143925 6880*a^2*e^(663/2*I*c) + 398612508602184099 79
7618213464893583100423327557993330634195015291012852305358265371442241359 11
3106146519054690230460080*a^2*e^(661/2*I*c) + 469811437014079742983720166 2
1303751653441794274933681143305269482262555422078791132625827649344909492 07

3035868314640200*a^2*e^(659/2*I*c) + 549140935306437649109502279093298286642071151104653437705824618506516690970915485474849970804454250926034882525081421920*a^2*e^(657/2*I*c) + 636592737563033962038907595159410207630226126748551544972393205357335273235966560353474541619072109609425303261030333480*a^2*e^(655/2*I*c) + 731962314882746930932643298184913142623544929508542538052238437217139684503440864983481224441799145110101150208078149600*a^2*e^(653/2*I*c) + 834830647252737130370352256191399634154462308618312283624738448826183345582990700043901989251342801050174088405942776680*a^2*e^(651/2*I*c) + 944553238998322012684234360243733605735140889390389676408061822904814729681532931792335624967472663525610160924422346720*a^2*e^(649/2*I*c) + 106025796374953633514781711862919397290428499069890974784826574010293877175837317687855132853273364249012490319764177944 0*a^2*e^(647/2*I*c) + 1180852990661139678826752973964900401369488895802453910984684024386892953596623999355559368055504957627536059400058806560*a^2*e^(645/2*I*c) + 1305045575264666719622445738569646486643942005634721936316646042608535115485389960589294914491574041407279419512731576020*a^2*e^(643/2*I*c) + 143137191334499328625814579465878959112813573154334449563267522698427043075293835337740680975480964484566886833882197 5120*a^2*e^(641/2*I*c) + 1558237584123540747505152782426540433864929969018290239445758871815326594322852854852718664426477851831755925555671727660*a^2*e^(639/2*I*c) + 168396739021853566943248119227362402641388949862053436879077458730298187771463996936763554251327927762169631050207413380 0*a^2*e^(637/2*I*c) + 1806862685474014061358992781500638421824105526179711819772973596359005838247462282270364980307784363004235593075525641260*a^2*e^(635/2*I*c) + 192526362237283947500511888080130802855312516229284947971945519780347026927574767180251081864547831854692676262761903477 60*a^2*e^(633/2*I*c) + 203761320423430278838887297426355980292248543580195171864518263707155037189319798754507598444565508555368911946128838508 0*a^2*e^(631/2*I*c) + 214251964619046711623814746757926022312992451440425137554782870765570734842808056050738631135790052666945878179408768316 0*a^2*e^(629/2*I*c) + 223881337720863632145627116955311108391527404449906360339719996503397886640432451200796133692815428080857357987846942914 0*a^2*e^(627/2*I*c) + 232559508450689666304119972963001914495032187554568606135867970661871572387842192521274480271052814069584804886326340162 0*a^2*e^(625/2*I*c) + 240227152626534500276407910147939754731649929031350785060489649742719688634225636482917330715633964895939957471168583534 0*a^2*e^(623/2*I*c) + 246857641395195604394202214341476123463319719794380679181903346168574735026395058628625011439317148416569985937168366882 0*a^2*e^(621/2*I*c) + 252457446685799628239354774705222304997140932533577086493004745173029888319981574827342006264621206412826186360317311322 0*a^2*e^(619/2*I*c) + 257064772383156388117355397683416885685254388955293074358989631221342578602823131157205503465755570179851665246188117902 0*a^2*e^(617/2*I*c) + 260746429867720574368683376394346344406190103001296558866913935883206050989754897202619949398240317985291179321291465344 0*a^2*e^(615/2*I*c) + 263593091107640264400012190592595214837514883339037305841170825406053370208446045909645927143009008517114278522103433236 0*a^2*e^(613/2*I*c) + 26571316314055601623005539239132253298975068920690239106683303205817633038888

817269159125294327515102322977211328837113б0*a^2*e^(611/2*I*c) + 2672256261
64032256794436570024629726576615992382345701505407820276026326693370970676б
844807754089575759625548721880960900*a^2*e^(609/2*I*c) + 268252255765808065
058923396912367219064304443221005612729202386568785237823486336038133620132
4629095652385752662511996320*a^2*e^(607/2*I*c) + 2689097015302344769335291４
993797207811237273244361433085703826600022522711966903933731338614476426885
42779676409253164100*a^2*e^(605/2*I*c) + 269301914666784120200421463622590б
37689042250377925372958544249878217206679269848399840063187311100392517878１
908847878880*a^2*e^(603/2*I*c) + 269513404031053495699935576247065494002893
25614355864085568921404953930361204955044310259895946698051324781535655629７
1060*a^2*e^(601/2*I*c) + 2696037531216064094803579134376074303754569689236４
6477143498642232094649856024504773729786159550911219227861543172305444０*a^2
*e^(599/2*I*c) + 2696037531216064094803579134376074303754569689236464771434
986422320946498560245047737297861595509112192278615431723054440*a^2*e^(597/
2*I*c) + 2695134040310534956999355762470654940028932561435586408556892140４9
539303612049550443102598959466980513247815356556297106０*a^2*e^(595/2*I*c) +
 269301914666784120200421463622590637689042250377925372958544249878217206６7
926984839984006318731110039251787819088478788８0*a^2*e^(593/2*I*c) + 268909７
015302344769335291499379720781123727324436143308570382660002252271196690393
373133861447642688542779676409253164100*a^2*e^(591/2*I*c) + 268252255765808
065058923396912367219064304443221005612729202386568785237823486336038133620
1324629095652385752662511996320*a^2*e^(589/2*I*c) + 267225626164032256794４3
657002462972657661599238234570150540782027602632669337097067668448077540895
757596255487218809609００*a^2*e^(587/2*I*c) + 265713163140556016230055392391３
225329897506892069023910668330320581763303888881726915912529432751510232297
721132883711360*a^2*e^(585/2*I*c) + 263593091107640264400012190592595214837
514883339037305841170825406053370208446045909645927143009008517114278522103
4332360*a^2*e^(583/2*I*c) + 260746429867720574368683376394346344406190103００
1296558866913935883206050989754897202619949398240317985291179321291465344０*
a^2*e^(581/2*I*c) + 257064772383156388117355397683416885685254388955293074３
589896312213425786028231311572055034657555701798516652461881179020*a^2*e^(5
79/2*I*c) + 252457446685799628239354774705222304997140932533577086493004745
173029888319981574827342006264621206412826186360317311322０*a^2*e^(577/2*I*c
) + 246857641395195604394202214341476123463319719794380679181903346168574７3
502639505862862501143931714841656998593716836688２0*a^2*e^(575/2*I*c) + 2402
271526265345002764079101479397547316499290313507850604896497427196886342256
364829173307156339648959399574711685835340*a^2*e^(573/2*I*c) + 232559508450
689666304119972963001914495032187554568606135867970661871572387842192521274
480271052814069584804886326340162０*a^2*e^(571/2*I*c) + 223881337720863632１4
562711695531110839152740444990636033971999650339788664043245120079613369281
5428080857357987846942914０*a^2*e^(569/2*I*c) + 214251964619046711623814746７
579260223129924514404251375547828707655707348428080560507386311357900526669
4587817940876831６0*a^2*e^(567/2*I*c) + 203761320423430278838887297426355980
292248543580195171864518263707155037189319798754507598444565508555368911946
1288385080*a^2*e^(565/2*I*c) + 192526362237283947500511880801308028553125１6

2292849479719455197803470269275747671802510818645478318546926762627619034776 0*a^2*e^(563/2*I*c) + 1806862685474014061358992781500638421824105526179711 8197729735963590058382474622822703649803077843630042355930755256412 60*a^2*e ^(561/2*I*c) + 1683967390218535669432481192273624026413889498620534368790774 5873029818777146399693676355425132792776216963105020741338 00*a^2*e^(559/2* I*c) + 1558237584123540747505152782426540433864929969018290239445758871815 3265943228528548527186644264778518317559255556717276 60*a^2*e^(557/2*I*c) + 1 4313719133449932862581457946587895911281357315433444956326752269842704307529 383533774068097548096448456688683388219751 20*a^2*e^(555/2*I*c) + 130504557 5264666719622445738569646486643942005634721936316646042608535115485389960589 294914491574041407279419512731576020*a^2*e^(553/2*I*c) + 11808529906611396 78826752973964900401369488895802453910984684024386892953596623999355559368055 50495762753605940005880656 0*a^2*e^(551/2*I*c) + 1060257963749536335147817 1186291939729042849906989097478482657401029387717583731768785513285327336424 9012490319764177944 0*a^2*e^(549/2*I*c) + 9445532389983220126842343602437336 0573514088939038967640806182290481472968153293179233562496747266352561016 0924422346720*a^2*e^(547/2*I*c) + 83483064725273713037035225619139963415446 23086183122836247384488261833455829907000439019892513428010501740884059427766 80*a^2*e^(545/2*I*c) + 7319623148827469309326432981849131426235449295085425 380522384372171396845034408649834812244417991451101011502080781496 00*a^2*e ^(543/2*I*c) + 6365927375630339620389075951594102076302261267485515449723932 05357335273235966560353474541619072109609425303261030333480*a^2*e^(541/2*I *c) + 5491409353064376491095022790932982866420711511046534377058246185065166 909709154854748499708044542509260348825250814219 20*a^2*e^(539/2*I*c) + 469 8114370140797492983720166213037516534417942749336811433052694822625554220787 91132625827649344909492073035868314640200*a^2*e^(537/2*I*c) + 398612508602 18409979761821346489358310042332755799333063419501529101285230535826537144224 135911310614651905469023046008 0*a^2*e^(535/2*I*c) + 3353798443262855927366 9546385701841843241318876648488111191239505924085524932824683072977935043910 823429674906143925688 0*a^2*e^(533/2*I*c) + 2798038809808230811515078553462 9919227824534181403146041150610637246927698514637994631512417083241051882908 0258705986280*a^2*e^(531/2*I*c) + 2314589548778656804817114675814923204757 0817928441083430743144908329699301573528399253315378363005782389446646638678 9920*a^2*e^(529/2*I*c) + 1898326808469924417509793980545507659834473807065 8269808650507901657222283530519648203708252054863549454019647477303239 2*a^ 2*e^(527/2*I*c) + 1543541657436974029954152161219163874463155086289121319286 00309585745568868263338383595893423751250560255188896660980640*a^2*e^(525/ 2*I*c) + 12441994931448740321617258853523885366758356969534639300036230704571 05664680854161109945544787582315474272293151299582 80*a^2*e^(523/2*I*c) + 99416866668940286820595310072281626110127180845024825225798161133567643192302 58992348598662058578726725476681673259899 20*a^2*e^(521/2*I*c) + 7874132585 54607106990679209859661327299366890938484608164751349318468300103185652398663 7858985635651761887673543969752 0*a^2*e^(519/2*I*c) + 618147708540153199824 4824473948743560555278512297891048137843504209036650063272662879349729076583 79772725635596095885 76*a^2*e^(517/2*I*c) + 480953426699660560207265457040

0619926666616063036101375515887806366134321063759672510490343976999998476242
53161931778351*a^2*e^(515/2*I*c) + 3708594553993260963723097865204034276410
360777816453731587009464079035003417707172319389206757754051041582732120207
8290*a^2*e^(513/2*I*c) + 28339072375239015657801316797536069668788909732601
389032465333712850620264720283658988975362676026266822753938421168705*a^2*e
^(511/2*I*c) + 214588392496363848785337067347919252128479014272105251978648
86973863458734886342259576872792909047798523915929365691940*a^2*e^(509/2*I*
c) + 1610072907829930926448116373437511521483953182188018802392446777870780
9792051397971564268356677680703285577513151431841*a^2*e^(507/2*I*c) + 11969
554932567565593177991401487663191149947263758650888132425196237881390457894
009588904534530296178324030985072573618*a^2*e^(505/2*I*c) + 881613168893121
181405720811553391735580178702933557560041097724239982955992461005161551364
6540527419139301483310423786*a^2*e^(503/2*I*c) + 64330993352691958087170206
396618494599861960856359687277765646258499326392809824960345969460078087581
61920095325761890*a^2*e^(501/2*I*c) + 4650280530057130827843153624560981667
840741811626179819584824809783591908945012506423661839456267739976826873672
738365*a^2*e^(499/2*I*c) + 332988643897483299252810109420711447828595587261
8100718692457613200121080012023835679244861800931812439160323444845807*a^2*
e^(497/2*I*c) + 23618147825924090731401517179520551201564993752366198142604
03866479477744294234718960967782715041717115313047558623183*a^2*e^(495/2*I*
c) + 1659217340078990366295623422038456618088548686457548538185410690033650
573056920057414962831294588203107486826119787423*a^2*e^(493/2*I*c) + 115445
433590485736424798255791257871810274684969177031422018671270603409920792753
0450655444722398232085044436220634697*a^2*e^(491/2*I*c) + 79550229077709817
140813486956045123684346956459551614933650508510524229042475860769294568992
4007436094637703203085305*a^2*e^(489/2*I*c) + 54284095940246108309656539990
534007609025499278976094433777448908629923584155703988243059101873944263638
4860204215400*a^2*e^(487/2*I*c) + 36681387023092159414310865499215429941201
020190629449080641286983995639286027102152174529408608623383776498147347617
8*a^2*e^(485/2*I*c) + 24543499517196850297668507975791665463235202112187823
6552926031364907280287667538662828687293957579330538913455736808*a^2*e^(483
/2*I*c) + 16260003126050357967763986974955772209925940814396948313847036278
4417124438163290111258560462574993542827637524092781*a^2*e^(481/2*I*c) + 10
665326172972472293227551257884734576057409584813868604720936073518886729792
3054892788279482015629448673456237211040*a^2*e^(479/2*I*c) + 69258517208288
436651591793330966261047861717319283852998403408459459819999319356554087437
075858538315437799030208205*a^2*e^(477/2*I*c) + 445239915206465860769067865
644659230606049419851837758185464614786775195102888323947153662562170637135
89099772007856*a^2*e^(475/2*I*c) + 2833435569095910075856346783902184507634
209486006385880783671350359538756924662880197422094362959333392221087875117
7*a^2*e^(473/2*I*c) + 17848741370378512799153304742903183425864668367256735
229392362669226980832673201354290319227799410874360671281422106*a^2*e^(471/
2*I*c) + 111289366630804461073300894765442967779833197921448973698572568707
54469969651791477159202549359802639971419696605690*a^2*e^(469/2*I*c) + 6867
972157551236921759647848323040789653661241470014722668084616115674752655075

3868988799082091909657901059093035855*a^2*e^(467/2*I*c) + 419478070904728048
3224815833940022555816707903442864843083388983235625506900033313228628940959
0728383555923885189 76*a^2*e^(465/2*I*c) + 253555413345835541566321579671 3
3208223074503798839126945167524396484446833067924103493020657889671187915541
8196133*a^2*e^(463/2*I*c) + 151669201186701211532104394665165894644929489 9
7634380157257401207441316543543915500155615317579513841282940984045 28*a^2*e
^(461/2*I*c) + 897758618407588265406502003227323745918017671431846078493905
12944053957584852382930950557050346743369868739159952 5*a^2*e^(459/2*I*c) +
5258201011704410918578723273984524964145257609369132875839115295805805385865
5964984658554156268697641758263632380 0*a^2*e^(457/2*I*c) + 304724800478424
7398258111579561682706454584857597709047020746598038504684619529199860710579
8091769281627045876568 2*a^2*e^(455/2*I*c) + 174722600888404804978530590100
4600032781806589788319053301543709827639846465138131607611460828647877939744
99383768*a^2*e^(453/2*I*c) + 991148498584213443894052367589553084320172585
78325989313493313927809241858243075104249489142628498003793332896533*a^2*e^
(451/2*I*c) + 556230034286025324330268884138982338642306180832447633659016 3
14958297387894329355497371750857342597984220542632 57*a^2*e^(449/2*I*c) + 30
8797603703517726930357308275844430947259923870484962827851375803495400250683
243429812243796212498170773512027 55*a^2*e^(447/2*I*c) + 169580097860474843
1986463767395616856892560764741946442111118701741821444897623387983347759758
533504551801755037 5*a^2*e^(445/2*I*c) + 921159800087095861287271096006116 3
3023957969318641036423642168538684946543522236295342605331746547645935280619
71*a^2*e^(443/2*I*c) + 494916366309989584381316250645382023285291988525334
59767048211717751062269714070060647443215323731689421384571 33*a^2*e^(441/2*
I*c) + 262992240003590928860559322898474810674609733464852970269492493648387
452399111696001657949595197260062318261106 6*a^2*e^(439/2*I*c) + 1382120082
4537093338725105874120595241499792549645110661616050094795141222314527779766
693559547793873261791938 90*a^2*e^(437/2*I*c) + 71831953977036726427602319 3
9236079963694712577173911427156557473781284114740614156007446313537426539474
74979790*a^2*e^(435/2*I*c) + 369178030253342447121644615776637010615775278
42378932484733796396526469695738711005334592324833097316911250412 5*a^2*e^(4
33/2*I*c) + 18761922522118689236295432417346425688858024568665450116181152 6
8191674285478598568804147139899393377167075458 96*a^2*e^(431/2*I*c) + 942798
8386022349792770581337276140866027284763698893546725763459879963554847009387
03306109589257937690774431 01*a^2*e^(429/2*I*c) + 468422396878371342691023 6
4439236488450935194566037660052119361796510411903219914369231181221570261150
235170750*a^2*e^(427/2*I*c) + 230096320007156857245011890261110507422675 23
553057578732719843669636960476167526014756393531959162197925032115*a^2*e^(4
25/2*I*c) + 1117406958028134317232944999929975062830254762476589973417129 07
17678737916201127059517927335920301363381599920*a^2*e^(423/2*I*c) + 5364370
5817764306760233668650266282168597296317241792638559685986189428565720429773
858691367975741011129343 60*a^2*e^(421/2*I*c) + 254570242524891909244474523
1903392706937806263515420686062286232533125040633932944013647476782825751916
866192*a^2*e^(419/2*I*c) + 119413503821823189278921418161014870843766468 87
19253024539331690089016746312190822555525802303755766475255060*a^2*e^(417/2

*I*c) + 553644976238504268760736932908203908959517626284011218937645206254241531004929708538056155465373941573477840*a^2*e^(415/2*I*c) + 2536975400921549248034126032133684203102252154338121939065797094383402025646597247218225250552329700756347 40*a^2*e^(413/2*I*c) + 1148901068512382915513357282655623647651210051195914970246348156153280609898661886276828393232905530079498 40*a^2*e^(411/2*I*c) + 514167531737321398666542394549591195897558854790098352378947800388958355588292594134683456026757386301641 00*a^2*e^(409/2*I*c) + 2273819973413365307802777673489234480836475084979153702737885610980009127817591663769163558243363950026156 0*a^2*e^(407/2*I*c) + 993597053594903087813334698317142855596825779938110671421541390503387260314805042522302535115413041027724 0*a^2*e^(405/2*I*c) + 4289831770876915604620621605250311958677128887569530679923476007397181724403545145491954691454914942555700*a^2*e^(403/2*I*c) + 182986267094803131328901419808732126355643540085389084856494180650354650175221673276568493133763676689464 0*a^2*e^(401/2*I*c) + 771111302353098224996612507872558890266159399819221015025614890733856653497550312410883732182309081849060*a^2*e^(399/2*I*c) + 321001870082230626552157935960255206975703259672220019809311160664723949929848535867562171221207552583920*a^2*e^(397/2*I*c) + 131996091090182003447057411825399119687071252908752803875765221141863578132827930499563016110773453608580*a^2*e^(395/2*I*c) + 53610291202997129243387227510746438880417396133990475401200151836824511033359061830417818144623930466160*a^2*e^(393/2*I*c) + 2150497228392055035861282930997456794673900631383363426467121398959767764326476947811059471421252585756 0*a^2*e^(391/2*I*c) + 8519276451134253778536171630746078299873324316380590414453537555043854967995509903575577929995103297680*a^2*e^(389/2*I*c) + 3332794513905359682186269108401623669887724824050879815632501441392605125415686565518742717075933147150*a^2*e^(387/2*I*c) + 128743308045757357230667360505210675848691769420345943762969782174358235065326556550829133272987408568 0*a^2*e^(385/2*I*c) + 491042141856878350715681756058445138552698769297425826668396199882849855448274647622775780304699322930*a^2*e^(383/2*I*c) + 1849089239940393578550118977040296033236373497300831262371548539751029049877855639334906667719154547 40*a^2*e^(381/2*I*c) + 687398125609725309215114971069632517451775270564920953016019732357933096700882822969544445600314349 30*a^2*e^(379/2*I*c) + 252252716628002121429694235425673024844174293101940357551113107420775796892150720212810816613457091 20*a^2*e^(377/2*I*c) + 913703632641901208311759228155356567277588504710020963574542295442139835621717828344427867188441266 0*a^2*e^(375/2*I*c) + 326648792310303813099926514082694062405040840445634019582858603362648534582534223736418439876291562 0*a^2*e^(373/2*I*c) + 115246147787225454323988848451514943587583490665601384113278992164876438505481074641169640610198151 0*a^2*e^(371/2*I*c) + 401239880509795846865762218014970016621860421334029285134283286090912984697175449116164770568435310*a^2*e^(369/2*I*c) + 13784020876187796043634965212539697513309813601869071933892494922599339573074480538244272906415241 0*a^2*e^(367/2*I*c) + 467200073750788489600390002175638519829255671038924203679790036373688463690237179510902468551554 70*a^2*e^(365/2*I*c) + 156223065664409210263436639434624267415625148615953252012481490590180475482454804917406647475532 30*a^2*e^(363/2*I*c) + 515302087148

6711873416491815131975951900434246025142352516552818224273483297543776745652059545730*a^2*e^(361/2*I*c) + 1676530371645263393714584422579978782563532149514208800221991656698632081178644609104890307855200*a^2*e^(359/2*I*c) + 5379613186712719119358120474976420724610694158490274473564618302712499421643192671679049320160600*a^2*e^(357/2*I*c) + 17023039171380937558022108035506702691245677274619472930083614439535129496870799664472641187920 0*a^2*e^(355/2*I*c) + 5311593939382952910273717641136711300549739931527030934110845476813656476429829413556485884739 0*a^2*e^(353/2*I*c) + 16340621960942206338329487769224971352662464448783601559800415763231873879690981091170280400080*a^2*e^(351/2*I*c) + 4955886749410854283637836408922370908861423693236555100736486744859805066952581996944150188670*a^2*e^(349/2*I*c) + 14816145216650511407916681110461741561613773326596625530887987775226384369659721915938901535 20*a^2*e^(347/2*I*c) + 4365770969617118557692877147033573898856451328865797312064993842309246728712185250380201482 30*a^2*e^(345/2*I*c) + 12677923591460860327846708769846048364283452347327321785486745897733577555808302754030880574 0*a^2*e^(343/2*I*c) + 3627814697373286004523746845042808477689053274892668639687973348031119130293692355016228990 0*a^2*e^(341/2*I*c) + 10228191850120678931201975750431518653979982536759165359640298725615598898961878198815353510*a^2*e^(339/2*I*c) + 2840894488629222010773847634980756855554160286708024741922802485707803328368153641110473200*a^2*e^(337/2*I*c) + 777245248463832164443579464317740424946189628494942453508580441800744828509867291417081630*a^2*e^(335/2*I*c) + 209435641246496342288374862958056438753891068972196618627904344080420177337078104676468880*a^2*e^(333/2*I*c) + 5557429400740565715941070222511012824742308033336147862034273091259108933697070671404947 0*a^2*e^(331/2*I*c) + 14520043237771024867578892274833151999983805655774942432102559165991274651263356626027360*a^2*e^(329/2*I*c) + 373482777754284296282094449715876412045906669724039458982566434651355122539420263128966 0*a^2*e^(327/2*I*c) + 945623831015067465565761737751781712729579043386050190772281518980746360423316243590560*a^2*e^(325/2*I*c) + 235638414403676636374964618535168235461531651215096600123550185747704196738532598229970*a^2*e^(323/2*I*c) + 577811943316180501840758724235617914218490352435716003202887065329816093316808041897 10*a^2*e^(321/2*I*c) + 1394025369616807940206425969265350761294521105261413049670445994795482476503319371027 0*a^2*e^(319/2*I*c) + 330847321970382353755624376976357081534917994358570627171160457144409477015291912473 0*a^2*e^(317/2*I*c) + 772297019533340318514767256445802696297496337802921019409000402066559896643815616259 0*a^2*e^(315/2*I*c) + 177282460032771865892099947703219400509401728120870156939007264944328352108674765830*a^2*e^(313/2*I*c) + 4001239388966249061627139921361425739977400940247399666641648062515788476876489658 0*a^2*e^(311/2*I*c) + 887750728519622061824165546477873249993522166437395165079765869887739812893620290 0*a^2*e^(309/2*I*c) + 193585694088706675715864869610835837558634179385085506203995989160459324888764648 0*a^2*e^(307/2*I*c) + 4148171360983457444915392773620073805132718828031457512978482193679783998468398 10*a^2*e^(305/2*I*c) + 873281382772633574536873936328292558206035827317378226560136567373140662707698 60*a^2*e^(303/2*I*c) + 1805826214706251079990263321103674819022743994744768011661354696943158714965773

0*a^2*e^(301/2*I*c) + 3667154885575556035354210370922300362357210115667534077868226474380300702979520*a^2*e^(299/2*I*c) + 731170121584724033220964486773088649792495972559727457509380085597040672846910*a^2*e^(297/2*I*c) + 143101677493167706049469001333839411556496168357433098121521463359375252809040*a^2*e^(295/2*I*c) + 27485654500744845946086864693951416729958544421088007484546058264731062865400*a^2*e^(293/2*I*c) + 5179610004567839676882734372075939558403884380512473251576883045496625080240*a^2*e^(291/2*I*c) + 957433522291942572603972061174768931380078714954598245160747546204280979860*a^2*e^(289/2*I*c) + 173551352210830111542403729997736548659579690262161334684378354693653143600*a^2*e^(287/2*I*c) + 30841709943145755974906466306871090919705337121093845564611475205831834740*a^2*e^(285/2*I*c) + 5371790823547775986769311672178060666294358172540326849409957986665686640*a^2*e^(283/2*I*c) + 916736869251326841783602023183005234330809250515685392295995174302631940*a^2*e^(281/2*I*c) + 153244689998280106303232133486628958245019231358231317009398623103014360*a^2*e^(279/2*I*c) + 25084568560525486523793075765839786939668166684250998147267060999843864*a^2*e^(277/2*I*c) + 4019467571972191918495205431223264437545950953166839320312436248766740*a^2*e^(275/2*I*c) + 630269011518917093786807783619832131991400363103105059485556854864080*a^2*e^(273/2*I*c) + 96678088682187070566952755698159384671499301435475363946248645511300*a^2*e^(271/2*I*c) + 14501667734089456372413097720073331427769744768582734443920820884880*a^2*e^(269/2*I*c) + 2126338350434067101841066179986723736309721747170637151333282385892*a^2*e^(267/2*I*c) + 304650073489624069501319666840972753356711517554147295115707791952*a^2*e^(265/2*I*c) + 42633155182758234213432657105359507039157758216710091608150751160*a^2*e^(263/2*I*c) + 5824867841884974805556257455805728440177379367311530786366553840*a^2*e^(261/2*I*c) + 776647773894140039601026125724635184851400081828079008519495205*a^2*e^(259/2*I*c) + 101008959448394278622065270281354488236767429874129774402372122*a^2*e^(257/2*I*c) + 12808036621165917614961411495703359665564662395820821879432651*a^2*e^(255/2*I*c) + 1582600527113724210945270692154487384537712932377861494537792*a^2*e^(253/2*I*c) + 1904560473149805962622214455758830176412490479327548630395435*a^2*e^(251/2*I*c) + 22310547737377338728195792669384697517889412712723300156650*a^2*e^(249/2*I*c) + 2542510822024809049111292052295925694458486937681586168494*a^2*e^(247/2*I*c) + 281698477370386606708598633818891039165559192659067598486*a^2*e^(245/2*I*c) + 30324466873468264078058992476301732181384084447966749251*a^2*e^(243/2*I*c) + 3169505085332677220309823086926906379156042673077997829*a^2*e^(241/2*I*c) + 321414485517907071866518386845402404565806226718602745*a^2*e^(239/2*I*c) + 31599729267161332823403075503125661623124842474211925*a^2*e^(237/2*I*c) + 3009497270402664372603369055821186361937123336960151*a^2*e^(235/2*I*c) + 277411701644365486379380075778816997842958595635411*a^2*e^(233/2*I*c) + 2472750116664706108328952875046745259446413496712*a^2*e^(231/2*I*c) + 2129312297800033603965109459542894851379636241390*a^2*e^(229/2*I*c) + 176951139921850074633194549001040224465598018440*a^2*e^(227/2*I*c) + 14175642468718517834053796420531668264840828827*a^2*e^(225/2*I*c) + 1093437903450413476694775388085248143435843184*a^2*e^(223/2*I*c) + 81106652744979453503605904560553941804516827*a^2*e^(2

21/2*I*c) + 577745991732304730583747893934339061756080O*a^2*e^(219/2*I*c) +
 3946352253376578652949659909823579027799935*a^2*e^(217/2*I*c) + 25807207438
709023405564698654381610855782*a^2*e^(215/2*I*c) + 1612950428548722021160870732573388748486*a^2*e^(213/2*I*c) + 96165064556404674374591793494770969751*a^2*e^(211/2*I*c) + 5458017107743192900932192332079754800*a^2*e^(209/2*I*c) + 294232725411218343537913910694524115*a^2*e^(207/2*I*c) + 15028015442916472784303355549568064*a^2*e^(205/2*I*c) + 725212537982338639553752606105971*a^2*e^(203/2*I*c) + 32964206161728793499031816369336*a^2*e^(201/2*I*c) + 1406472793060742817278133399694*a^2*e^(199/2*I*c) + 56109286874368068446384618040*a^2*e^(197/2*I*c) + 2083633993393098160454111295*a^2*e^(195/2*I*c) + 71659370102807444959242727*a^2*e^(193/2*I*c) + 2268898261098769561120041*a^2*e^(191/2*I*c) + 65678633862570503690097*a^2*e^(189/2*I*c) + 1723848657664106290905*a^2*e^(187/2*I*c) + 40614235388489346675*a^2*e^(185/2*I*c) + 848339120374641870*a^2*e^(183/2*I*c) + 15464515215103622*a^2*e^(181/2*I*c) + 241005431923542*a^2*e^(179/2*I*c) + 3121832019735*a^2*e^(177/2*I*c) + 32266997620*a^2*e^(175/2*I*c) + 249487095*a^2*e^(173/2*I*c) + 1282710*a^2*e^(171/2*I*c) + 3289*a^2*e^(169/2*I*c))/(e^(517*I*c) + 418*e^(516*I*c) + 87153*e^(515*I*c) + 12085216*e^(514*I*c) + 1253841160*e^(513*I*c) + 103818048048*e^(512*I*c) + 7146142307307*e^(511*I*c) + 420601518659718*e^(510*I*c) + 21608403021340047*e^(509*I*c) + 984382804329835768*e^(508*I*c) + 40261256699368950388*e^(507*I*c) + 1493326612293984160368*e^(506*I*c) + 50648660944512569972179*e^(505*I*c) + 1581796642397812408161814*e^(504*I*c) + 45759117183402579073139583*e^(503*I*c) + 1232445557346832245176696904*e^(502*I*c) + 310422225220746816156250205 22*e^(501*I*c) + 734057263616388449968842366924*e^(500*I*c) + 16353164647151530240529137618111*e^(499*I*c) + 34427715201287513414073930296 0914*e^(498*I*c) + 6868329225263681349501997341320517*e^(497*I*c) + 130171193079172823835151430773360024*e^(496*I*c) + 23489983742443470795327662030756 07598*e^(495*I*c) + 40443624781415311581857832389099634564*e^(494*I*c) + 665634670676210063754191847109971141414*e^(493*I*c) + 10490402669510897424624643766470754045064*e^(492*I*c) + 15856647611325756256611743222720388 4298856*e^(491*I*c) + 2302150411226234925855222345201500900533576*e^(490*I*c) + 32147887693375338817454482515377350383950278*e^(489*I*c) + 43233368864426155754794417925080044060496486 8*e^(488*I*c) + 5605927253067558551780452883689835514455118670*e^(487*I*c) + 7016451532254446290687354881374809108456 1870680*e^(486*I*c) + 848552202276512356496200136959676295361696315113*e^(485*I*c) + 9925490738534402272939987038714580495445431374618*e^(484*I*c) + 112391604542246650966429162063124338952554575234051*e^(483*I*c) + 1233096700139723365181997220750932590655287625342156*e^(482*I*c) + 131187818011721747296793398943181536949646753684811 94*e^(481*I*c) + 13544259491663611619157465062533164623850110162793 7224*e^(480*I*c) + 135799066316147984285064284803254498287835983958034 9899*e^(479*I*c) + 1323170887010489697380005673377991908934083675600958 0718*e^(478*I*c) + 1253704965869212726621980508512693231711673388540817829 59*e^(477*I*c) + 1155855412893594260345544966642687823630035899363232371472*e^(476*I*c) + 1037518449987117550190939895659668411680299708252666032352 4*e^(475*I*c) + 907226057222088149186422846394871877646075897

06493970774776*e^(474*I*c) + 773204636991145775061462731028098506094432675788136295011259*e^(473*I*c) + 6426195485535248576425068136870465530087114003875716691383902*e^(472*I*c) + 52108117629177048660492400985175830987505700566877818954141639*e^(471*I*c) + 412430698299915190848067222327219435067747934091894670488982928*e^(470*I*c) + 3187749929744346497211536044751776582320958627923816470590659024*e^(469*I*c) + 24070801913529757101858022914372045864746991786182039740274325264*e^(468*I*c) + 177642829135119348577194437675802830239905460092687136494961404333*e^(467*I*c) + 1281817464914970810859604189828359000790789921169405304612211251818*e^(466*I*c) + 9046693523825682979044338963104263167672586826367911338826483549173*e^(465*I*c) + 62473550781053295317710774690247114124125187565731848441781904032672*e^(464*I*c) + 422276126632003687547754746555709988710527133086660161366353656787288*e^(463*I*c) + 2794709104475686611842790694973699164482254723977210209725661304403472*e^(462*I*c) + 18115768495615758076710303055505625589254293659193314153418333944596408*e^(461*I*c) + 115051481852080848873700388354521315567640365124003103691176697194292320*e^(460*I*c) + 716099497599058079895633338552940229192858196481597830078819711862600096*e^(459*I*c) + 4369442482910113914565353136069595862669338858053419381214131241925047008*e^(458*I*c) + 26143976279902021443471945665080254563056810183520401889800285493144867448*e^(457*I*c) + 153436088745056254127327239461577071933130157764595997113973513183188399376*e^(456*I*c) + 883500968821791202600774541927769200737689393513734789368397093333311961880*e^(455*I*c) + 4992519712457043983505377976607953988397368297591114957991804893688371867680*e^(454*I*c) + 27693116538343259225983382637647936122664033859615133489846664694361471028310*e^(453*I*c) + 150822381431412413773566474210011746852297437597059186295243989481140398152780*e^(452*I*c) + 806679543607589140759305010796189568269842021613388955218916278823182639488190*e^(451*I*c) + 4238125846763232586394188569858685826755328005548627437019301405851325887594480*e^(450*I*c) + 21876482892713909928040345612578705805121508756226696317087651824252241418663320*e^(449*I*c) + 110969199687320974749922259595250444341219218535349655762591192576535872151766080*e^(448*I*c) + 5532691288195286125029188695589478290980219563093498435584044631512291778800081490*e^(447*I*c) + 2711843239670717527605640490148833507130242448403978318523237721944200392830108580*e^(446*I*c) + 13069817203488289886193205508375818392124991382340160316886507181296548981014818410*e^(445*I*c) + 61948596653035502879564338815234310660410902037882473161804774492916216575880077680*e^(444*I*c) + 288820755264730654469968572021047109427318619508995802020689904590319476295408324280*e^(443*I*c) + 1324756412367837473157472821162483691120966501948953926492241643788264284546437221120*e^(442*I*c) + 5978992172944143218459161149299819706321732111578494525245228742976468409105395536290*e^(441*I*c) + 26556806389043407534496702369101545795994861757741414789944652712127566910185274123140*e^(440*I*c) + 116104551683555043762911501712116399313733021132677481112824047246361794049635726479850*e^(439*I*c) + 499707567253859084357596314813794768069337190915967491907488904933922677579665354338960*e^(438*I*c) + 2117589733466855707101501429210414722401838837940752841618541440888545729943138209036820*e^(437*I*c) + 88367206408604703

0569451402154796955129679409226698304411837579002585458403679636476828O*e^(
436*I*c) + 3631836965230259173219744440979812202264082460413055250674258679
5183267354382847875885730*e^(435*I*c) + 147030816732276833163041582099592O4
751204372522535333923881916519300040762954474575322174O*e^(434*I*c) + 58640
3466972683242741643328921560909375197453864243299571990964608857245771134l4
52O4174990*e^(433*I*c) + 2304351073373840357379178597673066352016682781689l
39842097376663118488803841131935313641840*e^(432*I*c) + 8923209447343296763
3318818816384717934996186706010260597308959626532917702294930281625751OO*e^
(431*I*c) + 340540538512955691543523467221771726551875489107820085047183241
6872502943858916234921162804O*e^(430*I*c) + 1280989146016885396724805418304
09847707367500438601536803204497701119911289087105659482783340*e^(429*I*c)
+ 4750105788576015192723166179384252224217865972416710268943185154085114671
4096939311576879368O*e^(428*I*c) + 1736574218818191071874197472450158123883
564209950658639102337148122769080611680719741726053840*e^(427*I*c) + 625987
2156822252843650960708235034710201362776057176647226323089751446565288850l0
3898153859920*e^(426*I*c) + 22251959176795777757167366036007480222211364232
146399803864370963391491223687245823457351580140*e^(425*I*c) + 780098073680
242398756137330588514171253271146810708896407942492826334705807565570839232
03377160*e^(424*I*c) + 269745801440211296972683601863878954357962308520O765
95177128227629273240215209708218497363414140*e^(423*I*c) + 9200893930295890
328746018500271593226125263684447714897819743610788475288914688310384360649
51920*e^(422*I*c) + 3096131971621520162380301554241465451782362086810287537
748902904985934020179565706177131421614590*e^(421*I*c) + 102793647306638408
447395778624692626046488619142979725891652435306512306907262444624791998942
55180*e^(420*I*c) + 3367539887202156837590238459398275336255980105810418462
734541113626243194324077826072175699102709O*e^(419*I*c) + 10886799573182947
282673290519203488679728462135644562753090910442948674125782263347689835682
6454040*e^(418*I*c) + 34735147321471378087435208312956660123876576277594236
676273334995210388975398263640385755686777730O*e^(417*I*c) + 10938532144862
203586740324345008666784997700113058741724889759516120314567346082870955195
01041975440*e^(416*I*c) + 3400232560601651617521694680847089844198028831694
417424794868779328950548418125605446882081152636090*e^(415*I*c) + 104341175
1657039596665369315558240210946034809547302780741232142734681692856719777O3
76496170251803940*e^(414*I*c) + 3161093933128469275069430644361841465609596
9520945215743004044560386895241801579156543451940713351730*e^(413*I*c) + 94
556180258931986919334303466365652826858091314329189160736277175873841732196
453379953705679466826880*e^(412*I*c) + 279285755800035206679835368898165477
644864987794665387827488933863633745047373109049265172681702585720*e^(411*I
*c) + 814608187736530579670210025271921415597183369881214299823291969785549
876175969866367976653244974728560*e^(410*I*c) + 234651821923910514223814163
307346476889915570893502577804763741268178157576542221912740926015943871225
0*e^(409*I*c) + 66758662903711473585037668656692890108935438698305387087249
45291580951179188296606158111257706968604740*e^(408*I*c) + 1875998821886556
356416363573598607327825573725740570627910889136637842846741455993048117286
3538598193890*e^(407*I*c) + 52075178518793270386429263351544306951104993542

500582938155241689408138675254608030847907167748571734720*e^(406*I*c) + 142
801792450221762483180874918825274134305133275417780084795034644763509333503
150517345864659667189417080*e^(405*I*c) + 386876218234277165632451723049979
889263115282374607541692443176673997513742813591736171169652250611186480*e^
(404*I*c) + 103556198259200293522638457790861154861211149508019357369133986
4706029186482466241805664949381049856258510*e^(403*I*c) + 27388956247952656
033552276465660008862807783050848257029119389036561620042627361826577004063
01914070062380*e^(402*I*c) + 7158124686842941475473807363679839718172745581
538409044503383852693596921622426696740453944718143025248390*e^(401*I*c) +
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22660943641752976852924439870880*e^(400*I*c) + 4718822084346620769509950695
357378035710889749142256789804819901820770899700533386014883647952745615601
4520*e^(399*I*c) + 11904185540387796494822957794837046560060662318304552952
6900430209270473212773847794935586074714329479939280*e^(398*I*c) + 29682551
528266958968531827328023905008455503220341594151196265959688161571379993768
0026497408305672297618840*e^(397*I*c) + 73158497220681836287472962140397444
4280010446301161527339760544815300951787985538419764656214582667219914080*e
^(396*I*c) + 17824461149317518505563548566384219011744123222982494965916580
53939787198246565945975595575734193348887952160*e^(395*I*c) + 4293206478008
022126017488908851826494790620720660151451468181910917240027863968724539127
659633517053002976480*e^(394*I*c) + 102231820259548607672173903051864519235
62145473674293619918063490411487496121804590274592702770571515456414680*e^(
393*I*c) + 2406878513970527716119346564450614328524136103776821681892218440
0141048460210944696647752723371932874594597328*e^(392*I*c) + 56028683424903
517658495013858534516167162591034367972498174660907450666778154353271630344
650777885683547624184*e^(391*I*c) + 128967080084754712246023680866488384983
286259025533132044636109049545144029547003347761521666283977931640178464*e^
(390*I*c) + 293550743554342709808129453576562313299705982699187416862934373
964255615967138676253276302591561523515603264403*e^(389*I*c) + 660764473105
869097691475973850837934511089033149586707982764263394766756649565279879146
173318386505740391093990*e^(388*I*c) + 147093114661893434551503836230010016
048212774958144392990474691022477747019889905237911449399988700319941982957
9*e^(387*I*c) + 32384919313618514764233219335395790983777355392076414673462
35665823887048326949305609231585143748690203615957136*e^(386*I*c) + 7052132
414162197992602326524580143060985353054572933905524633121681021037340298366
342203324325307072413739061024*e^(385*I*c) + 151896342149088003964179117226
437547480485201097348124591098788104938443810626508189711996371214587494562
43274416*e^(384*I*c) + 3236273132241954941033008894364024746037832856131642
2931292427145902887913071643679502909055891236755143207382609*e^(383*I*c) +
68208033096793615683784409619244210818614991640041553424405527876893272496
608324231098148502466453967157728078994*e^(382*I*c) + 142213115964814517682
386667276769909482271681318790889840501039441748635545362467679832449103520
321953011780083069*e^(381*I*c) + 293344920034300720287042383448342866313806
285455040067823080445597545970023446231563554135133105493516316320059272*e^
(380*I*c) + 598650141112241858911676505180520150364003226841328081453597093

5877903386092124390855544668615826233503030619610 52*e^(379*I*c) + 120877035
84936583930894422220569350632837041081405937502265398461177376482166095597 3
48316012486982743302961586121 44*e^(378*I*c) + 2414966516810338503289076549 2
02740511710059011795447138773464205696455026442712426409599662771080264826 0
08985061097*e^(377*I*c) + 47741411110660989702218453305949620164727142303 74
23406066395684695092664268594692906411419440036093622359072547014 6*e^(376*I
*c) + 933934195805349422525175096571505730070730208381477477030621822424102
26482474199560429573630558238308985473032197 57*e^(375*I*c) + 18079820068028
85997034993862300723067656331420670884849990013964123733476326647934696323 7
93603932811318504159179384 8*e^(374*I*c) + 346376571726716901676573445371970
87048882354853993270472063943078773600446542963548348101269390443464480754 5
13928502*e^(373*I*c) + 656748592688673000988273758128752256106545516862611 0
36816640070075371157780972935335652438288733837229803532006119 56*e^(372*I*c
) + 123243941519332384741960072588103506596406339253616391082062969960682 41
90117457757389218177533919544626093238814891 57*e^(371*I*c) + 22891131173859
27800914926491623468344058677407764563261084109288572571747072892680743475 5
02257932447419233543953082 14*e^(370*I*c) + 420846342608949387277559021457 92
45865781209661485610226470084995294684520059801751194106289562104976095660 0
2969884927*e^(369*I*c) + 765867795513962781012558444628751418710940895281 30
47908367436615820716500321548914828664063148344331994554597989349 52*e^(368*
I*c) + 13796765297962120740171061880665894483554465012108901951071648603502
28928586815539003062875026711931941947738690360722*e^(367*I*c) + 2460442375
84542266392708163098326071473496809190549302714563923882719225488634936112 6
99145769240985112087330748745746 8*e^(366*I*c) + 4343909696601932173357359 68
77815792937012956819408271142154331753360939678459087667407382400371145706 6
7410936998017178*e^(365*I*c) + 75927527001466789611530950735850154731970297
46533633331549793961473285760935801904155116764831560875947581048693527224*
e^(364*I*c) + 13139771494104933881856681151418293112242551521535686871181 26
65798138776063481602617472013177357825660213067982983360 24*e^(363*I*c) + 22
514675741308069961506165586502872430421930210673264392997286485600640103867
25360484771554706059296769065379595114252 0*e^(362*I*c) + 381990158675860879
76002998756627674994795440667903625029322346250133286489120875005013638128 1
138939603496702807071615 30*e^(361*I*c) + 6417510069326006680623806488600459
71707408433000868393686161391645291080498446753531118427257986580888403472 4
1496099644*e^(360*I*c) + 106764832017165594838085234189333528733587673329 97
25300926610851867899392529159370907602822323469190904262433994093233 14*e^(3
59*I*c) + 175896258262755985757106812613979301265801031595484353614904672 86
51694422320757765804471841341413759957700914992467595 28*e^(358*I*c) + 28699
29436312314965572780108515769408968264974660663275288015606770071128374319 2
67350881209748617605113670088157287826 43*e^(357*I*c) + 46375828845736715454
49376782550056887333281455680493104239955998860128006386199040223683785911 0
884260234209454368229910 2*e^(356*I*c) + 742228640908173124916937049462525 61
73341489196791182704898310054977819512210699558396234524997486531246588735 5
3401442137*e^(355*I*c) + 117660072097578696518987505089023109220461269697 02
77433014535895788956771230793520381993106606880564628599822341722801012*e^(

354*I*c) + 1847505856462451533445284300571326323781162553304565971887670758
0910793067948218349281707731263646397220715701317037853334*e^(353*I*c) + 287
3610535922340187080835435582912277271967977394720159791070274927714276869553
14671826889810410613817038854034975440015 92*e^(352*I*c) + 44276730791054253
1852431611298569365658485193610019245704445513448330504532145251634711848811
3322482367046510348395480516 1*e^(351*I*c) + 675848043788852437256293594896 3
8576266948555471955194861228775679817185872623628719949670794018319579279 01
682582941234362*e^(350*I*c) + 1022042377943463485133997529516339964170212 22
4966366619305300830202609693215856833830941823739554135181902690795322068 10
13*e^(349*I*c) + 153128372066627753793473532128076829657125356529426315182 8
6142403097738200270711195396582159028513532779682154451996208592*e^(348*I*c
) + 2273160356612884110041950194705136766683665241807726091394481074847308 4
891890410181285412604854876625919565639521227223276*e^(347*I*c) + 334358978
2793658130117117545961082945429816796201741981007293673337850658442802420 10
72453193458155334046693516742390717832*e^(346*I*c) + 487332535059749234008 5
2255563052101402196469313659554492725674754339375283010407167744366955828 92
28374887058585324396544 89*e^(345*I*c) + 703863497605948315670482240613950 25
6985012022969663003767642203366977029615910998540554113762948714374681495 28
524796002762*e^(344*I*c) + 10074496185185374461175430098298016696240455383 6
2229218684846942699661206076989070463437310111609488281002767293701328193 57
*e^(343*I*c) + 142906319123055524246546928478954238371315925802022389236498
6521368398225020351556769709174190398345879670555884315664167 84*e^(342*I*c)
 + 200906587153578804380300469501441610174521851259541929209840688960859454
9085197748359058957576667708578886117387518584604 24*e^(341*I*c) + 279945244
4750398048229667304629608844921198748577911471240090794769204359417352933 09
3054304386873331299124541967740701072 64*e^(340*I*c) + 38664267305038004945 7
3825628183169626519755509907792770487402386298587950182473561628886310156 87
66478010120528733308274879 1*e^(339*I*c) + 529329252764113926003934836958243
5576725492389975607392144065991850478319555725837653586343954087715280097 45
467548382950094*e^(338*I*c) + 71836159638205824920911354448790108886838874 4
0337132103324919713759067383415515404572648043040396642559156073498019119 66
551*e^(337*I*c) + 966458275369037718747739130798151643483590684166832234688
0982911641606364181594521198157288093721251688362393644423973440 64*e^(336*I
*c) + 1289043515292933956480634330499677040181043935620106914267311067900 03
0058398839787692376954090545278554544997710058754772400*e^(335*I*c) + 17045
8299670782280820467821816769300269866114771277235502145654381093006963718 80
858828247575006052469632108103517064053494 08*e^(334*I*c) + 2234891276398439
4644786225783064348407246104844681778598226206586919214786452666530625638 23
55300122800100909360675106616894 4*e^(333*I*c) + 290538572232005700195334527
4489482790856692529959823749532695963414164833366773128218607899328588608 91
6176593772088622582464*e^(332*I*c) + 374525759487665120465733498842622638 81
4395450198683066422234922636107960954682227606750489938670308898230818571 71
43407211328*e^(331*I*c) + 4787527442780945685145204846971596165304169419328
2440732114595921296492550488768540598447206610781512881796125749863591945 60
*e^(330*I*c) + 6068949803156712248331871105329895471722806143008878014986 55

9653687260694816550470195890004511965527567432722969707577202160*e^(329*I*c
) + 76297318156278215804689924242070083664388967363330246618638381051104451
48946962328297631547032543419811821015837863013682720*e^(328*I*c) + 9513032
274019522954209113191268226642299912013525665940298381064797885690904993128
948035227412144035633851779511219335277360*e^(327*I*c) + 117642122748764840
800109007146734744933712781605578119837244558265660556176580864793686418649
08119643412413644803772131657280*e^(326*I*c) + 1442981628520843120453297837
537569196506315422464974755129585150738952408322697678968860136962839990074
7658579201929300744260*e^(325*I*c) + 17556273271224292396887291403125716213
491486261145478571376751690105656067838042151038271381300372757755676325408
026834544840*e^(324*I*c) + 211883214058828875396101983747068626958940492260
770937641325125133361905239789496943876860591245267550480429579542647066374
60*e^(323*I*c) + 2536717643911935362153226033598334815490498260612576171130
0683492963390816491583025705268737539982149639300226512657426118880*e^(322*
I*c) + 30128482414552703264559018953088177156013437493438201078413769835448
366148121754549197591129967170764969700180348699207838960*e^(321*I*c) + 355
001031060196498762723767969494822095813723710360050128778060274816728070599
43445240136315568500732379966585005678181937920*e^(320*I*c) + 4149983212196
370804378852378740134554178008893053820691885357902674927336467164003756348
8607716092887686471542838602788559660*e^(319*I*c) + 48133117678184029216503
748549110374478924719094635603892829364863916553792278822957368285106328164
715910598370871149079494360*e^(318*I*c) + 553909130449720862194326891463315
660814279598969699002144342968177311508638670566207686081876797097201529741
48474907904177340*e^(317*I*c) + 6324777410101217905179494607517556992407698
133813848315804240674745387472938763171054499524715291220511850059751105282
4347680*e^(316*I*c) + 71660329861173395524441943889284109134091157844655245
672084237402434944696464927131812190659629511140639501743303863582092880*e^
(315*I*c) + 805662491306826841818762018826235112063637903372180119541102106
42927765997644903820595421936873565314654415769070472655401600*e^(314*I*c)
+ 8988381580138238221397327047795460274479287701805196334714630737246431512
1274929402347942874802899499538953561056667668891020*e^(313*I*c) + 99512206
472057965951340341738023548515336403371717898040850470954657532977279113491
506880290726111154101941386019689567958040*e^(312*I*c) + 109332537349966223
203932678503426357079863707001728294011042076530403923862654018978676516417
314221089449922495612732870169660*e^(311*I*c) + 119209713702033927055755397
823688444444647424324502185328626347046599634721146573830681540495333543146
776810911910410468628960*e^(310*I*c) + 128995076011591903410763863427097329
948586173574595862705849159280943046458742663163454018491463855395649453952
212899632198680*e^(309*I*c) + 138529794549151089451352769576543403126330747
243680030832467205895819043568155239264876762867172754338684027849855385453
216080*e^(308*I*c) + 147648920805545333418623121767853777399782924748301228
793924342574999937955421765370101235122939557467548549202174550009604780*e^
(307*I*c) + 156185962953551196169738218832173696509852551589210730578365727
476259476474465955428502336673743686499175698677875693611243400*e^(306*I*c)
 + 163977816059607725375264559816505847894187785101455360391897424482998415

385787605765315509208337741590143078572243505132706580*e^(305*I*c) + 170869
848868953101176860306053103994340530390347260088432676842505555141293830838
961275974268928666494845723462544709102843680*e^(304*I*c) + 176720929970554
642004575770053095700595334659870682732031975915532387577052414866323511140
117680492929354517559479899220940360*e^(303*I*c) + 181408168770922059820368
553316697321639984862628298828569560273295630897626829345263592219034560853
530733710529842148537901680*e^(302*I*c) + 184831151983748941817667850174708
257138128172158269413287765358532240773244336191900818557829905895684494889
410451921524212840*e^(301*I*c) + 186915474436567514926351405623117503261987
508351930083824566444435689139233683411704641828762178799177848064220150818
355261280*e^(300*I*c) + 187615393168510050071497280564603510912403132920312
024370835062679037644990286285346673507093452964351257962696133511725652320
*e^(299*I*c) + 186915474436567514926351405623117503261987508351930083824566
444435689139233683411704641828762178799177848064220150818355261280*e^(298*I
*c) + 184831151983748941817667850174708257138128172158269413287765358532240
773244336191900818557829905895684494889410451921524212840*e^(297*I*c) + 181
408168770922059820368553316697321639984862628298828569560273295630897626829
345263592219034560853530733710529842148537901680*e^(296*I*c) + 176720929970
554642004575770053095700595334659870682732031975915532387577052414866323511
140117680492929354517559479899220940360*e^(295*I*c) + 170869848868953101176
860306053103994340530390347260088432676842505555141293830838961275974268928
666494845723462544709102843680*e^(294*I*c) + 163977816059607725375264559816
505847894187785101455360391897424482998415385787605765315509208337741590143
078572243505132706580*e^(293*I*c) + 156185962953551196169738218832173696509
852551589210730578365727476259476474465955428502336673743686499175698677875
693611243400*e^(292*I*c) + 147648920805545333418623121767853777399782924748
301228793924342574999937955421765370101235122939557467548549202174550009604
780*e^(291*I*c) + 138529794549151089451352769576543403126330747243680030832
467205895819043568155239264876762867172754338684027849855385453216080*e^(29
0*I*c) + 128995076011591903410763863427097329948586173574595862705849159280
943046458742663163454018491463855395649453952212899632198680*e^(289*I*c) +
119209713702033927055755397823688444444647424324502185328626347046599634721
146573830681540495333543146776810911910410468628960*e^(288*I*c) + 109332537
349966223203932678503426357079863707001728294011042076530403923862654018978
676516417314221089449922495612732870169660*e^(287*I*c) + 995122064720579659
513403417380235485153364033717178980408504709546575329772791134915068802907
261111541019413860196895679580400*e^(286*I*c) + 8988381580138238221397327047
795460274479287701805196334714630737246431512127492940234794287480289949953
8953561056667668891020*e^(285*I*c) + 80566249130682684181876201882623511206
363790337218011954110210642927765997644903820595421936873565314654415769070
472655401600*e^(284*I*c) + 716603298611733955244419438892841091340911578446
552456720842374024349446964649271318121906596295111406395017433038635820928
80*e^(283*I*c) + 6324777410101217905179494607517556992407698133813848315804
2406747453874729387631710544995247152912205118500597511052824347680*e^(282*
I*c) + 55390913044972086219432689146331566081427959896969900214434296817731

150863867056620768608187679709720152974148474907904177340*e^(281*I*c) + 481
331176781840292165037485491103744789247190946356038928293648639165537922788
229573682851063281647159105983708711490794943 60*e^(280*I*c) + 4149983212196
370804378852378740134554178008893053820691885357902674927336467164003756348
860771609288768647154283860278855966 0*e^(279*I*c) + 35500103106019649876272
376796949482209581372371036005012877806027481672807059943445240136315568500
732379966585005678181937920*e^(278*I*c) + 301284824145527032645590189530881
771560134374934382010784137698354483661481217545491975911299671707649697001
80348699207838960*e^(277*I*c) + 253671764391193536215322603359833481549049 8
260612576171130068349296339081649158302570526873753998214963930022651265742
6118880*e^(276*I*c) + 211883214058828875396101983747068626958940492260770 93
764132512513336190523978949694387686059124526755048042957954264706637460*e^
(275*I*c) + 17556273271224292396887291403125716213491486261145478571376751 6
901056560678380421510382713813003727577556763254080268345448 40*e^(274*I*c)
+ 144298162852084312045329783753756919650631542246497475512958515073895240 8
322697678968860136962839990074765857920192930074426 0*e^(273*I*c) + 11764212
274876484080001090071467347449337127816055781198372445582656605561765808647 9
368641864908119643412413644803772131657280*e^(272*I*c) + 951303227401952295
420911319126822664229991201352566594029838106479788569090499312894803522741
214403563385177951121933527736 0*e^(271*I*c) + 762973181562782158046899242 42
070083664388967363330246618638381051104451489469623282976315470325434198118
210158378630136827 20*e^(270*I*c) + 606894980315671224833187110532989547172 2
806143008878014986559653687260694816550470195890004511965527567432722969707
577202160*e^(269*I*c) + 478752744278094568514520484697159616530416941932824
407321145959212964925504887685405984472066107815128817961257498635919456 0*e
^(268*I*c) + 374525759487665120465733498842622638814395450198683066422234 92
263610796095468222760675048993867030889823081857171434072113 28*e^(267*I*c)
+ 290538572232005700195334527448948279085669252995982374953269596341416483 3
366773128218607899328588608916176593772088622582464*e^(266*I*c) + 223489127
639843946447862257830643484072461048446817785982262065869192147864526665306
256382355300122800100909360675106616894 4*e^(265*I*c) + 170458299670782280 82
046782181676930026986611477127723550214565438109300696371880858828247575006
052469632108103517064053494 08*e^(264*I*c) + 128904351529293395648063433049 9
677040181043935620106914267311067900030058398839787692376954090545278554544
997710058754772400*e^(263*I*c) + 966458275369037718747739130798151643483590
684166832234688098291164160636418159452119815728809372125168836239364442397
344064*e^(262*I*c) + 718361596382058249209113544487901088868388744033713210
332491971375906738341551540457264804304039664255915607349801911966551*e^(26
1*I*c) + 529329252764113926003934836958243557672549238997560739214406599185
047831955572583765358634395408771528009745467548382950094*e^(260*I*c) + 386
642673050380049457382562818316962651975550990779277048740238629858795018247
356162888631015687664780101205287333082748791*e^(259*I*c) + 279945244475039
804822966730462960884492119874857791147124009079476920435941735293309305430
438687333129912454196774070107264*e^(258*I*c) + 200906587153578804380300469
501441610174521851259541929209840688960859454908519774835905895757666770857

888611738751858460424*e^(257*I*c) + 142906319123055524246546928478954238371
315925802022389236498652136839822502035155676970917419039834587967055588431
566416784*e^(256*I*c) + 100744961851853744611754300982980166962404553836222
921868484694269966120607698907046343731011160948828100276729370132819357*e^
(255*I*c) + 703863497605948315670482240613950256985012022969663003767642203
366977029615910998540554113762948714374681495285247960027 62*e^(254*I*c) + 4
873325350597492340085225556305210140219646931365955449272567475433937528301
040716774436695582892283748870585853243965448 9*e^(253*I*c) + 33435897827936
581301171175459610829454298167962017419810072936733378506584428024201072453
193458155334046693516742390717832*e^(252*I*c) + 227316035661288411004195019
470513676668366524180772609139448107484730848918904101812854126048548766259
195656395212272232 76*e^(251*I*c) + 153128372066627753793473532128076829 6571
253565294263151828614240309773820027071119539658215902851353277968215445199
6208592*e^(250*I*c) + 102204237794346348513399752951633996417021222496 63666
193053008302026096932158568338309418237395541351819026907953220681013*e^(24
9*I*c) + 675848043788852437256293594896385762669485554719551948612287756798
171858726236287199496707940183195792790168258294123436 2*e^(248*I*c) + 44276
730791054253185243161129856936565848519361001924570444551344833050453214525
163471184881332248236704651034839548051 61*e^(247*I*c) + 287361053592234018 7
080835435582912277271967977394720159791070274927714276869531467182688981041
061381703885403497544001592*e^(246*I*c) + 184750585646245153344528430057132
632378116255330456597188767075809107930679482183492817077312636463972207157
0131703785334*e^(245*I*c) + 117660072097578696518987505089023109220461269 69
702774330145358957889567712307935203819931066068805646285998223417228 01012*
e^(244*I*c) + 742228640908173124916937049462525617334148919679118270489831 0
054977819512210699558396234524997486531246588735534014421 37*e^(243*I*c) + 4
637582884573671545449376782550056887333281455680493104239955998860128006386
199040223683785911088426023420945436822991 02*e^(242*I*c) + 2869929436312314
965572780108515769408968264974660663275288015606770071128374319267350881209
748617605113670088157287826 43*e^(241*I*c) + 175896258262755985757106812613 9
793012658010315954843536149046728651694422320757765804471841341413759957700
91499246759528*e^(240*I*c) + 106764832017165594838085234189333528733587673 3
299725300926610851867899392529159370907602822323469190904262433994093233 14*
e^(239*I*c) + 641751006932600668062380648860045971707408433000868393686161 3
916452910804984467535311184272579865808884034724149609964 4*e^(238*I*c) + 38
199015867586087976002998756627674994795440667903625029322346250133286489120
87500501363812811389396034967028070716153 0*e^(237*I*c) + 225146757413080699
615061655865028724304219302106732643929972864856006401038672536048477155470
605929676906537959511425 20*e^(236*I*c) + 131397714941049338818566811514182 9
311224255152153568687118126657981387760634816026174720131773578256602130679
8298336024*e^(235*I*c) + 759275270014667896115309507358501547319702974653 36
333315497939614732857609358019041551167648315608759475810486935272 24*e^(234
*I*c) + 434390969660193217335735968778157929370129568194082711421543317533 6
093967845908766740738240037114570667410936998017178*e^(233*I*c) + 246044237
584542266392708163098326071473496809190549302714563923882719225488634936112

699145769240985112087330748745746 8*e^(232*I*c) + 1379676529796212074017106188066589448355446501210890195107164860350228928586815539003062875026711931941947738690360722*e^(231*I*c) + 765867795513962781012558444628751418710940895281304790836743661582071650032154891482866406314834433199455459798934952*e^(230*I*c) + 4208463426089493872775590214579245865781209661485610226470084995294684520059801751194106289562104976095660029698849 27*e^(229*I*c) + 228911311738592780091492649162346834405867740776456326108410928857257174707289268074347550225793244741923354395308214*e^(228*I*c) + 12324394151933238474196007258810350659640633925361639108206296996068241901174577573892181775339195446260932388148915 7*e^(227*I*c) + 65674859268867300098827375812875225610654551686261103681664007007537115778097293533565243828873383722980353200611956*e^(226*I*c) + 3463765717267169016765734453719708704888235485399327047206394307877360044654296354834810126939044346448075451392850 2*e^(225*I*c) + 1807982006802885997034993862300723067656331420670884849990013964123733476326647934696323793603932811318504159179384 8*e^(224*I*c) + 93393419580534942252517509657150573007073020838147747703062182242410226482474199560429573630558238308985473032197 57*e^(223*I*c) + 4774141111066098970221845330594962016472714230374234060663956846950926642685946929064114194400360936223590725470146*e^(222*I*c) + 2414966516810338503289076549202740511710059011795447138773464205696455026442712426409599662771080264826008985061097*e^(221*I*c) + 120877035849365839308944222205693506328370410814059375022653984611773764821660955973483160124869827433029615861214 4*e^(220*I*c) + 5986501411122418589116765051805201503640032268413280814535970935877903386092124390855544668615826233503030619610 52*e^(219*I*c) + 293344920034300720287042383448342866313806285455040067823080445597545970023446231563554135133105493516316320059272*e^(218*I*c) + 142213115964814517682386667276769909482271681318790889840501039441748635545362467679832449103520321953011780083069*e^(217*I*c) + 682080330967936156837844096192442108186149916400415534244055278768932724966083242310981485024664539671577280789 94*e^(216*I*c) + 3236273132241954941033008894364024746037832856131642293129242714590288791307164367950290905589123675514320738260 9*e^(215*I*c) + 15189634214908800396417911722643754748048520109734812459109878810493844381062650818971199637121458749456243274416*e^(214*I*c) + 70521324141621979926023265245801430609853530545729339055246331216810210373402983663422033243253070724137390610 24*e^(213*I*c) + 32384919313618514764233219335395790983777355392076414673462356658238870483269493056092315851437486902036 15957136*e^(212*I*c) + 14709311466189343455150383623001001604821277495814439299047469102247774701988990523791144939998870031994198295 79*e^(211*I*c) + 66076447310586909769147597385083793451108903314958670798276426339476675664956527987914617331838650574039109399 0*e^(210*I*c) + 2935507435543427098081294535765623132997059826991874168629343739642556159671386762532763025915615235156032644 03*e^(209*I*c) + 128967080084754712246023680866488384983286259025533132044636109049545144029547003347761521666283977931640178464*e^(208*I*c) + 56028683424903517658495013858534516167162591034367972498174660907450666778154353271630344650777885683547624184*e^(207*I*c) + 240687851397052771611934656445061432852413610377682168189221844001410484602109446966477527233719 3

2874594597328*e^(206*I*c) + 1022318202595486076721739030518645192356214547З
674293619918063490411487496121804590274592702770571515456414680*e^(205*I*c)
 + 429320647800802212601748890885182649479062072066015145146818191091724002
7863968724539127659633517053002976480*e^(204*I*c) + 17824461149317518505563
548566384219011744123222982494965916580539397871982465659459755955757341933
48887952160*e^(203*I*c) + 7315849722068183628747296214039744442800104463011
61527339760544815300951787985538419764656214582667219914080*e^(202*I*c) + 2
968255152826695896853182732802390500845550322034159415119626595968816157137
99937680026497408305672297618840*e^(201*I*c) + 1190418554038779649482295779
483704656006066231830455295269004302092704732127738477949355860747143294799
39280*e^(200*I*c) + 4718822084346620769509950695357378035710889749142256789
8048199018207708997005333860148836479527456156014520*e^(199*I*c) + 18487405
299005732693752728611876490890858357021974882371570623800186245137722660943
641752976852924439870880*e^(198*I*c) + 715812468684294147547380736367983971
8172745581538409044503383852693596921622426696740453944718143025248390*e^(1
97*I*c) + 27388956247952656033552276465660008862807783050848257029119389036
56162004262736182657700406301914070062380*e^(196*I*c) + 1035561982592002935
226384577908611548612111495080193573691339864706029186482466241805664949381
049856258510*e^(195*I*c) + 386876218234277165632451723049979889263115282374
607541692443176673997513742813591736171169652250611186480*e^(194*I*c) + 142
801792450221762483180874918825274134305133275417780084795034644763509333503
150517345864659667189417080*e^(193*I*c) + 520751785187932703864292633515443
06951104993542500582938155241689408138675254608030847907167748571734720*e^(
192*I*c) + 1875998821886556356416363573598607327825573725740570627910889136
6378428467414559930481172863538598193890*e^(191*I*c) + 66758662903711473585
037668656692890108935438698305387087249452915809511791882966061581112577069
68604740*e^(190*I*c) + 2346518219239105142238141633073464768899155708935025
778047637412681781575765422219127409260159438712250*e^(189*I*c) + 814608187
736530579670210025271921415597183369881214299823291969785549876175969866367
976653244974728560*e^(188*I*c) + 279285755800035206679835368898165477644864
987794665387827488933863633745047373109049265172681702585720*e^(187*I*c) +
945561802589319869193343034663656528268580913143291891607362771758738417321
96453379953705679466826880*e^(186*I*c) + 3161093933128469275069430644361841
4656095969520945215743004044560386895241801579156543451940713351730*e^(185*
I*c) + 10434117516570395966653693155582402109460348095473027807412321427346
816928567197770376496170251803940*e^(184*I*c) + 340023256060165161752169468
0847089844198028831694417424794868779328950548418125605446882081152636090*e
^(183*I*c) + 10938532144862203586740324345008666784997700113058741724889759
51612031456734608287095519501041975440*e^(182*I*c) + 3473514732147137808743
520831295666012387657627759423667627333499521038897539826364038575568677773
00*e^(181*I*c) + 1088679957318294728267329051920348867972846213564456275309
09104429486741257822633476898356826454040*e^(180*I*c) + 3367539887202156837
590238459398275336255980105810418462734541113626243194324077826072175699102
7090*e^(179*I*c) + 10279364730663840844739577862469262604648861914297972589
165243530651230690726244462479199894255180*e^(178*I*c) + 309613197162152016

2380301554241465451782362086810287537748902904985934020179565706177131421614590*e^(177*I*c) + 920089393029589032874601850027159322612526368444771489781974361078847528891468831038436064951920*e^(176*I*c) + 26974580144021129697268360186387895435796230852007659517712822762927324021520970821849736341414 0*e^(175*I*c) + 78009807368024239875613733058851417125327114681070889640794249282633470580756557083923203377160*e^(174*I*c) + 22251959176795777757167366036007480222211364232146399803864370963391491223687245823457351580140*e^(173*I*c) + 6259872156822252843650960708235034710201362776057176647226323089751446565288850103898153859920*e^(172*I*c) + 17365742188181910718741974724501581238835642099506586391023371481227690806116807197417260538 40*e^(171*I*c) + 475010578857601519272316617938425222421786597241671026894318515408511467140969393115768793680*e^(170*I*c) + 128098914601688539672480541830409847707367500438601536803204497701119911289087105659482783340*e^(169*I*c) + 34054053851295569154352346722177172655187548910782008504718324168725029438589162349211628040*e^(168*I*c) + 89232094473432967633318818816384717934996186706010260597308959626532917702294930281625751 00*e^(167*I*c) + 2304351073373840357379178597673066352016682781689139842097376663118488803841131935313641840*e^(166*I*c) + 5864034669726832427416433289215609093751974538642432995719909646088572457711341452041749 90*e^(165*I*c) + 1470308167322768331630415820995920475120437252253533392388191651930004076295447457532217 40*e^(164*I*c) + 36318369652302591732197444409798122022640824604130552506742586795183267354382847875885730*e^(163*I*c) + 88367206408604703056945140215479695512967940922669830441183757900258545840367963647682 80*e^(162*I*c) + 211758973346685570710150142921041472240183883794075284161854144088854572994313820903682 0*e^(161*I*c) + 499707567253859084357596314813794768069337190915967491907488904933922677579665354338960*e^(160*I*c) + 1161045516835550437629115017121163993137330211326774811128240472463617940496357264798 50*e^(159*I*c) + 265568063890434075344967023691015457959948617577414147899446527121275669101852741231 40*e^(158*I*c) + 597899217294414321845916114929981970632173211157849452524522874297646840910539553629 0*e^(157*I*c) + 132475641236783747315747282116248369112096650194895392649224164378826428454643722112 0*e^(156*I*c) + 288820755264730654469968572021047109427318619508995802020689904590319476295408324280*e^(155*I*c) + 619485966530355028795643388152343106604109020378824731618047744929162165758800776 80*e^(154*I*c) + 130698172034882898861932055083758183921249913823401603168865071812965489810148184 10*e^(153*I*c) + 271184323967071752760564049014883350713024244840397831852323772194420039283010858 0*e^(152*I*c) + 553269128819528612502918869558947829098021956309349843584044631512291778800081490*e^(151*I*c) + 110969199687320974749922259595250444341219218535349655762591192576535872151766080*e^(150*I*c) + 218764828927139099280403456125787058051215087562266963170876518242522414186633 20*e^(149*I*c) + 4238125846763232586394188569858685826755328005548627437019301405851325887594480*e^(148*I*c) + 806679543607589140759305010796189568269842021613388955218916278823182639488190*e^(147*I*c) + 150822381431412413773566474210011746852297437597059186295243989481140398152780*e^(146*I*c) + 276931165383432592259833826376479361226640338596151334898466646943614710283 10*e^(145*I*c) + 4992519712

4570439835053779766079539883973682975911149579918048936883718676 80*e^(144*I*c) + 883500968821791202600774541927769200737689393513734789368397093333311961880*e^(143*I*c) + 153436088745056254127327239461577071933130157764595997113973513183188399376*e^(142*I*c) + 2614397627990202144347194566508025456305681018352040188980028549314486 7448*e^(141*I*c) + 4369442482910113914565353136069595862669338858053419381214131241925047008*e^(140*I*c) + 7160994975990580798956333385529402291928581964815978300788197118626000 96*e^(139*I*c) + 11505148185208084887370038835452131556764036512400310369117669719429232 0*e^(138*I*c) + 18115768495615758076710303055505625589254293659193314153418333944596408*e^(137*I*c) + 27947091044756866118427906949736991644822547239772102097256613044034 72*e^(136*I*c) + 42227612663200368754775474655570998871052713308666016136635365678 7288*e^(135*I*c) + 62473550781053295317710774690247114124125187565731848441781904032672*e^(134*I*c) + 9046693523825682979044338963104263167672586826367911338826483549173*e^(133*I*c) + 1281817464914970810859604189828359000790789921169405304612211251818*e^(132*I*c) + 17764282913511934857719443767580283023990546009268713649496140433 3*e^(131*I*c) + 24070801913529757101858022914372045864746991786182039740274325264*e^(130*I*c) + 3187749929744346497211536044751776582320958627923816470590659024*e^(129*I*c) + 4124306982999151908480672223272194350677479340918946704889829 28*e^(128*I*c) + 5210811762917704866049240098517583098750570056687781895414163 9*e^(127*I*c) + 6426195485535248576425068136870465530087114003875716691383902*e^(126*I*c) + 7732046369911457750614627310280985060944326757881362950112 59*e^(125*I*c) + 9072260572220881491864228463948718776460758970649397077477 6*e^(124*I*c) + 10375184499871175501909398956596684116802997082526660323524*e^(123*I*c) + 1155855412893594260345544966642687823630035899363232371472*e^(122*I*c) + 1253704965869212726621980508512693231711673388540817829 59*e^(121*I*c) + 1323170887010489697380005673377991908934083675600958071 8*e^(120*I*c) + 135799066316147984285064284803254498287835983958034989 9*e^(119*I*c) + 135442594916636116191574650625331646238501101627937224*e^(118*I*c) + 1311878180117217472967933989431815369496467536848119 4*e^(117*I*c) + 12330967001397233651819972207509325906552876253421 56*e^(116*I*c) + 11239160454224665096642916206312433895255457523405 1*e^(115*I*c) + 9925490738534402272939987038714580495445431374618*e^(114*I*c) + 84855220227651235649620013695967629536169631511 3*e^(113*I*c) + 7016451532254446290687354881374809108456187068 0*e^(112*I*c) + 5605927253067558551780452883689835514455118670*e^(111*I*c) + 432333688644261557547944179250800440604964868*e^(110*I*c) + 321478876933753388174544825153773503839502 78*e^(109*I*c) + 23021504112262349258552223452015009005335 76*e^(108*I*c) + 1585664761132575625661174322272038842988 56*e^(107*I*c) + 1049040266951089742462464376647075404506 4*e^(106*I*c) + 66563467067621006375419184710997114141 4*e^(105*I*c) + 40443624781415311581857832389099634564*e^(104*I*c) + 2348998374244347079532766203075607598*e^(103*I*c) + 1301711930791728238351514307733600 24*e^(102*I*c) + 6868329225263681349501997341320517*e^(101*I*c) + 3442771520128751341407393029609 14*e^(100*I*c) + 16353164647151530240529137618111*e^(99*I*c) + 7340572636163884499688423669 24*e^(98*I*c) + 310422225220746816156250205 22*e^(97*I*c) + 1232445557346832245176696904*e^

(96*I*c) + 4575911718340257907313958З*e^(95*I*c) + 158179664239781240816181
4*e^(94*I*c) + 506486609445125699721 79*e^(93*I*c) + 149332661229398416036 8*
e^(92*I*c) + 402612566993689503 88*e^(91*I*c) + 984382804329835768*e^(90*I*c
) + 21608403021340047*e^(89*I*c) + 420601518659718*e^(88*I*c) + 71461423073
07*e^(87*I*c) + 103818048048*e^(86*I*c) + 1253841160*e^(85*I*c) + 12085216*
e^(84*I*c) + 87153*e^(83*I*c) + 418*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x +
 c) + 7*(-3289*I*a^2*e^(1027/2*I*c) - 1282710*I*a^2*e^(1025/2*I*c) - 249487
095*I*a^2*e^(1023/2*I*c) - 32266997620*I*a^2*e^(1021/2*I*c) - 3121832019735
*I*a^2*e^(1019/2*I*c) - 241005431923542*I*a^2*e^(1017/2*I*c) - 154645152151
03422*I*a^2*e^(1015/2*I*c) - 848339120374563870*I*a^2*e^(1013/2*I*c) - 4061
4235388474175675*I*a^2*e^(1011/2*I*c) - 1723848657662144174935*I*a^2*e^(100
9/2*I*c) - 65678633862380668978797*I*a^2*e^(1007/2*I*c) - 22688982610841143
22780091*I*a^2*e^(1005/2*I*c) - 71659370101867067314058647*I*a^2*e^(1003/2*
I*c) - 2083633993341511741962220545*I*a^2*e^(1001/2*I*c) - 5610928687189836
9496093387980*I*a^2*e^(999/2*I*c) - 1406472792955917865136489871114*I*a^2*e
^(997/2*I*c) - 32964206157734965185866131506636*I*a^2*e^(995/2*I*c) - 72521
2537844370128223087979340181*I*a^2*e^(993/2*I*c) - 150280154385589713238519
50737244424*I*a^2*e^(991/2*I*c) - 294232725284515750583337235833091605*I*a^
2*e^(989/2*I*c) - 5458017104331277636863728788108882260*I*a^2*e^(987/2*I*c)
 - 96165064470879466516856468979981298953*I*a^2*e^(985/2*I*c) - 16129504265
44228644388946118660228217326*I*a^2*e^(983/2*I*c) - 258072073946102626661195
786625902499776722*I*a^2*e^(981/2*I*c) - 3946352244238357653778751945561697
98413535*I*a^2*e^(979/2*I*c) - 57774598994314219090425758589699185730701 40*
I*a^2*e^(977/2*I*c) - 81106652413090837180607129215519047725478483*I*a^2*e^
(975/2*I*c) - 1093437897602872607661796947121707741043900200*I*a^2*e^(973/2
*I*c) - 14175642370639692917078404160115322319156841267*I*a^2*e^(971/2*I*c)
 - 176951138352595690762855574906084921297520106020*I*a^2*e^(969/2*I*c) - 2
129312273803633942958758817457586335895472623670*I*a^2*e^(967/2*I*c) - 2472
75008153416299418283299311807791056493140303 08*I*a^2*e^(965/2*I*c) - 277411
696712606367968860766543182757632328151469299*I*a^2*e^(963/2*I*c) - 3009497
2039156679615666166879594392640279687879874 97*I*a^2*e^(961/2*I*c) - 3159972
840521089352337381463242323312885403217275646 5*I*a^2*e^(959/2*I*c) - 321414
474758468949963097519046442397490455658900239275*I*a^2*e^(957/2*I*c) - 3169
504955861830892959561795308811767842097316588802741*I*a^2*e^(955/2*I*c) - 3
032446536994915900659693056184256117658170352685167094 9*I*a^2*e^(953/2*I*c)
 - 2816984605029427076326216472231559681353662633013408887 14*I*a^2*e^(951/2
*I*c) - 254251063904048071086513381814224236865171205381188245338 6*I*a^2*e^
(949/2*I*c) - 223105458160631131987993731820259309988548587015290596064 30*I
*a^2*e^(947/2*I*c) - 190456027772701631222167952225792270942344905110743699
547445*I*a^2*e^(945/2*I*c) - 158260033440758234375055969559220791274299437 3
526005697205768*I*a^2*e^(943/2*I*c) - 128080347774618455483945008302899308 5
950785826015405418563046 9*I*a^2*e^(941/2*I*c) - 101008942321601073058743812
539394339550240476561660597100434478*I*a^2*e^(939/2*I*c) - 7766476193162283
173545885465874275081156657479526666691131955 15*I*a^2*e^(937/2*I*c) - 58248
664854859561608708022020755340987805120670117841775726579 20*I*a^2*e^(935/2*

I*c) - 42633143603942943140960289773464948350711612149585795367207109320*I*
a^2*e^(933/2*I*c) - 3046499772769501139302840524760863989906393256035330222
43244834208*I*a^2*e^(931/2*I*c) - 21263375717977943790460384126129765751128
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*c) - 630268657433514150995959099261502648982435588218176946585350750330080
*I*a^2*e^(923/2*I*c) - 4019464980430704864646368121098631727141859823429991
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c) - 9167359878151796279536868855736541471365903570952463617502393151928957
80*I*a^2*e^(915/2*I*c) - 53717849474781207090444195042039567737852480086461
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e^(909/2*I*c) - 95743199782253454173010118399133666677927231233258732028264
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903/2*I*c) - 14310135107329314200928393322744086315084207259642318859791923
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*e^(897/2*I*c) - 1805820397656247779207028248681315454972027552142291325676
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87/2*I*c) - 400121711511226785140418608364081512565882882434620899668441262
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0*I*a^2*e^(877/2*I*c) - 577806553230040116611059501868014698166807783088814
37669242770005565033316643354683390*I*a^2*e^(875/2*I*c) - 23563598520917497
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2*e^(873/2*I*c) - 945613068967215676111205365966310118361254135742385899036
704396326378661255246170345160*I*a^2*e^(871/2*I*c) - 3734780899103666924896
891172734183450725814252830409400966717277658895882383641210262740*I*a^2*e^
(869/2*I*c) - 1451984243291507578990719952928296287275230941084562598248070

697426615644714523290721876O*I*a^2*e^(867/2*I*c) - 5557344800195961223993682632402297269775973096630910130864795081166328159454378039227365O*I*a^2*e^(865/2*I*c) - 20943213499631348964775534154519983464782243850441272775465999443877082400711216670301632O*I*a^2*e^(863/2*I*c) - 777230951154547586594905586759083418923490516228159852999058710437580204374586904243317010*I*a^2*e^(861/2*I*c) - 2840837119758279389871998330348610271340731421578538884856194587081840614185808628164270200*I*a^2*e^(859/2*I*c) - 10227965293949311655493133309531679349667296556076415563536820773718188117601532107888284410*I*a^2*e^(857/2*I*c) - 36277266293394668016579895100105489749256844935749788822739768560569739914792417941950684060*I*a^2*e^(855/2*I*c) - 126775865626950263309319943838554954851498343676576355413893697564604056732997423489495758180*I*a^2*e^(853/2*I*c) - 436564397547890123843522035766730185021502894107522026965503385942026891357953271442864432870*I*a^2*e^(851/2*I*c) - 1481567399139257220742984856810817337276885474019576266630035615865701122312638498716501009480*I*a^2*e^(849/2*I*c) - 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5/2*I*c) - 1744330419158261975115028902637630836564860643400321112818111225
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/2*I*c) - 41847047550528261659745273009504208070629830145996472721237197973
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*e^(721/2*I*c) - 6902137883195922910041464000878806997244189478419384904376
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*c) - 106266524343343217664590361357231161622921001135223038707483473690437
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699619082139713753640264690466720702053560311601516116895520683068293669417
046374470910362666*I*a^2*e^(711/2*I*c) - 5403771767514964994284188266288554

1540636679441986209524820279886371421084713533359788456282690939393094209079 6205420*I*a^2*e^(709/2*I*c) - 791688014108601034196938571902557001504845712196126073563496646347934496907150906085300660569889896692451445978865145*I*a^2*e^(707/2*I*c) - 114860931018421184347532224687086442580311388303908132774332447216680617304783610999034334551040241487996672647029178 3*I*a^2*e^(705/2*I*c) - 165035069880593871264266483841627282698710920794160660056561049082176636320320464997648390279393386967096568369530566 7*I*a^2*e^(703/2*I*c) - 234849896924574057189558006491888732976955249553022253433577431382685457997162651232470672691565288715390666445716791 7*I*a^2*e^(701/2*I*c) - 331008697591622174183153895990834913625550955973233843790010058701225396750102044096046461766466151960204735872883478 3*I*a^2*e^(699/2*I*c) - 462112894333759536408849281744322264217611058625067976858055827538677708192611061558542717489800705734478779181173015 5*I*a^2*e^(697/2*I*c) - 639059381238672274690176185605654449852208047118165458611805086921344998723336140222214498323497550520326833840406907 0*I*a^2*e^(695/2*I*c) - 875474694138014080876719396593223537696370308846563407735446524300917634089580857705723275087251797204997746064089361 4*I*a^2*e^(693/2*I*c) - 118817392003719339723430585761058535199243991458482295045064526172323144917169951597187258083471599990453661939291266 22*I*a^2*e^(691/2*I*c) - 159762621405412190663910739051968522660967095555416803601179381870799961112986300465386664650227903998822734800953121 59*I*a^2*e^(689/2*I*c) - 212840204947745811406822158568352116473795328945261225223981686063833105296594297394507322896417421114319904375169702 20*I*a^2*e^(687/2*I*c) - 280957021041118522598744644724249791347012037766997432412309430918895925154477673324353510599672424676384909560396532 15*I*a^2*e^(685/2*I*c) - 367500552007064933329079576591406661210881823897004729959895322413813884810410417370538451027521647592250769768534478 70*I*a^2*e^(683/2*I*c) - 476356198918911917256834232268343221988791178397961063806977497695505656758649254888840194473399570479671642089470315 69*I*a^2*e^(681/2*I*c) - 611906118965037637892720728786420532096243751120063245517042845318091285849297344426195732340484752667721271080927210 24*I*a^2*e^(679/2*I*c) - 779004300384723884935232975431911048967136999667144514252374561025240310302823321338814039617775837396480963800713885 60*I*a^2*e^(677/2*I*c) - 982922628212793487848894044944258034604001166822608272604607919086727410065839247541721717494325250058525135537786236 80*I*a^2*e^(675/2*I*c) - 122926311130362982282930531800590413193892755472313438669937885559695115359158329870216181319401680622539825771904344440*I*a^2*e^(673/2*I*c) - 152383229842432070507148633325172656083380096888818957463018370238802480734804418338221079466921156239891439248449883680*I*a^2*e^(671/2*I*c) - 187247524619750552433254678023898305056473020604518334425544613285283731157047361688793462714993120367616167673996935608*I*a^2*e^(669/2*I*c) - 228086821979213161994154797898361140956767824538652850246924199657221150977419942700239602639983898674178986057439712320*I*a^2*e^(667/2*I*c) - 275427157458731124798325279881980836380771483663374738836564636407094610672777421045705435059330328502535069932806121560*I*a^2*e^(665/2*I*c) - 329724690555479726567444065640343362647708724976050921820324778018969968546065236836577815026028465724065587612640991920*I*a^2*e^(663/2*I*c) - 391334

54374736488519864677465209818547306922352592846073370602598740993764739057934925217641624091798291101691031577096\0*I*a^2*e^(661/2*I*c) - 4604777597645
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882757187926519094886636605309366642778263069398035616183392982442622288594
62992430659963524\0*I*a^2*e^(655/2*I*c) - 7126084825680016377422057561136586
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4828961744\0*I*a^2*e^(653/2*I*c) - 81026806164766796897230771656479369731262
960466861566931128655392224266337578449710624277121983121115667542568684456
292\0*I*a^2*e^(651/2*I*c) - 913446819168640466151130593147949820973487706939
69631293685074615584717408543193313653896120262325125102171571804141888\0*I*
a^2*e^(649/2*I*c) - 1020949307761046685483851694599176744159451920311114482
919641329915112719001444809615932039596196242112692638947129053040*I*a^2*e^
(647/2*I*c) - 1131292220201482520223678271335146824716930098519844139555825
140786899130297554994321714798551723344393464571710164372160*I*a^2*e^(645/2
*I*c) - 1242713857889209944794626889082276075977141843858465159493183489271
9245887627533655076545712304942466107466171322638541\00*I*a^2*e^(643/2*I*c)
- 1353195315451420313437489563356910414672170342830095956755770635775466291
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493678847799963487059674320737343640288580391271466623876882207508099433248
83548267772046667652822694860330417719054\0*I*a^2*e^(639/2*I*c) - 1562186964
787101490627013491081273159190897741838550609249842346755695952421966035252
0819723749390682388871935358890662\00*I*a^2*e^(637/2*I*c) - 1655729933770658
293771357769284118493945734494438803730125689639981417260441733582104520913
0923621600744708918329810495\80*I*a^2*e^(635/2*I*c) - 1738519323443834113007
443332766616165716605279946182900716200875367567243522959005653835445657888
73236442347763453632336\0*I*a^2*e^(633/2*I*c) - 1807966509711976871939839305
042715622727578634553781970459471779712682108764319874848175338812875321478
36905817003095436\0*I*a^2*e^(631/2*I*c) - 1861575144674768110426557177416946
225926130912471719654306955806539749713942241017532879502301920494398612936
40446959404\0*I*a^2*e^(629/2*I*c) - 1897020972388990207309023119915861711449
731378589391881830453022468540443348039250865860183534862239996983661831471
12194\0*I*a^2*e^(627/2*I*c) - 1912230808113858478866870753712714555289533816
394735307243195218359518803129887560593449941686882293838559049940338313580
*I*a^2*e^(625/2*I*c) - 1905457597458776709930827472866447261987176563583129
00256802259238911598325512239649088186552132493120236229967124388470\0*I*a^2
*e^(623/2*I*c) - 1875348552403554549312972640887885902657089680102597101290
48270355555792060350441403569585382245375804950943087964624502\0*I*a^2*e^(62
1/2*I*c) - 1821003585403273702574432851450914291658814786877621740198575512
179092602692929225363452883945313603152284886838427140580*I*a^2*e^(619/2*I*
c) - 1742021615759770488198059217318778347926047870427182243220864278894053
155565124470351463656875198719523915791426498304820*I*a^2*e^(617/2*I*c) - 1
638532781934653605223939671324076040272660534091984917932575369260055054951

963211213214142190996608510675175078391684400*I*a^2*e^(615/2*I*c) - 1511215
132227236154464803465184561563977472975464243358311848382431942528662150481
46369599774876619831846513557127191004O*I*a^2*e^(613/2*I*c) - 1361294954375
962964208845005629078239401669039370127901157612319707380265547568319507651
710875887725773374076368465724720*I*a^2*e^(611/2*I*c) - 119053051215752961 7
508686638644289631884070105590459157858409269993065320514056346241559425223
3469595452131461689324159 00*I*a^2*e^(609/2*I*c) - 1001179556004177634996376
586158449265434581066062335982673920549529820094682353352918795594803230886
711611153565466381120*I*a^2*e^(607/2*I*c) - 7959515408449643621057653697999
429075685492104456323227204751992219823242162787472241292512613213145544193
13857978534620*I*a^2*e^(605/2*I*c) - 5779459984288740017111214347692428241 3
532375068565558999758340355996298184904841816223547091239816029854234000089
6820560*I*a^2*e^(603/2*I*c) - 350578959120178195916347334453309038564005078
877277224682309521488800706637838812783226214194307553791389253059107552140
*I*a^2*e^(601/2*I*c) - 117499690284248794453528461426177116010601312991844 3
433977457400497017981418931029113196544434530106246513819306665675 60*I*a^2*
e^(599/2*I*c) + 117499690284248794453528461426177116010601312991844343397 74
574004970179814189310291131965444345301062465138193066656756 0*I*a^2*e^(597/
2*I*c) + 350578959120178195916347334453309038564005078877277224682309521488
800706637838812783226214194307553791389253059107552140*I*a^2*e^(595/2*I*c)
+ 577945998428874001711121434769242824135323750685655589997583403559962981 8
490484181622354709123981602985423400008968205 60*I*a^2*e^(593/2*I*c) + 79595
154084496436210576536979994290756854921044563232272047519922198232421627874
72241292512613213145544193138579785346 20*I*a^2*e^(591/2*I*c) + 100117955600
417763499637658615844926543458106606233598267392054952982009468235335291879
559480323088671161115356546638112 0*I*a^2*e^(589/2*I*c) + 119053051215752961
750868663864428963188407010559045915785840926999306532051405634624155942522
33469595452131461689324159 00*I*a^2*e^(587/2*I*c) + 1361294954375962964208 84
500562907823940166903937012790115761231970738026554756831950765171087588772
5773374076368465724720*I*a^2*e^(585/2*I*c) + 1511215132227236154464803465 18
456156397747297546424335831184838243194252866215048146369599774876619831846
5135571271910040*I*a^2*e^(583/2*I*c) + 163853278193465360522393967132407604
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8391684400*I*a^2*e^(581/2*I*c) + 1742021615759770488198059217318778347926 04
787042718224322086427889405315556512447035146365687519871952391579142649830
4820*I*a^2*e^(579/2*I*c) + 182100358540327370257443285145091429165881478687
762174019857551217909260269292922536345288394531360315228488683842714058 0*I
*a^2*e^(577/2*I*c) + 187534855240355454931297264088788590265708968010259710
129048270355555792060350441403569585382245375804950943087964624502 0*I*a^2*e
^(575/2*I*c) + 190545759745877670993082747286644726198717656358312900256802
259238911598325512239649088186552132493120236229967124388470 0*I*a^2*e^(573/
2*I*c) + 191223080811385847886687075371271455528953381639473530724319521835
951880312988756059344994168688229383855904994033831358 0*I*a^2*e^(571/2*I*c)
 + 189702097238899020730902311991586171144973137858939188183045302246854044
334803925086586018353486223999698366183147112194 0*I*a^2*e^(569/2*I*c) + 186

157514467476811042655717741694622592613091247171965430695580653974971394224
1017532879502301920494398612936404469594040*I*a^2*e^(567/2*I*c) + 180796650
971197687193983930504271562272757863455378197045947177971268210876431987484
8175338812875321478369058170030954360*I*a^2*e^(565/2*I*c) + 173851932344383
411300744333276661616571660527994618290071620087536756724352295900565383544
565788873236442347763453632336O*I*a^2*e^(563/2*I*c) + 165572993377065829377
135776928411849394573449443880373012568963998141726044173358210452091309236
2160074470891832981049580*I*a^2*e^(561/2*I*c) + 156218696478710149062701349
108127315919089774183855060924984234675569595242196603525208197237493906823
8887193535889066200*I*a^2*e^(559/2*I*c) + 146049367884779996348705967432073
734364028858039127146662387688220750809943324883548267772046667652822694860
3304177190540*I*a^2*e^(557/2*I*c) + 135319531545142031343748956335691041467
217034283009595675577063577546629106979211426648624747227723497367041576068
3624960*I*a^2*e^(555/2*I*c) + 124271385788920994479462688908227607597714184
385846515949318348927192458876275336550765457123049424661074661713226385410
0*I*a^2*e^(553/2*I*c) + 113129222020148252022367827133514682471693009851984
413955582514078689913029755499432171479855172334439346457171016437216O*I*a^
2*e^(551/2*I*c) + 102094930776104668548385169459917674415945192031111448291
964132991511271900144480961593203959619624211269263894712905304O*I*a^2*e^(5
49/2*I*c) + 913446819168640466151130593147949820973487706939696312936850746
155847174085431933136538961202623251251021715718041418880*I*a^2*e^(547/2*I*
c) + 810268061647667968972307716564793697312629604668615669311286553922426
6337578449710624277121983121115667542568684456292O*I*a^2*e^(545/2*I*c) + 71
260848256800163774220575611365861451365570073560552608144531201822397699462
839679688360102886934646029634194828961744O*I*a^2*e^(543/2*I*c) + 621377108
447225467417920977882757187926519094886636605309366642778263069398035616183
392982442622288594629924306599635240*I*a^2*e^(541/2*I*c) + 5372076563188509
565486762229023270847834089427969982383436982571112256868356666939740987247
70529906163920011962226824320*I*a^2*e^(539/2*I*c) + 460477597645217212869 9
634737348216544979048086181700779368662782031083222686729544238056047849434
320474823931135617140O*I*a^2*e^(537/2*I*c) + 391334543747364885198646774652
098185473069223525928460733706025987409937647390579349252176416240917982911
016910315770960*I*a^2*e^(535/2*I*c) + 329724690555479726567444065640343362 6
477087249760509218203247780189699685460652368365778150260284657240655876126
40991920*I*a^2*e^(533/2*I*c) + 275427157458731124798325279881980836380771 48
366337473883656463640709461067277742104570543505933032850253506993280612156
0*I*a^2*e^(531/2*I*c) + 228086821979213161994154797898361140956767824538652
850246924199657221150977419942700239602639983898674178986057439712320*I*a^2
*e^(529/2*I*c) + 187247524619750552433254678023898305056473020604518334425 5
446132852837311570473616887934627149931203676161676739969356 08*I*a^2*e^(527
/2*I*c) + 152383229842432070507148633325172656083380096888818957463018370 23
880248073480441833822107946692115623989143924844988368O*I*a^2*e^(525/2*I*c)
 + 122926311130362982282930531800590413193892755472313438669937885559695115
359158329870216181319401680622539825771904344440*I*a^2*e^(523/2*I*c) + 9829
226282127934878488940449442580346040011668226082726046079190867274100658392

4754172171749432525005852513553778623680*I*a^2*e^(521/2*I*c) + 779004300384
7238849352329754319110489671369996671445142523745610252403103028233213388140
3961777583739648096380071388560*I*a^2*e^(519/2*I*c) + 611906118965037637892
7207287864205320962437511200632455170428453180912858492973444261957323404847
5266772127108092721024*I*a^2*e^(517/2*I*c) + 476356198918911917256834232268
3432219887911783979610638069774976955056567586492548888401944733995704796716
4208947031569*I*a^2*e^(515/2*I*c) + 367500552007064933329079576591406661210
8818238970047299598953224138138848104104173705384510275216475922507697685344
7870*I*a^2*e^(513/2*I*c) + 28095702104111852259874464472424979134701203776
699743241230943091889592515447767332435351059967242467638490956039653215
*I*a^2*e^(511/2*I*c) + 21284020494774581140682215856835211647379532894526122
522398168606383310529659429739450732289641742111431990437516970220*I*a^2*e
^(509/2*I*c) + 159762621405412190663910739051968522660967095555416803601179
38187079996111298630046538666465022790399882273480095312159*I*a^2*e^(507/2*
I*c) + 11881739200371933972343058576105853519924399145848229504506452617232
314491716995159718725808347159999045366193929126622*I*a^2*e^(505/2*I*c) + 8
754746941380140808767193965932235376963703088465634077354465243009176340895
808577057232750872517972049977460640893614*I*a^2*e^(503/2*I*c) + 6390593812
386722746901761856056544498522080471181654586118050869213449987233361402222
144983234975505203268338404069070*I*a^2*e^(501/2*I*c) + 4621128943337595364
088492817443222642176110586250679768580558275386777081926110615585427174898
007057344787791811730155*I*a^2*e^(499/2*I*c) + 3310086975916221741831538959
908349136255509559732338437900100587012253967501020440960464617664661519602
047358728834783*I*a^2*e^(497/2*I*c) + 2348498969245740571895580064918887329
769552495530222534335774313826854579971626512324706726915652887153906664457
167917*I*a^2*e^(495/2*I*c) + 1650350698805938712642664838416272826987109207
941606600565610490821766363203204649976483902793933869670965683695305667*I*
a^2*e^(493/2*I*c) + 1148609310184211843475322246870864425803113883039081327
743324472166806173047836109990343345510402414879966726470291783*I*a^2*e^(49
1/2*I*c) + 7916880141086010341969385719025570015048457121961260735634966463
47934496907150906085300660569889896692451445978865145*I*a^2*e^(489/2*I*c) +
54037717675149649942841882662885541540636679441986209524820279886371421084
7135333597884562826909393930942090796205420*I*a^2*e^(487/2*I*c) + 365238706
137359616600070699619082139713753640264690466720702053560311601516116895520
683068293669417046374470910362666*I*a^2*e^(485/2*I*c) + 2444383201892857707
580722095698191999119397721562170492707501294583055032330740932091911137683
34682284550770545377772*I*a^2*e^(483/2*I*c) + 16197592468125257912943140037
174648724259240797114224301993075271492843524907075776646373484743257735961
9977355420469*I*a^2*e^(481/2*I*c) + 106266524343343217664590361357231161622
921001135223038707483473690437882872690697205296816108160492296802679988715
880*I*a^2*e^(479/2*I*c) + 6902137883195922910041464000878806997244189478419
3849043768221837087369885098447731719808741375563682226721172187125*I*a^2*e
^(477/2*I*c) + 443801139783859724656446823619250517026966277909604986097724
20753311935097096135857768437500727905258838167774746676*I*a^2*e^(475/2*I*c
) + 28247984729479992301795480363153077415126408060426867690538880688072317

5616348614898305442604902284061474270385508 25*I*a^2*e^(473/2*I*c) + 1779744
2845524838953370802687166119580730736872218590980608472358385298518927411 76
37602325291805184924290277518505 74*I*a^2*e^(471/2*I*c) + 110987938527300499
0046747762019025358821546539078513267660604535917754053262963983600772045 53
32604033960540691735410*I*a^2*e^(469/2*I*c) + 6850450138887912000825100452 1
9197450683430857336378277353532986091554200334158710965896284499805233405 25
77634548575*I*a^2*e^(467/2*I*c) + 4184704755052826165974527300950420807062 9
830145996472721237197973585066147059968849999574298825877893588884156943 6*
I*a^2*e^(465/2*I*c) + 2529823888499135589282113191325375524965955212119888 4
1501498547265066760121934413575213110625300786645869701878760 3*I*a^2*e^(463
/2*I*c) + 1513467109188784722926918732075266628364282411928629648438218524 2
6223068717704466663954740949682836395315908652378 4*I*a^2*e^(461/2*I*c) + 89
5963859958152493547412864584913395734896005557389795660279941388150830218 55
48706222194539917072796043341360695 55*I*a^2*e^(459/2*I*c) + 524832187724682
9255832157881667627824890935336768694834984095165643527820241984729598824 54
64078962606810453652986 0*I*a^2*e^(457/2*I*c) + 3041869819363768437858778210
1122947164511559342274019635806617254542551214036865656942506381573722692 61
83384463382*I*a^2*e^(455/2*I*c) + 1744330419158261975115028902637630836564 8
6064340032111281811122572047913024554638157278794872090651983244870819588*I
*a^2*e^(453/2*I*c) + 9896067877381332477907331410532728990479916658567060 28
2169308735859392174502312220015277595613937984667339726868 3*I*a^2*e^(451/2*
I*c) + 5554183005997454459226199215151483544997827808097614837608563086893 9
55478015900340932821327739806516984768909221 7*I*a^2*e^(449/2*I*c) + 3083749
8486831367957395151854756575713960143102205258573546485344350017752690692 42
0574468301659995665557849252505*I*a^2*e^(447/2*I*c) + 16936253315799612356 9
8344925932719830217498344500133630880020014962896317376407304258660371213 05
11291927885438795*I*a^2*e^(445/2*I*c) + 920052381638436744254578543846985 03
8761040130729716544440870038146259625460404328956433770971700480114292108 63
01*I*a^2*e^(443/2*I*c) + 4943590548857470413264240596076664907046400834929 9
917638568093740188814198303647279226115852010896201360263178 13*I*a^2*e^(441
/2*I*c) + 2627149553317327769969373244307872444486689137143160099808964778 2
018224422056849062562012291546049821466657598 66*I*a^2*e^(439/2*I*c) + 13807
5620910680839630484543159588638849741545601625200997596754800339156594182 19
27276762064601455403004258892730*I*a^2*e^(437/2*I*c) + 7176563761559070657 5
9936212018974356139973024595657687829172637355396336968070917450089165988 83
6269386494950630*I*a^2*e^(435/2*I*c) + 3688592850476133350192918636007388 55
4862660831641907600593561496904171642535191449040384885406797894649133164 45
*I*a^2*e^(433/2*I*c) + 18746779224890892995613305742194609608790340706831 75
914767714475477507191799548087640602293526679849155094639 36*I*a^2*e^(431/2*
I*c) + 9420877427344593322138142106366346053507432577851045982410748212617 0
49796264759180285888967357651207588553230 1*I*a^2*e^(429/2*I*c) + 4680923744
1776088077045456777905215867470570850449000893912280817571182977850837876 37
223024461006204444270031 0*I*a^2*e^(427/2*I*c) + 229944948973854262209732284
9443718412050643625067644940051101254055986083704591615963291146415552654 93
81431315*I*a^2*e^(425/2*I*c) + 1116720835214401921869511643766088521388225 8

1190980312521900237614940167917167791540907427929390911739677433360*I*a^2*e^
(423/2*I*c) + 5361297343869717108466799099301994222464831392534317407061352
455760155232727561073082302587812090643743399000*I*a^2*e^(421/2*I*c) + 2544
342231694517514161680716829692328719438051939346232937422768133102693822487
815133332831808782360878628192*I*a^2*e^(419/2*I*c) + 1193540212203970149421
352341419566090237495924977381826971513323434310326293065946843493363225350
201134814740*I*a^2*e^(417/2*I*c) + 5533879734013116424478230776166078762781
27152071843670678786017232780419838284554774403815733341601209348720*I*a^2*
e^(415/2*I*c) + 25358783719080902176724800908666865141518002646977951644478
5991183907648198192150423457499409024155250020340*I*a^2*e^(413/2*I*c) + 114
843847074590657631454363871040863902989618519194699666927573281569036469561
814440348196035699469668453920*I*a^2*e^(411/2*I*c) + 5139748384319518996364
905073658378182514140436383413544728268708912254880303684703641534352566390
1500899300*I*a^2*e^(409/2*I*c) + 227302714482538664361285717754148334137082
48224531663198648199827179865050434174612581384879203650868383240*I*a^2*e^(
407/2*I*c) + 99327486297545824373822263658864293182414591109418375827192714
08317025926367392879382082082371215951644280*I*a^2*e^(405/2*I*c) + 42885386
529098878491305898473516376430298484507783019644947145920525911974817319124
71426589520243516263980*I*a^2*e^(403/2*I*c) + 18293501339632766443945532790
262844261778484422754576862101588579449438190747987831613240424989973174278
40*I*a^2*e^(401/2*I*c) + 77091069649717521549831816316530964542702202376033
1201680944186642421184373976839928023191662176768831260*I*a^2*e^(399/2*I*c)
 + 320924341432592374089693111399042112950775535658726081343425825933752868
056210294766531099221236855879280*I*a^2*e^(397/2*I*c) + 1319665076093228473
441012594458590529932180359928097996644967960497684759145055398738984694024
06413970620*I*a^2*e^(395/2*I*c) + 53599146402224802194955307591891208395245
153076777159512871130579368836314443143560221865548609573152000*I*a^2*e^(39
3/2*I*c) + 2150082753551818650493261129930189934794992558666792894812847175
1935533041051245303799007069546262478120*I*a^2*e^(391/2*I*c) + 851775487746
162175921041758881837150696872910880460133173143067877735689119290858441136
9617457579050080*I*a^2*e^(389/2*I*c) + 333224317057538727789737456584778173
8681209257733774800866213262903845566248518176236173736361200045650*I*a^2*e
^(387/2*I*c) + 128723590620437935187166578688363744192559416786289821896235
7652677116687693117677467659775845901537560*I*a^2*e^(385/2*I*c) + 490972552
784544535911512963964502667546666352962707817110492155631344301953639158569
622404376536434270*I*a^2*e^(383/2*I*c) + 1848846881771967854498399170942797
85554649158317372506498787095812378385154076443311386842899167584820*I*a^2*
e^(381/2*I*c) + 68731484148635694613385798142456583980432634560150438395415
555262011420422746898783679369530992622830*I*a^2*e^(379/2*I*c) + 2522244797
925070855508755512528284721015817964178184919185591315573809227332815226920
4584407017233480*I*a^2*e^(377/2*I*c) + 913609187529074929225234328910909143
8177861375318724373623251354701581584015968521795430968115978060*I*a^2*e^(3
75/2*I*c) + 326617631258352081771390516393508453174232486921186787623770196
2931500933286006887180358613164105900*I*a^2*e^(373/2*I*c) + 115236006982268
734392696871710025839854804038946508854621186577486021454624759267672884887

4609796890*I*a^2*e^(371/2*I*c) + 40120733298154037019072011843782949228393545866397197866634636372205430524308821723931230793102891 0*I*a^2*e^(369/2*I*c) + 13782990714455520413264945567803326435907142727523557161996084131832445872381068507089947931805819 0*I*a^2*e^(367/2*I*c) + 4671679230724184286357367710608338391006486220931063169265594336349694103504744375235288933535175 0*I*a^2*e^(365/2*I*c) + 15621317269585162974350037701662073903832066053037757389465930231456447027071754543682438008358530*I*a^2*e^(363/2*I*c) + 5152720769966083245578376716126106022684268106522315494316716125362986122359504287481709712640290*I*a^2*e^(361/2*I*c) + 1676440635582304033425022876768122577635520638714090564423632904135623882124364564513385268391800*I*a^2*e^(359/2*I*c) + 5379348718149653916571491818562667863620214489159027341705896004317592448614577314570992531625 40*I*a^2*e^(357/2*I*c) + 17022271033683761030680775719386022812098751282490709371492863674401680990194834664716129015244 0*I*a^2*e^(355/2*I*c) + 531137409743579240772619244249540269676320120134376141267966739592578921048850228555378428378 70*I*a^2*e^(353/2*I*c) + 16340002040912101005907971254215709957762558244186239356823013791454033184300575049767279180480*I*a^2*e^(351/2*I*c) + 4955714538682426746341069484660548323003232579130180106682728827347533547752576357707952254670*I*a^2*e^(349/2*I*c) + 14815673991392572207429848568108173372768854740195762666300356158657011223126384987165010094 80*I*a^2*e^(347/2*I*c) + 4365643975478901238435220357667301850215028941075220269655033859420268913579532714428644328 70*I*a^2*e^(345/2*I*c) + 12677586562695026330931994383855495485149834367657635541389369756460405673299742348949575818 0*I*a^2*e^(343/2*I*c) + 36277266293394668016579895100105489749256844935749788822739768560569739914792417941950684060*I*a^2*e^(341/2*I*c) + 1022796529394931165549313330953167934966729655607641556353682077371818811760153210788828441 0*I*a^2*e^(339/2*I*c) + 28408371197582793898719983303486102713407314215785388848561945870818406141858086281642702 00*I*a^2*e^(337/2*I*c) + 77723095115454758659490558675908341892349051622815985299905871043758020437458690424331701 0*I*a^2*e^(335/2*I*c) + 20943213499631348964775534154519983464782243850441272775465999443877082400711216670301632 0*I*a^2*e^(333/2*I*c) + 555734480019596122399368263240229726977597309663091013086479508116632815945437803922736 50*I*a^2*e^(331/2*I*c) + 14519842432915075789907199529282962872752309410845625982480706974266156447145232907218760*I*a^2*e^(329/2*I*c) + 37347808991036669248968911727341834507258142528304094009667172776588958823836412102627 40*I*a^2*e^(327/2*I*c) + 945613068967215676111205365966310118361254135742385899036704396326378661255246170345160*I*a^2*e^(325/2*I*c) + 2356359852091749733863904016758364705506846886744415790864710163529804581803769952143 50*I*a^2*e^(323/2*I*c) + 577806553230040116611059501868014698166807783088814376692427700055650333166433546833 90*I*a^2*e^(321/2*I*c) + 13940136148716267995607572857020772155406626631585810450884412302964119799649057708170*I*a^2*e^(319/2*I*c) + 33084480295756053337919298415448913154677253061335781080407862277149706234712068603 70*I*a^2*e^(317/2*I*c) + 7722917160632749924403122523469757372236675017674202224759605583563438546613903209 30*I*a^2*e^(315/2*I*c) + 177281363270093527719016129562770152271161698446488654079612113477246381397761958630*I*a^2*e^(313/2*I*c) + 40012171151

122678514041860836408151256588288243462089966844126253521402025344585140*I*a^2*e^(311/2*I*c) + 8877462871939026886302990313437414184883499510782510846267398966612198923415358100*I*a^2*e^(309/2*I*c) + 1935848247966584672702453980970090148696760568465563229743602617395081958731894120*I*a^2*e^(307/2*I*c) + 414815466343823656661064248622633682876622904026735200531896157088593130927151330*I*a^2*e^(305/2*I*c) + 87327823598100374994317077387410249071586643589864753197028556930729086578763100*I*a^2*e^(303/2*I*c) + 18058203976562477792070282486813154549720275521422913256768735919726439041572530*I*a^2*e^(301/2*I*c) + 3667144340630566629952111359806942570024766504496043462982986858382541115071320*I*a^2*e^(299/2*I*c) + 731168247557642740954546447803172304438120782922849282615551880122607710743390*I*a^2*e^(297/2*I*c) + 143101351073293142009283933227440863150842072596423188597919239525418651353760*I*a^2*e^(295/2*I*c) + 27485598792264285077359588674910772175227041673233676962838136429637468948920*I*a^2*e^(293/2*I*c) + 5179600691768820561839579641215540340240326374097892582774073042443161947520*I*a^2*e^(291/2*I*c) + 957431997822534541730101183991336666779272312332587320282649934086537087060*I*a^2*e^(289/2*I*c) + 173551107925703126215341839166039663518594417069855504146507661560225573200*I*a^2*e^(287/2*I*c) + 30841671636860235940256291819500345382586813672641631674672477111150251380*I*a^2*e^(285/2*I*c) + 5371784947478120709044419504203956773785248008646190849516027804337557760*I*a^2*e^(283/2*I*c) + 916735987815179627953686885573654147136590357095246361750239315192895780*I*a^2*e^(281/2*I*c) + 153244560751845874009862374935321310982256761779852307795222356568491560*I*a^2*e^(279/2*I*c) + 25084550042270038051875041124597135587903984788805048794692954025826136*I*a^2*e^(277/2*I*c) + 4019464980430704864646368121098631727141859823429991139565731831230220*I*a^2*e^(275/2*I*c) + 630268657433514150995959099261502648982435588218176946585350750330080*I*a^2*e^(273/2*I*c) + 96678041469721516390319544690830600478916298492500715925487578541500*I*a^2*e^(271/2*I*c) + 14501661593606794900679644897245761052226002310796800725001239143760*I*a^2*e^(269/2*I*c) + 2126337571797794379046038412612976575112869060832179063823545402908*I*a^2*e^(267/2*I*c) + 304649977276950113930284052476086398990639325603533022243244834208*I*a^2*e^(265/2*I*c) + 42633143603942943140960289773464948350711612149585795367207109320*I*a^2*e^(263/2*I*c) + 5824866485485956160870802202075534098780512067011784177572657920*I*a^2*e^(261/2*I*c) + 776647619316228317354588546587427508115665747952666669113195515*I*a^2*e^(259/2*I*c) + 101008942321601073058743812539394339550240476561660597100434478*I*a^2*e^(257/2*I*c) + 12808034777461845548394500830289930859507858260154054185630469*I*a^2*e^(255/2*I*c) + 1582600334407582343750559695592207912742994373526005697205768*I*a^2*e^(253/2*I*c) + 190456027772701631222167952225792270942344905110743699547445*I*a^2*e^(251/2*I*c) + 22310545816063113198799373182025930998854858701529059606430*I*a^2*e^(249/2*I*c) + 2542510639040480710865133818142242368651712053811882453386*I*a^2*e^(247/2*I*c) + 281698460502942707632621647223155968135366263301340888714*I*a^2*e^(245/2*I*c) + 30324465369949159006596930561842561176581703526851670949*I*a^2*e^(243/2*I*c) + 3169504955861830892959561795308811767842097316588802741*I*a^2*e^(241/2*I*c) + 321414474758468949963097519046442397490

455658900239275*I*a^2*e^(239/2*I*c) + 315997284052108935233738146324232331288540321727564 65*I*a^2*e^(237/2*I*c) + 300949720391566796156661668795943926402796878798749 7*I*a^2*e^(235/2*I*c) + 277411696712606367968860766543182757632328151469299*I*a^2*e^(233/2*I*c) + 2472750081534162994182832993118077910564931403030 8*I*a^2*e^(231/2*I*c) + 2129312273803633942958758817457586335895472623670*I*a^2*e^(229/2*I*c) + 1769511383525956907628555749060849212975201060 20*I*a^2*e^(227/2*I*c) + 14175642370639692917078404160115322319156841267*I*a^2*e^(225/2*I*c) + 1093437897602872607661796947121707741043900200*I*a^2*e^(223/2*I*c) + 81106652413090837180607129215519047725478483*I*a^2*e^(221/2*I*c) + 5777459899431421909042575858969918573070140*I*a^2*e^(219/2*I*c) + 394635224423835765377875194556169798413535*I*a^2*e^(217/2*I*c) + 258072073946102626661957866259024997767 22*I*a^2*e^(215/2*I*c) + 1612950426544228644388946118660228217326*I*a^2*e^(213/2*I*c) + 96165064470879466516856468979981298953*I*a^2*e^(211/2*I*c) + 5458017104331277636863728788108882260*I*a^2*e^(209/2*I*c) + 294232725284515750583337235833091605*I*a^2*e^(207/2*I*c) + 15028015438558971323851950737244424*I*a^2*e^(205/2*I*c) + 725212537844370128223087979340181*I*a^2*e^(203/2*I*c) + 32964206157734965185866131506636*I*a^2*e^(201/2*I*c) + 1406472792955917865136489871114*I*a^2*e^(199/2*I*c) + 56109286871898369496093387980*I*a^2*e^(197/2*I*c) + 2083633993341511741962220545*I*a^2*e^(195/2*I*c) + 71659370101867067314058647*I*a^2*e^(193/2*I*c) + 2268898261084114322780091*I*a^2*e^(191/2*I*c) + 65678633862380668978797*I*a^2*e^(189/2*I*c) + 1723848657662144174935*I*a^2*e^(187/2*I*c) + 40614235388474175675*I*a^2*e^(185/2*I*c) + 848339120374563870*I*a^2*e^(183/2*I*c) + 15464515215103422*I*a^2*e^(181/2*I*c) + 241005431923542*I*a^2*e^(179/2*I*c) + 3121832019735*I*a^2*e^(177/2*I*c) + 32266997620*I*a^2*e^(175/2*I*c) + 249487095*I*a^2*e^(173/2*I*c) + 1282710*I*a^2*e^(171/2*I*c) + 3289*I*a^2*e^(169/2*I*c))/(e^(517*I*c) + 418*e^(516*I*c) + 87153*e^(515*I*c) + 12085216*e^(514*I*c) + 1253841160*e^(513*I*c) + 103818048048*e^(512*I*c) + 7146142307307*e^(511*I*c) + 420601518659718*e^(510*I*c) + 21608403021340047*e^(509*I*c) + 984382804329835768*e^(508*I*c) + 40261256699368950388*e^(507*I*c) + 1493326612293984160368*e^(506*I*c) + 50648660944512569972179*e^(505*I*c) + 1581796642397812408161814*e^(504*I*c) + 45759117183402579073139583*e^(503*I*c) + 1232445557346832245176696904*e^(502*I*c) + 31042222522074681615625020522*e^(501*I*c) + 734057263616388449968842366924*e^(500*I*c) + 16353164647151530240529137618111*e^(499*I*c) + 344277152012875134140739302960914*e^(498*I*c) + 6868329225263681349501997341320517*e^(497*I*c) + 13017119307917282383515143077336002 4*e^(496*I*c) + 2348998374244347079532766203075607598*e^(495*I*c) + 40443624781415311581857832389099634564*e^(494*I*c) + 6656346706762100637541918471099711414 14*e^(493*I*c) + 10490402669510897424624643766470754045064*e^(492*I*c) + 158566476113257562566117432227203884298856*e^(491*I*c) + 2302150411226234925855222345201500900533576*e^(490*I*c) + 32147887693375338817454482515377350383950278*e^(489*I*c) + 4323336886442615575479441792508004406049648 68*e^(488*I*c) + 5605927253067558551780452883689835514455118670*e^(487*I*c) + 70164515322544462906873548813748091084561870680*e^(486*I*c) + 848552202276512356496200136959676295361696315113*e^(485*I*c) + 99254907385344

02272939987038714580495445431374618*e^(484*I*c) + 1123916045422466509664291
62063124338952554575234051*e^(483*I*c) + 1233096700139723365181997220750932
590655287625342156*e^(482*I*c) + 131187818011721747296793398943181536949646
75368481194*e^(481*I*c) + 1354425949166361161915746506253316462385011016279
37224*e^(480*I*c) + 1357990663161479842850642848032544982878359839580349899
*e^(479*I*c) + 13231708870104896973800056733779919089340836756009580718*e^(
478*I*c) + 125370496586921272662198050851269323171167338854081782959*e^(477
*I*c) + 1155855412893594260345544966642687823630035899363232371472*e^(476*I
*c) + 10375184499871175501909398956596684116802997082526660323524*e^(475*I*
c) + 90722605722208814918642284639487187764607589706493970774776*e^(474*I*c
) + 773204636991145775061462731028098506094432675788136295011259*e^(473*I*c
) + 6426195485535248576425068136870465530087114003875716691383902*e^(472*I*
c) + 52108117629177048660492400985175830987505700566877818954141639*e^(471*
I*c) + 412430698299915190848067222327219435067747934091894670488982928*e^(4
70*I*c) + 3187749929744346497211536044751776582320958627923816470590659024*
e^(469*I*c) + 2407080191352975710185802291437204586474699178618203974027432
5264*e^(468*I*c) + 17764282913511934857719443767580283023990546009268713649
4961404333*e^(467*I*c) + 12818174649149708108596041898283590007907899211694
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826367911338826483549173*e^(465*I*c) + 624735507810532953177107746902471141
24125187565731848441781904032672*e^(464*I*c) + 4222761266320036875477547465
55709988710527133086660161366353656787288*e^(463*I*c) + 2794709104475686611
842790694973699164482254723977210209725661304403472*e^(462*I*c) + 181157684
95615758076710303055505625589254293659193314153418333944596408*e^(461*I*c)
+ 115051481852080848873700388354521315567640365124003103691176697194292320*
e^(460*I*c) + 7160994975990580798956333385529402291928581964815978300788197
11862600096*e^(459*I*c) + 4369442482910113914565353136069595862669338858053
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63056810183520401889800285493144867448*e^(457*I*c) + 1534360887450562541273
27239461577071933130157764595997113973513183188399376*e^(456*I*c) + 8835009
68821791202600774541927769200737689393513734789368397093333311961880*e^(455
*I*c) + 4992519712457043983505377976607953988397368297591114957991804893688
371867680*e^(454*I*c) + 276931165383432592259833826376479361226640338596151
33489846664694361471028310*e^(453*I*c) + 1508223814314124137735664742100117
46852297437597059186295243989481140398152780*e^(452*I*c) + 8066795436075891
40759305010796189568269842021613388955218916278823182639488190*e^(451*I*c)
+ 4238125846763232586394188569858685826755328005548627437019301405851325887
594480*e^(450*I*c) + 218764828927139099280403456125787058051215087562266963
17087651824252241418663320*e^(449*I*c) + 1109691996873209747499222595952504
44341219218535349655762591192576535872151766080*e^(448*I*c) + 5532691288195
28612502918869558947829098021956309349843584044631512291778800081490*e^(447
*I*c) + 2711843239670717527605640490148833507130242448403978318523237721944
200392830108580*e^(446*I*c) + 130698172034882898861932055083758183921249913
82340160316886507181296548981014818410*e^(445*I*c) + 6194859665303550287956
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28882075526473065446996857202104710942731861950899580202068990459031947629
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85274123140*e^(440*I*c) + 1161045516835550437629115017121163993137330211326
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96314813794768069337190915967491907488904933922677579665354338960*e^(438*I*
c) + 2117589733466855707101501429210414722401838837940752841618541440888545
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*e^(435*I*c) + 147030816732276833163041582099592047512043725225353339238819
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560909375197453864243299571990964608857245771134145204174990*e^(433*I*c) +
230435107337384035737917859767306635201668278168913984209737666311848880384
1131935313641840*e^(432*I*c) + 89232094473432967633318818816384717934996186
70601026059730895962653291770229493028162575100*e^(431*I*c) + 3405405385129
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8040*e^(430*I*c) + 12809891460168853967248054183040984770736750043860153680
3204497701119911289087105659482783340*e^(429*I*c) + 47501057885760151927231
6617938425222421786597241671026894318515408511467140969393115768793680*e^(4
28*I*c) + 17365742188181910718741974724501581238835642099506586391023371481
22769080611680719741726053840*e^(427*I*c) + 6259872156822252843650960708235
034710201362776057176647226323089751446565288850103898153859920*e^(426*I*c)
+ 222519591767957777571673660360074802222113642321463998038643709633914912
23687245823457351580140*e^(425*I*c) + 7800980736802423987561373305885141712
5327114681070889640794249282633470580756557083923203377160*e^(424*I*c) + 26
974580144021129697268360186387895435796230852007659517712822762927324021520
9708218497363414140*e^(423*I*c) + 92008939302958903287460185002715932261252
6368444771489781974361078847528891468831038436064951920*e^(422*I*c) + 30961
319716215201623803015542414654517823620868102875377489029049859340201795657
06177131421614590*e^(421*I*c) + 1027936473066384084473957786246926260464886
1914297972589165243530651230690726244462479199894255180*e^(420*I*c) + 33675
398872021568375902384593982753362559801058104184627345411136262431943240778
260721756991027090*e^(419*I*c) + 108867995731829472826732905192034886797284
621356445627530909104429486741257822633476898356826454040*e^(418*I*c) + 347
351473214713780874352083129566601238765762775942366762733349952103889753982
636403857556867777300*e^(417*I*c) + 109385321448622035867403243450086667849
9770011305874172488975951612031456734608287095519501041975440*e^(416*I*c) +
34002325606016516175216946808470898441980288316944174247948687793289505484
18125605446882081152636090*e^(415*I*c) + 1043411751657039596665369315558240
210946034809547302780741232142734681692856719770376496170251803940*e^(414*
I*c) + 31610939331284692750694306443618414656095969520945215743004044560386
895241801579156543451940713351730*e^(413*I*c) + 945561802589319869193343034

66365652826858091314329189160736277175873841732196453379953705679466826880*
e^(412*I*c) + 2792857558000352066798353688981654776448649877946653878274889
33863633745047373109049265172681702585720*e^(411*I*c) + 8146081877365305796
702100252719214155971833698812142998232919697855498761759698663679766532449
74728560*e^(410*I*c) + 2346518219239105142238141633073464768899155708935025
778047637412681781575765422219127409260159438712250*e^(409*I*c) + 667586629
037114735850376686566928901089354386983053870872494529158095117918829660615
8111257706968604740*e^(408*I*c) + 18759988218865563564163635735986073278255
737257405706279108891366378428467414559930481172863538598193890*e^(407*I*c)
 + 520751785187932703864292633515443069511049935425005829381552416894081386
75254608030847907167748571734720*e^(406*I*c) + 1428017924502217624831808749
188252741343051332754177800847950346447635093335031505173458646596671894170
80*e^(405*I*c) + 3868762182342771656324517230499798892631152823746075416924
43176673997513742813591736171169652250611186480*e^(404*I*c) + 1035561982592
002935226384577908611548612111495080193573691339864706029186482466241805664
949381049856258510*e^(403*I*c) + 273889562479526560335522764656600088628077
8305084825702911938903656162004262736182657700406301914070062380*e^(402*I*c
) + 71581246868429414754738073636798397181727455815384090445033838526935969
21622426696740453944718143025248390*e^(401*I*c) + 1848740529900573269375272
861187649089085835702197488237157062380018624513772266094364175297685292443
9870880*e^(400*I*c) + 47188220843466207695099506953573780357108897491422567
898048199018207708997005333860148836479527456156014520*e^(399*I*c) + 119041
855403877964948229577948370465600606623183045529526900430209270473212773847
794935586074714329479939280*e^(398*I*c) + 296825515282669589685318273280239
050084555032203415941511962659596881615713799937680026497408305672297618840
*e^(397*I*c) + 731584972206818362874729621403974444280010446301161527339760
544815300951787985538419764656214582667219914080*e^(396*I*c) + 178244611493
175185055635485663842190117441232229824949659165805393978719824656594597559
5575734193348887952160*e^(395*I*c) + 42932064780080221260174889088518264947
90620720660151451468181910917240027863968724539127659633517053002976480*e^(
394*I*c) + 1022318202595486076721739030518645192356214547367429361991806349
0411487496121804590274592702770571515456414680*e^(393*I*c) + 24068785139705
277161193465644506143285241361037768216818922184400141048460210944696647752
723371932874594597328*e^(392*I*c) + 560286834249035176584950138585345161671
62591034367972498174660907450666778154353271630344650777885683547624184*e^(
391*I*c) + 1289670800847547122460236808664883849832862590255331320446361090
49545144029547003347761521666283977931640178464*e^(390*I*c) + 2935507435543
427098081294535765623132997059826991874168629343739642556159671386762532763
02591561523515603264403*e^(389*I*c) + 6607644731058690976914759738508379345
11089033149586707982764263394766756649565279879146173318386505740391093990*
e^(388*I*c) + 1470931146618934345515038362300100160482127749581443929904746
910224777470198899052379114493999887003199419829579*e^(387*I*c) + 323849193
136185147642332193353957909837773553920764146734623566582388704832694930560
9231585143748690203615957136*e^(386*I*c) + 70521324141621979926023265245801
430609853530545729339055246331216810210373402983663422033243253070724137390

61024*e^(385*I*c) + 1518963421490880039641791172264375474804852010973481245
9109878810493844381062650818971199637121458749456243274416*e^(384*I*c) + 32
362731322419549410330088943640247460378328561316422931292427145902887913071
643679502909055891236755143207382609*e^(383*I*c) + 682080330967936156837844
096192442108186149916400415534244055278768932724966083242310981485024664539
67157728078994*e^(382*I*c) + 142213115964814517682386672767699094822716813
18790889840501039441748635545362467679832449103520321953011780083069*e^(381
*I*c) + 2933449200343007202870423834483428663138062854550400678230804455975
45970023446231563554135133105493516316320059272*e^(380*I*c) + 5986501411122
418589116765051805201503640032268413280814535970935877903386092124390855544
66861582623350303061961052*e^(379*I*c) + 120877035849365839308944222056935
063283704108140593750226539846117737648216609559734831601248698274330296158
612144*e^(378*I*c) + 241496651681033850328907654920274051171005901179544713
8773464205696455026442712426409599662771080264826008985061097*e^(377*I*c) +
47741411110660989702218453305949620164727142303742340606639568469509266426
85946929064114194400360936223590725470146*e^(376*I*c) + 9339341958053494225
251750965715057300707302083814774770306218224241022648247419956042957363055
823830898547303219757*e^(375*I*c) + 180798200680288599703499386230072306765
633142067088484999001396412373347632664793469632379360393281131850415917938
48*e^(374*I*c) + 3463765717267169016765734453719708704888235485399327047206
3943078773600446542963548348101269390443464480754513928502*e^(373*I*c) + 65
674859268867300098827375812875225610654551686261103681664007007537115778097
293533565243828873383722980353200611956*e^(372*I*c) + 123243941519332384741
960072588103506596406339253616391082062969960682419011745775738921817753391
954462609323881489157*e^(371*I*c) + 228911311738592780091492649162346834405
867740776456326108410928857257174707289268074347550225793244741923354395308
214*e^(370*I*c) + 420846342608949387277559021457924586578120966148561022647
008499529468452005980175119410628956210497609566002969884927*e^(369*I*c) +
765867795513962781012558444628751418710940895281304790836743661582071650032
154891482866406314834433199455459798934952*e^(368*I*c) + 137967652979621207
401710618806658944835544650121089019510716486035022892858681553900306287502
6711931941947738690360722*e^(367*I*c) + 24604423758454226639270816309832607
147349680919054930271456392388271922548863493611269914576924098511208733074
87457468*e^(366*I*c) + 4343909696601932173357359687781579293701295681940827
114215433175336093967845908766740738240037114570667410936998017178*e^(365*I
*c) + 759275270014667896115309507358501547319702974653363333154979396147328
5760935801904155116764831560875947581048693527224*e^(364*I*c) + 13139771494
104933881856681151418293112242551521535686871181266579813877606348160261747
201317735782566021306798298336024*e^(363*I*c) + 225146757413080699615061655
865028724304219302106732643929972864856006401038672536048477155470605929676
90653795951142520*e^(362*I*c) + 3819901586758608797600299875662767499479544
066790362502932234625013328648912087500501363812811389396034967028070716153
0*e^(361*I*c) + 64175100693260066806238064886004597170740843300086839368616
139164529108049844675353111842725798658088840347241496099644*e^(360*I*c) +
106764832017165594838085234189333528733587673329972530092661085186789939252

915937090760282232346919090426243399409323314*e^(359*I*c) + 175896258262755
985757106812613979301265801031595484353614904672865169442232075776580447184
1341413759957700914992467595 28*e^(358*I*c) + 286992943631231496557278010851
576940896826497466066327528801560677007112837431926735088120974861760511367
008815728782643*e^(357*I*c) + 463758288457367154544937678255005688733328145
568049310423995599886012800638619904022368378591108842602342094543682299102
*e^(356*I*c) + 742228640908173124916937049462525617334148919679118270489831
005497781951221069955839623452499748653124658873553401442137*e^(355*I*c) +
117660072097578696518987505089023109220461269697027743301453589578895677123
079352038199310660688056462859982234172280101 2*e^(354*I*c) + 18475058564624
515334452843005713263237811625533045659718876707580910793067948218349281707
7312636463972207157013170378 5334*e^(353*I*c) + 287361053592234018708083543 5
582912277271967977394720159791070274927714276869531467182688981041061381703
885403497544001592*e^(352*I*c) + 442767307910542531852431611298569365658485
193610019245704445513448330504532145251634711848813322482367046510348395480
5161*e^(351*I*c) + 675848043788852437256293594896385762669485554719551948 61
228775679817185872623628719949670794018319579279016825829412343 62*e^(350*I*
c) + 102204237794346348513399752951633996417021222496636661930530083020 2609
693215856833830941823739554135181902690795322068101 3*e^(349*I*c) + 15312837
206662775379347353212807682965712535652942631518286142403097738200270711195
39658215902851353277968215445199620 8592*e^(348*I*c) + 227316035661288411004
195019470513676668366524180772609139448107484730848918904101812854126048548
766259195656395212272232 76*e^(347*I*c) + 334358978279365813011711754596108 2
945429816796201741981007293673337850658442802420107245319345815533404669351
6742390717832*e^(346*I*c) + 487332535059749234008522555630521014021964693 13
659554492725674754339375283010407167744366955828922837488705858532439654489
*e^(345*I*c) + 703863497605948315670482240613950256985012022969663003767642
203366977029615910998540554113762948714374681495285247960027 62*e^(344*I*c)
+ 100744961851853744611754300982980166962404553836222921868484694269966120 6
076989070463437310111609488281002767293701328193 57*e^(343*I*c) + 1429063191
230555242465469284789542383713159258020223892364986521368398225020351556769
709174190398345879670555884315664167 84*e^(342*I*c) + 200906587153578804380 3
004695014416101745218512595419292098406889608594549085197748359058957576667
708578886117387518584604 24*e^(341*I*c) + 279945244475039804822966730462960 8
844921198748577911471240090794769204359417352933093054304386873331299124541
96774070107264*e^(340*I*c) + 386642673050380049457382562818316962651975550 9
907792770487402386298587950182473561628886310156876647801012052873330827487
91*e^(339*I*c) + 529329252764113926003934836958243557672549238997560739214 4
065991850478319555725837653586343954087715280097454675483829500 94*e^(338*I*
c) + 718361596382058249209113544487901088868388744033713210332491971375906 7
383415515404572648043040396642559156073498019119665 51*e^(337*I*c) + 9664582
753690377187477391307981516434835906841668322346880982911641606364181594521
19815728809372125168836239364442397344064*e^(336*I*c) + 128904351529293395 6
480634330499677040181043935620106914267311067900030058398839787692376954090
545278554544997710058754772400*e^(335*I*c) + 170458299670782280820467821816

769300269866114771277235502145654381093006963718808588282475750060524696321
0810351706405349408*e^(334*I*c) + 22348912763984394644786225783064348407246
104844681778598226206586919214786452666530625638235530012280010090936067510
66168944*e^(333*I*c) + 2905385722320057001953345274489482790856692529959823
74953269596341416483366773128218607899328588608916176593772088622582464*e^
(332*I*c) + 374525759487665120465733498842622638814395450198683066422234922
6361079609546822276067504899386703088982308185717143407211328*e^(331*I*c) +
47875274427809456851452048469715961653041694193282440732114595921296492550
48876854059844720661078151288179612574986359194560*e^(330*I*c) + 6068949803
156712248331871105329895471722806143008878014986559653687260694816550470195
890004511965527567432722969707577202160*e^(329*I*c) + 762973181562782158046
899242420700836643889673633302466186383810511044514894696232829763154703254
3419811821015837863013682720*e^(328*I*c) + 95130322740195229542091131912682
266422999120135256659402983810647978856909049931289480352274121440356338517
79511219335277360*e^(327*I*c) + 1176421227487648408001090071467347449337127
816055781198372445582656605561765808647936864186490811964341241364480377213
1657280*e^(326*I*c) + 14429816285208431204532978375375691965063154224649747
551295851507389524083226976789688601369628399900747658579201929300744260*e^
(325*I*c) + 175562732712242923968872914031257162134914862611454785713767516
90105656067838042151038271381300372757755676325408026834544840*e^(324*I*c)
+ 2118832140588288753961019837470686269589404922607709376413251251333619052
3978949694387686059124526755048042957954264706637460*e^(323*I*c) + 25367176
439119353621532260335983348154904982606125761711300683492963390816491583025
705268737539982149639300226512657426118880*e^(322*I*c) + 301284824145527032
645590189530881771560134374934382010784137698354483661481217545491975911299
67170764969700180348699207838960*e^(321*I*c) + 3550010310601964987627237679
694948220958137237103600501287780602748167280705994344524013631556850073237
9966585005678181937920*e^(320*I*c) + 41499832121963708043788523787401345541
780088930538206918853579026749273364671640037563488607716092887686471542838
602788559660*e^(319*I*c) + 481331176781840292165037485491103744789247190946
356038928293648639165537922788229573682851063281647159105983708711490794943
60*e^(318*I*c) + 5539091304497208621943268914633156608142795989696990021443
4296817731150863867056620768608187679709720152974148474907904177340*e^(317*
I*c) + 63247774101012179051794946075175569924076981338138483158042406747453
874729387631710544995247152912205118500597511052824347680*e^(316*I*c) + 716
603298611733955244419438892841091340911578446552456720842374024349446964649
27131812190659629511140639501743303863582092880*e^(315*I*c) + 8056624913068
268418187620188262351120636379033721801195411021064292776599764490382059542
1936873565314654415769070472655401600*e^(314*I*c) + 89883815801382382213973
270477954602744792877018051963347146307372464315121274929402347942874802899
499538953561056667668891020*e^(313*I*c) + 995122064720579659513403417380235
485153364033717178980408504709546575329772791134915068802907261111541019413
86019689567958040*e^(312*I*c) + 1093325373499662232039326785034263570798637
070017282940110420765304039238626540189786765164173142210894499224956127328
70169660*e^(311*I*c) + 1192097137020339270557553978236884444446474243245021

85328626347046599634721146573830681540495333543146776810911910410468628960*
e^(310*I*c) + 1289950760115919034107638634270973299485861735745958627058491
59280943046458742663163454018491463855395649453952212899632198680*e^(309*I*
c) + 1385297945491510894513527695765434031263307472436800308324672058958190
43568155239264876762867172754338684027849855385453216080*e^(308*I*c) + 1476
489208055453334186231217678537773997829247483012287939243425749999379554217
65370101235122939557467548549202174550009604780*e^(307*I*c) + 1561859629535
511961697382188321736965098525515892107305783657274762594764744659554285023
36673743686499175698677875693611243400*e^(306*I*c) + 1639778160596077253752
645598165058478941877851014553603918974244829984153857876057653155092083377
41590143078572243505132706580*e^(305*I*c) + 1708698488689531011768603060531
039943405303903472600884326768425055551412938308389612759742689286664948457
23462544709102843680*e^(304*I*c) + 1767209299705546420045757700530957005953
346598706827320319759155323875770524148663235111401176804929293545175594798
99220940360*e^(303*I*c) + 1814081687709220598203685533166973216399848626282
988285695602732956308976268293452635922190345608535307337105298421485379016
80*e^(302*I*c) + 1848311519837489418176678501747082571381281721582694132877
65358532240773244336191900818557829905895684494889410451921524212840*e^(301
*I*c) + 1869154744365675149263514056231175032619875083519300838245664444356
89139233683411704641828762178799177848064220150818355261280*e^(300*I*c) + 1
876153931685100500714972805646035109124031329203120243708350626790376449902
86285346673507093452964351257962696133511725652320*e^(299*I*c) + 1869154744
365675149263514056231175032619875083519300838245664444356891392336834117046
41828762178799177848064220150818355261280*e^(298*I*c) + 1848311519837489418
176678501747082571381281721582694132877653585322407732443361919008185578299
05895684494889410451921524212840*e^(297*I*c) + 1814081687709220598203685533
166973216399848626282988285695602732956308976268293452635922190345608535307
33710529842148537901680*e^(296*I*c) + 1767209299705546420045757700530957005
953346598706827320319759155323875770524148663235111401176804929293545175594
79899220940360*e^(295*I*c) + 1708698488689531011768603060531039943405303903
472600884326768425055551412938308389612759742689286664948457234625447091028
43680*e^(294*I*c) + 1639778160596077253752645598165058478941877851014553603
91897424482998415385787605765315509208337741590143078572243505132706580*e^(
293*I*c) + 1561859629535511961697382188321736965098525515892107305783657274
76259476474465955428502336673743686499175698677875693611243400*e^(292*I*c)
+ 1476489208055453334186231217678537773997829247483012287939243425749999379
55421765370101235122939557467548549202174550009604780*e^(291*I*c) + 1385297
945491510894513527695765434031263307472436800308324672058958190435681552392
64876762867172754338684027849855385453216080*e^(290*I*c) + 1289950760115919
034107638634270973299485861735745958627058491592809430464587426631634540184
91463855395649453952212899632198680*e^(289*I*c) + 1192097137020339270557553
978236884444446474243245021853286263470465996347211465738306815404953335431
46776810911910410468628960*e^(288*I*c) + 1093325373499662232039326785034263
570798637070017282940110420765304039238626540189786765164173142210894499224
95612732870169660*e^(287*I*c) + 9951220647205796595134034173802354851533640

337171789804085047095465753297727911349150688029072611115410194138601968956
7958040*e^(286*I*c) + 898838158013823822139732704779546027447928770180519633
347146307372464315121274929402347942874802899499538953561056667668891020*e^
(285*I*c) + 805662491306826841818762018826235112063637903372180119541102106
4292776599764490382059542193687356531465441576907047265540160 0*e^(284*I*c)
+ 716603298611733955244419438892841091340911578446552456720842374024349446 9
646492713181219065962951114063950174330386358209288 0*e^(283*I*c) + 63247774
101012179051794946075175569924076981338138483158042406747453874729387631710
544995247152912205118500597511052824347680*e^(282*I*c) + 553909130449720862
194326891463315660814279598969699002144342968177311508638670566207686081876
797097201529741484749079041773 40*e^(281*I*c) + 481331176781840292165037485 4
911037447892471909463560389282936486391655379227882295736828510632816471591
059837087114907949436 0*e^(280*I*c) + 414998321219637080437885237874013455 41
780088930538206918853579026749273364671640037563488607716092887686471542838
602788559660*e^(279*I*c) + 355001031060196498762723767969494822095813723710
360050128778060274816728070599434452401363155685007323799665850056781819379
20*e^(278*I*c) + 301284824145527032645590189530881771560134374934382010784 1
376983544836614812175454919759112996717076496970018034869920783896 0*e^(277*
I*c) + 253671764391193536215322603359833481549049826061257617113006834929 63
390816491583025705268737539982149639300226512657426118880*e^(276*I*c) + 211
883214058828875396101983747068626958940492260770937641325125133361905239789
496943876860591245267550480429579542647066374 60*e^(275*I*c) + 1755627327122
429239688729140312571621349148626114547857137675169010565606783804215103827
138130037275775567632540802683454484 0*e^(274*I*c) + 1442981628520843120453 2
978375375691965063154224649747551295851507389524083226976789688601369628399
900747658579201929300744260*e^(273*I*c) + 117642122748764840800109007146734
744933712781605578119837244558265660556176580864793686418649081196434124136
44803772131657280*e^(272*I*c) + 951303227401952295420911319126822664229991 2
013525665940298381064797885690904993128948035227412144035633851779511219335
277360*e^(271*I*c) + 762973181562782158046899242420700836643889673633302466
186383810511044514894696232829763154703254341981182101583786301368272 0*e^(2
70*I*c) + 606894980315671224833187110532989547172280614300887801498655965 36
872606948165504701958900045119655275674327229697075772021 60*e^(269*I*c) + 4
787527442780945685145204846971596165304169419328244073211459592129649255048
876854059844720661078151288179612574986359194560*e^(268*I*c) + 374525759487
665120465733498842622638814395450198683066422234922636107960954682227606750
489938670308898230818571714340721132 8*e^(267*I*c) + 29053857223200570019533
452744894827908566925299598237495326959634141648333667731282186078993285886
089161765937720886225824 64*e^(266*I*c) + 223489127639843946447862257830643 4
840724610484468177859822620658691921478645266653062563823553001228001009093
606751066168944*e^(265*I*c) + 170458299670782280820467821816769300269866114
771277235502145654381093006963718808588282475750060524696321081035170640534
9408*e^(264*I*c) + 128904351529293395648063433049967704018104393562010691 42
673110679000300583988397876923769540905452785545449977100587547724 00*e^(263
*I*c) + 966458275369037718747739130798151643483590684166832234688098291164 1

60636418159452119815728809372125168836239364442397344064*e^(262*I*c) + 7183
615963820582492091135444879010888683887440337132103324919713759067383415515
40457264804304039664255915607349801911966551*e^(261*I*c) + 5293292527641139
260039348369582435576725492389975607392144065991850478319555725837653586343
95408771528009745467548382950094*e^(260*I*c) + 3866426730503800494573825628
183169626519755509907792770487402386298587950182473561628886310156876647801
01205287333082748791*e^(259*I*c) + 2799452444750398048229667304629608844921
198748577911471240090794769204359417352933093054304386873331299124541967740
70107264*e^(258*I*c) + 2009065871535788043803004695014416101745218512595419
29209840688960859454908519774835905895757666770857888611738751858460424*e^(
257*I*c) + 1429063191230555242465469284789542383713159258020223892364986521
36839822502035155676970917419039834587967055588431566416784*e^(256*I*c) + 1
007449618518537446117543009829801669624045538362229218684846942699661206076
98907046343731011160948828100276729370132819357*e^(255*I*c) + 7038634976059
483156704822406139502569850120229696630037676422033669770296159109985405541
1376294871437468149528524796002762*e^(254*I*c) + 48733253505974923400852255
563052101402196469313659554492725674754339375283010407167744366955828922837
488705858532439654489*e^(253*I*c) + 334358978279365813011711754596108294542
981679620174198100729367333785065844280242010724531934581553340466935167423
90717832*e^(252*I*c) + 2273160356612884110041950194705136766683665241807726
0913944810748473084891890410181285412604854876625919565639521227223276*e^(2
51*I*c) + 15312837206662775379347353212807682965712535652942631518286142403
097738200270711195396582159028513532779682154451996208592*e^(250*I*c) + 102
204237794346348513399752951633996417021222496636661930530083020260969321585
68338309418237395541351819026907953220681013*e^(249*I*c) + 6758480437888524
372562935948963857626694855547195519486122877567981718587262362871994967079
401831957927901682582941234362*e^(248*I*c) + 442767307910542531852431611298
569365658485193610019245704445513448330504532145251634711848813322482367046
5103483954805161*e^(247*I*c) + 28736105359223401870808354355829122772719679
773947201597910702749277142768695314671826889810410613817038854034975440015
92*e^(246*I*c) + 1847505856462451533445284300571326323781162553304565971887
670758091079306794821834928170773126364639722071570131703785334*e^(245*I*c)
 + 117660072097578696518987505089023109220461269697027743301453589578895677
1230793520381993106606880564628599822341722801012*e^(244*I*c) + 74222864090
817312491693704946252561733414891967911827048983100549778195122106995583962
3452499748653124658873553401442137*e^(243*I*c) + 46375828845736715454493767
825500568873332814556804931042399559988601280063861990402236837859110884260
2342094543682299102*e^(242*I*c) + 28699294363123149655727801085157694089682
649746606632752880156067700711283743192673508812097486176051136700881572878
2643*e^(241*I*c) + 17589625826275598575710681261397930126580103159548435361
4904672865169442232075776580447184134141375995770091499246759528*e^(240*I*c
) + 10676483201716559483808523418933352873358767332997253009266108518678993
9252915937090760282232346919090426243399409323314*e^(239*I*c) + 64175100693
260066806238064886004597170740843300086839368616139164529108049844675353111
842725798658088840347241496099644*e^(238*I*c) + 381990158675860879760029987

566276749947954406679036250293223462501332864891208750050136381281138939603
49670280707161530*e^(237*I*c) + 225146757413080699615061655865028724304219 3
021067326439299728648560064010386725360484771554706059296769065379595114252
0*e^(236*I*c) + 131397714941049338818566811514182931122425515215356868711 81
266579813877606348160261747201317735782566021306798298336024*e^(235*I*c) +
759275270014667896115309507358501547319702974653363333154979396147328576093
58019041551167648315608759475810486935272 24*e^(234*I*c) + 43439096966019321
733573596877815792937012956819408271142154331753360939678459087667407382400
3711457066741093699801717 8*e^(233*I*c) + 246044237584542266392708163098326 0
714734968091905493027145639238827192254886349361126991457692409851120873307
487457468*e^(232*I*c) + 137967652979621207401710618806658944835544650121089
0195107164860350228928586815539003062875026711931941947738690360722*e^(231*
I*c) + 765867795513962781012558444628751418710940895281304790836743661582 07
165003215489148286640631483443319945545979893495 2*e^(230*I*c) + 42084634260
894938727755902145792458657812096614856102264700849952946845200598017511941
062895621049760956600296988492 7*e^(229*I*c) + 228911311738592780091492649 16
234683440586774077645632610841092885725717470728926807434755022579324474192
3354395308214*e^(228*I*c) + 123243941519332384741960072588103506596406339 25
361639108206296996068241901174577573892181775339195446260932388148915 7*e^(2
27*I*c) + 656748592688673000988273758128752256106545516862611036816640070 07
5371157780972935335652438288733837229803532006119 56*e^(226*I*c) + 346376571
726716901676573445371970870488823548539932704720639430787736004465429635483
481012693904434644807545139285 02*e^(225*I*c) + 180798200680288599703499386 2
300723067656331420670884849990013964123733476326647934696323793603932811318
5041591793848*e^(224*I*c) + 933934195805349422525175096571505730070730208 38
147747703062182242410226482474199560429573630558238308985473032197 57*e^(223
*I*c) + 477414111106609897022184533059496201647271423037423406066395684695 0
92664268594692906411419440036093622359072547014 6*e^(222*I*c) + 241496651681
033850328907654920274051171005901179544713877346420569645502644271242640959
966277108026482600898506109 7*e^(221*I*c) + 120877035849365839308944222205 69
350632837041081405937502265398461177376482166095597348316012486982743302961
58612144*e^(220*I*c) + 598650141112241858911676505180520150364003226841328 0
814535970935877903386092124390855544668615826233503030619610 52*e^(219*I*c)
+ 293344920034300720287042383448342866313806285455040067823080445597545970 0
23446231563554135133105493516316320059272*e^(218*I*c) + 142213115964814517 6
823866672767699094822716813187908898405010394417486355453624676798324491035
203219530117800830 69*e^(217*I*c) + 682080330967936156837844096192442108186 1
499164004155342440552787689327249660832423109814850246645396715772807899 4*e
^(216*I*c) + 323627313224195494103300889436402474603783285613164229312924 27
14590288791307164367950290905589123675514320738260 9*e^(215*I*c) + 151896342
149088003964179117226437547480485201097348124591098788104938443810626508189
711996371214587494562432744 16*e^(214*I*c) + 705213241416219799260232652458 0
143060985353054572933905524633121681021037340298366342203324325307072413739
061024*e^(213*I*c) + 323849193136185147642332193353957909837773553920764146
7346235665823887048326949305609231585143748690203615957136*e^(212*I*c) + 14

709311466189343455150383623001001604821277495814439299047469102247774701988
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738508379345110890331495867079827642633947667566495652798791461733183865057
40391093990*e^(210*I*c) + 2935507435543427098081294535765623132997059826991
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+ 1289670800847547122460236808664883849832862590255331320446361090495451440
29547003347761521666283977931640178464*e^(208*I*c) + 5602868342490351765849
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5683547624184*e^(207*I*c) + 24068785139705277161193465644506143285241361037
768216818922184400141048460210944696647752723371932874594597328*e^(206*I*c)
+ 102231820259548607672173903051864519235621454736742936199180634904114874
96121804590274592702770571515456414680*e^(205*I*c) + 4293206478008022126017
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053002976480*e^(204*I*c) + 178244611493175185055635485663842190117441232229
8249496591658053939787198246565945975595575734193348887952160*e^(203*I*c) +
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7985538419764656214582667219914080*e^(202*I*c) + 29682551528266958968531827
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7618840*e^(201*I*c) + 11904185540387796494822957794837046560060662318304552
9526900430209270473212773847794935586074714329479939280*e^(200*I*c) + 47188
220843466207695099506953573780357108897491422567898048199018207708997005333
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90890858357021974882371570623800186245137722660943641752976852924439870880*
e^(198*I*c) + 7158124686842941475473807363679839718172745581538409044503383
852693596921622426696740453944718143025248390*e^(197*I*c) + 273889562479526
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6301914070062380*e^(196*I*c) + 10355619825920029352263845779086115486121114
95080193573691339864706029186482466241805664949381049856258510*e^(195*I*c)
+ 3868762182342771656324517230499798892631152823746075416924431766739975137
42813591736171169652250611186480*e^(194*I*c) + 1428017924502217624831808749
188252741343051332754177800847950346447635093335031505173458646596671894170
80*e^(193*I*c) + 5207517851879327038642926335154430695110499354250058293815
5241689408138675254608030847907167748571734720*e^(192*I*c) + 18759988218865
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863538598193890*e^(191*I*c) + 667586629037114735850376686566928901089354386
9830538708724945291580951179188296606158111257706968604740*e^(190*I*c) + 23
465182192391051422381416330734647688991557089350257780476374126817815757654
22219127409260159438712250*e^(189*I*c) + 8146081877365305796702100252719214
15597183369881214299823291969785549876175969866367976653244974728560*e^(188
*I*c) + 2792857558000352066798353688981654776448649877946653878274889338636
33745047373109049265172681702585720*e^(187*I*c) + 9455618025893198691933430
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0*e^(186*I*c) + 31610939331284692750694306443618414656095969520945215743004
044560386895241801579156543451940713351730*e^(185*I*c) + 104341175165703959
666536931555824021094603480954730278074123214273468169285671977703764961702

51803940*e^(184*I*c) + 3400232560601651617521694680847089844198028831694417
4247948687793289505484181256054468820811526360900*e^(183*I*c) + 109385321448
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9501041975440*e^(182*I*c) + 3473514732147137808743520831295666012387657627
75942366762733349952103889753982636403857556867777300*e^(181*I*c) + 10886799
5731829472826732905192034886797284621356445627530909104429486741257822633476
6898356826454040*e^(180*I*c) + 3367539887202156837590238459398275336255980101
0581041846273454111362624319432407782607217569910270090*e^(179*I*c) + 102793
6473066384084473957786246926260464886191429797258916524353065123069072624446
62479199894255180*e^(178*I*c) + 3096131971621520162380301554241465451782362
0868102875377489029049859340201795657061771314216145900*e^(177*I*c) + 920089
3930295890328746018500271593226125263684447714897819743610788475288914688310
038436064951920*e^(176*I*c) + 2697458014402112969726836018638789543579623085
5200765951771282276292732402152097082184973634141400*e^(175*I*c) + 780098073
6802423987561373305885141712532711468107088964079424928263347058075655708392
23203377160*e^(174*I*c) + 2225195917679577775716736603600748022221136423214
6399803864370963391491223687245823457351580140*e^(173*I*c) + 62598721568222
5284365096070823503471020136277605717664722632308975144656528885010389815385
59920*e^(172*I*c) + 1736574218818191071874197472450158123883564209950658639
102337148122769080611680719741726053840*e^(171*I*c) + 475010578857601519272
3166179384252224217865972416710268943185154085114671409693931157687936800*e^
(170*I*c) + 1280989146016885396724805418304098477073675004386015368032044970
70111991128908710565948278334 0*e^(169*I*c) + 340540538512955691543523467221
77172655187548910782008504718324168725029438589162349211628040*e^(168*I*c)
+ 8923209447343296763331881881638471793499618670601026059730895962653291770
229493028162575100*e^(167*I*c) + 2304351073373840357379178597673066352016682
27816891398420973766631184888038411319353136418400*e^(166*I*c) + 58640346697
2683242741643328921560909375197453864243299571990964608857245771134145204174
4990*e^(165*I*c) + 1470308167322768331630415820995920475120437252253533392338
8191651930004076295447457532217400*e^(164*I*c) + 363183696523025917321974444
4097981220226408246041305525067425867951832673543828478758857300*e^(163*I*c)
 + 883672064086047030569451402154796955129679409226698304411837579002585458
4036796364768280*e^(162*I*c) + 2117589733466855707101501429210414722401838837
37940752841618541440888545729943138209036820*e^(161*I*c) + 4997075672538590
843575963148137947680693371909159674919074889049339226775796653543389600*e^(
160*I*c) + 1161045516835550437629115017121163993137330211326774811128240472
46361794049635726479850*e^(159*I*c) + 265568063890434075344967023691015457959
59948617577414147899446527121275669101852741231400*e^(158*I*c) + 59789921729
44143218459161149299819706321732111578494525245228742976468409105395536290*
e^(157*I*c) + 132475641236783747315747282116248369112096650194895392649224116
64378826428454643722112 0*e^(156*I*c) + 28882075526473065446996857202104710942
7318619508995802020689904590319476295408324280*e^(155*I*c) + 619485966530
3550287956433881523431066041090203788247316180477449291621657588007768 0*e^(
154*I*c) + 1306981720348828988619320550837581839212499138234016031688650718
129654898101481841 0*e^(153*I*c) + 2711843239670717527605640490148833507130 2

42448403978318523237721944200392830108580*e^(152*I*c) + 5532691288195286125 02918869558947829098021956309349843584044631512291778800081490*e^(151*I*c) + 1109691996873209747499222595952504443412192185353496557625911925765358721 51766080*e^(150*I*c) + 2187648289271390992804034561257870580512150875622669 6317087651824252241418663320*e^(149*I*c) + 42381258467632325863941885698586 85826755328005548627437019301405851325887594480*e^(148*I*c) + 8066795436075 89140759305010796189568269842021613388955218916278823182639488190*e^(147*I* c) + 1508223814314124137735664742100117468522974375970591862952439894811403 98152780*e^(146*I*c) + 2769311653834325922598338263764793612266403385961513 3489846664694361471028310*e^(145*I*c) + 49925197124570439835053779766079539 88397368297591114957991804893688371867680*e^(144*I*c) + 8835009688217912026 00774541927769200737689393513734789368397093333311961880*e^(143*I*c) + 1534 36088745056254127327239461577071933130157764595997113973513183188399376*e^(142*I*c) + 2614397627990202144347194566508025456305681018352040188980028549 3144867448*e^(141*I*c) + 4369442482910113914565353136069595862693388580534 19381214131241925047008*e^(140*I*c) + 7160994975990580798956333385529402291 92858196481597830078819711862600096*e^(139*I*c) + 1150514818520808488737003 88354521315567640365124003103691176697194292320*e^(138*I*c) + 1811576849561 5758076710303055505625589254293659193314153418333944596408*e^(137*I*c) + 27 94709104475686611842790694973699164482254723977210209725661304403472*e^(136 *I*c) + 4222761266320036875477547465557099887105271330866601613663536567872 88*e^(135*I*c) + 6247355078105329531771077469024711412412518756573184844178 1904032672*e^(134*I*c) + 90466935238256829790443389631042631676725868263679 11338826483549173*e^(133*I*c) + 1281817464914970810859604189828359000790789 921169405304612211251818*e^(132*I*c) + 177642829135119348577194437675802830 239905460092687136494961404333*e^(131*I*c) + 240708019135297571018580229143 72045864746991786182039740274325264*e^(130*I*c) + 3187749929744346497211536 044751776582320958627923816470590659024*e^(129*I*c) + 412430698299915190848 067222327219435067747934091894670488982928*e^(128*I*c) + 521081176291770486 60492400985175830987505700566877818954141639*e^(127*I*c) + 6426195485535248 576425068136870465530087114003875716691383902*e^(126*I*c) + 773204636991145 775061462731028098506094432675788136295011259*e^(125*I*c) + 907226057222088 14918642284639487187764607589706493970774776*e^(124*I*c) + 1037518449987117 5501909398956596684116802997082526660323524*e^(123*I*c) + 11558554128935942 60345544966642687823630035899363232371472*e^(122*I*c) + 1253704965869212726 62198050851269323171167338854081782959*e^(121*I*c) + 1323170887010489697380 0056733779919089340836756009580718*e^(120*I*c) + 13579906631614798428506428 48032544982878359839580349899*e^(119*I*c) + 1354425949166361161915746506253 31646238501101627937224*e^(118*I*c) + 1311878180117217472967933989431815369 4964675368481194*e^(117*I*c) + 12330967001397233651819972207509325906552876 25342156*e^(116*I*c) + 112391604542246650966429162063124338952554575234051* e^(115*I*c) + 9925490738534402272939987038714580495445431374618*e^(114*I*c) + 848552202276512356496200136959676295361696315113*e^(113*I*c) + 701645153 22544462906873548813748091084561870680*e^(112*I*c) + 5605927253067558551780 452883689835514455118670*e^(111*I*c) + 432333688644261557547944179250800440

604964868*e^(110*I*c) + 321478876933753388174544825153773503839502 78*e^(109
*I*c) + 23021504112262349258552223452015009005335 76*e^(108*I*c) + 158566476
11325756256611743222720388429885 6*e^(107*I*c) + 104904026695108974246246437
66470754045064*e^(106*I*c) + 66563467067621006375419184710997114141 4*e^(105
*I*c) + 40443624781415311581857832389099634564*e^(104*I*c) + 23489983742443
470795327662030756075 98*e^(103*I*c) + 130171193079172823835151430773360024*
e^(102*I*c) + 6868329225263681349501997341320517*e^(101*I*c) + 344277152012
875134140739302960914*e^(100*I*c) + 16353164647151530240529137618111*e^(99*
I*c) + 734057263616388449968842366924*e^(98*I*c) + 310422225220746816156250
20522*e^(97*I*c) + 1232445557346832245176696904*e^(96*I*c) + 45759117183402
579073139583*e^(95*I*c) + 1581796642397812408161814*e^(94*I*c) + 5064866094
4512569972179*e^(93*I*c) + 1493326612293984160368*e^(92*I*c) + 402612566993
68950388*e^(91*I*c) + 984382804329835768*e^(90*I*c) + 21608403021340047*e^(
89*I*c) + 420601518659718*e^(88*I*c) + 7146142307307*e^(87*I*c) + 103818048
048*e^(86*I*c) + 1253841160*e^(85*I*c) + 12085216*e^(84*I*c) + 87153*e^(83*
I*c) + 418*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) + 28*(299*a^2*e^(1027
/2*I*c) + 116610*a^2*e^(1025/2*I*c) + 22680645*a^2*e^(1023/2*I*c) + 2933363
420*a^2*e^(1021/2*I*c) + 283802910885*a^2*e^(1019/2*I*c) + 21909584720322*a
^2*e^(1017/2*I*c) + 1405865019554882*a^2*e^(1015/2*I*c) + 77121738215879370
*a^2*e^(1013/2*I*c) + 3692203217135946825*a^2*e^(1011/2*I*c) + 156713514333
171921595*a^2*e^(1009/2*I*c) + 5970784896604221606627*a^2*e^(1007/2*I*c) +
206263478282239243233771*a^2*e^(1005/2*I*c) + 6514488191198508953598437*a^2
*e^(1003/2*I*c) + 189421272128521178822066445*a^2*e^(1001/2*I*c) + 51008442
61395996953829648360*a^2*e^(999/2*I*c) + 127861163009333998455801820954*a^2
*e^(997/2*I*c) + 2996746014847853620317693731016*a^2*e^(995/2*I*c) + 659284
12548866286902779022351001*a^2*e^(993/2*I*c) + 1366183222241782313586863286
641184*a^2*e^(991/2*I*c) + 26748429587445855729768539197182585*a^2*e^(989/2
*I*c) + 496183373555284804627911954521619600*a^2*e^(987/2*I*c) + 8742278599
147295285480758801384765381*a^2*e^(985/2*I*c) + 146631857213698093058440158
830415565266*a^2*e^(983/2*I*c) + 2346109768759347903572910732245570209842*a
^2*e^(981/2*I*c) + 35875929609390406738394666219971221205725*a^2*e^(979/2*I
*c) + 525223629498383939328992961505581135597600*a^2*e^(977/2*I*c) + 737333
2079799133639063658614527645894565137*a^2*e^(975/2*I*c) + 99403445980961943
589598468520732983548550704*a^2*e^(973/2*I*c) + 128869477345205404677164078
8950472807542901137*a^2*e^(971/2*I*c) + 160864673227245526985013409757831 63
797842534840*a^2*e^(969/2*I*c) + 193573846127814805336166214026334290497006
915130*a^2*e^(967/2*I*c) + 224795466429934927362363715589497559910875366767
2*a^2*e^(965/2*I*c) + 25219245783549721366067799114158978864399924058441*a^
2*e^(963/2*I*c) + 273590663366155266234104272169452688263007484513781*a^2*e
^(961/2*I*c) + 2872702692034937563897971496575074831246739185614575*a^2*e^(
959/2*I*c) + 29219499075263535843858862377648073071285310974657915*a^2*e^(9
57/2*I*c) + 288136830654984406530837787337700439328183658059646399*a^2*e^(9
55/2*I*c) + 2756769770542048744355911382380396555656358932078858681*a^2*e^(
953/2*I*c) + 25608953102811736020699671981400531591652082353456701666*a^2*e
^(951/2*I*c) + 231137354125616547233443142991124898825470770660317194554*a^

2*e^(949/2*I*c) + 2028231682527169820869698431068546224630661674135401655870*a^2*e^(947/2*I*c) + 17314186832105700122787937106308399484490093525695416858785*a^2*e^(945/2*I*c) + 143872782220632026353482783145282086606314049235674031853952*a^2*e^(943/2*I*c) + 1164367032824623073366685138251309912040093060141928716087681*a^2*e^(941/2*I*c) + 9182633302160212452918968603806828036823248995981353166570702*a^2*e^(939/2*I*c) + 70604348724401170958829605205937063913034447082349890348162895*a^2*e^(937/2*I*c) + 529533489706434824451250188592739498197462491764283044018575440*a^2*e^(935/2*I*c) + 3875741803263271608578048125955066152785493897151672716099440360*a^2*e^(933/2*I*c) + 27695464742706927996157891275342643431040906047696742940234352112*a^2*e^(931/2*I*c) + 193303514872786115923379716628253419318944176435876056802589865772*a^2*e^(929/2*I*c) + 1318333654990888899417746520374288649257223133573127905086467548080*a^2*e^(927/2*I*c) + 8788918880786687559267555413796199314981595789787074901006933535500*a^2*e^(925/2*I*c) + 57297195830579479880905283759887310015692255967368709515502818525680*a^2*e^(923/2*I*c) + 365406237849518248372060960463581650995651842549690071352678851012540*a^2*e^(921/2*I*c) + 2280416002497499972330270356628053500702221025770502602102780787687624*a^2*e^(919/2*I*c) + 13931340194933935228013466294179987445068758219565436862349156508804360*a^2*e^(917/2*I*c) + 83339747736469143532428073310762163525113789344043183602916613227872140*a^2*e^(915/2*I*c) + 488344836125981471048169163657616516954158792795618978221198980949925840*a^2*e^(913/2*I*c) + 2803793220826297874163429682131102503306549005265399219277240917413502940*a^2*e^(911/2*I*c) + 15777404639975259272454933843539474544665236819117566997318672304666566800*a^2*e^(909/2*I*c) + 87039467228531013705409191271452383389335356884921808641492423363762400060*a^2*e^(907/2*I*c) + 470873979833165454444627659803101969430867153471663329279188629910819335440*a^2*e^(905/2*I*c) + 2498697917579895977978723588576283933137296518743481104776932566391579455400*a^2*e^(903/2*I*c) + 13009255453778977514917501132236907767356887691068368589411338908245552368240*a^2*e^(901/2*I*c) + 66470080272037903682198219835488944949996749070187078822650198449544212324410*a^2*e^(899/2*I*c) + 333378106740586138251610124958796714576935099619835073172307696551648259829120*a^2*e^(897/2*I*c) + 1641662348095460363514356729639026504243315309578757871628322407537121464954630*a^2*e^(895/2*I*c) + 7938933320497449635918969680758326307339116239071846330248311795038723075723660*a^2*e^(893/2*I*c) + 377107106707422037469802679360762145217845506499125755188205552220031814445215110*a^2*e^(891/2*I*c) + 175987317444160012665123402745831252173155432052395534884810603675523612022791280*a^2*e^(889/2*I*c) + 807047768188333538846684803460779790931055555100120589990758127536168861246233500*a^2*e^(887/2*I*c) + 3637498646026425598745279228803679517140090350241314216371570468174738174921307980*a^2*e^(885/2*I*c) + 161116628162411464679896502836324771389620584856574877922468282685664283130175327730*a^2*e^(883/2*I*c) + 70209017945411591200961651730058863557722458877098381486938641100483455911795967290*a^2*e^(881/2*I*c) + 300771234468452520266562607329665922159115381500087728345930006292005623202669775630*a^2*e^(879/2*I*c) + 1267300191943737324119320599349683654493348850217007321150739273112190995849189116570*a^2*e^(877/2*I*c) + 525285

606278183393820149086942244493046474642337458887176544669032400994119860091
2010*a^2*e^(875/2*I*c) + 2142176528983705740386959616994147567864550649247l
86416870451808279751320770760257807O*a^2*e^(873/2*I*c) + 859662077957427711
6311008408307932619869205078119881831903736271678521536933272322736O*a^2*e^
(871/2*I*c) + 339531565165818157488111546236514739245172484736482729741196 7
325487150772746212718150 60*a^2*e^(869/2*I*c) + 132001151473743564403925218 5
614537842325531317784101906639727300233020372137428050228960*a^2*e^(867/2*I
*c) + 505224056037277225250841188446932961822637692797906299614523611049177
370080544153910457O*a^2*e^(865/2*I*c) + 190397367004770341919144178744086 95
155655405986129726283796391182602876937826158174743280*a^2*e^(863/2*I*c) +
706592022204022196993271424724802422878766537649533021333603764482872261874
87345644845530*a^2*e^(861/2*I*c) + 258265319998385920800570589348242938126 4
459621216959490283779636037387145156629208579124 00*a^2*e^(859/2*I*c) + 9298
442698396182432776277869232434146236637762612203148716791997224555846984342
16819569010*a^2*e^(857/2*I*c) + 329804705399395014662084250372152905831848 5
356660075016582248017786240344190976379491032900*a^2*e^(855/2*I*c) + 115255
143382481221158069012236314088656650608739923317312167175458396413954935434
78555391940*a^2*e^(853/2*I*c) + 396893152747629625983440995776573121457424 0
822782643128242282484408995717469433224524020213O*a^2*e^(851/2*I*c) + 13469
404583173308483157417052349751010412883603540357635301598204857708143840674
7258639643920*a^2*e^(849/2*I*c) + 450541815994350416329563482655909244979 32
033443840591496841140615625295831700197728967932057O*a^2*e^(847/2*I*c) + 14
855351189531389488659783317179105994974562961777923747855905162334746559064
3954934297011448O*a^2*e^(845/2*I*c) + 482880723711149517085020202679552656 0
032755045691541653850695089412640252061166703373641008090*a^2*e^(843/2*I*c)
 + 154757897173974602762348431110439506950134710306254279251753537971128762
4195897458733855847120O*a^2*e^(841/2*I*c) + 489066090725200576110713705079 9
634022477668137977503492586820092379466421485454066818473522306O*a^2*e^(839
/2*I*c) + 152415374106074622939224284153659601550627109436325926621014480 22
93335348624678102171198901704 00*a^2*e^(837/2*I*c) + 468468261824774958091 79
107195535791661693332034260273942376891674924944340141880433675494310263O*a
^2*e^(835/2*I*c) + 142024878651818746671802304890173111837794685430081197 76
7107230441127897396944000158322128201313O*a^2*e^(833/2*I*c) + 424740092507 7
373176113486312190145472181686422993933942447632846633095644440032003339271
168690570*a^2*e^(831/2*I*c) + 125313382279208564920745903266740993744531228
689135168618545652497796427445784910594120409603825 10*a^2*e^(829/2*I*c) + 3
647765370604224594468882060469649421908133476712105791233191413780441530797
333779390217729459921O*a^2*e^(827/2*I*c) + 104773294919708181426456318246 70
784175857551744103986697180383807931926826937891958973400835466181O*a^2*e^(
825/2*I*c) + 296966005156563531105971074940050295210952963342292128773450 71
5502535457684406378925697100618058220*a^2*e^(823/2*I*c) + 830677890823405 59
388104802804137554233395528307396262678471831237609441676025354759120611865
9958460*a^2*e^(821/2*I*c) + 229332130801558691793279931702498233916860464 93
6917151484875086425752384379451193600253849898104192O*a^2*e^(819/2*I*c) + 6
249414012928962286061010403529002753607342360906086192033185103428400913070

889052292940484712327830*a^2*e^(817/2*I*c) + 168108967282259618741944983402
22314518223276631636193848187700774478509776074186756740832022063618940*a^2
*e^(815/2*I*c) + 4464306447159171747970402027656364257071788382666814516924
7611761065722522854988204793268950962007830*a^2*e^(813/2*I*c) + 11704754358
181518706267332142230356178960091716528425495941493214476219409688989043243
9125557135120080*a^2*e^(811/2*I*c) + 30300429227176309474572003993633457101
6895425314693546495893805386105536448400356863388712154386414250*a^2*e^(809
/2*I*c) + 77454342161420349560097161546607797965236888121893351042429424002
1409386956035526159745861544320722480*a^2*e^(807/2*I*c) + 19551720942932691
644662098033171025525950216475811512178778422970591270024951138107726547846
44585060360*a^2*e^(805/2*I*c) + 4874135079132755414347375690887802711794105
650938863970400230002709422093992525472165364797296790138960*a^2*e^(803/2*I
*c) + 120009057037681981749542820346317572094974119140734828047055158976899
69997576557491508854781156886995980*a^2*e^(801/2*I*c) + 2918531344865391744
146489048732318953323358055838602673457061502945702793349151273875323713463
0607181520*a^2*e^(799/2*I*c) + 70109686530806379548962065855267314803677176
495241796951534731669884594114550121278447472661295579702060*a^2*e^(797/2*I
*c) + 166373421015960065744946831605129638085441168071352620640483463800291
640278014342520469741317600337261840*a^2*e^(795/2*I*c) + 390041272754974777
005627699154842246988726024604162438024095285594852487855850372070546472734
126022684700*a^2*e^(793/2*I*c) + 903411976634483542635289998462833963669695
152185259996654868051991473572372870248662847924612744264062440*a^2*e^(791/
2*I*c) + 206746084187352999911842026513428376396444521265603155739957918539
0572143523605908612468666220745228526760*a^2*e^(789/2*I*c) + 46751116425487
460919156707540760323711761364540363599820752214772978099252044766666622390
31601034545996300*a^2*e^(787/2*I*c) + 1044663893361296440733687256037795716
5244351995018446220321535598596368046659626683803611150049940561221040*a^2*
e^(785/2*I*c) + 23068393515288186064484465603117961911284673754084184347491
242043413536449530894861283359363464825007526940*a^2*e^(783/2*I*c) + 503431
255467132379856233136463293306478583494956274929252051615666930016106505699
67429902726126062669565040*a^2*e^(781/2*I*c) + 1085851881577139421210778517
898957224225946890187204550705634761213011847278115743234662142918342018546
72060*a^2*e^(779/2*I*c) + 2314908265850057878077532735085387653932377948915
89480734288576865823349858144380580905331957850509282551472*a^2*e^(777/2*I*
c) + 4878144325211114975854067195068020556369220879498886270252084544473001
00038791012297859131526297355904933960*a^2*e^(775/2*I*c) + 1016149825224928
415282430116492426171242192567909037312010368898174633451476277701838680759
316125015139743120*a^2*e^(773/2*I*c) + 209250927524733972545755390380592999
3734938547721804454197071999505511719948252419379343549397905586122452665*a
^2*e^(771/2*I*c) + 42599806114811751815296146169680792882669983472869168677
65191606402809238614481985333675831806087956768872250*a^2*e^(769/2*I*c) + 8
574370436061278588323329731982052232445717828791755963170466238033798298798
179665096355346431444695120516791*a^2*e^(767/2*I*c) + 170637639438192012571
545460079441904848004835412196255703347731392002582189336345287645900829744
65232719019576*a^2*e^(765/2*I*c) + 3357753286250861240493214356205675816951

2543178723442784444413242416994607618240798840372204654901124952727575*a^2*e^(763/2*I*c) + 65335209855139745225460458167882643715464174702379903424415436335141712932934847111707604519947532103535939690*a^2*e^(761/2*I*c) + 125716823797005642317347526498401790837531685611023648804925465449065255408041032308439566500708700602697766710*a^2*e^(759/2*I*c) + 239226901086351112501913420176641388141834680717243149148240541912365024035242396630141827067823768453577792206*a^2*e^(757/2*I*c) + 450214953158482436877449323534443636424987689673176576808637277491307797447679834039022495671246539361123241623*a^2*e^(755/2*I*c) + 838003405633226261698002475165028859961836560477445660978330588882054803408792968277041826209840110522910353801*a^2*e^(753/2*I*c) + 1542802094651848674386929677506336135301451757782162481029354191378385655309839590342295782070267248163797079525*a^2*e^(751/2*I*c) + 2809543518668204266823796801627118763645888741191307504647885398224587315004606447902339962521984923603337579865*a^2*e^(749/2*I*c) + 5061099938970696245440097462936504060098234194867891099800067879466606691927034473565491643439734586575243562587*a^2*e^(747/2*I*c) + 9019036531054139364145036198729875181502788996721165710912853819799244035211696760046421655662466728741232371823*a^2*e^(745/2*I*c) + 15900249437791405935404298689959721296914556453023635621602157015426400883311961742504003269238750112959349688008*a^2*e^(743/2*I*c) + 27733123170528060665047793029187981069336565834501591355485919460176359570456976926692677356655692104901055424742*a^2*e^(741/2*I*c) + 47859395051478577485777148825622666491844189989671287148895312750031063089597039280342277891313648282659506765160*a^2*e^(739/2*I*c) + 81720646798485325019374317784322759957844922273569903847642933003662634138916360473885905820817778748179763625775*a^2*e^(737/2*I*c) + 138075050472911460011366856295168555289257189097324670311033951735099801993846300774206061209409704454402575173168*a^2*e^(735/2*I*c) + 230855486672626709723535927872568854471077332500022366798083306901537948948135371592062382972028832652892521530223*a^2*e^(733/2*I*c) + 381970324888971137824260417119355880508011405306507252717319111638967573708192814947593237962837516587367083029056*a^2*e^(731/2*I*c) + 625469971082512052221445939226339313157527561686453294385607721125006005737878528154829176814174073609304783133155*a^2*e^(729/2*I*c) + 1013663583381382315526119900385793780592897362259521880870256689578864566731937045334553766119426780595860617854190*a^2*e^(727/2*I*c) + 1625979420531105682414675218243753902020818169524222534201660329925485571915419014974199094126837464169182082222286*a^2*e^(725/2*I*c) + 2581627107009900734522064744597551209802304406910934736678835899008279100485386551512986171247434443617529951824987*a^2*e^(723/2*I*c) + 4057447205736508720494015062570842677505274148644881616811326702628107094774514265680940713014256351659607202219536*a^2*e^(721/2*I*c) + 6312726327493419321171003213006926022587697863019991394721190170435857084298246006024922226846516328771260784350055*a^2*e^(719/2*I*c) + 9723212783688537643304451173790932352763392117878194099713212407827924571779656265406369365137858973995542668178560*a^2*e^(717/2*I*c) + 14827078840958204423726546705512527357957361647396508632935988933241213590716537429203049741620280852461278755893511*a^2*e^(715/2*I*c) + 2238612040430000442287600735176164788352161033439978593903801179

044906786862784322623982433951940883091022520911 4648*a^2*e^(713/2*I*c) + 33
466028808642300425453129213091641815466355026636652947083261177887459487866
470370690708668514061085213215020765318*a^2*e^(711/2*I*c) + 495400606505030
630373822802586990494363519647331809299341174450805966315618962160157809709
840050905165213898821870000*a^2*e^(709/2*I*c) + 726207992189165652178758713
8
133934287480384013353137620330980577506779778460262098863480834399886641525
1767099657115*a^2*e^(707/2*I*c) + 105424853787028754469673960861051848077706
437917920140868750916701329558833838494542506726849196803900696805658192170
7*a^2*e^(705/2*I*c) + 151575170355739209946373876370057650549318320584509
04
195203458994214439720704966309544502325585579932040682815290481 3*a^2*e^(703
/2*I*c) + 215845003776805302861184692565927001383144850278090577691260137
35
549913497436131344802644438088295980436624628791497 3*a^2*e^(701/2*I*c) + 30
444639322714681461398353972744479817356485837498041308048827113525666191338
431334218387240233257875291232148009743 7*a^2*e^(699/2*I*c) + 42536406129097
286459938160524197691302624289235233411518585440495664431380543031546868590
2485280907282658089881714375*a^2*e^(697/2*I*c) + 588732911424652432036475
21
867626739183382958707173358155265359956911506265595863443618010564226852757
6118276535857990*a^2*e^(695/2*I*c) + 807253658137342307900160595544078420
18
981333839751395145958064955159381671809443604445001692419934962715530609250
3566*a^2*e^(693/2*I*c) + 109663657845944491637672328606982963424082904028
30
719846821149655071921388297862666408579801714653456704121372988031 58*a^2*e^
(691/2*I*c) + 147605799556939063722335269724248321056986186278058992331714
0
914906186165044966041302091938311768459791677885305942531*a^2*e^(689/2*I*c)
 + 196860807418766241096038612492180776083941991244911808807944047937883069
676383759211281732164851667819225022625188926 0*a^2*e^(687/2*I*c) + 26017021
223966451413459310334045709950274662042842744886537507537614986756688639708
8030448023479352992471235119542755 5*a^2*e^(685/2*I*c) + 3407421285455694046
474320798159090075798729924862080209650328438067504016881598067707844396242
531890195544301426987190*a^2*e^(683/2*I*c) + 4422742839523826762645479957
05
724354154012205495170378786211393790404856804828685096905646021812535708934
9296008547181*a^2*e^(681/2*I*c) + 568961590997030152010831964036397313447
01
908177496182015410405546717258037261898429721460046823921212896500404767716
16*a^2*e^(679/2*I*c) + 725483608490846840464667844698960066507970803851351
0
048563537225669386463363803374148622157625354861291347122905242320*a^2*e^(6
77/2*I*c) + 916967282297774397711132080454111190466027322150645165194970721
205595946601250519122057277328965570179245323042310512 0*a^2*e^(675/2*I*c) +
 114892074674554993444824187454781555630147611268161260805373834605316293
86
309522634240117536837763365043954166727248280*a^2*e^(673/2*I*c) + 142713476
457492261657144523776111167216233279632303483234605254933563184657380079264
4471735269145515758292419007468464 0*a^2*e^(671/2*I*c) + 1757549620213874323
744070248931841334869167108820905095696361351136690612608252127239460711551
593617252555289139539567 2*a^2*e^(669/2*I*c) + 214608696226037983738622953
75
991979844261527020594958201034758080773685660129127602861264204469990486648
515185847661920*a^2*e^(667/2*I*c) + 2598448182192879022901953322035281036
40
536514281394054210119467235039313168038586394302259987352886386330197028660

58680*a^2*e^(665/2*I*c) + 3119883339946498355189807082430995856239001431320
18775476726166507416087589238204021912044592368622314823462279334032 80*a^2*
e^(663/2*I*c) + 3714937280284471372854337396169851190966768613631268053 2545
0072544839433526476478813087889953519841750849017306788144 80*a^2*e^(661/2*I
*c) + 4387182261086100479501656414813124664525338076971839446184229521185 97
7435139748182505300214579055168537505621456488060 0*a^2*e^(659/2*I*c) + 5138
9489340580154074498243343336873717429605903842961369475936260749731849313 65
4276883477517483490016178128812433612320*a^2*e^(657/2*I*c) + 59710696542140
9973349982246393495403717260673053270158586132555990038346169057504642494 59
4714544289297676596805432538 80*a^2*e^(655/2*I*c) + 6882649613392925933394 63
4968875610718182709476068743154123679370760956715739335698001587472898644 55
0537593932111977360 0*a^2*e^(653/2*I*c) + 787088197407479900045877912467552 9
0361992333415998520820275403809147240788340833226353369635194374316050644 67
3527393080*a^2*e^(651/2*I*c) + 89309228362510024888650204274018479623278931
8292227516518692719971429409359396224994649413020238927832430365319398747 20
*a^2*e^(649/2*I*c) + 10055840372226804064251142934458723637594333986558344 6
76841323547039010936719869594461984057627222543485772651418022664 0*a^2*e^(6
47/2*I*c) + 1123664975908044593680142298210615741480846861249904900964261 58
1316192392928193566523547551912705590618666322066181233 60*a^2*e^(645/2*I*c)
 + 1246244166588406065087649720912475820567560144043815896789468108707853 49
79153332713768691858274659258080451849502020262 0*a^2*e^(643/2*I*c) + 137206
0715454503834427088740487943839009145181290980427580101741855327071723093 13
3049454567742953712460744715435530607 20*a^2*e^(641/2*I*c) + 149971561739194
3099958472856511082189112120346315313157404715990137942607329528046652323 02
3289279917257615227705517922 60*a^2*e^(639/2*I*c) + 162771207055202910574934
3454087735203172177728966769493359190627289513961413888280123991506021329 19
3384486136785945390 00*a^2*e^(637/2*I*c) + 175450274701932039519067286725080
4035889849267772374884214280480821755418624628524362502212536199409396351 12
553736957060*a^2*e^(635/2*I*c) + 187854193910793808031824107617460059143682
7871508389210150950306265464591466280065402343775284301501285757569951693 64
560*a^2*e^(633/2*I*c) + 199834002044982669165221847294687522204304595088347
2199020366475973917408781284633924040407412225849617472065397854614 80*a^2*e
^(631/2*I*c) + 2112517316558995032808891162605704279539626020518472832366 47
6396705794724988811954774109308665244321454889469583711019 60*a^2*e^(629/2*I
*c) + 2219854308997356715534041590615687374221215399695184007793987942763 53
778554405001186143206492042172329004119602578495740*a^2*e^(627/2*I*c) + 231
9335127952343637547269682636099123310288421407871840440788090546489334240 87
11586756776943726149952014680199802277222 0*a^2*e^(625/2*I*c) + 241018153332
6309908829894958664456455563042308232112697310873078739117718146311801723 60
5634605622313335487746683442935 40*a^2*e^(623/2*I*c) + 2491875041481943472 59
0986803835655599793558586717961616864727967484264428596334436260489166215 20
6933653084949059548634 20*a^2*e^(621/2*I*c) + 25641655035571186813578152461 6
2126221502465968339088488445131951569551439954649297384860518181525893646 81
978419136195020*a^2*e^(619/2*I*c) + 2627065245056297329000526424637610468 97
3601280814925207196020628746211730973551130883955538615128428285298187167 54

053220*a^2*e^(617/2*I*c) + 268082878390283041884174045398605459353728518517
558420909324395225512576313595290722225856442317049534262750408159248640*a^
2*e^(615/2*I*c) + 272591909277578264166044299459393830772239696947798720671
290661488134063850324048969486969810581354040036172071321899160*a^2*e^(613/
2*I*c) + 276296229230236287179383004123946668596905414210125405151426804368
014967729534325534952787742280869431062101106717052160*a^2*e^(611/2*I*c) +
279269348441491467178714617670078520724850441014995837904838918689456125765
086125858578645496849567201719177718577500300*a^2*e^(609/2*I*c) + 281589709
454974667721866672624011079887297161399777306608822769322849136380296502551
325787199139626207392754615890356320*a^2*e^(607/2*I*c) + 283334553241511338
020328671048420786223625257892886884589815372851166469619800685955743073768
087596286675562709921649100*a^2*e^(605/2*I*c) + 284574016420771420704193599
748242589732008960441520037039680402737468153733442912103350926971108090433
015340259175973280*a^2*e^(603/2*I*c) + 285365849398307215288826580662978865
841595519279197228325469882426298598034988143049654644002348988616277221990
835896860*a^2*e^(601/2*I*c) + 285751107933261952185844819866993604965269733
757206120203840534898677511720614812627553159457956333256326887429379709240
*a^2*e^(599/2*I*c) + 285751107933261952185844819866993604965269733757206120
203840534898677511720614812627553159457956333256326887429379709240*a^2*e^(5
97/2*I*c) + 285365849398307215288826580662978865841595519279197228325469882
426298598034988143049654644002348988616277221990835896860*a^2*e^(595/2*I*c)
 + 284574016420771420704193599748242589732008960441520037039680402737468153
733442912103350926971108090433015340259175973280*a^2*e^(593/2*I*c) + 283334
553241511338020328671048420786223625257892886884589815372851166469619800685
955743073768087596286675562709921649100*a^2*e^(591/2*I*c) + 281589709454974
667721866672624011079887297161399777306608822769322849136380296502551325787
199139626207392754615890356320*a^2*e^(589/2*I*c) + 279269348441491467178714
617670078520724850441014995837904838918689456125765086125858578645496849567
201719177718577500300*a^2*e^(587/2*I*c) + 276296229230236287179383004123946
668596905414210125405151426804368014967729534325534952787742280869431062101
106717052160*a^2*e^(585/2*I*c) + 272591909277578264166044299459393830772239
696947798720671290661488134063850324048969486969810581354040036172071321899
160*a^2*e^(583/2*I*c) + 268082878390283041884174045398605459353728518517558
420909324395225512576313595290722225856442317049534262750408159248640*a^2*e
^(581/2*I*c) + 262706524505629732900052642463761046897360128081492520719602
062874621173097355113088395553861512842828529818716754053220*a^2*e^(579/2*I
*c) + 256416550355711868135781524616212622150246596833908848844513195156955
143995464929738486051818152589364681978419136195020*a^2*e^(577/2*I*c) + 249
187504148194347259098680383565559979355858671796161686472796748426442859633
443626048916621520693365308494905954863420*a^2*e^(575/2*I*c) + 241018153332
630990882989495866445645556304230823211269731087307873911771814631180172360
563460562231333548774668344293540*a^2*e^(573/2*I*c) + 231933512795234363754
726968263609912331028842140787184044078809054648933424087115867567769437261
499520146801998022772220*a^2*e^(571/2*I*c) + 221985430899735671553404159061
568737422121539969518400779398794276353778554405001186143206492042172329004

119602578495740*a^2*e^(569/2*I*c) + 211251731655899503280889116260570427953
962602051847283236647639670579472498881195477410930866524432145488946958371
101960*a^2*e^(567/2*I*c) + 199834002044982669165221847294687522204304595088
347219902036647597391740878128463392404040741222584961747206539785461480*a^
2*e^(565/2*I*c) + 187854193910793808031824107617460059143682787150838921015
095030626546459146628006540234377528430150128575756995169364560*a^2*e^(563/
2*I*c) + 175450274701932039519067286725080403588984926777237488421428048082
175541862462852436250221253619940939635112553736957060*a^2*e^(561/2*I*c) +
162771207055202910574934345408773520317217772896676949335919062728951396141
388828012399150602132919338448613678594539000*a^2*e^(559/2*I*c) + 149971561
739194309995847285651108218911212034631531315740471599013794260732952804665
2323023289279917257615227705517922600*a^2*e^(557/2*I*c) + 137206071545450383
442708874048794383900914518129098042758010174185532707172309313304945456774
295371246074471543553060720*a^2*e^(555/2*I*c) + 124624416658840606508764972
091247582056756014404381589678946810870785349791533327137686918582746592580
804518495020202620*a^2*e^(553/2*I*c) + 112366497590804459368014229821061574
148084686124990490096426158131619239292819356652354755191270559061866632206
618123360*a^2*e^(551/2*I*c) + 100558403722268040642511429344587236375943339
865583446768413235470390109367198695944619840576272225434857726514180226640
*a^2*e^(549/2*I*c) + 893092283625100248886502042740184796232789318292227516
518692719971429409359396224994649413020238927832430365319398747200*a^2*e^(54
7/2*I*c) + 787088197407479900045877912467552903619923334159985208202754038O
914724078834083322635336963519437431605064467352739308O*a^2*e^(545/2*I*c) +
688264961339292593339463496887561071818270947606874315412367937076095671570
39335698001587472898644550537593932111977360O*a^2*e^(543/2*I*c) + 597106965
421409973349982246393495403717260673053270158586132555990038346169057504642
494594714544289297676596805432538800*a^2*e^(541/2*I*c) + 5138948934058015407
449824334333687371742960590384296136947593626074973184931365427688347751748
34900161781288124336123200*a^2*e^(539/2*I*c) + 438718226108610047950165641480
131246645253380769718394461842295211859774351397481825053002145790551685375
056214564880600*a^2*e^(537/2*I*c) + 371493728028447137285433739616985119096
676861363126805325450072544839433526476478813087889953519841750849017306788
14480*a^2*e^(535/2*I*c) + 311988333994649835518980708243099585623900143132O
187754767261665074160875892382040219120445923686223148234622793340328O*a^2*
e^(533/2*I*c) + 259844818219287902290195332203528103640536514281394054210110
946723503931316803858639430225998735288638633019702866058680*a^2*e^(531/2*I
*c) + 214608696226037983738622953759919798442615270205949582010347580807736
85660129127602861264204469990486648515185847661920*a^2*e^(529/2*I*c) + 1757
549620213874323744070248931841334869167108820905095696361351136690612608252
127239460711551593617252555289139539567200*a^2*e^(527/2*I*c) + 14271347645749
226165714452377611116721623327963230348323460525493356318465738007926444717
35269145515758292419007468464O*a^2*e^(525/2*I*c) + 114892074674554993444824
187454781555630147611268161260805373834605316293863095226342401175368377633
6504395416672724828O*a^2*e^(523/2*I*c) + 916967282297774397711132080454111
904660273221506451651949707212055959466012505191220572773289655701792453230

423105120*a^2*e^(521/2*I*c) + 72548360849084684046466784469896006650797080 3
85135100485635372256693864633638033741486221576253548612913471229052423 20*a
^2*e^(519/2*I*c) + 568961590997030152010831964036397313447019081774961820 15
41040554671725803726189842972146004682392121289650040476771616*a^2*e^(517/2
*I*c) + 44227428395238267626454799570572435415401220549517037878621139379 04
0485680482868509690564602181253570893492960085471 81*a^2*e^(515/2*I*c) + 340
74212854556940464743207981590900757987299248620802096503284380675040168815 9
806770784439624253189019554430142698719 0*a^2*e^(513/2*I*c) + 26017021223966
45141345931033404570995027466204284274488653750753761498675668863970880304 4
802347935299247123511954275 55*a^2*e^(511/2*I*c) + 196860807418766241096038 6
12492180776083941991244911808807944047937883069676383759211281732164851667 8
19225022625188926 0*a^2*e^(509/2*I*c) + 147605799556939063722335269724248321
05698618627805899233171409149061861650449660413020919383117684597916778853 0
5942531*a^2*e^(507/2*I*c) + 109663657845944916376723286069829634240829040 2
83071984682114965507192138829786266640857980171465345670412137298803158*a^2
*e^(505/2*I*c) + 807253658137342307900160595544078420189813338397513951459 5
80649551593816718094436044450016924199349627155306092503566*a^2*e^(503/2*I*
c) + 588732911424652432036475218676267391833829587071733581552653599569115 0
62655958634436180105642268527576118276535857990*a^2*e^(501/2*I*c) + 4253640
61290972864599381605241976913026242892352334115185854404956644313805430315 4
686859024852809072826580898817143 75*a^2*e^(499/2*I*c) + 304446393227146814 6
13983539727444798173564858374980413080488271135256661913384313342183872402 3
325787529123214800974 37*a^2*e^(497/2*I*c) + 215845003776805302861184692565 9
27001383144850278090577691260137355499134974361313448026444380882959804366 2
46287914973*a^2*e^(495/2*I*c) + 151575170355739209946373876370057650549318 3
205845090419520345899421443972070496630954450232558557993204068281529048 13*
a^2*e^(493/2*I*c) + 105424853787028754469673960861051848077064379179201408 6
8750916701329558833838494545250672684919680390069680565819217 07*a^2*e^(491/2
*I*c) + 726207992189165652178758713813393428748038401335313762033098057750 6
779778460262098863480834399886641525176709965711 5*a^2*e^(489/2*I*c) + 49540
06065050306303738228025869904943635196473318092993411744508059663156189621 6
01578097098400509051652138988218700 0*a^2*e^(487/2*I*c) + 334660288086423004
25453129213091641815466355026636652947083261177887459487866470370690708668 5
14061085213215020765318*a^2*e^(485/2*I*c) + 22386120404300004422876007351 76
16478835216103343997859390380117904490678686278432262398243395194088309102 2
5209114648*a^2*e^(483/2*I*c) + 148270788409582044237265467055125273579573 61
647396508632935988933241213590716537429203049741620280852461278755893511*a^
2*e^(481/2*I*c) + 972321278368853764330445117379093235276339211787819409971
3212407827924571779656265406369365137858973995542668178560*a^2*e^(479/2*I*c
) + 631272632749341932117100321300692602258769786301999139472119017043585 70
8429824600602492222684651632877126078435005 5*a^2*e^(477/2*I*c) + 4057447205
73650872049401506257084267750527414864488161681132670262810709477451426568 0
94071301425635165960720221953 6*a^2*e^(475/2*I*c) + 258162710700990073452206
47445975512098023044069109347366788358990082791004853865515129861712474344 4
3617529951824987*a^2*e^(473/2*I*c) + 162597942053110568241467521824375390 20

208181695242225342016603299254855719154190149741990941268374641691820822222
86*a^2*e^(471/2*I*c) + 1013663583381382315526119900385793780592897362259521
880870256689578864566731937045334553766119426780595860617854190*a^2*e^(469/
2*I*c) + 625469971082512052221445939226339313157527561686453294385607721125
006005737878528154829176814174073609304783133155*a^2*e^(467/2*I*c) + 381970
324888971137824260417119355880508011405306507252717319111638967573708192814
947593237962837516587367083029056*a^2*e^(465/2*I*c) + 230855486672626709723
535927872568854471077332500022366798083306901537948948135371592062382972028
832652892521530223*a^2*e^(463/2*I*c) + 1380750504729114600113668562951685555
289257189097324670311033951735099801993846300774206061209409704454402575173
168*a^2*e^(461/2*I*c) + 817206467984853250193743177843227599578449222735699
038476429330036626341389163604738859058208177787481797636257755*a^2*e^(459/2
*I*c) + 478593950514785774857771488256226664918441899896712871488953127500
3106308959703928034227789131364828265950676516 0*a^2*e^(457/2*I*c) + 27733123
170528060665047793029187981069336565834501591355485919460176359570456976926
692677356655692104901055424742*a^2*e^(455/2*I*c) + 159002494377914059354042
986899597212969145564530236356216021570154264008833119617425040032692387501
12959349688008*a^2*e^(453/2*I*c) + 901903653105413936414503619872987518150 2
788996721165710912853819799244035211696760046421655662466728741232371823*a^
2*e^(451/2*I*c) + 506109993897069624544009746293650406009823419486789109980
006787946660669192703447356549164343973458657524356258 7*a^2*e^(449/2*I*c) +
 280954351866820426682379680162711876364588874111913075046478853982245873150
046064479023399625219849236033375798 65*a^2*e^(447/2*I*c) + 1542802094651848
674386929677506336135301451757782162481029354191378385655309839590342295782
070267248163797079525*a^2*e^(445/2*I*c) + 838003405633226261698002475165028
859961836560477445660978330588882054803408792968277041826209840110522910353
801*a^2*e^(443/2*I*c) + 450214953158482436877449323534443636424987689673176
5768086372774913077974476798340390224956712465393611232416 23*a^2*e^(441/2*I
*c) + 239226901086351112501913420176641388141834680717243149148240541912365
024035242396630141827067823768453577792206*a^2*e^(439/2*I*c) + 125716823797
005642317347526498401790837531685611023648804925465449065255408041032308439
5665007087006026977667 10*a^2*e^(437/2*I*c) + 653352098551397452254604581678
826437154641747023799034244154363351417129329348471111707604519947532103535 9
39690*a^2*e^(435/2*I*c) + 335775328625086124049321435620567581695125431787 2
344278444441324241699460761824079884037220465490112495272757 5*a^2*e^(433/2*
I*c) + 170637639438192012571545460079441904848004835412196255703347731392 00
25821893363452876459008297446523271901957 6*a^2*e^(431/2*I*c) + 857437043606
127858832332973198205223244571782879175596317046623803379829879817966509635
5346431444695120516791*a^2*e^(429/2*I*c) + 425998061148117518152961461696 80
792882669983472869168677651916064028092386144819853336758318060879567688722
50*a^2*e^(427/2*I*c) + 209250927524733972545755390380592999373493854772180 4
45419707199950551171994825241937934354939790558612245266 5*a^2*e^(425/2*I*c)
 + 101614982522492841528243011649242617124219256790903731201036889817463345
1476277701838680759316125015139743120*a^2*e^(423/2*I*c) + 48781443252111149
758540671950680205563692208794988862702520845444730010003879101229785913152

6297355904933960*a^2*e^(421/2*I*c) + 231490826585005787807753273508538765393237794891589480734288576865823349858144380580905331957850509282551472*a^2*e^(419/2*I*c) + 10858518815771394212107785178989572242259468901872045507056347612130118472781157432346621429183420185467206O*a^2*e^(417/2*I*c) + 50343125546713237985623313646329330647858349495627492925205161566693001610650569967429902726126062669565040*a^2*e^(415/2*I*c) + 23068393515288186064484465603117961911284673754084184347491242043413536449530894861283359363464825007526940*a^2*e^(413/2*I*c) + 10446638933612964407336872560377957165244351995018446220321535598596368046659626683803611150049940561221040*a^2*e^(411/2*I*c) + 46751116425487460919156707540760323711761364540363599820752214772978099252044766666622390316010345459963OO*a^2*e^(409/2*I*c) + 20674608418735299991184202651342837639644452126560315573995791853905721435236059086124686662207452285267 60*a^2*e^(407/2*I*c) + 90341197663448354263528999846283396366969515218525999665486805199147357237287024866284792461274426406244O*a^2*e^(405/2*I*c) + 390041272754974777005627699154842246988726024604162438024095285594852487855850372070546472734126022684700*a^2*e^(403/2*I*c) + 166373421015960065744946831605129638085441168071352620640483463800291640278014342520469741317600337261840*a^2*e^(401/2*I*c) + 70109686530806379548962065855267314803677176495241796951534731669884594114550121278447472661295579702060*a^2*e^(399/2*I*c) + 29185313448653917441464890487323189533233580558386026734570615029457027933491512738753237134630607181520*a^2*e^(397/2*I*c) + 12000905703768198174954282034631757209497411914073482804705515897689969997576557491508854781156886995980*a^2*e^(395/2*I*c) + 48741350791327554143473756908878027117941056509388639704002300027094220939925254721653647972967901389 60*a^2*e^(393/2*I*c) + 19551720942932691644662098033171025525950216475811512178778422970591270024951138107726547846445850603 60*a^2*e^(391/2*I*c) + 774543421614203495600971615466077979652368881218933510424294240021409386956035526159745861544320722480*a^2*e^(389/2*I*c) + 30300429227176309474572003993633457101689542531469354649589380538610553644840035686338871215438641425O*a^2*e^(387/2*I*c) + 117047543581815187062673321422303561789600917165284254959414932144762194096889890432439125557135120080*a^2*e^(385/2*I*c) + 44643064471591717479704020276563642570717883826668145169247611761065722522854988204793268950962007830*a^2*e^(383/2*I*c) + 16810896728225961874194498340222314518223276631636193848187700774478509776074186756740832022063618940*a^2*e^(381/2*I*c) + 624941401292896228606101040352900275360734236090608619203318510342840091307088905229294048471232783O*a^2*e^(379/2*I*c) + 2293321308015586917932799317024982339168604649369171514848750864257523843794511936002538498981041920*a^2*e^(377/2*I*c) + 83067789082340559388104802804137554233395528307396262678471831237609441676025354759120611865995846O*a^2*e^(375/2*I*c) + 296966005156563531105971074940050295210952963342292128773450715502535457684406378925697100618058220*a^2*e^(373/2*I*c) + 1047732949197081814264563182467078417585755174410398669718038380793192682693789195897340083546618 10*a^2*e^(371/2*I*c) + 3647765370604224594468882060469649421908133476712105791233191413780441530797333779390217729459921O*a^2*e^(369/2*I*c) + 1253133822792085649207459032667409937445312286891351686185456524977964274457849105941204096038251O*a^2*e^(3

67/2*I*c) + 42474009250773731761134863121901454721816864229939339424476328466330956444400320033392711686905 70*a^2*e^(365/2*I*c) + 14202487865181874667180230489017311183779468543008119776710723044112789739694400015832212820131 30*a^2*e^(363/2*I*c) + 46846826182477495809179107195535791661693332034260273942376891674924944340141880433675494310263 0*a^2*e^(361/2*I*c) + 15241537410607462293922428415365960155062710943632592662101448022933353486246781021711989017040 0*a^2*e^(359/2*I*c) + 48906609072520057611071370507996340224776681379775034925868200923794664214854540668184735223060*a^2*e^(357/2*I*c) + 15475789717397460276234843111043950695013471030625427925175353797112876241958974587338558471200*a^2*e^(355/2*I*c) + 48288072371114951708502020267955265600327550456915416538506950894126402520611667033736410080 90*a^2*e^(353/2*I*c) + 148553511895313894886597833171791059949745629617779237478559051623347465590643954934297011448 0*a^2*e^(351/2*I*c) + 45054181599435041632956348265590924497932033443840591496841140615625295831700197728967932057 0*a^2*e^(349/2*I*c) + 134694045831733084831574170523497510104128836035403576353015982048577081438406747258639643920*a^2*e^(347/2*I*c) + 39689315274762962598344099577657312145742408227826431282422824844089957174694332245240202130*a^2*e^(345/2*I*c) + 11525514338248122115806901223631408865665060873992331731216717545839641395493543478555391940*a^2*e^(343/2*I*c) + 32980470539939501466208425037215290583184853566600750165822480177862403441909763794910329 00*a^2*e^(341/2*I*c) + 92984426983961824327762778692324341462366377626122031487167919972245558469843421681956901 0*a^2*e^(339/2*I*c) + 25826531999838592080057058934824293812644596212169594902837796360373871451566292085791240 0*a^2*e^(337/2*I*c) + 70659202220402219699327142472480242287876653764953302133360376448287226187487345644845530*a^2*e^(335/2*I*c) + 19039736700477034191914417874408695155655405986129726283796391182602876937826158174743280*a^2*e^(333/2*I*c) + 505224056037277225250841188446932961822637692797906299614523611049177370080544153910457 0*a^2*e^(331/2*I*c) + 132001151473743564403925218561453784232553131778410190663972730023302037213742805022896 0*a^2*e^(329/2*I*c) + 339531565165818157488111546236514739245172484736482729741196732548715077274621271815060*a^2*e^(327/2*I*c) + 859662077957427711631100840830793261986920507811988183190373627167852153693327232273 60*a^2*e^(325/2*I*c) + 21421765289837057403869596169941475678645506492471864168704518082797513207707602578070*a^2*e^(323/2*I*c) + 5252856062781833938201490869422444930464746423374588871765446690324009941198600912010*a^2*e^(321/2*I*c) + 126730019194373732411932059934968365449334885021700732115073927311219099584918911657 0*a^2*e^(319/2*I*c) + 30077123446845252026656260732966592215911538150008772834593000629200562320266977563 0*a^2*e^(317/2*I*c) + 70209017945411591200961651730058863557722458877098381486938641100483455911795967290*a^2*e^(315/2*I*c) + 16116628162411464679896502836324771389620584856574877922468282685664283130175327730*a^2*e^(313/2*I*c) + 36374986460264255987452792288036795171400903502413142163715704681747381749213079 80*a^2*e^(311/2*I*c) + 80704776818833353884668480346077979093105555510012058999075812753616886124623350 0*a^2*e^(309/2*I*c) + 175987317444160012665123402745831252173155432052395534884810603675523612022791280*a^2*e^(307/2*I*c) + 377107106707422037469802679360762145217845506499125

7551882055222003181444521511O*a^2*e^(305/2*I*c) + 7938933320497449635918969
680758326307339116239071846330248311795038723075723660*a^2*e^(303/2*I*c) +
1641662348095460363514356729639026504243315309578757871628322407537121464 95
4630*a^2*e^(301/2*I*c) + 333378106740586138251610124958796714576935099619 83
507317230769655164825982912O*a^2*e^(299/2*I*c) + 664700802720379036821982 19
8354889449499967490701870788226501984495442123244 10*a^2*e^(297/2*I*c) + 130
092554537789775149175011322369077673568876910683685894113389082455523682 40*
a^2*e^(295/2*I*c) + 2498697917579895977978723588576283933137296518743481104
776932566391579455400*a^2*e^(293/2*I*c) + 4708739798331654544446276598031 01
969430867153471663329279188629910819335440*a^2*e^(291/2*I*c) + 870394672285
3101370540919127145238338933535688492180864149242336376240006O*a^2*e^(289/2
*I*c) + 1577740463997525927245493384353947454466523681911756699731867230466
6566800*a^2*e^(287/2*I*c) + 2803793220826297874163429682131102503306549005 2
653992192772409174135O2940*a^2*e^(285/2*I*c) + 488344836125981471048169163 6
576165169541587927956189782211989809499258 40*a^2*e^(283/2*I*c) + 8333974773
646914353242807331076216352511378934404318360291661322787214O*a^2*e^(281/2*
I*c) + 1393134019493393522801346629417998744506875821956543686234915650880 4
360*a^2*e^(279/2*I*c) + 228041600249749997233027035662805350070222102577050
2602102780787687624*a^2*e^(277/2*I*c) + 365406237849518248372060960463581 65
0995651842549690071352678851012540*a^2*e^(275/2*I*c) + 572971958305794798 80
905283759887310015692255967368709515502818525680*a^2*e^(273/2*I*c) + 878891
888078668755926755541379619931498159578978707490100693353550O*a^2*e^(271/2*
I*c) + 131833365499088889941774652037428864925722313357312790508646754 8080*
a^2*e^(269/2*I*c) + 1933035148727861159233797166282534193189441764358760568
02589865772*a^2*e^(267/2*I*c) + 276954647427069279961578912753426434310409 0
6047696742940234352112*a^2*e^(265/2*I*c) + 3875741803263271608578048125955 0
661527854938971516727160994 40360*a^2*e^(263/2*I*c) + 529533489706434824451 2
50188592739498197462491764283044018575440*a^2*e^(261/2*I*c) + 7060434872440
117095882960520593706391303444708234989034816289 5*a^2*e^(259/2*I*c) + 91826
33302160212452918968603806828036823248995981353166570702*a^2*e^(257/2*I*c)
+ 116436703282462307336668513825130991204009306014192871608768 1*a^2*e^(255/
2*I*c) + 1438727822206320263534827831452820866063140492356740318539 52*a^2*e
^(253/2*I*c) + 17314186832105700122787937106308399484490093525695416858785*
a^2*e^(251/2*I*c) + 2028231682527169820869698431068546224630661674135401655
870*a^2*e^(249/2*I*c) + 231137354125616547233443142991124898825470770660317
194554*a^2*e^(247/2*I*c) + 2560895310281173602069967198140053159165208235 34
56701666*a^2*e^(245/2*I*c) + 2756769770542048744355911382380396555656358932
078858681*a^2*e^(243/2*I*c) + 2881368306549844065308377873377004393281836 58
059646399*a^2*e^(241/2*I*c) + 2921949907526353584385886237764807307128531 09
74657915*a^2*e^(239/2*I*c) + 2872702692034937563897971496575074831246739185
614575*a^2*e^(237/2*I*c) + 2735906633661552662341042721694526882630074845 13
781*a^2*e^(235/2*I*c) + 2521924578354972136606779911415897886439992405844 1*
a^2*e^(233/2*I*c) + 2247954664299349273623637155894975599108753667672*a^2*e
^(231/2*I*c) + 1935738461278148053361662140263342904970069151 30*a^2*e^(229/
2*I*c) + 160864673227245526985013409757831637978425348 40*a^2*e^(227/2*I*c)

+ 1288694773452054046771640788950472807542901137*a^2*e^(225/2*I*c) + 994034
45980961943589598468520732983548550704*a^2*e^(223/2*I*c) + 7373332079799133
639063658614527645894565137*a^2*e^(221/2*I*c) + 525223629498383939328992961
505581135597600*a^2*e^(219/2*I*c) + 358759296093904067383946662199712212057
25*a^2*e^(217/2*I*c) + 2346109768759347903572910732245570209842*a^2*e^(215/
2*I*c) + 146631857213698093058440158830415565266*a^2*e^(213/2*I*c) + 874227
8599147295285480758801384765381*a^2*e^(211/2*I*c) + 49618337355528480462791
1954521619600*a^2*e^(209/2*I*c) + 26748429587445855729768539197182585*a^2*e
^(207/2*I*c) + 1366183222241782313586863286641184*a^2*e^(205/2*I*c) + 65928
412548866286902779022351001*a^2*e^(203/2*I*c) + 299674601484785362031769373
1016*a^2*e^(201/2*I*c) + 127861163009333998455801820954*a^2*e^(199/2*I*c) +
 5100844261395996953829648360*a^2*e^(197/2*I*c) + 1894212721285211788220664
45*a^2*e^(195/2*I*c) + 6514488191198508953598437*a^2*e^(193/2*I*c) + 206263
478282239243233771*a^2*e^(191/2*I*c) + 5970784896604221606627*a^2*e^(189/2*
I*c) + 156713514333171921595*a^2*e^(187/2*I*c) + 3692203217135946825*a^2*e^
(185/2*I*c) + 77121738215879370*a^2*e^(183/2*I*c) + 1405865019554882*a^2*e^
(181/2*I*c) + 21909584720322*a^2*e^(179/2*I*c) + 283802910885*a^2*e^(177/2*
I*c) + 2933363420*a^2*e^(175/2*I*c) + 22680645*a^2*e^(173/2*I*c) + 116610*a
^2*e^(171/2*I*c) + 299*a^2*e^(169/2*I*c))/(e^(517*I*c) + 418*e^(516*I*c) +
87153*e^(515*I*c) + 12085216*e^(514*I*c) + 1253841160*e^(513*I*c) + 1038180
48048*e^(512*I*c) + 7146142307307*e^(511*I*c) + 420601518659718*e^(510*I*c)
 + 21608403021340047*e^(509*I*c) + 984382804329835768*e^(508*I*c) + 4026125
6699368950388*e^(507*I*c) + 1493326612293984160368*e^(506*I*c) + 5064866094
4512569972179*e^(505*I*c) + 1581796642397812408161814*e^(504*I*c) + 4575911
7183402579073139583*e^(503*I*c) + 1232445557346832245176696904*e^(502*I*c)
+ 31042222522074681615625020522*e^(501*I*c) + 73405726361638844996884236692
4*e^(500*I*c) + 16353164647151530240529137618111*e^(499*I*c) + 344277152012
875134140739302960914*e^(498*I*c) + 6868329225263681349501997341320517*e^(4
97*I*c) + 130171193079172823835151430773360024*e^(496*I*c) + 23489983742443
47079532766203075607598*e^(495*I*c) + 4044362478141531158185783238909963456
4*e^(494*I*c) + 665634670676210063754191847109971141414*e^(493*I*c) + 10490
402669510897424624643766470754045064*e^(492*I*c) + 158566476113257562566117
432227203884298856*e^(491*I*c) + 230215041122623492585522234520150090053357
6*e^(490*I*c) + 32147887693375338817454482515377350383950278*e^(489*I*c) +
432333688644261557547944179250800440604964868*e^(488*I*c) + 560592725306755
8551780452883689835514455118670*e^(487*I*c) + 70164515322544462906873548813
748091084561870680*e^(486*I*c) + 848552202276512356496200136959676295361696
315113*e^(485*I*c) + 9925490738534402272939987038714580495445431374618*e^(4
84*I*c) + 112391604542246650966429162063124338952554575234051*e^(483*I*c) +
 1233096700139723365181997220750932590655287625342156*e^(482*I*c) + 1311878
1801172174729679339894318153694964675368481194*e^(481*I*c) + 13544259491663
6116191574650625331646238501101627937224*e^(480*I*c) + 13579906631614798428
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6733779919089340836756009580718*e^(478*I*c) + 12537049658692127266219805085
1269323171167338854081782959*e^(477*I*c) + 11558554128935942603455449666426

8782363003589936323237147 2*e^(476*I*c) + 1037518449987117550190939895659668
4116802997082526660323524*e^(475*I*c) + 9072260572220881491864228463948718 7
7646075897064939707747 76*e^(474*I*c) + 7732046369911457750614627310280985 06
0944326757881362950112 59*e^(473*I*c) + 6426195485535248576425068136870465 53
0087114003875716691383902*e^(472*I*c) + 5210811762917704866049240098517583 0
98750570056687781895414 1639*e^(471*I*c) + 4124306982999151908480672223272 19
435067747934091894670488982928*e^(470*I*c) + 3187749929744346497211536044 75
1776582320958627923816470590659024*e^(469*I*c) + 2407080191352975710185802 2
91437204586474699178618203974027432 5264*e^(468*I*c) + 1776428291351193485 77
19443767580283023990546009268713649496140 4333*e^(467*I*c) + 128181746491497
08108596041898283590007907899211694053046122112 51818*e^(466*I*c) + 90466935
2382568297904433896310426316767258682636791133882648354 9173*e^(465*I*c) + 6
2473550781053295317710774690247114124125187565731848441781904032672*e^(464*
I*c) + 4222761266320036875477547465557099887105271330866601613663536567872 8
8*e^(463*I*c) + 2794709104475686611842790694973699164482254723977210209725 6
61304403472*e^(462*I*c) + 181157684956157580767103030555056255892542936591 9
3314153418333944596408*e^(461*I*c) + 115051481852080848873700388354521315 56
7640365124003103691176697194292320*e^(460*I*c) + 716099497599058079895633 33
85529402291928581964815978300788197118626000 96*e^(459*I*c) + 43694424829101
1391456535313606959586266933885805341938121413124192504 7008*e^(458*I*c) + 2
614397627990202144347194566508025456305681018352040188980028549314486 7448*e
^(457*I*c) + 153436088745056254127327239461577071933130157764595997113973 51
3183188399376*e^(456*I*c) + 883500968821791202600774541927769200737689393 51
3734789368397093333311961880*e^(455*I*c) + 499251971245704398350537797660 79
5398839736829759111495799180489368837186 7680*e^(454*I*c) + 2769311653834325
92259833826376479361226640338596151334898466646943614710283 10*e^(453*I*c) +
1508223814314124137735664742100117468522974375970591862952439894811403981 5
2780*e^(452*I*c) + 8066795436075891407593050107961895682698420216133889552 1
891627882318263948819 0*e^(451*I*c) + 4238125846763232586394188569858685826 7
553280055486274370193014058513258875944 80*e^(450*I*c) + 2187648289271390992
8040345612578705805121508756226696317087651824252241418663320*e^(449*I*c) +
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1766080*e^(448*I*c) + 5532691288195286125029188695589478290980219563093498 4
3584044631512291778800081490*e^(447*I*c) + 2711843239670717527605640490148 8
33507130242448403978318523237721944200392830108580*e^(446*I*c) + 1306981720
3488289886193205508375818392124991382340160316886507181296548981014818410*e
^(445*I*c) + 6194859665303550287956433881523431066041090203788247316180477 4
492916216575880077680*e^(444*I*c) + 2888207552647306544699685720210471094 27
31861950899580202068990459031947629540832428 0*e^(443*I*c) + 132475641236783
747315747282116248369112096650194895392649224164378826428454643722112 0*e^(4
42*I*c) + 5978992172944143218459161149299819706321732111578494525245228742 9
764684091053955362 90*e^(441*I*c) + 2655680638904340753449670236910154579599
4861757741414789944652712127566910185274123140*e^(440*I*c) + 11610455168355
5043762911501712116399313733021132677481112824047246361794049635726479850*e
^(439*I*c) + 4997075672538590843575963148137947680693371909159674919074889 0

4933922677579665354338960*e^(438*I*c) + 2117589733466855707101501429210414722401838837940752841618541440888545729943138209036820*e^(437*I*c) + 8836720640860470305694514021547969551296794092266983044118375790025854584036796364768280*e^(436*I*c) + 36318369652302591732197444409798122022640824604130552506742586795183267354382847875885730*e^(435*I*c) + 147030816732276833163041582099592047512043725225353339238819165193000407629544745753221740*e^(434*I*c) + 586403466972683242741643328921560909375197453864243299571990964608857245771134145204174990*e^(433*I*c) + 2304351073373840357379178597673066352016682781689139842097376663118488803841131935313641840*e^(432*I*c) + 8923209447343296763331881881638471793499618670601026059730895962653291770229493028162575100*e^(431*I*c) + 34054053851295569154352346722177172655187548910782008504718324168725029438589162349211628040*e^(430*I*c) + 128098914601688539672480541830409847707367500438601536803204497701119911289087105659482783340*e^(429*I*c) + 475010578857601519272316617938425222421786597241671026894318515408511467140969393115768793680*e^(428*I*c) + 1736574218818191071874197472450158123883564209950658639102337148122769080611680719741726053840*e^(427*I*c) + 6259872156822252843650960708235034710201362776057176647226323089751446565288850103898153859920*e^(426*I*c) + 22251959176795777757167366036007480222211364232146399803864370963391491223687245823457351580140*e^(425*I*c) + 78009807368024239875613733058851417125327114681070889640794249282633470580756557083923203377160*e^(424*I*c) + 269745801440211296972683601863878954357962308520076595177128227629273240215209708218497363414140*e^(423*I*c) + 920089393029589032874601850027159322612526368444771489781974361078847528891468831038436064951920*e^(422*I*c) + 3096131971621520162380301554241465451782362086810287537748902904985934020179565706177131421614590*e^(421*I*c) + 10279364730663840844739577862469262604648861914297972589165243530651230690726244462479199894255180*e^(420*I*c) + 33675398872021568375902384593982753362559801058104184627345411136262431943240778260721756991027090*e^(419*I*c) + 108867995731829472826732905192034886797284621356445627530909104429486741257822633476898356826454040*e^(418*I*c) + 347351473214713780874352083129566601238765762775942366762733349952103889753982636403857556867777300*e^(417*I*c) + 1093853214486220358674032434500866678499770011305874172488975951612031456734608287095519501041975440*e^(416*I*c) + 3400232560601651617521694680847089844198028831694417424794868779328950548418125605446882081152636090*e^(415*I*c) + 10434117516570395966653693155582402109460348095473027807412321427346816928567197770376496170251803940*e^(414*I*c) + 31610939331284692750694306443618414656095969520945215743004044560386895241801579156543451940713351730*e^(413*I*c) + 94556180258931986919334303466365652826858091314329189160736277175873841732196453379953705679466826880*e^(412*I*c) + 279285755800035206679835368898165477644864987794665387827488933863633745047373109049265172681702585720*e^(411*I*c) + 814608187736530579670210025271921415597183369881214299823291969785549876175969866367976653244974728560*e^(410*I*c) + 2346518219239105142238141633073464768899155708935025778047637412681781575765422219127409260159438712250*e^(409*I*c) + 6675866290371147358503766865669289010893543869830538708724945291580951179188296606158111257706968604740*e^(408*I*c) + 187599

882188655635641636357359860732782557372574057062791088913663784284674145599
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I*c) + 14280179245022176248318087491882527413430513327541778008479503464476
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01*I*c) + 18487405299005732693752728611876490890858357021974882371570623800
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+ 2968255152826695896853182732802390500845550322034159415119626595968816157
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 + 705213241416219799260232652458014306098535305457293390552463312168102103
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246588735534014421 37*e^(355*I*c) + 117660072097578696518987505089023109220461269697027743301453589578895677123079352038199310660688056462859982234172280101 2*e^(354*I*c) + 184750585646245153344528430057132632378116255330456597188767075809107930679482183492817077312636463972207157013170378533 4*e^(353*I*c) + 287361053592234018708083543558291227727196797739472015979107027492771427686953146718268898104106138170388540349754400159 2*e^(352*I*c) + 442767307910542531852431611298569365658485193610019245704445513448330504532145251634711848813322482367046510348395480516 1*e^(351*I*c) + 675848043788852437256293594896385762669485554719551948612287756798171858726236287199496707940183195792790168258294123436 2*e^(350*I*c) + 102204237794346348513399752951633996417021222496636661930530083020260969321585683383094182373955413518190269079532206810 13*e^(349*I*c) + 153128372066627753793473532128076829657125356529426315182861424030977382002707111953965821590285135327796821544519962085 92*e^(348*I*c) + 227316035661288411004195019470513676668366524180772609139448107484730848918904101812854126048548766259195656395212272232 76*e^(347*I*c) + 334358978279365813011711754596108294542981679620174198100729367333785065844280242010724531934581553340466935167423907178 32*e^(346*I*c) + 487332535059749234008522555630521014021964693136595544927256747543393752830104071677443669558289228374887058585324396544 89*e^(345*I*c) + 703863497605948315670482240613950256985012022969663003767642203366977029615910998540554113762948714374681495285247960027 62*e^(344*I*c) + 100744961851853744611754300982980166962404553836222921868484694269966120607698907046343731011160948828100276729370132819357*e^(343*I*c) + 14290631912305552424654692847895423837131592580202238923649865213683982250203515567697091741903983458796705558843156641678 4*e^(342*I*c) + 20090658715357880438030046950144161017452185125954192920984068896085945490851977483590589575766677085788861173875185846042 4*e^(341*I*c) + 27994524447503980482296673046296088449211987485779114712400907947692043594173529330930543043868733312991245419677407010726 4*e^(340*I*c) + 38664267305038004945738256281831696265197555099077927704874023862985879501824735616288863101568766478010120528733308274879 1*e^(339*I*c) + 52932925276411392600393483695824355767254923899756073921440659918504783195557258376535863439540877152800974546754838295009 4*e^(338*I*c) + 71836159638205824920911354448790108886838874403371321033249197137590673834155154045726480430403966425591560734980191196655 1*e^(337*I*c) + 96645827536903771874773913079815164348359068416683223468809829116416063641815945211981572880937212516883623936444239734406 4*e^(336*I*c) + 128904351529293395648063433049967704018104393562010691426731106790003005839883978769237695409054527855454499771005875477240 0*e^(335*I*c) + 170458299670782280820467821816769300269866114771277235502145654381093006963718808588282475750060524696321081035170640534940 8*e^(334*I*c) + 223489127639843946447862257830643484072461048446817785982262065869192147864526665306256382355300122800100909360675106616894 4*e^(333*I*c) + 290538572232005700195334527448948279085669252995982374953269596341416483336677312821860789932858860891617659377208862258246 4*e^(332*I*c) + 374525759487665120465733498842622638814395450198683066422234922636107960954682227606750489938670308898230818571714340721132 8*e^(331*I*c) + 478752744278094568514520484697159616530

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0578365727476259476474465955428502336673743686499175698677875693611243400*e
^(306*I*c) + 163977816059607725375264559816505847894187785101455360391897424
4829984153857876057653155092083377415901430785722435051327065808*e^(305*I*c
) + 1708698488689531011768603060531039943405303903472600884326768425055551
41293830838961275974268928666494845723462544709102843680*e^(304*I*c) + 17672
092997055464200457577005309570059533465987068273203197591553238757705241486
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22015081835526128o*e^(300*I*c) + 187615393168510050071497280564603510912403
1329203120243708350626790376449902862853466735070934529643512579626961335117
25652320*e^(299*I*c) + 18691547443656751492635140562311750326198750835193
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0*e^(298*I*c) + 184831151983748941817667850174708257138128172158269413287765
358532240773244336191900818557829905895684494889410451921524212840*e^(297*
I*c) + 1814081687709220598203685533166973216399848626282988285695602732956308
976268293452635922190345608535307337105298421485379016800*e^(296*I*c) + 17
672092997055464200457577005309570059533465987068273203197591553238757705241
4866323511140117680492929354517559479899220940360*e^(295*I*c) + 17086984886
8953101176860306053103994340530390347260088432676842505555141293830838961275
974268928666494845723462544709102843680*e^(294*I*c) + 1639778160596077253752
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4159014307857224350513270658o*e^(293*I*c) + 156185962953551196169738218832
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569867787569361124340o*e^(292*I*c) + 147648920805545333418623121767853777399
78292474830122879392434257499993795542176537010123512293955746754854920217
4550009604780*e^(291*I*c) + 138529794549151089451352769576543403126330747243
680030832467205895819043568155239264876762867172754338684027849855385453216
080*e^(290*I*c) + 128995076011591903410763863427097329948586173574595862705
849159280943046458742663163454018491463855395649453952212899632198680*e^(2
89*I*c) + 119209713702033927055755397823688444446474243245021853286263470465
99634721146573830681540495333543146776810911910410468628960*e^(288*I*c) +
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540189786765164173142210894499224956127328701696600*e^(287*I*c) + 99512206
4720579659513403417380235485153364033717178980408504709546575329772791134915
06880290726111154101941386019689567958040*e^(286*I*c) + 898838158013823822
1397327047795460274479287701805196334714630737246431512127492940234794287480
289949953895356105666766889102O*e^(285*I*c) + 805662491306826841818762018826
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4415769070472655401600*e^(284*I*c) + 716603298611733955244419438892841091340
911578446552456720842374024349446964649271318121906596295111406395017433038
63582092880*e^(283*I*c) + 632477741010121790517949460751755699240769813381

384831580424067474538747293876317105449952471529122051185005975110528243476
80*e^(282*I*c) + 553909130449720862194326891463315660814279598969699002144З
429681773115086386705662076860818767970972015297414847490790417734 0*e^(281*
I*c) + 481331176781840292165037485491103744789247190946356038928293648639 16
553792278822957368285106328164715910598370871149079494360*e^(280*I*c) + 414
998321219637080437885237874013455417800889305382069188535790267492733646716
400375634886077160928876864715428386027885596 60*e^(279*I*c) + 3550010310601
964987627237679694948220958137237103600501287780602748167280705994344524013
631556850073237996658500567818193792 0*e^(278*I*c) + 301284824145527032645 59
018953088177156013437493438201078413769835448366148121754549197591129967170
764969700180348699207838960*e^(277*I*c) + 253671764391193536215322603359833
481549049826061257617113006834929633908164915830257052687375399821496393002
2651265742611888 0*e^(276*I*c) + 211883214058828875396101983747068626958940 4
922607709376413251251333619052397894969438768605912452675504804295795426470
6637460*e^(275*I*c) + 175562732712242923968872914031257162134914862611454 78
571376751690105656067838042151038271381300372757755676325408026834544840*e^
(274*I*c) + 144298162852084312045329783753756919650631542246497475512958515
07389524083226976789688601369628399900747658579201929300744260*e^(273*I*c)
+ 117642122748764840800109007146734744933712781605578119837244558265660556 1
765808647936864186490811964341241364480377213165728 0*e^(272*I*c) + 95130322
740195229542091131912682266422999120135256659402983810647978856909049931289
480352274121440356338517795112193352773 60*e^(271*I*c) + 762973181562782158 0
468992424207008366438896736333024661863838105110445148946962328297631547032
5434198118210158378630136827 20*e^(270*I*c) + 606894980315671224833187110532
989547172280614300887801498655965368726069481655047019589000451196552756743
2722969707577202160*e^(269*I*c) + 478752744278094568514520484697159616530 41
694193282440732114595921296492550488768540598447206610781512881796125749863
59194560*e^(268*I*c) + 374525759487665120465733498842622638814395450198683 0
66422234922636107960954682227606750489938670308898230818571714340721132 8*e^
(267*I*c) + 290538572232005700195334527448948279085669252995982374953269596
3414164833366773128218607899328588608916176593772088622582464*e^(266*I*c) +
 223489127639843946447862257830643484072461048446817785982262065869192147 86
45266653062563823553001228001009093606751066168944*e^(265*I*c) + 1704582996
707822808204678218167693002698661147712772355021456543810930069637188085882
82475750060524696321081035170640534940 8*e^(264*I*c) + 12890435152929339564 8
063433049967704018104393562010691426731106790003005839883978769237695409054
5278554544997710058754772400*e^(263*I*c) + 966458275369037718747739130798 15
164348359068416683223468809829116416063641815945211981572880937212516883623
9364442397344064*e^(262*I*c) + 71836159638205824920911354448790108886838874
403371321033249197137590673834155154045726480430403966425591560734980191196
6551*e^(261*I*c) + 5293292527641139260039348369582435576725492389975607392 1
440659918504783195557258376535863439540877152800974546754838295009 4*e^(260*
I*c) + 38664267305038004945738256281831696265197555099077927704874023862985
87950182473561628886310156876647801012052873330827487 91*e^(259*I*c) + 27994
5244475039804822966730462960884492119874857791147124009079476920435941735 29

330930543043868733312991245419677407010726 4*e^(258*I*c) + 20090658715357880
438030046950144161017452185125954192920984068896085945490851977483590589575
76667708578886117387518584604 24*e^(257*I*c) + 142906319123055524246546928 47
895423837131592580202238923649865213683982250203515567697091741903983458796
7055588431566416784*e^(256*I*c) + 100744961851853744611754300982980166962 40
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2819357*e^(255*I*c) + 70386349760594831567048224061395025698501202296966300
376764220336697702961591099854055411376294871437468149528524796002762*e^(25
4*I*c) + 487332535059749234008522555630521014021964693136595544927256747543
393752830104071677443669558289228374887058585324396544 89*e^(253*I*c) + 3343
589782793658130117117545961082945429816796201741981007293673337850658442802
420107245319345815533404669351674239071783 2*e^(252*I*c) + 22731603566128841
100419501947051367666836652418077260913944810748473084891890410181285412604
854876625919565639521227223276*e^(251*I*c) + 153128372066627753793473532128
076829657125356529426315182861424030977382002707111953965821590285135327796
8215445199620859 2*e^(250*I*c) + 10220423779434634851339975295163399641702 12
224966366619305300830202609693215856833830941823739554135181902690795322068
1013*e^(249*I*c) + 67584804378885243725629359489638576266948555471955194861
228775679817185872623628719949670794018319579279016825829412343 62*e^(248*I*
c) + 442767307910542531852431611298569365658485193610019245704445513448330 5
045321452516347118488133224823670465103483954805161*e^(247*I*c) + 287361053
592234018708083543558291227727196797739472015979107027492771427686953146718
268898104106138170388540349754400159 2*e^(246*I*c) + 18475058564624515334452
843005713263237811625533045659718876707580910793067948218349281707731263646
397220715701317037853 34*e^(245*I*c) + 117660072097578696518987505089023109 2
204612696970277433014535895788956771230793520381993106606880564628599822341
722801012*e^(244*I*c) + 742228640908173124916937049462525617334148919679118
270489831005497781951221069955839623452499748653124658873553401442137*e^(24
3*I*c) + 463758288457367154544937678255005688733328145568049310423995599886
0128006386199040223683785911088426023420945436822991 02*e^(242*I*c) + 286992
943631231496557278010851576940896826497466066327528801560677007112837431926
73508812097486176051136700881572878264 3*e^(241*I*c) + 175896258262755985757
106812613979301265801031595484353614904672865169442232075776580447184134141
37599577009149924675952 8*e^(240*I*c) + 106764832017165594838085234189333528
733587673329972530092661085186789939252915937090760282232346919090426243399
409323314*e^(239*I*c) + 64175100693260066806238064886004597170740843300086 8
393686161391645291080498446753531118427257986580888403472414960996 44*e^(238
*I*c) + 381990158675860879760029987566276749947954406679036250293223462501 3
328648912087500501363812811389396034967028070716153 0*e^(237*I*c) + 22514675
741308069961506165586502872430421930210673264392997286485600640103867253604
84771554706059296769065379595114252 0*e^(236*I*c) + 131397714941049338818566
811514182931122425515215356868711812665798138776063481602617472013177357825
66021306798298336024*e^(235*I*c) + 75927527001466789611530950735850154731 97
029746533633331549793961473285760935801904155116764831560875947581048693527
224*e^(234*I*c) + 434390969660193217335735968778157929370129568194082711421

5433175336093967845908766740738240037114570667410936998017178*e^(233*I*c) +
 24604423758454226639270816309832607147349680919054930271456392388271922548
86349361126991457692409851120873307487457468*e^(232*I*c) + 1379676529796212
074017106188066589448355446501210890195107164860350228928586815539003062875
026711931941947738690360722*e^(231*I*c) + 765867795513962781012558444628751
4187109408952813047908367436615820716500321548914828664063148344331994554559
798934952*e^(230*I*c) + 420846342608949387277559021457924586578120966148561
022647008499529468452005980175119410628956210497609566002969884927*e^(229*I
*c) + 228911311738592780091492649162346834405867740776456326108410928857257
174707289268074347550225793244741923354395308214*e^(228*I*c) + 123243941519
332384741960072588103506596406339253616391082062969960682419011745775738921
817753391954462609323881489157*e^(227*I*c) + 656748592688673000988273758128
752256106545516862611036816640070075371157780972935335652438288733837229803
53200611956*e^(226*I*c) + 3463765717267169016765734453719708704888235485399
3270472063943078773600446542963548348101269390443464480754513928502*e^(225*
I*c) + 18079820068028859970349938623007230676563314206708848499900139641237
334763266479346963237936039328113185041591793848*e^(224*I*c) + 933934195805
349422525175096571505730070730208381477477030621822424102264824741995604295
7363055823830898547303219757*e^(223*I*c) + 47741411110660989702218453305949
620164727142303742340606639568469509266426859469290641141944003609362235907
25470146*e^(222*I*c) + 2414966516810338503289076549202740511710059011795447
138773464205696455026442712426409599662771080264826008985061097*e^(221*I*c)
 + 120877035849365839308944222205693506328370410814059375022653984611773764
8216609559734831601248698274330296158612144*e^(220*I*c) + 59865014111224185
891167650518052015036400322684132808145359709358779033860921243908555446686
1582623350303061961052*e^(219*I*c) + 29334492003430072028704238344834286631
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2*e^(218*I*c) + 14221311596481451768238666727676990948227168131879088984050
1039441748635545362467679832449103520321953011780083069*e^(217*I*c) + 68208
033096793615683784409619244210818614991640041553424405527876893272496608324
231098148502466453967157728078994*e^(216*I*c) + 323627313224195494103300889
436402474603783285613164229312924271459028879130716436795029090558912367551
43207382609*e^(215*I*c) + 1518963421490880039641791172264375474804852010973
4812459109878810493844381062650818971199637121458749456243274416*e^(214*I*c
) + 70521324141621979926023265245801430609853530545729339055246331216810210
37340298366342203324325307072413739061024*e^(213*I*c) + 3238491931361851476
423321933539579098377735539207641467346235665823887048326949305609231585143
748690203615957136*e^(212*I*c) + 147093114661893434551503836230010016048212
7749581443929904746910224777470198899052379114493999887003199419829579*e^(2
11*I*c) + 66076447310586909769147597385083793451108903314958670798276426339
4766756649565279879146173318386505740391093990*e^(210*I*c) + 29355074355434
270980812945357656231329970598269918741686293437396425561596713867625327630
2591561523515603264403*e^(209*I*c) + 12896708008475471224602368086648838498
3286259025533132044636109049545144029547003347761521666283977931640178464*e
^(208*I*c) + 56028683424903517658495013858534516167162591034367972498174660

907450666778154353271630344650777885683547624184*e^(207*I*c) + 240687851397
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52723371932874594597328*e^(206*I*c) + 1022318202595486076721739030518645192
3562145473674293619918063490411487496121804590274592702770571515456414680*e
^(205*I*c) + 42932064780080221260174889088518264947906207206601514514681819
10917240027863968724539127659633517053002976480*e^(204*I*c) + 1782446114931
751850556354856638421901174412322298249496591658053939787198246565945975595
575734193348887952160*e^(203*I*c) + 731584972206818362874729621403974444280
010446301161527339760544815300951787985538419764656214582667219914080*e^(20
2*I*c) + 296825515282669589685318273280239050084555032203415941511962659596
881615713799937680026497408305672297618840*e^(201*I*c) + 119041855403877964
948229577948370465600606623183045529526900430209270473212773847794935586074
714329479939280*e^(200*I*c) + 471882208434662076950995069535737803571088974
91422567898048199018207708997005333860148836479527456156014520*e^(199*I*c)
+ 1848740529900573269375272861187649089085835702197488237157062380018624513
7722660943641752976852924439870880*e^(198*I*c) + 71581246868429414754738073
636798397181727455815384090445033838526935969216224266967404539447181430252
48390*e^(197*I*c) + 2738895624795265603355227646566000886280778305084825702
911938903656162004262736182657700406301914070062380*e^(196*I*c) + 103556198
259200293522638457790861154861211149508019357369133986470602918648246624180
5664949381049856258510*e^(195*I*c) + 38687621823427716563245172304997988926
3115282374607541692443176673997513742813591736171169652250611186480*e^(194*
I*c) + 14280179245022176248318087491882527413430513327541778008479503464476
3509333503150517345864659667189417080*e^(193*I*c) + 52075178518793270386429
263351544306951104993542500582938155241689408138675254608030847907167748571
734720*e^(192*I*c) + 187599882188655635641636357359860732782557372574057062
79108891366378428467414559930481172863538598193890*e^(191*I*c) + 6675866290
371147358503766865669289010893543869830538708724945291580951179188296606158
111257706968604740*e^(190*I*c) + 234651821923910514223814163307346476889915
5708935025778047637412681781575765422219127409260159438712250*e^(189*I*c) +
 81460818773653057967021002527192141559718336988121429982329196978554987617
5969866367976653244974728560*e^(188*I*c) + 27928575580003520667983536889816
5477644864987794665387827488933863633745047373109049265172681702585720*e^(1
87*I*c) + 94556180258931986919334303466365652826858091314329189160736277175
873841732196453379953705679466826880*e^(186*I*c) + 316109393312846927506943
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30*e^(185*I*c) + 1043411751657039596665369315558240210946034809547302780741
2321427346816928567197770376496170251803940*e^(184*I*c) + 34002325606016516
175216946808470898441980288316944174247948687793289505484181256054468820811
52636090*e^(183*I*c) + 1093853214486220358674032434500866678499770011305874
172488975951612031456734608287095519501041975440*e^(182*I*c) + 347351473214
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556867777300*e^(181*I*c) + 108867995731829472826732905192034886797284621356
445627530909104429486741257822633476898356826454040*e^(180*I*c) + 336753988
720215683759023845939827533625598010581041846273454111362624319432407782607

21756991027090*e^(179*I*c) + 102793647306638408447395778624692626046488619142979725891652435306512306907262444624791998942551 80*e^(178*I*c) + 30961319716215201623803015542414654517823620868102875377489029049859340201795657061 77131421614590*e^(177*I*c) + 92008939302958903287460185002715932261252636844477148978197436107884752889146883103843606495192 0*e^(176*I*c) + 26974580144021129697268360186387895435796230852007659517712822762927324021520970821849 7363414140*e^(175*I*c) + 78009807368024239875613733058851417125327114681070889640794249282633470580756557083923203377160*e^(174*I*c) + 22251959176795777757167366036007480222211364232146399803864370963391491223687245823457351 580140*e^(173*I*c) + 62598721568222528436509607082350347102013627760571766472263230897514465652888501038981538599 20*e^(172*I*c) + 17365742188181910718741974724501581238835642099506586391023371481227690806116807197417260538 40*e^(171*I*c) + 47501057885760151927231661793842522242178659724167102689431851540851146714096939311576879368 0*e^(170*I*c) + 12809891460168853967248054183040984770736750043860153680320449770111991128908710565948278334 0*e^(169*I*c) + 34054053851295569154352346722177172655187548910782008504718324168725029438589162349211628040*e^(168*I*c) + 89232094473432967633318818816384717934996186706010260597308959626532917702294930281625751 00*e^(167*I*c) + 23043510733738403573791785976730663520166827816891398420973766631184888038411319353136418 40*e^(166*I*c) + 58640346697268324274164332892156090937519745386424329957199096460885724577113414520417499 0*e^(165*I*c) + 14703081673227683316304158209959204751204372522535333923881916519300040762954474575322174 0*e^(164*I*c) + 36318369652302591732197444409798122022640824604130552506742586795183267354382847875885730*e^(163*I*c) + 88367206408604703056945140215479695512967940922669830441183757900258545840367963647682 80*e^(162*I*c) + 21175897334668557071015014292104147224018388379407528416185414408885457299431382090368 20*e^(161*I*c) + 49970756725385908435759631481379476806933719091596749190748890493392267757966535433896 0*e^(160*I*c) + 11610455168355504376291150171211639931373302113267748111282404724636179404963572647985 0*e^(159*I*c) + 26556806389043407534496702369101545795994861757741414789944652712127566910185274123140*e^(158*I*c) + 59789921729441432184591611492998197063217321115784945252452287429764684091053955362 90*e^(157*I*c) + 13247564123678374731574728211624836911209665019489539264922416437882642845464372211 20*e^(156*I*c) + 28882075526473065446996857202104710942731861950899580202068990459031947629540832428 0*e^(155*I*c) + 61948596653035502879564338815234310660410902037882473161804774492916216575880077680*e^(154*I*c) + 13069817203488289886193205508375818392124991382340160316886507181296548981014818410*e^(153*I*c) + 271184323967071752760564049014883350713024244840397831852323772194420039283010858 0*e^(152*I*c) + 55326912881952861250291886955894782909802195630934984358404463151229177880008149 0*e^(151*I*c) + 11096919968732097474992225959525044434121921853534965576259119257653587215176608 0*e^(150*I*c) + 21876482892713909928040345612578705805121508756226696317087651824252241418663320*e^(149*I*c) + 42381258467632325863941885698586858267553280055486274370193014058513258875944 80*e^(148*I*c) + 80667954360758914075930501079618956826984202161338895521891627882318263948819 0*e^(147*I*c) + 15082238143141241377356647421001174

685229743759705918629524398948114039815278O*e^(146*I*c) + 27693116538343259
2259833826376479361226640338596151334898466646943614710283lO*e^(145*I*c) +
49925197124570439835053779766079539883973682975911149579918048936883718676
8O*e^(144*I*c) + 88350096882179120260077454192776920073768939351373478936839
7093333311961880*e^(143*I*c) + 15343608874505625412732723946157707193313015
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080254563056810183520401889800285493144867448*e^(141*I*c) + 436944248291011
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6099497599058079895633338552940229192858196481597830078819711862600096*e^(1
39*I*c) + 11505148185208084887370038835452131556764036512400310369117669719
4292320*e^(138*I*c) + 18115768495615758076710303055505625589254293659193314
153418333944596408*e^(137*I*c) + 279470910447568661184279069497369916448225
4723977210209725661304403472*e^(136*I*c) + 42227612663200368754775474655570
9988710527133086660161366353656787288*e^(135*I*c) + 62473550781053295317710
774690247114124125187565731848441781904032672*e^(134*I*c) + 904669352382568
2979044338963104263167672586826367911338826483549173*e^(133*I*c) + 12818174
64914970810859604189828359000790789921169405304612211251818*e^(132*I*c) + 1
77642829135119348577194437675802830239905460092687136494961404333*e^(131*I*
c) + 24070801913529757101858022914372045864746991786182039740274325264*e^(1
30*I*c) + 3187749929744346497211536044751776582320958627923816470590659024*
e^(129*I*c) + 4124306982999151908480672223272194350677479340918946704889829
28*e^(128*I*c) + 5210811762917704866049240098517583098750570056687781895414
1639*e^(127*I*c) + 64261954855352485764250681368704655300871140038757166913
83902*e^(126*I*c) + 7732046369911457750614627310280985060944326757881362950
11259*e^(125*I*c) + 9072260572220881491864228463948718776460758970649397077
4776*e^(124*I*c) + 10375184499871175501909398956596684116802997082526660323
524*e^(123*I*c) + 115585541289359426034554496664268782363003589936323237147
2*e^(122*I*c) + 125370496586921272662198050851269323171167338854081782959*e
^(121*I*c) + 13231708870104896973800056733779919089340836756009580718*e^(12
0*I*c) + 1357990663161479842850642848032544982878359839580349899*e^(119*I*c
) + 135442594916636116191574650625331646238501101627937224*e^(118*I*c) + 13
118781801172174729679339894318153694964675368481194*e^(117*I*c) + 123309670
0139723365181997220750932590655287625342156*e^(116*I*c) + 11239160454224665
0966429162063124338952554575234051*e^(115*I*c) + 99254907385344022729399870
38714580495445431374618*e^(114*I*c) + 8485522022765123564962001369596762953
61696315113*e^(113*I*c) + 70164515322544462906873548813748091084561870680*e
^(112*I*c) + 5605927253067558551780452883689835514455118670*e^(111*I*c) + 4
32333688644261557547944179250800440604964868*e^(110*I*c) + 3214788769337533
8817454482515377350383950278*e^(109*I*c) + 23021504112262349258552223452015
00900533576*e^(108*I*c) + 158566476113257562566117432227203884298856*e^(107
*I*c) + 10490402669510897424624643766470754045064*e^(106*I*c) + 66563467067
6210063754191847109971141414*e^(105*I*c) + 40443624781415311581857832389099
634564*e^(104*I*c) + 2348998374244347079532766203075607598*e^(103*I*c) + 13
0171193079172823835151430773360024*e^(102*I*c) + 68683292252636813495019973
41320517*e^(101*I*c) + 344277152012875134140739302960914*e^(100*I*c) + 1635

316464715153024052913761811 1*e^(99*I*c) + 7340572636163884499688423669 24*e^(98*I*c) + 3104222252207468161562502052 2*e^(97*I*c) + 1232445557346832245176696904*e^(96*I*c) + 457591171834025790731395 83*e^(95*I*c) + 1581796642397812408161814*e^(94*I*c) + 50648660944512569972179*e^(93*I*c) + 1493326612293984160368*e^(92*I*c) + 40261256699368950388*e^(91*I*c) + 984382804329835768*e^(90*I*c) + 21608403021340047*e^(89*I*c) + 420601518659718*e^(88*I*c) + 7146142307307*e^(87*I*c) + 103818048048*e^(86*I*c) + 1253841160*e^(85*I*c) + 12085216*e^(84*I*c) + 87153*e^(83*I*c) + 418*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) + 7*(299*I*a^2*e^(1027/2*I*c) + 116610*I*a^2*e^(1025/2*I*c) + 22680645*I*a^2*e^(1023/2*I*c) + 2933363420*I*a^2*e^(1021/2*I*c) + 283802910885*I*a^2*e^(1019/2*I*c) + 21909584720322*I*a^2*e^(1017/2*I*c) + 1405865019555002*I*a^2*e^(1015/2*I*c) + 77121738215926170*I*a^2*e^(1013/2*I*c) + 3692203217145049425*I*a^2*e^(1011/2*I*c) + 156713514334349191205*I*a^2*e^(1009/2*I*c) + 5970784896718122444327*I*a^2*e^(1007/2*I*c) + 20626347829103238836 1681*I*a^2*e^(1005/2*I*c) + 6514488191762735815405157*I*a^2*e^(1003/2*I*c) + 189421272159473056494074595*I*a^2*e^(1001/2*I*c) + 51008442628778183757 40499940*I*a^2*e^(999/2*I*c) + 127861163072229101394013407134*I*a^2*e^(997/2*I*c) + 2996746017244157830350053701476*I*a^2*e^(995/2*I*c) + 6592841263164773946168345782051 1*I*a^2*e^(993/2*I*c) + 13661832248562978655212170090208 24*I*a^2*e^(991/2*I*c) + 2674842966346797064781578555218 1215*I*a^2*e^(989/2*I*c) + 4961833756024532791076116853907 67740*I*a^2*e^(987/2*I*c) + 874227865046303006930100363723242 9883*I*a^2*e^(985/2*I*c) + 1466318584164118582075611937212883 20906*I*a^2*e^(983/2*I*c) + 2346109795219082040306865029327652810422*I*a^2*e^(981/2*I*c) + 35875930157695641006598626271371876133245*I*a^2*e^(979/2*I*c) + 525223640233639829417248502076803689088820*I*a^2*e^(977/2*I*c) + 7373332278938477877109516190844163180831833*I*a^2*e^(975/2*I*c) + 99403449489614415589324261326783015782654200*I*a^2*e^(973/2*I*c) + 128869483230185418749692569938588091290576741 7*I*a^2*e^(971/2*I*c) + 160864682643236554134757473045856084939299257 40*I*a^2*e^(969/2*I*c) + 193573860526473423179001809134869735140502053410*I*a^2*e^(967/2*I*c) + 2247954875096342235081391843579770658847258731308*I*a^2*e^(965/2*I*c) + 25219248742824948157547271484589255811816930894969*I*a^2*e^(963/2*I*c) + 273590703261713668448365859396559199738283337615067*I*a^2*e^(961/2*I*c) + 2872703209254401680718347285883520097429919909434035*I*a^2*e^(959/2*I*c) + 29219505531617139745995198456026235957224788107224865*I*a^2*e^(957/2*I*c) + 288136908346804733688436834384090051687033252355064191*I*a^2*e^(955/2*I*c) + 2756770672774248567550184031805577107703843954010093519*I*a^2*e^(953/2*I*c) + 25608963224785291572287952038770777479118266594544417374*I*a^2*e^(951/2*I*c) + 231137463934351535240227752765265592838813655877791732766*I*a^2*e^(949/2*I*c) + 2028232835526354300983369892820970081423531403040583023770*I*a^2*e^(947/2*I*c) + 17314198559836475415651393365133642453745100461062396834495*I*a^2*e^(945/2*I*c) + 143872897869958476711841808368973418609254139596808263965208*I*a^2*e^(943/2*I*c) + 1164368139316323606713195496495533903452490627065569725880879*I*a^2*e^(941/2*I*c) + 9182643580975122394482019949557981111651613557125350856577098*I*a^2*e^(939/2*I*c) + 70604441498160359313241260895971702149956086380303936 4

68404945*I*a^2*e^(937/2*I*c) + 52953430380431437131727928703158739934289831
9070257744555877120*I*a^2*e^(935/2*I*c) + 387574875295375725139232180409811
0389738719224033802668294149720*I*a^2*e^(933/2*I*c) + 276955224919873361222
97854656279067704143932579317971697894652128*I*a^2*e^(931/2*I*c) + 19330398
2244781919691500896347164102540863253211817387366117379028*I*a^2*e^(929/2*I
*c) + 1318337340904646289197961886292345009401456618543410019867356069360*I
*a^2*e^(927/2*I*c) + 878894722176403352444688879370312534478409467919461266
2969732267700*I*a^2*e^(925/2*I*c) + 572974083910783244258442207116960160604
58004240084890338934689925280*I*a^2*e^(923/2*I*c) + 36540779363619697337987
8926946921993102971243732578054647123414214820*I*a^2*e^(921/2*I*c) + 228042
7120078137719325513847874265148019541854031486848558248442727176*I*a^2*e^(9
19/2*I*c) + 139314177925091981614687974237525448386785995392752123323804426
51357560*I*a^2*e^(917/2*I*c) + 83340276962100363964566640495864516393854803
017236184470442989394035180*I*a^2*e^(915/2*I*c) + 4883483643690059612618015
02808542403226214848682295131186689348564834560*I*a^2*e^(913/2*I*c) + 28038
16222757253133472672279792586220272029806438905494766819989517225180*I*a^2*
e^(911/2*I*c) + 15777551334929884741558980231119513445377646781839885604883
296740586671600*I*a^2*e^(909/2*I*c) + 8704038273624124504811313552891743577
2531399861517048611706176997728840060*I*a^2*e^(907/2*I*c) + 470879572899329
452986316253534868514992585355812719048085012389615234670720*I*a^2*e^(905/2
*I*c) + 2498731377031195939020099006767775607036784147188475889323331541072
591988520*I*a^2*e^(903/2*I*c) + 1300945152021805442798772690930638802672821
8430095197151626190204529199816160*I*a^2*e^(901/2*I*c) + 664712059991868481
17890072662193021327677387770934414812726997704844663612890*I*a^2*e^(899/2*
I*c) + 33338444155217534857586385168528007939751540812720139284301050909814
4064832520*I*a^2*e^(897/2*I*c) + 164169729637814329912873364094099880544138
4198489236819275463423360050416710230*I*a^2*e^(895/2*I*c) + 793912239209648
9819576023365780909095910972043426214771545781246832910820414100*I*a^2*e^(8
93/2*I*c) + 377117140101616328512751948735862319229675664519554097468433744
16439997598272230*I*a^2*e^(891/2*I*c) + 17599254140146487259175830149983489
8740699910060781393774843202513062630336753720*I*a^2*e^(889/2*I*c) + 807074
460549539210003558596515532129897902975140321070941315505466030633289504700
*I*a^2*e^(887/2*I*c) + 3637632524900007961249646025024970707837559612619597
442737493322095743154754032540*I*a^2*e^(885/2*I*c) + 1611728744799820614279
8083894763175840848857114343543047242138953088137509988748530*I*a^2*e^(883/
2*I*c) + 702122063048016783325133455999109492462648029240170648330249799178
94264890884744230*I*a^2*e^(881/2*I*c) + 30078638004528714362895449962913656
2193246097877509863055826252064326569743630828470*I*a^2*e^(879/2*I*c) + 126
737087561381648317237671513461191515502353237594752736881659052212108959184
1195870*I*a^2*e^(877/2*I*c) + 525318021890119037052330796129201500498936014
5697116713826069492059896349225432472890*I*a^2*e^(875/2*I*c) + 214232263757
34147493294111979827037040590614426574817511241501723037567325263745727850*
I*a^2*e^(873/2*I*c) + 85972681691391354979713197091334370055201000372937152
633172947601816313260199706979160*I*a^2*e^(871/2*I*c) + 3395597687106525970
1328288817312950668437949251721078395194275059325692430095887234940*I*a^2*

e^(869/2*I*c) + 1320132342599574776582487491686376011020731128338564644972136377885389653577953327654360*I*a^2*e^(867/2*I*c) + 5052749693090074250020711633864893162784543894410325996308296849332368152124619583542550*I*a^2*e^(865/2*I*c) + 19041847118319726293265803273951207945593799588235034178026656550799568684461605603777920*I*a^2*e^(863/2*I*c) + 70667809192496838965532281733119872286671303574373760629554934333798898169280995448949110*I*a^2*e^(861/2*I*c) + 258299861869070319215539511486716381312735629658913082894934911762706535490482149535095400*I*a^2*e^(859/2*I*c) + 929980703633600952321625692946644952639044210651468835121797966088502026440103109950142510*I*a^2*e^(857/2*I*c) + 3298577503461372465605345536869123261456392605454980840206045785661659654642478147158578260*I*a^2*e^(855/2*I*c) + 11527544710214127291959320966284738345019810955968385265683600912288138678711188667077969580*I*a^2*e^(853/2*I*c) + 39696967339164674484698605925414889836548997086240408750738793856030209166162894182626765170*I*a^2*e^(851/2*I*c) + 134722445502792775389537013386891372826155603628085240383959392418361487884840921793997982680*I*a^2*e^(849/2*I*c) + 450645625803738882960885871030566143953108988238530005053615795799976664205719692805608636970*I*a^2*e^(847/2*I*c) + 1485908894655409129727579697390217111877691246727000929093187863829367925384373668136922959680*I*a^2*e^(845/2*I*c) + 4830133064761265676098823275890322270506766918770002889169425396499013319534724628237025832970*I*a^2*e^(843/2*I*c) + 15480423340995881584740416023332877545588024374995660159497444149878426588554491651581857867240*I*a^2*e^(841/2*I*c) + 48922566581328827996243369288346270469307859644664802730085010597182346996542663202606651415940*I*a^2*e^(839/2*I*c) + 152469533247657613494014223169079603947607129031097239090335734676330177814841868201155345866600*I*a^2*e^(837/2*I*c) + 468649433876940374716415334540852022756419671685290819126536222202383329230675172080843145521190*I*a^2*e^(835/2*I*c) + 1420846196643578803733575330926970974464675704020481618027446077982380731097941167611657029967430*I*a^2*e^(833/2*I*c) + 4249342990738608701078109187168768367693341231356030118163718909774173116310218460585993016680850*I*a^2*e^(831/2*I*c) + 12537562836732599179767010355152461056807191951005009796451823391079000655762189067741192305394090*I*a^2*e^(829/2*I*c) + 36497326353315963605420298190687465001055100758074304234792272161886339957870164613698417616283210*I*a^2*e^(827/2*I*c) + 104834609086572625907289346225890252429283565041460323851402795840051940483234866884215706838405390*I*a^2*e^(825/2*I*c) + 297154478443352847298744293536373570367631258373197290869967778261660884898898610815793932187264900*I*a^2*e^(823/2*I*c) + 831249333124270929749565123370219357165654568742620039903429231671547436113371386430716266759961060*I*a^2*e^(821/2*I*c) + 2295030419017144015110797732155375346477339079532575006580675869478858321228765847919467823502616280*I*a^2*e^(819/2*I*c) + 6254456957710857084990777507880196795826048342877391310115506167680233024354089893072681406475246730*I*a^2*e^(817/2*I*c) + 16825577675009653410652812996723598120483470175375332001250964015555125236873581387468224926998037020*I*a^2*e^(815/2*I*c) + 44685235946986673791925225525992813797485854939304559125279366181549713351572630218142149059140721370*I*a^2*e^(813/2*I*c) + 1171670844831237108639698079387721551699567853175230901748626

97344141293246236717353854714751253177160*I*a^2*e^(811/2*I*c) + 30333870635
075548727905717088251347474336020120036232795473704223354032916036441631311
5387680520970550*I*a^2*e^(809/2*I*c) + 775466756780053803300487429447750888
237325797624757919706744628478203937255833604141877857656968392480*I*a^2*e^
(807/2*I*c) + 1957688477178164823844184536565647794575532926755467360055820
937851704595970877608419045482885065913720*I*a^2*e^(805/2*I*c) + 4880904812
629492578182749704265723358376166867348003927103702683844870930164640446326
414262466377824000*I*a^2*e^(803/2*I*c) + 1201888522740550852777891824471307
7048854664134058582641410118464532001237995012608936579451133542506420*I*a^
2*e^(801/2*I*c) + 292324578477843471942327558706863993151718093462483465949
46497316944533356199777722113539614776201632080*I*a^2*e^(799/2*I*c) + 70231
742836691486232401821435646690204765370170934364279337989127944150596825723
542271716872404327490260*I*a^2*e^(797/2*I*c) + 1666854541786758673088478816
430259717371256882203030379686823499256790893313121747781173660390262858694
40*I*a^2*e^(795/2*I*c) + 39082901345847871376200586853174955051134836375540
2425375475219863201042469027671720992324263291992741380*I*a^2*e^(793/2*I*c)
 + 905375964480293043221568717617222804352981478608148290290910134804446811
145030581376444150025327895167080*I*a^2*e^(791/2*I*c) + 2072296968472727638
582366763214809350131036179733894803881601867867318900360235090208152423869
380817193240*I*a^2*e^(789/2*I*c) + 4686873873156101871190767974561598609513
443670201757460914232312505484627209871957976104328771649162041900*I*a^2*e^
(787/2*I*c) + 1047489711020580736784637506672333662224453652317656117621724
5839587779126630391482195110511043224435073120*I*a^2*e^(785/2*I*c) + 231354
575556672420151095626967247592694421472166873974898194890719416969466452628
69400576401992001928296540*I*a^2*e^(783/2*I*c) + 50500362504156859478353840
472838257985720430216874883086230302896996886794997397859935740848410975488
426320*I*a^2*e^(781/2*I*c) + 1089494105060243829214205754738692285159428724
96860505620768573056175175693027104049195507535238812688471740*I*a^2*e^(779
/2*I*c) + 23232441719723506208102256523595997332912970401651251149268440722
8447554005362475531181177257375428158576672*I*a^2*e^(777/2*I*c) + 489699557
155298676398555706690170103288962201587062038457047783309280898007016462695
325519866776349668712200*I*a^2*e^(775/2*I*c) + 1020362468343075226131935473
747821355290052152417646455220161102238032449230964279115841386608493376970
117760*I*a^2*e^(773/2*I*c) + 2101812264182065730411859582938002660622402353
730581510169623059960820290526673615762476646904104925062205465*I*a^2*e^(77
1/2*I*c) + 4280284024728837338195579377830489525167771127365155055905896472
260407749270429246786706643678954884633163010*I*a^2*e^(769/2*I*c) + 8618164
918788925203902059506702768733004223544564086461069581208848976475760787131
715839621109117547446849991*I*a^2*e^(767/2*I*c) + 1715713198535927799763949
795015467476277919035108756781919569951778466633338337833668711385869220404
4077794176*I*a^2*e^(765/2*I*c) + 337742897479789814249267399311608247971611
12237362925619159566387573730808632464292717707940688773187398723895*I*a^2*
e^(763/2*I*c) + 65745072618550512189873447315220858623931223310142529839808
121856850665718523376669691836042778846630737410930*I*a^2*e^(761/2*I*c) + 1
265608335829055341254571182834795882548867340664226813227430674530949554232

72892820673108496357191409969590*I*a^2*e^(759/2*I*c) + 24094512727676622
7320339940089298232681048239144248789324968088048819421447003749816077955279
624100315116789806*I*a^2*e^(757/2*I*c) + 453673232394267043949605922569329
9809405496269993825998435056623116862573019665379203608383246677291334822355
83*I*a^2*e^(755/2*I*c) + 8448853220591619323689935171172081111839443557646
32182261257568921304529568367117463318791743206771210437760631*I*a^2*e^(753
/2*I*c) + 155634309696857376475647523541193301673378631310723900486480057866
6621277030123112055440836769200504575169913345*I*a^2*e^(751/2*I*c) + 28358
890227167933110932671089134114841174308170409759286396549113682115146981129
27408762873660302882359781905835*I*a^2*e^(749/2*I*c) + 51117871550982319663
8144441399841376973803984062978998663613586137709643711053535226119644466163
5160446805767627*I*a^2*e^(747/2*I*c) + 91154745536838262814361423059106684
0258258198885674585108557449802670867744282680338340126638781316206259452595
3*I*a^2*e^(745/2*I*c) + 16081708037117239364885424953083244936515724921299
386778600225951179498131171589524219045138516435810850207340428*I*a^2*e^(74
3/2*I*c) + 2807080481602620981076564109527504212794812804138943562972048564
3024095406486924220542522448143563324518401964482*I*a^2*e^(741/2*I*c) + 484
8092066051426686753515724572870067245346536590134444783005329826730084909821
4762864212092705639132905793681740*I*a^2*e^(739/2*I*c) + 82852142966860851
43161142011759637225646673944870189720446044142649863254890021968337411640
986907458522921325945*I*a^2*e^(737/2*I*c) + 1401126097156444901142996236202
2373263446164751270180690824038387865474539908783685880471162940076251542595
5916824*I*a^2*e^(735/2*I*c) + 23448502098041246734174319914535202946807635
2266379854608773522593799565958621176141472761686768653754135750141593*I*a^
2*e^(733/2*I*c) + 3883661307729365140350452261015287260999763430674350240848
98656054932162774966074464370430510444616487043887402836*I*a^2*e^(731/2*I*
c) + 6366196753590080176222160089204077247084401076299878481343671810431067
80412514399115423605660760788697651634379005*I*a^2*e^(729/2*I*c) + 10328933
9010862345166262992190205982552015045634114895481924124598682717274604515381
0766991498955787562750756646550*I*a^2*e^(727/2*I*c) + 16587926940728714791
0186994254470497316892457594307110330957077408626202954246122875334328311262
0767567415651784874*I*a^2*e^(725/2*I*c) + 26370267049400575417176034160990
47901577339805399244480403700320734657027382051540741428399462562160665232399
986075*I*a^2*e^(723/2*I*c) + 41499948103659005228074682132781930916561417
31116367453829137630709191482537488782374639033936237089896768763566876*I*a
^2*e^(721/2*I*c) + 64657096563000678127862675144471066879025814333109191780
38542426426780363215033938034518725151681639996365849163135*I*a^2*e^(719/2*
I*c) + 99734557816683321004826191207790447961988845705188503626756204008003
80525655955470978275300874201998244732697737400*I*a^2*e^(717/2*I*c) + 15232
155197244469983477235120489934255399594332170569196782170361245875795753404
131530065929326205229838601927955519*I*a^2*e^(715/2*I*c) + 2303503397660786
1848764777813625859138663747527131798877008816594078301950324404686986975822
232657903821541105390532*I*a^2*e^(713/2*I*c) + 344948248565668222808335097
0147940299549936501441740704289262338429483788416879224070200558775516959641
4970227728126*I*a^2*e^(711/2*I*c) + 51154349273662615909216231190623364827

611251722641045147869080165842930085677025925218103510278265118135145553584
580*I*a^2*e^(709/2*I*c) + 7512782632111591022008579582351090881458838771875
5712029825386842788704037764840837864988871197826414756226327584715*I*a^2*e
^(707/2*I*c) + 109278560723550930958638148152377305018874412559953150839397
105157171522052107943777228097015723239016040062510748533*I*a^2*e^(705/2*I*
c) + 1574386486831341464742255088228696345104075897898805015891611538045006
57734549235665125080321402913947303819424223977*I*a^2*e^(703/2*I*c) + 22467
587013781696744857429090657201235362457224788962377186655669552753584956209
2439004233144825309318376200907596647*I*a^2*e^(701/2*I*c) + 317611854590359
842624867588299694397092051295753012234334896647966925083208128923978657573
859261411691474063180579773*I*a^2*e^(699/2*I*c) + 4447937565765568052265985
571218812558914206601789540056061908597679079003755266990872810797754019354
79298706556678625*I*a^2*e^(697/2*I*c) + 61711890741549188200889368999237498
602605861459518063693459633141317037978048758571458704778846921411345179551
6499370*I*a^2*e^(695/2*I*c) + 848308102584636362484162825743572316210570041
224952064440187703108373794290161871693531289023220368566861588408740234*I*
a^2*e^(693/2*I*c) + 1155418271261525364764099832556015695656671742148397430
770621919769591262069324891797346089718216295419176001175584602*I*a^2*e^(69
1/2*I*c) + 1559379265746722157601116633770545905680845286466195068047437750
582100850218558934063441346166219284236292591756007869*I*a^2*e^(689/2*I*c)
+ 2085532515622353289775297137684356044555717847895905712020991677926353632
697196135336156922652753946110662598182357060*I*a^2*e^(687/2*I*c) + 2764141
551913183823232240538311434861698053782540087737778740958755195255197468794
265331998300489529793104153836938365*I*a^2*e^(685/2*I*c) + 3630836299606049
901259711668223783516359548315616426099543877893492461453478630388967263756
039510415511889625376389370*I*a^2*e^(683/2*I*c) + 4726945091253225709284701
620253529588027362773911267160094581860855616546226572637107723406479754761
335508976269914579*I*a^2*e^(681/2*I*c) + 6099661241729520049877973018323299
594149962508203841935762640399428877526099801926994421670829050753700797133
864249984*I*a^2*e^(679/2*I*c) + 7801985537042156770644275419004423215569828
427612566994744061595455071803838672709040326328594306655699615422670941360
*I*a^2*e^(677/2*I*c) + 9892383001478135230032539289730880802930949483982413
461465804587893896576239270994398101763117672285400912303258185280*I*a^2*e^
(675/2*I*c) + 1243409271248787660618086383964100720378208694205271972753248
8449954289915481768007300367716998430298025515215263240040*I*a^2*e^(673/2*I
*c) + 154940340739378891189078604664064752867270400483777892795074774249507
14627734498672369684614416130884899948506496976480*I*a^2*e^(671/2*I*c) + 19
141262538036155544818609953329709894938435396042778174361103892567106894147
006088532658059808481944657444464667813928*I*a^2*e^(669/2*I*c) + 2344494275
310972061619099448239626334477546731486566463392537771134367647914380142313
1782286928982641584906730652336320*I*a^2*e^(667/2*I*c) + 284718276522237485
491067080889253342674583103628338435078037069541557296231905630342278097948
21598285838730011875428360*I*a^2*e^(665/2*I*c) + 34283257825099361469629029
64699798701635741039313337876860784218594231344941134240798399418976200089
374372937336277520*I*a^2*e^(663/2*I*c) + 4093172590825989006501067641289805

99350021675414437149684224475067236578143624236160274677960379565942494702O
7911160560*I*a^2*e^(661/2*I*c) + 484570844705692062028835940300589468351722
766518437992672347958848344224971557014613764251403472927696222870092534422
00*I*a^2*e^(659/2*I*c) + 56882511269373287870539195822437152004680104321850
22939670892600501269384367580335094519646397392062841225628383223232O*I*a^2
*e^(657/2*I*c) + 66210380689814888721157202178156524725300428557949731096O3
0018469991922414680985665275947873824643920689185621817195640*I*a^2*e^(655/
2*I*c) + 764182222193923150876837562784057752836506762015726045537927059213
11480435170616914405792951857748812649327303490604640*I*a^2*e^(653/2*I*c) +
 87454973338365020493040891275447029237532017105088938657341030070141081586
543085297206983544492390393869271998602113720*I*a^2*e^(651/2*I*c) + 9923775
261516638892682597483629999017754882776595217676164347019255997423976321777
0479232350108190016210097408947946880*I*a^2*e^(649/2*I*c) + 111649386683169
175905340386817436347581012040347378979113869960210757779770685735228549707
336610684327510689931586511440*I*a^2*e^(647/2*I*c) + 1245369201586228804377
233574104924916274847257121455379401686331920475946242178129455790303635027
01898045319958355946560*I*a^2*e^(645/2*I*c) + 13771131907758733659394974770
922079392808252883121784533905783038068722150139469413642285446957455269158
8871302472423100*I*a^2*e^(643/2*I*c) + 150948545513948896128558440622825450
599113182826877373160132263862850745383456730881605090985571977587756201763
874677760*I*a^2*e^(641/2*I*c) + 1639921340429383893892256515873090499834780
095020309950925913433798473645052525505677375063465764353632685119463074327
40*I*a^2*e^(639/2*I*c) + 17655734097234500011005070412147532602526008802387
2962060596666821011054235305398302353921234166369742208455804477035400*I*a^
2*e^(637/2*I*c) + 188336867093755763287399456292591578241527924733164764702
870711365091789132541972304352146740778900143326958742782477380*I*a^2*e^(63
5/2*I*c) + 1990080773230358754188101430126020470325655498190936599284100241
26213956651006647088382356775180926199506332461163896160*I*a^2*e^(633/2*I*c
) + 20824155995852600557755365457953980429555672976681302421485406417079365
6725481586279526287325763568906607290452125497960*I*a^2*e^(631/2*I*c) + 215
710788862031986131314760876619509722697669102804696344437524165882302085220
441314010414559115310505632713041800563240*I*a^2*e^(629/2*I*c) + 2211025783
828626695740553495019335716128549986148679539512300952865082892135739343399
76617529581891276161128355770449340*I*a^2*e^(627/2*I*c) + 22412795796157893
172920975099679649222146391969926682954770169868208546365760842198312918062
2041022833070349554614032580*I*a^2*e^(625/2*I*c) + 224533045357590740043360
207419063480374496445086224306972898952727492000443367189384084387014008320
007336848252442351700*I*a^2*e^(623/2*I*c) + 2221094679604372803660200628702
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67999904808020*I*a^2*e^(621/2*I*c) + 21670387335018916188925391097041103119
472484764883594965696672868367256398560906116425852512709414712811608491686
3495980*I*a^2*e^(619/2*I*c) + 208226084708306358093649771579465852434363766
772952777959519157479546252544982513897370413187324342062073067119188597020
*I*a^2*e^(617/2*I*c) + 1966554941120943568598374855496882167189718738080325
39175218270546486750286660449996087951876167053363772436503198669200*I*a^2*

e^(615/2*I*c) + 182045346113101993025375617567147472310766357687334445619835660822772617872843112295661673067279164398356825168900855240*I*a^2*e^(613/2*I*c) + 164524642949883386780879611739425630216678555120136856424422933930968874874654856422558330216317466771849726211997355920*I*a^2*e^(611/2*I*c) + 144297497750869524271910782851992127993955010068529181184808921877382505548298335144664374339743032217233080067477001300*I*a^2*e^(609/2*I*c) + 121639868631933856772017292190332008344816613925479968028867572670823450147938585266247649652554944275677884270413328320*I*a^2*e^(607/2*I*c) + 96893719441596910044889117012440950291020439770151527577177611508808188500572872477073629458560345895007381079831424020*I*a^2*e^(605/2*I*c) + 70458766374210588223159026861223445333341753439960632221750998997297048156150655074881354085103291330810095125378469360*I*a^2*e^(603/2*I*c) + 42782077961669277675640862330375110601819532686365819109825348265088913439588364246424948792319286916984200949647432740*I*a^2*e^(601/2*I*c) + 14345893481329936950121653593657325353238574049422623814263012969352846730780039535900084812106747735276310173764055960*I*a^2*e^(599/2*I*c) - 14345893481329936950121653593657325353238574049422623814263012969352846730780039535900084812106747735276310173764055960*I*a^2*e^(597/2*I*c) - 42782077961669277675640862330375110601819532686365819109825348265088913439588364246424948792319286916984200949647432740*I*a^2*e^(595/2*I*c) - 70458766374210588223159026861223445333341753439960632221750998997297048156150655074881354085103291330810095125378469360*I*a^2*e^(593/2*I*c) - 96893719441596910044889117012440950291020439770151527577177611508808188500572872477073629458560345895007381079831424020*I*a^2*e^(591/2*I*c) - 121639868631933856772017292190332008344816613925479968028867572670823450147938585266247649652554944275677884270413328320*I*a^2*e^(589/2*I*c) - 144297497750869524271910782851992127993955010068529181184808921877382505548298335144664374339743032217233080067477001300*I*a^2*e^(587/2*I*c) - 164524642949883386780879611739425630216678555120136856424422933930968874874654856422558330216317466771849726211997355920*I*a^2*e^(585/2*I*c) - 182045346113101993025375617567147472310766357687334445619835660822772617872843112295661673067279164398356825168900855240*I*a^2*e^(583/2*I*c) - 196655494112094356859837485549688216718971873808032539175218270546486750286660449996087951876167053363772436503198669200*I*a^2*e^(581/2*I*c) - 208226084708306358093649771579465852434363766772952777959519157479546252544982513897370413187324342062073067119188597020*I*a^2*e^(579/2*I*c) - 216703873350189161889253910970411031194724847648835949656966728683672563985609061164258525127094147128116084916863495980*I*a^2*e^(577/2*I*c) - 222109467960437280366020062870258143910978561940461423361930719843483296905763027899463977958166886104616267999904808020*I*a^2*e^(575/2*I*c) - 224533045357590740043360207419063480374496445086224306972898952727492000443367189384084387014008320007336848252442351700*I*a^2*e^(573/2*I*c) - 224127957961578931729209750996796492221463919699266829547701698682085463657608421983129180622041022833070349554614032580*I*a^2*e^(571/2*I*c) - 221102578382862669574055349501933571612854998614867953951230095286508289213573934339976617529581891276161128355770449340*I*a^2*e^(569/2*I*c) - 215710788862031986131314760876619509722697669102804696344437524165882302085220

441314010414559115310505632713041800563240*I*a^2*e^(567/2*I*c) - 2082415599
585260055775536545795398042955567297668130242148540641707936567254815862795
262873257635689066072904521254979 60*I*a^2*e^(565/2*I*c) - 19900807732303587
541881014301260204703256554981909365992841002412621395665100664708838235677
518092619950633246116389 6160*I*a^2*e^(563/2*I*c) - 18833686709375576328739 9
456292591578241527924733164764702870711365091789132541972304352146740778900
143326958742782477380*I*a^2*e^(561/2*I*c) - 176557340972345000110050704121 4
753260252600880238729620605966668210110542353053983023539212341663697422084
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*I*a^2*e^(555/2*I*c) - 137711319077587336593949747709220793928082528831217 8
453390578303806872215013946941364228544695745526915888713024724231 00*I*a^2*
e^(553/2*I*c) - 124536920158622880437723357410492491627484725712145537940 16
863319204759462421781294557903036350270189804531995835594 6560*I*a^2*e^(551/
2*I*c) - 111649386683169175905340386817436347581012040347378979113869960210
757779770685735228549707336610684327510689931586511440*I*a^2*e^(549/2*I*c)
- 992377526151663889268259748362999901775488277659521767616434701925599742 3
976321777047923235010819001621009740894794688 0*I*a^2*e^(547/2*I*c) - 874549
733383650204930408912754470292375320171050889386573410300701410815865430852
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392068918562181719564 0*I*a^2*e^(541/2*I*c) - 568825112693732878705391958224
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172276651843799267234795884834422497155701461376425140347292769622287009253
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14437149684224475067236578143624236160274677960379565942494702079111605 60*I
*a^2*e^(535/2*I*c) - 342832578250993614696290296469979870163574103931333378
768607842185942313449411342407983994189762000893743729373362775 20*I*a^2*e^(
533/2*I*c) - 284718276522237485491067080889253342674583103628338435078037 06
9541557296231905630342278097948215982858387300118754283 60*I*a^2*e^(531/2*I*
c) - 234449427531097206161909944823962633447754673148656646339253777113436 7
647914380142313178228692898264158490673065233632 0*I*a^2*e^(529/2*I*c) - 191
412625380361555448186099533297098949384353960427781743611038925671068941470
0608853265805980848194465744446466781392 8*I*a^2*e^(527/2*I*c) - 15494034073
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684614416130884899948506496976480*I*a^2*e^(525/2*I*c) - 124340927124878766 0
618086383964100720378208694205271972753248844995428991548176800730036771699
843029802551521526324004 0*I*a^2*e^(523/2*I*c) - 989238300147813523003253928
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8979029751403210709413155054660306332895047 00*I*a^2*e^(309/2*I*c) - 1759925

414014648725917583014998348987406999100607813937748432025130626303367537 20*I*a^2*e^(307/2*I*c) - 377117140101616328512751948735862319229675664519554097468433744164399975982722 30*I*a^2*e^(305/2*I*c) - 7939122392096489819576023365780909095910972043426214771545781246832910820414100*I*a^2*e^(303/2*I*c) - 164169729637814329912873364094099880544138419848923681927546342336005041671023 0*I*a^2*e^(301/2*I*c) - 33338444155217534857586385168528007939751540812720139284301050909814406483252 0*I*a^2*e^(299/2*I*c) - 66471205999186848117890072662193021327677387770934414812726997704844663612890*I*a^2*e^(297/2*I*c) - 13009451520218054427987726909306388026728218430095197151626190204529199816160*I*a^2*e^(295/2*I*c) - 24987313770311959390200990067677756070367841471884758893233315410725919885 20*I*a^2*e^(293/2*I*c) - 47087957289932945298631625353486851499258535581271904808501238961523467072 0*I*a^2*e^(291/2*I*c) - 870403827362412450481131355289174357725313998615170486117061769977288400 60*I*a^2*e^(289/2*I*c) - 15777551334929884741558980231119513445377646781839885604883296740586671600*I*a^2*e^(287/2*I*c) - 28038162227572531334726722797925862202720298064389054947668199895172251 80*I*a^2*e^(285/2*I*c) - 48834836436900596126180150280854240322621484868229513111866893485648345 60*I*a^2*e^(283/2*I*c) - 8334027696210036396456664049586451639385480301723618447044298939403518 0*I*a^2*e^(281/2*I*c) - 139314177925091981614687974237525448386785995392752123323804426513575 60*I*a^2*e^(279/2*I*c) - 228042712007813771932551384787426514801954185403148684855824844272717 6*I*a^2*e^(277/2*I*c) - 365407793636196973379878926946921993102971243732578054647123414214820*I*a^2*e^(275/2*I*c) - 5729740839107832442584422071169601606045800424008489033893468992528 0*I*a^2*e^(273/2*I*c) - 878894722176403352444688879370312534478409467919461266296973226770 0*I*a^2*e^(271/2*I*c) - 13183373409046462891979618862923450094014566185434100198673560693 60*I*a^2*e^(269/2*I*c) - 19330398224478191969150089634716410254086325321181738736611737902 8*I*a^2*e^(267/2*I*c) - 276955224919873361222978546562790677041439325793179716978946521 28*I*a^2*e^(265/2*I*c) - 38757487529537572513923218040981103897387192240338026682941497 20*I*a^2*e^(263/2*I*c) - 5295343038043143713172792870315873993428983190702577445558771 20*I*a^2*e^(261/2*I*c) - 706044414981603593132412608959717021499560863803039364684049 45*I*a^2*e^(259/2*I*c) - 91826435809751223944820199495579811116516135571253508565770 98*I*a^2*e^(257/2*I*c) - 116436813931632360671319549649553390345249062706556972588087 9*I*a^2*e^(255/2*I*c) - 14387289786995847671184180836897341860925413959680826396520 8*I*a^2*e^(253/2*I*c) - 173141985598364754156513933651336424537451004610623968344 95*I*a^2*e^(251/2*I*c) - 202823283552635430098336989282097008142353140304058302377 0*I*a^2*e^(249/2*I*c) - 2311374639343515352402277527652655928388136558777917327 66*I*a^2*e^(247/2*I*c) - 2560896322478529157228795203877077747911826659454441737 4*I*a^2*e^(245/2*I*c) - 2756770672774248567550184031805577107703843954010093519*I*a^2*e^(243/2*I*c) - 2881369083468047336884368343840900516870332523550641 91*I*a^2*e^(241/2*I*c) - 2921950553161713974599519845602623595722478810722486 5*I*a^2*e^(239/2*I*c) - 2872703209254401680718347285883520097429919909434035*I*a^2*e^(237/2*I*c) - 2735907032617136684483658593965591997382833376150 67*I*a^2*e^(235/2*I*c) - 252192487428249481575472714845892558118169308949 69*I*a^2

*e^(233/2*I*c) - 22479548750963422350813918435797706588472587313O8*I*a^2*e^
(231/2*I*c) - 19357386052647342317900180913486973514050205341O*I*a^2*e^(229
/2*I*c) - 16086468264323655413475747304585608493929925740*I*a^2*e^(227/2*I*
c) - 1288694832301854187496925699385880912905767417*I*a^2*e^(225/2*I*c) - 9
9403449489614415589324261326783015782654200*I*a^2*e^(223/2*I*c) - 737333227
8938477877109516190844163180831833*I*a^2*e^(221/2*I*c) - 525223640233639829
417248502076803689088820*I*a^2*e^(219/2*I*c) - 3587593015769564100659862627
1371876133245*I*a^2*e^(217/2*I*c) - 234610979521908204030686502932765281042
2*I*a^2*e^(215/2*I*c) - 146631858416411858207561193721288320906*I*a^2*e^(21
3/2*I*c) - 8742278650463030069301003637232429883*I*a^2*e^(211/2*I*c) - 4961
83375602453279107611685390767740*I*a^2*e^(209/2*I*c) - 26748429663467970647
815785552181215*I*a^2*e^(207/2*I*c) - 1366183224856297865521217009020824*I*
a^2*e^(205/2*I*c) - 65928412631647739461683457820511*I*a^2*e^(203/2*I*c) -
2996746017244157830350053701476*I*a^2*e^(201/2*I*c) - 127861163072229101394
013407134*I*a^2*e^(199/2*I*c) - 5100844262877818375740499940*I*a^2*e^(197/2
*I*c) - 189421272159473056494074595*I*a^2*e^(195/2*I*c) - 65144881917627358
15405157*I*a^2*e^(193/2*I*c) - 206263478291032388361681*I*a^2*e^(191/2*I*c)
 - 5970784896718122444327*I*a^2*e^(189/2*I*c) - 156713514334349191205*I*a^2
*e^(187/2*I*c) - 3692203217145049425*I*a^2*e^(185/2*I*c) - 7712173821592617
0*I*a^2*e^(183/2*I*c) - 1405865019555002*I*a^2*e^(181/2*I*c) - 219095847203
22*I*a^2*e^(179/2*I*c) - 283802910885*I*a^2*e^(177/2*I*c) - 2933363420*I*a^
2*e^(175/2*I*c) - 22680645*I*a^2*e^(173/2*I*c) - 116610*I*a^2*e^(171/2*I*c)
 - 299*I*a^2*e^(169/2*I*c))/(e^(517*I*c) + 418*e^(516*I*c) + 87153*e^(515*I
*c) + 12085216*e^(514*I*c) + 1253841160*e^(513*I*c) + 103818048048*e^(512*I
*c) + 7146142307307*e^(511*I*c) + 420601518659718*e^(510*I*c) + 21608403021
340047*e^(509*I*c) + 984382804329835768*e^(508*I*c) + 40261256699368950388*
e^(507*I*c) + 1493326612293984160368*e^(506*I*c) + 50648660944512569972179*
e^(505*I*c) + 1581796642397812408161814*e^(504*I*c) + 457591171834025790731
39583*e^(503*I*c) + 1232445557346832245176696904*e^(502*I*c) + 310422225220
74681615625020522*e^(501*I*c) + 734057263616388449968842366924*e^(500*I*c)
+ 16353164647151530240529137618111*e^(499*I*c) + 34427715201287513414073930
2960914*e^(498*I*c) + 6868329225263681349501997341320517*e^(497*I*c) + 1301
71193079172823835151430773360024*e^(496*I*c) + 2348998374244347079532766203
075607598*e^(495*I*c) + 40443624781415311581857832389099634564*e^(494*I*c)
+ 665634670676210063754191847109971141414*e^(493*I*c) + 1049040266951089742
4624643766470754045064*e^(492*I*c) + 15856647611325756256611743222720388429
8856*e^(491*I*c) + 2302150411226234925855222345201500900533576*e^(490*I*c)
+ 32147887693375338817454482515377350383950278*e^(489*I*c) + 43233368864426
1557547944179250800440604964868*e^(488*I*c) + 56059272530675585517804528836
89835514455118670*e^(487*I*c) + 7016451532254446290687354881374809108456187
0680*e^(486*I*c) + 848552202276512356496200136959676295361696315113*e^(485*
I*c) + 9925490738534402272939987038714580495445431374618*e^(484*I*c) + 1123
91604542246650966429162063124338952554575234051*e^(483*I*c) + 1233096700139
723365181997220750932590655287625342156*e^(482*I*c) + 131187818011721747296
79339894318153694964675368481194*e^(481*I*c) + 1354425949166361161915746506

2533164623850110162793722 4*e^(480*I*c) + 13579906631614798428506428480325449828783598395803498 99*e^(479*I*c) + 132317088701048969738000567337799190893408367560095807 18*e^(478*I*c) + 125370496586921272662198050851269323171167338854081782959*e^(477*I*c) + 115585541289359426034554496664268782363003589936323237 1472*e^(476*I*c) + 103751844998711755019093989565966841168029970825266603 23524*e^(475*I*c) + 907226057222088149186422846394871877646075897064939707 74776*e^(474*I*c) + 773204636991145775061462731028098506094432675788136295011259*e^(473*I*c) + 64261954855352485764250681368704655300871140038757166913 83902*e^(472*I*c) + 52108117629177048660492400985175830987505700566877818954141639*e^(471*I*c) + 41243069829991519084806722232721943506774793409189467048898 2928*e^(470*I*c) + 318774992974434649721153604475177658232095862792381647059065 9024*e^(469*I*c) + 2407080191352975710185802291437204586474699178618203974027432 5264*e^(468*I*c) + 17764282913511934857719443767580283023990546009268713649496140 4333*e^(467*I*c) + 12818174649149708108596041898283590007907899211694053046122112 51818*e^(466*I*c) + 9046693523825682979044338963104263167672586826367911338826483549173*e^(465*I*c) + 6247355078105329531771077469024711412412518756573184844178190403267 2*e^(464*I*c) + 42227612663200368754775474655570998871052713308666016136635365678728 8*e^(463*I*c) + 279470910447568661184279069497369916448225472397721020972566130440347 2*e^(462*I*c) + 1811576849561575807671030305550562558925429365919331415341833394459640 8*e^(461*I*c) + 11505148185208084887370038835452131556764036512400310369117669719429232 0*e^(460*I*c) + 716099497599058079895633338552940229192858196481597830078819711862600096*e^(459*I*c) + 4369442482910113914565353136069595862669338858053419381214131241925047008*e^(458*I*c) + 26143976279902021443471945665080254563056810183520401889800285493144867448*e^(457*I*c) + 153436088745056254127327239461577071933130157764595997113973513183188399376*e^(456*I*c) + 88350096882179120260077454192776920073768939351373478936839709333331196188 0*e^(455*I*c) + 4992519712457043983505377976607953988397368297591114957991804893688371867680*e^(454*I*c) + 27693116538343259225983382637647936122664033859615133489846664694361471028310*e^(453*I*c) + 150822381431412413773566474210011746852297437597059186295243989481140398152780*e^(452*I*c) + 80667954360758914075930501079618956826984202161338895521891627882318263948819 0*e^(451*I*c) + 4238125846763232586394188569858685826755328005548627437019301405851325887594480*e^(450*I*c) + 21876482892713909928040345612578705805121508756226696317087651824252241418663320*e^(449*I*c) + 110969199687320974749922259595250444341219218535349655762591192576535872151766080*e^(448*I*c) + 55326912881952861250291886955894782909802195630934984358404463151229177880008149 0*e^(447*I*c) + 2711843239670717527605640490148833507130242448403978318523237721944200392830108580*e^(446*I*c) + 13069817203488289886193205508375818392124991382340160316886507181296548981014818410*e^(445*I*c) + 61948596653035502879564338815234310660410902037882473161804774492916216575880077680*e^(444*I*c) + 28882075526473065446996857202104710942731861950899580202068990459031947629540832428 0*e^(443*I*c) + 1324756412367837473157472821162483691120966501948953926492241643788264284546437221120*e^(442*I*c) + 5978992172944143218459161149299819706321732111578494525245228742976468409105395

536290*e^(441*I*c) + 26556806389043407534496702369101545795994861757741414789944652712127566910185274123140*e^(440*I*c) + 11610455168355504376291150171211639931373302113267748111282404724636179404963572647985 0*e^(439*I*c) + 4997075672538590843575963148137947680693371909159674919074889049339226775796 65354338960*e^(438*I*c) + 211758973346685570710150142921041472240183883794075284161854144088854572994313820903682 0*e^(437*I*c) + 883672064086047030569451402154796955129679409226698304411837579002585458403679636476828 0*e^(436*I*c) + 363183696523025917321974444097981220226408246041305525067425867951832673543828478758857 30*e^(435*I*c) + 14703081673227683316304158209959204751204372522535333923881916519300040762954474575322174 0*e^(434*I*c) + 586403466972683242741643328921560909375197453864243299571990964608857245771134145204174990*e^(433*I*c) + 2304351073373840357379178597673066352016682781689139842097376663118488803841131935313641840*e^(432*I*c) + 892320944734329676333188188163847179349961867060102605973089596265329177022949302816257510 0*e^(431*I*c) + 3405405385129556915435234672217717265518754891078200850471832416872502943858916234921162804 0*e^(430*I*c) + 1280989146016885396724805418304098477073675004386015368032044977011199112890871056594827833 40*e^(429*I*c) + 475010578857601519272316617938425222421786597241671026894318515408511467140969393115768793680*e^(428*I*c) + 173657421881819107187419747245015812388356420995065863910233714812276908061168071974172605384 0*e^(427*I*c) + 62598721568222528436509607082350347102013627760571766472263230897514465652888501038981538599 20*e^(426*I*c) + 22251959176795777757167366036007480222221136423214639980386437096339149122368724582345735158014 0*e^(425*I*c) + 78009807368024239875613733058851417125327114681070889640794249282633470580756557083923203377160*e^(424*I*c) + 2697458014402112969726836018638789543579623085200765951771282276292732402152097082184973634141 40*e^(423*I*c) + 920089393029589032874601850027159322612526368444771489781974361078847528891468831038436064951920*e^(422*I*c) + 30961319716215201623803015542414654517823620868102875377489029049859340201795657061771314216145 90*e^(421*I*c) + 102793647306638408447395778624692626046488619142979725891652435306512306907262444624791998942551 80*e^(420*I*c) + 336753988720215683759023845939827533625598010581041846273454111362624319432407782607217569910270 90*e^(419*I*c) + 108867995731829472826732905192034886797284621356445627530909104429486741257822633476898356826454040*e^(418*I*c) + 347351473214713780874352083129566601238765762775942366762733349952103889753982636403857556867777300*e^(417*I*c) + 109385321448622035867403243450086667849977001130587417248897595161203145673460828709551950104 1975440*e^(416*I*c) + 340023256060165161752169468084708984419802883169441742479486877932895054841812560544688208115263609 0*e^(415*I*c) + 10434117516570395966653693155582402109460348095473027807412321427346816928567197770376496170251803940*e^(414*I*c) + 316109393312846927506943064436184146560959695209452157430040445603868952418015791565434519407133517 30*e^(413*I*c) + 945561802589319869193343034663656528268580913143291891607362771758738417321964533799537056794668268 80*e^(412*I*c) + 279285755800035206679835368898165477644864987794665387827488933863633745047373109049265172681702585720*e^(411*I*c)
+ 814608187736530579670210025271921415597183369881214299823291969785549876 1

7596986636797665324497472856O*e^(410*I*c) + 2346518219239105142238141633073
464768899155708935025778047637412681781575765422219127409260159438712250*e^
(409*I*c) + 6675866290371147358503766865669289010893543869830538708724945 29
158095117918829660615811125770696860474O*e^(408*I*c) + 18759988218865563564
1636357359860732782557372574057062791088913663784284674145599304811728635 38
598193890*e^(407*I*c) + 52075178518793270386429263351544306951104993542500 5
829381552416894081386752546080308479071677485717347 20*e^(406*I*c) + 1428017
924502217624831808749188252741343051332754177800847950346447635093335031505
173458646596671894170 80*e^(405*I*c) + 386876218234277165632451723049979889 2
631152823746075416924431766739975137428135917361711696522506111864 80*e^(404
*I*c) + 103556198259200293522638457790861154861211149508019357369133986470 6
0291864824662418056649493810498562585 10*e^(403*I*c) + 273889562479526560335
522764656600088628077830508482570291193890365616200426273618265770040630191
4070062380*e^(402*I*c) + 71581246868429414754738073636798397181727455815384
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740529900573269375272861187649089085835702197488237157062380018624513772266
09436417529768529244398708 80*e^(400*I*c) + 471882208434662076950995069535 73
780357108897491422567898048199018207708997005333860148836479527456156014520
*e^(399*I*c) + 11904185540387796494822957794837046560060662318304552952690 0
430209270473212773847794935586074714329479939280*e^(398*I*c) + 296825515282
669589685318273280239050084555032203415941511962659596881615713799937680026
497408305672297618840*e^(397*I*c) + 731584972206818362874729621403974444280
010446301161527339760544815300951787985538419764656214582667219914080*e^(39
6*I*c) + 178244611493175185055635485663842190117441232229824949659165805393
978719824656594597559557573419334888795216O*e^(395*I*c) + 42932064780080221
260174889088518264947906207206601514514681819109172400278639687245391276596
335170530029764 80*e^(394*I*c) + 102231820259548607672173903051864519235621 4
547367429361991806349041148749612180459027459270277057151545641468O*e^(393*
I*c) + 240687851397052771611934656445061432852413610377682168189221844001 41
0484602109446966477527233719328745945973 28*e^(392*I*c) + 560286834249035176
584950138585345161671625910343679724981746609074506667781543532716303446507
778856835476241 84*e^(391*I*c) + 1289670800847547122460236808664883849832862
5902553313204463610904954514402954700334776152166628397793164017846 4*e^(390
*I*c) + 293550743554342709808129453576562313299705982699187416862934373964 2
5561596713867625327630259156152351560326440 3*e^(389*I*c) + 6607644731058690
976914759738508379345110890331495867079827642633947667566495652798791461733
18386505740391093990*e^(388*I*c) + 1470931146618934345515038362300100160482
12774958144392990474691022477747019889905237911449399988700319941982957 9*e^
(387*I*c) + 323849193136185147642332193353957909837773553920764146734623566
58238870483269493056092315851437486902036159571 36*e^(386*I*c) + 70521324141
621979926023265245801430609853530545729339055246331216810210373402983663422
033243253070724137390610 24*e^(385*I*c) + 151896342149088003964179117226437 5
474804852010973481245910987881049384438106265081897119963712145874945624327
4416*e^(384*I*c) + 3236273132241954941033008894364024746037832856131642293 1
29242714590288791307164367950290905589123675514320738260 9*e^(383*I*c) + 682

080330967936156837844096192442108186149916400415534244055278768932724966083
24231098148502466453967157728078994*e^(382*I*c) + 142213115964814517682386
672767699094822716813187908898405010394417486355453624676798324491035203219
53011780083069*e^(381*I*c) + 29334492003430072028704238344834286631380628542
550400678230804455975459700234462315635541351331054935163163200592722*e^(380
*I*c) + 59865014111224185891167650518052015036400322684132808145359709358779
90338609212439085554466861582623350303061961052*e^(379*I*c) + 1208770358493
658393089442222056935063283704108140593750226539846117737648216609559734831
60124869827433029615861214 4*e^(378*I*c) + 241496651681033850328907654920274
051171005901179544713877346420569645502644271242640959966277108026482600898
5061097*e^(377*I*c) + 477414111106609897022184533059496201647271423037423340
606639568469509266426859469290641141944003609362235907254701 46*e^(376*I*c)
+ 933934195805349422525175096571505730070730208381477477030621822424102264 8
24741995604295736305582383089854730321975 7*e^(375*I*c) + 180798200680288599
703499386230072306765633142067088484999001396412373347632664793469632379360
393281131850415917938 48*e^(374*I*c) + 346376571726716901676573445371970870 4
888235485399327047206394307877360044654296354834810126939044346448075451392
8502*e^(373*I*c) + 656748592688673000988273758128752256106545516862611036 81
66400700753711577809729353356524382887338372298035320061195 6*e^(372*I*c) +
123243941519332384741960072588103506596406339253616391082062969960682419011
745777573892181775339195446260932388148915 7*e^(371*I*c) + 228911311738592780
091492649162346834405867740776456326108410928857257174707289268074347550225
793244741923354395308214*e^(370*I*c) + 420846342608949387277559021457924586
578120966148561022647008499529468452005980175119410628956210497609566002969
884927*e^(369*I*c) + 765867795513962781012558444628751418710940895281304790
836743661582071650032154891482866406314834433199455459798934952*e^(368*I*c)
+ 137967652979621207401710618806658944835544650121089019510716486035022892
858681553900306287502671193194194773869036072 2*e^(367*I*c) + 24604423758454
226639270816309832607147349680919054930271456392388271922548863493611269914
576924098511208733074874574 68*e^(366*I*c) + 434390969660193217335735968778 1
579293701295681940827114215433175336093967845908766740738240037114570667410
936998017178*e^(365*I*c) + 759275270014667896115309507358501547319702974653
363333154979396147328576093580190415511676483156087594758104869352722 4*e^(3
64*I*c) + 131397714941049338818566811514182931122425515215356868711812665 79
813877606348160261747201317735782566021306798298336024*e^(363*I*c) + 225146
757413080699615061655865028724304219302106732643929972864856006401038672536
04847715547060592967690653795951142520*e^(362*I*c) + 381990158675860879760 0
299875662767499479544066790362502932234625013328648912087500501363812811389
396034967028070716153 0*e^(361*I*c) + 641751006932600668062380648860045971 70
740843300086839368616139164529108049844675353111842725798658088840347241496
099644*e^(360*I*c) + 106764832017165594838085234189333528733587673329972530
092661085186789939252915937090760282232346919090426243399409323314*e^(359*I
*c) + 175896258262755985757106812613979301265801031595484353614904672865169
44223207577658044718413414137599577009149924675952 8*e^(358*I*c) + 286992943
631231496557278010851576940896826497466066327528801560677007112837431926735

088120974861760511367008815728782643*e^(357*I*c) + 463758288457367154544937
678255005688733328145568049310423995599886012800638619904022368378591108842
602342094543682299102*e^(356*I*c) + 742228640908173124916937049462525617334
148919679118270489831005497781951221069955839623452499748653124658873553401
442137*e^(355*I*c) + 117660072097578696518987505089023109220461269697027743
301453589578895677123079352038199310660688056462859982234172280l012*e^(354*
I*c) + 184750585646245153344528430057132632378116255330456597188767075809l0
793067948218349281707731263646397220715701317037853344*e^(353*I*c) + 2873610
535922340187080835435582912277271967977394720159791070274927714276869531467
182688981041061381703885403497544001592*e^(352*I*c) + 442767307910542531852
431611298569365658485193610019245704445513448330504532145251634711848813322
482367046510348395480516l*e^(351*I*c) + 675848043788852437256293594896385 76
266948555471955194861228775679817185872623628719949670794018319579279016825
82941234362*e^(350*I*c) + 102204237794346348513399752951633996417021222496 6
366619305300830202609693215856833830941823739554135181902690795322068101 3*e
^(349*I*c) + 153128372066627753793473532128076829657125356529426315182861 42
403097738200270711195396582159028513532779682154451996208592*e^(348*I*c) +
227316035661288411004195019470513676668366524180772609139448107484730848918
904101812854126048548766259195656395212272232 76*e^(347*I*c) + 3343589782793
658130117117545961082945429816796201741981007293673337850658442802420107245
319345815533404669351674239071783 2*e^(346*I*c) + 487332535059749234008522 55
563052101402196469313659554492725674754339375283010407167744366955828922837
488705858532439654489*e^(345*I*c) + 703863497605948315670482240613950256985
012022969663003767642203366977029615910998540554113762948714374681495285247
96002762*e^(344*I*c) + 100744961851853744611754300982980166962404553836222 9
218684846942699661206076989070463437310111609488281002767293701328193 57*e^(
343*I*c) + 142906319123055524246546928478954238371315925802022389236498652 1
368398225020351556769709174190398345879670555884315664167 84*e^(342*I*c) + 2
009065871535788043803004695014416101745218512595419292098406889608594549085
197748359058957576667708578886117387518584604 24*e^(341*I*c) + 2799452444750
398048229667304629608844921198748577911471240090794769204359417352933093054
3043868733312991245419677407010726 4*e^(340*I*c) + 386642673050380049457382 5
628183169626519755509907792770487402386298587950182473561628886310156876647
801012052873330827487 91*e^(339*I*c) + 529329252764113926003934836958243557 6
725492389975607392144065991850478319555725837653586343954087715280097454675
48382950094*e^(338*I*c) + 718361596382058249209113544487901088868388744033 7
132103324919713759067383415515404572648043040396642559156073498019119665 51*
e^(337*I*c) + 966458275369037718747739130798151643483590684166832234688098 2
911641606364181594521198157288093721251688362393644423973440 64*e^(336*I*c)
+ 128904351529293395648063433049967704018104393562010691426731106790003005 8
398839787692376954090545278554544997710058754772400*e^(335*I*c) + 170458299
670782280820467821816769300269866114771277235502145654381093006963718808588
282475750060524696321081035170640534940 8*e^(334*I*c) + 223489127639843946 44
786225783064348407246104844681778598226206586919214786452666530625638235530
012280010090936067510661689 44*e^(333*I*c) + 290538572232005700195334527448 9

482790856692529959823749532695963414164833366773128218607899328588608916176
593772088622582464*e^(332*I*c) + 374525759487665120465733498842622638814395
450198683066422234922636107960954682227606750489938670308898230818571714340
7211328*e^(331*I*c) + 478752744278094568514520484697159616530416941932824407
321145959212964925504887685405984472066107815128817961257498635919456O*e^(
330*I*c) + 606894980315671224833187110532989547172280614300887801498655965
3687260694816550470195890004511965527567432722969707577202160*e^(329*I*c) +
762973181562782158046899242420700836643889673633302466186383810511044514894
696232829763154703254341981182101583786301368272O*e^(328*I*c) + 95130322740
195229542091131912682266422999120135256659402983810647978856909049931289480
35227412144035633851779511219335277360*e^(327*I*c) + 117642122748764840800 1
090071467347449337127816055781198372445582656605561765808647936864186490811
96434124136448037721316572800*e^(326*I*c) + 144298162852084312045329783753756
919650631542246497475512958515073895240832269767896886013696283999007476585
7920192930074426O*e^(325*I*c) + 175562732712242923968872914031257162134914
862611454785713767516901056560678380421510382713813003727577556763254080268
34544840*e^(324*I*c) + 211883214058828875396101983747068626958940492260770 9
376413251251333619052397894969438768605912452675504804295795426470663746O*e
^(323*I*c) + 253671764391193536215322603359833481549049826061257617113006834
92963390816491583025705268737539982149639300226512657426118880*e^(322*I*c)
 + 301284824145527032645590189530881771560134374934382010784137698354483661
48121754549197591129967170764969700180348699207838960*e^(321*I*c) + 3550010
310601964987627237679694948220958137237103600501287780602748167280705994344
524013631556850073237996658500567818193792O*e^(320*I*c) + 4149983212196370 8
043788523787401345541780088930538206918853579026749273364671640037563488607
71609288768647154283860278855966O*e^(319*I*c) + 481331176781840292165037485
491103744789247190946356038928293648639165537922788229573682851063281647159
105983708711490794943 60*e^(318*I*c) + 553909130449720862194326891463315660 8
142795989696990021443429681773115086386705662076860818767970972015297414847
4907904177340*e^(317*I*c) + 632477741010121790517949460751755699240769813381
384831580424067474538747293876317105449952471529122051185005975110528243476
80*e^(316*I*c) + 716603298611733955244419438892841091340911578446552456720
842374024349446964649271318121906596295111406395017433038635820928 80*e^(315
*I*c) + 805662491306826841818762018826235112063637903372180119541102106429 2
776599764490382059542193687356531465441576907047265540160O*e^(314*I*c) + 89
883815801382382213973270477954602744792877018051963347146307372464315121274
929402347942874802899499538953561056667668891020*e^(313*I*c) + 995122064720
579659513403417380235485153364033717178980408504709546575329772791134915068
8029072611115410194138601968956795804O*e^(312*I*c) + 109332537349966223203 9
326785034263570798637070017282940110420765304039238626540189786765164173142
21089449922495612732870169660*e^(311*I*c) + 1192097137020339270557553978236
884444446474243245021853286263470465996347211465738306815404953335431467768
1091191041046862896O*e^(310*I*c) + 128995076011591903410763863427097329948 5
861735745958627058491592809430464587426631634540184914638553956494539522128
99632198680*e^(309*I*c) + 1385297945491510894513527695765434031263307472436

800308324672058958190435681552392648767628671727543386840278498553854532160
80*e^(308*I*c) + 14764892080554533341862312176785377739978292474830122879392
4342574999937955421765370101235122939557467548549202174550009604780*e^(307
*I*c) + 1561859629535511961697382188321736965098525515892107305783657274762
594764744659554285023366737436864991756986778756936112434000*e^(306*I*c) + 1
639778160596077253752645598165058478941877851014553603918974244829984153857
876057653155092083377415901430785722435051327065800*e^(305*I*c) + 1708698488
689531011768603060531039943405303903472600884326768425055551412938308389612
759742689286664948457234625447091028436800*e^(304*I*c) + 176720929970554642
0045757700530957005953346598706827320319759155323875770524148663235111401176
804929293545175594798992209403600*e^(303*I*c) + 181408168770922059820368553
3166973216399848626282988285695602732956308976268293452635922190345608535307
3371052984214853790168 0*e^(302*I*c) + 18483115198374894181766785017470825713
812817215826941328776535853224077324433619190081855782990589568449488941045
1921524212840*e^(301*I*c) + 18691547443656751492635140562311750326198750835
19300838245664444356891392336834117046418287621787991778480642201508183552
61280*e^(300*I*c) + 18761539316851005007149728056460351091240313292031202437
0835062679037644990286285346673507093452964351257962696133511725652320*e^(
299*I*c) + 1869154744365675149263514056231175032619875083519300838245664444
356891392336834117046418287621787991778480642201508183552612800*e^(298*I*c)
+ 1848311519837489418176678501747082571381281721582694132877653585322407732
4433619190081855782990589568449488941045192152421284 0*e^(297*I*c) + 1814081
6877092205982036855331669732163998486262829882856956027329563089762682934526
35922190345608535307337105298421485379016800*e^(296*I*c) + 1767209299705546
4200457577005309570059533465987068273203197591553238757705241486632351114011
7680492929354517559479899220940360*e^(295*I*c) + 170869848868953101176860306
053103994340530390347260088432676842505555141293830838961275974268928666494
84572346254470910284368 0*e^(294*I*c) + 163977816059607725375264559816505847
89418778510145536039189742448299841538578760576531550920833774159014307857
2243505132706580*e^(293*I*c) + 15618596295355119616973821883217369650985255
158921073057836572747625947647446595542850233667374368649917569867787569361
1243400*e^(292*I*c) + 14764892080554533341862312176785377739978292474830122
8793924342574999937955421765370101235122939557467548549202174550009604780*
e^(291*I*c) + 13852979454915108945135276957654340312633074724368003083246720
58958190435681552392648767628671727543386840278498553854532160 80*e^(290*I*
c) + 128995076011591903410763863427097329948586173574595862705849159280943046
4587426631634540184914638553956494539522128996321986 80*e^(289*I*c) + 1192
097137020339270557553978236884444446474243245021853286263470465996347211465
7383068154049533354314677681091191041046862896 0*e^(288*I*c) + 1093325373499
6622320393267850342635707986370700172829401104207653040392386265401897867651
641731422108944992249561273287016966 0*e^(287*I*c) + 995122064720579659513403
4173802354851533640337171789804085047095465753297727911349150688029072611
1154101941386019689567958040*e^(286*I*c) + 8988381580138238221397327047795460
274479287701805196334714630737246431512127492940234794287480289949953895356
1056667668891020*e^(285*I*c) + 805662491306826841818762018826235112063637

903372180119541102106429277659976449038205954219368735653146544157690704726
55401600*e^(284*I*c) + 7166032986117339552444194388928410913409115784465524
5672084237402434944696464927131812190659629511140639501743303863582092880*e
^(283*I*c) + 63247774101012179051794946075175569924076981338138483158042406
747453874729387631710544995247152912205118500597511052824347680*e^(282*I*c)
 + 553909130449720862194326891463315660814279598969699002144342968177311508
63867056620768608187679709720152974148474907904177340*e^(281*I*c) + 4813311
767818402921650374854911037447892471909463560389282936486391655379227882295
7368285106328164715910598370871149079494360*e^(280*I*c) + 41499832121963708
043788523787401345541780088930538206918853579026749273364671640037563488607
716092887686471542838602788559660*e^(279*I*c) + 355001031060196498762723767
969494822095813723710360050128778060274816728070599434452401363155685007323
79966585005678181937920*e^(278*I*c) + 3012848241455270326455901895308817715
601343749343820107841376983544836614812175454919759112996717076496970018034
8699207838960*e^(277*I*c) + 25367176439119353621532260335983348154904982606
125761711300683492963390816491583025705268737539982149639300226512657426118
880*e^(276*I*c) + 211883214058828875396101983747068626958940492260770937641
32512513336190523978949694387686059124526755048042957954264706637460*e^(275
*I*c) + 1755627327122429239688729140312571621349148626114547857137675169010
5656067838042151038271381300372757755676325408026834544840*e^(274*I*c) + 14
429816285208431204532978375375691965063154224649747551295851507389524083226
976789688601369628399900747658579201929300744260*e^(273*I*c) + 117642122748
764840800109007146734744933712781605578119837244558265660556176580864793686
41864908119643412413644803772131657280*e^(272*I*c) + 9513032274019522954209
113191268226642299912013525665940298381064797885690904993128948035227412144
035633851779511219335277360*e^(271*I*c) + 762973181562782158046899242420700
836643889673633302466186383810511044514894696232829763154703254341981182101
5837863013682720*e^(270*I*c) + 60689498031567122483318711053298954717228061
430088780149865596536872606948165504701958900045119655275674327229697075772
02160*e^(269*I*c) + 4787527442780945685145204846971596165304169419328244073
211459592129649255048876854059844720661078151288179612574986359194560*e^(26
8*I*c) + 374525759487665120465733498842622638814395450198683066422234922636
1079609546822276067504899386703088982308185717143407211328*e^(267*I*c) + 29
053857223200570019533452744894827908566925299598237495326959634141648333667
73128218607899328588608916176593772088622582464*e^(266*I*c) + 2234891276398
439464478622578306434840724610484468177859822620658691921478645266653062563
823553001228001009093606751066168944*e^(265*I*c) + 170458299670782280820467
821816769300269866114771277235502145654381093006963718808588282475750060524
6963210810351706405349408*e^(264*I*c) + 12890435152929339564806343304996770
401810439356201069142673110679000300583988397876923769540905452785545449977
10058754772400*e^(263*I*c) + 9664582753690377187477391307981516434835906841
668322346880982911641606364181594521198157288093721251688362393644423973440
64*e^(262*I*c) + 7183615963820582492091135444879010888683887440337132103324
91971375906738341551540457264804304039664255915607349801911966551*e^(261*I*
c) + 5293292527641139260039348369582435576725492389975607392144065991850478

319555725837653586343954087715280097454675483829500 94*e^(260*I*c) + 3866426
7305038004945738256281831696265197555099077927704874023862985879501824735 61
6288863101568766478010120528733308274879 1*e^(259*I*c) + 2799452444750398048
2296673046296088449211987485779114712400907947692043594173529330930543043 86
873331299124541967740701072 64*e^(258*I*c) + 2009065871535788043803004695014
4161017452185125954192920984068896085945490851977483590589575766677085788 86
11738751858460424*e^(257*I*c) + 1429063191230555242465469284789542383713159
2580202238923649865213683982250203515567697091741903983458796705558843156 64
16784*e^(256*I*c) + 1007449618518537446117543009829801669624045538362229218
6848469426996612060769890704634373101116094882810027672937013281935 7*e^(255
*I*c) + 7038634976059483156704822406139502569850120229696630037676422033669
7702961591099854055411376294871437468149528524796002762*e^(254*I*c) + 48733
2535059749234008522555630521014021964693136595544927256747543393752830104 07
16774436695582892283748870585853243965448 9*e^(253*I*c) + 334358978279365813
0117117545961082945429816796201741981007293673337850658442802420107245319 34
58155334046693516742390717832*e^(252*I*c) + 227316035661288411004195019470 5
1367666836652418077260913944810748473084891890410181285412604854876625919 56
5639521227223276*e^(251*I*c) + 1531283720666277537934735321280768296571253 5
6529426315182861424030977382002707111953965821590285135327796821544519962 08
592*e^(250*I*c) + 1022042377943463485133997529516339964170212224966366619 30
530083020260969321585683383094182373955413518190269079532206810 13*e^(249*I*
c) + 6758480437888524372562935948963857626694855547195519486122877567981718
5872623628719949670794018319579279016825829412343 62*e^(248*I*c) + 442767307
9105425318524316112985693656584851936100192457044455134483305045321452516 34
7118488133224823670465103483954805161*e^(247*I*c) + 287361053592234018708 08
3543558291227727196797739472015979107027492771427686953146718268898104106 13
81703885403497544001592*e^(246*I*c) + 184750585646245153344528430057132632 3
7811625533045659718876707580910793067948218349281707731263646397220715701 31
703785334*e^(245*I*c) + 117660072097578696518987505089023109220461269697027
7433014535895788956771230793520381993106606880564628599822341722801012*e^(2
44*I*c) + 742228640908173124916937049462525617334148919679118270489831005 49
77819512210699558396234524997486531246588735534014421 37*e^(243*I*c) + 46375
8288457367154544937678255005688733328145568049310423995599886012800638619 90
4022368378591108842602342094543682299102*e^(242*I*c) + 286992943631231496 55
7278010851576940896826497466066327528801560677007112837431926735088120974 86
1760511367008815728782643*e^(241*I*c) + 175896258262755985757106812613979 30
1265801031595484353614904672865169442232075776580447184134141375995770091 49
9246759528*e^(240*I*c) + 1067648320171655948380852341893335287335876733299 7
2530092661085186789939252915937090760282232346919090426243399409323314*e^(2
39*I*c) + 641751006932600668062380648860045971707408433000868393686161391 64
52910804984467535311184272579865808884034724149609964 4*e^(238*I*c) + 381990
1586758608797600299875662767499479544066790362502932234625013328648912087 50
0501363812811389396034967028070716153 0*e^(237*I*c) + 225146757413080699615 0
6165586502872430421930210673264392997286485600640103867253604847715547060 59
296769065379595114252 0*e^(236*I*c) + 1313977149410493388185668115141829311 2

24255152153568687118126657981387760634816026174720131773578256602130679829833
6024*e^(235*I*c) + 759275270014667896115309507358501547319702974653363333
1549793961473285760935801904155116764831560875947581048693527224*e^(234*I*c
) + 434390969660193217335735968778157929370129568194082711421543317533609396
78459087667407382400371145706674109369980171 78*e^(233*I*c) + 2460442375845
4226639270816309832607147349680919054930271456392388271922548863493611269914
576924098511208733074874574 68*e^(232*I*c) + 1379676529796212074017106188066
5894483554465012108901951071648603502289285868155390030628750267119319419477
38690360722*e^(231*I*c) + 765867795513962781012558444628751418710940895281
30479083674366158207165003215489148286640631483443319945545979893495 2*e^(2
30*I*c) + 420846342608949387277559021457924586578120966148561022647008499529
46845200598017511941062895621049760956600296988492 7*e^(229*I*c) + 22891131
1738592780091492649162346834405867740776456326108410928857257174707289268074
347550225793244741923354395308214*e^(228*I*c) + 1232439415193323847419600 7
2588103506596406339253616391082062969960682419011745775738921817753391954462
609323881489157*e^(227*I*c) + 6567485926886730009882737581287522561065455 1
68626110368166400700753711577809729353356524382887338372298035320061195 6*e^
(226*I*c) + 346376571726716901676573445371970870488823548539932704720639430
78773600446542963548348101269390443464480754513928502*e^(225*I*c) + 1807982
0068028859970349938623007230676563314206708848499900139641237334763266479346
963237936039328113185041591793848*e^(224*I*c) + 933934195805349422525175096
57150573007073020838147747703062182242410226482474199560429573630558238308
98547303219757*e^(223*I*c) + 477414111106609897022184533059496201647271423 0
3742340606639568469509266426859469290641141944003609362235907254701 46*e^(22
2*I*c) + 241496651681033850328907654920274051171005901179544713877346420569
6455026442712426409599662771080264826008985061097*e^(221*I*c) + 12087703584
9365839308944222205693506328370410814059375022653984611773764821660955973483
16012486982743302961586121 44*e^(220*I*c) + 598650141112241858911676505180 5
20150364003226841328081453597093587790338609212439085554466861582623350303 0
61961052*e^(219*I*c) + 2933449200343007202870423834483428663138062854550400
6782308044559754597002344623156355413513310549351631632005927 2*e^(218*I*c)
+ 142213115964814517682386667276769909482271681318790889840501039441748635 5
4536246767983244910352032195301178008306 9*e^(217*I*c) + 6820803309679361568
3784409619244210818614991640041553424405527876893272496608324231098148502466
453967157728078994*e^(216*I*c) + 323627313224195494103300889436402474603783
285613164229312924271459028879130716436795029090558912367551432073826 09*e^
(215*I*c) + 151896342149088003964179117226437547480485201097348124591098788
10493844381062650818971199637121458749456243274416*e^(214*I*c) + 7052132414
1621979926023265245801430609853530545729339055246331216810210373402983663422
03324325307072413739061024*e^(213*I*c) + 323849193136185147642332193353957
909837773553920764146734623566582388704832694930560923158514374869020361595
7136*e^(212*I*c) + 1470931146618934345515038362300100160482127749581443929 9
04746910224777470198899052379114493999887003199419829579*e^(211*I*c) + 6607
6447310586909769147597385083793451108903314958670798276426339476675664956527
987914617331838650574039109399 0*e^(210*I*c) + 293550743554342709808129453 5

7656231329970598269918741686293437396425561596713867625327630259156152351560
03264403*e^(209*I*c) + 1289670800847547122460236808664883849832862590255331
3204463610904954514402954700334776152166628397793164017846 4*e^(208*I*c) + 5
602868342490351765849501385853451616716259103436797249817466090745066677815
43532716303446507778856835476241 84*e^(207*I*c) + 24068785139705277161193465
644506143285241361037768216818922184400141048460210944696647752723371932874
594597328*e^(206*I*c) + 10223182025954860767217390305186451923562145473674 2
936199180634904114874961218045902745927027705715154564146 80*e^(205*I*c) + 4
293206478008022126017488908851826494790620720660151451468181910917240027863
968724539127659633517053002976480*e^(204*I*c) + 1782446114931751850556354 85
663842190117441232229824949659165805393978719824656594597559557573419334888
7952160*e^(203*I*c) + 73158497220681836287472962140397444428001044630116152
733976054481530095178798553841976465621458266721991408 0*e^(202*I*c) + 29682
551528266958968531827328023905008455503220341594151196265959688161571379993
768002649740830567229761884 0*e^(201*I*c) + 119041855403877964948229577948 37
046560060662318304552952690043020927047321277384779493558607471432947993928
0*e^(200*I*c) + 47188220843466207695099506953573780357108897491422567898048
1990182077089970053338601488364795274561560145 20*e^(199*I*c) + 184874052990
057326937527286118764908908583570219748823715706238001862451377226609436417
5297685292443987088 0*e^(198*I*c) + 7158124686842941475473807363679839718172
7455815384090445033838526935969216224266967404539447181430252483 90*e^(197*I
*c) + 273889562479526560335522764656600088628077830508482570291193890365616
200426273618265770040630191407006238 0*e^(196*I*c) + 10355619825920029352263
845779086115486121114950801935736913398647060291864824662418056649493810498
56258510*e^(195*I*c) + 386876218234277165632451723049979889263115282374607 5
416924431766739975137428135917361711696522506111864 80*e^(194*I*c) + 1428017
924502217624831808749188252741343051332754177800847950346447635093335031505
173458646596671894170 80*e^(193*I*c) + 5207517851879327038642926335154430695
1104993542500582938155241689408138675254608030847907167748571734720*e^(192*
I*c) + 187599882188655635641636357359860732782557372574057062791088913663 78
42846741455993048117286353859819389 0*e^(191*I*c) + 667586629037114735850376
686566928901089354386983053870872494529158095117918829660615811125770696860
4740*e^(190*I*c) + 2346518219239105142238141633073464768899155708935025778 0
4763741268178157576542221912740926015943871225 0*e^(189*I*c) + 8146081877365
305796702100252719214155971833698812142998232919697855498761759698663679766
53244974728560*e^(188*I*c) + 279285755800035206679835368898165477644864987 7
9466538782748893386363374504737310904926517268170258572 0*e^(187*I*c) + 9455
618025893198691933430346636565282685809131432918916073627717587384173219645
3379953705679466826880*e^(186*I*c) + 316109393312846927506943064436184146 56
0959695209452157430040445603868952418015791565434519407133517 30*e^(185*I*c)
 + 104341175165703959666536931555824021094603480954730278074123214273468169
2856719777037649617025180394 0*e^(184*I*c) + 340023256060165161752169468084 7
0898441980288316944174247948687793289505484181256054468820811526360 90*e^(18
3*I*c) + 109385321448622035867403243450086667849977001130587417248897595161
20314567346082870955195010419754 40*e^(182*I*c) + 3473514732147137808743520 8

3129566601238765762775942366762733349952103889753982636403857556867777300*e
^(181*I*c) + 108867995731829472826732905192034886797284621356445627530909104429486741257822633476898356826454040*e^(180*I*c) + 33675398872021568375902
384593982753362559801058104184627345411136262431943240778260721756991027090
*e^(179*I*c) + 1027936473066384084473957786246926260464886191429797258916524353065123069072624446247919989425518 0*e^(178*I*c) + 30961319716215201623803015542414654517823620868102875377489029049859340201795657061771314216145 90
*e^(177*I*c) + 92008939302958903287460185002715932261252636844477148978197436107884752889146883103843606495192 0*e^(176*I*c) + 269745801440211296972683
601863878954357962308520076595177128227629273240215209708218497363414140*e^
(175*I*c) + 78009807368024239875613733058851417125327114681070889640794249282633470580756557083923203377160*e^(174*I*c) + 2225195917679577775716736603
6007480222211364232146399803864370963391491223687245823457351580140*e^(173*
I*c) + 625987215682225284365096070823503471020136277605717664722632308975144656528885010389815385992 0*e^(172*I*c) + 173657421881819107187419747245015812388356420995065863910233714812276908061168071974172605384 0*e^(171*I*c) +
4750105788576015192723166179384252224217865972416710268943185154085114671409693931157687936 80*e^(170*I*c) + 1280989146016885396724805418304098477073675004386015368032044977011199112890871056594827833 40*e^(169*I*c) + 340540538
512955691543523467221771726551875489107820085047183241687250294385891623492
11628040*e^(168*I*c) + 89232094473432967633318818816384717934996186706010260597308959626532917702294930281625751 00*e^(167*I*c) + 230435107337384035737
917859767306635201668278168913984209737666311848880384113193531364184 0*e^(1
66*I*c) + 586403466972683242741643328921560909375197453864243299571990964608857245771134145204174990*e^(165*I*c) + 14703081673227683316304158209959204
751204372522535333923881916519300040762954474575322174 0*e^(164*I*c) + 36318
369652302591732197444409798122022640824604130552506742586795183267354382847
875885730*e^(163*I*c) + 88367206408604703056945140215479695512967940922669830441183757900258545840367963647682 80*e^(162*I*c) + 2117589733466855707101501429210414722401838837940752841618541440888545729943138209036820*e^(161*I*
c) + 49970756725385908435759631481379476806933719091596749190748890493392267757966535433896 0*e^(160*I*c) + 1161045516835550437629115017121163993137330
211326774811128240472463617940496357264798 50*e^(159*I*c) + 2655680638904340
753449670236910154579599486175774141478994465271212756691018527412314 0*e^(1
58*I*c) + 5978992172944143218459161149299819706321732111578494525245228742976468409105395536290*e^(157*I*c) + 13247564123678374731574728211624836911209665019489539264922416437882642845464372211 20*e^(156*I*c) + 288820755264730
654469968572021047109427318619508995802020689904590319476295408324280*e^(15
5*I*c) + 619485966530355028795643388152343106604109020378824731618047744929
16216575880077680*e^(154*I*c) + 13069817203488289886193205508375818392124991382340160316886507181296548981014818410*e^(153*I*c) + 271184323967071752760564049014883350713024244840397831852323772194420039283010858 0*e^(152*I*c)
+ 553269128819528612502918869558947829098021956309349843584044631512291778800081490*e^(151*I*c) + 1109691996873209747499222595952504443412192185353496
5576259119257653587215176608 0*e^(150*I*c) + 2187648289271390992804034561257

870580512150875622669631708765182425224141866332O*e^(149*I*c) + 42381258467
632325863941885698586858267553280055486274370193014058513258875944 80*e^(148
*I*c) + 806679543607589140759305010796189568269842021613388955218916278823l
82639488190*e^(147*I*c) + 1508223814314124137735664742100117468522974375970
5918629524398948114039815278O*e^(146*I*c) + 276931165383432592259833826376 4
793612266403385961513348984666469436147102831O*e^(145*I*c) + 49925197124570
43983505377976607953988397368297591114957991804893688371867680*e^(144*I*c)
+ 8835009688217912026007745419277692007376893935137347893683970933333119618
80*e^(143*I*c) + 1534360887450562541273272394615770719331301577645959971139
73513183188399376*e^(142*I*c) + 2614397627990202144347194566508025456305681
0183520401889800285493144867448*e^(141*I*c) + 436944248291011391456535313 60
695958626693388580534193812141312419250470 08*e^(140*I*c) + 7160994975990580
7989563333855294022919285819648159783007881971186260 0096*e^(139*I*c) + 1150
514818520808488737003883545213155676403651240031036911766971942923 20*e^(138
*I*c) + 181115768495615758076710303055505625589254293659193314153418333944 59
6408*e^(137*I*c) + 2794709104475686611842790694973699164482254723977210 2097
25661304403472*e^(136*I*c) + 422276126632003687547754746555709988710527 1330
866601613663536567872 88*e^(135*I*c) + 624735507810532953177107746902471141 2
41251875657318484417819040326 72*e^(134*I*c) + 904669352382568297904433896 31
04263167672586826367911338826483549173*e^(133*I*c) + 1281817464914970810859
6041898283590007907899211694053046122112518 18*e^(132*I*c) + 177642829135119
348577194437675802830239905460092687136494961404333*e^(131*I*c) + 240708019
1352975710185802291437204586474699178618203974027432526 4*e^(130*I*c) + 3187
749929744346497211536044751776582320958627923816470590659024*e^(129*I*c) +
412430698299915190848067222327219435067747934091894670488982928*e^(128*I*c)
 + 521081176291770486604924009851758309875057005668778189541416 39*e^(127*I*
c) + 642619548553524857642506813687046553008711400387571669138390 2*e^(126*I
*c) + 773204636991145775061462731028098506094432675788136295011259*e^(125*I
*c) + 907226057222088149186422846394871877646075897064939707747 76*e^(124*I*
c) + 1037518449987117550190939895659668411680299708252666032352 4*e^(123*I*c
) + 1155855412893594260345544966642687823630035899363232371472*e^(122*I*c)
+ 1253704965869212726621980508512693231711673388540817829 59*e^(121*I*c) + 1
323170887010489697380005673377991908934083675600958071 8*e^(120*I*c) + 13579
906631614798428506428480325449828783598395803498 99*e^(119*I*c) + 1354425949
166361161915746506253316462385011016279372 24*e^(118*I*c) + 1311878180117217
472967933989431815369496467536848119 4*e^(117*I*c) + 1233096700139723365181 9
972207509325906552876253421 56*e^(116*I*c) + 1123916045422466509664291620631
243389525545752340 51*e^(115*I*c) + 99254907385344022729399870387145804954 45
431374618*e^(114*I*c) + 8485522022765123564962001369596762953616963151 13*e^
(113*I*c) + 701645153225444629068735488137480910845618706 80*e^(112*I*c) + 5
605927253067558551780452883689835514455118670*e^(111*I*c) + 432333688644261
55754794417925080044060496486 8*e^(110*I*c) + 3214788769337533881745448251 53
77350383950278*e^(109*I*c) + 2302150411226234925855222345201500900533576*e^
(108*I*c) + 15856647611325756256611743222720388429885 6*e^(107*I*c) + 104904
02669510897424624643766470754045064*e^(106*I*c) + 665634670676210063754191 8

47109971141414*e^(105*I*c) + 40443624781415311581857832389099634564*e^(104*I*c) + 23489983742443470795327662030756075598*e^(103*I*c) + 1301711930791728238351514307733600024*e^(102*I*c) + 68683292252636813495019973413205 17*e^(101*I*c) + 344277152012875134140739302960914*e^(100*I*c) + 1635316464715153024052913761811 1*e^(99*I*c) + 734057263616388449968842366924*e^(98*I*c) + 310422225220746816156250205 22*e^(97*I*c) + 1232445557346832245176696904*e^(96*I*c) + 45759117183402579073139583*e^(95*I*c) + 1581796642397812408161814*e^(94*I*c) + 50648660944512569972179*e^(93*I*c) + 1493326612293984160368*e^(92*I*c) + 40261256699368950388*e^(91*I*c) + 984382804329835768*e^(90*I*c) + 21608403021340047*e^(89*I*c) + 420601518659718*e^(88*I*c) + 7146142307307*e^(87*I*c) + 103818048048*e^(86*I*c) + 1253841160*e^(85*I*c) + 12085216*e^(84*I*c) + 87153*e^(83*I*c) + 418*e^(82*I*c) + e^(81*I*c)))*tan(1/4*d*x + c) - 14*(23*a^2*e^(1027/2*I*c) + 8970*a^2*e^(1025/2*I*c) + 1744665*a^2*e^(1023/2*I*c) + 225643340*a^2*e^(1021/2*I*c) + 21830993145*a^2*e^(1019/2*I*c) + 1685352670794*a^2*e^(1017/2*I*c) + 108143463042714*a^2*e^(1015/2*I*c) + 5932441401233490*a^2*e^(1013/2*I*c) + 284015632089714525*a^2*e^(1011/2*I*c) + 12054885718238165655*a^2*e^(1009/2*I*c) + 459291145921837770879*a^2*e^(1007/2*I*c) + 15866421408580747568967*a^2*e^(1005/2*I*c) + 501114476390712619058089*a^2*e^(1003/2*I*c) + 14570867094745692063264465*a^2*e^(1001/2*I*c) + 392372635871953337607706440*a^2*e^(999/2*I*c) + 9835474093767985284835740178*a^2*e^(997/2*I*c) + 230518924833500391396633471432*a^2*e^(995/2*I*c) + 50714163711386971235167483127 97*a^2*e^(993/2*I*c) + 105091017765905750210205432017088*a^2*e^(991/2*I*c) + 2057571526219280176660569426269565*a^2*e^(989/2*I*c) + 38167952336853964450194985322999760*a^2*e^(987/2*I*c) + 672482982322867333154107212909456 57*a^2*e^(985/2*I*c) + 1127937394020555226758111602017879420 2*a^2*e^(983/2*I*c) + 18046998899665602300838581802100518559 4*a^2*e^(981/2*I*c) + 2759687033617389036404063195416999823985*a^2*e^(979/2*I*c) + 40401820406264183313387690283892201648160*a^2*e^(977/2*I*c) + 567179441813227622186529241088113209451509*a^2*e^(975/2*I*c) + 764641982122710512439170071251750274718708 8*a^2*e^(973/2*I*c) + 99130382277532022515819177881629325075859509*a^2*e^(971/2*I*c) + 1237420804707705093991102638839493330163931640*a^2*e^(969/2*I*c) + 1489029954769462240648878891564899996474069170*a^2*e^(967/2*I*c) + 17291964360772444113317335456599860540110377650 4*a^2*e^(965/2*I*c) + 19399427420700995098311434932495073739799633036 77*a^2*e^(963/2*I*c) + 210454458721348496801378614981824081260145633264 57*a^2*e^(961/2*I*c) + 2209772627615971348700418782411891426639424448894 35*a^2*e^(959/2*I*c) + 2247655430280602939346801439987511004122770572057975*a^2*e^(957/2*I*c) + 221643915069267111318263329384810743783535652584416 43*a^2*e^(955/2*I*c) + 2120594444226415683705056896138917612349292887515357 57*a^2*e^(953/2*I*c) + 1969922064355959547894504865149532487975181829580265482*a^2*e^(951/2*I*c) + 177798246216445015346779871308212977850347063391452241 78*a^2*e^(949/2*I*c) + 156018117308149873911753787065575404463673778724880411510*a^2*e^(947/2*I*c) + 1331863531921951594349497448051501144604555176329102286 45*a^2*e^(945/2*I*c) + 11067166739593806537994432532202323892559358824814410948544*a^2*e^(943/2*I*c) + 8956697846475560153138642623244921735308706010199451695283 7*a^2*e^(

941/2*I*c) + 706359042600440090623627368646803874663354915637996034416454*a
^2*e^(939/2*I*c) + 543112752777682010778982301823112214654884546632491031441
38155*a^2*e^(937/2*I*c) + 40733554024740134900859594350647954212567407648957
747058481680*a^2*e^(935/2*I*c) + 298135766092049821265508565759859757268901
97740477616767694840520*a^2*e^(933/2*I*c) + 213043516559613540804755219936850
30713318260420219498712471318 24*a^2*e^(931/2*I*c) + 148696209239349281958601
71826698271613545069265812546978930298844*a^2*e^(929/2*I*c) + 10141122575
476372516077609301456905198476636667938621489641703256 0*a^2*e^(927/2*I*c) +
 676077945863029742736783795661095141326065268116577325076514243900*a^2*e^(
925/2*I*c) + 440753107112315394691557544240786736827320443644168232595205888
0560*a^2*e^(923/2*I*c) + 281085707944360048898681550954252919755243371245423
27266338411863980*a^2*e^(921/2*I*c) + 175419464181837861206705490491499611761
89749403084287359709432613 7448*a^2*e^(919/2*I*c) + 1071661434847365356402500
4901165851994917410896239637509476622090221 20*a^2*e^(917/2*I*c) + 6410
8854118862082272356143692442840947738507328803415845695712479891 80*a^2*e^(9
15/2*I*c) + 375658912654834216259223272376633939730617913440758172955655456
41550480*a^2*e^(913/2*I*c) + 215682293904367048229452566525170165451086345847
776055567286526724207180*a^2*e^(911/2*I*c) + 1213684086474480030032963524
9038720368262006429101436574680076903773012 00*a^2*e^(909/2*I*c) + 669557812
26652343052268700744658503183211437985081481198523803457445814 20*a^2*e^(907
/2*I*c) + 362225078234474520943161523836818058470868226859734556930620207991
31961680*a^2*e^(905/2*I*c) + 192216100832677211425583919374607410256140382
9630649982185633265407390578 00*a^2*e^(903/2*I*c) + 100076216506457306558003
9704950705594622141532403147100702228104518209922480*a^2*e^(901/2*I*c) + 51
133713404620801884705792163322470511998009337758134729860301536677684799 70*
a^2*e^(899/2*I*c) + 2564609163526230666377598990704819369302648107270778598
20653479704371745526 40*a^2*e^(897/2*I*c) + 126290665976649423752795293300 55
8365078090948368244878972263607020367969724510*a^2*e^(895/2*I*c) + 61073557
684864691322903531669001548120128321614764883763107293893779595356902 0*a^2*
e^(893/2*I*c) + 290108070545720122348080751595056269069605494213742345944813
3177752600175055070*a^2*e^(891/2*I*c) + 135388229027922757485636045160644 7
92113243644556105596653749569580574114388981 60*a^2*e^(889/2*I*c) + 62087428
05993370214485193955781674305094301522153672615902434069697543097148190 0*a^
2*e^(887/2*I*c) + 279841843449723329022256022542885182491449861432225949373
308219431658133659304060*a^2*e^(885/2*I*c) + 123990929743896845849802042104
4704877786634944232208108330855107855869727352550810*a^2*e^(883/2*I*c) + 54
015092850750556638448628821387292768098169292999783334700946692720250870679
52130*a^2*e^(881/2*I*c) + 23140122603439479772392844447344267578241288491 28
269332682013379311946987190905431 0*a^2*e^(879/2*I*c) + 975027064963445187 39
819416482817785708749119763377367851251579953471302421416590690*a^2*e^(877/
2*I*c) + 404148737461691129448272381486081487215931511785097115337433651585
8975232084874795 70*a^2*e^(875/2*I*c) + 164820164213914670563389414978347637
47658550316983992688290569216718648320349203637 90*a^2*e^(873/2*I*c) + 66144
400820020510453479219244127878363376621124553998877451160580978585651720285
83520*a^2*e^(871/2*I*c) + 261250209735261028241906825713759560880929483452 4

0408465888776831062032840805359036420*a^2*e^(869/2*I*c) + 10157022331200088
98899552699132747473837183232983774023601657581594080554480337593627 20*a^2*
e^(867/2*I*c) + 3887639689201023745839058832751335703731382951698483776363 3
4256622974927805402558286690*a^2*e^(865/2*I*c) + 146513422906430083034821 02
33782702338437177567650054898553731358964520863696142827138160*a^2*e^(863/2
*I*c) + 5437521451042031455370282099308345101312396580420987248763253424089
7433932471749701934 10*a^2*e^(861/2*I*c) + 1987538327019812301639807395478 20
48143086744479176706215294931939285231552377668666774800*a^2*e^(859/2*I*c)
+ 715613132766860595434204098832225344733524398557722747277633623872103175 0
9376711352805370*a^2*e^(857/2*I*c) + 2538313201292654886772680409124822491 8
89037103512786729720327185914058761314001021157469 00*a^2*e^(855/2*I*c) + 88
7096148111783819792698075211637937350128251820639471668845531985819368043 59
6429487700180*a^2*e^(853/2*I*c) + 3054976505229053186358196512899823679196 5
39270073164577798894149381563584247883834020602010*a^2*e^(851/2*I*c) + 1036
832427833694706645534803655654449472691347656052168964108774960636789159517
5422870841040*a^2*e^(849/2*I*c) + 3468353477788217285559024783916145971150 8
47826859959514397893745906509806291031266298009309 0*a^2*e^(847/2*I*c) + 114
367222654004146039785488306144607682565282217212089722715844480032864714063
018623336102960*a^2*e^(845/2*I*c) + 3717846282778484078737407308431584155 33
1024222823171480231787304011497972969610256375804417 30*a^2*e^(843/2*I*c) +
11916260267120045202285359629167111819646810329793550809906409737347745088 0
9765193594567308000*a^2*e^(841/2*I*c) + 37661117341863148447457366228609850
0411090450828881018940892196972245768758904815187588088922 0*a^2*e^(839/2*I*
c) + 1173805156223944291043665868661695293162135916390152574975505940091233
1209404508874859876592800*a^2*e^(837/2*I*c) + 3608214295578937292179532627 6
16372011593666944343042789492382182383571239582501823493315730211 0*a^2*e^(8
35/2*I*c) + 1094019478518122537369397367574314021949959064703932873323441 22
1036859098853977129474733265186 10*a^2*e^(833/2*I*c) + 32721724488805508426 2
892186197327446953686436737681340634739093336235382375514336377928793244690
*a^2*e^(831/2*I*c) + 9655322182092512646070397164737377298293576765349041 49
0149042681284596591204705207557369391920 70*a^2*e^(829/2*I*c) + 281097503606
779152602078316141434903543061096416439129012877500571867619956228103890661
7666401970*a^2*e^(827/2*I*c) + 807506748017092085680269545851955927262234 21
0203529752666982032678058400615887441729888453662217 0*a^2*e^(825/2*I*c) + 2
28914224622760059708976994951758274329914227542096467117918610747237635344 0
04009917560091360933 40*a^2*e^(823/2*I*c) + 640434248339001489626605649373 08
5847925884105561358833921722009766306748265383141633435705827422 20*a^2*e^(8
21/2*I*c) + 176843212577304640940434087070526800206912147942357555568484158
874194832893725593513293339771528640*a^2*e^(819/2*I*c) + 4820038555273598 42
0587489389295657624987171738671533814188168297730577501737011958794089328 82
129710*a^2*e^(817/2*I*c) + 1296869787700945503527478186253438429283866993 10
5679751956812206964316306426908093383593771068875180*a^2*e^(815/2*I*c) + 34
4477423926449063101739463504528286766144417364728013448944906727969077088 01
5419571263814369067 0510*a^2*e^(813/2*I*c) + 9033952674591972024099323322407
00921947876387600923769278945094738861263186426467979796147352984776 0*a^2*e

^(811/2*I*c) + 23392734792358449986470914988641685348168613137145022740977224897697160854430483589336483946581829650*a^2*e^(809/2*I*c) + 59814047894924395116715176262926258735827009585441667308321325957072358824867958015638415996637992560*a^2*e^(807/2*I*c) + 151034681275961781670081880741865931451570808839279104804123701285639063747843522793214727666247721320*a^2*e^(805/2*I*c) + 376645844573615546184166510990416154645940002848766465441678202978044480377315238707708815985878943120*a^2*e^(803/2*I*c) + 927692098027065483765752065317996252674826674534631116047718959743097855192680766331861590769408198460*a^2*e^(801/2*I*c) + 2256936640197646172409588754483391048238912559719597692916098711340142755437285078061404880797678311440*a^2*e^(799/2*I*c) + 5423877415356140734240076530281376392307183648754518352919070721950593841907858843558278519237201933020*a^2*e^(797/2*I*c) + 12876713525916989223366823193023054088090488752457893124234397628679992437662682878994494276660041769680*a^2*e^(795/2*I*c) + 30201888617895119234147767797086586812217490454601051236525729423437716476833896661754018658154022389900*a^2*e^(793/2*I*c) + 69988368274664388580883736712738303159327351505142299304675566880142922981296353915575157471652388092680*a^2*e^(791/2*I*c) + 160253943840621057078138437984495917828994512049873464602063929877936771758934087025740251939283794149320*a^2*e^(789/2*I*c) + 362585708102908727461692262308497693854332721503869703743775437736913882412243026230183024991966728272700*a^2*e^(787/2*I*c) + 810698514587734599341419926912945883958489502890417749835477031467724072007792742636256985473924406832880*a^2*e^(785/2*I*c) + 1791356871286179453076261895297548714275627637620322018468056279043104785643232974994540293493766790807180*a^2*e^(783/2*I*c) + 3912063292298370671823656265180627510381042688906961451087421710967460980974243159240293773328259061298480*a^2*e^(781/2*I*c) + 8444177149381193033478801248743170134902792413015392319772244917564145947358160863746469962582546517551020*a^2*e^(779/2*I*c) + 18016188203161151595570847680260903085281484547568939274327212858568842514711832067992981021945668432453744*a^2*e^(777/2*I*c) + 37996950850034038233850830306205827170017764253586941498028293120742516484664499219084036933062000158769320*a^2*e^(775/2*I*c) + 79221081373658264272879848670833963158393802618546130507463440333508958081178065157747031476513568516431440*a^2*e^(773/2*I*c) + 163291912624014896869889921756370257404344116207519220566929295476847426915494195734247976197944827166856605*a^2*e^(771/2*I*c) + 332771401353095630876781482769166072007566368785944639929752492013340507467607203423204297878103391257399650*a^2*e^(769/2*I*c) + 670517439437730975214058382921475629655071200139334454271221441426048415295599199783168621980211682925980307*a^2*e^(767/2*I*c) + 1335925163388878989942887543237873573477354078078040384838340726239029587514889857191688753727386206824536152*a^2*e^(765/2*I*c) + 2632008195543601126886567258671080082793179330943932952648086736257575292194786895789417136105832466949897075*a^2*e^(763/2*I*c) + 5128027932104560135559026593192544604592901120537915741822852980300115191592803605514077707054780313193678930*a^2*e^(761/2*I*c) + 9880899198808563287233613519855332010559992941772794510424197819767831159955107339288892516466317402233238590*a^2*e^(759/2*I*c) + 18830001036742739401007198462226884604435327942040227457903683414392625117

45482513821846103788175606946009546 2*a^2*e^(757/2*I*c) + 354925185722847832
61790721091007984213268935867291381099943547658996866612281989451531913916 1
63009433157485571*a^2*e^(755/2*I*c) + 661729793288180939921505464238203516 2
752852372860854002119931270260080224075665893897413823318345715397706079 7*a
^2*e^(753/2*I*c) + 12204128126857543983447988302990699194420160067581866401
325623015491396458064340669238189760339409304370344202 5*a^2*e^(751/2*I*c) +
 222658798242792334181002206109280104097850168579789527367599387695046282 88
902140101202554874582809766677823156 5*a^2*e^(749/2*I*c) + 40188785017504508
015031388991007269452800944701646807261145319396663248746567607461705605177
3919819622001323159*a^2*e^(747/2*I*c) + 71767324920670553943767575873920097
462584452902452927707470260940478945808166620375787523398677784333943177897
1*a^2*e^(745/2*I*c) + 1268032974404884995880090665342368454273004000561016 0
2385367918667551700955036450424884618007637091117280889437 6*a^2*e^(743/2*I*
c) + 2216875962324492560656475252069459616280748019821115392295053079963518
36192210680955839583547056239661270391089 4*a^2*e^(741/2*I*c) + 383516964831
21774129557589570455880725598132347774881382377235378539069217956900403124 0
446530849866596380773188 0*a^2*e^(739/2*I*c) + 6565767959307153022882983461 9
744537570730217235007718128652478013026176517587654983378556847546660473321
09346955*a^2*e^(737/2*I*c) + 1112422688241289810643238399018764325994794191
948692614355578299900846301535590589525141555426051145216276710689 6*a^2*e^(
735/2*I*c) + 1865362646285053280303514058810471751408543109884886941968918 6
6543573543835555408048328577488681543918124795283 31*a^2*e^(733/2*I*c) + 309
593486425765628601652998173661658629226486668425796475504851207868785347857 3
1743960086739464887905409107011859 2*a^2*e^(731/2*I*c) + 5086061865420950083
533559153160520120167735286246615994357148142901870562289168145260417888380
924597995752327841 5*a^2*e^(729/2*I*c) + 827102161961927446592859468136034 74
744793948296346331753106207063703754012444364328700859979459109222867113617
510*a^2*e^(727/2*I*c) + 13315301844139519603401477035876369100009863696073 9
548768552317876384874768681586531648288117265885968911213464902*a^2*e^(725/
2*I*c) + 212218928188673385825585486875626217952905358371974613119305643729
514631087950307170160593893009749320293414137639*a^2*e^(723/2*I*c) + 334877
229377355089426560502609284393492614010501825504426666861674218991625217228
23626275504357286376646461753915 2*a^2*e^(721/2*I*c) + 523218326398909441228
13838656966178912328317484398004726204031941195851978524226374892634774886 7
5882736694187901 15*a^2*e^(719/2*I*c) + 809475688654593052224501094178917252
980035293905898453796392919564557037778617746976730948724902348115224486645
600*a^2*e^(717/2*I*c) + 124015564057522683211246144658763515180020658900739
017222936903158267886075275533279331003594413534113068492179462 7*a^2*e^(715
/2*I*c) + 188160461868069902702454351569865200312642651000462991963767076 78
5106375254909391376433590964492404142336445756405 6*a^2*e^(713/2*I*c) + 2827
410762917657346065292926703346273000172053162448180906376970875870523643742
22930186777029837140925016248670644 6*a^2*e^(711/2*I*c) + 42081058799009656 7
104481160318687178813705026824971664290885292245016673590410899653815163230
2993343796013355257880*a^2*e^(709/2*I*c) + 620369980767329471118721080211 44
212850853086945744288084100595853011031037228772905226051408470437457943030

26775415*a^2*e^(707/2*I*c) + 905963489471626610604125011465485981917077095 8
994890643823267294971612713252112667925034180484391205562621557500199*a^2*e
^(705/2*I*c) + 131067843765579140601235842829739716168027656278860131867281
252997375039972447886767293507155233679089682020168149 61*a^2*e^(703/2*I*c)
+ 187861234561218024604447776337413486622749892957741223279460411367997239 3
476402754557315410294201364682923899675 5521*a^2*e^(701/2*I*c) + 26678662604
166841848095788924129301979448932840410184329153779340794009872890361466821
390436483345842294941747333409*a^2*e^(699/2*I*c) + 375411345309312949907076
283118878966417380012487360455442254727581286124794355396485399362672455035
94181132790075635*a^2*e^(697/2*I*c) + 523477547914145620096904247463625961 5
597005932613387746572682372750616929974976286787233738293308030257583235431
2830*a^2*e^(695/2*I*c) + 723381176581835441253396192787045700703980625039 68
469165923503150270252549867503793649405257860558789674577875168502*a^2*e^(6
93/2*I*c) + 990709333414297197602970045457468870551580177755061961507795918
979669303216746380846295952488464392179861861676915 66*a^2*e^(691/2*I*c) + 1
344828546045721626428840967446952957135004987386452006510355485923549332394
834302319516825747713780152475147073422 87*a^2*e^(689/2*I*c) + 1809510824618
191818695813304988792572428725718115718920483829817869705697213909872572459
059241083421792474962623973 40*a^2*e^(687/2*I*c) + 241357793711347328232760 9
590718728464284134012731389363008530096007019884060645842590310192251149561
73896476656268335*a^2*e^(685/2*I*c) + 319153720818304987432002171533540880 0
739785633976845781847779169877992931630884082047360763702149210031174230470
33230*a^2*e^(683/2*I*c) + 418417473137181457241238509087329325282408939687 7
216062965991125177653395872555871837976644605971129399816286401191 37*a^2*e^
(681/2*I*c) + 543906466712812351904914755982917835109482213336493662162465 3
100349346061889628675519683252520558836292548902152352 32*a^2*e^(679/2*I*c)
+ 701094689019682891416623968292126716907599403053712158434755550345947349 9
482955390468889097426389312175374740259754 40*a^2*e^(677/2*I*c) + 8961920355
975037209271807078077066028702648087726047622951692184665561922309601678440
785734133918285417613324100510 40*a^2*e^(675/2*I*c) + 113613969356153715597 8
568944899860990716224618498598331698010751957196904760729746742387960564144
749497838935456211960*a^2*e^(673/2*I*c) + 142857608790754115407016752894453
517980762876865018136822572838041989915471907902387694640681948777850843831
9784170080*a^2*e^(671/2*I*c) + 178176831829496693528059784841405472372983 63
548717084325768592352016467647943896189509505874913530813750554425377755 44*
a^2*e^(669/2*I*c) + 220450484881927125857768664743780267386022877783506686 2
747405782838776390348098557012295819426306998948329682289436640*a^2*e^(667/
2*I*c) + 270594649944996307730421914875997577613545365348393733791756619433
689219556830563155471311684966044174625838545572316 0*a^2*e^(665/2*I*c) + 32
954345219222178101235110820882370320399432856468780343002902891323602533505
160067216307877786710590752414227814061 60*a^2*e^(663/2*I*c) + 3982256683723
412940987002608432103465539772199439132030360365812174562265353125356974005
03358094352763214301781166856 0*a^2*e^(661/2*I*c) + 477537474879123150545968
399666527814610204346354866288991622477572359598824493319433054794836177389
065035255574636140 0*a^2*e^(659/2*I*c) + 5683119408403859311000751624003623 1

488608208471207766480066528273851195374220703844734081088304510355083937269
80174240*a^2*e^(657/2*I*c) + 6712861418522615724988858473795623314248057954
884136819874564233080140888033656717736078828058598240124888994298326360*a^
2*e^(655/2*I*c) + 787067024908872037443069512725257813818390760011548448756
7789602589829762952732597658246852175521239128818848207047200*a^2*e^(653/2*
I*c) + 91609737380630587614977376948117073446973469195890750935573822620798
52822162643836169596839715953389931229146306843160*a^2*e^(651/2*I*c) + 1058
623385911710506650733480513866864889318683528870371443099194626006627859975
2585501637968876434411898083966268318240*a^2*e^(649/2*I*c) + 12146654565504
797783672415623355290385431521572754643028081311118774641507895483012327171
848886038795599157607589336080*a^2*e^(647/2*I*c) + 138399376099471873989204
752380174900209956108648629891563231150082467766771666466864251379229720695
44356469424336874720*a^2*e^(645/2*I*c) + 1566110116368601184782458239234044
886066938476679972162717922203521376820514126055609506038475263236181932703
2020892140*a^2*e^(643/2*I*c) + 17602373941334170158602804303413344263296373
051657482244301069046136457777485221759920683874338340816767315010883070640
*a^2*e^(641/2*I*c) + 19653174438252726752541792477777619934650225271457413
46579124704111270169852610316237530213837076731939155254031315220*a^2*e^(63
9/2*I*c) + 2180018094657529251098759558153408779545501567139438439807556810
2023793126789691655257472560286308276031522589116147800*a^2*e^(637/2*I*c) +
 24027493459410529878342393314596701203692315139519374776263890070912654038
803572108760194498231541018946484500110764820*a^2*e^(635/2*I*c) + 263168836
945024245212481243876288800464809215795717366607784396111020491267193928674
91978361605672355038563370490434320*a^2*e^(633/2*I*c) + 2864812461220060601
372002405432777931524031087082124165142024060554568814490053708919821326385
1453828234588917547711560*a^2*e^(631/2*I*c) + 30999386333592884159610215585
305952854889407725459965085076104937976196911732638644879528970536122548468
911408679508520*a^2*e^(629/2*I*c) + 333476816393137132776489667910175466641
478627744256121856468997745312213933869257141075472252852730542903145965949
77580*a^2*e^(627/2*I*c) + 3566934156165823421939301591416525880023144723499
2175120111621953758773880356130515026339013759664087801990290045546540*a^2*
e^(625/2*I*c) + 37940500212170537906421927439740074329537276968507943576124
882485983705492251107761060039819420913129160456600166235380*a^2*e^(623/2*I
*c) + 401375680536466143754333426685279018978222583062893971772776139870250
21024009192926575679052108438711600692277041112940*a^2*e^(621/2*I*c) + 4223
767435092749730816760791277049538441050990699929435925460859839383190862700
7418402687181252824823543923401086446140*a^2*e^(619/2*I*c) + 44219062414309
796885036555682850910798132641174189091355070247306856269259520267158532714
171765231548167835085083759540*a^2*e^(617/2*I*c) + 460614252564034938067668
169663307994388334771809988593995473930967657173021186924595282786976542841
87890865264198490880*a^2*e^(615/2*I*c) + 4774617408598129132026036222830018
345928279440677646144908614295224316238252464662558813944616663514704992754
2868878520*a^2*e^(613/2*I*c) + 49256637251142339677939547027108976858345467
610518344678311703270141917623803626587961704546454017361035725620405883520
*a^2*e^(611/2*I*c) + 505781923678642695971460350025649056223221849146426945

2870241526951500070338339537039938043554893145504660486081461 5100*a^2*e^(609/2*I*c) + 516983389779920970119491087635182786091572912056331651875042295664202679382674135986726666816056068513938113127654718 40*a^2*e^(607/2*I*c) + 526067227656051632452333852752003396449395303421583708917408064223475566220424603581835250293395073105939114822258999 00*a^2*e^(605/2*I*c) + 532951247986600196698491744108009210277692661226623298727506854636000929695489986274679432466633969731579342529634721 60*a^2*e^(603/2*I*c) + 537574302461117464874812442196755362012959615093852812346034320605597567888564442107335191600943229868258032243647342 20*a^2*e^(601/2*I*c) + 539895904795798801118095979013789222865272271755665479268604824974775390148511698422502865948846762701105837396744898 80*a^2*e^(599/2*I*c) + 539895904795798801118095979013789222865272271755665479268604824974775390148511698422502865948846762701105837396744898 80*a^2*e^(597/2*I*c) + 537574302461117464874812442196755362012959615093852812346034320605597567888564442107335191600943229868258032243647342 20*a^2*e^(595/2*I*c) + 532951247986600196698491744108009210277692661226623298727506854636000929695489986274679432466633969731579342529634721 60*a^2*e^(593/2*I*c) + 526067227656051632452333852752003396449395303421583708917408064223475566220424603581835250293395073105939114822258999 00*a^2*e^(591/2*I*c) + 516983389779920970119491087635182786091572912056331651875042295664202679382674135986726666816056068513938113127654718 40*a^2*e^(589/2*I*c) + 505781923678642695971460350025649056223221849146426945287024152695150007033833953703993804355489314550466048608146151 00*a^2*e^(587/2*I*c) + 492566372511423396779395470271089768583454676105183446783117032701419176238036265879617045464540173610357256204058835 20*a^2*e^(585/2*I*c) + 477461740859812913202603622283001834592827944067764614490861429522431623825246466255881394461666351470499275428688785 20*a^2*e^(583/2*I*c) + 460614252564034938067668169663307994388334771809988593995473930967657173021186924595282786976542841878908652641984908 80*a^2*e^(581/2*I*c) + 442190624143097968850365556828509107981326411741890913550702473068562692595202671585327141717652315481678350850837595 40*a^2*e^(579/2*I*c) + 422376743509274973081676079127704953844105099069992943592546085983938319086270074184026871812528248235439234010864461 40*a^2*e^(577/2*I*c) + 401375680536466143754333426685279018978222583062893971772776139870250210240091929265756790521084387116006922770411129 40*a^2*e^(575/2*I*c) + 379405002121705379064219274397400743295372769685079435761248824859837054922511077610600398194209131291604566001662353 80*a^2*e^(573/2*I*c) + 356693415616582342193930159141652588002314472349921751201116219537587738803561305150263390137596640878019902900455465 40*a^2*e^(571/2*I*c) + 333476816393137132776489667910175466641478627744256121856468997745312213933869257141075472252852730542903145965949775 80*a^2*e^(569/2*I*c) + 309993863335928841596102155853059528548894077254599650850761049379761969117326386448795289705361225484689114086795085 20*a^2*e^(567/2*I*c) + 286481246122006060137200240543277793152403108708212416514202406055456881449005370891982132638514538282345889175477115 60*a^2*e^(565/2*I*c) + 263168836945024245212481243876288800464809215795717366607784396111020491267193928674919783616056723550385633704904343 20*a^2*e^(563/2*I*c) + 240274934594105298783423933145967012036923151395193747762638900709126

540388035721087601944982315410189464845001107648 20*a^2*e^(561/2*I*c) + 2180
0180946575292510987595581534087795455015671394384398075568102023793126789 69
165525747256028630827603152258911614 7800*a^2*e^(559/2*I*c) + 19653174438252
72675254179247777761993465022527145741346579124704111270169852610316237530
213837076731939155254031315220*a^2*e^(557/2*I*c) + 176023739413341701586028
0430341334426329637305165748224430106904613645777748522175992068387433834 08
16767315010883070640*a^2*e^(555/2*I*c) + 15661101163686011847824582392340 44
88606693847667997216271792220352137682051412605560950603847526323618193270 3
2020892140*a^2*e^(553/2*I*c) + 138399376099471873989204752380174900209956 10
8648629891563231150082467766771666466864251379229720695443564694243368747 20
*a^2*e^(551/2*I*c) + 121466545655047977836724156233552903854315215727546430
28081311118774641507895483012327171848886038795599157607589336080*a^2*e^(54
9/2*I*c) + 105862338591171050665073348051386686488931868352887037144309919 4
626006627859975258550163796887643441189808396626831824 0*a^2*e^(547/2*I*c) +
 916097373806305876149773769481170734469734691958907509355738226207985282 21
626438361695968397159533899312291463068431 60*a^2*e^(545/2*I*c) + 7870670249
08872037443069512725257813818390760011548448756778960258982976295273259765 8
246852175521239128818848207047200*a^2*e^(543/2*I*c) + 6712861418522615724 98
88584737956233142480579548841368198745642330801408880336567177360788280585 9
82401248889942983263 60*a^2*e^(541/2*I*c) + 568311940840385931100075162400 36
2314886082084712077664800665282738511953742207038447340810883045103550839 37
26980174240*a^2*e^(539/2*I*c) + 477537474879123150545968399666527814610204 3
46354866288991622477572359598824493319433054794836177389065035255574636140 0
*a^2*e^(537/2*I*c) + 398225668372341294098700260843210346553977219943913203
0360365812174562265353125356974005033580943527632143017811668560*a^2*e^(535
/2*I*c) + 329543452192221781012351108208823703203994328564687803430029028 91
323602533505160067216307877786710590752414227814061 60*a^2*e^(533/2*I*c) + 2
7059464994499630773042191487599757761354536534839373379175661943368921955 68
3056315547131168496604417462583854557231 60*a^2*e^(531/2*I*c) + 220450484881
92712585776866474378026738602287778350668627474057828387763903480985570122 9
5819426306998948329682289436640*a^2*e^(529/2*I*c) + 178176831829496693528 05
97848414054723729836354871708432576859235201646764794389618950950587491353 0
813750554425377755 44*a^2*e^(527/2*I*c) + 142857608790754115407016752894453 5
179807628768650181368225728380419899154719079023876946406819487775084383 19
784170080*a^2*e^(525/2*I*c) + 1136139693561537155978568944899860990716224 61
849859833169801075195719690476072974674238796056414474949783893545621196 0*a
^2*e^(523/2*I*c) + 896192035597503720927180707807706602870264808772604762 29
5169218466556192230960167844078573413391828541761332410051040*a^2*e^(521/2*
I*c) + 701094689019682891416623968292126716907599403053712158434755550345 94
7349948295539046888909742638931217537474025975440*a^2*e^(519/2*I*c) + 54390
6466712812351904914755982917835109482213336493662162465310034934606188962 86
755196832525205558836292548902152352 32*a^2*e^(517/2*I*c) + 41841747313718145
72412385090873293252824089396877216062965991125177653395872555871837976644 6
0597112939981628640119137*a^2*e^(515/2*I*c) + 319153720818304987432002171 53
354088007397856339768457818477791698779929316308840820473607637021492100311

7423047033230*a^2*e^(513/2*I*c) + 24135779371134732823276095907187284642841
34012731389363008530096007019884060645842590310192251149561738964766562683
5*a^2*e^(511/2*I*c) + 18095108246181918186958133049887925724287257181157189
2048382981786970569721390987257245905924108342179247496262397340*a^2*e^(509
/2*I*c) + 13448285460457216264288409674469529571350049873864520065103554859
235493323948343023195168257477137801524751470734 2287*a^2*e^(507/2*I*c) + 99
07093334142971976029700454574688705515801777550619615077959189796693032167 4
6380846295952488464392179861861676915 66*a^2*e^(505/2*I*c) + 723381176581835
44125339619278704570070398062503968469165923503150270252549867503793649405 2
5786055878967457787516850 2*a^2*e^(503/2*I*c) + 52347754791414562009690424 74
63625961559700593261338774657268237275061692997497628678723373829330803025 7
5832354312830*a^2*e^(501/2*I*c) + 37541134530931294990707628311887896641738
00124873604554422547275812861247943553964853993626724550359418113279007563 5
*a^2*e^(499/2*I*c) + 2667866260416684184809578892412930197944893284041018 43
29153779340794009872890361466821390436483345842294941747333409*a^2*e^(497/2
*I*c) + 187861234561218024604447776337413486622749892957741223279460411367 9
972393476402754557315410294201364682923899675552 1*a^2*e^(495/2*I*c) + 13106
7843765579140601235842829739716168027656278860131867281252997375039972447 88
67672935071552336790896820201681496 1*a^2*e^(493/2*I*c) + 905963489471626610
60412501146548598191707709589948906438232672949716127132521126679250341804 8
43912055626215575001 99*a^2*e^(491/2*I*c) + 620369980767329471118721080211 44
21285085308694574428808410059585301103103722877290522605140847043745794303 0
26775415*a^2*e^(489/2*I*c) + 42081058799009656710448116031868717881370502 68
249716642908852922450166735904108996538151632302993343796013355257880*a^2*e
^(487/2*I*c) + 28274107629176573460652929267033462730001720531624481809063 7
6970875870523643742229301867770298371409250162486706446*a^2*e^(485/2*I*c) +
 18816046186806990270245435156986520031264265100046299196376707678510637525
49093913764335909644924041423364457564056*a^2*e^(483/2*I*c) + 1240155640575
22683211246144658763515180020658900739017222936903158267886075275533279331 0
035944135341130684921794627*a^2*e^(481/2*I*c) + 80947568865459305222450109 4
178917252980035293905898453796392919564557037778617746976730948724902348115
224486645600*a^2*e^(479/2*I*c) + 52321832639890944122813838656966178912328 3
174843980047262040319411958519785242263748926347748867588273669418790115*a^
2*e^(477/2*I*c) + 33487722937735508942656050260928439349261401050182550442 6
66686167421899162521722823626275504357286376646461753915 2*a^2*e^(475/2*I*c)
 + 21221892818867338582558548687562621795290535837197461311930564372951463 1
087950307170160593893009749320293414137639*a^2*e^(473/2*I*c) + 133153018441
39519603401477035876369100009863696073954876855231787638487476868158653164 8
288117265885968911213464902*a^2*e^(471/2*I*c) + 82710216196192744659285946 8
13603474744793948296346331753106207063703754012444364328700859979459109222 8
67113617510*a^2*e^(469/2*I*c) + 508606186542095008353355915316052012016773 5
286246615994357148142901870562289168145260417888380924597995752327841 5*a^2*
e^(467/2*I*c) + 30959348642576562860165299817366165862922648668425796475504
851207868785347857317439600867394648879054091070118592*a^2*e^(465/2*I*c) +
18653626462850532803035140588104717514085431098848869419689186654357354383 5

5554080483285774886815439181247952833l*a^2*e^(463/2*I*c) + 1112422688241289
8106432383990187643259947941919486926143555782999008463015355905895251415555
4260511452162767106896*a^2*e^(461/2*I*c) + 65657679593071530228829834619744
537570730217235007718128652478013026176517587654983378556847546660473321093
46955*a^2*e^(459/2*I*c) + 3835169648312177412955758957045588072559813234777
488138237723537853906921795690040312404465308498665963807731880*a^2*e^(457/
2*I*c) + 221687596232449256065647525206945961628074801982111539229505307996
3518361922106809558395835470562396612703910894*a^2*e^(455/2*I*c) + 12680329
744048849958800906653423684542730040005610160238536791866755170095503645042
48846180076370911172808894376*a^2*e^(453/2*I*c) + 7176732492067055394376757
587392009746258445290245292770747026094047894580816662037578752339867778433
39431778971*a^2*e^(451/2*I*c) + 4018878501750450801503138899100726945280094
47016468072611453193966632487465676074617056051773919819622001323159*a^2*e^
(449/2*I*c) + 2226587982427923341810022061092801040978501685797895273675993
87695046282889021401012025548745828097666778231565*a^2*e^(447/2*I*c) + 1220
412812685754398344798830299069919442016006758186640132562301549139645806434
06692381897603394093043703442025*a^2*e^(445/2*I*c) + 6617297932881809399215
054642382035162752852372860854002119931270260080224075665893897413823318345
7153977060797*a^2*e^(443/2*I*c) + 35492518572284783261790721091007984213268
935867291381099943547658996866612281989451531913916163009433157485571*a^2*e
^(441/2*I*c) + 188300010367427394010071984622268846044353279420402274579036
83414392625117454825138218461037881756069460095462*a^2*e^(439/2*I*c) + 9880
899198808563287233613519855332010559992941772794510424197819767831159955107
339288892516466317402233238590*a^2*e^(437/2*I*c) + 512802793210456013555902
659319254460459290112053791574182285298030011519159280360551407770705478031
3193678930*a^2*e^(435/2*I*c) + 26320081955436011268865672586710800827931793
30943932952648086736257575292194786895789417136105832466949897075*a^2*e^(43
3/2*I*c) + 1335925163388878989942887543237873573477354078078040384838340726
239029587514889857191688753727386206824536152*a^2*e^(431/2*I*c) + 670517439
437730975214058382921475629655071200139334454271221441426048415295599199783
168621980211682925980307*a^2*e^(429/2*I*c) + 332771401353095630876781482769
166072007566368785944639929752492013340507467607203423204297878103391257399
650*a^2*e^(427/2*I*c) + 163291912624014896869889921756370257404344116207519
220566929295476847426915494195734247976197944827166856605*a^2*e^(425/2*I*c)
 + 792210813736582642728798486708339631583938026185461305074634403335089580
81178065157747031476513568516431440*a^2*e^(423/2*I*c) + 3799695085003403823
385083030620582717001776425358694149802829312074251648466449921908403693306
2000158769320*a^2*e^(421/2*I*c) + 18016188203161151595570847680260903085281
484547568939274327212858568842514711832067992981021945668432453744*a^2*e^(4
19/2*I*c) + 844417714938119303347880124874317013490279241301539231977224491
7564145947358160863746469962582546517551020*a^2*e^(417/2*I*c) + 39120632922
983706718236562651806275103810426889069614510874217109674609809742431592402
93773328259061298480*a^2*e^(415/2*I*c) + 1791356871286179453076261895297548
714275627637620322018468056279043104785643232974994540293493766790807180*a^
2*e^(413/2*I*c) + 810698514587734599341419926912945883958489502890417749835

477031467724072007792742636256985473924406832880*a^2*e^(411/2*I*c) + 362585
708102908727461692262308497693854332721503869703743775437736913882412243026
2301830249919667282727 00*a^2*e^(409/2*I*c) + 16025394384062105707813843798 4
495917828994512049873464602063929877936771758934087025740251939283794149320
*a^2*e^(407/2*I*c) + 69988368274664388580883736712738303159327351505142299 3
046755668801429229812963539155751574716523880926 80*a^2*e^(405/2*I*c) + 3020
188861789511923414776779708658681221749045460105123652572942343771647683389
666175401865815402238990 0*a^2*e^(403/2*I*c) + 128767135259169892233668231 93
023054088090488752457893124234397628679992437662682878994494276660041769680
*a^2*e^(401/2*I*c) + 542387741535614073424007653028137639230718364875451835
291907072195059384190785884355827851923720193302 0*a^2*e^(399/2*I*c) + 22569
366401976461724095887544833910482389125597195976929160987113401427554372850
7806140488079767831144 0*a^2*e^(397/2*I*c) + 9276920980270654837657520653179
9625267482667453463111604771895974309785519268076633186159076940819846 0*a^2
*e^(395/2*I*c) + 376645844573615546184166510990416154645940002848766465441 6
7820297804448037731523870770881598587894312 0*a^2*e^(393/2*I*c) + 1510346812
759617816700818807418659314515708088392791048041237012856390637478435227932
1472766624772132 0*a^2*e^(391/2*I*c) + 598140478949243951167151762629262587 3
58270095854416673083213259570723588248679580156384159966379925 60*a^2*e^(389
/2*I*c) + 2339273479235844998647091498864168534816861313714502274097722489 7
6971608544304835893364839465818296 50*a^2*e^(387/2*I*c) + 903395267459197202
409932332240700921947876387600923769278945094738861263186426467979796147352
984776 0*a^2*e^(385/2*I*c) + 344477423926449063101739463504528286766144417 36
4728013448944906727969077088015419571263814369067051 0*a^2*e^(383/2*I*c) + 1
296869787700945503527478186253438429283866993105679751956812206964316306426
9080933835937710688751 80*a^2*e^(381/2*I*c) + 48200385552735984205874893892 9
56576249871717386715338141881682977305775017370119587940893288212971 0*a^2*e
^(379/2*I*c) + 176843212577304640940434087070526800206912147942357555568484
1588741948328937255935132933397715286 40*a^2*e^(377/2*I*c) + 640434248339001
489626605649373085847925884105561358833921722009766306748265383141633435705
8274222 0*a^2*e^(375/2*I*c) + 228914224622760059708976994951758274329914227 5
42096467117918610747237635344004009917560091360933 40*a^2*e^(373/2*I*c) + 80
750674801709208568026954585195592726223421020352975266698203267805840061588
744172988845366221 70*a^2*e^(371/2*I*c) + 281097503606779152602078316141434 9
035430610964164391290128775005718676199562281038906617666401970*a^2*e^(369/
2*I*c) + 965532218209251264607039716473737729829357676534904149014904268128
45965912047052075573693919207 0*a^2*e^(367/2*I*c) + 327217244888055084262892
1861973274469536864367376813406347390933362353823755143363779287932446 90*a^
2*e^(365/2*I*c) + 109401947851812253736939736757431402194995906470393287332
344122103685909885397712947473326518610*a^2*e^(363/2*I*c) + 360821429557893
729217953262761637201159366694434304278949238218238357123958250182349331573
02110*a^2*e^(361/2*I*c) + 117380515622394429104366586866169529316213591639 0
15257497550594009123312094045088748598765928 00*a^2*e^(359/2*I*c) + 37661117
341863148447457366228609850041109045082888101894089219697224576875890481518
75880889220*a^2*e^(357/2*I*c) + 1191626026712004520228535962916711181964681

0329793550809906409737347745088097651935945673080000*a^2*e^(355/2*I*c) + 371
784628277848407873740730843158415533102422282317148023178730401149797296961
025637580441730*a^2*e^(353/2*I*c) + 114367222654004146039785488306144607682
565282217212089722715844480032864714063018623336102960*a^2*e^(351/2*I*c) +
346835347778821728555902478391614597115084782685995951439789374590650980629
10312662980093090*a^2*e^(349/2*I*c) + 1036832427833694706645534803655654449
4726913476560521689641087749606367891595175422870841040*a^2*e^(347/2*I*c) +
30549765052290531863581965128998236791965392700731645777988941493815635842
47883834020602010*a^2*e^(345/2*I*c) + 8870961481117838197926980752116379373
50128251820639471668845531985819368043596429487700180*a^2*e^(343/2*I*c) + 2
538313201292654886772680409124822491889037103512786729720327185914058761314
00102115746900*a^2*e^(341/2*I*c) + 7156131327668605954342040988322253447335
2439855772274727763362387210317509376711352805370*a^2*e^(339/2*I*c) + 19875
383270198123016398073954782048143086744479176706215294931939285231552377668
666774800*a^2*e^(337/2*I*c) + 543752145104203145537028209930834510131239658
0420987248763253424089743393247174970193410*a^2*e^(335/2*I*c) + 14651342290
643008303482102337827023384371775676500548985537313589645208636961428271381
60*a^2*e^(333/2*I*c) + 3887639689201023745839058832751335703731382951698483
77636334256622974927805402558286690*a^2*e^(331/2*I*c) + 1015702233120008898
89955269913274747383718323298377402360165758159408055448033759362720*a^2*e^
(329/2*I*c) + 2612502097352610282419068257137595608809294834524040846588877
6831062032840805359036420*a^2*e^(327/2*I*c) + 66144400820020510453479219244
12787836337662112455399887745116058097858565172028583520*a^2*e^(325/2*I*c)
+ 1648201642139146705633894149783476374765855031698399268829056921671864832
034920363790*a^2*e^(323/2*I*c) + 404148737461691129448272381486081487215931
511785097115337433651585897523208487479570*a^2*e^(321/2*I*c) + 975027064963
44518739819416482817785708749119763377367851251579953471302421416590690*a^2
*e^(319/2*I*c) + 2314012260343947977239284444734426757824128849128269332682
0133793119469871909054310*a^2*e^(317/2*I*c) + 54015092850750556638448628821
38729276809816929299978333470094669272025087067952130*a^2*e^(315/2*I*c) + 1
239909297438968458498020421044704877786634944232208108330855107855869727352
550810*a^2*e^(313/2*I*c) + 279841843449723329022256022542885182491449861432
225949373308219431658133659304060*a^2*e^(311/2*I*c) + 620874280599337021448
51939557816743050943015221536726159024340696975430971481900*a^2*e^(309/2*I*
c) + 1353882290279227574856360451606447921132436445561055966537495695805741
1438898160*a^2*e^(307/2*I*c) + 29010807054572012234808075159505626906960549
42137423459448133177752600175055070*a^2*e^(305/2*I*c) + 6107355768486469132
29035316690015481201283216147648837631072938937795953569020*a^2*e^(303/2*I*
c) + 1262906659766494237527952933005583650780909483682448789722636070203679
69724510*a^2*e^(301/2*I*c) + 2564609163526230666377598990704819369302648107
2707785982065347970437174552640*a^2*e^(299/2*I*c) + 51133713404620801884705
79216332247051199800933775813472986030153667768479970*a^2*e^(297/2*I*c) + 1
000762165064573065580039704950705594622141532403147100702228104518209922480
*a^2*e^(295/2*I*c) + 192216100832677211425583919374607410256140382963064998
218563326540739057800*a^2*e^(293/2*I*c) + 362225078234474520943161523836818

0584708682268597345569306202079913196168O*a^2*e^(291/2*I*c) + 6695578122665
2343052268700744658503183211437985081481198523803457445814 20*a^2*e^(289/2*I
*c) + 1213684086474480030032963524903872036826200642910143657468007690377 30
1200*a^2*e^(287/2*I*c) + 215682293904367048229452566525170165451086345847 77
605556728652672 4207180*a^2*e^(285/2*I*c) + 3756589126548342162592232723766 3
3939730617913440758172955655456415 50480*a^2*e^(283/2*I*c) + 641088541188620
8227235614369244284094773850732880341584569571247989180*a^2*e^(281/2*I*c) +
1071661434847365356402500490116585199491741089623963750947662209022120*a^2
*e^(279/2*I*c) + 175419464181837861206705490491499611761897494030842873597 0
94326137448*a^2*e^(277/2*I*c) + 281085707944360048898681550954252919755243 3
712454232726633841186 3980*a^2*e^(275/2*I*c) + 440753107112315394691557544 24
0786736827320443644168232595205888 0560*a^2*e^(273/2*I*c) + 6760779458630297
4273678379566109514132606526811657732507651424 3900*a^2*e^(271/2*I*c) + 1014
1122575476372516077609301456905198476636667938621489641703 2560*a^2*e^(269/2
*I*c) + 1486962092393492819586017182669827161354506926581254697893029884 4*a
^2*e^(267/2*I*c) + 213043516559613540804755219936850307133182604202194987 12
47131824*a^2*e^(265/2*I*c) + 298135766092049821265508565759859757268901977 4
04776167694840520*a^2*e^(263/2*I*c) + 4073355402474013490085959435064795421
2567407648957747058481680*a^2*e^(261/2*I*c) + 5431127527776820107789823018 2
311221465488454663249103144381 55*a^2*e^(259/2*I*c) + 706359042600440090623 6
2736864680387466335491563799603441645 4*a^2*e^(257/2*I*c) + 8956697846475560
1531386426232449217353087060101994516952837*a^2*e^(255/2*I*c) + 11067166739
5938065379944325322023238925593588248144109485 44*a^2*e^(253/2*I*c) + 133186
353192195159434949744805150114460455517763291022864 5*a^2*e^(251/2*I*c) + 15
6018117308149873911753787065575404463673778724880411510*a^2*e^(249/2*I*c) +
177798246216445015346779871308212977850347063391452241 78*a^2*e^(247/2*I*c)
+ 196992206435595954789450486514953248797518182958026548 2*a^2*e^(245/2*I*c
) + 212059444422641568370505689613891761234929288751535757*a^2*e^(243/2*I*c
) + 221643915069267111318263329384810743783535652584416 43*a^2*e^(241/2*I*c)
+ 224765543028060293934680143998751100412277057205797 5*a^2*e^(239/2*I*c) +
220977262761597134870041878241189142663942444889435*a^2*e^(237/2*I*c) + 21
045445872134849680137861498182408126014563326457*a^2*e^(235/2*I*c) + 193994
274207009950983114349324950737397996330367 7*a^2*e^(233/2*I*c) + 17291964360
772444113317335456599860540110377650 4*a^2*e^(231/2*I*c) + 14890299547694622
406488788915648999996474069170*a^2*e^(229/2*I*c) + 123742080470770509399110
263883949333016393164 0*a^2*e^(227/2*I*c) + 991303822775320225158191778816 29
325075859509*a^2*e^(225/2*I*c) + 764641982122710512439170071251750274718708
8*a^2*e^(223/2*I*c) + 567179441813227622186529241088113209451509*a^2*e^(221
/2*I*c) + 404018204062641833133876902838922016481 60*a^2*e^(219/2*I*c) + 275
968703361738903640406319541699982398 5*a^2*e^(217/2*I*c) + 18046998899665602
300838581802100518559 4*a^2*e^(215/2*I*c) + 1127937394020555226758111602017 8
794202*a^2*e^(213/2*I*c) + 672482982322867333315410721290945657*a^2*e^(211/
2*I*c) + 381679523368539644501949853229997 60*a^2*e^(209/2*I*c) + 2057571526
219280176660569426269565*a^2*e^(207/2*I*c) + 105091017765905750210205432017
088*a^2*e^(205/2*I*c) + 50714163711386971235167483127 97*a^2*e^(203/2*I*c) +

230518924833500391396633471432*a^2*e^(201/2*I*c) + 9835474093767985284835740178*a^2*e^(199/2*I*c) + 3923726358719533376077064 40*a^2*e^(197/2*I*c) + 145708670947456920632644 65*a^2*e^(195/2*I*c) + 50111447639071261905808 9*a^2*e^(193/2*I*c) + 1586642140858074756896 7*a^2*e^(191/2*I*c) + 459291145921837770879*a^2*e^(189/2*I*c) + 12054885718238165655*a^2*e^(187/2*I*c) + 284015632089714525*a^2*e^(185/2*I*c) + 5932441401233490*a^2*e^(183/2*I*c) + 108143463042714*a^2*e^(181/2*I*c) + 1685352670794*a^2*e^(179/2*I*c) + 21830993145*a^2*e^(177/2*I*c) + 225643340*a^2*e^(175/2*I*c) + 1744665*a^2*e^(173/2*I*c) + 8970*a^2*e^(171/2*I*c) + 23*a^2*e^(169/2*I*c))/(e^(517*I*c) + 418*e^(516*I*c) + 87153*e^(515*I*c) + 12085216*e^(514*I*c) + 1253841160*e^(513*I*c) + 103818048048*e^(512*I*c) + 7146142307307*e^(511*I*c) + 420601518659718*e^(510*I*c) + 21608403021340047*e^(509*I*c) + 984382804329835768*e^(508*I*c) + 40261256699368950388*e^(507*I*c) + 1493326612293984160368*e^(506*I*c) + 50648660944512569972179*e^(505*I*c) + 1581796642397812408161814*e^(504*I*c) + 45759117183402579073139583*e^(503*I*c) + 1232445557346832245176696904*e^(502*I*c) + 31042222522074681615625020522*e^(501*I*c) + 734057263616388449968842366924*e^(500*I*c) + 16353164647151530240529137618111*e^(499*I*c) + 344277152012875134140739302960914*e^(498*I*c) + 6868329225263681349501997341320517*e^(497*I*c) + 130171193079172823835151430773360024*e^(496*I*c) + 2348998374244347079532766203075607598*e^(495*I*c) + 404436247814153115818578323890996 34564*e^(494*I*c) + 665634670676210063754191847109971141414*e^(493*I*c) + 10490402669510897424624643766470754045064*e^(492*I*c) + 158566476113257562566117432227203884298856*e^(491*I*c) + 2302150411226234925855222345201500900533576*e^(490*I*c) + 32147887693375338817454482515377350383950278*e^(489*I*c) + 432333688644261557547944179250800440604964868*e^(488*I*c) + 5605927253067558551780452883689835514455118670*e^(487*I*c) + 70164515322544462906873548813748091084561870680*e^(486*I*c) + 848552202276512356496200136959676295361696315113*e^(485*I*c) + 9925490738534402272939987038714580495445431374618*e^(484*I*c) + 112391604542246650966429162063124338952554575234051*e^(483*I*c) + 1233096700139723365181997220750932590655287625342156*e^(482*I*c) + 13118781801172174729679339894318153694964675368481194*e^(481*I*c) + 135442594916636116191574650625331646238501101627937224*e^(480*I*c) + 1357990663161479842850642848032544982878359839580349899*e^(479*I*c) + 13231708870104896973800056733779919089340836756009580718*e^(478*I*c) + 125370496586921272662198050851269323171167338854081782959*e^(477*I*c) + 1155855412893594260345544966642687823630035899363232371472*e^(476*I*c) + 10375184499871175501909398956596684116802997082526660323524*e^(475*I*c) + 90722605722208814918642284639487187764607589706493970774776*e^(474*I*c) + 773204636991145775061462731028098506094432675788136295011259*e^(473*I*c) + 6426195485535248576425068136870465530087114003875716691383902*e^(472*I*c) + 52108117629177048660492400985175830987505700566877818954141639*e^(471*I*c) + 412430698299915190848067222327219435067747934091894670488982928*e^(470*I*c) + 3187749929744346497211536044751776582320958627923816470590659024*e^(469*I*c) + 24070801913529757101858022914372045864746991786182039740274325264*e^(468*I*c) + 177642829135119348577194437675802830239905460092687136494961404333*e^(467*I*c) + 128181

746491497081085960418982835900079078992116940530461221125181 8*e^(466*I*c) +
 9046693523825682979044338963104263167672586826367911338826483549173*e^(465
*I*c) + 624735507810532953177107746902471141241251875657318484417819040326 7
2*e^(464*I*c) + 42227612663200368754775474655570998871052713308666016136635
3656787288*e^(463*I*c) + 27947091044756866118427906949736991644822547239772
1020972566130440 3472*e^(462*I*c) + 181157684956157580767103030555056255892 5
429365919331415341833394459640 8*e^(461*I*c) + 115051481852080848873700388 35
452131556764036512400310369117669719429232 0*e^(460*I*c) + 71609949759905807
9895633338552940229192858196481597830078819711862600096*e^(459*I*c) + 43694
424829101139145653531360695958626693388580534193812141312419250470 08*e^(458
*I*c) + 2614397627990202144347194566508025456305681018352040188980028549314
4867448*e^(457*I*c) + 153436088745056254127327239461577071933130157764595 99
711397351318318839937 6*e^(456*I*c) + 88350096882179120260077454192776920073
7689393513734789368397093333311961880*e^(455*I*c) + 499251971245704398350 53
7797660795398839736829759111495799180489368837186768 0*e^(454*I*c) + 2769311
65383432592259833826376479361226640338596151334898466646943614710283 10*e^(4
53*I*c) + 1508223814314124137735664742100117468522974375970591862952439894 8
1140398152780*e^(452*I*c) + 80667954360758914075930501079618956826984202161
33889552189162788231826394881 90*e^(451*I*c) + 42381258467632325863941885698
5868582675532800554862743701930140585132588759448 0*e^(450*I*c) + 2187648289
271390992804034561257870580512150875622669631708765182425224141866332 0*e^(4
49*I*c) + 1109691996873209747499222595952504443412192185353496557625911925 7
6535872151766080*e^(448*I*c) + 553269128819528612502918869558947829098021 95
630934984358404463151229177880008149 0*e^(447*I*c) + 27118432396707175276056
404901488335071302424484039783185232377219442003928301085 80*e^(446*I*c) + 1
306981720348828988619320550837581839212499138234016031688650718129654898101
4818410*e^(445*I*c) + 619485966530355028795643388152343106604109020378824 73
1618047744929162165758800776 80*e^(444*I*c) + 28882075526473065446996857202 1
0471094273186195089958020206899045903194762954083242 80*e^(443*I*c) + 132475
641236783747315747282116248369112096650194895392649224164378826428454643722
1120*e^(442*I*c) + 597899217294414321845916114929981970632173211157849452 52
452287429764684091053955362 90*e^(441*I*c) + 265568063890434075344967023691 0
1545795994861757741414789944652712127566910185274123140*e^(440*I*c) + 11610
455168355504376291150171211639931373302113267748111282404724636179404963572
6479850*e^(439*I*c) + 499707567253859084357596314813794768069337190915967 49
190748890493392267757966535433896 0*e^(438*I*c) + 21175897334668557071015014
2921041472240183883794075284161854144088854572994313820903682 0*e^(437*I*c)
+ 88367206408604703056945140215479695512967940922669830441183757900258545 84
036796364768280*e^(436*I*c) + 363183696523025917321974444097981220226408246
04130555250674258679518326735438284787588573 0*e^(435*I*c) + 1470308167322768
331630415820995920475120437252253533392388191651930004076295447457532217 40*
e^(434*I*c) + 586403466972683242741643328921560909375197453864243299571990 9
6460885724577113414520417499 0*e^(433*I*c) + 23043510733738403573791785976 73
066352016682781689139842097376663118488803841131935313641840*e^(432*I*c) +
89232094473432967633318818816384717934996186706010260597308959626532917702 2

9493028162575100*e^(431*I*c) + 340540538512955691543523467221771726551875489107820085047183241687250294385891623492116280 40*e^(430*I*c) + 128098914601688539672480541830409847707367500438601536803204497701119911289087105659482783340*e^(429*I*c) + 475010578857601519272316617938425222421786597241671026894318515408511467140969393115768793680*e^(428*I*c) + 1736574218818191071874197472450158123883564209950658639102337148122769080611680719741726053840*e^(427*I*c) + 62598721568222528436509607082350347102013627760571766472263230897514465652888501038981538599 20*e^(426*I*c) + 2225195917679577775716736603600748022221136423214639980386437096339149122368724582345735158014 0*e^(425*I*c) + 78009807368024239875613733058851417125327114681070889640794249282633470580756557083923203377160*e^(424*I*c) + 26974580144021129697268360186387895435796230852007659517712822762927324021520970821849736341414 0*e^(423*I*c) + 92008939302958903287460185002715932261252636844477148978197436107884752889146883103843606495192 0*e^(422*I*c) + 30961319716215201623803015542414654517823620868102875377489029049859340201795657061771314216145 90*e^(421*I*c) + 1027936473066384084473957786246926260464886191429797258916524353065123069072624446247919989425518 0*e^(420*I*c) + 33675398872021568375902384593982753362559801058104184627345411136262431943240778260721756991027090*e^(419*I*c) + 108867995731829472826732905192034886797284621356445627530909104429486741257822633476898356826454040*e^(418*I*c) + 347351473214713780874352083129566601238765762775942366762733349952103889753982636403857556867777300*e^(417*I*c) + 1093853214486220358674032434500866678499770011305874172488975951612031456734608287095519501041975440*e^(416*I*c) + 340023256060165161752169468084708984419802883169441742479486877932895054841812560544688208115263609 0*e^(415*I*c) + 1043411751657039596665369315558240210946034809547302780741232142734681692856719777037649617025180394 0*e^(414*I*c) + 316109393312846927506943064436184146560959695209452157430040445603868952418015791565434519407133517 30*e^(413*I*c) + 945561802589319869193343034663656528268580913143291891607362771758738417321964533799537056794668268 80*e^(412*I*c) + 279285755800035206679835368898165477644864987794665387827488933863633745047373109049265172681702585720*e^(411*I*c) + 814608187736530579670210025271921415597183369881214299823291969785549876175969866367976653244974728560*e^(410*I*c) + 234651821923910514223814163307346476889915570893502577804763741268178157576542221912740926015943871225 0*e^(409*I*c) + 66758662903711473585037668656692890108935438698305387087249452915809511791882966061581112577069686047 40*e^(408*I*c) + 1875998821886556356416363573598607327825573725740570627910889136637842846741455993048117286353859819389 0*e^(407*I*c) + 5207517851879327038642926335154430695110499354250058293815524168940813867525460803084790716774857173472 0*e^(406*I*c) + 1428017924502217624831808749188252741343051332754177800847950346447635093335031505173458646596671894170 80*e^(405*I*c) + 38687621823427716563245172304997988926311528237460754169244317667399751374281359173617116965225061118648 0*e^(404*I*c) + 10355619825920029352263845779086115486121114950801935736913398647060291864824662418056649493810498562585 10*e^(403*I*c) + 27388956247952656033552276465660008862807783050848257029119389036561620042627361826577004063019140700623 80*e^(402*I*c) + 715812468684294147547380736

3679839718172745581538409044503383852693596921622426696740453944718143025248390*e^(401*I*c) + 1848740529900573269375272861187649089085835702197488237157062380018624513772266094364175297685292443987088 0*e^(400*I*c) + 471882208434662076950995069535737803571088974914225678980481990182077089970053338601488364795274561560145 20*e^(399*I*c) + 119041855403877964948229577948370465600606623183045529526900430209270473212773847794935586074714329479939280*e^(398*I*c) + 2968255152826695896853182732802390500845550322034159415119626595968816157137999376800264974083056722976188 40*e^(397*I*c) + 7315849722068183628747296214039744442800104463011615273397605448153009517879855384197646562145826672199140 80*e^(396*I*c) + 1782446114931751850556354856638421901174412322298249496591658053939787198246565945975595575734193348887952160*e^(395*I*c) + 4293206478008022126017488908851826494790620720660151451468181910917240027863968724539127659633517053002976480*e^(394*I*c) + 1022318202595486076721739030518645192356214547367429361991806349041148749612180459027459270277057151545641468 0*e^(393*I*c) + 2406878513970527716119346564450614328524136103776821681892218440014104846021094469664775272337193287459459732 8*e^(392*I*c) + 5602868342490351765849501385853451616716259103436797249817466090745066677815435327163034465077788568354762418 4*e^(391*I*c) + 1289670800847547122460236808664883849832862590255331320446361090495451440295470033477615216662839779316401784 64*e^(390*I*c) + 2935507435543427098081294535765623132997059826991874168629343739642556159671386762532763025915615235156032644 03*e^(389*I*c) + 6607644731058690976914759738508379345110890331495867079827642633947667566495652798791461733183865057403910939 90*e^(388*I*c) + 1470931146618934345515038362300100160482127749581443929904746910224777470198899052379114493999887003199419829579*e^(387*I*c) + 3238491931361851476423321933539579098377735539207641467346235665823887048326949305609231585143748690203615957136*e^(386*I*c) + 7052132414162197992602326524580143060985353054572933905524633121681021037340298366342203324325307072413739061024*e^(385*I*c) + 1518963421490880039641791172264375474804852010973481245910987881049384438106265081897119963712145874945624327441 6*e^(384*I*c) + 3236273132241954941033008894364024746037832856131642293129242714590288791307164367950290905589123675514320738260 9*e^(383*I*c) + 6820803309679361568378440961924421081861499164004155342440552787689327249660832423109814850246645396715772807899 4*e^(382*I*c) + 1422131159648145176823866727676990948227168131879088984050103944174863554536246767983244910352032195301178008306 9*e^(381*I*c) + 2933449200343007202870423834483428663138062854550400678230804455975459700234462315635541351331054935163163200592 72*e^(380*I*c) + 5986501411122418589116765051805201503640032268413280814535970935877903386092124390855544668615826233503030619610 52*e^(379*I*c) + 1208770358493658393089442222056935063283704108140593750226539846117737648216609559734831601248698274330296158612 144*e^(378*I*c) + 2414966516810338503289076549202740511710059011795447138773464205696455026442712426409599662771080264826008985061 097*e^(377*I*c) + 4774141111066098970221845330594962016472714230374234060663956846950926642685946929064114194400360936223590725470 146*e^(376*I*c) + 9339341958053494225251750965715057300707302083814774770306218224241022648247419956042957363055823830898547303219757*e^(375*I*

c) + 1807982006802885997034993862300723067656331420670884849990013964123733
47632664793469632379360393281131850415917938 48*e^(374*I*c) + 34637657172671
690167657344537197087048882354853993270472063943078773600446542963548348101
2693904434644807545139285 02*e^(373*I*c) + 6567485926886730009882737581287 52
256106545516862611036816640070075371157780972935335652438288733837229803532
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910820629699606824190117457757389218177533919544626093238814 89157*e^(371*I*
c) + 2289113117385927800914926491623468344058677407764563261084109288572571
7470728926807434755022579324474192335439530 8214*e^(370*I*c) + 4208463426089
493872775590214579245865781209661485610226470084995294684520059801751194106
2895621049760956600296988 4927*e^(369*I*c) + 76586779551396278101255844462 87
514187109408952813047908367436615820716500321548914828664063148344331994554
59798934952*e^(368*I*c) + 13796765297962120740171061880665894483554465012 10
8901951071648603502289285868155390030628750267119319419477386903607 22*e^(36
7*I*c) + 2460442375845422663927081630983260714734968091905493027145639238 82
719225488634936112699145769240985112087330748745 7468*e^(366*I*c) + 43439096
966019321733573596877815792937012956819408271142154331753360939678459087667
40738240037114570667410936998017178*e^(365*I*c) + 75927527001466789611530 95
073585015473197029746533633331549793961473285760935801904155116764831560875
947581048693527224*e^(364*I*c) + 131397714941049338818566811514182931122425
515215356868711812665798138776063481602617472013177357825660213067982983360
24*e^(363*I*c) + 2251467574130806996150616558650287243042193021067326439299
72864856006401038672536048477155470605929676906537959511425 20*e^(362*I*c) +
38199015867586087976002998756627674994795440667903625029322346250133286489
1208750050136381281138939603496702807071615 30*e^(361*I*c) + 641751006932600
668062380648860045971707408433000868393686161391645291080498446753531118427
2579865808884034724149609964 4*e^(360*I*c) + 1067648320171655948380852341893
335287335876733299725300926610851867899392529159370907602822323469190904262
43399409323314*e^(359*I*c) + 1758962582627559857571068126139793012658010315
9548435361490467286516944223207577658044718413414137599577009149924675952 8*
e^(358*I*c) + 2869929436312314965572780108515769408968264974660663275288015
6067700711283743192673508812097486176051136700881572878264 3*e^(357*I*c) + 4
637582884573671545449376782550056887333281455680493104239955998860128006386
19904022368378591108842602342094543682299102*e^(356*I*c) + 7422286409081731
249169370494625256173341489196791182704898310054977819512210699558396234524
9974865312465887355340144213 7*e^(355*I*c) + 117660072097578696518987505 0890
231092204612696970277433014535895788956771230793520381993106606880564628599
822341722801012*e^(354*I*c) + 184750585646245153344528430057132632378116255
330456597188767075809107930679482183492817077312636463972207157013170378533
4*e^(353*I*c) + 287361053592234018708083543558291227727196797739472015979 10
70274927714276869531467182688981041061381703885403497544001592*e^(352*I*c)
+ 4427673079105425318524316112985693656584851936100192457044455134483305045
3214525163471184881332248236704651034839548051 61*e^(351*I*c) + 675848043788
852437256293594896385762669485554719551948612287756798171858726236287199496
7079401831957927901682582941234362*e^(350*I*c) + 1022042377943463485133997 5

29516339964170212224966366619305300830202609693215856833830941823739554135181902690795322068101 3*e^(349*I*c) + 15312837206662775379347353212807682965712535652942631518286142403097738200270711195396582159028513532779682154451996208592*e^(348*I*c) + 22731603566128841100419501947051367666836652418077260913944810748473084891890410181285412604854876625919565639521227223276*e^(347*I*c) + 33435897827936581301171175459610829454298167962017419810072936733378506584428024201072453193458155334046693516742390717832*e^(346*I*c) + 48733253505974923400852255563052101402196469313659554492725674754339375283010407167744366955828922837488705858532439654489*e^(345*I*c) + 70386349760594831567048224061395025698501202296966300376764220336697702961591099854055411376294871437468149528524796002762*e^(344*I*c) + 10074496185185374461175430098298016696240455383622292186848469426996612060769890704634373101116094882810027672937013281935 7*e^(343*I*c) + 14290631912305552424654692847895423837131592580202238923649865213683982250203515567697091741903983458796705558843156 6416784*e^(342*I*c) + 20090658715357880438030046950144161017452185125954192920984068896085945490851977483590589575766677085788861173875185846042 4*e^(341*I*c) + 27994524447503980482296673046296088449211987485779114712400907947692043594173529330930543043868733312991245419677407010726 4*e^(340*I*c) + 38664267305038004945738256281831696265197555099077927704874023862985879501824735616288863101568766478010120528733308274879 1*e^(339*I*c) + 52932925276411392600393483695824355767254923899756073921440659918504783195557258376535863439540877152800974546754838295009 4*e^(338*I*c) + 71836159638205824920911354448790108886838874403371321033249197137590673834155154045726480430403966425591560734980191196655 1*e^(337*I*c) + 96645827536903771874773913079815164348359068416683223468809829116416063641815945211981572880937212516883623936444 2397344064*e^(336*I*c) + 12890435152929339564806343304996770401810439356201069142673110679000300583988397876923769540905452785545449977100587547724 00*e^(335*I*c) + 17045829967078228082046782181676930026986611477127723550214565438109300696371880858828247575006052469632108103517064053494 08*e^(334*I*c) + 22348912763984394644786225783064348407246104844681778598226206586919214786452666530625638235530012280010090936067510661689 44*e^(333*I*c) + 29053857223200570019533452744894827908566925299598237495326959634141648333667731282186078993285886089161765937720886225824 64*e^(332*I*c) + 37452575948766512046573349884262263881439545019868306642223492263610796095468222760675048993867030889823081857171434072113 28*e^(331*I*c) + 47875274427809456851452048469715961653041694193282440732114595921296492550488768540598447206610781512881796125749863591945 60*e^(330*I*c) + 60689498031567122483318711053298954717228061430088780149865596536872606948165504701958900045119655275674327229697075 77202160*e^(329*I*c) + 76297318156278215804689924242070083664388967363330246618638381051104451489469623282976315470325434198118210158378630136827 20*e^(328*I*c) + 95130322740195229542091131912682266422999120135256659402983810647978856909049931289480352274121440356338517795112193352773 60*e^(327*I*c) + 11764212274876484080010900714673474493371278160557811983724455826566055617658086479368641864908119643412413644803772131657280*e^(326*I*c) + 14429816285208431204532978375375691965063154224649747551295851507389524083226976789 6

886013696283999007476585792019293007442600*e^(325*I*c) + 1755627327122429239
688729140312571621349148626114547857137675169010565606783804215103827138130
0372757755676325408026834544840*e^(324*I*c) + 21188321405882887539610198374
706862695894049226077093764132512513336190523978949694387686059124526755048
042957954264706637460*e^(323*I*c) + 253671764391193536215322603359833481549
049826061257617113006834929633908164915830257052687375399821496393002265126
57426118880*e^(322*I*c) + 3012848241455270326455901895308817715601343749343
820107841376983544836614812175454919759112996717076496970018034869920783896
0*e^(321*I*c) + 35500103106019649876272376796949482209581372371036005012877
806027481672807059943445240136315568500732379966585005678181937920*e^(320*I
*c) + 414998321219637080437885237874013455417800889305382069188535790267492
73364671640037563488607716092887686471542838602788559660*e^(319*I*c) + 4813
311767818402921650374854911037447892471909463560389282936486391655379227882
2957368285106328164715910598370871149079494360*e^(318*I*c) + 55390913044972
086219432689146331566081427959896969900214434296817731150863867056620768608
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460751755699240769813381384831580424067474538747293876317105449952471529122
05118500597511052824347680*e^(316*I*c) + 7166032986117339552444194388928410
913409115784465524567208423740243494469646492713181219065962951114063950174
3303863582092880*e^(315*I*c) + 80566249130682684181876201882623511206363790
337218011954110210642927765997644903820595421936873565314654415769070472655
401600*e^(314*I*c) + 898838158013823822139732704779546027447928770180519633
47146307372464315121274929402347942874802899499538953561056667668891020*e^(
313*I*c) + 9951220647205796595134034173802354851533640337171789804085047095
4657532977279113491506880290726111154101941386019689567958040*e^(312*I*c) +
 10933253734996622320393267850342635707986370700172829401104207653040392386
2654018978676516417314221089449922495612732870169660*e^(311*I*c) + 11920971
370203392705575539782368844444464742432450218532862634704659963472114657383
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341076386342709732994858617357459586270584915928094304645874266316345401849
1463855395649453952212899632198680*e^(309*I*c) + 13852979454915108945135276
957654340312633074724368003083246720589581904356815523926487676286717275433
8684027849855385453216080*e^(308*I*c) + 14764892080554533341862312176785377
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158921073057836572747625947647446595542850233667374368649917569867787569361
1243400*e^(306*I*c) + 16397781605960772537526455981650584789418778510145536
0391897424482998415385787605765315509208337741590143078572243505132706580*e
^(305*I*c) + 17086984886895310117686030605310399434053039034726008843267684
2505555141293830838961275974268928666494845723462544709102843680*e^(304*I*c
) + 17672092997055464200457577005309570059533465987068273203197591553238757
7052414866323511140117680492929354517559479899220940360*e^(303*I*c) + 18140
816877092205982036855331669732163998486262829882856956027329563089762682934
5263592219034560853530733710529842148537901680*e^(302*I*c) + 18483115198374
894181766785017470825713812817215826941328776535853224077324433619190081855

782990589568449488941045192152421284 0*e^(301*I*c) + 1869154744365675149263514056231175032619875083519300838245664444356891392336834117046418287621787991778480642201508183552612 80*e^(300*I*c) + 187615393168510050071497280564603510912403132920312024370835062679037644990286285346673507093452964351257962696133511725652320*e^(299*I*c) + 18691547443656751492635140562311750326198750835193008382456644443568913923368341170464182876217879917784806422015081835526128 0*e^(298*I*c) + 18483115198374894181766785017470825713812817215826941328776535853224077324433619190081855782990589568449488941045192152421284 0*e^(297*I*c) + 18140816877092205982036855331669732163998486262829882856956027329563089762682934526359221903456085353073371052984214853790168 0*e^(296*I*c) + 17672092997055464200457577005309570059533465987068273203197591553238757705241486632351114011768049292935451755947989922094036 0*e^(295*I*c) + 17086984886895310117686030605310399434053039034726008843267684250555514129383083896127597426892866649484572346254470910284368 0*e^(294*I*c) + 16397781605960772537526455981650584789418778510145536039189742448299841538578760576531550920833774159014307857224350513270658 0*e^(293*I*c) + 15618596295355119616973821883217369650985255158921073057836572747625947647446595542850233667374368649917569867787569361124340 0*e^(292*I*c) + 14764892080554533341862312176785377739978292474830122879392434257499993795542176537010123512293955746754854920217455000960478 0*e^(291*I*c) + 13852979454915108945135276957654340312633074724368003083246720589581904356815523926487676286717275433868402784985538545321608 0*e^(290*I*c) + 12899507601159190341076386342709732994858617357459586270584915928094304645874266316345401849146385539564945395221289963219868 0*e^(289*I*c) + 11920971370203392705575539782368844444464742432450218532862634704659963472114657383068154049533354314677681091191041046862896 0*e^(288*I*c) + 10933253734996622320393267850342635707986370700172829401104207653040392386265401897867651641731422108944992249561273287016966 0*e^(287*I*c) + 99512206472057965951340341738023548515336403371717898040850470954657532977279113491506880290726111154101941386019689567958040*e^(286*I*c) + 89883815801382382213973270477954602744792877018051963347146307372464315121274929402347942874802899499538953561056667668891020*e^(285*I*c) + 80566249130682684181876201882623511206363790337218011954110210642927765997644903820595421936873565314654415769070472655401600*e^(284*I*c) + 71660329861173395524441943889284109134091157844655245672084237402434944696464927131812190659629511140639501743303863582092880*e^(283*I*c) + 63247774101012179051794946075175569924076981338138483158042406747453874729387631710544995247152912205118500597511052824347680*e^(282*I*c) + 55390913044972086219432689146331566081427959896969900214434296817731150863867056620768608187679709720152974148474907904177340*e^(281*I*c) + 48133117678184029216503748549110374478924719094635603892829364863916553792278822957368285106328164715910598370871149079494360*e^(280*I*c) + 41499832121963708043788523787401345541780088930538206918853579026749273364671640037563488607716092887686471542838602788559660*e^(279*I*c) + 35500103106019649876272376796949482209581372371036005012877806027481672807059943445240136315568500732379966585005678181937920*e^(278*I*c) + 30128482414552703264559018953088177156013437493438201078413769835448366148121754549197591

1299671707649697001803486992078389 60*e^(277*I*c) + 2536717643911935362153226033598334815490498260612576171130068349296339081649158302570526873753998214963930022651265742611888 0*e^(276*I*c) + 2118832140588288753961019837470686269589404922607709376413251251333619052397894969438768605912452675504804295795426470663746 0*e^(275*I*c) + 1755627327122429239688729140312571621349148626114547857137675169010565606783804215103827138130037275775567632540802683454484 0*e^(274*I*c) + 1442981628520843120453297837537569196506315422464974755129585150738952408322697678968860136962839990074765857920192930074426 0*e^(273*I*c) + 1176421227487648408001090071467347449337127816055781198372445582656605561765808647936864186490811964341241364480377213165728 0*e^(272*I*c) + 9513032274019522954209113191268226642299912013525665940298381064797885690904993128948035227412144035633851779511219335277360*e^(271*I*c) + 76297318156278215804689924242070083664388967363330246618638381051104451489469623282976315470325434198118210158378630136827 20*e^(270*I*c) + 6068949803156712248331871105329895471722806143008878014986559653687260694816550470195890004511965527567432722969707577202160*e^(269*I*c) + 4787527442780945685145204846971596165304169419328244073211459592129649255048876854059844720661078151288179612574986359194560*e^(268*I*c) + 3745257594876651204657334988426226388143954501986830664222349226361079609546822276067504899386703088982308185717143407211328*e^(267*I*c) + 2905385722320057001953345274489482790856692529959823749532695963414164833366773128218607899328588608916176593772088622582464*e^(266*I*c) + 2234891276398439464478622578306434840724610484468177859822620658691921478645266653062563823553001228001009093606751066168944*e^(265*I*c) + 17045829967078228082046782181676930026986611477127723550214565438109300696371880858828247575006052469632108103517064053494 08*e^(264*I*c) + 1289043515292933956480634330499677040181043935620106914267311067900030058398839787692376954090545278554544997710058754772400*e^(263*I*c) + 96645827536903771874773913079815164348359068416683223468809829116416063641815945211981572880937212516883623936444239734406 4*e^(262*I*c) + 71836159638205824920911354448790108886838874403371321033249197137590673834155154045726480430403966425591560734980191196655 1*e^(261*I*c) + 5293292527641139260039348369582435576725492389975607392144065991850478319555725837653586343954087715280097454675483829500 94*e^(260*I*c) + 38664267305038004945738256281831696265197555099077927704874023862985879501824735616288863101568766478010120528733308274879 1*e^(259*I*c) + 279945244475039804822966730462960884492119874857791147124009079476920435941735293309305430438687333129912454196774070107264*e^(258*I*c) + 20090658715357880438030046950144161017452185125954192920984068896085945490851977483590589575766677085788861173875185846042 4*e^(257*I*c) + 14290631912305552424654692847895423837131592580202238923649865213683982250203515567697091741903983458796705558843156641678 4*e^(256*I*c) + 10074496185185374461175430098298016696240455383622292186848469426996612060769890704634373101116094882810027672937013281935 7*e^(255*I*c) + 70386349760594831567048224061395025698501202296966300376764220336697702961591099854055411376294871437468149528524796002762*e^(254*I*c) + 48733253505974923400852255563052101402196469313659554492725674754339375283010407167744366955828922837488705858532439654489*e^(253*I*

c) + 334358978279365813011711754596108294542981679620174198100729367333785065844280242010724531934581553340466935167423907178 32*e^(252*I*c) + 22731603566128841100419501947051367666836652418077260913944810748473084891890410181285412604854876625919565639521227223276*e^(251*I*c) + 15312837206662775379347353212807682965712535652942631518286142403097738200270711195396582159028513532779682154451996208592*e^(250*I*c) + 10220423779434634851339975295163399641702122249663666193053008302026096932158568338309418237395541351819026907953220681013*e^(249*I*c) + 67584804378885243725629359489638576266948555471955194861228775679817185872623628719949670794018319579279016825829412343 62*e^(248*I*c) + 44276730791054253185243161129856936565848519361001924570444551344833050453214525163471184881332248236704651034839548051 61*e^(247*I*c) + 28736105359223401870808354355829122772719679773947201597910702749277142768695314671826889810410613817038854034975440015 92*e^(246*I*c) + 18475058564624515334452843005713263237811625533045659718876707580910793067948218349281707731263646397220715701317037853 34*e^(245*I*c) + 11766007209757869651898750508902310922046126969702774330145358957889567712307935203819931066068805646285998223417228010 12*e^(244*I*c) + 74222864090817312491693704946252561733414891967911827048983100549778195122106995583962345249974865312465887355340144213 7*e^(243*I*c) + 46375828845736715454493767825500568873332814556804931042399559988601280063861990402236837859110884260234209454368229910 2*e^(242*I*c) + 28699294363123149655727801085157694089682649746606632752880156067700711283743192673508812097486176051136700881572878264 3*e^(241*I*c) + 17589625826275598575710681261397930126580103159548435361490467286516944223207577658044718413414137599577009149924675952 8*e^(240*I*c) + 10676483201716559483808523418933352873358767332997253009266108518678993925291593709076028223234691909042624339940932331 4*e^(239*I*c) + 64175100693260066806238064886004597170740843300086839368616139164529108049844675353111842725798658088840347241496099644*e^(238*I*c) + 38199015867586087976002998756627674994795440667903625029322346250133286489120875005013638128113893960349670280707161530*e^(237*I*c) + 22514675741308069961506165586502872430421930210673264392997286485600640103867253604847715547060592967690653795951142520*e^(236*I*c) + 13139771494104933881856681151418293112242551521535686871181266579813877606348160261747201317735782566021306798298336024*e^(235*I*c) + 75927527001466789611530950735850154731970297465336333315497939614732857609358019041551167648315608759475810486935272 24*e^(234*I*c) + 43439096966019321733573596877815792937012956819408271142154331753360939678459087667407382400371145706674109369980171 78*e^(233*I*c) + 24604423758454226639270816309832607147349680919054930271456392388271922548863493611269914576924098511208733074874574 68*e^(232*I*c) + 13796765297962120740171061880665894483554465012108901951071648603502289285868155390030628750267119319419477386903607 22*e^(231*I*c) + 76586779551396278101255844462875141871094089528130479083674366158207165003215489148286640631483443319945545979893495 2*e^(230*I*c) + 42084634260894938727755902145792458657812096614856102264700849952946845200598017511941062895621049760956600296988492 7*e^(229*I*c) + 22891131173859278009149264916234683440586774077645632610841092885725717470728926807434755022579324474192335439530821 4*e^(228*I*c) + 123

243941519332384741960072588103506596406339253616391082062969960682419011745
775738921817753391954462609323881489157*e^(227*I*c) + 656748592688673000988
273758128752256106545516862611036816640070075371157780972935335652438288733
83722980353200611956*e^(226*I*c) + 3463765717267169016765734453719708704888
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2*e^(225*I*c) + 18079820068028859970349938623007230676563314206708848499900
139641237334763266479346963237936039328113185041591793848*e^(224*I*c) + 933
934195805349422525175096571505730070730208381477477030621822424102264824741
9956042957363055823830898547303219757*e^(223*I*c) + 47741411110660989702218
453305949620164727142303742340606639568469509266426859469290641141944003609
36223590725470146*e^(222*I*c) + 2414966516810338503289076549202740511710059
011795447138773464205696455026442712426409599662771080264826008985061097*e^
(221*I*c) + 120877035849365839308944222205693506328370410814059375022653984
6117737648216609559734831601248698274330296158612144*e^(220*I*c) + 59865014
111224185891167650518052015036400322684132808145359709358779033860921243908
5554466861582623350303061961052*e^(219*I*c) + 29334492003430072028704238344
834286631380628545504006782308044559754597002344623156355413513310549351631
6320059272*e^(218*I*c) + 14221311596481451768238666727676990948227168131879
0889840501039441748635545362467679832449103520321953011780083069*e^(217*I*c
) + 68208033096793615683784409619244210818614991640041553424405527876893272
496608324231098148502466453967157728078994*e^(216*I*c) + 323627313224195494
103300889436402474603783285613164229312924271459028879130716436795029090558
91236755143207382609*e^(215*I*c) + 1518963421490880039641791172264375474804
8520109734812459109878810493844381062650818971199637121458749456243274416*e
^(214*I*c) + 70521324141621979926023265245801430609853530545729339055246331
21681021037340298366342203324325307072413739061024*e^(213*I*c) + 3238491931
361851476423321933539579098377735539207641467346235665823887048326949305609
231585143748690203615957136*e^(212*I*c) + 147093114661893434551503836230010
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9579*e^(211*I*c) + 66076447310586909769147597385083793451108903314958670798
2764263394766756649565279879146173318386505740391093990*e^(210*I*c) + 29355
074355434270980812945357656231329970598269918741686293437396425561596713867
6253276302591561523515603264403*e^(209*I*c) + 12896708008475471224602368086
648838498328625902553313204463610904954514402954700334776152166628397793164
0178464*e^(208*I*c) + 56028683424903517658495013858534516167162591034367972
498174660907450666778154353271630344650777885683547624184*e^(207*I*c) + 240
687851397052771611934656445061432852413610377682168189221844001410484602109
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6414680*e^(205*I*c) + 42932064780080221260174889088518264947906207206601514
51468181910917240027863968724539127659633517053002976480*e^(204*I*c) + 1782
446114931751850556354856638421901174412322298249496591658053939787198246565
945975595575734193348887952160*e^(203*I*c) + 731584972206818362874729621403
974444280010446301161527339760544815300951787985538419764656214582667219914
080*e^(202*I*c) + 296825515282669589685318273280239050084555032203415941511

962659596881615713799937680026497408305672297618840*e^(201*I*c) + 119041855
403877964948229577948370465600606623183045529526900430209270473212773847794
935586074714329479939280*e^(200*I*c) + 471882208434662076950995069535737803
57108897491422567898048199018207708997005333860148836479527456156014520*e^(
199*I*c) + 184874052990057326937527286118764908908583570219748823715706238O
01862451377226609436417529768529244398708800*e^(198*I*c) + 71581246868429414
754738073636798397181727455815384090445033838526935969216224266967404539447
18143025248390*e^(197*I*c) + 2738895624795265603355227646566000886280778305
084825702911938903656162004262736182657700406301914070062380*e^(196*I*c) +
103556198259200293522638457790861154861211149508019357369133986470602918648
24662418056649493810498562585l0*e^(195*I*c) + 386876218234277165632451723O4
997988926311528237460754169244317667399751374281359173617116965225061118648
0*e^(194*I*c) + 14280179245022176248318087491882527413430513327541778008479
503464476350933350315051734586465966718941708O*e^(193*I*c) + 52075178518793
270386429263351544306951104993542500582938155241689408138675254608030847907
167748571734720*e^(192*I*c) + 187599882188655635641636357359860732782557372
574057062791088913663784284674145599304811728635385981938 90*e^(191*I*c) + 6
675866290371147358503766865669289010893543869830538708724945291580951179188
296606158111257706968604740*e^(190*I*c) + 234651821923910514223814163307346
476889915570893502577804763741268178157576542221912740926015943871225O*e^(1
89*I*c) + 81460818773653057967021002527192141559718336988121429982329196978
554987617596986636797665324497472856O*e^(188*I*c) + 27928575580003520667983
536889816547764486498779466538782748893386363374504737310904926517268170258
5720*e^(187*I*c) + 94556180258931986919334303466365652826858091314329189160
736277175873841732196453379953705679466826880*e^(186*I*c) + 316109393312846
927506943064436184146560959695209452157430040445603868952418015791565434519
40713351730*e^(185*I*c) + 1043411751657039596665369315558240210946034809547
302780741232142734681692856719777037649617025180394O*e^(184*I*c) + 34002325
606016516175216946808470898441980288316944174247948687793289505484181256054
46882081152636090*e^(183*I*c) + 109385321448622035867403243450086667849977O
011305874172488975951612031456734608287095519501041975440*e^(182*I*c) + 347
351473214713780874352083129566601238765762775942366762733349952103889753982
636403857556867777300*e^(181*I*c) + 108867995731829472826732905192034886797
284621356445627530909104429486741257822633476898356826454040*e^(180*I*c) +
336753988720215683759023845939827533625598010581041846273454111362624319432
407782607217569910270 90*e^(179*I*c) + 102793647306638408447395778624692626O
464886191429797258916524353065123069072624446247919989425518O*e^(178*I*c) +
309613197162152016238030155424146545178236208681028753774890290498593402O1
795657061771314216145 90*e^(177*I*c) + 9200893930295890328746018500271593226
125263684447714897819743610788475288914688310384360649519 20*e^(176*I*c) + 2
697458014402112969726836018638789543579623085200765951771282276292732402152
097082184973634141 40*e^(175*I*c) + 7800980736802423987561373305885141712532
711468107088964079424928263347058075655708392320337716O*e^(174*I*c) + 22251
959176795777757167366036007480222211364232146399803864370963391491223687245
823457351580140*e^(173*I*c) + 625987215682225284365096070823503471020136277

605717664722632308975144656528885010389815385992O*e^(172*I*c) + 17365742188
181910718741974724501581238835642099506586391023371481227690806116807197417
26053840*e^(171*I*c) + 475010578857601519272316617938425222421786597241671O
268943185154085114671409693931157687936 80*e^(170*I*c) + 1280989146016885396
724805418304098477073675004386015368032044977011199112890871056594827833 40*
e^(169*I*c) + 340540538512955691543523467221771726551875489107820085047183 2
4168725029438589162349211628040*e^(168*I*c) + 892320944734329676333188188 16
38471793499618670601026059730895962653291770229493028162575100*e^(167*I*c)
+ 230435107337384035737917859767306635201668278168913984209737666311848880 3
841131935313641840*e^(166*I*c) + 586403466972683242741643328921560909375197
453864243299571990964608857245771134145204174990*e^(165*I*c) + 147030816732
276833163041582099592047512043725225353339238819165193000407629544745753221
740*e^(164*I*c) + 363183696523025917321974444097981220226408246041305525067
425867951832673543828478758857 30*e^(163*I*c) + 883672064086047030569451402 1
547969551296794092266983044118375790025854584036796364768280*e^(162*I*c) +
211758973346685570710150142921041472240183883794075284161854144088854572994
3138209036820*e^(161*I*c) + 499707567253859084357596314813794768069337190 91
596749190748890493392267757966535433896 0*e^(160*I*c) + 1161045516835550437 6
291150171211639931373302113267748111282404724636179404963572647985 0*e^(159*
I*c) + 265568063890434075344967023691015457959948617577414147899446527121 27
566910185274123140*e^(158*I*c) + 597899217294414321845916114929981970632173
2111578494525245228742976468409105395536290*e^(157*I*c) + 13247564123678374
731574728211624836911209665019489539264922416437882642845464372211 20*e^(156
*I*c) + 288820755264730654469968572021047109427318619508995802020689904590 3
19476295408324280*e^(155*I*c) + 619485966530355028795643388152343106604109 0
2037882473161804774492916216575880077680*e^(154*I*c) + 13069817203488289886
19320550837581839212499138234016031688650718129654898101481841 0*e^(153*I*c)
 + 271184323967071752760564049014883350713024244840397831852323772194420039
2830108580*e^(152*I*c) + 553269128819528612502918869558947829098021956309 34
98435840446315122917788000814 90*e^(151*I*c) + 110969199687320974749922259 59
52504443412192185353496557625911925765358721517660 80*e^(150*I*c) + 21876482
89271390992804034561257870580512150875622669631708765182425224141866332 0*e^
(149*I*c) + 423812584676323258639418856985868582675532800554862743701930140
5851325887594480*e^(148*I*c) + 806679543607589140759305010796189568269842 02
161338895521891627882318263948819 0*e^(147*I*c) + 150822381431412413773566 47
421001174685229743759705918629524398948114039815278 0*e^(146*I*c) + 27693116
538343259225983382637647936122664033859615133489846664694361471028310*e^(14
5*I*c) + 499251971245704398350537797660795398839736829759111495799180489368
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4789368397093333311961880*e^(143*I*c) + 153436088745056254127327239461577 07
19331301577645959971139735131831883993 76*e^(142*I*c) + 2614397627990202144 3
47194566508025456305681018352040188980028549314486744 8*e^(141*I*c) + 436944
248291011391456535313606959586266933885805341938121413124192504700 8*e^(140*
I*c) + 716099497599058079895633338552940229192858196481597830078819711862 60
0096*e^(139*I*c) + 115051481852080848873700388354521315567640365124003103 69

1176697194292320*e^(138*I*c) + 18115768495615758076710303055505625589254293
659193314153418333944596408*e^(137*I*c) + 279470910447568661184279069497369
9164482254723977210209725661304403472*e^(136*I*c) + 42227612663200368754775
4746555709988710527133086660161366353656787288*e^(135*I*c) + 62473550781053
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3523825682979044338963104263167672586826367911338826483549173*e^(133*I*c) +
 1281817464914970810859604189828359000790789921169405304612211251818*e^(132
*I*c) + 177642829135119348577194437675802830239905460092687136494961404333*
e^(131*I*c) + 2407080191352975710185802291437204586474699178618203974027432
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718*e^(120*I*c) + 1357990663161479842850642848032544982878359839580349899*e
^(119*I*c) + 135442594916636116191574650625331646238501101627937224*e^(118*
I*c) + 13118781801172174729679339894318153694964675368481194*e^(117*I*c) +
1233096700139723365181997220750932590655287625342156*e^(116*I*c) + 11239160
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72939987038714580495445431374618*e^(114*I*c) + 8485522022765123564962001369
59676295361696315113*e^(113*I*c) + 7016451532254446290687354881374809108456
1870680*e^(112*I*c) + 5605927253067558551780452883689835514455118670*e^(111
*I*c) + 432333688644261557547944179250800440604964868*e^(110*I*c) + 3214788
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22345201500900533576*e^(108*I*c) + 1585664761132575625661174322272038842988
56*e^(107*I*c) + 10490402669510897424624643766470754045064*e^(106*I*c) + 66
5634670676210063754191847109971141414*e^(105*I*c) + 40443624781415311581857
832389099634564*e^(104*I*c) + 2348998374244347079532766203075607598*e^(103*
I*c) + 130171193079172823835151430773360024*e^(102*I*c) + 68683292252636813
49501997341320517*e^(101*I*c) + 344277152012875134140739302960914*e^(100*I*
c) + 16353164647151530240529137618111*e^(99*I*c) + 734057263616388449968842
366924*e^(98*I*c) + 31042222522074681615625020522*e^(97*I*c) + 123244555734
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96642397812408161814*e^(94*I*c) + 50648660944512569972179*e^(93*I*c) + 1493
326612293984160368*e^(92*I*c) + 40261256699368950388*e^(91*I*c) + 984382804
329835768*e^(90*I*c) + 21608403021340047*e^(89*I*c) + 420601518659718*e^(88
*I*c) + 7146142307307*e^(87*I*c) + 103818048048*e^(86*I*c) + 1253841160*e^(
85*I*c) + 12085216*e^(84*I*c) + 87153*e^(83*I*c) + 418*e^(82*I*c) + e^(81*I
*c)))*tan(1/4*d*x + c) + (-23*I*a^2*e^(1027/2*I*c) - 8970*I*a^2*e^(1025/2*I
*c) - 1744665*I*a^2*e^(1023/2*I*c) - 225643340*I*a^2*e^(1021/2*I*c) - 21830

993145*I*a^2*e^(1019/2*I*c) - 1685352670794*I*a^2*e^(1017/2*I*c) - 10814346 3042754*I*a^2*e^(1015/2*I*c) - 5932441401249090*I*a^2*e^(1013/2*I*c) - 2840 15632092748725*I*a^2*e^(1011/2*I*c) - 120548857186305888825*I*a^2*e^(1009/2* I*c) - 459291145959804703779*I*a^2*e^(1007/2*I*c) - 1586642141151179341 6437 *I*a^2*e^(1005/2*I*c) - 50111447657878791264 1049*I*a^2*e^(1003/2*I*c) - 145 708671050629529815008 15*I*a^2*e^(1001/2*I*c) - 392372636365891369041933300* I*a^2*e^(999/2*I*c) - 983547411473286286843958 2838*I*a^2*e^(997/2*I*c) - 23 051892563225986371688150 4052*I*a^2*e^(995/2*I*c) - 507141639873210303020152 1505627*I*a^2*e^(993/2*I*c) - 1050910186373934635902355068 4728*I*a^2*e^(99 1/2*I*c) - 2057571551559319523757433019101275*I*a^2*e^(989/2*I*c) - 3816795 301922046178837787847170 8140*I*a^2*e^(987/2*I*c) - 672482999427386036344407 124264639911*I*a^2*e^(985/2*I*c) - 112793743410890245169503897038228 11442*I *a^2*e^(983/2*I*c) - 180469997815998782717102062578903704334*I*a^2*e^(981/2 *I*c) - 275968721637154731085032231863795 3260785*I*a^2*e^(979/2*I*c) - 4040 182398434876173155161054285879351 1300*I*a^2*e^(977/2*I*c) - 567179508185660 065903323118694229252909501*I*a^2*e^(975/2*I*c) - 764642099062564610784 2349 221267149768725400*I*a^2*e^(973/2*I*c) - 991304018911506162270346403754 6131 0347846749*I*a^2*e^(971/2*I*c) - 1237421118518768552107714053055438083 34261 7820*I*a^2*e^(969/2*I*c) - 14890304346273125682306935846029108244114648650* I*a^2*e^(967/2*I*c) - 172919713857046613813065255730042186229347958876*I*a^ 2*e^(965/2*I*c) - 1939943728233712898582615509996583301055554831933*I*a^2*e ^(963/2*I*c) - 21045459166656329934203131234228410676256368947239*I*a^2*e^(961/2*I*c) - 220977435109557963897348194591419349596075084671135*I*a^2*e^(9 59/2*I*c) - 2247657581576890158328281459463053249136155142818885*I*a^2*e^(9 57/2*I*c) - 22164417393124784256780107055497427057394288021910427*I*a^2*e^(955/2*I*c) - 212059745023134629411867496681427459939018060659823083*I*a^2*e ^(953/2*I*c) - 1969925436555096263303543513345030378604353635783621398*I*a^ 2*e^(951/2*I*c) - 17779861202993747975617805656916892771717874809673606262* I*a^2*e^(949/2*I*c) - 1560185013908330149240289335226455810918366872675734 4 7170*I*a^2*e^(947/2*I*c) - 1331867438356900947394085333963308875669933795 52 7159861115*I*a^2*e^(945/2*I*c) - 1106720525890316431184947487283714894740 29 11102321523307256*I*a^2*e^(943/2*I*c) - 8956734697546641643656095901274667 2 316379146573614093235883*I*a^2*e^(941/2*I*c) - 7063624656191022682262028794 627032853064375356018208010937 46*I*a^2*e^(939/2*I*c) - 54311584202896956902 676282164178832015067816448256736638951 25*I*a^2*e^(937/2*I*c) - 40733825083 879692084677912159273504330596927222466270616023040*I*a^2*e^(935/2*I*c) - 2 981380798057955166367217467136663387761346390934173084580836 40*I*a^2*e^(933 /2*I*c) - 213045438963978410253928109646589963305287562547075465590539 7856* I*a^2*e^(931/2*I*c) - 1486977648897849130944430745259468560983320227680999 4 141174545956*I*a^2*e^(929/2*I*c) - 101412452467011514987960508445679910794 7 130860967371451873546751 20*I*a^2*e^(927/2*I*c) - 67608737685731247414677178 604938420673746923907172061398049203930 0*I*a^2*e^(925/2*I*c) - 440760179517 712023738911348195974326425786442828349077137005346256 0*I*a^2*e^(923/2*I*c) - 281090883693732081557077857440001487224968658894703178673625123067 40*I*a ^2*e^(921/2*I*c) - 1754231621964961239400909311813064226670584405691704228 5

1340745050152*I*a^2*e^(919/2*I*c) - 107168724187918360820483485443098817212
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670642714870903983781671889666877915127767039192690108854011426099 20*I*a^2*
e^(913/2*I*c) - 215689939758874013967187220833533731643242074212236222605516
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 - 362243658255481769079439605579958387100105565618941470113231351735814022
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374503991778257094228867244440476224017707247445734826860865899835364 3330*I
*a^2*e^(899/2*I*c) - 2564819401306316144581391732361147394896766130890887 83
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 - 620962735163185935779611173057839829149089325652410656700713936757357671
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^(883/2*I*c) - 540256474462854504612952008124460438123572687338459558380408
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346576790*I*a^2*e^(877/2*I*c) - 404255916197314410205903631345838918131518 6
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I*a^2*e^(873/2*I*c) - 661657871755268626935239803550388761267460908426096 01
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(869/2*I*c) - 101610100398813728244802148232520096631517489501850198195876 6
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2*I*c) - 146583001674253512451913146901065257757197591875644054160385146725
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*c) - 198867587799113605322612027213532735821605971082743528597158857825056
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c) - 254005801287017540347401034978022085833970670738098147773886519381628 9
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1913856875978988239568134264776314007646535947673652724060*I*a^2*e^(853/2*I*c) - 30574902625221304721112695399039819786695248720134641123484099855335905247785238772369400090*I*a^2*e^(851/2*I*c) - 103776474298111268920821296539685875165453416594719110175099266389481283166180086952156183600*I*a^2*e^(849/2*I*c) - 34717589857137672406923008566078790348191298872900136928769377324783537177053188579391348690*I*a^2*e^(847/2*I*c) - 114489751326591781601587296582666933164906419123301856728368547861073543833187799753283463360*I*a^2*e^(845/2*I*c) - 372218924150378894435720409026640059890955392590616282572164380128530253733901184626128906290*I*a^2*e^(843/2*I*c) - 119314265750582670724834440624950185293640630911035594239694349009543441669669854220724449588 0*I*a^2*e^(841/2*I*c) - 377133056150951252461585059664034129435796729959627104559876741809101356227126401846277148898 0*I*a^2*e^(839/2*I*c) - 117557492389849429622100629661757412192769384297540981500776815193118756218047057203702119698 00*I*a^2*e^(837/2*I*c) - 3614129366786451470661371008181246363071190460228865411242106017716130660769405986038377127923 0*I*a^2*e^(835/2*I*c) - 10959682143632428417265121520355099279636900948325071067734539680585149820755990826655299186051 0*I*a^2*e^(833/2*I*c) - 3278501563382507256487219221898208284880171022676335915892437775623639272433943562024321405386 50*I*a^2*e^(831/2*I*c) - 9675588575734204212008448257450196919849659011193218589152039675180019486799097492298119614565 30*I*a^2*e^(829/2*I*c) - 28173738427399681436868976846067277182864146168429216505290464163186308668946113749551429035219 70*I*a^2*e^(827/2*I*c) - 80949904867520311028628473800621572123881065235445698045032995526436571517176482406482706538698 30*I*a^2*e^(825/2*I*c) - 22952599365030951424654740299581867088783137153355417738039160015930697452167681087479690813393300*I*a^2*e^(823/2*I*c) - 64228709360409812420586138356564211085008288762762209697005815481413905982724399323193964745568820*I*a^2*e^(821/2*I*c) - 17739675542894941311253267670481610036345737247085728407535826797922296244876270368213078057695276 0*I*a^2*e^(819/2*I*c) - 48363526958592048060938770794545787674333598392241081605700079969044227986469869593619763857960261 0*I*a^2*e^(817/2*I*c) - 13016134911812689742870905495352836273574359977532320427036565826100847193174467504929638878482913 40*I*a^2*e^(815/2*I*c) - 34583839811600962138198349861812216060308877037588927489205362384885746329814533272316423366381450 90*I*a^2*e^(813/2*I*c) - 90724826785314223906784821166674475956778674383723568247838872567636628542051313816851971497101117 20*I*a^2*e^(811/2*I*c) - 23500381807335365823718129066801316443196720042966976789038657507310743872020449940329840767115547150*I*a^2*e^(809/2*I*c) - 60110869062284374159448209854726838711429891271925437784821736413864552441235504659113309232113779360*I*a^2*e^(807/2*I*c) - 15184249844321680132979221701134989863470387416943076510333347856618440977436539297273379065418907 0040*I*a^2*e^(805/2*I*c) - 37881600212892061636985592961216087458076872371139225191584250552518856234247082552041642281808259200 0*I*a^2*e^(803/2*I*c) - 93344733685928184322435539734205849466869829244402825293491548760399650735711033150273663969275935834 0*I*a^2*e^(801/2*I*c) - 22720048811620935900466503561284482119532730047520542947942040259999751890733350464666986287796514 01360*I*a^2*e^(799/2*I*c) - 54628286678221586727361647210129385627818090917

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) - 12976133089122616927641373067671760628448690333305759931883973052278026
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/2*I*c) - 16178708438189461126289696260126574890420941225938900637455184128
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^2*e^(785/2*I*c) - 18125017737117436736993992115331571295088238451140025138
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7/2*I*c) - 3858660998287657496223400479535149465741817808337559048890103195
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3405*I*a^2*e^(771/2*I*c) - 339081049398958631695033084312249444034247861955
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*I*c) - 6840964393238201555734771754472551627703517728713097064328153201771
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/2*I*c) - 10140082596804607404376090989361337712629273671384446340003481136
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*e^(753/2*I*c) - 1261558844450858809909057230508638945302599921104251461305
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20581*I*a^2*e^(745/2*I*c) - 13225410027687245271645902870752516183035559216
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743/2*I*c) - 23180048596133418845744953509005175801585656213363187889470522
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^(733/2*I*c) - 328441725889849239257452481701006143358104612840057395251609
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I*a^2*e^(723/2*I*c) - 36166957083407726067731633129296551496029436983618740
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2*I*c) - 567339614895630128342983728404200845089288305505097140213560633981
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/2*I*c) - 69093103807838607892815109268897036078418535879007165861544111515
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I*c) - 83517876975248044258519777946946588944585187567768264892079917516487
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*a^2*e^(683/2*I*c) - 498509499153258403729144890980204589097433923264131841
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1/2*I*c) - 6511907152788140899870344218335142853224331708738436883692464497
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6739656*I*a^2*e^(669/2*I*c) - 270178097219987688678575421108092666409622887
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*a^2*e^(667/2*I*c) - 332422018682049400516624062136424440385293496180132862
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65/2*I*c) - 405549356101263502455389330044135493501084712983515452498569001
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40*I*a^2*e^(651/2*I*c) - 12849659528917295448887838389721821666429652280839
717230872070976527285743131454112500472959858220404943909001977151360*I*a^2

*e^(649/2*I*c) - 146371754405967862663183294727607590760013680088920556209271337990592824901908974945022178281192530488422240713123984480*I*a^2*e^(647/2*I*c) - 1652697385897486163910802331037113605435737465719873221275554650289263272259153631481346077820489460688124423941671712O*I*a^2*e^(645/2*I*c) - 18495019957411734279807585585659028619914871376370221914181336130221442716020270657023135022033488496344464969637878700*I*a^2*e^(643/2*I*c) - 205110244484387267003749408472565004487338792532316141176148918425064192914980659510498070361832431218068023762654323 20*I*a^2*e^(641/2*I*c) - 2253853611568512850973906173801376640600697458109936424718042835198554640590460260137643922717673027997364094250979218O*I*a^2*e^(639/2*I*c) - 24535311108873854631583838561781463173989229567453522895600654095852502781216398579180366741352217131290346900784364200*I*a^2*e^(637/2*I*c) - 2645398140906918779129366718128208253140007832522532325943072293403735930148722069099152411424873018733576337242912546O*I*a^2*e^(635/2*I*c) - 2824303140101484012442527423723821404992091876461221192138051297791288972954685556866910997854165358367845863042833712O*I*a^2*e^(633/2*I*c) - 2984807565676241077739247841798856293660572180380363032495633110341868884088961640975591753212776247068008219417343732O*I*a^2*e^(631/2*I*c) - 3121341361032589865622950752731666120779125407165377491052692461158609085461581097250736613852938345287518553937166868O*I*a^2*e^(629/2*I*c) - 3228381876916375193216221915047739516474610649099623976801128730135756143329754823126722703690383477286313642263284780*I*a^2*e^(627/2*I*c) - 3300650260582806911123483352383727448845832160491854959491559899932830135139194267631472561851434795676894592768433826O*I*a^2*e^(625/2*I*c) - 333331775289235723258466118280603925507618604249635804060402845530268620342263337295531433764299590677006898863307889O0*I*a^2*e^(623/2*I*c) - 332221305715899049824548255310152200708414431373762009302340011698341642975972176429628321094964767689150075206388439 40*I*a^2*e^(621/2*I*c) - 3264021078513775039551434446682444890714460813064615891894173774779734143769818937118459598273530542543582468428377686O*I*a^2*e^(619/2*I*c) - 315646297175799001151561332211815560367300935968137345565370653689381189503941600550684266948824684745990659243391393 40*I*a^2*e^(617/2*I*c) - 2998447644032640893009935311975612975498169166609187485515930274152618240654084284301744309075542210397969103697894600O*I*a^2*e^(615/2*I*c) - 2790185665391948457934368490260510663499083569322427790277299350904681669755491582206037365649669711200823785861298468O*I*a^2*e^(613/2*I*c) - 253325793436343557795444871672021015005344836286539463290357821491238715872786428908784020712783329691734937674580026 40*I*a^2*e^(611/2*I*c) - 22306333733644730379455210266251557215600572197223122288850891726285188766620799206359532978080306708567111158747156900*I*a^2*e^(609/2*I*c) - 1886632296240298333282511891401381324789966556111263428748040067679310454182474996308729298119502484657220972963918944O*I*a^2*e^(607/2*I*c) - 150683476720907760233760330301963133029417630971254094354949784205827927117731031359742449496060163125057888238258407 40*I*a^2*e^(605/2*I*c) - 109793609947359760449164031447559769661960407617052049037495768799372161688349241491297842514725770564880479603508095 20*I*a^2*e^(603/2*I*c) - 66755444804312177590827259183014300018779913559371858760261598546140768866654203546644767640

6109543285680671671892 4980*I*a^2*e^(601/2*I*c) - 22399805579503550425420743
51925567380095848081760118386223202535338433670077335615007773599342750473 4
69385817621308920*I*a^2*e^(599/2*I*c) + 223998055795035504254207435192556 73
800958480817601183862232025353384336700773356150077735993427504734693858176
21308920*I*a^2*e^(597/2*I*c) + 66755444804312177590827259183014300018779913
559371858760261598546140768866654203546644767640610954328568067167189249 80*
I*a^2*e^(595/2*I*c) + 109793609947359760449164031447559769661960407617052 04
90374957687993721616883492414912978425147257705648804796035080952 0*I*a^2*e^
(593/2*I*c) + 150683476720907760233760330301963133029417630971254094354 9497
842058279271177310313597424494960601631250578882382584074 0*I*a^2*e^(591/2*I
*c) + 18866322962402983332825118914013813247899665561112634287480400676 7931
045418247499630872929811950248465722097296391894 40*I*a^2*e^(589/2*I*c) + 22
306333733644730379455210266251557215600572197223122288850891726285188766620
7992063595329780803067085671111587471569 00*I*a^2*e^(587/2*I*c) + 2533257934
363435577954448716720210150053448362865394632903578214912387158727864289087
840207127833296917349376745800264 0*I*a^2*e^(585/2*I*c) + 279018566539194845
793436849026051066349908356932242779027729935090468166975549158220603736564
9669711200823785861298468 0*I*a^2*e^(583/2*I*c) + 2998447644032640893009 9353
119756129754981691666091874855159302741526182406540842843017443090755422103
979691036978946000*I*a^2*e^(581/2*I*c) + 315646297175799001151561332211 8155
603673009359681373455653706536893811895039416005506842669488246847459906592
4339139340*I*a^2*e^(579/2*I*c) + 3264021078513775039551434446682444890714 46
081306461589189417377477973414376981893711845959827353054254358246842837768
60*I*a^2*e^(577/2*I*c) + 332221305715899049824548255310152200708414431373 76
200930234001169834164297597217642962832109496476768915007520638843940*I*a^2
*e^(575/2*I*c) + 33333177528923572325846611828060392550761860424963580406 04
028455302686203422633372955314337642995906770068988633078890 0*I*a^2*e^(573/
2*I*c) + 33006502605828069111234833523837274488458321604918549594915598999 3
28301351391942676314725618514347956768945927684338260*I*a^2*e^(571/2*I*c) +
 322838187691637519321622191504773951647461064909962397680112873013575614 33
297548231267227036903834777286313642263284780*I*a^2*e^(569/2*I*c) + 3121341
361032589865622950752731666120779125407165377491052692461158609085461581097
250736613852938345287518553937166868 0*I*a^2*e^(567/2*I*c) + 298480756567624
107773924784179885629366057218038036303249563311034186888408896164097559175
32127762470680082194173437320*I*a^2*e^(565/2*I*c) + 2824303140101484012 4425
274237238214049920918764612211921380512977912889729546855568669109978541653
583678458630428337120*I*a^2*e^(563/2*I*c) + 26453981409069187791293667181 28
208253140007832522532325943072293403735930148722069099152411424873018733576
3372429125460*I*a^2*e^(561/2*I*c) + 24535311108873854631583838561781463 1739
892295674535228956006540958525027812163985791803667413522171312903469007843
64200*I*a^2*e^(559/2*I*c) + 22538536115685128509739061738013766406006974581
099364247180428351985546405904602601376439227176730279973640942509792180*I*
a^2*e^(557/2*I*c) + 205110244484387267003749408472565004487338792532316 1411
761489184250641929149806595104980703618324312180680237626543232 0*I*a^2*e^(5
55/2*I*c) + 18495019957411734279807585585659028619914871376370221914181 3361

30221442716020270657023135022033488496344464969637878700*I*a^2*e^(553/2*I*c
) + 165269738589748616391080233103711360543573746571987322127555465028926327
2259153631481346077820489460688124423941671712O*I*a^2*e^(551/2*I*c) + 1463
717544059678626631832947276075907600136800889205562092713379905928249019089
749450221782811925304884222407131239848O*I*a^2*e^(549/2*I*c) + 128496595289
172954488878383897218216664296522808397172308720709765272857431314541125004
72959858220404943909001977151360*I*a^2*e^(547/2*I*c) + 11182357732757305788
606125219832724255700185686697695750773456925745718469676671665332383375458
7819844030778673269564 40*I*a^2*e^(545/2*I*c) + 9647453055735341956744109660
981872243803141830016361146898234401219614120958244978337409906070346233171
019358264000480*I*a^2*e^(543/2*I*c) + 825189325232861791713496500815678O896
071640246109540703311686461626974697776290689348607898858162877878927869163
809880*I*a^2*e^(541/2*I*c) + 699801709577143537605745995805012474680123419 4
620229525750507285124859821010861715153517826996821338842938734860615040*I*
a^2*e^(539/2*I*c) + 588424918243225139079762159915621515160855552527392878
72752903351193265754133961649031619947510340547504157788058700O*I*a^2*e^(53
7/2*I*c) + 490582253753402966135019137348573887282442883805673193090612167O
75380422074573865987024436328099952332738289720044152O*I*a^2*e^(535/2*I*c)
+ 405549356101263502455389330044135493501084712983515452498569001679454511 3
96313678602328901391590537856469214364345864O*I*a^2*e^(533/2*I*c) + 3324220
186820494005166240621364244403852934961801328621031245367970100658499892606
876336284620902405991453408165588520*I*a^2*e^(531/2*I*c) + 2701780972199876
886785754211080926664096228871020710457482488324723670365135550692459168767
272049066762300379877743040*I*a^2*e^(529/2*I*c) + 217731969048282654771711 2
293043048619928285927038310216927854685140177477854762032123070408699283792
898254962886739656*I*a^2*e^(527/2*I*c) + 173980645966267455699286776317959 9
429842093891548125321011280666982199891892856492664415622347650053752088149
727624160*I*a^2*e^(525/2*I*c) + 137841218511280786821265588672751099560622 6
409519843637641551742037668539116041066140052440183078269143615845581155080
*I*a^2*e^(523/2*I*c) + 108279791731158921336755666005271059821490164985258 7
681350797657654387598767948898248611815354945578372200449025175360*I*a^2*e^
(521/2*I*c) + 843324512701914744543402909720616107962415992154595239399925 4
097076303951899540296080708983526898187052099845083695 20*I*a^2*e^(519/2*I*c
) + 651190715278814089987034421833514285322433170873843688369246449708975 37
974942529395497997853328447085461484497146636 8*I*a^2*e^(517/2*I*c) + 498509
499153258403729144890980204589097433923264131841430599901592653873152072717
512660804753287716928576078663461983*I*a^2*e^(515/2*I*c) + 3783333346885029
059048026143031103999432654861157851787405147285864242374913240291146324417
822093818453339385232658 90*I*a^2*e^(513/2*I*c) + 284639106087160680073162 34
605334764966138706164988664709925230927430389317429244819923320048217996928
9319599583782705*I*a^2*e^(511/2*I*c) + 212282878705188354649502352775941442
121310160088506940041461217611549577446696222647786382828325447861991528982
057300*I*a^2*e^(509/2*I*c) + 156933755451895633858471703806116907346357899 5
479734426282513001454066679897386404576303578569000000583605580791617 13*I*a
^2*e^(507/2*I*c) + 1149948298540085448006040505267361290686621708123406823 8

567902082794232916125453397458629662560988093204276311150 6754*I*a^2*e^(505/
2*I*c) + 835178769752480442585197779469465889445851875677682648920799175164
871300824293681169429589876537324713950543991395 38*I*a^2*e^(503/2*I*c) + 60
117036809531954534774175328542432917785471258270317443583066712344018654100
343282519010777886383221363137483769490*I*a^2*e^(501/2*I*c) + 4288542606290
519837613611568777949831319762493941724102371210731156016608065113664271150
7677332263314929421901176965*I*a^2*e^(499/2*I*c) + 30317425197511637627 7283
848312800571925857478348208632257263170282939462399098005109017284002857400
1188850644649 2561*I*a^2*e^(497/2*I*c) + 2123836584523158555591853196164 4690
235000015826170045512728950554645775595698170974068108854741604809260562872
043619*I*a^2*e^(495/2*I*c) + 1474250608159172064872411391157795097287526449
591218016644304211649997124632183878016973923418702583501200283915 0189*I*a^
2*e^(493/2*I*c) + 1013952787581646734322079349854917007583906560454670 73852
819544974945797112454643754742583666364373339149671334 76201*I*a^2*e^(491/2*
I*c) + 6909310380783860789281510926889703607841853587900716586154411151 5013
974497211154151291404190912707565388024535838 95*I*a^2*e^(489/2*I*c) + 46644
046194423261614083371806148988132314961825934722594050803959540003674570959
9460152178229301427783270905461 5380*I*a^2*e^(487/2*I*c) + 31194351823904045
785264754002935552154841366001694466773595073129947614111315094715884141888
1367670476819988386 5942*I*a^2*e^(485/2*I*c) + 20665569821602512673114857611
921723223404768298078377841268861201489011910889679265211355648086881826419
11560667924*I*a^2*e^(483/2*I*c) + 1356074964232792211022122776313085620131 6
159165113971814228074160573966852453595826891477946475319355582836019844 43*
I*a^2*e^(481/2*I*c) + 8813693903152742201742418843817961522650552642497193 0
879150226481443484910075933783284034434373571444030609956 6040*I*a^2*e^(479/
2*I*c) + 567339614895630128342983728404200845089288305550509714021356063398 1
0627513361743367958091925662397769551999215059 15*I*a^2*e^(477/2*I*c) + 3616
695708340772606773163312929655149602943698361874034355533628022011392504750
72743485753652885635408470996847372*I*a^2*e^(475/2*I*c) + 2283165111834663 5
760074033939789265172476358111312485881423239869972250832424972565773797037
196520939819612590477 5*I*a^2*e^(473/2*I*c) + 142722318968673080123248059644
214027010647362985060273998965493470580757388030700770801323590848378479588
489351378*I*a^2*e^(471/2*I*c) + 883381746409812375401852593923124758903355 1
445179560816263317963445774962364388709557480475504999196692917622283 0*I*a^
2*e^(469/2*I*c) + 5413518706936177504751993760542656592350761379499973178 68
282766835385587717498328152511005924176854149488646841 45*I*a^2*e^(467/2*I*c
) + 328441725889849239257452481701006143358104612840057395251609568638114 44
85139371442478290576848958023885281023389 2*I*a^2*e^(465/2*I*c) + 1972682929
919065151030155855601200340219105234862278242443532532936069557635228499947
87920325166543853440975767 01*I*a^2*e^(463/2*I*c) + 117286869772010165189037
778180635432649656561035757958868696244479317635654723527506620225595340935
18133411921208*I*a^2*e^(461/2*I*c) + 690251866563603728376298024278490996 78
839353716623572378212215283291749068007923947329463677485053815336176076 45*
I*a^2*e^(459/2*I*c) + 4020729692728752072547527964414583880720959971898567 3
78088190721921140689114594980080070716969583769101530510140*I*a^2*e^(457/2*

I*c) + 231800485961334188457449535090051758015856562133631878894705221466231971922337700407850433164758908764036097495 4*I*a^2*e^(455/2*I*c) + 13225410027687245271645902870752516183035559216180833489217915827253696179198591565450687109111482198342228623 96*I*a^2*e^(453/2*I*c) + 74672814922433629133747278822750782651525405547963429829616341921688099165840300651627297465712660256966762058 1*I*a^2*e^(451/2*I*c) + 41720334685234278608868896322064091778007587759204634007891157690273764588009873939937985168264211297805134039*I*a^2*e^(449/2*I*c) + 23064195048734977698461337735625152416912708100691513109693292236074874160605658293929177108588451936018489125 5*I*a^2*e^(447/2*I*c) + 12615588444508588099090572305086389453025999211042514613056914922257491898408371034780355802779336514472944656 5*I*a^2*e^(445/2*I*c) + 68269842357184501611988226541759877359893560816980579165757639885910403041554476683238744066404341119496497267*I*a^2*e^(443/2*I*c) + 36549041212131229783274664803103982301706053016635099893874998475671653869877438572422373857662116557803137691*I*a^2*e^(441/2*I*c) + 19356299380926294640449334320481234743091292154311607631598423149396817585242619148155405769562070657818017062*I*a^2*e^(439/2*I*c) + 10140082596804607404376090989361337712629273671384446340003481136225061610661712978027889222103814938027534150*I*a^2*e^(437/2*I*c) + 52542053315628400861248402353101698809320987341776979631277027119955905761956900693691812471722966160542508 10*I*a^2*e^(435/2*I*c) + 26927282448425364461722623574956155733196639443211460545174612226257404076090636468048967716925892506859097 15*I*a^2*e^(433/2*I*c) + 13648077061320324179712693353613780904653490228983600018030481420618939272009003331874483166734129793458987 52*I*a^2*e^(431/2*I*c) + 68409643932382015557347717544725516277035177287130970643281532017718026238671412608057622710783996349263350 7*I*a^2*e^(429/2*I*c) + 33908104939895863169503308431224944403424786195546965817398228014378077813887689542995518841206898343531137 0*I*a^2*e^(427/2*I*c) + 16618941002251115567274793379648778017515414556569019749473008667024648037226698449778484768907857657655340 5*I*a^2*e^(425/2*I*c) + 80535993554416862856990385694317829375028680305891033754271854598237850137678037212744640081812890524571520*I*a^2*e^(423/2*I*c) + 38586609982876574962234004795351494657418178083375590488901031957266204930635139096439961363048441151269800*I*a^2*e^(421/2*I*c) + 18277470691534917701563233602298403971199737084099495749012388579821538776969597068131015951749218506666144*I*a^2*e^(419/2*I*c) + 85585699131774977720413736285672113976827764195153726973137506812103604497173350946878181530956793605 16780*I*a^2*e^(417/2*I*c) + 39615443892690555191826925561670874009158112607811540466428348321668868873652248218172209707957893438762 40*I*a^2*e^(415/2*I*c) + 18125017737117436736993992115331571295088238451140025138488727102115054652351459326400028627204117297527 80*I*a^2*e^(413/2*I*c) + 81962478951711301916428170954148752036823343688944088312811218591526365565145598288057734711341041430704 0*I*a^2*e^(411/2*I*c) + 36630795479832020512879893615535139155433517646739162203997828414937138087324165245647711354382057427350 0*I*a^2*e^(409/2*I*c) + 16178708438189461126289696260126574890420941225938900637455184128816500549377303095821095676061264649228 0*I*a^2*e^(407/2*I*c) + 70612062571169786899446458797376311651332630936204874511242735563516386888084909

5996197865807877112363600*I*a^2*e^(405/2*I*c) + 30452467856086501554669370686334847084024075050669682405271556997575409244948107709378067847213898960660*I*a^2*e^(403/2*I*c) + 12976133089122616927641373067671760628448690333305759931883973052278026353267012367339299301873995466880*I*a^2*e^(401/2*I*c) + 54628286678221586727361647210129385627818090917703635636870182714540991311991715966764906344624392292220*I*a^2*e^(399/2*I*c) + 2272004881162093590046650356128448211953273004752054294794204025999975189073335046466698628779651401360*I*a^2*e^(397/2*I*c) + 933447336859281843224355397342058494668698292444028252934915487603996507357110331502736639692759358340*I*a^2*e^(395/2*I*c) + 378816002128920616369855929612160874580768723711392251915842505525188562342470825520416422818082592000*I*a^2*e^(393/2*I*c) + 151842498443216801329792217011349898634703874169430765103333478566184409774365392972733790654189070040*I*a^2*e^(391/2*I*c) + 60110869062284374159448209854726838711429891271925437784821736413864552441235504659113309232113779360*I*a^2*e^(389/2*I*c) + 23500381807335365823718129066801316443196720042966976789038657507310743872020449940329840767115547150*I*a^2*e^(387/2*I*c) + 9072482678531422390678482116667447595677867438372356824783887256763662854205131381685197149710111720*I*a^2*e^(385/2*I*c) + 3458383981160096213819834986181221606030887703758892748920536238488574632981453327231642336638145090*I*a^2*e^(383/2*I*c) + 1301613491181268974287090549535283627357435997753232042703656582610084719317446750492963887848291340*I*a^2*e^(381/2*I*c) + 483635269585920480609387707945457876743335983922410816057000799690442279864698695936197638579602610*I*a^2*e^(379/2*I*c) + 177396755428949413112532676704816100363457372470857284075358267979222962448762703682130780576952760*I*a^2*e^(377/2*I*c) + 64228709360409812420586138356564211085008288762762209697005815481413905982724399323193964745568820*I*a^2*e^(375/2*I*c) + 22952599365030951424654740299581867088783137153355417738039160015930697452167681087479690813393300*I*a^2*e^(373/2*I*c) + 8094990486752031102862847380062157212388106523544569804503299552643657151717648240648270653869830*I*a^2*e^(371/2*I*c) + 2817373842739968143686897684606727718286414616842921650529046416318630866894611374955142903521970*I*a^2*e^(369/2*I*c) + 967558857573420421200844825745019691984965901119321858915203967518001948679909749229811961456530*I*a^2*e^(367/2*I*c) + 327850156338250725648721922189820828488017102267633591589243777562363927243394356202432140538650*I*a^2*e^(365/2*I*c) + 109596821436324284172651215203550992796369009483250710677345396805851498207559908266552991860510*I*a^2*e^(363/2*I*c) + 36141293667864514706613710081812463630711904602288654112421060177161306607694059860383771279230*I*a^2*e^(361/2*I*c) + 11755749238984942962210062966175741219276938429754098150077681519311875621804705720370211969800*I*a^2*e^(359/2*I*c) + 3771330561509512524615850596640341294357967299596271045598767418091013562271264018462771488980*I*a^2*e^(357/2*I*c) + 1193142657505826707248344406249501852936406309110355942396943490095434416696698542207244495880*I*a^2*e^(355/2*I*c) + 372218924150378894435720409026640059890955392590616282572164380128530253733901184626128906290*I*a^2*e^(353/2*I*c) + 114489751326591781601587296582666933164906419123301856728368547861073543833187799753283463360*I*a^2*e^(351/2*I*c) + 347175898571376724069230085660787903481912988

72900136928769377324783537177053188579391348690*I*a^2*e^(349/2*I*c) + 10377
647429811126892082129653968587516545341659471911017509926638948128316618008
695215618360*I*a^2*e^(347/2*I*c) + 3057490262522130472111269539903981978669
524872013464112348409985533590524778523877236940090*I*a^2*e^(345/2*I*c) + 8
877635774210624749402322148173319138568759789882395681342647763140076465359
47673652724060*I*a^2*e^(343/2*I*c) + 25400580128701754034740103497802208583
3970670738098147773886519381628953611819486811955620*I*a^2*e^(341/2*I*c) +
716062179458509947174306826027645592286227222278082368247999623391032951213
87601682173670*I*a^2*e^(339/2*I*c) + 19886758779911360532261202721353273582
160597108274352859715885782505631373182736113224200*I*a^2*e^(337/2*I*c) + 5
440357551230374902439985027394698228560509433313958273980496531279067808247
723147105870*I*a^2*e^(335/2*I*c) + 1465830016742535124519131469010652577571
975918756440541603851467254363529939075434269440*I*a^2*e^(333/2*I*c) + 3889
319141196329548401301490861407894523738557878079102128441517960492890046054
06967150*I*a^2*e^(331/2*I*c) + 10161010039881372824480214823252009663151748
9501850198195876637177700803300250750696120*I*a^2*e^(329/2*I*c) + 261343335
842817661995062037066653597967114111592037165616028425137494769358915740815
80*I*a^2*e^(327/2*I*c) + 66165787175526862693523980355038876126746090842609
60128356927902046841481605353166520*I*a^2*e^(325/2*I*c) + 16486845255781261
98504085391316407022187711819746696897272619021774566583748173498450*I*a^2*
e^(323/2*I*c) + 40425591619731441020590363134583891813151862203181436828939
1512007823341054252319330*I*a^2*e^(321/2*I*c) + 975260870034870226325822902
89825035947901332365723366039562344307089798567346576790*I*a^2*e^(319/2*I*c
) + 23145134405275963083954762748231025164257628027633977804093014188701364
289864915790*I*a^2*e^(317/2*I*c) + 5402564744628545046129520081244604381235
726873384595583804088637122848866439830910*I*a^2*e^(315/2*I*c) + 1240127624
408790585914281618049099992149775260140355696852903419692530227177449210*I*
a^2*e^(313/2*I*c) + 2798861939746417403756726266426530638552651149606779017
21413367956114946541063180*I*a^2*e^(311/2*I*c) + 62096273516318593577961117
305783982914908932565241065670071393675735767176645100*I*a^2*e^(309/2*I*c)
+ 1354055460508770231039339647727636740044411298407754301934206346492976732
2886040*I*a^2*e^(307/2*I*c) + 290141340780504627769992880642657016436198065
6563461341652112845236338748650110*I*a^2*e^(305/2*I*c) + 610798290612478058
634809110185506816479817707018034933796191469491921071289700*I*a^2*e^(303/2
*I*c) + 1263022613669708131901208630681647294039935119601317431552553654830
34776033710*I*a^2*e^(301/2*I*c) + 25648194013063161445813917323611473948967
661308908878336387655736333479132840*I*a^2*e^(299/2*I*c) + 5113745039917782
570942288672444404762240177072474457348268608658998353643330*I*a^2*e^(297/2
*I*c) + 1000827267878708901757364273781353911409779752889226260010612599185
707764320*I*a^2*e^(295/2*I*c) + 1922272134809049488720343211549109209854258
03997803298273976235657509933640*I*a^2*e^(293/2*I*c) + 36224365825548176907
943960557995838710010556561894147011323135173581402240*I*a^2*e^(291/2*I*c)
+ 6695882317013495222345368298476838368511994443900460264534471085890483820
*I*a^2*e^(289/2*I*c) + 1213732838510510306428982602384538617690483226714330
573193357678961518000*I*a^2*e^(287/2*I*c) + 2156899397588740139671872208335

3373164324207421223622260516554457255406O*I*a^2*e^(285/2*I*c) + 37567064271
48709039837816718896668779151277670391926901088540114260992O*I*a^2*e^(283/2
*I*c) + 6411061389985712625839045934560628663538960416714378812599630238383
260*I*a^2*e^(281/2*I*c) + 1071687241879183608204834854430988172125784220926
15532601736666403132O*I*a^2*e^(279/2*I*c) + 1754231621964961239400909311813
06422667058440569170422851340745050152*I*a^2*e^(277/2*I*c) + 28109088369373
208155707785744000148722496865889470317867362512306740*I*a^2*e^(275/2*I*c)
+ 4407601795177120237389113481959743264257864428283490771370053462560*I*a^2
*e^(273/2*I*c) + 6760873768573124741467717860493842067374692390717206139804
92039300*I*a^2*e^(271/2*I*c) + 10141245246701151498796050844567991079471308
6096737145187354675120*I*a^2*e^(269/2*I*c) + 148697764889784913094443074525
94685609833202276809994141174545956*I*a^2*e^(267/2*I*c) + 21304543896397841
02539281096465899633052875625470754655905397856*I*a^2*e^(265/2*I*c) + 29813
8079805795516636721746713666338776134639093417308458083640*I*a^2*e^(263/2*I
*c) + 4073382508387969208467791215927350433059692722246627061602304O*I*a^2*
e^(261/2*I*c) + 54311584202896956902676282164178832015067816448256736638951
25*I*a^2*e^(259/2*I*c) + 70636246561910226822620287946270328530643753560182
0801093746*I*a^2*e^(257/2*I*c) + 895673469754664164365609590127466723163791
46573614093235883*I*a^2*e^(255/2*I*c) + 11067205258903164311849474872837148
947402911102321523307256*I*a^2*e^(253/2*I*c) + 1331867438356900947394085333
963308875669933795527159861115*I*a^2*e^(251/2*I*c) + 1560185013908330149240
28933522645581091836687267573447170*I*a^2*e^(249/2*I*c) + 17779861202993747
975617805656916892771717874809673606262*I*a^2*e^(247/2*I*c) + 1969925436555
096263303543513345030378604353635783621398*I*a^2*e^(245/2*I*c) + 2120597450
23134629411867496681427459939018060659823083*I*a^2*e^(243/2*I*c) + 22164417
393124784256780107055497427057394288021910427*I*a^2*e^(241/2*I*c) + 2247657
581576890158328281459463053249136155142818885*I*a^2*e^(239/2*I*c) + 2209774
35109557963897348194591419349596075084671135*I*a^2*e^(237/2*I*c) + 21045459
166656329934203131234228410676256368947239*I*a^2*e^(235/2*I*c) + 1939943728
233712898582615509996583301055554831933*I*a^2*e^(233/2*I*c) + 1729197138570
46613813065255730042186229347958876*I*a^2*e^(231/2*I*c) + 14890304346273125
682306935846029108244114648650*I*a^2*e^(229/2*I*c) + 1237421118518768552107
714053055438083342617820*I*a^2*e^(227/2*I*c) + 9913040189115061622703464037
5461310347846749*I*a^2*e^(225/2*I*c) + 764642099062564610784234922126714976
8725400*I*a^2*e^(223/2*I*c) + 567179508185660065903323118694229252909501*I*
a^2*e^(221/2*I*c) + 40401823984348761731551610542858793511300*I*a^2*e^(219/
2*I*c) + 2759687216371547310850322318637953260785*I*a^2*e^(217/2*I*c) + 180
469997815998782717102062578903704334*I*a^2*e^(215/2*I*c) + 1127937434108902
4516950389703822811442*I*a^2*e^(213/2*I*c) + 672482999427386036344407124264
639911*I*a^2*e^(211/2*I*c) + 38167953019220461788377878471708140*I*a^2*e^(2
09/2*I*c) + 2057571551559319523757433019101275*I*a^2*e^(207/2*I*c) + 105091
018637393463590223550684728*I*a^2*e^(205/2*I*c) + 5071416398732103030201521
505627*I*a^2*e^(203/2*I*c) + 230518925632259863716881504052*I*a^2*e^(201/2*
I*c) + 9835474114732862868439582838*I*a^2*e^(199/2*I*c) + 39237263636589136
9041933300*I*a^2*e^(197/2*I*c) + 14570867105062952981500815*I*a^2*e^(195/2*

I*c) + 501114476578787912641049*I*a^2*e^(193/2*I*c) + 15866421411511793416437*I*a^2*e^(191/2*I*c) + 459291145959804703779*I*a^2*e^(189/2*I*c) + 12054885718630588825*I*a^2*e^(187/2*I*c) + 284015632092748725*I*a^2*e^(185/2*I*c) + 5932441401249090*I*a^2*e^(183/2*I*c) + 108143463042754*I*a^2*e^(181/2*I*c) + 1685352670794*I*a^2*e^(179/2*I*c) + 21830993145*I*a^2*e^(177/2*I*c) + 225643340*I*a^2*e^(175/2*I*c) + 1744665*I*a^2*e^(173/2*I*c) + 8970*I*a^2*e^(171/2*I*c) + 23*I*a^2*e^(169/2*I*c))/(e^(517*I*c) + 418*e^(516*I*c) + 87153*e^(515*I*c) + 12085216*e^(514*I*c) + 1253841160*e^(513*I*c) + 103818048048*e^(512*I*c) + 7146142307307*e^(511*I*c) + 420601518659718*e^(510*I*c) + 21608403021340047*e^(509*I*c) + 984382804329835768*e^(508*I*c) + 40261256699368950388*e^(507*I*c) + 1493326612293984160368*e^(506*I*c) + 50648660944512569972179*e^(505*I*c) + 1581796642397812408161814*e^(504*I*c) + 45759117183402579073139583*e^(503*I*c) + 1232445557346832245176696904*e^(502*I*c) + 31042222522074681615625020522*e^(501*I*c) + 734057263616388449968842366924*e^(500*I*c) + 16353164647151530240529137618111*e^(499*I*c) + 344277152012875134140739302960914*e^(498*I*c) + 6868329225263681349501997341320517*e^(497*I*c) + 130171193079172823835151430773360024*e^(496*I*c) + 2348998374244347079532766203075607598*e^(495*I*c) + 40443624781415311581857832389099634564*e^(494*I*c) + 665634670676210063754191847109971141414*e^(493*I*c) + 10490402669510897424624643766470754045064*e^(492*I*c) + 158566476113257562566117432227203884298856*e^(491*I*c) + 2302150411226234925855222345201500900533576*e^(490*I*c) + 32147887693375338817454482515377350383950278*e^(489*I*c) + 432333688644261557547944179250800440604964868*e^(488*I*c) + 5605927253067558551780452883689835514455118670*e^(487*I*c) + 70164515322544462906873548813748091084561870680*e^(486*I*c) + 848552202276512356496200136959676295361696315113*e^(485*I*c) + 9925490738534402272939987038714580495445431374618*e^(484*I*c) + 112391604542246650966429162063124338952554575234051*e^(483*I*c) + 1233096700139723365181997220750932590655287625342156*e^(482*I*c) + 13118781801172174729679339894318153694964675368481194*e^(481*I*c) + 135442594916636116191574650625331646238501101627937224*e^(480*I*c) + 1357990663161479842850642848032544982878359839580349899*e^(479*I*c) + 13231708870104896973800056733779919089340836756009580718*e^(478*I*c) + 125370496586921272662198050851269323171167338854081782959*e^(477*I*c) + 1155855412893594260345544966642687823630035899363232371472*e^(476*I*c) + 10375184499871175501909398956596684116802997082526660323524*e^(475*I*c) + 90722605722208814918642284639487187764607589706493970774776*e^(474*I*c) + 773204636991145775061462731028098506094432675788136295011259*e^(473*I*c) + 6426195485535248576425068136870465530087114003875716691383902*e^(472*I*c) + 52108117629177048660492400985175830987505700566877818954141639*e^(471*I*c) + 412430698299915190848067222327219435067747934091894670488982928*e^(470*I*c) + 3187749929744346497211536044751776582320958627923816470590659024*e^(469*I*c) + 24070801913529757101858022914372045864746991786182039740274325264*e^(468*I*c) + 177642829135119348577194437675802830239905460092687136494961404333*e^(467*I*c) + 1281817464914970810859604189828359000790789921169405304612211251818*e^(466*I*c) + 9046693523825682979044338963104263167672586826367911338826483549173*e^(465*I*c) + 62473

5507810532953177107746902471141241251875657318484417819040326 72*e^(464*I*c)
 + 4222761266320036875477547465557099887105271330866601613663536567 87288*e^
(463*I*c) + 279470910447568661184279069497369916448225472397721020972566130
4403472*e^(462*I*c) + 181157684956157580767103030555056255892542936591933 14
153418333944596408*e^(461*I*c) + 115051481852080848873700388354521315567640
365124003103691176697194292320*e^(460*I*c) + 716099497599058079895633338552
940229192858196481597830078819711862600096*e^(459*I*c) + 436944248291011391
456535313606959586266933885805341938121413124192504 7008*e^(458*I*c) + 26143
976279902021443471945665080254563056810183520401889800285493144867448*e^(45
7*I*c) + 153436088745056254127327239461577071933130157764595997113973513183
188399376*e^(456*I*c) + 883500968821791202600774541927769200737689393513734
789368397093333311961880*e^(455*I*c) + 499251971245704398350537797660795398
839736829759111495799180489368837186 7680*e^(454*I*c) + 276931165383432592 25
9833826376479361226640338596151334898466646943614710283 10*e^(453*I*c) + 150
822381431412413773566474210011746852297437597059186295243989481140398152780
*e^(452*I*c) + 806679543607589140759305010796189568269842021613388955218916
27882318263948 8190*e^(451*I*c) + 423812584676323258639418856985868582675532
8005548627437019301405851325887594480*e^(450*I*c) + 218764828927139099280 40
345612578705805121508756226696317087651824252241418663320*e^(449*I*c) + 110
969199687320974749922259595250444341219218535349655762591192576535872151766
080*e^(448*I*c) + 553269128819528612502918869558947829098021956309349843584
0446315122917788000 81490*e^(447*I*c) + 271184323967071752760564049014883350
713024244840397831852323772194420039283010858 0*e^(446*I*c) + 13069817203488
28988619320550837581839212499138234016031688650718129654898101481 8410*e^(44
5*I*c) + 619485966530355028795643388152343106604109020378824731618047744929
16216575880077680*e^(444*I*c) + 288820755264730654469968572021047109427318 6
1950899580202068990459031947629540832 4280*e^(443*I*c) + 1324756412367837473
15747282116248369112096650194895392649224164378826428454643722 1120*e^(442*I
*c) + 597899217294414321845916114929981970632173211157849452524522874297646
8409105395536290*e^(441*I*c) + 265568063890434075344967023691015457959948 61
7577414147899446527121275669101852741231 40*e^(440*I*c) + 1161045516835550 43
762911501712116399313733021132677481112824047246361794049635726479850*e^(43
9*I*c) + 499707567253859084357596314813794768069337190915967491907488904933
922677579665354338960*e^(438*I*c) + 211758973346685570710150142921041472240
18388379407528416185414408885457299431382090368 20*e^(437*I*c) + 88367206408
604703056945140215479695512967940922669830441183757900258545840367963647682
80*e^(436*I*c) + 363183696523025917321974444097981220226408246041305525067 4
25867951832673543828478758857 30*e^(435*I*c) + 147030816732276833163041582 09
959204751204372522535333923881916519300040762954474575322 1740*e^(434*I*c) +
 5864034669726832427416433289215609093751974538642432995719909646088572457 7
1134145204174990*e^(433*I*c) + 230435107337384035737917859767306635201668 27
81689139842097376663118488803841131935313641840*e^(432*I*c) + 8923209447343
296763331881881638471793499618670601026059730895962653291770229493028162575
100*e^(431*I*c) + 340540538512955691543523467221771726551875489107820085047
18324168725029438589162349211628040*e^(430*I*c) + 1280989146016885396724805

4183040984770736750043860153680320449770111991128908710565948278 3340*e^(429
*I*c) + 475010578857601519272316617938425222421786597241671026894318515408 5
114671409693931157687936 80*e^(428*I*c) + 173657421881819107187419747245015 8
1238835642099506586391023371481227690806116807197417260538 40*e^(427*I*c) +
6259872156822252843650960708235034710201362776057176647226323089751446565 28
885010389815385992 0*e^(426*I*c) + 22251959176795777757167366036007480222211
364232146399803864370963391491223687245823457351580140*e^(425*I*c) + 780098
0736802423987561373305885141712532711468107088964079424928263347058075655 70
83923203377160*e^(424*I*c) + 269745801440211296972683601863878954357962308 5
2007659517712822762927324021520970821849736341414 0*e^(423*I*c) + 9200893930
2958903287460185002715932261252636844477148978197436107884752889146883103 84
36064951920*e^(422*I*c) + 30961319716215201623803015542414654517823620868 10
287537748902904985934020179565706177131421614590*e^(421*I*c) + 102793647306
6384084473957786246926260464886191429797258916524353065123069072624446247 91
99894255180*e^(420*I*c) + 33675398872021568375902384593982753362559801058 10
418462734541113626243194324077826072175699102709 0*e^(419*I*c) + 10886799573
1829472826732905192034886797284621356445627530909104429486741257822633476 89
8356826454040*e^(418*I*c) + 347351473214713780874352083129566601238765762 77
59423667627333499521038897539826364038575568677773 00*e^(417*I*c) + 10938532
1448622035867403243450086667849977001130587417248897595161203145673460828 70
95519501041975440*e^(416*I*c) + 340023256060165161752169468084708984419802 8
83169441742479486877932895054841812560544688208115263609 0*e^(415*I*c) + 104
3411751657039596665369315558240210946034809547302780741232142734681692856 71
97770376496170251803940*e^(414*I*c) + 316109393312846927506943064436184146 5
6095969520945215743004044560386895241801579156543451940713351730*e^(413*I*c
) + 9455618025893198691933430346636565282685809131432918916073627717587384 1
732196453379953705679466826880*e^(412*I*c) + 279285755800035206679835368898
1654776448649877946653878274889338636337450473731090492651726817025857 20*e^
(411*I*c) + 814608187736530579670210025271921415597183369881214299823291969
7855498761759698663679766532449747285 60*e^(410*I*c) + 234651821923910514223
8141633073464768899155708935025778047637412681781575765422219127409260159 43
8712250*e^(409*I*c) + 667586629037114735850376686566928901089354386983053 87
0872494529158095117918829660615811125770696860474 0*e^(408*I*c) + 1875998821
8865563564163635735986073278255737257405706279108891366378428467414559930 48
1172863538598193890*e^(407*I*c) + 520751785187932703864292633515443069511 04
993542500582938155241689408138675254608030847907167748571734720*e^(406*I*c)
 + 142801792450221762483180874918825274134305133275417780084795034644763509
333503150517345864659667189417080*e^(405*I*c) + 386876218234277165632451723
0499798892631152823746075416924431766739975137428135917361711696522506111 86
480*e^(404*I*c) + 1035561982592002935226384577908611548612111495080193573 69
133986470602918648246624180566494938104985625851 0*e^(403*I*c) + 27388956247
9526560335522764656600088628077830508482570291193890365616200426273618265 77
00406301914070062380*e^(402*I*c) + 71581246868429414754738073636798397181 72
7455815384090445033838526935969216224266967404539447181430252483 90*e^(401*I
*c) + 184874052990057326937527286118764908908583570219748823715706238001862

4513772266094364175297685292443987088O*e^(400*I*c) + 4718822084346620769509
950695357378035710889749142256789804819901820770899700533386014883647952745
6156014520*e^(399*I*c) + 11904185540387796494822957794837046560060662318304
5529526900430209270473212773847794935586074714329479939280*e^(398*I*c) + 29
682551528266958968531827328023905008455503220341594151196265959688161571379
9937680026497408305672297618840*e^(397*I*c) + 73158497220681836287472962140
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4080*e^(396*I*c) + 17824461149317518505563548566384219011744123222982494965
91658053939787198246565945975595575734193348887952160*e^(395*I*c) + 4293206
478008022126017488908851826494790620720660151451468181910917240027863968724
539127659633517053002976480*e^(394*I*c) + 102231820259548607672173903051864
519235621454736742936199180634904114874961218045902745927027705715154564146
80*e^(393*I*c) + 2406878513970527716119346564450614328524136103776821681892
2184400141048460210944696647752723371932874594597328*e^(392*I*c) + 56028683
424903517658495013858534516167162591034367972498174660907450666778154353271
630344650777885683547624184*e^(391*I*c) + 128967080084754712246023680866488
384983286259025533132044636109049545144029547003347761521666283977931640178
464*e^(390*I*c) + 293550743554342709808129453576562313299705982699187416862
934373964255615967138676253276302591561523515603264403*e^(389*I*c) + 660764
473105869097691475973850837934511089033149586707982764263394766756649565279
879146173318386505740391093990*e^(388*I*c) + 147093114661893434551503836230
010016048212774958144392990474691022477747019889905237911449399988700319941
9829579*e^(387*I*c) + 32384919313618514764233219335395790983777355392076414
67346235665823887048326949305609231585143748690203615957136*e^(386*I*c) + 7
052132414162197992602326524580143060985353054572933905524633121681021037340
298366342203324325307072413739061024*e^(385*I*c) + 151896342149088003964179
117226437547480485201097348124591098788104938443810626508189711996371214587
49456243274416*e^(384*I*c) + 3236273132241954941033008894364024746037832856
1316422931292427145902887913071643679502909055891236755143207382609*e^(383*
I*c) + 68208033096793615683784409619244210818614991640041553424405527876893
272496608324231098148502466453967157728078994*e^(382*I*c) + 142213115964814
517682386667276769909482271681318790889840501039441748635545362467679832449
103520321953011780083069*e^(381*I*c) + 293344920034300720287042383448342866
313806285455040067823080445597545970023446231563554135133105493516316320059
272*e^(380*I*c) + 598650141112241858911676505180520150364003226841328081453
597093587790338609212439085554466861582623350303061961052*e^(379*I*c) + 120
877035849365839308944222205693506328370410814059375022653984611773764821660
9559734831601248698274330296158612144*e^(378*I*c) + 24149665168103385032890
765492027405117100590117954471387734642056964550264427124264095996627710802
64826008985061097*e^(377*I*c) + 4774141111066098970221845330594962016472714
230374234060663956846950926642685946929064114194400360936223590725470146*e^
(376*I*c) + 933934195805349422525175096571505730070730208381477477030621822
4241022648247419956042957363055823830898547303219757*e^(375*I*c) + 18079820
068028859970349938623007230676563314206708848499900139641237334763266479346
963237936039328113185041591793848*e^(374*I*c) + 346376571726716901676573445

371970870488823548539932704720639430787736004465429635483481012693904434644
80754513928502*e^(373*I*c) + 6567485926886730009882737581287522561065455168
6261103681664007007537115778097293533565243828873383722980353200611956*e^(3
72*I*c) + 12324394151933238474196007258810350659640633925361639108206296996
0682419011745775738921817753391954462609323881489157*e^(371*I*c) + 22891131
173859278009149264916234683440586774077645632610841092885725717470728926807
4347550225793244741923354395308214*e^(370*I*c) + 42084634260894938727755902
145792458657812096614856102264700849952946845200598017511941062895621049760
9566002969884927*e^(369*I*c) + 76586779551396278101255844462875141871094089
5281304790836743661582071650032154891482866406314834433199455459798934952*e
^(368*I*c) + 13796765297962120740171061880665894483554465012108901951071648
60350228928586815539003062875026711931941947738690360722*e^(367*I*c) + 2460
442375845422663927081630983260714734968091905493027145639238827192254886349
361126991457692409851120873307487457468*e^(366*I*c) + 434390969660193217335
735968778157929370129568194082711421543317533609396784590876674073824003711
4570667410936998017178*e^(365*I*c) + 75927527001466789611530950735850154731
970297465336333315497939614732857609358019041551167648315608759475810486935
27224*e^(364*I*c) + 1313977149410493388185668115141829311224255152153568687
1181266579813877606348160261747201317735782566021306798298336024*e^(363*I*c
) + 22514675741308069961506165586502872430421930210673264392997286485600640
103867253604847715547060592967690653795951142520*e^(362*I*c) + 381990158675
860879760029987566276749947954406679036250293223462501332864891208750050136
38128113893960349670280707161530*e^(361*I*c) + 6417510069326006680623806488
600459717074084330008683936861613916452910804984467535311184272579865808884
0347241496099644*e^(360*I*c) + 10676483201716559483808523418933352873358767
332997253009266108518678993925291593709076028223234691909042624339940932331
4*e^(359*I*c) + 17589625826275598575710681261397930126580103159548435361490
4672865169442232075776580447184134141375995770091499246759528*e^(358*I*c) +
 28699294363123149655727801085157694089682649746606632752880156067700711283
7431926735088120974861760511367008815728782643*e^(357*I*c) + 46375828845736
715454493767825500568873332814556804931042399559988601280063861990402236837
8591108842602342094543682299102*e^(356*I*c) + 74222864090817312491693704946
252561733414891967911827048983100549778195122106995583962345249974865312465
8873553401442137*e^(355*I*c) + 11766007209757869651898750508902310922046126
969702774330145358957889567712307935203819931066068805646285998223417228010
12*e^(354*I*c) + 1847505856462451533445284300571326323781162553304565971887
670758091079306794821834928170773126364639722071570131703785334*e^(353*I*c)
 + 287361053592234018708083543558291227727196797739472015979107027492771427
6869531467182688981041061381703885403497544001592*e^(352*I*c) + 44276730791
054253185243161129856936565848519361001924570444551344833050453214525163471
18488133224823670465103483954805161*e^(351*I*c) + 6758480437888524372562935
948963857626694855547195519486122877567981718587262362871994967079401831957
927901682582941234362*e^(350*I*c) + 102204237794346348513399752951633996417
021222496636661930530083020260969321585683383094182373955413518190269079532
20681013*e^(349*I*c) + 1531283720666277537934735321280768296571253565294263

1518286142403097738200270711195396582159028513532779682154451996208592*e^(3
48*I*c) + 22731603566128841100419501947051367666836652418077260913944810748
473084891890410181285412604854876625919565639521227223276*e^(347*I*c) + 334
358978279365813011711754596108294542981679620174198100729367333785065844280
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149528524796002762*e^(344*I*c) + 100744961851853744611754300982980166962404
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819357*e^(343*I*c) + 142906319123055524246546928478954238371315925802022389
236498652136839822502035155676970917419039834587967055588431566416784*e^(34
2*I*c) + 200906587153578804380300469501441610174521851259541929209840688960
859454908519774835905895757666770857888611738751858460424*e^(341*I*c) + 279
945244475039804822966730462960884492119874857791147124009079476920435941735
293309305430438687333129912454196774070107264*e^(340*I*c) + 386642673050380
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388744033713210332491971375906738341551540457264804304039664255915607349801
911966551*e^(337*I*c) + 966458275369037718747739130798151643483590684166832
234688098291164160636418159452119815728809372125168836239364442397344064*e^
(336*I*c) + 128904351529293395648063433049967704018104393562010691426731106
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37188085882824757500605246963210810351706405349408*e^(334*I*c) + 2234891276
398439464478622578306434840724610484468177859822620658691921478645266653062
563823553001228001009093606751066168944*e^(333*I*c) + 290538572232005700195
334527448948279085669252995982374953269596341416483336677312821860789932858
8608916176593772088622582464*e^(332*I*c) + 37452575948766512046573349884262
263881439545019868306642223492263610796095468222760675048993867030889823081
85717143407211328*e^(331*I*c) + 4787527442780945685145204846971596165304169
419328244073211459592129649255048876854059844720661078151288179612574986359
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29*I*c) + 76297318156278215804689924242070083664388967363330246618638381051
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513032274019522954209113191268226642299912013525665940298381064797885690904
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41864908119643412413644803772131657280*e^(326*I*c) + 1442981628520843120453
297837537569196506315422464974755129585150738952408322697678968860136962839
9900747658579201929300744260*e^(325*I*c) + 17556273271224292396887291403125
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325408026834544840*e^(324*I*c) + 2118832140588288753961019837470686269589404922607709376413251251333619052397894969438768605912452675504804295795426470663746O*e^(323*I*c) + 2536717643911935362153226033598334815490498260612576171130068349296339081649158302570526873753998214963930022651265742611888O*e
^(322*I*c) + 30128482414552703264559018953088177156013437493438201078413769835448366148121754549197591129967170764969700180348699207838960*e^(321*I*c)
 + 35500103106019649876272376796949482209581372371036005012877806027481672807059943445240136315568500732379966585005678181937920*e^(320*I*c) + 41499832121963708043788523787401345541780088930538206918853579026749273364671640037563488607716092887686471542838602788559660*e^(319*I*c) + 48133117678184029216503748549110374478924719094635603892829364863916553792278822957368285106328164715910598370871149079494360*e^(318*I*c) + 553909130449720862194326891463315660814279598969699002144342968177311508638670566207686081876797097201529741484749079041773400*e^(317*I*c) + 632477741010121790517949460751755699240769813381384831580424067474538747293876317105449952471529122051185005975110528243476800*e^(316*I*c) + 716603298611733955244419438892841091340911578446552456720842374024349446964649271318121906596295111406395017433038635820928800*e^(315*I*c) + 805662491306826841818762018826235112063637903372180119541102106429277659976449038205954219368735653146544157690704726554016000*e^(314
*I*c) + 898838158013823822139732704779546027447928770180519633471463073724643151212749294023479428748028994995389535610566676688910200*e^(313*I*c) + 99512206472057965951340341738023548515336403371717898040850470954657532977279113491506880290726111154101941386019689567958040*e^(312*I*c) + 1093325373499662232039326785034263570798637070017282940110420765304039238626540189786765164173142210894499224956127328701696600*e^(311*I*c) + 11920971370203392705575539782368844444464742432450218532862634704659963472114657383068154049533354314677681091191041046862896O*e^(310*I*c) + 128995076011591903410763863427097329948586173574595862705849159280943046458742663163454018491463855395649453952212899632198680*e^(309*I*c) + 138529794549151089451352769576543403126330747243680030832467205895819043568155239264876762867172754338684027849855385453216080*e^(308*I*c) + 147648920805545333418623121767853777399782924748301228793924342574999937955421765370101235122939557467548549202174550009604780*e^(307*I*c) + 156185962953551196169738218832173696509852551589210730578365727476259476474465955428502336673743686499175698677875693611243400*e^(30
6*I*c) + 163977816059607725375264559816505847894187785101455360391897424482998415385787605765315509208337741590143078572243505132706580*e^(305*I*c) +
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c) + 4637582884573671545449376782550056887333281455680493104239955998860128
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) + 38199015867586087976002998756627674994795440667903625029322346250133286
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e^(234*I*c) + 4343909696601932173357359687781579293701295681940827114215433
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+ 2289113117385927800914926491623468344058677407764563261084109288572571747
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53391954462609323881489157*e^(227*I*c) + 6567485926886730009882737581287522

561065455168626110368166400700753711577809729353356524382887338372298035320
0611956*e^(226*I*c) + 346376571726716901676573445371970870488823548539932 70
4720639430787736004465429635483481012693904434644807545139285 02*e^(225*I*c)
 + 180798200680288599703499386230072306765633142067088484999001396412373347
632664793469632379360393281131850415917938 48*e^(224*I*c) + 9339341958053494
225251750965715057300707302083814774770306218224241022648247419956042957363
0558238308985473032197 57*e^(223*I*c) + 477414111106609897022184533059496201
647271423037423406066395684695092664268594692906411419440036093622359072547
0146*e^(222*I*c) + 241496651681033850328907654920274051171005901179544713 87
7346420569645502644271242640959966277108026482600898506109 7*e^(221*I*c) + 1
208770358493658393089442222056935063283704108140593750226539846117737648216
609559734831601248698274330296158612144*e^(220*I*c) + 598650141112241858911
676505180520150364003226841328081453597093587790338609212439085554466861582
623350303061961052*e^(219*I*c) + 293344920034300720287042383448342866313806
285455040067823080445597545970023446231563554135133105493516316320059272*e^
(218*I*c) + 142213115964814517682386667276769909482271681318790889840501039
441748635545362467679832449103520321953011780083069*e^(217*I*c) + 682080330
967936156837844096192442108186149916400415534244055278768932724966083242310
981485024664539671577280789 94*e^(216*I*c) + 323627313224195494103300889436 4
024746037832856131642293129242714590288791307164367950290905589123675514320
7382609*e^(215*I*c) + 151896342149088003964179117226437547480485201097348 12
459109878810493844381062650818971199637121458749456243274416*e^(214*I*c) +
705213241416219799260232652458014306098535305457293390552463312168102103734
0298366342203324325307072413739061024*e^(213*I*c) + 323849193136185147642 33
219335395790983777355392076414673462356658238870483269493056092315851437486
90203615957136*e^(212*I*c) + 147093114661893434551503836230010016048212774 9
58144392990474691022477747019889905237911449399988700319941982957 9*e^(211*I
*c) + 660764473105869097691475973850837934511089033149586707982764263394766
75664956527987914617331838650574039109399 0*e^(210*I*c) + 293550743554342709
808129453576562313299705982699187416862934373964255615967138676253276302591
561523515603264403*e^(209*I*c) + 128967080084754712246023680866488384983286
259025533132044636109049545144029547003347761521666283977931640178464*e^(20
8*I*c) + 560286834249035176584950138585345161671625910343679724981746609074
50666778154353271630344650777885683547624184*e^(207*I*c) + 2406878513970527
716119346564450614328524136103776821681892218440014104846021094469664775272
3371932874594597328*e^(206*I*c) + 102231820259548607672173903051864519235 62
145473674293619918063490411487496121804590274592702770571515456414680*e^(20
5*I*c) + 429320647800802212601748890885182649479062072066015145146818191091
724002786396872453912765963351705300297648 0*e^(204*I*c) + 17824461149317518
505563548566384219011744123222982494965916580539397871982465659459755955757
34193348887952160*e^(203*I*c) + 731584972206818362874729621403974444280010 4
463011615273397605448153009517879855384197646562145826672199140 80*e^(202*I*
c) + 296825515282669589685318273280239050084555032203415941511962659596881 6
157137999376800264974083056722976188 40*e^(201*I*c) + 11904185540387796494 82
295779483704656006066231830455295269004302092704732127738477949355860747143

29479939280*e^(200*I*c) + 4718822084346620769509950695357378035710889749142
2567898048199018207708997005333860148836479527456156014520*e^(199*I*c) + 18
487405299005732693752728611876490890858357021974882371570623800186245137722
660943641752976852924439870880*e^(198*I*c) + 715812468684294147547380736367
983971817274558153840904450338385269359692162242669674045394471814302524839
0*e^(197*I*c) + 27388956247952656033552276465660008862807783050848257029119
38903656162004262736182657700406301914070062380*e^(196*I*c) + 1035561982592
002935226384577908611548612111495080193573691339864706029186482466241805664
949381049856258510*e^(195*I*c) + 386876218234277165632451723049979889263115
282374607541692443176673997513742813591736171169652250611186480*e^(194*I*c)
 + 142801792450221762483180874918825274134305133275417780084795034644763509
333503150517345864659667189417080*e^(193*I*c) + 520751785187932703864292633
515443069511049935425005829381552416894081386752546080308479071677485717347
20*e^(192*I*c) + 1875998821886556356416363573598607327825573725740570627910
8891366378428467414559930481172863538598193890*e^(191*I*c) + 66758662903711
473585037668656692890108935438698305387087249452915809511791882966061581112
57706968604740*e^(190*I*c) + 2346518219239105142238141633073464768899155708
935025778047637412681781575765422219127409260159438712250*e^(189*I*c) + 814
608187736530579670210025271921415597183369881214299823291969785549876175969
866367976653244974728560*e^(188*I*c) + 279285755800035206679835368898165477
644864987794665387827488933863633745047373109049265172681702585720*e^(187*I
*c) + 945561802589319869193343034663656528268580913143291891607362771758738
41732196453379953705679466826880*e^(186*I*c) + 3161093933128469275069430644
3618414656095969520945215743004044560386895241801579156543451940713351730*e
^(185*I*c) + 10434117516570395966653693155582402109460348095473027807412321
427346816928567197770376496170251803940*e^(184*I*c) + 340023256060165161752
169468084708984419802883169441742479486877932895054841812560544688208115263
6090*e^(183*I*c) + 10938532144862203586740324345008666784997700113058741724
88975951612031456734608287095519501041975440*e^(182*I*c) + 3473514732147137
808743520831295666012387657627759423667627333499521038897539826364038575568
67777300*e^(181*I*c) + 1088679957318294728267329051920348867972846213564456
27530909104429486741257822633476898356826454040*e^(180*I*c) + 3367539887202
156837590238459398275336255980105810418462734541113626243194324077826072175
6991027090*e^(179*I*c) + 10279364730663840844739577862469262604648861914297
972589165243530651230690726244462479199894255180*e^(178*I*c) + 309613197162
152016238030155424146545178236208681028753774890290498593402017956570617713
1421614590*e^(177*I*c) + 92008939302958903287460185002715932261252636844477
1489781974361078847528891468831038436064951920*e^(176*I*c) + 26974580144021
129697268360186387895435796230852007659517712822762927324021520970821849736
3414140*e^(175*I*c) + 78009807368024239875613733058851417125327114681070889
640794249282633470580756557083923203377160*e^(174*I*c) + 222519591767957777
571673660360074802222113642321463998038643709633914912236872458234573515801
40*e^(173*I*c) + 6259872156822252843650960708235034710201362776057176647226
323089751446565288850103898153859920*e^(172*I*c) + 173657421881819107187419
7472450158123883564209950658639102337148122769080611680719741726053840*e^(1

71*I*c) + 4750105788576015192723166179384252224217865972416710268943185154085114671409693931157687936 80*e^(170*I*c) + 12809891460168853967248054183040984770736750043860153680320449770111991128908710565948278334 0*e^(169*I*c) + 34054053851295569154352346722177172655187548910782008504718324168725029438589162349211628040*e^(168*I*c) + 892320944734329676333188188163847179349961867060102605973089596265329177022949302816257510 0*e^(167*I*c) + 23043510733738403573791785976730663520166827816891398420973766631184888038411319353136 41840*e^(166*I*c) + 586403466972683242741643328921560909375197453864243299571990964608857245771134145204174990*e^(165*I*c) + 147030816732276833163041582099592047512043725225353339238819165193000407629544745753221740*e^(164*I*c) + 36318369652302591732197444409798122022640824604130552506742586795183267354382847875885730*e^(163*I*c) + 883672064086047030569451402154796955129679409226698304411837579002585458403679636476828 0*e^(162*I*c) + 211758973346685570710150142921041472240183883794075284161854144088854572994313820903682 0*e^(161*I*c) + 49970756725385908435759631481379476806933719091596749190748890493392267757966535433896 0*e^(160*I*c) + 11610455168355504376291150171211639931373302113267748111282404724636179404963572647985 0*e^(159*I*c) + 26556806389043407534496702369101545795994861757741414789944652712127566910185274123140*e^(158*I*c) + 597899217294414321845916114929981970632173211157849452524522874297646840910539553629 0*e^(157*I*c) + 13247564123678374731574728211624836911209665019489539264922416437882642845464372211 20*e^(156*I*c) + 28882075526473065446996857202104710942731861950899580202068990459031947629540832 4280*e^(155*I*c) + 61948596653035502879564338815234310660410902037882473161804774492916216575880077680*e^(154*I*c) + 13069817203488289886193205508375818392124991382340160316886507181296548981014818410*e^(153*I*c) + 2711843239670717527605640490148833507130242448403978318523237721944200392830108580*e^(152*I*c) + 5532691288195286125029188695589478290980219563093498435840446315122917788000814 90*e^(151*I*c) + 1109691996873209747499222595952504443412192185353496557625911925765358721517660 80*e^(150*I*c) + 2187648289271390992804034561257870580512150875622669631708765182425224141866332 0*e^(149*I*c) + 4238125846763232586394188569858685826755328005548627437019301405851325887594480*e^(148*I*c) + 80667954360758914075930501079618956826984202161338895521891627882318263948819 0*e^(147*I*c) + 15082238143141241377356647421001174685229743759705918629524398948114039815278 0*e^(146*I*c) + 27693116538343259225983382637647936122664033859615133489846664694361471028310*e^(145*I*c) + 4992519712457043983505377976607953988397368297591114957991804893688371867680*e^(144*I*c) + 883500968821791202600774541927769200737689393513734789368397093333311961880*e^(143*I*c) + 1534360887450562541273272394615770719331301577645959971139735131831883993 76*e^(142*I*c) + 26143976279902021443471945665080254563056810183520401889800285493144867448*e^(141*I*c) + 43694424829101139145653531360695958626693388580534193812141312419250470 08*e^(140*I*c) + 716099497599058079895633338552940229192858196481597830078819711862600096*e^(139*I*c) + 115051481852080848873700388354521315567640365124003103691176697194292320*e^(138*I*c) + 18115768495615758076710303055505625589254293659193314153418333944596408*e^(137*I*c) + 279470910447568661184279069497369916448225472 3

977210209725661304403472*e^(136*I*c) + 422276126632003687547754746555709988710527133086660161366353656787288*e^(135*I*c) + 62473550781053295317710774690247114124125187565731848441781904032672*e^(134*I*c) + 9046693523825682979044338963104263167672586826367911338826483549173*e^(133*I*c) + 1281817464914970810859604189828359000790789921169405304612211251818*e^(132*I*c) + 177642829135119348577194437675802830239905460092687136494961404333*e^(131*I*c) + 24070801913529757101858022914372045864746991786182039740274325264*e^(130*I*c) + 3187749929744346497211536044751776582320958627923816470590659024*e^(129*I*c) + 412430698299915190848067222327219435067747934091894670488982928*e^(128*I*c) + 52108117629177048660492400985175830987505700566877818954141639*e^(127*I*c) + 6426195485535248576425068136870465530087114003875716691383902*e^(126*I*c) + 773204636991145775061462731028098506094432675788136295011259*e^(125*I*c) + 90722605722208814918642284639487187764607589706493970774776*e^(124*I*c) + 10375184499871175501909398956596684116802997082526660323524*e^(123*I*c) + 1155855412893594260345544966642687823630035899363232371472*e^(122*I*c) + 125370496586921272662198050851269323171167338854081782959*e^(121*I*c) + 13231708870104896973800056733779919089340836756009580718*e^(120*I*c) + 1357990663161479842850642848032544982878359839580349899*e^(119*I*c) + 135442594916636116191574650625331646238501101627937224*e^(118*I*c) + 13118781801172174729679339894318153694964675368481194*e^(117*I*c) + 1233096700139723365181997220750932590655287625342156*e^(116*I*c) + 112391604542246650966429162063124338952554575234051*e^(115*I*c) + 9925490738534402272939987038714580495445431374618*e^(114*I*c) + 848552202276512356496200136959676295361696315113*e^(113*I*c) + 70164515322544462906873548813748091084561870680*e^(112*I*c) + 5605927253067558551780452883689835514455118670*e^(111*I*c) + 432333688644261557547944179250800440604964868*e^(110*I*c) + 32147887693375338817454482515377350383950278*e^(109*I*c) + 2302150411226234925855222345201500900533576*e^(108*I*c) + 158566476113257562566117432227203884298856*e^(107*I*c) + 10490402669510897424624643766470754045064*e^(106*I*c) + 665634670676210063754191847109971141414*e^(105*I*c) + 40443624781415311581857832389099634564*e^(104*I*c) + 2348998374244347079532766203075607598*e^(103*I*c) + 130171193079172823835151430773360024*e^(102*I*c) + 6868329225263681349501997341320517*e^(101*I*c) + 344277152012875134140739302960914*e^(100*I*c) + 16353164647151530240529137618111*e^(99*I*c) + 734057263616388449968842366924*e^(98*I*c) + 31042222522074681615625020522*e^(97*I*c) + 1232445557346832245176696904*e^(96*I*c) + 45759117183402579073139583*e^(95*I*c) + 1581796642397812408161814*e^(94*I*c) + 50648660944512569972179*e^(93*I*c) + 1493326612293984160368*e^(92*I*c) + 40261256699368950388*e^(91*I*c) + 984382804329835768*e^(90*I*c) + 21608403021340047*e^(89*I*c) + 420601518659718*e^(88*I*c) + 7146142307307*e^(87*I*c) + 103818048048*e^(86*I*c) + 1253841160*e^(85*I*c) + 12085216*e^(84*I*c) + 87153*e^(83*I*c) + 418*e^(82*I*c) + e^(81*I*c)))*sqrt(a)*sgn(cos(1/2*d*x + 1/2*c))/((tan(1/4*d*x + c)^4*tan(1/2*c)^8 - 14*tan(1/4*d*x + c)^4*tan(1/2*c)^6 + 24*tan(1/4*d*x + c)^3*tan(1/2*c)^7 - 6*tan(1/4*d*x + c)^2*tan(1/2*c)^8 - 56*tan(1/4*d*x + c)^3*tan(1/2*c)^5 + 84*tan(1/4*d*x + c)^2*tan(1/2*c)^6 - 24*tan(1/4*d*x + c)*tan(1/2*c)^7 + tan(1/2*c)^8 + 14*

```
tan(1/4*d*x + c)^4*tan(1/2*c)^2 - 56*tan(1/4*d*x + c)^3*tan(1/2*c)^3 + 56*t
an(1/4*d*x + c)*tan(1/2*c)^5 - 14*tan(1/2*c)^6 - tan(1/4*d*x + c)^4 + 24*ta
n(1/4*d*x + c)^3*tan(1/2*c) - 84*tan(1/4*d*x + c)^2*tan(1/2*c)^2 + 56*tan(1
/4*d*x + c)*tan(1/2*c)^3 + 6*tan(1/4*d*x + c)^2 - 24*tan(1/4*d*x + c)*tan(1
/2*c) + 14*tan(1/2*c)^2 - 1)^4*d)
```

Mupad [B] (verification not implemented)

Time = 18.39 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.01

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{35\,a^2\,\sin\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)\,\sqrt{a+a\,\cos\left(c+d\,x\right)}-\frac{35\,a^2\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\sqrt{a+a\,\cos(c+d\,x)}}{2}+\cdots}{\frac{63\,d\,\sqrt{\cos(c+d\,x)}\,\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{8}+\frac{63\,d\,\sqrt{\cos(c+d\,x)}\,\cos\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)}{8}+\frac{21\,d\,\sqrt{\cos(c+d\,x)}\,\cos\left(\frac{5\,c}{2}+\frac{5\,d\,x}{2}\right)}{8}+\cdots}$$

```
[In] int((a + a*cos(c + d*x))^(5/2)/cos(c + d*x)^(9/2),x)
```

```
[Out] (35*a^2*sin((3*c)/2 + (3*d*x)/2)*(a + a*cos(c + d*x))^(1/2) - (35*a^2*sin(c
/2 + (d*x)/2)*(a + a*cos(c + d*x))^(1/2))/2 + (23*a^2*sin((7*c)/2 + (7*d*x)
/2)*(a + a*cos(c + d*x))^(1/2))/2)/((63*d*cos(c + d*x)^(1/2)*cos(c/2 + (d*x
)/2))/8 + (63*d*cos(c + d*x)^(1/2)*cos((3*c)/2 + (3*d*x)/2))/8 + (21*d*cos(
c + d*x)^(1/2)*cos((5*c)/2 + (5*d*x)/2))/8 + (21*d*cos(c + d*x)^(1/2)*cos((
7*c)/2 + (7*d*x)/2))/8)
```

3.220 $\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 201

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \frac{38a^3\sin(c+dx)}{63d\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{146a^3\sin(c+dx)}{105d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{584a^3\sin(c+dx)}{315d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{1168a^3\sin(c+dx)}{315d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)}$$

```
[Out] 38/63*a^3*sin(d*x+c)/d/cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^(1/2)+146/105*a^3*
sin(d*x+c)/d/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(1/2)+584/315*a^3*sin(d*x+c)
/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2)+1168/315*a^3*sin(d*x+c)/d/cos(d*
x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2)+2/9*a^2*sin(d*x+c)*(a+a*cos(d*x+c))^(1/2)
/d/cos(d*x+c)^(9/2)
```

Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 201, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2841, 3059, 2851, 2850}

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \frac{584a^3\sin(c+dx)}{315d\cos^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{146a^3\sin(c+dx)}{105d\cos^{\frac{5}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{38a^3\sin(c+dx)}{63d\cos^{\frac{7}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{1168a^3\sin(c+dx)}{315d\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}} + \frac{2a^2\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{9d\cos^{\frac{9}{2}}(c+dx)}$$

```
[In] Int[(a + a*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(11/2),x]
```

```
[Out] (38*a^3*Sin[c + d*x])/(63*d*Cos[c + d*x]^(7/2)*Sqrt[a + a*Cos[c + d*x]]) +
(146*a^3*Sin[c + d*x])/(105*d*Cos[c + d*x]^(5/2)*Sqrt[a + a*Cos[c + d*x]])
+ (584*a^3*Sin[c + d*x])/(315*d*Cos[c + d*x]^(3/2)*Sqrt[a + a*Cos[c + d*x]]
) + (1168*a^3*Sin[c + d*x])/(315*d*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*
x]]) + (2*a^2*Sqrt[a + a*Cos[c + d*x]]*Sin[c + d*x])/(9*d*Cos[c + d*x]^(9/2
))
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rule 3059

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[(-b^2)*(B*c - A*d)*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)
*(b*c + a*d)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*
c - 2*a*d*(n + 1)))/(2*d*(n + 1)*(b*c + a*d)), Int[Sqrt[a + b*Sin[e + f*x]]
*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
```

1]

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)} \\
&\quad -\frac{1}{9}(2a)\int\frac{\left(-\frac{19a}{2}-\frac{15}{2}a\cos(c+dx)\right)\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx \\
&= \frac{38a^3\sin(c+dx)}{63d\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)} \\
&\quad +\frac{1}{21}\left(73a^2\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx \\
&= \frac{38a^3\sin(c+dx)}{63d\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}+\frac{146a^3\sin(c+dx)}{105d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} \\
&\quad +\frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)}+\frac{1}{105}\left(292a^2\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{38a^3\sin(c+dx)}{63d\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}+\frac{146a^3\sin(c+dx)}{105d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} \\
&\quad +\frac{584a^3\sin(c+dx)}{315d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)} \\
&\quad +\frac{1}{315}\left(584a^2\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{38a^3\sin(c+dx)}{63d\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}+\frac{146a^3\sin(c+dx)}{105d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} \\
&\quad +\frac{584a^3\sin(c+dx)}{315d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} \\
&\quad +\frac{1168a^3\sin(c+dx)}{315d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)}
\end{aligned}$$

Mathematica [A] (verified)

Time = 5.21 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.42

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \frac{a^2\sqrt{a(1+\cos(c+dx))}(727+698\cos(c+dx)+803\cos(2(c+dx))+146\cos$$
$$315d\cos^{\frac{9}{2}}(c+dx)$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(11/2),x]
```

```
[Out] (a^2*Sqrt[a*(1 + Cos[c + d*x])]*(727 + 698*Cos[c + d*x] + 803*Cos[2*(c + d*
x)] + 146*Cos[3*(c + d*x)] + 146*Cos[4*(c + d*x)])*Tan[(c + d*x)/2])/(315*d
*Cos[c + d*x]^(9/2))
```

Maple [A] (verified)

Time = 5.27 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.42

method	result	size
default	$\frac{2\sin(dx+c)\left(584\left(\cos^4(dx+c)\right)+292\left(\cos^3(dx+c)\right)+219\left(\cos^2(dx+c)\right)+130\cos(dx+c)+35\right)\sqrt{a(1+\cos(dx+c))}\,a^2}{315d(1+\cos(dx+c))\cos(dx+c)^{\frac{9}{2}}}$	85

```
[In] int((a+cos(d*x+c)*a)^(5/2)/cos(d*x+c)^(11/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/315/d*sin(d*x+c)*(584*cos(d*x+c)^4+292*cos(d*x+c)^3+219*cos(d*x+c)^2+130*
cos(d*x+c)+35)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))/cos(d*x+c)^(9/2)*a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.53

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \frac{2\left(584\,a^2\cos{(dx+c)}^4+292\,a^2\cos{(dx+c)}^3+219\,a^2\cos{(dx+c)}^2+130\,a^2\cos\right.}{315\left(d\cos{(dx+c)}^6+d\right.}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(11/2),x, algorithm="fricas")
```

```
[Out] 2/315*(584*a^2*cos(d*x + c)^4 + 292*a^2*cos(d*x + c)^3 + 219*a^2*cos(d*x +
c)^2 + 130*a^2*cos(d*x + c) + 35*a^2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x
 + c))*sin(d*x + c)/(d*cos(d*x + c)^6 + d*cos(d*x + c)^5)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(5/2)/cos(d*x+c)**(11/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 289, normalized size of antiderivative = 1.44

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \frac{8\left(\frac{315\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)}{\cos(dx+c)+1} - \frac{945\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^{3}}{(\cos(dx+c)+1)^{3}} + \frac{1449\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^{5}}{(\cos(dx+c)+1)^{5}} - \frac{1287\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^{7}}{(\cos(dx+c)+1)^{7}}\right.}{315\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{11}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{11}{2}}\left(\frac{3\sin(dx+c}{(\cos(dx+c)+\right.}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(11/2),x, algorithm="maxima")
```

```
[Out] 8/315*(315*sqrt(2)*a^(5/2)*sin(d*x + c)/(cos(d*x + c) + 1) - 945*sqrt(2)*a^
(5/2)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 1449*sqrt(2)*a^(5/2)*sin(d*x +
c)^5/(cos(d*x + c) + 1)^5 - 1287*sqrt(2)*a^(5/2)*sin(d*x + c)^7/(cos(d*x +
c) + 1)^7 + 572*sqrt(2)*a^(5/2)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9 - 104*s
qrt(2)*a^(5/2)*sin(d*x + c)^11/(cos(d*x + c) + 1)^11)*(sin(d*x + c)^2/(cos(
d*x + c) + 1)^2 + 1)^3/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(11/2)*(-si
n(d*x + c)/(cos(d*x + c) + 1) + 1)^(11/2)*(3*sin(d*x + c)^2/(cos(d*x + c) +
 1)^2 + 3*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + sin(d*x + c)^6/(cos(d*x + c
) + 1)^6 + 1))
```

Giac [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(11/2),x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [B] (verification not implemented)

Time = 21.05 (sec) , antiderivative size = 279, normalized size of antiderivative = 1.39

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \frac{\sqrt{a+a\,\cos\left(c+d\,x\right)}\,\left(\frac{192\,a^2\,\mathrm{e}^{\frac{c\,9\mathrm{i}}{2}+\frac{d\,x\,9\mathrm{i}}{2}}\cdots}{5\,d}\cdots\right.}{12\,\sqrt{\cos\left(c+d\,x\right)}\,\mathrm{e}^{\frac{c\,9\mathrm{i}}{2}+\frac{d\,x\,9\mathrm{i}}{2}}\,\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)+8\,\sqrt{\cos\left(c+d\,x\right)}\,\mathrm{e}^{\frac{c\,9\mathrm{i}}{2}+\frac{d\,x\,9\mathrm{i}}{2}}\,\cos\left(\frac{3\,c}{2}\cdots\right.}$$

```
[In] int((a + a*cos(c + d*x))^(5/2)/cos(c + d*x)^(11/2),x)
```

```
[Out] ((a + a*cos(c + d*x))^(1/2)*((192*a^2*exp((c*9i)/2 + (d*x*9i)/2)*sin(c/2 +
(d*x)/2))/(5*d) - (16*a^2*exp((c*9i)/2 + (d*x*9i)/2)*sin((3*c)/2 + (3*d*x)/
2))/(3*d) + (1168*a^2*exp((c*9i)/2 + (d*x*9i)/2)*sin((5*c)/2 + (5*d*x)/2))/
(35*d) + (2336*a^2*exp((c*9i)/2 + (d*x*9i)/2)*sin((9*c)/2 + (9*d*x)/2))/(31
5*d)))/(12*cos(c + d*x)^(1/2)*exp((c*9i)/2 + (d*x*9i)/2)*cos(c/2 + (d*x)/2)
 + 8*cos(c + d*x)^(1/2)*exp((c*9i)/2 + (d*x*9i)/2)*cos((3*c)/2 + (3*d*x)/2)
 + 8*cos(c + d*x)^(1/2)*exp((c*9i)/2 + (d*x*9i)/2)*cos((5*c)/2 + (5*d*x)/2)
 + 2*cos(c + d*x)^(1/2)*exp((c*9i)/2 + (d*x*9i)/2)*cos((7*c)/2 + (7*d*x)/2)
 + 2*cos(c + d*x)^(1/2)*exp((c*9i)/2 + (d*x*9i)/2)*cos((9*c)/2 + (9*d*x)/2)
)
```

3.221 $\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{5}{4}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 38

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{5}{4}}(c+dx)}\,dx=\frac{4a^2\sin(c+dx)}{d\sqrt[4]{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 4*a^2*sin(d*x+c)/d/cos(d*x+c)^(1/4)/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2841, 8}

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{5}{4}}(c+dx)}\,dx=\frac{4a^2\sin(c+dx)}{d\sqrt[4]{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(5/4),x]
[Out] (4*a^2*Sin[c + d*x])/(d*Cos[c + d*x]^(1/4)*Sqrt[a + a*Cos[c + d*x]])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
```

```
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{4a^2\sin(c+dx)}{d\sqrt[4]{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}-(4a)\int 0\,dx\\ &= \frac{4a^2\sin(c+dx)}{d\sqrt[4]{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 51, normalized size of antiderivative = 1.34

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{5}{4}}(c+dx)}\,dx=\frac{2(a(1+\cos(c+dx)))^{3/2}\sec^2\left(\frac{1}{2}(c+dx)\right)\tan\left(\frac{1}{2}(c+dx)\right)}{d\sqrt[4]{\cos(c+dx)}}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(5/4),x]
[Out] (2*(a*(1 + Cos[c + d*x]))^(3/2)*Sec[(c + d*x)/2]^2*Tan[(c + d*x)/2])/(d*Cos
[c + d*x]^(1/4))
```

Maple [F]

$$\int \frac{(a+\cos(dx+c)\,a)^{\frac{3}{2}}}{\cos(dx+c)^{\frac{5}{4}}}dx$$

```
[In] int((a+cos(d*x+c)*a)^(3/2)/cos(d*x+c)^(5/4),x)
[Out] int((a+cos(d*x+c)*a)^(3/2)/cos(d*x+c)^(5/4),x)
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 50, normalized size of antiderivative = 1.32

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{5}{4}}(c+dx)}\,dx=\frac{4\sqrt{a\cos(dx+c)+a}a\cos(dx+c)^{\frac{3}{4}}\sin(dx+c)}{d\cos(dx+c)^2+d\cos(dx+c)}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(5/4),x, algorithm="fricas")
[Out] 4*sqrt(a*cos(d*x + c) + a)*a*cos(d*x + c)^(3/4)*sin(d*x + c)/(d*cos(d*x + c
)^2 + d*cos(d*x + c))
```

Sympy [F]

$$\int \frac{(a + a\cos(c + dx))^{3/2}}{\cos^{\frac{5}{4}}(c + dx)}\,dx = \int \frac{(a(\cos(c + dx) + 1))^{\frac{3}{2}}}{\cos^{\frac{5}{4}}(c + dx)}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))**(3/2)/cos(d*x+c)**(5/4),x)
[Out] Integral((a*(cos(c + d*x) + 1))**(3/2)/cos(c + d*x)**(5/4), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 121 vs. $2(34) = 68$.

Time = 0.33 (sec) , antiderivative size = 121, normalized size of antiderivative = 3.18

$$\int \frac{(a + a\cos(c + dx))^{3/2}}{\cos^{\frac{5}{4}}(c + dx)}\,dx = \frac{4\left(\frac{\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)}{\cos(dx+c)+1} - \frac{\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}\right)}{d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1} + 1\right)^{\frac{5}{4}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1} + 1\right)^{\frac{5}{4}}\left(\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2} + 1\right)^{\frac{1}{4}}}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(5/4),x, algorithm="maxima")
[Out] 4*(sqrt(2)*a^(3/2)*sin(d*x + c)/(cos(d*x + c) + 1) - sqrt(2)*a^(3/2)*sin(d*
x + c)^3/(cos(d*x + c) + 1)^3)/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(5/
4)*(-sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(5/4)*(sin(d*x + c)^2/(cos(d*x +
c) + 1)^2 + 1)^(1/4))
```

Giac [F(-1)]

Timed out.

$$\int \frac{(a + a\cos(c + dx))^{3/2}}{\cos^{\frac{5}{4}}(c + dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(5/4),x, algorithm="giac")
[Out] Timed out
```

Mupad [B] (verification not implemented)

Time = 0.63 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.11

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{5}{4}}(c+dx)}\,dx = \frac{4\,a\,\sin\left(c+d\,x\right)\,\sqrt{a\,\left(\cos\left(c+d\,x\right)+1\right)}}{d\cos\left(c+d\,x\right)^{1/4}\,\left(\cos\left(c+d\,x\right)+1\right)}$$

```
[In] int((a + a*cos(c + d*x))^(3/2)/cos(c + d*x)^(5/4),x)
[Out] (4*a*sin(c + d*x)*(a*(cos(c + d*x) + 1))^(1/2))/(d*cos(c + d*x)^(1/4)*(cos(
c + d*x) + 1))
```

3.222 $\int \frac{\sqrt{a+a\cos(e+fx)}}{\sqrt{\cos(e+fx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 37

$$\int \frac{\sqrt{a+a\cos(e+fx)}}{\sqrt{\cos(e+fx)}}\,dx=\frac{2\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(e+fx)}{\sqrt{a+a\cos(e+fx)}}\right)}{f}$$

```
[Out] 2*arcsin(sin(f*x+e)*a^(1/2)/(a+a*cos(f*x+e))^(1/2))*a^(1/2)/f
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2853, 222}

$$\int \frac{\sqrt{a+a\cos(e+fx)}}{\sqrt{\cos(e+fx)}}\,dx=\frac{2\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(e+fx)}{\sqrt{a\cos(e+fx)+a}}\right)}{f}$$

```
[In] Int[Sqrt[a + a*Cos[e + f*x]]/Sqrt[Cos[e + f*x]],x]
```

```
[Out] (2*Sqrt[a]*ArcSin[(Sqrt[a]*Sin[e + f*x])/Sqrt[a + a*Cos[e + f*x]]])/f
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
```

```
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rubi steps

$$\text{integral} = -\frac{2\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(e+fx)}{\sqrt{a+a\cos(e+fx)}}\right)}{f}$$
$$= \frac{2\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(e+fx)}{\sqrt{a+a\cos(e+fx)}}\right)}{f}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 50, normalized size of antiderivative = 1.35

$$\int \frac{\sqrt{a+a\cos(e+fx)}}{\sqrt{\cos(e+fx)}}\,dx = \frac{\sqrt{2}\arcsin\left(\sqrt{2}\sin\left(\frac{1}{2}(e+fx)\right)\right)\sqrt{a(1+\cos(e+fx))}\sec\left(\frac{1}{2}(e+fx)\right)}{f}$$

```
[In] Integrate[Sqrt[a + a*Cos[e + f*x]]/Sqrt[Cos[e + f*x]],x]
[Out] (Sqrt[2]*ArcSin[Sqrt[2]*Sin[(e + f*x)/2]]*Sqrt[a*(1 + Cos[e + f*x])]*Sec[(e
 + f*x)/2])/f
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 71 vs. $2(31) = 62$.

Time = 4.90 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.95

method	result	size
default	$\frac{2\sqrt{\frac{\cos(fx+e)}{1+\cos(fx+e)}}\,\sqrt{a(1+\cos(fx+e))}\,\arctan\left(\tan(fx+e)\sqrt{\frac{\cos(fx+e)}{1+\cos(fx+e)}}\right)}{f\sqrt{\cos(fx+e)}}$	72

```
[In] int((a+cos(f*x+e)*a)^(1/2)/cos(f*x+e)^(1/2),x,method=_RETURNVERBOSE)
[Out] 2/f/cos(f*x+e)^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*(a*(1+cos(f*x+e)))^(
1/2)*arctan(tan(f*x+e)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 119, normalized size of antiderivative = 3.22

$$\int \frac{\sqrt{a+a\cos(e+fx)}}{\sqrt{\cos(e+fx)}}\,dx = \left[\frac{\sqrt{-a}\log\left(\frac{2\,a\cos(fx+e)^2-2\,\sqrt{a\cos(fx+e)+a}\sqrt{-a}\sqrt{\cos(fx+e)}\sin(fx+e)+a\cos(fx+e)-a}{\cos(fx+e)+1}\right)}{f}, -\frac{2\,\sqrt{a}\arctan\left(\frac{\sqrt{a\cos(fx+e)+a}\sqrt{\cos(fx+e)}}{\sqrt{a}\sin(fx+e)}\right)}{f}\right]$$

```
[In] integrate((a+a*cos(f*x+e))^(1/2)/cos(f*x+e)^(1/2),x, algorithm="fricas")
[Out] [sqrt(-a)*log((2*a*cos(f*x + e)^2 - 2*sqrt(a*cos(f*x + e) + a)*sqrt(-a)*sqr
t(cos(f*x + e))*sin(f*x + e) + a*cos(f*x + e) - a)/(cos(f*x + e) + 1))/f, -
2*sqrt(a)*arctan(sqrt(a*cos(f*x + e) + a)*sqrt(cos(f*x + e))/(sqrt(a)*sin(f
*x + e)))/f]
```

Sympy [F]

$$\int \frac{\sqrt{a+a\cos(e+fx)}}{\sqrt{\cos(e+fx)}}\,dx = \int \frac{\sqrt{a\left(\cos\left(e+fx\right)+1\right)}}{\sqrt{\cos\left(e+fx\right)}}\,dx$$

```
[In] integrate((a+a*cos(f*x+e))**(1/2)/cos(f*x+e)**(1/2),x)
[Out] Integral(sqrt(a*(cos(e + f*x) + 1))/sqrt(cos(e + f*x)), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 146 vs. 2(31) = 62.

Time = 0.39 (sec) , antiderivative size = 146, normalized size of antiderivative = 3.95

$$\int \frac{\sqrt{a+a\cos(e+fx)}}{\sqrt{\cos(e+fx)}}\,dx = \frac{\sqrt{a}\arctan\left(\left(\cos\left(2\,fx+2\,e\right)^2+\sin\left(2\,fx+2\,e\right)^2+2\,\cos\left(2\,fx+2\,e\right)+1\right)^{\frac{1}{4}}\sin\left(\frac{1}{2}\,\arctan\left(\sin\left(2\,fx+2\,e\right),\right.\right.\right.}{}$$

```
[In] integrate((a+a*cos(f*x+e))^(1/2)/cos(f*x+e)^(1/2),x, algorithm="maxima")
```

```
[Out] sqrt(a)*arctan2((cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*
e) + 1)^(1/4)*sin(1/2*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) + si
n(f*x + e), (cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) +
 1)^(1/4)*cos(1/2*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) + cos(f*
x + e))/f
```

Giac [F]

$$\int \frac{\sqrt{a+a\cos(e+fx)}}{\sqrt{\cos(e+fx)}}\,dx=\int \frac{\sqrt{a\cos\left(fx+e\right)+a}}{\sqrt{\cos\left(fx+e\right)}}\,dx$$

```
[In] integrate((a+a*cos(f*x+e))^(1/2)/cos(f*x+e)^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(a*cos(f*x + e) + a)/sqrt(cos(f*x + e)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{a+a\cos(e+fx)}}{\sqrt{\cos(e+fx)}}\,dx=\int \frac{\sqrt{a+a\,\cos\left(e+f\,x\right)}}{\sqrt{\cos\left(e+f\,x\right)}}\,dx$$

```
[In] int((a + a*cos(e + f*x))^(1/2)/cos(e + f*x)^(1/2),x)
[Out] int((a + a*cos(e + f*x))^(1/2)/cos(e + f*x)^(1/2), x)
```

3.223 $\int \frac{\sqrt{a-a\cos(e+fx)}}{\sqrt{-\cos(e+fx)}}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 38

$$\int \frac{\sqrt{a-a\cos(e+fx)}}{\sqrt{-\cos(e+fx)}}\,dx = -\frac{2\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(e+fx)}{\sqrt{a-a\cos(e+fx)}}\right)}{f}$$

```
[Out] -2*arcsin(sin(f*x+e)*a^(1/2)/(a-a*cos(f*x+e))^(1/2))*a^(1/2)/f
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.071, Rules used = {2853, 222}

$$\int \frac{\sqrt{a-a\cos(e+fx)}}{\sqrt{-\cos(e+fx)}}\,dx = -\frac{2\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(e+fx)}{\sqrt{a-a\cos(e+fx)}}\right)}{f}$$

```
[In] Int[Sqrt[a - a*Cos[e + f*x]]/Sqrt[-Cos[e + f*x]],x]
[Out] (-2*Sqrt[a]*ArcSin[(Sqrt[a]*Sin[e + f*x])/Sqrt[a - a*Cos[e + f*x]]])/f
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
```

```
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{2\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, \frac{a\sin(e+fx)}{\sqrt{a-a\cos(e+fx)}}\right)}{f}\\ &= -\frac{2\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(e+fx)}{\sqrt{a-a\cos(e+fx)}}\right)}{f}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 55, normalized size of antiderivative = 1.45

$$\int \frac{\sqrt{a-a\cos(e+fx)}}{\sqrt{-\cos(e+fx)}}\,dx = \frac{2\arcsin\left(\sqrt{-\cos(e+fx)}\right)\sqrt{a-a\cos(e+fx)}\cot\left(\frac{1}{2}(e+fx)\right)}{f\sqrt{1+\cos(e+fx)}}$$

```
[In] Integrate[Sqrt[a - a*Cos[e + f*x]]/Sqrt[-Cos[e + f*x]],x]
[Out] (2*ArcSin[Sqrt[-Cos[e + f*x]]]*Sqrt[a - a*Cos[e + f*x]]*Cot[(e + f*x)/2])/(
f*Sqrt[1 + Cos[e + f*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 82 vs. 2(32) = 64.

Time = 3.37 (sec) , antiderivative size = 83, normalized size of antiderivative = 2.18

method	result	size
default	$\frac{2\sqrt{-\frac{\cos(fx+e)}{1+\cos(fx+e)}}\,\sqrt{-a(\cos(fx+e)-1)}\,\arctan\left(\sqrt{-\frac{\cos(fx+e)}{1+\cos(fx+e)}}\right)(\cot(fx+e)+\csc(fx+e))}{f\sqrt{-\cos(fx+e)}}$	83

```
[In] int((a-cos(f*x+e)*a)^(1/2)/(-cos(f*x+e))^(1/2),x,method=_RETURNVERBOSE)
[Out] 2/f*(-cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*(-a*(cos(f*x+e)-1))^(1/2)*arctan((-c
os(f*x+e)/(1+cos(f*x+e)))^(1/2))/(-cos(f*x+e))^(1/2)*(cot(f*x+e)+csc(f*x+e)
)
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 164, normalized size of antiderivative = 4.32

$$\int \frac{\sqrt{a-a\cos(e+fx)}}{\sqrt{-\cos(e+fx)}}\,dx = \left[\frac{\sqrt{-a}\log\left(\frac{4\sqrt{-a\cos(fx+e)+a}\left(2\cos(fx+e)^2+3\cos(fx+e)+1\right)\sqrt{-a}\sqrt{-\cos(fx+e)}-\left(8a\cos(fx+e)^2+8a\cos(fx+e)+a\right)\sin(fx+e)}{\sin(fx+e)}\right)}{2f},\right.$$

```
[In] integrate((a-a*cos(f*x+e))^(1/2)/(-cos(f*x+e))^(1/2),x, algorithm="fricas")
[Out] [1/2*sqrt(-a)*log((4*sqrt(-a*cos(f*x + e) + a)*(2*cos(f*x + e)^2 + 3*cos(f*
x + e) + 1)*sqrt(-a)*sqrt(-cos(f*x + e)) - (8*a*cos(f*x + e)^2 + 8*a*cos(f*
x + e) + a)*sin(f*x + e))/sin(f*x + e))/f, sqrt(a)*arctan(1/2*sqrt(-a*cos(f
*x + e) + a)*sqrt(-cos(f*x + e))*(2*cos(f*x + e) + 1)/(sqrt(a)*cos(f*x + e)
*sin(f*x + e)))/f]
```

Sympy [F]

$$\int \frac{\sqrt{a-a\cos(e+fx)}}{\sqrt{-\cos(e+fx)}}\,dx = \int \frac{\sqrt{-a\left(\cos\left(e+fx\right)-1\right)}}{\sqrt{-\cos\left(e+fx\right)}}\,dx$$

```
[In] integrate((a-a*cos(f*x+e))**(1/2)/(-cos(f*x+e))**(1/2),x)
[Out] Integral(sqrt(-a*(cos(e + f*x) - 1))/sqrt(-cos(e + f*x)), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 420 vs. 2(32) = 64.

Time = 0.41 (sec) , antiderivative size = 420, normalized size of antiderivative = 11.05

$$\int \frac{\sqrt{a-a\cos(e+fx)}}{\sqrt{-\cos(e+fx)}}\,dx = \frac{\sqrt{-a}\left(\log\left(4\sqrt{\cos\left(2fx+2e\right)^2+\sin\left(2fx+2e\right)^2+2\cos\left(2fx+2e\right)+1}\cos\left(\frac{1}{2}\arctan\left(\sin\left(2fx+2e\right)\right.\right.\right.\right.}{}$$

```
[In] integrate((a-a*cos(f*x+e))^(1/2)/(-cos(f*x+e))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(-a)*(log(4*sqrt(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*
f*x + 2*e) + 1)*cos(1/2*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1))^2
+ 4*sqrt(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)*
sin(1/2*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1))^2 + 8*(cos(2*f*x +
 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/4)*cos(1/2*arctan
2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) + 4) - log(cos(f*x + e)^2 + sin(
f*x + e)^2 + sqrt(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2
*e) + 1)*(cos(1/2*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1))^2 + sin(
1/2*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1))^2) + 2*(cos(2*f*x + 2*
e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/4)*(cos(f*x + e)*cos
(1/2*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) + sin(f*x + e)*sin(1/
2*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)))))/f
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 83 vs. $2(32) = 64$.

Time = 0.50 (sec) , antiderivative size = 83, normalized size of antiderivative = 2.18

$$\int \frac{\sqrt{a-a\cos(e+fx)}}{\sqrt{-\cos(e+fx)}}\,dx = -\frac{4\sqrt{a}\arctan\left(-\frac{1}{2}\sqrt{2}\left(\sqrt{2}+\frac{2\left(2\sqrt{2}-\sqrt{-\tan\left(\frac{1}{4}fx+\frac{1}{4}e\right)^4+6\tan\left(\frac{1}{4}fx+\frac{1}{4}e\right)^2-1}\right)}{\tan\left(\frac{1}{4}fx+\frac{1}{4}e\right)^2-3}\right)\right)\operatorname{sgn}\left(\sin\left(\frac{1}{2}fx+\frac{1}{2}e\right)\right)}{f}$$

```
[In] integrate((a-a*cos(f*x+e))^(1/2)/(-cos(f*x+e))^(1/2),x, algorithm="giac")
```

```
[Out] -4*sqrt(a)*arctan(-1/2*sqrt(2)*(sqrt(2) + 2*(2*sqrt(2) - sqrt(-tan(1/4*f*x
+ 1/4*e)^4 + 6*tan(1/4*f*x + 1/4*e)^2 - 1))/(tan(1/4*f*x + 1/4*e)^2 - 3)))*
sgn(sin(1/2*f*x + 1/2*e))/f
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{a-a\cos(e+fx)}}{\sqrt{-\cos(e+fx)}}\,dx = \int \frac{\sqrt{a-a\,\cos\left(e+f\,x\right)}}{\sqrt{-\cos\left(e+f\,x\right)}}\,dx$$

```
[In] int((a - a*cos(e + f*x))^(1/2)/(-cos(e + f*x))^(1/2),x)
```

```
[Out] int((a - a*cos(e + f*x))^(1/2)/(-cos(e + f*x))^(1/2), x)
```

3.224 $\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 171

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{7\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4\sqrt{a}d} - \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 7/4*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d/a^(1/2)-arctan(1/2*
sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*2^(1/2)
/d/a^(1/2)+1/2*cos(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)-1/4*sin
(d*x+c)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.52 (sec) , antiderivative size = 171, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {2857, 3062, 3061, 2861, 211, 2853, 222}

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{7\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{4\sqrt{a}d} - \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d} + \frac{\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{2d\sqrt{a\cos(c+dx)+a}} - \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{4d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Cos[c + d*x]^(5/2)/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (7*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(4*Sqrt[a]*d) -
 (Sqrt[2]*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a
+ a*Cos[c + d*x]])])/(Sqrt[a]*d) - (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(4*d*S
qrt[a + a*Cos[c + d*x]]) + (Cos[c + d*x]^(3/2)*Sin[c + d*x])/(2*d*Sqrt[a +
a*Cos[c + d*x]])
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2857

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[-2*d*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n - 1)/(f*(2*n - 1)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(b*(2*n - 1))
, Int[((c + d*Sin[e + f*x])^(n - 2)/Sqrt[a + b*Sin[e + f*x]])*Simp[a*c*d -
b*(2*d^2*(n - 1) + c^2*(2*n - 1)) + d*(a*d - b*c*(4*n - 3))*Sin[e + f*x], x
], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
 b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[n, 1] && IntegerQ[2*n]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
```

```
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3062

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(-B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(f*(m +
n + 1))), x] + Dist[1/(b*(m + n + 1)), Int[(a + b*Sin[e + f*x])^m*(c + d*Si
n[e + f*x])^(n - 1)*Simp[A*b*c*(m + n + 1) + B*(a*c*m + b*d*n) + (A*b*d*(m
+ n + 1) + B*(a*d*m + b*c*n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 -
 d^2, 0] && GtQ[n, 0] && (IntegerQ[n] || EqQ[m + 1/2, 0])
```

Rubi steps

$$\text{integral} = \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}} - \frac{\int \frac{\sqrt{\cos(c+dx)}(-3a+a\cos(c+dx))}{\sqrt{a+a\cos(c+dx)}}\,dx}{4a}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}} - \frac{\int \frac{\frac{a^2}{2}-\frac{7}{2}a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{4a^2}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}} + \frac{7\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx}{8a} - \int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}} - \frac{7\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4ad} + \frac{(2a)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

$$= \frac{7\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4\sqrt{a}d} - \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}} + \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 151, normalized size of antiderivative = 0.88

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{\left(\arcsin\left(\sqrt{1-\cos(c+dx)}\right)+8\arcsin\left(\sqrt{\cos(c+dx)}\right)-4\sqrt{2}\arctan\left(\frac{\sqrt{\cos(c+dx)}}{\sqrt{\sin^2\left(\frac{1}{2}(c+dx)\right)}}\right)-2\sqrt{1-\cos(\ldots}{4d\sqrt{1-\cos(c+dx)}\sqrt{a(1+\cos(c\ldots}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] -1/4*((ArcSin[Sqrt[1 - Cos[c + d*x]]] + 8*ArcSin[Sqrt[Cos[c + d*x]]] - 4*Sq
rt[2]*ArcTan[Sqrt[Cos[c + d*x]]/Sqrt[Sin[(c + d*x)/2]^2]] - 2*Sqrt[1 - Cos[
c + d*x]]*Cos[c + d*x]^(3/2) + Sqrt[-((-1 + Cos[c + d*x])*Cos[c + d*x])])*S
in[c + d*x])/(d*Sqrt[1 - Cos[c + d*x]]*Sqrt[a*(1 + Cos[c + d*x])])
```

Maple [A] (verified)

Time = 12.77 (sec) , antiderivative size = 178, normalized size of antiderivative = 1.04

method	result
default	$\frac{\left(2\sqrt{2}\,\cos(dx+c)\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-\sin(dx+c)\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+7\sqrt{2}\,\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)+8\arcsin(\cot(dx+\ldots}{8d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,a}$

```
[In] int(cos(d*x+c)^(5/2)/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/8/d*(2*2^(1/2)*cos(d*x+c)*sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-si
n(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+7*2^(1/2)*arctan(tan(d*x
+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))+8*arcsin(cot(d*x+c)-csc(d*x+c)))*(a*
(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^(1/2)/(1+cos(d*x+c))/(cos(d*x+c)/(1+cos(d*
x+c)))^(1/2)*2^(1/2)/a
```

Fricas [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 155, normalized size of antiderivative = 0.91

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{\sqrt{a\cos(dx+c)+a}(2\cos(dx+c)-1)\sqrt{\cos(dx+c)}\sin(dx+c)-7\sqrt{a}(\cos(dx+c)+1)\arctan\left(\frac{\sqrt{a\cos\ldots}{4\left(ad\cos(dx+c)+ad\right)}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/4*(sqrt(a*cos(d*x + c) + a)*(2*cos(d*x + c) - 1)*sqrt(cos(d*x + c))*sin(d
*x + c) - 7*sqrt(a)*(cos(d*x + c) + 1)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt
(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) + 4*sqrt(2)*(a*cos(d*x + c) + a)*arc
tan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x +
c)))/sqrt(a))/(a*d*cos(d*x + c) + a*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)/(a+a*cos(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{\sqrt{a\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(cos(d*x + c)^(5/2)/sqrt(a*cos(d*x + c) + a), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\cos\left(c+d\,x\right)^{5/2}}{\sqrt{a+a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(cos(c + d*x)^(5/2)/(a + a*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(5/2)/(a + a*cos(c + d*x))^(1/2), x)
```

3.225 $\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 128

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d/a^(1/2)+arctan(1/2*sin
(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*2^(1/2)/d/
a^(1/2)+sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {2857, 3061, 2861, 211, 2853, 222}

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d} + \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d} + \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Cos[c + d*x]^(3/2)/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] -(ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]/(Sqrt[a]*d)) + (S
qrt[2]*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a
*Cos[c + d*x]])])/(Sqrt[a]*d) + (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(d*Sqrt[a
 + a*Cos[c + d*x]])
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2857

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[-2*d*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n - 1)/(f*(2*n - 1)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(b*(2*n - 1))
, Int[((c + d*Sin[e + f*x])^(n - 2)/Sqrt[a + b*Sin[e + f*x]])*Simp[a*c*d -
b*(2*d^2*(n - 1) + c^2*(2*n - 1)) + d*(a*d - b*c*(4*n - 3))*Sin[e + f*x], x
], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
 b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[n, 1] && IntegerQ[2*n]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
```

```
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}} - \frac{\int \frac{-a+a\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{2a}\\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}} - \frac{\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx}{2a} + \int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx\\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}} + \frac{\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{ad}\\
&\quad - \frac{(2a)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{d}\\
&= -\frac{\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d}\\
&\quad + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 122, normalized size of antiderivative = 0.95

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\left(\arcsin\left(\sqrt{1-\cos(c+dx)}\right) + 2\arcsin\left(\sqrt{\cos(c+dx)}\right) - \sqrt{2}\arctan\left(\frac{\sqrt{\cos(c+dx)}}{\sqrt{\sin^2\left(\frac{1}{2}(c+dx)\right)}}\right) + \sqrt{-((-1+\cos(c}\right.}{d\sqrt{1-\cos(c+dx)}\sqrt{a(1+\cos(c+dx))}}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] ((ArcSin[Sqrt[1 - Cos[c + d*x]]] + 2*ArcSin[Sqrt[Cos[c + d*x]]] - Sqrt[2]*A
rcTan[Sqrt[Cos[c + d*x]]/Sqrt[Sin[(c + d*x)/2]^2]] + Sqrt[-((-1 + Cos[c + d
*x])*Cos[c + d*x])]*Sin[c + d*x])/(d*Sqrt[1 - Cos[c + d*x]]*Sqrt[a*(1 + Co
s[c + d*x])])
```

Maple [A] (verified)

Time = 12.04 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.10

method	result
default	$\frac{\left(\sin(dx+c)\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-\sqrt{2}\,\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)-2\arcsin(\cot(dx+c)-\csc(dx+c))\right)\left(\sqrt{\cos}(dx+c)\right)\sqrt{a(1+\cos(}}{2d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,a}$

[In] int(cos(d*x+c)^(3/2)/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)

[Out] 1/2/d*(sin(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-2^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))-2*arcsin(cot(d*x+c)-csc(d*x+c)))*cos(d*x+c)^(1/2)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)/a

Fricas [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 143, normalized size of antiderivative = 1.12

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\sqrt{a}(\cos(dx+c)+1)\arctan\left(\frac{\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-\frac{\sqrt{2}(a\cos(dx+c)+a)\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)}{\sqrt{a}}+\sqrt{}}{ad\cos(dx+c)+ad}$$

[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] (sqrt(a)*(cos(d*x + c) + 1)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - sqrt(2)*(a*cos(d*x + c) + a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c)))/sqrt(a) + sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*sin(d*x + c))/(a*d*cos(d*x + c) + a*d)

Sympy [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a(\cos(c+dx)+1)}}\,dx$$

[In] integrate(cos(d*x+c)**(3/2)/(a+a*cos(d*x+c))**(1/2),x)

[Out] Integral(cos(c + d*x)**(3/2)/sqrt(a*(cos(c + d*x) + 1)), x)

Maxima [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{3}{2}}}{\sqrt{a\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(3/2)/sqrt(a*cos(d*x + c) + a), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\cos\left(c+d\,x\right)^{3/2}}{\sqrt{a+a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)/(a + a*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(3/2)/(a + a*cos(c + d*x))^(1/2), x)
```

3.226 $\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 95

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{2\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} - \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d}$$

```
[Out] 2*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/d/a^(1/2)-arctan(1/2*si
n(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*2^(1/2)/d
/a^(1/2)
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2856, 2853, 222, 2861, 211}

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{2\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d} - \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (2*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(Sqrt[a]*d) - (
Sqrt[2]*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a +
a*Cos[c + d*x]])])/(Sqrt[a]*d)
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2856

```
Int[Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(a_) + (b_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c
 + d*Sin[e + f*x]], x], x] + Dist[(b*c - a*d)/b, Int[1/(Sqrt[a + b*Sin[e +
f*x]]*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx}{a} - \int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx \\
&= -\frac{2\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{ad} \\
&\quad + \frac{(2a)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{d} \\
&= \frac{2\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} - \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.94

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+a\cos(c+dx)}}\,dx$$
$$= \frac{\left(-2\arcsin\left(\sqrt{\cos(c+dx)}\right)+\sqrt{2}\arctan\left(\frac{\sqrt{2}\sqrt{\cos(c+dx)}}{\sqrt{1-\cos(c+dx)}}\right)\right)\sin(c+dx)}{d\sqrt{1-\cos(c+dx)}\sqrt{a(1+\cos(c+dx))}}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/Sqrt[a + a*Cos[c + d*x]],x]
[Out] ((-2*ArcSin[Sqrt[Cos[c + d*x]]] + Sqrt[2]*ArcTan[(Sqrt[2]*Sqrt[Cos[c + d*x]
])/Sqrt[1 - Cos[c + d*x]]])*Sin[c + d*x])/(d*Sqrt[1 - Cos[c + d*x]]*Sqrt[a*
(1 + Cos[c + d*x])])
```

Maple [A] (verified)

Time = 3.73 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.14

method	result	size
default	$\frac{\left(\sqrt{\cos}(dx+c)\right)\sqrt{a(1+\cos(dx+c))}\left(\sqrt{2}\,\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)+\arcsin(\cot(dx+c)-\csc(dx+c))\right)\sqrt{2}}{d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,a}$	108

```
[In] int(cos(d*x+c)^(1/2)/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/d*cos(d*x+c)^(1/2)*(a*(1+cos(d*x+c)))^(1/2)*(2^(1/2)*arctan(tan(d*x+c)*(c
os(d*x+c)/(1+cos(d*x+c)))^(1/2))+arcsin(cot(d*x+c)-csc(d*x+c)))/(1+cos(d*x+
c))/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)/a
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.94

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+a\cos(c+dx)}}\,dx$$
$$= \frac{\sqrt{2}\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-2\sqrt{a}\arctan\left(\frac{\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)}{ad}$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] (sqrt(2)*sqrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))
/(sqrt(a)*sin(d*x + c))) - 2*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(c
os(d*x + c))/(sqrt(a)*sin(d*x + c))))/(a*d)
```

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(c+dx\right)}}{\sqrt{a\left(\cos\left(c+dx\right)+1\right)}}\,dx$$

```
[In] integrate(cos(d*x+c)**(1/2)/(a+a*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(cos(c + d*x))/sqrt(a*(cos(c + d*x) + 1)), x)
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.70 (sec) , antiderivative size = 698, normalized size of antiderivative = 7.35

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\sqrt{a}\arctan\left(\frac{\left(\left|2\,e^{(i\,dx+i\,c)}+2\right|^4+16\,\cos(dx+c)^4+16\,\sin(dx+c)^4+8\left(\cos(dx+c)^2-\sin(dx+c)^2-2\,\cos(dx+c)+1\right)\left|2\,e^{(i\,dx+i\,c)}+2\right|^2-64}{}\right.}{}$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] -(sqrt(2)*sqrt(a)*arctan2(((abs(2*e^(I*d*x + I*c) + 2)^4 + 16*cos(d*x + c)^
4 + 16*sin(d*x + c)^4 + 8*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c)
 + 1)*abs(2*e^(I*d*x + I*c) + 2)^2 - 64*cos(d*x + c)^3 + 32*(cos(d*x + c)^2
 - 2*cos(d*x + c) + 1)*sin(d*x + c)^2 + 96*cos(d*x + c)^2 - 64*cos(d*x + c)
 + 16)^(1/4)*sin(1/2*arctan2(8*(cos(d*x + c) - 1)*sin(d*x + c)/abs(2*e^(I*d
*x + I*c) + 2)^2, (abs(2*e^(I*d*x + I*c) + 2)^2 + 4*cos(d*x + c)^2 - 4*sin(
d*x + c)^2 - 8*cos(d*x + c) + 4)/abs(2*e^(I*d*x + I*c) + 2)^2)) + 2*sin(d*x
 + c))/abs(2*e^(I*d*x + I*c) + 2), ((abs(2*e^(I*d*x + I*c) + 2)^4 + 16*cos(
d*x + c)^4 + 16*sin(d*x + c)^4 + 8*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos
(d*x + c) + 1)*abs(2*e^(I*d*x + I*c) + 2)^2 - 64*cos(d*x + c)^3 + 32*(cos(d
*x + c)^2 - 2*cos(d*x + c) + 1)*sin(d*x + c)^2 + 96*cos(d*x + c)^2 - 64*cos
(d*x + c) + 16)^(1/4)*cos(1/2*arctan2(8*(cos(d*x + c) - 1)*sin(d*x + c)/abs
(2*e^(I*d*x + I*c) + 2)^2, (abs(2*e^(I*d*x + I*c) + 2)^2 + 4*cos(d*x + c)^2
 - 4*sin(d*x + c)^2 - 8*cos(d*x + c) + 4)/abs(2*e^(I*d*x + I*c) + 2)^2)) +
2*cos(d*x + c) - 2)/abs(2*e^(I*d*x + I*c) + 2)) - sqrt(a)*arctan2((cos(2*d*
x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + sin(d*x + c), (cos(2*d*x +
2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2
(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + cos(d*x + c)))/(a*d)
```

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{a\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(cos(d*x + c))/sqrt(a*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(c+d\,x\right)}}{\sqrt{a+a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(a + a*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(1/2)/(a + a*cos(c + d*x))^(1/2), x)
```

3.227 $\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 56

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d}$$

```
[Out] arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/
2))*2^(1/2)/d/a^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2861, 211}

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d}$$

```
[In] Int[1/(Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]]),x]
```

```
[Out] (Sqrt[2]*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a +
 a*Cos[c + d*x]])]])/(Sqrt[a]*d)
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = -\frac{(2a)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{d}$$
$$= \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 51, normalized size of antiderivative = 0.91

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx = \frac{2\arctan\left(\frac{\sin\left(\frac{1}{2}(c+dx)\right)}{\sqrt{\cos(c+dx)}}\right)\cos\left(\frac{1}{2}(c+dx)\right)}{d\sqrt{a(1+\cos(c+dx))}}$$

```
[In] Integrate[1/(Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]]),x]
[Out] (2*ArcTan[Sin[(c + d*x)/2]/Sqrt[Cos[c + d*x]]]*Cos[(c + d*x)/2])/(d*Sqrt[a*
(1 + Cos[c + d*x])])
```

Maple [A] (verified)

Time = 4.50 (sec) , antiderivative size = 67, normalized size of antiderivative = 1.20

method	result	size
default	$-\frac{\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{a(1+\cos(dx+c))}\,\arcsin(\cot(dx+c)-\csc(dx+c))\sqrt{2}}{d\sqrt{\cos(dx+c)}\,a}$	67

```
[In] int(1/cos(d*x+c)^(1/2)/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/d/cos(d*x+c)^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(a*(1+cos(d*x+c)))^
(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))*2^(1/2)/a
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 159, normalized size of antiderivative = 2.84

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx = \left[\frac{\sqrt{2}\sqrt{-\frac{1}{a}}\log\left(-\frac{2\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{-\frac{1}{a}}\sqrt{\cos(dx+c)}\sin(dx+c)-3\cos(dx+c)^2-2\cos(dx+c)+1}{\cos(dx+c)^2+2\cos(dx+c)+1}\right)}{2d}, \frac{\sqrt{2}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+\cdots}}{2\left(\cos(dx\cdots\right.}\right.}{\sqrt{a\cdots}}\right.$$

[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] [1/2*sqrt(2)*sqrt(-1/a)*log(-(2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(-1/a)*sqrt(cos(d*x + c))*sin(d*x + c) - 3*cos(d*x + c)^2 - 2*cos(d*x + c) + 1)/(cos(d*x + c)^2 + 2*cos(d*x + c) + 1))/d, sqrt(2)*arctan(1/2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*sin(d*x + c)/((cos(d*x + c)^2 + cos(d*x + c))*sqrt(a)))/(sqrt(a)*d)]

Sympy [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{a\left(\cos\left(c+dx\right)+1\right)}\sqrt{\cos\left(c+dx\right)}}\,dx$$

[In] integrate(1/cos(d*x+c)**(1/2)/(a+a*cos(d*x+c))**(1/2),x)

[Out] Integral(1/(sqrt(a*(cos(c + d*x) + 1))*sqrt(cos(c + d*x))), x)

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.71 (sec) , antiderivative size = 522, normalized size of antiderivative = 9.32

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\sqrt{2}\arctan\left(\frac{\left(\left|e^{(i\,dx+i\,c)}+1\right|^4+\cos(dx+c)^4+\sin(dx+c)^4+2\left(\cos(dx+c)^2-\sin(dx+c)^2-2\cos(dx+c)+1\right)\left|e^{(i\,dx+i\,c)}+1\right|^2-4\cos(dx+c)^3+2\left(\mathrm{co}\cdots\right.\right.}{\cdots}\right.}{\cdots}$$

[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")

```
[Out] sqrt(2)*arctan2(((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x + c
)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d*x
 + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) + 1)
*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*sin(1/2*arct
an2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e^(I
*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)/
abs(e^(I*d*x + I*c) + 1)^2)) + sin(d*x + c))/abs(e^(I*d*x + I*c) + 1), ((ab
s(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x + c)^4 + 2*(cos(d*x + c
)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d*x + I*c) + 1)^2 - 4*c
os(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) + 1)*sin(d*x + c)^2 + 6*
cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*sqrt(a)*cos(1/2*arctan2(2*(cos(d
*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e^(I*d*x + I*c)
+ 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)/abs(e^(I*d*x
 + I*c) + 1)^2)) + sqrt(a)*cos(d*x + c) - sqrt(a))/(sqrt(a)*abs(e^(I*d*x +
I*c) + 1)))/(sqrt(a)*d)
```

Giac [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{a\cos\left(dx+c\right)+a}\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{a+a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^(1/2)), x)
```

3.228 $\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 93

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1
/2))*2^(1/2)/d/a^(1/2)+2*sin(d*x+c)/d/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/
2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 93, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2858, 12, 2861, 211}

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx = \frac{2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}} - \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d}$$

```
[In] Int[1/(Cos[c + d*x]^(3/2)*Sqrt[a + a*Cos[c + d*x]]),x]
```

```
[Out] -((Sqrt[2]*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a
 + a*Cos[c + d*x]])])/(Sqrt[a]*d)) + (2*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]]
*Sqrt[a + a*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} - \frac{\int \frac{a}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{a} \\
&= \frac{2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} - \int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx \\
&= \frac{2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} + \frac{(2a)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{d} \\
&= -\frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}
\end{aligned}
$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 1.55 (sec) , antiderivative size = 180, normalized size of antiderivative = 1.94

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx$$
$$=\frac{2\cos\left(\frac{1}{2}(c+dx)\right)\sin\left(\frac{1}{2}(c+dx)\right)\left(\frac{1}{2}\cos(c+dx)(2+\cos(c+dx))\csc^4\left(\frac{1}{2}(c+dx)\right)\left(1-\cos(c+dx)+\text{arcta}\right.\right.}{}$$

```
[In] Integrate[1/(Cos[c + d*x]^(3/2)*Sqrt[a + a*Cos[c + d*x]]),x]
```

```
[Out] (2*Cos[(c + d*x)/2]*Sin[(c + d*x)/2]*((Cos[c + d*x]*(2 + Cos[c + d*x])*Csc[
(c + d*x)/2]^4*(1 - Cos[c + d*x] + ArcTanh[Sqrt[-(Sec[c + d*x]*Sin[(c + d*x
)/2]^2)]]*Cos[c + d*x]*Sqrt[2 - 2*Sec[c + d*x]]))/2 - (Hypergeometric2F1[2,
 5/2, 7/2, -(Sec[c + d*x]*Sin[(c + d*x)/2]^2)]*Sin[c + d*x]*Tan[c + d*x])/1
0))/(d*Cos[c + d*x]^(3/2)*Sqrt[a*(1 + Cos[c + d*x])])
```

Maple [A] (verified)

Time = 5.28 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.40

method	result
default	$\frac{\left(\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \arcsin(\cot(dx+c)-\csc(dx+c))+\sqrt{2}\ \sin(dx+c)+\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \arcsin(\cot(dx+c)-\csc(dx+c))\right)\sqrt{a(1+\cos(}}{d(1+\cos(dx+c))\sqrt{\cos(dx+c)}\,a}$

```
[In] int(1/cos(d*x+c)^(3/2)/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x
+c))+2^(1/2)*sin(d*x+c)+(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)
-csc(d*x+c)))*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))/cos(d*x+c)^(1/2)*2^(1
/2)/a
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 132, normalized size of antiderivative = 1.42

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx =$$
$$-\frac{\frac{\sqrt{2}\left(a\cos(dx+c)^2+a\cos(dx+c)\right)\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}\sin(dx+c)}{2\left(\cos(dx+c)^2+\cos(dx+c)\right)\sqrt{a}}\right)}{\sqrt{a}}-2\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}\sin(}{ad\cos(dx+c)^2+ad\cos(dx+c)}$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] -(sqrt(2)*(a*cos(d*x + c)^2 + a*cos(d*x + c))*arctan(1/2*sqrt(2)*sqrt(a*cos
(d*x + c) + a)*sqrt(cos(d*x + c))*sin(d*x + c)/((cos(d*x + c)^2 + cos(d*x +
 c))*sqrt(a)))/sqrt(a) - 2*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*sin(
d*x + c))/(a*d*cos(d*x + c)^2 + a*d*cos(d*x + c))
```

Sympy [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{a\left(\cos\left(c+dx\right)+1\right)}\cos^{\frac{3}{2}}\left(c+dx\right)}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(3/2)/(a+a*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/(sqrt(a*(cos(c + d*x) + 1))*cos(c + d*x)**(3/2)), x)
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.65 (sec) , antiderivative size = 665, normalized size of antiderivative = 7.15

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{2\cos\left(\frac{1}{2}\arctan\left(\sin\left(2\,dx+2\,c\right),\cos\left(2\,dx+2\,c\right)+1\right)\right)\sin\left(dx+c\right)-2\left(\cos\left(dx+c\right)-1\right)\sin\left(\frac{1}{2}\arctan\left(\mathrm{si}\right.\right.}{}$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] (2*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x + c) -
2*(cos(d*x + c) - 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1
)) - sqrt(2)*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c)
+ 1)^(1/4)*arctan2(((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x
+ c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*
d*x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) +
 1)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*sin(1/2*a
rctan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e
^(I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) +
1)/abs(e^(I*d*x + I*c) + 1)^2)) + sin(d*x + c))/abs(e^(I*d*x + I*c) + 1), (
(abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x + c)^4 + 2*(cos(d*x
+ c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d*x + I*c) + 1)^2 -
```

```
4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) + 1)*sin(d*x + c)^2 +
 6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*sqrt(a)*cos(1/2*arctan2(2*(co
s(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e^(I*d*x + I*
c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)/abs(e^(I*
d*x + I*c) + 1)^2)) + sqrt(a)*cos(d*x + c) - sqrt(a))/(sqrt(a)*abs(e^(I*d*x
 + I*c) + 1))))/((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2
*c) + 1)^(1/4)*sqrt(a)*d)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx=\int \frac{1}{\sqrt{a\cos\left(dx+c\right)+a}\cos\left(dx+c\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(a*cos(d*x + c) + a)*cos(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx=\int \frac{1}{{\cos\left(c+d\,x\right)}^{3/2}\,\sqrt{a+a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^(1/2)), x)
```

3.229 $\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 131

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

```
[Out] arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/
2))*2^(1/2)/d/a^(1/2)+2/3*sin(d*x+c)/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1
/2)-2/3*sin(d*x+c)/d/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2858, 3063, 12, 2861, 211}

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d} + \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} - \frac{2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[1/(Cos[c + d*x]^(5/2)*Sqrt[a + a*Cos[c + d*x]]),x]
```

```
[Out] (Sqrt[2]*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a +
 a*Cos[c + d*x]])])/(Sqrt[a]*d) + (2*Sin[c + d*x])/(3*d*Cos[c + d*x]^(3/2)*
Sqrt[a + a*Cos[c + d*x]]) - (2*Sin[c + d*x])/(3*d*Sqrt[Cos[c + d*x]]*Sqrt[a
 + a*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{\int \frac{a-2a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx}{3a} \\
&= \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} \\
&\quad - \frac{2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} - \frac{2\int -\frac{3a^2}{2\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{3a^2} \\
&= \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} \\
&\quad + \int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx \\
&= \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} \\
&\quad - \frac{(2a)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{d} \\
&= \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} \\
&\quad - \frac{2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}
\end{aligned}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 7.16 (sec) , antiderivative size = 473, normalized size of antiderivative = 3.61

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{2\cot\left(\frac{c}{2}+\frac{dx}{2}\right)\csc^4\left(\frac{c}{2}+\frac{dx}{2}\right)\left(12\cos^4\left(\frac{1}{2}(c+dx)\right)\,{}_3F_2\left(2,2,\frac{7}{2};1,\frac{9}{2};\frac{\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}{-1+2\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}\right)\sin^8\left(\frac{c}{2}+\frac{dx}{2}\right)+12\right.}{}$$

```
[In] Integrate[1/(Cos[c + d*x]^(5/2)*Sqrt[a + a*Cos[c + d*x]]),x]
```

```
[Out] (-2*Cot[c/2 + (d*x)/2]*Csc[c/2 + (d*x)/2]^4*(12*Cos[(c + d*x)/2]^4*Hypergeo
metricPFQ[{2, 2, 7/2}, {1, 9/2}, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*
x)/2]^2)]*Sin[c/2 + (d*x)/2]^8 + 12*Hypergeometric2F1[2, 7/2, 9/2, Sin[c/2
```

```
+ (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^8*(4 - 7*Sin
[c/2 + (d*x)/2]^2 + 3*Sin[c/2 + (d*x)/2]^4) + 7*(1 - 2*Sin[c/2 + (d*x)/2]^2
)^3*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(15 - 20*Sin[c
/2 + (d*x)/2]^2 + 8*Sin[c/2 + (d*x)/2]^4)*(ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^
2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*(3 - 6*Sin[c/2 + (d*x)/2]^2) + Sqrt[Sin[c
/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(-3 + 7*Sin[c/2 + (d*x)/2]^2
))))/(63*d*Sqrt[a*(1 + Cos[c + d*x])]*(1 - 2*Sin[c/2 + (d*x)/2]^2)^(7/2))
```

Maple [A] (verified)

Time = 5.85 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.21

method	result
default	$-\frac{\left(3\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,(\cos^2(dx+c))\arcsin(\cot(dx+c)-\csc(dx+c))+\sin(dx+c)\cos(dx+c)\sqrt{2}+3\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\arcsin(\cot(dx-$
	$3d(1+\cos(dx+c))\cos(dx+c)^{\frac{3}{2}}a$

```
[In] int(1/cos(d*x+c)^(5/2)/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/3/d*(3*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*arcsin(cot(d*x+c)-
csc(d*x+c))+sin(d*x+c)*cos(d*x+c)*2^(1/2)+3*cos(d*x+c)*(cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))-2^(1/2)*sin(d*x+c))*(a*(1+cos(d
*x+c)))^(1/2)/(1+cos(d*x+c))/cos(d*x+c)^(3/2)*2^(1/2)/a
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.11

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx =$$

$$-\frac{2\sqrt{a\cos(dx+c)+a}(\cos(dx+c)-1)\sqrt{\cos(dx+c)}\sin(dx+c)-\frac{3\sqrt{2}\left(a\cos(dx+c)^3+a\cos(dx+c)^2\right)\arctan\left(\frac{\sqrt{2}\sqrt{}}{}\right.}{\sqrt{a}}}{3\left(ad\cos(dx+c)^3+ad\cos(dx+c)^2\right)}$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] -1/3*(2*sqrt(a*cos(d*x + c) + a)*(cos(d*x + c) - 1)*sqrt(cos(d*x + c))*sin(
d*x + c) - 3*sqrt(2)*(a*cos(d*x + c)^3 + a*cos(d*x + c)^2)*arctan(1/2*sqrt(
2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*sin(d*x + c)/((cos(d*x + c)^
2 + cos(d*x + c))*sqrt(a)))/sqrt(a))/(a*d*cos(d*x + c)^3 + a*d*cos(d*x + c)
^2)
```

Sympy [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{a\left(\cos\left(c+dx\right)+1\right)}\cos^{\frac{5}{2}}\left(c+dx\right)}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(5/2)/(a+a*cos(d*x+c))**(1/2),x)
[Out] Integral(1/(sqrt(a*(cos(c + d*x) + 1))*cos(c + d*x)**(5/2)), x)
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.65 (sec) , antiderivative size = 818, normalized size of antiderivative = 6.24

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] 1/3*(3*(sqrt(2)*cos(2*d*x + 2*c)^2 + sqrt(2)*sin(2*d*x + 2*c)^2 + 2*sqrt(2)
*cos(2*d*x + 2*c) + sqrt(2))*arctan2(((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x
 + c)^4 + sin(d*x + c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x +
 c) + 1)*abs(e^(I*d*x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2
- 2*cos(d*x + c) + 1)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) +
1)^(1/4)*sin(1/2*arctan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I
*c) + 1)^2, (abs(e^(I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 -
 2*cos(d*x + c) + 1)/abs(e^(I*d*x + I*c) + 1)^2)) + sin(d*x + c))/abs(e^(I*
d*x + I*c) + 1), ((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x +
c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d*
x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) + 1
)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*sqrt(a)*cos
(1/2*arctan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2,
(abs(e^(I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x +
 c) + 1)/abs(e^(I*d*x + I*c) + 1)^2)) + sqrt(a)*cos(d*x + c) - sqrt(a))/(sq
rt(a)*abs(e^(I*d*x + I*c) + 1))) - 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)
^2 + 2*cos(2*d*x + 2*c) + 1)^(3/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c) + 1))*sin(d*x + c) - (cos(d*x + c) - 3)*sin(1/2*arctan2(sin(2*d
*x + 2*c), cos(2*d*x + 2*c) + 1))) - 4*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*
c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(3/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c) + 1))*sin(d*x + c) - (cos(d*x + c) + 1)*sin(3/2*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c) + 1))))/((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*
c)^2 + 2*cos(2*d*x + 2*c) + 1)*sqrt(a)*d)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{a\cos(dx+c)+a}\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(a*cos(d*x + c) + a)*cos(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{1}{\cos(c+d\,x)^{5/2}\,\sqrt{a+a\,\cos(c+d\,x)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(5/2)*(a + a*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(5/2)*(a + a*cos(c + d*x))^(1/2)), x)
```

3.230 $\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 169

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{26\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1
/2))*2^(1/2)/d/a^(1/2)+2/5*sin(d*x+c)/d/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(
1/2)-2/15*sin(d*x+c)/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2)+26/15*sin(d*
x+c)/d/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used

$= \{2858, 3063, 12, 2861, 211\}$

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d} - \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{26\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[1/(Cos[c + d*x]^(7/2)*Sqrt[a + a*Cos[c + d*x]]),x]
```

```
[Out] -((Sqrt[2]*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a
 + a*Cos[c + d*x]])])/(Sqrt[a]*d)) + (2*Sin[c + d*x])/(5*d*Cos[c + d*x]^(5/
2)*Sqrt[a + a*Cos[c + d*x]]) - (2*Sin[c + d*x])/(15*d*Cos[c + d*x]^(3/2)*Sq
rt[a + a*Cos[c + d*x]]) + (26*Sin[c + d*x])/(15*d*Sqrt[Cos[c + d*x]]*Sqrt[a
 + a*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
```

```
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{\int \frac{a-4a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx}{5a} \\
&= \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} \\
&\quad - \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{2\int \frac{-\frac{13a^2}{2}+a^2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx}{15a^2} \\
&= \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} \\
&\quad + \frac{26\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} - \frac{4\int \frac{15a^3}{4\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{15a^3} \\
&= \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} \\
&\quad + \frac{26\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} - \int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx \\
&= \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} \\
&\quad + \frac{26\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} \\
&\quad + \frac{(2a)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{d}
\end{aligned}$$

$$= -\frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{26\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 8.59 (sec) , antiderivative size = 1540, normalized size of antiderivative = 9.11

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx =$$

$$-\frac{2\cot\left(\frac{c}{2}+\frac{dx}{2}\right)\csc^6\left(\frac{c}{2}+\frac{dx}{2}\right)\left(4725\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)-48825\sin^4\left(\frac{c}{2}+\frac{dx}{2}\right)+210105\sin^6\left(\frac{c}{2}+\frac{dx}{2}\right)-486630\right.}{}$$

```
[In] Integrate[1/(Cos[c + d*x]^(7/2)*Sqrt[a + a*Cos[c + d*x]]),x]
```

```
[Out] (-2*Cot[c/2 + (d*x)/2]*Csc[c/2 + (d*x)/2]^6*(4725*Sin[c/2 + (d*x)/2]^2 - 48
825*Sin[c/2 + (d*x)/2]^4 + 210105*Sin[c/2 + (d*x)/2]^6 - 486630*Sin[c/2 + (
d*x)/2]^8 + 655812*Sin[c/2 + (d*x)/2]^10 - 710*Hypergeometric2F1[2, 9/2, 11
/2, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^
10 - 40*Cos[(c + d*x)/2]^6*HypergeometricPFQ[{2, 2, 2, 9/2}, {1, 1, 11/2},
Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^10 -
 518760*Sin[c/2 + (d*x)/2]^12 + 1770*Hypergeometric2F1[2, 9/2, 11/2, Sin[c/
2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^12 + 22665
6*Sin[c/2 + (d*x)/2]^14 - 1500*Hypergeometric2F1[2, 9/2, 11/2, Sin[c/2 + (d
*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^14 - 42048*Sin[c
/2 + (d*x)/2]^16 + 440*Hypergeometric2F1[2, 9/2, 11/2, Sin[c/2 + (d*x)/2]^2
/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^16 + 4725*ArcTanh[Sqrt[S
in[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Sqrt[Sin[c/2 + (d*x)/2]
^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)] - 56700*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2
/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^2*Sqrt[Sin[c/2 + (d*x)/
2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)] + 291060*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2
]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^4*Sqrt[Sin[c/2 + (d*
x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)] - 833760*ArcTanh[Sqrt[Sin[c/2 + (d*x
)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^6*Sqrt[Sin[c/2 +
(d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)] + 1458000*ArcTanh[Sqrt[Sin[c/2 +
(d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^8*Sqrt[Sin[c/
2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)] - 1598400*ArcTanh[Sqrt[Sin[c/
2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^10*Sqrt[S
in[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)] + 1080000*ArcTanh[Sqrt[S
```

```
in[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^12*S
qrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)] - 414720*ArcTanh[Sq
rt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^
14*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)] + 69120*ArcTanh
[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/
2]^16*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)] + 60*Cos[(c
+ d*x)/2]^4*HypergeometricPFQ[{2, 2, 9/2}, {1, 11/2}, Sin[c/2 + (d*x)/2]^2/
(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^10*(-5 + 4*Sin[c/2 + (d*x
)/2]^2)))/(675*d*Sqrt[a*(1 + Cos[c + d*x])]*(1 - 2*Sin[c/2 + (d*x)/2]^2)^(7
/2)*(-1 + 2*Sin[c/2 + (d*x)/2]^2))
```

Maple [A] (verified)

Time = 5.85 (sec) , antiderivative size = 180, normalized size of antiderivative = 1.07

method	result
default	$\frac{\left(15\left(\cos^{3}(dx+c)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\arcsin(\cot(dx+c)-\csc(dx+c))+13\sqrt{2}\left(\cos^{2}(dx+c)\right)\sin(dx+c)+15\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\left(\cos^{2}(dx+c)\right)\operatorname{arcs}\right.}{15d(1+\cos(dx+c))\cos(dx+c)^{\frac{5}{2}}a}$

```
[In] int(1/cos(d*x+c)^(7/2)/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/15/d*(15*cos(d*x+c)^3*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)
-csc(d*x+c))+13*2^(1/2)*cos(d*x+c)^2*sin(d*x+c)+15*(cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*cos(d*x+c)^2*arcsin(cot(d*x+c)-csc(d*x+c))-sin(d*x+c)*cos(d*x+c)*
2^(1/2)+3*2^(1/2)*sin(d*x+c))*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))/cos(d
*x+c)^(5/2)*2^(1/2)/a
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 157, normalized size of antiderivative = 0.93

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{2\sqrt{a\cos(dx+c)+a}\left(13\cos(dx+c)^{2}-\cos(dx+c)+3\right)\sqrt{\cos(dx+c)}\sin(dx+c)-\frac{15\sqrt{2}\left(a\cos(dx+c)^{4}+a\right.}{}}{15\left(ad\cos(dx+c)^{4}+ad\cos(dx+c)^{3}\right)}$$

```
[In] integrate(1/cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/15*(2*sqrt(a*cos(d*x + c) + a)*(13*cos(d*x + c)^2 - cos(d*x + c) + 3)*sqr
t(cos(d*x + c))*sin(d*x + c) - 15*sqrt(2)*(a*cos(d*x + c)^4 + a*cos(d*x + c
)^3)*arctan(1/2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*sin(d*x
 + c)/((cos(d*x + c)^2 + cos(d*x + c))*sqrt(a)))/sqrt(a))/(a*d*cos(d*x + c)
^4 + a*d*cos(d*x + c)^3)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(7/2)/(a+a*cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.65 (sec) , antiderivative size = 1006, normalized size of antiderivative = 5.95

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate(1/cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] -1/15*(15*(sqrt(2)*cos(2*d*x + 2*c)^2 + sqrt(2)*sin(2*d*x + 2*c)^2 + 2*sqrt
(2)*cos(2*d*x + 2*c) + sqrt(2))*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 +
2*cos(2*d*x + 2*c) + 1)^(1/4)*arctan2(((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*
x + c)^4 + sin(d*x + c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x
+ c) + 1)*abs(e^(I*d*x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2
 - 2*cos(d*x + c) + 1)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) +
 1)^(1/4)*sin(1/2*arctan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x +
I*c) + 1)^2, (abs(e^(I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2
- 2*cos(d*x + c) + 1)/abs(e^(I*d*x + I*c) + 1)^2)) + sin(d*x + c))/abs(e^(I
*d*x + I*c) + 1), ((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x +
 c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d
*x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) +
1)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*sqrt(a)*co
s(1/2*arctan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2,
 (abs(e^(I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x
+ c) + 1)/abs(e^(I*d*x + I*c) + 1)^2)) + sqrt(a)*cos(d*x + c) - sqrt(a))/(s
qrt(a)*abs(e^(I*d*x + I*c) + 1))) - 26*(cos(2*d*x + 2*c)^2*sin(d*x + c) + s
in(2*d*x + 2*c)^2*sin(d*x + c) + 2*cos(2*d*x + 2*c)*sin(d*x + c) + sin(d*x
+ c))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 24*cos(5/2
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x + c) - 24*(cos(d*
x + c) - 1)*sin(5/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 2*((
13*cos(d*x + c) - 15)*cos(2*d*x + 2*c)^2 + (13*cos(d*x + c) - 15)*sin(2*d*x
 + 2*c)^2 + 2*(13*cos(d*x + c) - 15)*cos(2*d*x + 2*c) + 13*cos(d*x + c) - 1
5)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 4*sqrt(cos(2*
d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*(7*cos(3/2*arct
```

```
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x + c) - (7*cos(d*x + c)
 - 5)*sin(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))))/((cos(2*d*
x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(5/4)*sqrt(a)*d)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{a\cos\left(dx+c\right)+a}\cos\left(dx+c\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(a*cos(d*x + c) + a)*cos(d*x + c)^(7/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{1}{{\cos\left(c+d\,x\right)}^{7/2}\,\sqrt{a+a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(7/2)*(a + a*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(7/2)*(a + a*cos(c + d*x))^(1/2)), x)
```

3.231 $\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 126

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d}+\frac{7\arcsin\left(\frac{\sin(c+dx)}{\sqrt{1+\cos(c+dx)}}\right)}{4d} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{1+\cos(c+dx)}}+\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{1+\cos(c+dx)}}$$

```
[Out] 7/4*arcsin(sin(d*x+c)/(1+cos(d*x+c))^(1/2))/d-arcsin(sin(d*x+c)/(1+cos(d*x+
c)))*2^(1/2)/d+1/2*cos(d*x+c)^(3/2)*sin(d*x+c)/d/(1+cos(d*x+c))^(1/2)-1/4*s
in(d*x+c)*cos(d*x+c)^(1/2)/d/(1+cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2857, 3062, 3061, 2860, 222, 2853}

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{\cos(c+dx)+1}\right)}{d}+\frac{7\arcsin\left(\frac{\sin(c+dx)}{\sqrt{\cos(c+dx)+1}}\right)}{4d} + \frac{\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{2d\sqrt{\cos(c+dx)+1}}-\frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{4d\sqrt{\cos(c+dx)+1}}$$

```
[In] Int[Cos[c + d*x]^(5/2)/Sqrt[1 + Cos[c + d*x]],x]
```

```
[Out] -((Sqrt[2]*ArcSin[Sin[c + d*x]/(1 + Cos[c + d*x])])/d) + (7*ArcSin[Sin[c +
d*x]/Sqrt[1 + Cos[c + d*x]]])/(4*d) - (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(4*
```

```
d*Sqrt[1 + Cos[c + d*x]]) + (Cos[c + d*x]^(3/2)*Sin[c + d*x])/(2*d*Sqrt[1 +
 Cos[c + d*x]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2857

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[-2*d*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n - 1)/(f*(2*n - 1)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(b*(2*n - 1))
, Int[((c + d*Sin[e + f*x])^(n - 2)/Sqrt[a + b*Sin[e + f*x]])*Simp[a*c*d -
b*(2*d^2*(n - 1) + c^2*(2*n - 1)) + d*(a*d - b*c*(4*n - 3))*Sin[e + f*x], x
], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
 b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[n, 1] && IntegerQ[2*n]
```

Rule 2860

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[-Sqrt[2]/(Sqrt[a]*f), Subst[Int[1/Sqrt[1 - x
^2], x], x, b*(Cos[e + f*x]/(a + b*Sin[e + f*x]))], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 - b^2, 0] && EqQ[d, a/b] && GtQ[a, 0]
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3062

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(-B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(f*(m +
n + 1))), x] + Dist[1/(b*(m + n + 1)), Int[(a + b*Sin[e + f*x])^m*(c + d*Si
```

```
n[e + f*x])^(n - 1)*Simp[A*b*c*(m + n + 1) + B*(a*c*m + b*d*n) + (A*b*d*(m
+ n + 1) + B*(a*d*m + b*c*n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 -
 d^2, 0] && GtQ[n, 0] && (IntegerQ[n] || EqQ[m + 1/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{1+\cos(c+dx)}} - \frac{1}{4}\int \frac{(-3+\cos(c+dx))\sqrt{\cos(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx \\
&= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{1+\cos(c+dx)}} + \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{1+\cos(c+dx)}} \\
&\quad - \frac{1}{4}\int \frac{\frac{1}{2}-\frac{7}{2}\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx \\
&= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{1+\cos(c+dx)}} + \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{1+\cos(c+dx)}} \\
&\quad + \frac{7}{8}\int \frac{\sqrt{1+\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx - \int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx \\
&= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{1+\cos(c+dx)}} + \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{1+\cos(c+dx)}} \\
&\quad - \frac{7\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, -\frac{\sin(c+dx)}{\sqrt{1+\cos(c+dx)}}\right)}{4d} + \frac{\sqrt{2}\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, -\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d} \\
&= -\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d} + \frac{7\arcsin\left(\frac{\sin(c+dx)}{\sqrt{1+\cos(c+dx)}}\right)}{4d} \\
&\quad - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{1+\cos(c+dx)}} + \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{1+\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.07

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = -\frac{\left(\arcsin\left(\sqrt{1-\cos(c+dx)}\right) + 8\arcsin\left(\sqrt{\cos(c+dx)}\right) - 4\sqrt{2}\arctan\left(\frac{\sqrt{\cos(c+dx)}}{\sqrt{\sin^2\left(\frac{1}{2}(c+dx)\right)}}\right) - 2\sqrt{1-\cos(c}{4d\sqrt{\sin^2(c+dx)}}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)/Sqrt[1 + Cos[c + d*x]],x]
```

```
[Out] -1/4*((ArcSin[Sqrt[1 - Cos[c + d*x]]] + 8*ArcSin[Sqrt[Cos[c + d*x]]] - 4*Sq
rt[2]*ArcTan[Sqrt[Cos[c + d*x]]/Sqrt[Sin[(c + d*x)/2]^2]] - 2*Sqrt[1 - Cos[
c + d*x]]*Cos[c + d*x]^(3/2) + Sqrt[-((-1 + Cos[c + d*x])*Cos[c + d*x])])*S
in[c + d*x])/(d*Sqrt[Sin[c + d*x]^2])
```

Maple [A] (verified)

Time = 12.56 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.34

method	result
default	$\frac{\left(2\sin(dx+c)\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+4\arcsin(\cot(dx+c)-\csc(dx+c))\sqrt{2}-\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+7\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(\cdots}{1+\cos\cdots}}\right.\right.}{8d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$

```
[In] int(cos(d*x+c)^(5/2)/(1+cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/8/d*(2*sin(d*x+c)*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+4*arcsin(c
ot(d*x+c)-csc(d*x+c))*2^(1/2)-sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+
7*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)))*cos(d*x+c)^(1/2)*(2
+2*cos(d*x+c))^(1/2)/(1+cos(d*x+c))/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/
2)
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.07

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx$$
$$= \frac{(2\cos(dx+c)-1)\sqrt{\cos(dx+c)+1}\sqrt{\cos(dx+c)}\sin(dx+c)+4\left(\sqrt{2}\cos(dx+c)+\sqrt{2}\right)\arctan\left(\frac{\sqrt{2}\cdots}{\cdots}\right.}{4\left(d\cos(dx+c)+d\right)}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(1+cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/4*((2*cos(d*x + c) - 1)*sqrt(cos(d*x + c) + 1)*sqrt(cos(d*x + c))*sin(d*x
 + c) + 4*(sqrt(2)*cos(d*x + c) + sqrt(2))*arctan(sqrt(2)*sqrt(cos(d*x + c)
 + 1)*sqrt(cos(d*x + c))/sin(d*x + c)) - 7*(cos(d*x + c) + 1)*arctan(sqrt(c
os(d*x + c) + 1)*sqrt(cos(d*x + c))/sin(d*x + c)))/(d*cos(d*x + c) + d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)/(1+cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{\sqrt{\cos\left(dx+c\right)+1}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(1+cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(5/2)/sqrt(cos(d*x + c) + 1), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(1+cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{\cos\left(c+d\,x\right)^{5/2}}{\sqrt{\cos\left(c+d\,x\right)+1}}\,dx$$

```
[In] int(cos(c + d*x)^(5/2)/(cos(c + d*x) + 1)^(1/2),x)
[Out] int(cos(c + d*x)^(5/2)/(cos(c + d*x) + 1)^(1/2), x)
```

3.232 $\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 85

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx=\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d}-\frac{\arcsin\left(\frac{\sin(c+dx)}{\sqrt{1+\cos(c+dx)}}\right)}{d}+\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{1+\cos(c+dx)}}$$

```
[Out] -arcsin(sin(d*x+c)/(1+cos(d*x+c))^(1/2))/d+arcsin(sin(d*x+c)/(1+cos(d*x+c))
)*2^(1/2)/d+sin(d*x+c)*cos(d*x+c)^(1/2)/d/(1+cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2857, 3061, 2860, 222, 2853}

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx=\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{\cos(c+dx)+1}\right)}{d}-\frac{\arcsin\left(\frac{\sin(c+dx)}{\sqrt{\cos(c+dx)+1}}\right)}{d}+\frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{d\sqrt{\cos(c+dx)+1}}$$

```
[In] Int[Cos[c + d*x]^(3/2)/Sqrt[1 + Cos[c + d*x]],x]
```

```
[Out] (Sqrt[2]*ArcSin[Sin[c + d*x]/(1 + Cos[c + d*x])])/d - ArcSin[Sin[c + d*x]/S
qrt[1 + Cos[c + d*x]]]/d + (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(d*Sqrt[1 + Co
s[c + d*x]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2857

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[-2*d*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n - 1)/(f*(2*n - 1)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(b*(2*n - 1))
, Int[((c + d*Sin[e + f*x])^(n - 2)/Sqrt[a + b*Sin[e + f*x]])*Simp[a*c*d -
b*(2*d^2*(n - 1) + c^2*(2*n - 1)) + d*(a*d - b*c*(4*n - 3))*Sin[e + f*x], x
], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
 b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[n, 1] && IntegerQ[2*n]
```

Rule 2860

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[-Sqrt[2]/(Sqrt[a]*f), Subst[Int[1/Sqrt[1 - x
^2], x], x, b*(Cos[e + f*x]/(a + b*Sin[e + f*x]))], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 - b^2, 0] && EqQ[d, a/b] && GtQ[a, 0]
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{1+\cos(c+dx)}} - \frac{1}{2}\int \frac{-1+\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx \\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{1+\cos(c+dx)}} - \frac{1}{2}\int \frac{\sqrt{1+\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx \\
&\quad + \int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx
\end{aligned}
$$

$$= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{1+\cos(c+dx)}} + \frac{\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, -\frac{\sin(c+dx)}{\sqrt{1+\cos(c+dx)}}\right)}{d} - \frac{\sqrt{2}\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, -\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d}$$

$$= \frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d} - \frac{\arcsin\left(\frac{\sin(c+dx)}{\sqrt{1+\cos(c+dx)}}\right)}{d} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{1+\cos(c+dx)}}$$

Mathematica [A] (warning: unable to verify)

Time = 0.12 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.25

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \frac{\left(\arcsin\left(\sqrt{1-\cos(c+dx)}\right) + 2\arcsin\left(\sqrt{\cos(c+dx)}\right) - \sqrt{2}\arctan\left(\frac{\sqrt{\cos(c+dx)}}{\sqrt{\sin^2\left(\frac{1}{2}(c+dx)\right)}}\right) + \sqrt{-((-1+\cos}\right.}{d\sqrt{\sin^2(c+dx)}}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)/Sqrt[1 + Cos[c + d*x]],x]
```

```
[Out] ((ArcSin[Sqrt[1 - Cos[c + d*x]]] + 2*ArcSin[Sqrt[Cos[c + d*x]]] - Sqrt[2]*A
rcTan[Sqrt[Cos[c + d*x]]/Sqrt[Sin[(c + d*x)/2]^2]] + Sqrt[-((-1 + Cos[c + d
*x])*Cos[c + d*x])])*Sin[c + d*x])/(d*Sqrt[Sin[c + d*x]^2])
```

Maple [A] (verified)

Time = 12.86 (sec) , antiderivative size = 133, normalized size of antiderivative = 1.56

method	result
default	$-\frac{\left(\arcsin(\cot(dx+c)-\csc(dx+c))\sqrt{2}-\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\right)\left(\sqrt{\cos}(dx+c)\right)\sqrt{2+2\cos(dx+}}{2d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$

```
[In] int(cos(d*x+c)^(3/2)/(1+cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/d*(arcsin(cot(d*x+c)-csc(d*x+c))*2^(1/2)-sin(d*x+c)*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)+arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)))*cos(d
*x+c)^(1/2)*(2+2*cos(d*x+c))^(1/2)/(1+cos(d*x+c))/(cos(d*x+c)/(1+cos(d*x+c)
))^(1/2)*2^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.47

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx =$$
$$-\frac{\left(\sqrt{2}\cos\left(dx+c\right)+\sqrt{2}\right)\arctan\left(\frac{\sqrt{2}\sqrt{\cos(dx+c)+1}\sqrt{\cos(dx+c)}}{\sin(dx+c)}\right)-\left(\cos\left(dx+c\right)+1\right)\arctan\left(\frac{\sqrt{\cos(dx+c)+1}\sqrt{\cos(d}}{\sin(dx+c)}\right.}{d\cos\left(dx+c\right)+d}$$

```
[In] integrate(cos(d*x+c)^(3/2)/(1+cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] -((sqrt(2)*cos(d*x + c) + sqrt(2))*arctan(sqrt(2)*sqrt(cos(d*x + c) + 1)*sq
rt(cos(d*x + c))/sin(d*x + c)) - (cos(d*x + c) + 1)*arctan(sqrt(cos(d*x + c
) + 1)*sqrt(cos(d*x + c))/sin(d*x + c)) - sqrt(cos(d*x + c) + 1)*sqrt(cos(d
*x + c))*sin(d*x + c))/(d*cos(d*x + c) + d)
```

Sympy [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{\cos^{\frac{3}{2}}\left(c+dx\right)}{\sqrt{\cos\left(c+dx\right)+1}}\,dx$$

```
[In] integrate(cos(d*x+c)**(3/2)/(1+cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(cos(c + d*x)**(3/2)/sqrt(cos(c + d*x) + 1), x)
```

Maxima [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{3}{2}}}{\sqrt{\cos\left(dx+c\right)+1}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(1+cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(cos(d*x + c)^(3/2)/sqrt(cos(d*x + c) + 1), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(3/2)/(1+cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{\cos\left(c+d\,x\right)^{3/2}}{\sqrt{\cos\left(c+d\,x\right)+1}}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)/(cos(c + d*x) + 1)^(1/2),x)
[Out] int(cos(c + d*x)^(3/2)/(cos(c + d*x) + 1)^(1/2), x)
```

3.233 $\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 54

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d}+\frac{2\arcsin\left(\frac{\sin(c+dx)}{\sqrt{1+\cos(c+dx)}}\right)}{d}$$

```
[Out] 2*arcsin(sin(d*x+c)/(1+cos(d*x+c))^(1/2))/d-arcsin(sin(d*x+c)/(1+cos(d*x+c)
))*2^(1/2)/d
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2856, 2853, 222, 2860}

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx = \frac{2\arcsin\left(\frac{\sin(c+dx)}{\sqrt{\cos(c+dx)+1}}\right)}{d}-\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{\cos(c+dx)+1}\right)}{d}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/Sqrt[1 + Cos[c + d*x]],x]
```

```
[Out] -((Sqrt[2]*ArcSin[Sin[c + d*x]/(1 + Cos[c + d*x])])/d) + (2*ArcSin[Sin[c +
d*x]/Sqrt[1 + Cos[c + d*x]]])/d
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2856

```
Int[Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(a_) + (b_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c
 + d*Sin[e + f*x]], x], x] + Dist[(b*c - a*d)/b, Int[1/(Sqrt[a + b*Sin[e +
f*x]]*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2860

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[-Sqrt[2]/(Sqrt[a]*f), Subst[Int[1/Sqrt[1 - x
^2], x], x, b*(Cos[e + f*x]/(a + b*Sin[e + f*x]))], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 - b^2, 0] && EqQ[d, a/b] && GtQ[a, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx + \int \frac{\sqrt{1+\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx \\
&= -\frac{2\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, -\frac{\sin(c+dx)}{\sqrt{1+\cos(c+dx)}}\right)}{d} + \frac{\sqrt{2}\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, -\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d} \\
&= -\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d} + \frac{2\arcsin\left(\frac{\sin(c+dx)}{\sqrt{1+\cos(c+dx)}}\right)}{d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.87

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx = -\frac{\left(2\arcsin\left(\sqrt{\cos(c+dx)}\right)-\sqrt{2}\arctan\left(\frac{\sqrt{\cos(c+dx)}}{\sqrt{\sin^2\left(\frac{1}{2}(c+dx)\right)}}\right)\right)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sin(c+dx)}{d\sqrt{-((-1+\cos(c+dx))\cos(c+dx))}}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/Sqrt[1 + Cos[c + d*x]],x]
[Out] -(((2*ArcSin[Sqrt[Cos[c + d*x]]] - Sqrt[2]*ArcTan[Sqrt[Cos[c + d*x]]/Sqrt[S
in[(c + d*x)/2]^2]])*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sin[c + d*x])/(d
*Sqrt[-((-1 + Cos[c + d*x])*Cos[c + d*x])]))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 107 vs. $2(50) = 100$.

Time = 2.64 (sec) , antiderivative size = 108, normalized size of antiderivative = 2.00

method	result	size
default	$\frac{\left(\sqrt{\cos}(dx+c)\right)\sqrt{2+2\cos(dx+c)}\left(\arcsin(\cot(dx+c)-\csc(dx+c))\sqrt{2}+2\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\right)\sqrt{2}}{2d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$	108

```
[In] int(cos(d*x+c)^(1/2)/(1+cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/d*cos(d*x+c)^(1/2)*(2+2*cos(d*x+c))^(1/2)*(arcsin(cot(d*x+c)-csc(d*x+c)
)*2^(1/2)+2*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)))/(1+cos(d*
x+c))/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.30

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx = \frac{\sqrt{2}\arctan\left(\frac{\sqrt{2}\sqrt{\cos(dx+c)+1}\sqrt{\cos(dx+c)}}{\sin(dx+c)}\right)-2\arctan\left(\frac{\sqrt{\cos(dx+c)+1}\sqrt{\cos(dx+c)}}{\sin(dx+c)}\right)}{d}$$

```
[In] integrate(cos(d*x+c)^(1/2)/(1+cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] (sqrt(2)*arctan(sqrt(2)*sqrt(cos(d*x + c) + 1)*sqrt(cos(d*x + c))/sin(d*x +
 c)) - 2*arctan(sqrt(cos(d*x + c) + 1)*sqrt(cos(d*x + c))/sin(d*x + c)))/d
```

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos(c+dx)}}{\sqrt{\cos(c+dx)+1}}\,dx$$

```
[In] integrate(cos(d*x+c)**(1/2)/(1+cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(cos(c + d*x))/sqrt(cos(c + d*x) + 1), x)
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.67 (sec) , antiderivative size = 689, normalized size of antiderivative = 12.76

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\arctan\left(\frac{\left(\left|2\,e^{(i\,dx+i\,c)}+2\right|^4+16\,\cos(dx+c)^4+16\,\sin(dx+c)^4+8\left(\cos(dx+c)^2-\sin(dx+c)^2-2\,\cos(dx+c)+1\right)\left|2\,e^{(i\,dx+i\,c)}+2\right|^2-64\,\cos\cdots}{\cdots}\right.}{\cdots}$$

```
[In] integrate(cos(d*x+c)^(1/2)/(1+cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -(sqrt(2)*arctan2(((abs(2*e^(I*d*x + I*c) + 2)^4 + 16*cos(d*x + c)^4 + 16*s
in(d*x + c)^4 + 8*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*ab
s(2*e^(I*d*x + I*c) + 2)^2 - 64*cos(d*x + c)^3 + 32*(cos(d*x + c)^2 - 2*cos
(d*x + c) + 1)*sin(d*x + c)^2 + 96*cos(d*x + c)^2 - 64*cos(d*x + c) + 16)^(
1/4)*sin(1/2*arctan2(8*(cos(d*x + c) - 1)*sin(d*x + c)/abs(2*e^(I*d*x + I*c
) + 2)^2, (abs(2*e^(I*d*x + I*c) + 2)^2 + 4*cos(d*x + c)^2 - 4*sin(d*x + c)
^2 - 8*cos(d*x + c) + 4)/abs(2*e^(I*d*x + I*c) + 2)^2)) + 2*sin(d*x + c))/a
bs(2*e^(I*d*x + I*c) + 2), ((abs(2*e^(I*d*x + I*c) + 2)^4 + 16*cos(d*x + c)
^4 + 16*sin(d*x + c)^4 + 8*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c
) + 1)*abs(2*e^(I*d*x + I*c) + 2)^2 - 64*cos(d*x + c)^3 + 32*(cos(d*x + c)^
2 - 2*cos(d*x + c) + 1)*sin(d*x + c)^2 + 96*cos(d*x + c)^2 - 64*cos(d*x + c
) + 16)^(1/4)*cos(1/2*arctan2(8*(cos(d*x + c) - 1)*sin(d*x + c)/abs(2*e^(I*
d*x + I*c) + 2)^2, (abs(2*e^(I*d*x + I*c) + 2)^2 + 4*cos(d*x + c)^2 - 4*sin
(d*x + c)^2 - 8*cos(d*x + c) + 4)/abs(2*e^(I*d*x + I*c) + 2)^2)) + 2*cos(d*
x + c) - 2)/abs(2*e^(I*d*x + I*c) + 2)) - arctan2((cos(2*d*x + 2*c)^2 + sin
(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c) + 1)) + sin(d*x + c), (cos(2*d*x + 2*c)^2 + sin(2*d
*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c) + 1)) + cos(d*x + c)))/d
```

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos(dx+c)}}{\sqrt{\cos(dx+c)+1}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(1+cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(cos(d*x + c))/sqrt(cos(d*x + c) + 1), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(c+d\,x\right)}}{\sqrt{\cos\left(c+d\,x\right)+1}}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(cos(c + d*x) + 1)^(1/2),x)
[Out] int(cos(c + d*x)^(1/2)/(cos(c + d*x) + 1)^(1/2), x)
```

3.234 $\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 27

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx = \frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d}$$

```
[Out] arcsin(sin(d*x+c)/(1+cos(d*x+c)))*2^(1/2)/d
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2860, 222}

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx = \frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{\cos(c+dx)+1}\right)}{d}$$

```
[In] Int[1/(Sqrt[Cos[c + d*x]]*Sqrt[1 + Cos[c + d*x]]),x]
[Out] (Sqrt[2]*ArcSin[Sin[c + d*x]/(1 + Cos[c + d*x])])/d
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2860

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[-Sqrt[2]/(Sqrt[a]*f), Subst[Int[1/Sqrt[1 - x
^2], x], x, b*(Cos[e + f*x]/(a + b*Sin[e + f*x]))], x] /; FreeQ[{a, b, d, e
```

```
, f}, x] && EqQ[a^2 - b^2, 0] && EqQ[d, a/b] && GtQ[a, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{\sqrt{2}\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, -\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d}\\ &= \frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.81

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx = \frac{2\arctan\left(\frac{\sin\left(\frac{1}{2}(c+dx)\right)}{\sqrt{\cos(c+dx)}}\right)\cos\left(\frac{1}{2}(c+dx)\right)}{d\sqrt{1+\cos(c+dx)}}$$

```
[In] Integrate[1/(Sqrt[Cos[c + d*x]]*Sqrt[1 + Cos[c + d*x]]),x]
[Out] (2*ArcTan[Sin[(c + d*x)/2]/Sqrt[Cos[c + d*x]]]*Cos[(c + d*x)/2])/(d*Sqrt[1
+ Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 60 vs. 2(25) = 50.

Time = 4.22 (sec) , antiderivative size = 61, normalized size of antiderivative = 2.26

method	result	size
default	$-\frac{\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{2+2\cos(dx+c)}\,\arcsin(\cot(dx+c)-\csc(dx+c))}{d\sqrt{\cos(dx+c)}}$	61

```
[In] int(1/cos(d*x+c)^(1/2)/(1+cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/d/cos(d*x+c)^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(2+2*cos(d*x+c))^(1
/2)*arcsin(cot(d*x+c)-csc(d*x+c))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 54 vs. 2(25) = 50.

Time = 0.29 (sec) , antiderivative size = 54, normalized size of antiderivative = 2.00

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx = \frac{\sqrt{2}\arctan\left(\frac{\sqrt{2}\sqrt{\cos(dx+c)+1}\sqrt{\cos(dx+c)}\sin(dx+c)}{2\left(\cos(dx+c)^2+\cos(dx+c)\right)}\right)}{d}$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(1+cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] sqrt(2)*arctan(1/2*sqrt(2)*sqrt(cos(d*x + c) + 1)*sqrt(cos(d*x + c))*sin(d*
x + c)/(cos(d*x + c)^2 + cos(d*x + c)))/d
```

Sympy [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos(c+dx)+1}\sqrt{\cos(c+dx)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(1/2)/(1+cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/(sqrt(cos(c + d*x) + 1)*sqrt(cos(c + d*x))), x)
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.66 (sec) , antiderivative size = 505, normalized size of antiderivative = 18.70

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx = \frac{\sqrt{2}\arctan\left(\frac{\left(\left|e^{(i\,dx+i\,c)}+1\right|^4+\cos(dx+c)^4+\sin(dx+c)^4+2\left(\cos(dx+c)^2-\sin(dx+c)^2-2\,\cos(dx+c)+1\right)\left|e^{(i\,dx+i\,c)}+1\right|^2-4\,\cos(dx+c)^3+2\,(\right.}{}\right.}{}$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(1+cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] sqrt(2)*arctan2(((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x + c
)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d*x
 + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) + 1)
*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*sin(1/2*arct
an2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e^(I
```

```
*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)/
abs(e^(I*d*x + I*c) + 1)^2)) + sin(d*x + c))/abs(e^(I*d*x + I*c) + 1), ((ab
s(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x + c)^4 + 2*(cos(d*x + c
)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d*x + I*c) + 1)^2 - 4*c
os(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) + 1)*sin(d*x + c)^2 + 6*
cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*cos(1/2*arctan2(2*(cos(d*x + c)
- 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e^(I*d*x + I*c) + 1)^2 +
 cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)/abs(e^(I*d*x + I*c)
+ 1)^2)) + cos(d*x + c) - 1)/abs(e^(I*d*x + I*c) + 1))/d
```

Giac [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx=\int \frac{1}{\sqrt{\cos\left(dx+c\right)+1}\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(1+cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(cos(d*x + c) + 1)*sqrt(cos(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx=\int \frac{1}{\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{\cos\left(c+d\,x\right)+1}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(cos(c + d*x) + 1)^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(cos(c + d*x) + 1)^(1/2)), x)
```

3.235 $\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 62

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d} + \frac{2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}$$

```
[Out] -arcsin(sin(d*x+c)/(1+cos(d*x+c)))*2^(1/2)/d+2*sin(d*x+c)/d/cos(d*x+c)^(1/2
)/(1+cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2858, 2860, 222}

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx = \frac{2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{\cos(c+dx)+1}} - \frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{\cos(c+dx)+1}\right)}{d}$$

```
[In] Int[1/(Cos[c + d*x]^(3/2)*Sqrt[1 + Cos[c + d*x]]),x]
```

```
[Out] -((Sqrt[2]*ArcSin[Sin[c + d*x]/(1 + Cos[c + d*x])])/d) + (2*Sin[c + d*x])/(
d*Sqrt[Cos[c + d*x]]*Sqrt[1 + Cos[c + d*x]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2860

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[-Sqrt[2]/(Sqrt[a]*f), Subst[Int[1/Sqrt[1 - x
^2], x], x, b*(Cos[e + f*x]/(a + b*Sin[e + f*x]))], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 - b^2, 0] && EqQ[d, a/b] && GtQ[a, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}} - \int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx\\ &= \frac{2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}} + \frac{\sqrt{2}\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, -\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d}\\ &= -\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d} + \frac{2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\end{aligned}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 1.27 (sec) , antiderivative size = 178, normalized size of antiderivative = 2.87

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx = \frac{2\cos\left(\frac{1}{2}(c+dx)\right)\sin\left(\frac{1}{2}(c+dx)\right)\left(\frac{1}{2}\cos(c+dx)(2+\cos(c+dx))\csc^4\left(\frac{1}{2}(c+dx)\right)\left(1-\cos(c+dx)+\text{arcta}\right.\right.}{}$$

```
[In] Integrate[1/(Cos[c + d*x]^(3/2)*Sqrt[1 + Cos[c + d*x]]),x]
```

```
[Out] (2*Cos[(c + d*x)/2]*Sin[(c + d*x)/2]*((Cos[c + d*x]*(2 + Cos[c + d*x])*Csc[
(c + d*x)/2]^4*(1 - Cos[c + d*x] + ArcTanh[Sqrt[-(Sec[c + d*x]*Sin[(c + d*x
)/2]^2)]]*Cos[c + d*x]*Sqrt[2 - 2*Sec[c + d*x]]))/2 - (Hypergeometric2F1[2,
 5/2, 7/2, -(Sec[c + d*x]*Sin[(c + d*x)/2]^2)]*Sin[c + d*x]*Tan[c + d*x])/1
0))/(d*Cos[c + d*x]^(3/2)*Sqrt[1 + Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 131 vs. $2(56) = 112$.

Time = 4.94 (sec) , antiderivative size = 132, normalized size of antiderivative = 2.13

method	result
default	$\frac{\left(\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\cos(dx+c)\sqrt{2}\,\arcsin(\cot(dx+c)-\csc(dx+c))+\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{2}\,\arcsin(\cot(dx+c)-\csc(dx+c))+2\sin(dx+c)\right)\sqrt{2+}}{2d(1+\cos(dx+c))\sqrt{\cos(dx+c)}}$

```
[In] int(1/cos(d*x+c)^(3/2)/(1+cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/d*((cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)*2^(1/2)*arcsin(cot(d*x+
c)-csc(d*x+c))+(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)*arcsin(cot(d*x+c)-
csc(d*x+c))+2*sin(d*x+c))*(2+2*cos(d*x+c))^(1/2)/(1+cos(d*x+c))/cos(d*x+c)^
(1/2)*2^(1/2)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 121 vs. $2(56) = 112$.

Time = 0.28 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.95

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx = -\frac{\left(\sqrt{2}\cos\left(dx+c\right)^2+\sqrt{2}\cos\left(dx+c\right)\right)\arctan\left(\frac{\sqrt{2}\sqrt{\cos(dx+c)+1}\sqrt{\cos(dx+c)}\sin(dx+c)}{2\left(\cos(dx+c)^2+\cos(dx+c)\right)}\right)-2\sqrt{\cos\left(dx+c\right)+1}}{d\cos\left(dx+c\right)^2+d\cos\left(dx+c\right)}$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(1+cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] -((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*cos(d*x + c))*arctan(1/2*sqrt(2)*sqrt(c
os(d*x + c) + 1)*sqrt(cos(d*x + c))*sin(d*x + c)/(cos(d*x + c)^2 + cos(d*x
+ c))) - 2*sqrt(cos(d*x + c) + 1)*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d
*x + c)^2 + d*cos(d*x + c))
```

Sympy [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos(c+dx)+1}\cos^{\frac{3}{2}}(c+dx)}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(3/2)/(1+cos(d*x+c))**(1/2),x)
[Out] Integral(1/(sqrt(cos(c + d*x) + 1)*cos(c + d*x)**(3/2)), x)
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.58 (sec) , antiderivative size = 648, normalized size of antiderivative = 10.45

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx$$

$$= \frac{2 \cos\left(\frac{1}{2}\arctan\left(\sin\left(2\,dx+2\,c\right),\cos\left(2\,dx+2\,c\right)+1\right)\right)\sin\left(dx+c\right)-2\left(\cos\left(dx+c\right)-1\right)\sin\left(\frac{1}{2}\arctan\left(\sin\right.\right.}{}$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(1+cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] (2*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x + c) -
2*(cos(d*x + c) - 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1
)) - sqrt(2)*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c)
+ 1)^(1/4)*arctan2(((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x
+ c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*
d*x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) +
 1)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*sin(1/2*a
rctan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e
^(I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) +
1)/abs(e^(I*d*x + I*c) + 1)^2)) + sin(d*x + c))/abs(e^(I*d*x + I*c) + 1), (
(abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x + c)^4 + 2*(cos(d*x
+ c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d*x + I*c) + 1)^2 -
4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) + 1)*sin(d*x + c)^2 +
 6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*cos(1/2*arctan2(2*(cos(d*x +
c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e^(I*d*x + I*c) + 1)^
2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)/abs(e^(I*d*x + I*
c) + 1)^2)) + cos(d*x + c) - 1)/abs(e^(I*d*x + I*c) + 1)))/((cos(2*d*x + 2*
c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*d)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos(dx+c)+1}\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(1+cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(cos(d*x + c) + 1)*cos(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{1}{\cos(c+d\,x)^{3/2}\,\sqrt{\cos(c+d\,x)+1}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(3/2)*(cos(c + d*x) + 1)^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(3/2)*(cos(c + d*x) + 1)^(1/2)), x)
```

3.236 $\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 98

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx = \frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d} + \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}} - \frac{2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}$$

```
[Out] arcsin(sin(d*x+c)/(1+cos(d*x+c)))*2^(1/2)/d+2/3*sin(d*x+c)/d/cos(d*x+c)^(3/
2)/(1+cos(d*x+c))^(1/2)-2/3*sin(d*x+c)/d/cos(d*x+c)^(1/2)/(1+cos(d*x+c))^(1
/2)
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2858, 3063, 12, 2860, 222}

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx = \frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{\cos(c+dx)+1}\right)}{d} + \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{\cos(c+dx)+1}} - \frac{2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{\cos(c+dx)+1}}$$

```
[In] Int[1/(Cos[c + d*x]^(5/2)*Sqrt[1 + Cos[c + d*x]]),x]
```

```
[Out] (Sqrt[2]*ArcSin[Sin[c + d*x]/(1 + Cos[c + d*x])])/d + (2*Sin[c + d*x])/(3*d
*Cos[c + d*x]^(3/2)*Sqrt[1 + Cos[c + d*x]]) - (2*Sin[c + d*x])/(3*d*Sqrt[Co
s[c + d*x]]*Sqrt[1 + Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2860

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[-Sqrt[2]/(Sqrt[a]*f), Subst[Int[1/Sqrt[1 - x
^2], x], x, b*(Cos[e + f*x]/(a + b*Sin[e + f*x]))], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 - b^2, 0] && EqQ[d, a/b] && GtQ[a, 0]
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}} - \frac{1}{3}\int \frac{1-2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx \\
&= \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}} - \frac{2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}} \\
&\quad - \frac{2}{3}\int -\frac{3}{2\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx \\
&= \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}} - \frac{2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}} \\
&\quad + \int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx \\
&= \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}} - \frac{2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}} \\
&\quad - \frac{\sqrt{2}\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, -\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d} \\
&= \frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d} + \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}} \\
&\quad - \frac{2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}
\end{aligned}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 6.45 (sec) , antiderivative size = 471, normalized size of antiderivative = 4.81

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx =$$

$$-\frac{2\cot\left(\frac{c}{2}+\frac{dx}{2}\right)\csc^4\left(\frac{c}{2}+\frac{dx}{2}\right)\left(12\cos^4\left(\frac{1}{2}(c+dx)\right)\,{}_3F_2\left(2,2,\frac{7}{2};1,\frac{9}{2};\frac{\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}{-1+2\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}\right)\sin^8\left(\frac{c}{2}+\frac{dx}{2}\right)+12\,\mathrm{H}\right.}{}$$

```
[In] Integrate[1/(Cos[c + d*x]^(5/2)*Sqrt[1 + Cos[c + d*x]]),x]
```

```
[Out] (-2*Cot[c/2 + (d*x)/2]*Csc[c/2 + (d*x)/2]^4*(12*Cos[(c + d*x)/2]^4*Hypergeo
metricPFQ[{2, 2, 7/2}, {1, 9/2}, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*
x)/2]^2)]*Sin[c/2 + (d*x)/2]^8 + 12*Hypergeometric2F1[2, 7/2, 9/2, Sin[c/2
+ (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^8*(4 - 7*Sin
```

```
[c/2 + (d*x)/2]^2 + 3*Sin[c/2 + (d*x)/2]^4) + 7*(1 - 2*Sin[c/2 + (d*x)/2]^2
)^3*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(15 - 20*Sin[c
/2 + (d*x)/2]^2 + 8*Sin[c/2 + (d*x)/2]^4)*(ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^
2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*(3 - 6*Sin[c/2 + (d*x)/2]^2) + Sqrt[Sin[c
/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(-3 + 7*Sin[c/2 + (d*x)/2]^2
))))/(63*d*Sqrt[1 + Cos[c + d*x]]*(1 - 2*Sin[c/2 + (d*x)/2]^2)^(7/2))
```

Maple [A] (verified)

Time = 4.83 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.59

method	result
default	$-\frac{\left(3\left(\cos^{2}(dx+c)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\arcsin(\cot(dx+c)-\csc(dx+c))\sqrt{2}+3\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\cos(dx+c)\sqrt{2}\,\arcsin(\cot(dx+c)-\csc(dx+c))+\right.}{6d(1+\cos(dx+c))\cos(dx+c)^{\frac{3}{2}}}$

```
[In] int(1/cos(d*x+c)^(5/2)/(1+cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/6/d*(3*cos(d*x+c)^2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-
csc(d*x+c))*2^(1/2)+3*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)*2^(1/2)*
arcsin(cot(d*x+c)-csc(d*x+c))+2*cos(d*x+c)*sin(d*x+c)-2*sin(d*x+c))*(2+2*co
s(d*x+c))^(1/2)/(1+cos(d*x+c))/cos(d*x+c)^(3/2)*2^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 134, normalized size of antiderivative = 1.37

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx =$$
$$-\frac{2\sqrt{\cos(dx+c)+1}(\cos(dx+c)-1)\sqrt{\cos(dx+c)}\sin(dx+c)-3\left(\sqrt{2}\cos(dx+c)^{3}+\sqrt{2}\cos(dx+\right.}{3\left(d\cos(dx+c)^{3}+d\cos(dx+c)^{2}\right)}$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(1+cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] -1/3*(2*sqrt(cos(d*x + c) + 1)*(cos(d*x + c) - 1)*sqrt(cos(d*x + c))*sin(d*
x + c) - 3*(sqrt(2)*cos(d*x + c)^3 + sqrt(2)*cos(d*x + c)^2)*arctan(1/2*sqr
t(2)*sqrt(cos(d*x + c) + 1)*sqrt(cos(d*x + c))*sin(d*x + c)/(cos(d*x + c)^2
 + cos(d*x + c))))/(d*cos(d*x + c)^3 + d*cos(d*x + c)^2)
```

Sympy [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos{(c+dx)}+1}\cos^{\frac{5}{2}}{(c+dx)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(5/2)/(1+cos(d*x+c))**(1/2),x)
[Out] Integral(1/(sqrt(cos(c + d*x) + 1)*cos(c + d*x)**(5/2)), x)
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.57 (sec) , antiderivative size = 801, normalized size of antiderivative = 8.17

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(1+cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] 1/3*(3*(sqrt(2)*cos(2*d*x + 2*c)^2 + sqrt(2)*sin(2*d*x + 2*c)^2 + 2*sqrt(2)
*cos(2*d*x + 2*c) + sqrt(2))*arctan2(((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x
 + c)^4 + sin(d*x + c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x +
 c) + 1)*abs(e^(I*d*x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2
- 2*cos(d*x + c) + 1)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) +
1)^(1/4)*sin(1/2*arctan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I
*c) + 1)^2, (abs(e^(I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 -
 2*cos(d*x + c) + 1)/abs(e^(I*d*x + I*c) + 1)^2)) + sin(d*x + c))/abs(e^(I*
d*x + I*c) + 1), ((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x +
c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d*
x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) + 1
)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*cos(1/2*arc
tan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e^(
I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)
/abs(e^(I*d*x + I*c) + 1)^2)) + cos(d*x + c) - 1)/abs(e^(I*d*x + I*c) + 1))
 - 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(3/
4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x + c) -
 (cos(d*x + c) - 3)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)
)) - 4*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(
1/4)*(cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x + c)
 - (cos(d*x + c) + 1)*sin(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
1))))/((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*d
)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos(dx+c)+1}\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(1+cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(cos(d*x + c) + 1)*cos(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{1}{\cos(c+d\,x)^{5/2}\,\sqrt{\cos(c+d\,x)+1}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(5/2)*(cos(c + d*x) + 1)^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(5/2)*(cos(c + d*x) + 1)^(1/2)), x)
```

3.237 $\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 134

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d} + \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{1+\cos(c+dx)}} - \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}} + \frac{26\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}$$

```
[Out] -arcsin(sin(d*x+c)/(1+cos(d*x+c)))*2^(1/2)/d+2/5*sin(d*x+c)/d/cos(d*x+c)^(5
/2)/(1+cos(d*x+c))^(1/2)-2/15*sin(d*x+c)/d/cos(d*x+c)^(3/2)/(1+cos(d*x+c))^
(1/2)+26/15*sin(d*x+c)/d/cos(d*x+c)^(1/2)/(1+cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 134, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used

$= \{2858, 3063, 12, 2860, 222\}$

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{\cos(c+dx)+1}\right)}{d} - \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{\cos(c+dx)+1}} + \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{\cos(c+dx)+1}} + \frac{26\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{\cos(c+dx)+1}}$$

```
[In] Int[1/(Cos[c + d*x]^(7/2)*Sqrt[1 + Cos[c + d*x]]),x]
```

```
[Out] -((Sqrt[2]*ArcSin[Sin[c + d*x]/(1 + Cos[c + d*x])])/d) + (2*Sin[c + d*x])/(
5*d*Cos[c + d*x]^(5/2)*Sqrt[1 + Cos[c + d*x]]) - (2*Sin[c + d*x])/(15*d*Cos
[c + d*x]^(3/2)*Sqrt[1 + Cos[c + d*x]]) + (26*Sin[c + d*x])/(15*d*Sqrt[Cos[
c + d*x]]*Sqrt[1 + Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2860

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[-Sqrt[2]/(Sqrt[a]*f), Subst[Int[1/Sqrt[1 - x
^2], x], x, b*(Cos[e + f*x]/(a + b*Sin[e + f*x]))], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 - b^2, 0] && EqQ[d, a/b] && GtQ[a, 0]
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{1+\cos(c+dx)}} - \frac{1}{5}\int \frac{1-4\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx \\
&= \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{1+\cos(c+dx)}} - \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}} \\
&\quad - \frac{2}{15}\int \frac{-\frac{13}{2}+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx \\
&= \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{1+\cos(c+dx)}} - \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}} \\
&\quad + \frac{26\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}} - \frac{4}{15}\int \frac{15}{4\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx \\
&= \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{1+\cos(c+dx)}} - \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}} \\
&\quad + \frac{26\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}} - \int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx \\
&= \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{1+\cos(c+dx)}} - \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}} \\
&\quad + \frac{26\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}} + \frac{\sqrt{2}\,\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, -\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d} \\
&= -\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d} + \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{1+\cos(c+dx)}} \\
&\quad - \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}} + \frac{26\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}
\end{aligned}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 7.17 (sec) , antiderivative size = 1538, normalized size of antiderivative = 11.48

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx =$$

$$-\frac{2\cot\left(\frac{c}{2}+\frac{dx}{2}\right)\csc^6\left(\frac{c}{2}+\frac{dx}{2}\right)\left(4725\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)-48825\sin^4\left(\frac{c}{2}+\frac{dx}{2}\right)+210105\sin^6\left(\frac{c}{2}+\frac{dx}{2}\right)-48663\right.}{}$$

```
[In] Integrate[1/(Cos[c + d*x]^(7/2)*Sqrt[1 + Cos[c + d*x]]),x]
```

```
[Out] (-2*Cot[c/2 + (d*x)/2]*Csc[c/2 + (d*x)/2]^6*(4725*Sin[c/2 + (d*x)/2]^2 - 48
825*Sin[c/2 + (d*x)/2]^4 + 210105*Sin[c/2 + (d*x)/2]^6 - 486630*Sin[c/2 + (
d*x)/2]^8 + 655812*Sin[c/2 + (d*x)/2]^10 - 710*Hypergeometric2F1[2, 9/2, 11
/2, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^
10 - 40*Cos[(c + d*x)/2]^6*HypergeometricPFQ[{2, 2, 2, 9/2}, {1, 1, 11/2},
Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^10 -
 518760*Sin[c/2 + (d*x)/2]^12 + 1770*Hypergeometric2F1[2, 9/2, 11/2, Sin[c/
2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^12 + 22665
6*Sin[c/2 + (d*x)/2]^14 - 1500*Hypergeometric2F1[2, 9/2, 11/2, Sin[c/2 + (d
*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^14 - 42048*Sin[c
/2 + (d*x)/2]^16 + 440*Hypergeometric2F1[2, 9/2, 11/2, Sin[c/2 + (d*x)/2]^2
/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^16 + 4725*ArcTanh[Sqrt[S
in[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Sqrt[Sin[c/2 + (d*x)/2]
^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)] - 56700*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2
/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^2*Sqrt[Sin[c/2 + (d*x)/
2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)] + 291060*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2
]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^4*Sqrt[Sin[c/2 + (d*
x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)] - 833760*ArcTanh[Sqrt[Sin[c/2 + (d*x
)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^6*Sqrt[Sin[c/2 +
(d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)] + 1458000*ArcTanh[Sqrt[Sin[c/2 +
(d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^8*Sqrt[Sin[c/
2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)] - 1598400*ArcTanh[Sqrt[Sin[c/
2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^10*Sqrt[S
in[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)] + 1080000*ArcTanh[Sqrt[S
in[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^12*S
qrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)] - 414720*ArcTanh[Sq
rt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^
14*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)] + 69120*ArcTanh
[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/
2]^16*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)] + 60*Cos[(c
+ d*x)/2]^4*HypergeometricPFQ[{2, 2, 9/2}, {1, 11/2}, Sin[c/2 + (d*x)/2]^2/
```

```
(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^10*(-5 + 4*Sin[c/2 + (d*x
)/2]^2)))/(675*d*Sqrt[1 + Cos[c + d*x]]*(1 - 2*Sin[c/2 + (d*x)/2]^2)^(7/2)*
(-1 + 2*Sin[c/2 + (d*x)/2]^2))
```

Maple [A] (verified)

Time = 5.38 (sec) , antiderivative size = 174, normalized size of antiderivative = 1.30

method	result
default	$\frac{\left(15\left(\cos^{3}(dx+c)\right)\sqrt{2}\,\arcsin(\cot(dx+c)-\csc(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+15\left(\cos^{2}(dx+c)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\arcsin(\cot(dx+c)-\csc(dx+c))\sqrt{2}-}{30d(1+\cos(dx+c))\cos(dx+c)^{\frac{5}{2}}}$

```
[In] int(1/cos(d*x+c)^(7/2)/(1+cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/30/d*(15*cos(d*x+c)^3*2^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)+15*cos(d*x+c)^2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcs
in(cot(d*x+c)-csc(d*x+c))*2^(1/2)+26*cos(d*x+c)^2*sin(d*x+c)-2*cos(d*x+c)*s
in(d*x+c)+6*sin(d*x+c))*(2+2*cos(d*x+c))^(1/2)/(1+cos(d*x+c))/cos(d*x+c)^(5
/2)*2^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.09

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx$$
$$=\frac{2\left(13\cos\left(dx+c\right)^{2}-\cos\left(dx+c\right)+3\right)\sqrt{\cos\left(dx+c\right)+1}\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-15\left(\sqrt{2}\cos\left(dx+c\right)^{4}\right.}{15\left(d\cos\left(dx+c\right)^{4}+d\cos\left(dx+c\right)^{3}\right)}$$

```
[In] integrate(1/cos(d*x+c)^(7/2)/(1+cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/15*(2*(13*cos(d*x + c)^2 - cos(d*x + c) + 3)*sqrt(cos(d*x + c) + 1)*sqrt(
cos(d*x + c))*sin(d*x + c) - 15*(sqrt(2)*cos(d*x + c)^4 + sqrt(2)*cos(d*x +
 c)^3)*arctan(1/2*sqrt(2)*sqrt(cos(d*x + c) + 1)*sqrt(cos(d*x + c))*sin(d*x
 + c)/(cos(d*x + c)^2 + cos(d*x + c))))/(d*cos(d*x + c)^4 + d*cos(d*x + c)^
3)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(7/2)/(1+cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.59 (sec) , antiderivative size = 989, normalized size of antiderivative = 7.38

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate(1/cos(d*x+c)^(7/2)/(1+cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] -1/15*(15*(sqrt(2)*cos(2*d*x + 2*c)^2 + sqrt(2)*sin(2*d*x + 2*c)^2 + 2*sqrt
(2)*cos(2*d*x + 2*c) + sqrt(2))*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 +
2*cos(2*d*x + 2*c) + 1)^(1/4)*arctan2(((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*
x + c)^4 + sin(d*x + c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x
+ c) + 1)*abs(e^(I*d*x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2
 - 2*cos(d*x + c) + 1)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) +
 1)^(1/4)*sin(1/2*arctan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x +
I*c) + 1)^2, (abs(e^(I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2
- 2*cos(d*x + c) + 1)/abs(e^(I*d*x + I*c) + 1)^2)) + sin(d*x + c))/abs(e^(I
*d*x + I*c) + 1), ((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x +
 c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d
*x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) +
1)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*cos(1/2*ar
ctan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e^
(I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1
)/abs(e^(I*d*x + I*c) + 1)^2)) + cos(d*x + c) - 1)/abs(e^(I*d*x + I*c) + 1)
) - 26*(cos(2*d*x + 2*c)^2*sin(d*x + c) + sin(2*d*x + 2*c)^2*sin(d*x + c) +
 2*cos(2*d*x + 2*c)*sin(d*x + c) + sin(d*x + c))*cos(1/2*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c) + 1)) + 24*cos(5/2*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c) + 1))*sin(d*x + c) - 24*(cos(d*x + c) - 1)*sin(5/2*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 2*((13*cos(d*x + c) - 15)*cos(2*d*x
+ 2*c)^2 + (13*cos(d*x + c) - 15)*sin(2*d*x + 2*c)^2 + 2*(13*cos(d*x + c) -
 15)*cos(2*d*x + 2*c) + 13*cos(d*x + c) - 15)*sin(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c) + 1)) - 4*sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^
2 + 2*cos(2*d*x + 2*c) + 1)*(7*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
```

```
+ 2*c) + 1))*sin(d*x + c) - (7*cos(d*x + c) - 5)*sin(3/2*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c) + 1))))/((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2
+ 2*cos(2*d*x + 2*c) + 1)^(5/4)*d)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx=\int \frac{1}{\sqrt{\cos\left(dx+c\right)+1}\cos\left(dx+c\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(7/2)/(1+cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(cos(d*x + c) + 1)*cos(d*x + c)^(7/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx=\int \frac{1}{{\cos\left(c+d\,x\right)}^{7/2}\,\sqrt{\cos\left(c+d\,x\right)+1}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(7/2)*(cos(c + d*x) + 1)^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(7/2)*(cos(c + d*x) + 1)^(1/2)), x)
```

3.238 $\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 174

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = -\frac{3\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{3/2}d} + \frac{9\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{3\sqrt{\cos(c+dx)}\sin(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -3*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(3/2)/d-1/2*cos(d*x+
c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(3/2)+9/4*arctan(1/2*sin(d*x+c)*a^(1
/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(3/2)/d*2^(1/2)+3/2*
sin(d*x+c)*cos(d*x+c)^(1/2)/a/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.56 (sec) , antiderivative size = 174, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used

$= \{2844, 3062, 3061, 2861, 211, 2853, 222\}$

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = -\frac{3\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{a^{3/2}d} + \frac{9\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{2d(a\cos(c+dx)+a)^{3/2}} + \frac{3\sin(c+dx)\sqrt{\cos(c+dx)}}{2ad\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Cos[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-3*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(a^(3/2)*d) +
(9*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos
[c + d*x]])])/(2*Sqrt[2]*a^(3/2)*d) - (Cos[c + d*x]^(3/2)*Sin[c + d*x])/(2*
d*(a + a*Cos[c + d*x])^(3/2)) + (3*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(2*a*d*
Sqrt[a + a*Cos[c + d*x]])
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3062

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(-B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(f*(m +
n + 1))), x] + Dist[1/(b*(m + n + 1)), Int[(a + b*Sin[e + f*x])^m*(c + d*Si
n[e + f*x])^(n - 1)*Simp[A*b*c*(m + n + 1) + B*(a*c*m + b*d*n) + (A*b*d*(m
+ n + 1) + B*(a*d*m + b*c*n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 -
 d^2, 0] && GtQ[n, 0] && (IntegerQ[n] || EqQ[m + 1/2, 0])
```

Rubi steps

$$\text{integral} = -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} - \frac{\int \frac{\sqrt{\cos(c+dx)}\left(\frac{3a}{2}-3a\cos(c+dx)\right)}{\sqrt{a+a\cos(c+dx)}}\,dx}{2a^2}$$

$$= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{3\sqrt{\cos(c+dx)}\sin(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}} - \frac{\int \frac{-\frac{3a^2}{2}+3a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{2a^3}$$

$$= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{3\sqrt{\cos(c+dx)}\sin(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}} - \frac{3\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx}{2a^2} + \frac{9\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{4a}$$

$$= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{3\sqrt{\cos(c+dx)}\sin(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}} - \frac{9\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2d} + \frac{3\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^2d}$$

$$= -\frac{3\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{3/2}d} + \frac{9\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{3\sqrt{\cos(c+dx)}\sin(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.30 (sec) , antiderivative size = 212, normalized size of antiderivative = 1.22

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{\left(-9\sqrt{2}\arctan\left(\frac{\sqrt{\cos(c+dx)}}{\sqrt{\sin^2\left(\frac{1}{2}(c+dx)\right)}}\right) - 9\sqrt{2}\arctan\left(\frac{\sqrt{\cos(c+dx)}}{\sqrt{\sin^2\left(\frac{1}{2}(c+dx)\right)}}\right)\cos(c+dx) + \right.}{}$$

[In] Integrate[Cos[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^(3/2),x]

[Out] ((-9*Sqrt[2]*ArcTan[Sqrt[Cos[c + d*x]]/Sqrt[Sin[(c + d*x)/2]^2]] - 9*Sqrt[2]*ArcTan[Sqrt[Cos[c + d*x]]/Sqrt[Sin[(c + d*x)/2]^2]]*Cos[c + d*x] + 4*Sqrt[1 - Cos[c + d*x]]*Cos[c + d*x]^(3/2) + 6*Sqrt[-((-1 + Cos[c + d*x])*Cos[c + d*x])] + 6*ArcSin[Sqrt[1 - Cos[c + d*x]]]*(1 + Cos[c + d*x]) + 18*ArcSin[Sqrt[Cos[c + d*x]]]*(1 + Cos[c + d*x]))*Sin[c + d*x])/(4*d*Sqrt[1 - Cos[c + d*x]]*(a*(1 + Cos[c + d*x]))^(3/2))

Maple [A] (verified)

Time = 11.47 (sec) , antiderivative size = 240, normalized size of antiderivative = 1.38

method	result
default	$\frac{\left(2\sqrt{2}\cos(dx+c)\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+3\sin(dx+c)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-6\sqrt{2}\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\cos(dx+c)-6\sqrt{2}\,a\right.}{4d(1+\cos(}$

[In] int(cos(d*x+c)^(5/2)/(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)

[Out] 1/4/d*(2*2^(1/2)*cos(d*x+c)*sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+3*sin(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-6*2^(1/2)*arctan(tan(d

```
*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))*cos(d*x+c)-6*2^(1/2)*arctan(tan(d*
x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))-9*arcsin(cot(d*x+c)-csc(d*x+c))*cos
(d*x+c)-9*arcsin(cot(d*x+c)-csc(d*x+c)))*cos(d*x+c)^(1/2)*(a*(1+cos(d*x+c))
)^(1/2)/(1+cos(d*x+c))^2/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)/a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 192, normalized size of antiderivative = 1.10

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = -\frac{9\sqrt{2}\left(\cos\left(dx+c\right)^{2}+2\cos\left(dx+c\right)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-2\sqrt{a\cos\left(dx+c\right)+a}(2}{4\left(a^{2}d\cos\left(dx+\right.\right.}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] -1/4*(9*sqrt(2)*(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(2
)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - 2*s
qrt(a*cos(d*x + c) + a)*(2*cos(d*x + c) + 3)*sqrt(cos(d*x + c))*sin(d*x + c
) - 12*(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(a*cos(d*x
+ c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))))/(a^2*d*cos(d*x + c)^2
 + 2*a^2*d*cos(d*x + c) + a^2*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)/(a+a*cos(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(cos(d*x + c)^(5/2)/(a*cos(d*x + c) + a)^(3/2), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)^{5/2}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^{3/2}}\,dx$$

```
[In] int(cos(c + d*x)^(5/2)/(a + a*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)^(5/2)/(a + a*cos(c + d*x))^(3/2), x)
```

3.239 $\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 134

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{2\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{3/2}d} - \frac{5\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}$$

```
[Out] 2*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(3/2)/d-5/4*arctan(1/
2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(3/
2)/d*2^(1/2)-1/2*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^(3/2)
```

Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 134, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {2844, 3061, 2861, 211, 2853, 222}

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{2\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{a^{3/2}d} - \frac{5\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{2d(a\cos(c+dx)+a)^{3/2}}$$

```
[In] Int[Cos[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(a^(3/2)*d) - (
5*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[
```

```
c + d*x]])])/(2*Sqrt[2]*a^(3/2)*d) - (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(2*d
*(a + a*Cos[c + d*x])^(3/2))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} - \frac{\int \frac{\frac{a}{2}-2a\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{2a^2}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx}{a^2} - \frac{5\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{4a}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{5\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2d} - \frac{2\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^2d}$$

$$= \frac{2\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{3/2}d} - \frac{5\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}$$

Mathematica [A] (verified)

Time = 0.33 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.18

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx =$$

$$-\frac{\left(2\arcsin\left(\sqrt{1-\cos(c+dx)}\right)(1+\cos(c+dx)) + 10\arcsin\left(\sqrt{\cos(c+dx)}\right)(1+\cos(c+dx)) + \sqrt{2}\Big(-}{4d\sqrt{1-\cos(c+dx)}(a(1+c}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] -1/4*((2*ArcSin[Sqrt[1 - Cos[c + d*x]]]*(1 + Cos[c + d*x]) + 10*ArcSin[Sqrt
[Cos[c + d*x]]]*(1 + Cos[c + d*x]) + Sqrt[2]*(-5*ArcTan[Sqrt[Cos[c + d*x]]/
Sqrt[Sin[(c + d*x)/2]^2]]*(1 + Cos[c + d*x]) + 2*Sqrt[Cos[c + d*x]*Sin[(c +
 d*x)/2]^2]))*Sin[c + d*x])/(d*Sqrt[1 - Cos[c + d*x]]*(a*(1 + Cos[c + d*x])
)^(3/2))
```

Maple [A] (verified)

Time = 3.32 (sec) , antiderivative size = 204, normalized size of antiderivative = 1.52

method	result
default	$\frac{\left(4\sqrt{2}\, \arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\cos(dx+c)-\sin(dx+c)\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+4\sqrt{2}\, \arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)+5\arcsin(}{4d(1+\cos(dx+c))^2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c}}}$

```
[In] int(cos(d*x+c)^(3/2)/(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/d*(4*2^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))*cos(d
*x+c)-sin(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+4*2^(1/2)*arctan
(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))+5*arcsin(cot(d*x+c)-csc(d*x+
c))*cos(d*x+c)+5*arcsin(cot(d*x+c)-csc(d*x+c)))*cos(d*x+c)^(1/2)*(a*(1+cos(
d*x+c)))^(1/2)/(1+cos(d*x+c))^2/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)/a
^2
```

Fricas [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 182, normalized size of antiderivative = 1.36

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\, dx = \frac{5\sqrt{2}\left(\cos\left(dx+c\right)^2+2\,\cos\left(dx+c\right)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)}{}$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/4*(5*sqrt(2)*(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(2)
*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - 8*(c
os(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)
*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - 2*sqrt(a*cos(d*x + c) + a)*sq
rt(cos(d*x + c))*sin(d*x + c))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c)
 + a^2*d)
```

Sympy [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\, dx = \int \frac{\cos^{\frac{3}{2}}\left(c+dx\right)}{\left(a\left(\cos\left(c+dx\right)+1\right)\right)^{\frac{3}{2}}}\, dx$$

```
[In] integrate(cos(d*x+c)**(3/2)/(a+a*cos(d*x+c))**(3/2),x)
```

```
[Out] Integral(cos(c + d*x)**(3/2)/(a*(cos(c + d*x) + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{3}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(3/2)/(a*cos(d*x + c) + a)^(3/2), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)^{3/2}}{{\left(a+a\,\cos\left(c+d\,x\right)\right)}^{3/2}}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)/(a + a*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)^(3/2)/(a + a*cos(c + d*x))^(3/2), x)
```

3.240 $\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 97

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{3/2}}\,dx=\frac{\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d}+\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}$$

```
[Out] 1/4*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))
^(1/2))/a^(3/2)/d*2^(1/2)+1/2*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x+c)
)^(3/2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2843, 12, 2861, 211}

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{3/2}}\,dx=\frac{\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d}+\frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{2d(a\cos(c+dx)+a)^{3/2}}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c
+ d*x]])]/(2*Sqrt[2]*a^(3/2)*d) + (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(2*d*(a
 + a*Cos[c + d*x])^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2843

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*
((c + d*Sin[e + f*x])^n/(a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[a*d*n - b*c*
(m + 1) - b*d*(m + n + 1)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e,
 f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && L
tQ[m, -1] && LtQ[0, n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c,
 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{\int \frac{a}{2\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{2a^2} \\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{4a} \\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} - \frac{\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2d} \\
&= \frac{\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.21 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.22

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{\cos\left(\frac{1}{2}(c+dx)\right)\sqrt{1+\cos(c+dx)}\left(\arcsin\left(\frac{\sin\left(\frac{1}{2}(c+dx)\right)}{\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)}}\right)\sqrt{1+\cos(c+dx)}\right.}{2d(a(1+\cos(c+dx)))^{3/2}}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (Cos[(c + d*x)/2]*Sqrt[1 + Cos[c + d*x]]*(ArcSin[Sin[(c + d*x)/2]/Sqrt[Cos[
(c + d*x)/2]^2]]*Sqrt[1 + Cos[c + d*x]] + 2*Sqrt[Cos[c + d*x]/(1 + Cos[c +
d*x])]*Sin[(c + d*x)/2]))/(2*d*(a*(1 + Cos[c + d*x]))^(3/2))
```

Maple [A] (verified)

Time = 3.48 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.35

method	result
default	$-\frac{\left(-\sin(dx+c)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+\arcsin(\cot(dx+c)-\csc(dx+c))\cos(dx+c)+\arcsin(\cot(dx+c)-\csc(dx+c))\right)\sqrt{a(1+\cos(dx+c))}\,(\sqrt{c}}{4d(1+\cos(dx+c))^2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,a^2}$

```
[In] int(cos(d*x+c)^(1/2)/(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/d*(-sin(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+arcsin(cot(d*
x+c)-csc(d*x+c))*cos(d*x+c)+arcsin(cot(d*x+c)-csc(d*x+c)))*(a*(1+cos(d*x+c)
))^(1/2)*cos(d*x+c)^(1/2)/(1+cos(d*x+c))^2/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2
)*2^(1/2)/a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.49

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{\sqrt{2}\left(\cos(dx+c)^2+2\cos(dx+c)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{a}\sqrt{\cos(dx+c)}}{2\left(a\cos(dx+c)^2+a\cos(dx+c\right.}\right.}{4\left(a^2d\cos(dx+c)^2+2a^2d\cos(\right.}$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/4*(sqrt(2)*(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(a)*arctan(1/2*sqrt(
2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*sqrt(cos(d*x + c))*sin(d*x + c)/(a*cos(
d*x + c)^2 + a*cos(d*x + c))) + 2*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c
))*sin(d*x + c))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)
```

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\sqrt{\cos(c+dx)}}{(a(\cos(c+dx)+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)**(1/2)/(a+a*cos(d*x+c))**(3/2),x)
[Out] Integral(sqrt(cos(c + d*x))/(a*(cos(c + d*x) + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\sqrt{\cos(dx+c)}}{(a\cos(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(sqrt(cos(d*x + c))/(a*cos(d*x + c) + a)^(3/2), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\sqrt{\cos(c+d\,x)}}{(a+a\,\cos(c+d\,x))^{3/2}}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(a + a*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)^(1/2)/(a + a*cos(c + d*x))^(3/2), x)
```

3.241 $\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 97

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx = \frac{3\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}$$

```
[Out] 3/4*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))
^(1/2))/a^(3/2)/d*2^(1/2)-1/2*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x+c)
)^(3/2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.160$, Rules used = {2845, 12, 2861, 211}

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx = \frac{3\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{2d(a\cos(c+dx)+a)^{3/2}}$$

```
[In] Int[1/(Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^(3/2)),x]
```

```
[Out] (3*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos
[c + d*x]])])/(2*Sqrt[2]*a^(3/2)*d) - (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(2*
d*(a + a*Cos[c + d*x])^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}+\frac{\int \frac{3a}{2\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{2a^2} \\
&= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}+\frac{3\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{4a} \\
&= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}-\frac{3\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2d} \\
&= \frac{3\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d}-\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.39 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.09

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx = -\frac{\cos\left(\frac{1}{2}(c+dx)\right)\sqrt{\cos(c+dx)}\left(2+3\text{arctanh}\left(\sqrt{-\sec(c+dx)\sin^2\left(\frac{1}{2}(c+dx)\right)}\right)\cot^2\left(\frac{1}{2}(c+dx)\right)\sqrt{2-2\text{se}}\right.}{2d(a(1+\cos(c+dx)))^{3/2}}$$

```
[In] Integrate[1/(Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^(3/2)),x]
```

```
[Out] -1/2*(Cos[(c + d*x)/2]*Sqrt[Cos[c + d*x]]*(2 + 3*ArcTanh[Sqrt[-(Sec[c + d*x
]*Sin[(c + d*x)/2]^2)]]*Cot[(c + d*x)/2]^2*Sqrt[2 - 2*Sec[c + d*x]])*Sin[(c
 + d*x)/2])/(d*(a*(1 + Cos[c + d*x]))^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 180 vs. 2(78) = 156.

Time = 4.20 (sec) , antiderivative size = 181, normalized size of antiderivative = 1.87

method	result
default	$\frac{\sqrt{-(\csc^2(dx+c))(1-\cos(dx+c))^2+1}\sqrt{\frac{a}{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1}}\left(-\sqrt{-(\csc^2(dx+c))(1-\cos(dx+c))^2+1}\,(\csc(dx+c)-\cot(dx+c)\right.}{4d\sqrt{-\frac{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2-1}{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1}}\,a^2}$

```
[In] int(1/cos(d*x+c)^(1/2)/(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/d/(-(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)
)^(1/2)*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(a/(csc(d*x+c)^2*(1-cos(d*
x+c))^2+1))^(1/2)*(-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(csc(d*x+c)-co
t(d*x+c))-3*arcsin(cot(d*x+c)-csc(d*x+c)))*2^(1/2)/a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.51

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx = \frac{3\sqrt{2}\left(\cos(dx+c)^2+2\cos(dx+c)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+}}{2\left(a\cos\right.}\right.}{4\left(a^2d\cos(dx+c\right.}$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/4*(3*sqrt(2)*(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(a)*arctan(1/2*sqr
t(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*sqrt(cos(d*x + c))*sin(d*x + c)/(a*co
s(d*x + c)^2 + a*cos(d*x + c))) - 2*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x +
 c))*sin(d*x + c))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)
```

Sympy [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(a(\cos(c+dx)+1))^{\frac{3}{2}}\sqrt{\cos(c+dx)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(1/2)/(a+a*cos(d*x+c))**(3/2),x)
[Out] Integral(1/((a*(cos(c + d*x) + 1))**(3/2)*sqrt(cos(c + d*x))), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{3}{2}}\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^(3/2)*sqrt(cos(d*x + c))), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{\sqrt{\cos(c+d\,x)}\,{(a+a\,\cos(c+d\,x))}^{3/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^(3/2)),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^(3/2)), x)
```

3.242 $\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 137

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx = -\frac{7\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\sin(c+dx)}{2d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}} + \frac{5\sin(c+dx)}{2ad\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -7/4*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c)
)^(1/2))/a^(3/2)/d*2^(1/2)-1/2*sin(d*x+c)/d/(a+a*cos(d*x+c))^(3/2)/cos(d*x+
c)^(1/2)+5/2*sin(d*x+c)/a/d/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2845, 3063, 12, 2861, 211}

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx = -\frac{7\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d} + \frac{5\sin(c+dx)}{2ad\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}} - \frac{\sin(c+dx)}{2d\sqrt{\cos(c+dx)}(a\cos(c+dx)+a)^{3/2}}$$

```
[In] Int[1/(Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^(3/2)),x]
```

```
[Out] (-7*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Co
s[c + d*x]])])/(2*Sqrt[2]*a^(3/2)*d) - Sin[c + d*x]/(2*d*Sqrt[Cos[c + d*x]]
```

```
*(a + a*Cos[c + d*x])^(3/2)) + (5*Sin[c + d*x])/(2*a*d*Sqrt[Cos[c + d*x]]*S
qrt[a + a*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rubi steps

$$\text{integral} = -\frac{\sin(c+dx)}{2d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}} + \frac{\int \frac{\frac{5a}{2}-a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx}{2a^2}$$

$$= -\frac{\sin(c+dx)}{2d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}} + \frac{5\sin(c+dx)}{2ad\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} + \frac{\int -\frac{7a^2}{4\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{a^3}$$

$$= -\frac{\sin(c+dx)}{2d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}} + \frac{5\sin(c+dx)}{2ad\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} - \frac{7\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{4a}$$

$$= -\frac{\sin(c+dx)}{2d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}} + \frac{5\sin(c+dx)}{2ad\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} + \frac{7\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2d}$$

$$= -\frac{7\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\sin(c+dx)}{2d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}} + \frac{5\sin(c+dx)}{2ad\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 6.60 (sec) , antiderivative size = 247, normalized size of antiderivative = 1.80

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx = \frac{-\frac{35}{2}\cos^2(c+dx)\cot\left(\frac{1}{2}(c+dx)\right)\csc^4\left(\frac{1}{2}(c+dx)\right)\left(78+108\cos(c\right.}{}$$

```
[In] Integrate[1/(Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^(3/2)),x]
```

```
[Out] ((-35*Cos[c + d*x]^2*Cot[(c + d*x)/2]*Csc[(c + d*x)/2]^4*(78 + 108*Cos[c +
d*x] + 80*Cos[2*(c + d*x)] - 204*Cos[3*(c + d*x)] - 62*Cos[4*(c + d*x)] + 1
2*ArcTanh[Sqrt[-(Sec[c + d*x]*Sin[(c + d*x)/2]^2)]]*Cos[(c + d*x)/2]^2*(64
+ 55*Cos[c + d*x] + 64*Cos[2*(c + d*x)] + 17*Cos[3*(c + d*x)])*Sqrt[2 - 2*S
ec[c + d*x]]))/2 - 768*Cos[(c + d*x)/2]^5*HypergeometricPFQ[{2, 2, 5/2}, {1
, 9/2}, -(Sec[c + d*x]*Sin[(c + d*x)/2]^2)]*Sin[(c + d*x)/2]^3)/(3360*d*Cos
[c + d*x]^(5/2)*(a*(1 + Cos[c + d*x]))^(3/2))
```

Maple [A] (verified)

Time = 5.57 (sec) , antiderivative size = 196, normalized size of antiderivative = 1.43

method	result
default	$\frac{\left(7\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,(\cos^2(dx+c))\arcsin(\cot(dx+c)-\csc(dx+c))+5\sin(dx+c)\cos(dx+c)\sqrt{2}+14\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\arcsin(\cot(d}{4d\sqrt{\cos(dx+c)}\,(1+\cos(dx+c}$

[In] int(1/cos(d*x+c)^(3/2)/(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)

[Out] 1/4/d*(7*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*arcsin(cot(d*x+c)-csc(d*x+c))+5*sin(d*x+c)*cos(d*x+c)*2^(1/2)+14*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))+4*2^(1/2)*sin(d*x+c)+7*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c)))*(a*(1+cos(d*x+c)))^(1/2)/cos(d*x+c)^(1/2)/(1+cos(d*x+c))^2*2^(1/2)/a^2

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 171, normalized size of antiderivative = 1.25

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx =$$
$$-\frac{7\sqrt{2}\left(\cos\left(dx+c\right)^{3}+2\,\cos\left(dx+c\right)^{2}+\cos\left(dx+c\right)\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{a}\sqrt{\cos(dx+c)}\sin(dx+c)}{2\left(a\cos(dx+c)^{2}+a\cos(dx+c)\right)}\right)-2}{4\left(a^{2}d\cos\left(dx+c\right)^{3}+2\,a^{2}d\cos\left(dx+c\right)^{2}+a^{2}d\cos\right.}$$

[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")

[Out] -1/4*(7*sqrt(2)*(cos(d*x + c)^3 + 2*cos(d*x + c)^2 + cos(d*x + c))*sqrt(a)*arctan(1/2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*sqrt(cos(d*x + c))*sin(d*x + c)/(a*cos(d*x + c)^2 + a*cos(d*x + c))) - 2*sqrt(a*cos(d*x + c) + a)*(5*cos(d*x + c) + 4)*sqrt(cos(d*x + c))*sin(d*x + c))/(a^2*d*cos(d*x + c)^3 + 2*a^2*d*cos(d*x + c)^2 + a^2*d*cos(d*x + c))

Sympy [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{\left(a\left(\cos\left(c+dx\right)+1\right)\right)^{\frac{3}{2}}\cos^{\frac{3}{2}}\left(c+dx\right)}\,dx$$

[In] integrate(1/cos(d*x+c)**(3/2)/(a+a*cos(d*x+c))**(3/2),x)

[Out] Integral(1/((a*(cos(c + d*x) + 1))**(3/2)*cos(c + d*x)**(3/2)), x)

Maxima [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^(3/2)*cos(d*x + c)^(3/2)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)^(3/2)*cos(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{\cos(c+d\,x)^{3/2}\,(a+a\,\cos(c+d\,x))^{3/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^(3/2)),x)
[Out] int(1/(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^(3/2)), x)
```

3.243 $\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 177

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx = \frac{11\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\sin(c+dx)}{2d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}} + \frac{7\sin(c+dx)}{6ad\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{19\sin(c+dx)}{6ad\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -1/2*sin(d*x+c)/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(3/2)+11/4*arctan(1/2*s
in(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(3/2)/
d*2^(1/2)+7/6*sin(d*x+c)/a/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2)-19/6*s
in(d*x+c)/a/d/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.49 (sec) , antiderivative size = 177, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2845, 3063, 12, 2861, 211}

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx = \frac{11\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d} + \frac{7\sin(c+dx)}{6ad\cos^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} - \frac{\sin(c+dx)}{2d\cos^{\frac{3}{2}}(c+dx)(a\cos(c+dx)+a)^{3/2}} - \frac{19\sin(c+dx)}{6ad\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[1/(Cos[c + d*x]^(5/2)*(a + a*Cos[c + d*x])^(3/2)),x]
```

```
[Out] (11*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Co
s[c + d*x]])])/(2*Sqrt[2]*a^(3/2)*d) - Sin[c + d*x]/(2*d*Cos[c + d*x]^(3/2)
*(a + a*Cos[c + d*x])^(3/2)) + (7*Sin[c + d*x])/(6*a*d*Cos[c + d*x]^(3/2)*S
qrt[a + a*Cos[c + d*x]]) - (19*Sin[c + d*x])/(6*a*d*Sqrt[Cos[c + d*x]]*Sqrt
[a + a*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
```

```
+ 1/2, 0])
```

Rubi steps

$$\text{integral} = -\frac{\sin(c+dx)}{2d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}} + \frac{\int \frac{\frac{7a}{2}-2a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx}{2a^2}$$

$$= -\frac{\sin(c+dx)}{2d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}} + \frac{7\sin(c+dx)}{6ad\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{\int \frac{-\frac{19a^2}{4}+\frac{7}{2}a^2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx}{3a^3}$$

$$= -\frac{\sin(c+dx)}{2d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}} + \frac{7\sin(c+dx)}{6ad\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{19\sin(c+dx)}{6ad\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} + \frac{2\int \frac{33a^3}{8\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{3a^4}$$

$$= -\frac{\sin(c+dx)}{2d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}} + \frac{7\sin(c+dx)}{6ad\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{19\sin(c+dx)}{6ad\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} + \frac{11\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{4a}$$

$$= -\frac{\sin(c+dx)}{2d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}} + \frac{7\sin(c+dx)}{6ad\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{19\sin(c+dx)}{6ad\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} - \frac{11\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2d}$$

$$= \frac{11\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\sin(c+dx)}{2d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}} + \frac{7\sin(c+dx)}{6ad\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{19\sin(c+dx)}{6ad\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 8.23 (sec) , antiderivative size = 589, normalized size of antiderivative = 3.33

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx = \frac{\cot^3\left(\frac{c}{2}+\frac{dx}{2}\right)\csc^4\left(\frac{c}{2}+\frac{dx}{2}\right)\sec^2\left(\frac{1}{2}(c+dx)\right)\left(-80\cos^6\left(\frac{1}{2}(c+dx\right.\right.}{}$$

```
[In] Integrate[1/(Cos[c + d*x]^(5/2)*(a + a*Cos[c + d*x])^(3/2)),x]
```

```
[Out] (Cot[c/2 + (d*x)/2]^3*Csc[c/2 + (d*x)/2]^4*Sec[(c + d*x)/2]^2*(-80*Cos[(c +
 d*x)/2]^6*HypergeometricPFQ[{2, 2, 2, 7/2}, {1, 1, 11/2}, Sin[c/2 + (d*x)/
2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^10 + 120*Cos[(c + d*
x)/2]^4*HypergeometricPFQ[{2, 2, 7/2}, {1, 11/2}, Sin[c/2 + (d*x)/2]^2/(-1
+ 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^10*(-5 + 4*Sin[c/2 + (d*x)/2]
^2) + 21*(1 - 2*Sin[c/2 + (d*x)/2]^2)^3*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*S
in[c/2 + (d*x)/2]^2)]*(-15*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/
2 + (d*x)/2]^2)]]*(-392 + 2347*Sin[c/2 + (d*x)/2]^2 - 5391*Sin[c/2 + (d*x)/
2]^4 + 5972*Sin[c/2 + (d*x)/2]^6 - 3232*Sin[c/2 + (d*x)/2]^8 + 696*Sin[c/2
+ (d*x)/2]^10) + Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(
-5880 + 37165*Sin[c/2 + (d*x)/2]^2 - 89856*Sin[c/2 + (d*x)/2]^4 + 103992*Si
n[c/2 + (d*x)/2]^6 - 58336*Sin[c/2 + (d*x)/2]^8 + 12960*Sin[c/2 + (d*x)/2]^
10))))/(945*d*(a*(1 + Cos[c + d*x]))^(3/2)*(1 - 2*Sin[c/2 + (d*x)/2]^2)^(7/
2))
```

Maple [A] (verified)

Time = 4.68 (sec) , antiderivative size = 223, normalized size of antiderivative = 1.26

method	result
default	$-\frac{\left(33\left(\cos^3(dx+c)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\arcsin(\cot(dx+c)-\csc(dx+c))+19\sqrt{2}\left(\cos^2(dx+c)\right)\sin(dx+c)+66\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\left(\cos^2(dx+c)\right)\mathrm{arc}\right.}{12d\,c}$

```
[In] int(1/cos(d*x+c)^(5/2)/(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/12/d*(33*cos(d*x+c)^3*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c
)-csc(d*x+c))+19*2^(1/2)*cos(d*x+c)^2*sin(d*x+c)+66*(cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*cos(d*x+c)^2*arcsin(cot(d*x+c)-csc(d*x+c))+12*sin(d*x+c)*cos(d*x
+c)*2^(1/2)+33*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+
c)-csc(d*x+c))-4*2^(1/2)*sin(d*x+c))*(a*(1+cos(d*x+c)))^(1/2)/cos(d*x+c)^(3
/2)/(1+cos(d*x+c))^2*2^(1/2)/a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 185, normalized size of antiderivative = 1.05

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx = \frac{33\sqrt{2}\left(\cos(dx+c)^4+2\cos(dx+c)^3+\cos(dx+c)^2\right)\sqrt{a}\arctan}{}$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/12*(33*sqrt(2)*(cos(d*x + c)^4 + 2*cos(d*x + c)^3 + cos(d*x + c)^2)*sqrt(
a)*arctan(1/2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*sqrt(cos(d*x + c))*s
in(d*x + c)/(a*cos(d*x + c)^2 + a*cos(d*x + c))) - 2*sqrt(a*cos(d*x + c) +
a)*(19*cos(d*x + c)^2 + 12*cos(d*x + c) - 4)*sqrt(cos(d*x + c))*sin(d*x + c
))/(a^2*d*cos(d*x + c)^4 + 2*a^2*d*cos(d*x + c)^3 + a^2*d*cos(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(5/2)/(a+a*cos(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(1/((a*cos(d*x + c) + a)^(3/2)*cos(d*x + c)^(5/2)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)^(3/2)*cos(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{\cos(c+d\,x)^{5/2}\,(a+a\,\cos(c+d\,x))^{3/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(5/2)*(a + a*cos(c + d*x))^(3/2)),x)
[Out] int(1/(cos(c + d*x)^(5/2)*(a + a*cos(c + d*x))^(3/2)), x)
```

3.244 $\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 214

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = -\frac{5\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{5/2}d} + \frac{115\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{15\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{35\sqrt{\cos(c+dx)}\sin(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -5*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(5/2)/d-1/4*cos(d*x+
c)^(5/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(5/2)-15/16*cos(d*x+c)^(3/2)*sin(d*x
+c)/a/d/(a+a*cos(d*x+c))^(3/2)+115/32*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)
/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(5/2)/d*2^(1/2)+35/16*sin(d*x+c
)*cos(d*x+c)^(1/2)/a^2/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.72 (sec) , antiderivative size = 214, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used

$= \{2844, 3056, 3062, 3061, 2861, 211, 2853, 222\}$

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = -\frac{5\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{a^{5/2}d} + \frac{115\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{35\sin(c+dx)\sqrt{\cos(c+dx)}}{16a^2d\sqrt{a\cos(c+dx)+a}} - \frac{\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{4d(a\cos(c+dx)+a)^{5/2}} - \frac{15\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{16ad(a\cos(c+dx)+a)^{3/2}}$$

```
[In] Int[Cos[c + d*x]^(7/2)/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (-5*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(a^(5/2)*d) +
(115*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*C
os[c + d*x]])])/(16*Sqrt[2]*a^(5/2)*d) - (Cos[c + d*x]^(5/2)*Sin[c + d*x])/
(4*d*(a + a*Cos[c + d*x])^(5/2)) - (15*Cos[c + d*x]^(3/2)*Sin[c + d*x])/(16
*a*d*(a + a*Cos[c + d*x])^(3/2)) + (35*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(16
*a^2*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3062

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(-B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(f*(m +
n + 1))), x] + Dist[1/(b*(m + n + 1)), Int[(a + b*Sin[e + f*x])^m*(c + d*Si
n[e + f*x])^(n - 1)*Simp[A*b*c*(m + n + 1) + B*(a*c*m + b*d*n) + (A*b*d*(m
+ n + 1) + B*(a*d*m + b*c*n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 -
 d^2, 0] && GtQ[n, 0] && (IntegerQ[n] || EqQ[m + 1/2, 0])
```

Rubi steps

$$\text{integral} = -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{\int \frac{\cos^{\frac{3}{2}}(c+dx)\left(\frac{5a}{2}-5a\cos(c+dx)\right)}{(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2}$$

$$= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{15\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} - \frac{\int \frac{\sqrt{\cos(c+dx)}\left(\frac{45a^2}{4}-\frac{35}{2}a^2\cos(c+dx)\right)}{\sqrt{a+a\cos(c+dx)}}dx}{8a^4}$$

$$= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{15\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{35\sqrt{\cos(c+dx)}\sin(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}} - \frac{\int \frac{-\frac{35a^3}{4}+20a^3\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}dx}{8a^5}$$

$$= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{15\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{35\sqrt{\cos(c+dx)}\sin(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}} - \frac{5\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}dx}{2a^3} + \frac{115\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}dx}{32a^2}$$

$$= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{15\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{35\sqrt{\cos(c+dx)}\sin(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}} + \frac{5\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^3d} - \frac{115\text{Subst}\left(\int \frac{1}{2a^2+ax^2}dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16ad}$$

$$= -\frac{5\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{5/2}d} + \frac{115\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{15\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{35\sqrt{\cos(c+dx)}\sin(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.70 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.01

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}dx = \frac{\left(140\arcsin\left(\sqrt{1-\cos(c+dx)}\right)\cos^4\left(\frac{1}{2}(c+dx)\right) + 460\arcsin\left(\sqrt{\cos(c+dx)}\right.\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(7/2)/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] ((140*ArcSin[Sqrt[1 - Cos[c + d*x]]]*Cos[(c + d*x)/2]^4 + 460*ArcSin[Sqrt[C
os[c + d*x]]]*Cos[(c + d*x)/2]^4 - 230*Sqrt[2]*ArcTan[Sqrt[Cos[c + d*x]]/Sq
rt[Sin[(c + d*x)/2]^2]]*Cos[(c + d*x)/2]^4 + 55*Sqrt[1 - Cos[c + d*x]]*Cos[
c + d*x]^(3/2) + 16*Sqrt[1 - Cos[c + d*x]]*Cos[c + d*x]^(5/2) + 35*Sqrt[-((
-1 + Cos[c + d*x])*Cos[c + d*x])]*Sin[c + d*x])/(16*d*Sqrt[1 - Cos[c + d*x
]]*(a*(1 + Cos[c + d*x]))^(5/2))
```

Maple [A] (verified)

Time = 12.74 (sec) , antiderivative size = 344, normalized size of antiderivative = 1.61

method	result
default	$\frac{\left(16\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,(\cos^2(dx+c))\sin(dx+c)-80\sqrt{2}\,\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)(\cos^2(dx+c))+55\sqrt{2}\,\cos(dx+c)\sin(dx+c)\right.}{}$

```
[In] int(cos(d*x+c)^(7/2)/(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/32/d*(16*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*sin(d*x+c
)-80*2^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))*cos(d*x+c
)^2+55*2^(1/2)*cos(d*x+c)*sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-115*
arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^2-160*2^(1/2)*arctan(tan(d*x+c)*(c
os(d*x+c)/(1+cos(d*x+c)))^(1/2))*cos(d*x+c)+35*sin(d*x+c)*2^(1/2)*(cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)-230*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)-80*2^
(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))-115*arcsin(cot(d
*x+c)-csc(d*x+c)))*cos(d*x+c)^(1/2)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))
^3/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)/a^3
```

Fricas [A] (verification not implemented)

none

Time = 0.43 (sec) , antiderivative size = 236, normalized size of antiderivative = 1.10

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx =$$

$$-\frac{115\,\sqrt{2}\left(\cos\left(dx+c\right)^{3}+3\,\cos\left(dx+c\right)^{2}+3\,\cos\left(dx+c\right)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-2\,\sqrt{}}{}$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] -1/32*(115*sqrt(2)*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)
*sqrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a
)*sin(d*x + c))) - 2*sqrt(a*cos(d*x + c) + a)*(16*cos(d*x + c)^2 + 55*cos(d
*x + c) + 35)*sqrt(cos(d*x + c))*sin(d*x + c) - 160*(cos(d*x + c)^3 + 3*cos
```

```
(d*x + c)^2 + 3*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*s
qrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*
cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(7/2)/(a+a*cos(d*x+c))**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{7}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(7/2)/(a*cos(d*x + c) + a)^(5/2), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{{\cos\left(c+d\,x\right)}^{7/2}}{{\left(a+a\,\cos\left(c+d\,x\right)\right)}^{5/2}}\,dx$$

```
[In] int(cos(c + d*x)^(7/2)/(a + a*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)^(7/2)/(a + a*cos(c + d*x))^(5/2), x)
```

3.245 $\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 174

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{2\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{5/2}d} - \frac{43\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{11\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}$$

```
[Out] 2*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(5/2)/d-1/4*cos(d*x+c
)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(5/2)-43/32*arctan(1/2*sin(d*x+c)*a^(
1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(5/2)/d*2^(1/2)-11/
16*sin(d*x+c)*cos(d*x+c)^(1/2)/a/d/(a+a*cos(d*x+c))^(3/2)
```

Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 174, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {2844, 3056, 3061, 2861, 211, 2853, 222}

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{2\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{a^{5/2}d} - \frac{43\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{4d(a\cos(c+dx)+a)^{5/2}} - \frac{11\sin(c+dx)\sqrt{\cos(c+dx)}}{16ad(a\cos(c+dx)+a)^{3/2}}$$

[In] Int[Cos[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^(5/2),x]

[Out] (2*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(a^(5/2)*d) - (43*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]])])/(16*Sqrt[2]*a^(5/2)*d) - (Cos[c + d*x]^(3/2)*Sin[c + d*x])/(4*d*(a + a*Cos[c + d*x])^(5/2)) - (11*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(16*a*d*(a + a*Cos[c + d*x])^(3/2))

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
```

```
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{\int \frac{\sqrt{\cos(c+dx)}\left(\frac{3a}{2}-4a\cos(c+dx)\right)}{(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2} \\
&= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{11\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} - \frac{\int \frac{\frac{11a^2}{4}-8a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{8a^4} \\
&= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{11\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} \\
&\quad + \frac{\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx}{a^3} - \frac{43\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{32a^2} \\
&= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{11\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} \\
&\quad - \frac{2\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^3d} \\
&\quad + \frac{43\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16ad} \\
&= \frac{2\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{5/2}d} - \frac{43\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} \\
&\quad - \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{11\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.53 (sec) , antiderivative size = 191, normalized size of antiderivative = 1.10

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx =$$
$$-\frac{\left(44\arcsin\left(\sqrt{1-\cos(c+dx)}\right)\cos^4\left(\frac{1}{2}(c+dx)\right)+172\arcsin\left(\sqrt{\cos(c+dx)}\right)\cos^4\left(\frac{1}{2}(c+dx)\right)-86\sqrt{2}\,\mathrm{arc}\right.}{16d\sqrt{1-\mathrm{c}}}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] -1/16*((44*ArcSin[Sqrt[1 - Cos[c + d*x]]]*Cos[(c + d*x)/2]^4 + 172*ArcSin[S
qrt[Cos[c + d*x]]]*Cos[(c + d*x)/2]^4 - 86*Sqrt[2]*ArcTan[Sqrt[Cos[c + d*x]
]/Sqrt[Sin[(c + d*x)/2]^2]]*Cos[(c + d*x)/2]^4 + 15*Sqrt[1 - Cos[c + d*x]]*
Cos[c + d*x]^(3/2) + 11*Sqrt[-((-1 + Cos[c + d*x])*Cos[c + d*x])])*Sin[c +
d*x])/(d*Sqrt[1 - Cos[c + d*x]]*(a*(1 + Cos[c + d*x]))^(5/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 329 vs. 2(143) = 286.

Time = 3.85 (sec) , antiderivative size = 330, normalized size of antiderivative = 1.90

method	result
default	$-\frac{\left(-\frac{(\csc^2(dx+c))(1-\cos(dx+c))^2-1}{(\csc^2(dx+c))(1-\cos(dx+c))^2+1}\right)^{\frac{5}{2}}\left((\csc^2(dx+c))(1-\cos(dx+c))^2+1\right)^3\sqrt{\frac{a}{(\csc^2(dx+c))(1-\cos(dx+c))^2+1}}\left(-2(\csc^3(dx+c))\sqrt{-(\mathrm{c}}\right.}{}$

```
[In] int(cos(d*x+c)^(5/2)/(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/32/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+
1))^(5/2)/(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(5/2)*(csc(d*x+c)^2*(1-cos(d*x
+c))^2+1)^3*(a/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2)*(-2*csc(d*x+c)^3*(-
csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(1-cos(d*x+c))^3+32*2^(1/2)*arctan(2
^(1/2)*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)/(csc(d*x+c)^2*(1-cos(d*x+c)
)^2-1)*(csc(d*x+c)-cot(d*x+c)))+13*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)
*(csc(d*x+c)-cot(d*x+c))-43*arcsin(cot(d*x+c)-csc(d*x+c)))*2^(1/2)/a^3
```

Fricas [A] (verification not implemented)

none

Time = 0.43 (sec) , antiderivative size = 226, normalized size of antiderivative = 1.30

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{43\,\sqrt{2}\left(\cos\left(dx+c\right)^3+3\,\cos\left(dx+c\right)^2+3\,\cos\left(dx+c\right)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a}}{}\right.}{}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/32*(43*sqrt(2)*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*s
qrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*
sin(d*x + c))) - 2*sqrt(a*cos(d*x + c) + a)*(15*cos(d*x + c) + 11)*sqrt(cos
(d*x + c))*sin(d*x + c) - 64*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x
 + c) + 1)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt
(a)*sin(d*x + c))))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*
d*cos(d*x + c) + a^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)/(a+a*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(cos(d*x + c)^(5/2)/(a*cos(d*x + c) + a)^(5/2), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)^{5/2}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int(cos(c + d*x)^(5/2)/(a + a*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)^(5/2)/(a + a*cos(c + d*x))^(5/2), x)
```

3.246 $\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 137

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{3\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{7\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}$$

```
[Out] 3/32*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c)
)^(1/2))/a^(5/2)/d*2^(1/2)-1/4*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x+c
))^(5/2)+7/16*sin(d*x+c)*cos(d*x+c)^(1/2)/a/d/(a+a*cos(d*x+c))^(3/2)
```

Rubi [A] (verified)

Time = 0.32 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2844, 3057, 12, 2861, 211}

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{3\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{7\sin(c+dx)\sqrt{\cos(c+dx)}}{16ad(a\cos(c+dx)+a)^{3/2}} - \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{4d(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[Cos[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (3*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos
[c + d*x]])])/(16*Sqrt[2]*a^(5/2)*d) - (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(4
```

```
*d*(a + a*Cos[c + d*x])^(5/2)) + (7*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(16*a*
d*(a + a*Cos[c + d*x])^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\text{integral} = -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{\int \frac{\frac{a}{2}-3a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{7\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} - \frac{\int -\frac{3a^2}{4\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{8a^4}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{7\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{3\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{32a^2}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{7\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} - \frac{3\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16ad}$$

$$= \frac{3\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{7\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}$$

Mathematica [A] (verified)

Time = 0.54 (sec) , antiderivative size = 149, normalized size of antiderivative = 1.09

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{\cos^5\left(\frac{1}{2}(c+dx)\right)\left(3\arcsin\left(\frac{\sin\left(\frac{1}{2}(c+dx)\right)}{\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)}}\right)\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)} + \sqrt{2}\sqrt{\frac{\cos(c\cdots}{1+\cos(\cdots}}\right.}{4d\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)}(a(1+\cos(c+\cdots}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (Cos[(c + d*x)/2]^5*(3*ArcSin[Sin[(c + d*x)/2]/Sqrt[Cos[(c + d*x)/2]^2]]*Sq
rt[Cos[(c + d*x)/2]^2] + Sqrt[2]*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sin[
(c + d*x)/2]*(5 - 2*Tan[(c + d*x)/2]^2)))/(4*d*Sqrt[Cos[(c + d*x)/2]^2]*(a*
(1 + Cos[c + d*x]))^(5/2))
```

Maple [A] (verified)

Time = 3.63 (sec) , antiderivative size = 196, normalized size of antiderivative = 1.43

method	result
default	$-\frac{\left(-7\sqrt{2}\cos(dx+c)\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+3\arcsin(\cot(dx+c)-\csc(dx+c))\left(\cos^2(dx+c)\right)-3\sin(dx+c)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+6\arcsi\right.}{32d(1+\cos(dx+c))^3\sqrt{\frac{\cos(dx-}{1+\cos(dx}}}$

[In] int(cos(d*x+c)^(3/2)/(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)

[Out] -1/32/d*(-7*2^(1/2)*cos(d*x+c)*sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+3*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^2-3*sin(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+6*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)+3*arcsin(cot(d*x+c)-csc(d*x+c)))*cos(d*x+c)^(1/2)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^3/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)/a^3

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 180, normalized size of antiderivative = 1.31

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{3\sqrt{2}\left(\cos(dx+c)^3+3\cos(dx+c)^2+3\cos(dx+c)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos}}{2}\right.}{32\left(a^3d\cos(dx+c)^3+3\right.}$$

[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")

[Out] 1/32*(3*sqrt(2)*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*sqrt(a)*arctan(1/2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*sqrt(cos(d*x + c))*sin(d*x + c)/(a*cos(d*x + c)^2 + a*cos(d*x + c))) + 2*sqrt(a*cos(d*x + c) + a)*(7*cos(d*x + c) + 3)*sqrt(cos(d*x + c))*sin(d*x + c))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)

Sympy [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos^{\frac{3}{2}}(c+dx)}{\left(a\left(\cos(c+dx)+1\right)\right)^{\frac{5}{2}}}\,dx$$

[In] integrate(cos(d*x+c)**(3/2)/(a+a*cos(d*x+c))**(5/2),x)

[Out] Integral(cos(c + d*x)**(3/2)/(a*(cos(c + d*x) + 1))**(5/2), x)

Maxima [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{3}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(3/2)/(a*cos(d*x + c) + a)^(5/2), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)^{3/2}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)/(a + a*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)^(3/2)/(a + a*cos(c + d*x))^(5/2), x)
```

3.247 $\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 137

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{5\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}$$

```
[Out] 5/32*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c)
)^(1/2))/a^(5/2)/d*2^(1/2)+1/4*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x+c
))^(5/2)+1/16*sin(d*x+c)*cos(d*x+c)^(1/2)/a/d/(a+a*cos(d*x+c))^(3/2)
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2843, 3057, 12, 2861, 211}

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{5\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{16ad(a\cos(c+dx)+a)^{3/2}} + \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{4d(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (5*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos
[c + d*x]])])/(16*Sqrt[2]*a^(5/2)*d) + (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(4
```

```
*d*(a + a*Cos[c + d*x])^(5/2)) + (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(16*a*d*
(a + a*Cos[c + d*x])^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2843

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*
((c + d*Sin[e + f*x])^n/(a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[a*d*n - b*c*
(m + 1) - b*d*(m + n + 1)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e,
 f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && L
tQ[m, -1] && LtQ[0, n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c,
 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\text{integral} = \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{\int \frac{\frac{a}{2}+a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2}$$

$$= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{\int \frac{5a^2}{4\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{8a^4}$$

$$= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{5\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{32a^2}$$

$$= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} - \frac{5\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16ad}$$

$$= \frac{5\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}$$

Mathematica [A] (verified)

Time = 0.74 (sec) , antiderivative size = 122, normalized size of antiderivative = 0.89

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{\cos\left(\frac{1}{2}(c+dx)\right)\sqrt{\cos(c+dx)}\left(-2+6\csc^2\left(\frac{1}{2}(c+dx)\right)-5\text{arctanh}\left(\sqrt{-\sec(c}\right.\right.}{8d(a(1+\cos}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (Cos[(c + d*x)/2]*Sqrt[Cos[c + d*x]]*(-2 + 6*Csc[(c + d*x)/2]^2 - 5*ArcTanh
[Sqrt[-(Sec[c + d*x]*Sin[(c + d*x)/2]^2)]]*Cot[(c + d*x)/2]^4*Sqrt[2 - 2*Se
c[c + d*x]])*Sin[(c + d*x)/2]^3)/(8*d*(a*(1 + Cos[c + d*x]))^(5/2))
```

Maple [A] (verified)

Time = 3.36 (sec) , antiderivative size = 195, normalized size of antiderivative = 1.42

method	result
default	$\frac{\left(\sqrt{2}\,\cos(dx+c)\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+5\sin(dx+c)\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-5\arcsin(\cot(dx+c)-\csc(dx+c))\left(\cos^{2}(dx+c)\right)-10\arcsin(c}{32d(1+\cos(dx+c))^{3}\sqrt{\frac{\cos(dx+c}{1+\cos(dx+}}}$

```
[In] int(cos(d*x+c)^(1/2)/(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/32/d*(2^(1/2)*cos(d*x+c)*sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+5*s
in(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-5*arcsin(cot(d*x+c)-csc
(d*x+c))*cos(d*x+c)^2-10*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)-5*arcsin(
cot(d*x+c)-csc(d*x+c)))*(a*(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^(1/2)/(1+cos(d*
x+c))^3/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)/a^3
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 178, normalized size of antiderivative = 1.30

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{5\sqrt{2}\left(\cos(dx+c)^{3}+3\,\cos(dx+c)^{2}+3\,\cos(dx+c)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\,c}}{}\right.}{32\left(a^{3}d\cos(dx+c)^{3}+\right.}$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/32*(5*sqrt(2)*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*sq
rt(a)*arctan(1/2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*sqrt(cos(d*x + c)
)*sin(d*x + c)/(a*cos(d*x + c)^2 + a*cos(d*x + c))) + 2*sqrt(a*cos(d*x + c)
 + a)*(cos(d*x + c) + 5)*sqrt(cos(d*x + c))*sin(d*x + c))/(a^3*d*cos(d*x +
c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\sqrt{\cos(c+dx)}}{\left(a\left(\cos(c+dx)+1\right)\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)**(1/2)/(a+a*cos(d*x+c))**(5/2),x)
```

```
[Out] Integral(sqrt(cos(c + d*x))/(a*(cos(c + d*x) + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\sqrt{\cos(dx+c)}}{(a\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(sqrt(cos(d*x + c))/(a*cos(d*x + c) + a)^(5/2), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\sqrt{\cos(c+d\,x)}}{(a+a\,\cos(c+d\,x))^{5/2}}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(a + a*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)^(1/2)/(a + a*cos(c + d*x))^(5/2), x)
```

3.248 $\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 137

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}\,dx = \frac{19\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{9\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}$$

```
[Out] 19/32*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c
))^(1/2))/a^(5/2)/d*2^(1/2)-1/4*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x+
c))^(5/2)-9/16*sin(d*x+c)*cos(d*x+c)^(1/2)/a/d/(a+a*cos(d*x+c))^(3/2)
```

Rubi [A] (verified)

Time = 0.32 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2845, 3057, 12, 2861, 211}

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}\,dx = \frac{19\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{9\sin(c+dx)\sqrt{\cos(c+dx)}}{16ad(a\cos(c+dx)+a)^{3/2}} - \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{4d(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[1/(Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^(5/2)),x]
```

```
[Out] (19*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Co
s[c + d*x]])])/(16*Sqrt[2]*a^(5/2)*d) - (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(
```

```
4*d*(a + a*Cos[c + d*x])^(5/2)) - (9*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(16*a
*d*(a + a*Cos[c + d*x])^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}}+\frac{\int\frac{\frac{7a}{2}-a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2}\\
&= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}}-\frac{9\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}+\frac{\int\frac{19a^2}{4\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{8a^4}\\
&= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}}-\frac{9\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}+\frac{19\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{32a^2}\\
&= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}}-\frac{9\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}\\
&\quad-\frac{19\text{Subst}\left(\int\frac{1}{2a^2+ax^2}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16ad}\\
&= \frac{19\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d}\\
&\quad-\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}}-\frac{9\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.85 (sec) , antiderivative size = 134, normalized size of antiderivative = 0.98

$$\int\frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}\,dx=$$

$$-\frac{\sec^2\left(\frac{1}{2}(c+dx)\right)\left(-76\text{arctanh}\left(\sqrt{-\sec(c+dx)\sin^2\left(\frac{1}{2}(c+dx)\right)}\right)\cos^4\left(\frac{1}{2}(c+dx)\right)+\cos(c+dx)(13+9\cos\right.}{32\sqrt{2}a^2d\sqrt{-1+\cos(c+dx)}\sqrt{a(1+\cos(c+dx))}}$$

```
[In] Integrate[1/(Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^(5/2)),x]
```

```
[Out] -1/32*(Sec[(c + d*x)/2]^2*(-76*ArcTanh[Sqrt[-(Sec[c + d*x]*Sin[(c + d*x)/2]
^2)]]*Cos[(c + d*x)/2]^4 + Cos[c + d*x]*(13 + 9*Cos[c + d*x])*Sqrt[2 - 2*Se
c[c + d*x]])*Tan[(c + d*x)/2])/(Sqrt[2]*a^2*d*Sqrt[-1 + Cos[c + d*x]]*Sqrt[
a*(1 + Cos[c + d*x])])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 228 vs. 2(112) = 224.

Time = 5.67 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.67

method	result
default	$\frac{\sqrt{-(\csc^2(dx+c))(1-\cos(dx+c))^2+1}\,\sqrt{\frac{a}{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1}}\left(-2(\csc^3(dx+c))\sqrt{-(\csc^2(dx+c))(1-\cos(dx+c))^2+1}\,(1-\cos(\right.}{32d\sqrt{-\frac{\left(\csc^2(dx+c)\right)(1-\cos(dx+}{\left(\csc^2(dx+c)\right)(1-\cos(dx+}}}$

[In] int(1/cos(d*x+c)^(1/2)/(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)

[Out] 1/32/d/(-(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1
))^(1/2)*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(a/(csc(d*x+c)^2*(1-cos(d
x+c))^2+1))^(1/2)(-2*csc(d*x+c)^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2
)*(1-cos(d*x+c))^3-11*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(csc(d*x+c)-
cot(d*x+c))-19*arcsin(cot(d*x+c)-csc(d*x+c)))*2^(1/2)/a^3

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 180, normalized size of antiderivative = 1.31

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}\,dx = \frac{19\sqrt{2}\left(\cos(dx+c)^3+3\cos(dx+c)^2+3\cos(dx+c)+1\right)\sqrt{a}\,a}{32\left(a^3d\,c\right.}$$

[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")

[Out] 1/32*(19*sqrt(2)*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*s
qrt(a)*arctan(1/2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*sqrt(cos(d*x + c
))*sin(d*x + c)/(a*cos(d*x + c)^2 + a*cos(d*x + c))) - 2*sqrt(a*cos(d*x + c
) + a)*(9*cos(d*x + c) + 13)*sqrt(cos(d*x + c))*sin(d*x + c))/(a^3*d*cos(d*
x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)

Sympy [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{\left(a\left(\cos\left(c+dx\right)+1\right)\right)^{\frac{5}{2}}\sqrt{\cos\left(c+dx\right)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(1/2)/(a+a*cos(d*x+c))**(5/2),x)
[Out] Integral(1/((a*(cos(c + d*x) + 1))**(5/2)*sqrt(cos(c + d*x))), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^(5/2)*sqrt(cos(d*x + c))), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{\sqrt{\cos\left(c+d\,x\right)}\,{\left(a+a\,\cos\left(c+d\,x\right)\right)}^{5/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^(5/2)),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^(5/2)), x)
```

3.249 $\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 177

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx = -\frac{75\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\sin(c+dx)}{4d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}} - \frac{13\sin(c+dx)}{16ad\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}} + \frac{49\sin(c+dx)}{16a^2d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -75/32*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(5/2)/d*2^(1/2)-1/4*sin(d*x+c)/d/(a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(1/2)-13/16*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(1/2)+49/16*sin(d*x+c)/a^2/d/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.48 (sec) , antiderivative size = 177, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {2845, 3057, 3063, 12, 2861, 211}

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx = -\frac{75\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{49\sin(c+dx)}{16a^2d\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}} - \frac{13\sin(c+dx)}{16ad\sqrt{\cos(c+dx)}(a\cos(c+dx)+a)^{3/2}} - \frac{\sin(c+dx)}{4d\sqrt{\cos(c+dx)}(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[1/(Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^(5/2)),x]
```

```
[Out] (-75*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*C
os[c + d*x]])])/(16*Sqrt[2]*a^(5/2)*d) - Sin[c + d*x]/(4*d*Sqrt[Cos[c + d*x
]]*(a + a*Cos[c + d*x])^(5/2)) - (13*Sin[c + d*x])/(16*a*d*Sqrt[Cos[c + d*x
]]*(a + a*Cos[c + d*x])^(3/2)) + (49*Sin[c + d*x])/(16*a^2*d*Sqrt[Cos[c + d
*x]]*Sqrt[a + a*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
```

```
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\sin(c+dx)}{4d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}} + \frac{\int \frac{\frac{9a}{2}-2a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2} \\
&= -\frac{\sin(c+dx)}{4d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}} \\
&\quad - \frac{13\sin(c+dx)}{16ad\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}} + \frac{\int \frac{\frac{49a^2}{4}-\frac{13}{2}a^2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx}{8a^4} \\
&= -\frac{\sin(c+dx)}{4d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}} - \frac{13\sin(c+dx)}{16ad\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}} \\
&\quad + \frac{49\sin(c+dx)}{16a^2d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} + \frac{\int -\frac{75a^3}{8\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{4a^5} \\
&= -\frac{\sin(c+dx)}{4d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}} - \frac{13\sin(c+dx)}{16ad\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}} \\
&\quad + \frac{49\sin(c+dx)}{16a^2d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} - \frac{75\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{32a^2} \\
&= -\frac{\sin(c+dx)}{4d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}} - \frac{13\sin(c+dx)}{16ad\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}} \\
&\quad + \frac{49\sin(c+dx)}{16a^2d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} \\
&\quad + \frac{75\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16ad}
\end{aligned}
$$

$$= -\frac{75\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\sin(c+dx)}{4d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}} - \frac{13\sin(c+dx)}{16ad\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}} + \frac{49\sin(c+dx)}{16a^2d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 7.21 (sec) , antiderivative size = 506, normalized size of antiderivative = 2.86

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx = \frac{2\cos^5\left(\frac{c}{2}+\frac{dx}{2}\right)\sec^4\left(\frac{1}{2}(c+dx)\right)\sin\left(\frac{c}{2}+\frac{dx}{2}\right)\left(\frac{8\cos^6\left(\frac{1}{2}(c+dx)\right)\,{}_4F_3\left(\right.}{3}\right.}{}$$

```
[In] Integrate[1/(Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^(5/2)),x]
```

```
[Out] (2*Cos[c/2 + (d*x)/2]^5*Sec[(c + d*x)/2]^4*Sin[c/2 + (d*x)/2]*((8*Cos[(c +
d*x)/2]^6*HypergeometricPFQ[{2, 2, 2, 5/2}, {1, 1, 11/2}, Sin[c/2 + (d*x)/2
]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^2)/(315*(-1 + 2*Sin[c
/2 + (d*x)/2]^2)) + (Csc[c/2 + (d*x)/2]^8*(1 - 2*Sin[c/2 + (d*x)/2]^2)^2*Sq
rt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(-15*ArcTanh[Sqrt[Si
n[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Cos[(c + d*x)/2]^4*(-343
 + 1465*Sin[c/2 + (d*x)/2]^2 - 2021*Sin[c/2 + (d*x)/2]^4 + 824*Sin[c/2 + (d
*x)/2]^6) + Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(-5145
 + 33980*Sin[c/2 + (d*x)/2]^2 - 87764*Sin[c/2 + (d*x)/2]^4 + 109737*Sin[c/2
 + (d*x)/2]^6 - 66122*Sin[c/2 + (d*x)/2]^8 + 15344*Sin[c/2 + (d*x)/2]^10)))
/120))/(d*(a*(1 + Cos[c + d*x]))^(5/2)*(1 - 2*Sin[c/2 + (d*x)/2]^2)^(3/2))
```

Maple [A] (verified)

Time = 5.65 (sec) , antiderivative size = 260, normalized size of antiderivative = 1.47

method	result
default	$\frac{\left(75\left(\cos^3(dx+c)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\arcsin(\cot(dx+c)-\csc(dx+c))+49\sqrt{2}\left(\cos^2(dx+c)\right)\sin(dx+c)+225\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\left(\cos^2(dx+c)\right)\mathrm{ar}}{}$

```
[In] int(1/cos(d*x+c)^(3/2)/(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/32/d*(75*cos(d*x+c)^3*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)
-csc(d*x+c))+49*2^(1/2)*cos(d*x+c)^2*sin(d*x+c)+225*(cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*cos(d*x+c)^2*arcsin(cot(d*x+c)-csc(d*x+c))+85*sin(d*x+c)*cos(d*x
```

```
+c)*2^(1/2)+225*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x
+c)-csc(d*x+c))+32*2^(1/2)*sin(d*x+c)+75*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
arcsin(cot(d*x+c)-csc(d*x+c)))*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^3/co
s(d*x+c)^(1/2)*2^(1/2)/a^3
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 205, normalized size of antiderivative = 1.16

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx =$$
$$-\frac{75\sqrt{2}\left(\cos(dx+c)^4+3\cos(dx+c)^3+3\cos(dx+c)^2+\cos(dx+c)\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{a}\sqrt{\cos(d}}{2\left(a\cos(dx+c)^2+a\cos(\right.}\right.}{32\left(a^3d\cos(dx+c)^4+3\,a^3d\cos(dx+c)^3\right.}$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] -1/32*(75*sqrt(2)*(cos(d*x + c)^4 + 3*cos(d*x + c)^3 + 3*cos(d*x + c)^2 + c
os(d*x + c))*sqrt(a)*arctan(1/2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*sq
rt(cos(d*x + c))*sin(d*x + c)/(a*cos(d*x + c)^2 + a*cos(d*x + c))) - 2*sqrt
(a*cos(d*x + c) + a)*(49*cos(d*x + c)^2 + 85*cos(d*x + c) + 32)*sqrt(cos(d*
x + c))*sin(d*x + c))/(a^3*d*cos(d*x + c)^4 + 3*a^3*d*cos(d*x + c)^3 + 3*a^
3*d*cos(d*x + c)^2 + a^3*d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(3/2)/(a+a*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{5}{2}}\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^(5/2)*cos(d*x + c)^(3/2)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{5}{2}}\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)^(5/2)*cos(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{{\cos\left(c+d\,x\right)}^{3/2}\,{\left(a+a\,\cos\left(c+d\,x\right)\right)}^{5/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^(5/2)),x)
[Out] int(1/(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^(5/2)), x)
```

3.250 $\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 217

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx = \frac{163\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\sin(c+dx)}{4d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}} - \frac{17\sin(c+dx)}{16ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}} + \frac{95\sin(c+dx)}{48a^2d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{299\sin(c+dx)}{48a^2d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -1/4*sin(d*x+c)/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(5/2)-17/16*sin(d*x+c)/
a/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(3/2)+163/32*arctan(1/2*sin(d*x+c)*a^
(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(5/2)/d*2^(1/2)+95
/48*sin(d*x+c)/a^2/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2)-299/48*sin(d*x
+c)/a^2/d/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.70 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {2845, 3057, 3063, 12, 2861, 211}

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx = \frac{163\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{95\sin(c+dx)}{48a^2d\cos^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} - \frac{299\sin(c+dx)}{48a^2d\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}} - \frac{17\sin(c+dx)}{16ad\cos^{\frac{3}{2}}(c+dx)(a\cos(c+dx)+a)^{3/2}} - \frac{\sin(c+dx)}{4d\cos^{\frac{3}{2}}(c+dx)(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[1/(Cos[c + d*x]^(5/2)*(a + a*Cos[c + d*x])^(5/2)),x]
```

```
[Out] (163*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*C
os[c + d*x]])])/(16*Sqrt[2]*a^(5/2)*d) - Sin[c + d*x]/(4*d*Cos[c + d*x]^(3/
2)*(a + a*Cos[c + d*x])^(5/2)) - (17*Sin[c + d*x])/(16*a*d*Cos[c + d*x]^(3/
2)*(a + a*Cos[c + d*x])^(3/2)) + (95*Sin[c + d*x])/(48*a^2*d*Cos[c + d*x]^(
3/2)*Sqrt[a + a*Cos[c + d*x]]) - (299*Sin[c + d*x])/(48*a^2*d*Sqrt[Cos[c +
d*x]]*Sqrt[a + a*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
```

```
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sin(c+dx)}{4d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}+\frac{\int \frac{\frac{11a}{2}-3a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2}\\
&= -\frac{\sin(c+dx)}{4d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\\
&\quad -\frac{17\sin(c+dx)}{16ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}+\frac{\int \frac{\frac{95a^2}{4}-17a^2\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx}{8a^4}\\
&= -\frac{\sin(c+dx)}{4d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}-\frac{17\sin(c+dx)}{16ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\\
&\quad +\frac{95\sin(c+dx)}{48a^2d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}+\frac{\int \frac{-\frac{299a^3}{8}+\frac{95}{4}a^3\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx}{12a^5}\\
&= -\frac{\sin(c+dx)}{4d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}-\frac{17\sin(c+dx)}{16ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\\
&\quad +\frac{95\sin(c+dx)}{48a^2d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\\
&\quad -\frac{299\sin(c+dx)}{48a^2d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}+\frac{\int \frac{489a^4}{16\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{6a^6}
\end{aligned}$$

$$
\begin{aligned}
&= -\frac{\sin(c+dx)}{4d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}} - \frac{17\sin(c+dx)}{16ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}} \\
&\quad + \frac{95\sin(c+dx)}{48a^2d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} \\
&\quad - \frac{299\sin(c+dx)}{48a^2d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} + \frac{163\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}dx}{32a^2} \\
&= -\frac{\sin(c+dx)}{4d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}} - \frac{17\sin(c+dx)}{16ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}} \\
&\quad + \frac{95\sin(c+dx)}{48a^2d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} \\
&\quad - \frac{299\sin(c+dx)}{48a^2d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} \\
&\quad - \frac{163\text{Subst}\left(\int\frac{1}{2a^2+ax^2}dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16ad} \\
&= \frac{163\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\sin(c+dx)}{4d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}} \\
&\quad - \frac{17\sin(c+dx)}{16ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}} \\
&\quad + \frac{95\sin(c+dx)}{48a^2d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} \\
&\quad - \frac{299\sin(c+dx)}{48a^2d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}
\end{aligned}
$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 9.07 (sec) , antiderivative size = 639, normalized size of antiderivative = 2.94

$$
\int\frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}dx =
$$

$$
-\frac{\cot^5\left(\frac{c}{2}+\frac{dx}{2}\right)\csc^4\left(\frac{c}{2}+\frac{dx}{2}\right)\sec^4\left(\frac{1}{2}(c+dx)\right)\left(640\cos^8\left(\frac{1}{2}(c+dx)\right)\ {}_5F_4\left(2,2,2,2,\frac{7}{2};1,1,1,\frac{13}{2};\frac{\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}{-1+2\sin^2\left(\frac{c}{2}+\right.}\right.\right.}{}
$$

```
[In] Integrate[1/(Cos[c + d*x]^(5/2)*(a + a*Cos[c + d*x])^(5/2)),x]
```

```
[Out] -1/41580*(Cot[c/2 + (d*x)/2]^5*Csc[c/2 + (d*x)/2]^4*Sec[(c + d*x)/2]^4*(640
*Cos[(c + d*x)/2]^8*HypergeometricPFQ[{2, 2, 2, 2, 7/2}, {1, 1, 1, 13/2}, S
```

```
in[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^12 -
1280*Cos[(c + d*x)/2]^6*HypergeometricPFQ[{2, 2, 2, 7/2}, {1, 1, 13/2}, Sin
[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^12*(-6
+ 5*Sin[c/2 + (d*x)/2]^2) + 33*(1 - 2*Sin[c/2 + (d*x)/2]^2)^3*Sqrt[Sin[c/2
+ (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(-105*ArcTanh[Sqrt[Sin[c/2 + (d
*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Cos[(c + d*x)/2]^4*(-10935 + 72902
*Sin[c/2 + (d*x)/2]^2 - 188110*Sin[c/2 + (d*x)/2]^4 + 234156*Sin[c/2 + (d*x
)/2]^6 - 140732*Sin[c/2 + (d*x)/2]^8 + 33208*Sin[c/2 + (d*x)/2]^10) + Sqrt[
Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(-1148175 + 10333785*Si
n[c/2 + (d*x)/2]^2 - 38990350*Sin[c/2 + (d*x)/2]^4 + 79946462*Sin[c/2 + (d*
x)/2]^6 - 96281836*Sin[c/2 + (d*x)/2]^8 + 68243596*Sin[c/2 + (d*x)/2]^10 -
26448512*Sin[c/2 + (d*x)/2]^12 + 4344400*Sin[c/2 + (d*x)/2]^14))))/(d*(a*(1
 + Cos[c + d*x]))^(5/2)*(1 - 2*Sin[c/2 + (d*x)/2]^2)^(7/2))
```

Maple [A] (verified)

Time = 5.45 (sec) , antiderivative size = 287, normalized size of antiderivative = 1.32

method	result
default	$-\frac{\left(489\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \arcsin(\cot(dx+c)-\csc(dx+c))\left(\cos^4(dx+c)\right)+299\sqrt{2}\left(\cos^3(dx+c)\right)\sin(dx+c)+1467\left(\cos^3(dx+c)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c}}$

```
[In] int(1/cos(d*x+c)^(5/2)/(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/96/d*(489*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c)
)*cos(d*x+c)^4+299*2^(1/2)*cos(d*x+c)^3*sin(d*x+c)+1467*cos(d*x+c)^3*(cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))+503*2^(1/2)*cos(d
*x+c)^2*sin(d*x+c)+1467*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*arcs
in(cot(d*x+c)-csc(d*x+c))+160*sin(d*x+c)*cos(d*x+c)*2^(1/2)+489*cos(d*x+c)*
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))-32*2^(1/2)*
sin(d*x+c))*(a*(1+cos(d*x+c)))^(1/2)/cos(d*x+c)^(3/2)/(1+cos(d*x+c))^3*2^(1
/2)/a^3
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 219, normalized size of antiderivative = 1.01

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx = \frac{489\,\sqrt{2}\left(\cos\left(dx+c\right)^5+3\,\cos\left(dx+c\right)^4+3\,\cos\left(dx+c\right)^3+\cos\left(d\right.\right.}{}$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/96*(489*sqrt(2)*(cos(d*x + c)^5 + 3*cos(d*x + c)^4 + 3*cos(d*x + c)^3 + c
os(d*x + c)^2)*sqrt(a)*arctan(1/2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*
sqrt(cos(d*x + c))*sin(d*x + c)/(a*cos(d*x + c)^2 + a*cos(d*x + c))) - 2*(2
99*cos(d*x + c)^3 + 503*cos(d*x + c)^2 + 160*cos(d*x + c) - 32)*sqrt(a*cos(
d*x + c) + a)*sqrt(cos(d*x + c))*sin(d*x + c))/(a^3*d*cos(d*x + c)^5 + 3*a^
3*d*cos(d*x + c)^4 + 3*a^3*d*cos(d*x + c)^3 + a^3*d*cos(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(5/2)/(a+a*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{5}{2}}\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(1/((a*cos(d*x + c) + a)^(5/2)*cos(d*x + c)^(5/2)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{5}{2}}\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate(1/((a*cos(d*x + c) + a)^(5/2)*cos(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^{5/2}\,\left(a+a\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(5/2)*(a + a*cos(c + d*x))^(5/2)),x)
[Out] int(1/(cos(c + d*x)^(5/2)*(a + a*cos(c + d*x))^(5/2)), x)
```

3.251 $\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 254

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = -\frac{7\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{7/2}d} + \frac{637\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64\sqrt{2}a^{7/2}d} - \frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{7\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} - \frac{259\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} + \frac{189\sqrt{\cos(c+dx)}\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -7*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(7/2)/d-1/6*cos(d*x+
c)^(7/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(7/2)-7/16*cos(d*x+c)^(5/2)*sin(d*x+
c)/a/d/(a+a*cos(d*x+c))^(5/2)-259/192*cos(d*x+c)^(3/2)*sin(d*x+c)/a^2/d/(a+
a*cos(d*x+c))^(3/2)+637/128*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c
)^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(7/2)/d*2^(1/2)+189/64*sin(d*x+c)*cos(d*x
+c)^(1/2)/a^3/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.95 (sec) , antiderivative size = 254, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {2844, 3056, 3062, 3061, 2861, 211, 2853, 222}

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = -\frac{7\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{a^{7/2}d} + \frac{637\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{64\sqrt{2}a^{7/2}d} + \frac{189\sin(c+dx)\sqrt{\cos(c+dx)}}{64a^3d\sqrt{a\cos(c+dx)+a}} - \frac{259\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{192a^2d(a\cos(c+dx)+a)^{3/2}} - \frac{\sin(c+dx)\cos^{\frac{7}{2}}(c+dx)}{6d(a\cos(c+dx)+a)^{7/2}} - \frac{7\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{16ad(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[Cos[c + d*x]^(9/2)/(a + a*Cos[c + d*x])^(7/2),x]
```

```
[Out] (-7*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(a^(7/2)*d) +
(637*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*C
os[c + d*x]])])/(64*Sqrt[2]*a^(7/2)*d) - (Cos[c + d*x]^(7/2)*Sin[c + d*x])/
(6*d*(a + a*Cos[c + d*x])^(7/2)) - (7*Cos[c + d*x]^(5/2)*Sin[c + d*x])/(16*
a*d*(a + a*Cos[c + d*x])^(5/2)) - (259*Cos[c + d*x]^(3/2)*Sin[c + d*x])/(19
2*a^2*d*(a + a*Cos[c + d*x])^(3/2)) + (189*Sqrt[Cos[c + d*x]]*Sin[c + d*x])
/(64*a^3*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
```

```
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3062

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(-B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(f*(m +
n + 1))), x] + Dist[1/(b*(m + n + 1)), Int[(a + b*Sin[e + f*x])^m*(c + d*Si
n[e + f*x])^(n - 1)*Simp[A*b*c*(m + n + 1) + B*(a*c*m + b*d*n) + (A*b*d*(m
+ n + 1) + B*(a*d*m + b*c*n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
```

```
, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 -
 d^2, 0] && GtQ[n, 0] && (IntegerQ[n] || EqQ[m + 1/2, 0])
```

Rubi steps

$$\text{integral} = -\frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{\int \frac{\cos^{\frac{5}{2}}(c+dx)\left(\frac{7a}{2}-7a\cos(c+dx)\right)}{(a+a\cos(c+dx))^{5/2}}\,dx}{6a^2}$$

$$= -\frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{7\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} - \frac{\int \frac{\cos^{\frac{3}{2}}(c+dx)\left(\frac{105a^2}{4}-\frac{77}{2}a^2\cos(c+dx)\right)}{(a+a\cos(c+dx))^{3/2}}\,dx}{24a^4}$$

$$= -\frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{7\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} - \frac{259\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} - \frac{\int \frac{\sqrt{\cos(c+dx)}\left(\frac{777a^3}{8}-\frac{567}{4}a^3\cos(c+dx)\right)}{\sqrt{a+a\cos(c+dx)}}\,dx}{48a^6}$$

$$= -\frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{7\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} - \frac{259\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} + \frac{189\sqrt{\cos(c+dx)}\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}} - \frac{\int \frac{-\frac{567a^4}{8}+168a^4\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{48a^7}$$

$$= -\frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{7\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} - \frac{259\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} + \frac{189\sqrt{\cos(c+dx)}\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}} - \frac{7\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx}{2a^4} + \frac{637\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{128a^3}$$

$$= -\frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{7\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} - \frac{259\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} + \frac{189\sqrt{\cos(c+dx)}\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}} + \frac{7\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^4d} - \frac{637\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64a^2d}$$

$$= -\frac{7\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{7/2}d} + \frac{637\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64\sqrt{2}a^{7/2}d} - \frac{\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{7\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} - \frac{259\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} + \frac{189\sqrt{\cos(c+dx)}\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 1.10 (sec) , antiderivative size = 256, normalized size of antiderivative = 1.01

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{\sqrt{a(1+\cos(c+dx))}\left(4536\arcsin\left(\sqrt{1-\cos(c+dx)}\right)\cos^6\left(\frac{1}{2}(c+dx)\right)+15\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(9/2)/(a + a*Cos[c + d*x])^(7/2),x]
```

```
[Out] (Sqrt[a*(1 + Cos[c + d*x])]*(4536*ArcSin[Sqrt[1 - Cos[c + d*x]]]*Cos[(c + d
*x)/2]^6 + 15288*ArcSin[Sqrt[Cos[c + d*x]]]*Cos[(c + d*x)/2]^6 - 7644*Sqrt[
2]*ArcTan[Sqrt[Cos[c + d*x]]/Sqrt[Sin[(c + d*x)/2]^2]]*Cos[(c + d*x)/2]^6 +
 1442*Sqrt[1 - Cos[c + d*x]]*Cos[c + d*x]^(3/2) + 1099*Sqrt[1 - Cos[c + d*x
]]*Cos[c + d*x]^(5/2) + 192*Sqrt[1 - Cos[c + d*x]]*Cos[c + d*x]^(7/2) + 567
*Sqrt[-((-1 + Cos[c + d*x])*Cos[c + d*x])]*Sin[c + d*x])/(192*a^4*d*Sqrt[1
 - Cos[c + d*x]]*(1 + Cos[c + d*x])^4)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 447 vs. $2(211) = 422$.

Time = 12.47 (sec) , antiderivative size = 448, normalized size of antiderivative = 1.76

method	result
default	$\frac{\left(192\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\left(\cos^3(dx+c)\right)\sin(dx+c)+1099\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\left(\cos^2(dx+c)\right)\sin(dx+c)-1344\sqrt{2}\arctan\left(\tan(dx+c)\sqrt{\frac{\cos}{1+c}}\right.\right.}{}$

```
[In] int(cos(d*x+c)^(9/2)/(a+cos(d*x+c)*a)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/384/d*(192*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^3*sin(d*x
+c)+1099*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*sin(d*x+c)-
1344*2^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))*cos(d*x+c
)^3+1442*2^(1/2)*cos(d*x+c)*sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-19
11*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^3-4032*2^(1/2)*arctan(tan(d*x+c
)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))*cos(d*x+c)^2+567*sin(d*x+c)*2^(1/2)*(c
```

```
os(d*x+c)/(1+cos(d*x+c)))^(1/2)-5733*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+
c)^2-4032*2^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))*cos(
d*x+c)-5733*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)-1344*2^(1/2)*arctan(ta
n(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))-1911*arcsin(cot(d*x+c)-csc(d*x+
c)))*cos(d*x+c)^(1/2)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^4/(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*2^(1/2)/a^4
```

Fricas [A] (verification not implemented)

none

Time = 0.54 (sec) , antiderivative size = 280, normalized size of antiderivative = 1.10

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = -\frac{1911\,\sqrt{2}\left(\cos\left(dx+c\right)^4+4\,\cos\left(dx+c\right)^3+6\,\cos\left(dx+c\right)^2+4\,\cos\left(dx+c\right)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}}{\sqrt{a}\sin(dx+}\right.}{}$$

```
[In] integrate(cos(d*x+c)^(9/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] -1/384*(1911*sqrt(2)*(cos(d*x + c)^4 + 4*cos(d*x + c)^3 + 6*cos(d*x + c)^2
+ 4*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(
cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - 2*(192*cos(d*x + c)^3 + 1099*cos(d*
x + c)^2 + 1442*cos(d*x + c) + 567)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x +
 c))*sin(d*x + c) - 2688*(cos(d*x + c)^4 + 4*cos(d*x + c)^3 + 6*cos(d*x + c
)^2 + 4*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(cos(
d*x + c))/(sqrt(a)*sin(d*x + c))))/(a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(d*x
+ c)^3 + 6*a^4*d*cos(d*x + c)^2 + 4*a^4*d*cos(d*x + c) + a^4*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(9/2)/(a+a*cos(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{\cos(dx+c)^{\frac{9}{2}}}{(a\cos(dx+c)+a)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(9/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(9/2)/(a*cos(d*x + c) + a)^(7/2), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(9/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{\cos(c+d\,x)^{9/2}}{(a+a\,\cos(c+d\,x))^{7/2}}\,dx$$

```
[In] int(cos(c + d*x)^(9/2)/(a + a*cos(c + d*x))^(7/2),x)
[Out] int(cos(c + d*x)^(9/2)/(a + a*cos(c + d*x))^(7/2), x)
```

3.252 $\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 214

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{2\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{7/2}d} - \frac{177\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64\sqrt{2}a^{7/2}d} - \frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{17\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} - \frac{49\sqrt{\cos(c+dx)}\sin(c+dx)}{64a^2d(a+a\cos(c+dx))^{3/2}}$$

```
[Out] 2*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(7/2)/d-1/6*cos(d*x+c
)^(5/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(7/2)-17/48*cos(d*x+c)^(3/2)*sin(d*x+
c)/a/d/(a+a*cos(d*x+c))^(5/2)-177/128*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)
/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(7/2)/d*2^(1/2)-49/64*sin(d*x+c
)*cos(d*x+c)^(1/2)/a^2/d/(a+a*cos(d*x+c))^(3/2)
```

Rubi [A] (verified)

Time = 0.72 (sec) , antiderivative size = 214, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used

$= \{2844, 3056, 3061, 2861, 211, 2853, 222\}$

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{2\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{a^{7/2}d} - \frac{177\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{64\sqrt{2}a^{7/2}d} - \frac{49\sin(c+dx)\sqrt{\cos(c+dx)}}{64a^2d(a\cos(c+dx)+a)^{3/2}} - \frac{\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{6d(a\cos(c+dx)+a)^{7/2}} - \frac{17\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{48ad(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[Cos[c + d*x]^(7/2)/(a + a*Cos[c + d*x])^(7/2),x]
```

```
[Out] (2*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]])/(a^(7/2)*d) - (
177*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Co
s[c + d*x]])])/(64*Sqrt[2]*a^(7/2)*d) - (Cos[c + d*x]^(5/2)*Sin[c + d*x])/(
6*d*(a + a*Cos[c + d*x])^(7/2)) - (17*Cos[c + d*x]^(3/2)*Sin[c + d*x])/(48*
a*d*(a + a*Cos[c + d*x])^(5/2)) - (49*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(64*
a^2*d*(a + a*Cos[c + d*x])^(3/2))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{\int \frac{\cos^{\frac{3}{2}}(c+dx)\left(\frac{5a}{2}-6a\cos(c+dx)\right)}{(a+a\cos(c+dx))^{5/2}}\,dx}{6a^2} \\
&= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{17\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} - \frac{\int \frac{\sqrt{\cos(c+dx)}\left(\frac{51a^2}{4}-24a^2\cos(c+dx)\right)}{(a+a\cos(c+dx))^{3/2}}\,dx}{24a^4} \\
&= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{17\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} \\
&\quad - \frac{49\sqrt{\cos(c+dx)}\sin(c+dx)}{64a^2d(a+a\cos(c+dx))^{3/2}} - \frac{\int \frac{\frac{147a^3}{8}-48a^3\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{48a^6}
\end{aligned}$$

$$= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{17\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} - \frac{49\sqrt{\cos(c+dx)}\sin(c+dx)}{64a^2d(a+a\cos(c+dx))^{3/2}} + \frac{\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx}{a^4} - \frac{177\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{128a^3}$$

$$= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{17\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} - \frac{49\sqrt{\cos(c+dx)}\sin(c+dx)}{64a^2d(a+a\cos(c+dx))^{3/2}} - \frac{2\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^4d} + \frac{177\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64a^2d}$$

$$= \frac{2\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^{7/2}d} - \frac{177\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64\sqrt{2}a^{7/2}d} - \frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{17\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} - \frac{49\sqrt{\cos(c+dx)}\sin(c+dx)}{64a^2d(a+a\cos(c+dx))^{3/2}}$$

Mathematica [A] (verified)

Time = 1.01 (sec) , antiderivative size = 230, normalized size of antiderivative = 1.07

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = -\frac{\sqrt{a(1+\cos(c+dx))}\left(1176\arcsin\left(\sqrt{1-\cos(c+dx)}\right)\cos^6\left(\frac{1}{2}(c+dx)\right)+4248\arcsin\left(\sqrt{\cos(c+dx)}\right)\text{co}\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(7/2)/(a + a*Cos[c + d*x])^(7/2),x]
```

```
[Out] -1/192*(Sqrt[a*(1 + Cos[c + d*x])]*(1176*ArcSin[Sqrt[1 - Cos[c + d*x]]]*Cos
[(c + d*x)/2]^6 + 4248*ArcSin[Sqrt[Cos[c + d*x]]]*Cos[(c + d*x)/2]^6 - 2124
*Sqrt[2]*ArcTan[Sqrt[Cos[c + d*x]]/Sqrt[Sin[(c + d*x)/2]^2]]*Cos[(c + d*x)/
2]^6 + 362*Sqrt[1 - Cos[c + d*x]]*Cos[c + d*x]^(3/2) + 247*Sqrt[1 - Cos[c +
 d*x]]*Cos[c + d*x]^(5/2) + 147*Sqrt[-((-1 + Cos[c + d*x])*Cos[c + d*x])])*
Sin[c + d*x])/(a^4*d*Sqrt[1 - Cos[c + d*x]]*(1 + Cos[c + d*x])^4)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 377 vs. 2(177) = 354.

Time = 3.92 (sec) , antiderivative size = 378, normalized size of antiderivative = 1.77

method	result
default	$-\frac{\left(-\frac{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2-1}{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1}\right)^{\frac{7}{2}}\left(\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1\right)^4\sqrt{\frac{a}{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1}}\left(8\left(\csc^5(dx+c)\right)\sqrt{-(\csc\right.}{}$

[In] int(cos(d*x+c)^(7/2)/(a+cos(d*x+c)*a)^(7/2),x,method=_RETURNVERBOSE)

[Out] -1/384/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(7/2)/(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(7/2)*(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^4*(a/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2)*(8*csc(d*x+c)^5*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(1-cos(d*x+c))^5-50*csc(d*x+c)^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(1-cos(d*x+c))^3+384*2^(1/2)*arctan(2^(1/2)*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)*(csc(d*x+c)-cot(d*x+c)))+189*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(csc(d*x+c)-cot(d*x+c))-531*arcsin(cot(d*x+c)-csc(d*x+c)))*2^(1/2)/a^4

Fricas [A] (verification not implemented)

none

Time = 0.44 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.26

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{531\sqrt{2}\left(\cos\left(dx+c\right)^4+4\cos\left(dx+c\right)^3+6\cos\left(dx+c\right)^2+4\cos\left(dx+c\right)+1\right)}{}$$

[In] integrate(cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="fricas")

[Out] 1/384*(531*sqrt(2)*(cos(d*x + c)^4 + 4*cos(d*x + c)^3 + 6*cos(d*x + c)^2 + 4*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - 2*sqrt(a*cos(d*x + c) + a)*(247*cos(d*x + c)^2 + 362*cos(d*x + c) + 147)*sqrt(cos(d*x + c))*sin(d*x + c) - 768*(cos(d*x + c)^4 + 4*cos(d*x + c)^3 + 6*cos(d*x + c)^2 + 4*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))))/(a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(d*x + c)^3 + 6*a^4*d*cos(d*x + c)^2 + 4*a^4*d*cos(d*x + c) + a^4*d)

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(7/2)/(a+a*cos(d*x+c))**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{7}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(7/2)/(a*cos(d*x + c) + a)^(7/2), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{{\cos\left(c+d\,x\right)}^{7/2}}{{\left(a+a\,\cos\left(c+d\,x\right)\right)}^{7/2}}\,dx$$

```
[In] int(cos(c + d*x)^(7/2)/(a + a*cos(c + d*x))^(7/2),x)
[Out] int(cos(c + d*x)^(7/2)/(a + a*cos(c + d*x))^(7/2), x)
```

3.253 $\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 177

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{5\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64\sqrt{2}a^{7/2}d} - \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{13\sqrt{\cos(c+dx)}\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} + \frac{67\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}}$$

```
[Out] -1/6*cos(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(7/2)+5/128*arctan(1/2*
sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(7/2)
/d*2^(1/2)-13/48*sin(d*x+c)*cos(d*x+c)^(1/2)/a/d/(a+a*cos(d*x+c))^(5/2)+67/
192*sin(d*x+c)*cos(d*x+c)^(1/2)/a^2/d/(a+a*cos(d*x+c))^(3/2)
```

Rubi [A] (verified)

Time = 0.48 (sec) , antiderivative size = 177, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {2844, 3056, 3057, 12, 2861, 211}

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{5\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{64\sqrt{2}a^{7/2}d} + \frac{67\sin(c+dx)\sqrt{\cos(c+dx)}}{192a^2d(a\cos(c+dx)+a)^{3/2}} - \frac{\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{6d(a\cos(c+dx)+a)^{7/2}} - \frac{13\sin(c+dx)\sqrt{\cos(c+dx)}}{48ad(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[Cos[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^(7/2),x]
```

```
[Out] (5*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos
[c + d*x]])])/(64*Sqrt[2]*a^(7/2)*d) - (Cos[c + d*x]^(3/2)*Sin[c + d*x])/(6
*d*(a + a*Cos[c + d*x])^(7/2)) - (13*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(48*a
*d*(a + a*Cos[c + d*x])^(5/2)) + (67*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(192*
a^2*d*(a + a*Cos[c + d*x])^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
```

```
egerQ[2*n] || EqQ[c, 0])
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{\int \frac{\sqrt{\cos(c+dx)}\left(\frac{3a}{2}-5a\cos(c+dx)\right)}{(a+a\cos(c+dx))^{5/2}}\,dx}{6a^2} \\
&= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{13\sqrt{\cos(c+dx)}\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} - \frac{\int \frac{\frac{13a^2}{4}-\frac{27}{2}a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx}{24a^4} \\
&= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{13\sqrt{\cos(c+dx)}\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} \\
&\quad + \frac{67\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} - \frac{\int -\frac{15a^3}{8\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{48a^6} \\
&= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{13\sqrt{\cos(c+dx)}\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} \\
&\quad + \frac{67\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} + \frac{5\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{128a^3} \\
&= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{13\sqrt{\cos(c+dx)}\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} \\
&\quad + \frac{67\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} \\
&\quad - \frac{5\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64a^2d} \\
&= \frac{5\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64\sqrt{2}a^{7/2}d} - \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} \\
&\quad - \frac{13\sqrt{\cos(c+dx)}\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} + \frac{67\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}}
\end{aligned}$$

Mathematica [A] (warning: unable to verify)

Time = 1.79 (sec) , antiderivative size = 176, normalized size of antiderivative = 0.99

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{\cos^7\left(\frac{1}{2}(c+dx)\right)\sqrt{a(1+\cos(c+dx))}\left(15\arcsin\left(\frac{\sin\left(\frac{1}{2}(c+dx)\right)}{\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)}}\right)\sqrt{\cos^2\left(\frac{1}{2}(\right.}\right.}{24a^4d\sqrt{\cos^2\left(\right.}}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^(7/2),x]
```

```
[Out] (Cos[(c + d*x)/2]^7*Sqrt[a*(1 + Cos[c + d*x])]*(15*ArcSin[Sin[(c + d*x)/2]/
Sqrt[Cos[(c + d*x)/2]^2]]*Sqrt[Cos[(c + d*x)/2]^2] + Sqrt[2]*Sqrt[Cos[c + d
*x]/(1 + Cos[c + d*x])]*Sin[(c + d*x)/2]*(33 - 26*Tan[(c + d*x)/2]^2 + 8*Ta
n[(c + d*x)/2]^4)))/(24*a^4*d*Sqrt[Cos[(c + d*x)/2]^2]*(1 + Cos[c + d*x])^4
)
```

Maple [A] (verified)

Time = 3.60 (sec) , antiderivative size = 260, normalized size of antiderivative = 1.47

method	result
default	$-\frac{\left(-67\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,(\cos^2(dx+c))\sin(dx+c)+15\arcsin(\cot(dx+c)-\csc(dx+c))(\cos^3(dx+c))-50\sqrt{2}\,\cos(dx+c)\sin(dx+c)\sqrt{\frac{}{1}}\right.}{}$

```
[In] int(cos(d*x+c)^(5/2)/(a+cos(d*x+c)*a)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/384/d*(-67*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*sin(d*
x+c)+15*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^3-50*2^(1/2)*cos(d*x+c)*si
n(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+45*arcsin(cot(d*x+c)-csc(d*x+c))
*cos(d*x+c)^2-15*sin(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+45*ar
csin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)+15*arcsin(cot(d*x+c)-csc(d*x+c)))*co
s(d*x+c)^(1/2)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^4/(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*2^(1/2)/a^4
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 214, normalized size of antiderivative = 1.21

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{15\sqrt{2}\left(\cos\left(dx+c\right)^{4}+4\,\cos\left(dx+c\right)^{3}+6\,\cos\left(dx+c\right)^{2}+4\,\cos\left(dx+c\right)+1\right)\sqrt{}}{384\left(a^{4}d\cos\left(d\right.\right.}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/384*(15*sqrt(2)*(cos(d*x + c)^4 + 4*cos(d*x + c)^3 + 6*cos(d*x + c)^2 + 4
*cos(d*x + c) + 1)*sqrt(a)*arctan(1/2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt
(a)*sqrt(cos(d*x + c))*sin(d*x + c)/(a*cos(d*x + c)^2 + a*cos(d*x + c))) +
2*sqrt(a*cos(d*x + c) + a)*(67*cos(d*x + c)^2 + 50*cos(d*x + c) + 15)*sqrt(
cos(d*x + c))*sin(d*x + c))/(a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(d*x + c)^3
+ 6*a^4*d*cos(d*x + c)^2 + 4*a^4*d*cos(d*x + c) + a^4*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)/(a+a*cos(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] integrate(cos(d*x + c)^(5/2)/(a*cos(d*x + c) + a)^(7/2), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{\cos(c+d\,x)^{5/2}}{(a+a\,\cos(c+d\,x))^{7/2}}\,dx$$

```
[In] int(cos(c + d*x)^(5/2)/(a + a*cos(c + d*x))^(7/2),x)
[Out] int(cos(c + d*x)^(5/2)/(a + a*cos(c + d*x))^(7/2), x)
```

3.254 $\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 177

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{7\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64\sqrt{2}a^{7/2}d} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} + \frac{3\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} + \frac{17\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}}$$

```
[Out] 7/128*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c
))^(1/2))/a^(7/2)/d*2^(1/2)-1/6*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x+
c))^(7/2)+3/16*sin(d*x+c)*cos(d*x+c)^(1/2)/a/d/(a+a*cos(d*x+c))^(5/2)+17/19
2*sin(d*x+c)*cos(d*x+c)^(1/2)/a^2/d/(a+a*cos(d*x+c))^(3/2)
```

Rubi [A] (verified)

Time = 0.50 (sec) , antiderivative size = 177, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2844, 3057, 12, 2861, 211}

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{7\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{64\sqrt{2}a^{7/2}d} + \frac{17\sin(c+dx)\sqrt{\cos(c+dx)}}{192a^2d(a\cos(c+dx)+a)^{3/2}} + \frac{3\sin(c+dx)\sqrt{\cos(c+dx)}}{16ad(a\cos(c+dx)+a)^{5/2}} - \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{6d(a\cos(c+dx)+a)^{7/2}}$$

```
[In] Int[Cos[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^(7/2),x]
```

```
[Out] (7*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos
[c + d*x]])])/(64*Sqrt[2]*a^(7/2)*d) - (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(6
*d*(a + a*Cos[c + d*x])^(7/2)) + (3*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(16*a*
d*(a + a*Cos[c + d*x])^(5/2)) + (17*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(192*a
^2*d*(a + a*Cos[c + d*x])^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\text{integral} = -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{\int \frac{\frac{a}{2}-4a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}\,dx}{6a^2}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} + \frac{3\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} - \frac{\int \frac{-\frac{a^2}{4}-\frac{9}{2}a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx}{24a^4}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} + \frac{3\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} + \frac{17\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} - \frac{\int -\frac{21a^3}{8\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{48a^6}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} + \frac{3\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} + \frac{17\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} + \frac{7\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{128a^3}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} + \frac{3\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} + \frac{17\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} - \frac{7\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64a^2d}$$

$$= \frac{7\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64\sqrt{2}a^{7/2}d} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} + \frac{3\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} + \frac{17\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}}$$

Mathematica [A] (verified)

Time = 1.27 (sec) , antiderivative size = 148, normalized size of antiderivative = 0.84

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{\sec^4\left(\frac{1}{2}(c+dx)\right)\left(672\text{arctanh}\left(\sqrt{-\sec(c+dx)\sin^2\left(\frac{1}{2}(c+dx)\right)}\right)\cos^6\left(\frac{1}{2}(c+a\right.\right.}{3072\sqrt{2}a^3c}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^(7/2),x]
[Out] (Sec[(c + d*x)/2]^4*(672*ArcTanh[Sqrt[-(Sec[c + d*x]*Sin[(c + d*x)/2]^2)]]*
Cos[(c + d*x)/2]^6 + (140 + 135*Cos[c + d*x] + 140*Cos[2*(c + d*x)] + 17*Co
s[3*(c + d*x)])*Sqrt[2 - 2*Sec[c + d*x]])*Tan[(c + d*x)/2])/(3072*Sqrt[2]*a
^3*d*Sqrt[-1 + Cos[c + d*x]]*Sqrt[a*(1 + Cos[c + d*x])])
```

Maple [A] (verified)

Time = 3.74 (sec) , antiderivative size = 260, normalized size of antiderivative = 1.47

method	result
default	$\frac{\left(17\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,(\cos^2(dx+c))\sin(dx+c)+70\sqrt{2}\,\cos(dx+c)\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-21\arcsin(\cot(dx+c)-\csc(dx+c))(\cos^3(}{}$

```
[In] int(cos(d*x+c)^(3/2)/(a+cos(d*x+c)*a)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/384/d*(17*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*sin(d*x+
c)+70*2^(1/2)*cos(d*x+c)*sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-21*ar
csin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^3+21*sin(d*x+c)*2^(1/2)*(cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)-63*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^2-63*arcs
in(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)-21*arcsin(cot(d*x+c)-csc(d*x+c)))*cos(
d*x+c)^(1/2)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^4/(cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)*2^(1/2)/a^4
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 214, normalized size of antiderivative = 1.21

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{21\sqrt{2}\left(\cos\left(dx+c\right)^4+4\,\cos\left(dx+c\right)^3+6\,\cos\left(dx+c\right)^2+4\,\cos\left(dx+c\right)+1\right)}{384\,\left(a^4 d\cos\left(\right.\right.}$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/384*(21*sqrt(2)*(cos(d*x + c)^4 + 4*cos(d*x + c)^3 + 6*cos(d*x + c)^2 + 4
*cos(d*x + c) + 1)*sqrt(a)*arctan(1/2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt
(a)*sqrt(cos(d*x + c))*sin(d*x + c)/(a*cos(d*x + c)^2 + a*cos(d*x + c))) +
2*sqrt(a*cos(d*x + c) + a)*(17*cos(d*x + c)^2 + 70*cos(d*x + c) + 21)*sqrt(
cos(d*x + c))*sin(d*x + c))/(a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(d*x + c)^3
+ 6*a^4*d*cos(d*x + c)^2 + 4*a^4*d*cos(d*x + c) + a^4*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(3/2)/(a+a*cos(d*x+c))**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{\cos(dx+c)^{\frac{3}{2}}}{(a\cos(dx+c)+a)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(3/2)/(a*cos(d*x + c) + a)^(7/2), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{\cos(c+d\,x)^{3/2}}{(a+a\,\cos(c+d\,x))^{7/2}}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)/(a + a*cos(c + d*x))^(7/2),x)
[Out] int(cos(c + d*x)^(3/2)/(a + a*cos(c + d*x))^(7/2), x)
```

3.255 $\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 177

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{13\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64\sqrt{2}a^{7/2}d} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}}$$

```
[Out] 13/128*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+
c))^(1/2))/a^(7/2)/d*2^(1/2)+1/6*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x
+c))^(7/2)+1/16*sin(d*x+c)*cos(d*x+c)^(1/2)/a/d/(a+a*cos(d*x+c))^(5/2)-5/19
2*sin(d*x+c)*cos(d*x+c)^(1/2)/a^2/d/(a+a*cos(d*x+c))^(3/2)
```

Rubi [A] (verified)

Time = 0.50 (sec) , antiderivative size = 177, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2843, 3057, 12, 2861, 211}

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{13\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{64\sqrt{2}a^{7/2}d} - \frac{5\sin(c+dx)\sqrt{\cos(c+dx)}}{192a^2d(a\cos(c+dx)+a)^{3/2}} + \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{16ad(a\cos(c+dx)+a)^{5/2}} + \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{6d(a\cos(c+dx)+a)^{7/2}}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/(a + a*Cos[c + d*x])^(7/2),x]
```

```
[Out] (13*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Co
s[c + d*x]])])/(64*Sqrt[2]*a^(7/2)*d) + (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(
6*d*(a + a*Cos[c + d*x])^(7/2)) + (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(16*a*d
*(a + a*Cos[c + d*x])^(5/2)) - (5*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(192*a^2
*d*(a + a*Cos[c + d*x])^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2843

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*
((c + d*Sin[e + f*x])^n/(a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[a*d*n - b*c*
(m + 1) - b*d*(m + n + 1)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e,
 f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && L
tQ[m, -1] && LtQ[0, n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c,
 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}}+\frac{\int \frac{\frac{a}{2}+2a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}\,dx}{6a^2}\\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}}+\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}}+\frac{\int \frac{\frac{11a^2}{4}+\frac{3}{2}a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx}{24a^4}\\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}}+\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}}\\
&\quad-\frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}}+\frac{\int \frac{39a^3}{8\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{48a^6}\\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}}+\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}}\\
&\quad-\frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}}+\frac{13\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{128a^3}\\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}}+\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}}\\
&\quad-\frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}}\\
&\quad-\frac{13\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64a^2d}\\
&= \frac{13\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64\sqrt{2}a^{7/2}d}+\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}}\\
&\quad+\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}}-\frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 1.82 (sec) , antiderivative size = 149, normalized size of antiderivative = 0.84

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{7/2}}\,dx=\frac{\cos\left(\frac{1}{2}(c+dx)\right)\sqrt{\cos(c+dx)}\sqrt{a(1+\cos(c+dx))}\Big(73+4\cos(c+dx)-5\,\mathrm{co}}{}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/(a + a*Cos[c + d*x])^(7/2),x]
```

```
[Out] (Cos[(c + d*x)/2]*Sqrt[Cos[c + d*x]]*Sqrt[a*(1 + Cos[c + d*x])]*(73 + 4*Cos
[c + d*x] - 5*Cos[2*(c + d*x)] - 156*ArcTanh[Sqrt[-(Sec[c + d*x]*Sin[(c + d
*x)/2]^2)]]*Cos[(c + d*x)/2]^4*Cot[(c + d*x)/2]^2*Sqrt[2 - 2*Sec[c + d*x]])
*Sin[(c + d*x)/2])/(192*a^4*d*(1 + Cos[c + d*x])^4)
```

Maple [A] (verified)

Time = 3.24 (sec) , antiderivative size = 260, normalized size of antiderivative = 1.47

method	result
default	$-\frac{\left(5\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,(\cos^2(dx+c))\sin(dx+c)-2\sqrt{2}\,\cos(dx+c)\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+39\arcsin(\cot(dx+c)-\csc(dx+c))\left(\cos^3(dx\right.\right.}{}$

```
[In] int(cos(d*x+c)^(1/2)/(a+cos(d*x+c)*a)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/384/d*(5*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*sin(d*x+
c)-2*2^(1/2)*cos(d*x+c)*sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+39*arc
sin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^3-39*sin(d*x+c)*2^(1/2)*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)+117*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^2+117*arc
sin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)+39*arcsin(cot(d*x+c)-csc(d*x+c)))*(a*
(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^(1/2)/(1+cos(d*x+c))^4/(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)*2^(1/2)/a^4
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 214, normalized size of antiderivative = 1.21

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{39\sqrt{2}\left(\cos\left(dx+c\right)^4+4\cos\left(dx+c\right)^3+6\cos\left(dx+c\right)^2+4\cos\left(dx+c\right)+1\right)\cdots}{384\left(a^4d\cos\left(dx\cdots\right.\right.}$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/384*(39*sqrt(2)*(cos(d*x + c)^4 + 4*cos(d*x + c)^3 + 6*cos(d*x + c)^2 + 4
*cos(d*x + c) + 1)*sqrt(a)*arctan(1/2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt
(a)*sqrt(cos(d*x + c))*sin(d*x + c)/(a*cos(d*x + c)^2 + a*cos(d*x + c))) -
2*sqrt(a*cos(d*x + c) + a)*(5*cos(d*x + c)^2 - 2*cos(d*x + c) - 39)*sqrt(co
s(d*x + c))*sin(d*x + c))/(a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(d*x + c)^3 +
6*a^4*d*cos(d*x + c)^2 + 4*a^4*d*cos(d*x + c) + a^4*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(1/2)/(a+a*cos(d*x+c))**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="maxima")
[Out] integrate(sqrt(cos(d*x + c))/(a*cos(d*x + c) + a)^(7/2), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{\sqrt{\cos\left(c+d\,x\right)}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^{7/2}}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(a + a*cos(c + d*x))^(7/2),x)
[Out] int(cos(c + d*x)^(1/2)/(a + a*cos(c + d*x))^(7/2), x)
```

3.256 $\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 177

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{7/2}}\,dx = \frac{63\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64\sqrt{2}a^{7/2}d} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} - \frac{103\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}}$$

```
[Out] 63/128*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+
c))^(1/2))/a^(7/2)/d*2^(1/2)-1/6*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a+a*cos(d*x
+c))^(7/2)-5/16*sin(d*x+c)*cos(d*x+c)^(1/2)/a/d/(a+a*cos(d*x+c))^(5/2)-103/
192*sin(d*x+c)*cos(d*x+c)^(1/2)/a^2/d/(a+a*cos(d*x+c))^(3/2)
```

Rubi [A] (verified)

Time = 0.52 (sec) , antiderivative size = 177, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2845, 3057, 12, 2861, 211}

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{7/2}}\,dx = \frac{63\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{64\sqrt{2}a^{7/2}d} - \frac{103\sin(c+dx)\sqrt{\cos(c+dx)}}{192a^2d(a\cos(c+dx)+a)^{3/2}} - \frac{5\sin(c+dx)\sqrt{\cos(c+dx)}}{16ad(a\cos(c+dx)+a)^{5/2}} - \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{6d(a\cos(c+dx)+a)^{7/2}}$$

```
[In] Int[1/(Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^(7/2)),x]
```

```
[Out] (63*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Co
s[c + d*x]])])/(64*Sqrt[2]*a^(7/2)*d) - (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(
6*d*(a + a*Cos[c + d*x])^(7/2)) - (5*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(16*a
*d*(a + a*Cos[c + d*x])^(5/2)) - (103*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(192
*a^2*d*(a + a*Cos[c + d*x])^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
```

```
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\text{integral} = -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} + \frac{\int \frac{\frac{11a}{2}-2a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}\,dx}{6a^2}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} + \frac{\int \frac{\frac{73a^2}{4}-\frac{15}{2}a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx}{24a^4}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} - \frac{103\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} + \frac{\int \frac{189a^3}{8\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{48a^6}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} - \frac{103\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} + \frac{63\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{128a^3}$$

$$= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} - \frac{103\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} - \frac{63\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64a^2d}$$

$$= \frac{63\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64\sqrt{2}a^{7/2}d} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}} - \frac{103\sqrt{\cos(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}}$$

Mathematica [A] (verified)

Time = 1.45 (sec) , antiderivative size = 148, normalized size of antiderivative = 0.84

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{7/2}}\,dx =$$
$$-\frac{\sec^4\left(\frac{1}{2}(c+dx)\right)\left(-6048\text{arctanh}\left(\sqrt{-\sec(c+dx)\sin^2\left(\frac{1}{2}(c+dx)\right)}\right)\cos^6\left(\frac{1}{2}(c+dx)\right)+(532+1089\cos(c\right.}{3072\sqrt{2}a^3d\sqrt{-1+\cos(c+dx)}\sqrt{a(}}$$

```
[In] Integrate[1/(Sqrt[Cos[c + d*x]]*(a + a*Cos[c + d*x])^(7/2)),x]
```

```
[Out] -1/3072*(Sec[(c + d*x)/2]^4*(-6048*ArcTanh[Sqrt[-(Sec[c + d*x]*Sin[(c + d*x
)/2]^2)]]*Cos[(c + d*x)/2]^6 + (532 + 1089*Cos[c + d*x] + 532*Cos[2*(c + d*
x)] + 103*Cos[3*(c + d*x)])*Sqrt[2 - 2*Sec[c + d*x]])*Tan[(c + d*x)/2])/(Sq
rt[2]*a^3*d*Sqrt[-1 + Cos[c + d*x]]*Sqrt[a*(1 + Cos[c + d*x])])
```

Maple [A] (verified)

Time = 5.66 (sec) , antiderivative size = 277, normalized size of antiderivative = 1.56

method	result
default	$-\frac{\sqrt{-(\csc^2(dx+c))(1-\cos(dx+c))^2+1}\sqrt{\frac{a}{(\csc^2(dx+c))(1-\cos(dx+c))^2+1}}\left(8(\csc^5(dx+c))\sqrt{-(\csc^2(dx+c))(1-\cos(dx+c))^2+1}(1-\cos\right.}{}$

```
[In] int(1/cos(d*x+c)^(1/2)/(a+cos(d*x+c)*a)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/384/d/(-(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2
+1))^(1/2)*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(a/(csc(d*x+c)^2*(1-cos
(d*x+c))^2+1))^(1/2)*(8*csc(d*x+c)^5*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/
2)*(1-cos(d*x+c))^5+46*csc(d*x+c)^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2
)*(1-cos(d*x+c))^3+141*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(csc(d*x+c)
-cot(d*x+c))+189*arcsin(cot(d*x+c)-csc(d*x+c)))*2^(1/2)/a^4
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 214, normalized size of antiderivative = 1.21

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{7/2}}\,dx = \frac{189\sqrt{2}\left(\cos\left(dx+c\right)^4+4\,\cos\left(dx+c\right)^3+6\,\cos\left(dx+c\right)^2+4\,\cos\right.}{}$$

[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="fricas")

[Out] 1/384*(189*sqrt(2)*(cos(d*x + c)^4 + 4*cos(d*x + c)^3 + 6*cos(d*x + c)^2 + 4*cos(d*x + c) + 1)*sqrt(a)*arctan(1/2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*sqrt(cos(d*x + c))*sin(d*x + c)/(a*cos(d*x + c)^2 + a*cos(d*x + c))) - 2*sqrt(a*cos(d*x + c) + a)*(103*cos(d*x + c)^2 + 266*cos(d*x + c) + 195)*sqrt(cos(d*x + c))*sin(d*x + c))/(a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(d*x + c)^3 + 6*a^4*d*cos(d*x + c)^2 + 4*a^4*d*cos(d*x + c) + a^4*d)

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

[In] integrate(1/cos(d*x+c)**(1/2)/(a+a*cos(d*x+c))**(7/2),x)

[Out] Timed out

Maxima [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{1}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{7}{2}}\sqrt{\cos\left(dx+c\right)}}\,dx$$

[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="maxima")

[Out] integrate(1/((a*cos(d*x + c) + a)^(7/2)*sqrt(cos(d*x + c))), x)

Giac [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{1}{\sqrt{\cos(c+d\,x)}\,{(a+a\,\cos(c+d\,x))}^{7/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^(7/2)),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(a + a*cos(c + d*x))^(7/2)), x)
```

3.257 $\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 217

$$\begin{aligned}\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx &= -\frac{363\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64\sqrt{2}a^{7/2}d} \\ &- \frac{\sin(c+dx)}{6d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{7/2}} - \frac{19\sin(c+dx)}{48ad\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}} \\ &- \frac{199\sin(c+dx)}{192a^2d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}} \\ &+ \frac{691\sin(c+dx)}{192a^3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\end{aligned}$$

```
[Out] -363/128*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*
x+c))^(1/2))/a^(7/2)/d*2^(1/2)-1/6*sin(d*x+c)/d/(a+a*cos(d*x+c))^(7/2)/cos(
d*x+c)^(1/2)-19/48*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^(5/2)/cos(d*x+c)^(1/2)-1
99/192*sin(d*x+c)/a^2/d/(a+a*cos(d*x+c))^(3/2)/cos(d*x+c)^(1/2)+691/192*sin
(d*x+c)/a^3/d/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.71 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used

$= \{2845, 3057, 3063, 12, 2861, 211\}$

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx = -\frac{363\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{64\sqrt{2}a^{7/2}d} + \frac{691\sin(c+dx)}{192a^3d\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}} - \frac{199\sin(c+dx)}{192a^2d\sqrt{\cos(c+dx)}(a\cos(c+dx)+a)^{3/2}} - \frac{19\sin(c+dx)}{48ad\sqrt{\cos(c+dx)}(a\cos(c+dx)+a)^{5/2}} - \frac{\sin(c+dx)}{6d\sqrt{\cos(c+dx)}(a\cos(c+dx)+a)^{7/2}}$$

```
[In] Int[1/(Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^(7/2)),x]
```

```
[Out] (-363*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*
Cos[c + d*x]])])/(64*Sqrt[2]*a^(7/2)*d) - Sin[c + d*x]/(6*d*Sqrt[Cos[c + d*
x]]*(a + a*Cos[c + d*x])^(7/2)) - (19*Sin[c + d*x])/(48*a*d*Sqrt[Cos[c + d*
x]]*(a + a*Cos[c + d*x])^(5/2)) - (199*Sin[c + d*x])/(192*a^2*d*Sqrt[Cos[c
+ d*x]]*(a + a*Cos[c + d*x])^(3/2)) + (691*Sin[c + d*x])/(192*a^3*d*Sqrt[Co
s[c + d*x]]*Sqrt[a + a*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
```

```
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\sin(c+dx)}{6d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{7/2}}+\frac{\int \frac{\frac{13a}{2}-3a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx}{6a^2}\\
&= -\frac{\sin(c+dx)}{6d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{7/2}}\\
&\quad-\frac{19\sin(c+dx)}{48ad\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}+\frac{\int \frac{\frac{123a^2}{4}-19a^2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx}{24a^4}\\
&= -\frac{\sin(c+dx)}{6d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{7/2}}-\frac{19\sin(c+dx)}{48ad\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}\\
&\quad-\frac{199\sin(c+dx)}{192a^2d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}+\frac{\int \frac{\frac{691a^3}{8}-\frac{199}{4}a^3\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx}{48a^6}
\end{aligned}
$$

$$= -\frac{\sin(c+dx)}{6d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{7/2}} - \frac{19\sin(c+dx)}{48ad\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}} - \frac{199\sin(c+dx)}{192a^2d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}} + \frac{691\sin(c+dx)}{192a^3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} + \frac{\int -\frac{1089a^4}{16\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{24a^7}$$

$$= -\frac{\sin(c+dx)}{6d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{7/2}} - \frac{19\sin(c+dx)}{48ad\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}} - \frac{199\sin(c+dx)}{192a^2d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}} + \frac{691\sin(c+dx)}{192a^3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} - \frac{363\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{128a^3}$$

$$= -\frac{\sin(c+dx)}{6d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{7/2}} - \frac{19\sin(c+dx)}{48ad\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}} - \frac{199\sin(c+dx)}{192a^2d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}} + \frac{691\sin(c+dx)}{192a^3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} + \frac{363\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64a^2d}$$

$$= -\frac{363\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64\sqrt{2}a^{7/2}d} - \frac{\sin(c+dx)}{6d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{7/2}} - \frac{19\sin(c+dx)}{48ad\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}} - \frac{199\sin(c+dx)}{192a^2d\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}} + \frac{691\sin(c+dx)}{192a^3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 7.76 (sec) , antiderivative size = 559, normalized size of antiderivative = 2.58

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx = \frac{2\cos^7\left(\frac{c}{2}+\frac{dx}{2}\right)\sec^6\left(\frac{1}{2}(c+dx)\right)\sin\left(\frac{c}{2}+\frac{dx}{2}\right)\left(\frac{16\cos^8\left(\frac{1}{2}(c+dx)\right){}_5F_4\Big(2\ \ldots}{3\ldots}\right.}{\ldots}$$

```
[In] Integrate[1/(Cos[c + d*x]^(3/2)*(a + a*Cos[c + d*x])^(7/2)),x]
```

```
[Out] (2*Cos[c/2 + (d*x)/2]^7*Sec[(c + d*x)/2]^6*Sin[c/2 + (d*x)/2]*((16*Cos[(c +
 d*x)/2]^8*HypergeometricPFQ[{2, 2, 2, 2, 5/2}, {1, 1, 1, 13/2}, Sin[c/2 +
(d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^2)/(3465*(-1 +
 2*Sin[c/2 + (d*x)/2]^2)) - (Csc[c/2 + (d*x)/2]^10*(1 - 2*Sin[c/2 + (d*x)/2
]^2)^2*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(105*ArcTan
h[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Cos[(c + d*x)/2
]^6*(2187 - 12908*Sin[c/2 + (d*x)/2]^2 + 27986*Sin[c/2 + (d*x)/2]^4 - 26380
*Sin[c/2 + (d*x)/2]^6 + 8752*Sin[c/2 + (d*x)/2]^8) + Sqrt[Sin[c/2 + (d*x)/2
]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(-229635 + 2120790*Sin[c/2 + (d*x)/2]^2
- 8267707*Sin[c/2 + (d*x)/2]^4 + 17646926*Sin[c/2 + (d*x)/2]^6 - 22251094*S
in[c/2 + (d*x)/2]^8 + 16548816*Sin[c/2 + (d*x)/2]^10 - 6712984*Sin[c/2 + (d
*x)/2]^12 + 1144608*Sin[c/2 + (d*x)/2]^14)))/1680))/(d*(a*(1 + Cos[c + d*x]
))^(7/2)*(1 - 2*Sin[c/2 + (d*x)/2]^2)^(3/2))
```

Maple [A] (verified)

Time = 5.44 (sec) , antiderivative size = 324, normalized size of antiderivative = 1.49

method	result
default	$\frac{\left(1089\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\arcsin(\cot(dx+c)-\csc(dx+c))\left(\cos^4(dx+c)\right)+691\sqrt{2}\left(\cos^3(dx+c)\right)\sin(dx+c)+4356\left(\cos^3(dx+c)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ldots\right.}{\ldots}$

```
[In] int(1/cos(d*x+c)^(3/2)/(a+cos(d*x+c)*a)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/384/d*(1089*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c
))*cos(d*x+c)^4+691*2^(1/2)*cos(d*x+c)^3*sin(d*x+c)+4356*cos(d*x+c)^3*(cos(
d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))+1874*2^(1/2)*cos
(d*x+c)^2*sin(d*x+c)+6534*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*ar
csin(cot(d*x+c)-csc(d*x+c))+1599*sin(d*x+c)*cos(d*x+c)*2^(1/2)+4356*cos(d*x
+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))+384*2^(
1/2)*sin(d*x+c)+1089*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-cs
```

```
c(d*x+c))*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^4/cos(d*x+c)^(1/2)*2^(1/
2)/a^4
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 239, normalized size of antiderivative = 1.10

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx = -\frac{1089\sqrt{2}\left(\cos(dx+c)^5+4\cos(dx+c)^4+6\cos(dx+c)^3+4\cos(dx+c)^2+\cos(dx+c)\right)\sqrt{a}\arctan\left(\frac{\sqrt{\ }}{}\right.}{384\left(a^4d\cos(dx+c)^5+4a^4\right.}$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] -1/384*(1089*sqrt(2)*(cos(d*x + c)^5 + 4*cos(d*x + c)^4 + 6*cos(d*x + c)^3
 + 4*cos(d*x + c)^2 + cos(d*x + c))*sqrt(a)*arctan(1/2*sqrt(2)*sqrt(a*cos(d*
x + c) + a)*sqrt(a)*sqrt(cos(d*x + c))*sin(d*x + c)/(a*cos(d*x + c)^2 + a*c
os(d*x + c))) - 2*(691*cos(d*x + c)^3 + 1874*cos(d*x + c)^2 + 1599*cos(d*x
 + c) + 384)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*sin(d*x + c))/(a^4*
d*cos(d*x + c)^5 + 4*a^4*d*cos(d*x + c)^4 + 6*a^4*d*cos(d*x + c)^3 + 4*a^4*
d*cos(d*x + c)^2 + a^4*d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(3/2)/(a+a*cos(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{7}{2}}\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] integrate(1/((a*cos(d*x + c) + a)^(7/2)*cos(d*x + c)^(3/2)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{7}{2}}\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)^(7/2)*cos(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{1}{\cos(c+d\,x)^{3/2}\,(a+a\,\cos(c+d\,x))^{7/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^(7/2)),x)
[Out] int(1/(cos(c + d*x)^(3/2)*(a + a*cos(c + d*x))^(7/2)), x)
```

3.258 $\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 257

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx = \frac{1015\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64\sqrt{2}a^{7/2}d} - \frac{\sin(c+dx)}{6d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}} - \frac{23\sin(c+dx)}{48ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}} - \frac{109\sin(c+dx)}{64a^2d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}} + \frac{193\sin(c+dx)}{64a^3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{629\sin(c+dx)}{64a^3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -1/6*sin(d*x+c)/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(7/2)-23/48*sin(d*x+c)/
a/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(5/2)-109/64*sin(d*x+c)/a^2/d/cos(d*x
+c)^(3/2)/(a+a*cos(d*x+c))^(3/2)+1015/128*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(
1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(7/2)/d*2^(1/2)+193/64*sin(
d*x+c)/a^3/d/cos(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2)-629/64*sin(d*x+c)/a^3/
d/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.89 (sec) , antiderivative size = 257, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {2845, 3057, 3063, 12, 2861, 211}

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx = \frac{1015\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{64\sqrt{2}a^{7/2}d} + \frac{193\sin(c+dx)}{64a^3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} - \frac{629\sin(c+dx)}{64a^3d\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}} - \frac{109\sin(c+dx)}{64a^2d\cos^{\frac{3}{2}}(c+dx)(a\cos(c+dx)+a)^{3/2}} - \frac{23\sin(c+dx)}{48ad\cos^{\frac{3}{2}}(c+dx)(a\cos(c+dx)+a)^{5/2}} - \frac{\sin(c+dx)}{6d\cos^{\frac{3}{2}}(c+dx)(a\cos(c+dx)+a)^{7/2}}$$

```
[In] Int[1/(Cos[c + d*x]^(5/2)*(a + a*Cos[c + d*x])^(7/2)),x]
```

```
[Out] (1015*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*
Cos[c + d*x]])])/(64*Sqrt[2]*a^(7/2)*d) - Sin[c + d*x]/(6*d*Cos[c + d*x]^(3
/2)*(a + a*Cos[c + d*x])^(7/2)) - (23*Sin[c + d*x])/(48*a*d*Cos[c + d*x]^(3
/2)*(a + a*Cos[c + d*x])^(5/2)) - (109*Sin[c + d*x])/(64*a^2*d*Cos[c + d*x]
^(3/2)*(a + a*Cos[c + d*x])^(3/2)) + (193*Sin[c + d*x])/(64*a^3*d*Cos[c + d
*x]^(3/2)*Sqrt[a + a*Cos[c + d*x]]) - (629*Sin[c + d*x])/(64*a^3*d*Sqrt[Cos
[c + d*x]]*Sqrt[a + a*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\sin(c+dx)}{6d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}+\frac{\int\frac{\frac{15a}{2}-4a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx}{6a^2}\\
&= -\frac{\sin(c+dx)}{6d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\\
&\quad -\frac{23\sin(c+dx)}{48ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}+\frac{\int\frac{\frac{189a^2}{4}-\frac{69}{2}a^2\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx}{24a^4}
\end{aligned}
$$

$$= -\frac{\sin(c+dx)}{6d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}} - \frac{23\sin(c+dx)}{48ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}} - \frac{109\sin(c+dx)}{64a^2d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}} + \frac{\int \frac{\frac{1737a^3}{8}-\frac{327}{2}a^3\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}dx}{48a^6}$$

$$= -\frac{\sin(c+dx)}{6d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}} - \frac{23\sin(c+dx)}{48ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}} - \frac{109\sin(c+dx)}{64a^2d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}} + \frac{193\sin(c+dx)}{64a^3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} + \frac{\int \frac{-\frac{5661a^4}{16}+\frac{1737}{8}a^4\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}dx}{72a^7}$$

$$= -\frac{\sin(c+dx)}{6d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}} - \frac{23\sin(c+dx)}{48ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}} - \frac{109\sin(c+dx)}{64a^2d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}} + \frac{193\sin(c+dx)}{64a^3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{629\sin(c+dx)}{64a^3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} + \frac{\int \frac{9135a^5}{32\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}dx}{36a^8}$$

$$= -\frac{\sin(c+dx)}{6d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}} - \frac{23\sin(c+dx)}{48ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}} - \frac{109\sin(c+dx)}{64a^2d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}} + \frac{193\sin(c+dx)}{64a^3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{629\sin(c+dx)}{64a^3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} + \frac{1015\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}dx}{128a^3}$$

$$= -\frac{\sin(c+dx)}{6d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}} - \frac{23\sin(c+dx)}{48ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}} - \frac{109\sin(c+dx)}{64a^2d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}} + \frac{193\sin(c+dx)}{64a^3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{629\sin(c+dx)}{64a^3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}} - \frac{1015\text{Subst}\left(\int \frac{1}{2a^2+ax^2}dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64a^2d}$$

$$= \frac{1015\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64\sqrt{2}a^{7/2}d} - \frac{\sin(c+dx)}{6d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}} - \frac{23\sin(c+dx)}{48ad\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}} - \frac{109\sin(c+dx)}{64a^2d\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}} + \frac{193\sin(c+dx)}{64a^3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}} - \frac{629\sin(c+dx)}{64a^3d\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 10.28 (sec) , antiderivative size = 694, normalized size of antiderivative = 2.70

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx = \frac{\cot^7\left(\frac{c}{2}+\frac{dx}{2}\right)\csc^4\left(\frac{c}{2}+\frac{dx}{2}\right)\sec^6\left(\frac{1}{2}(c+dx)\right)\left(-7680\cos^{10}\left(\frac{1}{2}(c+\right.\right.}{}$$

```
[In] Integrate[1/(Cos[c + d*x]^(5/2)*(a + a*Cos[c + d*x])^(7/2)),x]
```

```
[Out] (Cot[c/2 + (d*x)/2]^7*Csc[c/2 + (d*x)/2]^4*Sec[(c + d*x)/2]^6*(-7680*Cos[(c
 + d*x)/2]^10*HypergeometricPFQ[{2, 2, 2, 2, 2, 7/2}, {1, 1, 1, 1, 15/2}, S
in[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^14 +
19200*Cos[(c + d*x)/2]^8*HypergeometricPFQ[{2, 2, 2, 2, 7/2}, {1, 1, 1, 15/
2}, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^
14*(-7 + 6*Sin[c/2 + (d*x)/2]^2) + 143*(1 - 2*Sin[c/2 + (d*x)/2]^2)^3*Sqrt[
Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(315*ArcTanh[Sqrt[Sin[c
/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*Cos[(c + d*x)/2]^6*(351384
- 2928877*Sin[c/2 + (d*x)/2]^2 + 9953934*Sin[c/2 + (d*x)/2]^4 - 17629526*Si
n[c/2 + (d*x)/2]^6 + 17139064*Sin[c/2 + (d*x)/2]^8 - 8670660*Sin[c/2 + (d*x
)/2]^10 + 1793816*Sin[c/2 + (d*x)/2]^12) + Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 +
2*Sin[c/2 + (d*x)/2]^2)]*(-110685960 + 1291549455*Sin[c/2 + (d*x)/2]^2 - 66
01900452*Sin[c/2 + (d*x)/2]^4 + 19406027859*Sin[c/2 + (d*x)/2]^6 - 36160322
412*Sin[c/2 + (d*x)/2]^8 + 44313222590*Sin[c/2 + (d*x)/2]^10 - 35736693140*
Sin[c/2 + (d*x)/2]^12 + 18305254212*Sin[c/2 + (d*x)/2]^14 - 5410719584*Sin[
c/2 + (d*x)/2]^16 + 704274992*Sin[c/2 + (d*x)/2]^18))))/(3243240*d*(a*(1 +
Cos[c + d*x]))^(7/2)*(1 - 2*Sin[c/2 + (d*x)/2]^2)^(7/2))
```

Maple [A] (verified)

Time = 5.86 (sec) , antiderivative size = 351, normalized size of antiderivative = 1.37

method	result
default	$-\frac{\left(3045\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\arcsin(\cot(dx+c)-\csc(dx+c))\left(\cos^5(dx+c)\right)+1887\sqrt{2}\left(\cos^4(dx+c)\right)\sin(dx+c)+12180\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\arcsin(\mathrm{co}\right.}{}$

[In] int(1/cos(d*x+c)^(5/2)/(a+cos(d*x+c)*a)^(7/2),x,method=_RETURNVERBOSE)

[Out] -1/384/d*(3045*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^5+1887*2^(1/2)*cos(d*x+c)^4*sin(d*x+c)+12180*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^4+5082*2^(1/2)*cos(d*x+c)^3*sin(d*x+c)+18270*cos(d*x+c)^3*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))+4251*2^(1/2)*cos(d*x+c)^2*sin(d*x+c)+12180*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*arcsin(cot(d*x+c)-csc(d*x+c))+896*sin(d*x+c)*cos(d*x+c)*2^(1/2)+3045*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))-128*2^(1/2)*sin(d*x+c))*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^4/cos(d*x+c)^(3/2)*2^(1/2)/a^4

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 253, normalized size of antiderivative = 0.98

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx = \frac{3045\sqrt{2}\left(\cos(dx+c)^6+4\cos(dx+c)^5+6\cos(dx+c)^4+4\cos\right.}{}$$

[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="fricas")

[Out] 1/384*(3045*sqrt(2)*(cos(d*x + c)^6 + 4*cos(d*x + c)^5 + 6*cos(d*x + c)^4 + 4*cos(d*x + c)^3 + cos(d*x + c)^2)*sqrt(a)*arctan(1/2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(a)*sqrt(cos(d*x + c))*sin(d*x + c)/(a*cos(d*x + c)^2 + a*cos(d*x + c))) - 2*(1887*cos(d*x + c)^4 + 5082*cos(d*x + c)^3 + 4251*cos(d*x + c)^2 + 896*cos(d*x + c) - 128)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*sin(d*x + c))/(a^4*d*cos(d*x + c)^6 + 4*a^4*d*cos(d*x + c)^5 + 6*a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(d*x + c)^3 + a^4*d*cos(d*x + c)^2)

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(5/2)/(a+a*cos(d*x+c))**(7/2),x)
[Out] Timed out
```

Maxima [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="maxima")
[Out] Timed out
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{7}{2}}\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)^(7/2)*cos(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{1}{\cos(c+d\,x)^{5/2}\,(a+a\,\cos(c+d\,x))^{7/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(5/2)*(a + a*cos(c + d*x))^(7/2)),x)
[Out] int(1/(cos(c + d*x)^(5/2)*(a + a*cos(c + d*x))^(7/2)), x)
```

3.259 $\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 217

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx = \frac{35\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{1024\sqrt{2}a^{9/2}d} - \frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}} - \frac{19\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{96ad(a+a\cos(c+dx))^{7/2}} - \frac{187\sqrt{\cos(c+dx)}\sin(c+dx)}{768a^2d(a+a\cos(c+dx))^{5/2}} + \frac{853\sqrt{\cos(c+dx)}\sin(c+dx)}{3072a^3d(a+a\cos(c+dx))^{3/2}}$$

```
[Out] -1/8*cos(d*x+c)^(5/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(9/2)-19/96*cos(d*x+c)^
(3/2)*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^(7/2)+35/2048*arctan(1/2*sin(d*x+c)*a
^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(9/2)/d*2^(1/2)-1
87/768*sin(d*x+c)*cos(d*x+c)^(1/2)/a^2/d/(a+a*cos(d*x+c))^(5/2)+853/3072*si
n(d*x+c)*cos(d*x+c)^(1/2)/a^3/d/(a+a*cos(d*x+c))^(3/2)
```

Rubi [A] (verified)

Time = 0.66 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {2844, 3056, 3057, 12, 2861, 211}

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx = \frac{35\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{1024\sqrt{2}a^{9/2}d} + \frac{853\sin(c+dx)\sqrt{\cos(c+dx)}}{3072a^3d(a\cos(c+dx)+a)^{3/2}} - \frac{187\sin(c+dx)\sqrt{\cos(c+dx)}}{768a^2d(a\cos(c+dx)+a)^{5/2}} - \frac{\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{8d(a\cos(c+dx)+a)^{9/2}} - \frac{19\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{96ad(a\cos(c+dx)+a)^{7/2}}$$

```
[In] Int[Cos[c + d*x]^(7/2)/(a + a*Cos[c + d*x])^(9/2),x]
```

```
[Out] (35*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Co
s[c + d*x]])])/(1024*Sqrt[2]*a^(9/2)*d) - (Cos[c + d*x]^(5/2)*Sin[c + d*x])
/(8*d*(a + a*Cos[c + d*x])^(9/2)) - (19*Cos[c + d*x]^(3/2)*Sin[c + d*x])/(9
6*a*d*(a + a*Cos[c + d*x])^(7/2)) - (187*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(
768*a^2*d*(a + a*Cos[c + d*x])^(5/2)) + (853*Sqrt[Cos[c + d*x]]*Sin[c + d*x
])/(3072*a^3*d*(a + a*Cos[c + d*x])^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
```

```
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}} - \frac{\int \frac{\cos^{\frac{3}{2}}(c+dx)\left(\frac{5a}{2}-7a\cos(c+dx)\right)}{(a+a\cos(c+dx))^{7/2}}\,dx}{8a^2} \\
&= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}} - \frac{19\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{96ad(a+a\cos(c+dx))^{7/2}} - \frac{\int \frac{\sqrt{\cos(c+dx)}\left(\frac{57a^2}{4}-\frac{65}{2}a^2\cos(c+dx)\right)}{(a+a\cos(c+dx))^{5/2}}\,dx}{48a^4} \\
&= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}} - \frac{19\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{96ad(a+a\cos(c+dx))^{7/2}} \\
&\quad - \frac{187\sqrt{\cos(c+dx)}\sin(c+dx)}{768a^2d(a+a\cos(c+dx))^{5/2}} - \frac{\int \frac{\frac{187a^3}{8}-\frac{333}{4}a^3\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx}{192a^6} \\
&= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}} - \frac{19\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{96ad(a+a\cos(c+dx))^{7/2}} \\
&\quad - \frac{187\sqrt{\cos(c+dx)}\sin(c+dx)}{768a^2d(a+a\cos(c+dx))^{5/2}} + \frac{853\sqrt{\cos(c+dx)}\sin(c+dx)}{3072a^3d(a+a\cos(c+dx))^{3/2}} \\
&\quad - \frac{\int -\frac{105a^4}{16\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{384a^8} \\
&= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}} - \frac{19\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{96ad(a+a\cos(c+dx))^{7/2}} \\
&\quad - \frac{187\sqrt{\cos(c+dx)}\sin(c+dx)}{768a^2d(a+a\cos(c+dx))^{5/2}} + \frac{853\sqrt{\cos(c+dx)}\sin(c+dx)}{3072a^3d(a+a\cos(c+dx))^{3/2}} \\
&\quad + \frac{35\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{2048a^4}
\end{aligned}
$$

$$= -\frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}} - \frac{19\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{96ad(a+a\cos(c+dx))^{7/2}} - \frac{187\sqrt{\cos(c+dx)}\sin(c+dx)}{768a^2d(a+a\cos(c+dx))^{5/2}} + \frac{853\sqrt{\cos(c+dx)}\sin(c+dx)}{3072a^3d(a+a\cos(c+dx))^{3/2}} - \frac{35\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{1024a^3d}$$

$$= \frac{35\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{1024\sqrt{2}a^{9/2}d} - \frac{\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}} - \frac{19\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{96ad(a+a\cos(c+dx))^{7/2}} - \frac{187\sqrt{\cos(c+dx)}\sin(c+dx)}{768a^2d(a+a\cos(c+dx))^{5/2}} + \frac{853\sqrt{\cos(c+dx)}\sin(c+dx)}{3072a^3d(a+a\cos(c+dx))^{3/2}}$$

Mathematica [A] (verified)

Time = 5.54 (sec) , antiderivative size = 190, normalized size of antiderivative = 0.88

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx = \frac{\cos^9\left(\frac{1}{2}(c+dx)\right)\sqrt{a(1+\cos(c+dx))}\left(105\arcsin\left(\frac{\sin\left(\frac{1}{2}(c+dx)\right)}{\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)}}\right)\sqrt{\cos^2\left(\frac{1}{2}\right.}\right.}{}$$

[In] Integrate[Cos[c + d*x]^(7/2)/(a + a*Cos[c + d*x])^(9/2),x]

[Out] (Cos[(c + d*x)/2]^9*Sqrt[a*(1 + Cos[c + d*x])]*(105*ArcSin[Sin[(c + d*x)/2]/Sqrt[Cos[(c + d*x)/2]^2]]*Sqrt[Cos[(c + d*x)/2]^2] + Sqrt[2]*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sin[(c + d*x)/2]*(279 - 326*Tan[(c + d*x)/2]^2 + 200*Tan[(c + d*x)/2]^4 - 48*Tan[(c + d*x)/2]^6)))/(192*a^5*d*Sqrt[Cos[(c + d*x)/2]^2]*(1 + Cos[c + d*x])^5)

Maple [A] (verified)

Time = 3.89 (sec) , antiderivative size = 350, normalized size of antiderivative = 1.61

method	result
default	$-\frac{\left(-\frac{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2-1}{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1}\right)^{\frac{7}{2}}\left(\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1\right)^4\sqrt{\frac{a}{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1}}\left(48\left(\csc^7(dx+c)\right)\sqrt{-\right.}\right.}{}$

[In] int(cos(d*x+c)^(7/2)/(a+cos(d*x+c)*a)^(9/2),x,method=_RETURNVERBOSE)

[Out] -1/6144/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(7/2)/(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(7/2)*(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^4*(a/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2)*(48*csc(d*x+c)^7*

```
(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(1-cos(d*x+c))^7-200*csc(d*x+c)^5*
(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(1-cos(d*x+c))^5+326*csc(d*x+c)^3*
(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(1-cos(d*x+c))^3-279*(-csc(d*x+c)^
2*(1-cos(d*x+c))^2+1)^(1/2)*(csc(d*x+c)-cot(d*x+c))+105*arcsin(cot(d*x+c)-c
sc(d*x+c)))*2^(1/2)/a^5
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.14

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx = \frac{105\sqrt{2}\left(\cos(dx+c)^5+5\cos(dx+c)^4+10\cos(dx+c)^3+10\cos(dx+c)^2 \cdots\right.}{6144 \cdots}$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^(9/2),x, algorithm="fricas")
```

```
[Out] 1/6144*(105*sqrt(2)*(cos(d*x + c)^5 + 5*cos(d*x + c)^4 + 10*cos(d*x + c)^3
+ 10*cos(d*x + c)^2 + 5*cos(d*x + c) + 1)*sqrt(a)*arctan(1/2*sqrt(2)*sqrt(a
*cos(d*x + c) + a)*sqrt(a)*sqrt(cos(d*x + c))*sin(d*x + c)/(a*cos(d*x + c)^
2 + a*cos(d*x + c))) + 2*(853*cos(d*x + c)^3 + 819*cos(d*x + c)^2 + 455*cos
(d*x + c) + 105)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*sin(d*x + c))/
(a^5*d*cos(d*x + c)^5 + 5*a^5*d*cos(d*x + c)^4 + 10*a^5*d*cos(d*x + c)^3 +
10*a^5*d*cos(d*x + c)^2 + 5*a^5*d*cos(d*x + c) + a^5*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(7/2)/(a+a*cos(d*x+c))**(9/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{7}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{9}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^(9/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(7/2)/(a*cos(d*x + c) + a)^(9/2), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+a*cos(d*x+c))^(9/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)^{7/2}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^{9/2}}\,dx$$

```
[In] int(cos(c + d*x)^(7/2)/(a + a*cos(c + d*x))^(9/2),x)
[Out] int(cos(c + d*x)^(7/2)/(a + a*cos(c + d*x))^(9/2), x)
```

3.260 $\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 217

$$\begin{aligned}\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx &= \frac{45\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{1024\sqrt{2}a^{9/2}d} \\ &\quad - \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{32ad(a+a\cos(c+dx))^{7/2}} \\ &\quad + \frac{33\sqrt{\cos(c+dx)}\sin(c+dx)}{256a^2d(a+a\cos(c+dx))^{5/2}} + \frac{73\sqrt{\cos(c+dx)}\sin(c+dx)}{1024a^3d(a+a\cos(c+dx))^{3/2}}\end{aligned}$$

```
[Out] -1/8*cos(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(9/2)+45/2048*arctan(1/
2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))/a^(9/
2)/d*2^(1/2)-5/32*sin(d*x+c)*cos(d*x+c)^(1/2)/a/d/(a+a*cos(d*x+c))^(7/2)+33
/256*sin(d*x+c)*cos(d*x+c)^(1/2)/a^2/d/(a+a*cos(d*x+c))^(5/2)+73/1024*sin(d
*x+c)*cos(d*x+c)^(1/2)/a^3/d/(a+a*cos(d*x+c))^(3/2)
```

Rubi [A] (verified)

Time = 0.82 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {2844, 3056, 3057, 12, 2861, 211}

$$\begin{aligned}\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx &= \frac{45\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{1024\sqrt{2}a^{9/2}d} \\ &\quad + \frac{73\sin(c+dx)\sqrt{\cos(c+dx)}}{1024a^3d(a\cos(c+dx)+a)^{3/2}} + \frac{33\sin(c+dx)\sqrt{\cos(c+dx)}}{256a^2d(a\cos(c+dx)+a)^{5/2}} \\ &\quad - \frac{\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{8d(a\cos(c+dx)+a)^{9/2}} - \frac{5\sin(c+dx)\sqrt{\cos(c+dx)}}{32ad(a\cos(c+dx)+a)^{7/2}}\end{aligned}$$

```
[In] Int[Cos[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^(9/2),x]
```

```
[Out] (45*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Co
s[c + d*x]])])/(1024*Sqrt[2]*a^(9/2)*d) - (Cos[c + d*x]^(3/2)*Sin[c + d*x])
/(8*d*(a + a*Cos[c + d*x])^(9/2)) - (5*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(32
*a*d*(a + a*Cos[c + d*x])^(7/2)) + (33*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(25
6*a^2*d*(a + a*Cos[c + d*x])^(5/2)) + (73*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/
(1024*a^3*d*(a + a*Cos[c + d*x])^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
```

```
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$\text{integral} = -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}} - \frac{\int \frac{\sqrt{\cos(c+dx)}\left(\frac{3a}{2}-6a\cos(c+dx)\right)}{(a+a\cos(c+dx))^{7/2}}\,dx}{8a^2}$$

$$= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{32ad(a+a\cos(c+dx))^{7/2}} - \frac{\int \frac{\frac{15a^2}{4}-21a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}\,dx}{48a^4}$$

$$= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{32ad(a+a\cos(c+dx))^{7/2}} + \frac{33\sqrt{\cos(c+dx)}\sin(c+dx)}{256a^2d(a+a\cos(c+dx))^{5/2}} - \frac{\int \frac{\frac{21a^3}{8}-\frac{99}{4}a^3\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx}{192a^6}$$

$$= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{32ad(a+a\cos(c+dx))^{7/2}} + \frac{33\sqrt{\cos(c+dx)}\sin(c+dx)}{256a^2d(a+a\cos(c+dx))^{5/2}} + \frac{73\sqrt{\cos(c+dx)}\sin(c+dx)}{1024a^3d(a+a\cos(c+dx))^{3/2}} - \frac{\int -\frac{135a^4}{16\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{384a^8}$$

$$= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{32ad(a+a\cos(c+dx))^{7/2}} + \frac{33\sqrt{\cos(c+dx)}\sin(c+dx)}{256a^2d(a+a\cos(c+dx))^{5/2}} + \frac{73\sqrt{\cos(c+dx)}\sin(c+dx)}{1024a^3d(a+a\cos(c+dx))^{3/2}} + \frac{45\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{2048a^4}$$

$$= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{32ad(a+a\cos(c+dx))^{7/2}} + \frac{33\sqrt{\cos(c+dx)}\sin(c+dx)}{256a^2d(a+a\cos(c+dx))^{5/2}} + \frac{73\sqrt{\cos(c+dx)}\sin(c+dx)}{1024a^3d(a+a\cos(c+dx))^{3/2}} - \frac{45\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{1024a^3d}$$

$$= \frac{45\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{1024\sqrt{2}a^{9/2}d} - \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}} - \frac{5\sqrt{\cos(c+dx)}\sin(c+dx)}{32ad(a+a\cos(c+dx))^{7/2}} + \frac{33\sqrt{\cos(c+dx)}\sin(c+dx)}{256a^2d(a+a\cos(c+dx))^{5/2}} + \frac{73\sqrt{\cos(c+dx)}\sin(c+dx)}{1024a^3d(a+a\cos(c+dx))^{3/2}}$$

Mathematica [A] (verified)

Time = 1.44 (sec) , antiderivative size = 158, normalized size of antiderivative = 0.73

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx = \frac{\sec^6\left(\frac{1}{2}(c+dx)\right)\left(5760\text{arctanh}\left(\sqrt{-\sec(c+dx)\sin^2\left(\frac{1}{2}(c+dx)\right)}\right)\cos^8\left(\frac{1}{2}(c\right.\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^(9/2),x]
```

```
[Out] (Sec[(c + d*x)/2]^6*(5760*ArcTanh[Sqrt[-(Sec[c + d*x]*Sin[(c + d*x)/2]^2)]]
*Cos[(c + d*x)/2]^8 + (999 + 2466*Cos[c + d*x] + 1072*Cos[2*(c + d*x)] + 70
2*Cos[3*(c + d*x)] + 73*Cos[4*(c + d*x)])*Sqrt[2 - 2*Sec[c + d*x]])*Tan[(c
+ d*x)/2])/(65536*Sqrt[2]*a^4*d*Sqrt[-1 + Cos[c + d*x]]*Sqrt[a*(1 + Cos[c +
 d*x])])
```

Maple [A] (verified)

Time = 3.50 (sec) , antiderivative size = 350, normalized size of antiderivative = 1.61

method	result
default	$\frac{\left(-\frac{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2-1}{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1}\right)^{\frac{5}{2}}\left(\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1\right)^3\sqrt{\frac{a}{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1}}\left(16\left(\csc^7(dx+c)\right)\sqrt{-(\mathrm{cs}\right.}{}$

```
[In] int(cos(d*x+c)^(5/2)/(a+cos(d*x+c)*a)^(9/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2048/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2
+1))^(5/2)/(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(5/2)*(csc(d*x+c)^2*(1-cos(d*
x+c))^2+1)^3*(a/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2)*(16*csc(d*x+c)^7*(
-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(1-cos(d*x+c))^7-24*csc(d*x+c)^5*(-
```

```
csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(1-cos(d*x+c))^5-30*csc(d*x+c)^3*(-c
sc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(1-cos(d*x+c))^3+83*(-csc(d*x+c)^2*(1
-cos(d*x+c))^2+1)^(1/2)*(csc(d*x+c)-cot(d*x+c))-45*arcsin(cot(d*x+c)-csc(d*
x+c)))*2^(1/2)/a^5
```

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.14

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx = \frac{45\sqrt{2}\left(\cos(dx+c)^5+5\cos(dx+c)^4+10\cos(dx+c)^3+10\cos(dx+c)^2+\right.}{2048\,(}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(9/2),x, algorithm="fricas")
```

```
[Out] 1/2048*(45*sqrt(2)*(cos(d*x + c)^5 + 5*cos(d*x + c)^4 + 10*cos(d*x + c)^3 +
 10*cos(d*x + c)^2 + 5*cos(d*x + c) + 1)*sqrt(a)*arctan(1/2*sqrt(2)*sqrt(a*
cos(d*x + c) + a)*sqrt(a)*sqrt(cos(d*x + c))*sin(d*x + c)/(a*cos(d*x + c)^2
 + a*cos(d*x + c))) + 2*(73*cos(d*x + c)^3 + 351*cos(d*x + c)^2 + 195*cos(d
*x + c) + 45)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*sin(d*x + c))/(a^
5*d*cos(d*x + c)^5 + 5*a^5*d*cos(d*x + c)^4 + 10*a^5*d*cos(d*x + c)^3 + 10*
a^5*d*cos(d*x + c)^2 + 5*a^5*d*cos(d*x + c) + a^5*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)/(a+a*cos(d*x+c))**(9/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx = \int \frac{\cos(dx+c)^{\frac{5}{2}}}{(a\cos(dx+c)+a)^{\frac{9}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(9/2),x, algorithm="maxima")
```

```
[Out] integrate(cos(d*x + c)^(5/2)/(a*cos(d*x + c) + a)^(9/2), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(9/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)^{5/2}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^{9/2}}\,dx$$

```
[In] int(cos(c + d*x)^(5/2)/(a + a*cos(c + d*x))^(9/2),x)
[Out] int(cos(c + d*x)^(5/2)/(a + a*cos(c + d*x))^(9/2), x)
```

3.261 $\int \frac{1}{\sqrt{\cos(x)}\sqrt{1+\cos(x)}} \, dx$

Optimal result

Integrand size = 15, antiderivative size = 16

$$\int \frac{1}{\sqrt{\cos(x)}\sqrt{1+\cos(x)}} \, dx = \sqrt{2}\arcsin\left(\frac{\sin(x)}{1+\cos(x)}\right)$$

```
[Out] arcsin(sin(x)/(1+cos(x)))*2^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2860, 222}

$$\int \frac{1}{\sqrt{\cos(x)}\sqrt{1+\cos(x)}} \, dx = \sqrt{2}\arcsin\left(\frac{\sin(x)}{\cos(x)+1}\right)$$

```
[In] Int[1/(Sqrt[Cos[x]]*Sqrt[1 + Cos[x]]),x]
[Out] Sqrt[2]*ArcSin[Sin[x]/(1 + Cos[x])]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2860

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[-Sqrt[2]/(Sqrt[a]*f), Subst[Int[1/Sqrt[1 - x
^2], x], x, b*(Cos[e + f*x]/(a + b*Sin[e + f*x]))], x] /; FreeQ[{a, b, d, e
```

```
, f}, x] && EqQ[a^2 - b^2, 0] && EqQ[d, a/b] && GtQ[a, 0]
```

Rubi steps

$$\begin{aligned} \text{integral} &= -\left(\sqrt{2}\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, -\frac{\sin(x)}{1+\cos(x)}\right)\right) \\ &= \sqrt{2}\arcsin\left(\frac{\sin(x)}{1+\cos(x)}\right) \end{aligned}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.88

$$\int \frac{1}{\sqrt{\cos(x)}\sqrt{1+\cos(x)}}\,dx = \frac{2\arctan\left(\frac{\sin\left(\frac{x}{2}\right)}{\sqrt{\cos(x)}}\right)\cos\left(\frac{x}{2}\right)}{\sqrt{1+\cos(x)}}$$

```
[In] Integrate[1/(Sqrt[Cos[x]]*Sqrt[1 + Cos[x]]),x]
[Out] (2*ArcTan[Sin[x/2]/Sqrt[Cos[x]]]*Cos[x/2])/Sqrt[1 + Cos[x]]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 33 vs. 2(14) = 28.

Time = 1.48 (sec) , antiderivative size = 34, normalized size of antiderivative = 2.12

method	result	size
default	$-\frac{\sqrt{\frac{\cos(x)}{\cos(x)+1}}\,\sqrt{2\cos(x)+2}\,\arcsin(-\csc(x)+\cot(x))}{\sqrt{\cos(x)}}$	34

```
[In] int(1/cos(x)^(1/2)/(cos(x)+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/cos(x)^(1/2)*(cos(x)/(cos(x)+1))^(1/2)*(2*cos(x)+2)^(1/2)*arcsin(-csc(x)
+cot(x))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 31 vs. $2(14) = 28$.

Time = 0.26 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.94

$$\int \frac{1}{\sqrt{\cos(x)}\sqrt{1+\cos(x)}}\,dx = \sqrt{2}\arctan\left(\frac{\sqrt{2}\sqrt{\cos(x)+1}\sqrt{\cos(x)}\sin(x)}{2\left(\cos(x)^2+\cos(x)\right)}\right)$$

```
[In] integrate(1/cos(x)^(1/2)/(1+cos(x))^(1/2),x, algorithm="fricas")
[Out] sqrt(2)*arctan(1/2*sqrt(2)*sqrt(cos(x) + 1)*sqrt(cos(x))*sin(x)/(cos(x)^2 +
 cos(x)))
```

Sympy [F]

$$\int \frac{1}{\sqrt{\cos(x)}\sqrt{1+\cos(x)}}\,dx = \int \frac{1}{\sqrt{\cos(x)+1}\sqrt{\cos(x)}}\,dx$$

```
[In] integrate(1/cos(x)**(1/2)/(1+cos(x))**(1/2),x)
[Out] Integral(1/(sqrt(cos(x) + 1)*sqrt(cos(x))), x)
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.51 (sec) , antiderivative size = 306, normalized size of antiderivative = 19.12

$$\int \frac{1}{\sqrt{\cos(x)}\sqrt{1+\cos(x)}}\,dx$$

$$= \sqrt{2}\arctan\left(\frac{\left(\left|e^{(ix)}+1\right|^4+\cos(x)^4+\sin(x)^4+2\left(\cos(x)^2-\sin(x)^2-2\cos(x)+1\right)\left|e^{(ix)}+1\right|^2-4\cos(\right.}{}\right.$$

```
[In] integrate(1/cos(x)^(1/2)/(1+cos(x))^(1/2),x, algorithm="maxima")
[Out] sqrt(2)*arctan2(((abs(e^(I*x) + 1)^4 + cos(x)^4 + sin(x)^4 + 2*(cos(x)^2 -
sin(x)^2 - 2*cos(x) + 1)*abs(e^(I*x) + 1)^2 - 4*cos(x)^3 + 2*(cos(x)^2 - 2*
cos(x) + 1)*sin(x)^2 + 6*cos(x)^2 - 4*cos(x) + 1)^(1/4)*sin(1/2*arctan2(2*(
cos(x) - 1)*sin(x)/abs(e^(I*x) + 1)^2, (abs(e^(I*x) + 1)^2 + cos(x)^2 - sin
(x)^2 - 2*cos(x) + 1)/abs(e^(I*x) + 1)^2)) + sin(x))/abs(e^(I*x) + 1), ((ab
s(e^(I*x) + 1)^4 + cos(x)^4 + sin(x)^4 + 2*(cos(x)^2 - sin(x)^2 - 2*cos(x)
+ 1)*abs(e^(I*x) + 1)^2 - 4*cos(x)^3 + 2*(cos(x)^2 - 2*cos(x) + 1)*sin(x)^2
 + 6*cos(x)^2 - 4*cos(x) + 1)^(1/4)*cos(1/2*arctan2(2*(cos(x) - 1)*sin(x)/a
bs(e^(I*x) + 1)^2, (abs(e^(I*x) + 1)^2 + cos(x)^2 - sin(x)^2 - 2*cos(x) + 1
)/abs(e^(I*x) + 1)^2)) + cos(x) - 1)/abs(e^(I*x) + 1))
```

Giac [F]

$$\int \frac{1}{\sqrt{\cos(x)}\sqrt{1+\cos(x)}}\,dx = \int \frac{1}{\sqrt{\cos\left(x\right)+1}\sqrt{\cos\left(x\right)}}\,dx$$

```
[In] integrate(1/cos(x)^(1/2)/(1+cos(x))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(cos(x) + 1)*sqrt(cos(x))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(x)}\sqrt{1+\cos(x)}}\,dx = \int \frac{1}{\sqrt{\cos\left(x\right)}\,\sqrt{\cos\left(x\right)+1}}\,dx$$

```
[In] int(1/(cos(x)^(1/2)*(cos(x) + 1)^(1/2)),x)
[Out] int(1/(cos(x)^(1/2)*(cos(x) + 1)^(1/2)), x)
```

3.262 $\int \frac{1}{\sqrt{\cos(x)}\sqrt{a+a\cos(x)}}\,dx$

Optimal result

Integrand size = 17, antiderivative size = 41

$$\int \frac{1}{\sqrt{\cos(x)}\sqrt{a+a\cos(x)}}\,dx = \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(x)}{\sqrt{2}\sqrt{\cos(x)}\sqrt{a+a\cos(x)}}\right)}{\sqrt{a}}$$

```
[Out] arctan(1/2*sin(x)*a^(1/2)*2^(1/2)/cos(x)^(1/2)/(a+a*cos(x))^(1/2))*2^(1/2)/
a^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2861, 211}

$$\int \frac{1}{\sqrt{\cos(x)}\sqrt{a+a\cos(x)}}\,dx = \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(x)}{\sqrt{2}\sqrt{\cos(x)}\sqrt{a\cos(x)+a}}\right)}{\sqrt{a}}$$

```
[In] Int[1/(Sqrt[Cos[x]]*Sqrt[a + a*Cos[x]]),x]
```

```
[Out] (Sqrt[2]*ArcTan[(Sqrt[a]*Sin[x])/(Sqrt[2]*Sqrt[Cos[x]]*Sqrt[a + a*Cos[x]])]
)/Sqrt[a]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = -\left((2a)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(x)}{\sqrt{\cos(x)}\sqrt{a+a\cos(x)}}\right)\right)$$
$$= \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(x)}{\sqrt{2}\sqrt{\cos(x)}\sqrt{a+a\cos(x)}}\right)}{\sqrt{a}}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 32, normalized size of antiderivative = 0.78

$$\int \frac{1}{\sqrt{\cos(x)}\sqrt{a+a\cos(x)}}\,dx = \frac{2\arctan\left(\frac{\sin\left(\frac{x}{2}\right)}{\sqrt{\cos(x)}}\right)\cos\left(\frac{x}{2}\right)}{\sqrt{a(1+\cos(x))}}$$

```
[In] Integrate[1/(Sqrt[Cos[x]]*Sqrt[a + a*Cos[x]]),x]
[Out] (2*ArcTan[Sin[x/2]/Sqrt[Cos[x]]]*Cos[x/2])/Sqrt[a*(1 + Cos[x])]
```

Maple [A] (verified)

Time = 1.46 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.98

method	result	size
default	$-\frac{\sqrt{\frac{\cos(x)}{\cos(x)+1}}\,\sqrt{a(\cos(x)+1)}\,\arcsin(-\csc(x)+\cot(x))\sqrt{2}}{\sqrt{\cos(x)}\,a}$	40

```
[In] int(1/cos(x)^(1/2)/(a+cos(x)*a)^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/cos(x)^(1/2)*(cos(x)/(cos(x)+1))^(1/2)*(a*(cos(x)+1))^(1/2)*arcsin(-csc(
x)+cot(x))*2^(1/2)/a
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 105, normalized size of antiderivative = 2.56

$$\int \frac{1}{\sqrt{\cos(x)}\sqrt{a+a\cos(x)}}\,dx = \left[\frac{1}{2}\,\sqrt{2}\sqrt{-\frac{1}{a}}\log\left(-\frac{2\,\sqrt{2}\sqrt{a\cos(x)+a}\sqrt{-\frac{1}{a}}\sqrt{\cos(x)}\sin(x)-3\,\cos(x)^2-2\,\cos(x)+1}{\cos(x)^2+2\,\cos(x)+1}\right), \frac{\sqrt{2}\arctan\left(\right.}{}\right.$$

```
[In] integrate(1/cos(x)^(1/2)/(a+a*cos(x))^(1/2),x, algorithm="fricas")
```

```
[Out] [1/2*sqrt(2)*sqrt(-1/a)*log(-(2*sqrt(2)*sqrt(a*cos(x) + a)*sqrt(-1/a)*sqrt(
cos(x))*sin(x) - 3*cos(x)^2 - 2*cos(x) + 1)/(cos(x)^2 + 2*cos(x) + 1)), sqr
t(2)*arctan(1/2*sqrt(2)*sqrt(a*cos(x) + a)*sqrt(cos(x))*sin(x)/((cos(x)^2 +
 cos(x))*sqrt(a)))/sqrt(a)]
```

Sympy [F]

$$\int \frac{1}{\sqrt{\cos(x)}\sqrt{a+a\cos(x)}}\,dx = \int \frac{1}{\sqrt{a\left(\cos(x)+1\right)}\sqrt{\cos(x)}}\,dx$$

```
[In] integrate(1/cos(x)**(1/2)/(a+a*cos(x))**(1/2),x)
```

```
[Out] Integral(1/(sqrt(a*(cos(x) + 1))*sqrt(cos(x))), x)
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.57 (sec) , antiderivative size = 323, normalized size of antiderivative = 7.88

$$\int \frac{1}{\sqrt{\cos(x)}\sqrt{a+a\cos(x)}}\,dx = \frac{\sqrt{2}\arctan\left(\frac{\left(\left|e^{(i\,x)}+1\right|^4+\cos(x)^4+\sin(x)^4+2\left(\cos(x)^2-\sin(x)^2-2\,\cos(x)+1\right)\left|e^{(i\,x)}+1\right|^2-4\,\cos(x)^3+2\left(\cos(x)^2-2\,\cos(x)+1\right)\sin(x)^2+6\,\mathrm{co}}{\left|e^{(i\,x)}+1\right|}\right.}{}$$

```
[In] integrate(1/cos(x)^(1/2)/(a+a*cos(x))^(1/2),x, algorithm="maxima")
```

```
[Out] sqrt(2)*arctan2(((abs(e^(I*x) + 1)^4 + cos(x)^4 + sin(x)^4 + 2*(cos(x)^2 -
sin(x)^2 - 2*cos(x) + 1)*abs(e^(I*x) + 1)^2 - 4*cos(x)^3 + 2*(cos(x)^2 - 2*
cos(x) + 1)*sin(x)^2 + 6*cos(x)^2 - 4*cos(x) + 1)^(1/4)*sin(1/2*arctan2(2*(
cos(x) - 1)*sin(x)/abs(e^(I*x) + 1)^2, (abs(e^(I*x) + 1)^2 + cos(x)^2 - sin
(x)^2 - 2*cos(x) + 1)/abs(e^(I*x) + 1)^2)) + sin(x))/abs(e^(I*x) + 1), ((ab
s(e^(I*x) + 1)^4 + cos(x)^4 + sin(x)^4 + 2*(cos(x)^2 - sin(x)^2 - 2*cos(x)
+ 1)*abs(e^(I*x) + 1)^2 - 4*cos(x)^3 + 2*(cos(x)^2 - 2*cos(x) + 1)*sin(x)^2
 + 6*cos(x)^2 - 4*cos(x) + 1)^(1/4)*sqrt(a)*cos(1/2*arctan2(2*(cos(x) - 1)*
sin(x)/abs(e^(I*x) + 1)^2, (abs(e^(I*x) + 1)^2 + cos(x)^2 - sin(x)^2 - 2*co
s(x) + 1)/abs(e^(I*x) + 1)^2)) + sqrt(a)*cos(x) - sqrt(a))/(sqrt(a)*abs(e^(
I*x) + 1)))/sqrt(a)
```

Giac [F]

$$\int \frac{1}{\sqrt{\cos(x)}\sqrt{a+a\cos(x)}}\,dx = \int \frac{1}{\sqrt{a\cos\left(x\right)+a}\sqrt{\cos\left(x\right)}}\,dx$$

```
[In] integrate(1/cos(x)^(1/2)/(a+a*cos(x))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a*cos(x) + a)*sqrt(cos(x))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(x)}\sqrt{a+a\cos(x)}}\,dx = \int \frac{1}{\sqrt{\cos\left(x\right)}\,\sqrt{a+a\,\cos\left(x\right)}}\,dx$$

```
[In] int(1/(cos(x)^(1/2)*(a + a*cos(x))^(1/2)),x)
```

```
[Out] int(1/(cos(x)^(1/2)*(a + a*cos(x))^(1/2)), x)
```

3.263 $\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 129

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}\,dx = -\frac{3\sqrt{a}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{4d} + \frac{3a\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a-a\cos(c+dx)}} - \frac{a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a-a\cos(c+dx)}}$$

```
[Out] -3/4*arctanh(sin(d*x+c)*a^(1/2)/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(1/2))*a^
(1/2)/d-1/2*a*cos(d*x+c)^(3/2)*sin(d*x+c)/d/(a-a*cos(d*x+c))^(1/2)+3/4*a*si
n(d*x+c)*cos(d*x+c)^(1/2)/d/(a-a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 129, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.115, Rules used = {2849, 2854, 213}

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}\,dx = -\frac{3\sqrt{a}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{4d} - \frac{a\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{2d\sqrt{a-a\cos(c+dx)}} + \frac{3a\sin(c+dx)\sqrt{\cos(c+dx)}}{4d\sqrt{a-a\cos(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^(3/2)*Sqrt[a - a*Cos[c + d*x]],x]
```

```
[Out] (-3*Sqrt[a]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[Cos[c + d*x]]*Sqrt[a - a*C
os[c + d*x]])])/(4*d) + (3*a*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(4*d*Sqrt[a -
 a*Cos[c + d*x]]) - (a*Cos[c + d*x]^(3/2)*Sin[c + d*x])/(2*d*Sqrt[a - a*Cos
[c + d*x]])
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rule 2854

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b + d*x^2), x], x
, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]))], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a-a\cos(c+dx)}} - \frac{3}{4}\int \sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}\,dx \\
&= \frac{3a\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a-a\cos(c+dx)}} - \frac{a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a-a\cos(c+dx)}} + \frac{3}{8}\int \frac{\sqrt{a-a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{3a\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a-a\cos(c+dx)}} - \frac{a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a-a\cos(c+dx)}} \\
&\quad + \frac{(3a)\text{Subst}\left(\int \frac{1}{-a+x^2}\,dx, x, \frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{4d} \\
&= -\frac{3\sqrt{a}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{4d} \\
&\quad + \frac{3a\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a-a\cos(c+dx)}} - \frac{a\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a-a\cos(c+dx)}}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.76 (sec) , antiderivative size = 186, normalized size of antiderivative = 1.44

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}\,dx = -\frac{e^{-\frac{3}{2}i(c+dx)}\left(\sqrt{1+e^{2i(c+dx)}}\left(1-2e^{i(c+dx)}-2e^{2i(c+dx)}+e^{3i(c+dx)}\right)+3e^{2i(c+dx)}\text{arcsinh}\left(e^{i(c+dx)}\right)+3e^{2i(c+dx)}\text{a}}{8d\sqrt{1+e^{2i(c+dx)}}}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)*Sqrt[a - a*Cos[c + d*x]],x]
```

```
[Out] -1/8*((Sqrt[1 + E^((2*I)*(c + d*x))]*(1 - 2*E^(I*(c + d*x)) - 2*E^((2*I)*(c
 + d*x)) + E^((3*I)*(c + d*x))) + 3*E^((2*I)*(c + d*x))*ArcSinh[E^(I*(c + d
*x))] + 3*E^((2*I)*(c + d*x))*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]])*Sqrt[
Cos[c + d*x]]*Sqrt[a - a*Cos[c + d*x]]*Csc[(c + d*x)/2])/(d*E^(((3*I)/2)*(c
 + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))])
```

Maple [A] (verified)

Time = 12.56 (sec) , antiderivative size = 152, normalized size of antiderivative = 1.18

method	result
default	$-\frac{\csc(dx+c)\left(2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,(\cos^2(dx+c))-\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+3\,\text{arctanh}\left(\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)-3\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\sqrt{-a(\cos(dx+}}{4d\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$

```
[In] int(cos(d*x+c)^(3/2)*(a-cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/d*csc(d*x+c)*(2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2-cos(d*x
+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+3*arctanh((cos(d*x+c)/(1+cos(d*x+c)))
^(1/2))-3*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))*(-a*(cos(d*x+c)-1))^(1/2)*cos(
d*x+c)^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 155, normalized size of antiderivative = 1.20

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}\,dx = \frac{3\sqrt{a}\log\left(\frac{4\sqrt{-a\cos(dx+c)+a}\left(2\cos(dx+c)^2+3\cos(dx+c)+1\right)\sqrt{a}\sqrt{\cos(dx+c)}-\left(8a\cos(dx+c)^2+8a\cos(dx+c)+a\right)\sin(dx+c)}{\sin(dx+c)}\right)\sin\left(dx\right.}{16\,d\sin\left(dx+c\right)}$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a-a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/16*(3*sqrt(a)*log((4*sqrt(-a*cos(d*x + c) + a)*(2*cos(d*x + c)^2 + 3*cos(
d*x + c) + 1)*sqrt(a)*sqrt(cos(d*x + c)) - (8*a*cos(d*x + c)^2 + 8*a*cos(d*
x + c) + a)*sin(d*x + c))/sin(d*x + c))*sin(d*x + c) - 4*sqrt(-a*cos(d*x +
c) + a)*(2*cos(d*x + c)^2 - cos(d*x + c) - 3)*sqrt(cos(d*x + c)))/(d*sin(d*
x + c))
```

Sympy [F]

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}\,dx = \int \sqrt{-a\left(\cos\left(c+dx\right)-1\right)}\cos^{\frac{3}{2}}\left(c+dx\right)dx$$

```
[In] integrate(cos(d*x+c)**(3/2)*(a-a*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(-a*(cos(c + d*x) - 1))*cos(c + d*x)**(3/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1063 vs. $2(107) = 214$.

Time = 0.43 (sec) , antiderivative size = 1063, normalized size of antiderivative = 8.24

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a-a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/16*(2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^
(1/4)*((cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(2*d*x + 2*
c) - (cos(2*d*x + 2*c) - 2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c))) - sin(2*d*x + 2*c))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c
) + 1)) + ((cos(2*d*x + 2*c) - 2)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c))) + sin(2*d*x + 2*c)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c))) + cos(2*d*x + 2*c) - 2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c) + 1)))*sqrt(-a) + 3*sqrt(-a)*(arctan2((cos(2*d*x + 2*c)^2 + sin(2*
d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c)))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
+ 1)) - cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*ar
ctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))), (cos(2*d*x + 2*c)^2 + sin(2*d*
x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c) + 1))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c
))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arct
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))) + 1) - arctan2((cos(2*d*x + 2*c)^
2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin
```

```
(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c) + 1)) - cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*
sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))), (cos(2*d*x + 2*c)^2
+ sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c) + 1))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*si
n(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))) - 1) + arctan2((cos(2*d
*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*ar
ctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2
*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c) + 1)) + 1) - arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x
+ 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c),
cos(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*
d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
1)) - 1)))/d
```

Giac [F]

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}\,dx=\int \sqrt{-a\cos\left(dx+c\right)+a}\cos\left(dx+c\right)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a-a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(-a*cos(d*x + c) + a)*cos(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}\,dx=\int \cos\left(c+d\,x\right)^{3/2}\,\sqrt{a-a\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)*(a - a*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(3/2)*(a - a*cos(c + d*x))^(1/2), x)
```

3.264 $\int \sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 85

$$\int \sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}\,dx=\frac{\sqrt{a}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{d}-\frac{a\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a-a\cos(c+dx)}}$$

```
[Out] arctanh(sin(d*x+c)*a^(1/2)/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(1/2))*a^(1/2)
/d-a*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a-a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.115, Rules used = {2849, 2854, 213}

$$\int \sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}\,dx=\frac{\sqrt{a}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{d}-\frac{a\sin(c+dx)\sqrt{\cos(c+dx)}}{d\sqrt{a-a\cos(c+dx)}}$$

```
[In] Int[Sqrt[Cos[c + d*x]]*Sqrt[a - a*Cos[c + d*x]],x]
```

```
[Out] (Sqrt[a]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[Cos[c + d*x]]*Sqrt[a - a*Cos[
c + d*x]])])/d - (a*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(d*Sqrt[a - a*Cos[c +
d*x]])
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rule 2854

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b + d*x^2), x], x
, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]))], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{a\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a-a\cos(c+dx)}}-\frac{1}{2}\int\frac{\sqrt{a-a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx\\ &= -\frac{a\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a-a\cos(c+dx)}}-\frac{a\text{Subst}\left(\int\frac{1}{-a+x^2}\,dx,x,\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{d}\\ &= \frac{\sqrt{a}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{d}-\frac{a\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a-a\cos(c+dx)}}\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.53 (sec) , antiderivative size = 152, normalized size of antiderivative = 1.79

$$\int\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}\,dx = -\frac{i\left(\left(1+e^{i(c+dx)}\right)\sqrt{1+e^{2i(c+dx)}}-e^{i(c+dx)}\text{arcsinh}\left(e^{i(c+dx)}\right)-e^{i(c+dx)}\text{arctanh}\left(\sqrt{1+e^{2i(c+dx)}}\right)\right)\sqrt{\cos(c+d}}{d\left(-1+e^{i(c+dx)}\right)\sqrt{1+e^{2i(c+dx)}}}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]*Sqrt[a - a*Cos[c + d*x]],x]
```

```
[Out] ((-I)*((1 + E^(I*(c + d*x)))*Sqrt[1 + E^((2*I)*(c + d*x))] - E^(I*(c + d*x)
)*ArcSinh[E^(I*(c + d*x))] - E^(I*(c + d*x))*ArcTanh[Sqrt[1 + E^((2*I)*(c +
 d*x))]])*Sqrt[Cos[c + d*x]]*Sqrt[a - a*Cos[c + d*x]])/(d*(-1 + E^(I*(c + d
*x)))*Sqrt[1 + E^((2*I)*(c + d*x))])
```

Maple [A] (verified)

Time = 12.95 (sec) , antiderivative size = 120, normalized size of antiderivative = 1.41

method	result	size
default	$-\frac{\csc(dx+c)\left(\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-\operatorname{arctanh}\left(\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\right)\left(\sqrt{\cos}(dx+c)\right)\sqrt{-a(\cos(dx+c)-1)}}{d\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$	120

```
[In] int(cos(d*x+c)^(1/2)*(a-cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/d*csc(d*x+c)*(cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)-arctanh((cos(d*x+c)/(1+cos(d*x+c)))^(1/2)))*cos(d*x+c)
^(1/2)*(-a*(cos(d*x+c)-1))^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 142, normalized size of antiderivative = 1.67

$$\int \sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}\,dx$$
$$=\frac{\sqrt{a}\log\left(-\frac{4\sqrt{-a\cos(dx+c)+a}\left(2\cos(dx+c)^2+3\cos(dx+c)+1\right)\sqrt{a}\sqrt{\cos(dx+c)}+\left(8a\cos(dx+c)^2+8a\cos(dx+c)+a\right)\sin(dx+c)}{\sin(dx+c)}\right)\sin(d}{4d\sin(dx+c)}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a-a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/4*(sqrt(a)*log(-(4*sqrt(-a*cos(d*x + c) + a)*(2*cos(d*x + c)^2 + 3*cos(d*
x + c) + 1)*sqrt(a)*sqrt(cos(d*x + c)) + (8*a*cos(d*x + c)^2 + 8*a*cos(d*x
+ c) + a)*sin(d*x + c))/sin(d*x + c))*sin(d*x + c) - 4*sqrt(-a*cos(d*x + c)
 + a)*(cos(d*x + c) + 1)*sqrt(cos(d*x + c)))/(d*sin(d*x + c))
```

Sympy [F]

$$\int \sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}\,dx = \int \sqrt{-a\left(\cos\left(c+dx\right)-1\right)}\sqrt{\cos\left(c+dx\right)}\,dx$$

```
[In] integrate(cos(d*x+c)**(1/2)*(a-a*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(-a*(cos(c + d*x) - 1))*sqrt(cos(c + d*x)), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 795 vs. $2(73) = 146$.

Time = 0.41 (sec) , antiderivative size = 795, normalized size of antiderivative = 9.35

$$\int \sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a-a*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] -1/4*(2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^
(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x + c
) - (cos(d*x + c) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
 1)))*sqrt(-a) + sqrt(-a)*(arctan2(-(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^
2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*
d*x + 2*c) + 1))*sin(d*x + c) - cos(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*
c), cos(2*d*x + 2*c) + 1))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*c
os(2*d*x + 2*c) + 1)^(1/4)*(cos(d*x + c)*cos(1/2*arctan2(sin(2*d*x + 2*c),
cos(2*d*x + 2*c) + 1)) + sin(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c) + 1))) + 1) - arctan2(-(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)
^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c) + 1))*sin(d*x + c) - cos(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c) + 1))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*
cos(2*d*x + 2*c) + 1)^(1/4)*(cos(d*x + c)*cos(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c) + 1)) + sin(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c) + 1))) - 1) + arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)
^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*
d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x +
2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) +
1) - arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c)
+ 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (cos(2
*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1)))/d
```

Giac [F]

$$\int \sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}\,dx = \int \sqrt{-a\cos\left(dx+c\right)+a}\sqrt{\cos\left(dx+c\right)}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a-a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(-a*cos(d*x + c) + a)*sqrt(cos(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}\,dx = \int \sqrt{\cos\left(c+d\,x\right)}\,\sqrt{a-a\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)*(a - a*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(1/2)*(a - a*cos(c + d*x))^(1/2), x)
```

3.265 $\int \frac{\sqrt{a-a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 48

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = -\frac{2\sqrt{a}\,\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{d}$$

```
[Out] -2*arctanh(sin(d*x+c)*a^(1/2)/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(1/2))*a^(1
/2)/d
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2854, 213}

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = -\frac{2\sqrt{a}\,\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{d}$$

```
[In] Int[Sqrt[a - a*Cos[c + d*x]]/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (-2*Sqrt[a]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[Cos[c + d*x]]*Sqrt[a - a*C
os[c + d*x]])])/d
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 2854

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b + d*x^2), x], x
, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]))], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{(2a)\text{Subst}\left(\int \frac{1}{-a+x^2}\,dx, x, \frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{d}$$
$$= -\frac{2\sqrt{a}\,\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.42 (sec) , antiderivative size = 125, normalized size of antiderivative = 2.60

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx =$$
$$-\frac{e^{\frac{1}{2}i(c+dx)}\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}\left(\text{arcsinh}\left(e^{i(c+dx)}\right)+\text{arctanh}\left(\sqrt{1+e^{2i(c+dx)}}\right)\right)\sqrt{a-a\cos(c+dx)}\,\text{cs}}{\sqrt{2}d\sqrt{1+e^{2i(c+dx)}}}$$

```
[In] Integrate[Sqrt[a - a*Cos[c + d*x]]/Sqrt[Cos[c + d*x]],x]
```

```
[Out] -((E^((I/2)*(c + d*x))*Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(I*(c + d*x))]*(Arc
Sinh[E^(I*(c + d*x))] + ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]])*Sqrt[a - a*
Cos[c + d*x]]*Csc[(c + d*x)/2])/(Sqrt[2]*d*Sqrt[1 + E^((2*I)*(c + d*x))]))
```

Maple [A] (verified)

Time = 4.55 (sec) , antiderivative size = 79, normalized size of antiderivative = 1.65

method	result	size
default	$-\frac{2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{-a(\cos(dx+c)-1)}\,\text{arctanh}\left(\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)(\cot(dx+c)+\csc(dx+c))}{d\sqrt{\cos(dx+c)}}$	79

```
[In] int((a-cos(d*x+c)*a)^(1/2)/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/d*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(-a*(cos(d*x+c)-1))^(1/2)*arctanh((c
os(d*x+c)/(1+cos(d*x+c)))^(1/2))/cos(d*x+c)^(1/2)*(cot(d*x+c)+csc(d*x+c))
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 155, normalized size of antiderivative = 3.23

$$\int \frac{\sqrt{a - a\cos(c + dx)}}{\sqrt{\cos(c + dx)}}\,dx = \left[\frac{\sqrt{a}\log\left(\frac{4\sqrt{-a\cos(dx+c)+a}\left(2\cos(dx+c)^2+3\cos(dx+c)+1\right)\sqrt{a}\sqrt{\cos(dx+c)}-\left(8a\cos(dx+c)^2+8a\cos(dx+c)+a\right)\sin(dx+c)}{\sin(dx+c)}\right)}{2d}, \frac{\sqrt{-a}\,a\ldots}{\ldots}\right.$$

```
[In] integrate((a-a*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/2*sqrt(a)*log((4*sqrt(-a*cos(d*x + c) + a)*(2*cos(d*x + c)^2 + 3*cos(d*x
 + c) + 1)*sqrt(a)*sqrt(cos(d*x + c)) - (8*a*cos(d*x + c)^2 + 8*a*cos(d*x +
 c) + a)*sin(d*x + c))/sin(d*x + c))/d, sqrt(-a)*arctan(1/2*sqrt(-a*cos(d*x
 + c) + a)*sqrt(-a)*(2*cos(d*x + c) + 1)/(a*sqrt(cos(d*x + c))*sin(d*x + c)
))/d]
```

Sympy [F]

$$\int \frac{\sqrt{a - a\cos(c + dx)}}{\sqrt{\cos(c + dx)}}\,dx = \int \frac{\sqrt{-a\left(\cos\left(c + dx\right) - 1\right)}}{\sqrt{\cos\left(c + dx\right)}}\,dx$$

```
[In] integrate((a-a*cos(d*x+c))**(1/2)/cos(d*x+c)**(1/2),x)
```

```
[Out] Integral(sqrt(-a*(cos(c + d*x) - 1))/sqrt(cos(c + d*x)), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 148 vs. 2(40) = 80.

Time = 0.36 (sec) , antiderivative size = 148, normalized size of antiderivative = 3.08

$$\int \frac{\sqrt{a - a\cos(c + dx)}}{\sqrt{\cos(c + dx)}}\,dx = \frac{\sqrt{-a}\arctan\left(\left(\cos\left(2dx + 2c\right)^2 + \sin\left(2dx + 2c\right)^2 + 2\cos\left(2dx + 2c\right) + 1\right)^{\frac{1}{4}}\sin\left(\frac{1}{2}\arctan\left(\sin\left(2dx + 2c\right)\ldots\right.\right.\right.}{\ldots}$$

```
[In] integrate((a-a*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] sqrt(-a)*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2
*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + s
in(d*x + c), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c)
+ 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + cos(d
*x + c))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 122 vs. 2(40) = 80.

Time = 0.45 (sec) , antiderivative size = 122, normalized size of antiderivative = 2.54

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = \frac{2\sqrt{a}\log\left(\frac{2\left(\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+2\sqrt{2}-\sqrt{\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^4-6\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+1}+1\right)}{\left|-2\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+4\sqrt{2}+2\sqrt{\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^4-6\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+1}-2\right|}\right)\operatorname{sgn}\left(\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}{d}$$

```
[In] integrate((a-a*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="giac")
```

```
[Out] 2*sqrt(a)*log(2*(tan(1/4*d*x + 1/4*c)^2 + 2*sqrt(2) - sqrt(tan(1/4*d*x + 1/
4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 1)/abs(-2*tan(1/4*d*x + 1/4*c)^2 +
 4*sqrt(2) + 2*sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1)
- 2))*sgn(sin(1/2*d*x + 1/2*c))/d
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{\sqrt{a-a\,\cos\left(c+d\,x\right)}}{\sqrt{\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int((a - a*cos(c + d*x))^(1/2)/cos(c + d*x)^(1/2),x)
```

```
[Out] int((a - a*cos(c + d*x))^(1/2)/cos(c + d*x)^(1/2), x)
```

3.266 $\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 37

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2a\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}$$

```
[Out] 2*a*sin(d*x+c)/d/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.038, Rules used = {2850}

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2a\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}$$

```
[In] Int[Sqrt[a - a*Cos[c + d*x]]/Cos[c + d*x]^(3/2),x]
[Out] (2*a*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]]*Sqrt[a - a*Cos[c + d*x]])
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{2a\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.08

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\frac{2\sqrt{a-a\cos(c+dx)}\cot\left(\frac{1}{2}(c+dx)\right)}{d\sqrt{\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[a - a*Cos[c + d*x]]/Cos[c + d*x]^(3/2),x]
[Out] (2*Sqrt[a - a*Cos[c + d*x]]*Cot[(c + d*x)/2])/(d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.46 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.08

method	result	size
default	$\frac{2\sqrt{-a(\cos(dx+c)-1)}\,(\cot(dx+c)+\csc(dx+c))}{d\sqrt{\cos(dx+c)}}$	40

```
[In] int((a-cos(d*x+c)*a)^(1/2)/cos(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
[Out] 2/d*(-a*(cos(d*x+c)-1))^(1/2)/cos(d*x+c)^(1/2)*(cot(d*x+c)+csc(d*x+c))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.14

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\frac{2\sqrt{-a\cos(dx+c)+a}(\cos(dx+c)+1)}{d\sqrt{\cos(dx+c)}\sin(dx+c)}$$

```
[In] integrate((a-a*cos(d*x+c))^(1/2)/cos(d*x+c)^(3/2),x, algorithm="fricas")
[Out] 2*sqrt(-a*cos(d*x + c) + a)*(cos(d*x + c) + 1)/(d*sqrt(cos(d*x + c))*sin(d*
x + c))
```

Sympy [F]

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{\sqrt{-a\left(\cos\left(c+dx\right)-1\right)}}{\cos^{\frac{3}{2}}\left(c+dx\right)}\,dx$$

```
[In] integrate((a-a*cos(d*x+c))**(1/2)/cos(d*x+c)**(3/2),x)
[Out] Integral(sqrt(-a*(cos(c + d*x) - 1))/cos(c + d*x)**(3/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 82 vs. $2(33) = 66$.

Time = 0.30 (sec) , antiderivative size = 82, normalized size of antiderivative = 2.22

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\left(\sqrt{2}\sqrt{a}-\frac{\sqrt{2}\sqrt{a}\sin(dx+c)^2}{(\cos(dx+c)+1)^2}\right)}{d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{3}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{3}{2}}}$$

```
[In] integrate((a-a*cos(d*x+c))^(1/2)/cos(d*x+c)^(3/2),x, algorithm="maxima")
[Out] 2*(sqrt(2)*sqrt(a) - sqrt(2)*sqrt(a)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2)/(
d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(3/2)*(-sin(d*x + c)/(cos(d*x + c)
+ 1) + 1)^(3/2))
```

Giac [A] (verification not implemented)

none

Time = 0.40 (sec) , antiderivative size = 62, normalized size of antiderivative = 1.68

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = -\frac{2\sqrt{2}\left(\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-1\right)\sqrt{a}\mathrm{sgn}\left(\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}{\sqrt{\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^4-6\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+1}d}$$

```
[In] integrate((a-a*cos(d*x+c))^(1/2)/cos(d*x+c)^(3/2),x, algorithm="giac")
[Out] -2*sqrt(2)*(tan(1/4*d*x + 1/4*c)^2 - 1)*sqrt(a)*sgn(sin(1/2*d*x + 1/2*c))/(
sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1)*d)
```

Mupad [B] (verification not implemented)

Time = 14.26 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.14

$$\int \frac{\sqrt{a - a\cos(c + dx)}}{\cos^{\frac{3}{2}}(c + dx)}\,dx = -\frac{2\,\sin\left(c + d\,x\right)\,\sqrt{-a\,\left(\cos\left(c + d\,x\right) - 1\right)}}{d\,\sqrt{\cos\left(c + d\,x\right)}\,\left(\cos\left(c + d\,x\right) - 1\right)}$$

```
[In] int((a - a*cos(c + d*x))^(1/2)/cos(c + d*x)^(3/2),x)
[Out] -(2*sin(c + d*x)*(-a*(cos(c + d*x) - 1))^(1/2))/(d*cos(c + d*x)^(1/2)*(cos(
c + d*x) - 1))
```

3.267 $\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 79

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2a\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} - \frac{4a\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}$$

```
[Out] 2/3*a*sin(d*x+c)/d/cos(d*x+c)^(3/2)/(a-a*cos(d*x+c))^(1/2)-4/3*a*sin(d*x+c)
/d/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 79, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2851, 2850}

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2a\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} - \frac{4a\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}$$

```
[In] Int[Sqrt[a - a*Cos[c + d*x]]/Cos[c + d*x]^(5/2),x]
```

```
[Out] (2*a*Sin[c + d*x])/(3*d*Cos[c + d*x]^(3/2)*Sqrt[a - a*Cos[c + d*x]]) - (4*a
*Sin[c + d*x])/(3*d*Sqrt[Cos[c + d*x]]*Sqrt[a - a*Cos[c + d*x]])
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{2a\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}-\frac{2}{3}\int\frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx\\ &= \frac{2a\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}-\frac{4a\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.33 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.66

$$\int\frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx=-\frac{2(-1+2\cos(c+dx))\sqrt{a-a\cos(c+dx)}\cot\left(\frac{1}{2}(c+dx)\right)}{3d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Integrate[Sqrt[a - a*Cos[c + d*x]]/Cos[c + d*x]^(5/2),x]
[Out] (-2*(-1 + 2*Cos[c + d*x])*Sqrt[a - a*Cos[c + d*x]]*Cot[(c + d*x)/2])/(3*d*C
os[c + d*x]^(3/2))
```

Maple [A] (verified)

Time = 5.58 (sec) , antiderivative size = 51, normalized size of antiderivative = 0.65

method	result	size
default	$-\frac{2\csc(dx+c)\sqrt{-a(\cos(dx+c)-1)}\,(-1+2(\cos^2(dx+c))+\cos(dx+c))}{3d\cos(dx+c)^{\frac{3}{2}}}$	51

```
[In] int((a-cos(d*x+c)*a)^(1/2)/cos(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3/d*csc(d*x+c)*(-a*(cos(d*x+c)-1))^(1/2)*(-1+2*cos(d*x+c)^2+cos(d*x+c))/
cos(d*x+c)^(3/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.66

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = -\frac{2\sqrt{-a\cos(dx+c)+a}\left(2\cos(dx+c)^2+\cos(dx+c)-1\right)}{3\,d\cos(dx+c)^{\frac{3}{2}}\sin(dx+c)}$$

```
[In] integrate((a-a*cos(d*x+c))^(1/2)/cos(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] -2/3*sqrt(-a*cos(d*x + c) + a)*(2*cos(d*x + c)^2 + cos(d*x + c) - 1)/(d*cos
(d*x + c)^(3/2)*sin(d*x + c))
```

Sympy [F]

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{\sqrt{-a\left(\cos(c+dx)-1\right)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx$$

```
[In] integrate((a-a*cos(d*x+c))**(1/2)/cos(d*x+c)**(5/2),x)
```

```
[Out] Integral(sqrt(-a*(cos(c + d*x) - 1))/cos(c + d*x)**(5/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 174 vs. 2(67) = 134.

Time = 0.31 (sec) , antiderivative size = 174, normalized size of antiderivative = 2.20

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = -\frac{2\left(\sqrt{2}\sqrt{a}-\frac{4\sqrt{2}\sqrt{a}\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{3\sqrt{2}\sqrt{a}\sin(dx+c)^4}{(\cos(dx+c)+1)^4}\right)\left(\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+1\right)^2}{3\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{5}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{5}{2}}\left(\frac{2\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+1\right)}$$

```
[In] integrate((a-a*cos(d*x+c))^(1/2)/cos(d*x+c)^(5/2),x, algorithm="maxima")
```

```
[Out] -2/3*(sqrt(2)*sqrt(a) - 4*sqrt(2)*sqrt(a)*sin(d*x + c)^2/(cos(d*x + c) + 1)
^2 + 3*sqrt(2)*sqrt(a)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4)*(sin(d*x + c)^2
/(cos(d*x + c) + 1)^2 + 1)^2/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(5/2)
*(-sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(5/2)*(2*sin(d*x + c)^2/(cos(d*x +
c) + 1)^2 + sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + 1))
```

Giac [A] (verification not implemented)

none

Time = 0.44 (sec) , antiderivative size = 90, normalized size of antiderivative = 1.14

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2\sqrt{2}\Big(\Big(\Big(\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2-15\Big)\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+15\Big)\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2-1\Big)\sqrt{a}\mathrm{sgn}\big(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\big)}{3\left(\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^4-6\,\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+1\right)^{\frac{3}{2}}d}$$

```
[In] integrate((a-a*cos(d*x+c))^(1/2)/cos(d*x+c)^(5/2),x, algorithm="giac")
```

```
[Out] 2/3*sqrt(2)*(((tan(1/4*d*x + 1/4*c)^2 - 15)*tan(1/4*d*x + 1/4*c)^2 + 15)*ta
n(1/4*d*x + 1/4*c)^2 - 1)*sqrt(a)*sgn(sin(1/2*d*x + 1/2*c))/((tan(1/4*d*x +
 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1)^(3/2)*d)
```

Mupad [B] (verification not implemented)

Time = 14.73 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.08

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{4\sqrt{-a\,\left(\cos\left(c+d\,x\right)-1\right)}\,\left(\sin\left(c+d\,x\right)-\sin\left(2\,c+2\,d\,x\right)+\sin\left(3\,c+3\,d\,x\right)\right)}{3\,d\,\sqrt{\cos\left(c+d\,x\right)}\,\left(3\,\cos\left(c+d\,x\right)-2\,\cos\left(2\,c+2\,d\,x\right)+\cos\left(3\,c+3\,d\,x\right)-2\right)}$$

```
[In] int((a - a*cos(c + d*x))^(1/2)/cos(c + d*x)^(5/2),x)
```

```
[Out] (4*(-a*(cos(c + d*x) - 1))^(1/2)*(sin(c + d*x) - sin(2*c + 2*d*x) + sin(3*c
 + 3*d*x)))/(3*d*cos(c + d*x)^(1/2)*(3*cos(c + d*x) - 2*cos(2*c + 2*d*x) +
cos(3*c + 3*d*x) - 2))
```

3.268 $\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 118

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2a\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} - \frac{8a\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{16a\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}$$

```
[Out] 2/5*a*sin(d*x+c)/d/cos(d*x+c)^(5/2)/(a-a*cos(d*x+c))^(1/2)-8/15*a*sin(d*x+c
)/d/cos(d*x+c)^(3/2)/(a-a*cos(d*x+c))^(1/2)+16/15*a*sin(d*x+c)/d/cos(d*x+c)
^(1/2)/(a-a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2851, 2850}

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = -\frac{8a\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{2a\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{16a\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}$$

```
[In] Int[Sqrt[a - a*Cos[c + d*x]]/Cos[c + d*x]^(7/2),x]
```

```
[Out] (2*a*Sin[c + d*x])/(5*d*Cos[c + d*x]^(5/2)*Sqrt[a - a*Cos[c + d*x]]) - (8*a
*Sin[c + d*x])/(15*d*Cos[c + d*x]^(3/2)*Sqrt[a - a*Cos[c + d*x]]) + (16*a*S
in[c + d*x])/(15*d*Sqrt[Cos[c + d*x]]*Sqrt[a - a*Cos[c + d*x]])
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{2a\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} - \frac{4}{5}\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{2a\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} \\
&\quad - \frac{8a\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{8}{15}\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{2a\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} - \frac{8a\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} \\
&\quad + \frac{16a\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.40 (sec) , antiderivative size = 62, normalized size of antiderivative = 0.53

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2\sqrt{a-a\cos(c+dx)}(7-4\cos(c+dx)+4\cos(2(c+dx)))\cot\left(\frac{1}{2}(c+dx)\right)}{15d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Integrate[Sqrt[a - a*Cos[c + d*x]]/Cos[c + d*x]^(7/2),x]
```

```
[Out] (2*Sqrt[a - a*Cos[c + d*x]]*(7 - 4*Cos[c + d*x] + 4*Cos[2*(c + d*x)])*Cot[(
c + d*x)/2])/(15*d*Cos[c + d*x]^(5/2))
```

Maple [A] (verified)

Time = 5.45 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.53

method	result	size
default	$\frac{2\csc(dx+c)\sqrt{-a(\cos(dx+c)-1)}\,(3+8(\cos^3(dx+c))+4(\cos^2(dx+c))-\cos(dx+c))}{15d\cos(dx+c)^{\frac{5}{2}}}$	63

```
[In] int((a-cos(d*x+c)*a)^(1/2)/cos(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/15/d*csc(d*x+c)*(-a*(cos(d*x+c)-1))^(1/2)*(3+8*cos(d*x+c)^3+4*cos(d*x+c)^
2-cos(d*x+c))/cos(d*x+c)^(5/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.54

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2\left(8\,\cos\left(dx+c\right)^{3}+4\,\cos\left(dx+c\right)^{2}-\cos\left(dx+c\right)+3\right)\sqrt{-a\cos\left(dx+c\right)+a}}{15\,d\cos\left(dx+c\right)^{\frac{5}{2}}\sin\left(dx+c\right)}$$

```
[In] integrate((a-a*cos(d*x+c))^(1/2)/cos(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] 2/15*(8*cos(d*x + c)^3 + 4*cos(d*x + c)^2 - cos(d*x + c) + 3)*sqrt(-a*cos(d
*x + c) + a)/(d*cos(d*x + c)^(5/2)*sin(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a-a*cos(d*x+c))**(1/2)/cos(d*x+c)**(7/2),x)
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 221 vs. $2(100) = 200$.

Time = 0.31 (sec) , antiderivative size = 221, normalized size of antiderivative = 1.87

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2\left(7\sqrt{2}\sqrt{a}-\frac{17\sqrt{2}\sqrt{a}\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{25\sqrt{2}\sqrt{a}\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{15\sqrt{2}\sqrt{a}\sin(dx+c)^6}{(\cos(dx+c)+1)^6}\right)\left(\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+1\right)^3}{15\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{7}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{7}{2}}\left(\frac{3\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{3\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+\frac{\sin(dx+c)^6}{(\cos(dx+c)+1)^6}+1\right)}$$

```
[In] integrate((a-a*cos(d*x+c))^(1/2)/cos(d*x+c)^(7/2),x, algorithm="maxima")
[Out] 2/15*(7*sqrt(2)*sqrt(a) - 17*sqrt(2)*sqrt(a)*sin(d*x + c)^2/(cos(d*x + c) +
 1)^2 + 25*sqrt(2)*sqrt(a)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 15*sqrt(2)
*sqrt(a)*sin(d*x + c)^6/(cos(d*x + c) + 1)^6)*(sin(d*x + c)^2/(cos(d*x + c)
 + 1)^2 + 1)^3/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(7/2)*(-sin(d*x + c
)/(cos(d*x + c) + 1) + 1)^(7/2)*(3*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 3*
sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + sin(d*x + c)^6/(cos(d*x + c) + 1)^6 +
 1))
```

Giac [A] (verification not implemented)

none

Time = 0.49 (sec) , antiderivative size = 120, normalized size of antiderivative = 1.02

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = -\frac{2\sqrt{2}\left(\left(\left(\left(\left(7\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-75\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+430\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-430\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}\right.\right.\right.}{15\left(\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^4-6\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+1\right)}$$

```
[In] integrate((a-a*cos(d*x+c))^(1/2)/cos(d*x+c)^(7/2),x, algorithm="giac")
```

```
[Out] -2/15*sqrt(2)*(((((7*tan(1/4*d*x + 1/4*c)^2 - 75)*tan(1/4*d*x + 1/4*c)^2 +
430)*tan(1/4*d*x + 1/4*c)^2 - 430)*tan(1/4*d*x + 1/4*c)^2 + 75)*tan(1/4*d*x
 + 1/4*c)^2 - 7)*sqrt(a)*sgn(sin(1/2*d*x + 1/2*c))/((tan(1/4*d*x + 1/4*c)^4
 - 6*tan(1/4*d*x + 1/4*c)^2 + 1)^(5/2)*d)
```

Mupad [B] (verification not implemented)

Time = 15.97 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.34

$$\int \frac{\sqrt{a-a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx$$
$$= \frac{8\sqrt{2\,a\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2}\,(7\,\sin\left(c+d\,x\right)-4\,\sin\left(2\,c+2\,d\,x\right)+9\,\sin\left(3\,c+3\,d\,x\right)-2\,\sin\left(4\,c+4\,d\,x\right)+2}{15\,d\,\sqrt{1-2\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2}\,\left(-16\sin\left(c+d\,x\right)^2-4\sin\left(2\,c+2\,d\,x\right)^2+20\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+10\sin\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)^2}$$

```
[In] int((a - a*cos(c + d*x))^(1/2)/cos(c + d*x)^(7/2),x)
```

```
[Out] (8*(2*a*sin(c/2 + (d*x)/2)^2)^(1/2)*(7*sin(c + d*x) - 4*sin(2*c + 2*d*x) +
9*sin(3*c + 3*d*x) - 2*sin(4*c + 4*d*x) + 2*sin(5*c + 5*d*x)))/(15*d*(1 - 2
*sin(c/2 + (d*x)/2)^2)^(1/2)*(20*sin(c/2 + (d*x)/2)^2 - 4*sin(2*c + 2*d*x)^
2 + 10*sin((3*c)/2 + (3*d*x)/2)^2 + 2*sin((5*c)/2 + (5*d*x)/2)^2 - 16*sin(c
 + d*x)^2))
```

3.269 $\int \sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 114

$$\int \sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)\,dx = -\frac{3\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{4d} + \frac{3\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{1-\cos(c+dx)}} - \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{1-\cos(c+dx)}}$$

```
[Out] -3/4*arctanh(sin(d*x+c)/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2))/d-1/2*cos(d*
x+c)^(3/2)*sin(d*x+c)/d/(1-cos(d*x+c))^(1/2)+3/4*sin(d*x+c)*cos(d*x+c)^(1/2
)/d/(1-cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {2849, 2854, 213}

$$\int \sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)\,dx = -\frac{3\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{4d} - \frac{\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{2d\sqrt{1-\cos(c+dx)}} + \frac{3\sin(c+dx)\sqrt{\cos(c+dx)}}{4d\sqrt{1-\cos(c+dx)}}$$

```
[In] Int[Sqrt[1 - Cos[c + d*x]]*Cos[c + d*x]^(3/2),x]
```

```
[Out] (-3*ArcTanh[Sin[c + d*x]/(Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c + d*x]])])/(4*d
) + (3*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(4*d*Sqrt[1 - Cos[c + d*x]]) - (Cos
[c + d*x]^(3/2)*Sin[c + d*x])/(2*d*Sqrt[1 - Cos[c + d*x]])
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rule 2854

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b + d*x^2), x], x
, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]))], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{1-\cos(c+dx)}}-\frac{3}{4}\int\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}\,dx\\
&= \frac{3\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{1-\cos(c+dx)}}-\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{1-\cos(c+dx)}}+\frac{3}{8}\int\frac{\sqrt{1-\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{3\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{1-\cos(c+dx)}}-\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{1-\cos(c+dx)}}\\
&\quad+\frac{3\text{Subst}\left(\int\frac{1}{-1+x^2}\,dx,x,\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{4d}\\
&= -\frac{3\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{4d}+\frac{3\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{1-\cos(c+dx)}}-\frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{1-\cos(c+dx)}}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.29 (sec) , antiderivative size = 181, normalized size of antiderivative = 1.59

$$\int \sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)\,dx = -\frac{e^{-\frac{3}{2}i(c+dx)}\left(\sqrt{1+e^{2i(c+dx)}}\left(1-2e^{i(c+dx)}-2e^{2i(c+dx)}+e^{3i(c+dx)}\right)+3e^{2i(c+dx)}\operatorname{arcsinh}\left(e^{i(c+dx)}\right)+3e^{2i(c+dx)}}{8d\sqrt{1+e^{2i(c+dx)}}}$$

```
[In] Integrate[Sqrt[1 - Cos[c + d*x]]*Cos[c + d*x]^(3/2),x]
```

```
[Out] -1/8*((Sqrt[1 + E^((2*I)*(c + d*x))]*(1 - 2*E^(I*(c + d*x)) - 2*E^((2*I)*(c
 + d*x)) + E^((3*I)*(c + d*x))) + 3*E^((2*I)*(c + d*x))*ArcSinh[E^(I*(c + d
*x))] + 3*E^((2*I)*(c + d*x))*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]])*Sqrt[
-((-1 + Cos[c + d*x])*Cos[c + d*x])]*Csc[(c + d*x)/2])/(d*E^(((3*I)/2)*(c +
 d*x))*Sqrt[1 + E^((2*I)*(c + d*x))])
```

Maple [A] (verified)

Time = 13.34 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.35

method	result
default	$-\frac{\csc(dx+c)\left(2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,(\cos^2(dx+c))-\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+3\,\operatorname{arctanh}\left(\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)-3\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\sqrt{-2\cos(dx}}{8d\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$

```
[In] int((1-cos(d*x+c))^(1/2)*cos(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/8/d*csc(d*x+c)*(2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2-cos(d*x
+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+3*arctanh((cos(d*x+c)/(1+cos(d*x+c)))
^(1/2))-3*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))*(-2*cos(d*x+c)+2)^(1/2)*cos(d*
x+c)^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.09

$$\int \sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)\,dx = -\frac{2\left(2\cos(dx+c)^2-\cos(dx+c)-3\right)\sqrt{-\cos(dx+c)+1}\sqrt{\cos(dx+c)}-3\log\left(-\frac{2(\cos(dx+c)+1)\sqrt{-\cos}}{}\right.}{8\,d\sin(dx+c)}$$

```
[In] integrate((1-cos(d*x+c))^(1/2)*cos(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/8*(2*(2*cos(d*x + c)^2 - cos(d*x + c) - 3)*sqrt(-cos(d*x + c) + 1)*sqrt(
cos(d*x + c)) - 3*log(-(2*(cos(d*x + c) + 1)*sqrt(-cos(d*x + c) + 1)*sqrt(c
os(d*x + c)) - (2*cos(d*x + c) + 1)*sin(d*x + c))/sin(d*x + c))*sin(d*x + c
))/(d*sin(d*x + c))
```

Sympy [F]

$$\int \sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)\,dx=\int \sqrt{1-\cos{(c+dx)}}\cos^{\frac{3}{2}}{(c+dx)}\,dx$$

```
[In] integrate((1-cos(d*x+c))**(1/2)*cos(d*x+c)**(3/2),x)
```

```
[Out] Integral(sqrt(1 - cos(c + d*x))*cos(c + d*x)**(3/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1305 vs. $2(96) = 192$.

Time = 0.40 (sec) , antiderivative size = 1305, normalized size of antiderivative = 11.45

$$\int \sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)\,dx=\text{Too large to display}$$

```
[In] integrate((1-cos(d*x+c))^(1/2)*cos(d*x+c)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/32*(4*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^
(1/4)*(((cos(2*d*x + 2*c) - 2)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c))) + sin(2*d*x + 2*c)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c))) + cos(2*d*x + 2*c) - 2)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c) + 1)) - (cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(2*d
*x + 2*c) - (cos(2*d*x + 2*c) - 2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*
d*x + 2*c))) - sin(2*d*x + 2*c))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c) + 1))) + 3*log(sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*co
s(2*d*x + 2*c) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)
)^2 + sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1
)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + 2*(cos(2*d*x
 + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arct
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1) - 3*log(sqrt(cos(2*d*x +
2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*cos(1/2*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x
 + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c) + 1))^2 - 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*
d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
```

```
1)) + 1) + 3*log(((cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 +
 sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2)*cos(1/2*arctan2(si
n(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + (cos(1/2*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c
)))^2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2)*sqrt(cos
(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1) + 2*(cos(2*d
*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*a
rctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*cos(1/2*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))) + 1) - 3*lo
g(((cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan
2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2)*cos(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c) + 1))^2 + (cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2)*sin(1/2*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2)*sqrt(cos(2*d*x + 2*c)^2
 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1) - 2*(cos(2*d*x + 2*c)^2 + s
in(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*
x + 2*c), cos(2*d*x + 2*c) + 1))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1
/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))) + 1))/d
```

Giac [F]

$$\int \sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)\,dx=\int \sqrt{-\cos\left(dx+c\right)+1}\cos\left(dx+c\right)^{\frac{3}{2}}\,dx$$

```
[In] integrate((1-cos(d*x+c))^(1/2)*cos(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate(sqrt(-cos(d*x + c) + 1)*cos(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)\,dx=\int \cos\left(c+d\,x\right)^{3/2}\,\sqrt{1-\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)*(1 - cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(3/2)*(1 - cos(c + d*x))^(1/2), x)
```

3.270 $\int \sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 72

$$\int \sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}\,dx = \frac{\operatorname{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{1-\cos(c+dx)}}$$

```
[Out] arctanh(sin(d*x+c)/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2))/d-sin(d*x+c)*cos(
d*x+c)^(1/2)/d/(1-cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.120$, Rules used = {2849, 2854, 213}

$$\int \sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}\,dx = \frac{\operatorname{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d} - \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{d\sqrt{1-\cos(c+dx)}}$$

```
[In] Int[Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c + d*x]],x]
```

```
[Out] ArcTanh[Sin[c + d*x]/(Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c + d*x]])]/d - (Sqrt
[Cos[c + d*x]]*Sin[c + d*x])/(d*Sqrt[1 - Cos[c + d*x]])
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rule 2854

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b + d*x^2), x], x
, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]))], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{1-\cos(c+dx)}} - \frac{1}{2}\int \frac{\sqrt{1-\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx \\
&= -\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{1-\cos(c+dx)}} - \frac{\text{Subst}\left(\int \frac{1}{-1+x^2}\,dx, x, \frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d} \\
&= \frac{\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d} - \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{1-\cos(c+dx)}}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.33 (sec) , antiderivative size = 155, normalized size of antiderivative = 2.15

$$\int \sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}\,dx =$$

$$-\frac{i\sqrt{2}\left(\left(1+e^{i(c+dx)}\right)\sqrt{1+e^{2i(c+dx)}} - e^{i(c+dx)}\text{arcsinh}\left(e^{i(c+dx)}\right) - e^{i(c+dx)}\text{arctanh}\left(\sqrt{1+e^{2i(c+dx)}}\right)\right)\sqrt{\cos(}}{d\left(-1+e^{i(c+dx)}\right)\sqrt{1+e^{2i(c+dx)}}}$$

```
[In] Integrate[Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c + d*x]],x]
```

```
[Out] ((-I)*Sqrt[2]*((1 + E^(I*(c + d*x)))*Sqrt[1 + E^((2*I)*(c + d*x))] - E^(I*(
c + d*x))*ArcSinh[E^(I*(c + d*x))] - E^(I*(c + d*x))*ArcTanh[Sqrt[1 + E^((2
*I)*(c + d*x))]])*Sqrt[Cos[c + d*x]*Sin[(c + d*x)/2]^2])/(d*(-1 + E^(I*(c +
 d*x)))*Sqrt[1 + E^((2*I)*(c + d*x))])
```

Maple [A] (verified)

Time = 13.25 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.69

method	result	size
default	$-\frac{\csc(dx+c)\left(\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-\operatorname{arctanh}\left(\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\right)\sqrt{-2\cos(dx+c)+2}\,\left(\sqrt{\cos}(dx+c)\right)\sqrt{2}}{2d\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$	122

```
[In] int((1-cos(d*x+c))^(1/2)*cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/d*csc(d*x+c)*(cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)-arctanh((cos(d*x+c)/(1+cos(d*x+c)))^(1/2)))*(-2*cos(
d*x+c)+2)^(1/2)*cos(d*x+c)^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.54

$$\int \sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}\,dx = -\frac{2\left(\cos\left(dx+c\right)+1\right)\sqrt{-\cos\left(dx+c\right)+1}\sqrt{\cos\left(dx+c\right)}-\log\left(-\frac{2\left(\cos(dx+c)+1\right)\sqrt{-\cos(dx+c)+1}\sqrt{\cos(dx+c)}+(2\cos}{\sin(dx+c)}\right.}{2\,d\sin\left(dx+c\right)}$$

```
[In] integrate((1-cos(d*x+c))^(1/2)*cos(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/2*(2*(cos(d*x + c) + 1)*sqrt(-cos(d*x + c) + 1)*sqrt(cos(d*x + c)) - log
(-(2*(cos(d*x + c) + 1)*sqrt(-cos(d*x + c) + 1)*sqrt(cos(d*x + c)) + (2*cos
(d*x + c) + 1)*sin(d*x + c))/sin(d*x + c))*sin(d*x + c))/(d*sin(d*x + c))
```

Sympy [F]

$$\int \sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}\,dx = \int \sqrt{1-\cos{(c+dx)}}\sqrt{\cos{(c+dx)}}\,dx$$

```
[In] integrate((1-cos(d*x+c))**(1/2)*cos(d*x+c)**(1/2),x)
[Out] Integral(sqrt(1 - cos(c + d*x))*sqrt(cos(c + d*x)), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 966 vs. $2(64) = 128$.

Time = 0.40 (sec) , antiderivative size = 966, normalized size of antiderivative = 13.42

$$\int \sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate((1-cos(d*x+c))^(1/2)*cos(d*x+c)^(1/2),x, algorithm="maxima")
[Out] 1/8*(4*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(
1/4)*((cos(d*x + c) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
 + 1)) + sin(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
1))) - log(sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c
) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + sqrt(co
s(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + 2*(cos(2*d*x + 2*c)^2 + s
in(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x
 + 2*c), cos(2*d*x + 2*c) + 1)) + 1) + log(sqrt(cos(2*d*x + 2*c)^2 + sin(2*
d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c) + 1))^2 + sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*c
os(2*d*x + 2*c) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1
))^2 - 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)
^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1) - log(
((cos(d*x + c)^2 + sin(d*x + c)^2)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*
d*x + 2*c) + 1))^2 + (cos(d*x + c)^2 + sin(d*x + c)^2)*sin(1/2*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2)*sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x
 + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1) + 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2
*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(d*x + c)*cos(1/2*arctan2(sin(2*d
*x + 2*c), cos(2*d*x + 2*c) + 1)) + sin(d*x + c)*sin(1/2*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c) + 1))) + 1) + log(((cos(d*x + c)^2 + sin(d*x + c)^
2)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + (cos(d*x +
c)^2 + sin(d*x + c)^2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
 1))^2)*sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) +
 1) - 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^
```

```
(1/4)*(cos(d*x + c)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)
) + sin(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))
+ 1))/d
```

Giac [F]

$$\int \sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}\,dx = \int \sqrt{-\cos(dx+c)+1}\sqrt{\cos(dx+c)}\,dx$$

```
[In] integrate((1-cos(d*x+c))^(1/2)*cos(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(-cos(d*x + c) + 1)*sqrt(cos(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}\,dx = \int \sqrt{\cos(c+d\,x)}\,\sqrt{1-\cos(c+d\,x)}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)*(1 - cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(1/2)*(1 - cos(c + d*x))^(1/2), x)
```

3.271 $\int \frac{\sqrt{1-\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 37

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = -\frac{2\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}$$

```
[Out] -2*arctanh(sin(d*x+c)/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2))/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2854, 213}

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = -\frac{2\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}$$

```
[In] Int[Sqrt[1 - Cos[c + d*x]]/Sqrt[Cos[c + d*x]],x]
[Out] (-2*ArcTanh[Sin[c + d*x]/(Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c + d*x]])])/d
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 2854

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b + d*x^2), x], x
```

```
, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]))], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{2\text{Subst}\left(\int \frac{1}{-1+x^2}\,dx, x, \frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}$$
$$= -\frac{2\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.17 (sec) , antiderivative size = 124, normalized size of antiderivative = 3.35

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = -\frac{e^{\frac{1}{2}i(c+dx)}\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}\left(\text{arcsinh}\left(e^{i(c+dx)}\right)+\text{arctanh}\left(\sqrt{1+e^{2i(c+dx)}}\right)\right)\sqrt{1-\cos(c+dx)}\csc\left(\right.}{\sqrt{2}d\sqrt{1+e^{2i(c+dx)}}}$$

```
[In] Integrate[Sqrt[1 - Cos[c + d*x]]/Sqrt[Cos[c + d*x]],x]
```

```
[Out] -((E^((I/2)*(c + d*x))*Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(I*(c + d*x))]*(Arc
Sinh[E^(I*(c + d*x))] + ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]])*Sqrt[1 - Co
s[c + d*x]]*Csc[(c + d*x)/2])/(Sqrt[2]*d*Sqrt[1 + E^((2*I)*(c + d*x))]))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 80 vs. 2(33) = 66.

Time = 4.75 (sec) , antiderivative size = 81, normalized size of antiderivative = 2.19

method	result	size
default	$-\frac{\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{-2\cos(dx+c)+2}\,\text{arctanh}\left(\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)(\cot(dx+c)+\csc(dx+c))}{d\sqrt{\cos(dx+c)}}$	81

```
[In] int((1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/d*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(-2*cos(d*x+c)+2)^(1/2)*arct
anh((cos(d*x+c)/(1+cos(d*x+c)))^(1/2))/cos(d*x+c)^(1/2)*(cot(d*x+c)+csc(d*x
+c))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 64, normalized size of antiderivative = 1.73

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = \frac{\log\left(-\frac{2\,(\cos(dx+c)+1)\sqrt{-\cos(dx+c)+1}\sqrt{\cos(dx+c)}-(2\,\cos(dx+c)+1)\sin(dx+c)}{\sin(dx+c)}\right)}{d}$$

```
[In] integrate((1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] log(-(2*(cos(d*x + c) + 1)*sqrt(-cos(d*x + c) + 1)*sqrt(cos(d*x + c)) - (2*
cos(d*x + c) + 1)*sin(d*x + c))/sin(d*x + c))/d
```

Sympy [F]

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{\sqrt{1-\cos\left(c+dx\right)}}{\sqrt{\cos\left(c+dx\right)}}\,dx$$

```
[In] integrate((1-cos(d*x+c))**(1/2)/cos(d*x+c)**(1/2),x)
```

```
[Out] Integral(sqrt(1 - cos(c + d*x))/sqrt(cos(c + d*x)), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 221 vs. 2(33) = 66.

Time = 0.36 (sec) , antiderivative size = 221, normalized size of antiderivative = 5.97

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = \frac{2\,\mathrm{arsinh}\,(1)+\log\left(\cos\left(dx+c\right)^2+\sin\left(dx+c\right)^2+\sqrt{\cos\left(2\,dx+2\,c\right)^2+\sin\left(2\,dx+2\,c\right)^2+2\,\cos\left(2\,dx+2\right.}\right.}{}$$

```
[In] integrate((1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/2*(2*arcsinh(1) + log(cos(d*x + c)^2 + sin(d*x + c)^2 + sqrt(cos(2*d*x +
2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*(cos(1/2*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c),
cos(2*d*x + 2*c) + 1))^2) + 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*
cos(2*d*x + 2*c) + 1)^(1/4)*(cos(d*x + c)*cos(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c) + 1)) + sin(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c) + 1)))))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 119 vs. 2(33) = 66.

Time = 0.60 (sec) , antiderivative size = 119, normalized size of antiderivative = 3.22

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = \frac{2\,\log\left(\frac{2\left(\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+2\,\sqrt{2}-\sqrt{\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^4-6\,\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+1}+1\right)}{\left|-2\,\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+4\,\sqrt{2}+2\,\sqrt{\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^4-6\,\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+1}-2\right|}\right)\mathrm{sgn}\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}{d}$$

```
[In] integrate((1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="giac")
```

```
[Out] 2*log(2*(tan(1/4*d*x + 1/4*c)^2 + 2*sqrt(2) - sqrt(tan(1/4*d*x + 1/4*c)^4 -
 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 1)/abs(-2*tan(1/4*d*x + 1/4*c)^2 + 4*sqrt(
2) + 2*sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) - 2))*sg
n(sin(1/2*d*x + 1/2*c))/d
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{\sqrt{1-\cos\left(c+d\,x\right)}}{\sqrt{\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int((1 - cos(c + d*x))^(1/2)/cos(c + d*x)^(1/2),x)
```

```
[Out] int((1 - cos(c + d*x))^(1/2)/cos(c + d*x)^(1/2), x)
```

3.272 $\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 35

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\sin(c+dx)}{d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}$$

```
[Out] 2*sin(d*x+c)/d/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.040$, Rules used = {2850}

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\sin(c+dx)}{d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}$$

```
[In] Int[Sqrt[1 - Cos[c + d*x]]/Cos[c + d*x]^(3/2),x]
[Out] (2*Sin[c + d*x])/(d*Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c + d*x]])
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{2\sin(c+dx)}{d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 39, normalized size of antiderivative = 1.11

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\sqrt{1-\cos(c+dx)}\cot\left(\frac{1}{2}(c+dx)\right)}{d\sqrt{\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[1 - Cos[c + d*x]]/Cos[c + d*x]^(3/2),x]
[Out] (2*Sqrt[1 - Cos[c + d*x]]*Cot[(c + d*x)/2])/(d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.50 (sec) , antiderivative size = 41, normalized size of antiderivative = 1.17

method	result	size
default	$\frac{\sqrt{-2\cos(dx+c)+2}\,(\cot(dx+c)+\csc(dx+c))\sqrt{2}}{d\sqrt{\cos(dx+c)}}$	41

```
[In] int((1-cos(d*x+c))^(1/2)/cos(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
[Out] 1/d*(-2*cos(d*x+c)+2)^(1/2)/cos(d*x+c)^(1/2)*(cot(d*x+c)+csc(d*x+c))*2^(1/2
)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 41, normalized size of antiderivative = 1.17

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\,(\cos\,(dx+c)+1)\sqrt{-\cos\,(dx+c)+1}}{d\sqrt{\cos\,(dx+c)}\sin\,(dx+c)}$$

```
[In] integrate((1-cos(d*x+c))^(1/2)/cos(d*x+c)^(3/2),x, algorithm="fricas")
[Out] 2*(cos(d*x + c) + 1)*sqrt(-cos(d*x + c) + 1)/(d*sqrt(cos(d*x + c))*sin(d*x
+ c))
```

Sympy [F]

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{\sqrt{1-\cos{(c+dx)}}}{\cos^{\frac{3}{2}}{(c+dx)}}\,dx$$

```
[In] integrate((1-cos(d*x+c))**(1/2)/cos(d*x+c)**(3/2),x)
[Out] Integral(sqrt(1 - cos(c + d*x))/cos(c + d*x)**(3/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 75 vs. $2(31) = 62$.

Time = 0.30 (sec) , antiderivative size = 75, normalized size of antiderivative = 2.14

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\left(\sqrt{2}-\frac{\sqrt{2}\sin(dx+c)^2}{(\cos(dx+c)+1)^2}\right)}{d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{3}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{3}{2}}}$$

```
[In] integrate((1-cos(d*x+c))^(1/2)/cos(d*x+c)^(3/2),x, algorithm="maxima")
[Out] 2*(sqrt(2) - sqrt(2)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2)/(d*(sin(d*x + c)/
(cos(d*x + c) + 1) + 1)^(3/2)*(-sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(3/2))
```

Giac [A] (verification not implemented)

none

Time = 0.61 (sec) , antiderivative size = 59, normalized size of antiderivative = 1.69

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = -\frac{2\sqrt{2}\left(\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2-1\right)\mathrm{sgn}\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}{\sqrt{\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^4-6\,\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+1}d}$$

```
[In] integrate((1-cos(d*x+c))^(1/2)/cos(d*x+c)^(3/2),x, algorithm="giac")
[Out] -2*sqrt(2)*(tan(1/4*d*x + 1/4*c)^2 - 1)*sgn(sin(1/2*d*x + 1/2*c))/(sqrt(tan
(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1)*d)
```

Mupad [B] (verification not implemented)

Time = 14.71 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.89

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\,\sin\left(c+d\,x\right)}{d\,\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{1-\cos\left(c+d\,x\right)}}$$

```
[In] int((1 - cos(c + d*x))^(1/2)/cos(c + d*x)^(3/2),x)
[Out] (2*sin(c + d*x))/(d*cos(c + d*x)^(1/2)*(1 - cos(c + d*x))^(1/2))
```

3.273 $\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 75

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)} - \frac{4\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}$$

```
[Out] 2/3*sin(d*x+c)/d/cos(d*x+c)^(3/2)/(1-cos(d*x+c))^(1/2)-4/3*sin(d*x+c)/d/(1-
cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2851, 2850}

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)} - \frac{4\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}$$

```
[In] Int[Sqrt[1 - Cos[c + d*x]]/Cos[c + d*x]^(5/2),x]
```

```
[Out] (2*Sin[c + d*x])/(3*d*Sqrt[1 - Cos[c + d*x]]*Cos[c + d*x]^(3/2)) - (4*Sin[c
 + d*x])/(3*d*Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c + d*x]])
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{2\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}-\frac{2}{3}\int\frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx\\ &= \frac{2\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}-\frac{4\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 51, normalized size of antiderivative = 0.68

$$\int\frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx=-\frac{2\sqrt{1-\cos(c+dx)}(-1+2\cos(c+dx))\cot\left(\frac{1}{2}(c+dx)\right)}{3d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Integrate[Sqrt[1 - Cos[c + d*x]]/Cos[c + d*x]^(5/2),x]
[Out] (-2*Sqrt[1 - Cos[c + d*x]]*(-1 + 2*Cos[c + d*x])*Cot[(c + d*x)/2])/(3*d*Cos
[c + d*x]^(3/2))
```

Maple [A] (verified)

Time = 4.40 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.71

method	result	size
default	$-\frac{\csc(dx+c)\sqrt{-2\cos(dx+c)+2}\,(-1+2(\cos^2(dx+c))+\cos(dx+c))\sqrt{2}}{3d\cos(dx+c)^{\frac{3}{2}}}$	53

```
[In] int((1-cos(d*x+c))^(1/2)/cos(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/3/d*csc(d*x+c)*(-2*cos(d*x+c)+2)^(1/2)*(-1+2*cos(d*x+c)^2+cos(d*x+c))/co
s(d*x+c)^(3/2)*2^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 51, normalized size of antiderivative = 0.68

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = -\frac{2\left(2\cos\left(dx+c\right)^{2}+\cos\left(dx+c\right)-1\right)\sqrt{-\cos\left(dx+c\right)+1}}{3\,d\cos\left(dx+c\right)^{\frac{3}{2}}\sin\left(dx+c\right)}$$

```
[In] integrate((1-cos(d*x+c))^(1/2)/cos(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] -2/3*(2*cos(d*x + c)^2 + cos(d*x + c) - 1)*sqrt(-cos(d*x + c) + 1)/(d*cos(d
*x + c)^(3/2)*sin(d*x + c))
```

Sympy [F]

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{\sqrt{1-\cos\left(c+dx\right)}}{\cos^{\frac{5}{2}}\left(c+dx\right)}\,dx$$

```
[In] integrate((1-cos(d*x+c))**(1/2)/cos(d*x+c)**(5/2),x)
```

```
[Out] Integral(sqrt(1 - cos(c + d*x))/cos(c + d*x)**(5/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 164 vs. 2(63) = 126.

Time = 0.30 (sec) , antiderivative size = 164, normalized size of antiderivative = 2.19

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = -\frac{2\left(\sqrt{2}-\frac{4\sqrt{2}\sin(dx+c)^{2}}{(\cos(dx+c)+1)^{2}}+\frac{3\sqrt{2}\sin(dx+c)^{4}}{(\cos(dx+c)+1)^{4}}\right)\left(\frac{\sin(dx+c)^{2}}{(\cos(dx+c)+1)^{2}}+1\right)^{2}}{3\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{5}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{5}{2}}\left(\frac{2\sin(dx+c)^{2}}{(\cos(dx+c)+1)^{2}}+\frac{\sin(dx+c)^{4}}{(\cos(dx+c)+1)^{4}}+1\right)}$$

```
[In] integrate((1-cos(d*x+c))^(1/2)/cos(d*x+c)^(5/2),x, algorithm="maxima")
```

```
[Out] -2/3*(sqrt(2) - 4*sqrt(2)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 3*sqrt(2)*s
in(d*x + c)^4/(cos(d*x + c) + 1)^4)*(sin(d*x + c)^2/(cos(d*x + c) + 1)^2 +
1)^2/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(5/2)*(-sin(d*x + c)/(cos(d*x
 + c) + 1) + 1)^(5/2)*(2*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + sin(d*x + c)
^4/(cos(d*x + c) + 1)^4 + 1))
```

Giac [A] (verification not implemented)

none

Time = 0.63 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.16

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2\sqrt{2}\left(\left(\left(\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2-15\right)\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+15\right)\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2-1\right)\mathrm{sgn}\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}{3\left(\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^4-6\,\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+1\right)^{\frac{3}{2}}d}$$

```
[In] integrate((1-cos(d*x+c))^(1/2)/cos(d*x+c)^(5/2),x, algorithm="giac")
```

```
[Out] 2/3*sqrt(2)*(((tan(1/4*d*x + 1/4*c)^2 - 15)*tan(1/4*d*x + 1/4*c)^2 + 15)*ta
n(1/4*d*x + 1/4*c)^2 - 1)*sgn(sin(1/2*d*x + 1/2*c))/((tan(1/4*d*x + 1/4*c)^
4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1)^(3/2)*d)
```

Mupad [B] (verification not implemented)

Time = 14.63 (sec) , antiderivative size = 84, normalized size of antiderivative = 1.12

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{4\sqrt{1-\cos\left(c+d\,x\right)}\left(\sin\left(c+d\,x\right)-\sin\left(2\,c+2\,d\,x\right)+\sin\left(3\,c+3\,d\,x\right)\right)}{3\,d\,\sqrt{\cos\left(c+d\,x\right)}\,\left(3\,\cos\left(c+d\,x\right)-2\,\cos\left(2\,c+2\,d\,x\right)+\cos\left(3\,c+3\,d\,x\right)-2\right)}$$

```
[In] int((1 - cos(c + d*x))^(1/2)/cos(c + d*x)^(5/2),x)
```

```
[Out] (4*(1 - cos(c + d*x))^(1/2)*(sin(c + d*x) - sin(2*c + 2*d*x) + sin(3*c + 3*
d*x)))/(3*d*cos(c + d*x)^(1/2)*(3*cos(c + d*x) - 2*cos(2*c + 2*d*x) + cos(3
*c + 3*d*x) - 2))
```

3.274 $\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 112

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2\sin(c+dx)}{5d\sqrt{1-\cos(c+dx)}\cos^{\frac{5}{2}}(c+dx)} - \frac{8\sin(c+dx)}{15d\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)} + \frac{16\sin(c+dx)}{15d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}$$

```
[Out] 2/5*sin(d*x+c)/d/cos(d*x+c)^(5/2)/(1-cos(d*x+c))^(1/2)-8/15*sin(d*x+c)/d/co
s(d*x+c)^(3/2)/(1-cos(d*x+c))^(1/2)+16/15*sin(d*x+c)/d/(1-cos(d*x+c))^(1/2)
/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2851, 2850}

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = -\frac{8\sin(c+dx)}{15d\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)} + \frac{2\sin(c+dx)}{5d\sqrt{1-\cos(c+dx)}\cos^{\frac{5}{2}}(c+dx)} + \frac{16\sin(c+dx)}{15d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}$$

```
[In] Int[Sqrt[1 - Cos[c + d*x]]/Cos[c + d*x]^(7/2),x]
```

```
[Out] (2*Sin[c + d*x])/(5*d*Sqrt[1 - Cos[c + d*x]]*Cos[c + d*x]^(5/2)) - (8*Sin[c
 + d*x])/(15*d*Sqrt[1 - Cos[c + d*x]]*Cos[c + d*x]^(3/2)) + (16*Sin[c + d*x
])/(15*d*Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c + d*x]])
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{2\sin(c+dx)}{5d\sqrt{1-\cos(c+dx)}\cos^{\frac{5}{2}}(c+dx)} - \frac{4}{5}\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{2\sin(c+dx)}{5d\sqrt{1-\cos(c+dx)}\cos^{\frac{5}{2}}(c+dx)} \\
&\quad - \frac{8\sin(c+dx)}{15d\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)} + \frac{8}{15}\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{2\sin(c+dx)}{5d\sqrt{1-\cos(c+dx)}\cos^{\frac{5}{2}}(c+dx)} - \frac{8\sin(c+dx)}{15d\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)} \\
&\quad + \frac{16\sin(c+dx)}{15d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.54

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2\sqrt{1-\cos(c+dx)}(3-4\cos(c+dx)+8\cos^2(c+dx))\cot\left(\frac{1}{2}(c+dx)\right)}{15d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Integrate[Sqrt[1 - Cos[c + d*x]]/Cos[c + d*x]^(7/2),x]
```

```
[Out] (2*Sqrt[1 - Cos[c + d*x]]*(3 - 4*Cos[c + d*x] + 8*Cos[c + d*x]^2)*Cot[(c + d*x)/2])/(15*d*Cos[c + d*x]^(5/2))
```

Maple [A] (verified)

Time = 5.57 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.58

method	result	size
default	$\frac{\csc(dx+c)\sqrt{-2\cos(dx+c)+2}\,(3+8(\cos^3(dx+c))+4(\cos^2(dx+c))-\cos(dx+c))\sqrt{2}}{15d\cos(dx+c)^{\frac{5}{2}}}$	65

```
[In] int((1-cos(d*x+c))^(1/2)/cos(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/15/d*csc(d*x+c)*(-2*cos(d*x+c)+2)^(1/2)*(3+8*cos(d*x+c)^3+4*cos(d*x+c)^2-cos(d*x+c))/cos(d*x+c)^(5/2)*2^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.56

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2\left(8\cos(dx+c)^3+4\cos(dx+c)^2-\cos(dx+c)+3\right)\sqrt{-\cos(dx+c)+1}}{15\,d\cos(dx+c)^{\frac{5}{2}}\sin(dx+c)}$$

```
[In] integrate((1-cos(d*x+c))^(1/2)/cos(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] 2/15*(8*cos(d*x + c)^3 + 4*cos(d*x + c)^2 - cos(d*x + c) + 3)*sqrt(-cos(d*x + c) + 1)/(d*cos(d*x + c)^(5/2)*sin(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((1-cos(d*x+c))**(1/2)/cos(d*x+c)**(7/2),x)
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 209 vs. 2(94) = 188.

Time = 0.31 (sec) , antiderivative size = 209, normalized size of antiderivative = 1.87

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2\left(7\sqrt{2}-\frac{17\sqrt{2}\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{25\sqrt{2}\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{15\sqrt{2}\sin(dx+c)^6}{(\cos(dx+c)+1)^6}\right)\left(\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+1\right)^3}{15\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{7}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{7}{2}}\left(\frac{3\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{3\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+\frac{\sin(dx+c)^6}{(\cos(dx+c)+1)^6}+1\right)}$$

```
[In] integrate((1-cos(d*x+c))^(1/2)/cos(d*x+c)^(7/2),x, algorithm="maxima")
[Out] 2/15*(7*sqrt(2) - 17*sqrt(2)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 25*sqrt(
2)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 15*sqrt(2)*sin(d*x + c)^6/(cos(d*x
 + c) + 1)^6)*(sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 1)^3/(d*(sin(d*x + c)/
(cos(d*x + c) + 1) + 1)^(7/2)*(-sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(7/2)*
(3*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 3*sin(d*x + c)^4/(cos(d*x + c) + 1
)^4 + sin(d*x + c)^6/(cos(d*x + c) + 1)^6 + 1))
```

Giac [A] (verification not implemented)

none

Time = 0.66 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.04

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = -\frac{2\sqrt{2}\left(\left(\left(\left(\left(7\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-75\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+430\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-430\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right.}{15\left(\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^4-6\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+1\right)^{\frac{5}{2}}d}$$

```
[In] integrate((1-cos(d*x+c))^(1/2)/cos(d*x+c)^(7/2),x, algorithm="giac")
```

```
[Out] -2/15*sqrt(2)*(((((7*tan(1/4*d*x + 1/4*c)^2 - 75)*tan(1/4*d*x + 1/4*c)^2 +
430)*tan(1/4*d*x + 1/4*c)^2 - 430)*tan(1/4*d*x + 1/4*c)^2 + 75)*tan(1/4*d*x
 + 1/4*c)^2 - 7)*sgn(sin(1/2*d*x + 1/2*c))/((tan(1/4*d*x + 1/4*c)^4 - 6*tan
(1/4*d*x + 1/4*c)^2 + 1)^(5/2)*d)
```

Mupad [B] (verification not implemented)

Time = 15.42 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.39

$$\int \frac{\sqrt{1-\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx$$
$$= \frac{8\sqrt{2\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2}\,(7\,\sin\left(c+d\,x\right)-4\,\sin\left(2\,c+2\,d\,x\right)+9\,\sin\left(3\,c+3\,d\,x\right)-2\,\sin\left(4\,c+4\,d\,x\right)+2}{15\,d\,\sqrt{1-2\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2}\,\left(-16\sin\left(c+d\,x\right)^2-4\sin\left(2\,c+2\,d\,x\right)^2+20\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+10\sin\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right.\right.}$$

```
[In] int((1 - cos(c + d*x))^(1/2)/cos(c + d*x)^(7/2),x)
```

```
[Out] (8*(2*sin(c/2 + (d*x)/2)^2)^(1/2)*(7*sin(c + d*x) - 4*sin(2*c + 2*d*x) + 9*
sin(3*c + 3*d*x) - 2*sin(4*c + 4*d*x) + 2*sin(5*c + 5*d*x)))/(15*d*(1 - 2*s
in(c/2 + (d*x)/2)^2)^(1/2)*(20*sin(c/2 + (d*x)/2)^2 - 4*sin(2*c + 2*d*x)^2
+ 10*sin((3*c)/2 + (3*d*x)/2)^2 + 2*sin((5*c)/2 + (5*d*x)/2)^2 - 16*sin(c +
 d*x)^2))
```

3.275 $\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{a-a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 185

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{a-a\cos(c+dx)}}\,dx = \frac{7\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{4\sqrt{a}d} - \frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a-a\cos(c+dx)}} + \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a-a\cos(c+dx)}}$$

```
[Out] 7/4*arctanh(sin(d*x+c)*a^(1/2)/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(1/2))/d/a
^(1/2)-arctanh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a-a*cos(d*x
+c))^(1/2))*2^(1/2)/d/a^(1/2)+1/2*cos(d*x+c)^(3/2)*sin(d*x+c)/d/(a-a*cos(d*
x+c))^(1/2)+1/4*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a-a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.56 (sec) , antiderivative size = 185, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.269, Rules used

= {2857, 3062, 3061, 2861, 214, 2854, 213}

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{a-a\cos(c+dx)}}\,dx = \frac{7\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{4\sqrt{a}d} - \frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{2d\sqrt{a-a\cos(c+dx)}} + \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{4d\sqrt{a-a\cos(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^(5/2)/Sqrt[a - a*Cos[c + d*x]],x]
```

```
[Out] (7*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[Cos[c + d*x]]*Sqrt[a - a*Cos[c + d*
x]])])/(4*Sqrt[a]*d) - (Sqrt[2]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqr
t[Cos[c + d*x]]*Sqrt[a - a*Cos[c + d*x]])])/(Sqrt[a]*d) + (Sqrt[Cos[c + d*x
]]*Sin[c + d*x])/(4*d*Sqrt[a - a*Cos[c + d*x]]) + (Cos[c + d*x]^(3/2)*Sin[c
 + d*x])/(2*d*Sqrt[a - a*Cos[c + d*x]])
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2854

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b + d*x^2), x], x
, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]))], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rule 2857

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[-2*d*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n - 1)/(f*(2*n - 1)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(b*(2*n - 1))
, Int[((c + d*Sin[e + f*x])^(n - 2)/Sqrt[a + b*Sin[e + f*x]])*Simp[a*c*d -
b*(2*d^2*(n - 1) + c^2*(2*n - 1)) + d*(a*d - b*c*(4*n - 3))*Sin[e + f*x], x
], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
```

```
 b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[n, 1] && IntegerQ[2*n]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3062

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(-B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(f*(m +
n + 1))), x] + Dist[1/(b*(m + n + 1)), Int[(a + b*Sin[e + f*x])^m*(c + d*Si
n[e + f*x])^(n - 1)*Simp[A*b*c*(m + n + 1) + B*(a*c*m + b*d*n) + (A*b*d*(m
+ n + 1) + B*(a*d*m + b*c*n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 -
 d^2, 0] && GtQ[n, 0] && (IntegerQ[n] || EqQ[m + 1/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a-a\cos(c+dx)}} + \frac{\int \frac{\sqrt{\cos(c+dx)}(3a+a\cos(c+dx))}{\sqrt{a-a\cos(c+dx)}}\,dx}{4a} \\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a-a\cos(c+dx)}} + \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a-a\cos(c+dx)}} - \frac{\int \frac{-\frac{a^2}{2}-\frac{7}{2}a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx}{4a^2} \\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a-a\cos(c+dx)}} + \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a-a\cos(c+dx)}} \\
&\quad - \frac{7\int \frac{\sqrt{a-a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx}{8a} + \int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx
\end{aligned}$$

$$= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a-a\cos(c+dx)}} + \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a-a\cos(c+dx)}} - \frac{7\text{Subst}\left(\int \frac{1}{-a+x^2}\,dx, x, \frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{4d} - \frac{(2a)\text{Subst}\left(\int \frac{1}{2a^2-ax^2}\,dx, x, \frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{d}$$

$$= \frac{7\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{4\sqrt{a}d} - \frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{a-a\cos(c+dx)}} + \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{a-a\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.11 (sec) , antiderivative size = 256, normalized size of antiderivative = 1.38

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{a-a\cos(c+dx)}}\,dx = -\frac{ie^{-2i(c+dx)}\left(-1+e^{i(c+dx)}\right)\left(7\sqrt{2}e^{2i(c+dx)}\text{arcsinh}\left(e^{i(c+dx)}\right) - 16e^{2i(c+dx)}\text{arctanh}\left(\frac{1+e^{i(c+dx)}}{\sqrt{2}\sqrt{1+e^{2i(c+dx)}}}\right) + \sqrt{2}\left(\sqrt{\right.\right.}{8\sqrt{2}d\sqrt{1+e^{2i(c+dx)}}}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)/Sqrt[a - a*Cos[c + d*x]],x]
```

```
[Out] ((-1/8*I)*(-1 + E^(I*(c + d*x)))*(7*Sqrt[2]*E^((2*I)*(c + d*x))*ArcSinh[E^(
I*(c + d*x))] - 16*E^((2*I)*(c + d*x))*ArcTanh[(1 + E^(I*(c + d*x)))/(Sqrt[
2]*Sqrt[1 + E^((2*I)*(c + d*x))])] + Sqrt[2]*(Sqrt[1 + E^((2*I)*(c + d*x))]
*(1 + 2*E^(I*(c + d*x)) + 2*E^((2*I)*(c + d*x)) + E^((3*I)*(c + d*x))) + 7*
E^((2*I)*(c + d*x))*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]]))*Sqrt[Cos[c + d
*x]])/(Sqrt[2]*d*E^((2*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*Sqrt[a -
 a*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 12.35 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.10

method	result
default	$\frac{\sin(dx+c)\left(2\left(\cos^2(dx+c)\right)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+3\cos(dx+c)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+7\sqrt{2}\,\text{arctanh}\left(\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)+\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-8\right.}{8d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{-a(\cos(dx+c)-1)}}$

```
[In] int(cos(d*x+c)^(5/2)/(a-cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/8/d*sin(d*x+c)*(2*cos(d*x+c)^2*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+
3*cos(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+7*2^(1/2)*arctanh((c
os(d*x+c)/(1+cos(d*x+c)))^(1/2))+2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-
8*arctanh(1/2*2^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)))*cos(d*x+c)^(1/2)/
(1+cos(d*x+c))/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)/(-a*(cos(d*x+c)-1))^(1/2)*
2^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 226, normalized size of antiderivative = 1.22

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{a-a\cos(c+dx)}}\,dx = \frac{4\sqrt{2}\sqrt{a}\log\left(-\frac{\frac{2\sqrt{2}\sqrt{-a\cos(dx+c)+a}(\cos(dx+c)+1)\sqrt{\cos(dx+c)}}{\sqrt{a}}-(3\cos(dx+c)+1)\sin(dx+c)}{(\cos(dx+c)-1)\sin(dx+c)}\right)\sin(dx+c)+7\sqrt{a}\log\left(-\frac{2\sqrt{-a\cos}}{}\right.}{}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/8*(4*sqrt(2)*sqrt(a)*log(-(2*sqrt(2)*sqrt(-a*cos(d*x + c) + a)*(cos(d*x +
 c) + 1)*sqrt(cos(d*x + c))/sqrt(a) - (3*cos(d*x + c) + 1)*sin(d*x + c))/((
cos(d*x + c) - 1)*sin(d*x + c)))*sin(d*x + c) + 7*sqrt(a)*log(-(2*sqrt(-a*c
os(d*x + c) + a)*sqrt(a)*(cos(d*x + c) + 1)*sqrt(cos(d*x + c)) + (2*a*cos(d
*x + c) + a)*sin(d*x + c))/sin(d*x + c))*sin(d*x + c) + 2*sqrt(-a*cos(d*x +
 c) + a)*(2*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*sqrt(cos(d*x + c)))/(a*d*s
in(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{a-a\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)/(a-a*cos(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{a-a\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{\sqrt{-a\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(5/2)/sqrt(-a*cos(d*x + c) + a), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 779 vs. $2(152) = 304$.

Time = 6.91 (sec) , antiderivative size = 779, normalized size of antiderivative = 4.21

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{a-a\cos(c+dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] 1/4*(2*sqrt(2)*log(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c)^4 - 6
*tan(1/4*d*x + 1/4*c)^2 + 1) + 1)/(sqrt(a)*sgn(sin(1/2*d*x + 1/2*c))) - 2*s
qrt(2)*log(abs(-tan(1/4*d*x + 1/4*c)^2 + sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*ta
n(1/4*d*x + 1/4*c)^2 + 1) + 3))/(sqrt(a)*sgn(sin(1/2*d*x + 1/2*c))) - 2*sqr
t(2)*log(abs(-tan(1/4*d*x + 1/4*c)^2 + sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(
1/4*d*x + 1/4*c)^2 + 1) + 1))/(sqrt(a)*sgn(sin(1/2*d*x + 1/2*c))) + 7*log(1
/8*abs(8*tan(1/4*d*x + 1/4*c)^2 - 16*sqrt(2) - 8*sqrt(tan(1/4*d*x + 1/4*c)^
4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 8)/(tan(1/4*d*x + 1/4*c)^2 + 2*sqrt(2)
- sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 1))/(sqrt(a
)*sgn(sin(1/2*d*x + 1/2*c))) - 4*sqrt(2)*(17*(tan(1/4*d*x + 1/4*c)^2 - sqrt
(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1))^7*sqrt(a) - 73*(ta
n(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)
^2 + 1))^6*sqrt(a) + 157*(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c
)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1))^5*sqrt(a) - 597*(tan(1/4*d*x + 1/4*c)^
2 - sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1))^4*sqrt(a)
+ 1603*(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*
x + 1/4*c)^2 + 1))^3*sqrt(a) - 875*(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d
*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1))^2*sqrt(a) - 1585*(tan(1/4*d*
x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1))
*sqrt(a) + 1737*sqrt(a))/(((tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4
*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1))^2 + 2*tan(1/4*d*x + 1/4*c)^2 - 2*sqr
t(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) - 7)^4*a*sgn(sin(1
/2*d*x + 1/2*c))))/d
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{a-a\cos(c+dx)}}\,dx = \int \frac{\cos\left(c+d\,x\right)^{5/2}}{\sqrt{a-a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(cos(c + d*x)^(5/2)/(a - a*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(5/2)/(a - a*cos(c + d*x))^(1/2), x)
```

3.276 $\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a-a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 141

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a-a\cos(c+dx)}}\,dx = \frac{\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d} - \frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a-a\cos(c+dx)}}$$

```
[Out] arctanh(sin(d*x+c)*a^(1/2)/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(1/2))/d/a^(1/
2)-arctanh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))
^(1/2))*2^(1/2)/d/a^(1/2)+sin(d*x+c)*cos(d*x+c)^(1/2)/d/(a-a*cos(d*x+c))^(1
/2)
```

Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used

$= \{2857, 3061, 2861, 214, 2854, 213\}$

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a-a\cos(c+dx)}}\,dx = \frac{\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d} - \frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{d\sqrt{a-a\cos(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^(3/2)/Sqrt[a - a*Cos[c + d*x]],x]
```

```
[Out] ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[Cos[c + d*x]]*Sqrt[a - a*Cos[c + d*x]]
)]/(Sqrt[a]*d) - (Sqrt[2]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[
c + d*x]]*Sqrt[a - a*Cos[c + d*x]])])/(Sqrt[a]*d) + (Sqrt[Cos[c + d*x]]*Sin
[c + d*x])/(d*Sqrt[a - a*Cos[c + d*x]])
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2854

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b + d*x^2), x], x
, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]))], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rule 2857

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[-2*d*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n - 1)/(f*(2*n - 1)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(b*(2*n - 1))
, Int[((c + d*Sin[e + f*x])^(n - 2)/Sqrt[a + b*Sin[e + f*x]])*Simp[a*c*d -
b*(2*d^2*(n - 1) + c^2*(2*n - 1)) + d*(a*d - b*c*(4*n - 3))*Sin[e + f*x], x
], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
 b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[n, 1] && IntegerQ[2*n]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a-a\cos(c+dx)}} + \frac{\int \frac{a+a\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx}{2a}$$

$$= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a-a\cos(c+dx)}} - \frac{\int \frac{\sqrt{a-a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx}{2a} + \int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx$$

$$= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a-a\cos(c+dx)}} - \frac{\text{Subst}\left(\int \frac{1}{-a+x^2}\,dx, x, \frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{d} - \frac{(2a)\text{Subst}\left(\int \frac{1}{2a^2-ax^2}\,dx, x, \frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{d}$$

$$= \frac{\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d} - \frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a-a\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.92 (sec) , antiderivative size = 228, normalized size of antiderivative = 1.62

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a-a\cos(c+dx)}}\,dx = -\frac{ie^{-i(c+dx)}\left(-1+e^{i(c+dx)}\right)\left(\sqrt{2}e^{i(c+dx)}\text{arcsinh}\left(e^{i(c+dx)}\right)-4e^{i(c+dx)}\text{arctanh}\left(\frac{1+e^{i(c+dx)}}{\sqrt{2}\sqrt{1+e^{2i(c+dx)}}}\right)+\sqrt{2}\left(\left(1+e^{i(c\cdots\right.\right.\right.}{2\sqrt{2}d\sqrt{1+e^{2i(c+dx)}}\sqrt{a-a\cos(c+\cdots}}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)/Sqrt[a - a*Cos[c + d*x]],x]
```

```
[Out] ((-1/2*I)*(-1 + E^(I*(c + d*x)))*(Sqrt[2]*E^(I*(c + d*x))*ArcSinh[E^(I*(c +
 d*x))] - 4*E^(I*(c + d*x))*ArcTanh[(1 + E^(I*(c + d*x)))/(Sqrt[2]*Sqrt[1 +
 E^((2*I)*(c + d*x))])] + Sqrt[2]*((1 + E^(I*(c + d*x)))*Sqrt[1 + E^((2*I)*
(c + d*x))] + E^(I*(c + d*x))*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]]))*Sqrt
[Cos[c + d*x]])/(Sqrt[2]*d*E^(I*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*Sq
rt[a - a*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 13.86 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.20

method	result
default	$\frac{\sin(dx+c)\left(\cos(dx+c)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+\sqrt{2}\,\text{arctanh}\left(\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)-2\,\text{arctanh}\left(\frac{\sqrt{2}}{2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}\right)\right)(\sqrt{\cos}(d\cdots}{2d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{-a(\cos(dx+c)-1)}}$

```
[In] int(cos(d*x+c)^(3/2)/(a-cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/d*sin(d*x+c)*(cos(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+2^(1
/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+2^(1/2)*arctanh((cos(d*x+c)/(1+cos(d*
x+c)))^(1/2))-2*arctanh(1/2*2^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)))*cos
(d*x+c)^(1/2)/(1+cos(d*x+c))/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)/(-a*(cos(d*x
+c)-1))^(1/2)*2^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 212, normalized size of antiderivative = 1.50

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a-a\cos(c+dx)}}\,dx$$
$$= \frac{\sqrt{2}\sqrt{a}\log\left(-\frac{\frac{2\sqrt{2}\sqrt{-a\cos(dx+c)+a}(\cos(dx+c)+1)\sqrt{\cos(dx+c)}}{\sqrt{a}}-(3\cos(dx+c)+1)\sin(dx+c)}{(\cos(dx+c)-1)\sin(dx+c)}\right)\sin(dx+c)+\sqrt{a}\log\left(-\frac{2\sqrt{-a\cos(}\right.}{}$$

[In] integrate(cos(d*x+c)^(3/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] 1/2*(sqrt(2)*sqrt(a)*log(-(2*sqrt(2)*sqrt(-a*cos(d*x + c) + a)*(cos(d*x + c
) + 1)*sqrt(cos(d*x + c))/sqrt(a) - (3*cos(d*x + c) + 1)*sin(d*x + c))/((co
s(d*x + c) - 1)*sin(d*x + c)))*sin(d*x + c) + sqrt(a)*log(-(2*sqrt(-a*cos(d
*x + c) + a)*sqrt(a)*(cos(d*x + c) + 1)*sqrt(cos(d*x + c)) + (2*a*cos(d*x +
 c) + a)*sin(d*x + c))/sin(d*x + c))*sin(d*x + c) + 2*sqrt(-a*cos(d*x + c)
+ a)*(cos(d*x + c) + 1)*sqrt(cos(d*x + c)))/(a*d*sin(d*x + c))

Sympy [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a-a\cos(c+dx)}}\,dx = \int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{-a\left(\cos(c+dx)-1\right)}}\,dx$$

[In] integrate(cos(d*x+c)**(3/2)/(a-a*cos(d*x+c))**(1/2),x)

[Out] Integral(cos(c + d*x)**(3/2)/sqrt(-a*(cos(c + d*x) - 1)), x)

Maxima [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a-a\cos(c+dx)}}\,dx = \int \frac{\cos(dx+c)^{\frac{3}{2}}}{\sqrt{-a\cos(dx+c)+a}}\,dx$$

[In] integrate(cos(d*x+c)^(3/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="maxima")

[Out] integrate(cos(d*x + c)^(3/2)/sqrt(-a*cos(d*x + c) + a), x)

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 581 vs. 2(118) = 236.

Time = 1.01 (sec) , antiderivative size = 581, normalized size of antiderivative = 4.12

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a-a\cos(c+dx)}}\,dx$$

$$= \frac{\frac{\sqrt{2}\log\left(\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2-\sqrt{\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^4-6\,\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+1}+1\right)}{\sqrt{a}\mathrm{sgn}\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}-\frac{\sqrt{2}\log\left(\left|-\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+\sqrt{\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^4-6\,\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+\cdots}\right.\right.}{\sqrt{a}\mathrm{sgn}\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}}{}$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*(sqrt(2)*log(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*t
an(1/4*d*x + 1/4*c)^2 + 1) + 1)/(sqrt(a)*sgn(sin(1/2*d*x + 1/2*c))) - sqrt(
2)*log(abs(-tan(1/4*d*x + 1/4*c)^2 + sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/
4*d*x + 1/4*c)^2 + 1) + 3))/(sqrt(a)*sgn(sin(1/2*d*x + 1/2*c))) - sqrt(2)*l
og(abs(-tan(1/4*d*x + 1/4*c)^2 + sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*
x + 1/4*c)^2 + 1) + 1))/(sqrt(a)*sgn(sin(1/2*d*x + 1/2*c))) + 2*log(1/2*abs
(2*tan(1/4*d*x + 1/4*c)^2 - 4*sqrt(2) - 2*sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*t
an(1/4*d*x + 1/4*c)^2 + 1) + 2)/(tan(1/4*d*x + 1/4*c)^2 + 2*sqrt(2) - sqrt(
tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 1))/(sqrt(a)*sgn(s
in(1/2*d*x + 1/2*c))) - 8*sqrt(2)*(3*(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4
*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1))^3*sqrt(a) - 7*(tan(1/4*d*x
 + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1))^
2*sqrt(a) + (tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1
/4*d*x + 1/4*c)^2 + 1))*sqrt(a) + 11*sqrt(a))/(((tan(1/4*d*x + 1/4*c)^2 - s
qrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1))^2 + 2*tan(1/4*d
*x + 1/4*c)^2 - 2*sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 +
1) - 7)^2*a*sgn(sin(1/2*d*x + 1/2*c))))/d
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a-a\cos(c+dx)}}\,dx=\int \frac{{\cos\left(c+d\,x\right)}^{3/2}}{\sqrt{a-a\,\cos\left(c+d\,x\right)}} \,d x$$

```
[In] int(cos(c + d*x)^(3/2)/(a - a*cos(c + d*x))^(1/2),x)
```

```
[Out] int(cos(c + d*x)^(3/2)/(a - a*cos(c + d*x))^(1/2), x)
```

3.277 $\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a-a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 107

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a-a\cos(c+dx)}}\,dx = \frac{2\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d} - \frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d}$$

```
[Out] 2*arctanh(sin(d*x+c)*a^(1/2)/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(1/2))/d/a^(
1/2)-arctanh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c
))^(1/2))*2^(1/2)/d/a^(1/2)
```

Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {2856, 2854, 213, 2861, 214}

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a-a\cos(c+dx)}}\,dx = \frac{2\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d} - \frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/Sqrt[a - a*Cos[c + d*x]],x]
```

```
[Out] (2*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[Cos[c + d*x]]*Sqrt[a - a*Cos[c + d*
x]])])/(Sqrt[a]*d) - (Sqrt[2]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[
Cos[c + d*x]]*Sqrt[a - a*Cos[c + d*x]])])/(Sqrt[a]*d)
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2854

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b + d*x^2), x], x
, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]))], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rule 2856

```
Int[Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(a_) + (b_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c
 + d*Sin[e + f*x]], x], x] + Dist[(b*c - a*d)/b, Int[1/(Sqrt[a + b*Sin[e +
f*x]]*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\int \frac{\sqrt{a-a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx}{a}+\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx \\
&= -\frac{2\text{Subst}\left(\int \frac{1}{-a+x^2}\,dx, x, \frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{d} \\
&\quad -\frac{(2a)\text{Subst}\left(\int \frac{1}{2a^2-ax^2}\,dx, x, \frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{d}
\end{aligned}$$

$$= \frac{2\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d} - \frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.52 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.50

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a-a\cos(c+dx)}}\,dx = -\frac{i\left(-1+e^{i(c+dx)}\right)\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}\left(\text{arcsinh}\left(e^{i(c+dx)}\right)-\sqrt{2}\text{arctanh}\left(\frac{1+e^{i(c+dx)}}{\sqrt{2}\sqrt{1+e^{2i(c+dx)}}}\right)+\text{arctanh}\left(\sqrt{\right.\right.}{\sqrt{2}d\sqrt{1+e^{2i(c+dx)}}\sqrt{a-a\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/Sqrt[a - a*Cos[c + d*x]],x]
```

```
[Out] ((-I)*(-1 + E^(I*(c + d*x)))*Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(I*(c + d*x))
]*(ArcSinh[E^(I*(c + d*x))] - Sqrt[2]*ArcTanh[(1 + E^(I*(c + d*x)))/(Sqrt[2
]*Sqrt[1 + E^((2*I)*(c + d*x))])] + ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]])
)/(Sqrt[2]*d*Sqrt[1 + E^((2*I)*(c + d*x))]*Sqrt[a - a*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 2.08 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.08

method	result	size
default	$\frac{\sin(dx+c)\left(-\operatorname{arctanh}\left(\frac{\sqrt{2}}{2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}\right)+\sqrt{2}\,\operatorname{arctanh}\left(\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\right)\left(\sqrt{\cos}(dx+c)\right)\sqrt{2}}{d(1+\cos(dx+c))\sqrt{-a(\cos(dx+c)-1)}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$	116

```
[In] int(cos(d*x+c)^(1/2)/(a-cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*sin(d*x+c)*(-arctanh(1/2*2^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))+2^(
1/2)*arctanh((cos(d*x+c)/(1+cos(d*x+c)))^(1/2)))*cos(d*x+c)^(1/2)/(1+cos(d*
x+c))/(-a*(cos(d*x+c)-1))^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.51

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a-a\cos(c+dx)}}\,dx = \frac{\sqrt{2}\sqrt{a}\log\left(-\frac{\frac{2\sqrt{2}\sqrt{-a\cos(dx+c)+a}(\cos(dx+c)+1)\sqrt{\cos(dx+c)}}{\sqrt{a}}-(3\cos(dx+c)+1)\sin(dx+c)}{(\cos(dx+c)-1)\sin(dx+c)}\right)+2\sqrt{a}\log\left(-\frac{2\sqrt{-a\cos(dx+c)+a}\sqrt{a}(\cos(dx+c)+1)\sqrt{\cos(dx+c)}+(2a\cos(dx+c)+a)\sin(dx+c)}{\sin(dx+c)}\right)}{2\,ad}$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/2*(sqrt(2)*sqrt(a)*log(-(2*sqrt(2)*sqrt(-a*cos(d*x + c) + a)*(cos(d*x + c
) + 1)*sqrt(cos(d*x + c))/sqrt(a) - (3*cos(d*x + c) + 1)*sin(d*x + c))/((co
s(d*x + c) - 1)*sin(d*x + c))) + 2*sqrt(a)*log(-(2*sqrt(-a*cos(d*x + c) + a
)*sqrt(a)*(cos(d*x + c) + 1)*sqrt(cos(d*x + c)) + (2*a*cos(d*x + c) + a)*si
n(d*x + c))/sin(d*x + c)))/(a*d)
```

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a-a\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-a(\cos(c+dx)-1)}}\,dx$$

```
[In] integrate(cos(d*x+c)**(1/2)/(a-a*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(cos(c + d*x))/sqrt(-a*(cos(c + d*x) - 1)), x)
```

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a-a\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos(dx+c)}}{\sqrt{-a\cos(dx+c)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(cos(d*x + c))/sqrt(-a*cos(d*x + c) + a), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 269 vs. $2(88) = 176$.

Time = 0.67 (sec) , antiderivative size = 269, normalized size of antiderivative = 2.51

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a-a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\left(2\sqrt{2}\log\left(\frac{2\left(\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+2\sqrt{2}-\sqrt{\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^4-6\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+1}+1\right)}{\left|-2\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+4\sqrt{2}+2\sqrt{\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^4-6\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+1}-2\right|}\right)-\log\left(\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2-\cdots\right.}{}$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(2)*(2*sqrt(2)*log(2*(tan(1/4*d*x + 1/4*c)^2 + 2*sqrt(2) - sqrt(ta
n(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 1)/abs(-2*tan(1/4*d*
x + 1/4*c)^2 + 4*sqrt(2) + 2*sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x +
1/4*c)^2 + 1) - 2)) - log(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c
)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 1) + log(abs(-tan(1/4*d*x + 1/4*c)^2
+ sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 3)) + log(a
bs(-tan(1/4*d*x + 1/4*c)^2 + sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x +
1/4*c)^2 + 1) + 1)))/(sqrt(a)*d*sgn(sin(1/2*d*x + 1/2*c)))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a-a\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(c+d\,x\right)}}{\sqrt{a-a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(a - a*cos(c + d*x))^(1/2),x)
```

```
[Out] int(cos(c + d*x)^(1/2)/(a - a*cos(c + d*x))^(1/2), x)
```

3.278 $\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 58

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d}$$

```
[Out] -arctanh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(
1/2))*2^(1/2)/d/a^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2861, 214}

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d}$$

```
[In] Int[1/(Sqrt[Cos[c + d*x]]*Sqrt[a - a*Cos[c + d*x]]),x]
```

```
[Out] -((Sqrt[2]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[
a - a*Cos[c + d*x]])])/(Sqrt[a]*d))
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = -\frac{(2a)\text{Subst}\left(\int \frac{1}{2a^2-ax^2}\,dx, x, \frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{d}$$

$$= -\frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.47 (sec) , antiderivative size = 118, normalized size of antiderivative = 2.03

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx$$
$$= \frac{i\left(-1+e^{i(c+dx)}\right)\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}\text{arctanh}\left(\frac{1+e^{i(c+dx)}}{\sqrt{2}\sqrt{1+e^{2i(c+dx)}}}\right)}{d\sqrt{1+e^{2i(c+dx)}}\sqrt{a-a\cos(c+dx)}}$$

```
[In] Integrate[1/(Sqrt[Cos[c + d*x]]*Sqrt[a - a*Cos[c + d*x]]),x]
```

```
[Out] (I*(-1 + E^(I*(c + d*x)))*Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(I*(c + d*x))]*A
rcTanh[(1 + E^(I*(c + d*x)))/(Sqrt[2]*Sqrt[1 + E^((2*I)*(c + d*x))])])/(d*S
qrt[1 + E^((2*I)*(c + d*x))]*Sqrt[a - a*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.99 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.38

method	result	size
default	$-\frac{\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\text{arctanh}\left(\frac{\sqrt{2}}{2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}\right)\sqrt{2}}{d\sqrt{\cos(dx+c)}\,\sqrt{-a(\cos(dx+c)-1)}}$	80

```
[In] int(1/cos(d*x+c)^(1/2)/(a-cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

[Out] -1/d*sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctanh(1/2*2^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))/cos(d*x+c)^(1/2)/(-a*(cos(d*x+c)-1))^(1/2)*2^(1/2)

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 144, normalized size of antiderivative = 2.48

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx = \left[\frac{\sqrt{2}\log\left(-\frac{\frac{2\sqrt{2}\sqrt{-a\cos(dx+c)+a}(\cos(dx+c)+1)\sqrt{\cos(dx+c)}}{\sqrt{a}}-(3\cos(dx+c)+1)\sin(dx+c)}{(\cos(dx+c)-1)\sin(dx+c)}\right)}{2\sqrt{a}d}, \frac{\sqrt{2}\sqrt{-\frac{1}{a}}\arctan\left(\frac{\sqrt{2}\sqrt{-a\cos(dx+c)+a}\sqrt{}}{\sin(dx+c}\right.}{d}\right.$$

[In] integrate(1/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] [1/2*sqrt(2)*log(-(2*sqrt(2)*sqrt(-a*cos(d*x + c) + a)*(cos(d*x + c) + 1)*sqrt(cos(d*x + c))/sqrt(a) - (3*cos(d*x + c) + 1)*sin(d*x + c))/((cos(d*x + c) - 1)*sin(d*x + c)))/(sqrt(a)*d), sqrt(2)*sqrt(-1/a)*arctan(sqrt(2)*sqrt(-a*cos(d*x + c) + a)*sqrt(-1/a)*sqrt(cos(d*x + c))/sin(d*x + c))/d]

Sympy [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-a\left(\cos\left(c+dx\right)-1\right)}\sqrt{\cos\left(c+dx\right)}}\,dx$$

[In] integrate(1/cos(d*x+c)**(1/2)/(a-a*cos(d*x+c))**(1/2),x)

[Out] Integral(1/(sqrt(-a*(cos(c + d*x) - 1))*sqrt(cos(c + d*x))), x)

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.43 (sec) , antiderivative size = 209, normalized size of antiderivative = 3.60

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\arctan\left(\frac{2\sqrt{2}\left(\cos(2dx+2c)^2+\sin(2dx+2c)^2+2\cos(2dx+2c)+1\right)^{\frac{1}{4}}\sin\left(\frac{1}{2}\arctan(\sin(2dx+2c),\cos(2dx+2c)+1)\right)}{\sqrt{a}\left|e^{(i\,dx+i\,c)}-1\right|}, \frac{2\left(\sqrt{2}\left(\cos(2dx\right.\right.}{}\right.}{\sqrt{-a}d}$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -sqrt(2)*arctan2(2*sqrt(2)*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos
(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
 + 1))/(sqrt(a)*abs(e^(I*d*x + I*c) - 1)), 2*(sqrt(2)*(cos(2*d*x + 2*c)^2 +
 sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sqrt(a)*cos(1/2*arctan2
(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - sqrt(-a)*abs(e^(I*d*x + I*c) -
1) + 2*sqrt(a))/(a*abs(e^(I*d*x + I*c) - 1)))/(sqrt(-a)*d)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 162 vs. $2(47) = 94$.

Time = 0.57 (sec) , antiderivative size = 162, normalized size of antiderivative = 2.79

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx = \frac{\sqrt{2}\left(\log\left(\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2-\sqrt{\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^4-6\,\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+1}+1\right)-\log\left(\left|-\tan\left(\frac{1}{4}\,dx+\right.\right.\right.}{}$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(2)*(log(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*t
an(1/4*d*x + 1/4*c)^2 + 1) + 1) - log(abs(-tan(1/4*d*x + 1/4*c)^2 + sqrt(ta
n(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 3)) - log(abs(-tan(1
/4*d*x + 1/4*c)^2 + sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2
+ 1) + 1)))/(sqrt(a)*d*sgn(sin(1/2*d*x + 1/2*c)))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{a-a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(a - a*cos(c + d*x))^(1/2)),x)
```

```
[Out] int(1/(cos(c + d*x)^(1/2)*(a - a*cos(c + d*x))^(1/2)), x)
```

3.279 $\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 95

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}$$

```
[Out] -arctanh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(
1/2))*2^(1/2)/d/a^(1/2)+2*sin(d*x+c)/d/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(1
/2)
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2858, 12, 2861, 214}

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = \frac{2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}} - \frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d}$$

```
[In] Int[1/(Cos[c + d*x]^(3/2)*Sqrt[a - a*Cos[c + d*x]]),x]
```

```
[Out] -((Sqrt[2]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[
a - a*Cos[c + d*x]])])/(Sqrt[a]*d)) + (2*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]
]*Sqrt[a - a*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}+\frac{\int \frac{a}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx}{a}\\
&= \frac{2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}+\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx\\
&= \frac{2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}-\frac{(2a)\text{Subst}\left(\int \frac{1}{2a^2-ax^2}\,dx,x,\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{d}\\
&= -\frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d}+\frac{2\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.53 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.65

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = \frac{2\left(-\frac{e^{-\frac{1}{2}i(c+dx)}\left(1+e^{2i(c+dx)}\right)\operatorname{arctanh}\left(\frac{1+e^{i(c+dx)}}{\sqrt{2}\sqrt{1+e^{2i(c+dx)}}}\right)}{\sqrt{2}}+2\sqrt{1+e^{2i(c+dx)}}\cos\left(\frac{1}{2}(c+dx)\right)\right)\sin\left(\frac{1}{2}(c+dx)\right)}{d\sqrt{1+e^{2i(c+dx)}}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}$$

[In] Integrate[1/(Cos[c + d*x]^(3/2)*Sqrt[a - a*Cos[c + d*x]]),x]

[Out] (2*(-(((1 + E^((2*I)*(c + d*x)))*ArcTanh[(1 + E^(I*(c + d*x)))/(Sqrt[2]*Sqrt[1 + E^((2*I)*(c + d*x))]])])/(Sqrt[2]*E^((I/2)*(c + d*x)))) + 2*Sqrt[1 + E^((2*I)*(c + d*x))]*Cos[(c + d*x)/2])*Sin[(c + d*x)/2])/(d*Sqrt[1 + E^((2*I)*(c + d*x))]*Sqrt[Cos[c + d*x]]*Sqrt[a - a*Cos[c + d*x]])

Maple [A] (verified)

Time = 5.45 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.89

method	result	size
default	$\frac{\left(-\operatorname{arctanh}\left(\frac{\sqrt{2}}{2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+\sqrt{2}\right)\sin(dx+c)\sqrt{2}}{d\sqrt{-a(\cos(dx+c)-1)}\,\sqrt{\cos(dx+c)}}$	85

[In] int(1/cos(d*x+c)^(3/2)/(a-cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)

[Out] 1/d*(-arctanh(1/2*2^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+2^(1/2))*sin(d*x+c)/(-a*(cos(d*x+c)-1))^(1/2)/cos(d*x+c)^(1/2)*2^(1/2)

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 152, normalized size of antiderivative = 1.60

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = \frac{\sqrt{2}\sqrt{a}\cos(dx+c)\log\left(-\frac{\frac{2\sqrt{2}\sqrt{-a\cos(dx+c)+a}(\cos(dx+c)+1)\sqrt{\cos(dx+c)}}{\sqrt{a}}-(3\cos(dx+c)+1)\sin(dx+c)}{(\cos(dx+c)-1)\sin(dx+c)}\right)\sin(dx+c)+4\sqrt{-a}}{2\,ad\cos(dx+c)\sin(dx+c)}$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/2*(sqrt(2)*sqrt(a)*cos(d*x + c)*log(-(2*sqrt(2)*sqrt(-a*cos(d*x + c) + a)
*(cos(d*x + c) + 1)*sqrt(cos(d*x + c))/sqrt(a) - (3*cos(d*x + c) + 1)*sin(d
*x + c))/((cos(d*x + c) - 1)*sin(d*x + c)))*sin(d*x + c) + 4*sqrt(-a*cos(d*
x + c) + a)*(cos(d*x + c) + 1)*sqrt(cos(d*x + c)))/(a*d*cos(d*x + c)*sin(d*
x + c))
```

Sympy [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-a(\cos(c+dx)-1)}\cos^{\frac{3}{2}}(c+dx)}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(3/2)/(a-a*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/(sqrt(-a*(cos(c + d*x) - 1))*cos(c + d*x)**(3/2)), x)
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.40 (sec) , antiderivative size = 351, normalized size of antiderivative = 3.69

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = \frac{2\cos\left(\frac{1}{2}\arctan(\sin(2dx+2c),\cos(2dx+2c)+1)\right)\sin(dx+c)-2(\cos(dx+c)+1)\sin\left(\frac{1}{2}\arctan(\text{si}\right.}{}$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] (2*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x + c) -
2*(cos(d*x + c) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1
)) - sqrt(2)*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c)
+ 1)^(1/4)*arctan2(2*sqrt(2)*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*c
os(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c) + 1))/(sqrt(a)*abs(e^(I*d*x + I*c) - 1)), 2*(sqrt(2)*(cos(2*d*x + 2*c)^2
 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sqrt(a)*cos(1/2*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - sqrt(-a)*abs(e^(I*d*x + I*c)
- 1) + 2*sqrt(a))/(a*abs(e^(I*d*x + I*c) - 1))))/((cos(2*d*x + 2*c)^2 + sin
(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sqrt(-a)*d)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 279 vs. $2(80) = 160$.

Time = 0.70 (sec) , antiderivative size = 279, normalized size of antiderivative = 2.94

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = -\frac{\frac{4\left(\frac{\sqrt{2}\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2}{\sqrt{a}\mathrm{sgn}\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}-\frac{\sqrt{2}}{\sqrt{a}\mathrm{sgn}\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}\right)}{\sqrt{\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^4-6\,\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+1}}-\frac{\sqrt{2}\log\left(\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2-\sqrt{\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^4-6\,\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+1}+1\right)}{\sqrt{a}\mathrm{sgn}\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}+\frac{\sqrt{2}\log\left(\right|}{}}{}$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] -1/2*(4*(sqrt(2)*tan(1/4*d*x + 1/4*c)^2/(sqrt(a)*sgn(sin(1/2*d*x + 1/2*c)))
 - sqrt(2)/(sqrt(a)*sgn(sin(1/2*d*x + 1/2*c))))/sqrt(tan(1/4*d*x + 1/4*c)^4
 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) - sqrt(2)*log(tan(1/4*d*x + 1/4*c)^2 - sqr
t(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 1)/(sqrt(a)*sgn(
sin(1/2*d*x + 1/2*c))) + sqrt(2)*log(abs(-tan(1/4*d*x + 1/4*c)^2 + sqrt(tan
(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 3))/(sqrt(a)*sgn(sin(
1/2*d*x + 1/2*c))) + sqrt(2)*log(abs(-tan(1/4*d*x + 1/4*c)^2 + sqrt(tan(1/4
*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 1))/(sqrt(a)*sgn(sin(1/2*
d*x + 1/2*c))))/d
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = \int \frac{1}{{\cos\left(c+d\,x\right)}^{3/2}\,\sqrt{a-a\,\cos\left(c+d\,x\right)}} \,d x$$

```
[In] int(1/(cos(c + d*x)^(3/2)*(a - a*cos(c + d*x))^(1/2)),x)
```

```
[Out] int(1/(cos(c + d*x)^(3/2)*(a - a*cos(c + d*x))^(1/2)), x)
```

3.280 $\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 135

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}$$

```
[Out] -arctanh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(
1/2))*2^(1/2)/d/a^(1/2)+2/3*sin(d*x+c)/d/cos(d*x+c)^(3/2)/(a-a*cos(d*x+c))^
(1/2)+2/3*sin(d*x+c)/d/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {2858, 3063, 12, 2861, 214}

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}$$

```
[In] Int[1/(Cos[c + d*x]^(5/2)*Sqrt[a - a*Cos[c + d*x]]),x]
```

```
[Out] -((Sqrt[2]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[
a - a*Cos[c + d*x]])])/(Sqrt[a]*d)) + (2*Sin[c + d*x])/(3*d*Cos[c + d*x]^(3
/2)*Sqrt[a - a*Cos[c + d*x]]) + (2*Sin[c + d*x])/(3*d*Sqrt[Cos[c + d*x]]*Sq
rt[a - a*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}+\frac{\int\frac{a+2a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx}{3a}\\
&= \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\\
&\quad+\frac{2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}-\frac{2\int-\frac{3a^2}{2\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx}{3a^2}\\
&= \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}+\frac{2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\\
&\quad+\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx\\
&= \frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}+\frac{2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\\
&\quad-\frac{(2a)\text{Subst}\left(\int\frac{1}{2a^2-ax^2}\,dx,x,\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{d}\\
&= -\frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d}\\
&\quad+\frac{2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}+\frac{2\sin(c+dx)}{3d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.47 (sec) , antiderivative size = 171, normalized size of antiderivative = 1.27

$$\int\frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx$$

$$=\frac{2\left(-\frac{3e^{-\frac{3}{2}i(c+dx)}\left(1+e^{2i(c+dx)}\right)^2\text{arctanh}\left(\frac{1+e^{i(c+dx)}}{\sqrt{2}\sqrt{1+e^{2i(c+dx)}}}\right)}{2\sqrt{2}}+2\sqrt{1+e^{2i(c+dx)}}\cos\left(\frac{1}{2}(c+dx)\right)(1+\cos(c+dx))\right)\text{si}}{3d\sqrt{1+e^{2i(c+dx)}}\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}$$

```
[In] Integrate[1/(Cos[c + d*x]^(5/2)*Sqrt[a - a*Cos[c + d*x]]),x]
[Out] (2*((-3*(1 + E^((2*I)*(c + d*x)))^2*ArcTanh[(1 + E^(I*(c + d*x)))/(Sqrt[2]*
Sqrt[1 + E^((2*I)*(c + d*x))])])/(2*Sqrt[2]*E^(((3*I)/2)*(c + d*x))) + 2*Sq
rt[1 + E^((2*I)*(c + d*x))]*Cos[(c + d*x)/2]*(1 + Cos[c + d*x]))*Sin[(c + d
*x)/2])/(3*d*Sqrt[1 + E^((2*I)*(c + d*x))]*Cos[c + d*x]^(3/2)*Sqrt[a - a*Co
s[c + d*x]])
```

Maple [A] (verified)

Time = 4.72 (sec) , antiderivative size = 102, normalized size of antiderivative = 0.76

method	result	size
default	$\frac{\left(-3\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\operatorname{arctanh}\left(\frac{\sqrt{2}}{2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}\right)+\sqrt{2}\,\cos(dx+c)+\sqrt{2}\right)\sin(dx+c)\sqrt{2}}{3d\sqrt{-a(\cos(dx+c)-1)}\,\cos(dx+c)^{\frac{3}{2}}}$	102

```
[In] int(1/cos(d*x+c)^(5/2)/(a-cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3/d*(-3*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctanh(1/2*2^(1/2)/
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))+2^(1/2)*cos(d*x+c)+2^(1/2))*sin(d*x+c)/(
-a*(cos(d*x+c)-1))^(1/2)/cos(d*x+c)^(3/2)*2^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 165, normalized size of antiderivative = 1.22

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx$$
$$= \frac{3\sqrt{2}\sqrt{a}\cos(dx+c)^2\log\left(-\frac{\frac{2\sqrt{2}\sqrt{-a\cos(dx+c)+a}(\cos(dx+c)+1)\sqrt{\cos(dx+c)}}{\sqrt{a}}-(3\cos(dx+c)+1)\sin(dx+c)}{(\cos(dx+c)-1)\sin(dx+c)}\right)\sin(dx+c)+4\sqrt{-}}{6\,ad\cos(dx+c)^2\sin(dx+c)}$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/6*(3*sqrt(2)*sqrt(a)*cos(d*x + c)^2*log(-(2*sqrt(2)*sqrt(-a*cos(d*x + c)
+ a)*(cos(d*x + c) + 1)*sqrt(cos(d*x + c))/sqrt(a) - (3*cos(d*x + c) + 1)*s
in(d*x + c))/((cos(d*x + c) - 1)*sin(d*x + c)))*sin(d*x + c) + 4*sqrt(-a*co
s(d*x + c) + a)*(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(cos(d*x + c)))/(
a*d*cos(d*x + c)^2*sin(d*x + c))
```

Sympy [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-a(\cos(c+dx)-1)}\cos^{\frac{5}{2}}(c+dx)}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(5/2)/(a-a*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/(sqrt(-a*(cos(c + d*x) - 1))*cos(c + d*x)**(5/2)), x)
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.41 (sec) , antiderivative size = 504, normalized size of antiderivative = 3.73

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx =$$

$$-\frac{3\left(\sqrt{2}\cos\left(2\,dx+2\,c\right)^2+\sqrt{2}\sin\left(2\,dx+2\,c\right)^2+2\,\sqrt{2}\cos\left(2\,dx+2\,c\right)+\sqrt{2}\right)\arctan\left(\frac{2\,\sqrt{2}\left(\cos(2\,dx+2\,c)^2+\mathrm{si}\right.}{}\right.}{}$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -1/3*(3*(sqrt(2)*cos(2*d*x + 2*c)^2 + sqrt(2)*sin(2*d*x + 2*c)^2 + 2*sqrt(2
)*cos(2*d*x + 2*c) + sqrt(2))*arctan2(2*sqrt(2)*(cos(2*d*x + 2*c)^2 + sin(2
*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c) + 1))/(sqrt(a)*abs(e^(I*d*x + I*c) - 1)), 2*(sqrt(2)*
(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sq
rt(a)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - sqrt(-a)*a
bs(e^(I*d*x + I*c) - 1) + 2*sqrt(a))/(a*abs(e^(I*d*x + I*c) - 1))) - 2*(cos
(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(3/4)*(cos(1
/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x + c) - (cos(d*x
 + c) + 3)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))) - 4*(c
os(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos
(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x + c) - (cos(d
*x + c) - 1)*sin(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))))/((c
os(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sqrt(-a)*d
)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 235 vs. $2(112) = 224$.

Time = 0.69 (sec) , antiderivative size = 235, normalized size of antiderivative = 1.74

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx =$$

$$-\frac{\sqrt{2}\left(\frac{8\left(\left(\left(\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2-3\right)\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+3\right)\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2-1\right)}{\left(\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^4-6\,\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+1\right)^{\frac{3}{2}}}-3\,\log\left(\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2-\sqrt{\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right.}\right.\right.}{}$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] -1/6*sqrt(2)*(8*(((tan(1/4*d*x + 1/4*c)^2 - 3)*tan(1/4*d*x + 1/4*c)^2 + 3)*
tan(1/4*d*x + 1/4*c)^2 - 1)/(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c
)^2 + 1)^(3/2) - 3*log(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c)^4
 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 1) + 3*log(abs(-tan(1/4*d*x + 1/4*c)^2 +
 sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 3)) + 3*log(
abs(-tan(1/4*d*x + 1/4*c)^2 + sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x +
 1/4*c)^2 + 1) + 1)))/(sqrt(a)*d*sgn(sin(1/2*d*x + 1/2*c)))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^{5/2}\,\sqrt{a-a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(5/2)*(a - a*cos(c + d*x))^(1/2)),x)
```

```
[Out] int(1/(cos(c + d*x)^(5/2)*(a - a*cos(c + d*x))^(1/2)), x)
```

3.281 $\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 173

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{26\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}$$

```
[Out] -arctanh(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(
1/2))*2^(1/2)/d/a^(1/2)+2/5*sin(d*x+c)/d/cos(d*x+c)^(5/2)/(a-a*cos(d*x+c))^
(1/2)+2/15*sin(d*x+c)/d/cos(d*x+c)^(3/2)/(a-a*cos(d*x+c))^(1/2)+26/15*sin(d
*x+c)/d/cos(d*x+c)^(1/2)/(a-a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.61 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used

$= \{2858, 3063, 12, 2861, 214\}$

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{26\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}$$

```
[In] Int[1/(Cos[c + d*x]^(7/2)*Sqrt[a - a*Cos[c + d*x]]),x]
```

```
[Out] -((Sqrt[2]*ArcTanh[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[
a - a*Cos[c + d*x]])])/(Sqrt[a]*d)) + (2*Sin[c + d*x])/(5*d*Cos[c + d*x]^(5
/2)*Sqrt[a - a*Cos[c + d*x]]) + (2*Sin[c + d*x])/(15*d*Cos[c + d*x]^(3/2)*S
qrt[a - a*Cos[c + d*x]]) + (26*Sin[c + d*x])/(15*d*Sqrt[Cos[c + d*x]]*Sqrt[
a - a*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
```

```
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rubi steps

$$\text{integral} = \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{\int \frac{a+4a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx}{5a}$$

$$= \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} - \frac{2\int \frac{-\frac{13a^2}{2}-a^2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx}{15a^2}$$

$$= \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{26\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}} + \frac{4\int \frac{15a^3}{4\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx}{15a^3}$$

$$= \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{26\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}} + \int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\,dx$$

$$= \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{26\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}} - \frac{(2a)\text{Subst}\left(\int \frac{1}{2a^2-ax^2}\,dx, x, \frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{d}$$

$$= -\frac{\sqrt{2}\text{arctanh}\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}\right)}{\sqrt{a}d} + \frac{2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{2\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}} + \frac{26\sin(c+dx)}{15d\sqrt{\cos(c+dx)}\sqrt{a-a\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.75 (sec) , antiderivative size = 218, normalized size of antiderivative = 1.26

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = \frac{e^{-\frac{5}{2}i(c+dx)}\left(2\sqrt{1+e^{2i(c+dx)}}\left(13+15e^{i(c+dx)}+40e^{2i(c+dx)}+40e^{3i(c+dx)}+15e^{4i(c+dx)}+13e^{5i(c+dx)}\right)-15\sqrt{2}(1\right.}{60d\sqrt{1+e^{2i(c+dx)}}\cos^{\frac{5}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}$$

```
[In] Integrate[1/(Cos[c + d*x]^(7/2)*Sqrt[a - a*Cos[c + d*x]]),x]
```

```
[Out] ((2*Sqrt[1 + E^((2*I)*(c + d*x))]*(13 + 15*E^(I*(c + d*x)) + 40*E^((2*I)*(c
 + d*x)) + 40*E^((3*I)*(c + d*x)) + 15*E^((4*I)*(c + d*x)) + 13*E^((5*I)*(c
 + d*x))) - 15*Sqrt[2]*(1 + E^((2*I)*(c + d*x)))^3*ArcTanh[(1 + E^(I*(c + d
*x)))/(Sqrt[2]*Sqrt[1 + E^((2*I)*(c + d*x))])])*Sin[(c + d*x)/2])/(60*d*E^(
((5*I)/2)*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*Cos[c + d*x]^(5/2)*Sqrt[
a - a*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 6.35 (sec) , antiderivative size = 120, normalized size of antiderivative = 0.69

method	result	size
default	$-\frac{\left(15\,\text{arctanh}\left(\frac{\sqrt{2}}{2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}\right)\left(\cos^2(dx+c)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-13\sqrt{2}\left(\cos^2(dx+c)\right)-\sqrt{2}\,\cos(dx+c)-3\sqrt{2}\right)\sin(dx+c)\sqrt{2}}{15d\sqrt{-a(\cos(dx+c)-1)}\,\cos(dx+c)^{\frac{5}{2}}}$	120

```
[In] int(1/cos(d*x+c)^(7/2)/(a-cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/15/d*(15*arctanh(1/2*2^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))*cos(d*x+
c)^2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-13*2^(1/2)*cos(d*x+c)^2-2^(1/2)*cos(
d*x+c)-3*2^(1/2))*sin(d*x+c)/(-a*(cos(d*x+c)-1))^(1/2)/cos(d*x+c)^(5/2)*2^(
1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 177, normalized size of antiderivative = 1.02

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = \frac{15\sqrt{2}\sqrt{a}\cos(dx+c)^3\log\left(-\frac{\frac{2\sqrt{2}\sqrt{-a\cos(dx+c)+a}(\cos(dx+c)+1)\sqrt{\cos(dx+c)}}{\sqrt{a}}-(3\cos(dx+c)+1)\sin(dx+c)}{(\cos(dx+c)-1)\sin(dx+c)}\right)\sin(dx+c)+4(1}{30\,ad\cos(dx+c)^3\sin}$$

```
[In] integrate(1/cos(d*x+c)^(7/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/30*(15*sqrt(2)*sqrt(a)*cos(d*x + c)^3*log(-(2*sqrt(2)*sqrt(-a*cos(d*x + c
) + a)*(cos(d*x + c) + 1)*sqrt(cos(d*x + c))/sqrt(a) - (3*cos(d*x + c) + 1)
*sin(d*x + c))/((cos(d*x + c) - 1)*sin(d*x + c)))*sin(d*x + c) + 4*(13*cos(
d*x + c)^3 + 14*cos(d*x + c)^2 + 4*cos(d*x + c) + 3)*sqrt(-a*cos(d*x + c) +
 a)*sqrt(cos(d*x + c)))/(a*d*cos(d*x + c)^3*sin(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(7/2)/(a-a*cos(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.44 (sec) , antiderivative size = 692, normalized size of antiderivative = 4.00

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate(1/cos(d*x+c)^(7/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -1/15*(15*(sqrt(2)*cos(2*d*x + 2*c)^2 + sqrt(2)*sin(2*d*x + 2*c)^2 + 2*sqrt
(2)*cos(2*d*x + 2*c) + sqrt(2))*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 +
2*cos(2*d*x + 2*c) + 1)^(1/4)*arctan2(2*sqrt(2)*(cos(2*d*x + 2*c)^2 + sin(2
*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c) + 1))/(sqrt(a)*abs(e^(I*d*x + I*c) - 1)), 2*(sqrt(2)*
```

```
(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sq
rt(a)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - sqrt(-a)*a
bs(e^(I*d*x + I*c) - 1) + 2*sqrt(a))/(a*abs(e^(I*d*x + I*c) - 1))) - 26*(co
s(2*d*x + 2*c)^2*sin(d*x + c) + sin(2*d*x + 2*c)^2*sin(d*x + c) + 2*cos(2*d
*x + 2*c)*sin(d*x + c) + sin(d*x + c))*cos(1/2*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c) + 1)) + 24*cos(5/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c
) + 1))*sin(d*x + c) - 24*(cos(d*x + c) + 1)*sin(5/2*arctan2(sin(2*d*x + 2*
c), cos(2*d*x + 2*c) + 1)) + 2*((13*cos(d*x + c) + 15)*cos(2*d*x + 2*c)^2 +
 (13*cos(d*x + c) + 15)*sin(2*d*x + 2*c)^2 + 2*(13*cos(d*x + c) + 15)*cos(2
*d*x + 2*c) + 13*cos(d*x + c) + 15)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c) + 1)) - 4*sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(
2*d*x + 2*c) + 1)*(7*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1
))*sin(d*x + c) - (7*cos(d*x + c) + 5)*sin(3/2*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c) + 1))))/((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*
d*x + 2*c) + 1)^(5/4)*sqrt(-a)*d)
```

Giac [A] (verification not implemented)

none

Time = 0.79 (sec) , antiderivative size = 265, normalized size of antiderivative = 1.53

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\left(\frac{4\left(\left(\left(\left(\left(17\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-165\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+650\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-650\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+165\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-17\right)}{\left(\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^4-6\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+1\right)^{\frac{5}{2}}}-15\right.}{}$$

```
[In] integrate(1/cos(d*x+c)^(7/2)/(a-a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] -1/30*sqrt(2)*(4*(((((17*tan(1/4*d*x + 1/4*c)^2 - 165)*tan(1/4*d*x + 1/4*c)
^2 + 650)*tan(1/4*d*x + 1/4*c)^2 - 650)*tan(1/4*d*x + 1/4*c)^2 + 165)*tan(1
/4*d*x + 1/4*c)^2 - 17)/(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2
+ 1)^(5/2) - 15*log(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c)^4 -
6*tan(1/4*d*x + 1/4*c)^2 + 1) + 1) + 15*log(abs(-tan(1/4*d*x + 1/4*c)^2 + s
qrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 3)) + 15*log(a
bs(-tan(1/4*d*x + 1/4*c)^2 + sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x +
1/4*c)^2 + 1) + 1)))/(sqrt(a)*d*sgn(sin(1/2*d*x + 1/2*c)))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a-a\cos(c+dx)}}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^{7/2}\,\sqrt{a-a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(7/2)*(a - a*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(7/2)*(a - a*cos(c + d*x))^(1/2)), x)
```

3.282 $\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{1-\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 161

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{1-\cos(c+dx)}}\,dx = \frac{7\operatorname{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{4d} - \frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{2}\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{1-\cos(c+dx)}} + \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{1-\cos(c+dx)}}$$

```
[Out] 7/4*arctanh(sin(d*x+c)/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2))/d-arctanh(1/2
*sin(d*x+c)*2^(1/2)/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2))*2^(1/2)/d+1/2*co
s(d*x+c)^(3/2)*sin(d*x+c)/d/(1-cos(d*x+c))^(1/2)+1/4*sin(d*x+c)*cos(d*x+c)^
(1/2)/d/(1-cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {2857, 3062, 3061, 2861, 212, 2854, 213}

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{1-\cos(c+dx)}}\,dx = \frac{7\operatorname{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{4d} - \frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{2}\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d} + \frac{\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{2d\sqrt{1-\cos(c+dx)}} + \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{4d\sqrt{1-\cos(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^(5/2)/Sqrt[1 - Cos[c + d*x]],x]
```

```
[Out] (7*ArcTanh[Sin[c + d*x]/(Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c + d*x]])])/(4*d)
 - (Sqrt[2]*ArcTanh[Sin[c + d*x]/(Sqrt[2]*Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c
 + d*x]])])/d + (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(4*d*Sqrt[1 - Cos[c + d*x
]]) + (Cos[c + d*x]^(3/2)*Sin[c + d*x])/(2*d*Sqrt[1 - Cos[c + d*x]])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 2854

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b + d*x^2), x], x
, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]))], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rule 2857

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[-2*d*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n - 1)/(f*(2*n - 1)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(b*(2*n - 1))
, Int[((c + d*Sin[e + f*x])^(n - 2)/Sqrt[a + b*Sin[e + f*x]])*Simp[a*c*d -
b*(2*d^2*(n - 1) + c^2*(2*n - 1)) + d*(a*d - b*c*(4*n - 3))*Sin[e + f*x], x
], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
 b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[n, 1] && IntegerQ[2*n]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3062

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(-B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(f*(m +
n + 1))), x] + Dist[1/(b*(m + n + 1)), Int[(a + b*Sin[e + f*x])^m*(c + d*Si
n[e + f*x])^(n - 1)*Simp[A*b*c*(m + n + 1) + B*(a*c*m + b*d*n) + (A*b*d*(m
+ n + 1) + B*(a*d*m + b*c*n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 -
 d^2, 0] && GtQ[n, 0] && (IntegerQ[n] || EqQ[m + 1/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{1-\cos(c+dx)}} + \frac{1}{4}\int \frac{\sqrt{\cos(c+dx)}(3+\cos(c+dx))}{\sqrt{1-\cos(c+dx)}}\,dx \\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{1-\cos(c+dx)}} + \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{1-\cos(c+dx)}} \\
&\quad - \frac{1}{4}\int \frac{-\frac{1}{2}-\frac{7}{2}\cos(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{1-\cos(c+dx)}} + \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{1-\cos(c+dx)}} \\
&\quad - \frac{7}{8}\int \frac{\sqrt{1-\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx + \int \frac{1}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{1-\cos(c+dx)}} + \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{1-\cos(c+dx)}} \\
&\quad - \frac{7\text{Subst}\left(\int \frac{1}{-1+x^2}\,dx, x, \frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{4d} \\
&\quad - \frac{2\text{Subst}\left(\int \frac{1}{2-x^2}\,dx, x, \frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}
\end{aligned}$$

$$= \frac{7\operatorname{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{4d} - \frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{2}\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{4d\sqrt{1-\cos(c+dx)}} + \frac{\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{1-\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.44 (sec) , antiderivative size = 255, normalized size of antiderivative = 1.58

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{1-\cos(c+dx)}}\,dx = -\frac{ie^{-2i(c+dx)}\left(-1+e^{i(c+dx)}\right)\left(7\sqrt{2}e^{2i(c+dx)}\operatorname{arcsinh}\left(e^{i(c+dx)}\right) - 16e^{2i(c+dx)}\operatorname{arctanh}\left(\frac{1+e^{i(c+dx)}}{\sqrt{2}\sqrt{1+e^{2i(c+dx)}}}\right) + \sqrt{2}\left(\sqrt{\right.\right.}{8\sqrt{2}d\sqrt{1+e^{2i(c+dx}}}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)/Sqrt[1 - Cos[c + d*x]],x]
```

```
[Out] ((-1/8*I)*(-1 + E^(I*(c + d*x)))*(7*Sqrt[2]*E^((2*I)*(c + d*x))*ArcSinh[E^(
I*(c + d*x))] - 16*E^((2*I)*(c + d*x))*ArcTanh[(1 + E^(I*(c + d*x)))/(Sqrt[
2]*Sqrt[1 + E^((2*I)*(c + d*x))])] + Sqrt[2]*(Sqrt[1 + E^((2*I)*(c + d*x))]
*(1 + 2*E^(I*(c + d*x)) + 2*E^((2*I)*(c + d*x)) + E^((3*I)*(c + d*x))) + 7*
E^((2*I)*(c + d*x))*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]]))*Sqrt[Cos[c + d
*x]])/(Sqrt[2]*d*E^((2*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*Sqrt[1 -
 Cos[c + d*x]])
```

Maple [A] (verified)

Time = 13.83 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.20

method	result
default	$-\frac{\sin(dx+c)\left(-2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,(\cos^2(dx+c))+4\ \operatorname{arctanh}\left(\frac{\sqrt{2}}{2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}\right)\sqrt{2}-3\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-7\ \mathrm{ar}\right.}{4d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \sqrt{-2\cos(dx+c)+2}}$

```
[In] int(cos(d*x+c)^(5/2)/(1-cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/d*sin(d*x+c)*(-2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2+4*arct
anh(1/2*2^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))*2^(1/2)-3*cos(d*x+c)*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)-(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-7*arctanh(
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)))*cos(d*x+c)^(1/2)/(1+cos(d*x+c))/(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)/(-2*cos(d*x+c)+2)^(1/2)*2^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 239, normalized size of antiderivative = 1.48

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{1-\cos(c+dx)}}\,dx = \frac{4\sqrt{2}\log\left(-\frac{2\left(\sqrt{2}\cos(dx+c)+\sqrt{2}\right)\sqrt{-\cos(dx+c)+1}\sqrt{\cos(dx+c)}-(3\cos(dx+c)+1)\sin(dx+c)}{(\cos(dx+c)-1)\sin(dx+c)}\right)\sin(dx+c)+2\left(2\cos(dx+c)\right.}{}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(1-cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/8*(4*sqrt(2)*log(-(2*(sqrt(2)*cos(d*x + c) + sqrt(2))*sqrt(-cos(d*x + c)
+ 1)*sqrt(cos(d*x + c)) - (3*cos(d*x + c) + 1)*sin(d*x + c))/((cos(d*x + c)
 - 1)*sin(d*x + c)))*sin(d*x + c) + 2*(2*cos(d*x + c)^2 + 3*cos(d*x + c) +
1)*sqrt(-cos(d*x + c) + 1)*sqrt(cos(d*x + c)) + 7*log(2*(sqrt(-cos(d*x + c)
 + 1)*sqrt(cos(d*x + c)) + sin(d*x + c))/sin(d*x + c))*sin(d*x + c) - 7*log
(2*(sqrt(-cos(d*x + c) + 1)*sqrt(cos(d*x + c)) - sin(d*x + c))/sin(d*x + c)
)*sin(d*x + c))/(d*sin(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{1-\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)/(1-cos(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{1-\cos(c+dx)}}\,dx = \int \frac{\cos(dx+c)^{\frac{5}{2}}}{\sqrt{-\cos(dx+c)+1}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(1-cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(cos(d*x + c)^(5/2)/sqrt(-cos(d*x + c) + 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 747 vs. 2(136) = 272.

Time = 6.63 (sec) , antiderivative size = 747, normalized size of antiderivative = 4.64

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{1-\cos(c+dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(1-cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 1/4*(2*sqrt(2)*log(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c)^4 - 6
*tan(1/4*d*x + 1/4*c)^2 + 1) + 1)/sgn(sin(1/2*d*x + 1/2*c)) - 2*sqrt(2)*log
(abs(-tan(1/4*d*x + 1/4*c)^2 + sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x
+ 1/4*c)^2 + 1) + 3))/sgn(sin(1/2*d*x + 1/2*c)) - 2*sqrt(2)*log(abs(-tan(1/
4*d*x + 1/4*c)^2 + sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 +
 1) + 1))/sgn(sin(1/2*d*x + 1/2*c)) - 7*log(tan(1/4*d*x + 1/4*c)^2 + 2*sqrt
(2) - sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 1)/sgn(
sin(1/2*d*x + 1/2*c)) + 7*log(abs(-tan(1/4*d*x + 1/4*c)^2 + 2*sqrt(2) + sqr
t(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) - 1))/sgn(sin(1/2*
d*x + 1/2*c)) - 4*sqrt(2)*(17*(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x +
1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1))^7 - 73*(tan(1/4*d*x + 1/4*c)^2 -
sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1))^6 + 157*(tan(1
/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2
+ 1))^5 - 597*(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan
(1/4*d*x + 1/4*c)^2 + 1))^4 + 1603*(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d
*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1))^3 - 875*(tan(1/4*d*x + 1/4*c
)^2 - sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1))^2 - 1585
*tan(1/4*d*x + 1/4*c)^2 + 1585*sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x
+ 1/4*c)^2 + 1) + 1737)/(((tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*
c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1))^2 + 2*tan(1/4*d*x + 1/4*c)^2 - 2*sqrt
(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) - 7)^4*sgn(sin(1/2*
d*x + 1/2*c))))/d
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{1-\cos(c+dx)}}\,dx = \int \frac{\cos\left(c+d\,x\right)^{5/2}}{\sqrt{1-\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(cos(c + d*x)^(5/2)/(1 - cos(c + d*x))^(1/2),x)
```

```
[Out] int(cos(c + d*x)^(5/2)/(1 - cos(c + d*x))^(1/2), x)
```

3.283 $\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1-\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 118

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1-\cos(c+dx)}}\,dx = \frac{\operatorname{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d} - \frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{2}\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{1-\cos(c+dx)}}$$

```
[Out] arctanh(sin(d*x+c)/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2))/d-arctanh(1/2*sin
(d*x+c)*2^(1/2)/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2))*2^(1/2)/d+sin(d*x+c)
*cos(d*x+c)^(1/2)/d/(1-cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {2857, 3061, 2861, 212, 2854, 213}

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1-\cos(c+dx)}}\,dx = \frac{\operatorname{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d} - \frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{2}\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d} + \frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{d\sqrt{1-\cos(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^(3/2)/Sqrt[1 - Cos[c + d*x]],x]
```

```
[Out] ArcTanh[Sin[c + d*x]/(Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c + d*x]])]/d - (Sqrt
[2]*ArcTanh[Sin[c + d*x]/(Sqrt[2]*Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c + d*x]]
)])/d + (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(d*Sqrt[1 - Cos[c + d*x]])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 2854

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b + d*x^2), x], x
, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]))], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rule 2857

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[-2*d*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n - 1)/(f*(2*n - 1)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(b*(2*n - 1))
, Int[((c + d*Sin[e + f*x])^(n - 2)/Sqrt[a + b*Sin[e + f*x]])*Simp[a*c*d -
b*(2*d^2*(n - 1) + c^2*(2*n - 1)) + d*(a*d - b*c*(4*n - 3))*Sin[e + f*x], x
], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
 b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[n, 1] && IntegerQ[2*n]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
```

```
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{1-\cos(c+dx)}}+\frac{1}{2}\int\frac{1+\cos(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{1-\cos(c+dx)}}-\frac{1}{2}\int\frac{\sqrt{1-\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx\\
&\quad+\int\frac{1}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{1-\cos(c+dx)}}-\frac{\text{Subst}\left(\int\frac{1}{-1+x^2}\,dx,x,\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}\\
&\quad-\frac{2\text{Subst}\left(\int\frac{1}{2-x^2}\,dx,x,\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}\\
&= \frac{\operatorname{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}\\
&\quad-\frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{2}\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}+\frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{1-\cos(c+dx)}}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.37 (sec) , antiderivative size = 227, normalized size of antiderivative = 1.92

$$\int\frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1-\cos(c+dx)}}\,dx = -\frac{ie^{-i(c+dx)}\left(-1+e^{i(c+dx)}\right)\left(\sqrt{2}e^{i(c+dx)}\operatorname{arcsinh}\left(e^{i(c+dx)}\right)-4e^{i(c+dx)}\operatorname{arctanh}\left(\frac{1+e^{i(c+dx)}}{\sqrt{2}\sqrt{1+e^{2i(c+dx)}}}\right)+\sqrt{2}\left(\left(1+e^{i(c\cdots\right.\right.\right.}{2\sqrt{2}d\sqrt{1+e^{2i(c+dx)}}\sqrt{1-\cos(c+d\cdots}}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)/Sqrt[1 - Cos[c + d*x]],x]
```

```
[Out] ((-1/2*I)*(-1 + E^(I*(c + d*x)))*(Sqrt[2]*E^(I*(c + d*x))*ArcSinh[E^(I*(c +
 d*x))] - 4*E^(I*(c + d*x))*ArcTanh[(1 + E^(I*(c + d*x)))/(Sqrt[2]*Sqrt[1 +
 E^((2*I)*(c + d*x))])] + Sqrt[2]*((1 + E^(I*(c + d*x)))*Sqrt[1 + E^((2*I)*
(c + d*x))] + E^(I*(c + d*x))*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]]))*Sqrt
[Cos[c + d*x]])/(Sqrt[2]*d*E^(I*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*Sq
rt[1 - Cos[c + d*x]])
```

Maple [A] (verified)

Time = 13.24 (sec) , antiderivative size = 159, normalized size of antiderivative = 1.35

method	result
default	$\frac{\sin(dx+c)\left(\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-\operatorname{arctanh}\left(\frac{\sqrt{2}}{2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}\right)\sqrt{2}+\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+\operatorname{arctanh}\left(\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\right)\left(\sqrt{\cos}(dx+c)\right)\sqrt{}}{d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{-2\cos(dx+c)+2}}$

```
[In] int(cos(d*x+c)^(3/2)/(1-cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*sin(d*x+c)*(cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-arctanh(1/2*2^
(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))*2^(1/2)+(cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)+arctanh((cos(d*x+c)/(1+cos(d*x+c)))^(1/2)))*cos(d*x+c)^(1/2)/(1+cos
(d*x+c))/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)/(-2*cos(d*x+c)+2)^(1/2)*2^(1/2)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 225 vs. 2(103) = 206.

Time = 0.26 (sec) , antiderivative size = 225, normalized size of antiderivative = 1.91

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1-\cos(c+dx)}}\,dx$$
$$= \frac{\sqrt{2}\log\left(-\frac{2\left(\sqrt{2}\cos(dx+c)+\sqrt{2}\right)\sqrt{-\cos(dx+c)+1}\sqrt{\cos(dx+c)}-(3\cos(dx+c)+1)\sin(dx+c)}{(\cos(dx+c)-1)\sin(dx+c)}\right)\sin(dx+c)+2\left(\cos(dx+c)+\right.}{}$$

```
[In] integrate(cos(d*x+c)^(3/2)/(1-cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/2*(sqrt(2)*log(-(2*(sqrt(2)*cos(d*x + c) + sqrt(2))*sqrt(-cos(d*x + c) +
1)*sqrt(cos(d*x + c)) - (3*cos(d*x + c) + 1)*sin(d*x + c))/((cos(d*x + c) -
 1)*sin(d*x + c)))*sin(d*x + c) + 2*(cos(d*x + c) + 1)*sqrt(-cos(d*x + c) +
 1)*sqrt(cos(d*x + c)) + log(2*(sqrt(-cos(d*x + c) + 1)*sqrt(cos(d*x + c))
+ sin(d*x + c))/sin(d*x + c))*sin(d*x + c) - log(2*(sqrt(-cos(d*x + c) + 1)
*sqrt(cos(d*x + c)) - sin(d*x + c))/sin(d*x + c))*sin(d*x + c))/(d*sin(d*x
+ c))
```

Sympy [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1-\cos(c+dx)}}\,dx = \int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1-\cos(c+dx)}}\,dx$$

[In] integrate(cos(d*x+c)**(3/2)/(1-cos(d*x+c))**(1/2),x)

[Out] Integral(cos(c + d*x)**(3/2)/sqrt(1 - cos(c + d*x)), x)

Maxima [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1-\cos(c+dx)}}\,dx = \int \frac{\cos(dx+c)^{\frac{3}{2}}}{\sqrt{-\cos(dx+c)+1}}\,dx$$

[In] integrate(cos(d*x+c)^(3/2)/(1-cos(d*x+c))^(1/2),x, algorithm="maxima")

[Out] integrate(cos(d*x + c)^(3/2)/sqrt(-cos(d*x + c) + 1), x)

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 560 vs. 2(103) = 206.

Time = 0.94 (sec) , antiderivative size = 560, normalized size of antiderivative = 4.75

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1-\cos(c+dx)}}\,dx$$
$$= \frac{\frac{\sqrt{2}\log\left(\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-\sqrt{\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^4-6\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+1}+1\right)}{\mathrm{sgn}\left(\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)} - \frac{\sqrt{2}\log\left(\left|-\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+\sqrt{\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^4-6\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+\right.\right.}{\mathrm{sgn}\left(\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}}{}$$

[In] integrate(cos(d*x+c)^(3/2)/(1-cos(d*x+c))^(1/2),x, algorithm="giac")

[Out] 1/2*(sqrt(2)*log(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*t
an(1/4*d*x + 1/4*c)^2 + 1) + 1)/sgn(sin(1/2*d*x + 1/2*c)) - sqrt(2)*log(abs
(-tan(1/4*d*x + 1/4*c)^2 + sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/
4*c)^2 + 1) + 3))/sgn(sin(1/2*d*x + 1/2*c)) - sqrt(2)*log(abs(-tan(1/4*d*x
+ 1/4*c)^2 + sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) +
1))/sgn(sin(1/2*d*x + 1/2*c)) - 2*log(tan(1/4*d*x + 1/4*c)^2 + 2*sqrt(2) -
sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 1)/sgn(sin(1/
2*d*x + 1/2*c)) + 2*log(abs(-tan(1/4*d*x + 1/4*c)^2 + 2*sqrt(2) + sqrt(tan(
1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) - 1))/sgn(sin(1/2*d*x +

```
1/2*c)) - 8*sqrt(2)*(3*(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c)^
4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1))^3 - 7*(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan
(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1))^2 + tan(1/4*d*x + 1/4*
c)^2 - sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 11)/((
(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4
*c)^2 + 1))^2 + 2*tan(1/4*d*x + 1/4*c)^2 - 2*sqrt(tan(1/4*d*x + 1/4*c)^4 -
6*tan(1/4*d*x + 1/4*c)^2 + 1) - 7)^2*sgn(sin(1/2*d*x + 1/2*c))))/d
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1-\cos(c+dx)}}\,dx = \int \frac{\cos\left(c+d\,x\right)^{3/2}}{\sqrt{1-\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)/(1 - cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(3/2)/(1 - cos(c + d*x))^(1/2), x)
```

3.284 $\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{1-\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 85

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{1-\cos(c+dx)}}\,dx = \frac{2\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d} - \frac{\sqrt{2}\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{2}\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}$$

```
[Out] 2*arctanh(sin(d*x+c)/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2))/d-arctanh(1/2*s
in(d*x+c)*2^(1/2)/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2))*2^(1/2)/d
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2856, 2854, 213, 2861, 212}

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{1-\cos(c+dx)}}\,dx = \frac{2\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d} - \frac{\sqrt{2}\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{2}\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/Sqrt[1 - Cos[c + d*x]],x]
```

```
[Out] (2*ArcTanh[Sin[c + d*x]/(Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c + d*x]])])/d - (
Sqrt[2]*ArcTanh[Sin[c + d*x]/(Sqrt[2]*Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c + d
*x]])])/d
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 2854

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b + d*x^2), x], x
, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]))], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rule 2856

```
Int[Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(a_) + (b_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c
 + d*Sin[e + f*x]], x], x] + Dist[(b*c - a*d)/b, Int[1/(Sqrt[a + b*Sin[e +
f*x]]*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \frac{1}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx - \int \frac{\sqrt{1-\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx \\
&= -\frac{2\text{Subst}\left(\int \frac{1}{2-x^2}\,dx, x, \frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d} - \frac{2\text{Subst}\left(\int \frac{1}{-1+x^2}\,dx, x, \frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d} \\
&= \frac{2\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d} - \frac{\sqrt{2}\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{2}\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.17 (sec) , antiderivative size = 160, normalized size of antiderivative = 1.88

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{1-\cos(c+dx)}}\,dx = -\frac{i\left(-1+e^{i(c+dx)}\right)\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}\left(\operatorname{arcsinh}\left(e^{i(c+dx)}\right)-\sqrt{2}\operatorname{arctanh}\left(\frac{1+e^{i(c+dx)}}{\sqrt{2}\sqrt{1+e^{2i(c+dx)}}}\right)+\operatorname{arctanh}\left(\sqrt{\right.\right.}{\sqrt{2}d\sqrt{1+e^{2i(c+dx)}}\sqrt{1-\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/Sqrt[1 - Cos[c + d*x]],x]
[Out] ((-I)*(-1 + E^(I*(c + d*x)))*Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(I*(c + d*x))
]*(ArcSinh[E^(I*(c + d*x))] - Sqrt[2]*ArcTanh[(1 + E^(I*(c + d*x)))/(Sqrt[2
]*Sqrt[1 + E^((2*I)*(c + d*x))])] + ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]])
)/(Sqrt[2]*d*Sqrt[1 + E^((2*I)*(c + d*x))]*Sqrt[1 - Cos[c + d*x]])
```

Maple [A] (verified)

Time = 2.12 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.36

method	result	size
default	$-\frac{\sin(dx+c)\left(\operatorname{arctanh}\left(\frac{\sqrt{2}}{2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}\right)\sqrt{2}-2\operatorname{arctanh}\left(\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\right)\left(\sqrt{\cos}(dx+c)\right)\sqrt{2}}{d(1+\cos(dx+c))\sqrt{-2\cos(dx+c)+2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$	116

```
[In] int(cos(d*x+c)^(1/2)/(1-cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/d*sin(d*x+c)*(arctanh(1/2*2^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))*2^(
1/2)-2*arctanh((cos(d*x+c)/(1+cos(d*x+c)))^(1/2)))*cos(d*x+c)^(1/2)/(1+cos(
d*x+c))/(-2*cos(d*x+c)+2)^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 170 vs. 2(74) = 148.

Time = 0.28 (sec) , antiderivative size = 170, normalized size of antiderivative = 2.00

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{1-\cos(c+dx)}}\,dx = \frac{\sqrt{2}\log\left(-\frac{2\left(\sqrt{2}\cos(dx+c)+\sqrt{2}\right)\sqrt{-\cos(dx+c)+1}\sqrt{\cos(dx+c)}-(3\cos(dx+c)+1)\sin(dx+c)}{(\cos(dx+c)-1)\sin(dx+c)}\right)+2\log\left(\frac{2\left(\sqrt{-\cos(dx+c)+1}\sqrt{\cos(dx+\right.}{\sin(dx+c)}\right.}{2d}$$

[In] integrate(cos(d*x+c)^(1/2)/(1-cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] 1/2*(sqrt(2)*log(-(2*(sqrt(2)*cos(d*x + c) + sqrt(2))*sqrt(-cos(d*x + c) + 1)*sqrt(cos(d*x + c)) - (3*cos(d*x + c) + 1)*sin(d*x + c))/((cos(d*x + c) - 1)*sin(d*x + c))) + 2*log(2*(sqrt(-cos(d*x + c) + 1)*sqrt(cos(d*x + c)) + sin(d*x + c))/sin(d*x + c)) - 2*log(2*(sqrt(-cos(d*x + c) + 1)*sqrt(cos(d*x + c)) - sin(d*x + c))/sin(d*x + c)))/d

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{1-\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos{(c+dx)}}}{\sqrt{1-\cos{(c+dx)}}}\,dx$$

[In] integrate(cos(d*x+c)**(1/2)/(1-cos(d*x+c))**(1/2),x)

[Out] Integral(sqrt(cos(c + d*x))/sqrt(1 - cos(c + d*x)), x)

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{1-\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos{(dx+c)}}}{\sqrt{-\cos{(dx+c)}+1}}\,dx$$

[In] integrate(cos(d*x+c)^(1/2)/(1-cos(d*x+c))^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(cos(d*x + c))/sqrt(-cos(d*x + c) + 1), x)

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 266 vs. 2(74) = 148.

Time = 0.58 (sec) , antiderivative size = 266, normalized size of antiderivative = 3.13

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{1-\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\left(2\sqrt{2}\log\left(\frac{2\left(\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+2\sqrt{2}-\sqrt{\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^4-6\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+1}+1\right)}{\left|-2\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+4\sqrt{2}+2\sqrt{\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^4-6\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+1}-2\right|}\right)-\log\left(\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-\sqrt{\right.\right.}{}$$

[In] integrate(cos(d*x+c)^(1/2)/(1-cos(d*x+c))^(1/2),x, algorithm="giac")

[Out] -1/2*sqrt(2)*(2*sqrt(2)*log(2*(tan(1/4*d*x + 1/4*c)^2 + 2*sqrt(2) - sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 1)/abs(-2*tan(1/4*d*

```
x + 1/4*c)^2 + 4*sqrt(2) + 2*sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x +
1/4*c)^2 + 1) - 2)) - log(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c
)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 1) + log(abs(-tan(1/4*d*x + 1/4*c)^2
+ sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 3)) + log(a
bs(-tan(1/4*d*x + 1/4*c)^2 + sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x +
1/4*c)^2 + 1) + 1)))/(d*sgn(sin(1/2*d*x + 1/2*c)))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{1-\cos(c+dx)}}\,dx=\int \frac{\sqrt{\cos\left(c+d\,x\right)}}{\sqrt{1-\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(1 - cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(1/2)/(1 - cos(c + d*x))^(1/2), x)
```

3.285 $\int \frac{1}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 47

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{2}\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}$$

```
[Out] -arctanh(1/2*sin(d*x+c)*2^(1/2)/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2))*2^(1
/2)/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2861, 212}

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\operatorname{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{2}\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}$$

```
[In] Int[1/(Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c + d*x]]),x]
```

```
[Out] -((Sqrt[2]*ArcTanh[Sin[c + d*x]/(Sqrt[2]*Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c
+ d*x]])])/d)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{2\text{Subst}\left(\int \frac{1}{2-x^2}\,dx, x, \frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}\\ &= -\frac{\sqrt{2}\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{2}\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.19 (sec) , antiderivative size = 110, normalized size of antiderivative = 2.34

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \frac{ie^{-i(c+dx)}\left(-1+e^{i(c+dx)}\right)\sqrt{1+e^{2i(c+dx)}}\text{arctanh}\left(\frac{1+e^{i(c+dx)}}{\sqrt{2}\sqrt{1+e^{2i(c+dx)}}}\right)}{\sqrt{2}d\sqrt{-((-1+\cos(c+dx))\cos(c+dx))}}$$

```
[In] Integrate[1/(Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c + d*x]]),x]
```

```
[Out] (I*(-1 + E^(I*(c + d*x)))*Sqrt[1 + E^((2*I)*(c + d*x))]*ArcTanh[(1 + E^(I*(
c + d*x)))/(Sqrt[2]*Sqrt[1 + E^((2*I)*(c + d*x))])])/(Sqrt[2]*d*E^(I*(c + d
*x))*Sqrt[-((-1 + Cos[c + d*x])*Cos[c + d*x])])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 83 vs. 2(40) = 80.

Time = 5.84 (sec) , antiderivative size = 84, normalized size of antiderivative = 1.79

method	result	size
default	$\frac{4\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,(\cos(dx+c)-1)\sin(dx+c)\,\text{arctanh}\left(\frac{\sqrt{2}}{2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}\right)}{d\sqrt{\cos(dx+c)}\,(-2\cos(dx+c)+2)^{\frac{3}{2}}}$	84

```
[In] int(1/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 4/d*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)-1)*sin(d*x+c)*arctanh(1/2
*2^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))/cos(d*x+c)^(1/2)/(-2*cos(d*x+c)
+2)^(3/2)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 84 vs. $2(40) = 80$.

Time = 0.27 (sec) , antiderivative size = 84, normalized size of antiderivative = 1.79

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \frac{\sqrt{2}\log\left(-\frac{2\left(\sqrt{2}\cos(dx+c)+\sqrt{2}\right)\sqrt{-\cos(dx+c)+1}\sqrt{\cos(dx+c)}-(3\cos(dx+c)+1)\sin(dx+c)}{(\cos(dx+c)-1)\sin(dx+c)}\right)}{2d}$$

```
[In] integrate(1/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(2)*log(-(2*(sqrt(2)*cos(d*x + c) + sqrt(2))*sqrt(-cos(d*x + c) + 1
)*sqrt(cos(d*x + c)) - (3*cos(d*x + c) + 1)*sin(d*x + c))/((cos(d*x + c) -
1)*sin(d*x + c)))/d
```

Sympy [F]

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{1-\cos{(c+dx)}}\sqrt{\cos{(c+dx)}}}\,dx$$

```
[In] integrate(1/(1-cos(d*x+c))**(1/2)/cos(d*x+c)**(1/2),x)
```

```
[Out] Integral(1/(sqrt(1 - cos(c + d*x))*sqrt(cos(c + d*x))), x)
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.38 (sec) , antiderivative size = 248, normalized size of antiderivative = 5.28

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \frac{\sqrt{2}\log\left(\frac{4\left(\left|ie^{(idx+ic)}-i\right|^2+2\sqrt{\cos(2dx+2c)^2+\sin(2dx+2c)^2+2\cos(2dx+2c)+1}\left(\cos\left(\frac{1}{2}\arctan(\sin(2dx+2c),\cos(2dx+2c)+1)\right)^2+\sin(\right.\right.}{}\right.}{}$$

```
[In] integrate(1/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(2)*log(4*(abs(I*e^(I*d*x + I*c) - I)^2 + 2*sqrt(cos(2*d*x + 2*c)^2
 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*(cos(1/2*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c) + 1))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*
d*x + 2*c) + 1))^2) - 2*(sqrt(2)*abs(I*e^(I*d*x + I*c) - I)*sin(1/2*arctan2
(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 2*sqrt(2)*cos(1/2*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c) + 1)))*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)
^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4) + 4)/abs(I*e^(I*d*x + I*c) - I)^2)/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 159 vs. $2(40) = 80$.

Time = 0.48 (sec) , antiderivative size = 159, normalized size of antiderivative = 3.38

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx$$
$$= \frac{\sqrt{2}\left(\log\left(\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2-\sqrt{\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^4-6\,\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+1}+1\right)-\log\left(\left|-\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\right.\right.\right.}{}$$

```
[In] integrate(1/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(2)*(log(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*t
an(1/4*d*x + 1/4*c)^2 + 1) + 1) - log(abs(-tan(1/4*d*x + 1/4*c)^2 + sqrt(ta
n(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 3)) - log(abs(-tan(1
/4*d*x + 1/4*c)^2 + sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2
+ 1) + 1)))/(d*sgn(sin(1/2*d*x + 1/2*c)))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{1-\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(1 - cos(c + d*x))^(1/2)),x)
```

```
[Out] int(1/(cos(c + d*x)^(1/2)*(1 - cos(c + d*x))^(1/2)), x)
```

3.286 $\int \frac{1}{\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 83

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}\,dx = -\frac{\sqrt{2}\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{2}\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d} + \frac{2\sin(c+dx)}{d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}$$

```
[Out] -arctanh(1/2*sin(d*x+c)*2^(1/2)/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2))*2^(1
/2)/d+2*sin(d*x+c)/d/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {2858, 2861, 212}

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\sin(c+dx)}{d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}} - \frac{\sqrt{2}\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{2}\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}$$

```
[In] Int[1/(Sqrt[1 - Cos[c + d*x]]*Cos[c + d*x]^(3/2)),x]
```

```
[Out] -((Sqrt[2]*ArcTanh[Sin[c + d*x]/(Sqrt[2]*Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c
+ d*x]])])/d) + (2*Sin[c + d*x])/(d*Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c + d*x
]])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2\sin(c+dx)}{d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}+\int\frac{1}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{2\sin(c+dx)}{d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}-\frac{2\text{Subst}\left(\int\frac{1}{2-x^2}\,dx,x,\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}\\
&= -\frac{\sqrt{2}\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{2}\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}+\frac{2\sin(c+dx)}{d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.27 (sec) , antiderivative size = 152, normalized size of antiderivative = 1.83

$$\int\frac{1}{\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}\,dx$$
$$=\frac{2\left(-\frac{e^{-\frac{1}{2}i(c+dx)}\left(1+e^{2i(c+dx)}\right)\text{arctanh}\left(\frac{1+e^{i(c+dx)}}{\sqrt{2}\sqrt{1+e^{2i(c+dx)}}}\right)}{\sqrt{2}}+2\sqrt{1+e^{2i(c+dx)}}\cos\left(\frac{1}{2}(c+dx)\right)\right)\sin\left(\frac{1}{2}(c+dx)\right)}{d\sqrt{1+e^{2i(c+dx)}}\sqrt{-((-1+\cos(c+dx))\cos(c+dx))}}$$

```
[In] Integrate[1/(Sqrt[1 - Cos[c + d*x]]*Cos[c + d*x]^(3/2)),x]
```

```
[Out] (2*(-(((1 + E^((2*I)*(c + d*x)))*ArcTanh[(1 + E^(I*(c + d*x)))/(Sqrt[2]*Sqr
t[1 + E^((2*I)*(c + d*x))])])/(Sqrt[2]*E^((I/2)*(c + d*x)))) + 2*Sqrt[1 + E
^((2*I)*(c + d*x))]*Cos[(c + d*x)/2])*Sin[(c + d*x)/2])/(d*Sqrt[1 + E^((2*I
)*(c + d*x))]*Sqrt[-((-1 + Cos[c + d*x])*Cos[c + d*x])])
```

Maple [A] (verified)

Time = 5.57 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.02

method	result	size
default	$-\frac{\left(\operatorname{arctanh}\left(\frac{\sqrt{2}}{2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}\right)\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-2\right)\sin(dx+c)\sqrt{2}}{d\sqrt{\cos(dx+c)}\,\sqrt{-2\cos(dx+c)+2}}$	85

```
[In] int(1/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/d*(arctanh(1/2*2^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))*2^(1/2)*(cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)-2)*sin(d*x+c)/cos(d*x+c)^(1/2)/(-2*cos(d*x+c)+2
)^(1/2)*2^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.73

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{\sqrt{2}\cos(dx+c)\log\left(-\frac{2\left(\sqrt{2}\cos(dx+c)+\sqrt{2}\right)\sqrt{-\cos(dx+c)+1}\sqrt{\cos(dx+c)}-(3\cos(dx+c)+1)\sin(dx+c)}{(\cos(dx+c)-1)\sin(dx+c)}\right)\sin(dx+c)+4\,(c}{2\,d\cos(dx+c)\sin(dx+c)}$$

```
[In] integrate(1/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/2*(sqrt(2)*cos(d*x + c)*log(-(2*(sqrt(2)*cos(d*x + c) + sqrt(2))*sqrt(-co
s(d*x + c) + 1)*sqrt(cos(d*x + c)) - (3*cos(d*x + c) + 1)*sin(d*x + c))/((c
os(d*x + c) - 1)*sin(d*x + c)))*sin(d*x + c) + 4*(cos(d*x + c) + 1)*sqrt(-c
os(d*x + c) + 1)*sqrt(cos(d*x + c)))/(d*cos(d*x + c)*sin(d*x + c))
```

Sympy [F]

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{\sqrt{1-\cos{(c+dx)}}\cos^{\frac{3}{2}}{(c+dx)}}\,dx$$

```
[In] integrate(1/(1-cos(d*x+c))**(1/2)/cos(d*x+c)**(3/2),x)
[Out] Integral(1/(sqrt(1 - cos(c + d*x))*cos(c + d*x)**(3/2)), x)
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.38 (sec) , antiderivative size = 400, normalized size of antiderivative = 4.82

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}\,dx =$$

$$-\frac{\sqrt{2}\left(2\sqrt{2}\sin{(dx+c)}\sin{\left(\frac{1}{2}\arctan{(\sin{(2\,dx+2\,c)},\cos{(2\,dx+2\,c)}+1)}\right)}+2\left(\sqrt{2}\cos{(dx+c)}+\sqrt{2}\right)c\right.}{}$$

```
[In] integrate(1/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(3/2),x, algorithm="maxima")
[Out] -1/2*sqrt(2)*(2*sqrt(2)*sin(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(
2*d*x + 2*c) + 1)) + 2*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(1/2*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2
*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*log(4*(abs(I*e^(I*d*x + I*c) - I)^2 +
 2*sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*(
cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + sin(1/2*arctan
2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2) - 2*(sqrt(2)*abs(I*e^(I*d*x +
 I*c) - I)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 2*sqr
t(2)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)))*(cos(2*d*x +
 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4) + 4)/abs(I*e^(
I*d*x + I*c) - I)^2))/((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d
*x + 2*c) + 1)^(1/4)*d)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 264 vs. $2(72) = 144$.

Time = 0.56 (sec) , antiderivative size = 264, normalized size of antiderivative = 3.18

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}\,dx = -\frac{\frac{4\left(\frac{\sqrt{2}\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2}{\operatorname{sgn}\left(\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}-\frac{\sqrt{2}}{\operatorname{sgn}\left(\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}\right)}{\sqrt{\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^4-6\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+1}}-\frac{\sqrt{2}\log\left(\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-\sqrt{\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^4-6\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+1}+1\right)}{\operatorname{sgn}\left(\sin\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}+\frac{\sqrt{2}\log\left(\left|-\mathrm{ta}\right.\right.}{}}{}$$

[In] integrate(1/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(3/2),x, algorithm="giac")

[Out] -1/2*(4*(sqrt(2)*tan(1/4*d*x + 1/4*c)^2/sgn(sin(1/2*d*x + 1/2*c)) - sqrt(2)
/sgn(sin(1/2*d*x + 1/2*c)))/sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1
/4*c)^2 + 1) - sqrt(2)*log(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*
c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 1)/sgn(sin(1/2*d*x + 1/2*c)) + sqrt(
2)*log(abs(-tan(1/4*d*x + 1/4*c)^2 + sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/
4*d*x + 1/4*c)^2 + 1) + 3))/sgn(sin(1/2*d*x + 1/2*c)) + sqrt(2)*log(abs(-ta
n(1/4*d*x + 1/4*c)^2 + sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)
^2 + 1) + 1))/sgn(sin(1/2*d*x + 1/2*c)))/d

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{{\cos\left(c+d\,x\right)}^{3/2}\,\sqrt{1-\cos\left(c+d\,x\right)}}\,dx$$

[In] int(1/(cos(c + d*x)^(3/2)*(1 - cos(c + d*x))^(1/2)),x)

[Out] int(1/(cos(c + d*x)^(3/2)*(1 - cos(c + d*x))^(1/2)), x)

3.287 $\int \frac{1}{\sqrt{1-\cos(c+dx)}\cos^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 122

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\cos^{\frac{5}{2}}(c+dx)}\,dx = -\frac{\sqrt{2}\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{2}\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d} + \frac{2\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)} + \frac{2\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}$$

```
[Out] -arctanh(1/2*sin(d*x+c)*2^(1/2)/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2))*2^(1
/2)/d+2/3*sin(d*x+c)/d/cos(d*x+c)^(3/2)/(1-cos(d*x+c))^(1/2)+2/3*sin(d*x+c)
/d/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2858, 3063, 12, 2861, 212}

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\cos^{\frac{5}{2}}(c+dx)}\,dx = -\frac{\sqrt{2}\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{2}\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d} + \frac{2\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)} + \frac{2\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}$$

```
[In] Int[1/(Sqrt[1 - Cos[c + d*x]]*Cos[c + d*x]^(5/2)),x]
```

```
[Out] -((Sqrt[2]*ArcTanh[Sin[c + d*x]/(Sqrt[2]*Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c
+ d*x]])])/d) + (2*Sin[c + d*x])/(3*d*Sqrt[1 - Cos[c + d*x]]*Cos[c + d*x]^(
3/2)) + (2*Sin[c + d*x])/(3*d*Sqrt[1 - Cos[c + d*x]]*Sqrt[Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}+\frac{1}{3}\int\frac{1+2\cos(c+dx)}{\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}\,dx\\
&= \frac{2\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}+\frac{2\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\\
&\quad -\frac{2}{3}\int-\frac{3}{2\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{2\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}+\frac{2\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\\
&\quad +\int\frac{1}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{2\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}+\frac{2\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\\
&\quad -\frac{2\text{Subst}\left(\int\frac{1}{2-x^2}\,dx,x,\frac{\sin(c+dx)}{\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}\\
&= -\frac{\sqrt{2}\text{arctanh}\left(\frac{\sin(c+dx)}{\sqrt{2}\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}\right)}{d}\\
&\quad +\frac{2\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}+\frac{2\sin(c+dx)}{3d\sqrt{1-\cos(c+dx)}\sqrt{\cos(c+dx)}}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.29 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.39

$$\int\frac{1}{\sqrt{1-\cos(c+dx)}\cos^{\frac{5}{2}}(c+dx)}\,dx$$

$$=\frac{2\left(-\frac{3e^{-\frac{3}{2}i(c+dx)}\left(1+e^{2i(c+dx)}\right)^2\text{arctanh}\left(\frac{1+e^{i(c+dx)}}{\sqrt{2}\sqrt{1+e^{2i(c+dx)}}}\right)}{2\sqrt{2}}+2\sqrt{1+e^{2i(c+dx)}}\cos\left(\frac{1}{2}(c+dx)\right)(1+\cos(c+dx))\right)\sin}{3d\sqrt{1+e^{2i(c+dx)}}\sqrt{1-\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Integrate[1/(Sqrt[1 - Cos[c + d*x]]*Cos[c + d*x]^(5/2)),x]
[Out] (2*((-3*(1 + E^((2*I)*(c + d*x)))^2*ArcTanh[(1 + E^(I*(c + d*x)))/(Sqrt[2]*
Sqrt[1 + E^((2*I)*(c + d*x))])])/(2*Sqrt[2]*E^(((3*I)/2)*(c + d*x))) + 2*Sq
rt[1 + E^((2*I)*(c + d*x))]*Cos[(c + d*x)/2]*(1 + Cos[c + d*x]))*Sin[(c + d
*x)/2])/(3*d*Sqrt[1 + E^((2*I)*(c + d*x))]*Sqrt[1 - Cos[c + d*x]]*Cos[c + d
*x]^(3/2))
```

Maple [A] (verified)

Time = 4.64 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.82

method	result	size
default	$-\frac{\left(3\cos(dx+c)\,\mathrm{arctanh}\left(\frac{\sqrt{2}}{2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}\right)\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-2\cos(dx+c)-2\right)\sin(dx+c)\sqrt{2}}{3d\cos(dx+c)^{\frac{3}{2}}\sqrt{-2\cos(dx+c)+2}}$	100

[In] int(1/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(5/2),x,method=_RETURNVERBOSE)

[Out] -1/3/d*(3*cos(d*x+c)*arctanh(1/2*2^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-2*cos(d*x+c)-2)*sin(d*x+c)/cos(d*x+c)^(3/2)/(-2*cos(d*x+c)+2)^(1/2)*2^(1/2)

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.29

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{3\sqrt{2}\cos\left(dx+c\right)^2\log\left(-\frac{2\left(\sqrt{2}\cos(dx+c)+\sqrt{2}\right)\sqrt{-\cos(dx+c)+1}\sqrt{\cos(dx+c)}-(3\cos(dx+c)+1)\sin(dx+c)}{(\cos(dx+c)-1)\sin(dx+c)}\right)\sin\left(dx+c\right)+4}{6\,d\cos\left(dx+c\right)^2\sin\left(dx+c\right)}$$

[In] integrate(1/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(5/2),x, algorithm="fricas")

[Out] 1/6*(3*sqrt(2)*cos(d*x + c)^2*log(-(2*(sqrt(2)*cos(d*x + c) + sqrt(2))*sqrt(-cos(d*x + c) + 1)*sqrt(cos(d*x + c)) - (3*cos(d*x + c) + 1)*sin(d*x + c))/((cos(d*x + c) - 1)*sin(d*x + c)))*sin(d*x + c) + 4*(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(-cos(d*x + c) + 1)*sqrt(cos(d*x + c)))/(d*cos(d*x + c)^2*sin(d*x + c))

Sympy [F]

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{\sqrt{1-\cos\left(c+dx\right)}\cos^{\frac{5}{2}}\left(c+dx\right)}\,dx$$

[In] integrate(1/(1-cos(d*x+c))**(1/2)/cos(d*x+c)**(5/2),x)

[Out] Integral(1/(sqrt(1 - cos(c + d*x))*cos(c + d*x)**(5/2)), x)

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.40 (sec) , antiderivative size = 563, normalized size of antiderivative = 4.61

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\cos^{\frac{5}{2}}(c+dx)}\,dx$$

$$= \frac{3\left(\cos(2\,dx+2\,c)^2+\sin(2\,dx+2\,c)^2+2\,\cos(2\,dx+2\,c)+1\right)\log\left(\frac{4\left(\left|i\,e^{(i\,dx+i\,c)}-i\right|^2+2\,\sqrt{\cos(2\,dx+2\,c)^2+\sin(2\,dx+2}\right.}{}\right.}{}$$

```
[In] integrate(1/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*(3*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*l
og(4*(abs(I*e^(I*d*x + I*c) - I)^2 + 2*sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x
+ 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c) + 1))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
1))^2) - 2*(sqrt(2)*abs(I*e^(I*d*x + I*c) - I)*sin(1/2*arctan2(sin(2*d*x +
2*c), cos(2*d*x + 2*c) + 1)) - 2*sqrt(2)*cos(1/2*arctan2(sin(2*d*x + 2*c),
cos(2*d*x + 2*c) + 1)))*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*
d*x + 2*c) + 1)^(1/4) + 4)/abs(I*e^(I*d*x + I*c) - I)^2) - 2*(sqrt(2)*sin(d
*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + (sqrt(2)
*cos(d*x + c) + 3*sqrt(2))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c) + 1)))*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1
)^(3/4) - 4*(sqrt(2)*sin(d*x + c)*sin(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c) + 1)) + (sqrt(2)*cos(d*x + c) - sqrt(2))*cos(3/2*arctan2(sin(2*d*
x + 2*c), cos(2*d*x + 2*c) + 1)))*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2
+ 2*cos(2*d*x + 2*c) + 1)^(1/4))/((sqrt(2)*cos(2*d*x + 2*c)^2 + sqrt(2)*sin
(2*d*x + 2*c)^2 + 2*sqrt(2)*cos(2*d*x + 2*c) + sqrt(2))*d)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 232 vs. 2(103) = 206.

Time = 0.54 (sec) , antiderivative size = 232, normalized size of antiderivative = 1.90

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\cos^{\frac{5}{2}}(c+dx)}\,dx = -\frac{\sqrt{2}\left(\frac{8\left(\left(\left(\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2-3\right)\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+3\right)\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2-1\right)}{\left(\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^4-6\,\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2+1\right)^{\frac{3}{2}}}-3\,\log\left(\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^2-\sqrt{\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^{}}\right.\right.}{}$$

```
[In] integrate(1/(1-cos(d*x+c))^(1/2)/cos(d*x+c)^(5/2),x, algorithm="giac")
```

```
[Out] -1/6*sqrt(2)*(8*(((tan(1/4*d*x + 1/4*c)^2 - 3)*tan(1/4*d*x + 1/4*c)^2 + 3)*
tan(1/4*d*x + 1/4*c)^2 - 1)/(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c
)^2 + 1)^(3/2) - 3*log(tan(1/4*d*x + 1/4*c)^2 - sqrt(tan(1/4*d*x + 1/4*c)^4
 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 1) + 3*log(abs(-tan(1/4*d*x + 1/4*c)^2 +
 sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1) + 3)) + 3*log(
abs(-tan(1/4*d*x + 1/4*c)^2 + sqrt(tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x +
 1/4*c)^2 + 1) + 1)))/(d*sgn(sin(1/2*d*x + 1/2*c)))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{1-\cos(c+dx)}\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^{5/2}\,\sqrt{1-\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(5/2)*(1 - cos(c + d*x))^(1/2)),x)
```

```
[Out] int(1/(cos(c + d*x)^(5/2)*(1 - cos(c + d*x))^(1/2)), x)
```

3.288 $\int \cos^{\frac{4}{3}}(c+dx)\sqrt[3]{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 78

$$\int \cos^{\frac{4}{3}}(c+dx)\sqrt[3]{a+a\cos(c+dx)}\,dx = \frac{2^{5/6}\,\text{AppellF1}\left(\frac{1}{2},-\frac{4}{3},\frac{1}{6},\frac{3}{2},1-\cos(c+dx),\frac{1}{2}(1-\cos(c+dx))\right)\sqrt[3]{a+a\cos(c+dx)}\sin(c+dx)}{d(1+\cos(c+dx))^{5/6}}$$

```
[Out] 2^(5/6)*AppellF1(1/2,-4/3,1/6,3/2,1-cos(d*x+c),1/2-1/2*cos(d*x+c))*(a+a*cos
(d*x+c))^(1/3)*sin(d*x+c)/d/(1+cos(d*x+c))^(5/6)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 78, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {2866, 2864, 138}

$$\int \cos^{\frac{4}{3}}(c+dx)\sqrt[3]{a+a\cos(c+dx)}\,dx = \frac{2^{5/6}\sin(c+dx)\sqrt[3]{a\cos(c+dx)+a}\,\text{AppellF1}\left(\frac{1}{2},-\frac{4}{3},\frac{1}{6},\frac{3}{2},1-\cos(c+dx),\frac{1}{2}(1-\cos(c+dx))\right)}{d(\cos(c+dx)+1)^{5/6}}$$

```
[In] Int[Cos[c + d*x]^(4/3)*(a + a*Cos[c + d*x])^(1/3),x]
```

```
[Out] (2^(5/6)*AppellF1[1/2, -4/3, 1/6, 3/2, 1 - Cos[c + d*x], (1 - Cos[c + d*x])
/2]*(a + a*Cos[c + d*x])^(1/3)*Sin[c + d*x])/(d*(1 + Cos[c + d*x])^(5/6))
```

Rule 138

```
Int[((b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_)*((e_) + (f_.)*(x_))^(p_), x_
Symbol] :> Simp[c^n*e^p*((b*x)^(m + 1)/(b*(m + 1)))*AppellF1[m + 1, -n, -p,
```

```
 m + 2, (-d)*(x/c), (-f)*(x/e)], x] /; FreeQ[{b, c, d, e, f, m, n, p}, x] &
& !IntegerQ[m] && !IntegerQ[n] && GtQ[c, 0] && (IntegerQ[p] || GtQ[e, 0])
```

Rule 2864

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)])^(m_), x_Symbol] :> Dist[(-b)*(d/b)^n*(Cos[e + f*x]/(f*Sqrt[a + b*Sin[e
 + f*x]]*Sqrt[a - b*Sin[e + f*x]])), Subst[Int[(a - x)^n*((2*a - x)^(m - 1/
2)/Sqrt[x]), x], x, a - b*Sin[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n},
 x] && EqQ[a^2 - b^2, 0] && !IntegerQ[m] && GtQ[a, 0] && GtQ[d/b, 0]
```

Rule 2866

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_), x_Symbol] :> Dist[a^IntPart[m]*((a + b*Sin[e + f*x])^FracPart[m
]/(1 + (b/a)*Sin[e + f*x])^FracPart[m]), Int[(1 + (b/a)*Sin[e + f*x])^m*(d*
Sin[e + f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 - b^2
, 0] && !IntegerQ[m] && !GtQ[a, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sqrt[3]{a+a\cos(c+dx)}\int\cos^{\frac{4}{3}}(c+dx)\sqrt[3]{1+\cos(c+dx)}\,dx}{\sqrt[3]{1+\cos(c+dx)}}\\ &= \frac{\left(\sqrt[3]{a+a\cos(c+dx)}\sin(c+dx)\right)\text{Subst}\left(\int\frac{(1-x)^{4/3}}{\sqrt[6]{2-x}\sqrt{x}}\,dx,x,1-\cos(c+dx)\right)}{d\sqrt{1-\cos(c+dx)}(1+\cos(c+dx))^{5/6}}\\ &= \frac{2^{5/6}\,\text{AppellF1}\left(\frac{1}{2},-\frac{4}{3},\frac{1}{6},\frac{3}{2},1-\cos(c+dx),\frac{1}{2}(1-\cos(c+dx))\right)\sqrt[3]{a+a\cos(c+dx)}\sin(c+dx)}{d(1+\cos(c+dx))^{5/6}}\end{aligned}$$

Mathematica [F]

$$\int\cos^{\frac{4}{3}}(c+dx)\sqrt[3]{a+a\cos(c+dx)}\,dx=\int\cos^{\frac{4}{3}}(c+dx)\sqrt[3]{a+a\cos(c+dx)}\,dx$$

```
[In] Integrate[Cos[c + d*x]^(4/3)*(a + a*Cos[c + d*x])^(1/3),x]
[Out] Integrate[Cos[c + d*x]^(4/3)*(a + a*Cos[c + d*x])^(1/3), x]
```

Maple [F]

$$\int \left(\cos^{\frac{4}{3}}(dx+c)\right)(a+\cos(dx+c)\,a)^{\frac{1}{3}}\,dx$$

```
[In] int(cos(d*x+c)^(4/3)*(a+cos(d*x+c)*a)^(1/3),x)
[Out] int(cos(d*x+c)^(4/3)*(a+cos(d*x+c)*a)^(1/3),x)
```

Fricas [F]

$$\int \cos^{\frac{4}{3}}(c+dx)\sqrt[3]{a+a\cos(c+dx)}\,dx = \int (a\cos(dx+c)+a)^{\frac{1}{3}}\cos(dx+c)^{\frac{4}{3}}\,dx$$

```
[In] integrate(cos(d*x+c)^(4/3)*(a+a*cos(d*x+c))^(1/3),x, algorithm="fricas")
[Out] integral((a*cos(d*x + c) + a)^(1/3)*cos(d*x + c)^(4/3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{4}{3}}(c+dx)\sqrt[3]{a+a\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(4/3)*(a+a*cos(d*x+c))**(1/3),x)
[Out] Timed out
```

Maxima [F]

$$\int \cos^{\frac{4}{3}}(c+dx)\sqrt[3]{a+a\cos(c+dx)}\,dx = \int (a\cos(dx+c)+a)^{\frac{1}{3}}\cos(dx+c)^{\frac{4}{3}}\,dx$$

```
[In] integrate(cos(d*x+c)^(4/3)*(a+a*cos(d*x+c))^(1/3),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^(1/3)*cos(d*x + c)^(4/3), x)
```

Giac [F]

$$\int \cos^{\frac{4}{3}}(c+dx)\sqrt[3]{a+a\cos(c+dx)}\,dx = \int (a\cos(dx+c)+a)^{\frac{1}{3}}\cos(dx+c)^{\frac{4}{3}}\,dx$$

```
[In] integrate(cos(d*x+c)^(4/3)*(a+a*cos(d*x+c))^(1/3),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^(1/3)*cos(d*x + c)^(4/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^{\frac{4}{3}}(c+dx)\sqrt[3]{a+a\cos(c+dx)}\,dx = \int \cos(c+d\,x)^{4/3}\,(a+a\,\cos(c+d\,x))^{1/3}\,dx$$

```
[In] int(cos(c + d*x)^(4/3)*(a + a*cos(c + d*x))^(1/3),x)
[Out] int(cos(c + d*x)^(4/3)*(a + a*cos(c + d*x))^(1/3), x)
```

3.289 $\int \cos^{\frac{4}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 79

$$\int \cos^{\frac{4}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx = \frac{2\sqrt[6]{2}\,\text{AppellF1}\left(\frac{1}{2},-\frac{4}{3},-\frac{1}{6},\frac{3}{2},1-\cos(c+dx),\frac{1}{2}(1-\cos(c+dx))\right)(a+a\cos(c+dx))^{2/3}\sin(c-}{d(1+\cos(c+dx))^{7/6}}$$

```
[Out] 2*2^(1/6)*AppellF1(1/2,-4/3,-1/6,3/2,1-cos(d*x+c),1/2-1/2*cos(d*x+c))*(a+a*
cos(d*x+c))^(2/3)*sin(d*x+c)/d/(1+cos(d*x+c))^(7/6)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 79, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.120$, Rules used = {2866, 2864, 138}

$$\int \cos^{\frac{4}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx = \frac{2\sqrt[6]{2}\sin(c+dx)(a\cos(c+dx)+a)^{2/3}\,\text{AppellF1}\left(\frac{1}{2},-\frac{4}{3},-\frac{1}{6},\frac{3}{2},1-\cos(c+dx),\frac{1}{2}(1-\cos(c+d}{d(\cos(c+dx)+1)^{7/6}}$$

```
[In] Int[Cos[c + d*x]^(4/3)*(a + a*Cos[c + d*x])^(2/3),x]
```

```
[Out] (2*2^(1/6)*AppellF1[1/2, -4/3, -1/6, 3/2, 1 - Cos[c + d*x], (1 - Cos[c + d*
x])/2]*(a + a*Cos[c + d*x])^(2/3)*Sin[c + d*x])/(d*(1 + Cos[c + d*x])^(7/6)
)
```

Rule 138

```
Int[((b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_)*((e_) + (f_.)*(x_))^(p_), x_
Symbol] :> Simp[c^n*e^p*((b*x)^(m + 1)/(b*(m + 1)))*AppellF1[m + 1, -n, -p,
```

```
m + 2, (-d)*(x/c), (-f)*(x/e)], x] /; FreeQ[{b, c, d, e, f, m, n, p}, x] &
& !IntegerQ[m] && !IntegerQ[n] && GtQ[c, 0] && (IntegerQ[p] || GtQ[e, 0])
```

Rule 2864

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)])^(m_), x_Symbol] :> Dist[(-b)*(d/b)^n*(Cos[e + f*x]/(f*Sqrt[a + b*Sin[e
 + f*x]]*Sqrt[a - b*Sin[e + f*x]])), Subst[Int[(a - x)^n*((2*a - x)^(m - 1/
2)/Sqrt[x]), x], x, a - b*Sin[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n},
 x] && EqQ[a^2 - b^2, 0] && !IntegerQ[m] && GtQ[a, 0] && GtQ[d/b, 0]
```

Rule 2866

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_), x_Symbol] :> Dist[a^IntPart[m]*((a + b*Sin[e + f*x])^FracPart[m
]/(1 + (b/a)*Sin[e + f*x])^FracPart[m]), Int[(1 + (b/a)*Sin[e + f*x])^m*(d*
Sin[e + f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 - b^2
, 0] && !IntegerQ[m] && !GtQ[a, 0]
```

Rubi steps

$$\text{integral} = \frac{(a+a\cos(c+dx))^{2/3}\int \cos^{\frac{4}{3}}(c+dx)(1+\cos(c+dx))^{2/3}\,dx}{(1+\cos(c+dx))^{2/3}}$$

$$= \frac{\left((a+a\cos(c+dx))^{2/3}\sin(c+dx)\right)\operatorname{Subst}\left(\int \frac{(1-x)^{4/3}\sqrt[6]{2-x}}{\sqrt{x}}\,dx, x, 1-\cos(c+dx)\right)}{d\sqrt{1-\cos(c+dx)}(1+\cos(c+dx))^{7/6}}$$

$$= \frac{2\sqrt[6]{2}\,\text{AppellF1}\left(\frac{1}{2},-\frac{4}{3},-\frac{1}{6},\frac{3}{2},1-\cos(c+dx),\frac{1}{2}(1-\cos(c+dx))\right)(a+a\cos(c+dx))^{2/3}\sin(c+d}{d(1+\cos(c+dx))^{7/6}}$$

Mathematica [F]

$$\int \cos^{\frac{4}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx = \int \cos^{\frac{4}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx$$

```
[In] Integrate[Cos[c + d*x]^(4/3)*(a + a*Cos[c + d*x])^(2/3),x]
[Out] Integrate[Cos[c + d*x]^(4/3)*(a + a*Cos[c + d*x])^(2/3), x]
```

Maple [F]

$$\int \left(\cos^{\frac{4}{3}}\left(dx+c\right)\right)\left(a+\cos\left(dx+c\right)a\right)^{\frac{2}{3}}dx$$

[In] int(cos(d*x+c)^(4/3)*(a+cos(d*x+c)*a)^(2/3),x)

[Out] int(cos(d*x+c)^(4/3)*(a+cos(d*x+c)*a)^(2/3),x)

Fricas [F(-1)]

Timed out.

$$\int \cos^{\frac{4}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx = \text{Timed out}$$

[In] integrate(cos(d*x+c)^(4/3)*(a+a*cos(d*x+c))^(2/3),x, algorithm="fricas")

[Out] Timed out

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{4}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx = \text{Timed out}$$

[In] integrate(cos(d*x+c)**(4/3)*(a+a*cos(d*x+c))**(2/3),x)

[Out] Timed out

Maxima [F]

$$\int \cos^{\frac{4}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx = \int \left(a\cos\left(dx+c\right)+a\right)^{\frac{2}{3}}\cos\left(dx+c\right)^{\frac{4}{3}}\,dx$$

[In] integrate(cos(d*x+c)^(4/3)*(a+a*cos(d*x+c))^(2/3),x, algorithm="maxima")

[Out] integrate((a*cos(d*x + c) + a)^(2/3)*cos(d*x + c)^(4/3), x)

Giac [F(-1)]

Timed out.

$$\int \cos^{\frac{4}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(4/3)*(a+a*cos(d*x+c))^(2/3),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \cos^{\frac{4}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx = \int \cos\left(c+d\,x\right)^{4/3}\,\left(a+a\,\cos\left(c+d\,x\right)\right)^{2/3}\,dx$$

```
[In] int(cos(c + d*x)^(4/3)*(a + a*cos(c + d*x))^(2/3),x)
[Out] int(cos(c + d*x)^(4/3)*(a + a*cos(c + d*x))^(2/3), x)
```

3.290 $\int \cos^{\frac{5}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 79

$$\int \cos^{\frac{5}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx = \frac{2\sqrt[6]{2}\,\text{AppellF1}\left(\frac{1}{2},-\frac{5}{3},-\frac{1}{6},\frac{3}{2},1-\cos(c+dx),\frac{1}{2}(1-\cos(c+dx))\right)(a+a\cos(c+dx))^{2/3}\sin(c+dx)}{d(1+\cos(c+dx))^{7/6}}$$

```
[Out] 2*2^(1/6)*AppellF1(1/2,-5/3,-1/6,3/2,1-cos(d*x+c),1/2-1/2*cos(d*x+c))*(a+a*
cos(d*x+c))^(2/3)*sin(d*x+c)/d/(1+cos(d*x+c))^(7/6)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 79, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.120$, Rules used = {2866, 2864, 138}

$$\int \cos^{\frac{5}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx = \frac{2\sqrt[6]{2}\sin(c+dx)(a\cos(c+dx)+a)^{2/3}\,\text{AppellF1}\left(\frac{1}{2},-\frac{5}{3},-\frac{1}{6},\frac{3}{2},1-\cos(c+dx),\frac{1}{2}(1-\cos(c+dx))\right)}{d(\cos(c+dx)+1)^{7/6}}$$

```
[In] Int[Cos[c + d*x]^(5/3)*(a + a*Cos[c + d*x])^(2/3),x]
```

```
[Out] (2*2^(1/6)*AppellF1[1/2, -5/3, -1/6, 3/2, 1 - Cos[c + d*x], (1 - Cos[c + d*
x])/2]*(a + a*Cos[c + d*x])^(2/3)*Sin[c + d*x])/(d*(1 + Cos[c + d*x])^(7/6)
)
```

Rule 138

```
Int[((b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_)*((e_) + (f_.)*(x_))^(p_), x_
Symbol] :> Simp[c^n*e^p*((b*x)^(m + 1)/(b*(m + 1)))*AppellF1[m + 1, -n, -p,
```

```
 m + 2, (-d)*(x/c), (-f)*(x/e)], x] /; FreeQ[{b, c, d, e, f, m, n, p}, x] &
&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[c, 0] && (IntegerQ[p] || GtQ[e, 0])
```

Rule 2864

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)])^(m_), x_Symbol] :> Dist[(-b)*(d/b)^n*(Cos[e + f*x]/(f*Sqrt[a + b*Sin[e
 + f*x]]*Sqrt[a - b*Sin[e + f*x]])), Subst[Int[(a - x)^n*((2*a - x)^(m - 1/
2)/Sqrt[x]), x], x, a - b*Sin[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n},
 x] && EqQ[a^2 - b^2, 0] &&  !IntegerQ[m] && GtQ[a, 0] && GtQ[d/b, 0]
```

Rule 2866

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_), x_Symbol] :> Dist[a^IntPart[m]*((a + b*Sin[e + f*x])^FracPart[m
]/(1 + (b/a)*Sin[e + f*x])^FracPart[m]), Int[(1 + (b/a)*Sin[e + f*x])^m*(d*
Sin[e + f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 - b^2
, 0] &&  !IntegerQ[m] &&  !GtQ[a, 0]
```

Rubi steps

$$\text{integral} = \frac{(a+a\cos(c+dx))^{2/3}\int \cos^{\frac{5}{3}}(c+dx)(1+\cos(c+dx))^{2/3}\,dx}{(1+\cos(c+dx))^{2/3}}$$

$$= \frac{\left((a+a\cos(c+dx))^{2/3}\sin(c+dx)\right)\text{Subst}\left(\int \frac{(1-x)^{5/3}\sqrt[6]{2-x}}{\sqrt{x}}\,dx, x, 1-\cos(c+dx)\right)}{d\sqrt{1-\cos(c+dx)}(1+\cos(c+dx))^{7/6}}$$

$$= \frac{2\sqrt[6]{2}\,\text{AppellF1}\left(\frac{1}{2},-\frac{5}{3},-\frac{1}{6},\frac{3}{2},1-\cos(c+dx),\frac{1}{2}(1-\cos(c+dx))\right)(a+a\cos(c+dx))^{2/3}\sin(c+d}{d(1+\cos(c+dx))^{7/6}}$$

Mathematica [F]

$$\int \cos^{\frac{5}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx = \int \cos^{\frac{5}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx$$

```
[In] Integrate[Cos[c + d*x]^(5/3)*(a + a*Cos[c + d*x])^(2/3),x]
[Out] Integrate[Cos[c + d*x]^(5/3)*(a + a*Cos[c + d*x])^(2/3), x]
```

Maple [F]

$$\int \left(\cos^{\frac{5}{3}}(dx+c)\right)(a+\cos(dx+c)\,a)^{\frac{2}{3}}\,dx$$

```
[In] int(cos(d*x+c)^(5/3)*(a+cos(d*x+c)*a)^(2/3),x)
[Out] int(cos(d*x+c)^(5/3)*(a+cos(d*x+c)*a)^(2/3),x)
```

Fricas [F]

$$\int \cos^{\frac{5}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx = \int (a\cos(dx+c)+a)^{\frac{2}{3}}\cos(dx+c)^{\frac{5}{3}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/3)*(a+a*cos(d*x+c))^(2/3),x, algorithm="fricas")
[Out] integral((a*cos(d*x + c) + a)^(2/3)*cos(d*x + c)^(5/3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{5}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/3)*(a+a*cos(d*x+c))**(2/3),x)
[Out] Timed out
```

Maxima [F]

$$\int \cos^{\frac{5}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx = \int (a\cos(dx+c)+a)^{\frac{2}{3}}\cos(dx+c)^{\frac{5}{3}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/3)*(a+a*cos(d*x+c))^(2/3),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^(2/3)*cos(d*x + c)^(5/3), x)
```

Giac [F]

$$\int \cos^{\frac{5}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx=\int (a\cos{(dx+c)}+a)^{\frac{2}{3}}\cos{(dx+c)}^{\frac{5}{3}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/3)*(a+a*cos(d*x+c))^(2/3),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^(2/3)*cos(d*x + c)^(5/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^{\frac{5}{3}}(c+dx)(a+a\cos(c+dx))^{2/3}\,dx=\int \cos{(c+d\,x)}^{5/3}\,{(a+a\,\cos{(c+d\,x)})}^{2/3}\,dx$$

```
[In] int(cos(c + d*x)^(5/3)*(a + a*cos(c + d*x))^(2/3),x)
[Out] int(cos(c + d*x)^(5/3)*(a + a*cos(c + d*x))^(2/3), x)
```

3.291 $\int (a + a\cos(c + dx)) \sec^{\frac{7}{2}}(c + dx)\, dx$

Optimal result

Integrand size = 21, antiderivative size = 151

$$\begin{aligned}\int (a + a\cos(c + dx)) \sec^{\frac{7}{2}}(c + dx)\, dx &= -\frac{6a\sqrt{\cos(c + dx)}E\left(\frac{1}{2}(c + dx)\middle|2\right)\sqrt{\sec(c + dx)}}{5d} \\ &\quad + \frac{2a\sqrt{\cos(c + dx)}\,\text{EllipticF}\left(\frac{1}{2}(c + dx), 2\right)\sqrt{\sec(c + dx)}}{3d} + \frac{6a\sqrt{\sec(c + dx)}\sin(c + dx)}{5d} \\ &\quad + \frac{2a\sec^{\frac{3}{2}}(c + dx)\sin(c + dx)}{3d} + \frac{2a\sec^{\frac{5}{2}}(c + dx)\sin(c + dx)}{5d}\end{aligned}$$

```
[Out] 2/3*a*sec(d*x+c)^(3/2)*sin(d*x+c)/d+2/5*a*sec(d*x+c)^(5/2)*sin(d*x+c)/d+6/5
*a*sin(d*x+c)*sec(d*x+c)^(1/2)/d-6/5*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2
*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+
c)^(1/2)/d+2/3*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(
sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used

= {3317, 3872, 3853, 3856, 2720, 2719}

$$\int (a+a\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)\,dx$$
$$=\frac{2a\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{5d}+\frac{2a\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3d}+\frac{6a\sin(c+dx)\sqrt{\sec(c+dx)}}{5d}+\frac{2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}-\frac{6a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}$$

```
[In] Int[(a + a*Cos[c + d*x])*Sec[c + d*x]^(7/2),x]
```

```
[Out] (-6*a*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(5*d
) + (2*a*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(
3*d) + (6*a*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(5*d) + (2*a*Sec[c + d*x]^(3/2
)*Sin[c + d*x])/(3*d) + (2*a*Sec[c + d*x]^(5/2)*Sin[c + d*x])/(5*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

```
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \sec^{\frac{5}{2}}(c+dx)(a+a\sec(c+dx))\,dx \\
&= a\int \sec^{\frac{5}{2}}(c+dx)\,dx + a\int \sec^{\frac{7}{2}}(c+dx)\,dx \\
&= \frac{2a\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{2a\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} \\
&\quad + \frac{1}{3}a\int \sqrt{\sec(c+dx)}\,dx + \frac{1}{5}(3a)\int \sec^{\frac{3}{2}}(c+dx)\,dx \\
&= \frac{6a\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} + \frac{2a\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{2a\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} \\
&\quad - \frac{1}{5}(3a)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + \frac{1}{3}\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{2a\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\
&\quad + \frac{6a\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} \\
&\quad + \frac{2a\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{2a\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} \\
&\quad - \frac{1}{5}\left(3a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= -\frac{6a\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} \\
&\quad + \frac{2a\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\
&\quad + \frac{6a\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} \\
&\quad + \frac{2a\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{2a\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.26 (sec) , antiderivative size = 268, normalized size of antiderivative = 1.77

$$\int (a+a\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)\,dx$$

$$= \frac{a(1+\cos(c+dx))\sec^2\left(\frac{1}{2}(c+dx)\right)\left(i\sqrt{2}e^{-i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(9\left(1+e^{2i(c+dx)}\right)+9(-1+e^{2ic})\sqrt{1+e^{2i(c+}\right.\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])*Sec[c + d*x]^(7/2),x]
```

```
[Out] (a*(1 + Cos[c + d*x])*Sec[(c + d*x)/2]^2*((I*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(
1 + E^((2*I)*(c + d*x)))]*(9*(1 + E^((2*I)*(c + d*x))) + 9*(-1 + E^((2*I)*c
))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I
)*(c + d*x))] + 5*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c +
 d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/E^(I*(c +
d*x)) + (1 - E^((2*I)*c))*Sqrt[Sec[c + d*x]]*(9*Cos[d*x]*Csc[c] + (5 + 3*Se
c[c + d*x])*Tan[c + d*x])))/(15*(d - d*E^((2*I)*c)))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 383 vs. 2(179) = 358.

Time = 9.73 (sec) , antiderivative size = 384, normalized size of antiderivative = 2.54

method	result
default	$-\frac{4\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a\left(-\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}{12\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{1}{2}\right)^2}+\frac{7\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\right.\right.}}{15\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right.}}\right.}{}$
parts	$-\frac{2a\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(24\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,E\left(\cos\right.\right.}{}$

```
[In] int((a+cos(d*x+c)*a)*sec(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -4*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a*(-1/12*cos(1
/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2
*d*x+1/2*c)^2-1/2)^2+7/15*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*
c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Elliptic
F(cos(1/2*d*x+1/2*c),2^(1/2))-1/40*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c
)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^3-3/5*sin(1/2*d*
x+1/2*c)^2*cos(1/2*d*x+1/2*c)/(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2
```

```
*c)^2)^(1/2)-3/10*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^
(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1
/2*d*x+1/2*c),2^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))))/sin(1/2*d*x+
1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 188, normalized size of antiderivative = 1.25

$$\int (a + a\cos(c + dx))\sec^{\frac{7}{2}}(c + dx)\,dx$$

$$= \frac{-5i\sqrt{2}a\cos{(dx+c)}^2\,\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin{(dx+c)})+5i\sqrt{2}a\cos{(dx+c)}^2\,\text{weie}}{}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] 1/15*(-5*I*sqrt(2)*a*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x + c)
 + I*sin(d*x + c)) + 5*I*sqrt(2)*a*cos(d*x + c)^2*weierstrassPInverse(-4, 0
, cos(d*x + c) - I*sin(d*x + c)) - 9*I*sqrt(2)*a*cos(d*x + c)^2*weierstrass
Zeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 9*
I*sqrt(2)*a*cos(d*x + c)^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0
, cos(d*x + c) - I*sin(d*x + c))) + 2*(9*a*cos(d*x + c)^2 + 5*a*cos(d*x + c
) + 3*a)*sin(d*x + c)/sqrt(cos(d*x + c)))/(d*cos(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))\sec^{\frac{7}{2}}(c + dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)**(7/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (a + a\cos(c + dx))\sec^{\frac{7}{2}}(c + dx)\, dx = \int (a\cos(dx + c) + a)\sec(dx + c)^{\frac{7}{2}}\, dx$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^(7/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)*sec(d*x + c)^(7/2), x)
```

Giac [F]

$$\int (a + a\cos(c + dx))\sec^{\frac{7}{2}}(c + dx)\, dx = \int (a\cos(dx + c) + a)\sec(dx + c)^{\frac{7}{2}}\, dx$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^(7/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)*sec(d*x + c)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))\sec^{\frac{7}{2}}(c + dx)\, dx = \int \left(\frac{1}{\cos(c + d\,x)}\right)^{7/2} (a + a\,\cos(c + d\,x))\, dx$$

```
[In] int((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x)),x)
[Out] int((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x)), x)
```

3.292 $\int (a+a\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 123

$$\begin{aligned}\int (a+a\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)\,dx &= -\frac{2a\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} \\ &+\frac{2a\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\ &+\frac{2a\sqrt{\sec(c+dx)}\sin(c+dx)}{d}+\frac{2a\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}\end{aligned}$$

```
[Out] 2/3*a*sec(d*x+c)^(3/2)*sin(d*x+c)/d+2*a*sin(d*x+c)*sec(d*x+c)^(1/2)/d-2*a*(
cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c)
,2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+2/3*a*(cos(1/2*d*x+1/2*c)^2)^
(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(
1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 123, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used

= {3317, 3872, 3853, 3856, 2719, 2720}

$$\int (a+a\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{2a\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3d}+\frac{2a\sin(c+dx)\sqrt{\sec(c+dx)}}{d} + \frac{2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} - \frac{2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}$$

```
[In] Int[(a + a*Cos[c + d*x])*Sec[c + d*x]^(5/2),x]
```

```
[Out] (-2*a*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/d +
(2*a*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3*d)
 + (2*a*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/d + (2*a*Sec[c + d*x]^(3/2)*Sin[c
+ d*x])/(3*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

```
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))\,dx \\
&= a\int \sec^{\frac{3}{2}}(c+dx)\,dx + a\int \sec^{\frac{5}{2}}(c+dx)\,dx \\
&= \frac{2a\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{2a\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} \\
&\quad + \frac{1}{3}a\int \sqrt{\sec(c+dx)}\,dx - a\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx \\
&= \frac{2a\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{2a\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} \\
&\quad + \frac{1}{3}\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&\quad - \left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= -\frac{2a\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\,2\right)\sqrt{\sec(c+dx)}}{d} \\
&\quad + \frac{2a\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\
&\quad + \frac{2a\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{2a\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.86 (sec) , antiderivative size = 255, normalized size of antiderivative = 2.07

$$
\int (a+a\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)\,dx
$$

$$
= \frac{a(1+\cos(c+dx))\sec^2\left(\frac{1}{2}(c+dx)\right)\left(i\sqrt{2}e^{-i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(3\left(1+e^{2i(c+dx)}\right)+3(-1+e^{2ic})\sqrt{1+e^{2i(c+dx}}\right.\right.}{}
$$

```
[In] Integrate[(a + a*Cos[c + d*x])*Sec[c + d*x]^(5/2),x]
```

```
[Out] (a*(1 + Cos[c + d*x])*Sec[(c + d*x)/2]^2*((I*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(
1 + E^((2*I)*(c + d*x)))]*(3*(1 + E^((2*I)*(c + d*x))) + 3*(-1 + E^((2*I)*c
))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I
)*(c + d*x))] + E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d
*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/E^(I*(c + d*
x)) - (-1 + E^((2*I)*c))*Sqrt[Sec[c + d*x]]*(3*Cos[d*x]*Csc[c] + Tan[c + d*
x])))/(3*(d - d*E^((2*I)*c)))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 367 vs. $2(159) = 318$.

Time = 8.44 (sec) , antiderivative size = 368, normalized size of antiderivative = 2.99

method	result
default	$-\frac{2\sqrt{-(-2(\cos^2(\frac{dx}{2}+\frac{c}{2}))+1)(\sin^2(\frac{dx}{2}+\frac{c}{2}))}\, a (12(\sin^4(\frac{dx}{2}+\frac{c}{2}))\cos(\frac{dx}{2}+\frac{c}{2})-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2(\sin^2(\frac{dx}{2}+\frac{c}{2}))-1}\, F(\cos}{}$
parts	$-\frac{2a(-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2(\sin^2(\frac{dx}{2}+\frac{c}{2}))-1}\, F(\cos(\frac{dx}{2}+\frac{c}{2}),\sqrt{2})(\sin^2(\frac{dx}{2}+\frac{c}{2}))-2(\sin^2(\frac{dx}{2}+\frac{c}{2}))\cos(\frac{dx}{2}+\frac{c}{2})+\sqrt{\frac{1}{2}-\frac{\cos(dx-}{2}}}{3\sqrt{-2(\sin^4(\frac{dx}{2}+\frac{c}{2}))+\sin^2(\frac{dx}{2}+\frac{c}{2})}\,(2(\cos^2(\frac{dx}{2}+\frac{c}{2}))-}$

```
[In] int((a+cos(d*x+c)*a)*sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a/(4*sin(1/2
*d*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)/sin(1/2*d*x+1/2*c)^3*(12*sin(1/2*d*
x+1/2*c)^4*cos(1/2*d*x+1/2*c)-2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x
+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)
^2-6*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*Elliptic
E(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2-8*sin(1/2*d*x+1/2*c)^2*c
os(1/2*d*x+1/2*c)+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(
1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(
2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*
sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^2-1)
^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 167, normalized size of antiderivative = 1.36

$$\int (a + a\cos(c + dx))\sec^{\frac{5}{2}}(c + dx)\,dx$$
$$= \frac{-i\sqrt{2}a\cos(dx + c)\,\text{weierstrassPInverse}(-4, 0, \cos(dx + c) + i\sin(dx + c)) + i\sqrt{2}a\cos(dx + c)\,\text{weierstra}}{}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/3*(-I*sqrt(2)*a*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c)) + I*sqrt(2)*a*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x
 + c) - I*sin(d*x + c)) - 3*I*sqrt(2)*a*cos(d*x + c)*weierstrassZeta(-4, 0,
 weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 3*I*sqrt(2)*a
*cos(d*x + c)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c
) - I*sin(d*x + c))) + 2*(3*a*cos(d*x + c) + a)*sin(d*x + c)/sqrt(cos(d*x +
 c)))/(d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))\sec^{\frac{5}{2}}(c + dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (a + a\cos(c + dx))\sec^{\frac{5}{2}}(c + dx)\,dx = \int (a\cos(dx + c) + a)\sec(dx + c)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((a*cos(d*x + c) + a)*sec(d*x + c)^(5/2), x)
```

Giac [F]

$$\int (a + a\cos(c + dx))\sec^{\frac{5}{2}}(c + dx)\,dx = \int (a\cos(dx + c) + a)\sec(dx + c)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)*sec(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))\sec^{\frac{5}{2}}(c + dx)\,dx = \int \left(\frac{1}{\cos(c + d\,x)}\right)^{5/2} (a + a\,\cos(c + d\,x))\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x)),x)
[Out] int((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x)), x)
```

3.293 $\int (a+a\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 97

$$\int (a+a\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)\,dx = -\frac{2a\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a\sqrt{\sec(c+dx)}\sin(c+dx)}{d}$$

```
[Out] 2*a*sin(d*x+c)*sec(d*x+c)^(1/2)/d-2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*
d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c
)^(1/2)/d+2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin
(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {3317, 3872, 3856, 2720, 3853, 2719}

$$\int (a+a\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{2a\sin(c+dx)\sqrt{\sec(c+dx)}}{d} + \frac{2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} - \frac{2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}$$

```
[In] Int[(a + a*Cos[c + d*x])*Sec[c + d*x]^(3/2),x]
```

```
[Out] (-2*a*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/d +
(2*a*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/d + (
2*a*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/d
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rubi steps

$$\text{integral} = \int \sqrt{\sec(c+dx)}(a+a\sec(c+dx))\,dx$$

$$= a\int \sqrt{\sec(c+dx)}\,dx + a\int \sec^{\frac{3}{2}}(c+dx)\,dx$$

$$= \frac{2a\sqrt{\sec(c+dx)}\sin(c+dx)}{d} - a\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + \left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{2a\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a\sqrt{\sec(c+dx)}\sin(c+dx)}{d} - \left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx$$

$$= -\frac{2a\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a\sqrt{\sec(c+dx)}\sin(c+dx)}{d}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.55 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.28

$$\int (a+a\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)\,dx =$$

$$-\frac{2iae^{-i(c+dx)}\left(-1+\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)+e^{i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\,\text{Hype}}{d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])*Sec[c + d*x]^(3/2),x]
```

```
[Out] ((-2*I)*a*(-1 + Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2,
3/4, -E^((2*I)*(c + d*x))] + E^(I*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*
Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))])*Sqrt[Sec[c + d*x]])
/(d*E^(I*(c + d*x)))
```

Maple [A] (verified)

Time = 3.84 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.53

method	result
default	$\frac{2a\left(2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right.}}{\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$
parts	$-\frac{2a\left(-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{-2\left(\sin^4\left(\frac{dx}{2}\right.\right.}}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int((a+cos(d*x+c)*a)*sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2*a*(2*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-(sin(1/2*d*x+1/2*c)^2)^(1/2)
*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-(si
n(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/
2*d*x+1/2*c),2^(1/2)))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/
d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.28

$$\int (a+a\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{-i\sqrt{2}a\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+i\sqrt{2}a\text{weierstrassPInverse}(-4,0,\cos(d}{}$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] (-I*sqrt(2)*a*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + I
*sqrt(2)*a*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - I*sq
rt(2)*a*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c))) + I*sqrt(2)*a*weierstrassZeta(-4, 0, weierstrassPInverse(-4,
 0, cos(d*x + c) - I*sin(d*x + c))) + 2*a*sin(d*x + c)/sqrt(cos(d*x + c)))/
d
```

Sympy [F]

$$\int (a + a\cos(c + dx))\sec^{\frac{3}{2}}(c + dx)\,dx = a\left(\int \cos(c + dx)\sec^{\frac{3}{2}}(c + dx)\,dx + \int \sec^{\frac{3}{2}}(c + dx)\,dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)**(3/2),x)
[Out] a*(Integral(cos(c + d*x)*sec(c + d*x)**(3/2), x) + Integral(sec(c + d*x)**(
3/2), x))
```

Maxima [F]

$$\int (a + a\cos(c + dx))\sec^{\frac{3}{2}}(c + dx)\,dx = \int (a\cos(dx + c) + a)\sec(dx + c)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)*sec(d*x + c)^(3/2), x)
```

Giac [F]

$$\int (a + a\cos(c + dx))\sec^{\frac{3}{2}}(c + dx)\,dx = \int (a\cos(dx + c) + a)\sec(dx + c)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)*sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))\sec^{\frac{3}{2}}(c + dx)\,dx = \int \left(\frac{1}{\cos(c + d\,x)}\right)^{3/2}(a + a\,\cos(c + d\,x))\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x)),x)
[Out] int((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x)), x)
```

3.294 $\int (a+a\cos(c+dx))\sqrt{\sec(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 75

$$\int (a+a\cos(c+dx))\sqrt{\sec(c+dx)}\,dx = \frac{2a\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d}$$

```
[Out] 2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1
/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+2*a*(cos(1/2*d*x+1/2*c)^
2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c
)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {3317, 3872, 3856, 2719, 2720}

$$\int (a+a\cos(c+dx))\sqrt{\sec(c+dx)}\,dx = \frac{2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}$$

```
[In] Int[(a + a*Cos[c + d*x])*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (2*a*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/d + (
2*a*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/d
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \frac{a+a\sec(c+dx)}{\sqrt{\sec(c+dx)}}\,dx \\
&= a\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + a\int \sqrt{\sec(c+dx)}\,dx \\
&= \left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&\quad + \left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= \frac{2a\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} \\
&\quad + \frac{2a\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.59 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.88

$$\int (a+a\cos(c+dx))\sqrt{\sec(c+dx)}\,dx = -\frac{2ia\left(1+e^{2i(c+dx)}-2\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)+2e^{i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\right.}{d\left(1+e^{2i(c+dx)}\right)\sqrt{\sec(c+dx)}}$$

```
[In] Integrate[(a + a*Cos[c + d*x])*Sqrt[Sec[c + d*x]],x]
```

```
[Out] ((-2*I)*a*(1 + E^((2*I)*(c + d*x)) - 2*Sqrt[1 + E^((2*I)*(c + d*x))]*Hyperg
eometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x))] + 2*E^(I*(c + d*x))*Sqrt[
1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*
x))]))/(d*(1 + E^((2*I)*(c + d*x)))*Sqrt[Sec[c + d*x]])
```

Maple [A] (verified)

Time = 3.63 (sec) , antiderivative size = 150, normalized size of antiderivative = 2.00

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\left(F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right.\right.}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$
parts	$-\frac{2a\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}+\frac{2a\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}\right.\right.\right.}}{\sqrt{}}$
risch	$-\frac{i\left(e^{2i(dx+c)}+1\right)a\sqrt{2}\sqrt{\frac{e^{i(dx+c)}}{e^{2i(dx+c)}+1}}\,e^{-i(dx+c)}}{d}-\frac{i\left(\frac{i\sqrt{-i\left(e^{i(dx+c)}+i\right)}\sqrt{2}\sqrt{i\left(e^{i(dx+c)}-i\right)}\sqrt{ie^{i(dx+c)}}\,F\left(\sqrt{-i\left(e^{i(dx+c)}+i\right)},\frac{\sqrt{2}}{2}\right)}{\sqrt{e^{3i(dx+c)}+e^{i(dx+c)}}}-\right.}{}$

```
[In] int((a+cos(d*x+c)*a)*sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a*(sin(1/2*d*x+1
/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+s
in(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-EllipticE
(cos(1/2*d*x+1/2*c),2^(1/2)))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)
^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.43

$$\int (a+a\cos(c+dx))\sqrt{\sec(c+dx)}\,dx = \frac{-i\sqrt{2}a\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+i\sqrt{2}a\text{weierstrassPInverse}(-4,0,\cos(dx}{}$$

[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^(1/2),x, algorithm="fricas")

[Out] (-I*sqrt(2)*a*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + I *sqrt(2)*a*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + I*sq rt(2)*a*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I* sin(d*x + c))) - I*sqrt(2)*a*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/d

Sympy [F]

$$\int (a+a\cos(c+dx))\sqrt{\sec(c+dx)}\,dx = a\left(\int\cos(c+dx)\sqrt{\sec(c+dx)}\,dx + \int\sqrt{\sec(c+dx)}\,dx\right)$$

[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)**(1/2),x)

[Out] a*(Integral(cos(c + d*x)*sqrt(sec(c + d*x)), x) + Integral(sqrt(sec(c + d*x)), x))

Maxima [F]

$$\int (a+a\cos(c+dx))\sqrt{\sec(c+dx)}\,dx = \int (a\cos(dx+c)+a)\sqrt{\sec(dx+c)}\,dx$$

[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^(1/2),x, algorithm="maxima")

[Out] integrate((a*cos(d*x + c) + a)*sqrt(sec(d*x + c)), x)

Giac [F]

$$\int (a + a\cos(c + dx))\sqrt{\sec(c + dx)}\,dx = \int (a\cos(dx + c) + a)\sqrt{\sec(dx + c)}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))*sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)*sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))\sqrt{\sec(c + dx)}\,dx = \int \sqrt{\frac{1}{\cos(c + d\,x)}}\,(a + a\,\cos(c + d\,x))\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x)),x)
[Out] int((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x)), x)
```

3.295 $\int \frac{a+a\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 101

$$\int \frac{a+a\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx = \frac{2a\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2a\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}$$

```
[Out] 2/3*a*sin(d*x+c)/d/sec(d*x+c)^(1/2)+2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/
2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x
+c)^(1/2)/d+2/3*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF
(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {3317, 3872, 3854, 3856, 2720, 2719}

$$\int \frac{a+a\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx = \frac{2a\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}$$

```
[In] Int[(a + a*Cos[c + d*x])/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (2*a*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/d + (
2*a*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3*d)
+ (2*a*Sin[c + d*x])/(3*d*Sqrt[Sec[c + d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \int \frac{a + a\sec(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx\\ &= a\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx + a\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx\end{aligned}$$

$$= \frac{2a\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{1}{3}a\int \sqrt{\sec(c+dx)}\,dx + \left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx$$

$$= \frac{2a\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{1}{3}\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{2a\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2a\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.93 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.39

$$\int \frac{a+a\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx = \frac{ae^{-2ic}(-i\cos(2c)+\sin(2c))\left(6-\frac{12\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)}{\sqrt{1+e^{2i(c+dx)}}}+2\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\right.}{3d\sqrt{\sec(c+dx)}}$$

```
[In] Integrate[(a + a*Cos[c + d*x])/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (a*((-I)*Cos[2*c] + Sin[2*c])*(6 - (12*Hypergeometric2F1[-1/4, 1/2, 3/4, -E
^((2*I)*(c + d*x))])/Sqrt[1 + E^((2*I)*(c + d*x))] + 2*Sqrt[1 + E^((2*I)*(c
 + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]*Sec[c + d*
x] + (2*I)*Sin[c + d*x]))/(3*d*E^((2*I)*c)*Sqrt[Sec[c + d*x]])
```

Maple [A] (verified)

Time = 5.66 (sec) , antiderivative size = 225, normalized size of antiderivative = 2.23

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a\left(4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2}\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)}$
parts	$-\frac{2a\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2}\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int((a+cos(d*x+c)*a)/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a*(4*sin(1/2*d
*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-2*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+(s
in(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1
/2*d*x+1/2*c),2^(1/2))-3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)
^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-2*sin(1/2*d*x+1/2*c)^4
+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^
(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.24

$$\int \frac{a+a\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx$$
$$=\frac{2\,a\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-i\,\sqrt{2}a\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))+i\,\sqrt{2}a\text{we}}{}$$

```
[In] integrate((a+a*cos(d*x+c))/sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/3*(2*a*sqrt(cos(d*x + c))*sin(d*x + c) - I*sqrt(2)*a*weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c)) + I*sqrt(2)*a*weierstrassPInverse(-4,
 0, cos(d*x + c) - I*sin(d*x + c)) + 3*I*sqrt(2)*a*weierstrassZeta(-4, 0, w
eierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*I*sqrt(2)*a*w
eierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x +
 c))))/d
```

Sympy [F]

$$\int \frac{a+a\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx = a\left(\int \frac{\cos{(c+dx)}}{\sqrt{\sec{(c+dx)}}}\,dx + \int \frac{1}{\sqrt{\sec{(c+dx)}}}\,dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))/sec(d*x+c)**(1/2),x)
[Out] a*(Integral(cos(c + d*x)/sqrt(sec(c + d*x)), x) + Integral(1/sqrt(sec(c + d
*x)), x))
```

Maxima [F]

$$\int \frac{a+a\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{a\cos{(dx+c)}+a}{\sqrt{\sec{(dx+c)}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))/sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)/sqrt(sec(d*x + c)), x)
```

Giac [F]

$$\int \frac{a+a\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{a\cos{(dx+c)}+a}{\sqrt{\sec{(dx+c)}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)/sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+a\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{a+a\,\cos{(c+d\,x)}}{\sqrt{\frac{1}{\cos(c+d\,x)}}}\,dx$$

```
[In] int((a + a*cos(c + d*x))/(1/cos(c + d*x))^(1/2),x)
[Out] int((a + a*cos(c + d*x))/(1/cos(c + d*x))^(1/2), x)
```

3.296 $\int \frac{a+a\cos(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 127

$$\int \frac{a+a\cos(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{6a\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{2a\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2a\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{2a\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}$$

```
[Out] 2/5*a*sin(d*x+c)/d/sec(d*x+c)^(3/2)+2/3*a*sin(d*x+c)/d/sec(d*x+c)^(1/2)+6/5
*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/
2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+2/3*a*(cos(1/2*d*x+1/2*c)
^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+
c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 127, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {3317, 3872, 3854, 3856, 2719, 2720}

$$\int \frac{a+a\cos(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{2a\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{2a\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{6a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}$$

```
[In] Int[(a + a*Cos[c + d*x])/Sec[c + d*x]^(3/2),x]
```

```
[Out] (6*a*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(5*d)
 + (2*a*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3
*d) + (2*a*Sin[c + d*x])/(5*d*Sec[c + d*x]^(3/2)) + (2*a*Sin[c + d*x])/(3*d
*Sqrt[Sec[c + d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rubi steps

$$\text{integral} = \int \frac{a + a\sec(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx$$

$$
\begin{aligned}
&= a\int \frac{1}{\sec^{\frac{5}{2}}(c+dx)}\,dx + a\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{2a\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{2a\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{1}{3}a\int \sqrt{\sec(c+dx)}\,dx + \frac{1}{5}(3a)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx \\
&= \frac{2a\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{2a\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} \\
&\quad + \frac{1}{3}\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&\quad + \frac{1}{5}\left(3a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= \frac{6a\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} \\
&\quad + \frac{2a\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\
&\quad + \frac{2a\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{2a\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.74 (sec) , antiderivative size = 224, normalized size of antiderivative = 1.76

$$
\int \frac{a+a\cos(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx = -\frac{iae^{-3i(c+dx)}(1+\cos(c+dx))\left(-3-10e^{i(c+dx)}+33e^{2i(c+dx)}+39e^{4i(c+dx)}+10e^{5i(c+dx)}+3e^{6i(c+dx)}-72\right.}{}
$$

```
[In] Integrate[(a + a*Cos[c + d*x])/Sec[c + d*x]^(3/2),x]
```

```
[Out] ((-1/120*I)*a*(1 + Cos[c + d*x])*(-3 - 10*E^(I*(c + d*x)) + 33*E^((2*I)*(c
+ d*x)) + 39*E^((4*I)*(c + d*x)) + 10*E^((5*I)*(c + d*x)) + 3*E^((6*I)*(c +
 d*x)) - 72*E^((2*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometri
c2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x))] + 40*E^((3*I)*(c + d*x))*Sqrt[1
+ E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x)
)])*Sec[(c + d*x)/2]^2*Sqrt[Sec[c + d*x]])/(d*E^((3*I)*(c + d*x)))
```

Maple [A] (verified)

Time = 6.65 (sec) , antiderivative size = 219, normalized size of antiderivative = 1.72

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\, a\left(24\left(\cos^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-28\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+5\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\right.}{15\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{}}$
parts	$-\frac{2a\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2(\mathrm{s}}\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int((a+cos(d*x+c)*a)/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/15*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a*(24*cos(1/2
*d*x+1/2*c)^7-28*cos(1/2*d*x+1/2*c)^5+5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*co
s(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-9*(sin(1/
2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticE(cos(1/2*d
*x+1/2*c),2^(1/2))+4*cos(1/2*d*x+1/2*c))/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d
*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.14

$$\int \frac{a+a\cos(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx$$
$$=\frac{-5i\sqrt{2}a\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+5i\sqrt{2}a\text{weierstrassPInverse}(-4,0,\cos(}{}$$

```
[In] integrate((a+a*cos(d*x+c))/sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/15*(-5*I*sqrt(2)*a*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x +
c)) + 5*I*sqrt(2)*a*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c
)) + 9*I*sqrt(2)*a*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*
x + c) + I*sin(d*x + c))) - 9*I*sqrt(2)*a*weierstrassZeta(-4, 0, weierstras
sPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(3*a*cos(d*x + c)^2 +
5*a*cos(d*x + c))*sin(d*x + c)/sqrt(cos(d*x + c)))/d
```

Sympy [F]

$$\int \frac{a + a\cos(c + dx)}{\sec^{\frac{3}{2}}(c + dx)}\, dx = a\left(\int \frac{\cos(c + dx)}{\sec^{\frac{3}{2}}(c + dx)}\, dx + \int \frac{1}{\sec^{\frac{3}{2}}(c + dx)}\, dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))/sec(d*x+c)**(3/2),x)
[Out] a*(Integral(cos(c + d*x)/sec(c + d*x)**(3/2), x) + Integral(sec(c + d*x)**(
-3/2), x))
```

Maxima [F]

$$\int \frac{a + a\cos(c + dx)}{\sec^{\frac{3}{2}}(c + dx)}\, dx = \int \frac{a\cos(dx + c) + a}{\sec(dx + c)^{\frac{3}{2}}}\, dx$$

```
[In] integrate((a+a*cos(d*x+c))/sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)/sec(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \frac{a + a\cos(c + dx)}{\sec^{\frac{3}{2}}(c + dx)}\, dx = \int \frac{a\cos(dx + c) + a}{\sec(dx + c)^{\frac{3}{2}}}\, dx$$

```
[In] integrate((a+a*cos(d*x+c))/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)/sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + a\cos(c + dx)}{\sec^{\frac{3}{2}}(c + dx)}\, dx = \int \frac{a + a\,\cos(c + d\,x)}{{\left(\frac{1}{\cos(c+d\,x)}\right)}^{3/2}}\, dx$$

```
[In] int((a + a*cos(c + d*x))/(1/cos(c + d*x))^(3/2),x)
[Out] int((a + a*cos(c + d*x))/(1/cos(c + d*x))^(3/2), x)
```

3.297 $\int \frac{a+a\cos(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 151

$$\int \frac{a+a\cos(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{6a\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{10a\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} + \frac{2a\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{2a\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{10a\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}$$

```
[Out] 2/7*a*sin(d*x+c)/d/sec(d*x+c)^(5/2)+2/5*a*sin(d*x+c)/d/sec(d*x+c)^(3/2)+10/
21*a*sin(d*x+c)/d/sec(d*x+c)^(1/2)+6/5*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1
/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*
x+c)^(1/2)/d+10/21*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {3317, 3872, 3854, 3856, 2720, 2719}

$$\int \frac{a+a\cos(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{2a\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{2a\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{10a\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{10a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{6a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}$$

```
[In] Int[(a + a*Cos[c + d*x])/Sec[c + d*x]^(5/2),x]
```

```
[Out] (6*a*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(5*d)
 + (10*a*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(
21*d) + (2*a*Sin[c + d*x])/(7*d*Sec[c + d*x]^(5/2)) + (2*a*Sin[c + d*x])/(5
*d*Sec[c + d*x]^(3/2)) + (10*a*Sin[c + d*x])/(21*d*Sqrt[Sec[c + d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rubi steps

$$\text{integral} = \int \frac{a + a\sec(c + dx)}{\sec^{\frac{7}{2}}(c + dx)}\,dx$$

$$= a\int \frac{1}{\sec^{\frac{7}{2}}(c+dx)}\,dx + a\int \frac{1}{\sec^{\frac{5}{2}}(c+dx)}\,dx$$

$$= \frac{2a\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{2a\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{1}{5}(3a)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + \frac{1}{7}(5a)\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \frac{2a\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{2a\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{10a\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{1}{21}(5a)\int \sqrt{\sec(c+dx)}\,dx + \frac{1}{5}\left(3a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx$$

$$= \frac{6a\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{2a\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{2a\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{10a\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{1}{21}\left(5a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{6a\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{10a\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} + \frac{2a\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{2a\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{10a\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.60 (sec) , antiderivative size = 198, normalized size of antiderivative = 1.31

$$\int \frac{a+a\cos(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx$$

$$= \frac{ae^{-4i(c+dx)}\sqrt{\sec(c+dx)}(\cos(4(c+dx))+i\sin(4(c+dx)))\left(-504i\cos(c+dx)+504ie^{-i(c+dx)}\sqrt{1+e^{2i(c+d}}\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])/Sec[c + d*x]^(5/2),x]
```

```
[Out] (a*Sqrt[Sec[c + d*x]]*(Cos[4*(c + d*x)] + I*Sin[4*(c + d*x)])*((-504*I)*Cos
[c + d*x] + ((504*I)*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4,
1/2, 3/4, -E^((2*I)*(c + d*x))])/E^(I*(c + d*x)) - (200*I)*Sqrt[1 + E^((2*I
)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))] + 42*S
in[c + d*x] + 130*Sin[2*(c + d*x)] + 42*Sin[3*(c + d*x)] + 15*Sin[4*(c + d*
x)]))/(420*d*E^((4*I)*(c + d*x)))
```

Maple [A] (verified)

Time = 9.77 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.79

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a\left(240\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-528\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+448\left(\sin^4\left(\frac{dx}{2}+\right.\right.\right.}{105\sqrt{-2\left(\sin\right.}}$
parts	$-\frac{2a\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right.}{5\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}\right.\right.}}$

```
[In] int((a+cos(d*x+c)*a)/sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/105*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a*(240*cos(1
/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8-528*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c
)^6+448*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-122*sin(1/2*d*x+1/2*c)^2*co
s(1/2*d*x+1/2*c)+25*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)
^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-63*(sin(1/2*d*x+1/2*c)^2)^(1/2
)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(
-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*c
os(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.03

$$\int \frac{a+a\cos(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx$$

$$= \frac{-25i\sqrt{2}a\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+25i\sqrt{2}a\text{weierstrassPInverse}(-4,0,\text{c}}{}$$

```
[In] integrate((a+a*cos(d*x+c))/sec(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/105*(-25*I*sqrt(2)*a*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x
+ c)) + 25*I*sqrt(2)*a*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x
+ c)) + 63*I*sqrt(2)*a*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, co
s(d*x + c) + I*sin(d*x + c))) - 63*I*sqrt(2)*a*weierstrassZeta(-4, 0, weier
strassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(15*a*cos(d*x + c
)^3 + 21*a*cos(d*x + c)^2 + 25*a*cos(d*x + c))*sin(d*x + c)/sqrt(cos(d*x +
c)))/d
```

Sympy [F]

$$\int \frac{a+a\cos(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx = a\left(\int \frac{\cos\left(c+dx\right)}{\sec^{\frac{5}{2}}\left(c+dx\right)}\,dx + \int \frac{1}{\sec^{\frac{5}{2}}\left(c+dx\right)}\,dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))/sec(d*x+c)**(5/2),x)
[Out] a*(Integral(cos(c + d*x)/sec(c + d*x)**(5/2), x) + Integral(sec(c + d*x)**(
-5/2), x))
```

Maxima [F]

$$\int \frac{a+a\cos(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{a\cos\left(dx+c\right)+a}{\sec\left(dx+c\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))/sec(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)/sec(d*x + c)^(5/2), x)
```

Giac [F]

$$\int \frac{a+a\cos(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{a\cos\left(dx+c\right)+a}{\sec\left(dx+c\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))/sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)/sec(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+a\cos(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{a+a\,\cos\left(c+d\,x\right)}{{\left(\frac{1}{\cos\left(c+d\,x\right)}\right)}^{5/2}}\,dx$$

```
[In] int((a + a*cos(c + d*x))/(1/cos(c + d*x))^(5/2),x)
[Out] int((a + a*cos(c + d*x))/(1/cos(c + d*x))^(5/2), x)
```

3.298 $\int (a + a\cos(c + dx))^2 \sec^{\frac{7}{2}}(c + dx)\, dx$

Optimal result

Integrand size = 23, antiderivative size = 161

$$\begin{aligned}\int (a + a\cos(c + dx))^2 \sec^{\frac{7}{2}}(c + dx)\, dx &= -\frac{16a^2\sqrt{\cos(c + dx)}E\left(\frac{1}{2}(c + dx)\middle|2\right)\sqrt{\sec(c + dx)}}{5d} \\ &+ \frac{4a^2\sqrt{\cos(c + dx)}\,\text{EllipticF}\left(\frac{1}{2}(c + dx), 2\right)\sqrt{\sec(c + dx)}}{3d} \\ &+ \frac{16a^2\sqrt{\sec(c + dx)}\sin(c + dx)}{5d} \\ &+ \frac{4a^2\sec^{\frac{3}{2}}(c + dx)\sin(c + dx)}{3d} + \frac{2a^2\sec^{\frac{5}{2}}(c + dx)\sin(c + dx)}{5d}\end{aligned}$$

```
[Out] 4/3*a^2*sec(d*x+c)^(3/2)*sin(d*x+c)/d+2/5*a^2*sec(d*x+c)^(5/2)*sin(d*x+c)/d
+16/5*a^2*sin(d*x+c)*sec(d*x+c)^(1/2)/d-16/5*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/
2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2
)*sec(d*x+c)^(1/2)/d+4/3*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c
)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used

$= \{3317, 3873, 3853, 3856, 2720, 4131, 2719\}$

$$\int (a+a\cos(c+dx))^2\sec^{\frac{7}{2}}(c+dx)\,dx = \frac{2a^2\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{5d}+\frac{4a^2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3d} + \frac{16a^2\sin(c+dx)\sqrt{\sec(c+dx)}}{5d} + \frac{4a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} - \frac{16a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}$$

```
[In] Int[(a + a*Cos[c + d*x])^2*Sec[c + d*x]^(7/2),x]
```

```
[Out] (-16*a^2*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(
5*d) + (4*a^2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x
]])/(3*d) + (16*a^2*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(5*d) + (4*a^2*Sec[c +
 d*x]^(3/2)*Sin[c + d*x])/(3*d) + (2*a^2*Sec[c + d*x]^(5/2)*Sin[c + d*x])/(
5*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3873

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^2, x_Symbol] :> Dist[2*a*(b/d), Int[(d*Csc[e + f*x])^(n + 1), x], x]
+ Int[(d*Csc[e + f*x])^n*(a^2 + b^2*Csc[e + f*x]^2), x] /; FreeQ[{a, b, d,
e, f, n}, x]
```

Rule 4131

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[(-C)*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*(m + 1)
)), x] + Dist[(C*m + A*(m + 1))/(m + 1), Int[(b*Csc[e + f*x])^m, x], x] /;
FreeQ[{b, e, f, A, C, m}, x] && NeQ[C*m + A*(m + 1), 0] &&  !LeQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))^2\,dx \\
&= \left(2a^2\right)\int \sec^{\frac{5}{2}}(c+dx)\,dx + \int \sec^{\frac{3}{2}}(c+dx)\left(a^2+a^2\sec^2(c+dx)\right)\,dx \\
&= \frac{4a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{2a^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} \\
&\quad + \frac{1}{3}\left(2a^2\right)\int \sqrt{\sec(c+dx)}\,dx + \frac{1}{5}\left(8a^2\right)\int \sec^{\frac{3}{2}}(c+dx)\,dx \\
&= \frac{16a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} + \frac{4a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} \\
&\quad + \frac{2a^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} - \frac{1}{5}\left(8a^2\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx \\
&\quad + \frac{1}{3}\left(2a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{4a^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\
&\quad + \frac{16a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} \\
&\quad + \frac{4a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{2a^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} \\
&\quad - \frac{1}{5}\left(8a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx
\end{aligned}$$

$$= -\frac{16a^2\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{4a^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{16a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} + \frac{4a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{2a^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.47 (sec) , antiderivative size = 261, normalized size of antiderivative = 1.62

$$\int (a+a\cos(c+dx))^2\sec^{\frac{7}{2}}(c+dx)\,dx$$

$$= \frac{a^2(1+\cos(c+dx))^2\sec^4\left(\frac{1}{2}(c+dx)\right)\left(-\frac{2i\sqrt{2}e^{-i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(12\left(1+e^{2i(c+dx)}\right)+12\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeom}\right.}{}\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^2*Sec[c + d*x]^(7/2),x]
```

```
[Out] (a^2*(1 + Cos[c + d*x])^2*Sec[(c + d*x)/2]^4*(((-2*I)*Sqrt[2]*Sqrt[E^(I*(c
+ d*x))/(1 + E^((2*I)*(c + d*x)))]*(12*(1 + E^((2*I)*(c + d*x))) + 12*(-1 +
 E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/
4, -E^((2*I)*(c + d*x))] + 5*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^
((2*I)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))
/(E^(I*(c + d*x))*(-1 + E^((2*I)*c))) + Sqrt[Sec[c + d*x]]*(24*Cos[d*x]*Csc
[c] + (10 + 3*Sec[c + d*x])*Tan[c + d*x])))/(30*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 385 vs. 2(189) = 378.

Time = 20.62 (sec) , antiderivative size = 386, normalized size of antiderivative = 2.40

method	result
default	$-\frac{8\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^2\left(-\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}{12\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{1}{2}\right)^2}+\frac{17\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}\right.\right.}}{30\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right.}}\right.}{}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*a)^2*sec(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -8*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^2*(-1/12*cos
(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1
/2*d*x+1/2*c)^2-1/2)^2+17/30*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1
/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellip
ticF(cos(1/2*d*x+1/2*c),2^(1/2))-4/5*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c
)/(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)-2/5*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^
4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-Ellipt
icE(cos(1/2*d*x+1/2*c),2^(1/2)))-1/80*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/
2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^3)/sin(1/2*d*
x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.25

$$\int (a+a\cos(c+dx))^2\sec^{\frac{7}{2}}(c+dx)\,dx =$$

$$-\frac{2\left(5i\sqrt{2}a^2\cos\left(dx+c\right)^2\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\sin\left(dx+c\right))-5i\sqrt{2}a^2\cos\left(dx+c\right)\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] -2/15*(5*I*sqrt(2)*a^2*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x +
c) + I*sin(d*x + c)) - 5*I*sqrt(2)*a^2*cos(d*x + c)^2*weierstrassPInverse(-
4, 0, cos(d*x + c) - I*sin(d*x + c)) + 12*I*sqrt(2)*a^2*cos(d*x + c)^2*weie
rstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)
)) - 12*I*sqrt(2)*a^2*cos(d*x + c)^2*weierstrassZeta(-4, 0, weierstrassPInv
erse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (24*a^2*cos(d*x + c)^2 + 10*a
^2*cos(d*x + c) + 3*a^2)*sin(d*x + c)/sqrt(cos(d*x + c)))/(d*cos(d*x + c)^2
)
```

Sympy [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^2 \sec^{\frac{7}{2}}(c + dx)\, dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**2*sec(d*x+c)**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a + a\cos(c + dx))^2 \sec^{\frac{7}{2}}(c + dx)\, dx = \int (a\cos(dx + c) + a)^2 \sec(dx + c)^{\frac{7}{2}}\, dx$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^(7/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^2*sec(d*x + c)^(7/2), x)
```

Giac [F]

$$\int (a + a\cos(c + dx))^2 \sec^{\frac{7}{2}}(c + dx)\, dx = \int (a\cos(dx + c) + a)^2 \sec(dx + c)^{\frac{7}{2}}\, dx$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^(7/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^2*sec(d*x + c)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^2 \sec^{\frac{7}{2}}(c + dx)\, dx = \int \left(\frac{1}{\cos(c + d\,x)}\right)^{7/2} (a + a\,\cos(c + d\,x))^2\, dx$$

```
[In] int((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))^2,x)
[Out] int((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))^2, x)
```

3.299 $\int (a+a\cos(c+dx))^2 \sec^{\frac{5}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 131

$$\int (a+a\cos(c+dx))^2 \sec^{\frac{5}{2}}(c+dx)\,dx = -\frac{4a^2\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{8a^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{4a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{2a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}$$

```
[Out] 2/3*a^2*sec(d*x+c)^(3/2)*sin(d*x+c)/d+4*a^2*sin(d*x+c)*sec(d*x+c)^(1/2)/d-4
*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+
1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+8/3*a^2*(cos(1/2*d*x+1/
2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(
d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used

$= \{3317, 3873, 3853, 3856, 2719, 4131, 2720\}$

$$\int (a+a\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{2a^2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3d}+\frac{4a^2\sin(c+dx)\sqrt{\sec(c+dx)}}{d} + \frac{8a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} - \frac{4a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}$$

```
[In] Int[(a + a*Cos[c + d*x])^2*Sec[c + d*x]^(5/2),x]
```

```
[Out] (-4*a^2*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/d
+ (8*a^2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(
3*d) + (4*a^2*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/d + (2*a^2*Sec[c + d*x]^(3/2
)*Sin[c + d*x])/(3*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

```
EqQ[n^2, 1/4]
```

Rule 3873

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^2, x_Symbol] :> Dist[2*a*(b/d), Int[(d*Csc[e + f*x])^(n + 1), x], x]
+ Int[(d*Csc[e + f*x])^n*(a^2 + b^2*Csc[e + f*x]^2), x] /; FreeQ[{a, b, d,
e, f, n}, x]
```

Rule 4131

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[(-C)*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*(m + 1)
)), x] + Dist[(C*m + A*(m + 1))/(m + 1), Int[(b*Csc[e + f*x])^m, x], x] /;
FreeQ[{b, e, f, A, C, m}, x] && NeQ[C*m + A*(m + 1), 0] && !LeQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \sqrt{\sec(c+dx)}(a+a\sec(c+dx))^2\,dx \\
&= \left(2a^2\right)\int \sec^{\frac{3}{2}}(c+dx)\,dx + \int \sqrt{\sec(c+dx)}\left(a^2+a^2\sec^2(c+dx)\right)\,dx \\
&= \frac{4a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{2a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} \\
&\quad + \frac{1}{3}\left(4a^2\right)\int \sqrt{\sec(c+dx)}\,dx - \left(2a^2\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx \\
&= \frac{4a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{2a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} \\
&\quad + \frac{1}{3}\left(4a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&\quad - \left(2a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= -\frac{4a^2\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} \\
&\quad + \frac{8a^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\
&\quad + \frac{4a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{2a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.06 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.91

$$\int (a + a\cos(c + dx))^2 \sec^{\frac{5}{2}}(c + dx)\, dx$$

$$= \frac{a^2(1+\cos(c+dx))^2 \sec^4\left(\frac{1}{2}(c+dx)\right)\left(-\frac{2i\sqrt{2}e^{-i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(3\left(1+e^{2i(c+dx)}\right)+3\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\text{ Hypergeomet}\right.}{}\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^2*Sec[c + d*x]^(5/2),x]
```

```
[Out] (a^2*(1 + Cos[c + d*x])^2*Sec[(c + d*x)/2]^4*(((-2*I)*Sqrt[2]*Sqrt[E^(I*(c
+ d*x))/(1 + E^((2*I)*(c + d*x)))]*(3*(1 + E^((2*I)*(c + d*x))) + 3*(-1 + E
^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4,
 -E^((2*I)*(c + d*x))] + 2*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^((
2*I)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/(
E^(I*(c + d*x))*(-1 + E^((2*I)*c))) + Sqrt[Sec[c + d*x]]*(6*Cos[d*x]*Csc[c]
 + Tan[c + d*x])))/(6*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 370 vs. 2(167) = 334.

Time = 19.14 (sec) , antiderivative size = 371, normalized size of antiderivative = 2.83

method	result
default	$-\frac{4\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\, a^2\left(12\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-6\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\, E\left(\cos\right.\right.}{}$
parts	$-\frac{2a^2\left(-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+}{2}}\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\right.}$

```
[In] int((a+cos(d*x+c)*a)^2*sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -4/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^2/(4*sin(1
/2*d*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)/sin(1/2*d*x+1/2*c)^3*(12*sin(1/2*
d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-6*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2
*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*
c)^2-4*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Ellipt
icF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2-7*sin(1/2*d*x+1/2*c)^2
*cos(1/2*d*x+1/2*c)+3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-
```

```
1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+2*(sin(1/2*d*x+1/2*c)^2)^(1/
2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))*
(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^
2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 179, normalized size of antiderivative = 1.37

$$\int (a+a\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)\,dx =$$
$$-\frac{2\left(2i\sqrt{2}a^2\cos\left(dx+c\right)\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))-2i\sqrt{2}a^2\cos\left(dx+c\right)\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] -2/3*(2*I*sqrt(2)*a^2*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c)
+ I*sin(d*x + c)) - 2*I*sqrt(2)*a^2*cos(d*x + c)*weierstrassPInverse(-4, 0,
 cos(d*x + c) - I*sin(d*x + c)) + 3*I*sqrt(2)*a^2*cos(d*x + c)*weierstrassZ
eta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*I
*sqrt(2)*a^2*cos(d*x + c)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0,
 cos(d*x + c) - I*sin(d*x + c))) - (6*a^2*cos(d*x + c) + a^2)*sin(d*x + c)/
sqrt(cos(d*x + c)))/(d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**2*sec(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (a + a\cos(c+dx))^2 \sec^{\frac{5}{2}}(c+dx)\,dx = \int (a\cos(dx+c) + a)^2 \sec(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^2*sec(d*x + c)^(5/2), x)
```

Giac [F]

$$\int (a + a\cos(c+dx))^2 \sec^{\frac{5}{2}}(c+dx)\,dx = \int (a\cos(dx+c) + a)^2 \sec(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^2*sec(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a + a\cos(c+dx))^2 \sec^{\frac{5}{2}}(c+dx)\,dx = \int \left(\frac{1}{\cos(c+d\,x)}\right)^{5/2} (a + a\,\cos(c+d\,x))^2\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^2,x)
[Out] int((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^2, x)
```

3.300 $\int (a+a\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 64

$$\int (a+a\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{4a^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d}+\frac{2a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{d}$$

```
[Out] 2*a^2*sin(d*x+c)*sec(d*x+c)^(1/2)/d+4*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(
1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d
*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 64, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {3317, 3873, 3856, 2720, 4128}

$$\int (a+a\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{2a^2\sin(c+dx)\sqrt{\sec(c+dx)}}{d}+\frac{4a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}$$

```
[In] Int[(a + a*Cos[c + d*x])^2*Sec[c + d*x]^(3/2),x]
```

```
[Out] (4*a^2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/d +
 (2*a^2*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/d
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3873

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^2, x_Symbol] :> Dist[2*a*(b/d), Int[(d*Csc[e + f*x])^(n + 1), x], x]
+ Int[(d*Csc[e + f*x])^n*(a^2 + b^2*Csc[e + f*x]^2), x] /; FreeQ[{a, b, d,
e, f, n}, x]
```

Rule 4128

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[A*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*m)), x] /;
 FreeQ[{b, e, f, A, C, m}, x] && EqQ[C*m + A*(m + 1), 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \frac{(a+a\sec(c+dx))^2}{\sqrt{\sec(c+dx)}}\,dx\\
&= \left(2a^2\right)\int \sqrt{\sec(c+dx)}\,dx+\int \frac{a^2+a^2\sec^2(c+dx)}{\sqrt{\sec(c+dx)}}\,dx\\
&= \frac{2a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{d}+\left(2a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{4a^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d}+\frac{2a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.71 (sec) , antiderivative size = 48, normalized size of antiderivative = 0.75

$$\int (a+a\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)\,dx$$
$$=\frac{2a^2\sqrt{\sec(c+dx)}\left(2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\sin(c+dx)\right)}{d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^2*Sec[c + d*x]^(3/2),x]
```

```
[Out] (2*a^2*Sqrt[Sec[c + d*x]]*(2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2] +
 Sin[c + d*x]))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 184 vs. 2(84) = 168.

Time = 5.01 (sec) , antiderivative size = 185, normalized size of antiderivative = 2.89

method	result
default	$-\frac{4a^2(-\cos(\frac{dx}{2}+\frac{c}{2})\sqrt{-2(\sin^4(\frac{dx}{2}+\frac{c}{2}))+\sin^2(\frac{dx}{2}+\frac{c}{2})}\,(\sin^2(\frac{dx}{2}+\frac{c}{2}))+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2(\sin^2(\frac{dx}{2}+\frac{c}{2}))-1}\,F(\cos(\frac{dx}{2}+\frac{c}{2})}{\sqrt{-2(\sin^4(\frac{dx}{2}+\frac{c}{2}))+\sin^2(\frac{dx}{2}+\frac{c}{2})}\,\sin(\frac{dx}{2}+\frac{c}{2})\sqrt{2(\cos^2(\frac{dx}{2}+\frac{c}{2}))-1}\,d}$
parts	$-\frac{2a^2(-2\cos(\frac{dx}{2}+\frac{c}{2})\sqrt{-2(\sin^4(\frac{dx}{2}+\frac{c}{2}))+\sin^2(\frac{dx}{2}+\frac{c}{2})}\,(\sin^2(\frac{dx}{2}+\frac{c}{2}))+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2(\sin^2(\frac{dx}{2}+\frac{c}{2}))-1}\,\sqrt{-2(\sin^4(\frac{dx}{2}}{\sqrt{-2(\sin^4(\frac{dx}{2}+\frac{c}{2}))+\sin^2(\frac{dx}{2}+\frac{c}{2})}\,\sin(\frac{dx}{2}+\frac{c}{2})\sqrt{2(\cos^2(\frac{dx}{2}+\frac{c}{2}))-1}\,d}$

```
[In] int((a+cos(d*x+c)*a)^2*sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -4*a^2*(-cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^
(1/2)*sin(1/2*d*x+1/2*c)^2+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*
c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*(-2*sin(1/2*d*x+1/2*c)^
4+sin(1/2*d*x+1/2*c)^2)^(1/2))/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.08 (sec) , antiderivative size = 77, normalized size of antiderivative = 1.20

$$\int (a+a\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)\,dx = -\frac{2\left(i\sqrt{2}a^2\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))-i\sqrt{2}a^2\text{weierstrassPInverse}(-4,0,\text{co}\right.}{d}$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^(3/2),x, algorithm="fricas")
[Out] -2*(I*sqrt(2)*a^2*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))
 - I*sqrt(2)*a^2*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))
- a^2*sin(d*x + c)/sqrt(cos(d*x + c)))/d
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**2*sec(d*x+c)**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+a\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)\,dx = \int (a\cos\left(dx+c\right)+a)^2\sec\left(dx+c\right)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^2*sec(d*x + c)^(3/2), x)
```

Giac [F]

$$\int (a+a\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)\,dx=\int (a\cos(dx+c)+a)^2\sec(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^2*sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)\,dx=\int \left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}(a+a\,\cos(c+d\,x))^2\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^2,x)
[Out] int((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^2, x)
```

3.301 $\int (a+a\cos(c+dx))^2\sqrt{\sec(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 107

$$\int (a+a\cos(c+dx))^2\sqrt{\sec(c+dx)}\,dx = \frac{4a^2\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{8a^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2a^2\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}$$

```
[Out] 2/3*a^2*sin(d*x+c)/d/sec(d*x+c)^(1/2)+4*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/co
s(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec
(d*x+c)^(1/2)/d+8/3*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ell
ipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {3317, 3873, 3856, 2719, 4130, 2720}

$$\int (a+a\cos(c+dx))^2\sqrt{\sec(c+dx)}\,dx = \frac{2a^2\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{8a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{4a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}$$

```
[In] Int[(a + a*Cos[c + d*x])^2*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (4*a^2*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/d +
 (8*a^2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3
*d) + (2*a^2*Sin[c + d*x])/(3*d*Sqrt[Sec[c + d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3873

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^2, x_Symbol] :> Dist[2*a*(b/d), Int[(d*Csc[e + f*x])^(n + 1), x], x]
+ Int[(d*Csc[e + f*x])^n*(a^2 + b^2*Csc[e + f*x]^2), x] /; FreeQ[{a, b, d,
e, f, n}, x]
```

Rule 4130

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[A*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*m)), x] +
Dist[(C*m + A*(m + 1))/(b^2*m), Int[(b*Csc[e + f*x])^(m + 2), x], x] /; Fre
eQ[{b, e, f, A, C}, x] && NeQ[C*m + A*(m + 1), 0] && LeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \int \frac{(a+a\sec(c+dx))^2}{\sec^{\frac{3}{2}}(c+dx)}\,dx\\ &= (2a^2)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx+\int \frac{a^2+a^2\sec^2(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx\end{aligned}$$

$$= \frac{2a^2\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{1}{3}(4a^2)\int\sqrt{\sec(c+dx)}\,dx + \left(2a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx$$

$$= \frac{4a^2\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a^2\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{1}{3}\left(4a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{4a^2\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{8a^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2a^2\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.19 (sec) , antiderivative size = 127, normalized size of antiderivative = 1.19

$$\int(a+a\cos(c+dx))^2\sqrt{\sec(c+dx)}\,dx = \frac{a^2\left(\frac{24i\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)}{\sqrt{1+e^{2i(c+dx)}}} + 2\left(-6i-4i\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2i(c+dx)}\right)\right.\right.}{3d\sqrt{\sec(c+dx)}}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^2*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (a^2*(((24*I)*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x))])/Sqrt
[1 + E^((2*I)*(c + d*x))] + 2*(-6*I - (4*I)*Sqrt[1 + E^((2*I)*(c + d*x))]*H
ypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]*Sec[c + d*x] + Sin[c
+ d*x])))/(3*d*Sqrt[Sec[c + d*x]])
```

Maple [A] (verified)

Time = 5.63 (sec) , antiderivative size = 228, normalized size of antiderivative = 2.13

method	result
default	$-\frac{4\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^2\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{\cdots}\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right.}$
parts	$-\frac{2a^2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}-\frac{2a^2\sqrt{\left(2\left(\cos^2\left(\frac{d}{}\right.\right.\right.}}{}$

```
[In] int((a+cos(d*x+c)*a)^2*sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -4/3*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^2*(2*sin(1/2
*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+2*
(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos
(1/2*d*x+1/2*c),2^(1/2))-3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*
c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-2*sin(1/2*d*x+1/2*c)
^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1
)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 134, normalized size of antiderivative = 1.25

$$\int (a+a\cos(c+dx))^2\sqrt{\sec(c+dx)}\,dx$$
$$=\frac{2\left(a^2\sqrt{\cos(dx+c)}\sin(dx+c)-2i\sqrt{2}a^2\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+2i\sqrt{\cdots}\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] 2/3*(a^2*sqrt(cos(d*x + c))*sin(d*x + c) - 2*I*sqrt(2)*a^2*weierstrassPInve
rse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 2*I*sqrt(2)*a^2*weierstrassPInv
erse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 3*I*sqrt(2)*a^2*weierstrassZet
a(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*I*s
qrt(2)*a^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) -
 I*sin(d*x + c))))/d
```

Sympy [F]

$$\int (a + a\cos(c + dx))^2 \sqrt{\sec(c + dx)}\, dx = a^2 \left(\int 2\cos(c + dx) \sqrt{\sec(c + dx)}\, dx + \int \cos^2(c + dx) \sqrt{\sec(c + dx)}\, dx + \int \sqrt{\sec(c + dx)}\, dx \right)$$

```
[In] integrate((a+a*cos(d*x+c))**2*sec(d*x+c)**(1/2),x)
[Out] a**2*(Integral(2*cos(c + d*x)*sqrt(sec(c + d*x)), x) + Integral(cos(c + d*x
)**2*sqrt(sec(c + d*x)), x) + Integral(sqrt(sec(c + d*x)), x))
```

Maxima [F]

$$\int (a + a\cos(c + dx))^2 \sqrt{\sec(c + dx)}\, dx = \int (a\cos(dx + c) + a)^2 \sqrt{\sec(dx + c)}\, dx$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^2*sqrt(sec(d*x + c)), x)
```

Giac [F]

$$\int (a + a\cos(c + dx))^2 \sqrt{\sec(c + dx)}\, dx = \int (a\cos(dx + c) + a)^2 \sqrt{\sec(dx + c)}\, dx$$

```
[In] integrate((a+a*cos(d*x+c))^2*sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^2*sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^2 \sqrt{\sec(c + dx)}\, dx = \int \sqrt{\frac{1}{\cos(c + d\,x)}}\, (a + a\,\cos(c + d\,x))^2\, dx$$

```
[In] int((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^2,x)
[Out] int((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^2, x)
```

3.302 $\int \frac{(a+a\cos(c+dx))^2}{\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 135

$$\int \frac{(a+a\cos(c+dx))^2}{\sqrt{\sec(c+dx)}}\,dx = \frac{16a^2\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{4a^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2a^2\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{4a^2\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}$$

```
[Out] 2/5*a^2*sin(d*x+c)/d/sec(d*x+c)^(3/2)+4/3*a^2*sin(d*x+c)/d/sec(d*x+c)^(1/2)
+16/5*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2
*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+4/3*a^2*(cos(1/2*d
*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))
*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {3317, 3873, 3854, 3856, 2720, 4130, 2719}

$$\int \frac{(a+a\cos(c+dx))^2}{\sqrt{\sec(c+dx)}}\,dx = \frac{2a^2\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{4a^2\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{4a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{16a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}$$

```
[In] Int[(a + a*Cos[c + d*x])^2/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (16*a^2*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(5
*d) + (4*a^2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]
])/(3*d) + (2*a^2*Sin[c + d*x])/(5*d*Sec[c + d*x]^(3/2)) + (4*a^2*Sin[c + d
*x])/(3*d*Sqrt[Sec[c + d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3873

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^2, x_Symbol] :> Dist[2*a*(b/d), Int[(d*Csc[e + f*x])^(n + 1), x], x]
+ Int[(d*Csc[e + f*x])^n*(a^2 + b^2*Csc[e + f*x]^2), x] /; FreeQ[{a, b, d,
e, f, n}, x]
```

Rule 4130

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[A*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*m)), x] +
```

```
Dist[(C*m + A*(m + 1))/(b^2*m), Int[(b*Csc[e + f*x])^(m + 2), x], x] /; Fre
eQ[{b, e, f, A, C}, x] && NeQ[C*m + A*(m + 1), 0] && LeQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \frac{(a+a\sec(c+dx))^2}{\sec^{\frac{5}{2}}(c+dx)}\,dx \\
&= (2a^2)\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx + \int \frac{a^2+a^2\sec^2(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{2a^2\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{4a^2\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} \\
&\quad + \frac{1}{3}(2a^2)\int \sqrt{\sec(c+dx)}\,dx + \frac{1}{5}(8a^2)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx \\
&= \frac{2a^2\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{4a^2\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} \\
&\quad + \frac{1}{3}\left(2a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&\quad + \frac{1}{5}\left(8a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= \frac{16a^2\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} \\
&\quad + \frac{4a^2\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\
&\quad + \frac{2a^2\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{4a^2\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.46 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.01

$$\int \frac{(a+a\cos(c+dx))^2}{\sqrt{\sec(c+dx)}}\,dx = \frac{a^2\left(-96i+\frac{192i\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)}{\sqrt{1+e^{2i(c+dx)}}} - 40i\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2i(c+dx)}\right.\right.}{30d\sqrt{\sec(c+dx)}}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^2/Sqrt[Sec[c + d*x]],x]
```

[Out] (a^2*(-96*I + ((192*I)*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x
))])/Sqrt[1 + E^((2*I)*(c + d*x))] - (40*I)*Sqrt[1 + E^((2*I)*(c + d*x))]*H
ypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]*Sec[c + d*x] + 40*Sin
[c + d*x] + 6*Sin[2*(c + d*x)]))/(30*d*Sqrt[Sec[c + d*x]])

Maple [A] (verified)

Time = 8.36 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.85

method	result
default	$-\frac{4\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^2\left(-12\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+32\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-13\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.}{15\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\right.}}$
parts	$\frac{2a^2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}-\frac{2a^2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.}{}$

[In] int((a+cos(d*x+c)*a)^2/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)

[Out] -4/15*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^2*(-12*cos(
1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+32*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2
*c)-13*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+5*(sin(1/2*d*x+1/2*c)^2)^(1/
2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1
2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(c
os(1/2*d*x+1/2*c),2^(1/2)))/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^
(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.16

$$\int \frac{(a+a\cos(c+dx))^2}{\sqrt{\sec(c+dx)}}\,dx = -\frac{2\left(5i\sqrt{2}a^2\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))-5i\sqrt{2}a^2\text{weierstrassPInverse}(-4,0\right.}{}$$

[In] integrate((a+a*cos(d*x+c))^2/sec(d*x+c)^(1/2),x, algorithm="fricas")

[Out] -2/15*(5*I*sqrt(2)*a^2*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x
+ c)) - 5*I*sqrt(2)*a^2*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x
 + c)) - 12*I*sqrt(2)*a^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0,
 cos(d*x + c) + I*sin(d*x + c))) + 12*I*sqrt(2)*a^2*weierstrassZeta(-4, 0,

```
weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (3*a^2*cos(d*x
 + c)^2 + 10*a^2*cos(d*x + c))*sin(d*x + c)/sqrt(cos(d*x + c)))/d
```

Sympy [F]

$$\int \frac{(a + a\cos(c + dx))^2}{\sqrt{\sec(c + dx)}}\,dx = a^2\left(\int \frac{2\cos(c + dx)}{\sqrt{\sec(c + dx)}}\,dx + \int \frac{\cos^2(c + dx)}{\sqrt{\sec(c + dx)}}\,dx + \int \frac{1}{\sqrt{\sec(c + dx)}}\,dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))**2/sec(d*x+c)**(1/2),x)
[Out] a**2*(Integral(2*cos(c + d*x)/sqrt(sec(c + d*x)), x) + Integral(cos(c + d*x
)**2/sqrt(sec(c + d*x)), x) + Integral(1/sqrt(sec(c + d*x)), x))
```

Maxima [F]

$$\int \frac{(a + a\cos(c + dx))^2}{\sqrt{\sec(c + dx)}}\,dx = \int \frac{(a\cos(dx + c) + a)^2}{\sqrt{\sec(dx + c)}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^2/sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^2/sqrt(sec(d*x + c)), x)
```

Giac [F]

$$\int \frac{(a + a\cos(c + dx))^2}{\sqrt{\sec(c + dx)}}\,dx = \int \frac{(a\cos(dx + c) + a)^2}{\sqrt{\sec(dx + c)}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^2/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^2/sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^2}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(a+a\,\cos(c+d\,x))^2}{\sqrt{\frac{1}{\cos(c+d\,x)}}}\,dx$$

```
[In] int((a + a*cos(c + d*x))^2/(1/cos(c + d*x))^(1/2),x)
[Out] int((a + a*cos(c + d*x))^2/(1/cos(c + d*x))^(1/2), x)
```

3.303 $\int \frac{(a+a\cos(c+dx))^2}{\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 161

$$\int \frac{(a+a\cos(c+dx))^2}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{12a^2\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{8a^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{7d} + \frac{2a^2\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{4a^2\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{8a^2\sin(c+dx)}{7d\sqrt{\sec(c+dx)}}$$

```
[Out] 2/7*a^2*sin(d*x+c)/d/sec(d*x+c)^(5/2)+4/5*a^2*sin(d*x+c)/d/sec(d*x+c)^(3/2)
+8/7*a^2*sin(d*x+c)/d/sec(d*x+c)^(1/2)+12/5*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2
)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)
*sec(d*x+c)^(1/2)/d+8/7*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)
*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {3317, 3873, 3854, 3856, 2719, 4130, 2720}

$$\int \frac{(a+a\cos(c+dx))^2}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{4a^2\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{2a^2\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{8a^2\sin(c+dx)}{7d\sqrt{\sec(c+dx)}} + \frac{8a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{7d} + \frac{12a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}$$

[In] Int[(a + a*Cos[c + d*x])^2/Sec[c + d*x]^(3/2),x]

[Out] (12*a^2*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(5*d) + (8*a^2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(7*d) + (2*a^2*Sin[c + d*x])/(7*d*Sec[c + d*x]^(5/2)) + (4*a^2*Sin[c + d*x])/(5*d*Sec[c + d*x]^(3/2)) + (8*a^2*Sin[c + d*x])/(7*d*Sqrt[Sec[c + d*x]])

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3873

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^2, x_Symbol] :> Dist[2*a*(b/d), Int[(d*Csc[e + f*x])^(n + 1), x], x]
+ Int[(d*Csc[e + f*x])^n*(a^2 + b^2*Csc[e + f*x]^2), x] /; FreeQ[{a, b, d,
e, f, n}, x]
```

Rule 4130

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[A*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*m)), x] +
```

```
Dist[(C*m + A*(m + 1))/(b^2*m), Int[(b*Csc[e + f*x])^(m + 2), x], x] /; Fre
eQ[{b, e, f, A, C}, x] && NeQ[C*m + A*(m + 1), 0] && LeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \frac{(a+a\sec(c+dx))^2}{\sec^{\frac{7}{2}}(c+dx)}\,dx \\
&= \left(2a^2\right)\int \frac{1}{\sec^{\frac{5}{2}}(c+dx)}\,dx + \int \frac{a^2+a^2\sec^2(c+dx)}{\sec^{\frac{7}{2}}(c+dx)}\,dx \\
&= \frac{2a^2\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{4a^2\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} \\
&\quad + \frac{1}{5}\left(6a^2\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + \frac{1}{7}\left(12a^2\right)\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{2a^2\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{4a^2\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{8a^2\sin(c+dx)}{7d\sqrt{\sec(c+dx)}} + \frac{1}{7}\left(4a^2\right)\int \sqrt{\sec(c+dx)}\,dx \\
&\quad + \frac{1}{5}\left(6a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= \frac{12a^2\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{2a^2\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} \\
&\quad + \frac{4a^2\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{8a^2\sin(c+dx)}{7d\sqrt{\sec(c+dx)}} + \frac{1}{7}\left(4a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{12a^2\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} \\
&\quad + \frac{8a^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{7d} \\
&\quad + \frac{2a^2\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{4a^2\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{8a^2\sin(c+dx)}{7d\sqrt{\sec(c+dx)}}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.69 (sec) , antiderivative size = 149, normalized size of antiderivative = 0.93

$$
\int \frac{(a+a\cos(c+dx))^2}{\sec^{\frac{3}{2}}(c+dx)}\,dx
= \frac{a^2\left(\frac{672i\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)}{\sqrt{1+e^{2i(c+dx)}}} + 2\left(-168i - 80i\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2i(c\right.\right.\right.}{140d\sqrt{\sec(c+dx)}}
$$

```
[In] Integrate[(a + a*Cos[c + d*x])^2/Sec[c + d*x]^(3/2),x]
```

```
[Out] (a^2*(((672*I)*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x))])/Sqr
t[1 + E^((2*I)*(c + d*x))] + 2*(-168*I - (80*I)*Sqrt[1 + E^((2*I)*(c + d*x)
)]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]*Sec[c + d*x] + 85
*Sin[c + d*x] + 28*Sin[2*(c + d*x)] + 5*Sin[3*(c + d*x)])))/(140*d*Sqrt[Sec
[c + d*x]])
```

Maple [A] (verified)

Time = 10.48 (sec) , antiderivative size = 272, normalized size of antiderivative = 1.69

method	result
default	$-\frac{4\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^2\left(40\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-116\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+126\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.}{35\sqrt{-2\left(\sin^4\left(\right.\right.}}$
parts	$-\frac{2a^2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\right.}\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int((a+cos(d*x+c)*a)^2/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -4/35*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^2*(40*cos(1
/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8-116*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c
)^6+126*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-39*sin(1/2*d*x+1/2*c)^2*cos
(1/2*d*x+1/2*c)+10*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^
(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-21*(sin(1/2*d*x+1/2*c)^2)^(1/2)
*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-
2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*co
s(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.06

$$\int \frac{(a+a\cos(c+dx))^2}{\sec^{\frac{3}{2}}(c+dx)}\,dx =$$
$$-\frac{2\left(10i\sqrt{2}a^2\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))-10i\sqrt{2}a^2\text{weierstrassPInverse}(-4\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^2/sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] -2/35*(10*I*sqrt(2)*a^2*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x
 + c)) - 10*I*sqrt(2)*a^2*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d
*x + c)) - 21*I*sqrt(2)*a^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4,
0, cos(d*x + c) + I*sin(d*x + c))) + 21*I*sqrt(2)*a^2*weierstrassZeta(-4, 0
, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (5*a^2*cos(d
*x + c)^3 + 14*a^2*cos(d*x + c)^2 + 20*a^2*cos(d*x + c))*sin(d*x + c)/sqrt(
cos(d*x + c)))/d
```

Sympy [F]

$$\int \frac{(a + a\cos(c + dx))^2}{\sec^{\frac{3}{2}}(c + dx)}\,dx = a^2\left(\int \frac{2\cos(c + dx)}{\sec^{\frac{3}{2}}(c + dx)}\,dx + \int \frac{\cos^2(c + dx)}{\sec^{\frac{3}{2}}(c + dx)}\,dx + \int \frac{1}{\sec^{\frac{3}{2}}(c + dx)}\,dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))**2/sec(d*x+c)**(3/2),x)
```

```
[Out] a**2*(Integral(2*cos(c + d*x)/sec(c + d*x)**(3/2), x) + Integral(cos(c + d*
x)**2/sec(c + d*x)**(3/2), x) + Integral(sec(c + d*x)**(-3/2), x))
```

Maxima [F]

$$\int \frac{(a + a\cos(c + dx))^2}{\sec^{\frac{3}{2}}(c + dx)}\,dx = \int \frac{(a\cos(dx + c) + a)^2}{\sec(dx + c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^2/sec(d*x+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((a*cos(d*x + c) + a)^2/sec(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \frac{(a + a\cos(c + dx))^2}{\sec^{\frac{3}{2}}(c + dx)}\,dx = \int \frac{(a\cos(dx + c) + a)^2}{\sec(dx + c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^2/sec(d*x+c)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((a*cos(d*x + c) + a)^2/sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^2}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(a+a\,\cos(c+d\,x))^2}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}\,dx$$

```
[In] int((a + a*cos(c + d*x))^2/(1/cos(c + d*x))^(3/2),x)
[Out] int((a + a*cos(c + d*x))^2/(1/cos(c + d*x))^(3/2), x)
```

3.304 $\int (a+a\cos(c+dx))^3 \sec^{\frac{9}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 187

$$\begin{aligned}\int (a+a\cos(c+dx))^3 \sec^{\frac{9}{2}}(c+dx)\,dx &= -\frac{28a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} \\ &+ \frac{52a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} \\ &+ \frac{28a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} + \frac{52a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d} \\ &+ \frac{6a^3\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a^3\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d}\end{aligned}$$

```
[Out] 52/21*a^3*sec(d*x+c)^(3/2)*sin(d*x+c)/d+6/5*a^3*sec(d*x+c)^(5/2)*sin(d*x+c)
/d+2/7*a^3*sec(d*x+c)^(7/2)*sin(d*x+c)/d+28/5*a^3*sin(d*x+c)*sec(d*x+c)^(1/
2)/d-28/5*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin
(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+52/21*a^3*(cos
(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^
(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 187, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {3317, 3876, 3853, 3856, 2719, 2720}

$$\begin{aligned}&\int (a+a\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)\,dx\\&=\frac{2a^3\sin(c+dx)\sec^{\frac{7}{2}}(c+dx)}{7d}+\frac{6a^3\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{5d}\\&\quad+\frac{52a^3\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{21d}+\frac{28a^3\sin(c+dx)\sqrt{\sec(c+dx)}}{5d}\\&\quad+\frac{52a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d}\\&\quad-\frac{28a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}\end{aligned}$$

```
[In] Int[(a + a*Cos[c + d*x])^3*Sec[c + d*x]^(9/2),x]
```

```
[Out] (-28*a^3*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(
5*d) + (52*a^3*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*
x]])/(21*d) + (28*a^3*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(5*d) + (52*a^3*Sec[
c + d*x]^(3/2)*Sin[c + d*x])/(21*d) + (6*a^3*Sec[c + d*x]^(5/2)*Sin[c + d*x
])/(5*d) + (2*a^3*Sec[c + d*x]^(7/2)*Sin[c + d*x])/(7*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
```

```
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3876

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^(m_), x_Symbol] :> Int[ExpandTrig[(a + b*csc[e + f*x])^m*(d*csc[e + f
*x])^n, x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 - b^2, 0] && I
GtQ[m, 0] && RationalQ[n]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))^3\,dx \\
&= \int \left(a^3\sec^{\frac{3}{2}}(c+dx)+3a^3\sec^{\frac{5}{2}}(c+dx)+3a^3\sec^{\frac{7}{2}}(c+dx)+a^3\sec^{\frac{9}{2}}(c+dx)\right)dx \\
&= a^3\int \sec^{\frac{3}{2}}(c+dx)\,dx+a^3\int \sec^{\frac{9}{2}}(c+dx)\,dx \\
&\quad+\left(3a^3\right)\int \sec^{\frac{5}{2}}(c+dx)\,dx+\left(3a^3\right)\int \sec^{\frac{7}{2}}(c+dx)\,dx \\
&= \frac{2a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{d}+\frac{2a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{d} \\
&\quad+\frac{6a^3\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{2a^3\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d} \\
&\quad+\frac{1}{7}\left(5a^3\right)\int \sec^{\frac{5}{2}}(c+dx)\,dx-a^3\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx \\
&\quad+a^3\int \sqrt{\sec(c+dx)}\,dx+\frac{1}{5}\left(9a^3\right)\int \sec^{\frac{3}{2}}(c+dx)\,dx \\
&= \frac{28a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{5d}+\frac{52a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d} \\
&\quad+\frac{6a^3\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{2a^3\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d} \\
&\quad+\frac{1}{21}\left(5a^3\right)\int \sqrt{\sec(c+dx)}\,dx-\frac{1}{5}\left(9a^3\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx \\
&\quad+\left(a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&\quad-\left(a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx
\end{aligned}
$$

$$= -\frac{2a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} + \frac{28a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} + \frac{52a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d} + \frac{6a^3\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a^3\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{1}{21}\left(5a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}dx - \frac{1}{5}\left(9a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}dx$$

$$= -\frac{28a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{52a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} + \frac{28a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} + \frac{52a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d} + \frac{6a^3\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a^3\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 2.13 (sec) , antiderivative size = 279, normalized size of antiderivative = 1.49

$$\int(a+a\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)\,dx$$

$$= \frac{a^3(1+\cos(c+dx))^3\sec^6\left(\frac{1}{2}(c+dx)\right)\left(-\frac{2i\sqrt{2}e^{-i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(147(1+e^{2i(c+dx)})+147(-1+e^{2ic})\sqrt{1+e^{2i(c+dx)}}\,\text{Hyperge}\right.}{}\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^3*Sec[c + d*x]^(9/2),x]
```

```
[Out] (a^3*(1 + Cos[c + d*x])^3*Sec[(c + d*x)/2]^6*(((-2*I)*Sqrt[2]*Sqrt[E^(I*(c
+ d*x))/(1 + E^((2*I)*(c + d*x)))]*(147*(1 + E^((2*I)*(c + d*x))) + 147*(-1
 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2,
3/4, -E^((2*I)*(c + d*x))] + 65*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 +
 E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))
]))/(E^(I*(c + d*x))*(-1 + E^((2*I)*c))) + Sqrt[Sec[c + d*x]]*(294*Cos[d*x]
*Csc[c] + (80 + 63*Cos[c + d*x] + 65*Cos[2*(c + d*x)])*Sec[c + d*x]^2*Tan[c
 + d*x])))/(420*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 438 vs. $2(211) = 422$.

Time = 64.02 (sec) , antiderivative size = 439, normalized size of antiderivative = 2.35

method	result
default	$-\frac{16\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\, a^3 \left(-\frac{13\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}{168\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{1}{2}\right)^2}+\frac{53\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos\right.}}{105\sqrt{-2\left(\sin^4\left(\frac{d}{}\right.\right.}}\right.}{}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*a)^3*sec(d*x+c)^(9/2),x,method=_RETURNVERBOSE)
```

```
[Out] -16*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^3*(-13/168*
cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(co
s(1/2*d*x+1/2*c)^2-1/2)^2+53/105*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d
*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*E
llipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/448*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d
*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^4-7/10*s
in(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)/(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/
2*d*x+1/2*c)^2)^(1/2)-7/20*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2
*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(Ellipt
icF(cos(1/2*d*x+1/2*c),2^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))-3/16
0*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(
cos(1/2*d*x+1/2*c)^2-1/2)^3)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^
(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 215, normalized size of antiderivative = 1.15

$$\int (a + a\cos(c + dx))^3 \sec^{\frac{9}{2}}(c + dx)\, dx =$$

$$-\frac{2\left(65i\sqrt{2}a^3\cos(dx+c)^3 \operatorname{weierstrassPInverse}(-4, 0, \cos(dx+c) + i\sin(dx+c)) - 65i\sqrt{2}a^3\cos(dx\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^(9/2),x, algorithm="fricas")
```

```
[Out] -2/105*(65*I*sqrt(2)*a^3*cos(d*x + c)^3*weierstrassPInverse(-4, 0, cos(d*x
+ c) + I*sin(d*x + c)) - 65*I*sqrt(2)*a^3*cos(d*x + c)^3*weierstrassPInvers
e(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 147*I*sqrt(2)*a^3*cos(d*x + c)^3*
```

```
weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x
+ c))) - 147*I*sqrt(2)*a^3*cos(d*x + c)^3*weierstrassZeta(-4, 0, weierstras
sPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (294*a^3*cos(d*x + c)^3
+ 130*a^3*cos(d*x + c)^2 + 63*a^3*cos(d*x + c) + 15*a^3)*sin(d*x + c)/sqrt(
cos(d*x + c)))/(d*cos(d*x + c)^3)
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)\,dx=\text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**3*sec(d*x+c)**(9/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+a\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)\,dx=\int (a\cos(dx+c)+a)^3\sec(dx+c)^{\frac{9}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^(9/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^3*sec(d*x + c)^(9/2), x)
```

Giac [F]

$$\int (a+a\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)\,dx=\int (a\cos(dx+c)+a)^3\sec(dx+c)^{\frac{9}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^(9/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^3*sec(d*x + c)^(9/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)\,dx=\int \left(\frac{1}{\cos\left(c+d\,x\right)}\right)^{9/2}\,{\left(a+a\,\cos\left(c+d\,x\right)\right)}^3\,dx$$

```
[In] int((1/cos(c + d*x))^(9/2)*(a + a*cos(c + d*x))^3,x)
[Out] int((1/cos(c + d*x))^(9/2)*(a + a*cos(c + d*x))^3, x)
```

3.305 $\int (a+a\cos(c+dx))^3 \sec^{\frac{7}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 157

$$\begin{aligned}\int (a+a\cos(c+dx))^3 \sec^{\frac{7}{2}}(c+dx)\,dx &= -\frac{36a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} \\ &\quad+\frac{4a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} \\ &\quad+\frac{36a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} \\ &\quad+\frac{2a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{d}+\frac{2a^3\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}\end{aligned}$$

```
[Out] 2*a^3*sec(d*x+c)^(3/2)*sin(d*x+c)/d+2/5*a^3*sec(d*x+c)^(5/2)*sin(d*x+c)/d+3
6/5*a^3*sin(d*x+c)*sec(d*x+c)^(1/2)/d-36/5*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)
/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*
sec(d*x+c)^(1/2)/d+4*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*El
lipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used

= {3317, 3876, 3856, 2720, 3853, 2719}

$$\int (a+a\cos(c+dx))^3\sec^{\frac{7}{2}}(c+dx)\,dx$$
$$= \frac{2a^3\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{5d} + \frac{2a^3\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{d} + \frac{36a^3\sin(c+dx)\sqrt{\sec(c+dx)}}{5d} + \frac{4a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} - \frac{36a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}$$

```
[In] Int[(a + a*Cos[c + d*x])^3*Sec[c + d*x]^(7/2),x]
```

```
[Out] (-36*a^3*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(
5*d) + (4*a^3*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x
]])/d + (36*a^3*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(5*d) + (2*a^3*Sec[c + d*x
]^(3/2)*Sin[c + d*x])/d + (2*a^3*Sec[c + d*x]^(5/2)*Sin[c + d*x])/(5*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3876

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^(m_), x_Symbol] :> Int[ExpandTrig[(a + b*csc[e + f*x])^m*(d*csc[e + f
*x])^n, x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 - b^2, 0] && I
GtQ[m, 0] && RationalQ[n]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \sqrt{\sec(c+dx)}(a+a\sec(c+dx))^3\,dx \\
&= \int \left(a^3\sqrt{\sec(c+dx)}+3a^3\sec^{\frac{3}{2}}(c+dx)+3a^3\sec^{\frac{5}{2}}(c+dx)+a^3\sec^{\frac{7}{2}}(c+dx)\right)\,dx \\
&= a^3\int \sqrt{\sec(c+dx)}\,dx+a^3\int \sec^{\frac{7}{2}}(c+dx)\,dx \\
&\quad +\left(3a^3\right)\int \sec^{\frac{3}{2}}(c+dx)\,dx+\left(3a^3\right)\int \sec^{\frac{5}{2}}(c+dx)\,dx \\
&= \frac{6a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{d}+\frac{2a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{d} \\
&\quad +\frac{2a^3\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{1}{5}\left(3a^3\right)\int \sec^{\frac{3}{2}}(c+dx)\,dx \\
&\quad +a^3\int \sqrt{\sec(c+dx)}\,dx-\left(3a^3\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx \\
&\quad +\left(a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{2a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} \\
&\quad +\frac{36a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{5d}+\frac{2a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{d} \\
&\quad +\frac{2a^3\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}-\frac{1}{5}\left(3a^3\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx \\
&\quad +\left(a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&\quad -\left(3a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{6a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} \\
&+ \frac{4a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} \\
&+ \frac{36a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} \\
&+ \frac{2a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{d} + \frac{2a^3\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} \\
&- \frac{1}{5}\left(3a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx \\
&= -\frac{36a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} \\
&+ \frac{4a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} \\
&+ \frac{36a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} \\
&+ \frac{2a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{d} + \frac{2a^3\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.49 (sec) , antiderivative size = 259, normalized size of antiderivative = 1.65

$$
\int(a+a\cos(c+dx))^3\sec^{\frac{7}{2}}(c+dx)\,dx
$$

$$
= \frac{a^3(1+\cos(c+dx))^3\sec^6\left(\frac{1}{2}(c+dx)\right)\left(-\frac{2i\sqrt{2}e^{-i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(9\left(1+e^{2i(c+dx)}\right)+9\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeom}\right.}{}\right.}{}
$$

```
[In] Integrate[(a + a*Cos[c + d*x])^3*Sec[c + d*x]^(7/2),x]
```

```
[Out] (a^3*(1 + Cos[c + d*x])^3*Sec[(c + d*x)/2]^6*(((-2*I)*Sqrt[2]*Sqrt[E^(I*(c
+ d*x))/(1 + E^((2*I)*(c + d*x)))]*(9*(1 + E^((2*I)*(c + d*x))) + 9*(-1 + E
^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4,
 -E^((2*I)*(c + d*x))] + 5*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^((
2*I)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/(
E^(I*(c + d*x))*(-1 + E^((2*I)*c))) + Sqrt[Sec[c + d*x]]*(18*Cos[d*x]*Csc[c
] + (5 + Sec[c + d*x])*Tan[c + d*x])))/(20*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 385 vs. 2(189) = 378.

Time = 64.27 (sec) , antiderivative size = 386, normalized size of antiderivative = 2.46

method	result
default	$-\frac{16\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^3\left(\frac{7\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{10\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}-\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin\right.}}{16\left(\cos^2\left(\right.\right.}\right.}{}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*a)^3*sec(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -16*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^3*(7/10*(si
n(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x
+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))
-1/16*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/
2)/(cos(1/2*d*x+1/2*c)^2-1/2)^2-9/10*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c
)/(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)-9/20*(sin(1/2*d
*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)
^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-Ellip
ticE(cos(1/2*d*x+1/2*c),2^(1/2)))-1/160*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+
1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^3)/sin(1/2*
d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 200, normalized size of antiderivative = 1.27

$$\int (a+a\cos(c+dx))^3\sec^{\frac{7}{2}}(c+dx)\,dx =$$

$$-\frac{2\left(5i\sqrt{2}a^3\cos\left(dx+c\right)^2\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\sin\left(dx+c\right))-5i\sqrt{2}a^3\cos\left(dx+c\right)\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] -2/5*(5*I*sqrt(2)*a^3*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x + c
) + I*sin(d*x + c)) - 5*I*sqrt(2)*a^3*cos(d*x + c)^2*weierstrassPInverse(-4
, 0, cos(d*x + c) - I*sin(d*x + c)) + 9*I*sqrt(2)*a^3*cos(d*x + c)^2*weiers
trassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)))
 - 9*I*sqrt(2)*a^3*cos(d*x + c)^2*weierstrassZeta(-4, 0, weierstrassPInvers
e(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (18*a^3*cos(d*x + c)^2 + 5*a^3*c
os(d*x + c) + a^3)*sin(d*x + c)/sqrt(cos(d*x + c)))/(d*cos(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^3 \sec^{\frac{7}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**3*sec(d*x+c)**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+a\cos(c+dx))^3 \sec^{\frac{7}{2}}(c+dx)\,dx = \int (a\cos(dx+c)+a)^3 \sec(dx+c)^{\frac{7}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^(7/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^3*sec(d*x + c)^(7/2), x)
```

Giac [F]

$$\int (a+a\cos(c+dx))^3 \sec^{\frac{7}{2}}(c+dx)\,dx = \int (a\cos(dx+c)+a)^3 \sec(dx+c)^{\frac{7}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^(7/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^3*sec(d*x + c)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^3 \sec^{\frac{7}{2}}(c+dx)\,dx = \int \left(\frac{1}{\cos(c+d\,x)}\right)^{7/2} (a+a\,\cos(c+d\,x))^3\,dx$$

```
[In] int((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))^3,x)
[Out] int((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))^3, x)
```

3.306 $\int (a+a\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 131

$$
\begin{aligned}
\int (a+a\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)\,dx
&= -\frac{4a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} \\
&\quad+\frac{20a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\
&\quad+\frac{6a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{d}+\frac{2a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}
\end{aligned}
$$

```
[Out] 2/3*a^3*sec(d*x+c)^(3/2)*sin(d*x+c)/d+6*a^3*sin(d*x+c)*sec(d*x+c)^(1/2)/d-4
*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+
1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+20/3*a^3*(cos(1/2*d*x+1
/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos
(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used

$= \{3317, 3876, 3856, 2719, 2720, 3853\}$

$$\int (a+a\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)\,dx$$
$$= \frac{2a^3\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3d} + \frac{6a^3\sin(c+dx)\sqrt{\sec(c+dx)}}{d} + \frac{20a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} - \frac{4a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}$$

```
[In] Int[(a + a*Cos[c + d*x])^3*Sec[c + d*x]^(5/2),x]
```

```
[Out] (-4*a^3*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/d
+ (20*a^3*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/
(3*d) + (6*a^3*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/d + (2*a^3*Sec[c + d*x]^(3/
2)*Sin[c + d*x])/(3*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

```
EqQ[n^2, 1/4]
```

Rule 3876

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^(m_), x_Symbol] :> Int[ExpandTrig[(a + b*csc[e + f*x])^m*(d*csc[e + f
*x])^n, x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 - b^2, 0] && I
GtQ[m, 0] && RationalQ[n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \frac{(a+a\sec(c+dx))^3}{\sqrt{\sec(c+dx)}}\,dx \\
&= \int \left(\frac{a^3}{\sqrt{\sec(c+dx)}}+3a^3\sqrt{\sec(c+dx)}+3a^3\sec^{\frac{3}{2}}(c+dx)+a^3\sec^{\frac{5}{2}}(c+dx)\right)\,dx \\
&= a^3\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx+a^3\int \sec^{\frac{5}{2}}(c+dx)\,dx \\
&\quad+\left(3a^3\right)\int \sqrt{\sec(c+dx)}\,dx+\left(3a^3\right)\int \sec^{\frac{3}{2}}(c+dx)\,dx \\
&= \frac{6a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{d}+\frac{2a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} \\
&\quad+\frac{1}{3}a^3\int \sqrt{\sec(c+dx)}\,dx-\left(3a^3\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx \\
&\quad+\left(a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx \\
&\quad+\left(3a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{2a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} \\
&\quad+\frac{6a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} \\
&\quad+\frac{6a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{d}+\frac{2a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} \\
&\quad+\frac{1}{3}\left(a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&\quad-\left(3a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx
\end{aligned}$$

$$= -\frac{4a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{20a^3\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{6a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{2a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.39 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.20

$$\int (a+a\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)\,dx = -\frac{ia^3\sec^{\frac{3}{2}}(c+dx)\left(-6-6\cos(2(c+dx))+6e^{-2i(c+dx)}\left(1+e^{2i(c+dx)}\right)^{3/2}\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-\right.\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^3*Sec[c + d*x]^(5/2),x]
```

```
[Out] ((-1/3*I)*a^3*Sec[c + d*x]^(3/2)*(-6 - 6*Cos[2*(c + d*x)] + (6*(1 + E^((2*I
)*(c + d*x)))^(3/2)*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x))]
)/E^((2*I)*(c + d*x)) + 20*Sqrt[1 + E^((2*I)*(c + d*x))]*Cos[c + d*x]*Hyper
geometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))] + (2*I)*Sin[c + d*x] + (9
*I)*Sin[2*(c + d*x)]))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 370 vs. 2(167) = 334.

Time = 62.79 (sec) , antiderivative size = 371, normalized size of antiderivative = 2.83

method	result
default	$-\frac{4\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^3\left(18\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-10\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\right.\right.}{}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*a)^3*sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -4/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^3/(4*sin(1
/2*d*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)/sin(1/2*d*x+1/2*c)^3*(18*sin(1/2*
d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-10*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*
d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2
*c)^2-6*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellip
```

```
ticE(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2-10*sin(1/2*d*x+1/2*c)
^2*cos(1/2*d*x+1/2*c)+5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^
2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+3*(sin(1/2*d*x+1/2*c)^2)^(
1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))
)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c
)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 179, normalized size of antiderivative = 1.37

$$\int (a + a\cos(c + dx))^3 \sec^{\frac{5}{2}}(c + dx)\, dx =$$
$$-\frac{2\left(5i\sqrt{2}a^3\cos(dx + c)\,\text{weierstrassPInverse}(-4, 0, \cos(dx + c) + i\,\sin(dx + c)) - 5i\sqrt{2}a^3\cos(dx + c)\,\text{w}\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] -2/3*(5*I*sqrt(2)*a^3*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c)
+ I*sin(d*x + c)) - 5*I*sqrt(2)*a^3*cos(d*x + c)*weierstrassPInverse(-4, 0,
 cos(d*x + c) - I*sin(d*x + c)) + 3*I*sqrt(2)*a^3*cos(d*x + c)*weierstrassZ
eta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*I
*sqrt(2)*a^3*cos(d*x + c)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0,
 cos(d*x + c) - I*sin(d*x + c))) - (9*a^3*cos(d*x + c) + a^3)*sin(d*x + c)/
sqrt(cos(d*x + c)))/(d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^3 \sec^{\frac{5}{2}}(c + dx)\, dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**3*sec(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (a + a\cos(c + dx))^3 \sec^{\frac{5}{2}}(c + dx)\, dx = \int (a\cos(dx + c) + a)^3 \sec(dx + c)^{\frac{5}{2}}\, dx$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^3*sec(d*x + c)^(5/2), x)
```

Giac [F]

$$\int (a + a\cos(c + dx))^3 \sec^{\frac{5}{2}}(c + dx)\, dx = \int (a\cos(dx + c) + a)^3 \sec(dx + c)^{\frac{5}{2}}\, dx$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^3*sec(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^3 \sec^{\frac{5}{2}}(c + dx)\, dx = \int \left(\frac{1}{\cos(c + d\,x)}\right)^{5/2} (a + a\,\cos(c + d\,x))^3\, dx$$

```
[In] int((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^3,x)
[Out] int((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^3, x)
```

3.307 $\int (a+a\cos(c+dx))^3 \sec^{\frac{3}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 131

$$\int (a+a\cos(c+dx))^3 \sec^{\frac{3}{2}}(c+dx)\,dx = \frac{4a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{20a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2a^3\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{2a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{d}$$

```
[Out] 2/3*a^3*sin(d*x+c)/d/sec(d*x+c)^(1/2)+2*a^3*sin(d*x+c)*sec(d*x+c)^(1/2)/d+4
*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+
1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+20/3*a^3*(cos(1/2*d*x+1
/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos
(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used

$= \{3317, 3876, 3854, 3856, 2720, 2719, 3853\}$

$$\int (a+a\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)\,dx$$
$$=\frac{2a^3\sin(c+dx)\sqrt{\sec(c+dx)}}{d}+\frac{2a^3\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}$$
$$+\frac{20a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}$$
$$+\frac{4a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}$$

```
[In] Int[(a + a*Cos[c + d*x])^3*Sec[c + d*x]^(3/2),x]
```

```
[Out] (4*a^3*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/d +
 (20*a^3*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(
3*d) + (2*a^3*Sin[c + d*x])/(3*d*Sqrt[Sec[c + d*x]]) + (2*a^3*Sqrt[Sec[c +
d*x]]*Sin[c + d*x])/d
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
```

```
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3876

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^(m_), x_Symbol] :> Int[ExpandTrig[(a + b*csc[e + f*x])^m*(d*csc[e + f
*x])^n, x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 - b^2, 0] && I
GtQ[m, 0] && RationalQ[n]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \frac{(a+a\sec(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx\\
&= \int \left(\frac{a^3}{\sec^{\frac{3}{2}}(c+dx)}+\frac{3a^3}{\sqrt{\sec(c+dx)}}+3a^3\sqrt{\sec(c+dx)}+a^3\sec^{\frac{3}{2}}(c+dx)\right)dx\\
&= a^3\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx+a^3\int \sec^{\frac{3}{2}}(c+dx)\,dx\\
&\quad+\left(3a^3\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx+\left(3a^3\right)\int \sqrt{\sec(c+dx)}\,dx\\
&= \frac{2a^3\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}+\frac{2a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{d}+\frac{1}{3}a^3\int \sqrt{\sec(c+dx)}\,dx\\
&\quad-a^3\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx+\left(3a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\\
&\quad+\left(3a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx\\
&= \frac{6a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d}\\
&\quad+\frac{6a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d}\\
&\quad+\frac{2a^3\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}+\frac{2a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{d}\\
&\quad+\frac{1}{3}\left(a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\\
&\quad-\left(a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx
\end{aligned}
$$

$$= \frac{4a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{20a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2a^3\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{2a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{d}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.39 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.03

$$\int (a+a\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)\,dx$$
$$= \frac{a^3\left(\frac{24i\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)}{\sqrt{1+e^{2i(c+dx)}}} + 2\left(-6i-10i\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2i(c+dx}\right.\right.\right.}{3d\sqrt{\sec(c+dx)}}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^3*Sec[c + d*x]^(3/2),x]
```

```
[Out] (a^3*(((24*I)*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x))])/Sqrt
[1 + E^((2*I)*(c + d*x))] + 2*(-6*I - (10*I)*Sqrt[1 + E^((2*I)*(c + d*x))]*
Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]*Sec[c + d*x] + Sin[c
 + d*x] + 3*Tan[c + d*x])))/(3*d*Sqrt[Sec[c + d*x]])
```

Maple [A] (verified)

Time = 7.91 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.31

method	result
default	$-\frac{4a^3\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-4\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+5\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\right.}{3\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$
parts	$-\frac{2a^3\left(-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{-2\left(\sin^4\left(\frac{dx}{2}\right.\right.}\right.}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int((a+cos(d*x+c)*a)^3*sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -4/3*a^3*(2*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-4*sin(1/2*d*x+1/2*c)^2*
cos(1/2*d*x+1/2*c)+5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1
)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-3*(sin(1/2*d*x+1/2*c)^2)^(1/2
)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/s
in(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.13

$$\int (a+a\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)\,dx =$$

$$-\frac{2\left(5i\sqrt{2}a^3\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))-5i\sqrt{2}a^3\text{weierstrassPInverse}(-4,0\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] -2/3*(5*I*sqrt(2)*a^3*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x +
 c)) - 5*I*sqrt(2)*a^3*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x
+ c)) - 3*I*sqrt(2)*a^3*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, c
os(d*x + c) + I*sin(d*x + c))) + 3*I*sqrt(2)*a^3*weierstrassZeta(-4, 0, wei
erstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (a^3*cos(d*x + c)
 + 3*a^3)*sin(d*x + c)/sqrt(cos(d*x + c)))/d
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**3*sec(d*x+c)**(3/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (a+a\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)\,dx = \int (a\cos(dx+c)+a)^3\sec(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((a*cos(d*x + c) + a)^3*sec(d*x + c)^(3/2), x)
```

Giac [F]

$$\int (a+a\cos(c+dx))^3 \sec^{\frac{3}{2}}(c+dx)\,dx = \int (a\cos(dx+c)+a)^3 \sec(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^3*sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^3 \sec^{\frac{3}{2}}(c+dx)\,dx = \int \left(\frac{1}{\cos(c+d\,x)}\right)^{3/2} (a+a\,\cos(c+d\,x))^3\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^3,x)
[Out] int((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^3, x)
```

3.308 $\int (a+a\cos(c+dx))^3\sqrt{\sec(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 131

$$\int (a+a\cos(c+dx))^3\sqrt{\sec(c+dx)}\,dx = \frac{36a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{4a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a^3\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{2a^3\sin(c+dx)}{d\sqrt{\sec(c+dx)}}$$

```
[Out] 2/5*a^3*sin(d*x+c)/d/sec(d*x+c)^(3/2)+2*a^3*sin(d*x+c)/d/sec(d*x+c)^(1/2)+3
6/5*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d
*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+4*a^3*(cos(1/2*d*x+1
/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos
(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used

= {3317, 3876, 3854, 3856, 2719, 2720}

$$\int (a+a\cos(c+dx))^3\sqrt{\sec(c+dx)}\,dx$$
$$=\frac{2a^3\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)}+\frac{2a^3\sin(c+dx)}{d\sqrt{\sec(c+dx)}}$$
$$+\frac{4a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}$$
$$+\frac{36a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}$$

```
[In] Int[(a + a*Cos[c + d*x])^3*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (36*a^3*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(5
*d) + (4*a^3*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]
])/d + (2*a^3*Sin[c + d*x])/(5*d*Sec[c + d*x]^(3/2)) + (2*a^3*Sin[c + d*x])
/(d*Sqrt[Sec[c + d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

```
EqQ[n^2, 1/4]
```

Rule 3876

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^(m_), x_Symbol] :> Int[ExpandTrig[(a + b*csc[e + f*x])^m*(d*csc[e + f
*x])^n, x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 - b^2, 0] && I
GtQ[m, 0] && RationalQ[n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \frac{(a+a\sec(c+dx))^3}{\sec^{\frac{5}{2}}(c+dx)}\,dx\\
&= \int \left(\frac{a^3}{\sec^{\frac{5}{2}}(c+dx)}+\frac{3a^3}{\sec^{\frac{3}{2}}(c+dx)}+\frac{3a^3}{\sqrt{\sec(c+dx)}}+a^3\sqrt{\sec(c+dx)}\right)dx\\
&= a^3\int \frac{1}{\sec^{\frac{5}{2}}(c+dx)}\,dx+a^3\int \sqrt{\sec(c+dx)}\,dx\\
&\quad+\left(3a^3\right)\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx+\left(3a^3\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx\\
&= \frac{2a^3\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)}+\frac{2a^3\sin(c+dx)}{d\sqrt{\sec(c+dx)}}+\frac{1}{5}\left(3a^3\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx\\
&\quad+a^3\int \sqrt{\sec(c+dx)}\,dx+\left(a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\\
&\quad+\left(3a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx\\
&= \frac{6a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d}\\
&\quad+\frac{2a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d}+\frac{2a^3\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)}\\
&\quad+\frac{2a^3\sin(c+dx)}{d\sqrt{\sec(c+dx)}}+\frac{1}{5}\left(3a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx\\
&\quad+\left(a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{36a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d}\\
&\quad+\frac{4a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d}\\
&\quad+\frac{2a^3\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)}+\frac{2a^3\sin(c+dx)}{d\sqrt{\sec(c+dx)}}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.31 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.05

$$\int (a+a\cos(c+dx))^3\sqrt{\sec(c+dx)}\,dx$$
$$= \frac{a^3\left(\frac{144i\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)}{\sqrt{1+e^{2i(c+dx)}}}+2\left(-36i-20i\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2i(c+\right.\right.\right.}}{10d\sqrt{\sec(c+dx)}}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^3*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (a^3*(((144*I)*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x))])/Sqr
t[1 + E^((2*I)*(c + d*x))] + 2*(-36*I - (20*I)*Sqrt[1 + E^((2*I)*(c + d*x))
]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]*Sec[c + d*x] + 10*
Sin[c + d*x] + Sin[2*(c + d*x)])))/(10*d*Sqrt[Sec[c + d*x]])
```

Maple [A] (verified)

Time = 6.86 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.91

method	result
default	$-\frac{4\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^3\left(-4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+14\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-6\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right.\right.}{5\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\right.}}$
parts	$-\frac{2a^3\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}-\frac{2a^3\sqrt{\left(2\left(\cos^2\left(\right.\right.\right.}}{}$

```
[In] int((a+cos(d*x+c)*a)^3*sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -4/5*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^3*(-4*cos(1/
2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+14*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c
)-6*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*
(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-9*(s
in(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1
/2*d*x+1/2*c),2^(1/2)))/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2
)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.19

$$\int (a+a\cos(c+dx))^3\sqrt{\sec(c+dx)}\,dx =$$

$$-\frac{2\left(5i\sqrt{2}a^3\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))-5i\sqrt{2}a^3\text{weierstrassPInverse}(-4,0\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] -2/5*(5*I*sqrt(2)*a^3*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x +
 c)) - 5*I*sqrt(2)*a^3*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x
+ c)) - 9*I*sqrt(2)*a^3*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, c
os(d*x + c) + I*sin(d*x + c))) + 9*I*sqrt(2)*a^3*weierstrassZeta(-4, 0, wei
erstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (a^3*cos(d*x + c)
^2 + 5*a^3*cos(d*x + c))*sin(d*x + c)/sqrt(cos(d*x + c)))/d
```

Sympy [F]

$$\int (a+a\cos(c+dx))^3\sqrt{\sec(c+dx)}\,dx = a^3\left(\int 3\cos(c+dx)\sqrt{\sec(c+dx)}\,dx + \int 3\cos^2(c+dx)\sqrt{\sec(c+dx)}\,dx + \int \cos^3(c+dx)\sqrt{\sec(c+dx)}\,dx + \int \sqrt{\sec(c+dx)}\,dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))**3*sec(d*x+c)**(1/2),x)
```

```
[Out] a**3*(Integral(3*cos(c + d*x)*sqrt(sec(c + d*x)), x) + Integral(3*cos(c + d
*x)**2*sqrt(sec(c + d*x)), x) + Integral(cos(c + d*x)**3*sqrt(sec(c + d*x))
, x) + Integral(sqrt(sec(c + d*x)), x))
```

Maxima [F]

$$\int (a + a\cos(c + dx))^3 \sqrt{\sec(c + dx)}\, dx = \int (a\cos(dx + c) + a)^3 \sqrt{\sec(dx + c)}\, dx$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^3*sqrt(sec(d*x + c)), x)
```

Giac [F]

$$\int (a + a\cos(c + dx))^3 \sqrt{\sec(c + dx)}\, dx = \int (a\cos(dx + c) + a)^3 \sqrt{\sec(dx + c)}\, dx$$

```
[In] integrate((a+a*cos(d*x+c))^3*sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^3*sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^3 \sqrt{\sec(c + dx)}\, dx = \int \sqrt{\frac{1}{\cos(c + d\,x)}}\,(a + a\,\cos(c + d\,x))^3\, dx$$

```
[In] int((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^3,x)
[Out] int((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^3, x)
```

3.309 $\int \frac{(a+a\cos(c+dx))^3}{\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 161

$$\int \frac{(a+a\cos(c+dx))^3}{\sqrt{\sec(c+dx)}}\,dx=\frac{28a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d}+\frac{52a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d}+\frac{2a^3\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)}+\frac{6a^3\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)}+\frac{52a^3\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}$$

```
[Out] 2/7*a^3*sin(d*x+c)/d/sec(d*x+c)^(5/2)+6/5*a^3*sin(d*x+c)/d/sec(d*x+c)^(3/2)
+52/21*a^3*sin(d*x+c)/d/sec(d*x+c)^(1/2)+28/5*a^3*(cos(1/2*d*x+1/2*c)^2)^(1
/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/
2)*sec(d*x+c)^(1/2)/d+52/21*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/
2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2
)/d
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {3317, 3876, 3854, 3856, 2720, 2719}

$$\int \frac{(a+a\cos(c+dx))^3}{\sqrt{\sec(c+dx)}}\,dx=\frac{6a^3\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)}+\frac{2a^3\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)}+\frac{52a^3\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}+\frac{52a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d}+\frac{28a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}$$

```
[In] Int[(a + a*Cos[c + d*x])^3/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (28*a^3*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(5
*d) + (52*a^3*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x
]])/(21*d) + (2*a^3*Sin[c + d*x])/(7*d*Sec[c + d*x]^(5/2)) + (6*a^3*Sin[c +
 d*x])/(5*d*Sec[c + d*x]^(3/2)) + (52*a^3*Sin[c + d*x])/(21*d*Sqrt[Sec[c +
d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3876

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^(m_), x_Symbol] :> Int[ExpandTrig[(a + b*csc[e + f*x])^m*(d*csc[e + f
*x])^n, x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 - b^2, 0] && I
GtQ[m, 0] && RationalQ[n]
```

Rubi steps

$$\text{integral} = \int \frac{(a + a\sec(c+dx))^3}{\sec^{\frac{7}{2}}(c+dx)}\,dx$$

$$= \int \left(\frac{a^3}{\sec^{\frac{7}{2}}(c+dx)} + \frac{3a^3}{\sec^{\frac{5}{2}}(c+dx)} + \frac{3a^3}{\sec^{\frac{3}{2}}(c+dx)} + \frac{a^3}{\sqrt{\sec(c+dx)}}\right)dx$$

$$= a^3 \int \frac{1}{\sec^{\frac{7}{2}}(c+dx)}\,dx + a^3 \int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + \left(3a^3\right)\int \frac{1}{\sec^{\frac{5}{2}}(c+dx)}\,dx + \left(3a^3\right)\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \frac{2a^3\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{6a^3\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{2a^3\sin(c+dx)}{d\sqrt{\sec(c+dx)}} + \frac{1}{7}\left(5a^3\right)\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx + a^3\int \sqrt{\sec(c+dx)}\,dx + \frac{1}{5}\left(9a^3\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + \left(a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx$$

$$= \frac{2a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a^3\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{6a^3\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{52a^3\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{1}{21}\left(5a^3\right)\int \sqrt{\sec(c+dx)}\,dx + \left(a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx + \frac{1}{5}\left(9a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx$$

$$= \frac{28a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{2a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a^3\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{6a^3\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{52a^3\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{1}{21}\left(5a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{28a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{52a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} + \frac{2a^3\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{6a^3\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{52a^3\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 2.21 (sec) , antiderivative size = 146, normalized size of antiderivative = 0.91

$$\int \frac{(a + a\cos(c + dx))^3}{\sqrt{\sec(c + dx)}}\,dx = \frac{a^3\left(-2352i + \frac{4704i\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)}{\sqrt{1+e^{2i(c+dx)}}} - 1040i\sqrt{1 + e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2}\right.\right.}{420d\sqrt{\sec(c + dx)}}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^3/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (a^3*(-2352*I + ((4704*I)*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c +
d*x))])/Sqrt[1 + E^((2*I)*(c + d*x))] - (1040*I)*Sqrt[1 + E^((2*I)*(c + d*x
))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]*Sec[c + d*x] + 1
070*Sin[c + d*x] + 252*Sin[2*(c + d*x)] + 30*Sin[3*(c + d*x)]))/(420*d*Sqrt
[Sec[c + d*x]])
```

Maple [A] (verified)

Time = 11.25 (sec) , antiderivative size = 272, normalized size of antiderivative = 1.69

method	result
default	$-\frac{4\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^3\left(120\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-432\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+602\left(\sin^4\left(\frac{dx}{2}\right.\right.\right.}{105\sqrt{-2\left(s\right.}}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*a)^3/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -4/105*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^3*(120*cos
(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8-432*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2
*c)^6+602*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-208*sin(1/2*d*x+1/2*c)^2*
cos(1/2*d*x+1/2*c)+65*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-
1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-147*(sin(1/2*d*x+1/2*c)^2)^(
1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))
)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(
2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.06

$$\int \frac{(a+a\cos(c+dx))^3}{\sqrt{\sec(c+dx)}}\,dx =$$

$$-\frac{2\left(65i\sqrt{2}a^3\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))-65i\sqrt{2}a^3\text{weierstrassPInverse}(-4\right.}{}$$

[In] integrate((a+a*cos(d*x+c))^3/sec(d*x+c)^(1/2),x, algorithm="fricas")

[Out] -2/105*(65*I*sqrt(2)*a^3*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) - 65*I*sqrt(2)*a^3*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 147*I*sqrt(2)*a^3*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 147*I*sqrt(2)*a^3*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (15*a^3*cos(d*x + c)^3 + 63*a^3*cos(d*x + c)^2 + 130*a^3*cos(d*x + c))*sin(d*x + c)/sqrt(cos(d*x + c)))/d

Sympy [F]

$$\int \frac{(a+a\cos(c+dx))^3}{\sqrt{\sec(c+dx)}}\,dx = a^3\left(\int \frac{3\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx + \int \frac{3\cos^2(c+dx)}{\sqrt{\sec(c+dx)}}\,dx + \int \frac{\cos^3(c+dx)}{\sqrt{\sec(c+dx)}}\,dx + \int \frac{1}{\sqrt{\sec(c+dx)}}\,dx\right)$$

[In] integrate((a+a*cos(d*x+c))**3/sec(d*x+c)**(1/2),x)

[Out] a**3*(Integral(3*cos(c + d*x)/sqrt(sec(c + d*x)), x) + Integral(3*cos(c + d*x)**2/sqrt(sec(c + d*x)), x) + Integral(cos(c + d*x)**3/sqrt(sec(c + d*x)), x) + Integral(1/sqrt(sec(c + d*x)), x))

Maxima [F]

$$\int \frac{(a+a\cos(c+dx))^3}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(a\cos(dx+c)+a)^3}{\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^3/sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^3/sqrt(sec(d*x + c)), x)
```

Giac [F]

$$\int \frac{(a+a\cos(c+dx))^3}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(a\cos(dx+c)+a)^3}{\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^3/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^3/sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^3}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(a+a\,\cos(c+d\,x))^3}{\sqrt{\frac{1}{\cos(c+d\,x)}}}\,dx$$

```
[In] int((a + a*cos(c + d*x))^3/(1/cos(c + d*x))^(1/2),x)
[Out] int((a + a*cos(c + d*x))^3/(1/cos(c + d*x))^(1/2), x)
```

3.310 $\int \frac{(a+a\cos(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 187

$$\int \frac{(a+a\cos(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{68a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{15d} + \frac{44a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} + \frac{2a^3\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)} + \frac{6a^3\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{68a^3\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)} + \frac{44a^3\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}$$

```
[Out] 2/9*a^3*sin(d*x+c)/d/sec(d*x+c)^(7/2)+6/7*a^3*sin(d*x+c)/d/sec(d*x+c)^(5/2)
+68/45*a^3*sin(d*x+c)/d/sec(d*x+c)^(3/2)+44/21*a^3*sin(d*x+c)/d/sec(d*x+c)^
(1/2)+68/15*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(s
in(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+44/21*a^3*(c
os(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),
2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 187, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {3317, 3876, 3854, 3856, 2719, 2720}

$$\begin{aligned}\int \frac{(a+a\cos(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx &= \frac{68a^3\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)}+\frac{6a^3\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} \\ &\quad+\frac{2a^3\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)}+\frac{44a^3\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} \\ &\quad+\frac{44a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} \\ &\quad+\frac{68a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15d}\end{aligned}$$

```
[In] Int[(a + a*Cos[c + d*x])^3/Sec[c + d*x]^(3/2),x]
```

```
[Out] (68*a^3*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(1
5*d) + (44*a^3*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*
x]])/(21*d) + (2*a^3*Sin[c + d*x])/(9*d*Sec[c + d*x]^(7/2)) + (6*a^3*Sin[c
+ d*x])/(7*d*Sec[c + d*x]^(5/2)) + (68*a^3*Sin[c + d*x])/(45*d*Sec[c + d*x]
^(3/2)) + (44*a^3*Sin[c + d*x])/(21*d*Sqrt[Sec[c + d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3876

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^(m_), x_Symbol] :> Int[ExpandTrig[(a + b*csc[e + f*x])^m*(d*csc[e + f
*x])^n, x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 - b^2, 0] && I
GtQ[m, 0] && RationalQ[n]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \frac{(a+a\sec(c+dx))^3}{\sec^{\frac{9}{2}}(c+dx)}\,dx\\
&= \int \left(\frac{a^3}{\sec^{\frac{9}{2}}(c+dx)}+\frac{3a^3}{\sec^{\frac{7}{2}}(c+dx)}+\frac{3a^3}{\sec^{\frac{5}{2}}(c+dx)}+\frac{a^3}{\sec^{\frac{3}{2}}(c+dx)}\right)dx\\
&= a^3\int \frac{1}{\sec^{\frac{9}{2}}(c+dx)}\,dx+a^3\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx\\
&\quad+\left(3a^3\right)\int \frac{1}{\sec^{\frac{7}{2}}(c+dx)}\,dx+\left(3a^3\right)\int \frac{1}{\sec^{\frac{5}{2}}(c+dx)}\,dx\\
&= \frac{2a^3\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)}+\frac{6a^3\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)}+\frac{6a^3\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)}+\frac{2a^3\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}\\
&\quad+\frac{1}{3}a^3\int \sqrt{\sec(c+dx)}\,dx+\frac{1}{9}\left(7a^3\right)\int \frac{1}{\sec^{\frac{5}{2}}(c+dx)}\,dx\\
&\quad+\frac{1}{5}\left(9a^3\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx+\frac{1}{7}\left(15a^3\right)\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx\\
&= \frac{2a^3\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)}+\frac{6a^3\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)}+\frac{68a^3\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)}+\frac{44a^3\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}\\
&\quad+\frac{1}{15}\left(7a^3\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx+\frac{1}{7}\left(5a^3\right)\int \sqrt{\sec(c+dx)}\,dx\\
&\quad+\frac{1}{3}\left(a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\\
&\quad+\frac{1}{5}\left(9a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx
\end{aligned}
$$

$$= \frac{18a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{2a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2a^3\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)} + \frac{6a^3\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{68a^3\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)} + \frac{44a^3\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{1}{15}\left(7a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx + \frac{1}{7}\left(5a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{68a^3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{15d} + \frac{44a^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} + \frac{2a^3\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)} + \frac{6a^3\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{68a^3\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)} + \frac{44a^3\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 2.62 (sec) , antiderivative size = 156, normalized size of antiderivative = 0.83

$$\int\frac{(a+a\cos(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{a^3\left(-11424i + \frac{22848i\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)}{\sqrt{1+e^{2i(c+dx)}}} - 5280i\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},-\right.\right.}{2520d\sqrt{\text{se}}}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^3/Sec[c + d*x]^(3/2),x]
```

```
[Out] (a^3*(-11424*I + ((22848*I)*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c
+ d*x))])/Sqrt[1 + E^((2*I)*(c + d*x))] - (5280*I)*Sqrt[1 + E^((2*I)*(c + d
*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]*Sec[c + d*x] +
 5820*Sin[c + d*x] + 2044*Sin[2*(c + d*x)] + 540*Sin[3*(c + d*x)] + 70*Sin[
4*(c + d*x)]))/(2520*d*Sqrt[Sec[c + d*x]])
```

Maple [A] (verified)

Time = 12.57 (sec) , antiderivative size = 260, normalized size of antiderivative = 1.39

method	result
default	$-\frac{4\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\, a^3\left(560\left(\cos^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-600\left(\cos^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+212\left(\cos^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+66\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right.}{315\sqrt{-2\left(\sin^4\left(\right.\right.}}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*a)^3/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -4/315*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^3*(560*cos
(1/2*d*x+1/2*c)^11-600*cos(1/2*d*x+1/2*c)^9+212*cos(1/2*d*x+1/2*c)^7+66*cos
(1/2*d*x+1/2*c)^5-430*cos(1/2*d*x+1/2*c)^3+165*(sin(1/2*d*x+1/2*c)^2)^(1/2)
*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-35
7*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticE(
cos(1/2*d*x+1/2*c),2^(1/2))+192*cos(1/2*d*x+1/2*c))/(-2*sin(1/2*d*x+1/2*c)^
4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)
^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 183, normalized size of antiderivative = 0.98

$$\int \frac{(a+a\cos(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx =$$

$$-\frac{2\left(165i\sqrt{2}a^3\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))-165i\sqrt{2}a^3\text{weierstrassPInverse}(\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^3/sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] -2/315*(165*I*sqrt(2)*a^3*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d
*x + c)) - 165*I*sqrt(2)*a^3*weierstrassPInverse(-4, 0, cos(d*x + c) - I*si
n(d*x + c)) - 357*I*sqrt(2)*a^3*weierstrassZeta(-4, 0, weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 357*I*sqrt(2)*a^3*weierstrassZeta(
-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (35*a^3
*cos(d*x + c)^4 + 135*a^3*cos(d*x + c)^3 + 238*a^3*cos(d*x + c)^2 + 330*a^3
*cos(d*x + c))*sin(d*x + c)/sqrt(cos(d*x + c)))/d
```

Sympy [F]

$$\int \frac{(a+a\cos(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx = a^3\left(\int \frac{3\cos(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx + \int \frac{3\cos^2(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx + \int \frac{\cos^3(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx + \int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))**3/sec(d*x+c)**(3/2),x)
```

```
[Out] a**3*(Integral(3*cos(c + d*x)/sec(c + d*x)**(3/2), x) + Integral(3*cos(c +
d*x)**2/sec(c + d*x)**(3/2), x) + Integral(cos(c + d*x)**3/sec(c + d*x)**(3
/2), x) + Integral(sec(c + d*x)**(-3/2), x))
```

Maxima [F]

$$\int \frac{(a+a\cos(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(a\cos(dx+c)+a)^3}{\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^3/sec(d*x+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((a*cos(d*x + c) + a)^3/sec(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \frac{(a+a\cos(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(a\cos(dx+c)+a)^3}{\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^3/sec(d*x+c)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((a*cos(d*x + c) + a)^3/sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(a+a\,\cos(c+d\,x))^3}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}\,dx$$

```
[In] int((a + a*cos(c + d*x))^3/(1/cos(c + d*x))^(3/2),x)
```

```
[Out] int((a + a*cos(c + d*x))^3/(1/cos(c + d*x))^(3/2), x)
```

3.311 $\int (a+a\cos(c+dx))^4 \sec^{\frac{9}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 187

$$\begin{aligned}\int (a+a\cos(c+dx))^4 \sec^{\frac{9}{2}}(c+dx)\,dx &= -\frac{64a^4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} \\ &\quad+\frac{136a^4\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} \\ &\quad+\frac{64a^4\sqrt{\sec(c+dx)}\sin(c+dx)}{5d}+\frac{94a^4\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d} \\ &\quad+\frac{8a^4\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{2a^4\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d}\end{aligned}$$

```
[Out] 94/21*a^4*sec(d*x+c)^(3/2)*sin(d*x+c)/d+8/5*a^4*sec(d*x+c)^(5/2)*sin(d*x+c)
/d+2/7*a^4*sec(d*x+c)^(7/2)*sin(d*x+c)/d+64/5*a^4*sin(d*x+c)*sec(d*x+c)^(1/
2)/d-64/5*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin
(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+136/21*a^4*(co
s(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2
^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 187, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {3317, 3876, 3856, 2720, 3853, 2719}

$$\begin{aligned}
&\int (a+a\cos(c+dx))^4\sec^{\frac{9}{2}}(c+dx)\,dx\\
&=\frac{2a^4\sin(c+dx)\sec^{\frac{7}{2}}(c+dx)}{7d}+\frac{8a^4\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{5d}\\
&+\frac{94a^4\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{21d}+\frac{64a^4\sin(c+dx)\sqrt{\sec(c+dx)}}{5d}\\
&+\frac{136a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d}\\
&-\frac{64a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}
\end{aligned}$$

```
[In] Int[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^(9/2),x]
```

```
[Out] (-64*a^4*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(
5*d) + (136*a^4*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d
*x]])/(21*d) + (64*a^4*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(5*d) + (94*a^4*Sec
[c + d*x]^(3/2)*Sin[c + d*x])/(21*d) + (8*a^4*Sec[c + d*x]^(5/2)*Sin[c + d*
x])/(5*d) + (2*a^4*Sec[c + d*x]^(7/2)*Sin[c + d*x])/(7*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
```

```
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3876

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^(m_), x_Symbol] :> Int[ExpandTrig[(a + b*csc[e + f*x])^m*(d*csc[e + f
*x])^n, x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 - b^2, 0] && I
GtQ[m, 0] && RationalQ[n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \sqrt{\sec(c+dx)}(a+a\sec(c+dx))^4\,dx \\
&= \int \left(a^4\sqrt{\sec(c+dx)}+4a^4\sec^{\frac{3}{2}}(c+dx)+6a^4\sec^{\frac{5}{2}}(c+dx)+4a^4\sec^{\frac{7}{2}}(c+dx)\right. \\
&\qquad \left.+a^4\sec^{\frac{9}{2}}(c+dx)\right)\,dx \\
&= a^4\int \sqrt{\sec(c+dx)}\,dx+a^4\int \sec^{\frac{9}{2}}(c+dx)\,dx+\left(4a^4\right)\int \sec^{\frac{3}{2}}(c+dx)\,dx \\
&\quad +\left(4a^4\right)\int \sec^{\frac{7}{2}}(c+dx)\,dx+\left(6a^4\right)\int \sec^{\frac{5}{2}}(c+dx)\,dx \\
&= \frac{8a^4\sqrt{\sec(c+dx)}\sin(c+dx)}{d}+\frac{4a^4\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{d} \\
&\quad +\frac{8a^4\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{2a^4\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d} \\
&\quad +\frac{1}{7}\left(5a^4\right)\int \sec^{\frac{5}{2}}(c+dx)\,dx+\left(2a^4\right)\int \sqrt{\sec(c+dx)}\,dx \\
&\quad +\frac{1}{5}\left(12a^4\right)\int \sec^{\frac{3}{2}}(c+dx)\,dx-\left(4a^4\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx \\
&\quad +\left(a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx
\end{aligned}$$

$$= \frac{2a^4\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} + \frac{64a^4\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} + \frac{94a^4\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d} + \frac{8a^4\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a^4\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{1}{21}(5a^4)\int\sqrt{\sec(c+dx)}\,dx - \frac{1}{5}(12a^4)\int\frac{1}{\sqrt{\sec(c+dx)}}\,dx + \left(2a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx - \left(4a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx$$

$$= -\frac{8a^4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{6a^4\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} + \frac{64a^4\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} + \frac{94a^4\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d} + \frac{8a^4\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a^4\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{1}{21}\left(5a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx - \frac{1}{5}\left(12a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx$$

$$= -\frac{64a^4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{136a^4\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} + \frac{64a^4\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} + \frac{94a^4\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d} + \frac{8a^4\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a^4\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 2.67 (sec) , antiderivative size = 271, normalized size of antiderivative = 1.45

$$\int (a+a\cos(c+dx))^4 \sec^{\frac{9}{2}}(c+dx)\,dx$$
$$=\frac{a^4(1+\cos(c+dx))^4\sec^8\left(\frac{1}{2}(c+dx)\right)\left(-\frac{4i\sqrt{2}e^{-i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(168\left(1+e^{2i(c+dx)}\right)+168\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hyperge}\right.}{}\right.}{}$$

[In] Integrate[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^(9/2),x]

[Out] (a^4*(1 + Cos[c + d*x])^4*Sec[(c + d*x)/2]^8*(((-4*I)*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)))]*(168*(1 + E^((2*I)*(c + d*x))) + 168*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x))] + 85*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/(E^(I*(c + d*x))*(-1 + E^((2*I)*c))) + Sqrt[Sec[c + d*x]]*(672*Cos[d*x]*Csc[c] + (235 + 84*Sec[c + d*x] + 15*Sec[c + d*x]^2)*Tan[c + d*x])))/(840*d)

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 438 vs. 2(211) = 422.

Time = 202.27 (sec) , antiderivative size = 439, normalized size of antiderivative = 2.35

method	result
default	$-\frac{32\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^4\left(\frac{253\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{420\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}-\frac{47\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-}}{672(c}\right.}{}$
parts	Expression too large to display

[In] int((a+cos(d*x+c)*a)^4*sec(d*x+c)^(9/2),x,method=_RETURNVERBOSE)

[Out] -32*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^4*(253/420*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-47/672*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^2-4/5*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)/(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)-2/5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c

```
*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-El
lipticE(cos(1/2*d*x+1/2*c),2^(1/2)))-1/80*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*
x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^3-1/896*c
os(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos
(1/2*d*x+1/2*c)^2-1/2)^4)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/
2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 215, normalized size of antiderivative = 1.15

$$\int (a + a\cos(c + dx))^4 \sec^{\frac{9}{2}}(c + dx)\, dx =$$

$$-\frac{2\left(170i\sqrt{2}a^4\cos\left(dx+c\right)^3\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\sin\left(dx+c\right))-170i\sqrt{2}a^4\cos\left(d\right.\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^(9/2),x, algorithm="fricas")
```

```
[Out] -2/105*(170*I*sqrt(2)*a^4*cos(d*x + c)^3*weierstrassPInverse(-4, 0, cos(d*x
 + c) + I*sin(d*x + c)) - 170*I*sqrt(2)*a^4*cos(d*x + c)^3*weierstrassPInve
rse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 336*I*sqrt(2)*a^4*cos(d*x + c)^
3*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*
x + c))) - 336*I*sqrt(2)*a^4*cos(d*x + c)^3*weierstrassZeta(-4, 0, weierstr
assPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (672*a^4*cos(d*x + c)^
3 + 235*a^4*cos(d*x + c)^2 + 84*a^4*cos(d*x + c) + 15*a^4)*sin(d*x + c)/sqr
t(cos(d*x + c)))/(d*cos(d*x + c)^3)
```

Sympy [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^4 \sec^{\frac{9}{2}}(c + dx)\, dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**4*sec(d*x+c)**(9/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (a+a\cos(c+dx))^4\sec^{\frac{9}{2}}(c+dx)\,dx = \int (a\cos(dx+c)+a)^4\sec(dx+c)^{\frac{9}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^(9/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^4*sec(d*x + c)^(9/2), x)
```

Giac [F]

$$\int (a+a\cos(c+dx))^4\sec^{\frac{9}{2}}(c+dx)\,dx = \int (a\cos(dx+c)+a)^4\sec(dx+c)^{\frac{9}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^(9/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^4*sec(d*x + c)^(9/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^4\sec^{\frac{9}{2}}(c+dx)\,dx = \int \left(\frac{1}{\cos(c+d\,x)}\right)^{9/2}(a+a\,\cos(c+d\,x))^4\,dx$$

```
[In] int((1/cos(c + d*x))^(9/2)*(a + a*cos(c + d*x))^4,x)
[Out] int((1/cos(c + d*x))^(9/2)*(a + a*cos(c + d*x))^4, x)
```

3.312 $\int (a+a\cos(c+dx))^4 \sec^{\frac{7}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 161

$$\begin{aligned}\int (a+a\cos(c+dx))^4 \sec^{\frac{7}{2}}(c+dx)\,dx &= -\frac{56a^4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} \\ &\quad+\frac{32a^4\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\ &\quad+\frac{66a^4\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} \\ &\quad+\frac{8a^4\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}+\frac{2a^4\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}\end{aligned}$$

```
[Out] 8/3*a^4*sec(d*x+c)^(3/2)*sin(d*x+c)/d+2/5*a^4*sec(d*x+c)^(5/2)*sin(d*x+c)/d
+66/5*a^4*sin(d*x+c)*sec(d*x+c)^(1/2)/d-56/5*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/
2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2
)*sec(d*x+c)^(1/2)/d+32/3*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*
c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/
d
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {3317, 3876, 3856, 2719, 2720, 3853}

$$\int (a+a\cos(c+dx))^4\sec^{\frac{7}{2}}(c+dx)\,dx$$
$$=\frac{2a^4\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{5d}+\frac{8a^4\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3d}+\frac{66a^4\sin(c+dx)\sqrt{\sec(c+dx)}}{5d}+\frac{32a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}-\frac{56a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}$$

```
[In] Int[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^(7/2),x]
```

```
[Out] (-56*a^4*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(
5*d) + (32*a^4*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*
x]])/(3*d) + (66*a^4*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(5*d) + (8*a^4*Sec[c
+ d*x]^(3/2)*Sin[c + d*x])/(3*d) + (2*a^4*Sec[c + d*x]^(5/2)*Sin[c + d*x])/
(5*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
```

```
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3876

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^(m_), x_Symbol] :> Int[ExpandTrig[(a + b*csc[e + f*x])^m*(d*csc[e + f
*x])^n, x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 - b^2, 0] && I
GtQ[m, 0] && RationalQ[n]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \frac{(a+a\sec(c+dx))^4}{\sqrt{\sec(c+dx)}}\,dx\\
&= \int \left(\frac{a^4}{\sqrt{\sec(c+dx)}} + 4a^4\sqrt{\sec(c+dx)} + 6a^4\sec^{\frac{3}{2}}(c+dx) + 4a^4\sec^{\frac{5}{2}}(c+dx) + a^4\sec^{\frac{7}{2}}(c+dx)\right)dx\\
&= a^4\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + a^4\int \sec^{\frac{7}{2}}(c+dx)\,dx + \left(4a^4\right)\int \sqrt{\sec(c+dx)}\,dx\\
&\quad + \left(4a^4\right)\int \sec^{\frac{5}{2}}(c+dx)\,dx + \left(6a^4\right)\int \sec^{\frac{3}{2}}(c+dx)\,dx\\
&= \frac{12a^4\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{8a^4\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}\\
&\quad + \frac{2a^4\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{1}{5}\left(3a^4\right)\int \sec^{\frac{3}{2}}(c+dx)\,dx\\
&\quad + \frac{1}{3}\left(4a^4\right)\int \sqrt{\sec(c+dx)}\,dx - \left(6a^4\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx\\
&\quad + \left(a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx\\
&\quad + \left(4a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{2a^4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} \\
&+ \frac{8a^4\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} \\
&+ \frac{66a^4\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} + \frac{8a^4\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} \\
&+ \frac{2a^4\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} - \frac{1}{5}(3a^4)\int\frac{1}{\sqrt{\sec(c+dx)}}\,dx \\
&+ \frac{1}{3}\left(4a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&- \left(6a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx \\
&= -\frac{10a^4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} \\
&+ \frac{32a^4\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\
&+ \frac{66a^4\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} \\
&+ \frac{8a^4\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{2a^4\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} \\
&- \frac{1}{5}\left(3a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx \\
&= -\frac{56a^4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} \\
&+ \frac{32a^4\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\
&+ \frac{66a^4\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} \\
&+ \frac{8a^4\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{2a^4\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 3.66 (sec) , antiderivative size = 278, normalized size of antiderivative = 1.73

$$
\int(a+a\cos(c+dx))^4\sec^{\frac{7}{2}}(c+dx)\,dx
$$

$$
= \frac{a^4(1+\cos(c+dx))^4\sec^8\left(\frac{1}{2}(c+dx)\right)\left(-\frac{8i\sqrt{2}e^{-i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(21\left(1+e^{2i(c+dx)}\right)+21\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeon}\right.}{}\right.}{}
$$

[In] Integrate[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^(7/2),x]

[Out] (a^4*(1 + Cos[c + d*x])^4*Sec[(c + d*x)/2]^8*(((-8*I)*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)))]*(21*(1 + E^((2*I)*(c + d*x))) + 21*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x))] + 20*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/(E^(I*(c + d*x))*(-1 + E^((2*I)*c))) + Sqrt[Sec[c + d*x]]*(-3*(-61 + 5*Cos[2*c])*Cos[d*x]*Csc[c] + 30*Cos[c]*Sin[d*x] + 2*(20 + 3*Sec[c + d*x])*Tan[c + d*x])))/(240*d)

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 385 vs. 2(189) = 378.

Time = 202.29 (sec) , antiderivative size = 386, normalized size of antiderivative = 2.40

method	result
default	$-\frac{32\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,a^4\left(\frac{41\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{60\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}-\frac{7\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}}{}\right.}{}$
parts	Expression too large to display

[In] int((a+cos(d*x+c)*a)^4*sec(d*x+c)^(7/2),x,method=_RETURNVERBOSE)

[Out] -32*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^4*(41/60*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-7/20*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))-1/24*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^2-33/40*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)/(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)-1/320*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^3)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.25

$$\int (a+a\cos(c+dx))^4\sec^{\frac{7}{2}}(c+dx)\,dx =$$

$$-\frac{2\left(40i\sqrt{2}a^4\cos(dx+c)^2\,\mathrm{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))-40i\sqrt{2}a^4\cos(dx+\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] -2/15*(40*I*sqrt(2)*a^4*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x +
 c) + I*sin(d*x + c)) - 40*I*sqrt(2)*a^4*cos(d*x + c)^2*weierstrassPInverse
(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 42*I*sqrt(2)*a^4*cos(d*x + c)^2*we
ierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x +
c))) - 42*I*sqrt(2)*a^4*cos(d*x + c)^2*weierstrassZeta(-4, 0, weierstrassPI
nverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (99*a^4*cos(d*x + c)^2 + 20
*a^4*cos(d*x + c) + 3*a^4)*sin(d*x + c)/sqrt(cos(d*x + c)))/(d*cos(d*x + c)
^2)
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^4\sec^{\frac{7}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**4*sec(d*x+c)**(7/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (a+a\cos(c+dx))^4\sec^{\frac{7}{2}}(c+dx)\,dx = \int (a\cos(dx+c)+a)^4\sec(dx+c)^{\frac{7}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^(7/2),x, algorithm="maxima")
```

```
[Out] integrate((a*cos(d*x + c) + a)^4*sec(d*x + c)^(7/2), x)
```

Giac [F]

$$\int (a + a\cos(c + dx))^4 \sec^{\frac{7}{2}}(c + dx)\,dx = \int (a\cos(dx + c) + a)^4 \sec(dx + c)^{\frac{7}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^(7/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^4*sec(d*x + c)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^4 \sec^{\frac{7}{2}}(c + dx)\,dx = \int \left(\frac{1}{\cos(c + d\,x)}\right)^{7/2} (a + a\,\cos(c + d\,x))^4\,dx$$

```
[In] int((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))^4,x)
[Out] int((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))^4, x)
```

3.313 $\int (a+a\cos(c+dx))^4 \sec^{\frac{5}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 118

$$\int (a+a\cos(c+dx))^4 \sec^{\frac{5}{2}}(c+dx)\,dx = \frac{40a^4\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2a^4\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{8a^4\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{2a^4\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}$$

```
[Out] 2/3*a^4*sec(d*x+c)^(3/2)*sin(d*x+c)/d+2/3*a^4*sin(d*x+c)/d/sec(d*x+c)^(1/2)
+8*a^4*sin(d*x+c)*sec(d*x+c)^(1/2)/d+40/3*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/
cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*s
ec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {3317, 3876, 3854, 3856, 2720, 2719, 3853}

$$\int (a+a\cos(c+dx))^4 \sec^{\frac{5}{2}}(c+dx)\,dx = \frac{2a^4\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3d} + \frac{8a^4\sin(c+dx)\sqrt{\sec(c+dx)}}{d} + \frac{2a^4\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{40a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}$$

```
[In] Int[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^(5/2),x]
```

```
[Out] (40*a^4*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3
*d) + (2*a^4*Sin[c + d*x])/(3*d*Sqrt[Sec[c + d*x]]) + (8*a^4*Sqrt[Sec[c + d
*x]]*Sin[c + d*x])/d + (2*a^4*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(3*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3876

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^(m_), x_Symbol] :> Int[ExpandTrig[(a + b*csc[e + f*x])^m*(d*csc[e + f
*x])^n, x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 - b^2, 0] && I
GtQ[m, 0] && RationalQ[n]
```

Rubi steps

$$\text{integral} = \int \frac{(a + a\sec(c+dx))^4}{\sec^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \int \left(\frac{a^4}{\sec^{\frac{3}{2}}(c+dx)} + \frac{4a^4}{\sqrt{\sec(c+dx)}} + 6a^4\sqrt{\sec(c+dx)} + 4a^4\sec^{\frac{3}{2}}(c+dx) + a^4\sec^{\frac{5}{2}}(c+dx)\right)dx$$

$$= a^4\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx + a^4\int \sec^{\frac{5}{2}}(c+dx)\,dx + (4a^4)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + (4a^4)\int \sec^{\frac{3}{2}}(c+dx)\,dx + (6a^4)\int \sqrt{\sec(c+dx)}\,dx$$

$$= \frac{2a^4\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{8a^4\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{2a^4\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + 2\left(\frac{1}{3}a^4\int \sqrt{\sec(c+dx)}\,dx\right) - (4a^4)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + \left(4a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx + \left(6a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{8a^4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{12a^4\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a^4\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{8a^4\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{2a^4\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + 2\left(\frac{1}{3}\left(a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\right) - \left(4a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx$$

$$= \frac{40a^4\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2a^4\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{8a^4\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{2a^4\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}$$

Mathematica [A] (verified)

Time = 2.18 (sec) , antiderivative size = 70, normalized size of antiderivative = 0.59

$$\int (a + a\cos(c + dx))^4 \sec^{\frac{5}{2}}(c + dx)\, dx$$
$$= \frac{a^4 \sec^{\frac{3}{2}}(c + dx) \left(80 \cos^{\frac{3}{2}}(c + dx) \operatorname{EllipticF}\left(\frac{1}{2}(c + dx), 2\right) + 5\sin(c + dx) + 24\sin(2(c + dx)) + \sin(3(c + \right.}{6d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^(5/2),x]
```

```
[Out] (a^4*Sec[c + d*x]^(3/2)*(80*Cos[c + d*x]^(3/2)*EllipticF[(c + d*x)/2, 2] +
5*Sin[c + d*x] + 24*Sin[2*(c + d*x)] + Sin[3*(c + d*x)]))/(6*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 291 vs. 2(128) = 256.

Time = 202.99 (sec) , antiderivative size = 292, normalized size of antiderivative = 2.47

method	result
default	$\frac{8\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\, a^4 \left(2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-14\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+10\sqrt{\frac{1}{2}-\frac{\cos(dx+}{2}}\right.}{3\left(4\left(\sin^4\right.\right.}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*a)^4*sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 8/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^4/(4*sin(1/
2*d*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)/sin(1/2*d*x+1/2*c)^3*(2*cos(1/2*d*
x+1/2*c)*sin(1/2*d*x+1/2*c)^6-14*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+10
*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(co
s(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2+7*sin(1/2*d*x+1/2*c)^2*cos(1
/2*d*x+1/2*c)-5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/
2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*
d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.03

$$\int (a + a\cos(c + dx))^4 \sec^{\frac{5}{2}}(c + dx)\, dx =$$
$$-\frac{2\left(10i\sqrt{2}a^4\cos(dx + c)\,\text{weierstrassPInverse}(-4, 0, \cos(dx + c) + i\sin(dx + c)) - 10i\sqrt{2}a^4\cos(dx + c\right.}{3\,d\cos(dx}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] -2/3*(10*I*sqrt(2)*a^4*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c)
 + I*sin(d*x + c)) - 10*I*sqrt(2)*a^4*cos(d*x + c)*weierstrassPInverse(-4,
0, cos(d*x + c) - I*sin(d*x + c)) - (a^4*cos(d*x + c)^2 + 12*a^4*cos(d*x +
c) + a^4)*sin(d*x + c)/sqrt(cos(d*x + c)))/(d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^4 \sec^{\frac{5}{2}}(c + dx)\, dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**4*sec(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (a + a\cos(c + dx))^4 \sec^{\frac{5}{2}}(c + dx)\, dx = \int (a\cos(dx + c) + a)^4 \sec(dx + c)^{\frac{5}{2}}\, dx$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((a*cos(d*x + c) + a)^4*sec(d*x + c)^(5/2), x)
```

Giac [F]

$$\int (a + a\cos(c + dx))^4 \sec^{\frac{5}{2}}(c + dx)\,dx = \int (a\cos(dx + c) + a)^4 \sec(dx + c)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^4*sec(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^4 \sec^{\frac{5}{2}}(c + dx)\,dx = \int \left(\frac{1}{\cos(c + d\,x)}\right)^{5/2} (a + a\,\cos(c + d\,x))^4\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^4,x)
[Out] int((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^4, x)
```

3.314 $\int (a+a\cos(c+dx))^4 \sec^{\frac{3}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 159

$$\int (a+a\cos(c+dx))^4 \sec^{\frac{3}{2}}(c+dx)\,dx = \frac{56a^4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{32a^4\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2a^4\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{8a^4\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{2a^4\sqrt{\sec(c+dx)}\sin(c+dx)}{d}$$

```
[Out] 2/5*a^4*sin(d*x+c)/d/sec(d*x+c)^(3/2)+8/3*a^4*sin(d*x+c)/d/sec(d*x+c)^(1/2)
+2*a^4*sin(d*x+c)*sec(d*x+c)^(1/2)/d+56/5*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/
cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*s
ec(d*x+c)^(1/2)/d+32/3*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*
EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 159, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used

= {3317, 3876, 3854, 3856, 2719, 2720, 3853}

$$\int (a+a\cos(c+dx))^4\sec^{\frac{3}{2}}(c+dx)\,dx$$
$$=\frac{2a^4\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)}+\frac{2a^4\sin(c+dx)\sqrt{\sec(c+dx)}}{d}+\frac{8a^4\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}+\frac{32a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{56a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}$$

```
[In] Int[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^(3/2),x]
```

```
[Out] (56*a^4*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(5
*d) + (32*a^4*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x
]])/(3*d) + (2*a^4*Sin[c + d*x])/(5*d*Sec[c + d*x]^(3/2)) + (8*a^4*Sin[c +
d*x])/(3*d*Sqrt[Sec[c + d*x]]) + (2*a^4*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/d
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
```

```
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3876

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^(m_), x_Symbol] :> Int[ExpandTrig[(a + b*csc[e + f*x])^m*(d*csc[e + f
*x])^n, x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 - b^2, 0] && I
GtQ[m, 0] && RationalQ[n]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \frac{(a+a\sec(c+dx))^4}{\sec^{\frac{5}{2}}(c+dx)}\,dx\\
&= \int \left(\frac{a^4}{\sec^{\frac{5}{2}}(c+dx)}+\frac{4a^4}{\sec^{\frac{3}{2}}(c+dx)}+\frac{6a^4}{\sqrt{\sec(c+dx)}}+4a^4\sqrt{\sec(c+dx)}+a^4\sec^{\frac{3}{2}}(c+dx)\right)dx\\
&= a^4\int \frac{1}{\sec^{\frac{5}{2}}(c+dx)}\,dx+a^4\int \sec^{\frac{3}{2}}(c+dx)\,dx+\left(4a^4\right)\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx\\
&\quad+\left(4a^4\right)\int \sqrt{\sec(c+dx)}\,dx+\left(6a^4\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx\\
&= \frac{2a^4\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)}+\frac{8a^4\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}\\
&\quad+\frac{2a^4\sqrt{\sec(c+dx)}\sin(c+dx)}{d}+\frac{1}{5}\left(3a^4\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx\\
&\quad-a^4\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx+\frac{1}{3}\left(4a^4\right)\int \sqrt{\sec(c+dx)}\,dx\\
&\quad+\left(4a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\\
&\quad+\left(6a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{12a^4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} \\
&+ \frac{8a^4\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} \\
&+ \frac{2a^4\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{8a^4\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{2a^4\sqrt{\sec(c+dx)}\sin(c+dx)}{d} \\
&+ \frac{1}{5}\left(3a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx \\
&- \left(a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx \\
&+ \frac{1}{3}\left(4a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{56a^4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} \\
&+ \frac{32a^4\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\
&+ \frac{2a^4\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{8a^4\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{2a^4\sqrt{\sec(c+dx)}\sin(c+dx)}{d}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 3.03 (sec) , antiderivative size = 150, normalized size of antiderivative = 0.94

$$
\int(a+a\cos(c+dx))^4\sec^{\frac{3}{2}}(c+dx)\,dx
= \frac{a^4\left(-336i+\frac{672i\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)}{\sqrt{1+e^{2i(c+dx)}}}-320i\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2i(c+dx)}\right)\right.}{30d\sqrt{\sec(c+dx)}}
$$

```
[In] Integrate[(a + a*Cos[c + d*x])^4*Sec[c + d*x]^(3/2),x]
```

```
[Out] (a^4*(-336*I + ((672*I)*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*
x))])/Sqrt[1 + E^((2*I)*(c + d*x))] - (320*I)*Sqrt[1 + E^((2*I)*(c + d*x))]
*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]*Sec[c + d*x] + 80*S
in[c + d*x] + 3*Sec[c + d*x]*Sin[3*(c + d*x)] + 63*Tan[c + d*x]))/(30*d*Sqr
t[Sec[c + d*x]])
```

Maple [A] (verified)

Time = 10.71 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.22

method	result
default	$\frac{8a^4\left(6\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-26\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+19\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-20\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}\right.\right.}}{15\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*a)^4*sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 8/15*a^4*(6*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6-26*sin(1/2*d*x+1/2*c)^4
*cos(1/2*d*x+1/2*c)+19*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-20*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+
1/2*c),2^(1/2))+21*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^
(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*
d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.02

$$\int (a+a\cos(c+dx))^4\sec^{\frac{3}{2}}(c+dx)\,dx =$$

$$-\frac{2\left(40i\sqrt{2}a^4\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))-40i\sqrt{2}a^4\text{weierstrassPInverse}(-4\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] -2/15*(40*I*sqrt(2)*a^4*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x
 + c)) - 40*I*sqrt(2)*a^4*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d
*x + c)) - 42*I*sqrt(2)*a^4*weierstrassZeta(-4, 0, weierstrassPInverse(-4,
0, cos(d*x + c) + I*sin(d*x + c))) + 42*I*sqrt(2)*a^4*weierstrassZeta(-4, 0
, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (3*a^4*cos(d
*x + c)^2 + 20*a^4*cos(d*x + c) + 15*a^4)*sin(d*x + c)/sqrt(cos(d*x + c)))/
d
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^4\sec^{\frac{3}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**4*sec(d*x+c)**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+a\cos(c+dx))^4\sec^{\frac{3}{2}}(c+dx)\,dx = \int (a\cos(dx+c)+a)^4\sec(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^4*sec(d*x + c)^(3/2), x)
```

Giac [F]

$$\int (a+a\cos(c+dx))^4\sec^{\frac{3}{2}}(c+dx)\,dx = \int (a\cos(dx+c)+a)^4\sec(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^4*sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^4\sec^{\frac{3}{2}}(c+dx)\,dx = \int \left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}(a+a\,\cos(c+d\,x))^4\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^4,x)
[Out] int((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^4, x)
```

3.315 $\int (a+a\cos(c+dx))^4\sqrt{\sec(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 161

$$\int (a+a\cos(c+dx))^4\sqrt{\sec(c+dx)}\,dx = \frac{64a^4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{136a^4\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} + \frac{2a^4\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{8a^4\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{94a^4\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}$$

```
[Out] 2/7*a^4*sin(d*x+c)/d/sec(d*x+c)^(5/2)+8/5*a^4*sin(d*x+c)/d/sec(d*x+c)^(3/2)
+94/21*a^4*sin(d*x+c)/d/sec(d*x+c)^(1/2)+64/5*a^4*(cos(1/2*d*x+1/2*c)^2)^(1
/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/
2)*sec(d*x+c)^(1/2)/d+136/21*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1
/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/
2)/d
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used

$= \{3317, 3876, 3854, 3856, 2720, 2719\}$

$$\int (a + a\cos(c + dx))^4 \sqrt{\sec(c + dx)}\, dx$$
$$= \frac{8a^4 \sin(c + dx)}{5d \sec^{\frac{3}{2}}(c + dx)} + \frac{2a^4 \sin(c + dx)}{7d \sec^{\frac{5}{2}}(c + dx)} + \frac{94a^4 \sin(c + dx)}{21d\sqrt{\sec(c + dx)}}$$
$$+ \frac{136a^4 \sqrt{\cos(c + dx)}\sqrt{\sec(c + dx)}\,\text{EllipticF}\left(\frac{1}{2}(c + dx), 2\right)}{21d}$$
$$+ \frac{64a^4 \sqrt{\cos(c + dx)}\sqrt{\sec(c + dx)}E\left(\frac{1}{2}(c + dx)\middle| 2\right)}{5d}$$

```
[In] Int[(a + a*Cos[c + d*x])^4*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (64*a^4*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(5
*d) + (136*a^4*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*
x]])/(21*d) + (2*a^4*Sin[c + d*x])/(7*d*Sec[c + d*x]^(5/2)) + (8*a^4*Sin[c
+ d*x])/(5*d*Sec[c + d*x]^(3/2)) + (94*a^4*Sin[c + d*x])/(21*d*Sqrt[Sec[c +
 d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

```
EqQ[n^2, 1/4]
```

Rule 3876

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^(m_), x_Symbol] :> Int[ExpandTrig[(a + b*csc[e + f*x])^m*(d*csc[e + f
*x])^n, x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 - b^2, 0] && I
GtQ[m, 0] && RationalQ[n]
```

Rubi steps

$$\text{integral} = \int \frac{(a+a\sec(c+dx))^4}{\sec^{\frac{7}{2}}(c+dx)}\,dx$$

$$= \int \left(\frac{a^4}{\sec^{\frac{7}{2}}(c+dx)} + \frac{4a^4}{\sec^{\frac{5}{2}}(c+dx)} + \frac{6a^4}{\sec^{\frac{3}{2}}(c+dx)} + \frac{4a^4}{\sqrt{\sec(c+dx)}} + a^4\sqrt{\sec(c+dx)}\right)dx$$

$$= a^4\int \frac{1}{\sec^{\frac{7}{2}}(c+dx)}\,dx + a^4\int \sqrt{\sec(c+dx)}\,dx + \left(4a^4\right)\int \frac{1}{\sec^{\frac{5}{2}}(c+dx)}\,dx + \left(4a^4\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + \left(6a^4\right)\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \frac{2a^4\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{8a^4\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{4a^4\sin(c+dx)}{d\sqrt{\sec(c+dx)}} + \frac{1}{7}\left(5a^4\right)\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx + \left(2a^4\right)\int \sqrt{\sec(c+dx)}\,dx + \frac{1}{5}\left(12a^4\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + \left(a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx + \left(4a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx$$

$$= \frac{8a^4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a^4\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a^4\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{8a^4\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{94a^4\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{1}{21}\left(5a^4\right)\int \sqrt{\sec(c+dx)}\,dx + \left(2a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx + \frac{1}{5}\left(12a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx$$

$$= \frac{64a^4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{6a^4\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a^4\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{8a^4\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{94a^4\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{1}{21}\left(5a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}dx$$

$$= \frac{64a^4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{136a^4\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} + \frac{2a^4\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{8a^4\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{94a^4\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 3.03 (sec) , antiderivative size = 146, normalized size of antiderivative = 0.91

$$\int(a+a\cos(c+dx))^4\sqrt{\sec(c+dx)}\,dx = \frac{a^4\left(-5376i+\frac{10752i\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)}{\sqrt{1+e^{2i(c+dx)}}}-2720i\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},-e\right.\right.}{420d\sqrt{\sec(c+dx)}}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^4*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (a^4*(-5376*I + ((10752*I)*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c +
 d*x))])/Sqrt[1 + E^((2*I)*(c + d*x))] - (2720*I)*Sqrt[1 + E^((2*I)*(c + d*
x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]*Sec[c + d*x] +
1910*Sin[c + d*x] + 336*Sin[2*(c + d*x)] + 30*Sin[3*(c + d*x)]))/(420*d*Sqr
t[Sec[c + d*x]])
```

Maple [A] (verified)

Time = 11.15 (sec) , antiderivative size = 272, normalized size of antiderivative = 1.69

method	result
default	$-\frac{8\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\, a^4\left(60\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-258\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+448\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.}{105\sqrt{-2\left(\sin^4\right.}}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*a)^4*sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -8/105*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^4*(60*cos(
1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8-258*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*
c)^6+448*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-167*sin(1/2*d*x+1/2*c)^2*c
os(1/2*d*x+1/2*c)+85*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1
)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-168*(sin(1/2*d*x+1/2*c)^2)^(1
/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))
/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2
*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.06

$$\int (a+a\cos(c+dx))^4\sqrt{\sec(c+dx)}\,dx =$$

$$-\frac{2\left(170i\sqrt{2}a^4\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))-170i\sqrt{2}a^4\text{weierstrassPInverse}(\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] -2/105*(170*I*sqrt(2)*a^4*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d
*x + c)) - 170*I*sqrt(2)*a^4*weierstrassPInverse(-4, 0, cos(d*x + c) - I*si
n(d*x + c)) - 336*I*sqrt(2)*a^4*weierstrassZeta(-4, 0, weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 336*I*sqrt(2)*a^4*weierstrassZeta(
-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (15*a^4
*cos(d*x + c)^3 + 84*a^4*cos(d*x + c)^2 + 235*a^4*cos(d*x + c))*sin(d*x + c
)/sqrt(cos(d*x + c)))/d
```

Sympy [F]

$$\int (a + a\cos(c + dx))^4 \sqrt{\sec(c + dx)}\, dx = a^4 \left(\int 4\cos(c + dx)\sqrt{\sec(c + dx)}\, dx + \int 6\cos^2(c + dx)\sqrt{\sec(c + dx)}\, dx + \int 4\cos^3(c + dx)\sqrt{\sec(c + dx)}\, dx + \int \cos^4(c + dx)\sqrt{\sec(c + dx)}\, dx + \int \sqrt{\sec(c + dx)}\, dx \right)$$

```
[In] integrate((a+a*cos(d*x+c))**4*sec(d*x+c)**(1/2),x)
[Out] a**4*(Integral(4*cos(c + d*x)*sqrt(sec(c + d*x)), x) + Integral(6*cos(c + d
*x)**2*sqrt(sec(c + d*x)), x) + Integral(4*cos(c + d*x)**3*sqrt(sec(c + d*x
)), x) + Integral(cos(c + d*x)**4*sqrt(sec(c + d*x)), x) + Integral(sqrt(se
c(c + d*x)), x))
```

Maxima [F]

$$\int (a + a\cos(c + dx))^4 \sqrt{\sec(c + dx)}\, dx = \int (a\cos(dx + c) + a)^4 \sqrt{\sec(dx + c)}\, dx$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^4*sqrt(sec(d*x + c)), x)
```

Giac [F]

$$\int (a + a\cos(c + dx))^4 \sqrt{\sec(c + dx)}\, dx = \int (a\cos(dx + c) + a)^4 \sqrt{\sec(dx + c)}\, dx$$

```
[In] integrate((a+a*cos(d*x+c))^4*sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^4*sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^4\sqrt{\sec(c+dx)}\,dx=\int \sqrt{\frac{1}{\cos\left(c+d\,x\right)}}\,{\left(a+a\,\cos\left(c+d\,x\right)\right)}^4\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^4,x)
[Out] int((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^4, x)
```

3.316 $\int \frac{(a+a\cos(c+dx))^4}{\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 187

$$\begin{aligned}\int \frac{(a+a\cos(c+dx))^4}{\sqrt{\sec(c+dx)}}\,dx &= \frac{152a^4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{15d} \\ &\quad+\frac{32a^4\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{7d} \\ &\quad+\frac{2a^4\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)}+\frac{8a^4\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} \\ &\quad+\frac{122a^4\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)}+\frac{32a^4\sin(c+dx)}{7d\sqrt{\sec(c+dx)}}\end{aligned}$$

```
[Out] 2/9*a^4*sin(d*x+c)/d/sec(d*x+c)^(7/2)+8/7*a^4*sin(d*x+c)/d/sec(d*x+c)^(5/2)
+122/45*a^4*sin(d*x+c)/d/sec(d*x+c)^(3/2)+32/7*a^4*sin(d*x+c)/d/sec(d*x+c)^
(1/2)+152/15*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(
sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+32/7*a^4*(c
os(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),
2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 187, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used

$= \{3317, 3876, 3854, 3856, 2719, 2720\}$

$$\int \frac{(a+a\cos(c+dx))^4}{\sqrt{\sec(c+dx)}}\,dx = \frac{122a^4\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)} + \frac{8a^4\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{2a^4\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)} + \frac{32a^4\sin(c+dx)}{7d\sqrt{\sec(c+dx)}} + \frac{32a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{7d} + \frac{152a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{15d}$$

```
[In] Int[(a + a*Cos[c + d*x])^4/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (152*a^4*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(
15*d) + (32*a^4*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d
*x]])/(7*d) + (2*a^4*Sin[c + d*x])/(9*d*Sec[c + d*x]^(7/2)) + (8*a^4*Sin[c
+ d*x])/(7*d*Sec[c + d*x]^(5/2)) + (122*a^4*Sin[c + d*x])/(45*d*Sec[c + d*x
]^(3/2)) + (32*a^4*Sin[c + d*x])/(7*d*Sqrt[Sec[c + d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

```
EqQ[n^2, 1/4]
```

Rule 3876

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^(m_), x_Symbol] :> Int[ExpandTrig[(a + b*csc[e + f*x])^m*(d*csc[e + f
*x])^n, x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 - b^2, 0] && I
GtQ[m, 0] && RationalQ[n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \frac{(a+a\sec(c+dx))^4}{\sec^{\frac{9}{2}}(c+dx)}\,dx\\
&= \int \left(\frac{a^4}{\sec^{\frac{9}{2}}(c+dx)}+\frac{4a^4}{\sec^{\frac{7}{2}}(c+dx)}+\frac{6a^4}{\sec^{\frac{5}{2}}(c+dx)}+\frac{4a^4}{\sec^{\frac{3}{2}}(c+dx)}+\frac{a^4}{\sqrt{\sec(c+dx)}}\right)dx\\
&= a^4\int \frac{1}{\sec^{\frac{9}{2}}(c+dx)}\,dx+a^4\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx+\left(4a^4\right)\int \frac{1}{\sec^{\frac{7}{2}}(c+dx)}\,dx\\
&\quad+\left(4a^4\right)\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx+\left(6a^4\right)\int \frac{1}{\sec^{\frac{5}{2}}(c+dx)}\,dx\\
&= \frac{2a^4\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)}+\frac{8a^4\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)}+\frac{12a^4\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)}+\frac{8a^4\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}\\
&\quad+\frac{1}{9}\left(7a^4\right)\int \frac{1}{\sec^{\frac{5}{2}}(c+dx)}\,dx+\frac{1}{3}\left(4a^4\right)\int \sqrt{\sec(c+dx)}\,dx\\
&\quad+\frac{1}{7}\left(20a^4\right)\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx+\frac{1}{5}\left(18a^4\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx\\
&\quad+\left(a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx\\
&= \frac{2a^4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d}+\frac{2a^4\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)}\\
&\quad+\frac{8a^4\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)}+\frac{122a^4\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)}+\frac{32a^4\sin(c+dx)}{7d\sqrt{\sec(c+dx)}}\\
&\quad+\frac{1}{15}\left(7a^4\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx+\frac{1}{21}\left(20a^4\right)\int \sqrt{\sec(c+dx)}\,dx\\
&\quad+\frac{1}{3}\left(4a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\\
&\quad+\frac{1}{5}\left(18a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx
\end{aligned}$$

$$= \frac{46a^4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{8a^4\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2a^4\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)} + \frac{8a^4\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{122a^4\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)} + \frac{32a^4\sin(c+dx)}{7d\sqrt{\sec(c+dx)}} + \frac{1}{15}\left(7a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx + \frac{1}{21}\left(20a^4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{152a^4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{15d} + \frac{32a^4\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{7d} + \frac{2a^4\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)} + \frac{8a^4\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{122a^4\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)} + \frac{32a^4\sin(c+dx)}{7d\sqrt{\sec(c+dx)}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 3.24 (sec) , antiderivative size = 156, normalized size of antiderivative = 0.83

$$\int\frac{(a+a\cos(c+dx))^4}{\sqrt{\sec(c+dx)}}\,dx$$

$$= \frac{a^4\left(-25536i + \frac{51072i\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)}{\sqrt{1+e^{2i(c+dx)}}} - 11520i\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},-\right.\right.}{2520d\sqrt{\text{se}}}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^4/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (a^4*(-25536*I + ((51072*I)*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c
+ d*x))])/Sqrt[1 + E^((2*I)*(c + d*x))] - (11520*I)*Sqrt[1 + E^((2*I)*(c +
d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]*Sec[c + d*x]
+ 12240*Sin[c + d*x] + 3556*Sin[2*(c + d*x)] + 720*Sin[3*(c + d*x)] + 70*Si
n[4*(c + d*x)]))/(2520*d*Sqrt[Sec[c + d*x]])
```

Maple [A] (verified)

Time = 16.32 (sec) , antiderivative size = 260, normalized size of antiderivative = 1.39

method	result
default	$-\frac{8\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\, a^4\left(280\left(\cos^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-120\left(\cos^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+34\left(\cos^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+72\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right.\right.}{315\sqrt{-2\left(\sin^4\right.}}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*a)^4/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -8/315*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*a^4*(280*cos
(1/2*d*x+1/2*c)^11-120*cos(1/2*d*x+1/2*c)^9+34*cos(1/2*d*x+1/2*c)^7+72*cos(
1/2*d*x+1/2*c)^5-485*cos(1/2*d*x+1/2*c)^3+180*(sin(1/2*d*x+1/2*c)^2)^(1/2)*
(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-399
*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticE(c
os(1/2*d*x+1/2*c),2^(1/2))+219*cos(1/2*d*x+1/2*c))/(-2*sin(1/2*d*x+1/2*c)^4
+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^
(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 183, normalized size of antiderivative = 0.98

$$\int \frac{(a+a\cos(c+dx))^4}{\sqrt{\sec(c+dx)}}\,dx =$$

$$-\frac{2\left(360i\sqrt{2}a^4\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))-360i\sqrt{2}a^4\text{weierstrassPInverse}\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^4/sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] -2/315*(360*I*sqrt(2)*a^4*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d
*x + c)) - 360*I*sqrt(2)*a^4*weierstrassPInverse(-4, 0, cos(d*x + c) - I*si
n(d*x + c)) - 798*I*sqrt(2)*a^4*weierstrassZeta(-4, 0, weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 798*I*sqrt(2)*a^4*weierstrassZeta(
-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - (35*a^4
*cos(d*x + c)^4 + 180*a^4*cos(d*x + c)^3 + 427*a^4*cos(d*x + c)^2 + 720*a^4
*cos(d*x + c))*sin(d*x + c)/sqrt(cos(d*x + c)))/d
```

Sympy [F]

$$\int \frac{(a+a\cos(c+dx))^4}{\sqrt{\sec(c+dx)}}\,dx = a^4\left(\int \frac{4\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx + \int \frac{6\cos^2(c+dx)}{\sqrt{\sec(c+dx)}}\,dx + \int \frac{4\cos^3(c+dx)}{\sqrt{\sec(c+dx)}}\,dx + \int \frac{\cos^4(c+dx)}{\sqrt{\sec(c+dx)}}\,dx + \int \frac{1}{\sqrt{\sec(c+dx)}}\,dx\right)$$

```
[In] integrate((a+a*cos(d*x+c))**4/sec(d*x+c)**(1/2),x)
```

```
[Out] a**4*(Integral(4*cos(c + d*x)/sqrt(sec(c + d*x)), x) + Integral(6*cos(c + d
*x)**2/sqrt(sec(c + d*x)), x) + Integral(4*cos(c + d*x)**3/sqrt(sec(c + d*x
)), x) + Integral(cos(c + d*x)**4/sqrt(sec(c + d*x)), x) + Integral(1/sqrt(
sec(c + d*x)), x))
```

Maxima [F]

$$\int \frac{(a+a\cos(c+dx))^4}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(a\cos(dx+c)+a)^4}{\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^4/sec(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((a*cos(d*x + c) + a)^4/sqrt(sec(d*x + c)), x)
```

Giac [F]

$$\int \frac{(a+a\cos(c+dx))^4}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(a\cos(dx+c)+a)^4}{\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^4/sec(d*x+c)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((a*cos(d*x + c) + a)^4/sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a + a\cos(c + dx))^4}{\sqrt{\sec(c + dx)}}\, dx = \int \frac{(a + a\,\cos(c + d\,x))^4}{\sqrt{\frac{1}{\cos(c+d\,x)}}}\, dx$$

```
[In] int((a + a*cos(c + d*x))^4/(1/cos(c + d*x))^(1/2),x)
[Out] int((a + a*cos(c + d*x))^4/(1/cos(c + d*x))^(1/2), x)
```

3.317 $\int \frac{\sec^{\frac{5}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 164

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{ad} + \frac{5\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3ad} - \frac{3\sqrt{\sec(c+dx)}\sin(c+dx)}{ad} + \frac{5\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3ad} - \frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{d(a+a\sec(c+dx))}$$

```
[Out] 5/3*sec(d*x+c)^(3/2)*sin(d*x+c)/a/d-sec(d*x+c)^(5/2)*sin(d*x+c)/d/(a+a*sec(
d*x+c))-3*sin(d*x+c)*sec(d*x+c)^(1/2)/a/d+3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/co
s(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec
(d*x+c)^(1/2)/a/d+5/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellip
ticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a/d
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 164, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used

$= \{3317, 3903, 3872, 3853, 3856, 2719, 2720\}$

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{d(a\sec(c+dx)+a)} + \frac{5\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3ad} - \frac{3\sin(c+dx)\sqrt{\sec(c+dx)}}{ad} + \frac{5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3ad} + \frac{3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad}$$

```
[In] Int[Sec[c + d*x]^(5/2)/(a + a*Cos[c + d*x]),x]
```

```
[Out] (3*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a*d) +
 (5*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3*a*d
) - (3*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(a*d) + (5*Sec[c + d*x]^(3/2)*Sin[c
 + d*x])/(3*a*d) - (Sec[c + d*x]^(5/2)*Sin[c + d*x])/(d*(a + a*Sec[c + d*x]
))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

```
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3903

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)/(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_)), x_Symbol] :> Simp[d^2*Cot[e + f*x]*((d*Csc[e + f*x])^(n - 2)/(f*(a +
b*Csc[e + f*x]))), x] - Dist[d^2/(a*b), Int[(d*Csc[e + f*x])^(n - 2)*(b*(n
- 2) - a*(n - 1)*Csc[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[
a^2 - b^2, 0] && GtQ[n, 1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \frac{\sec^{\frac{7}{2}}(c+dx)}{a+a\sec(c+dx)}\,dx \\
&= -\frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{d(a+a\sec(c+dx))} - \frac{\int \sec^{\frac{3}{2}}(c+dx)\left(\frac{3a}{2}-\frac{5}{2}a\sec(c+dx)\right)\,dx}{a^2} \\
&= -\frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{d(a+a\sec(c+dx))} - \frac{3\int \sec^{\frac{3}{2}}(c+dx)\,dx}{2a} + \frac{5\int \sec^{\frac{5}{2}}(c+dx)\,dx}{2a} \\
&= -\frac{3\sqrt{\sec(c+dx)}\sin(c+dx)}{ad} + \frac{5\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3ad} \\
&\quad - \frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{d(a+a\sec(c+dx))} + \frac{5\int \sqrt{\sec(c+dx)}\,dx}{6a} + \frac{3\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx}{2a} \\
&= -\frac{3\sqrt{\sec(c+dx)}\sin(c+dx)}{ad} + \frac{5\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3ad} \\
&\quad - \frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{d(a+a\sec(c+dx))} + \frac{\left(5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{6a} \\
&\quad + \frac{\left(3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{2a}
\end{aligned}$$

$$= \frac{3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{ad} + \frac{5\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3ad} - \frac{3\sqrt{\sec(c+dx)}\sin(c+dx)}{ad} + \frac{5\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3ad} - \frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{d(a+a\sec(c+dx))}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 2.51 (sec) , antiderivative size = 285, normalized size of antiderivative = 1.74

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\cos^2\left(\frac{1}{2}(c+dx)\right)\left(\frac{2i\sqrt{2}e^{-i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(9\left(1+e^{2i(c+dx)}\right)+9\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)\right.}{-1+e^{2ic}}\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^(5/2)/(a + a*Cos[c + d*x]),x]
```

```
[Out] (Cos[(c + d*x)/2]^2*(((2*I)*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c +
 d*x)))]*(9*(1 + E^((2*I)*(c + d*x))) + 9*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2
*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x))] - 5
*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeom
etric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/(E^(I*(c + d*x))*(-1 + E^((
2*I)*c))) - Sqrt[Sec[c + d*x]]*(18*Cos[d*x]*Csc[c] + Sec[c + d*x]*(-5*Sec[(
c + d*x)/2]*Sin[(3*(c + d*x))/2] + Tan[(c + d*x)/2]))))/(3*a*d*(1 + Cos[c +
 d*x]))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 412 vs. 2(198) = 396.

Time = 5.17 (sec) , antiderivative size = 413, normalized size of antiderivative = 2.52

method	result
default	$\frac{\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\left(10\cos\left(\frac{dx}{2}+\frac{c}{2}\right)F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\sqrt{\frac{1}{2}-\frac{\cos(dx}{2}}\right.}{}$

```
[In] int(sec(d*x+c)^(5/2)/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)/a/cos(1/2*d*x
+1/2*c)/sin(1/2*d*x+1/2*c)^3/(4*sin(1/2*d*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2
+1)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(10*cos(1/2*d*x+1/
2*c)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*
sin(1/2*d*x+1/2*c)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2-18*cos(1/2*d*x+1/2*c)*El
lipticE(cos(1/2*d*x+1/2*c),2^(1/2))*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2
*d*x+1/2*c)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2-36*sin(1/2*d*x+1/2*c)^6-5*cos(1
/2*d*x+1/2*c)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)
*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+9*cos(1/2*d*x+1/2*c)*(sin(1/2*d*x+1/
2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c)
,2^(1/2))+44*sin(1/2*d*x+1/2*c)^4-11*sin(1/2*d*x+1/2*c)^2)/(2*cos(1/2*d*x+1
/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.51

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx =$$

$$-\frac{5\left(i\sqrt{2}\cos\left(dx+c\right)^2+i\sqrt{2}\cos\left(dx+c\right)\right)\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))+5\left(-\right.}{}$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] -1/6*(5*(I*sqrt(2)*cos(d*x + c)^2 + I*sqrt(2)*cos(d*x + c))*weierstrassPInv
erse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 5*(-I*sqrt(2)*cos(d*x + c)^2 -
 I*sqrt(2)*cos(d*x + c))*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*
x + c)) + 9*(-I*sqrt(2)*cos(d*x + c)^2 - I*sqrt(2)*cos(d*x + c))*weierstras
sZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 9
*(I*sqrt(2)*cos(d*x + c)^2 + I*sqrt(2)*cos(d*x + c))*weierstrassZeta(-4, 0,
 weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(9*cos(d*x
+ c)^2 + 4*cos(d*x + c) - 2)*sin(d*x + c)/sqrt(cos(d*x + c)))/(a*d*cos(d*x
+ c)^2 + a*d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(5/2)/(a+a*cos(d*x+c)),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{a\cos\left(dx+c\right)+a}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+a*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^(5/2)/(a*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{a\cos\left(dx+c\right)+a}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+a*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(5/2)/(a*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}}{a+a\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)/(a + a*cos(c + d*x)),x)
[Out] int((1/cos(c + d*x))^(5/2)/(a + a*cos(c + d*x)), x)
```

3.318 $\int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 136

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{ad} - \frac{\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{ad} + \frac{3\sqrt{\sec(c+dx)}\sin(c+dx)}{ad} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{d(a+a\sec(c+dx))}$$

```
[Out] -sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*sec(d*x+c))+3*sin(d*x+c)*sec(d*x+c)^(1/
2)/a/d-3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*
d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a/d-(cos(1/2*d*x+1/2*
c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*
x+c)^(1/2)*sec(d*x+c)^(1/2)/a/d
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {3317, 3903, 3872, 3856, 2720, 3853, 2719}

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = -\frac{\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{d(a\sec(c+dx)+a)} + \frac{3\sin(c+dx)\sqrt{\sec(c+dx)}}{ad} - \frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{ad} - \frac{3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad}$$

```
[In] Int[Sec[c + d*x]^(3/2)/(a + a*Cos[c + d*x]),x]
```

```
[Out] (-3*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a*d)
- (Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a*d) +
 (3*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(a*d) - (Sec[c + d*x]^(3/2)*Sin[c + d*
x])/(d*(a + a*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3903

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)/(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_)), x_Symbol] :> Simp[d^2*Cot[e + f*x]*((d*Csc[e + f*x])^(n - 2)/(f*(a +
b*Csc[e + f*x]))), x] - Dist[d^2/(a*b), Int[(d*Csc[e + f*x])^(n - 2)*(b*(n
```

```
- 2) - a*(n - 1)*Csc[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[
a^2 - b^2, 0] && GtQ[n, 1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \frac{\sec^{\frac{5}{2}}(c+dx)}{a+a\sec(c+dx)}\,dx \\
&= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{d(a+a\sec(c+dx))} - \frac{\int \sqrt{\sec(c+dx)}\left(\frac{a}{2}-\frac{3}{2}a\sec(c+dx)\right)\,dx}{a^2} \\
&= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{d(a+a\sec(c+dx))} - \frac{\int \sqrt{\sec(c+dx)}\,dx}{2a} + \frac{3\int \sec^{\frac{3}{2}}(c+dx)\,dx}{2a} \\
&= \frac{3\sqrt{\sec(c+dx)}\sin(c+dx)}{ad} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{d(a+a\sec(c+dx))} \\
&\quad - \frac{3\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx}{2a} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{2a} \\
&= -\frac{\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{ad} + \frac{3\sqrt{\sec(c+dx)}\sin(c+dx)}{ad} \\
&\quad - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{d(a+a\sec(c+dx))} - \frac{\left(3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{2a} \\
&= -\frac{3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{ad} \\
&\quad - \frac{\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{ad} \\
&\quad + \frac{3\sqrt{\sec(c+dx)}\sin(c+dx)}{ad} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{d(a+a\sec(c+dx))}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.60 (sec) , antiderivative size = 256, normalized size of antiderivative = 1.88

$$
\int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx
$$

$$
= \frac{\cos^2\left(\frac{1}{2}(c+dx)\right)\left(-\frac{2i\sqrt{2}e^{-i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(3\left(1+e^{2i(c+dx)}\right)+3\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)\right.}{d\left(-1+e^{2ic}\right)}\right.}{a(1+\cos(c+}
$$

```
[In] Integrate[Sec[c + d*x]^(3/2)/(a + a*Cos[c + d*x]),x]
```

```
[Out] (Cos[(c + d*x)/2]^2*(((-2*I)*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c
+ d*x)))]*(3*(1 + E^((2*I)*(c + d*x))) + 3*(-1 + E^((2*I)*c))*Sqrt[1 + E^((
2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x))] -
E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeome
tric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/(d*E^(I*(c + d*x))*(-1 + E^(
(2*I)*c))) + (Sqrt[Sec[c + d*x]]*(6*Cos[d*x]*Csc[c] - 2*Tan[(c + d*x)/2]))/
d))/(a*(1 + Cos[c + d*x]))
```

Maple [A] (verified)

Time = 3.14 (sec) , antiderivative size = 253, normalized size of antiderivative = 1.86

method	result
default	$-\frac{-\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\left(F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-3E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.}{a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right.}}$

```
[In] int(sec(d*x+c)^(3/2)/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] -(-cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*
(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(co
s(1/2*d*x+1/2*c),2^(1/2))-3*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))+6*(-2*si
n(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)^4-5*(-2*s
in(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)^2)/a/cos
(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/
2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 196, normalized size of antiderivative = 1.44

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\left(i\sqrt{2}\cos\left(dx+c\right)+i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))+\left(-i\sqrt{2}\cos\left(dx+c\right)\right.}{}$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/2*((I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*
x + c) + I*sin(d*x + c)) + (-I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstras
sPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 3*(I*sqrt(2)*cos(d*x + c)
```

```
 + I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c
) + I*sin(d*x + c))) - 3*(-I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZ
eta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(
3*cos(d*x + c) + 2)*sin(d*x + c)/sqrt(cos(d*x + c)))/(a*d*cos(d*x + c) + a*
d)
```

Sympy [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\cos(c+dx)+1}\,dx}{a}$$

```
[In] integrate(sec(d*x+c)**(3/2)/(a+a*cos(d*x+c)),x)
[Out] Integral(sec(c + d*x)**(3/2)/(cos(c + d*x) + 1), x)/a
```

Maxima [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \int \frac{\sec(dx+c)^{\frac{3}{2}}}{a\cos(dx+c)+a}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^(3/2)/(a*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx = \int \frac{\sec(dx+c)^{\frac{3}{2}}}{a\cos(dx+c)+a}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(3/2)/(a*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+a\cos(c+dx)}\,dx=\int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}{a+a\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)/(a + a*cos(c + d*x)),x)
[Out] int((1/cos(c + d*x))^(3/2)/(a + a*cos(c + d*x)), x)
```

3.319 $\int \frac{\sqrt{\sec(c+dx)}}{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 110

$$\int \frac{\sqrt{\sec(c+dx)}}{a+a\cos(c+dx)}\,dx = \frac{\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{ad} + \frac{\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{ad} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{d(a+a\sec(c+dx))}$$

```
[Out] -sin(d*x+c)*sec(d*x+c)^(1/2)/d/(a+a*sec(d*x+c))+(cos(1/2*d*x+1/2*c)^2)^(1/2
)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)
*sec(d*x+c)^(1/2)/a/d+(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellip
ticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a/d
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {3317, 3903, 3872, 3856, 2719, 2720}

$$\int \frac{\sqrt{\sec(c+dx)}}{a+a\cos(c+dx)}\,dx = -\frac{\sin(c+dx)\sqrt{\sec(c+dx)}}{d(a\sec(c+dx)+a)} + \frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{ad} + \frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad}$$

```
[In] Int[Sqrt[Sec[c + d*x]]/(a + a*Cos[c + d*x]),x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a*d) + (
Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a*d) - (S
qrt[Sec[c + d*x]]*Sin[c + d*x])/(d*(a + a*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3903

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)/(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_)), x_Symbol] :> Simp[d^2*Cot[e + f*x]*((d*Csc[e + f*x])^(n - 2)/(f*(a +
b*Csc[e + f*x]))), x] - Dist[d^2/(a*b), Int[(d*Csc[e + f*x])^(n - 2)*(b*(n
- 2) - a*(n - 1)*Csc[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[
a^2 - b^2, 0] && GtQ[n, 1]
```

Rubi steps

$$\text{integral} = \int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+a\sec(c+dx)}\,dx$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{d(a+a\sec(c+dx))} - \frac{\int \frac{-\frac{a}{2}-\frac{1}{2}a\sec(c+dx)}{\sqrt{\sec(c+dx)}}\,dx}{a^2}$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{d(a+a\sec(c+dx))} + \frac{\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx}{2a} + \frac{\int \sqrt{\sec(c+dx)}\,dx}{2a}$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{d(a+a\sec(c+dx))} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{2a} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{2a}$$

$$= \frac{\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{ad} + \frac{\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{ad} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{d(a+a\sec(c+dx))}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.92 (sec) , antiderivative size = 180, normalized size of antiderivative = 1.64

$$\int \frac{\sqrt{\sec(c+dx)}}{a+a\cos(c+dx)}\,dx = -\frac{4i\cos^2\left(\frac{1}{2}(c+dx)\right)\left(1+e^{2i(c+dx)}-\left(1+e^{i(c+dx)}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)\right.}{ad\left(1+e^{i(c+d}\right.}$$

```
[In] Integrate[Sqrt[Sec[c + d*x]]/(a + a*Cos[c + d*x]),x]
```

```
[Out] ((-4*I)*Cos[(c + d*x)/2]^2*(1 + E^((2*I)*(c + d*x)) - (1 + E^(I*(c + d*x)))
*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*
(c + d*x))] + E^(I*(c + d*x))*(1 + E^(I*(c + d*x)))*Sqrt[1 + E^((2*I)*(c +
d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))])*Sqrt[Sec[c +
 d*x]])/(a*d*(1 + E^(I*(c + d*x)))^3)
```

Maple [A] (verified)

Time = 2.10 (sec) , antiderivative size = 200, normalized size of antiderivative = 1.82

method	result
default	$\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\left(-\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\left(F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-E\left(\cos\left(\frac{dx}{2}\right.\right.\right.\right.}{a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-}}$

```
[In] int(sec(d*x+c)^(1/2)/(a+cos(d*x+c)*a),x,method=_RETURNVERBOSE)
```

```
[Out] ((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-cos(1/2*d*x+1/2*c
)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(
cos(1/2*d*x+1/2*c),2^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))+2*sin(1/
2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)/a/cos(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1
/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c
)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 184, normalized size of antiderivative = 1.67

$$\int \frac{\sqrt{\sec(c+dx)}}{a+a\cos(c+dx)}\,dx = \frac{\left(-i\sqrt{2}\cos\left(dx+c\right)-i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))+\left(i\sqrt{2}\cos\left(dx+c\right)\right.}{}$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/2*((-I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d
*x + c) + I*sin(d*x + c)) + (I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstras
sPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + (I*sqrt(2)*cos(d*x + c) +
 I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c)
+ I*sin(d*x + c))) + (-I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(
-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - 2*sqrt(
cos(d*x + c))*sin(d*x + c))/(a*d*cos(d*x + c) + a*d)
```

Sympy [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{a+a\cos(c+dx)}\,dx = \frac{\int \frac{\sqrt{\sec(c+dx)}}{\cos(c+dx)+1}\,dx}{a}$$

```
[In] integrate(sec(d*x+c)**(1/2)/(a+a*cos(d*x+c)),x)
[Out] Integral(sqrt(sec(c + d*x))/(cos(c + d*x) + 1), x)/a
```

Maxima [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{a+a\cos(c+dx)}\,dx = \int \frac{\sqrt{\sec(dx+c)}}{a\cos(dx+c)+a}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(sqrt(sec(d*x + c))/(a*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{a+a\cos(c+dx)}\,dx = \int \frac{\sqrt{\sec(dx+c)}}{a\cos(dx+c)+a}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(sqrt(sec(d*x + c))/(a*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{a+a\cos(c+dx)}\,dx = \int \frac{\sqrt{\frac{1}{\cos(c+d\,x)}}}{a+a\,\cos(c+d\,x)}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)/(a + a*cos(c + d*x)),x)
[Out] int((1/cos(c + d*x))^(1/2)/(a + a*cos(c + d*x)), x)
```

3.320 $\int \frac{1}{(a+a\cos(c+dx))\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 110

$$\int \frac{1}{(a+a\cos(c+dx))\sqrt{\sec(c+dx)}}\,dx = -\frac{\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{ad} + \frac{\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{ad} + \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{d(a+a\sec(c+dx))}$$

```
[Out] sin(d*x+c)*sec(d*x+c)^(1/2)/d/(a+a*sec(d*x+c))-(cos(1/2*d*x+1/2*c)^2)^(1/2)
/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*
sec(d*x+c)^(1/2)/a/d+(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a/d
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {3317, 3905, 3872, 3856, 2719, 2720}

$$\int \frac{1}{(a+a\cos(c+dx))\sqrt{\sec(c+dx)}}\,dx = \frac{\sin(c+dx)\sqrt{\sec(c+dx)}}{d(a\sec(c+dx)+a)} + \frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{ad} - \frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad}$$

```
[In] Int[1/((a + a*Cos[c + d*x])*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] -((Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a*d))
+ (Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a*d) +
 (Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(d*(a + a*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3905

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)/(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_)), x_Symbol] :> Simp[(-b)*d*Cot[e + f*x]*((d*Csc[e + f*x])^(n - 1)/(a*f*
(a + b*Csc[e + f*x]))), x] + Dist[d*((n - 1)/(a*b)), Int[(d*Csc[e + f*x])^(
n - 1)*(a - b*Csc[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[
a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \int \frac{\sqrt{\sec(c+dx)}}{a+a\sec(c+dx)}\,dx$$

$$= \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{d(a+a\sec(c+dx))} - \frac{\int \frac{a-a\sec(c+dx)}{\sqrt{\sec(c+dx)}}dx}{2a^2}$$

$$= \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{d(a+a\sec(c+dx))} - \frac{\int \frac{1}{\sqrt{\sec(c+dx)}}dx}{2a} + \frac{\int \sqrt{\sec(c+dx)}dx}{2a}$$

$$= \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{d(a+a\sec(c+dx))} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}dx}{2a} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}dx}{2a}$$

$$= -\frac{\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{ad} + \frac{\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{ad} + \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{d(a+a\sec(c+dx))}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.91 (sec) , antiderivative size = 181, normalized size of antiderivative = 1.65

$$\int \frac{1}{(a+a\cos(c+dx))\sqrt{\sec(c+dx)}}dx = -\frac{4i\cos^2\left(\frac{1}{2}(c+dx)\right)\left(-1-e^{2i(c+dx)}+\left(1+e^{i(c+dx)}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c\cdots}\right.\right.}{ad\left(1+e^{i(c\cdots}\right.}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] ((-4*I)*Cos[(c + d*x)/2]^2*(-1 - E^((2*I)*(c + d*x)) + (1 + E^(I*(c + d*x))
)*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)
*(c + d*x))] + E^(I*(c + d*x))*(1 + E^(I*(c + d*x)))*Sqrt[1 + E^((2*I)*(c +
 d*x))]*Hypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))])*Sqrt[Sec[c
+ d*x]])/(a*d*(1 + E^(I*(c + d*x)))^3)
```

Maple [A] (verified)

Time = 2.93 (sec) , antiderivative size = 198, normalized size of antiderivative = 1.80

method	result
default	$-\frac{\sqrt{(2(\cos^2(\frac{dx}{2}+\frac{c}{2}))-1)(\sin^2(\frac{dx}{2}+\frac{c}{2}))}\,(\cos(\frac{dx}{2}+\frac{c}{2})\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2(\sin^2(\frac{dx}{2}+\frac{c}{2}))-1}\,(F(\cos(\frac{dx}{2}+\frac{c}{2}),\sqrt{2})+E(\cos(\frac{dx}{2}+}{a\sqrt{-2(\sin^4(\frac{dx}{2}+\frac{c}{2}))+\sin^2(\frac{dx}{2}+\frac{c}{2})}\,\cos(\frac{dx}{2}+\frac{c}{2})\sin(\frac{dx}{2}+\frac{c}{2})\sqrt{2(\cos^2(\frac{dx}{2}+\frac{c}{2}))-}$

```
[In] int(1/(a+cos(d*x+c)*a)/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(cos(1/2*d*x+1/2*c
)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(EllipticF(
cos(1/2*d*x+1/2*c),2^(1/2))+EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))+2*sin(1/
2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)/a/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x
+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c
)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 184, normalized size of antiderivative = 1.67

$$\int \frac{1}{(a+a\cos(c+dx))\sqrt{\sec(c+dx)}}\,dx$$
$$= \frac{\left(-i\sqrt{2}\cos(dx+c)-i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\,\sin(dx+c))+\left(i\sqrt{2}\cos(dx+c)+\right.}{}$$

```
[In] integrate(1/(a+a*cos(d*x+c))/sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/2*((-I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d
*x + c) + I*sin(d*x + c)) + (I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstras
sPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + (-I*sqrt(2)*cos(d*x + c)
- I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c)
 + I*sin(d*x + c))) + (I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(
-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*sqrt(
cos(d*x + c))*sin(d*x + c))/(a*d*cos(d*x + c) + a*d)
```

Sympy [F]

$$\int \frac{1}{(a+a\cos(c+dx))\sqrt{\sec(c+dx)}}\,dx = \frac{\int \frac{1}{\cos(c+dx)\sqrt{\sec(c+dx)}+\sqrt{\sec(c+dx)}}\,dx}{a}$$

```
[In] integrate(1/(a+a*cos(d*x+c))/sec(d*x+c)**(1/2),x)
[Out] Integral(1/(cos(c + d*x)*sqrt(sec(c + d*x)) + sqrt(sec(c + d*x))), x)/a
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{(a\cos(dx+c)+a)\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))/sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)*sqrt(sec(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{(a+a\cos(c+dx))\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{(a\cos(dx+c)+a)\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)*sqrt(sec(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{\sqrt{\frac{1}{\cos(c+d\,x)}}\,(a+a\,\cos(c+d\,x))}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))),x)
[Out] int(1/((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))), x)
```

3.321 $\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 112

$$\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{ad} - \frac{\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{ad} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{d(a+a\sec(c+dx))}$$

```
[Out] -sin(d*x+c)*sec(d*x+c)^(1/2)/d/(a+a*sec(d*x+c))+3*(cos(1/2*d*x+1/2*c)^2)^(1
/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/
2)*sec(d*x+c)^(1/2)/a/d-(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ell
ipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a/d
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {3317, 3904, 3872, 3856, 2719, 2720}

$$\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)}\,dx = -\frac{\sin(c+dx)\sqrt{\sec(c+dx)}}{d(a\sec(c+dx)+a)} - \frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{ad} + \frac{3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad}$$

```
[In] Int[1/((a + a*Cos[c + d*x])*Sec[c + d*x]^(3/2)),x]
```

```
[Out] (3*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a*d) -
 (Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a*d) -
(Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(d*(a + a*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3904

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)/(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_)), x_Symbol] :> Simp[Cot[e + f*x]*((d*Csc[e + f*x])^n/(f*(a + b*Csc[e +
f*x]))), x] - Dist[1/a^2, Int[(d*Csc[e + f*x])^n*(a*(n - 1) - b*n*Csc[e + f
*x]), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 - b^2, 0] && LtQ[n, 0]
```

Rubi steps

$$\text{integral} = \int \frac{1}{\sqrt{\sec(c+dx)}(a+a\sec(c+dx))}\,dx$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{d(a+a\sec(c+dx))} - \frac{\int \frac{-\frac{3a}{2}+\frac{1}{2}a\sec(c+dx)}{\sqrt{\sec(c+dx)}}\,dx}{a^2}$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{d(a+a\sec(c+dx))} - \frac{\int \sqrt{\sec(c+dx)}\,dx}{2a} + \frac{3\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx}{2a}$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{d(a+a\sec(c+dx))} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{2a} + \frac{\left(3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{2a}$$

$$= \frac{3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{ad} - \frac{\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{ad} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{d(a+a\sec(c+dx))}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.47 (sec) , antiderivative size = 311, normalized size of antiderivative = 2.78

$$\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \frac{\cos^2\left(\frac{1}{2}(c+dx)\right)\left(\frac{2i\sqrt{2}e^{-i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(3\left(1+e^{2i(c+dx)}\right)+3\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)+\right.}{d\left(-1+e^{2ic}\right)}\right.}{}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])*Sec[c + d*x]^(3/2)),x]
```

```
[Out] (Cos[(c + d*x)/2]^2*(((2*I)*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c +
 d*x)))]*(3*(1 + E^((2*I)*(c + d*x))) + 3*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2
*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x))] + E
^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeomet
ric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/(d*E^(I*(c + d*x))*(-1 + E^((
2*I)*c))) - ((Cos[(c - d*x)/2] + 2*Cos[(3*c + d*x)/2] + 2*Cos[(c + 3*d*x)/2
] + Cos[(5*c + 3*d*x)/2])*Csc[c/2]*Sec[c/2]*Sec[(c + d*x)/2]*Sqrt[Sec[c + d
*x]])/(2*d)))/(a*(1 + Cos[c + d*x]))
```

Maple [A] (verified)

Time = 3.44 (sec) , antiderivative size = 199, normalized size of antiderivative = 1.78

method	result
default	$\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\left(F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)+3E\left(\cos\left(\frac{dx}{2}-\right.\right.\right.\right.}{a\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-}}$

```
[In] int(1/(a+cos(d*x+c)*a)/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] ((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(cos(1/2*d*x+1/2*c)
*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(EllipticF(c
os(1/2*d*x+1/2*c),2^(1/2))+3*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))+2*sin(1
/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)/a/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*
x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*
c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 186, normalized size of antiderivative = 1.66

$$\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{\left(i\sqrt{2}\cos\left(dx+c\right)+i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))+\left(-i\sqrt{2}\cos\left(dx+c\right)\right.}{}$$

```
[In] integrate(1/(a+a*cos(d*x+c))/sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/2*((I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*
x + c) + I*sin(d*x + c)) + (-I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstras
sPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 3*(-I*sqrt(2)*cos(d*x + c
) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x +
c) + I*sin(d*x + c))) - 3*(I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZ
eta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - 2*s
qrt(cos(d*x + c))*sin(d*x + c))/(a*d*cos(d*x + c) + a*d)
```

Sympy [F]

$$\int \frac{1}{(a + a\cos(c + dx))\sec^{\frac{3}{2}}(c + dx)}\,dx = \frac{\int \frac{1}{\cos(c+dx)\sec^{\frac{3}{2}}(c+dx)+\sec^{\frac{3}{2}}(c+dx)}\,dx}{a}$$

```
[In] integrate(1/(a+a*cos(d*x+c))/sec(d*x+c)**(3/2),x)
[Out] Integral(1/(cos(c + d*x)*sec(c + d*x)**(3/2) + sec(c + d*x)**(3/2)), x)/a
```

Maxima [F]

$$\int \frac{1}{(a + a\cos(c + dx))\sec^{\frac{3}{2}}(c + dx)}\,dx = \int \frac{1}{(a\cos(dx + c) + a)\sec(dx + c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))/sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)*sec(d*x + c)^(3/2)), x)
```

Giac [F]

$$\int \frac{1}{(a + a\cos(c + dx))\sec^{\frac{3}{2}}(c + dx)}\,dx = \int \frac{1}{(a\cos(dx + c) + a)\sec(dx + c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)*sec(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a + a\cos(c + dx))\sec^{\frac{3}{2}}(c + dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}\,(a + a\,\cos(c + d\,x))}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))),x)
[Out] int(1/((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))), x)
```

3.322 $\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 140

$$\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)}\,dx = -\frac{3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{ad} + \frac{5\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3ad} + \frac{5\sin(c+dx)}{3ad\sqrt{\sec(c+dx)}} - \frac{\sin(c+dx)}{d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))}$$

```
[Out] 5/3*sin(d*x+c)/a/d/sec(d*x+c)^(1/2)-sin(d*x+c)/d/(a+a*sec(d*x+c))/sec(d*x+c
)^(1/2)-3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2
*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a/d+5/3*(cos(1/2*d*x
+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*c
os(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a/d
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used

$= \{3317, 3904, 3872, 3854, 3856, 2720, 2719\}$

$$\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)}\,dx$$
$$= \frac{5\sin(c+dx)}{3ad\sqrt{\sec(c+dx)}} - \frac{\sin(c+dx)}{d\sqrt{\sec(c+dx)}(a\sec(c+dx)+a)} + \frac{5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3ad} - \frac{3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{ad}$$

```
[In] Int[1/((a + a*Cos[c + d*x])*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (-3*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a*d)
+ (5*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3*a*
d) + (5*Sin[c + d*x])/(3*a*d*Sqrt[Sec[c + d*x]]) - Sin[c + d*x]/(d*Sqrt[Sec
[c + d*x]]*(a + a*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

```
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3904

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)/(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_)), x_Symbol] :> Simp[Cot[e + f*x]*((d*Csc[e + f*x])^n/(f*(a + b*Csc[e +
f*x]))), x] - Dist[1/a^2, Int[(d*Csc[e + f*x])^n*(a*(n - 1) - b*n*Csc[e + f
*x]), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 - b^2, 0] && LtQ[n, 0]
```

Rubi steps

$$\text{integral} = \int \frac{1}{\sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))}\,dx$$

$$= -\frac{\sin(c+dx)}{d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))} - \frac{\int \frac{-\frac{5a}{2}+\frac{3}{2}a\sec(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx}{a^2}$$

$$= -\frac{\sin(c+dx)}{d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))} - \frac{3\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx}{2a} + \frac{5\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx}{2a}$$

$$= \frac{5\sin(c+dx)}{3ad\sqrt{\sec(c+dx)}} - \frac{\sin(c+dx)}{d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))} + \frac{5\int \sqrt{\sec(c+dx)}\,dx}{6a} - \frac{\left(3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{2a}$$

$$= -\frac{3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{ad} + \frac{5\sin(c+dx)}{3ad\sqrt{\sec(c+dx)}} - \frac{\sin(c+dx)}{d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))} + \frac{\left(5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{6a}$$

$$= -\frac{3\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{ad} + \frac{5\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3ad} + \frac{5\sin(c+dx)}{3ad\sqrt{\sec(c+dx)}} - \frac{\sin(c+dx)}{d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 3.07 (sec) , antiderivative size = 312, normalized size of antiderivative = 2.23

$$\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{\cos^2\left(\frac{1}{2}(c+dx)\right)\left(-\frac{2i\sqrt{2}e^{-i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(9\left(1+e^{2i(c+dx)}\right)+9\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)\right.}{-1+e^{2ic}}\right.}{}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (Cos[(c + d*x)/2]^2*(((-2*I)*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c
+ d*x)))]*(9*(1 + E^((2*I)*(c + d*x))) + 9*(-1 + E^((2*I)*c))*Sqrt[1 + E^((
2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x))] +
5*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeo
metric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/(E^(I*(c + d*x))*(-1 + E^(
(2*I)*c))) + 2*Sqrt[Sec[c + d*x]]*(3*(2 + Cos[2*c])*Cos[d*x]*Csc[c] + Cos[2
*d*x]*Sin[2*c] - 3*Sec[c/2]*Sec[(c + d*x)/2]*Sin[(d*x)/2] - 6*Cos[c]*Sin[d*
x] + Cos[2*c]*Sin[2*d*x] - 3*Tan[c/2])))/(3*a*d*(1 + Cos[c + d*x]))
```

Maple [A] (verified)

Time = 4.52 (sec) , antiderivative size = 215, normalized size of antiderivative = 1.54

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\left(5F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)+9E\left(\cos\left(\frac{dx}{2}\right.\right.\right.\right.}{3a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\right.}}$

```
[In] int(1/(a+cos(d*x+c)*a)/sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(cos(1/2*d*x+1
/2*c)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(5*Elli
pticF(cos(1/2*d*x+1/2*c),2^(1/2))+9*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))-
8*sin(1/2*d*x+1/2*c)^6+18*sin(1/2*d*x+1/2*c)^4-7*sin(1/2*d*x+1/2*c)^2)/a/co
s(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1
/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.48

$$\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)}\,dx = -\frac{5\left(i\sqrt{2}\cos\left(dx+c\right)+i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))+5\left(-i\sqrt{2}\cos\left(dx\right.\right.}{}$$

```
[In] integrate(1/(a+a*cos(d*x+c))/sec(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] -1/6*(5*(I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos
(d*x + c) + I*sin(d*x + c)) + 5*(-I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weier
strassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 9*(I*sqrt(2)*cos(d*x
 + c) + I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*
x + c) + I*sin(d*x + c))) + 9*(-I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierst
rassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)))
- 2*(2*cos(d*x + c)^2 + 5*cos(d*x + c))*sin(d*x + c)/sqrt(cos(d*x + c)))/(a
*d*cos(d*x + c) + a*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))/sec(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos\left(dx+c\right)+a)\sec\left(dx+c\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))/sec(d*x+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(1/((a*cos(d*x + c) + a)*sec(d*x + c)^(5/2)), x)
```

Giac [F]

$$\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)}\,dx=\int \frac{1}{(a\cos(dx+c)+a)\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))/sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)*sec(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)}\,dx=\int \frac{1}{{\left(\frac{1}{\cos(c+d\,x)}\right)}^{5/2}\,\left(a+a\,\cos\left(c+d\,x\right)\right)}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))),x)
[Out] int(1/((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))), x)
```

3.323 $\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 168

$$\begin{aligned}\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)}\,dx &= \frac{21\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5ad} \\ &\quad - \frac{5\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3ad} + \frac{7\sin(c+dx)}{5ad\sec^{\frac{3}{2}}(c+dx)} \\ &\quad - \frac{5\sin(c+dx)}{3ad\sqrt{\sec(c+dx)}} - \frac{\sin(c+dx)}{d\sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))}\end{aligned}$$

```
[Out] 7/5*sin(d*x+c)/a/d/sec(d*x+c)^(3/2)-sin(d*x+c)/d/sec(d*x+c)^(3/2)/(a+a*sec(
d*x+c))-5/3*sin(d*x+c)/a/d/sec(d*x+c)^(1/2)+21/5*(cos(1/2*d*x+1/2*c)^2)^(1/
2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2
)*sec(d*x+c)^(1/2)/a/d-5/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*
EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a/d
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used

$= \{3317, 3904, 3872, 3854, 3856, 2719, 2720\}$

$$\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)}\,dx$$
$$= -\frac{\sin(c+dx)}{d\sec^{\frac{3}{2}}(c+dx)(a\sec(c+dx)+a)} + \frac{7\sin(c+dx)}{5ad\sec^{\frac{3}{2}}(c+dx)} - \frac{5\sin(c+dx)}{3ad\sqrt{\sec(c+dx)}} - \frac{5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3ad} + \frac{21\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5ad}$$

```
[In] Int[1/((a + a*Cos[c + d*x])*Sec[c + d*x]^(7/2)),x]
```

```
[Out] (21*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(5*a*d
) - (5*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3*
a*d) + (7*Sin[c + d*x])/(5*a*d*Sec[c + d*x]^(3/2)) - (5*Sin[c + d*x])/(3*a*
d*Sqrt[Sec[c + d*x]]) - Sin[c + d*x]/(d*Sec[c + d*x]^(3/2)*(a + a*Sec[c + d
*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

```
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3904

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)/(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_)), x_Symbol] :> Simp[Cot[e + f*x]*((d*Csc[e + f*x])^n/(f*(a + b*Csc[e +
f*x]))), x] - Dist[1/a^2, Int[(d*Csc[e + f*x])^n*(a*(n - 1) - b*n*Csc[e + f
*x]), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 - b^2, 0] && LtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \frac{1}{\sec^{\frac{5}{2}}(c+dx)(a+a\sec(c+dx))}\,dx \\
&= -\frac{\sin(c+dx)}{d\sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))} - \frac{\int \frac{-\frac{7a}{2}+\frac{5}{2}a\sec(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx}{a^2} \\
&= -\frac{\sin(c+dx)}{d\sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))} - \frac{5\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx}{2a} + \frac{7\int \frac{1}{\sec^{\frac{5}{2}}(c+dx)}\,dx}{2a} \\
&= \frac{7\sin(c+dx)}{5ad\sec^{\frac{3}{2}}(c+dx)} - \frac{5\sin(c+dx)}{3ad\sqrt{\sec(c+dx)}} - \frac{\sin(c+dx)}{d\sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))} \\
&\quad - \frac{5\int \sqrt{\sec(c+dx)}\,dx}{6a} + \frac{21\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx}{10a} \\
&= \frac{7\sin(c+dx)}{5ad\sec^{\frac{3}{2}}(c+dx)} - \frac{5\sin(c+dx)}{3ad\sqrt{\sec(c+dx)}} - \frac{\sin(c+dx)}{d\sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))} \\
&\quad - \frac{\left(5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{6a} \\
&\quad + \frac{\left(21\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{10a} \\
&= \frac{21\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5ad} \\
&\quad - \frac{5\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3ad} + \frac{7\sin(c+dx)}{5ad\sec^{\frac{3}{2}}(c+dx)} \\
&\quad - \frac{5\sin(c+dx)}{3ad\sqrt{\sec(c+dx)}} - \frac{\sin(c+dx)}{d\sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 2.22 (sec) , antiderivative size = 341, normalized size of antiderivative = 2.03

$$\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)}\,dx = \frac{\cos^2\left(\frac{1}{2}(c+dx)\right)\left(\frac{8i\sqrt{2}e^{-i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(63(1+e^{2i(c+dx)})+63(-1+e^{2ic})\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)\right.}{-1+e^{2ic}}\right.}{}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])*Sec[c + d*x]^(7/2)),x]
```

```
[Out] (Cos[(c + d*x)/2]^2*(((8*I)*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c +
 d*x)))]*(63*(1 + E^((2*I)*(c + d*x))) + 63*(-1 + E^((2*I)*c))*Sqrt[1 + E^(
(2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x))] +
 25*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hyperg
eometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/(E^(I*(c + d*x))*(-1 + E
^((2*I)*c))) - Sqrt[Sec[c + d*x]]*(18*(17 + 11*Cos[2*c])*Cos[d*x]*Csc[c] +
4*(10*Cos[2*d*x]*Sin[2*c] - 3*Cos[3*d*x]*Sin[3*c] - 30*Sec[c/2]*Sec[(c + d*
x)/2]*Sin[(d*x)/2] - 99*Cos[c]*Sin[d*x] + 10*Cos[2*c]*Sin[2*d*x] - 3*Cos[3*
c]*Sin[3*d*x] - 30*Tan[c/2]))))/(60*a*d*(1 + Cos[c + d*x]))
```

Maple [A] (verified)

Time = 5.24 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.36

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\left(25F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)+63E\left(\cos\right.\right.\right.}{15a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}\right.}$

```
[In] int(1/(a+cos(d*x+c)*a)/sec(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/15*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-cos(1/2*d*x
+1/2*c)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(25*E
llipticF(cos(1/2*d*x+1/2*c),2^(1/2))+63*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2
)))+48*sin(1/2*d*x+1/2*c)^8-56*sin(1/2*d*x+1/2*c)^6-30*sin(1/2*d*x+1/2*c)^4
+23*sin(1/2*d*x+1/2*c)^2)/a/cos(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^4+sin
(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2
)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.29

$$\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)}\,dx =$$

$$-\frac{25\left(-i\sqrt{2}\cos\left(dx+c\right)-i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))+25\left(i\sqrt{2}\cos\right.}{}$$

```
[In] integrate(1/(a+a*cos(d*x+c))/sec(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] -1/30*(25*(-I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0,
cos(d*x + c) + I*sin(d*x + c)) + 25*(I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*we
ierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 63*(-I*sqrt(2)*co
s(d*x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, c
os(d*x + c) + I*sin(d*x + c))) + 63*(I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*we
ierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x +
c))) - 2*(6*cos(d*x + c)^3 - 4*cos(d*x + c)^2 - 25*cos(d*x + c))*sin(d*x +
c)/sqrt(cos(d*x + c)))/(a*d*cos(d*x + c) + a*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))/sec(d*x+c)**(7/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{1}{\left(a\cos\left(dx+c\right)+a\right)\sec\left(dx+c\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))/sec(d*x+c)^(7/2),x, algorithm="maxima")
```

```
[Out] integrate(1/((a*cos(d*x + c) + a)*sec(d*x + c)^(7/2)), x)
```

Giac [F]

$$\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)\sec(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))/sec(d*x+c)^(7/2),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)*sec(d*x + c)^(7/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{7/2}\,(a+a\,\cos(c+d\,x))}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))),x)
[Out] int(1/((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))), x)
```

3.324 $\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 202

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{7\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a^2d} + \frac{10\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3a^2d} - \frac{7\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d} + \frac{10\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2d} - \frac{7\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2}$$

```
[Out] 10/3*sec(d*x+c)^(3/2)*sin(d*x+c)/a^2/d-7/3*sec(d*x+c)^(5/2)*sin(d*x+c)/a^2/
d/(1+sec(d*x+c))-1/3*sec(d*x+c)^(7/2)*sin(d*x+c)/d/(a+a*sec(d*x+c))^2-7*sin
(d*x+c)*sec(d*x+c)^(1/2)/a^2/d+7*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1
/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/
2)/a^2/d+10/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin
(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^2/d
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used

$= \{3317, 3901, 4104, 3872, 3853, 3856, 2719, 2720\}$

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{7\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{3a^2d(\sec(c+dx)+1)} + \frac{10\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3a^2d} - \frac{7\sin(c+dx)\sqrt{\sec(c+dx)}}{a^2d} + \frac{10\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} + \frac{7\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} - \frac{\sin(c+dx)\sec^{\frac{7}{2}}(c+dx)}{3d(a\sec(c+dx)+a)^2}$$

```
[In] Int[Sec[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (7*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a^2*d)
 + (10*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3*
a^2*d) - (7*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(a^2*d) + (10*Sec[c + d*x]^(3/
2)*Sin[c + d*x])/(3*a^2*d) - (7*Sec[c + d*x]^(5/2)*Sin[c + d*x])/(3*a^2*d*(
1 + Sec[c + d*x])) - (Sec[c + d*x]^(7/2)*Sin[c + d*x])/(3*d*(a + a*Sec[c +
d*x])^2)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3901

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-d^2)*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d
*Csc[e + f*x])^(n - 2)/(f*(2*m + 1))), x] + Dist[d^2/(a*b*(2*m + 1)), Int[(
a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^(n - 2)*(b*(n - 2) + a*(m - n
+ 2)*Csc[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 - b^2, 0
] && LtQ[m, -1] && GtQ[n, 2] && (IntegersQ[2*m, 2*n] || IntegerQ[m])
```

Rule 4104

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_)*(csc[(e_.) + (f_.)*(x_)]*(B_.) + (A_)), x_Symbol] :> Simp[d*(A*b
- a*B)*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d*Csc[e + f*x])^(n - 1)/(a*f*(
2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(
d*Csc[e + f*x])^(n - 1)*Simp[A*(a*d*(n - 1)) - B*(b*d*(n - 1)) - d*(a*B*(m
- n + 1) + A*b*(m + n))*Csc[e + f*x], x], x], x] /; FreeQ[{a, b, d, e, f, A
, B}, x] && NeQ[A*b - a*B, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)] && Gt
Q[n, 0]
```

Rubi steps

$$\text{integral} = \int \frac{\sec^{\frac{9}{2}}(c+dx)}{(a+a\sec(c+dx))^2}\,dx$$

$$= -\frac{\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2} - \frac{\int \frac{\sec^{\frac{5}{2}}(c+dx)\left(\frac{5a}{2}-\frac{9}{2}a\sec(c+dx)\right)}{a+a\sec(c+dx)}\,dx}{3a^2}$$

$$= -\frac{7\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2} - \frac{\int \sec^{\frac{3}{2}}(c+dx)\left(\frac{21a^2}{2}-15a^2\sec(c+dx)\right)\,dx}{3a^4}$$

$$= -\frac{7\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2} - \frac{7\int\sec^{\frac{3}{2}}(c+dx)\,dx}{2a^2} + \frac{5\int\sec^{\frac{5}{2}}(c+dx)\,dx}{a^2}$$

$$= -\frac{7\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d} + \frac{10\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2d} - \frac{7\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2} + \frac{5\int\sqrt{\sec(c+dx)}\,dx}{3a^2} + \frac{7\int\frac{1}{\sqrt{\sec(c+dx)}}\,dx}{2a^2}$$

$$= -\frac{7\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d} + \frac{10\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2d} - \frac{7\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2} + \frac{\left(5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3a^2} + \frac{\left(7\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx}{2a^2}$$

$$= \frac{7\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a^2d} + \frac{10\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3a^2d} - \frac{7\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d} + \frac{10\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2d} - \frac{7\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 2.01 (sec) , antiderivative size = 287, normalized size of antiderivative = 1.42

$$\int\frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{e^{-\frac{1}{2}i(4c+3dx)}(-1+e^{ic})\cos\left(\frac{1}{2}(c+dx)\right)\csc\left(\frac{c}{2}\right)\left(-10-37e^{i(c+dx)}-65e^{2i(c+dx)}-82e^{3i(c+dx)}-68e^{4i(c+dx)}\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] -1/12*((-1 + E^(I*c))*Cos[(c + d*x)/2]*Csc[c/2]*(-10 - 37*E^(I*(c + d*x)) -
 65*E^((2*I)*(c + d*x)) - 82*E^((3*I)*(c + d*x)) - 68*E^((4*I)*(c + d*x)) -
 53*E^((5*I)*(c + d*x)) - 21*E^((6*I)*(c + d*x)) + (10*I)*(1 + E^(I*(c + d*
x)))^3*(1 + E^((2*I)*(c + d*x)))*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2,
2] + 7*E^(I*(c + d*x))*(1 + E^(I*(c + d*x)))^3*(1 + E^((2*I)*(c + d*x)))^(3
/2)*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x))])*Sqrt[Sec[c + d*
x]])/(a^2*d*E^((I/2)*(4*c + 3*d*x))*(1 + E^((2*I)*(c + d*x)))*(1 + Cos[c +
d*x])^2)
```

Maple [A] (verified)

Time = 9.83 (sec) , antiderivative size = 413, normalized size of antiderivative = 2.04

method	result
default	$-\frac{\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\frac{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}{3\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^3}+\frac{6\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}-\frac{22\sqrt{\frac{1}{2}-\cos}}{}\right.}{}$

```
[In] int(sec(d*x+c)^(5/2)/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)/a^2*(1/3*(-2
*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)^3+6*(-
2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)-22/3*
(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*
d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/
2))+14*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*s
in(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*
c),2^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))-2/3*cos(1/2*d*x+1/2*c)*(
-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1
/2)^2+16*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)/(-(-2*cos(1/2*d*x+1/2*c)^2
+1)*sin(1/2*d*x+1/2*c)^2)^(1/2))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2
-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 328, normalized size of antiderivative = 1.62

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx =$$

$$-\frac{10\left(i\sqrt{2}\cos\left(dx+c\right)^3+2i\sqrt{2}\cos\left(dx+c\right)^2+i\sqrt{2}\cos\left(dx+c\right)\right)\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)}{}$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -1/6*(10*(I*sqrt(2)*cos(d*x + c)^3 + 2*I*sqrt(2)*cos(d*x + c)^2 + I*sqrt(2)
*cos(d*x + c))*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) +
10*(-I*sqrt(2)*cos(d*x + c)^3 - 2*I*sqrt(2)*cos(d*x + c)^2 - I*sqrt(2)*cos(
d*x + c))*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 21*(-
I*sqrt(2)*cos(d*x + c)^3 - 2*I*sqrt(2)*cos(d*x + c)^2 - I*sqrt(2)*cos(d*x +
 c))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin
(d*x + c))) + 21*(I*sqrt(2)*cos(d*x + c)^3 + 2*I*sqrt(2)*cos(d*x + c)^2 + I
*sqrt(2)*cos(d*x + c))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, co
s(d*x + c) - I*sin(d*x + c))) + 2*(21*cos(d*x + c)^3 + 32*cos(d*x + c)^2 +
8*cos(d*x + c) - 2)*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^2*d*cos(d*x + c)^3
+ 2*a^2*d*cos(d*x + c)^2 + a^2*d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(5/2)/(a+a*cos(d*x+c))**2,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] integrate(sec(d*x + c)^(5/2)/(a*cos(d*x + c) + a)^2, x)
```

Giac [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+a*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^(5/2)/(a*cos(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^2}\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)/(a + a*cos(c + d*x))^2,x)
[Out] int((1/cos(c + d*x))^(5/2)/(a + a*cos(c + d*x))^2, x)
```

3.325 $\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 176

$$\begin{aligned}\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = &-\frac{4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a^2d}\\&-\frac{5\sqrt{\cos(c+dx)}\,\mathrm{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3a^2d}\\&+\frac{4\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d}\\&-\frac{5\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2d(1+\sec(c+dx))}-\frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2}\end{aligned}$$

```
[Out] -5/3*sec(d*x+c)^(3/2)*sin(d*x+c)/a^2/d/(1+sec(d*x+c))-1/3*sec(d*x+c)^(5/2)*
sin(d*x+c)/d/(a+a*sec(d*x+c))^2+4*sin(d*x+c)*sec(d*x+c)^(1/2)/a^2/d-4*(cos(
1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(
1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^2/d-5/3*(cos(1/2*d*x+1/2*c)^2)^(1
/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/
2)*sec(d*x+c)^(1/2)/a^2/d
```

Rubi [A] (verified)

Time = 0.32 (sec) , antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.348$, Rules used

$= \{3317, 3901, 4104, 3872, 3856, 2720, 3853, 2719\}$

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = -\frac{5\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3a^2d(\sec(c+dx)+1)} + \frac{4\sin(c+dx)\sqrt{\sec(c+dx)}}{a^2d} - \frac{5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} - \frac{4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} - \frac{\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{3d(a\sec(c+dx)+a)^2}$$

```
[In] Int[Sec[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (-4*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a^2*d
) - (5*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3*
a^2*d) + (4*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(a^2*d) - (5*Sec[c + d*x]^(3/2
)*Sin[c + d*x])/(3*a^2*d*(1 + Sec[c + d*x])) - (Sec[c + d*x]^(5/2)*Sin[c +
d*x])/(3*d*(a + a*Sec[c + d*x])^2)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

```
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3901

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-d^2)*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d
*Csc[e + f*x])^(n - 2)/(f*(2*m + 1))), x] + Dist[d^2/(a*b*(2*m + 1)), Int[(
a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^(n - 2)*(b*(n - 2) + a*(m - n
+ 2)*Csc[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 - b^2, 0
] && LtQ[m, -1] && GtQ[n, 2] && (IntegersQ[2*m, 2*n] || IntegerQ[m])
```

Rule 4104

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_)*(csc[(e_.) + (f_.)*(x_)]*(B_.) + (A_)), x_Symbol] :> Simp[d*(A*b
- a*B)*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d*Csc[e + f*x])^(n - 1)/(a*f*(
2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(
d*Csc[e + f*x])^(n - 1)*Simp[A*(a*d*(n - 1)) - B*(b*d*(n - 1)) - d*(a*B*(m
- n + 1) + A*b*(m + n))*Csc[e + f*x], x], x], x] /; FreeQ[{a, b, d, e, f, A
, B}, x] && NeQ[A*b - a*B, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)] && Gt
Q[n, 0]
```

Rubi steps

$$\text{integral} = \int \frac{\sec^{\frac{7}{2}}(c+dx)}{(a+a\sec(c+dx))^2}\,dx$$

$$= -\frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2} - \frac{\int \frac{\sec^{\frac{3}{2}}(c+dx)\left(\frac{3a}{2}-\frac{7}{2}a\sec(c+dx)\right)}{a+a\sec(c+dx)}\,dx}{3a^2}$$

$$= -\frac{5\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2} - \frac{\int \sqrt{\sec(c+dx)}\left(\frac{5a^2}{2}-6a^2\sec(c+dx)\right)dx}{3a^4}$$

$$= -\frac{5\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2} - \frac{5\int \sqrt{\sec(c+dx)}\,dx}{6a^2} + \frac{2\int \sec^{\frac{3}{2}}(c+dx)\,dx}{a^2}$$

$$= \frac{4\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d} - \frac{5\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2} - \frac{2\int\frac{1}{\sqrt{\sec(c+dx)}}dx}{a^2} - \frac{\left(5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}dx}{6a^2}$$

$$= -\frac{5\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3a^2d} + \frac{4\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d} - \frac{5\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2} - \frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}dx}{a^2}$$

$$= -\frac{4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a^2d} - \frac{5\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3a^2d} + \frac{4\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d} - \frac{5\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.18 (sec) , antiderivative size = 252, normalized size of antiderivative = 1.43

$$\int\frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^2}dx = -\frac{e^{-idx}\cos\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}\left(-4ie^{-i(c+dx)}\left(1+e^{i(c+dx)}\right)^3\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3}{4}\right.\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] -1/6*(Cos[(c + d*x)/2]*Sqrt[Sec[c + d*x]]*(((-4*I)*(1 + E^(I*(c + d*x)))^3*
Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c
 + d*x))])/E^(I*(c + d*x)) + 40*Cos[(c + d*x)/2]^3*Sqrt[Cos[c + d*x]]*Ellip
ticF[(c + d*x)/2, 2]*(Cos[(c + d*x)/2] - I*Sin[(c + d*x)/2]) + I*(29 + 50*C
os[c + d*x] + 17*Cos[2*(c + d*x)] + (12*I)*Sin[c + d*x] + (7*I)*Sin[2*(c +
d*x)]))*(Cos[(c + 3*d*x)/2] + I*Sin[(c + 3*d*x)/2]))/(a^2*d*E^(I*d*x)*(1 +
Cos[c + d*x])^2)
```

Maple [A] (verified)

Time = 3.49 (sec) , antiderivative size = 405, normalized size of antiderivative = 2.30

method	result
default	$-\frac{2\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\left(5F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-12E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\right)\cos(}{}$

```
[In] int(sec(d*x+c)^(3/2)/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/6*(2*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*s
in(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(5*EllipticF(cos(1/2*d*x+1/
2*c),2^(1/2))-12*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*cos(1/2*d*x+1/2*c)*
sin(1/2*d*x+1/2*c)^2-2*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)
^2)^(1/2)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(5*EllipticF
(cos(1/2*d*x+1/2*c),2^(1/2))-12*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*cos(
1/2*d*x+1/2*c)-48*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*sin(
1/2*d*x+1/2*c)^6+86*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*si
n(1/2*d*x+1/2*c)^4-37*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*
sin(1/2*d*x+1/2*c)^2)/a^2/cos(1/2*d*x+1/2*c)^3/(-2*sin(1/2*d*x+1/2*c)^4+sin
(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2
)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 278, normalized size of antiderivative = 1.58

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx =$$

$$-\frac{5\left(-i\sqrt{2}\cos\left(dx+c\right)^2-2i\sqrt{2}\cos\left(dx+c\right)-i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\sin\left(dx+\right.}{}$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -1/6*(5*(-I*sqrt(2)*cos(d*x + c)^2 - 2*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*
weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 5*(I*sqrt(2)*co
s(d*x + c)^2 + 2*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4
, 0, cos(d*x + c) - I*sin(d*x + c)) + 12*(I*sqrt(2)*cos(d*x + c)^2 + 2*I*sq
rt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 12*(-I*sqrt(2)*cos(d*x + c)^2 - 2*
I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInve
rse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - 2*(12*cos(d*x + c)^2 + 19*cos(
```

```
d*x + c) + 6)*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^2*d*cos(d*x + c)^2 + 2*a^
2*d*cos(d*x + c) + a^2*d)
```

Sympy [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\cos^2(c+dx)+2\cos(c+dx)+1}\,dx}{a^2}$$

```
[In] integrate(sec(d*x+c)**(3/2)/(a+a*cos(d*x+c))**2,x)
[Out] Integral(sec(c + d*x)**(3/2)/(cos(c + d*x)**2 + 2*cos(c + d*x) + 1), x)/a**
2
```

Maxima [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\sec(dx+c)^{\frac{3}{2}}}{(a\cos(dx+c)+a)^2}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^(3/2)/(a*cos(d*x + c) + a)^2, x)
```

Giac [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\sec(dx+c)^{\frac{3}{2}}}{(a\cos(dx+c)+a)^2}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(3/2)/(a*cos(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}{(a+a\,\cos(c+d\,x))^2}\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)/(a + a*cos(c + d*x))^2,x)
[Out] int((1/cos(c + d*x))^(3/2)/(a + a*cos(c + d*x))^2, x)
```

3.326 $\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 149

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^2}\,dx = \frac{\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a^2d} + \frac{2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3a^2d} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2}$$

```
[Out] -1/3*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*sec(d*x+c))^2-sin(d*x+c)*sec(d*x+c)
^(1/2)/a^2/d/(1+sec(d*x+c))+(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)
*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^
2/d+2/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d
*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^2/d
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 149, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {3317, 3901, 4104, 3872, 3856, 2719, 2720}

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^2}\,dx = -\frac{\sin(c+dx)\sqrt{\sec(c+dx)}}{a^2d(\sec(c+dx)+1)} + \frac{2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} + \frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} - \frac{\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3d(a\sec(c+dx)+a)^2}$$

```
[In] Int[Sqrt[Sec[c + d*x]]/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a^2*d) +
 (2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3*a^2
*d) - (Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(a^2*d*(1 + Sec[c + d*x])) - (Sec[c
 + d*x]^(3/2)*Sin[c + d*x])/(3*d*(a + a*Sec[c + d*x])^2)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3901

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-d^2)*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d
*Csc[e + f*x])^(n - 2)/(f*(2*m + 1))), x] + Dist[d^2/(a*b*(2*m + 1)), Int[(
a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^(n - 2)*(b*(n - 2) + a*(m - n
+ 2)*Csc[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 - b^2, 0
] && LtQ[m, -1] && GtQ[n, 2] && (IntegersQ[2*m, 2*n] || IntegerQ[m])
```

Rule 4104

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_)*(csc[(e_.) + (f_.)*(x_)]*(B_.) + (A_)), x_Symbol] :> Simp[d*(A*b
- a*B)*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d*Csc[e + f*x])^(n - 1)/(a*f*(
2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(
d*Csc[e + f*x])^(n - 1)*Simp[A*(a*d*(n - 1)) - B*(b*d*(n - 1)) - d*(a*B*(m
- n + 1) + A*b*(m + n))*Csc[e + f*x], x], x], x] /; FreeQ[{a, b, d, e, f, A
, B}, x] && NeQ[A*b - a*B, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)] && Gt
Q[n, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\sec(c+dx))^2}\,dx \\
&= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2} - \frac{\int \frac{\sqrt{\sec(c+dx)}\left(\frac{a}{2}-\frac{5}{2}a\sec(c+dx)\right)}{a+a\sec(c+dx)}\,dx}{3a^2} \\
&= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2} - \frac{\int \frac{-\frac{3a^2}{2}-a^2\sec(c+dx)}{\sqrt{\sec(c+dx)}}\,dx}{3a^4} \\
&= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2} \\
&\quad + \frac{\int \sqrt{\sec(c+dx)}\,dx}{3a^2} + \frac{\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx}{2a^2}
\end{aligned}
$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}dx}{3a^2} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}dx}{2a^2}$$

$$= \frac{\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a^2d} + \frac{2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3a^2d} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.08 (sec) , antiderivative size = 242, normalized size of antiderivative = 1.62

$$\int\frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^2}dx = \frac{e^{-idx}\cos\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}\left(-ie^{-i(c+dx)}\left(1+e^{i(c+dx)}\right)^3\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3}{4},\frac{7}{4},\right.\right.}{}$$

```
[In] Integrate[Sqrt[Sec[c + d*x]]/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (Cos[(c + d*x)/2]*Sqrt[Sec[c + d*x]]*(((-I)*(1 + E^(I*(c + d*x)))^3*Sqrt[1
+ E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x)
)])/E^(I*(c + d*x)) + 16*Cos[(c + d*x)/2]^3*Sqrt[Cos[c + d*x]]*EllipticF[(c
 + d*x)/2, 2]*(Cos[(c + d*x)/2] - I*Sin[(c + d*x)/2]) + I*(5 + 14*Cos[c + d
*x] + 5*Cos[2*(c + d*x)] + I*Sin[2*(c + d*x)]))*(Cos[(c + 3*d*x)/2] + I*Sin
[(c + 3*d*x)/2]))/(6*a^2*d*E^(I*d*x)*(1 + Cos[c + d*x])^2)
```

Maple [A] (verified)

Time = 2.58 (sec) , antiderivative size = 257, normalized size of antiderivative = 1.72

method	result
default	$\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(12\left(\cos^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-4\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\cos\right.\right.}{6a^2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin}}$

```
[In] int(sec(d*x+c)^(1/2)/(a+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(12*cos(1/2*d*x
+1/2*c)^6-4*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*
EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^3+6*(sin(1/2*d*x+1
/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^3*Ellip
ticE(cos(1/2*d*x+1/2*c),2^(1/2))-16*cos(1/2*d*x+1/2*c)^4+3*cos(1/2*d*x+1/2*
c)^2+1)/a^2/cos(1/2*d*x+1/2*c)^3/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c
)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 277, normalized size of antiderivative = 1.86

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^2}\,dx =$$

$$-\frac{2\left(i\sqrt{2}\cos\left(dx+c\right)^2+2i\sqrt{2}\cos\left(dx+c\right)+i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right.}{}$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -1/6*(2*(I*sqrt(2)*cos(d*x + c)^2 + 2*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*w
eierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 2*(-I*sqrt(2)*co
s(d*x + c)^2 - 2*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4
, 0, cos(d*x + c) - I*sin(d*x + c)) + 3*(-I*sqrt(2)*cos(d*x + c)^2 - 2*I*sq
rt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 3*(I*sqrt(2)*cos(d*x + c)^2 + 2*I*
sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInvers
e(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(3*cos(d*x + c)^2 + 4*cos(d*x
+ c))*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(
d*x + c) + a^2*d)
```

Sympy [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^2}\,dx = \frac{\int \frac{\sqrt{\sec\left(c+dx\right)}}{\cos^2\left(c+dx\right)+2\cos\left(c+dx\right)+1}\,dx}{a^2}$$

```
[In] integrate(sec(d*x+c)**(1/2)/(a+a*cos(d*x+c))**2,x)
```

```
[Out] Integral(sqrt(sec(c + d*x))/(cos(c + d*x)**2 + 2*cos(c + d*x) + 1), x)/a**2
```

Maxima [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\sqrt{\sec\left(dx+c\right)}}{\left(a\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(sqrt(sec(d*x + c))/(a*cos(d*x + c) + a)^2, x)
```

Giac [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\sqrt{\sec\left(dx+c\right)}}{\left(a\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(sqrt(sec(d*x + c))/(a*cos(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\sqrt{\frac{1}{\cos(c+d\,x)}}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^2}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)/(a + a*cos(c + d*x))^2,x)
[Out] int((1/cos(c + d*x))^(1/2)/(a + a*cos(c + d*x))^2, x)
```

3.327 $\int \frac{1}{(a+a\cos(c+dx))^2\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 77

$$\int \frac{1}{(a+a\cos(c+dx))^2\sqrt{\sec(c+dx)}}\,dx = \frac{\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3a^2d}+\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2}$$

```
[Out] 1/3*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*sec(d*x+c))^2+1/3*(cos(1/2*d*x+1/2*c
)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x
+c)^(1/2)*sec(d*x+c)^(1/2)/a^2/d
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {3317, 3900, 21, 3856, 2720}

$$\int \frac{1}{(a+a\cos(c+dx))^2\sqrt{\sec(c+dx)}}\,dx = \frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d}+\frac{\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3d(a\sec(c+dx)+a)^2}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^2*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3*a^2*d)
 + (Sec[c + d*x]^(3/2)*Sin[c + d*x])/(3*d*(a + a*Sec[c + d*x])^2)
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3900

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[b*d*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d*Cs
c[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] - Dist[d/(a*b*(2*m + 1)), Int[(a +
 b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^(n - 1)*(a*(n - 1) - b*(m + n)*Cs
c[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 - b^2, 0] && Lt
Q[m, -1] && LtQ[1, n, 2] && (IntegersQ[2*m, 2*n] || IntegerQ[m])
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\sec(c+dx))^2}\,dx \\
&= \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2}+\frac{\int \frac{\sqrt{\sec(c+dx)}\left(\frac{a}{2}+\frac{1}{2}a\sec(c+dx)\right)}{a+a\sec(c+dx)}\,dx}{3a^2} \\
&= \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2}+\frac{\int \sqrt{\sec(c+dx)}\,dx}{6a^2} \\
&= \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2}+\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{6a^2}
\end{aligned}
$$

$$=\frac{\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3a^2d}+\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2}$$

Mathematica [A] (verified)

Time = 0.54 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.27

$$\int\frac{1}{(a+a\cos(c+dx))^2\sqrt{\sec(c+dx)}}\,dx$$
$$=\frac{\cos\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}\Big(4\cos^3\left(\frac{1}{2}(c+dx)\right)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)-\sin\left(\frac{1}{2}(c+dx)\right)\cdot}{3a^2d(1+\cos(c+dx))^2}$$

[In] Integrate[1/((a + a*Cos[c + d*x])^2*Sqrt[Sec[c + d*x]]),x]

[Out] (Cos[(c + d*x)/2]*Sqrt[Sec[c + d*x]]*(4*Cos[(c + d*x)/2]^3*Sqrt[Cos[c + d*x
]]*EllipticF[(c + d*x)/2, 2] - Sin[(c + d*x)/2] + Sin[(3*(c + d*x))/2]))/(3
*a^2*d*(1 + Cos[c + d*x])^2)

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 187 vs. 2(93) = 186.

Time = 3.28 (sec) , antiderivative size = 188, normalized size of antiderivative = 2.44

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\cos^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+2\left(\cos^4\right.\right.}{6a^2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

[In] int(1/(a+cos(d*x+c)*a)^2/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)

[Out] -1/6*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*x+1
/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^3+2*cos(1/2*d*x+1/2*c)^4-3*cos(1/2*d*x+1/
2*c)^2+1)/a^2/cos(1/2*d*x+1/2*c)^3/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2
*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 150, normalized size of antiderivative = 1.95

$$\int \frac{1}{(a + a\cos(c + dx))^2 \sqrt{\sec(c + dx)}}\,dx = \frac{\left(-i\sqrt{2}\cos\left(dx+c\right)^2 - 2i\sqrt{2}\cos\left(dx+c\right) - i\sqrt{2}\right)\mathrm{weierstrassPInverse}(-4, 0, \cos\left(dx+c\right) + i\,\sin\left(dx+c\right)}{6\left(a^2 d\right.}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^2/sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/6*((-I*sqrt(2)*cos(d*x + c)^2 - 2*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*wei
erstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + (I*sqrt(2)*cos(d*x
 + c)^2 + 2*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0,
cos(d*x + c) - I*sin(d*x + c)) + 2*sqrt(cos(d*x + c))*sin(d*x + c))/(a^2*d*
cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)
```

Sympy [F]

$$\int \frac{1}{(a + a\cos(c + dx))^2 \sqrt{\sec(c + dx)}}\,dx = \frac{\int \frac{1}{\cos^2\left(c+dx\right)\sqrt{\sec\left(c+dx\right)} + 2\cos\left(c+dx\right)\sqrt{\sec\left(c+dx\right)} + \sqrt{\sec\left(c+dx\right)}}\,dx}{a^2}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**2/sec(d*x+c)**(1/2),x)
```

```
[Out] Integral(1/(cos(c + d*x)**2*sqrt(sec(c + d*x)) + 2*cos(c + d*x)*sqrt(sec(c
+ d*x)) + sqrt(sec(c + d*x))), x)/a**2
```

Maxima [F]

$$\int \frac{1}{(a + a\cos(c + dx))^2 \sqrt{\sec(c + dx)}}\,dx = \int \frac{1}{\left(a\cos\left(dx+c\right) + a\right)^2 \sqrt{\sec\left(dx+c\right)}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^2/sec(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/((a*cos(d*x + c) + a)^2*sqrt(sec(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{(a + a\cos(c + dx))^2 \sqrt{\sec(c + dx)}}\, dx = \int \frac{1}{\left(a\cos\left(dx + c\right) + a\right)^2 \sqrt{\sec\left(dx + c\right)}}\, dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^2/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)^2*sqrt(sec(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a + a\cos(c + dx))^2 \sqrt{\sec(c + dx)}}\, dx = \int \frac{1}{\sqrt{\frac{1}{\cos(c+d\,x)}}\,\left(a + a\,\cos\left(c + d\,x\right)\right)^2}\, dx$$

```
[In] int(1/((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^2),x)
[Out] int(1/((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^2), x)
```

3.328 $\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 149

$$\begin{aligned}\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)}\,dx &= -\frac{\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a^2d} \\ &\quad+\frac{2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3a^2d} \\ &\quad+\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d(1+\sec(c+dx))}-\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2}\end{aligned}$$

```
[Out] -1/3*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*sec(d*x+c))^2+sin(d*x+c)*sec(d*x+c)
^(1/2)/a^2/d/(1+sec(d*x+c))-(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)
*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^
2/d+2/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d
*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^2/d
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 149, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used

$= \{3317, 3902, 4104, 3872, 3856, 2719, 2720\}$

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)}\,dx$$
$$= \frac{\sin(c+dx)\sqrt{\sec(c+dx)}}{a^2d(\sec(c+dx)+1)} + \frac{2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} - \frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} - \frac{\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3d(a\sec(c+dx)+a)^2}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^2*Sec[c + d*x]^(3/2)),x]
```

```
[Out] -((Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a^2*d)
) + (2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3*
a^2*d) + (Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(a^2*d*(1 + Sec[c + d*x])) - (Se
c[c + d*x]^(3/2)*Sin[c + d*x])/(3*d*(a + a*Sec[c + d*x])^2)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3902

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-Cot[e + f*x])*(a + b*Csc[e + f*x])^m*((d*Csc
[e + f*x])^n/(f*(2*m + 1))), x] + Dist[1/(a^2*(2*m + 1)), Int[(a + b*Csc[e
+ f*x])^(m + 1)*(d*Csc[e + f*x])^n*(a*(2*m + n + 1) - b*(m + n + 1)*Csc[e +
 f*x]), x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && LtQ[
m, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m])
```

Rule 4104

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_)*(csc[(e_.) + (f_.)*(x_)]*(B_.) + (A_)), x_Symbol] :> Simp[d*(A*b
- a*B)*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d*Csc[e + f*x])^(n - 1)/(a*f*(
2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(
d*Csc[e + f*x])^(n - 1)*Simp[A*(a*d*(n - 1)) - B*(b*d*(n - 1)) - d*(a*B*(m
- n + 1) + A*b*(m + n))*Csc[e + f*x], x], x], x] /; FreeQ[{a, b, d, e, f, A
, B}, x] && NeQ[A*b - a*B, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)] && Gt
Q[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \frac{\sqrt{\sec(c+dx)}}{(a+a\sec(c+dx))^2}\,dx \\
&= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2} - \frac{\int \frac{\sqrt{\sec(c+dx)}\left(-\frac{5a}{2}+\frac{1}{2}a\sec(c+dx)\right)}{a+a\sec(c+dx)}\,dx}{3a^2} \\
&= \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2} - \frac{\int \frac{\frac{3a^2}{2}-a^2\sec(c+dx)}{\sqrt{\sec(c+dx)}}\,dx}{3a^4} \\
&= \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2} + \frac{\int \sqrt{\sec(c+dx)}\,dx}{3a^2} - \frac{\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx}{2a^2} \\
&= \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2} \\
&\quad + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3a^2} \\
&\quad - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{2a^2}
\end{aligned}$$

$$= -\frac{\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a^2d} + \frac{2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3a^2d} + \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d(1+\sec(c+dx))} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d(a+a\sec(c+dx))^2}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.26 (sec) , antiderivative size = 239, normalized size of antiderivative = 1.60

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{e^{-idx}\cos\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}\left(16\cos^3\left(\frac{1}{2}(c+dx)\right)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\left(\cos\left(\frac{1}{2}(c+\right.\right.\right.}{}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^2*Sec[c + d*x]^(3/2)),x]
```

```
[Out] (Cos[(c + d*x)/2]*Sqrt[Sec[c + d*x]]*(16*Cos[(c + d*x)/2]^3*Sqrt[Cos[c + d*
x]]*EllipticF[(c + d*x)/2, 2]*(Cos[(c + d*x)/2] - I*Sin[(c + d*x)/2]) + I*(
-7 - 10*Cos[c + d*x] - 7*Cos[2*(c + d*x)] + ((1 + E^(I*(c + d*x)))^3*Sqrt[1
 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x
))])/E^(I*(c + d*x)) + I*Sin[2*(c + d*x)]))*(Cos[(c + 3*d*x)/2] + I*Sin[(c
+ 3*d*x)/2]))/(6*a^2*d*E^(I*d*x)*(1 + Cos[c + d*x])^2)
```

Maple [A] (verified)

Time = 3.72 (sec) , antiderivative size = 257, normalized size of antiderivative = 1.72

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(12\left(\cos^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+4\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\cos\right.\right.}{6a^2\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\ \text{c}}$

```
[In] int(1/(a+cos(d*x+c)*a)^2/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/6*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(12*cos(1/2*d*
x+1/2*c)^6+4*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)
*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^3+6*(sin(1/2*d*x+
1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^3*Elli
pticE(cos(1/2*d*x+1/2*c),2^(1/2))-20*cos(1/2*d*x+1/2*c)^4+9*cos(1/2*d*x+1/2
```

```
*c)^2-1)/a^2/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d
*x+1/2*c)^3/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 277, normalized size of antiderivative = 1.86

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)}\,dx =$$
$$-\frac{2\left(i\sqrt{2}\cos(dx+c)^2+2i\sqrt{2}\cos(dx+c)+i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+$$

```
[In] integrate(1/(a+a*cos(d*x+c))^2/sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/6*(2*(I*sqrt(2)*cos(d*x + c)^2 + 2*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*w
eierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 2*(-I*sqrt(2)*co
s(d*x + c)^2 - 2*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4
, 0, cos(d*x + c) - I*sin(d*x + c)) + 3*(I*sqrt(2)*cos(d*x + c)^2 + 2*I*sqr
t(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-
4, 0, cos(d*x + c) + I*sin(d*x + c))) + 3*(-I*sqrt(2)*cos(d*x + c)^2 - 2*I*
sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInvers
e(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - 2*(3*cos(d*x + c)^2 + 2*cos(d*x
+ c))*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(
d*x + c) + a^2*d)
```

Sympy [F]

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{\int \frac{1}{\cos^2(c+dx)\sec^{\frac{3}{2}}(c+dx)+2\cos(c+dx)\sec^{\frac{3}{2}}(c+dx)+\sec^{\frac{3}{2}}(c+dx)}\,dx}{a^2}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**2/sec(d*x+c)**(3/2),x)
```

```
[Out] Integral(1/(cos(c + d*x)**2*sec(c + d*x)**(3/2) + 2*cos(c + d*x)*sec(c + d*
x)**(3/2) + sec(c + d*x)**(3/2)), x)/a**2
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^2 \sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^2 \sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^2/sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^2*sec(d*x + c)^(3/2)), x)
```

Giac [F]

$$\int \frac{1}{(a+a\cos(c+dx))^2 \sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^2 \sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^2/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)^2*sec(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^2 \sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}(a+a\,\cos(c+d\,x))^2}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^2),x)
[Out] int(1/((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^2), x)
```

3.329 $\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 152

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a^2d} - \frac{5\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3a^2d} - \frac{5\sqrt{\sec(c+dx)}\sin(c+dx)}{3a^2d(1+\sec(c+dx))} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{3d(a+a\sec(c+dx))^2}$$

```
[Out] -5/3*sin(d*x+c)*sec(d*x+c)^(1/2)/a^2/d/(1+sec(d*x+c))-1/3*sin(d*x+c)*sec(d*
x+c)^(1/2)/d/(a+a*sec(d*x+c))^2+4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+
1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1
/2)/a^2/d-5/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin
(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^2/d
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used

$= \{3317, 3902, 4105, 3872, 3856, 2719, 2720\}$

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)}\,dx$$
$$= -\frac{5\sin(c+dx)\sqrt{\sec(c+dx)}}{3a^2d(\sec(c+dx)+1)} - \frac{5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d}$$
$$+ \frac{4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{a^2d} - \frac{\sin(c+dx)\sqrt{\sec(c+dx)}}{3d(a\sec(c+dx)+a)^2}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^2*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (4*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a^2*d)
 - (5*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3*a
^2*d) - (5*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(3*a^2*d*(1 + Sec[c + d*x])) -
(Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(3*d*(a + a*Sec[c + d*x])^2)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3902

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-Cot[e + f*x])*(a + b*Csc[e + f*x])^m*((d*Csc
[e + f*x])^n/(f*(2*m + 1))), x] + Dist[1/(a^2*(2*m + 1)), Int[(a + b*Csc[e
+ f*x])^(m + 1)*(d*Csc[e + f*x])^n*(a*(2*m + n + 1) - b*(m + n + 1)*Csc[e +
 f*x]), x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && LtQ[
m, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m])
```

Rule 4105

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_)*(csc[(e_.) + (f_.)*(x_)]*(B_.) + (A_)), x_Symbol] :> Simp[(-(A*b
- a*B))*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d*Csc[e + f*x])^n/(b*f*(2*m +
 1))), x] - Dist[1/(a^2*(2*m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc
[e + f*x])^n*Simp[b*B*n - a*A*(2*m + n + 1) + (A*b - a*B)*(m + n + 1)*Csc[e
 + f*x], x], x], x] /; FreeQ[{a, b, d, e, f, A, B, n}, x] && NeQ[A*b - a*B,
 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)] &&  !GtQ[n, 0]
```

Rubi steps

$$\text{integral} = \int \frac{1}{\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^2}\,dx$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{3d(a+a\sec(c+dx))^2} - \frac{\int \frac{-\frac{7a}{2}+\frac{3}{2}a\sec(c+dx)}{\sqrt{\sec(c+dx)}(a+a\sec(c+dx))}\,dx}{3a^2}$$

$$= -\frac{5\sqrt{\sec(c+dx)}\sin(c+dx)}{3a^2d(1+\sec(c+dx))} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{3d(a+a\sec(c+dx))^2} - \frac{\int \frac{-6a^2+\frac{5}{2}a^2\sec(c+dx)}{\sqrt{\sec(c+dx)}}\,dx}{3a^4}$$

$$= -\frac{5\sqrt{\sec(c+dx)}\sin(c+dx)}{3a^2d(1+\sec(c+dx))} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{3d(a+a\sec(c+dx))^2} - \frac{5\int \sqrt{\sec(c+dx)}\,dx}{6a^2} + \frac{2\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx}{a^2}$$

$$= -\frac{5\sqrt{\sec(c+dx)}\sin(c+dx)}{3a^2d(1+\sec(c+dx))} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{3d(a+a\sec(c+dx))^2} - \frac{\left(5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{6a^2} + \frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{a^2}$$

$$= \frac{4\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a^2d} - \frac{5\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3a^2d} - \frac{5\sqrt{\sec(c+dx)}\sin(c+dx)}{3a^2d(1+\sec(c+dx))} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{3d(a+a\sec(c+dx))^2}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.66 (sec) , antiderivative size = 259, normalized size of antiderivative = 1.70

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)}\,dx = -\frac{e^{-idx}\cos\left(\frac{1}{2}(c+dx)\right)\csc\left(\frac{c}{2}\right)\sec\left(\frac{c}{2}\right)\sqrt{\sec(c+dx)}\sin(c)(\cos(dx)+i\sin(dx))\left(-24i\cos\left(\frac{1}{2}(c+dx)\right)-18\right.}{}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^2*Sec[c + d*x]^(5/2)),x]
```

```
[Out] -1/6*(Cos[(c + d*x)/2]*Csc[c/2]*Sec[c/2]*Sqrt[Sec[c + d*x]]*Sin[c]*(Cos[d*x
] + I*Sin[d*x])*((-24*I)*Cos[(c + d*x)/2] - (18*I)*Cos[(3*(c + d*x))/2] - (
6*I)*Cos[(5*(c + d*x))/2] + 20*Cos[(c + d*x)/2]^3*Sqrt[Cos[c + d*x]]*Ellipt
icF[(c + d*x)/2, 2] + ((2*I)*(1 + E^(I*(c + d*x)))^3*Sqrt[1 + E^((2*I)*(c +
 d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x))])/E^((I/2)*(c
 + d*x)) + Sin[(c + d*x)/2] + 2*Sin[(3*(c + d*x))/2] + 3*Sin[(5*(c + d*x))/
2]))/(a^2*d*E^(I*d*x)*(1 + Cos[c + d*x])^2)
```

Maple [A] (verified)

Time = 4.53 (sec) , antiderivative size = 257, normalized size of antiderivative = 1.69

method	result
default	$\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(24\left(\cos^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+10\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\cos^3\right.\right.}{6a^2\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\cos}$

```
[In] int(1/(a+cos(d*x+c)*a)^2/sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(24*cos(1/2*d*x
+1/2*c)^6+10*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)
*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^3+24*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^3*Ell
ipticE(cos(1/2*d*x+1/2*c),2^(1/2))-38*cos(1/2*d*x+1/2*c)^4+15*cos(1/2*d*x+1
```

```
/2*c)^2-1)/a^2/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2
*d*x+1/2*c)^3/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 277, normalized size of antiderivative = 1.82

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)}\,dx =$$

$$-\frac{5\left(-i\sqrt{2}\cos\left(dx+c\right)^2-2i\sqrt{2}\cos\left(dx+c\right)-i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\sin\left(dx\right.}{}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^2/sec(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] -1/6*(5*(-I*sqrt(2)*cos(d*x + c)^2 - 2*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*
weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 5*(I*sqrt(2)*co
s(d*x + c)^2 + 2*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4
, 0, cos(d*x + c) - I*sin(d*x + c)) + 12*(-I*sqrt(2)*cos(d*x + c)^2 - 2*I*s
qrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse
(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 12*(I*sqrt(2)*cos(d*x + c)^2 + 2*
I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInve
rse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(6*cos(d*x + c)^2 + 5*cos(d*
x + c))*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*co
s(d*x + c) + a^2*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**2/sec(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos{(dx+c)}+a)^2\sec{(dx+c)}^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^2/sec(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^2*sec(d*x + c)^(5/2)), x)
```

Giac [F]

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos{(dx+c)}+a)^2\sec{(dx+c)}^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^2/sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)^2*sec(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{{\left(\frac{1}{\cos(c+d\,x)}\right)}^{5/2}\,{\left(a+a\,\cos{(c+d\,x)}\right)}^2}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^2),x)
[Out] int(1/((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^2), x)
```

3.330 $\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 178

$$\begin{aligned}
\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{7}{2}}(c+dx)}\,dx
&= -\frac{7\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a^2d} \\
&\quad+\frac{10\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3a^2d}+\frac{10\sin(c+dx)}{3a^2d\sqrt{\sec(c+dx)}} \\
&\quad-\frac{7\sin(c+dx)}{3a^2d\sqrt{\sec(c+dx)}(1+\sec(c+dx))}-\frac{\sin(c+dx)}{3d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^2}
\end{aligned}$$

```
[Out] 10/3*sin(d*x+c)/a^2/d/sec(d*x+c)^(1/2)-7/3*sin(d*x+c)/a^2/d/(1+sec(d*x+c))/
sec(d*x+c)^(1/2)-1/3*sin(d*x+c)/d/(a+a*sec(d*x+c))^2/sec(d*x+c)^(1/2)-7*(co
s(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2
^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^2/d+10/3*(cos(1/2*d*x+1/2*c)^2)
^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^
(1/2)*sec(d*x+c)^(1/2)/a^2/d
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 178, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used

$= \{3317, 3902, 4105, 3872, 3854, 3856, 2720, 2719\}$

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{7}{2}}(c+dx)}\,dx$$
$$= \frac{10\sin(c+dx)}{3a^2d\sqrt{\sec(c+dx)}} - \frac{7\sin(c+dx)}{3a^2d\sqrt{\sec(c+dx)}(\sec(c+dx)+1)} + \frac{10\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d} - \frac{7\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} - \frac{\sin(c+dx)}{3d\sqrt{\sec(c+dx)}(a\sec(c+dx)+a)^2}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^2*Sec[c + d*x]^(7/2)),x]
```

```
[Out] (-7*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a^2*d
) + (10*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3
*a^2*d) + (10*Sin[c + d*x])/(3*a^2*d*Sqrt[Sec[c + d*x]]) - (7*Sin[c + d*x])
/(3*a^2*d*Sqrt[Sec[c + d*x]]*(1 + Sec[c + d*x])) - Sin[c + d*x]/(3*d*Sqrt[S
ec[c + d*x]]*(a + a*Sec[c + d*x])^2)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

```
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3902

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-Cot[e + f*x])*(a + b*Csc[e + f*x])^m*((d*Csc
[e + f*x])^n/(f*(2*m + 1))), x] + Dist[1/(a^2*(2*m + 1)), Int[(a + b*Csc[e
+ f*x])^(m + 1)*(d*Csc[e + f*x])^n*(a*(2*m + n + 1) - b*(m + n + 1)*Csc[e +
 f*x]), x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && LtQ[
m, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m])
```

Rule 4105

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_)*(csc[(e_.) + (f_.)*(x_)]*(B_.) + (A_)), x_Symbol] :> Simp[(-(A*b
- a*B))*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d*Csc[e + f*x])^n/(b*f*(2*m +
 1))), x] - Dist[1/(a^2*(2*m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc
[e + f*x])^n*Simp[b*B*n - a*A*(2*m + n + 1) + (A*b - a*B)*(m + n + 1)*Csc[e
 + f*x], x], x], x] /; FreeQ[{a, b, d, e, f, A, B, n}, x] && NeQ[A*b - a*B,
 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)] &&  !GtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \frac{1}{\sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))^2}\,dx \\
&= -\frac{\sin(c+dx)}{3d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^2} - \frac{\int \frac{-\frac{9a}{2}+\frac{5}{2}a\sec(c+dx)}{\sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))}\,dx}{3a^2} \\
&= -\frac{7\sin(c+dx)}{3a^2d\sqrt{\sec(c+dx)}(1+\sec(c+dx))} \\
&\quad -\frac{\sin(c+dx)}{3d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^2} - \frac{\int \frac{-15a^2+\frac{21}{2}a^2\sec(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx}{3a^4} \\
&= -\frac{7\sin(c+dx)}{3a^2d\sqrt{\sec(c+dx)}(1+\sec(c+dx))} - \frac{\sin(c+dx)}{3d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^2} \\
&\quad -\frac{7\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx}{2a^2} + \frac{5\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx}{a^2}
\end{aligned}$$

$$
\begin{aligned}
&= \frac{10\sin(c+dx)}{3a^2d\sqrt{\sec(c+dx)}} - \frac{7\sin(c+dx)}{3a^2d\sqrt{\sec(c+dx)}(1+\sec(c+dx))} \\
&\quad - \frac{\sin(c+dx)}{3d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^2} + \frac{5\int\sqrt{\sec(c+dx)}\,dx}{3a^2} \\
&\quad - \frac{\left(7\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx}{2a^2} \\
&= -\frac{7\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a^2d} + \frac{10\sin(c+dx)}{3a^2d\sqrt{\sec(c+dx)}} \\
&\quad - \frac{7\sin(c+dx)}{3a^2d\sqrt{\sec(c+dx)}(1+\sec(c+dx))} - \frac{\sin(c+dx)}{3d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^2} \\
&\quad + \frac{\left(5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3a^2} \\
&= -\frac{7\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a^2d} \\
&\quad + \frac{10\sqrt{\cos(c+dx)}\,\mathrm{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3a^2d} + \frac{10\sin(c+dx)}{3a^2d\sqrt{\sec(c+dx)}} \\
&\quad - \frac{7\sin(c+dx)}{3a^2d\sqrt{\sec(c+dx)}(1+\sec(c+dx))} - \frac{\sin(c+dx)}{3d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^2}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.63 (sec) , antiderivative size = 257, normalized size of antiderivative = 1.44

$$
\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{7}{2}}(c+dx)}\,dx = \frac{e^{-idx}\cos\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}(\cos(dx)+i\sin(dx))\left(-84i\cos\left(\frac{1}{2}(c+dx)\right)-63i\cos\left(\frac{3}{2}(c+dx)\right)-21i\right.}{}
$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^2*Sec[c + d*x]^(7/2)),x]
```

```
[Out] (Cos[(c + d*x)/2]*Sqrt[Sec[c + d*x]]*(Cos[d*x] + I*Sin[d*x])*((-84*I)*Cos[(
c + d*x)/2] - (63*I)*Cos[(3*(c + d*x))/2] - (21*I)*Cos[(5*(c + d*x))/2] + 8
0*Cos[(c + d*x)/2]^3*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2] + ((7*I)*
(1 + E^(I*(c + d*x)))^3*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2
, 3/4, 7/4, -E^((2*I)*(c + d*x))])/E^((I/2)*(c + d*x)) + 3*Sin[(c + d*x)/2]
 + 10*Sin[(3*(c + d*x))/2] + 12*Sin[(5*(c + d*x))/2] + Sin[(7*(c + d*x))/2]
))/(6*a^2*d*E^(I*d*x)*(1 + Cos[c + d*x])^2)
```

Maple [A] (verified)

Time = 5.27 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.52

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(16\left(\cos^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+12\left(\cos^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+20\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\right.}{6a^2\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\mathrm{si}}}$

```
[In] int(1/(a+cos(d*x+c)*a)^2/sec(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/6*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(16*cos(1/2*d*
x+1/2*c)^8+12*cos(1/2*d*x+1/2*c)^6+20*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(
1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/2*d*x
+1/2*c)^3+42*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)
*cos(1/2*d*x+1/2*c)^3*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-48*cos(1/2*d*x+
1/2*c)^4+21*cos(1/2*d*x+1/2*c)^2-1)/a^2/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*
x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)^3/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/
2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 287, normalized size of antiderivative = 1.61

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{7}{2}}(c+dx)}\,dx =$$

$$-\frac{10\left(i\sqrt{2}\cos\left(dx+c\right)^2+2i\sqrt{2}\cos\left(dx+c\right)+i\sqrt{2}\right)\mathrm{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+\right.}{}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^2/sec(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] -1/6*(10*(I*sqrt(2)*cos(d*x + c)^2 + 2*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*
weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 10*(-I*sqrt(2)*
cos(d*x + c)^2 - 2*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(
-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 21*(I*sqrt(2)*cos(d*x + c)^2 + 2*I*
sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInvers
e(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 21*(-I*sqrt(2)*cos(d*x + c)^2 -
2*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPIn
verse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - 2*(2*cos(d*x + c)^3 + 13*cos
(d*x + c)^2 + 10*cos(d*x + c))*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^2*d*cos(
d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**2/sec(d*x+c)**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^2\sec(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^2/sec(d*x+c)^(7/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^2*sec(d*x + c)^(7/2)), x)
```

Giac [F]

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^2\sec(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^2/sec(d*x+c)^(7/2),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)^2*sec(d*x + c)^(7/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{7/2}\,(a+a\,\cos(c+d\,x))^2}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))^2),x)
[Out] int(1/((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))^2), x)
```

3.331 $\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{9}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 200

$$\begin{aligned}\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{9}{2}}(c+dx)}\,dx &= \frac{56\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5a^2d} \\ &\quad - \frac{5\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{a^2d} \\ &\quad + \frac{56\sin(c+dx)}{15a^2d\sec^{\frac{3}{2}}(c+dx)} - \frac{5\sin(c+dx)}{a^2d\sqrt{\sec(c+dx)}} \\ &\quad - \frac{3\sin(c+dx)}{a^2d\sec^{\frac{3}{2}}(c+dx)(1+\sec(c+dx))} - \frac{\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))^2}\end{aligned}$$

```
[Out] 56/15*sin(d*x+c)/a^2/d/sec(d*x+c)^(3/2)-3*sin(d*x+c)/a^2/d/sec(d*x+c)^(3/2)
/(1+sec(d*x+c))-1/3*sin(d*x+c)/d/sec(d*x+c)^(3/2)/(a+a*sec(d*x+c))^2-5*sin(
d*x+c)/a^2/d/sec(d*x+c)^(1/2)+56/5*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x
+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(
1/2)/a^2/d-5*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(
1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^2/d
```

Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 200, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {3317, 3902, 4105, 3872, 3854, 3856, 2719, 2720}

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{9}{2}}(c+dx)}\,dx$$
$$= -\frac{3\sin(c+dx)}{a^2d\sec^{\frac{3}{2}}(c+dx)(\sec(c+dx)+1)}+\frac{56\sin(c+dx)}{15a^2d\sec^{\frac{3}{2}}(c+dx)}$$
$$-\frac{5\sin(c+dx)}{a^2d\sqrt{\sec(c+dx)}}-\frac{5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{a^2d}$$
$$+\frac{56\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^2d}-\frac{\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)(a\sec(c+dx)+a)^2}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^2*Sec[c + d*x]^(9/2)),x]
```

```
[Out] (56*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(5*a^2
*d) - (5*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(
a^2*d) + (56*Sin[c + d*x])/(15*a^2*d*Sec[c + d*x]^(3/2)) - (5*Sin[c + d*x])
/(a^2*d*Sqrt[Sec[c + d*x]]) - (3*Sin[c + d*x])/(a^2*d*Sec[c + d*x]^(3/2)*(1
 + Sec[c + d*x])) - Sin[c + d*x]/(3*d*Sec[c + d*x]^(3/2)*(a + a*Sec[c + d*x
])^2)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
```

```
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3902

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-Cot[e + f*x])*(a + b*Csc[e + f*x])^m*((d*Csc
[e + f*x])^n/(f*(2*m + 1))), x] + Dist[1/(a^2*(2*m + 1)), Int[(a + b*Csc[e
+ f*x])^(m + 1)*(d*Csc[e + f*x])^n*(a*(2*m + n + 1) - b*(m + n + 1)*Csc[e +
 f*x]), x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && LtQ[
m, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m])
```

Rule 4105

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_)*(csc[(e_.) + (f_.)*(x_)]*(B_.) + (A_)), x_Symbol] :> Simp[(-(A*b
- a*B))*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d*Csc[e + f*x])^n/(b*f*(2*m +
 1))), x] - Dist[1/(a^2*(2*m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc
[e + f*x])^n*Simp[b*B*n - a*A*(2*m + n + 1) + (A*b - a*B)*(m + n + 1)*Csc[e
 + f*x], x], x], x] /; FreeQ[{a, b, d, e, f, A, B, n}, x] && NeQ[A*b - a*B,
 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)] &&  !GtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \frac{1}{\sec^{\frac{5}{2}}(c+dx)(a+a\sec(c+dx))^2}\,dx \\
&= -\frac{\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))^2}-\frac{\int \frac{-\frac{11a}{2}+\frac{7}{2}a\sec(c+dx)}{\sec^{\frac{5}{2}}(c+dx)(a+a\sec(c+dx))}\,dx}{3a^2} \\
&= -\frac{3\sin(c+dx)}{a^2d\sec^{\frac{3}{2}}(c+dx)(1+\sec(c+dx))} \\
&\quad -\frac{\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))^2}-\frac{\int \frac{-28a^2+\frac{45}{2}a^2\sec(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx}{3a^4}
\end{aligned}
$$

$$= -\frac{3\sin(c+dx)}{a^2d\sec^{\frac{3}{2}}(c+dx)(1+\sec(c+dx))} - \frac{\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))^2} - \frac{15\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}dx}{2a^2} + \frac{28\int \frac{1}{\sec^{\frac{5}{2}}(c+dx)}dx}{3a^2}$$

$$= \frac{56\sin(c+dx)}{15a^2d\sec^{\frac{3}{2}}(c+dx)} - \frac{5\sin(c+dx)}{a^2d\sqrt{\sec(c+dx)}} - \frac{3\sin(c+dx)}{a^2d\sec^{\frac{3}{2}}(c+dx)(1+\sec(c+dx))} - \frac{\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))^2} - \frac{5\int\sqrt{\sec(c+dx)}dx}{2a^2} + \frac{28\int\frac{1}{\sqrt{\sec(c+dx)}}dx}{5a^2}$$

$$= \frac{56\sin(c+dx)}{15a^2d\sec^{\frac{3}{2}}(c+dx)} - \frac{5\sin(c+dx)}{a^2d\sqrt{\sec(c+dx)}} - \frac{3\sin(c+dx)}{a^2d\sec^{\frac{3}{2}}(c+dx)(1+\sec(c+dx))} - \frac{\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))^2} - \frac{\left(5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}dx}{2a^2} + \frac{\left(28\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}dx}{5a^2}$$

$$= \frac{56\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5a^2d} - \frac{5\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{a^2d} + \frac{56\sin(c+dx)}{15a^2d\sec^{\frac{3}{2}}(c+dx)} - \frac{5\sin(c+dx)}{a^2d\sqrt{\sec(c+dx)}} - \frac{3\sin(c+dx)}{a^2d\sec^{\frac{3}{2}}(c+dx)(1+\sec(c+dx))} - \frac{\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))^2}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.88 (sec) , antiderivative size = 271, normalized size of antiderivative = 1.36

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{9}{2}}(c+dx)}dx$$
$$= \frac{e^{-idx}\cos\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}(\cos(dx)+i\sin(dx))\left(1344i\cos\left(\frac{1}{2}(c+dx)\right)+1008i\cos\left(\frac{3}{2}(c+dx)\right)+3\right.}{}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^2*Sec[c + d*x]^(9/2)),x]
```

```
[Out] (Cos[(c + d*x)/2]*Sqrt[Sec[c + d*x]]*(Cos[d*x] + I*Sin[d*x])*((1344*I)*Cos[
(c + d*x)/2] + (1008*I)*Cos[(3*(c + d*x))/2] + (336*I)*Cos[(5*(c + d*x))/2]
```

```
 - 1200*Cos[(c + d*x)/2]^3*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2] - (
(112*I)*(1 + E^(I*(c + d*x)))^3*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometri
c2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x))])/E^((I/2)*(c + d*x)) - 34*Sin[(c
+ d*x)/2] - 148*Sin[(3*(c + d*x))/2] - 168*Sin[(5*(c + d*x))/2] - 11*Sin[(7
*(c + d*x))/2] + 3*Sin[(9*(c + d*x))/2]))/(60*a^2*d*E^(I*d*x)*(1 + Cos[c +
d*x])^2)
```

Maple [A] (verified)

Time = 5.86 (sec) , antiderivative size = 283, normalized size of antiderivative = 1.42

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(96\left(\cos^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-352\left(\cos^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+120\left(\cos^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-150\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\right.}{30a^2\cos\left(\frac{dx}{2}+\right.}$

```
[In] int(1/(a+cos(d*x+c)*a)^2/sec(d*x+c)^(9/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/30*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(96*cos(1/2*d
*x+1/2*c)^10-352*cos(1/2*d*x+1/2*c)^8+120*cos(1/2*d*x+1/2*c)^6-150*(sin(1/2
*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*
x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^3-336*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^3*EllipticE(cos(1/2*d*x+1
/2*c),2^(1/2))+266*cos(1/2*d*x+1/2*c)^4-135*cos(1/2*d*x+1/2*c)^2+5)/a^2/cos
(1/2*d*x+1/2*c)^3/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(
1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 297, normalized size of antiderivative = 1.48

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{9}{2}}(c+dx)}\,dx = -\frac{75\left(-i\sqrt{2}\cos\left(dx+c\right)^2-2i\sqrt{2}\cos\left(dx+c\right)-i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx\right.}{}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^2/sec(d*x+c)^(9/2),x, algorithm="fricas")
```

```
[Out] -1/30*(75*(-I*sqrt(2)*cos(d*x + c)^2 - 2*I*sqrt(2)*cos(d*x + c) - I*sqrt(2)
)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 75*(I*sqrt(2)
*cos(d*x + c)^2 + 2*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse
(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 168*(-I*sqrt(2)*cos(d*x + c)^2 - 2
```

```
*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInv
erse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 168*(I*sqrt(2)*cos(d*x + c)^2
 + 2*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(-4, 0, weierstrass
PInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - 2*(6*cos(d*x + c)^4 - 8*c
os(d*x + c)^3 - 94*cos(d*x + c)^2 - 75*cos(d*x + c))*sin(d*x + c)/sqrt(cos(
d*x + c)))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{9}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**2/sec(d*x+c)**(9/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^2\sec(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^2/sec(d*x+c)^(9/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^2*sec(d*x + c)^(9/2)), x)
```

Giac [F]

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^2\sec(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^2/sec(d*x+c)^(9/2),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)^2*sec(d*x + c)^(9/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^2\sec^{\frac{9}{2}}(c+dx)}\,dx=\int \frac{1}{{\left(\frac{1}{\cos\left(c+d\,x\right)}\right)}^{9/2}\,{\left(a+a\,\cos\left(c+d\,x\right)\right)}^2}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(9/2)*(a + a*cos(c + d*x))^2),x)
[Out] int(1/((1/cos(c + d*x))^(9/2)*(a + a*cos(c + d*x))^2), x)
```

3.332 $\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^3} dx$

Optimal result

Integrand size = 23, antiderivative size = 221

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^3} dx = -\frac{49\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{10a^3d} - \frac{13\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{6a^3d} + \frac{49\sqrt{\sec(c+dx)}\sin(c+dx)}{10a^3d} - \frac{\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{8\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} - \frac{13\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d(a^3+a^3\sec(c+dx))}$$

```
[Out] -1/5*sec(d*x+c)^(7/2)*sin(d*x+c)/d/(a+a*sec(d*x+c))^3-8/15*sec(d*x+c)^(5/2)
*sin(d*x+c)/a/d/(a+a*sec(d*x+c))^2-13/6*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a^3+
a^3*sec(d*x+c))+49/10*sin(d*x+c)*sec(d*x+c)^(1/2)/a^3/d-49/10*(cos(1/2*d*x+
1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*co
s(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^3/d-13/6*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos
(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(
d*x+c)^(1/2)/a^3/d
```

Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 221, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.348$, Rules used = {3317, 3901, 4104, 3872, 3856, 2720, 3853, 2719}

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{13\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{6d\,(a^3\sec(c+dx)+a^3)} + \frac{49\sin(c+dx)\sqrt{\sec(c+dx)}}{10a^3d} - \frac{13\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{6a^3d} - \frac{49\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{10a^3d} - \frac{\sin(c+dx)\sec^{\frac{7}{2}}(c+dx)}{5d(a\sec(c+dx)+a)^3} - \frac{8\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{15ad(a\sec(c+dx)+a)^2}$$

```
[In] Int[Sec[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (-49*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(10*a
^3*d) - (13*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]]
)/(6*a^3*d) + (49*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(10*a^3*d) - (Sec[c + d*
x]^(7/2)*Sin[c + d*x])/(5*d*(a + a*Sec[c + d*x])^3) - (8*Sec[c + d*x]^(5/2)
*Sin[c + d*x])/(15*a*d*(a + a*Sec[c + d*x])^2) - (13*Sec[c + d*x]^(3/2)*Sin
[c + d*x])/(6*d*(a^3 + a^3*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
```

```
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3901

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-d^2)*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d
*Csc[e + f*x])^(n - 2)/(f*(2*m + 1))), x] + Dist[d^2/(a*b*(2*m + 1)), Int[(
a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^(n - 2)*(b*(n - 2) + a*(m - n
+ 2)*Csc[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 - b^2, 0
] && LtQ[m, -1] && GtQ[n, 2] && (IntegersQ[2*m, 2*n] || IntegerQ[m])
```

Rule 4104

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_)*(csc[(e_.) + (f_.)*(x_)]*(B_.) + (A_)), x_Symbol] :> Simp[d*(A*b
- a*B)*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d*Csc[e + f*x])^(n - 1)/(a*f*(
2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(
d*Csc[e + f*x])^(n - 1)*Simp[A*(a*d*(n - 1)) - B*(b*d*(n - 1)) - d*(a*B*(m
- n + 1) + A*b*(m + n))*Csc[e + f*x], x], x], x] /; FreeQ[{a, b, d, e, f, A
, B}, x] && NeQ[A*b - a*B, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)] && Gt
Q[n, 0]
```

Rubi steps

$$\text{integral} = \int \frac{\sec^{\frac{9}{2}}(c+dx)}{(a+a\sec(c+dx))^3}\,dx$$

$$= -\frac{\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{\int \frac{\sec^{\frac{5}{2}}(c+dx)\left(\frac{5a}{2}-\frac{11}{2}a\sec(c+dx)\right)}{(a+a\sec(c+dx))^2}\,dx}{5a^2}$$

$$= -\frac{\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{8\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} - \frac{\int \frac{\sec^{\frac{3}{2}}(c+dx)\left(12a^2-\frac{41}{2}a^2\sec(c+dx)\right)}{a+a\sec(c+dx)}\,dx}{15a^4}$$

$$= -\frac{\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{8\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} - \frac{13\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d\left(a^3+a^3\sec(c+dx)\right)} - \frac{\int \sqrt{\sec(c+dx)}\left(\frac{65a^3}{4} - \frac{147}{4}a^3\sec(c+dx)\right)dx}{15a^6}$$

$$= -\frac{\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{8\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} - \frac{13\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d\left(a^3+a^3\sec(c+dx)\right)} - \frac{13\int \sqrt{\sec(c+dx)}dx}{12a^3} + \frac{49\int \sec^{\frac{3}{2}}(c+dx)dx}{20a^3}$$

$$= \frac{49\sqrt{\sec(c+dx)}\sin(c+dx)}{10a^3d} - \frac{\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{8\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} - \frac{13\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d\left(a^3+a^3\sec(c+dx)\right)} - \frac{49\int \frac{1}{\sqrt{\sec(c+dx)}}dx}{20a^3} - \frac{\left(13\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}dx}{12a^3}$$

$$= -\frac{13\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{6a^3d} + \frac{49\sqrt{\sec(c+dx)}\sin(c+dx)}{10a^3d} - \frac{\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{8\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} - \frac{13\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d\left(a^3+a^3\sec(c+dx)\right)} - \frac{\left(49\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}dx}{20a^3}$$

$$= -\frac{49\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{10a^3d} - \frac{13\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{6a^3d} + \frac{49\sqrt{\sec(c+dx)}\sin(c+dx)}{10a^3d} - \frac{\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{8\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} - \frac{13\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d\left(a^3+a^3\sec(c+dx)\right)}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.85 (sec) , antiderivative size = 363, normalized size of antiderivative = 1.64

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{2\cos^6\left(\frac{1}{2}(c+dx)\right)\left(-\frac{2i\sqrt{2}e^{-i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(147\left(1+e^{2i(c+dx)}\right)+147\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)\cdots\right)}{-1+e^{2ic}}\cdots\right)}{\cdots}$$

```
[In] Integrate[Sec[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (2*Cos[(c + d*x)/2]^6*(((-2*I)*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(
c + d*x)))]*(147*(1 + E^((2*I)*(c + d*x))) + 147*(-1 + E^((2*I)*c))*Sqrt[1
+ E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x
))] - 65*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*H
ypergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/(E^(I*(c + d*x))*(-
1 + E^((2*I)*c))) + ((1284*Cos[(c - d*x)/2] + 921*Cos[(3*c + d*x)/2] + 1243
*Cos[(c + 3*d*x)/2] + 374*Cos[(5*c + 3*d*x)/2] + 670*Cos[(3*c + 5*d*x)/2] +
 65*Cos[(7*c + 5*d*x)/2] + 147*Cos[(5*c + 7*d*x)/2])*Csc[c/2]*Sec[c/2]*Sec[
(c + d*x)/2]^5*Sqrt[Sec[c + d*x]])/32))/(15*a^3*d*(1 + Cos[c + d*x])^3)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 554 vs. 2(245) = 490.

Time = 4.38 (sec) , antiderivative size = 555, normalized size of antiderivative = 2.51

method	result
default	$-\frac{-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\left(65F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-147E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\right)\cdots}{\cdots}$

```
[In] int(sec(d*x+c)^(3/2)/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/60*(-2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(-2
*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(65*EllipticF(cos(1/2*d*x
+1/2*c),2^(1/2))-147*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*cos(1/2*d*x+1/2
*c)*sin(1/2*d*x+1/2*c)^4+4*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*
c)^2-1)^(1/2)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(65*Elli
pticF(cos(1/2*d*x+1/2*c),2^(1/2))-147*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))
)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2
*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
```

```
2)^(1/2)*(65*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-147*EllipticE(cos(1/2*d*
x+1/2*c),2^(1/2)))*cos(1/2*d*x+1/2*c)+588*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*
d*x+1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)^8-1634*(-2*sin(1/2*d*x+1/2*c)^4+sin(
1/2*d*x+1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)^6+1488*(-2*sin(1/2*d*x+1/2*c)^4+
sin(1/2*d*x+1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)^4-439*(-2*sin(1/2*d*x+1/2*c)
^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)^2)/a^3/cos(1/2*d*x+1/2*c)
^5/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/
(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 354, normalized size of antiderivative = 1.60

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx =$$

$$-\frac{65\left(-i\sqrt{2}\cos\left(dx+c\right)^3-3i\sqrt{2}\cos\left(dx+c\right)^2-3i\sqrt{2}\cos\left(dx+c\right)-i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,c}{}$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] -1/60*(65*(-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3*I*sqr
t(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c)) + 65*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 +
 3*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x +
 c) - I*sin(d*x + c)) + 147*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x
 + c)^2 + 3*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(-4, 0, weie
rstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 147*(-I*sqrt(2)*co
s(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3*I*sqrt(2)*cos(d*x + c) - I*sq
rt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*s
in(d*x + c))) - 2*(147*cos(d*x + c)^3 + 376*cos(d*x + c)^2 + 295*cos(d*x +
c) + 60)*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*c
os(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \frac{\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\cos^3(c+dx)+3\cos^2(c+dx)+3\cos(c+dx)+1}\,dx}{a^3}$$

```
[In] integrate(sec(d*x+c)**(3/2)/(a+a*cos(d*x+c))**3,x)
```

```
[Out] Integral(sec(c + d*x)**(3/2)/(cos(c + d*x)**3 + 3*cos(c + d*x)**2 + 3*cos(c
 + d*x) + 1), x)/a**3
```

Maxima [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{3}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^3}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^3,x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^(3/2)/(a*cos(d*x + c) + a)^3, x)
```

Giac [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{3}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^3}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(3/2)/(a*cos(d*x + c) + a)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^3}\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)/(a + a*cos(c + d*x))^3,x)
[Out] int((1/cos(c + d*x))^(3/2)/(a + a*cos(c + d*x))^3, x)
```

3.333 $\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 195

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^3}\,dx = \frac{9\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{10a^3d} + \frac{\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{2a^3d} - \frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5ad(a+a\sec(c+dx))^2} - \frac{9\sqrt{\sec(c+dx)}\sin(c+dx)}{10d\left(a^3+a^3\sec(c+dx)\right)}$$

```
[Out] -1/5*sec(d*x+c)^(5/2)*sin(d*x+c)/d/(a+a*sec(d*x+c))^3-2/5*sec(d*x+c)^(3/2)*
sin(d*x+c)/a/d/(a+a*sec(d*x+c))^2-9/10*sin(d*x+c)*sec(d*x+c)^(1/2)/d/(a^3+a
^3*sec(d*x+c))+9/10*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipti
cE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^3/d+1/2*
(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c
),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^3/d
```

Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 195, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used

= {3317, 3901, 4104, 3872, 3856, 2719, 2720}

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^3}\,dx = -\frac{9\sin(c+dx)\sqrt{\sec(c+dx)}}{10d\left(a^3\sec(c+dx)+a^3\right)} + \frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{2a^3d} + \frac{9\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{10a^3d} - \frac{\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{5d(a\sec(c+dx)+a)^3} - \frac{2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{5ad(a\sec(c+dx)+a)^2}$$

```
[In] Int[Sqrt[Sec[c + d*x]]/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (9*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(10*a^3
*d) + (Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(2*
a^3*d) - (Sec[c + d*x]^(5/2)*Sin[c + d*x])/(5*d*(a + a*Sec[c + d*x])^3) - (
2*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(5*a*d*(a + a*Sec[c + d*x])^2) - (9*Sqrt
[Sec[c + d*x]]*Sin[c + d*x])/(10*d*(a^3 + a^3*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
```

```
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3901

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-d^2)*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d
*Csc[e + f*x])^(n - 2)/(f*(2*m + 1))), x] + Dist[d^2/(a*b*(2*m + 1)), Int[(
a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^(n - 2)*(b*(n - 2) + a*(m - n
+ 2)*Csc[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 - b^2, 0
] && LtQ[m, -1] && GtQ[n, 2] && (IntegersQ[2*m, 2*n] || IntegerQ[m])
```

Rule 4104

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_)*(csc[(e_.) + (f_.)*(x_)]*(B_.) + (A_)), x_Symbol] :> Simp[d*(A*b
- a*B)*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d*Csc[e + f*x])^(n - 1)/(a*f*(
2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(
d*Csc[e + f*x])^(n - 1)*Simp[A*(a*d*(n - 1)) - B*(b*d*(n - 1)) - d*(a*B*(m
- n + 1) + A*b*(m + n))*Csc[e + f*x], x], x], x] /; FreeQ[{a, b, d, e, f, A
, B}, x] && NeQ[A*b - a*B, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)] && Gt
Q[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \frac{\sec^{\frac{7}{2}}(c+dx)}{(a+a\sec(c+dx))^3}\,dx \\
&= -\frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{\int \frac{\sec^{\frac{3}{2}}(c+dx)\left(\frac{3a}{2}-\frac{9}{2}a\sec(c+dx)\right)}{(a+a\sec(c+dx))^2}\,dx}{5a^2} \\
&= -\frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5ad(a+a\sec(c+dx))^2} - \frac{\int \frac{\sqrt{\sec(c+dx)}\left(3a^2-\frac{21}{2}a^2\sec(c+dx)\right)}{a+a\sec(c+dx)}\,dx}{15a^4} \\
&= -\frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5ad(a+a\sec(c+dx))^2} \\
&\quad - \frac{9\sqrt{\sec(c+dx)}\sin(c+dx)}{10d\left(a^3+a^3\sec(c+dx)\right)} - \frac{\int \frac{-\frac{27a^3}{4}-\frac{15}{4}a^3\sec(c+dx)}{\sqrt{\sec(c+dx)}}\,dx}{15a^6} \\
&= -\frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5ad(a+a\sec(c+dx))^2} \\
&\quad - \frac{9\sqrt{\sec(c+dx)}\sin(c+dx)}{10d\left(a^3+a^3\sec(c+dx)\right)} + \frac{\int \sqrt{\sec(c+dx)}\,dx}{4a^3} + \frac{9\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx}{20a^3}
\end{aligned}$$

$$=-\frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3}-\frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5ad(a+a\sec(c+dx))^2}-\frac{9\sqrt{\sec(c+dx)}\sin(c+dx)}{10d\left(a^3+a^3\sec(c+dx)\right)}+\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{4a^3}+\frac{\left(9\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx}{20a^3}$$

$$=\frac{9\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{10a^3d}+\frac{\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{2a^3d}-\frac{\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3}-\frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5ad(a+a\sec(c+dx))^2}-\frac{9\sqrt{\sec(c+dx)}\sin(c+dx)}{10d\left(a^3+a^3\sec(c+dx)\right)}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.78 (sec) , antiderivative size = 274, normalized size of antiderivative = 1.41

$$\int\frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^3}\,dx$$

$$=\frac{e^{-idx}\cos\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}\left(-3ie^{-2i(c+dx)}\left(1+e^{i(c+dx)}\right)^5\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3}{4},\frac{7}{4}\right.\right.}{}$$

```
[In] Integrate[Sqrt[Sec[c + d*x]]/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (Cos[(c + d*x)/2]*Sqrt[Sec[c + d*x]]*(((-3*I)*(1 + E^(I*(c + d*x)))^5*Sqrt[
1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*
x))])/E^((2*I)*(c + d*x)) + 160*Cos[(c + d*x)/2]^5*Sqrt[Cos[c + d*x]]*Ellip
ticF[(c + d*x)/2, 2]*(Cos[(c + d*x)/2] - I*Sin[(c + d*x)/2]) + (2*I)*(34 +
69*Cos[c + d*x] + 34*Cos[2*(c + d*x)] + 7*Cos[3*(c + d*x)] + (2*I)*Sin[c +
d*x] + (6*I)*Sin[2*(c + d*x)] + (2*I)*Sin[3*(c + d*x)]))*(Cos[(c + 3*d*x)/2
] + I*Sin[(c + 3*d*x)/2]))/(40*a^3*d*E^(I*d*x)*(1 + Cos[c + d*x])^3)
```

Maple [A] (verified)

Time = 2.81 (sec) , antiderivative size = 268, normalized size of antiderivative = 1.37

method	result
default	$\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(36\left(\cos^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-10\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\text{co}\right.\right.}{20a^3\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^5\sqrt{-2\left(\sin^4\left(\frac{dx}{2}\right.\right.}}$

```
[In] int(sec(d*x+c)^(1/2)/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/20*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(36*cos(1/2*d*
x+1/2*c)^8-10*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2
)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^5+18*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^5*El
lipticE(cos(1/2*d*x+1/2*c),2^(1/2))-46*cos(1/2*d*x+1/2*c)^6+8*cos(1/2*d*x+1
/2*c)^4+cos(1/2*d*x+1/2*c)^2+1)/a^3/cos(1/2*d*x+1/2*c)^5/(-2*sin(1/2*d*x+1/
2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)
^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 353, normalized size of antiderivative = 1.81

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^3}\,dx =$$

$$-\frac{5\left(i\sqrt{2}\cos\left(dx+c\right)^3+3i\sqrt{2}\cos\left(dx+c\right)^2+3i\sqrt{2}\cos\left(dx+c\right)+i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,\cos\left(\right.}{}$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] -1/20*(5*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + 3*I*sqrt(
2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) + I*si
n(d*x + c)) + 5*(-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3
*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c
) - I*sin(d*x + c)) + 9*(-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x +
c)^2 - 3*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, weierst
rassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 9*(I*sqrt(2)*cos(d*x
+ c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + 3*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))
*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x
 + c))) + 2*(9*cos(d*x + c)^3 + 22*cos(d*x + c)^2 + 15*cos(d*x + c))*sin(d*
x + c)/sqrt(cos(d*x + c)))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 +
 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^3}\,dx = \frac{\int \frac{\sqrt{\sec(c+dx)}}{\cos^3(c+dx)+3\cos^2(c+dx)+3\cos(c+dx)+1}\,dx}{a^3}$$

```
[In] integrate(sec(d*x+c)**(1/2)/(a+a*cos(d*x+c))**3,x)
[Out] Integral(sqrt(sec(c + d*x))/(cos(c + d*x)**3 + 3*cos(c + d*x)**2 + 3*cos(c
+ d*x) + 1), x)/a**3
```

Maxima [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\sqrt{\sec(dx+c)}}{(a\cos(dx+c)+a)^3}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^3,x, algorithm="maxima")
[Out] integrate(sqrt(sec(d*x + c))/(a*cos(d*x + c) + a)^3, x)
```

Giac [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\sqrt{\sec(dx+c)}}{(a\cos(dx+c)+a)^3}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate(sqrt(sec(d*x + c))/(a*cos(d*x + c) + a)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^3}\,dx = \int \frac{\sqrt{\frac{1}{\cos(c+d\,x)}}}{(a+a\,\cos(c+d\,x))^3}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)/(a + a*cos(c + d*x))^3,x)
[Out] int((1/cos(c + d*x))^(1/2)/(a + a*cos(c + d*x))^3, x)
```

3.334 $\int \frac{1}{(a+a\cos(c+dx))^3\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 195

$$\begin{aligned}\int \frac{1}{(a+a\cos(c+dx))^3\sqrt{\sec(c+dx)}}\,dx &= \frac{\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{10a^3d} \\ &\quad+\frac{\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{6a^3d}-\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} \\ &\quad-\frac{4\sqrt{\sec(c+dx)}\sin(c+dx)}{15ad(a+a\sec(c+dx))^2}+\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{6d\left(a^3+a^3\sec(c+dx)\right)}\end{aligned}$$

```
[Out] -1/5*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*sec(d*x+c))^3-4/15*sin(d*x+c)*sec(d
*x+c)^(1/2)/a/d/(a+a*sec(d*x+c))^2+1/6*sin(d*x+c)*sec(d*x+c)^(1/2)/d/(a^3+a
^3*sec(d*x+c))+1/10*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipti
cE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^3/d+1/6*
(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c
),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^3/d
```

Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 195, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used

$= \{3317, 3901, 4104, 4105, 3872, 3856, 2719, 2720\}$

$$\begin{aligned}
&\int \frac{1}{(a+a\cos(c+dx))^3\sqrt{\sec(c+dx)}}\,dx \\
&= \frac{\sin(c+dx)\sqrt{\sec(c+dx)}}{6d\left(a^3\sec(c+dx)+a^3\right)} + \frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{6a^3d} \\
&\quad + \frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} \\
&\quad - \frac{\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{5d(a\sec(c+dx)+a)^3} - \frac{4\sin(c+dx)\sqrt{\sec(c+dx)}}{15ad(a\sec(c+dx)+a)^2}
\end{aligned}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^3*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(10*a^3*d
) + (Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(6*a^
3*d) - (Sec[c + d*x]^(3/2)*Sin[c + d*x])/(5*d*(a + a*Sec[c + d*x])^3) - (4*
Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(15*a*d*(a + a*Sec[c + d*x])^2) + (Sqrt[Se
c[c + d*x]]*Sin[c + d*x])/(6*d*(a^3 + a^3*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
```

```
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3901

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-d^2)*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d
*Csc[e + f*x])^(n - 2)/(f*(2*m + 1))), x] + Dist[d^2/(a*b*(2*m + 1)), Int[(
a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^(n - 2)*(b*(n - 2) + a*(m - n
+ 2)*Csc[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 - b^2, 0
] && LtQ[m, -1] && GtQ[n, 2] && (IntegersQ[2*m, 2*n] || IntegerQ[m])
```

Rule 4104

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_)*(csc[(e_.) + (f_.)*(x_)]*(B_.) + (A_)), x_Symbol] :> Simp[d*(A*b
- a*B)*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d*Csc[e + f*x])^(n - 1)/(a*f*(
2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(
d*Csc[e + f*x])^(n - 1)*Simp[A*(a*d*(n - 1)) - B*(b*d*(n - 1)) - d*(a*B*(m
- n + 1) + A*b*(m + n))*Csc[e + f*x], x], x], x] /; FreeQ[{a, b, d, e, f, A
, B}, x] && NeQ[A*b - a*B, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)] && Gt
Q[n, 0]
```

Rule 4105

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_)*(csc[(e_.) + (f_.)*(x_)]*(B_.) + (A_)), x_Symbol] :> Simp[(-(A*b
- a*B))*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d*Csc[e + f*x])^n/(b*f*(2*m +
 1))), x] - Dist[1/(a^2*(2*m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc
[e + f*x])^n*Simp[b*B*n - a*A*(2*m + n + 1) + (A*b - a*B)*(m + n + 1)*Csc[e
 + f*x], x], x], x] /; FreeQ[{a, b, d, e, f, A, B, n}, x] && NeQ[A*b - a*B,
 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)] &&  !GtQ[n, 0]
```

Rubi steps

$$\text{integral} = \int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\sec(c+dx))^3}\,dx$$

$$= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{\int \frac{\sqrt{\sec(c+dx)}\left(\frac{a}{2}-\frac{7}{2}a\sec(c+dx)\right)}{(a+a\sec(c+dx))^2}\,dx}{5a^2}$$

$$= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{4\sqrt{\sec(c+dx)}\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} - \frac{\int \frac{-2a^2-\frac{9}{2}a^2\sec(c+dx)}{\sqrt{\sec(c+dx)}(a+a\sec(c+dx))}\,dx}{15a^4}$$

$$= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{4\sqrt{\sec(c+dx)}\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} + \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{6d\,(a^3+a^3\sec(c+dx))} - \frac{\int \frac{-\frac{3a^3}{4}-\frac{5}{4}a^3\sec(c+dx)}{\sqrt{\sec(c+dx)}}dx}{15a^6}$$

$$= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{4\sqrt{\sec(c+dx)}\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} + \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{6d\,(a^3+a^3\sec(c+dx))} + \frac{\int \frac{1}{\sqrt{\sec(c+dx)}}dx}{20a^3} + \frac{\int \sqrt{\sec(c+dx)}dx}{12a^3}$$

$$= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{4\sqrt{\sec(c+dx)}\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} + \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{6d\,(a^3+a^3\sec(c+dx))} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}dx}{20a^3} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}dx}{12a^3}$$

$$= \frac{\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{10a^3d} + \frac{\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{6a^3d} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{4\sqrt{\sec(c+dx)}\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} + \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{6d\,(a^3+a^3\sec(c+dx))}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.62 (sec) , antiderivative size = 363, normalized size of antiderivative = 1.86

$$\int \frac{1}{(a+a\cos(c+dx))^3\sqrt{\sec(c+dx)}}dx = \frac{2\cos^6\left(\frac{1}{2}(c+dx)\right)\left(\frac{2i\sqrt{2}e^{-i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(3(1+e^{2i(c+dx)})+3(-1+e^{2ic})\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right)\right.}{-1+e^{2ic}}\right.}{}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^3*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (2*Cos[(c + d*x)/2]^6*(((2*I)*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c
 + d*x)))]*(3*(1 + E^((2*I)*(c + d*x))) + 3*(-1 + E^((2*I)*c))*Sqrt[1 + E^(
(2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x))] -
```

```
5*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hyperge
ometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/(E^(I*(c + d*x))*(-1 + E^
((2*I)*c))) - ((36*Cos[(c - d*x)/2] + 9*Cos[(3*c + d*x)/2] + 7*Cos[(c + 3*d
*x)/2] + 26*Cos[(5*c + 3*d*x)/2] + 10*Cos[(3*c + 5*d*x)/2] + 5*Cos[(7*c + 5
*d*x)/2] + 3*Cos[(5*c + 7*d*x)/2])*Csc[c/2]*Sec[c/2]*Sec[(c + d*x)/2]^5*Sqr
t[Sec[c + d*x]])/32))/(15*a^3*d*(1 + Cos[c + d*x])^3)
```

Maple [A] (verified)

Time = 4.51 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.38

method	result
default	$\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(12\left(\cos^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-10\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\cos\right.\right.}{60a^3\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^5\sqrt{-2\left(\sin^4\left(\frac{dx}{2}\right.\right.}}$

```
[In] int(1/(a+cos(d*x+c)*a)^3/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/60*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(12*cos(1/2*d*
x+1/2*c)^8-10*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2
)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^5+6*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^5*Ell
ipticE(cos(1/2*d*x+1/2*c),2^(1/2))-22*cos(1/2*d*x+1/2*c)^6+6*cos(1/2*d*x+1/
2*c)^4+7*cos(1/2*d*x+1/2*c)^2-3)/a^3/cos(1/2*d*x+1/2*c)^5/(-2*sin(1/2*d*x+1
/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c
)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 353, normalized size of antiderivative = 1.81

$$\int \frac{1}{(a+a\cos(c+dx))^3\sqrt{\sec(c+dx)}}\,dx =$$

$$-\frac{5\left(i\sqrt{2}\cos\left(dx+c\right)^3+3i\sqrt{2}\cos\left(dx+c\right)^2+3i\sqrt{2}\cos\left(dx+c\right)+i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,\cos(\ldots}{}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^3/sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/60*(5*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + 3*I*sqrt(
2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) + I*si
n(d*x + c)) + 5*(-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3
*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c
```

```
) - I*sin(d*x + c)) + 3*(-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x +
c)^2 - 3*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, weierst
rassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 3*(I*sqrt(2)*cos(d*x
+ c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + 3*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))
*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x
 + c))) + 2*(3*cos(d*x + c)^3 + 4*cos(d*x + c)^2 - 5*cos(d*x + c))*sin(d*x
+ c)/sqrt(cos(d*x + c)))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3
*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F]

$$\int \frac{1}{(a+a\cos(c+dx))^3\sqrt{\sec(c+dx)}}\,dx = \frac{\int \frac{1}{\cos^3(c+dx)\sqrt{\sec(c+dx)}+3\cos^2(c+dx)\sqrt{\sec(c+dx)}+3\cos(c+dx)\sqrt{\sec(c+dx)}+\sqrt{\sec(c+dx)}}\,dx}{a^3}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**3/sec(d*x+c)**(1/2),x)
```

```
[Out] Integral(1/(cos(c + d*x)**3*sqrt(sec(c + d*x)) + 3*cos(c + d*x)**2*sqrt(sec
(c + d*x)) + 3*cos(c + d*x)*sqrt(sec(c + d*x)) + sqrt(sec(c + d*x))), x)/a*
*3
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^3\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^3\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^3/sec(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/((a*cos(d*x + c) + a)^3*sqrt(sec(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{(a+a\cos(c+dx))^3\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^3\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^3/sec(d*x+c)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/((a*cos(d*x + c) + a)^3*sqrt(sec(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^3\sqrt{\sec(c+dx)}}\,dx=\int \frac{1}{\sqrt{\frac{1}{\cos(c+d\,x)}}\,{\left(a+a\,\cos\left(c+d\,x\right)\right)}^3}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^3),x)
[Out] int(1/((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^3), x)
```

3.335 $\int \frac{1}{(a+a\cos(c+dx))^3 \sec^{\frac{3}{2}}(c+dx)} dx$

Optimal result

Integrand size = 23, antiderivative size = 195

$$\begin{aligned}\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)}\,dx &= -\frac{\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{10a^3d} \\ &\quad+\frac{\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{6a^3d}+\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} \\ &\quad-\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{15ad(a+a\sec(c+dx))^2}+\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{6d\left(a^3+a^3\sec(c+dx)\right)}\end{aligned}$$

```
[Out] 1/5*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*sec(d*x+c))^3-1/15*sin(d*x+c)*sec(d*
x+c)^(1/2)/a/d/(a+a*sec(d*x+c))^2+1/6*sin(d*x+c)*sec(d*x+c)^(1/2)/d/(a^3+a^
3*sec(d*x+c))-1/10*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elliptic
E(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^3/d+1/6*(
cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c)
,2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^3/d
```

Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 195, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used

= {3317, 3900, 4104, 4105, 3872, 3856, 2719, 2720}

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)}\,dx$$
$$= \frac{\sin(c+dx)\sqrt{\sec(c+dx)}}{6d\,(a^3\sec(c+dx)+a^3)} + \frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{6a^3d}$$
$$- \frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{10a^3d}$$
$$+ \frac{\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{5d(a\sec(c+dx)+a)^3} - \frac{\sin(c+dx)\sqrt{\sec(c+dx)}}{15ad(a\sec(c+dx)+a)^2}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^3*Sec[c + d*x]^(3/2)),x]
```

```
[Out] -1/10*(Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a^
3*d) + (Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(6
*a^3*d) + (Sec[c + d*x]^(3/2)*Sin[c + d*x])/(5*d*(a + a*Sec[c + d*x])^3) -
(Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(15*a*d*(a + a*Sec[c + d*x])^2) + (Sqrt[S
ec[c + d*x]]*Sin[c + d*x])/(6*d*(a^3 + a^3*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
```

```
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3900

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[b*d*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d*Cs
c[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] - Dist[d/(a*b*(2*m + 1)), Int[(a +
 b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^(n - 1)*(a*(n - 1) - b*(m + n)*Cs
c[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 - b^2, 0] && Lt
Q[m, -1] && LtQ[1, n, 2] && (IntegersQ[2*m, 2*n] || IntegerQ[m])
```

Rule 4104

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_)*(csc[(e_.) + (f_.)*(x_)]*(B_.) + (A_)), x_Symbol] :> Simp[d*(A*b
- a*B)*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d*Csc[e + f*x])^(n - 1)/(a*f*(
2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(
d*Csc[e + f*x])^(n - 1)*Simp[A*(a*d*(n - 1)) - B*(b*d*(n - 1)) - d*(a*B*(m
- n + 1) + A*b*(m + n))*Csc[e + f*x], x], x], x] /; FreeQ[{a, b, d, e, f, A
, B}, x] && NeQ[A*b - a*B, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)] && Gt
Q[n, 0]
```

Rule 4105

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_)*(csc[(e_.) + (f_.)*(x_)]*(B_.) + (A_)), x_Symbol] :> Simp[(-(A*b
- a*B))*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d*Csc[e + f*x])^n/(b*f*(2*m +
 1))), x] - Dist[1/(a^2*(2*m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc
[e + f*x])^n*Simp[b*B*n - a*A*(2*m + n + 1) + (A*b - a*B)*(m + n + 1)*Csc[e
 + f*x], x], x], x] /; FreeQ[{a, b, d, e, f, A, B, n}, x] && NeQ[A*b - a*B,
 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)] &&  !GtQ[n, 0]
```

Rubi steps

$$\text{integral} = \int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\sec(c+dx))^3}\,dx$$

$$= \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} + \frac{\int \frac{\sqrt{\sec(c+dx)}\left(\frac{a}{2}+\frac{3}{2}a\sec(c+dx)\right)}{(a+a\sec(c+dx))^2}\,dx}{5a^2}$$

$$= \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} + \frac{\int \frac{\frac{a^2}{2}+3a^2\sec(c+dx)}{\sqrt{\sec(c+dx)}(a+a\sec(c+dx))}\,dx}{15a^4}$$

$$= \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} + \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{6d(a^3+a^3\sec(c+dx))} + \frac{\int \frac{-\frac{3a^3}{4}+\frac{5}{4}a^3\sec(c+dx)}{\sqrt{\sec(c+dx)}}dx}{15a^6}$$

$$= \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} + \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{6d(a^3+a^3\sec(c+dx))} - \frac{\int \frac{1}{\sqrt{\sec(c+dx)}}dx}{20a^3} + \frac{\int \sqrt{\sec(c+dx)}dx}{12a^3}$$

$$= \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} + \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{6d(a^3+a^3\sec(c+dx))} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}dx}{20a^3} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}dx}{12a^3}$$

$$= -\frac{\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{10a^3d} + \frac{\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{6a^3d} + \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} + \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{6d(a^3+a^3\sec(c+dx))}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 1.74 (sec) , antiderivative size = 363, normalized size of antiderivative = 1.86

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)}dx$$

$$= \frac{2\cos^6\left(\frac{1}{2}(c+dx)\right)\left(-\frac{2i\sqrt{2}e^{-i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(3(1+e^{2i(c+dx)})+3(-1+e^{2ic})\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+}\right.}{-1+e^{2ic}}\right.}{}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^3*Sec[c + d*x]^(3/2)),x]
```

```
[Out] (2*Cos[(c + d*x)/2]^6*(((-2*I)*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(
c + d*x)))]*(3*(1 + E^((2*I)*(c + d*x))) + 3*(-1 + E^((2*I)*c))*Sqrt[1 + E^
((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x))]
```

```
+ 5*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hyperg
eometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]]))/(E^(I*(c + d*x))*(-1 + E
^((2*I)*c))) + ((36*Cos[(c - d*x)/2] + 9*Cos[(3*c + d*x)/2] + 17*Cos[(c + 3
*d*x)/2] + 16*Cos[(5*c + 3*d*x)/2] + 20*Cos[(3*c + 5*d*x)/2] - 5*Cos[(7*c +
 5*d*x)/2] + 3*Cos[(5*c + 7*d*x)/2])*Csc[c/2]*Sec[c/2]*Sec[(c + d*x)/2]^5*S
qrt[Sec[c + d*x]])/32))/(15*a^3*d*(1 + Cos[c + d*x])^3)
```

Maple [A] (verified)

Time = 4.80 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.38

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(12\left(\cos^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+10\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\mathrm{c}\right.\right.}{60a^3\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^5\sqrt{-2\left(\sin^4\left(\right.\right.}}$

```
[In] int(1/(a+cos(d*x+c)*a)^3/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/60*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(12*cos(1/2*d
*x+1/2*c)^8+10*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/
2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^5+6*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^5*El
lipticE(cos(1/2*d*x+1/2*c),2^(1/2))-2*cos(1/2*d*x+1/2*c)^6-24*cos(1/2*d*x+1
/2*c)^4+17*cos(1/2*d*x+1/2*c)^2-3)/a^3/cos(1/2*d*x+1/2*c)^5/(-2*sin(1/2*d*x
+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2
*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 353, normalized size of antiderivative = 1.81

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)}\,dx =$$

$$-\frac{5\left(i\sqrt{2}\cos\left(dx+c\right)^3+3i\sqrt{2}\cos\left(dx+c\right)^2+3i\sqrt{2}\cos\left(dx+c\right)+i\sqrt{2}\right)\mathrm{weierstrassPInverse}(-4,0,\cos\left(d\right.}{}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^3/sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/60*(5*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + 3*I*sqrt(
2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) + I*si
n(d*x + c)) + 5*(-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3
*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c
```

```
) - I*sin(d*x + c)) + 3*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c
)^2 + 3*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(-4, 0, weierstr
assPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 3*(-I*sqrt(2)*cos(d*x
+ c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))
*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x
 + c))) - 2*(3*cos(d*x + c)^3 + 14*cos(d*x + c)^2 + 5*cos(d*x + c))*sin(d*x
 + c)/sqrt(cos(d*x + c)))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 +
3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^3 \sec^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**3/sec(d*x+c)**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^3 \sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^3 \sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^3/sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^3*sec(d*x + c)^(3/2)), x)
```

Giac [F]

$$\int \frac{1}{(a+a\cos(c+dx))^3 \sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^3 \sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^3/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)^3*sec(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}\,{\left(a+a\,\cos\left(c+d\,x\right)\right)}^3}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^3),x)
[Out] int(1/((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^3), x)
```

3.336 $\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 195

$$\begin{aligned}\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)}\,dx &= -\frac{9\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{10a^3d}\\ &\quad+\frac{\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{2a^3d}-\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3}\\ &\quad+\frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{5ad(a+a\sec(c+dx))^2}+\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{2d\left(a^3+a^3\sec(c+dx)\right)}\end{aligned}$$

```
[Out] -1/5*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*sec(d*x+c))^3+2/5*sin(d*x+c)*sec(d*
x+c)^(1/2)/a/d/(a+a*sec(d*x+c))^2+1/2*sin(d*x+c)*sec(d*x+c)^(1/2)/d/(a^3+a^
3*sec(d*x+c))-9/10*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elliptic
E(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^3/d+1/2*(
cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c)
,2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^3/d
```

Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 195, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used

$= \{3317, 3902, 4104, 4105, 3872, 3856, 2719, 2720\}$

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)}\,dx$$
$$= \frac{\sin(c+dx)\sqrt{\sec(c+dx)}}{2d\,(a^3\sec(c+dx)+a^3)} + \frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\mathrm{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{2a^3d}$$
$$- \frac{9\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{10a^3d}$$
$$- \frac{\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{5d(a\sec(c+dx)+a)^3} + \frac{2\sin(c+dx)\sqrt{\sec(c+dx)}}{5ad(a\sec(c+dx)+a)^2}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^3*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (-9*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(10*a^
3*d) + (Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(2
*a^3*d) - (Sec[c + d*x]^(3/2)*Sin[c + d*x])/(5*d*(a + a*Sec[c + d*x])^3) +
(2*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(5*a*d*(a + a*Sec[c + d*x])^2) + (Sqrt[
Sec[c + d*x]]*Sin[c + d*x])/(2*d*(a^3 + a^3*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
```

```
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3902

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-Cot[e + f*x])*(a + b*Csc[e + f*x])^m*((d*Csc
[e + f*x])^n/(f*(2*m + 1))), x] + Dist[1/(a^2*(2*m + 1)), Int[(a + b*Csc[e
+ f*x])^(m + 1)*(d*Csc[e + f*x])^n*(a*(2*m + n + 1) - b*(m + n + 1)*Csc[e +
 f*x]), x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && LtQ[
m, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m])
```

Rule 4104

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_)*(csc[(e_.) + (f_.)*(x_)]*(B_.) + (A_)), x_Symbol] :> Simp[d*(A*b
- a*B)*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d*Csc[e + f*x])^(n - 1)/(a*f*(
2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(
d*Csc[e + f*x])^(n - 1)*Simp[A*(a*d*(n - 1)) - B*(b*d*(n - 1)) - d*(a*B*(m
- n + 1) + A*b*(m + n))*Csc[e + f*x], x], x], x] /; FreeQ[{a, b, d, e, f, A
, B}, x] && NeQ[A*b - a*B, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)] && Gt
Q[n, 0]
```

Rule 4105

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_)*(csc[(e_.) + (f_.)*(x_)]*(B_.) + (A_)), x_Symbol] :> Simp[(-(A*b
- a*B))*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d*Csc[e + f*x])^n/(b*f*(2*m +
 1))), x] - Dist[1/(a^2*(2*m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc
[e + f*x])^n*Simp[b*B*n - a*A*(2*m + n + 1) + (A*b - a*B)*(m + n + 1)*Csc[e
 + f*x], x], x], x] /; FreeQ[{a, b, d, e, f, A, B, n}, x] && NeQ[A*b - a*B,
 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)] &&  !GtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \frac{\sqrt{\sec(c+dx)}}{(a+a\sec(c+dx))^3}\,dx \\
&= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{\int \frac{\sqrt{\sec(c+dx)}\left(-\frac{9a}{2}+\frac{3}{2}a\sec(c+dx)\right)}{(a+a\sec(c+dx))^2}\,dx}{5a^2} \\
&= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} + \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{5ad(a+a\sec(c+dx))^2} - \frac{\int \frac{3a^2-\frac{9}{2}a^2\sec(c+dx)}{\sqrt{\sec(c+dx)}(a+a\sec(c+dx))}\,dx}{15a^4}
\end{aligned}$$

$$= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} + \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{5ad(a+a\sec(c+dx))^2} + \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{2d\left(a^3+a^3\sec(c+dx)\right)} - \frac{\int \frac{\frac{27a^3}{4}-\frac{15}{4}a^3\sec(c+dx)}{\sqrt{\sec(c+dx)}}dx}{15a^6}$$

$$= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} + \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{5ad(a+a\sec(c+dx))^2} + \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{2d\left(a^3+a^3\sec(c+dx)\right)} + \frac{\int \sqrt{\sec(c+dx)}dx}{4a^3} - \frac{9\int \frac{1}{\sqrt{\sec(c+dx)}}dx}{20a^3}$$

$$= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} + \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{5ad(a+a\sec(c+dx))^2} + \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{2d\left(a^3+a^3\sec(c+dx)\right)} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}dx}{4a^3} - \frac{\left(9\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}dx}{20a^3}$$

$$= -\frac{9\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{10a^3d} + \frac{\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{2a^3d} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d(a+a\sec(c+dx))^3} + \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{5ad(a+a\sec(c+dx))^2} + \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{2d\left(a^3+a^3\sec(c+dx)\right)}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 2.30 (sec) , antiderivative size = 272, normalized size of antiderivative = 1.39

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)}dx$$

$$= \frac{e^{-idx}\cos\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}\left(160\cos^5\left(\frac{1}{2}(c+dx)\right)\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\left(\cos\left(\frac{1}{2}(c+\right.\right.\right.}{}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^3*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (Cos[(c + d*x)/2]*Sqrt[Sec[c + d*x]]*(160*Cos[(c + d*x)/2]^5*Sqrt[Cos[c + d
*x]]*EllipticF[(c + d*x)/2, 2]*(Cos[(c + d*x)/2] - I*Sin[(c + d*x)/2]) + I*
(-68 - 128*Cos[c + d*x] - 68*Cos[2*(c + d*x)] - 24*Cos[3*(c + d*x)] + (3*(1
 + E^(I*(c + d*x)))^5*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2,
3/4, 7/4, -E^((2*I)*(c + d*x))])/E^((2*I)*(c + d*x)) + (6*I)*Sin[c + d*x] +
 (8*I)*Sin[2*(c + d*x)] + (6*I)*Sin[3*(c + d*x)]))*(Cos[(c + 3*d*x)/2] + I*
Sin[(c + 3*d*x)/2]))/(40*a^3*d*E^(I*d*x)*(1 + Cos[c + d*x])^3)
```

Maple [A] (verified)

Time = 5.17 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.38

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(36\left(\cos^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+10\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\right.}{20a^3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin}}$

```
[In] int(1/(a+cos(d*x+c)*a)^3/sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/20*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(36*cos(1/2*d
*x+1/2*c)^8+10*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/
2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^5+18*(sin(1/2*d
*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^5*E
llipticE(cos(1/2*d*x+1/2*c),2^(1/2))-66*cos(1/2*d*x+1/2*c)^6+38*cos(1/2*d*x
+1/2*c)^4-9*cos(1/2*d*x+1/2*c)^2+1)/a^3/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*
x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)^5/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/
2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 353, normalized size of antiderivative = 1.81

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)}\,dx =$$

$$-\frac{5\left(i\sqrt{2}\cos\left(dx+c\right)^3+3i\sqrt{2}\cos\left(dx+c\right)^2+3i\sqrt{2}\cos\left(dx+c\right)+i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,\cos(}{}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^3/sec(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] -1/20*(5*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + 3*I*sqrt(
2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) + I*si
n(d*x + c)) + 5*(-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3
*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c
) - I*sin(d*x + c)) + 9*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c
)^2 + 3*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(-4, 0, weierstr
assPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 9*(-I*sqrt(2)*cos(d*x
+ c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))
*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x
 + c))) - 2*(9*cos(d*x + c)^3 + 12*cos(d*x + c)^2 + 5*cos(d*x + c))*sin(d*x
 + c)/sqrt(cos(d*x + c)))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 +
3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**3/sec(d*x+c)**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^3\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^3/sec(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^3*sec(d*x + c)^(5/2)), x)
```

Giac [F]

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^3\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^3/sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)^3*sec(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}(a+a\,\cos(c+d\,x))^3}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^3),x)
[Out] int(1/((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^3), x)
```

3.337 $\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 195

$$\begin{aligned}\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{7}{2}}(c+dx)}\,dx &= \frac{49\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{10a^3d} \\ &\quad - \frac{13\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{6a^3d} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{5d(a+a\sec(c+dx))^3} \\ &\quad - \frac{8\sqrt{\sec(c+dx)}\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} - \frac{13\sqrt{\sec(c+dx)}\sin(c+dx)}{6d\left(a^3+a^3\sec(c+dx)\right)}\end{aligned}$$

```
[Out] -1/5*sin(d*x+c)*sec(d*x+c)^(1/2)/d/(a+a*sec(d*x+c))^3-8/15*sin(d*x+c)*sec(d
*x+c)^(1/2)/a/d/(a+a*sec(d*x+c))^2-13/6*sin(d*x+c)*sec(d*x+c)^(1/2)/d/(a^3+
a^3*sec(d*x+c))+49/10*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellip
ticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^3/d-13
/6*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/
2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^3/d
```

Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 195, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used

$= \{3317, 3902, 4105, 3872, 3856, 2719, 2720\}$

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{7}{2}}(c+dx)}\,dx$$
$$= -\frac{13\sin(c+dx)\sqrt{\sec(c+dx)}}{6d\left(a^3\sec(c+dx)+a^3\right)} - \frac{13\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{6a^3d}$$
$$+ \frac{49\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{10a^3d}$$
$$- \frac{8\sin(c+dx)\sqrt{\sec(c+dx)}}{15ad(a\sec(c+dx)+a)^2} - \frac{\sin(c+dx)\sqrt{\sec(c+dx)}}{5d(a\sec(c+dx)+a)^3}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^3*Sec[c + d*x]^(7/2)),x]
```

```
[Out] (49*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(10*a^
3*d) - (13*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])
/(6*a^3*d) - (Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(5*d*(a + a*Sec[c + d*x])^3)
 - (8*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(15*a*d*(a + a*Sec[c + d*x])^2) - (1
3*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(6*d*(a^3 + a^3*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
```

```
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3902

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-Cot[e + f*x])*(a + b*Csc[e + f*x])^m*((d*Csc
[e + f*x])^n/(f*(2*m + 1))), x] + Dist[1/(a^2*(2*m + 1)), Int[(a + b*Csc[e
+ f*x])^(m + 1)*(d*Csc[e + f*x])^n*(a*(2*m + n + 1) - b*(m + n + 1)*Csc[e +
 f*x]), x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && LtQ[
m, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m])
```

Rule 4105

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_)*(csc[(e_.) + (f_.)*(x_)]*(B_.) + (A_)), x_Symbol] :> Simp[(-(A*b
- a*B))*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d*Csc[e + f*x])^n/(b*f*(2*m +
 1))), x] - Dist[1/(a^2*(2*m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc
[e + f*x])^n*Simp[b*B*n - a*A*(2*m + n + 1) + (A*b - a*B)*(m + n + 1)*Csc[e
 + f*x], x], x], x] /; FreeQ[{a, b, d, e, f, A, B, n}, x] && NeQ[A*b - a*B,
 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)] &&  !GtQ[n, 0]
```

Rubi steps

$$\text{integral} = \int \frac{1}{\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^3}\,dx$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{\int \frac{-\frac{11a}{2}+\frac{5}{2}a\sec(c+dx)}{\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^2}\,dx}{5a^2}$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{8\sqrt{\sec(c+dx)}\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} - \frac{\int \frac{-\frac{41a^2}{2}+12a^2\sec(c+dx)}{\sqrt{\sec(c+dx)}(a+a\sec(c+dx))}\,dx}{15a^4}$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{8\sqrt{\sec(c+dx)}\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} - \frac{13\sqrt{\sec(c+dx)}\sin(c+dx)}{6d\left(a^3+a^3\sec(c+dx)\right)} - \frac{\int \frac{-\frac{147a^3}{4}+\frac{65}{4}a^3\sec(c+dx)}{\sqrt{\sec(c+dx)}}\,dx}{15a^6}$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{8\sqrt{\sec(c+dx)}\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} - \frac{13\sqrt{\sec(c+dx)}\sin(c+dx)}{6d\left(a^3+a^3\sec(c+dx)\right)} - \frac{13\int \sqrt{\sec(c+dx)}\,dx}{12a^3} + \frac{49\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx}{20a^3}$$

$$
\begin{aligned}
&= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{8\sqrt{\sec(c+dx)}\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} \\
&\quad - \frac{13\sqrt{\sec(c+dx)}\sin(c+dx)}{6d\,(a^3+a^3\sec(c+dx))} - \frac{\left(13\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{12a^3} \\
&\quad + \frac{\left(49\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{20a^3} \\
&= \frac{49\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{10a^3d} \\
&\quad - \frac{13\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{6a^3d} \\
&\quad - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{5d(a+a\sec(c+dx))^3} - \frac{8\sqrt{\sec(c+dx)}\sin(c+dx)}{15ad(a+a\sec(c+dx))^2} \\
&\quad - \frac{13\sqrt{\sec(c+dx)}\sin(c+dx)}{6d\,(a^3+a^3\sec(c+dx))}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 2.06 (sec) , antiderivative size = 378, normalized size of antiderivative = 1.94

$$
\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{7}{2}}(c+dx)}\,dx
= \frac{2\cos^6\left(\frac{1}{2}(c+dx)\right)\left(\frac{2i\sqrt{2}e^{-i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(147\left(1+e^{2i(c+dx)}\right)+147\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+\cdots}\right.\right.}{-1+e^{2ic}}\right.}{}
$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^3*Sec[c + d*x]^(7/2)),x]
```

```
[Out] (2*Cos[(c + d*x)/2]^6*(((2*I)*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c
 + d*x)))]*(147*(1 + E^((2*I)*(c + d*x))) + 147*(-1 + E^((2*I)*c))*Sqrt[1 +
 E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x)
)] + 65*E^(I*(c + d*x))*(-1 + E^((2*I)*c))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hy
pergeometric2F1[1/4, 1/2, 5/4, -E^((2*I)*(c + d*x))]))/(E^(I*(c + d*x))*(-1
 + E^((2*I)*c))) - ((1134*Cos[(c - d*x)/2] + 1071*Cos[(3*c + d*x)/2] + 923*
Cos[(c + 3*d*x)/2] + 694*Cos[(5*c + 3*d*x)/2] + 470*Cos[(3*c + 5*d*x)/2] +
265*Cos[(7*c + 5*d*x)/2] + 117*Cos[(5*c + 7*d*x)/2] + 30*Cos[(9*c + 7*d*x)/
2])*Csc[c/2]*Sec[c/2]*Sec[(c + d*x)/2]^5*Sqrt[Sec[c + d*x]])/32))/(15*a^3*d
*(1 + Cos[c + d*x])^3)
```

Maple [A] (verified)

Time = 5.62 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.38

method	result
default	$\frac{\sqrt{\left(2\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\left(348\left(\cos^{8}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+130\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\right.\right.}{60a^{3}\sqrt{-2\left(\sin^{4}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+}}$

[In] int(1/(a+cos(d*x+c)*a)^3/sec(d*x+c)^(7/2),x,method=_RETURNVERBOSE)

[Out] 1/60*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(348*cos(1/2*d*x+1/2*c)^8+130*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/2*d*x+1/2*c)^5+294*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*cos(1/2*d*x+1/2*c)^5*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-578*cos(1/2*d*x+1/2*c)^6+264*cos(1/2*d*x+1/2*c)^4-37*cos(1/2*d*x+1/2*c)^2+3)/a^3/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)^5/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 353, normalized size of antiderivative = 1.81

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{7}{2}}(c+dx)}\,dx =$$

$$-\frac{65\left(-i\sqrt{2}\cos\left(dx+c\right)^{3}-3i\sqrt{2}\cos\left(dx+c\right)^{2}-3i\sqrt{2}\cos\left(dx+c\right)-i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,c}{}$$

[In] integrate(1/(a+a*cos(d*x+c))^3/sec(d*x+c)^(7/2),x, algorithm="fricas")

[Out] -1/60*(65*(-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 65*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + 3*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 147*(-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 147*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + 3*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(87*cos(d*x + c)^3 + 146*cos(d*x + c)^2 + 65*cos(d*x + c))*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**3/sec(d*x+c)**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^3\sec(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^3/sec(d*x+c)^(7/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^3*sec(d*x + c)^(7/2)), x)
```

Giac [F]

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^3\sec(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^3/sec(d*x+c)^(7/2),x, algorithm="giac")
[Out] integrate(1/((a*cos(d*x + c) + a)^3*sec(d*x + c)^(7/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{7/2}(a+a\,\cos(c+d\,x))^3}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))^3),x)
[Out] int(1/((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))^3), x)
```

3.338 $\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 221

$$\begin{aligned}
\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)}\,dx
&= -\frac{119\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{10a^3d} \\
&\quad + \frac{11\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{2a^3d} \\
&\quad + \frac{11\sin(c+dx)}{2a^3d\sqrt{\sec(c+dx)}} - \frac{\sin(c+dx)}{5d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^3} \\
&\quad - \frac{2\sin(c+dx)}{3ad\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^2} - \frac{119\sin(c+dx)}{30d\sqrt{\sec(c+dx)}\,(a^3+a^3\sec(c+dx))}
\end{aligned}$$

```
[Out] 11/2*sin(d*x+c)/a^3/d/sec(d*x+c)^(1/2)-1/5*sin(d*x+c)/d/(a+a*sec(d*x+c))^3/
sec(d*x+c)^(1/2)-2/3*sin(d*x+c)/a/d/(a+a*sec(d*x+c))^2/sec(d*x+c)^(1/2)-119
/30*sin(d*x+c)/d/(a^3+a^3*sec(d*x+c))/sec(d*x+c)^(1/2)-119/10*(cos(1/2*d*x+
1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*co
s(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^3/d+11/2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos
(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(
d*x+c)^(1/2)/a^3/d
```

Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 221, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {3317, 3902, 4105, 3872, 3854, 3856, 2720, 2719}

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)}\,dx = \frac{11\sin(c+dx)}{2a^3d\sqrt{\sec(c+dx)}} - \frac{119\sin(c+dx)}{30d\sqrt{\sec(c+dx)}\,(a^3\sec(c+dx)+a^3)} + \frac{11\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{2a^3d} - \frac{119\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{10a^3d} - \frac{2\sin(c+dx)}{3ad\sqrt{\sec(c+dx)}(a\sec(c+dx)+a)^2} - \frac{\sin(c+dx)}{5d\sqrt{\sec(c+dx)}(a\sec(c+dx)+a)^3}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^3*Sec[c + d*x]^(9/2)),x]
```

```
[Out] (-119*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(10*
a^3*d) + (11*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]
])/(2*a^3*d) + (11*Sin[c + d*x])/(2*a^3*d*Sqrt[Sec[c + d*x]]) - Sin[c + d*x
]/(5*d*Sqrt[Sec[c + d*x]]*(a + a*Sec[c + d*x])^3) - (2*Sin[c + d*x])/(3*a*d
*Sqrt[Sec[c + d*x]]*(a + a*Sec[c + d*x])^2) - (119*Sin[c + d*x])/(30*d*Sqrt
[Sec[c + d*x]]*(a^3 + a^3*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
```

```
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3902

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-Cot[e + f*x])*(a + b*Csc[e + f*x])^m*((d*Csc
[e + f*x])^n/(f*(2*m + 1))), x] + Dist[1/(a^2*(2*m + 1)), Int[(a + b*Csc[e
+ f*x])^(m + 1)*(d*Csc[e + f*x])^n*(a*(2*m + n + 1) - b*(m + n + 1)*Csc[e +
 f*x]), x], x] /; FreeQ[{a, b, d, e, f, n}, x] && EqQ[a^2 - b^2, 0] && LtQ[
m, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m])
```

Rule 4105

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_)*(csc[(e_.) + (f_.)*(x_)]*(B_.) + (A_)), x_Symbol] :> Simp[(-(A*b
- a*B))*Cot[e + f*x]*(a + b*Csc[e + f*x])^m*((d*Csc[e + f*x])^n/(b*f*(2*m +
 1))), x] - Dist[1/(a^2*(2*m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc
[e + f*x])^n*Simp[b*B*n - a*A*(2*m + n + 1) + (A*b - a*B)*(m + n + 1)*Csc[e
 + f*x], x], x], x] /; FreeQ[{a, b, d, e, f, A, B, n}, x] && NeQ[A*b - a*B,
 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)] &&  !GtQ[n, 0]
```

Rubi steps

$$\text{integral} = \int \frac{1}{\sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))^3}\,dx$$

$$= -\frac{\sin(c+dx)}{5d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^3} - \frac{\int \frac{-\frac{13a}{2}+\frac{7}{2}a\sec(c+dx)}{\sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))^2}\,dx}{5a^2}$$

$$= -\frac{\sin(c+dx)}{5d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^3} - \frac{2\sin(c+dx)}{3ad\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^2} - \frac{\int \frac{-\frac{69a^2}{2}+25a^2\sec(c+dx)}{\sec^{\frac{3}{2}}(c+dx)(a+a\sec(c+dx))}dx}{15a^4}$$

$$= -\frac{\sin(c+dx)}{5d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^3} - \frac{2\sin(c+dx)}{3ad\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^2} - \frac{119\sin(c+dx)}{30d\sqrt{\sec(c+dx)}\,(a^3+a^3\sec(c+dx))} - \frac{\int \frac{-\frac{495a^3}{4}+\frac{357}{4}a^3\sec(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}dx}{15a^6}$$

$$= -\frac{\sin(c+dx)}{5d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^3} - \frac{2\sin(c+dx)}{3ad\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^2} - \frac{119\sin(c+dx)}{30d\sqrt{\sec(c+dx)}\,(a^3+a^3\sec(c+dx))} - \frac{119\int \frac{1}{\sqrt{\sec(c+dx)}}dx}{20a^3} + \frac{33\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}dx}{4a^3}$$

$$= \frac{11\sin(c+dx)}{2a^3d\sqrt{\sec(c+dx)}} - \frac{\sin(c+dx)}{5d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^3} - \frac{2\sin(c+dx)}{3ad\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^2} - \frac{119\sin(c+dx)}{30d\sqrt{\sec(c+dx)}\,(a^3+a^3\sec(c+dx))} + \frac{11\int \sqrt{\sec(c+dx)}dx}{4a^3} - \frac{\left(119\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}dx}{20a^3}$$

$$= -\frac{119\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{10a^3d} + \frac{11\sin(c+dx)}{2a^3d\sqrt{\sec(c+dx)}} - \frac{\sin(c+dx)}{5d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^3} - \frac{2\sin(c+dx)}{3ad\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^2} - \frac{119\sin(c+dx)}{30d\sqrt{\sec(c+dx)}\,(a^3+a^3\sec(c+dx))} + \frac{\left(11\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}dx}{4a^3}$$

$$= -\frac{119\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{10a^3d} + \frac{11\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{2a^3d} + \frac{11\sin(c+dx)}{2a^3d\sqrt{\sec(c+dx)}} - \frac{\sin(c+dx)}{5d\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^3} - \frac{2\sin(c+dx)}{3ad\sqrt{\sec(c+dx)}(a+a\sec(c+dx))^2} - \frac{119\sin(c+dx)}{30d\sqrt{\sec(c+dx)}\,(a^3+a^3\sec(c+dx))}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 2.35 (sec) , antiderivative size = 285, normalized size of antiderivative = 1.29

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)}\,dx$$
$$= \frac{e^{-idx}\cos\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}(\cos(dx)+i\sin(dx))\left(-5355i\cos\left(\frac{1}{2}(c+dx)\right)-3927i\cos\left(\frac{3}{2}(c+dx)\right)\right.}{}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^3*Sec[c + d*x]^(9/2)),x]
```

```
[Out] (Cos[(c + d*x)/2]*Sqrt[Sec[c + d*x]]*(Cos[d*x] + I*Sin[d*x])*((-5355*I)*Cos
[(c + d*x)/2] - (3927*I)*Cos[(3*(c + d*x))/2] - (1785*I)*Cos[(5*(c + d*x))/
2] - (357*I)*Cos[(7*(c + d*x))/2] + 5280*Cos[(c + d*x)/2]^5*Sqrt[Cos[c + d*
x]]*EllipticF[(c + d*x)/2, 2] + ((119*I)*(1 + E^(I*(c + d*x)))^5*Sqrt[1 + E
^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x))])
/E^(((3*I)/2)*(c + d*x)) + 193*Sin[(c + d*x)/2] + 579*Sin[(3*(c + d*x))/2]
+ 555*Sin[(5*(c + d*x))/2] + 227*Sin[(7*(c + d*x))/2] + 10*Sin[(9*(c + d*x)
)/2]))/(120*a^3*d*E^(I*d*x)*(1 + Cos[c + d*x])^3)
```

Maple [A] (verified)

Time = 5.57 (sec) , antiderivative size = 283, normalized size of antiderivative = 1.28

method	result
default	$-\frac{\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(160\left(\cos^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+468\left(\cos^{8}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+330\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\right.}{60a^3\sqrt{-2\left(\sin\right.}}$

```
[In] int(1/(a+cos(d*x+c)*a)^3/sec(d*x+c)^(9/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/60*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(160*cos(1/2*
d*x+1/2*c)^10+468*cos(1/2*d*x+1/2*c)^8+330*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*cos(1/
2*d*x+1/2*c)^5+714*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)
^(1/2)*cos(1/2*d*x+1/2*c)^5*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-1058*cos(
1/2*d*x+1/2*c)^6+474*cos(1/2*d*x+1/2*c)^4-47*cos(1/2*d*x+1/2*c)^2+3)/a^3/(-
2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)^5/sin
(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 363, normalized size of antiderivative = 1.64

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)}\,dx =$$

$$-\frac{165\left(i\sqrt{2}\cos\left(dx+c\right)^3+3i\sqrt{2}\cos\left(dx+c\right)^2+3i\sqrt{2}\cos\left(dx+c\right)+i\sqrt{2}\right)\text{weierstrassPInverse}(-4,0,\cos}{}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^3/sec(d*x+c)^(9/2),x, algorithm="fricas")
```

```
[Out] -1/60*(165*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d*x + c)^2 + 3*I*sqr
t(2)*cos(d*x + c) + I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c)) + 165*(-I*sqrt(2)*cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2
 - 3*I*sqrt(2)*cos(d*x + c) - I*sqrt(2))*weierstrassPInverse(-4, 0, cos(d*x
 + c) - I*sin(d*x + c)) + 357*(I*sqrt(2)*cos(d*x + c)^3 + 3*I*sqrt(2)*cos(d
*x + c)^2 + 3*I*sqrt(2)*cos(d*x + c) + I*sqrt(2))*weierstrassZeta(-4, 0, we
ierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 357*(-I*sqrt(2)*
cos(d*x + c)^3 - 3*I*sqrt(2)*cos(d*x + c)^2 - 3*I*sqrt(2)*cos(d*x + c) - I*
sqrt(2))*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I
*sin(d*x + c))) - 2*(20*cos(d*x + c)^4 + 237*cos(d*x + c)^3 + 376*cos(d*x +
 c)^2 + 165*cos(d*x + c))*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^3*d*cos(d*x +
 c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**3/sec(d*x+c)**(9/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{1}{\left(a\cos\left(dx+c\right)+a\right)^3\sec\left(dx+c\right)^{\frac{9}{2}}}\,dx$$

[In] integrate(1/(a+a*cos(d*x+c))^3/sec(d*x+c)^(9/2),x, algorithm="maxima")

[Out] integrate(1/((a*cos(d*x + c) + a)^3*sec(d*x + c)^(9/2)), x)

Giac [F]

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{1}{\left(a\cos\left(dx+c\right)+a\right)^3\sec\left(dx+c\right)^{\frac{9}{2}}}\,dx$$

[In] integrate(1/(a+a*cos(d*x+c))^3/sec(d*x+c)^(9/2),x, algorithm="giac")

[Out] integrate(1/((a*cos(d*x + c) + a)^3*sec(d*x + c)^(9/2)), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{9/2}\,\left(a+a\,\cos\left(c+d\,x\right)\right)^3}\,dx$$

[In] int(1/((1/cos(c + d*x))^(9/2)*(a + a*cos(c + d*x))^3),x)

[Out] int(1/((1/cos(c + d*x))^(9/2)*(a + a*cos(c + d*x))^3), x)

3.339 $\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 153

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\,dx = \frac{32a\sqrt{\sec(c+dx)}\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{16a\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{12a\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{2a\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 16/35*a*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+12/35*a*sec(d*
x+c)^(5/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+2/7*a*sec(d*x+c)^(7/2)*sin(d
*x+c)/d/(a+a*cos(d*x+c))^(1/2)+32/35*a*sin(d*x+c)*sec(d*x+c)^(1/2)/d/(a+a*c
os(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.42 (sec) , antiderivative size = 153, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used

$= \{4307, 2851, 2850\}$

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\,dx = \frac{2a\sin(c+dx)\sec^{\frac{7}{2}}(c+dx)}{7d\sqrt{a\cos(c+dx)+a}} + \frac{12a\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{35d\sqrt{a\cos(c+dx)+a}} + \frac{16a\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{35d\sqrt{a\cos(c+dx)+a}} + \frac{32a\sin(c+dx)\sqrt{\sec(c+dx)}}{35d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x]^(9/2),x]
```

```
[Out] (32*a*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(35*d*Sqrt[a + a*Cos[c + d*x]]) + (1
6*a*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(35*d*Sqrt[a + a*Cos[c + d*x]]) + (12*
a*Sec[c + d*x]^(5/2)*Sin[c + d*x])/(35*d*Sqrt[a + a*Cos[c + d*x]]) + (2*a*S
ec[c + d*x]^(7/2)*Sin[c + d*x])/(7*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx$$

$$= \frac{2a\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}} + \frac{1}{7}\left(6\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx$$

$$= \frac{12a\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{2a\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}} + \frac{1}{35}\left(24\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx$$

$$= \frac{16a\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{12a\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{2a\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}} + \frac{1}{35}\left(16\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \frac{32a\sqrt{\sec(c+dx)}\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{16a\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{12a\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{2a\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.46

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\,dx$$
$$= \frac{2\sqrt{a(1+\cos(c+dx))}(9+18\cos(c+dx)+4\cos(2(c+dx))+4\cos(3(c+dx)))\sec^{\frac{7}{2}}(c+dx)\tan\left(\frac{1}{2}(c+d\right.}{35d}$$

```
[In] Integrate[Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x]^(9/2),x]
```

```
[Out] (2*Sqrt[a*(1 + Cos[c + d*x])]*(9 + 18*Cos[c + d*x] + 4*Cos[2*(c + d*x)] + 4
*Cos[3*(c + d*x)])*Sec[c + d*x]^(7/2)*Tan[(c + d*x)/2])/(35*d)
```

Maple [A] (verified)

Time = 6.55 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.47

method	result	size
default	$-\frac{2\cot(dx+c)\left(\sec^{\frac{9}{2}}(dx+c)\right)\sqrt{a(1+\cos(dx+c))}\,(16(\cos^4(dx+c))-8(\cos^3(dx+c))-2(\cos^2(dx+c))-\cos(dx+c)-5)}{35d}$	72

```
[In] int(sec(d*x+c)^(9/2)*(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/35/d*cot(d*x+c)*sec(d*x+c)^(9/2)*(a*(1+cos(d*x+c)))^(1/2)*(16*cos(d*x+c)
^4-8*cos(d*x+c)^3-2*cos(d*x+c)^2-cos(d*x+c)-5)
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.53

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\,dx = \frac{2\left(16\cos\left(dx+c\right)^3+8\cos\left(dx+c\right)^2+6\cos\left(dx+c\right)+5\right)\sqrt{a\cos\left(dx+c\right)+a}\sin\left(dx+c\right)}{35\left(d\cos\left(dx+c\right)^4+d\cos\left(dx+c\right)^3\right)\sqrt{\cos\left(dx+c\right)}}$$

```
[In] integrate(sec(d*x+c)^(9/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 2/35*(16*cos(d*x + c)^3 + 8*cos(d*x + c)^2 + 6*cos(d*x + c) + 5)*sqrt(a*cos
(d*x + c) + a)*sin(d*x + c)/((d*cos(d*x + c)^4 + d*cos(d*x + c)^3)*sqrt(cos
(d*x + c)))
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(9/2)*(a+a*cos(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 283 vs. 2(129) = 258.

Time = 0.33 (sec) , antiderivative size = 283, normalized size of antiderivative = 1.85

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\,dx$$
$$= \frac{2\left(\frac{35\sqrt{2}\sqrt{a}\sin(dx+c)}{\cos(dx+c)+1} - \frac{70\sqrt{2}\sqrt{a}\sin(dx+c)^3}{(\cos(dx+c)+1)^3} + \frac{84\sqrt{2}\sqrt{a}\sin(dx+c)^5}{(\cos(dx+c)+1)^5} - \frac{58\sqrt{2}\sqrt{a}\sin(dx+c)^7}{(\cos(dx+c)+1)^7} + \frac{9\sqrt{2}\sqrt{a}\sin(dx+c)^9}{(\cos(dx+c)+1)^9}\right)\left(\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}\right.}{35\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{9}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{9}{2}}\left(\frac{4\sin(dx+c)^2}{(\cos(dx+c)+1)^2} + \frac{6\sin(dx+c)^4}{(\cos(dx+c)+1)^4} + \frac{4\sin(dx+c)^6}{(\cos(dx+c)+1)^6} + \frac{\sin(dx+c)^8}{(\cos(dx+c)+1)^8} + \right.}$$

```
[In] integrate(sec(d*x+c)^(9/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 2/35*(35*sqrt(2)*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) - 70*sqrt(2)*sqrt(
a)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 84*sqrt(2)*sqrt(a)*sin(d*x + c)^5/
(cos(d*x + c) + 1)^5 - 58*sqrt(2)*sqrt(a)*sin(d*x + c)^7/(cos(d*x + c) + 1)
^7 + 9*sqrt(2)*sqrt(a)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9)*(sin(d*x + c)^2
/(cos(d*x + c) + 1)^2 + 1)^4/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(9/2)
*(-sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(9/2)*(4*sin(d*x + c)^2/(cos(d*x +
c) + 1)^2 + 6*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + 4*sin(d*x + c)^6/(cos(d
*x + c) + 1)^6 + sin(d*x + c)^8/(cos(d*x + c) + 1)^8 + 1))
```

Giac [A] (verification not implemented)

none

Time = 0.40 (sec) , antiderivative size = 143, normalized size of antiderivative = 0.93

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\,dx$$
$$= \frac{4\sqrt{2}\left(\left(\left(\left(7\left(5\left(\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-10\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+267\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-3684\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}\right.\right.\right.\right.}{35\left(\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^4-6\,\mathrm{ta}\right.}$$

```
[In] integrate(sec(d*x+c)^(9/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 4/35*sqrt(2)*(((((7*(5*(tan(1/4*d*x + 1/4*c)^2 - 10)*tan(1/4*d*x + 1/4*c)^2
+ 267)*tan(1/4*d*x + 1/4*c)^2 - 3684)*tan(1/4*d*x + 1/4*c)^2 + 1869)*tan(1/
4*d*x + 1/4*c)^2 - 350)*tan(1/4*d*x + 1/4*c)^2 + 35)*sqrt(a)*sgn(cos(1/2*d*
x + 1/2*c))*tan(1/4*d*x + 1/4*c)/((tan(1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x +
 1/4*c)^2 + 1)^(7/2)*d)
```

Mupad [B] (verification not implemented)

Time = 18.85 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.07

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\,dx$$
$$=\frac{14\,\sin\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)\,\sqrt{a+a\,\cos\left(c+d\,x\right)}\,\sqrt{\frac{2\,{\mathrm{e}}^{c\,1{}\mathrm{i}+d\,x\,1{}\mathrm{i}}}{{\mathrm{e}}^{c\,2{}\mathrm{i}+d\,x\,2{}\mathrm{i}}+1}}+4\,\sin\left(\frac{7\,c}{2}+\frac{7\,d\,x}{2}\right)\,\sqrt{a+a\,\cos\left(c+d\,x\right)}\,\sqrt{\frac{2\,{\mathrm{e}}^{c\,1{}\mathrm{i}+d\,x\,1{}\mathrm{i}}}{{\mathrm{e}}^{c\,2{}\mathrm{i}+d\,x\,2{}\mathrm{i}}+1}}}{\frac{105\,d\,\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{8}+\frac{105\,d\,\cos\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)}{8}+\frac{35\,d\,\cos\left(\frac{5\,c}{2}+\frac{5\,d\,x}{2}\right)}{8}+\frac{35\,d\,\cos\left(\frac{7\,c}{2}+\frac{7\,d\,x}{2}\right)}{8}}$$

```
[In] int((1/cos(c + d*x))^(9/2)*(a + a*cos(c + d*x))^(1/2),x)
```

```
[Out] (14*sin((3*c)/2 + (3*d*x)/2)*(a + a*cos(c + d*x))^(1/2)*((2*exp(c*1i + d*x*
1i))/(exp(c*2i + d*x*2i) + 1))^(1/2) + 4*sin((7*c)/2 + (7*d*x)/2)*(a + a*co
s(c + d*x))^(1/2)*((2*exp(c*1i + d*x*1i))/(exp(c*2i + d*x*2i) + 1))^(1/2))/
((105*d*cos(c/2 + (d*x)/2))/8 + (105*d*cos((3*c)/2 + (3*d*x)/2))/8 + (35*d*
cos((5*c)/2 + (5*d*x)/2))/8 + (35*d*cos((7*c)/2 + (7*d*x)/2))/8)
```

3.340 $\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 115

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\,dx = \frac{16a\sqrt{\sec(c+dx)}\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} + \frac{8a\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} + \frac{2a\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 8/15*a*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+2/5*a*sec(d*x+c
)^(5/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+16/15*a*sin(d*x+c)*sec(d*x+c)^(
1/2)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.120$, Rules used = {4307, 2851, 2850}

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\,dx = \frac{2a\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{5d\sqrt{a\cos(c+dx)+a}} + \frac{8a\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{15d\sqrt{a\cos(c+dx)+a}} + \frac{16a\sin(c+dx)\sqrt{\sec(c+dx)}}{15d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x]^(7/2),x]
```

```
[Out] (16*a*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(15*d*Sqrt[a + a*Cos[c + d*x]]) + (8
*a*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(15*d*Sqrt[a + a*Cos[c + d*x]]) + (2*a*
Sec[c + d*x]^(5/2)*Sin[c + d*x])/(5*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx \\
&= \frac{2a\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}}+\frac{1}{5}\left(4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{8a\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}}+\frac{2a\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} \\
&\quad+\frac{1}{15}\left(8\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{16a\sqrt{\sec(c+dx)}\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}}+\frac{8a\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}}+\frac{2a\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.53

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\,dx = \frac{2\sqrt{a(1+\cos(c+dx))}(7+4\cos(c+dx)+4\cos(2(c+dx)))\sec^{\frac{5}{2}}(c+dx)\tan\left(\frac{1}{2}(c+dx)\right)}{15d}$$

```
[In] Integrate[Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x]^(7/2),x]
```

```
[Out] (2*Sqrt[a*(1 + Cos[c + d*x])]*(7 + 4*Cos[c + d*x] + 4*Cos[2*(c + d*x)])*Sec
[c + d*x]^(5/2)*Tan[(c + d*x)/2])/(15*d)
```

Maple [A] (verified)

Time = 6.08 (sec) , antiderivative size = 62, normalized size of antiderivative = 0.54

method	result	size
default	$-\frac{2\cot(dx+c)\left(\sec^{\frac{7}{2}}(dx+c)\right)\sqrt{a(1+\cos(dx+c))}\,(8(\cos^3(dx+c))-4(\cos^2(dx+c))-\cos(dx+c)-3)}{15d}$	62

```
[In] int(sec(d*x+c)^(7/2)*(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/15/d*cot(d*x+c)*sec(d*x+c)^(7/2)*(a*(1+cos(d*x+c)))^(1/2)*(8*cos(d*x+c)^
3-4*cos(d*x+c)^2-cos(d*x+c)-3)
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.62

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\,dx = \frac{2\sqrt{a\cos(dx+c)+a}\left(8\cos(dx+c)^2+4\cos(dx+c)+3\right)\sin(dx+c)}{15\left(d\cos(dx+c)^3+d\cos(dx+c)^2\right)\sqrt{\cos(dx+c)}}$$

```
[In] integrate(sec(d*x+c)^(7/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 2/15*sqrt(a*cos(d*x + c) + a)*(8*cos(d*x + c)^2 + 4*cos(d*x + c) + 3)*sin(d
*x + c)/((d*cos(d*x + c)^3 + d*cos(d*x + c)^2)*sqrt(cos(d*x + c)))
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\,dx=\text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(7/2)*(a+a*cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 237 vs. 2(97) = 194.

Time = 0.31 (sec) , antiderivative size = 237, normalized size of antiderivative = 2.06

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\,dx = \frac{2\left(\frac{15\sqrt{2}\sqrt{a}\sin(dx+c)}{\cos(dx+c)+1}-\frac{25\sqrt{2}\sqrt{a}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{17\sqrt{2}\sqrt{a}\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{7\sqrt{2}\sqrt{a}\sin(dx+c)^7}{(\cos(dx+c)+1)^7}\right)\left(\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+1\right)^3}{15\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{7}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{7}{2}}\left(\frac{3\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{3\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+\frac{\sin(dx+c)^6}{(\cos(dx+c)+1)^6}+1\right)}$$

```
[In] integrate(sec(d*x+c)^(7/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] 2/15*(15*sqrt(2)*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) - 25*sqrt(2)*sqrt(
a)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 17*sqrt(2)*sqrt(a)*sin(d*x + c)^5/
(cos(d*x + c) + 1)^5 - 7*sqrt(2)*sqrt(a)*sin(d*x + c)^7/(cos(d*x + c) + 1)^
7)*(sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 1)^3/(d*(sin(d*x + c)/(cos(d*x +
c) + 1) + 1)^(7/2)*(-sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(7/2)*(3*sin(d*x
+ c)^2/(cos(d*x + c) + 1)^2 + 3*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + sin(d
*x + c)^6/(cos(d*x + c) + 1)^6 + 1))
```

Giac [A] (verification not implemented)

none

Time = 0.40 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.01

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\,dx = \frac{4\sqrt{2}\left(\left(\left(5\left(3\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-20\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+282\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-100\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2\right.}{15\left(\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^4-6\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+1\right)^{\frac{5}{2}}d}$$

```
[In] integrate(sec(d*x+c)^(7/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 4/15*sqrt(2)*(((5*(3*tan(1/4*d*x + 1/4*c)^2 - 20)*tan(1/4*d*x + 1/4*c)^2 +
282)*tan(1/4*d*x + 1/4*c)^2 - 100)*tan(1/4*d*x + 1/4*c)^2 + 15)*sqrt(a)*sgn
(cos(1/2*d*x + 1/2*c))*tan(1/4*d*x + 1/4*c)/((tan(1/4*d*x + 1/4*c)^4 - 6*ta
n(1/4*d*x + 1/4*c)^2 + 1)^(5/2)*d)
```

Mupad [B] (verification not implemented)

Time = 1.86 (sec) , antiderivative size = 134, normalized size of antiderivative = 1.17

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\,dx$$
$$=\frac{8\,\sqrt{a\,\left(\cos\left(c+d\,x\right)+1\right)}\,\sqrt{\frac{1}{\cos(c+d\,x)}}\,\left(7\,\sin\left(c+d\,x\right)+4\,\sin\left(2\,c+2\,d\,x\right)+9\,\sin\left(3\,c+3\,d\,x\right)+2\,\sin\left(4\,c+4\right.\right.}{15\,d\,\left(10\,\cos\left(c+d\,x\right)+8\,\cos\left(2\,c+2\,d\,x\right)+5\,\cos\left(3\,c+3\,d\,x\right)+2\,\cos\left(4\,c+4\,d\,x\right)+\cos\left(5\,c\right.\right.}$$

```
[In] int((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))^(1/2),x)
```

```
[Out] (8*(a*(cos(c + d*x) + 1))^(1/2)*(1/cos(c + d*x))^(1/2)*(7*sin(c + d*x) + 4*
sin(2*c + 2*d*x) + 9*sin(3*c + 3*d*x) + 2*sin(4*c + 4*d*x) + 2*sin(5*c + 5*
d*x)))/(15*d*(10*cos(c + d*x) + 8*cos(2*c + 2*d*x) + 5*cos(3*c + 3*d*x) + 2
*cos(4*c + 4*d*x) + cos(5*c + 5*d*x) + 6))
```

3.341 $\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 77

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{4a\sqrt{\sec(c+dx)}\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{2a\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 2/3*a*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+4/3*a*sin(d*x+c)
*sec(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {4307, 2851, 2850}

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{2a\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3d\sqrt{a\cos(c+dx)+a}} + \frac{4a\sin(c+dx)\sqrt{\sec(c+dx)}}{3d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x]^(5/2),x]
```

```
[Out] (4*a*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(3*d*Sqrt[a + a*Cos[c + d*x]]) + (2*a
*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(3*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx\\
&= \frac{2a\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}+\frac{1}{3}\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx\\
&= \frac{4a\sqrt{\sec(c+dx)}\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}+\frac{2a\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 51, normalized size of antiderivative = 0.66

$$\begin{aligned}
&\int\sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\,dx\\
&=\frac{2\sqrt{a(1+\cos(c+dx))}(1+2\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)\tan\left(\frac{1}{2}(c+dx)\right)}{3d}
\end{aligned}$$

```
[In] Integrate[Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x]^(5/2),x]
```

```
[Out] (2*Sqrt[a*(1 + Cos[c + d*x])]*(1 + 2*Cos[c + d*x])*Sec[c + d*x]^(3/2)*Tan[(
c + d*x)/2])/(3*d)
```

Maple [A] (verified)

Time = 6.51 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.68

method	result	size
default	$-\frac{2\cot(dx+c)\left(\sec^{\frac{5}{2}}(dx+c)\right)\sqrt{a(1+\cos(dx+c))}\,(2(\cos^2(dx+c))-\cos(dx+c)-1)}{3d}$	52

```
[In] int(sec(d*x+c)^(5/2)*(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3/d*cot(d*x+c)*sec(d*x+c)^(5/2)*(a*(1+cos(d*x+c)))^(1/2)*(2*cos(d*x+c)^2
-cos(d*x+c)-1)
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.77

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{2\sqrt{a\cos(dx+c)+a}(2\cos(dx+c)+1)\sin(dx+c)}{3\left(d\cos(dx+c)^2+d\cos(dx+c)\right)\sqrt{\cos(dx+c)}}$$

```
[In] integrate(sec(d*x+c)^(5/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 2/3*sqrt(a*cos(d*x + c) + a)*(2*cos(d*x + c) + 1)*sin(d*x + c)/((d*cos(d*x
+ c)^2 + d*cos(d*x + c))*sqrt(cos(d*x + c)))
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(5/2)*(a+a*cos(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 190 vs. 2(65) = 130.

Time = 0.35 (sec) , antiderivative size = 190, normalized size of antiderivative = 2.47

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{2\left(\frac{3\sqrt{2}\sqrt{a}\sin(dx+c)}{\cos(dx+c)+1}-\frac{4\sqrt{2}\sqrt{a}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{\sqrt{2}\sqrt{a}\sin(dx+c)^5}{(\cos(dx+c)+1)^5}\right)\left(\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+1\right)^2}{3\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{5}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{5}{2}}\left(\frac{2\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+1\right)}$$

```
[In] integrate(sec(d*x+c)^(5/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 2/3*(3*sqrt(2)*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) - 4*sqrt(2)*sqrt(a)*
sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + sqrt(2)*sqrt(a)*sin(d*x + c)^5/(cos(d
*x + c) + 1)^5)*(sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 1)^2/(d*(sin(d*x + c
)/(cos(d*x + c) + 1) + 1)^(5/2)*(-sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(5/2
)*(2*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + sin(d*x + c)^4/(cos(d*x + c) + 1
)^4 + 1))
```

Giac [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.13

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{4\sqrt{2}\left(\left(3\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2-10\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+3\right)\sqrt{a}\operatorname{sgn}\left(\cos\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)}{3\left(\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^4-6\tan\left(\frac{1}{4}dx+\frac{1}{4}c\right)^2+1\right)^{\frac{3}{2}}d}$$

```
[In] integrate(sec(d*x+c)^(5/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 4/3*sqrt(2)*((3*tan(1/4*d*x + 1/4*c)^2 - 10)*tan(1/4*d*x + 1/4*c)^2 + 3)*sq
rt(a)*sgn(cos(1/2*d*x + 1/2*c))*tan(1/4*d*x + 1/4*c)/((tan(1/4*d*x + 1/4*c)
^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1)^(3/2)*d)
```

Mupad [B] (verification not implemented)

Time = 0.83 (sec) , antiderivative size = 84, normalized size of antiderivative = 1.09

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{4\sqrt{a\,\left(\cos\left(c+d\,x\right)+1\right)}\,\sqrt{\frac{1}{\cos(c+d\,x)}}\,\left(\sin\left(c+d\,x\right)+\sin\left(2\,c+2\,d\,x\right)+\sin\left(3\,c+3\,d\,x\right)\right)}{3\,d\,\left(3\,\cos\left(c+d\,x\right)+2\,\cos\left(2\,c+2\,d\,x\right)+\cos\left(3\,c+3\,d\,x\right)+2\right)}$$

```
[In] int((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^(1/2),x)
```

```
[Out] (4*(a*(cos(c + d*x) + 1))^(1/2)*(1/cos(c + d*x))^(1/2)*(sin(c + d*x) + sin(
2*c + 2*d*x) + sin(3*c + 3*d*x)))/(3*d*(3*cos(c + d*x) + 2*cos(2*c + 2*d*x)
 + cos(3*c + 3*d*x) + 2))
```

3.342 $\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 36

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\,dx=\frac{2a\sqrt{\sec(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 2*a*sin(d*x+c)*sec(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 36, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {4307, 2850}

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\,dx=\frac{2a\sin(c+dx)\sqrt{\sec(c+dx)}}{d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x]^(3/2),x]
```

```
[Out] (2*a*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
```

```
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$
$$= \frac{2a\sqrt{\sec(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 39, normalized size of antiderivative = 1.08

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{2\sqrt{a(1+\cos(c+dx))}\sqrt{\sec(c+dx)}\tan\left(\frac{1}{2}(c+dx)\right)}{d}$$

```
[In] Integrate[Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x]^(3/2),x]
[Out] (2*Sqrt[a*(1 + Cos[c + d*x])]*Sqrt[Sec[c + d*x]]*Tan[(c + d*x)/2])/d
```

Maple [A] (verified)

Time = 5.78 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.11

method	result	size
default	$-\frac{2\cot(dx+c)\left(\sec^{\frac{3}{2}}(dx+c)\right)(\cos(dx+c)-1)\sqrt{a(1+\cos(dx+c))}}{d}$	40

```
[In] int(sec(d*x+c)^(3/2)*(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
[Out] -2/d*cot(d*x+c)*sec(d*x+c)^(3/2)*(cos(d*x+c)-1)*(a*(1+cos(d*x+c)))^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.11

$$\int \sqrt{a + a\cos(c + dx)}\sec^{\frac{3}{2}}(c + dx)\,dx = \frac{2\sqrt{a\cos(dx + c) + a}\sin(dx + c)}{(d\cos(dx + c) + d)\sqrt{\cos(dx + c)}}$$

```
[In] integrate(sec(d*x+c)^(3/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] 2*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/((d*cos(d*x + c) + d)*sqrt(cos(d*x
+ c)))
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{a + a\cos(c + dx)}\sec^{\frac{3}{2}}(c + dx)\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(3/2)*(a+a*cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 98 vs. $2(32) = 64$.

Time = 0.32 (sec) , antiderivative size = 98, normalized size of antiderivative = 2.72

$$\int \sqrt{a + a\cos(c + dx)}\sec^{\frac{3}{2}}(c + dx)\,dx = \frac{2\left(\frac{\sqrt{2}\sqrt{a}\sin(dx+c)}{\cos(dx+c)+1} - \frac{\sqrt{2}\sqrt{a}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}\right)}{d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1} + 1\right)^{\frac{3}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1} + 1\right)^{\frac{3}{2}}}$$

```
[In] integrate(sec(d*x+c)^(3/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] 2*(sqrt(2)*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) - sqrt(2)*sqrt(a)*sin(d*
x + c)^3/(cos(d*x + c) + 1)^3)/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(3/
2)*(-sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(3/2))
```

Giac [A] (verification not implemented)

none

Time = 0.39 (sec) , antiderivative size = 58, normalized size of antiderivative = 1.61

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{4\sqrt{2}\sqrt{a}\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)}{\sqrt{\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^{4}-6\,\tan\left(\frac{1}{4}\,dx+\frac{1}{4}\,c\right)^{2}+1}d}$$

```
[In] integrate(sec(d*x+c)^(3/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 4*sqrt(2)*sqrt(a)*sgn(cos(1/2*d*x + 1/2*c))*tan(1/4*d*x + 1/4*c)/(sqrt(tan(
1/4*d*x + 1/4*c)^4 - 6*tan(1/4*d*x + 1/4*c)^2 + 1)*d)
```

Mupad [B] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 43, normalized size of antiderivative = 1.19

$$\int \sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{2\,\sin\left(c+d\,x\right)\,\sqrt{a\,\left(\cos\left(c+d\,x\right)+1\right)}\,\sqrt{\frac{1}{\cos(c+d\,x)}}}{d\,\left(\cos\left(c+d\,x\right)+1\right)}$$

```
[In] int((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^(1/2),x)
```

```
[Out] (2*sin(c + d*x)*(a*(cos(c + d*x) + 1))^(1/2)*(1/cos(c + d*x))^(1/2))/(d*(co
s(c + d*x) + 1))
```

3.343 $\int \sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 57

$$\int \sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}\,dx = \frac{2\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d}$$

```
[Out] 2*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))*a^(1/2)*cos(d*x+c)^(1/2
)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {4307, 2853, 222}

$$\int \sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}\,dx = \frac{2\sqrt{a}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{d}$$

```
[In] Int[Sqrt[a + a*Cos[c + d*x]]*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (2*Sqrt[a]*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[Cos
[c + d*x]]*Sqrt[Sec[c + d*x]])/d
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx \\ &= -\frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} \\ &= \frac{2\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.23

$$\int \sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}\,dx = \frac{\sqrt{2}\arcsin\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right)\sqrt{\cos(c+dx)}\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}}{d}$$

```
[In] Integrate[Sqrt[a + a*Cos[c + d*x]]*Sqrt[Sec[c + d*x]],x]
[Out] (Sqrt[2]*ArcSin[Sqrt[2]*Sin[(c + d*x)/2]]*Sqrt[Cos[c + d*x]]*Sqrt[a*(1 + Co
s[c + d*x])]*Sec[(c + d*x)/2]*Sqrt[Sec[c + d*x]])/d
```

Maple [A] (verified)

Time = 6.85 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.54

method	result	size
default	$\frac{2\left(\sqrt{\sec}(dx+c)\right)\sqrt{a(1+\cos(dx+c))}\,\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\cos(dx+c)}{d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$	88

```
[In] int(sec(d*x+c)^(1/2)*(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d*sec(d*x+c)^(1/2)*(a*(1+cos(d*x+c)))^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2))*cos(d*x+c)/(1+cos(d*x+c))/(cos(d*x+c)/(1+cos(d*x+c)
))^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 119, normalized size of antiderivative = 2.09

$$\int \sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}\,dx = \left[\frac{\sqrt{-a}\log\left(\frac{2\,a\cos(dx+c)^2-2\,\sqrt{a\cos(dx+c)+a}\sqrt{-a}\sqrt{\cos(dx+c)}\sin(dx+c)+a\cos(dx+c)-a}{\cos(dx+c)+1}\right)}{d}, -\frac{2\,\sqrt{a}\arctan\left(\frac{\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)}{d}\right]$$

```
[In] integrate(sec(d*x+c)^(1/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] [sqrt(-a)*log((2*a*cos(d*x + c)^2 - 2*sqrt(a*cos(d*x + c) + a)*sqrt(-a)*sqr
t(cos(d*x + c))*sin(d*x + c) + a*cos(d*x + c) - a)/(cos(d*x + c) + 1))/d, -
2*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d
*x + c)))/d]
```

Sympy [F]

$$\int \sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}\,dx = \int \sqrt{a\left(\cos\left(c+dx\right)+1\right)}\sqrt{\sec\left(c+dx\right)}\,dx$$

```
[In] integrate(sec(d*x+c)**(1/2)*(a+a*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(a*(cos(c + d*x) + 1))*sqrt(sec(c + d*x)), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 146 vs. $2(47) = 94$.

Time = 0.37 (sec) , antiderivative size = 146, normalized size of antiderivative = 2.56

$$\int \sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}\,dx$$
$$= \frac{\sqrt{a}\arctan\left(\left(\cos\left(2\,dx+2\,c\right)^{2}+\sin\left(2\,dx+2\,c\right)^{2}+2\,\cos\left(2\,dx+2\,c\right)+1\right)^{\frac{1}{4}}\sin\left(\frac{1}{2}\,\arctan\left(\sin\left(2\,dx+2\,c\right),\right.\right.\right.}{}$$

```
[In] integrate(sec(d*x+c)^(1/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] sqrt(a)*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*
c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + si
n(d*x + c), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) +
 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + cos(d*
x + c))/d
```

Giac [F]

$$\int \sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}\,dx = \int \sqrt{a\cos\left(dx+c\right)+a}\sqrt{\sec\left(dx+c\right)}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)*(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(a*cos(d*x + c) + a)*sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}\,dx = \int \sqrt{\frac{1}{\cos\left(c+d\,x\right)}}\,\sqrt{a+a\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^(1/2),x)
```

```
[Out] int((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^(1/2), x)
```

3.344 $\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 92

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\sec(c+dx)}}\,dx = \frac{\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d} + \frac{a\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

```
[Out] a*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2)+arcsin(sin(d*x+c)*a^
(1/2)/(a+a*cos(d*x+c))^(1/2))*a^(1/2)*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {4307, 2849, 2853, 222}

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\sec(c+dx)}}\,dx = \frac{\sqrt{a}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{d} + \frac{a\sin(c+dx)}{d\sqrt{\sec(c+dx)}\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sqrt[a + a*Cos[c + d*x]]/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (Sqrt[a]*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[Cos[c
 + d*x]]*Sqrt[Sec[c + d*x]])/d + (a*Sin[c + d*x])/(d*Sqrt[a + a*Cos[c + d*x
]]*Sqrt[Sec[c + d*x]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx\\
&= \frac{a\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}\\
&\quad+\frac{1}{2}\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{a\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}\\
&\quad-\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\operatorname{Subst}\left(\int\frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}\\
&= \frac{\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d}+\frac{a\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.05

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\sec(c+dx)}}\,dx$$
$$= \frac{\sqrt{\cos(c+dx)}\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}\left(\sqrt{2}\arcsin\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right)+2\sqrt{\cos}\right.}{2d}$$

```
[In] Integrate[Sqrt[a + a*Cos[c + d*x]]/Sqrt[Sec[c + d*x]],x]
[Out] (Sqrt[Cos[c + d*x]]*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*Sqrt[Sec[c
+ d*x]]*(Sqrt[2]*ArcSin[Sqrt[2]*Sin[(c + d*x)/2]] + 2*Sqrt[Cos[c + d*x]]*Si
n[(c + d*x)/2]))/(2*d)
```

Maple [A] (verified)

Time = 14.16 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.17

method	result	size
default	$\frac{\left(\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\right)\sqrt{a(1+\cos(dx+c))}}{d(1+\cos(dx+c))\sqrt{\sec(dx+c)}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$	108

```
[In] int((a+cos(d*x+c)*a)^(1/2)/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/d*(sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+arctan(tan(d*x+c)*(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)))*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))/sec(d*
x+c)^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 88, normalized size of antiderivative = 0.96

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\sec(c+dx)}}\,dx = -\frac{\sqrt{a}(\cos(dx+c)+1)\arctan\left(\frac{\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}\sin(dx+c)}{d\cos(dx+c)+d}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2),x, algorithm="fricas")
[Out] -(sqrt(a)*(cos(d*x + c) + 1)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x +
 c))/(sqrt(a)*sin(d*x + c))) - sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*
sin(d*x + c))/(d*cos(d*x + c) + d)
```

Sympy [F]

$$\int \frac{\sqrt{a + a\cos(c + dx)}}{\sqrt{\sec(c + dx)}}\,dx = \int \frac{\sqrt{a\left(\cos\left(c + dx\right) + 1\right)}}{\sqrt{\sec\left(c + dx\right)}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))**(1/2)/sec(d*x+c)**(1/2),x)
```

```
[Out] Integral(sqrt(a*(cos(c + d*x) + 1))/sqrt(sec(c + d*x)), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 791 vs. 2(78) = 156.

Time = 0.41 (sec) , antiderivative size = 791, normalized size of antiderivative = 8.60

$$\int \frac{\sqrt{a + a\cos(c + dx)}}{\sqrt{\sec(c + dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/4*(2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(
1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x + c)
 - (cos(d*x + c) - 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
1)))*sqrt(a) + sqrt(a)*(arctan2(-(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 +
 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c) + 1))*sin(d*x + c) - cos(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c) + 1))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(
2*d*x + 2*c) + 1)^(1/4)*(cos(d*x + c)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c) + 1)) + sin(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*
d*x + 2*c) + 1))) + 1) - arctan2(-(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2
+ 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c) + 1))*sin(d*x + c) - cos(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c)
, cos(2*d*x + 2*c) + 1))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos
(2*d*x + 2*c) + 1)^(1/4)*(cos(d*x + c)*cos(1/2*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c) + 1)) + sin(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c) + 1))) - 1) - arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2
+ 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c
) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1)
+ arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1
)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (cos(2*d*
x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1)))/d
```

Giac [F]

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{\sqrt{a\cos\left(dx+c\right)+a}}{\sqrt{\sec\left(dx+c\right)}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(a*cos(d*x + c) + a)/sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{\sqrt{a+a\,\cos\left(c+d\,x\right)}}{\sqrt{\frac{1}{\cos(c+d\,x)}}}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(1/2)/(1/cos(c + d*x))^(1/2),x)
[Out] int((a + a*cos(c + d*x))^(1/2)/(1/cos(c + d*x))^(1/2), x)
```

3.345 $\int \frac{\sqrt{a+a\cos(c+dx)}}{\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 136

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{3\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{4d} + \frac{a\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)} + \frac{3a\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

```
[Out] 1/2*a*sin(d*x+c)/d/sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2)+3/4*a*sin(d*x+c)
/d/(a+a*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2)+3/4*arcsin(sin(d*x+c)*a^(1/2)/(a
+a*cos(d*x+c))^(1/2))*a^(1/2)*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {4307, 2849, 2853, 222}

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{3\sqrt{a}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{4d} + \frac{a\sin(c+dx)}{2d\sec^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{3a\sin(c+dx)}{4d\sqrt{\sec(c+dx)}\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sqrt[a + a*Cos[c + d*x]]/Sec[c + d*x]^(3/2),x]
```

```
[Out] (3*Sqrt[a]*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[Cos
[c + d*x]]*Sqrt[Sec[c + d*x]])/(4*d) + (a*Sin[c + d*x])/(2*d*Sqrt[a + a*Cos
[c + d*x]]*Sec[c + d*x]^(3/2)) + (3*a*Sin[c + d*x])/(4*d*Sqrt[a + a*Cos[c +
 d*x]]*Sqrt[Sec[c + d*x]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx$$

$$= \frac{a\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)} + \frac{1}{4}\left(3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx$$

$$= \frac{a\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)} + \frac{3a\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} + \frac{1}{8}\left(3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{a\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)} + \frac{3a\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} - \frac{\left(3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d}$$

$$= \frac{3\sqrt{a}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{4d} + \frac{a\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)} + \frac{3a\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.82

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{\sqrt{\cos(c+dx)}\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}\left(3\sqrt{2}\arcsin\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right)+2\sqrt{\right.}}{8d}$$

```
[In] Integrate[Sqrt[a + a*Cos[c + d*x]]/Sec[c + d*x]^(3/2),x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*Sqrt[Sec[c
+ d*x]]*(3*Sqrt[2]*ArcSin[Sqrt[2]*Sin[(c + d*x)/2]] + 2*Sqrt[Cos[c + d*x]]*
(2*Sin[(c + d*x)/2] + Sin[(3*(c + d*x))/2])))/(8*d)
```

Maple [A] (verified)

Time = 14.20 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.07

method	result	si
default	$\frac{\sqrt{a(1+\cos(dx+c))}\left(2\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+3\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+3\sec(dx+c)\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\right)}{4d(1+\cos(dx+c))\sec(dx+c)^{\frac{3}{2}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$	14

```
[In] int((a+cos(d*x+c)*a)^(1/2)/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/d*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))/sec(d*x+c)^(3/2)/(cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*(2*sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+3*tan
(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+3*sec(d*x+c)*arctan(tan(d*x+c)*(c
os(d*x+c)/(1+cos(d*x+c)))^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 108, normalized size of antiderivative = 0.79

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = -\frac{3\sqrt{a}(\cos(dx+c)+1)\arctan\left(\frac{\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-\frac{\sqrt{a\cos(dx+c)+a}\left(2\cos(dx+c)^2+3\cos(dx+c)\right)\sin(dx+c)}{\sqrt{\cos(dx+c)}}}{4\left(d\cos(dx+c)+d\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/4*(3*sqrt(a)*(cos(d*x + c) + 1)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(cos
(d*x + c))/(sqrt(a)*sin(d*x + c))) - sqrt(a*cos(d*x + c) + a)*(2*cos(d*x +
c)^2 + 3*cos(d*x + c))*sin(d*x + c)/sqrt(cos(d*x + c)))/(d*cos(d*x + c) + d
)
```

Sympy [F]

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{\sqrt{a\left(\cos\left(c+dx\right)+1\right)}}{\sec^{\frac{3}{2}}\left(c+dx\right)}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))**(1/2)/sec(d*x+c)**(3/2),x)
```

```
[Out] Integral(sqrt(a*(cos(c + d*x) + 1))/sec(c + d*x)**(3/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1059 vs. 2(112) = 224.

Time = 0.43 (sec) , antiderivative size = 1059, normalized size of antiderivative = 7.79

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/sec(d*x+c)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/16*(2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^
(1/4)*((cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(2*d*x + 2*
c) - (cos(2*d*x + 2*c) - 2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c))) + sin(2*d*x + 2*c))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c
) + 1)) + ((cos(2*d*x + 2*c) - 2)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d
```

```
*x + 2*c))) + sin(2*d*x + 2*c)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c))) - cos(2*d*x + 2*c) + 2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c) + 1)))*sqrt(a) + 3*sqrt(a)*(arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*
x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c)))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
1)) - cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arct
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))), (cos(2*d*x + 2*c)^2 + sin(2*d*x
+ 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c) + 1))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan
2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))) + 1) - arctan2((cos(2*d*x + 2*c)^2
+ sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c) + 1)) - cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*si
n(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))), (cos(2*d*x + 2*c)^2 +
sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d
*x + 2*c), cos(2*d*x + 2*c) + 1))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(
1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))) - 1) - arctan2((cos(2*d*x
 + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arct
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d
*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c) + 1)) + 1) + arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x +
2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*
x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)
) - 1)))/d
```

Giac [F]

$$\int \frac{\sqrt{a+a\cos(c+dx)}}{\sec^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{\sqrt{a\cos\left(dx+c\right)+a}}{\sec\left(dx+c\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^(1/2)/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate(sqrt(a*cos(d*x + c) + a)/sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{a + a\cos(c + dx)}}{\sec^{\frac{3}{2}}(c + dx)}\, dx = \int \frac{\sqrt{a + a\,\cos(c + d\,x)}}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}\, dx$$

```
[In] int((a + a*cos(c + d*x))^(1/2)/(1/cos(c + d*x))^(3/2),x)
[Out] int((a + a*cos(c + d*x))^(1/2)/(1/cos(c + d*x))^(3/2), x)
```

3.346 $\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{9}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 161

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \frac{208a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{105d\sqrt{a+a\cos(c+dx)}} + \frac{104a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{105d\sqrt{a+a\cos(c+dx)}} + \frac{26a^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 104/105*a^2*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+26/35*a^2*
sec(d*x+c)^(5/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+2/7*a^2*sec(d*x+c)^(7/
2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+208/105*a^2*sin(d*x+c)*sec(d*x+c)^(1
/2)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4307, 2841, 21, 2851, 2850}

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \frac{2a^2\sin(c+dx)\sec^{\frac{7}{2}}(c+dx)}{7d\sqrt{a\cos(c+dx)+a}} + \frac{26a^2\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{35d\sqrt{a\cos(c+dx)+a}} + \frac{104a^2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{105d\sqrt{a\cos(c+dx)+a}} + \frac{208a^2\sin(c+dx)\sqrt{\sec(c+dx)}}{105d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(9/2),x]
```

```
[Out] (208*a^2*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(105*d*Sqrt[a + a*Cos[c + d*x]])
+ (104*a^2*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(105*d*Sqrt[a + a*Cos[c + d*x]]
) + (26*a^2*Sec[c + d*x]^(5/2)*Sin[c + d*x])/(35*d*Sqrt[a + a*Cos[c + d*x]]
) + (2*a^2*Sec[c + d*x]^(7/2)*Sin[c + d*x])/(7*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
```

```
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx\\
&= \frac{2a^2\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}} - \frac{1}{7}\left(2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{13a}{2}-\frac{13}{2}a\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx\\
&= \frac{2a^2\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}} + \frac{1}{7}\left(13a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx\\
&= \frac{26a^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}} + \frac{1}{35}\left(52a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx\\
&= \frac{104a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{105d\sqrt{a+a\cos(c+dx)}} + \frac{26a^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}}\\
&\quad + \frac{1}{105}\left(104a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx\\
&= \frac{208a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{105d\sqrt{a+a\cos(c+dx)}} + \frac{104a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{105d\sqrt{a+a\cos(c+dx)}} + \frac{26a^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{35d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.45

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \frac{2a\sqrt{a(1+\cos(c+dx))}(41+117\cos(c+dx)+26\cos(2(c+dx))+26\cos(3(c+dx)))\sec^{\frac{7}{2}}(c+dx)\tan\left(\frac{1}{2}(c+dx)\right)}{105d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(9/2),x]
[Out] (2*a*Sqrt[a*(1 + Cos[c + d*x])]*(41 + 117*Cos[c + d*x] + 26*Cos[2*(c + d*x)
] + 26*Cos[3*(c + d*x)])*Sec[c + d*x]^(7/2)*Tan[(c + d*x)/2])/(105*d)
```

Maple [A] (verified)

Time = 5.97 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.45

method	result	size
default	$-\frac{2\cot(dx+c)\sqrt{a(1+\cos(dx+c))}\left(\sec^{\frac{9}{2}}(dx+c)\right)\left(104\left(\cos^4(dx+c)\right)-52\left(\cos^3(dx+c)\right)-13\left(\cos^2(dx+c)\right)-24\cos(dx+c)-15\right)a}{105d}$	73

[In] int((a+cos(d*x+c)*a)^(3/2)*sec(d*x+c)^(9/2),x,method=_RETURNVERBOSE)

[Out] -2/105/d*cot(d*x+c)*(a*(1+cos(d*x+c)))^(1/2)*sec(d*x+c)^(9/2)*(104*cos(d*x+c)^4-52*cos(d*x+c)^3-13*cos(d*x+c)^2-24*cos(d*x+c)-15)*a

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.53

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \frac{2\left(104\,a\cos(dx+c)^3+52\,a\cos(dx+c)^2+39\,a\cos(dx+c)+15\,a\right)\sqrt{a\cos(dx+c)+a}\sin(dx+c)}{105\left(d\cos(dx+c)^4+d\cos(dx+c)^3\right)\sqrt{\cos(dx+c)}}$$

[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^(9/2),x, algorithm="fricas")

[Out] 2/105*(104*a*cos(d*x + c)^3 + 52*a*cos(d*x + c)^2 + 39*a*cos(d*x + c) + 15*a)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/((d*cos(d*x + c)^4 + d*cos(d*x + c)^3)*sqrt(cos(d*x + c)))

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \text{Timed out}$$

[In] integrate((a+a*cos(d*x+c))**(3/2)*sec(d*x+c)**(9/2),x)

[Out] Timed out

Maxima [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 263, normalized size of antiderivative = 1.63

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \frac{4\left(\frac{105\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)}{\cos(dx+c)+1}-\frac{245\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{273\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{171\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)^7}{(\cos(dx+c)+1)^7}+\frac{38\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)^9}{(\cos(dx+c)+1)^9}\right)}{105\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{9}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{9}{2}}\left(\frac{3\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{3\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+\frac{\sin(dx+c)}{(\cos(dx+c)+}\right.}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^(9/2),x, algorithm="maxima")
```

```
[Out] 4/105*(105*sqrt(2)*a^(3/2)*sin(d*x + c)/(cos(d*x + c) + 1) - 245*sqrt(2)*a^
(3/2)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 273*sqrt(2)*a^(3/2)*sin(d*x + c
)^5/(cos(d*x + c) + 1)^5 - 171*sqrt(2)*a^(3/2)*sin(d*x + c)^7/(cos(d*x + c)
 + 1)^7 + 38*sqrt(2)*a^(3/2)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9)*(sin(d*x
+ c)^2/(cos(d*x + c) + 1)^2 + 1)^3/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)
^(9/2)*(-sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(9/2)*(3*sin(d*x + c)^2/(cos(
d*x + c) + 1)^2 + 3*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + sin(d*x + c)^6/(c
os(d*x + c) + 1)^6 + 1))
```

Giac [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^(9/2),x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [B] (verification not implemented)

Time = 18.01 (sec) , antiderivative size = 221, normalized size of antiderivative = 1.37

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \frac{-35\,a\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\sqrt{a+a\,\cos\left(c+d\,x\right)}\,\sqrt{\frac{2\,{\mathrm{e}}^{c\,1{}\mathrm{i}+d\,x\,1{}\mathrm{i}}}{{\mathrm{e}}^{c\,2{}\mathrm{i}+d\,x\,2{}\mathrm{i}}+1}}+91\,a\,\sin\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)\,\sqrt{a+a\,\cos\left(c+d\,x\right.}}{\frac{315\,d\,\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{8}+\frac{315\,d\,\cos\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)}{8}+\frac{105\,d\,\cos\left(\frac{5\,c}{2}+\frac{5}{}\right.}{8}}$$

```
[In] int((1/cos(c + d*x))^(9/2)*(a + a*cos(c + d*x))^(3/2),x)
```

```
[Out] (91*a*sin((3*c)/2 + (3*d*x)/2)*(a + a*cos(c + d*x))^(1/2)*((2*exp(c*1i + d*
x*1i))/(exp(c*2i + d*x*2i) + 1))^(1/2) - 35*a*sin(c/2 + (d*x)/2)*(a + a*cos
(c + d*x))^(1/2)*((2*exp(c*1i + d*x*1i))/(exp(c*2i + d*x*2i) + 1))^(1/2) +
26*a*sin((7*c)/2 + (7*d*x)/2)*(a + a*cos(c + d*x))^(1/2)*((2*exp(c*1i + d*x
*1i))/(exp(c*2i + d*x*2i) + 1))^(1/2))/((315*d*cos(c/2 + (d*x)/2))/8 + (315
*d*cos((3*c)/2 + (3*d*x)/2))/8 + (105*d*cos((5*c)/2 + (5*d*x)/2))/8 + (105*
d*cos((7*c)/2 + (7*d*x)/2))/8)
```

3.347 $\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{7}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 121

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{7}{2}}(c+dx)\,dx=\frac{12a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}}+\frac{6a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 6/5*a^2*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+2/5*a^2*sec(d*
x+c)^(5/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+12/5*a^2*sin(d*x+c)*sec(d*x+
c)^(1/2)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4307, 2841, 21, 2851, 2850}

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{7}{2}}(c+dx)\,dx=\frac{2a^2\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{5d\sqrt{a\cos(c+dx)+a}}+\frac{6a^2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{5d\sqrt{a\cos(c+dx)+a}}+\frac{12a^2\sin(c+dx)\sqrt{\sec(c+dx)}}{5d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(7/2),x]
```

```
[Out] (12*a^2*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(5*d*Sqrt[a + a*Cos[c + d*x]]) + (
6*a^2*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(5*d*Sqrt[a + a*Cos[c + d*x]]) + (2*
a^2*Sec[c + d*x]^(5/2)*Sin[c + d*x])/(5*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx$$

$$= \frac{2a^2 \sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} - \frac{1}{5}\left(2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{9a}{2}-\frac{9}{2}a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}dx$$

$$= \frac{2a^2 \sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} + \frac{1}{5}\left(9a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}dx$$

$$= \frac{6a^2 \sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2 \sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} + \frac{1}{5}\left(6a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}dx$$

$$= \frac{12a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} + \frac{6a^2 \sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2 \sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 62, normalized size of antiderivative = 0.51

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{7}{2}}(c+dx)\,dx = \frac{2a\sqrt{a(1+\cos(c+dx))}(4+3\cos(c+dx)+3\cos(2(c+dx)))\sec^{\frac{5}{2}}(c+dx)\tan\left(\frac{1}{2}(c+dx)\right)}{5d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(7/2),x]
[Out] (2*a*Sqrt[a*(1 + Cos[c + d*x])]*(4 + 3*Cos[c + d*x] + 3*Cos[2*(c + d*x)])*S
ec[c + d*x]^(5/2)*Tan[(c + d*x)/2])/(5*d)
```

Maple [A] (verified)

Time = 6.28 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.52

method	result	size
default	$-\frac{2\cot(dx+c)\sqrt{a(1+\cos(dx+c))}\left(\sec^{\frac{7}{2}}(dx+c)\right)(6(\cos^3(dx+c))-3(\cos^2(dx+c))-2\cos(dx+c)-1)a}{5d}$	63

```
[In] int((a+cos(d*x+c)*a)^(3/2)*sec(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
[Out] -2/5/d*cot(d*x+c)*(a*(1+cos(d*x+c)))^(1/2)*sec(d*x+c)^(7/2)*(6*cos(d*x+c)^3
-3*cos(d*x+c)^2-2*cos(d*x+c)-1)*a
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.60

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{7}{2}}(c+dx)\,dx = \frac{2\left(6\,a\cos\left(dx+c\right)^{2}+3\,a\cos\left(dx+c\right)+a\right)\sqrt{a\cos\left(dx+c\right)+a}\sin\left(dx+c\right)}{5\left(d\cos\left(dx+c\right)^{3}+d\cos\left(dx+c\right)^{2}\right)\sqrt{\cos\left(dx+c\right)}}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^(7/2),x, algorithm="fricas")
[Out] 2/5*(6*a*cos(d*x + c)^2 + 3*a*cos(d*x + c) + a)*sqrt(a*cos(d*x + c) + a)*si
n(d*x + c)/((d*cos(d*x + c)^3 + d*cos(d*x + c)^2)*sqrt(cos(d*x + c)))
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{7}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(3/2)*sec(d*x+c)**(7/2),x)
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 217 vs. 2(103) = 206.

Time = 0.32 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.79

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{7}{2}}(c+dx)\,dx = \frac{4\left(\frac{5\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)}{\cos(dx+c)+1}-\frac{10\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)^{3}}{(\cos(dx+c)+1)^{3}}+\frac{7\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)^{5}}{(\cos(dx+c)+1)^{5}}-\frac{2\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)^{7}}{(\cos(dx+c)+1)^{7}}\right)\left(\frac{\sin(dx+c)^{2}}{(\cos(dx+c)+1)^{2}}+1\right)^{2}}{5\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{7}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{7}{2}}\left(\frac{2\sin(dx+c)^{2}}{(\cos(dx+c)+1)^{2}}+\frac{\sin(dx+c)^{4}}{(\cos(dx+c)+1)^{4}}+1\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^(7/2),x, algorithm="maxima")
[Out] 4/5*(5*sqrt(2)*a^(3/2)*sin(d*x + c)/(cos(d*x + c) + 1) - 10*sqrt(2)*a^(3/2)
*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 7*sqrt(2)*a^(3/2)*sin(d*x + c)^5/(co
s(d*x + c) + 1)^5 - 2*sqrt(2)*a^(3/2)*sin(d*x + c)^7/(cos(d*x + c) + 1)^7)*
(sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 1)^2/(d*(sin(d*x + c)/(cos(d*x + c)
+ 1) + 1)^(7/2)*(-sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(7/2)*(2*sin(d*x + c
)^2/(cos(d*x + c) + 1)^2 + sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + 1))
```

Giac [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{7}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^(7/2),x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [B] (verification not implemented)

Time = 1.70 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.12

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{7}{2}}(c+dx)\,dx = \frac{4\,a\,\sqrt{a\,\left(\cos\left(c+d\,x\right)+1\right)}\,\sqrt{\frac{1}{\cos\left(c+d\,x\right)}}\,\left(8\,\sin\left(c+d\,x\right)+6\,\sin\left(2\,c+2\,d\,x\right)+11\,\sin\left(3\,c+3\,d\,x\right)+\right.}{5\,d\,\left(10\,\cos\left(c+d\,x\right)+8\,\cos\left(2\,c+2\,d\,x\right)+5\,\cos\left(3\,c+3\,d\,x\right)+2\,\cos\left(4\,c+4\,d\,x\right)\right.}$$

```
[In] int((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))^(3/2),x)
```

```
[Out] (4*a*(a*(cos(c + d*x) + 1))^(1/2)*(1/cos(c + d*x))^(1/2)*(8*sin(c + d*x) +
6*sin(2*c + 2*d*x) + 11*sin(3*c + 3*d*x) + 3*sin(4*c + 4*d*x) + 3*sin(5*c +
 5*d*x)))/(5*d*(10*cos(c + d*x) + 8*cos(2*c + 2*d*x) + 5*cos(3*c + 3*d*x) +
 2*cos(4*c + 4*d*x) + cos(5*c + 5*d*x) + 6))
```

3.348 $\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 81

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)\,dx=\frac{10a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 2/3*a^2*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+10/3*a^2*sin(d
*x+c)*sec(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {4307, 2841, 21, 2850}

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)\,dx=\frac{2a^2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3d\sqrt{a\cos(c+dx)+a}}+\frac{10a^2\sin(c+dx)\sqrt{\sec(c+dx)}}{3d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(5/2),x]
```

```
[Out] (10*a^2*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(3*d*Sqrt[a + a*Cos[c + d*x]]) + (
2*a^2*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(3*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{2a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} \\
&\quad -\frac{1}{3}\left(2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{5a}{2}-\frac{5}{2}a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx \\
&= \frac{2a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}+\frac{1}{3}\left(5a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{10a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.64

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)\,dx=\frac{2a\sqrt{a(1+\cos(c+dx))}(1+5\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)\tan\left(\frac{1}{2}(c+dx)\right)}{3d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(5/2),x]
[Out] (2*a*Sqrt[a*(1 + Cos[c + d*x])]*(1 + 5*Cos[c + d*x])*Sec[c + d*x]^(3/2)*Tan
[(c + d*x)/2])/(3*d)
```

Maple [A] (verified)

Time = 4.94 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.65

method	result	size
default	$-\frac{2\cot(dx+c)\sqrt{a(1+\cos(dx+c))}\left(\sec^{\frac{5}{2}}(dx+c)\right)(5(\cos^2(dx+c))-4\cos(dx+c)-1)a}{3d}$	53

```
[In] int((a+cos(d*x+c)*a)^(3/2)*sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
[Out] -2/3/d*cot(d*x+c)*(a*(1+cos(d*x+c)))^(1/2)*sec(d*x+c)^(5/2)*(5*cos(d*x+c)^2
-4*cos(d*x+c)-1)*a
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.74

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)\,dx=\frac{2\,(5\,a\cos(dx+c)+a)\sqrt{a\cos(dx+c)+a}\sin(dx+c)}{3\,\left(d\cos(dx+c)^2+d\cos(dx+c)\right)\sqrt{\cos(dx+c)}}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^(5/2),x, algorithm="fricas")
[Out] 2/3*(5*a*cos(d*x + c) + a)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/((d*cos(d*
x + c)^2 + d*cos(d*x + c))*sqrt(cos(d*x + c)))
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(3/2)*sec(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.54

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{4\left(\frac{3\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)}{\cos(dx+c)+1} - \frac{5\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)^3}{(\cos(dx+c)+1)^3} + \frac{2\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)^5}{(\cos(dx+c)+1)^5}\right)}{3\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{5}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{5}{2}}}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^(5/2),x, algorithm="maxima")
```

```
[Out] 4/3*(3*sqrt(2)*a^(3/2)*sin(d*x + c)/(cos(d*x + c) + 1) - 5*sqrt(2)*a^(3/2)*
sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 2*sqrt(2)*a^(3/2)*sin(d*x + c)^5/(cos
(d*x + c) + 1)^5)/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(5/2)*(-sin(d*x
+ c)/(cos(d*x + c) + 1) + 1)^(5/2))
```

Giac [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [B] (verification not implemented)

Time = 0.81 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.12

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)\,dx=\frac{2\,a\,\sqrt{a\,\left(\cos\left(c+d\,x\right)+1\right)}\,\sqrt{\frac{1}{\cos(c+d\,x)}}\,\left(5\,\sin\left(c+d\,x\right)+2\,\sin\left(2\,c+2\,d\,x\right)+5\,\sin\left(3\,c+3\,d\,x\right)\right)}{3\,d\,\left(3\,\cos\left(c+d\,x\right)+2\,\cos\left(2\,c+2\,d\,x\right)+\cos\left(3\,c+3\,d\,x\right)+2\right)}$$

```
[In] int((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^(3/2),x)
```

```
[Out] (2*a*(a*(cos(c + d*x) + 1))^(1/2)*(1/cos(c + d*x))^(1/2)*(5*sin(c + d*x) +
2*sin(2*c + 2*d*x) + 5*sin(3*c + 3*d*x)))/(3*d*(3*cos(c + d*x) + 2*cos(2*c
+ 2*d*x) + cos(3*c + 3*d*x) + 2))
```

3.349 $\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 96

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)\,dx=\frac{2a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d}+\frac{2a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 2*a^(3/2)*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2
)*sec(d*x+c)^(1/2)/d+2*a^2*sin(d*x+c)*sec(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^(
1/2)
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4307, 2841, 21, 2853, 222}

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)\,dx=\frac{2a^{3/2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{d}+\frac{2a^2\sin(c+dx)\sqrt{\sec(c+dx)}}{d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(3/2),x]
```

```
[Out] (2*a^(3/2)*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[Cos
[c + d*x]]*Sqrt[Sec[c + d*x]])/d + (2*a^2*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/
(d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \frac{2a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}} - \left(2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{a}{2}-\frac{1}{2}a\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}dx$$

$$= \frac{2a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}} + \left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}dx$$

$$= \frac{2a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}} - \frac{\left(2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

$$= \frac{2a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d} + \frac{2a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.89

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{a\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}\left(\sqrt{2}\arcsin\left(\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)\right)\sqrt{\cos(c+d}\right.}{d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(3/2),x]
[Out] (a*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*Sqrt[Sec[c + d*x]]*(Sqrt[2]*
ArcSin[Sqrt[2]*Sin[(c + d*x)/2]]*Sqrt[Cos[c + d*x]] + 2*Sin[(c + d*x)/2]))/
d
```

Maple [A] (verified)

Time = 6.61 (sec) , antiderivative size = 150, normalized size of antiderivative = 1.56

method	result
default	$\frac{2\left(\sec^{\frac{3}{2}}(dx+c)\right)\left(\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)+\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)+\right.}{d(1+\cos(dx+c))}$

```
[In] int((a+cos(d*x+c)*a)^(3/2)*sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d*sec(d*x+c)^(3/2)*(cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(t
an(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))+(cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))+sin(d*x+c))*cos(d*
x+c)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))*a
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 91, normalized size of antiderivative = 0.95

$$\int (a + a\cos(c + dx))^{3/2}\sec^{\frac{3}{2}}(c + dx)\,dx = -\frac{2\left((a\cos(dx + c) + a)\sqrt{a}\arctan\left(\frac{\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right) - \frac{\sqrt{a\cos(dx+c)+a}a\sin(dx+c)}{\sqrt{\cos(dx+c)}}\right)}{d\cos(dx + c) + d}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] -2*((a*cos(d*x + c) + a)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(cos(d
*x + c))/(sqrt(a)*sin(d*x + c))) - sqrt(a*cos(d*x + c) + a)*a*sin(d*x + c)/
sqrt(cos(d*x + c)))/(d*cos(d*x + c) + d)
```

Sympy [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^{3/2}\sec^{\frac{3}{2}}(c + dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(3/2)*sec(d*x+c)**(3/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 997 vs. $2(82) = 164$.

Time = 0.43 (sec) , antiderivative size = 997, normalized size of antiderivative = 10.39

$$\int (a + a\cos(c + dx))^{3/2}\sec^{\frac{3}{2}}(c + dx)\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/2*((a*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*
c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/2
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - cos(1/2*arctan2(sin(2*d
```

```
*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c)))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c)
 + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*cos(1
/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x
 + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c)))) + 1) - a*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*co
s(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c)))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - cos(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c)))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(
2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
 + 1))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c)))) - 1) - a*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2
*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x
 + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))
 + 1) + a*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x +
2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (
cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos
(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1))*(cos(2*d*x + 2*
c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sqrt(a) + 4*(a*co
s(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c))) - (a*cos(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c))) - a)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1
)))*sqrt(a))/((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c)
 + 1)^(1/4)*d)
```

Giac [F]

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)\,dx=\int (a\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^{3/2} \sec^{\frac{3}{2}}(c + dx)\, dx = \int \left(\frac{1}{\cos(c + d\, x)}\right)^{3/2} (a + a\, \cos(c + d\, x))^{3/2}\, dx$$

```
[In] int((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^(3/2),x)
[Out] int((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^(3/2), x)
```

3.350 $\int (a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 95

$$\int (a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\,dx = \frac{3a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d}+\frac{a^2\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

```
[Out] a^2*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2)+3*a^(3/2)*arcsin(s
in(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)
/d
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4307, 2842, 21, 2853, 222}

$$\int (a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\,dx = \frac{3a^{3/2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{d}+\frac{a^2\sin(c+dx)}{d\sqrt{\sec(c+dx)}\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (3*a^(3/2)*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[Cos
[c + d*x]]*Sqrt[Sec[c + d*x]])/d + (a^2*Sin[c + d*x])/(d*Sqrt[a + a*Cos[c +
 d*x]]*Sqrt[Sec[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2842

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
+ n)), Int[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^n*Simp[a*b*c*(
m - 2) + b^2*d*(n + 1) + a^2*d*(m + n) - b*(b*c*(m - 1) - a*d*(3*m + 2*n -
2))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c
- a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1] &&  !LtQ[n
, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] || (IntegerQ[m] && EqQ[c
, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{(a+a\cos(c+dx))^{3/2}}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{a^2 \sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} + \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{3a^2}{2}+\frac{3}{2}a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{a^2 \sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} + \frac{1}{2}\left(3a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{a^2 \sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} - \frac{\left(3a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

$$= \frac{3a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d} + \frac{a^2\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.04

$$\int (a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\,dx = \frac{a\sqrt{\cos(c+dx)}\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}\left(3\sqrt{2}\arcsin\left(\right.\right.}{2d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x]],x]
[Out] (a*Sqrt[Cos[c + d*x]]*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*Sqrt[Sec[
c + d*x]]*(3*Sqrt[2]*ArcSin[Sqrt[2]*Sin[(c + d*x)/2]] + 2*Sqrt[Cos[c + d*x]
]*Sin[(c + d*x)/2]))/(2*d)
```

Maple [A] (verified)

Time = 15.56 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.23

method	result	size
default	$\frac{\left(\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+3\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\right)\left(\sqrt{\sec}(dx+c)\right)\sqrt{a(1+\cos(dx+c))}\,\cos(dx+c)a}{d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$	117

```
[In] int((a+cos(d*x+c)*a)^(3/2)*sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+3*arctan(tan(d*x+c)*(cos(
d*x+c)/(1+cos(d*x+c)))^(1/2)))*sec(d*x+c)^(1/2)*(a*(1+cos(d*x+c)))^(1/2)*co
s(d*x+c)/(1+cos(d*x+c))/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 90, normalized size of antiderivative = 0.95

$$\int (a + a\cos(c + dx))^{3/2}\sqrt{\sec(c + dx)}\,dx = \frac{\sqrt{a\cos(dx + c) + a}a\sqrt{\cos(dx + c)}\sin(dx + c) - 3(a\cos(dx + c) + a)\sqrt{a}\arcta}{d\cos(dx + c) + d}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] (sqrt(a*cos(d*x + c) + a)*a*sqrt(cos(d*x + c))*sin(d*x + c) - 3*(a*cos(d*x
+ c) + a)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(
a)*sin(d*x + c))))/(d*cos(d*x + c) + d)
```

Sympy [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^{3/2}\sqrt{\sec(c + dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(3/2)*sec(d*x+c)**(1/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 803 vs. 2(81) = 162.

Time = 0.43 (sec) , antiderivative size = 803, normalized size of antiderivative = 8.45

$$\int (a + a\cos(c + dx))^{3/2}\sqrt{\sec(c + dx)}\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/4*(2*(a*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x
+ c) - (a*cos(d*x + c) - a)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
```

```
*c) + 1)))*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) +
1)^(1/4)*sqrt(a) + 3*(a*arctan2(-(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 +
 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c) + 1))*sin(d*x + c) - cos(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c) + 1))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(
2*d*x + 2*c) + 1)^(1/4)*(cos(d*x + c)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c) + 1)) + sin(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*
d*x + 2*c) + 1))) + 1) - a*arctan2(-(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^
2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*
d*x + 2*c) + 1))*sin(d*x + c) - cos(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*
c), cos(2*d*x + 2*c) + 1))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*c
os(2*d*x + 2*c) + 1)^(1/4)*(cos(d*x + c)*cos(1/2*arctan2(sin(2*d*x + 2*c),
cos(2*d*x + 2*c) + 1)) + sin(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c) + 1))) - 1) - a*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c
)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x +
 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) +
 1) + a*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*
c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (co
s(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1
/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1))*sqrt(a))/d
```

Giac [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\,dx=\text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\,dx=\int \sqrt{\frac{1}{\cos\left(c+d\,x\right)}}\,{\left(a+a\,\cos\left(c+d\,x\right)\right)}^{3/2}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^(3/2),x)
[Out] int((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^(3/2), x)
```

3.351 $\int \frac{(a+a\cos(c+dx))^{3/2}}{\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 140

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\sqrt{\sec(c+dx)}}\,dx = \frac{7a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{4d} + \frac{a^2\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)} + \frac{7a^2\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

```
[Out] 1/2*a^2*sin(d*x+c)/d/sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2)+7/4*a^2*sin(d*
x+c)/d/(a+a*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2)+7/4*a^(3/2)*arcsin(sin(d*x+c
)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {4307, 2842, 21, 2849, 2853, 222}

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\sqrt{\sec(c+dx)}}\,dx = \frac{7a^{3/2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{4d} + \frac{a^2\sin(c+dx)}{2d\sec^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{7a^2\sin(c+dx)}{4d\sqrt{\sec(c+dx)}\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2)/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (7*a^(3/2)*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[Cos
[c + d*x]]*Sqrt[Sec[c + d*x]])/(4*d) + (a^2*Sin[c + d*x])/(2*d*Sqrt[a + a*C
```

```
os[c + d*x]]*Sec[c + d*x]^(3/2)) + (7*a^2*Sin[c + d*x])/(4*d*Sqrt[a + a*Cos
[c + d*x]]*Sqrt[Sec[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2842

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
+ n)), Int[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^n*Simp[a*b*c*(
m - 2) + b^2*d*(n + 1) + a^2*d*(m + n) - b*(b*c*(m - 1) - a*d*(3*m + 2*n -
2))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c
- a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1] &&  !LtQ[n
, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] || (IntegerQ[m] && EqQ[c
, 0]))
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
```

```
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}\,dx\\
&= \frac{a^2\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\\
&\quad+\frac{1}{2}\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{\cos(c+dx)}\left(\frac{7a^2}{2}+\frac{7}{2}a^2\cos(c+dx)\right)}{\sqrt{a+a\cos(c+dx)}}\,dx\\
&= \frac{a^2\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\\
&\quad+\frac{1}{4}\left(7a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx\\
&= \frac{a^2\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}+\frac{7a^2\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}\\
&\quad+\frac{1}{8}\left(7a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{a^2\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}+\frac{7a^2\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}\\
&\quad-\frac{\left(7a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int\frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d}\\
&= \frac{7a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{4d}\\
&\quad+\frac{a^2\sin(c+dx)}{2d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}+\frac{7a^2\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.21 (sec) , antiderivative size = 112, normalized size of antiderivative = 0.80

$$\int\frac{(a+a\cos(c+dx))^{3/2}}{\sqrt{\sec(c+dx)}}\,dx=\frac{a\sqrt{\cos(c+dx)}\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}\left(7\sqrt{2}\arcsin\right.}{8}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(3/2)/Sqrt[Sec[c + d*x]],x]
[Out] (a*Sqrt[Cos[c + d*x]]*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*Sqrt[Sec[
c + d*x]]*(7*Sqrt[2]*ArcSin[Sqrt[2]*Sin[(c + d*x)/2]] + 2*Sqrt[Cos[c + d*x]
]*(6*Sin[(c + d*x)/2] + Sin[(3*(c + d*x))/2])))/(8*d)
```

Maple [A] (verified)

Time = 14.24 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.04

method	result	si
default	$\frac{\left(2\sin(dx+c)\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+7\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+7\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\right)\sqrt{a(1+\cos(dx+c))}\,a}{4d(1+\cos(dx+c))\sqrt{\sec(dx+c)}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$	1

```
[In] int((a+cos(d*x+c)*a)^(3/2)/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/d*(2*sin(d*x+c)*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+7*sin(d*x+
c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+7*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)))*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))/sec(d*x+c)^(1/2)/
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 112, normalized size of antiderivative = 0.80

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\sqrt{\sec(c+dx)}}\,dx = -\frac{7\left(a\cos\left(dx+c\right)+a\right)\sqrt{a}\arctan\left(\frac{\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-\frac{\left(2\,a\cos(dx+c)^2+7\,a\cos(dx+c)\right)\sqrt{a\cos(dx+c)+a}\sin(dx+c)}{\sqrt{\cos(dx+c)}}}{4\left(d\cos\left(dx+c\right)+d\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/4*(7*(a*cos(d*x + c) + a)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(c
os(d*x + c))/(sqrt(a)*sin(d*x + c))) - (2*a*cos(d*x + c)^2 + 7*a*cos(d*x +
c))*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/sqrt(cos(d*x + c)))/(d*cos(d*x +
c) + d)
```

Sympy [F]

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{\left(a\left(\cos\left(c+dx\right)+1\right)\right)^{\frac{3}{2}}}{\sqrt{\sec\left(c+dx\right)}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))**(3/2)/sec(d*x+c)**(1/2),x)
```

```
[Out] Integral((a*(cos(c + d*x) + 1))**(3/2)/sqrt(sec(c + d*x)), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1080 vs. $2(116) = 232$.

Time = 0.43 (sec) , antiderivative size = 1080, normalized size of antiderivative = 7.71

$$\int \frac{(a + a\cos(c + dx))^{3/2}}{\sqrt{\sec(c + dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/16*(2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^
(1/4)*((a*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(2*d*x +
2*c) + a*sin(2*d*x + 2*c) - (a*cos(2*d*x + 2*c) - 6*a)*sin(1/2*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c))))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c) + 1)) + (a*sin(2*d*x + 2*c)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c))) - a*cos(2*d*x + 2*c) + (a*cos(2*d*x + 2*c) - 6*a)*cos(1/2*a
rctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 6*a)*sin(1/2*arctan2(sin(2*d*
x + 2*c), cos(2*d*x + 2*c) + 1)))*sqrt(a) + 7*(a*arctan2((cos(2*d*x + 2*c)^
2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c) + 1)) - cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*
sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))), (cos(2*d*x + 2*c)^2
+ sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c) + 1))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*si
n(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))) + 1) - a*arctan2((cos(2
*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c) + 1)) - cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))), (cos(2*d
*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*a
rctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*cos(1/2*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))) - 1) - a*ar
ctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1
/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (cos(2*d*x +
2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2
(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1) + a*arctan2((cos(2*d*x + 2*c
)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(si
n(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2
*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c) + 1)) - 1))*sqrt(a))/d
```

Giac [F]

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(a\cos(dx+c)+a)^{\frac{3}{2}}}{\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^(3/2)/sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(a+a\cos(c+dx))^{3/2}}{\sqrt{\frac{1}{\cos(c+dx)}}}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(3/2)/(1/cos(c + d*x))^(1/2),x)
[Out] int((a + a*cos(c + d*x))^(3/2)/(1/cos(c + d*x))^(1/2), x)
```

3.352 $\int \frac{(a+a\cos(c+dx))^{3/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 180

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{11a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{8d} + \frac{a^2\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)} + \frac{11a^2\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)} + \frac{11a^2\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

```
[Out] 1/3*a^2*sin(d*x+c)/d/sec(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(1/2)+11/12*a^2*sin(
d*x+c)/d/sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2)+11/8*a^2*sin(d*x+c)/d/(a+a
*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2)+11/8*a^(3/2)*arcsin(sin(d*x+c)*a^(1/2)/
(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 180, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {4307, 2842, 21, 2849, 2853, 222}

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{11a^{3/2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{8d} + \frac{11a^2\sin(c+dx)}{12d\sec^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{a^2\sin(c+dx)}{3d\sec^{\frac{5}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{11a^2\sin(c+dx)}{8d\sqrt{\sec(c+dx)}\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2)/Sec[c + d*x]^(3/2),x]
```

```
[Out] (11*a^(3/2)*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[Co
s[c + d*x]]*Sqrt[Sec[c + d*x]])/(8*d) + (a^2*Sin[c + d*x])/(3*d*Sqrt[a + a*
Cos[c + d*x]]*Sec[c + d*x]^(5/2)) + (11*a^2*Sin[c + d*x])/(12*d*Sqrt[a + a*
Cos[c + d*x]]*Sec[c + d*x]^(3/2)) + (11*a^2*Sin[c + d*x])/(8*d*Sqrt[a + a*C
os[c + d*x]]*Sqrt[Sec[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2842

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
+ n)), Int[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^n*Simp[a*b*c*(
m - 2) + b^2*d*(n + 1) + a^2*d*(m + n) - b*(b*c*(m - 1) - a*d*(3*m + 2*n -
2))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c
- a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1] &&  !LtQ[n
, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] || (IntegerQ[m] && EqQ[c
, 0]))
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}\,dx \\
&= \frac{a^2\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)} \\
&\quad+\frac{1}{3}\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{3}{2}}(c+dx)\left(\frac{11a^2}{2}+\frac{11}{2}a^2\cos(c+dx)\right)}{\sqrt{a+a\cos(c+dx)}}\,dx \\
&= \frac{a^2\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)} \\
&\quad+\frac{1}{6}\left(11a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx \\
&= \frac{a^2\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)}+\frac{11a^2\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)} \\
&\quad+\frac{1}{8}\left(11a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx \\
&= \frac{a^2\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)}+\frac{11a^2\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)} \\
&\quad+\frac{11a^2\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} \\
&\quad+\frac{1}{16}\left(11a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{a^2\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)}+\frac{11a^2\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)} \\
&\quad+\frac{11a^2\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} \\
&\quad-\frac{\left(11a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d}
\end{aligned}$$

$$= \frac{11a^{3/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{8d} + \frac{a^2\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)} + \frac{11a^2\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)} + \frac{11a^2\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 126, normalized size of antiderivative = 0.70

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{a\sqrt{\cos(c+dx)}\sqrt{a(1+\cos(c+dx))}\sec\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}\left(33\sqrt{2}\,\mathrm{arc}\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(3/2)/Sec[c + d*x]^(3/2),x]
```

```
[Out] (a*Sqrt[Cos[c + d*x]]*Sqrt[a*(1 + Cos[c + d*x])]*Sec[(c + d*x)/2]*Sqrt[Sec[
c + d*x]]*(33*Sqrt[2]*ArcSin[Sqrt[2]*Sin[(c + d*x)/2]] + 2*Sqrt[Cos[c + d*x
]]*(26*Sin[(c + d*x)/2] + 9*Sin[(3*(c + d*x))/2] + 2*Sin[(5*(c + d*x))/2]))
)/(48*d)
```

Maple [A] (verified)

Time = 14.72 (sec) , antiderivative size = 179, normalized size of antiderivative = 0.99

method	result
default	$\frac{\sqrt{a(1+\cos(dx+c))}\left(8\sin(dx+c)\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+22\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+33\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+33\sec(dx+c)\right.}{24d(1+\cos(dx+c))\sec(dx+c)^{\frac{3}{2}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$

```
[In] int((a+cos(d*x+c)*a)^(3/2)/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/24/d*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))/sec(d*x+c)^(3/2)/(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*(8*sin(d*x+c)*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)+22*sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+33*tan(d*x+c)*(cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)+33*sec(d*x+c)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)))*a
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 123, normalized size of antiderivative = 0.68

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = -\frac{33\,(a\cos{(dx+c)}+a)\sqrt{a}\arctan\left(\frac{\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-\frac{\left(8\,a\cos(dx+c)^3+22\,a\cos(dx+c)^2+33\,a\cos(dx+c)\right)\sqrt{a\cos(dx}}{\sqrt{\cos(dx+c)}}}{24\,(d\cos{(dx+c)}+d)}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/24*(33*(a*cos(d*x + c) + a)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt
(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - (8*a*cos(d*x + c)^3 + 22*a*cos(d*x
 + c)^2 + 33*a*cos(d*x + c))*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/sqrt(cos
(d*x + c)))/(d*cos(d*x + c) + d)
```

Sympy [F]

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(a(\cos{(c+dx)}+1))^{\frac{3}{2}}}{\sec^{\frac{3}{2}}{(c+dx)}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))**(3/2)/sec(d*x+c)**(3/2),x)
```

```
[Out] Integral((a*(cos(c + d*x) + 1))**(3/2)/sec(c + d*x)**(3/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1942 vs. 2(150) = 300.

Time = 0.53 (sec) , antiderivative size = 1942, normalized size of antiderivative = 10.79

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/96*(4*(a*cos(3/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*
c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1))*sin(3*d*x
+ 3*c) - (a*cos(3*d*x + 3*c) - a)*sin(3/2*arctan2(sin(2/3*arctan2(sin(3*d*x
 + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x +
3*c))) + 1)))*(cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin
```

(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin
(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(3/4)*sqrt(a) + 6*(cos(2/3*arctan2(s
in(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), c
os(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))
) + 1)^(1/4)*((3*a*sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1
1*a*sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))))*cos(1/2*arctan2(s
in(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*
d*x + 3*c), cos(3*d*x + 3*c))) + 1)) - (3*a*cos(2/3*arctan2(sin(3*d*x + 3*c
), cos(3*d*x + 3*c))) + 5*a*cos(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3
*c))) - 8*a)*sin(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x +
3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)))*sqrt(a)
 + 33*(a*arctan2(-(cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 +
 sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2
(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*(cos(1/2*arctan2(sin(2/3*a
rctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*
c), cos(3*d*x + 3*c))) + 1))*sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x +
3*c))) - cos(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))*sin(1/2*arcta
n2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(si
n(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1))), (cos(2/3*arctan2(sin(3*d*x + 3*c
), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c
)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*(
cos(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))*cos(1/2*arctan2(sin(2/
3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x +
 3*c), cos(3*d*x + 3*c))) + 1)) + sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d
*x + 3*c)))*sin(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3
*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1))) + 1) - a
*arctan2(-(cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3
*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d
*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*(cos(1/2*arctan2(sin(2/3*arctan2(s
in(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(
3*d*x + 3*c))) + 1))*sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) -
 cos(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))*sin(1/2*arctan2(sin(2
/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x
+ 3*c), cos(3*d*x + 3*c))) + 1))), (cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3
*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 +
2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*(cos(1/3*
arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))*cos(1/2*arctan2(sin(2/3*arctan
2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), c
os(3*d*x + 3*c))) + 1)) + sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c
)))*sin(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), c
os(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1))) - 1) - a*arctan2
((cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(
sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c)
, cos(3*d*x + 3*c))) + 1)^(1/4)*sin(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x +
 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*

```
c))) + 1)), (cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2
/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3
*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(2/3*arctan2(
sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos
(3*d*x + 3*c))) + 1)) + 1) + a*arctan2((cos(2/3*arctan2(sin(3*d*x + 3*c), c
os(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^
2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*sin(1
/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*ar
ctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)), (cos(2/3*arctan2(sin(3*d*
x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*
x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^
(1/4)*cos(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))),
 cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)) - 1))*sqrt(a))/
d
```

Giac [F]

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{(a\cos(dx+c)+a)^{\frac{3}{2}}}{\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^(3/2)/sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{3/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{(a+a\,\cos(c+d\,x))^{3/2}}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(3/2)/(1/cos(c + d*x))^(3/2),x)
[Out] int((a + a*cos(c + d*x))^(3/2)/(1/cos(c + d*x))^(3/2), x)
```

3.353 $\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{11}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 201

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{11}{2}}(c+dx)\,dx = \frac{1168a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{315d\sqrt{a+a\cos(c+dx)}} + \frac{584a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{315d\sqrt{a+a\cos(c+dx)}} + \frac{146a^3\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{105d\sqrt{a+a\cos(c+dx)}} + \frac{38a^3\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{63d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\sin(c+dx)}{9d}$$

```
[Out] 584/315*a^3*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+146/105*a^
3*sec(d*x+c)^(5/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+38/63*a^3*sec(d*x+c)
^(7/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+2/9*a^2*sec(d*x+c)^(9/2)*sin(d*x
+c)*(a+a*cos(d*x+c))^(1/2)/d+1168/315*a^3*sin(d*x+c)*sec(d*x+c)^(1/2)/d/(a+
a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.52 (sec) , antiderivative size = 201, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4307, 2841, 3059, 2851, 2850}

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{11}{2}}(c+dx)\,dx = \frac{38a^3\sin(c+dx)\sec^{\frac{7}{2}}(c+dx)}{63d\sqrt{a\cos(c+dx)+a}} + \frac{146a^3\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{105d\sqrt{a\cos(c+dx)+a}} + \frac{584a^3\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{315d\sqrt{a\cos(c+dx)+a}} + \frac{1168a^3\sin(c+dx)\sqrt{\sec(c+dx)}}{315d\sqrt{a\cos(c+dx)+a}} + \frac{2a^2\sin(c+dx)\sec^{\frac{9}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}}{9d}$$

[In] Int[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(11/2),x]

[Out] (1168*a^3*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(315*d*Sqrt[a + a*Cos[c + d*x]]) + (584*a^3*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(315*d*Sqrt[a + a*Cos[c + d*x]]) + (146*a^3*Sec[c + d*x]^(5/2)*Sin[c + d*x])/(105*d*Sqrt[a + a*Cos[c + d*x]]) + (38*a^3*Sec[c + d*x]^(7/2)*Sin[c + d*x])/(63*d*Sqrt[a + a*Cos[c + d*x]]) + (2*a^2*Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x]^(9/2)*Sin[c + d*x])/(9*d)

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rule 3059

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[(-b^2)*(B*c - A*d)*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)
*(b*c + a*d)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*
c - 2*a*d*(n + 1)))/(2*d*(n + 1)*(b*c + a*d)), Int[Sqrt[a + b*Sin[e + f*x]]
*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
```

```
1]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx$$

$$= \frac{2a^2\sqrt{a+a\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\sin(c+dx)}{9d} - \frac{1}{9}\left(2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\left(-\frac{19a}{2}-\frac{15}{2}a\cos(c+dx)\right)\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx$$

$$= \frac{38a^3\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{63d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\sin(c+dx)}{9d} + \frac{1}{21}\left(73a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx$$

$$= \frac{146a^3\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{105d\sqrt{a+a\cos(c+dx)}} + \frac{38a^3\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{63d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\sin(c+dx)}{9d} + \frac{1}{105}\left(292a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx$$

$$= \frac{584a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{315d\sqrt{a+a\cos(c+dx)}} + \frac{146a^3\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{105d\sqrt{a+a\cos(c+dx)}} + \frac{38a^3\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{63d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\sin(c+dx)}{9d} + \frac{1}{315}\left(584a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \frac{1168a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{315d\sqrt{a+a\cos(c+dx)}} + \frac{584a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{315d\sqrt{a+a\cos(c+dx)}} + \frac{146a^3\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{105d\sqrt{a+a\cos(c+dx)}} + \frac{38a^3\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{63d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\sin(c+dx)}{9d}$$

Mathematica [A] (verified)

Time = 5.58 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.42

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{11}{2}}(c+dx)\,dx = \frac{a^2\sqrt{a(1+\cos(c+dx))}(727+698\cos(c+dx)+803\cos(2(c+dx))+146\cos(3(c+dx))+146\cos}{315d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(11/2),x]
```

```
[Out] (a^2*Sqrt[a*(1 + Cos[c + d*x])]*(727 + 698*Cos[c + d*x] + 803*Cos[2*(c + d*
x)] + 146*Cos[3*(c + d*x)] + 146*Cos[4*(c + d*x)])*Sec[c + d*x]^(9/2)*Tan[(
c + d*x)/2])/(315*d)
```

Maple [A] (verified)

Time = 1.56 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.42

$$-\frac{2\cot(dx+c)\sqrt{a(1+\cos(dx+c))}\left(\sec^{\frac{11}{2}}(dx+c)\right)(584(\cos^5(dx+c))-292(\cos^4(dx+c))-73(\cos^3(d}{315d}$$

```
[In] int((a+cos(d*x+c)*a)^(5/2)*sec(d*x+c)^(11/2),x)
```

```
[Out] -2/315/d*cot(d*x+c)*(a*(1+cos(d*x+c)))^(1/2)*sec(d*x+c)^(11/2)*(584*cos(d*x
+c)^5-292*cos(d*x+c)^4-73*cos(d*x+c)^3-89*cos(d*x+c)^2-95*cos(d*x+c)-35)*a^
2
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.53

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{11}{2}}(c+dx)\,dx = \frac{2\left(584\,a^2\cos(dx+c)^4+292\,a^2\cos(dx+c)^3+219\,a^2\cos(dx+c)^2+130\,a^2\cos(dx+c)+35\,a^2\right)\sqrt{}}{315\left(d\cos(dx+c)^5+d\cos(dx+c)^4\right)\sqrt{\cos(dx+c)}}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^(11/2),x, algorithm="fricas")
```

```
[Out] 2/315*(584*a^2*cos(d*x + c)^4 + 292*a^2*cos(d*x + c)^3 + 219*a^2*cos(d*x +
c)^2 + 130*a^2*cos(d*x + c) + 35*a^2)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)
/((d*cos(d*x + c)^5 + d*cos(d*x + c)^4)*sqrt(cos(d*x + c)))
```

Sympy [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^{5/2}\sec^{\frac{11}{2}}(c + dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(5/2)*sec(d*x+c)**(11/2),x)
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 289, normalized size of antiderivative = 1.44

$$\int (a + a\cos(c + dx))^{5/2}\sec^{\frac{11}{2}}(c + dx)\,dx = \frac{8\left(\frac{315\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)}{\cos(dx+c)+1} - \frac{945\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^3}{(\cos(dx+c)+1)^3} + \frac{1449\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^5}{(\cos(dx+c)+1)^5} - \frac{1287\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^7}{(\cos(dx+c)+1)^7} + \frac{572\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^9}{(\cos(dx+c)+1)^9}\right.}{315\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{11}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{11}{2}}\left(\frac{3\sin(dx+c)^2}{(\cos(dx+c)+1)^2} + \frac{3\sin(dx+c)^4}{(\cos(dx+c)+1)^4}\right.}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^(11/2),x, algorithm="maxima")
[Out] 8/315*(315*sqrt(2)*a^(5/2)*sin(d*x + c)/(cos(d*x + c) + 1) - 945*sqrt(2)*a^
(5/2)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 1449*sqrt(2)*a^(5/2)*sin(d*x +
c)^5/(cos(d*x + c) + 1)^5 - 1287*sqrt(2)*a^(5/2)*sin(d*x + c)^7/(cos(d*x +
c) + 1)^7 + 572*sqrt(2)*a^(5/2)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9 - 104*s
qrt(2)*a^(5/2)*sin(d*x + c)^11/(cos(d*x + c) + 1)^11)*(sin(d*x + c)^2/(cos(
d*x + c) + 1)^2 + 1)^3/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(11/2)*(-si
n(d*x + c)/(cos(d*x + c) + 1) + 1)^(11/2)*(3*sin(d*x + c)^2/(cos(d*x + c) +
 1)^2 + 3*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + sin(d*x + c)^6/(cos(d*x + c
) + 1)^6 + 1))
```

Giac [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^{5/2}\sec^{\frac{11}{2}}(c + dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^(11/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [B] (verification not implemented)

Time = 18.61 (sec) , antiderivative size = 306, normalized size of antiderivative = 1.52

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{11}{2}}(c+dx)\,dx = \frac{\sqrt{\frac{1}{\frac{e^{-c\,1i-d\,x\,1i}}{2}+\frac{e^{c\,1i+d\,x\,1i}}{2}}}\left(\frac{192\,a^2\,e^{\frac{c\,9i}{2}+\frac{d\,x\,9i}{2}}\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\sqrt{a+a\,\cos(c+d\,x)}}{5\,d}-\frac{16\,a^2\,e^{\frac{c\,9i}{2}+\frac{d\,x\,9i}{2}}\,\sin\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)\sqrt{a+a\,\cos(c+c}}{3\,d}\right.}{12\,e^{\frac{c\,9i}{2}+\frac{d\,x\,9i}{2}}\,\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)+8\,e^{\frac{c\,9i}{2}+\frac{d\,x\,9i}{2}}\,\cos\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)+8\,e^{\frac{c\,9i}{2}+\frac{d\,x\,9i}{2}}\,\cos\left(\frac{5\,c}{2}\right.}$$

```
[In] int((1/cos(c + d*x))^(11/2)*(a + a*cos(c + d*x))^(5/2),x)
```

```
[Out] ((1/(exp(- c*1i - d*x*1i)/2 + exp(c*1i + d*x*1i)/2))^(1/2)*((192*a^2*exp((c
*9i)/2 + (d*x*9i)/2)*sin(c/2 + (d*x)/2)*(a + a*cos(c + d*x))^(1/2))/(5*d) -
 (16*a^2*exp((c*9i)/2 + (d*x*9i)/2)*sin((3*c)/2 + (3*d*x)/2)*(a + a*cos(c +
 d*x))^(1/2))/(3*d) + (1168*a^2*exp((c*9i)/2 + (d*x*9i)/2)*sin((5*c)/2 + (5
*d*x)/2)*(a + a*cos(c + d*x))^(1/2))/(35*d) + (2336*a^2*exp((c*9i)/2 + (d*x
*9i)/2)*sin((9*c)/2 + (9*d*x)/2)*(a + a*cos(c + d*x))^(1/2))/(315*d)))/(12*
exp((c*9i)/2 + (d*x*9i)/2)*cos(c/2 + (d*x)/2) + 8*exp((c*9i)/2 + (d*x*9i)/2
)*cos((3*c)/2 + (3*d*x)/2) + 8*exp((c*9i)/2 + (d*x*9i)/2)*cos((5*c)/2 + (5*
d*x)/2) + 2*exp((c*9i)/2 + (d*x*9i)/2)*cos((7*c)/2 + (7*d*x)/2) + 2*exp((c*
9i)/2 + (d*x*9i)/2)*cos((9*c)/2 + (9*d*x)/2))
```

3.354 $\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{9}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 161

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{9}{2}}(c+dx)\,dx=\frac{92a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{21d\sqrt{a+a\cos(c+dx)}}+\frac{46a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d\sqrt{a+a\cos(c+dx)}}+\frac{6a^3\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\sqrt{a+a\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d}$$

```
[Out] 46/21*a^3*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+6/7*a^3*sec(
d*x+c)^(5/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+2/7*a^2*sec(d*x+c)^(7/2)*s
in(d*x+c)*(a+a*cos(d*x+c))^(1/2)/d+92/21*a^3*sin(d*x+c)*sec(d*x+c)^(1/2)/d/
(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4307, 2841, 3059, 2851, 2850}

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{9}{2}}(c+dx)\,dx=\frac{6a^3\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{7d\sqrt{a\cos(c+dx)+a}}+\frac{46a^3\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{21d\sqrt{a\cos(c+dx)+a}}+\frac{92a^3\sin(c+dx)\sqrt{\sec(c+dx)}}{21d\sqrt{a\cos(c+dx)+a}}+\frac{2a^2\sin(c+dx)\sec^{\frac{7}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}}{7d}$$

```
[In] Int[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(9/2),x]
```

```
[Out] (92*a^3*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(21*d*Sqrt[a + a*Cos[c + d*x]]) +
(46*a^3*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(21*d*Sqrt[a + a*Cos[c + d*x]]) +
(6*a^3*Sec[c + d*x]^(5/2)*Sin[c + d*x])/(7*d*Sqrt[a + a*Cos[c + d*x]]) + (2
*a^2*Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x]^(7/2)*Sin[c + d*x])/(7*d)
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2851

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((c + d*Sin[e
+ f*x])^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] + Dis
t[(2*n + 3)*((b*c - a*d)/(2*b*(n + 1)*(c^2 - d^2))), Int[Sqrt[a + b*Sin[e +
 f*x]]*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1] && NeQ[2*n + 3, 0] && IntegerQ[2*n]
```

Rule 3059

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[(-b^2)*(B*c - A*d)*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)
*(b*c + a*d)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*
c - 2*a*d*(n + 1)))/(2*d*(n + 1)*(b*c + a*d)), Int[Sqrt[a + b*Sin[e + f*x]]
*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx \\
&= \frac{2a^2\sqrt{a+a\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d} \\
&\quad -\frac{1}{7}\left(2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\left(-\frac{15a}{2}-\frac{11}{2}a\cos(c+dx)\right)\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx \\
&= \frac{6a^3\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\sqrt{a+a\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d} \\
&\quad +\frac{1}{7}\left(23a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{46a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d\sqrt{a+a\cos(c+dx)}}+\frac{6a^3\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}} \\
&\quad +\frac{2a^2\sqrt{a+a\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d} \\
&\quad +\frac{1}{21}\left(46a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{92a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{21d\sqrt{a+a\cos(c+dx)}}+\frac{46a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d\sqrt{a+a\cos(c+dx)}} \\
&\quad +\frac{6a^3\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\sqrt{a+a\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 5.52 (sec) , antiderivative size = 74, normalized size of antiderivative = 0.46

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{9}{2}}(c+dx)\,dx=\frac{a^2\sqrt{a(1+\cos(c+dx))}(29+93\cos(c+dx)+23\cos(2(c+dx))+23\cos(3(c+dx)))\sec^{\frac{7}{2}}(c+dx)\ldots}{21d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(9/2),x]
[Out] (a^2*Sqrt[a*(1 + Cos[c + d*x])]*(29 + 93*Cos[c + d*x] + 23*Cos[2*(c + d*x)]
 + 23*Cos[3*(c + d*x)])*Sec[c + d*x]^(7/2)*Tan[(c + d*x)/2])/(21*d)
```

Maple [A] (verified)

Time = 1.38 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.47

$$-\frac{2\cot\left(dx+c\right)\sqrt{a\left(1+\cos\left(dx+c\right)\right)}\left(\sec^{\frac{9}{2}}\left(dx+c\right)\right)\left(46(\cos^{4}\left(dx+c\right))-23(\cos^{3}\left(dx+c\right))-11(\cos^{2}\left(dx+\right.\right.}{21d}$$

[In] int((a+cos(d*x+c)*a)^(5/2)*sec(d*x+c)^(9/2),x)

[Out] -2/21/d*cot(d*x+c)*(a*(1+cos(d*x+c)))^(1/2)*sec(d*x+c)^(9/2)*(46*cos(d*x+c)^4-23*cos(d*x+c)^3-11*cos(d*x+c)^2-9*cos(d*x+c)-3)*a^2

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.58

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{9}{2}}(c+dx)\,dx=\frac{2\left(46\,a^{2}\cos\left(dx+c\right)^{3}+23\,a^{2}\cos\left(dx+c\right)^{2}+12\,a^{2}\cos\left(dx+c\right)+3\,a^{2}\right)\sqrt{a\cos\left(dx+c\right)+a}\sin\left(dx+\right.}{21\left(d\cos\left(dx+c\right)^{4}+d\cos\left(dx+c\right)^{3}\right)\sqrt{\cos\left(dx+c\right)}}$$

[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^(9/2),x, algorithm="fricas")

[Out] 2/21*(46*a^2*cos(d*x + c)^3 + 23*a^2*cos(d*x + c)^2 + 12*a^2*cos(d*x + c) + 3*a^2)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/((d*cos(d*x + c)^4 + d*cos(d*x + c)^3)*sqrt(cos(d*x + c)))

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{9}{2}}(c+dx)\,dx=\text{Timed out}$$

[In] integrate((a+a*cos(d*x+c))**(5/2)*sec(d*x+c)**(9/2),x)

[Out] Timed out

Maxima [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 243, normalized size of antiderivative = 1.51

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \frac{8\left(\frac{21\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)}{\cos(dx+c)+1}-\frac{56\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{63\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{36\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^7}{(\cos(dx+c)+1)^7}+\frac{8\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^9}{(\cos(dx+c)+1)^9}\right)\left(\frac{\sin}{(\cos}\right.}{21\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{9}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{9}{2}}\left(\frac{2\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+1\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^(9/2),x, algorithm="maxima")
```

```
[Out] 8/21*(21*sqrt(2)*a^(5/2)*sin(d*x + c)/(cos(d*x + c) + 1) - 56*sqrt(2)*a^(5/
2)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 63*sqrt(2)*a^(5/2)*sin(d*x + c)^5/
(cos(d*x + c) + 1)^5 - 36*sqrt(2)*a^(5/2)*sin(d*x + c)^7/(cos(d*x + c) + 1)
^7 + 8*sqrt(2)*a^(5/2)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9)*(sin(d*x + c)^2
/(cos(d*x + c) + 1)^2 + 1)^2/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(9/2)
*(-sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(9/2)*(2*sin(d*x + c)^2/(cos(d*x +
c) + 1)^2 + sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + 1))
```

Giac [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^(9/2),x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [B] (verification not implemented)

Time = 18.31 (sec) , antiderivative size = 227, normalized size of antiderivative = 1.41

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \frac{-\frac{35\,a^2\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\sqrt{a+a\,\cos(c+d\,x)}\,\sqrt{\frac{2\,{\mathrm{e}}^{c\,1\mathrm{i}+d\,x\,1\mathrm{i}}}{{\mathrm{e}}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}}{2}+35\,a^2\,\sin\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)\,\sqrt{a+a\,\cos\left(c+d\,x\right)}\,\sqrt{\frac{2\,{\mathrm{e}}^{c\,1\mathrm{i}+d\,x}}{{\mathrm{e}}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}}}}{\frac{63\,d\,\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{8}+\frac{63\,d\,\cos\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)}{8}+\frac{21\,d\,\cos\left(\frac{5\,c}{2}+\frac{5\,d\,x}{2}\right)}{8}+\frac{21\,d\,\cos(}{}}$$

```
[In] int((1/cos(c + d*x))^(9/2)*(a + a*cos(c + d*x))^(5/2),x)
```

```
[Out] (35*a^2*sin((3*c)/2 + (3*d*x)/2)*(a + a*cos(c + d*x))^(1/2)*((2*exp(c*1i +
d*x*1i))/(exp(c*2i + d*x*2i) + 1))^(1/2) - (35*a^2*sin(c/2 + (d*x)/2)*(a +
a*cos(c + d*x))^(1/2)*((2*exp(c*1i + d*x*1i))/(exp(c*2i + d*x*2i) + 1))^(1/
2))/2 + (23*a^2*sin((7*c)/2 + (7*d*x)/2)*(a + a*cos(c + d*x))^(1/2)*((2*exp
(c*1i + d*x*1i))/(exp(c*2i + d*x*2i) + 1))^(1/2))/2)/((63*d*cos(c/2 + (d*x)
/2))/8 + (63*d*cos((3*c)/2 + (3*d*x)/2))/8 + (21*d*cos((5*c)/2 + (5*d*x)/2)
)/8 + (21*d*cos((7*c)/2 + (7*d*x)/2))/8)
```

3.355 $\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 121

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)\,dx=\frac{86a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}}+\frac{22a^3\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}$$

```
[Out] 22/15*a^3*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+2/5*a^2*sec(
d*x+c)^(5/2)*sin(d*x+c)*(a+a*cos(d*x+c))^(1/2)/d+86/15*a^3*sin(d*x+c)*sec(d
*x+c)^(1/2)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {4307, 2841, 3059, 2850}

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)\,dx=\frac{22a^3\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{15d\sqrt{a\cos(c+dx)+a}}+\frac{86a^3\sin(c+dx)\sqrt{\sec(c+dx)}}{15d\sqrt{a\cos(c+dx)+a}}+\frac{2a^2\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}}{5d}$$

```
[In] Int[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(7/2),x]
```

```
[Out] (86*a^3*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(15*d*Sqrt[a + a*Cos[c + d*x]]) +
(22*a^3*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(15*d*Sqrt[a + a*Cos[c + d*x]]) +
(2*a^2*Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x]^(5/2)*Sin[c + d*x])/(5*d)
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2850

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Simp[-2*b^2*(Cos[e + f*x]/(f*(b*c + a*d)*Sq
rt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]])), x] /; FreeQ[{a, b, c, d,
 e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3059

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[(-b^2)*(B*c - A*d)*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)
*(b*c + a*d)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*
c - 2*a*d*(n + 1)))/(2*d*(n + 1)*(b*c + a*d)), Int[Sqrt[a + b*Sin[e + f*x]]
*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx\\
&= \frac{2a^2\sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}\\
&\quad-\frac{1}{5}\left(2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\left(-\frac{11a}{2}-\frac{7}{2}a\cos(c+dx)\right)\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx
\end{aligned}$$

$$= \frac{22a^3 \sec^{\frac{3}{2}}(c+dx) \sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)} \sec^{\frac{5}{2}}(c+dx) \sin(c+dx)}{5d} + \frac{1}{15}\left(43a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \frac{86a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} + \frac{22a^3 \sec^{\frac{3}{2}}(c+dx) \sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)} \sec^{\frac{5}{2}}(c+dx) \sin(c+dx)}{5d}$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.53

$$\int (a+a\cos(c+dx))^{5/2} \sec^{\frac{7}{2}}(c+dx)\,dx = \frac{a^2\sqrt{a(1+\cos(c+dx))}(49+28\cos(c+dx)+43\cos(2(c+dx)))\sec^{\frac{5}{2}}(c+dx)\tan\left(\frac{1}{2}(c+dx)\right)}{15d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(7/2),x]
[Out] (a^2*Sqrt[a*(1 + Cos[c + d*x])]*(49 + 28*Cos[c + d*x] + 43*Cos[2*(c + d*x)]
)*Sec[c + d*x]^(5/2)*Tan[(c + d*x)/2])/(15*d)
```

Maple [A] (verified)

Time = 1.16 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.54

$$-\frac{2\cot(dx+c)\sqrt{a(1+\cos(dx+c))}\left(\sec^{\frac{7}{2}}(dx+c)\right)(43(\cos^3(dx+c))-29(\cos^2(dx+c))-11\cos(dx+}{15d}$$

```
[In] int((a+cos(d*x+c)*a)^(5/2)*sec(d*x+c)^(7/2),x)
[Out] -2/15/d*cot(d*x+c)*(a*(1+cos(d*x+c)))^(1/2)*sec(d*x+c)^(7/2)*(43*cos(d*x+c)
^3-29*cos(d*x+c)^2-11*cos(d*x+c)-3)*a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.67

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)\,dx=\frac{2\left(43\,a^2\cos\left(dx+c\right)^2+14\,a^2\cos\left(dx+c\right)+3\,a^2\right)\sqrt{a\cos\left(dx+c\right)+a}\sin\left(dx+c\right)}{15\left(d\cos\left(dx+c\right)^3+d\cos\left(dx+c\right)^2\right)\sqrt{\cos\left(dx+c\right)}}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] 2/15*(43*a^2*cos(d*x + c)^2 + 14*a^2*cos(d*x + c) + 3*a^2)*sqrt(a*cos(d*x +
 c) + a)*sin(d*x + c)/((d*cos(d*x + c)^3 + d*cos(d*x + c)^2)*sqrt(cos(d*x +
 c)))
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)\,dx=\text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(5/2)*sec(d*x+c)**(7/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.25

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)\,dx=\frac{8\left(\frac{15\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)}{\cos(dx+c)+1}-\frac{35\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{28\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{8\sqrt{2}a^{\frac{5}{2}}\sin(dx+c)^7}{(\cos(dx+c)+1)^7}\right)}{15\,d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{7}{2}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{7}{2}}}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^(7/2),x, algorithm="maxima")
```

```
[Out] 8/15*(15*sqrt(2)*a^(5/2)*sin(d*x + c)/(cos(d*x + c) + 1) - 35*sqrt(2)*a^(5/
2)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 28*sqrt(2)*a^(5/2)*sin(d*x + c)^5/
(cos(d*x + c) + 1)^5 - 8*sqrt(2)*a^(5/2)*sin(d*x + c)^7/(cos(d*x + c) + 1)^
7)/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(7/2)*(-sin(d*x + c)/(cos(d*x +
 c) + 1) + 1)^(7/2))
```

Giac [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^{5/2}\sec^{\frac{7}{2}}(c + dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^(7/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [B] (verification not implemented)

Time = 1.67 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.13

$$\int (a + a\cos(c + dx))^{5/2}\sec^{\frac{7}{2}}(c + dx)\,dx = \frac{2\,a^2\,\sqrt{a\,\left(\cos\left(c+d\,x\right)+1\right)}\,\sqrt{\frac{1}{\cos\left(c+d\,x\right)}}\,\left(98\,\sin\left(c+d\,x\right)+56\,\sin\left(2\,c+2\,d\,x\right)+141\,\sin\left(3\,c+3\,d\,x\right)\right.}{15\,d\,\left(10\,\cos\left(c+d\,x\right)+8\,\cos\left(2\,c+2\,d\,x\right)+5\,\cos\left(3\,c+3\,d\,x\right)+2\,\cos\left(4\,c+4\right.\right.}$$

```
[In] int((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))^(5/2),x)
[Out] (2*a^2*(a*(cos(c + d*x) + 1))^(1/2)*(1/cos(c + d*x))^(1/2)*(98*sin(c + d*x)
 + 56*sin(2*c + 2*d*x) + 141*sin(3*c + 3*d*x) + 28*sin(4*c + 4*d*x) + 43*si
n(5*c + 5*d*x)))/(15*d*(10*cos(c + d*x) + 8*cos(2*c + 2*d*x) + 5*cos(3*c +
3*d*x) + 2*cos(4*c + 4*d*x) + cos(5*c + 5*d*x) + 6))
```

3.356 $\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 138

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{2a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d} + \frac{14a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}$$

```
[Out] 2/3*a^2*sec(d*x+c)^(3/2)*sin(d*x+c)*(a+a*cos(d*x+c))^(1/2)/d+2*a^(5/2)*arcs
in(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(
1/2)/d+14/3*a^3*sin(d*x+c)*sec(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4307, 2841, 3059, 2853, 222}

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{2a^{5/2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{d} + \frac{14a^3\sin(c+dx)\sqrt{\sec(c+dx)}}{3d\sqrt{a\cos(c+dx)+a}} + \frac{2a^2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}}{3d}$$

```
[In] Int[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(5/2),x]
```

```
[Out] (2*a^(5/2)*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[Cos
[c + d*x]]*Sqrt[Sec[c + d*x]])/d + (14*a^3*Sqrt[Sec[c + d*x]]*Sin[c + d*x])
/(3*d*Sqrt[a + a*Cos[c + d*x]]) + (2*a^2*Sqrt[a + a*Cos[c + d*x]]*Sec[c + d
*x]^(3/2)*Sin[c + d*x])/(3*d)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 3059

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[(-b^2)*(B*c - A*d)*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)
*(b*c + a*d)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*
c - 2*a*d*(n + 1)))/(2*d*(n + 1)*(b*c + a*d)), Int[Sqrt[a + b*Sin[e + f*x]]
*(c + d*Sin[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x]
 && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -
1]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{2a^2\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} \\
&\quad -\frac{1}{3}\left(2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\left(-\frac{7a}{2}-\frac{3}{2}a\cos(c+dx)\right)\sqrt{a+a\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{14a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} \\
&\quad +\left(a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{14a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} \\
&\quad -\frac{\left(2a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} \\
&= \frac{2a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d} \\
&\quad +\frac{14a^3\sqrt{\sec(c+dx)}\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}+\frac{2a^2\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}
\end{aligned}
$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 6.19 (sec) , antiderivative size = 404, normalized size of antiderivative = 2.93

$$
\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{(a(1+\cos(c+dx)))^{5/2}\csc^3\left(\frac{c}{2}+\frac{dx}{2}\right)\sec^5\left(\frac{c}{2}+\frac{dx}{2}\right)\sqrt{\frac{1}{1-2\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}}\sqrt{1-2\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}\left(256\cos^4\right.}{}
$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(5/2),x]
```

```
[Out] ((a*(1 + Cos[c + d*x]))^(5/2)*Csc[c/2 + (d*x)/2]^3*Sec[c/2 + (d*x)/2]^5*Sqr
t[(1 - 2*Sin[c/2 + (d*x)/2]^2)^(-1)]*Sqrt[1 - 2*Sin[c/2 + (d*x)/2]^2]*(256*
Cos[(c + d*x)/2]^4*HypergeometricPFQ[{3/2, 2, 7/2}, {1, 9/2}, 2*Sin[c/2 + (
```

```
d*x)/2]^2]*Sin[c/2 + (d*x)/2]^6 + 512*Hypergeometric2F1[3/2, 7/2, 9/2, 2*Si
n[c/2 + (d*x)/2]^2]*Sin[c/2 + (d*x)/2]^6*(2 - 3*Sin[c/2 + (d*x)/2]^2 + Sin[
c/2 + (d*x)/2]^4) + (21*Sqrt[2]*ArcSin[Sqrt[2]*Sqrt[Sin[c/2 + (d*x)/2]^2]]*
(15 - 10*Sin[c/2 + (d*x)/2]^2 + 3*Sin[c/2 + (d*x)/2]^4))/Sqrt[Sin[c/2 + (d*
x)/2]^2] - 14*Sqrt[1 - 2*Sin[c/2 + (d*x)/2]^2]*(45 + 30*Sin[c/2 + (d*x)/2]^
2 - 31*Sin[c/2 + (d*x)/2]^4 + 12*Sin[c/2 + (d*x)/2]^6)))/(672*d)
```

Maple [A] (verified)

Time = 1.31 (sec) , antiderivative size = 181, normalized size of antiderivative = 1.31

$$\frac{2\left(\sec^{\frac{5}{2}}\left(dx+c\right)\right)\sqrt{a\left(1+\cos\left(dx+c\right)\right)}\left(3\arctan\left(\tan\left(dx+c\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\left(\cos^{3}\left(dx+c\right)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right.}{}$$

```
[In] int((a+cos(d*x+c)*a)^(5/2)*sec(d*x+c)^(5/2),x)
```

```
[Out] 2/3/d*sec(d*x+c)^(5/2)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))*(3*arctan(ta
n(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))*cos(d*x+c)^3*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)+3*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*arctan(tan
(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))+8*cos(d*x+c)^2*sin(d*x+c)+cos(d*
x+c)*sin(d*x+c))*a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 128, normalized size of antiderivative = 0.93

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)\,dx = -\frac{2\left(3\left(a^{2}\cos\left(dx+c\right)^{2}+a^{2}\cos\left(dx+c\right)\right)\sqrt{a}\arctan\left(\frac{\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-\frac{\left(8a^{2}\cos(dx+c)+a^{2}\right)\sqrt{a\cos(dx+c)+}}{\sqrt{\cos(dx+c)}}\right.}{3\left(d\cos\left(dx+c\right)^{2}+d\cos\left(dx+c\right)\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] -2/3*(3*(a^2*cos(d*x + c)^2 + a^2*cos(d*x + c))*sqrt(a)*arctan(sqrt(a*cos(d
*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - (8*a^2*cos(d*x +
c) + a^2)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/sqrt(cos(d*x + c)))/(d*cos(
d*x + c)^2 + d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^{5/2} \sec^{\frac{5}{2}}(c + dx)\, dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(5/2)*sec(d*x+c)**(5/2),x)
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1395 vs. $2(116) = 232$.

Time = 0.44 (sec) , antiderivative size = 1395, normalized size of antiderivative = 10.11

$$\int (a + a\cos(c + dx))^{5/2} \sec^{\frac{5}{2}}(c + dx)\, dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^(5/2),x, algorithm="maxima")
[Out] 1/6*(30*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^
(3/4)*a^(5/2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 2*
(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*((
12*a^2*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(2*d*x + 2*c
) - 3*a^2*sin(2*d*x + 2*c) - 4*(3*a^2*cos(2*d*x + 2*c) + 4*a^2)*sin(3/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))))*cos(3/2*arctan2(sin(2*d*x + 2*c)
, cos(2*d*x + 2*c) + 1)) + (12*a^2*sin(2*d*x + 2*c)*sin(3/2*arctan2(sin(2*d
*x + 2*c), cos(2*d*x + 2*c))) + 3*a^2*cos(2*d*x + 2*c) - a^2 + 4*(3*a^2*cos
(2*d*x + 2*c) + 4*a^2)*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
)*sin(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)))*sqrt(a) + 3*((a
^2*cos(2*d*x + 2*c)^2 + a^2*sin(2*d*x + 2*c)^2 + 2*a^2*cos(2*d*x + 2*c) + a
^2)*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) +
 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - cos(1/2*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c)))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1
)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*cos(1/2*a
rctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c)))) + 1) - (a^2*cos(2*d*x + 2*c)^2 + a^2*sin(2*d*x + 2*c)^2 + 2*a^2*cos(
2*d*x + 2*c) + a^2)*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*co
s(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c)))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - cos(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c)))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(
```

```
2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
 + 1))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c)))) - 1) - (a^2*cos(2*d*x + 2*c)^2 + a^2*sin(2*d*x + 2*c
)^2 + 2*a^2*cos(2*d*x + 2*c) + a^2)*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x
 + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2
*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
 1)) + 1) + (a^2*cos(2*d*x + 2*c)^2 + a^2*sin(2*d*x + 2*c)^2 + 2*a^2*cos(2*
d*x + 2*c) + a^2)*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(
2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
+ 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(
1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1))*sqrt(a)
)/((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*d)
```

Giac [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)\,dx = \int \left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}(a+a\,\cos(c+d\,x))^{5/2}\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^(5/2),x)
[Out] int((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^(5/2), x)
```

3.357 $\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 134

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{5a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d} - \frac{a^3\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} + \frac{2a^2\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d}$$

```
[Out] -a^3*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2)+5*a^(5/2)*arcsin(
sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2
)/d+2*a^2*sin(d*x+c)*(a+a*cos(d*x+c))^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 134, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4307, 2841, 3060, 2853, 222}

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{5a^{5/2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{d} - \frac{a^3\sin(c+dx)}{d\sqrt{\sec(c+dx)}\sqrt{a\cos(c+dx)+a}} + \frac{2a^2\sin(c+dx)\sqrt{\sec(c+dx)}\sqrt{a\cos(c+dx)+a}}{d}$$

```
[In] Int[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(3/2),x]
```

```
[Out] (5*a^(5/2)*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[Cos
[c + d*x]]*Sqrt[Sec[c + d*x]])/d - (a^3*Sin[c + d*x])/(d*Sqrt[a + a*Cos[c +
 d*x]]*Sqrt[Sec[c + d*x]]) + (2*a^2*Sqrt[a + a*Cos[c + d*x]]*Sqrt[Sec[c + d
*x]]*Sin[c + d*x])/d
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 3060

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[-2*b*B*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(2*n + 3)*Sqrt[a +
b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*c - 2*a*d*(n + 1)))/(b
*d*(2*n + 3)), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
b^2, 0] && NeQ[c^2 - d^2, 0] &&  !LtQ[n, -1]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{(a+a\cos(c+dx))^{5/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{2a^2\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d} \\
&\quad -\left(2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\left(-\frac{3a}{2}+\frac{1}{2}a\cos(c+dx)\right)\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx \\
&= -\frac{a^3\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} \\
&\quad +\frac{2a^2\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d} \\
&\quad +\frac{1}{2}\left(5a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx \\
&= -\frac{a^3\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}+\frac{2a^2\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d} \\
&\quad -\frac{\left(5a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{d} \\
&= \frac{5a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d} \\
&\quad -\frac{a^3\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} \\
&\quad +\frac{2a^2\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d}
\end{aligned}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 1.97 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.51

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{\sqrt{\cos(c+dx)}(a(1+\cos(c+dx)))^{5/2}\sec^4\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}(7(89+28\cos(c+dx)+3\cos$$

[In] Integrate[(a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(3/2),x]

[Out] (Sqrt[Cos[c + d*x]]*(a*(1 + Cos[c + d*x]))^(5/2)*Sec[(c + d*x)/2]^4*Sqrt[Se
c[c + d*x]]*(7*(89 + 28*Cos[c + d*x] + 3*Cos[2*(c + d*x)])*Hypergeometric2F
1[1/2, 3/2, 7/2, 2*Sin[(c + d*x)/2]^2] + 24*(3 + Cos[c + d*x])*Hypergeometr
ic2F1[3/2, 5/2, 9/2, 2*Sin[(c + d*x)/2]^2]*Sin[c + d*x]^2 + 6*Csc[(c + d*x)
/2]^2*HypergeometricPFQ[{3/2, 2, 5/2}, {1, 9/2}, 2*Sin[(c + d*x)/2]^2]*Sin[
c + d*x]^4)*Tan[(c + d*x)/2])/(420*d)

Maple [A] (verified)

Time = 16.28 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.25

method	result
default	$\frac{\left(\sec^{\frac{3}{2}}(dx+c)\right)\left(5\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)+\cos(dx+c)\sin(dx+c)+5\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\arctan\left(\tan(\right.\right.}{d(1+\cos(dx+c))}$

[In] int((a+cos(d*x+c)*a)^(5/2)*sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)

[Out] 1/d*sec(d*x+c)^(3/2)*(5*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan
(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))+cos(d*x+c)*sin(d*x+c)+5*(cos
(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2))+2*sin(d*x+c))*cos(d*x+c)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))*a^
2

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.83

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)\,dx = -\frac{5\left(a^2\cos\left(dx+c\right)+a^2\right)\sqrt{a}\arctan\left(\frac{\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-\frac{\left(a^2\cos(dx+c)+2a^2\right)\sqrt{a\cos(dx+c)+a}\sin(dx+c)}{\sqrt{\cos(dx+c)}}}{d\cos\left(dx+c\right)+d}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] -(5*(a^2*cos(d*x + c) + a^2)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(c
os(d*x + c))/(sqrt(a)*sin(d*x + c))) - (a^2*cos(d*x + c) + 2*a^2)*sqrt(a*co
s(d*x + c) + a)*sin(d*x + c)/sqrt(cos(d*x + c)))/(d*cos(d*x + c) + d)
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(5/2)*sec(d*x+c)**(3/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 973 vs. 2(116) = 232.

Time = 0.43 (sec) , antiderivative size = 973, normalized size of antiderivative = 7.26

$$\int (a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/4*(2*(a^2*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*
x + c) - (a^2*cos(d*x + c) - a^2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c) + 1)))*sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x
 + 2*c) + 1)*sqrt(a) + 5*(a^2*arctan2(-(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*
c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c) + 1))*sin(d*x + c) - cos(d*x + c)*sin(1/2*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c) + 1))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 +
2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(d*x + c)*cos(1/2*arctan2(sin(2*d*x + 2*c
```

```
), cos(2*d*x + 2*c) + 1)) + sin(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2*c),
cos(2*d*x + 2*c) + 1))) + 1) - a^2*arctan2(-(cos(2*d*x + 2*c)^2 + sin(2*d*x
 + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c)
, cos(2*d*x + 2*c) + 1))*sin(d*x + c) - cos(d*x + c)*sin(1/2*arctan2(sin(2*
d*x + 2*c), cos(2*d*x + 2*c) + 1))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)
^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(d*x + c)*cos(1/2*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c) + 1)) + sin(d*x + c)*sin(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c) + 1))) - 1) - a^2*arctan2((cos(2*d*x + 2*c)^2 + sin(2
*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*c
os(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c) + 1)) + 1) + a^2*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*co
s(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c
) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)
^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1))*(cos(
2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sqrt(a)
 + 8*(a^2*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x
+ c) - (a^2*cos(d*x + c) - a^2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c) + 1)))*sqrt(a))/((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2
*d*x + 2*c) + 1)^(1/4)*d)
```

Giac [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^{5/2} \sec^{\frac{3}{2}}(c + dx)\, dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^{5/2} \sec^{\frac{3}{2}}(c + dx)\, dx = \int \left(\frac{1}{\cos(c + d\,x)}\right)^{3/2} (a + a\,\cos(c + d\,x))^{5/2}\, dx$$

```
[In] int((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^(5/2),x)
[Out] int((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^(5/2), x)
```

3.358 $\int (a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 140

$$\int (a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}\,dx = \frac{19a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{4d} + \frac{9a^3\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} + \frac{a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{2d\sqrt{\sec(c+dx)}}$$

```
[Out] 9/4*a^3*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2)+1/2*a^2*sin(d*
x+c)*(a+a*cos(d*x+c))^(1/2)/d/sec(d*x+c)^(1/2)+19/4*a^(5/2)*arcsin(sin(d*x+
c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4307, 2842, 3060, 2853, 222}

$$\int (a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}\,dx = \frac{19a^{5/2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{4d} + \frac{9a^3\sin(c+dx)}{4d\sqrt{\sec(c+dx)}\sqrt{a\cos(c+dx)+a}} + \frac{a^2\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{2d\sqrt{\sec(c+dx)}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(5/2)*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (19*a^(5/2)*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[Co
s[c + d*x]]*Sqrt[Sec[c + d*x]])/(4*d) + (9*a^3*Sin[c + d*x])/(4*d*Sqrt[a +
a*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]) + (a^2*Sqrt[a + a*Cos[c + d*x]]*Sin[c +
 d*x])/(2*d*Sqrt[Sec[c + d*x]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2842

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
+ n)), Int[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^n*Simp[a*b*c*(
m - 2) + b^2*d*(n + 1) + a^2*d*(m + n) - b*(b*c*(m - 1) - a*d*(3*m + 2*n -
2))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c
- a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1] &&  !LtQ[n
, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] || (IntegerQ[m] && EqQ[c
, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 3060

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[-2*b*B*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(2*n + 3)*Sqrt[a +
b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*c - 2*a*d*(n + 1)))/(b
*d*(2*n + 3)), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
b^2, 0] && NeQ[c^2 - d^2, 0] &&  !LtQ[n, -1]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{(a+a\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{2d\sqrt{\sec(c+dx)}} \\
&\quad +\frac{1}{2}\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}\left(\frac{5a^2}{2}+\frac{9}{2}a^2\cos(c+dx)\right)}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{9a^3\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}+\frac{a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{2d\sqrt{\sec(c+dx)}} \\
&\quad +\frac{1}{8}\left(19a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{9a^3\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}+\frac{a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{2d\sqrt{\sec(c+dx)}} \\
&\quad -\frac{\left(19a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{4d} \\
&= \frac{19a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{4d} \\
&\quad +\frac{9a^3\sin(c+dx)}{4d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}+\frac{a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{2d\sqrt{\sec(c+dx)}}
\end{aligned}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 1.95 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.44

$$\int (a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}\,dx = \frac{\sqrt{\cos(c+dx)}(a(1+\cos(c+dx)))^{5/2}\sec^4\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}(7(89+28\cos$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(5/2)*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*(a*(1 + Cos[c + d*x]))^(5/2)*Sec[(c + d*x)/2]^4*Sqrt[Se
c[c + d*x]]*(7*(89 + 28*Cos[c + d*x] + 3*Cos[2*(c + d*x)])*Hypergeometric2F
1[1/2, 1/2, 7/2, 2*Sin[(c + d*x)/2]^2] + 8*(3 + Cos[c + d*x])*Hypergeometri
c2F1[3/2, 3/2, 9/2, 2*Sin[(c + d*x)/2]^2]*Sin[c + d*x]^2 + 2*Csc[(c + d*x)/
2]^2*HypergeometricPFQ[{3/2, 3/2, 2}, {1, 9/2}, 2*Sin[(c + d*x)/2]^2]*Sin[c
 + d*x]^4)*Tan[(c + d*x)/2])/(420*d)
```

Maple [A] (verified)

Time = 16.03 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.10

method	result
default	$\frac{\left(2\sin(dx+c)\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+11\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+19\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\right)\left(\sqrt{\sec}(dx+c)\right)\sqrt{a(1+\cos}}{4d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$

```
[In] int((a+cos(d*x+c)*a)^(5/2)*sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/d*(2*sin(d*x+c)*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+11*sin(d*x
+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+19*arctan(tan(d*x+c)*(cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)))*sec(d*x+c)^(1/2)*(a*(1+cos(d*x+c)))^(1/2)*cos(d*x+c)/(1
+cos(d*x+c))/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 120, normalized size of antiderivative = 0.86

$$\int (a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}\,dx =$$
$$-\frac{19\left(a^2\cos\left(dx+c\right)+a^2\right)\sqrt{a}\arctan\left(\frac{\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-\frac{\left(2a^2\cos(dx+c)^2+11a^2\cos(dx+c)\right)\sqrt{a\cos(dx+c)+a}\sin(}{\sqrt{\cos(dx+c)}}}{4\left(d\cos\left(dx+c\right)+d\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/4*(19*(a^2*cos(d*x + c) + a^2)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*s
qrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - (2*a^2*cos(d*x + c)^2 + 11*a^2*
cos(d*x + c))*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/sqrt(cos(d*x + c)))/(d*
cos(d*x + c) + d)
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(5/2)*sec(d*x+c)**(1/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1106 vs. $2(116) = 232$.

Time = 0.43 (sec) , antiderivative size = 1106, normalized size of antiderivative = 7.90

$$\int (a + a\cos(c + dx))^{5/2}\sqrt{\sec(c + dx)}\, dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/16*(2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^
(1/4)*((a^2*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(2*d*x
+ 2*c) + a^2*sin(2*d*x + 2*c) - (a^2*cos(2*d*x + 2*c) - 10*a^2)*sin(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))))*cos(1/2*arctan2(sin(2*d*x + 2*c)
, cos(2*d*x + 2*c) + 1)) + (a^2*sin(2*d*x + 2*c)*sin(1/2*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c))) - a^2*cos(2*d*x + 2*c) + 10*a^2 + (a^2*cos(2*d*x
 + 2*c) - 10*a^2)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))))*sin
(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)))*sqrt(a) + 19*(a^2*ar
ctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1
/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/2*arctan2(s
in(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - cos(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4
)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*cos(1/2*arctan2
(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), c
os(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))))
 + 1) - a^2*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x
+ 2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin
(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - cos(1/2*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c)))), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x +
2*c) + 1)^(1/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*c
os(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c)))) - 1) - a^2*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2
+ 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c
) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1)
+ a^2*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c)
 + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (cos(
2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1))*sqrt(a))/d
```

Giac [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)*sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}\,dx = \int \sqrt{\frac{1}{\cos(c+d\,x)}}\,\left(a+a\,\cos(c+d\,x)\right)^{5/2}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^(5/2),x)
[Out] int((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^(5/2), x)
```

3.359 $\int \frac{(a+a\cos(c+dx))^{5/2}}{\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 180

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sqrt{\sec(c+dx)}}\,dx = \frac{25a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{8d} + \frac{13a^3\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)} + \frac{a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)} + \frac{25a^3\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

```
[Out] 13/12*a^3*sin(d*x+c)/d/sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2)+1/3*a^2*sin(
d*x+c)*(a+a*cos(d*x+c))^(1/2)/d/sec(d*x+c)^(3/2)+25/8*a^3*sin(d*x+c)/d/(a+a
*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2)+25/8*a^(5/2)*arcsin(sin(d*x+c)*a^(1/2)/
(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 180, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {4307, 2842, 3060, 2849, 2853, 222}

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sqrt{\sec(c+dx)}}\,dx = \frac{25a^{5/2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{8d} + \frac{13a^3\sin(c+dx)}{12d\sec^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{25a^3\sin(c+dx)}{8d\sqrt{\sec(c+dx)}\sqrt{a\cos(c+dx)+a}} + \frac{a^2\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{3d\sec^{\frac{3}{2}}(c+dx)}$$

```
[In] Int[(a + a*Cos[c + d*x])^(5/2)/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (25*a^(5/2)*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[Co
s[c + d*x]]*Sqrt[Sec[c + d*x]])/(8*d) + (13*a^3*Sin[c + d*x])/(12*d*Sqrt[a
+ a*Cos[c + d*x]]*Sec[c + d*x]^(3/2)) + (a^2*Sqrt[a + a*Cos[c + d*x]]*Sin[c
 + d*x])/(3*d*Sec[c + d*x]^(3/2)) + (25*a^3*Sin[c + d*x])/(8*d*Sqrt[a + a*C
os[c + d*x]]*Sqrt[Sec[c + d*x]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2842

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
+ n)), Int[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^n*Simp[a*b*c*(
m - 2) + b^2*d*(n + 1) + a^2*d*(m + n) - b*(b*c*(m - 1) - a*d*(3*m + 2*n -
2))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c
- a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1] &&  !LtQ[n
, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] || (IntegerQ[m] && EqQ[c
, 0]))
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 3060

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[-2*b*B*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(2*n + 3)*Sqrt[a +
b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*c - 2*a*d*(n + 1)))/(b
```

```
*d*(2*n + 3)), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
b^2, 0] && NeQ[c^2 - d^2, 0] &&  !LtQ[n, -1]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}\,dx\\
&= \frac{a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)}\\
&\quad+\frac{1}{3}\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\left(\frac{9a^2}{2}\right.\\
&\qquad\left.+\frac{13}{2}a^2\cos(c+dx)\right)\,dx\\
&= \frac{13a^3\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}+\frac{a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)}\\
&\quad+\frac{1}{8}\left(25a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx\\
&= \frac{13a^3\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}+\frac{a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)}\\
&\quad+\frac{25a^3\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}\\
&\quad+\frac{1}{16}\left(25a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{13a^3\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}+\frac{a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)}\\
&\quad+\frac{25a^3\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}\\
&\quad-\frac{\left(25a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\operatorname{Subst}\left(\int\frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{8d}
\end{aligned}$$

$$= \frac{25a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{8d} + \frac{13a^3\sin(c+dx)}{12d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)} + \frac{a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)} + \frac{25a^3\sin(c+dx)}{8d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 2.00 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.12

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sqrt{\sec(c+dx)}}\,dx = \frac{\sqrt{\cos(c+dx)}(a(1+\cos(c+dx)))^{5/2}\sec^4\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}(7(89+$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(5/2)/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*(a*(1 + Cos[c + d*x]))^(5/2)*Sec[(c + d*x)/2]^4*Sqrt[Se
c[c + d*x]]*(7*(89 + 28*Cos[c + d*x] + 3*Cos[2*(c + d*x)])*Hypergeometric2F
1[-1/2, 1/2, 7/2, 2*Sin[(c + d*x)/2]^2] - 8*(3 + Cos[c + d*x])*Hypergeometr
ic2F1[1/2, 3/2, 9/2, 2*Sin[(c + d*x)/2]^2]*Sin[c + d*x]^2 - 2*Csc[(c + d*x)
/2]^2*HypergeometricPFQ[{1/2, 3/2, 2}, {1, 9/2}, 2*Sin[(c + d*x)/2]^2]*Sin[
c + d*x]^4)*Tan[(c + d*x)/2])/(420*d)
```

Maple [A] (verified)

Time = 14.78 (sec) , antiderivative size = 183, normalized size of antiderivative = 1.02

method	result
default	$\frac{\left(8\sin(dx+c)(\cos^2(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+34\sin(dx+c)\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+75\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+75\arctan\left(\tan(dx+\right.\right.}{24d(1+\cos(dx+c))\sqrt{\sec(dx+c)}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$

```
[In] int((a+cos(d*x+c)*a)^(5/2)/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/24/d*(8*sin(d*x+c)*cos(d*x+c)^2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+34*sin(
d*x+c)*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+75*sin(d*x+c)*(cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)+75*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(
1/2)))*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))/sec(d*x+c)^(1/2)/(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 133, normalized size of antiderivative = 0.74

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sqrt{\sec(c+dx)}}\,dx =$$
$$-\frac{75\left(a^2\cos\left(dx+c\right)+a^2\right)\sqrt{a}\arctan\left(\frac{\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-\frac{\left(8\,a^2\cos(dx+c)^3+34\,a^2\cos(dx+c)^2+75\,a^2\cos(dx+c)\right)\sqrt{a\,c}}{\sqrt{\cos(dx+c)}}}{24\left(d\cos\left(dx+c\right)+d\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/24*(75*(a^2*cos(d*x + c) + a^2)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*
sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - (8*a^2*cos(d*x + c)^3 + 34*a^2
*cos(d*x + c)^2 + 75*a^2*cos(d*x + c))*sqrt(a*cos(d*x + c) + a)*sin(d*x + c
)/sqrt(cos(d*x + c)))/(d*cos(d*x + c) + d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sqrt{\sec(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(5/2)/sec(d*x+c)**(1/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1964 vs. $2(150) = 300$.

Time = 0.54 (sec) , antiderivative size = 1964, normalized size of antiderivative = 10.91

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sqrt{\sec(c+dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/96*(4*(a^2*cos(3/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x +
3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1))*sin(3*d*
x + 3*c) - (a^2*cos(3*d*x + 3*c) - a^2)*sin(3/2*arctan2(sin(2/3*arctan2(sin
(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*
d*x + 3*c))) + 1)))*(cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2
 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arcta
```

n2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(3/4)*sqrt(a) + 30*(cos(2/3*ar
ctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x +
3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x
+ 3*c))) + 1)^(1/4)*((a^2*sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c
))) + 5*a^2*sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))))*cos(1/2*a
rctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan
2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)) - (a^2*cos(2/3*arctan2(sin(3*d
*x + 3*c), cos(3*d*x + 3*c))) + 3*a^2*cos(1/3*arctan2(sin(3*d*x + 3*c), cos
(3*d*x + 3*c))) - 4*a^2)*sin(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c),
cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) +
1)))*sqrt(a) + 75*(a^2*arctan2(-(cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*
x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*c
os(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*(cos(1/2*arc
tan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(
sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1))*sin(1/3*arctan2(sin(3*d*x + 3*c)
, cos(3*d*x + 3*c))) - cos(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))
*sin(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(
2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1))), (cos(2/3*arctan2(s
in(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), c
os(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))
) + 1)^(1/4)*(cos(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))*cos(1/2*
arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arcta
n2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)) + sin(1/3*arctan2(sin(3*d*x +
3*c), cos(3*d*x + 3*c)))*sin(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c),
cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) +
1))) + 1) - a^2*arctan2(-(cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*
c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3
*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*(cos(1/2*arctan2(s
in(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*
d*x + 3*c), cos(3*d*x + 3*c))) + 1))*sin(1/3*arctan2(sin(3*d*x + 3*c), cos(
3*d*x + 3*c))) - cos(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))*sin(1
/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*ar
ctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1))), (cos(2/3*arctan2(sin(3*d
*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d
*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)
^(1/4)*(cos(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))*cos(1/2*arctan
2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin
(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)) + sin(1/3*arctan2(sin(3*d*x + 3*c),
cos(3*d*x + 3*c)))*sin(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3
*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)))
- 1) - a^2*arctan2((cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2
+ sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan
2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*sin(1/2*arctan2(sin(2/3*a
rctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*
c), cos(3*d*x + 3*c))) + 1)), (cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x

```
+ 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos
(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)^(1/4)*cos(1/2*arctan
2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))), cos(2/3*arctan2(sin
(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)) + 1) + a^2*arctan2((cos(2/3*arctan2
(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*d*x + 3*c),
 cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c
))) + 1)^(1/4)*sin(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x
+ 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) + 1)), (cos(
2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))^2 + sin(2/3*arctan2(sin(3*
d*x + 3*c), cos(3*d*x + 3*c)))^2 + 2*cos(2/3*arctan2(sin(3*d*x + 3*c), cos(
3*d*x + 3*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(2/3*arctan2(sin(3*d*x + 3*c),
 cos(3*d*x + 3*c))), cos(2/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))) +
 1)) - 1))*sqrt(a))/d
```

Giac [F]

$$\int \frac{(a + a\cos(c + dx))^{5/2}}{\sqrt{\sec(c + dx)}}\, dx = \int \frac{(a\cos(dx + c) + a)^{\frac{5}{2}}}{\sqrt{\sec(dx + c)}}\, dx$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^(5/2)/sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a + a\cos(c + dx))^{5/2}}{\sqrt{\sec(c + dx)}}\, dx = \int \frac{(a + a\cos(c + dx))^{5/2}}{\sqrt{\frac{1}{\cos(c+dx)}}}\, dx$$

```
[In] int((a + a*cos(c + d*x))^(5/2)/(1/cos(c + d*x))^(1/2),x)
[Out] int((a + a*cos(c + d*x))^(5/2)/(1/cos(c + d*x))^(1/2), x)
```

3.360 $\int \frac{(a+a\cos(c+dx))^{5/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 220

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{163a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{64d} + \frac{17a^3\sin(c+dx)}{24d\sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)} + \frac{a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{4d\sec^{\frac{5}{2}}(c+dx)} + \frac{163a^3\sin(c+dx)}{96d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)} + \frac{163a^3\sin(c+dx)}{64d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

```
[Out] 17/24*a^3*sin(d*x+c)/d/sec(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(1/2)+163/96*a^3*s
in(d*x+c)/d/sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2)+1/4*a^2*sin(d*x+c)*(a+a
*cos(d*x+c))^(1/2)/d/sec(d*x+c)^(5/2)+163/64*a^3*sin(d*x+c)/d/(a+a*cos(d*x+
c))^(1/2)/sec(d*x+c)^(1/2)+163/64*a^(5/2)*arcsin(sin(d*x+c)*a^(1/2)/(a+a*co
s(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.56 (sec) , antiderivative size = 220, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used

$= \{4307, 2842, 3060, 2849, 2853, 222\}$

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{163a^{5/2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{64d} + \frac{163a^3\sin(c+dx)}{96d\sec^{\frac{3}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{17a^3\sin(c+dx)}{24d\sec^{\frac{5}{2}}(c+dx)\sqrt{a\cos(c+dx)+a}} + \frac{163a^3\sin(c+dx)}{64d\sqrt{\sec(c+dx)}\sqrt{a\cos(c+dx)+a}} + \frac{a^2\sin(c+dx)\sqrt{a\cos(c+dx)+a}}{4d\sec^{\frac{5}{2}}(c+dx)}$$

```
[In] Int[(a + a*Cos[c + d*x])^(5/2)/Sec[c + d*x]^(3/2),x]
```

```
[Out] (163*a^(5/2)*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[C
os[c + d*x]]*Sqrt[Sec[c + d*x]])/(64*d) + (17*a^3*Sin[c + d*x])/(24*d*Sqrt[
a + a*Cos[c + d*x]]*Sec[c + d*x]^(5/2)) + (a^2*Sqrt[a + a*Cos[c + d*x]]*Sin
[c + d*x])/(4*d*Sec[c + d*x]^(5/2)) + (163*a^3*Sin[c + d*x])/(96*d*Sqrt[a +
 a*Cos[c + d*x]]*Sec[c + d*x]^(3/2)) + (163*a^3*Sin[c + d*x])/(64*d*Sqrt[a
+ a*Cos[c + d*x]]*Sqrt[Sec[c + d*x]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2842

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
+ n)), Int[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^n*Simp[a*b*c*(
m - 2) + b^2*d*(n + 1) + a^2*d*(m + n) - b*(b*c*(m - 1) - a*d*(3*m + 2*n -
2))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c
- a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1] &&  !LtQ[n
, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] || (IntegerQ[m] && EqQ[c
, 0]))
```

Rule 2849

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Simp[-2*b*Cos[e + f*x]*((c + d*Sin[e + f*x])
^n/(f*(2*n + 1)*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[2*n*((b*c + a*d)/(b*(
2*n + 1))), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^(n - 1), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0
] && NeQ[c^2 - d^2, 0] && GtQ[n, 0] && IntegerQ[2*n]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 3060

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) + (
f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp
[-2*b*B*Cos[e + f*x]*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(2*n + 3)*Sqrt[a +
b*Sin[e + f*x]])), x] + Dist[(A*b*d*(2*n + 3) - B*(b*c - 2*a*d*(n + 1)))/(b
*d*(2*n + 3)), Int[Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
b^2, 0] && NeQ[c^2 - d^2, 0] &&  !LtQ[n, -1]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}\,dx \\
&= \frac{a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{4d\sec^{\frac{5}{2}}(c+dx)} + \frac{1}{4}\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\left(\frac{13a^2}{2}+\frac{17}{2}a^2\cos(c+dx)\right)dx \\
&= \frac{17a^3\sin(c+dx)}{24d\sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)} + \frac{a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{4d\sec^{\frac{5}{2}}(c+dx)} \\
&\quad + \frac{1}{48}\left(163a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}\,dx \\
&= \frac{17a^3\sin(c+dx)}{24d\sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)} + \frac{a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{4d\sec^{\frac{5}{2}}(c+dx)} \\
&\quad + \frac{163a^3\sin(c+dx)}{96d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)} \\
&\quad + \frac{1}{64}\left(163a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}\,dx
\end{aligned}$$

$$= \frac{17a^3\sin(c+dx)}{24d\sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)} + \frac{a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{4d\sec^{\frac{5}{2}}(c+dx)} + \frac{163a^3\sin(c+dx)}{96d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)} + \frac{163a^3\sin(c+dx)}{64d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} + \frac{1}{128}\left(163a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{17a^3\sin(c+dx)}{24d\sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)} + \frac{a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{4d\sec^{\frac{5}{2}}(c+dx)} + \frac{163a^3\sin(c+dx)}{96d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)} + \frac{163a^3\sin(c+dx)}{64d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} - \frac{\left(163a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int\frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{64d}$$

$$= \frac{163a^{5/2}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{64d} + \frac{17a^3\sin(c+dx)}{24d\sqrt{a+a\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)} + \frac{a^2\sqrt{a+a\cos(c+dx)}\sin(c+dx)}{4d\sec^{\frac{5}{2}}(c+dx)} + \frac{163a^3\sin(c+dx)}{96d\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)} + \frac{163a^3\sin(c+dx)}{64d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 2.03 (sec) , antiderivative size = 202, normalized size of antiderivative = 0.92

$$\int\frac{(a+a\cos(c+dx))^{5/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{\sqrt{\cos(c+dx)}(a(1+\cos(c+dx)))^{5/2}\sec^4\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}(7(89+28$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(5/2)/Sec[c + d*x]^(3/2),x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*(a*(1 + Cos[c + d*x]))^(5/2)*Sec[(c + d*x)/2]^4*Sqrt[Se
c[c + d*x]]*(7*(89 + 28*Cos[c + d*x] + 3*Cos[2*(c + d*x)])*Hypergeometric2F
1[-3/2, 1/2, 7/2, 2*Sin[(c + d*x)/2]^2] - 24*(3 + Cos[c + d*x])*Hypergeomet
ric2F1[-1/2, 3/2, 9/2, 2*Sin[(c + d*x)/2]^2]*Sin[c + d*x]^2 - 6*Csc[(c + d*
x)/2]^2*HypergeometricPFQ[{-1/2, 3/2, 2}, {1, 9/2}, 2*Sin[(c + d*x)/2]^2]*S
in[c + d*x]^4)*Tan[(c + d*x)/2])/(420*d)
```

Maple [A] (verified)

Time = 13.83 (sec) , antiderivative size = 216, normalized size of antiderivative = 0.98

method	result
default	$\frac{\sqrt{a(1+\cos(dx+c))}\left(48\sin(dx+c)\left(\cos^2(dx+c)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+184\sin(dx+c)\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+326\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right.}{192d(1+\cos(dx+c))\sec(dx+c)^{\frac{3}{2}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$

```
[In] int((a+cos(d*x+c)*a)^(5/2)/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/192/d*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))/sec(d*x+c)^(3/2)/(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*(48*sin(d*x+c)*cos(d*x+c)^2*(cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)+184*sin(d*x+c)*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+326*
sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+489*tan(d*x+c)*(cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)+489*sec(d*x+c)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)))*a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 146, normalized size of antiderivative = 0.66

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx =$$
$$-\frac{489\left(a^2\cos\left(dx+c\right)+a^2\right)\sqrt{a}\arctan\left(\frac{\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-\frac{\left(48\,a^2\cos(dx+c)^4+184\,a^2\cos(dx+c)^3+326\,a^2\cos(dx+c\ldots\right.}{\sqrt{\cos(dx\ldots}}}{192\left(d\cos\left(dx+c\right)+d\right)}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/192*(489*(a^2*cos(d*x + c) + a^2)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a
)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - (48*a^2*cos(d*x + c)^4 + 184
*a^2*cos(d*x + c)^3 + 326*a^2*cos(d*x + c)^2 + 489*a^2*cos(d*x + c))*sqrt(a
*cos(d*x + c) + a)*sin(d*x + c)/sqrt(cos(d*x + c)))/(d*cos(d*x + c) + d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(5/2)/sec(d*x+c)**(3/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 7450 vs. 2(184) = 368.

Time = 0.70 (sec) , antiderivative size = 7450, normalized size of antiderivative = 33.86

$$\int \frac{(a + a\cos(c + dx))^{5/2}}{\sec^{\frac{3}{2}}(c + dx)}\, dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/768*(10*(cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2
*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d
*x + 4*c), cos(4*d*x + 4*c))) + 1)^(3/4)*((3*a^2*cos(4*d*x + 4*c)^2*sin(4*d
*x + 4*c) + 3*a^2*sin(4*d*x + 4*c)^3 + 12*(a^2*sin(4*d*x + 4*c)^3 + (a^2*co
s(4*d*x + 4*c)^2 - 2*a^2*cos(4*d*x + 4*c) + a^2)*sin(4*d*x + 4*c))*cos(1/2*
arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 12*(a^2*sin(4*d*x + 4*c)^3
 + (a^2*cos(4*d*x + 4*c)^2 + 2*a^2*cos(4*d*x + 4*c) + a^2)*sin(4*d*x + 4*c)
)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 3*(2*a^2*cos(1/2
*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + a^2*sin(4*
d*x + 4*c) - 2*(a^2*cos(4*d*x + 4*c) + a^2)*sin(1/2*arctan2(sin(4*d*x + 4*c
), cos(4*d*x + 4*c))))*cos(3/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))
 + 12*(a^2*sin(4*d*x + 4*c)^3 + (a^2*cos(4*d*x + 4*c)^2 - a^2*cos(4*d*x + 4
*c))*sin(4*d*x + 4*c))*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))
 + (8*a^2*cos(4*d*x + 4*c)^2 + 8*a^2*sin(4*d*x + 4*c)^2 - 3*a^2*cos(4*d*x +
 4*c) + 32*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - 2*a^2*cos(4*d
*x + 4*c) + a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 3
2*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 + 2*a^2*cos(4*d*x + 4*c)
 + a^2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*(16*a^2*
cos(4*d*x + 4*c)^2 + 16*a^2*sin(4*d*x + 4*c)^2 - 19*a^2*cos(4*d*x + 4*c) +
3*a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 2*(64*a^2*cos
(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + 19*a^2
*sin(4*d*x + 4*c))*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*si
n(3/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 12*(4*a^2*cos(1/2*arct
an2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c)^2 + a^2*sin(4*d*x
 + 4*c)^2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*cos(3/2*ar
ctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2
(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)) - (3*a^2*cos(4*d*x + 4*c)^3 - 8
*a^2*cos(4*d*x + 4*c)^2 + 4*(3*a^2*cos(4*d*x + 4*c)^3 - 14*a^2*cos(4*d*x +
4*c)^2 + 19*a^2*cos(4*d*x + 4*c) + (3*a^2*cos(4*d*x + 4*c) - 8*a^2)*sin(4*d
*x + 4*c)^2 - 8*a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2
 + (3*a^2*cos(4*d*x + 4*c) - 8*a^2)*sin(4*d*x + 4*c)^2 + 4*(3*a^2*cos(4*d*x
 + 4*c)^3 - 2*a^2*cos(4*d*x + 4*c)^2 - 13*a^2*cos(4*d*x + 4*c) + (3*a^2*cos
(4*d*x + 4*c) - 8*a^2)*sin(4*d*x + 4*c)^2 - 8*a^2)*sin(1/2*arctan2(sin(4*d*
x + 4*c), cos(4*d*x + 4*c)))^2 + (8*a^2*cos(4*d*x + 4*c)^2 + 8*a^2*sin(4*d*
x + 4*c)^2 - 3*a^2*cos(4*d*x + 4*c) + 32*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(
```

4*d*x + 4*c)^2 - 2*a^2*cos(4*d*x + 4*c) + a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 32*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 + 2*a^2*cos(4*d*x + 4*c) + a^2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*(16*a^2*cos(4*d*x + 4*c)^2 + 16*a^2*sin(4*d*x + 4*c)^2 - 19*a^2*cos(4*d*x + 4*c) + 3*a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 2*(64*a^2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + 19*a^2*sin(4*d*x + 4*c))*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*cos(3/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 4*(3*a^2*cos(4*d*x + 4*c)^3 - 11*a^2*cos(4*d*x + 4*c)^2 + 8*a^2*cos(4*d*x + 4*c) + (3*a^2*cos(4*d*x + 4*c) - 8*a^2)*sin(4*d*x + 4*c)^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 3*(2*a^2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + a^2*sin(4*d*x + 4*c) - 2*(a^2*cos(4*d*x + 4*c) + a^2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*sin(3/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 4*(4*(3*a^2*cos(4*d*x + 4*c) - 8*a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + (3*a^2*cos(4*d*x + 4*c) - 8*a^2)*sin(4*d*x + 4*c))*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*sin(3/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)))*sqrt(a) - 6*(cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*((3*a^2*cos(4*d*x + 4*c)^2*sin(4*d*x + 4*c) + 3*a^2*sin(4*d*x + 4*c)^3 + 3*a^2*cos(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) - 160*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 + 2*a^2*cos(4*d*x + 4*c) + a^2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^3 + 4*(3*a^2*sin(4*d*x + 4*c)^3 + 3*(a^2*cos(4*d*x + 4*c)^2 - 2*a^2*cos(4*d*x + 4*c) + a^2)*sin(4*d*x + 4*c) - 160*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - 2*a^2*cos(4*d*x + 4*c) + a^2)*sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 4*(3*a^2*sin(4*d*x + 4*c)^3 + 160*a^2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + (3*a^2*cos(4*d*x + 4*c)^2 + 6*a^2*cos(4*d*x + 4*c) + 43*a^2)*sin(4*d*x + 4*c) - 160*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 + 2*a^2*cos(4*d*x + 4*c) + a^2)*sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*(6*a^2*sin(4*d*x + 4*c)^3 + 3*a^2*cos(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + 6*(a^2*cos(4*d*x + 4*c)^2 - a^2*cos(4*d*x + 4*c))*sin(4*d*x + 4*c) - (320*a^2*cos(4*d*x + 4*c)^2 + 320*a^2*sin(4*d*x + 4*c)^2 - 317*a^2*cos(4*d*x + 4*c) - 3*a^2)*sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 2*(20*a^2*cos(4*d*x + 4*c)^2 + 26*a^2*sin(4*d*x + 4*c)^2 - 317*a^2*sin(4*d*x + 4*c)*sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 80*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - 2*a^2*cos(4*d*x + 4*c) + a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 8*(10*a^2*cos(4*d*x + 4*c)^2 + 13*a^2*sin(4*d*x + 4*c)^2 - 160*a^2*sin(4*d*x + 4*c)*sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 10*a^2*cos(4*d

*x + 4*c))*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 3*(a^2*co
s(4*d*x + 4*c) + a^2)*cos(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))
*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - (160*a^2*cos(4*d*x
+ 4*c)^2 + 160*a^2*sin(4*d*x + 4*c)^2 + 3*a^2*cos(4*d*x + 4*c))*sin(1/4*arc
tan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*cos(1/2*arctan2(sin(1/2*arctan2(
sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos
(4*d*x + 4*c))) + 1)) - (3*a^2*cos(4*d*x + 4*c)^3 + 120*a^2*cos(4*d*x + 4*c
)^2 - 160*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - 2*a^2*cos(4*d*
x + 4*c) + a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^3 - 3*
a^2*sin(4*d*x + 4*c)*sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) +
 4*(3*a^2*cos(4*d*x + 4*c)^3 + 74*a^2*cos(4*d*x + 4*c)^2 - 197*a^2*cos(4*d*
x + 4*c) + (3*a^2*cos(4*d*x + 4*c) + 80*a^2)*sin(4*d*x + 4*c)^2 + 120*a^2 -
 80*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - 2*a^2*cos(4*d*x + 4*
c) + a^2)*cos(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*cos(1/2*arc
tan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 3*(a^2*cos(4*d*x + 4*c) + 40*
a^2)*sin(4*d*x + 4*c)^2 + 4*(3*a^2*cos(4*d*x + 4*c)^3 + 126*a^2*cos(4*d*x +
 4*c)^2 + 243*a^2*cos(4*d*x + 4*c) + 3*(a^2*cos(4*d*x + 4*c) + 40*a^2)*sin(
4*d*x + 4*c)^2 + 120*a^2 - 40*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c
)^2 + 2*a^2*cos(4*d*x + 4*c) + a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4
*d*x + 4*c))) - 80*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 + 2*a^2
*cos(4*d*x + 4*c) + a^2)*cos(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)
)))*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*(6*a^2*cos(4
*d*x + 4*c)^3 + 214*a^2*cos(4*d*x + 4*c)^2 - 3*a^2*sin(4*d*x + 4*c)*sin(1/4
*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 240*a^2*cos(4*d*x + 4*c) +
2*(3*a^2*cos(4*d*x + 4*c) + 110*a^2)*sin(4*d*x + 4*c)^2 - (160*a^2*cos(4*d*
x + 4*c)^2 + 160*a^2*sin(4*d*x + 4*c)^2 - 157*a^2*cos(4*d*x + 4*c) - 3*a^2)
*cos(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*cos(1/2*arctan2(sin(
4*d*x + 4*c), cos(4*d*x + 4*c))) - (80*a^2*cos(4*d*x + 4*c)^2 + 80*a^2*sin(
4*d*x + 4*c)^2 + 3*a^2*cos(4*d*x + 4*c))*cos(1/4*arctan2(sin(4*d*x + 4*c),
cos(4*d*x + 4*c))) + 2*(320*a^2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x
 + 4*c)))^2*sin(4*d*x + 4*c) + 157*a^2*cos(1/4*arctan2(sin(4*d*x + 4*c), co
s(4*d*x + 4*c)))*sin(4*d*x + 4*c) + 8*(80*a^2*cos(1/4*arctan2(sin(4*d*x + 4
*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) - (3*a^2*cos(4*d*x + 4*c) + 110*a^
2)*sin(4*d*x + 4*c))*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) -
 6*(a^2*cos(4*d*x + 4*c) + 40*a^2)*sin(4*d*x + 4*c) + 3*(a^2*cos(4*d*x + 4*
c) + a^2)*sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*sin(1/2*arc
tan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*sin(1/2*arctan2(sin(1/2*arctan2(
sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos
(4*d*x + 4*c))) + 1)))*sqrt(a) + 489*((a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d
*x + 4*c)^2 + 4*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - 2*a^2*co
s(4*d*x + 4*c) + a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^
2 + 4*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 + 2*a^2*cos(4*d*x +
4*c) + a^2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 4*(a^2
*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - a^2*cos(4*d*x + 4*c))*cos(1/
2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 4*(4*a^2*cos(1/2*arctan2(s

in(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + a^2*sin(4*d*x + 4*c)
)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*arctan2(-(cos(1/2*a
rctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x +
 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x
 + 4*c))) + 1)^(1/4)*(cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos
(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1))
*sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - cos(1/4*arctan2(sin
(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x
 + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x +
4*c))) + 1))), (cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + si
n(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(si
n(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*(cos(1/4*arctan2(sin(4*d*x +
4*c), cos(4*d*x + 4*c)))*cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c),
cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) +
1)) + sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(1/2*arctan2(
sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4
*d*x + 4*c), cos(4*d*x + 4*c))) + 1))) + 1) - (a^2*cos(4*d*x + 4*c)^2 + a^2
*sin(4*d*x + 4*c)^2 + 4*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 -
2*a^2*cos(4*d*x + 4*c) + a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x +
 4*c)))^2 + 4*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 + 2*a^2*cos(
4*d*x + 4*c) + a^2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2
+ 4*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - a^2*cos(4*d*x + 4*c)
)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 4*(4*a^2*cos(1/2*a
rctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + a^2*sin(4*d*
x + 4*c))*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*arctan2(-(c
os(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin
(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), c
os(4*d*x + 4*c))) + 1)^(1/4)*(cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4
*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)
)) + 1))*sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - cos(1/4*arc
tan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(1/2*arctan2(sin(1/2*arctan2(s
in(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(
4*d*x + 4*c))) + 1))), (cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))
)^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*ar
ctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*(cos(1/4*arctan2(sin(
4*d*x + 4*c), cos(4*d*x + 4*c)))*cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x
+ 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4
*c))) + 1)) + sin(1/4*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(1/2*
arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arcta
n2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1))) - 1) - (a^2*cos(4*d*x + 4*c)
^2 + a^2*sin(4*d*x + 4*c)^2 + 4*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4
*c)^2 - 2*a^2*cos(4*d*x + 4*c) + a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos
(4*d*x + 4*c)))^2 + 4*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 + 2*
a^2*cos(4*d*x + 4*c) + a^2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4
c)))^2 + 4(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - a^2*cos(4*d*

```
x + 4*c))*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 4*(4*a^2*c
os(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + a^2*
sin(4*d*x + 4*c))*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*arc
tan2((cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arct
an2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x +
4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*sin(1/2*arctan2(sin(1/2*arctan2(sin(4*d
*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x
+ 4*c))) + 1)), (cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + s
in(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(s
in(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1/2*arct
an2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c),
 cos(4*d*x + 4*c))) + 1)) + 1) + (a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x +
4*c)^2 + 4*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - 2*a^2*cos(4*d
*x + 4*c) + a^2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 4
*(a^2*cos(4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 + 2*a^2*cos(4*d*x + 4*c)
+ a^2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 4*(a^2*cos(
4*d*x + 4*c)^2 + a^2*sin(4*d*x + 4*c)^2 - a^2*cos(4*d*x + 4*c))*cos(1/2*arc
tan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 4*(4*a^2*cos(1/2*arctan2(sin(4*
d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + a^2*sin(4*d*x + 4*c))*sin
(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*arctan2((cos(1/2*arctan2
(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c),
 cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c
))) + 1)^(1/4)*sin(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x
+ 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)), (cos(
1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*
d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(
4*d*x + 4*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c),
 cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) +
 1)) - 1))*sqrt(a))/((4*(cos(4*d*x + 4*c)^2 + sin(4*d*x + 4*c)^2 - 2*cos(4*
d*x + 4*c) + 1)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 4*
(cos(4*d*x + 4*c)^2 + sin(4*d*x + 4*c)^2 + 2*cos(4*d*x + 4*c) + 1)*sin(1/2*
arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + cos(4*d*x + 4*c)^2 + 4*(co
s(4*d*x + 4*c)^2 + sin(4*d*x + 4*c)^2 - cos(4*d*x + 4*c))*cos(1/2*arctan2(s
in(4*d*x + 4*c), cos(4*d*x + 4*c))) + sin(4*d*x + 4*c)^2 - 4*(4*cos(1/2*arc
tan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))*sin(4*d*x + 4*c) + sin(4*d*x + 4*
c))*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*d)
```

Giac [F]

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{(a\cos(dx+c)+a)^{\frac{5}{2}}}{\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^(5/2)/sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+a\cos(c+dx))^{5/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{(a+a\,\cos(c+d\,x))^{5/2}}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}\,dx$$

```
[In] int((a + a*cos(c + d*x))^(5/2)/(1/cos(c + d*x))^(3/2),x)
[Out] int((a + a*cos(c + d*x))^(5/2)/(1/cos(c + d*x))^(3/2), x)
```

3.361 $\int \frac{\sec^{\frac{7}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 154

$$\int \frac{\sec^{\frac{7}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d} + \frac{26\sqrt{\sec(c+dx)}\sin(c+dx)}{15d\sqrt{1+\cos(c+dx)}} - \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d\sqrt{1+\cos(c+dx)}} + \frac{2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{1+\cos(c+dx)}}$$

```
[Out] -2/15*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(1+cos(d*x+c))^(1/2)+2/5*sec(d*x+c)^(5/
2)*sin(d*x+c)/d/(1+cos(d*x+c))^(1/2)-arcsin(sin(d*x+c)/(1+cos(d*x+c)))*2^(1
/2)*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+26/15*sin(d*x+c)*sec(d*x+c)^(1/2)/d
/(1+cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.36 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {4307, 2858, 3063, 12, 2860, 222}

$$\int \frac{\sec^{\frac{7}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sin(c+dx)}{\cos(c+dx)+1}\right)}{d} + \frac{2\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{5d\sqrt{\cos(c+dx)+1}} - \frac{2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{15d\sqrt{\cos(c+dx)+1}} + \frac{26\sin(c+dx)\sqrt{\sec(c+dx)}}{15d\sqrt{\cos(c+dx)+1}}$$

```
[In] Int[Sec[c + d*x]^(7/2)/Sqrt[1 + Cos[c + d*x]],x]
```

```
[Out] -((Sqrt[2]*ArcSin[Sin[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[Cos[c + d*x]]*Sqrt[
Sec[c + d*x]])/d) + (26*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(15*d*Sqrt[1 + Cos
[c + d*x]]) - (2*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(15*d*Sqrt[1 + Cos[c + d*
x]]) + (2*Sec[c + d*x]^(5/2)*Sin[c + d*x])/(5*d*Sqrt[1 + Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2860

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[-Sqrt[2]/(Sqrt[a]*f), Subst[Int[1/Sqrt[1 - x
^2], x], x, b*(Cos[e + f*x]/(a + b*Sin[e + f*x]))], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 - b^2, 0] && EqQ[d, a/b] && GtQ[a, 0]
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx$$

$$= \frac{2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{1+\cos(c+dx)}} - \frac{1}{5}\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1-4\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx$$

$$= -\frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d\sqrt{1+\cos(c+dx)}} + \frac{2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{1+\cos(c+dx)}} - \frac{1}{15}\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{13}{2}+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx$$

$$= \frac{26\sqrt{\sec(c+dx)}\sin(c+dx)}{15d\sqrt{1+\cos(c+dx)}} - \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d\sqrt{1+\cos(c+dx)}} + \frac{2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{1+\cos(c+dx)}} - \frac{1}{15}\left(4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{15}{4\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx$$

$$= \frac{26\sqrt{\sec(c+dx)}\sin(c+dx)}{15d\sqrt{1+\cos(c+dx)}} - \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d\sqrt{1+\cos(c+dx)}} + \frac{2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{1+\cos(c+dx)}} - \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,d$$

$$= \frac{26\sqrt{\sec(c+dx)}\sin(c+dx)}{15d\sqrt{1+\cos(c+dx)}} - \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d\sqrt{1+\cos(c+dx)}} + \frac{2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{1+\cos(c+dx)}} + \frac{\left(\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, -\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d}$$

$$= -\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d} + \frac{26\sqrt{\sec(c+dx)}\sin(c+dx)}{15d\sqrt{1+\cos(c+dx)}} - \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d\sqrt{1+\cos(c+dx)}} + \frac{2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{1+\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 7.27 (sec) , antiderivative size = 1540, normalized size of antiderivative = 10.00

$$\int \frac{\sec^{\frac{7}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = -\frac{2\cot\left(\frac{c}{2}+\frac{dx}{2}\right)\csc^6\left(\frac{c}{2}+\frac{dx}{2}\right)\left(\frac{1}{1-2\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}\right)^{7/2}\left(4725\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)-48825\sin^4\left(\frac{c}{2}+\frac{dx}{2}\right)+210105\sin\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^(7/2)/Sqrt[1 + Cos[c + d*x]],x]
```

```
[Out] (-2*Cot[c/2 + (d*x)/2]*Csc[c/2 + (d*x)/2]^6*((1 - 2*Sin[c/2 + (d*x)/2]^2)^(
-1))^(7/2)*(4725*Sin[c/2 + (d*x)/2]^2 - 48825*Sin[c/2 + (d*x)/2]^4 + 210105
*Sin[c/2 + (d*x)/2]^6 - 486630*Sin[c/2 + (d*x)/2]^8 + 655812*Sin[c/2 + (d*x
)/2]^10 - 710*Hypergeometric2F1[2, 9/2, 11/2, Sin[c/2 + (d*x)/2]^2/(-1 + 2*
Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^10 - 40*Cos[(c + d*x)/2]^6*Hyperg
eometricPFQ[{2, 2, 2, 9/2}, {1, 1, 11/2}, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[
c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^10 - 518760*Sin[c/2 + (d*x)/2]^12 + 1
770*Hypergeometric2F1[2, 9/2, 11/2, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 +
(d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^12 + 226656*Sin[c/2 + (d*x)/2]^14 - 1500*Hy
pergeometric2F1[2, 9/2, 11/2, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/
2]^2)]*Sin[c/2 + (d*x)/2]^14 - 42048*Sin[c/2 + (d*x)/2]^16 + 440*Hypergeome
tric2F1[2, 9/2, 11/2, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*S
in[c/2 + (d*x)/2]^16 + 4725*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c
/2 + (d*x)/2]^2)]]*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]
 - 56700*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*
Sin[c/2 + (d*x)/2]^2*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2
)] + 291060*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)
]]*Sin[c/2 + (d*x)/2]^4*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2
]^2)] - 833760*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]
^2)]]*Sin[c/2 + (d*x)/2]^6*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x
)/2]^2)] + 1458000*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x
)/2]^2)]]*Sin[c/2 + (d*x)/2]^8*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 +
(d*x)/2]^2)] - 1598400*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 +
(d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^10*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c
/2 + (d*x)/2]^2)] + 1080000*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c
/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^12*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*
Sin[c/2 + (d*x)/2]^2)] - 414720*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*S
in[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^14*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1
+ 2*Sin[c/2 + (d*x)/2]^2)] + 69120*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 +
2*Sin[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^16*Sqrt[Sin[c/2 + (d*x)/2]^2/(
-1 + 2*Sin[c/2 + (d*x)/2]^2)] + 60*Cos[(c + d*x)/2]^4*HypergeometricPFQ[{2,
```

```
2, 9/2}, {1, 11/2}, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Si
n[c/2 + (d*x)/2]^10*(-5 + 4*Sin[c/2 + (d*x)/2]^2)))/(675*d*Sqrt[1 + Cos[c +
 d*x]]*(-1 + 2*Sin[c/2 + (d*x)/2]^2))
```

Maple [A] (verified)

Time = 5.94 (sec) , antiderivative size = 182, normalized size of antiderivative = 1.18

method	result
default	$\frac{\left(\sec^{\frac{7}{2}}(dx+c)\right)\sqrt{2+2\cos(dx+c)}\left(15\left(\cos^4(dx+c)\right)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\arcsin(\cot(dx+c)-\csc(dx+c))+15\left(\cos^3(dx+c)\right)\sqrt{2}\arcsin(\cot(dx}{30d(1+\cos(dx+c)}$

```
[In] int(sec(d*x+c)^(7/2)/(1+cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/30/d*sec(d*x+c)^(7/2)*(2+2*cos(d*x+c))^(1/2)/(1+cos(d*x+c))*(15*cos(d*x+c
)^4*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))
+15*cos(d*x+c)^3*2^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))*(cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)+26*sin(d*x+c)*cos(d*x+c)^3-2*cos(d*x+c)^2*sin(d*x+c)+6*cos(d*
x+c)*sin(d*x+c))*2^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 130, normalized size of antiderivative = 0.84

$$\int \frac{\sec^{\frac{7}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \frac{15\left(\sqrt{2}\cos\left(dx+c\right)^{3}+\sqrt{2}\cos\left(dx+c\right)^{2}\right)\arctan\left(\frac{\sqrt{2}\sqrt{\cos(dx+c)+1}\sqrt{\cos(dx+c)}}{\sin(dx+c)}\right)+\frac{2\left(13\cos(dx+c)^{2}-\cos(dx+c)+3\right)\sqrt{\cos}}{\sqrt{\cos(dx+c)}}}{15\left(d\cos\left(dx+c\right)^{3}+d\cos\left(dx+c\right)^{2}\right)}$$

```
[In] integrate(sec(d*x+c)^(7/2)/(1+cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/15*(15*(sqrt(2)*cos(d*x + c)^3 + sqrt(2)*cos(d*x + c)^2)*arctan(sqrt(2)*s
qrt(cos(d*x + c) + 1)*sqrt(cos(d*x + c))/sin(d*x + c)) + 2*(13*cos(d*x + c)
^2 - cos(d*x + c) + 3)*sqrt(cos(d*x + c) + 1)*sin(d*x + c)/sqrt(cos(d*x + c
)))/(d*cos(d*x + c)^3 + d*cos(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{7}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(7/2)/(1+cos(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.56 (sec) , antiderivative size = 989, normalized size of antiderivative = 6.42

$$\int \frac{\sec^{\frac{7}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate(sec(d*x+c)^(7/2)/(1+cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -1/15*(15*(sqrt(2)*cos(2*d*x + 2*c)^2 + sqrt(2)*sin(2*d*x + 2*c)^2 + 2*sqrt
(2)*cos(2*d*x + 2*c) + sqrt(2))*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 +
2*cos(2*d*x + 2*c) + 1)^(1/4)*arctan2(((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*
x + c)^4 + sin(d*x + c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x
+ c) + 1)*abs(e^(I*d*x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2
 - 2*cos(d*x + c) + 1)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) +
 1)^(1/4)*sin(1/2*arctan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x +
I*c) + 1)^2, (abs(e^(I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2
- 2*cos(d*x + c) + 1)/abs(e^(I*d*x + I*c) + 1)^2)) + sin(d*x + c))/abs(e^(I
*d*x + I*c) + 1), ((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x +
 c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d
*x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) +
1)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*cos(1/2*ar
ctan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e^
(I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1
)/abs(e^(I*d*x + I*c) + 1)^2)) + cos(d*x + c) - 1)/abs(e^(I*d*x + I*c) + 1)
) - 26*(cos(2*d*x + 2*c)^2*sin(d*x + c) + sin(2*d*x + 2*c)^2*sin(d*x + c) +
 2*cos(2*d*x + 2*c)*sin(d*x + c) + sin(d*x + c))*cos(1/2*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c) + 1)) + 24*cos(5/2*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c) + 1))*sin(d*x + c) - 24*(cos(d*x + c) - 1)*sin(5/2*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 2*((13*cos(d*x + c) - 15)*cos(2*d*x
+ 2*c)^2 + (13*cos(d*x + c) - 15)*sin(2*d*x + 2*c)^2 + 2*(13*cos(d*x + c) -
 15)*cos(2*d*x + 2*c) + 13*cos(d*x + c) - 15)*sin(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c) + 1)) - 4*sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^
```

```
2 + 2*cos(2*d*x + 2*c) + 1)*(7*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c) + 1))*sin(d*x + c) - (7*cos(d*x + c) - 5)*sin(3/2*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c) + 1))))/((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2
+ 2*cos(2*d*x + 2*c) + 1)^(5/4)*d)
```

Giac [F]

$$\int \frac{\sec^{\frac{7}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx=\int \frac{\sec\left(dx+c\right)^{\frac{7}{2}}}{\sqrt{\cos\left(dx+c\right)+1}}\,dx$$

```
[In] integrate(sec(d*x+c)^(7/2)/(1+cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(7/2)/sqrt(cos(d*x + c) + 1), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{7}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx=\int \frac{{\left(\frac{1}{\cos\left(c+d\,x\right)}\right)}^{7/2}}{\sqrt{\cos\left(c+d\,x\right)+1}}\,dx$$

```
[In] int((1/cos(c + d*x))^(7/2)/(cos(c + d*x) + 1)^(1/2),x)
[Out] int((1/cos(c + d*x))^(7/2)/(cos(c + d*x) + 1)^(1/2), x)
```

3.362 $\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}} dx$

Optimal result

Integrand size = 23, antiderivative size = 118

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}} dx = \frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d} - \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{3d\sqrt{1+\cos(c+dx)}} + \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{1+\cos(c+dx)}}$$

```
[Out] 2/3*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(1+cos(d*x+c))^(1/2)+arcsin(sin(d*x+c)/(1
+cos(d*x+c)))*2^(1/2)*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d-2/3*sin(d*x+c)*se
c(d*x+c)^(1/2)/d/(1+cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {4307, 2858, 3063, 12, 2860, 222}

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}} dx = \frac{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sin(c+dx)}{\cos(c+dx)+1}\right)}{d} + \frac{2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3d\sqrt{\cos(c+dx)+1}} - \frac{2\sin(c+dx)\sqrt{\sec(c+dx)}}{3d\sqrt{\cos(c+dx)+1}}$$

```
[In] Int[Sec[c + d*x]^(5/2)/Sqrt[1 + Cos[c + d*x]],x]
```

```
[Out] (Sqrt[2]*ArcSin[Sin[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[Cos[c + d*x]]*Sqrt[Se
c[c + d*x]])/d - (2*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(3*d*Sqrt[1 + Cos[c +
d*x]]) + (2*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(3*d*Sqrt[1 + Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2860

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[-Sqrt[2]/(Sqrt[a]*f), Subst[Int[1/Sqrt[1 - x
^2], x], x, b*(Cos[e + f*x]/(a + b*Sin[e + f*x]))], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 - b^2, 0] && EqQ[d, a/b] && GtQ[a, 0]
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx$$
$$= \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{1+\cos(c+dx)}} - \frac{1}{3}\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1-2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx$$
$$= -\frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{3d\sqrt{1+\cos(c+dx)}} + \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{1+\cos(c+dx)}} - \frac{1}{3}\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int -\frac{3}{2\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx$$
$$= -\frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{3d\sqrt{1+\cos(c+dx)}} + \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{1+\cos(c+dx)}} + \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx$$
$$= -\frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{3d\sqrt{1+\cos(c+dx)}} + \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{1+\cos(c+dx)}} - \frac{\left(\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\operatorname{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, -\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d}$$
$$= \frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d} - \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{3d\sqrt{1+\cos(c+dx)}} + \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{1+\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 6.45 (sec) , antiderivative size = 473, normalized size of antiderivative = 4.01

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx =$$
$$-\frac{2\cot\left(\frac{c}{2}+\frac{dx}{2}\right)\csc^4\left(\frac{c}{2}+\frac{dx}{2}\right)\left(\frac{1}{1-2\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}\right)^{7/2}\left(12\cos^4\left(\frac{1}{2}(c+dx)\right)\,{}_3F_2\left(2,2,\frac{7}{2};1,\frac{9}{2};\frac{\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}{-1+2\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}\right)\right.}{}$$

[In] Integrate[Sec[c + d*x]^(5/2)/Sqrt[1 + Cos[c + d*x]],x]

[Out] (-2*Cot[c/2 + (d*x)/2]*Csc[c/2 + (d*x)/2]^4*((1 - 2*Sin[c/2 + (d*x)/2]^2)^(-1))^(7/2)*(12*Cos[(c + d*x)/2]^4*HypergeometricPFQ[{2, 2, 7/2}, {1, 9/2}, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^8 + 12*Hypergeometric2F1[2, 7/2, 9/2, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^8*(4 - 7*Sin[c/2 + (d*x)/2]^2 + 3*Sin[c/2 + (d*x)/2]^4) + 7*(1 - 2*Sin[c/2 + (d*x)/2]^2)^3*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(15 - 20*Sin[c/2 + (d*x)/2]^2 + 8*Sin[c/2 + (d*x)/2]^4)*(ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*(3 - 6*Sin[c/2 + (d*x)/2]^2) + Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(-3 + 7*Sin[c/2 + (d*x)/2]^2))))/(63*d*Sqrt[1 + Cos[c + d*x]])

Maple [A] (verified)

Time = 6.41 (sec) , antiderivative size = 166, normalized size of antiderivative = 1.41

method	result
default	$-\frac{\left(\sec^{\frac{5}{2}}(dx+c)\right)\sqrt{2+2\cos(dx+c)}\left(3\left(\cos^{3}(dx+c)\right)\sqrt{2}\,\arcsin(\cot(dx+c)-\csc(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+3\left(\cos^{2}(dx+c)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \text{ar}\right.}{6d(1+\cos(dx+c))}$

[In] int(sec(d*x+c)^(5/2)/(1+cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)

[Out] -1/6/d*sec(d*x+c)^(5/2)*(2+2*cos(d*x+c))^(1/2)/(1+cos(d*x+c))*(3*cos(d*x+c)^3*2^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+3*cos(d*x+c)^2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))*2^(1/2)+2*cos(d*x+c)^2*sin(d*x+c)-2*cos(d*x+c)*sin(d*x+c))*2^(1/2)

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 114, normalized size of antiderivative = 0.97

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = -\frac{3\left(\sqrt{2}\cos\left(dx+c\right)^{2}+\sqrt{2}\cos\left(dx+c\right)\right)\arctan\left(\frac{\sqrt{2}\sqrt{\cos(dx+c)+1}\sqrt{\cos(dx+c)}}{\sin(dx+c)}\right)+\frac{2\sqrt{\cos(dx+c)+1}(\cos(dx+c)-1)\sin(dx}{\sqrt{\cos(dx+c)}}}{3\left(d\cos\left(dx+c\right)^{2}+d\cos\left(dx+c\right)\right)}$$

[In] integrate(sec(d*x+c)^(5/2)/(1+cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] -1/3*(3*(sqrt(2)*cos(d*x + c)^2 + sqrt(2)*cos(d*x + c))*arctan(sqrt(2)*sqrt(cos(d*x + c) + 1)*sqrt(cos(d*x + c))/sin(d*x + c)) + 2*sqrt(cos(d*x + c) + 1)*(cos(d*x + c) - 1)*sin(d*x + c)/sqrt(cos(d*x + c)))/(d*cos(d*x + c)^2 + d*cos(d*x + c))

Sympy [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(5/2)/(1+cos(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.56 (sec) , antiderivative size = 801, normalized size of antiderivative = 6.79

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate(sec(d*x+c)^(5/2)/(1+cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/3*(3*(sqrt(2)*cos(2*d*x + 2*c)^2 + sqrt(2)*sin(2*d*x + 2*c)^2 + 2*sqrt(2)
*cos(2*d*x + 2*c) + sqrt(2))*arctan2(((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x
 + c)^4 + sin(d*x + c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x +
 c) + 1)*abs(e^(I*d*x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2
- 2*cos(d*x + c) + 1)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) +
1)^(1/4)*sin(1/2*arctan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I
*c) + 1)^2, (abs(e^(I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 -
 2*cos(d*x + c) + 1)/abs(e^(I*d*x + I*c) + 1)^2)) + sin(d*x + c))/abs(e^(I*
d*x + I*c) + 1), ((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x +
c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d*
x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) + 1
)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*cos(1/2*arc
tan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e^(
I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)
/abs(e^(I*d*x + I*c) + 1)^2)) + cos(d*x + c) - 1)/abs(e^(I*d*x + I*c) + 1))
 - 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(3/
4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x + c) -
 (cos(d*x + c) - 3)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)
)) - 4*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(
1/4)*(cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x + c)
 - (cos(d*x + c) + 1)*sin(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
1))))/((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*d
)
```

Giac [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\sqrt{\cos\left(dx+c\right)+1}}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(1+cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(5/2)/sqrt(cos(d*x + c) + 1), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}}{\sqrt{\cos\left(c+d\,x\right)+1}}\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)/(cos(c + d*x) + 1)^(1/2),x)
[Out] int((1/cos(c + d*x))^(5/2)/(cos(c + d*x) + 1)^(1/2), x)
```

3.363 $\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 82

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d} + \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{d\sqrt{1+\cos(c+dx)}}$$

```
[Out] -arcsin(sin(d*x+c)/(1+cos(d*x+c)))*2^(1/2)*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2
)/d+2*sin(d*x+c)*sec(d*x+c)^(1/2)/d/(1+cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {4307, 2858, 2860, 222}

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \frac{2\sin(c+dx)\sqrt{\sec(c+dx)}}{d\sqrt{\cos(c+dx)+1}} - \frac{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sin(c+dx)}{\cos(c+dx)+1}\right)}{d}$$

```
[In] Int[Sec[c + d*x]^(3/2)/Sqrt[1 + Cos[c + d*x]],x]
```

```
[Out] -((Sqrt[2]*ArcSin[Sin[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[Cos[c + d*x]]*Sqrt[
Sec[c + d*x]])/d) + (2*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(d*Sqrt[1 + Cos[c +
 d*x]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2860

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[-Sqrt[2]/(Sqrt[a]*f), Subst[Int[1/Sqrt[1 - x
^2], x], x, b*(Cos[e + f*x]/(a + b*Sin[e + f*x]))], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 - b^2, 0] && EqQ[d, a/b] && GtQ[a, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}}\,dx$$

$$= \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{d\sqrt{1+\cos(c+dx)}} - \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx$$

$$= \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{d\sqrt{1+\cos(c+dx)}} + \frac{\left(\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, -\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d}$$

$$= -\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d} + \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{d\sqrt{1+\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 1.32 (sec) , antiderivative size = 178, normalized size of antiderivative = 2.17

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx$$
$$= \frac{2\cos\left(\frac{1}{2}(c+dx)\right)\sec^{\frac{3}{2}}(c+dx)\sin\left(\frac{1}{2}(c+dx)\right)\left(\frac{1}{2}\cos(c+dx)(2+\cos(c+dx))\csc^4\left(\frac{1}{2}(c+dx)\right)\left(1-\cos(\right.\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^(3/2)/Sqrt[1 + Cos[c + d*x]],x]
```

```
[Out] (2*Cos[(c + d*x)/2]*Sec[c + d*x]^(3/2)*Sin[(c + d*x)/2]*((Cos[c + d*x]*(2 +
 Cos[c + d*x])*Csc[(c + d*x)/2]^4*(1 - Cos[c + d*x] + ArcTanh[Sqrt[-(Sec[c
+ d*x]*Sin[(c + d*x)/2]^2)]]*Cos[c + d*x]*Sqrt[2 - 2*Sec[c + d*x]]))/2 - (H
ypergeometric2F1[2, 5/2, 7/2, -(Sec[c + d*x]*Sin[(c + d*x)/2]^2)]*Sin[c + d
*x]*Tan[c + d*x])/10))/(d*Sqrt[1 + Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.88 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.68

method	result
default	$\frac{\left(\sec^{\frac{3}{2}}(dx+c)\right)\left(\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\cos(dx+c)\sqrt{2}\,\arcsin(\cot(dx+c)-\csc(dx+c))+\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{2}\,\arcsin(\cot(dx+c)-\csc(dx+c))+2\,\mathrm{s}\right.}{2d(1+\cos(dx+c))}$

```
[In] int(sec(d*x+c)^(3/2)/(1+cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/d*sec(d*x+c)^(3/2)*((cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)*2^(1/2
)*arcsin(cot(d*x+c)-csc(d*x+c))+(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)*a
rcsin(cot(d*x+c)-csc(d*x+c))+2*sin(d*x+c))*cos(d*x+c)*(2+2*cos(d*x+c))^(1/2
)/(1+cos(d*x+c))*2^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 86, normalized size of antiderivative = 1.05

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx$$
$$= \frac{\left(\sqrt{2}\cos(dx+c)+\sqrt{2}\right)\arctan\left(\frac{\sqrt{2}\sqrt{\cos(dx+c)+1}\sqrt{\cos(dx+c)}}{\sin(dx+c)}\right)+\frac{2\sqrt{\cos(dx+c)+1}\sin(dx+c)}{\sqrt{\cos(dx+c)}}}{d\cos(dx+c)+d}$$

```
[In] integrate(sec(d*x+c)^(3/2)/(1+cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] ((sqrt(2)*cos(d*x + c) + sqrt(2))*arctan(sqrt(2)*sqrt(cos(d*x + c) + 1)*sqr
t(cos(d*x + c))/sin(d*x + c)) + 2*sqrt(cos(d*x + c) + 1)*sin(d*x + c)/sqrt(
cos(d*x + c)))/(d*cos(d*x + c) + d)
```

Sympy [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{\cos(c+dx)+1}}\,dx$$

```
[In] integrate(sec(d*x+c)**(3/2)/(1+cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sec(c + d*x)**(3/2)/sqrt(cos(c + d*x) + 1), x)
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.55 (sec) , antiderivative size = 648, normalized size of antiderivative = 7.90

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx$$

$$= \frac{2\cos\left(\frac{1}{2}\arctan\left(\sin\left(2dx+2c\right),\cos\left(2dx+2c\right)+1\right)\right)\sin\left(dx+c\right)-2\left(\cos\left(dx+c\right)-1\right)\sin\left(\frac{1}{2}\arctan\left(\sin\right.\right.}{}$$

```
[In] integrate(sec(d*x+c)^(3/2)/(1+cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] (2*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x + c) -
2*(cos(d*x + c) - 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1
)) - sqrt(2)*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c)
+ 1)^(1/4)*arctan2(((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x
+ c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*
d*x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) +
 1)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*sin(1/2*a
rctan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e
^(I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) +
1)/abs(e^(I*d*x + I*c) + 1)^2)) + sin(d*x + c))/abs(e^(I*d*x + I*c) + 1), (
(abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x + c)^4 + 2*(cos(d*x
+ c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d*x + I*c) + 1)^2 -
4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) + 1)*sin(d*x + c)^2 +
```

```
6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*cos(1/2*arctan2(2*(cos(d*x +
c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e^(I*d*x + I*c) + 1)^
2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)/abs(e^(I*d*x + I*
c) + 1)^2)) + cos(d*x + c) - 1)/abs(e^(I*d*x + I*c) + 1)))/((cos(2*d*x + 2*
c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*d)
```

Giac [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{3}{2}}}{\sqrt{\cos\left(dx+c\right)+1}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(1+cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(3/2)/sqrt(cos(d*x + c) + 1), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}{\sqrt{\cos\left(c+d\,x\right)+1}}\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)/(cos(c + d*x) + 1)^(1/2),x)
[Out] int((1/cos(c + d*x))^(3/2)/(cos(c + d*x) + 1)^(1/2), x)
```

3.364 $\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 47

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx=\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d}$$

```
[Out] arcsin(sin(d*x+c)/(1+cos(d*x+c)))*2^(1/2)*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)
/d
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {4307, 2860, 222}

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx=\frac{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sin(c+dx)}{\cos(c+dx)+1}\right)}{d}$$

```
[In] Int[Sqrt[Sec[c + d*x]]/Sqrt[1 + Cos[c + d*x]],x]
```

```
[Out] (Sqrt[2]*ArcSin[Sin[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[Cos[c + d*x]]*Sqrt[Se
c[c + d*x]])/d
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2860

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[-Sqrt[2]/(Sqrt[a]*f), Subst[Int[1/Sqrt[1 - x
^2], x], x, b*(Cos[e + f*x]/(a + b*Sin[e + f*x]))], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 - b^2, 0] && EqQ[d, a/b] && GtQ[a, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx\\ &= -\frac{\left(\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int\frac{1}{\sqrt{1-x^2}}\,dx,x,-\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d}\\ &= \frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 68, normalized size of antiderivative = 1.45

$$\int\frac{\sqrt{\sec(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx = \frac{2\arctan\left(\frac{\sin\left(\frac{1}{2}(c+dx)\right)}{\sqrt{\cos(c+dx)}}\right)\cos\left(\frac{1}{2}(c+dx)\right)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\sec(c+dx)}}{d}$$

```
[In] Integrate[Sqrt[Sec[c + d*x]]/Sqrt[1 + Cos[c + d*x]],x]
```

```
[Out] (2*ArcTan[Sin[(c + d*x)/2]/Sqrt[Cos[c + d*x]]]*Cos[(c + d*x)/2]*Sqrt[Cos[c
+ d*x]/(1 + Cos[c + d*x])]*Sqrt[Sec[c + d*x]])/d
```

Maple [A] (verified)

Time = 5.92 (sec) , antiderivative size = 77, normalized size of antiderivative = 1.64

method	result	size
default	$-\frac{\sqrt{2+2\cos(dx+c)}\,\arcsin(\cot(dx+c)-\csc(dx+c))\left(\sqrt{\sec}(dx+c)\right)\cos(dx+c)}{d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$	77

```
[In] int(sec(d*x+c)^(1/2)/(1+cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

[Out] -1/d*(2+2*cos(d*x+c))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))*sec(d*x+c)^(1/2)*cos(d*x+c)/(1+cos(d*x+c))/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.83

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\arctan\left(\frac{\sqrt{2}\sqrt{\cos(dx+c)+1}\sqrt{\cos(dx+c)}}{\sin(dx+c)}\right)}{d}$$

[In] integrate(sec(d*x+c)^(1/2)/(1+cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] -sqrt(2)*arctan(sqrt(2)*sqrt(cos(d*x + c) + 1)*sqrt(cos(d*x + c))/sin(d*x + c))/d

Sympy [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{\sqrt{\sec(c+dx)}}{\sqrt{\cos(c+dx)+1}}\,dx$$

[In] integrate(sec(d*x+c)**(1/2)/(1+cos(d*x+c))**(1/2),x)

[Out] Integral(sqrt(sec(c + d*x))/sqrt(cos(c + d*x) + 1), x)

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.58 (sec) , antiderivative size = 505, normalized size of antiderivative = 10.74

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx = \frac{\sqrt{2}\arctan\left(\frac{\left(\left|e^{(i\,dx+i\,c)}+1\right|^4+\cos(dx+c)^4+\sin(dx+c)^4+2\left(\cos(dx+c)^2-\sin(dx+c)^2-2\cos(dx+c)+1\right)\left|e^{(i\,dx+i\,c)}+1\right|^2-4\cos(dx+c)^3+2\left(\cos\right.\right.}{}\right)}{}$$

[In] integrate(sec(d*x+c)^(1/2)/(1+cos(d*x+c))^(1/2),x, algorithm="maxima")

[Out] sqrt(2)*arctan2(((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x + c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d*x

```
 + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) + 1)
*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*sin(1/2*arct
an2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e^(I
*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)/
abs(e^(I*d*x + I*c) + 1)^2)) + sin(d*x + c))/abs(e^(I*d*x + I*c) + 1), ((ab
s(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x + c)^4 + 2*(cos(d*x + c
)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d*x + I*c) + 1)^2 - 4*c
os(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) + 1)*sin(d*x + c)^2 + 6*
cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*cos(1/2*arctan2(2*(cos(d*x + c)
- 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e^(I*d*x + I*c) + 1)^2 +
 cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)/abs(e^(I*d*x + I*c)
+ 1)^2)) + cos(d*x + c) - 1)/abs(e^(I*d*x + I*c) + 1))/d
```

Giac [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{\sqrt{\sec(dx+c)}}{\sqrt{\cos(dx+c)+1}}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(1+cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(sec(d*x + c))/sqrt(cos(d*x + c) + 1), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx = \int \frac{\sqrt{\frac{1}{\cos(c+d\,x)}}}{\sqrt{\cos(c+d\,x)+1}}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)/(cos(c + d*x) + 1)^(1/2),x)
[Out] int((1/cos(c + d*x))^(1/2)/(cos(c + d*x) + 1)^(1/2), x)
```

3.365 $\int \frac{1}{\sqrt{1+\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 94

$$\begin{aligned}\int \frac{1}{\sqrt{1+\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx &= -\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d} \\ &\quad + \frac{2\arcsin\left(\frac{\sin(c+dx)}{\sqrt{1+\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d}\end{aligned}$$

```
[Out] 2*arcsin(sin(d*x+c)/(1+cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)
/d-arcsin(sin(d*x+c)/(1+cos(d*x+c)))*2^(1/2)*cos(d*x+c)^(1/2)*sec(d*x+c)^(1
/2)/d
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$, Rules used = {4307, 2856, 2853, 222, 2860}

$$\begin{aligned}\int \frac{1}{\sqrt{1+\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx &= \frac{2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sin(c+dx)}{\sqrt{\cos(c+dx)+1}}\right)}{d} \\ &\quad - \frac{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sin(c+dx)}{\cos(c+dx)+1}\right)}{d}\end{aligned}$$

```
[In] Int[1/(Sqrt[1 + Cos[c + d*x]]*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] -((Sqrt[2]*ArcSin[Sin[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[Cos[c + d*x]]*Sqrt[
Sec[c + d*x]])/d) + (2*ArcSin[Sin[c + d*x]/Sqrt[1 + Cos[c + d*x]]]*Sqrt[Cos
[c + d*x]]*Sqrt[Sec[c + d*x]])/d
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2856

```
Int[Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(a_) + (b_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c
 + d*Sin[e + f*x]], x], x] + Dist[(b*c - a*d)/b, Int[1/(Sqrt[a + b*Sin[e +
f*x]]*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2860

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[-Sqrt[2]/(Sqrt[a]*f), Subst[Int[1/Sqrt[1 - x
^2], x], x, b*(Cos[e + f*x]/(a + b*Sin[e + f*x]))], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 - b^2, 0] && EqQ[d, a/b] && GtQ[a, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{1+\cos(c+dx)}}\,dx \\
&= -\left(\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx\right) \\
&\quad + \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{1+\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx
\end{aligned}$$

$$= -\frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, -\frac{\sin(c+dx)}{\sqrt{1+\cos(c+dx)}}\right)}{d} + \frac{\left(\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, -\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d}$$

$$= -\frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d} + \frac{2\arcsin\left(\frac{\sin(c+dx)}{\sqrt{1+\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.55 (sec) , antiderivative size = 171, normalized size of antiderivative = 1.82

$$\int \frac{1}{\sqrt{1+\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx = \frac{i\sqrt{2}e^{-\frac{1}{2}i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\sqrt{1+e^{2i(c+dx)}}\left(-\text{arcsinh}\left(e^{i(c+dx)}\right)+\sqrt{2}\text{arctanh}\left(\frac{-1+e^{i(c+dx)}}{\sqrt{2}\sqrt{1+e^{2i(c+dx)}}}\right)+\text{arctanh}\left(\sqrt{1+\right.\right.}{d\sqrt{1+\cos(c+dx)}}$$

```
[In] Integrate[1/(Sqrt[1 + Cos[c + d*x]]*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (I*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)))]*Sqrt[1 + E^((2*I
)*(c + d*x))]*(-ArcSinh[E^(I*(c + d*x))] + Sqrt[2]*ArcTanh[(-1 + E^(I*(c +
d*x)))/(Sqrt[2]*Sqrt[1 + E^((2*I)*(c + d*x))])] + ArcTanh[Sqrt[1 + E^((2*I)
*(c + d*x))]])*Cos[(c + d*x)/2])/(d*E^((I/2)*(c + d*x))*Sqrt[1 + Cos[c + d*
x]])
```

Maple [A] (verified)

Time = 4.45 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.15

method	result	size
default	$\frac{\sqrt{2+2\cos(dx+c)}\left(\arcsin(\cot(dx+c)-\csc(dx+c))\sqrt{2}+2\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\right)\sqrt{2}}{2d(1+\cos(dx+c))\sqrt{\sec(dx+c)}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$	108

```
[In] int(1/sec(d*x+c)^(1/2)/(1+cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/d*(2+2*cos(d*x+c))^(1/2)*(arcsin(cot(d*x+c)-csc(d*x+c))*2^(1/2)+2*arcta
n(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)))/(1+cos(d*x+c))/sec(d*x+c)^
(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 70, normalized size of antiderivative = 0.74

$$\int \frac{1}{\sqrt{1+\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx = \frac{\sqrt{2}\arctan\left(\frac{\sqrt{2}\sqrt{\cos(dx+c)+1}\sqrt{\cos(dx+c)}}{\sin(dx+c)}\right)-2\arctan\left(\frac{\sqrt{\cos(dx+c)+1}\sqrt{\cos(dx+c)}}{\sin(dx+c)}\right)}{d}$$

```
[In] integrate(1/sec(d*x+c)^(1/2)/(1+cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] (sqrt(2)*arctan(sqrt(2)*sqrt(cos(d*x + c) + 1)*sqrt(cos(d*x + c))/sin(d*x +
 c)) - 2*arctan(sqrt(cos(d*x + c) + 1)*sqrt(cos(d*x + c))/sin(d*x + c)))/d
```

Sympy [F]

$$\int \frac{1}{\sqrt{1+\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos(c+dx)+1}\sqrt{\sec(c+dx)}}\,dx$$

```
[In] integrate(1/sec(d*x+c)**(1/2)/(1+cos(d*x+c))**(1/2),x)
[Out] Integral(1/(sqrt(cos(c + d*x) + 1)*sqrt(sec(c + d*x))), x)
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.60 (sec) , antiderivative size = 689, normalized size of antiderivative = 7.33

$$\int \frac{1}{\sqrt{1+\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx = -\frac{\sqrt{2}\arctan\left(\frac{\left(\left|2e^{(idx+ic)}+2\right|^4+16\cos(dx+c)^4+16\sin(dx+c)^4+8\left(\cos(dx+c)^2-\sin(dx+c)^2-2\cos(dx+c)+1\right)\left|2e^{(idx+ic)}+2\right|^2-64\cos\right.}{}\right.}{}$$

```
[In] integrate(1/sec(d*x+c)^(1/2)/(1+cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] -(sqrt(2)*arctan2(((abs(2*e^(I*d*x + I*c) + 2)^4 + 16*cos(d*x + c)^4 + 16*s
in(d*x + c)^4 + 8*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*ab
s(2*e^(I*d*x + I*c) + 2)^2 - 64*cos(d*x + c)^3 + 32*(cos(d*x + c)^2 - 2*cos
(d*x + c) + 1)*sin(d*x + c)^2 + 96*cos(d*x + c)^2 - 64*cos(d*x + c) + 16)^(
```

```
1/4)*sin(1/2*arctan2(8*(cos(d*x + c) - 1)*sin(d*x + c)/abs(2*e^(I*d*x + I*c
) + 2)^2, (abs(2*e^(I*d*x + I*c) + 2)^2 + 4*cos(d*x + c)^2 - 4*sin(d*x + c)
^2 - 8*cos(d*x + c) + 4)/abs(2*e^(I*d*x + I*c) + 2)^2)) + 2*sin(d*x + c))/a
bs(2*e^(I*d*x + I*c) + 2), ((abs(2*e^(I*d*x + I*c) + 2)^4 + 16*cos(d*x + c)
^4 + 16*sin(d*x + c)^4 + 8*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c
) + 1)*abs(2*e^(I*d*x + I*c) + 2)^2 - 64*cos(d*x + c)^3 + 32*(cos(d*x + c)^
2 - 2*cos(d*x + c) + 1)*sin(d*x + c)^2 + 96*cos(d*x + c)^2 - 64*cos(d*x + c
) + 16)^(1/4)*cos(1/2*arctan2(8*(cos(d*x + c) - 1)*sin(d*x + c)/abs(2*e^(I*
d*x + I*c) + 2)^2, (abs(2*e^(I*d*x + I*c) + 2)^2 + 4*cos(d*x + c)^2 - 4*sin
(d*x + c)^2 - 8*cos(d*x + c) + 4)/abs(2*e^(I*d*x + I*c) + 2)^2)) + 2*cos(d*
x + c) - 2)/abs(2*e^(I*d*x + I*c) + 2)) - arctan2((cos(2*d*x + 2*c)^2 + sin
(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c) + 1)) + sin(d*x + c), (cos(2*d*x + 2*c)^2 + sin(2*d
*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c) + 1)) + cos(d*x + c)))/d
```

Giac [F]

$$\int \frac{1}{\sqrt{1+\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos(dx+c)+1}\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate(1/sec(d*x+c)^(1/2)/(1+cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(cos(d*x + c) + 1)*sqrt(sec(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{1+\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos(c+d\,x)+1}\,\sqrt{\frac{1}{\cos(c+d\,x)}}}\,dx$$

```
[In] int(1/((cos(c + d*x) + 1)^(1/2)*(1/cos(c + d*x))^(1/2)),x)
[Out] int(1/((cos(c + d*x) + 1)^(1/2)*(1/cos(c + d*x))^(1/2)), x)
```

3.366 $\int \frac{1}{\sqrt{1+\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 125

$$\int \frac{1}{\sqrt{1+\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d} - \frac{\arcsin\left(\frac{\sin(c+dx)}{\sqrt{1+\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d} + \frac{\sin(c+dx)}{d\sqrt{1+\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

```
[Out] sin(d*x+c)/d/(1+cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2)-arcsin(sin(d*x+c)/(1+cos
(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+arcsin(sin(d*x+c)/(1+co
s(d*x+c)))*2^(1/2)*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {4307, 2857, 3061, 2860, 222, 2853}

$$\int \frac{1}{\sqrt{1+\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sin(c+dx)}{\cos(c+dx)+1}\right)}{d} - \frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sin(c+dx)}{\sqrt{\cos(c+dx)+1}}\right)}{d} + \frac{\sin(c+dx)}{d\sqrt{\cos(c+dx)+1}\sqrt{\sec(c+dx)}}$$

```
[In] Int[1/(Sqrt[1 + Cos[c + d*x]]*Sec[c + d*x]^(3/2)),x]
```

```
[Out] (Sqrt[2]*ArcSin[Sin[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[Cos[c + d*x]]*Sqrt[Se
c[c + d*x]])/d - (ArcSin[Sin[c + d*x]/Sqrt[1 + Cos[c + d*x]]]*Sqrt[Cos[c +
d*x]]*Sqrt[Sec[c + d*x]])/d + Sin[c + d*x]/(d*Sqrt[1 + Cos[c + d*x]]*Sqrt[S
ec[c + d*x]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2857

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[-2*d*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n - 1)/(f*(2*n - 1)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(b*(2*n - 1))
, Int[((c + d*Sin[e + f*x])^(n - 2)/Sqrt[a + b*Sin[e + f*x]])*Simp[a*c*d -
b*(2*d^2*(n - 1) + c^2*(2*n - 1)) + d*(a*d - b*c*(4*n - 3))*Sin[e + f*x], x
], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
 b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[n, 1] && IntegerQ[2*n]
```

Rule 2860

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[-Sqrt[2]/(Sqrt[a]*f), Subst[Int[1/Sqrt[1 - x
^2], x], x, b*(Cos[e + f*x]/(a + b*Sin[e + f*x]))], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 - b^2, 0] && EqQ[d, a/b] && GtQ[a, 0]
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{1+\cos(c+dx)}}\,dx \\
&= \frac{\sin(c+dx)}{d\sqrt{1+\cos(c+dx)}\sqrt{\sec(c+dx)}} \\
&\quad -\frac{1}{2}\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-1+\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx \\
&= \frac{\sin(c+dx)}{d\sqrt{1+\cos(c+dx)}\sqrt{\sec(c+dx)}} \\
&\quad -\frac{1}{2}\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{1+\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx \\
&\quad +\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}}\,dx \\
&= \frac{\sin(c+dx)}{d\sqrt{1+\cos(c+dx)}\sqrt{\sec(c+dx)}} \\
&\quad +\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, -\frac{\sin(c+dx)}{\sqrt{1+\cos(c+dx)}}\right)}{d} \\
&\quad -\frac{\left(\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, -\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)}{d} \\
&= \frac{\sqrt{2}\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d} \\
&\quad -\frac{\arcsin\left(\frac{\sin(c+dx)}{\sqrt{1+\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d} \\
&\quad +\frac{\sin(c+dx)}{d\sqrt{1+\cos(c+dx)}\sqrt{\sec(c+dx)}}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.66 (sec) , antiderivative size = 257, normalized size of antiderivative = 2.06

$$\int \frac{1}{\sqrt{1+\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx$$
$$= \frac{ie^{-2i(c+dx)}\left(1+e^{i(c+dx)}\right)\left(1-e^{i(c+dx)}+e^{2i(c+dx)}-e^{3i(c+dx)}+e^{i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\operatorname{arcsinh}\left(e^{i(c+dx)}\right)+2\sqrt{2}e\right.}{4d\sqrt{1+\right.}$$

```
[In] Integrate[1/(Sqrt[1 + Cos[c + d*x]]*Sec[c + d*x]^(3/2)),x]
```

```
[Out] ((I/4)*(1 + E^(I*(c + d*x)))*(1 - E^(I*(c + d*x)) + E^((2*I)*(c + d*x)) - E
^((3*I)*(c + d*x)) + E^(I*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*ArcSinh[
E^(I*(c + d*x))] + 2*Sqrt[2]*E^(I*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*
ArcTanh[(1 - E^(I*(c + d*x)))/(Sqrt[2]*Sqrt[1 + E^((2*I)*(c + d*x))])] - E^
(I*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*ArcTanh[Sqrt[1 + E^((2*I)*(c +
d*x))]])*Sqrt[Sec[c + d*x]])/(d*E^((2*I)*(c + d*x))*Sqrt[1 + Cos[c + d*x]])
```

Maple [A] (verified)

Time = 13.54 (sec) , antiderivative size = 133, normalized size of antiderivative = 1.06

method	result	size
default	$-\frac{\left(\arcsin(\cot(dx+c)-\csc(dx+c))\sqrt{2}-\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\right)\sqrt{2+2\cos(dx+c)}\,\sqrt{2}}{2d\sqrt{\sec(dx+c)}\,(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$	133

```
[In] int(1/sec(d*x+c)^(3/2)/(1+cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/d/sec(d*x+c)^(1/2)*(arcsin(cot(d*x+c)-csc(d*x+c))*2^(1/2)-sin(d*x+c)*(
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)))*(2+2*cos(d*x+c))^(1/2)/(1+cos(d*x+c))/(cos(d*x+c)/(1+cos(d*x+c)
))^(1/2)*2^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1+\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx =$$
$$-\frac{\left(\sqrt{2}\cos\left(dx+c\right)+\sqrt{2}\right)\arctan\left(\frac{\sqrt{2}\sqrt{\cos(dx+c)+1}\sqrt{\cos(dx+c)}}{\sin(dx+c)}\right)-\left(\cos\left(dx+c\right)+1\right)\arctan\left(\frac{\sqrt{\cos(dx+c)+1}\sqrt{\cos}}{\sin(dx+c)}\right.}{d\cos\left(dx+c\right)+d}$$

```
[In] integrate(1/sec(d*x+c)^(3/2)/(1+cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] -((sqrt(2)*cos(d*x + c) + sqrt(2))*arctan(sqrt(2)*sqrt(cos(d*x + c) + 1)*sq
rt(cos(d*x + c))/sin(d*x + c)) - (cos(d*x + c) + 1)*arctan(sqrt(cos(d*x + c
) + 1)*sqrt(cos(d*x + c))/sin(d*x + c)) - sqrt(cos(d*x + c) + 1)*sqrt(cos(d
*x + c))*sin(d*x + c))/(d*cos(d*x + c) + d)
```

Sympy [F]

$$\int \frac{1}{\sqrt{1+\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{\sqrt{\cos\left(c+dx\right)+1}\sec^{\frac{3}{2}}\left(c+dx\right)}\,dx$$

```
[In] integrate(1/sec(d*x+c)**(3/2)/(1+cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/(sqrt(cos(c + d*x) + 1)*sec(c + d*x)**(3/2)), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{1+\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{\sqrt{\cos\left(dx+c\right)+1}\sec\left(dx+c\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/sec(d*x+c)^(3/2)/(1+cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(cos(d*x + c) + 1)*sec(d*x + c)^(3/2)), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{1+\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/sec(d*x+c)^(3/2)/(1+cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{1+\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{\sqrt{\cos(c+d\,x)+1}\,\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}\,dx$$

```
[In] int(1/((cos(c + d*x) + 1)^(1/2)*(1/cos(c + d*x))^(3/2)),x)
[Out] int(1/((cos(c + d*x) + 1)^(1/2)*(1/cos(c + d*x))^(3/2)), x)
```

3.367 $\int \frac{\sec^{\frac{7}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 189

$$\int \frac{\sec^{\frac{7}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{\sqrt{a}d} + \frac{26\sqrt{\sec(c+dx)}\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} - \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} + \frac{2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -2/15*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+2/5*sec(d*x+c)^(
5/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)-arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1
/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*2^(1/2)*cos(d*x+c)^(1/2)*sec(d
*x+c)^(1/2)/d/a^(1/2)+26/15*sin(d*x+c)*sec(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^
(1/2)
```

Rubi [A] (verified)

Time = 0.68 (sec) , antiderivative size = 189, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used

$= \{4307, 2858, 3063, 12, 2861, 211\}$

$$\int \frac{\sec^{\frac{7}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$$
$$= -\frac{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d}$$
$$+ \frac{2\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{5d\sqrt{a\cos(c+dx)+a}} - \frac{2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{15d\sqrt{a\cos(c+dx)+a}} + \frac{26\sin(c+dx)\sqrt{\sec(c+dx)}}{15d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sec[c + d*x]^(7/2)/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] -((Sqrt[2]*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a
 + a*Cos[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(Sqrt[a]*d)) +
(26*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(15*d*Sqrt[a + a*Cos[c + d*x]]) - (2*S
ec[c + d*x]^(3/2)*Sin[c + d*x])/(15*d*Sqrt[a + a*Cos[c + d*x]]) + (2*Sec[c
+ d*x]^(5/2)*Sin[c + d*x])/(5*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{a-4a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx}{5a}$$

$$= -\frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} + \frac{2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} - \frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{13a^2}{2}+a^2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx}{15a^2}$$

$$= \frac{26\sqrt{\sec(c+dx)}\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} - \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} + \frac{2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} - \frac{\left(4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{15a^3}{4\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{15a^3}$$

$$= \frac{26\sqrt{\sec(c+dx)}\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} - \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} + \frac{2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} - \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}$$

$$= \frac{26\sqrt{\sec(c+dx)}\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} - \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} + \frac{2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}} + \frac{\left(2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

$$= -\frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{\sqrt{a}d} + \frac{26\sqrt{\sec(c+dx)}\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} - \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d\sqrt{a+a\cos(c+dx)}} + \frac{2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 7.21 (sec) , antiderivative size = 1542, normalized size of antiderivative = 8.16

$$\int \frac{\sec^{\frac{7}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{2\cot\left(\frac{c}{2}+\frac{dx}{2}\right)\csc^6\left(\frac{c}{2}+\frac{dx}{2}\right)\left(\frac{1}{1-2\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}\right)^{7/2}\left(4725\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)-48825\sin^4\left(\frac{c}{2}+\frac{dx}{2}\right)+210105\sin^6\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^(7/2)/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (-2*Cot[c/2 + (d*x)/2]*Csc[c/2 + (d*x)/2]^6*((1 - 2*Sin[c/2 + (d*x)/2]^2)^(
-1))^(7/2)*(4725*Sin[c/2 + (d*x)/2]^2 - 48825*Sin[c/2 + (d*x)/2]^4 + 210105
*Sin[c/2 + (d*x)/2]^6 - 486630*Sin[c/2 + (d*x)/2]^8 + 655812*Sin[c/2 + (d*x
)/2]^10 - 710*Hypergeometric2F1[2, 9/2, 11/2, Sin[c/2 + (d*x)/2]^2/(-1 + 2*
Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^10 - 40*Cos[(c + d*x)/2]^6*Hyperg
eometricPFQ[{2, 2, 2, 9/2}, {1, 1, 11/2}, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[
c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^10 - 518760*Sin[c/2 + (d*x)/2]^12 + 1
770*Hypergeometric2F1[2, 9/2, 11/2, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 +
(d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^12 + 226656*Sin[c/2 + (d*x)/2]^14 - 1500*Hy
pergeometric2F1[2, 9/2, 11/2, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/
2]^2)]*Sin[c/2 + (d*x)/2]^14 - 42048*Sin[c/2 + (d*x)/2]^16 + 440*Hypergeome
tric2F1[2, 9/2, 11/2, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*S
in[c/2 + (d*x)/2]^16 + 4725*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c
/2 + (d*x)/2]^2)]]*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]
 - 56700*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*
Sin[c/2 + (d*x)/2]^2*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2
```

```
)] + 291060*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)
]]*Sin[c/2 + (d*x)/2]^4*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2
]^2)] - 833760*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]
^2)]]*Sin[c/2 + (d*x)/2]^6*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x
)/2]^2)] + 1458000*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x
)/2]^2)]]*Sin[c/2 + (d*x)/2]^8*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 +
(d*x)/2]^2)] - 1598400*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 +
(d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^10*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c
/2 + (d*x)/2]^2)] + 1080000*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c
/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^12*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*
Sin[c/2 + (d*x)/2]^2)] - 414720*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*S
in[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^14*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1
+ 2*Sin[c/2 + (d*x)/2]^2)] + 69120*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 +
2*Sin[c/2 + (d*x)/2]^2)]]*Sin[c/2 + (d*x)/2]^16*Sqrt[Sin[c/2 + (d*x)/2]^2/(
-1 + 2*Sin[c/2 + (d*x)/2]^2)] + 60*Cos[(c + d*x)/2]^4*HypergeometricPFQ[{2,
 2, 9/2}, {1, 11/2}, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Si
n[c/2 + (d*x)/2]^10*(-5 + 4*Sin[c/2 + (d*x)/2]^2)))/(675*d*Sqrt[a*(1 + Cos[
c + d*x])]*(-1 + 2*Sin[c/2 + (d*x)/2]^2))
```

Maple [A] (verified)

Time = 6.08 (sec) , antiderivative size = 188, normalized size of antiderivative = 0.99

method	result
default	$\frac{\left(\sec^{\frac{7}{2}}(dx+c)\right)\sqrt{a(1+\cos(dx+c))}\left(15\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\arcsin(\cot(dx+c)-\csc(dx+c))\left(\cos^4(dx+c)\right)+15\left(\cos^3(dx+c)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\text{a}}{15d(1+\cos(dx-}$

```
[In] int(sec(d*x+c)^(7/2)/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/15/d*sec(d*x+c)^(7/2)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))*(15*(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^4+15*co
s(d*x+c)^3*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))+
13*2^(1/2)*cos(d*x+c)^3*sin(d*x+c)-2^(1/2)*cos(d*x+c)^2*sin(d*x+c)+3*sin(d*
x+c)*cos(d*x+c)*2^(1/2))*2^(1/2)/a
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 141, normalized size of antiderivative = 0.75

$$\int \frac{\sec^{\frac{7}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\frac{15\sqrt{2}\left(a\cos(dx+c)^3+a\cos(dx+c)^2\right)\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)}{\sqrt{a}}+\frac{2\sqrt{a\cos(dx+c)+a}\left(13\cos(dx+c)^2-\cos(dx+c)+3\right)\sin(dx+c)}{\sqrt{\cos(dx+c)}}}{15\left(ad\cos\left(dx+c\right)^3+ad\cos\left(dx+c\right)^2\right)}$$

```
[In] integrate(sec(d*x+c)^(7/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/15*(15*sqrt(2)*(a*cos(d*x + c)^3 + a*cos(d*x + c)^2)*arctan(sqrt(2)*sqrt(
a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c)))/sqrt(a) + 2*
sqrt(a*cos(d*x + c) + a)*(13*cos(d*x + c)^2 - cos(d*x + c) + 3)*sin(d*x + c
)/sqrt(cos(d*x + c)))/(a*d*cos(d*x + c)^3 + a*d*cos(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{7}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(7/2)/(a+a*cos(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.60 (sec) , antiderivative size = 1006, normalized size of antiderivative = 5.32

$$\int \frac{\sec^{\frac{7}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate(sec(d*x+c)^(7/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -1/15*(15*(sqrt(2)*cos(2*d*x + 2*c)^2 + sqrt(2)*sin(2*d*x + 2*c)^2 + 2*sqrt
(2)*cos(2*d*x + 2*c) + sqrt(2))*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 +
2*cos(2*d*x + 2*c) + 1)^(1/4)*arctan2(((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*
x + c)^4 + sin(d*x + c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x
+ c) + 1)*abs(e^(I*d*x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2
 - 2*cos(d*x + c) + 1)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) +
 1)^(1/4)*sin(1/2*arctan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x +
I*c) + 1)^2, (abs(e^(I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2
- 2*cos(d*x + c) + 1)/abs(e^(I*d*x + I*c) + 1)^2)) + sin(d*x + c))/abs(e^(I
*d*x + I*c) + 1), ((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x +
 c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d
*x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) +
1)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*sqrt(a)*co
s(1/2*arctan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2,
 (abs(e^(I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x
+ c) + 1)/abs(e^(I*d*x + I*c) + 1)^2)) + sqrt(a)*cos(d*x + c) - sqrt(a))/(s
qrt(a)*abs(e^(I*d*x + I*c) + 1))) - 26*(cos(2*d*x + 2*c)^2*sin(d*x + c) + s
```

```
in(2*d*x + 2*c)^2*sin(d*x + c) + 2*cos(2*d*x + 2*c)*sin(d*x + c) + sin(d*x
+ c))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 24*cos(5/2
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x + c) - 24*(cos(d*
x + c) - 1)*sin(5/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 2*((
13*cos(d*x + c) - 15)*cos(2*d*x + 2*c)^2 + (13*cos(d*x + c) - 15)*sin(2*d*x
 + 2*c)^2 + 2*(13*cos(d*x + c) - 15)*cos(2*d*x + 2*c) + 13*cos(d*x + c) - 1
5)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 4*sqrt(cos(2*
d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*(7*cos(3/2*arct
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x + c) - (7*cos(d*x + c)
 - 5)*sin(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))))/((cos(2*d*
x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(5/4)*sqrt(a)*d)
```

Giac [F]

$$\int \frac{\sec^{\frac{7}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx=\int \frac{\sec\left(dx+c\right)^{\frac{7}{2}}}{\sqrt{a\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(sec(d*x+c)^(7/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(7/2)/sqrt(a*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{7}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx=\int \frac{{\left(\frac{1}{\cos\left(c+d\,x\right)}\right)}^{7/2}}{\sqrt{a+a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int((1/cos(c + d*x))^(7/2)/(a + a*cos(c + d*x))^(1/2),x)
[Out] int((1/cos(c + d*x))^(7/2)/(a + a*cos(c + d*x))^(1/2), x)
```

3.368 $\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 151

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{\sqrt{a}d} - \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 2/3*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)+arctan(1/2*sin(d*x
+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*2^(1/2)*cos(d*
x+c)^(1/2)*sec(d*x+c)^(1/2)/d/a^(1/2)-2/3*sin(d*x+c)*sec(d*x+c)^(1/2)/d/(a+
a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {4307, 2858, 3063, 12, 2861, 211}

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d} + \frac{2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3d\sqrt{a\cos(c+dx)+a}} - \frac{2\sin(c+dx)\sqrt{\sec(c+dx)}}{3d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sec[c + d*x]^(5/2)/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (Sqrt[2]*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a +
 a*Cos[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(Sqrt[a]*d) - (2*
Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(3*d*Sqrt[a + a*Cos[c + d*x]]) + (2*Sec[c
+ d*x]^(3/2)*Sin[c + d*x])/(3*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{a-2a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx}{3a}$$

$$= -\frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} - \frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int-\frac{3a^2}{2\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{3a^2}$$

$$= -\frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= -\frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} - \frac{\left(2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int\frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

$$= \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{\sqrt{a}d} - \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}} + \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 6.46 (sec) , antiderivative size = 475, normalized size of antiderivative = 3.15

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{2\cot\left(\frac{c}{2}+\frac{dx}{2}\right)\csc^4\left(\frac{c}{2}+\frac{dx}{2}\right)\left(\frac{1}{1-2\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}\right)^{7/2}\left(12\cos^4\left(\frac{1}{2}(c+dx)\right)\ {}_3F_2\left(2,2,\frac{7}{2};1,\frac{9}{2};\frac{\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}{-1+2\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}\right)\right.}{}$$

[In] Integrate[Sec[c + d*x]^(5/2)/Sqrt[a + a*Cos[c + d*x]],x]

[Out] (-2*Cot[c/2 + (d*x)/2]*Csc[c/2 + (d*x)/2]^4*((1 - 2*Sin[c/2 + (d*x)/2]^2)^(-1))^(7/2)*(12*Cos[(c + d*x)/2]^4*HypergeometricPFQ[{2, 2, 7/2}, {1, 9/2}, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^8 + 12*Hypergeometric2F1[2, 7/2, 9/2, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^8*(4 - 7*Sin[c/2 + (d*x)/2]^2 + 3*Sin[c/2 + (d*x)/2]^4) + 7*(1 - 2*Sin[c/2 + (d*x)/2]^2)^3*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(15 - 20*Sin[c/2 + (d*x)/2]^2 + 8*Sin[c/2 + (d*x)/2]^4)*(ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*(3 - 6*Sin[c/2 + (d*x)/2]^2) + Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(-3 + 7*Sin[c/2 + (d*x)/2]^2))))/(63*d*Sqrt[a*(1 + Cos[c + d*x])])

Maple [A] (verified)

Time = 6.80 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.11

method	result
default	$-\frac{\left(\sec^{\frac{5}{2}}(dx+c)\right)\sqrt{a(1+\cos(dx+c))}\left(3\left(\cos^3(dx+c)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\arcsin(\cot(dx+c)-\csc(dx+c))+\sqrt{2}\left(\cos^2(dx+c)\right)\sin(dx+c)+3\right.}{3d(1+\cos(dx+c))a}$

[In] int(sec(d*x+c)^(5/2)/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)

[Out] -1/3/d*sec(d*x+c)^(5/2)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))*(3*cos(d*x+c)^3*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))+2^(1/2)*cos(d*x+c)^2*sin(d*x+c)+3*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*arcsin(cot(d*x+c)-csc(d*x+c))-sin(d*x+c)*cos(d*x+c)*2^(1/2))*2^(1/2)/a

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 125, normalized size of antiderivative = 0.83

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{\frac{3\sqrt{2}\left(a\cos(dx+c)^2+a\cos(dx+c)\right)\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)}{\sqrt{a}}+\frac{2\sqrt{a\cos(dx+c)+a}(\cos(dx+c)-1)\sin(dx+c)}{\sqrt{\cos(dx+c)}}}{3\left(ad\cos(dx+c)^2+ad\cos(dx+c)\right)}$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] -1/3*(3*sqrt(2)*(a*cos(d*x + c)^2 + a*cos(d*x + c))*arctan(sqrt(2)*sqrt(a*c
os(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c)))/sqrt(a) + 2*sqr
t(a*cos(d*x + c) + a)*(cos(d*x + c) - 1)*sin(d*x + c)/sqrt(cos(d*x + c)))/(
a*d*cos(d*x + c)^2 + a*d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(5/2)/(a+a*cos(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.60 (sec) , antiderivative size = 818, normalized size of antiderivative = 5.42

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/3*(3*(sqrt(2)*cos(2*d*x + 2*c)^2 + sqrt(2)*sin(2*d*x + 2*c)^2 + 2*sqrt(2)
*cos(2*d*x + 2*c) + sqrt(2))*arctan2(((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x
 + c)^4 + sin(d*x + c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x +
 c) + 1)*abs(e^(I*d*x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2
- 2*cos(d*x + c) + 1)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) +
```

```
1)^(1/4)*sin(1/2*arctan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I
*c) + 1)^2, (abs(e^(I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 -
 2*cos(d*x + c) + 1)/abs(e^(I*d*x + I*c) + 1)^2)) + sin(d*x + c))/abs(e^(I*
d*x + I*c) + 1), ((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x +
c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d*
x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) + 1
)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*sqrt(a)*cos
(1/2*arctan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2,
(abs(e^(I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x +
 c) + 1)/abs(e^(I*d*x + I*c) + 1)^2)) + sqrt(a)*cos(d*x + c) - sqrt(a))/(sq
rt(a)*abs(e^(I*d*x + I*c) + 1))) - 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)
^2 + 2*cos(2*d*x + 2*c) + 1)^(3/4)*(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c) + 1))*sin(d*x + c) - (cos(d*x + c) - 3)*sin(1/2*arctan2(sin(2*d
*x + 2*c), cos(2*d*x + 2*c) + 1))) - 4*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*
c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*(cos(3/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c) + 1))*sin(d*x + c) - (cos(d*x + c) + 1)*sin(3/2*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c) + 1))))/((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*
c)^2 + 2*cos(2*d*x + 2*c) + 1)*sqrt(a)*d)
```

Giac [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx=\int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\sqrt{a\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(5/2)/sqrt(a*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx=\int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}}{\sqrt{a+a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)/(a + a*cos(c + d*x))^(1/2),x)
[Out] int((1/cos(c + d*x))^(5/2)/(a + a*cos(c + d*x))^(1/2), x)
```

3.369 $\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 113

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{\sqrt{a}d} + \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1
/2))*2^(1/2)*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d/a^(1/2)+2*sin(d*x+c)*sec(d
*x+c)^(1/2)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 113, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4307, 2858, 12, 2861, 211}

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{2\sin(c+dx)\sqrt{\sec(c+dx)}}{d\sqrt{a\cos(c+dx)+a}} - \frac{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d}$$

```
[In] Int[Sec[c + d*x]^(3/2)/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] -((Sqrt[2]*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a
 + a*Cos[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(Sqrt[a]*d)) +
(2*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2858

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n + 1)/(f*(n + 1)*(c^2 - d^2)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(2*
b*(n + 1)*(c^2 - d^2)), Int[(c + d*Sin[e + f*x])^(n + 1)*(Simp[a*d - 2*b*c*
(n + 1) + b*d*(2*n + 3)*Sin[e + f*x], x]/Sqrt[a + b*Sin[e + f*x]]), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &
& NeQ[c^2 - d^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{a}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{a}$$

$$= \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}} - \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}} + \frac{\left(2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\mathrm{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

$$= -\frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{\sqrt{a}d} + \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 1.54 (sec) , antiderivative size = 180, normalized size of antiderivative = 1.59

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{2\cos\left(\frac{1}{2}(c+dx)\right)\sec^{\frac{3}{2}}(c+dx)\sin\left(\frac{1}{2}(c+dx)\right)\left(\frac{1}{2}\cos(c+dx)(2+\cos(c+dx))\csc^4\left(\frac{1}{2}(c+dx)\right)\left(1-\cos(c\right.\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^(3/2)/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (2*Cos[(c + d*x)/2]*Sec[c + d*x]^(3/2)*Sin[(c + d*x)/2]*((Cos[c + d*x]*(2 +
 Cos[c + d*x])*Csc[(c + d*x)/2]^4*(1 - Cos[c + d*x] + ArcTanh[Sqrt[-(Sec[c
+ d*x]*Sin[(c + d*x)/2]^2)]]*Cos[c + d*x]*Sqrt[2 - 2*Sec[c + d*x]]))/2 - (H
ypergeometric2F1[2, 5/2, 7/2, -(Sec[c + d*x]*Sin[(c + d*x)/2]^2)]*Sin[c + d
*x]*Tan[c + d*x])/10))/(d*Sqrt[a*(1 + Cos[c + d*x])])
```

Maple [A] (verified)

Time = 6.07 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.20

method	result
default	$\frac{\left(\sec^{\frac{3}{2}}(dx+c)\right)\left(\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \arcsin(\cot(dx+c)-\csc(dx+c))+\sqrt{2}\ \sin(dx+c)+\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \arcsin(\cot(dx+c)-\csc(dx-}{d(1+\cos(dx+c))a}$

[In] int(sec(d*x+c)^(3/2)/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)

[Out] 1/d*sec(d*x+c)^(3/2)*(cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))+2^(1/2)*sin(d*x+c)+(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c)))*cos(d*x+c)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))*2^(1/2)/a

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 98, normalized size of antiderivative = 0.87

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\frac{\sqrt{2}(a\cos(dx+c)+a)\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)}{\sqrt{a}}+\frac{2\sqrt{a\cos(dx+c)+a}\sin(dx+c)}{\sqrt{\cos(dx+c)}}}{ad\cos(dx+c)+ad}$$

[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] (sqrt(2)*(a*cos(d*x + c) + a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c)))/sqrt(a) + 2*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/sqrt(cos(d*x + c)))/(a*d*cos(d*x + c) + a*d)

Sympy [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a(\cos(c+dx)+1)}}\,dx$$

[In] integrate(sec(d*x+c)**(3/2)/(a+a*cos(d*x+c))**(1/2),x)

[Out] Integral(sec(c + d*x)**(3/2)/sqrt(a*(cos(c + d*x) + 1)), x)

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.58 (sec) , antiderivative size = 665, normalized size of antiderivative = 5.88

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= \frac{2\cos\left(\frac{1}{2}\arctan\left(\sin\left(2\,dx+2\,c\right),\cos\left(2\,dx+2\,c\right)+1\right)\right)\sin\left(dx+c\right)-2\left(\cos\left(dx+c\right)-1\right)\sin\left(\frac{1}{2}\arctan\left(\sin\right.\right.}{}$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] (2*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))*sin(d*x + c) -
2*(cos(d*x + c) - 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1
)) - sqrt(2)*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c)
+ 1)^(1/4)*arctan2(((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x
+ c)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*
d*x + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) +
 1)*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*sin(1/2*a
rctan2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e
^(I*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) +
1)/abs(e^(I*d*x + I*c) + 1)^2)) + sin(d*x + c))/abs(e^(I*d*x + I*c) + 1), (
(abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x + c)^4 + 2*(cos(d*x
+ c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d*x + I*c) + 1)^2 -
4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) + 1)*sin(d*x + c)^2 +
 6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*sqrt(a)*cos(1/2*arctan2(2*(co
s(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e^(I*d*x + I*
c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)/abs(e^(I*
d*x + I*c) + 1)^2)) + sqrt(a)*cos(d*x + c) - sqrt(a))/(sqrt(a)*abs(e^(I*d*x
 + I*c) + 1))))/((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2
*c) + 1)^(1/4)*sqrt(a)*d)
```

Giac [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{3}{2}}}{\sqrt{a\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^(3/2)/sqrt(a*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}{\sqrt{a+a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)/(a + a*cos(c + d*x))^(1/2),x)
[Out] int((1/cos(c + d*x))^(3/2)/(a + a*cos(c + d*x))^(1/2), x)
```

3.370 $\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 56

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sqrt{\sec(c+dx)}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d}$$

```
[Out] arctan(1/2*sin(d*x+c)*a^(1/2)*sec(d*x+c)^(1/2)*2^(1/2)/(a+a*cos(d*x+c))^(1/
2))*2^(1/2)/d/a^(1/2)
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 76, normalized size of antiderivative = 1.36, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.120$, Rules used = {4307, 2861, 211}

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d}$$

```
[In] Int[Sqrt[Sec[c + d*x]]/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (Sqrt[2]*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a +
 a*Cos[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(Sqrt[a]*d)
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx$$

$$= -\frac{\left(2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

$$= \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{\sqrt{a}d}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 71, normalized size of antiderivative = 1.27

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{2\arctan\left(\frac{\sin\left(\frac{1}{2}(c+dx)\right)}{\sqrt{\cos(c+dx)}}\right)\cos\left(\frac{1}{2}(c+dx)\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{d\sqrt{a(1+\cos(c+dx))}}$$

```
[In] Integrate[Sqrt[Sec[c + d*x]]/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (2*ArcTan[Sin[(c + d*x)/2]/Sqrt[Cos[c + d*x]]]*Cos[(c + d*x)/2]*Sqrt[Cos[c
+ d*x]]*Sqrt[Sec[c + d*x]])/(d*Sqrt[a*(1 + Cos[c + d*x])])
```

Maple [A] (verified)

Time = 6.87 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.48

method	result	size
default	$-\frac{\arcsin(\cot(dx+c)-\csc(dx+c))\left(\sqrt{\sec}(dx+c)\right)\sqrt{a(1+\cos(dx+c))}\,\cos(dx+c)\sqrt{2}}{d(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,a}$	83

[In] int(sec(d*x+c)^(1/2)/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)

[Out] -1/d*arcsin(cot(d*x+c)-csc(d*x+c))*sec(d*x+c)^(1/2)*(a*(1+cos(d*x+c)))^(1/2)*cos(d*x+c)/(1+cos(d*x+c))/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)/a

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 144, normalized size of antiderivative = 2.57

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{a+a\cos(c+dx)}}\,dx = \left[\frac{\sqrt{2}\sqrt{-\frac{1}{a}}\log\left(-\frac{2\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{-\frac{1}{a}}\sqrt{\cos(dx+c)}\sin(dx+c)-3\cos(dx+c)^2-2\cos(dx+c)+1}{\cos(dx+c)^2+2\cos(dx+c)+1}\right)}{2\,d}, -\frac{\sqrt{2}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)}{\sqrt{a}d}\right]$$

[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] [1/2*sqrt(2)*sqrt(-1/a)*log(-(2*sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(-1/a)*sqrt(cos(d*x + c))*sin(d*x + c) - 3*cos(d*x + c)^2 - 2*cos(d*x + c) + 1)/(cos(d*x + c)^2 + 2*cos(d*x + c) + 1))/d, -sqrt(2)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c)))/(sqrt(a)*d)]

Sympy [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\sqrt{\sec{(c+dx)}}}{\sqrt{a\left(\cos{(c+dx)}+1\right)}}\,dx$$

```
[In] integrate(sec(d*x+c)**(1/2)/(a+a*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(sec(c + d*x))/sqrt(a*(cos(c + d*x) + 1)), x)
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.63 (sec) , antiderivative size = 522, normalized size of antiderivative = 9.32

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{\sqrt{2}\arctan\left(\frac{\left(\left|e^{(i\,dx+i\,c)}+1\right|^4+\cos(dx+c)^4+\sin(dx+c)^4+2\left(\cos(dx+c)^2-\sin(dx+c)^2-2\,\cos(dx+c)+1\right)\left|e^{(i\,dx+i\,c)}+1\right|^2-4\,\cos(dx+c)^3+2\,\left(\cdots\right.}{\cdots}\right.}{\cdots}$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] sqrt(2)*arctan2(((abs(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x + c
)^4 + 2*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d*x
 + I*c) + 1)^2 - 4*cos(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) + 1)
*sin(d*x + c)^2 + 6*cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*sin(1/2*arct
an2(2*(cos(d*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e^(I
*d*x + I*c) + 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)/
abs(e^(I*d*x + I*c) + 1)^2)) + sin(d*x + c))/abs(e^(I*d*x + I*c) + 1), ((ab
s(e^(I*d*x + I*c) + 1)^4 + cos(d*x + c)^4 + sin(d*x + c)^4 + 2*(cos(d*x + c
)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)*abs(e^(I*d*x + I*c) + 1)^2 - 4*c
os(d*x + c)^3 + 2*(cos(d*x + c)^2 - 2*cos(d*x + c) + 1)*sin(d*x + c)^2 + 6*
cos(d*x + c)^2 - 4*cos(d*x + c) + 1)^(1/4)*sqrt(a)*cos(1/2*arctan2(2*(cos(d
*x + c) - 1)*sin(d*x + c)/abs(e^(I*d*x + I*c) + 1)^2, (abs(e^(I*d*x + I*c)
+ 1)^2 + cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c) + 1)/abs(e^(I*d*x
 + I*c) + 1)^2)) + sqrt(a)*cos(d*x + c) - sqrt(a))/(sqrt(a)*abs(e^(I*d*x +
I*c) + 1)))/(sqrt(a)*d)
```

Giac [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\sqrt{\sec\left(dx+c\right)}}{\sqrt{a\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(sec(d*x + c))/sqrt(a*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{a+a\cos(c+dx)}}\,dx = \int \frac{\sqrt{\frac{1}{\cos(c+d\,x)}}}{\sqrt{a+a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)/(a + a*cos(c + d*x))^(1/2),x)
[Out] int((1/cos(c + d*x))^(1/2)/(a + a*cos(c + d*x))^(1/2), x)
```

3.371 $\int \frac{1}{\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 105

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx = \frac{2\arctan\left(\frac{\sqrt{a}\sqrt{\sec(c+dx)}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d} - \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sqrt{\sec(c+dx)}\sin(c+dx)}{\sqrt{2}\sqrt{a+a\cos(c+dx)}}\right)}{\sqrt{a}d}$$

```
[Out] 2*arctan(sin(d*x+c)*a^(1/2)*sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))/d/a^(1
/2)-arctan(1/2*sin(d*x+c)*a^(1/2)*sec(d*x+c)^(1/2)*2^(1/2)/(a+a*cos(d*x+c))
^(1/2))*2^(1/2)/d/a^(1/2)
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.29, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {4307, 2856, 2853, 222, 2861, 211}

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx = \frac{2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d} - \frac{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d}$$

```
[In] Int[1/(Sqrt[a + a*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (2*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[Cos[c + d*x
]]*Sqrt[Sec[c + d*x]])/(Sqrt[a]*d) - (Sqrt[2]*ArcTan[(Sqrt[a]*Sin[c + d*x])
/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]])]*Sqrt[Cos[c + d*x]]*
Sqrt[Sec[c + d*x]])/(Sqrt[a]*d)
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2856

```
Int[Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(a_) + (b_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c
 + d*Sin[e + f*x]], x], x] + Dist[(b*c - a*d)/b, Int[1/(Sqrt[a + b*Sin[e +
f*x]]*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{\cos(c+dx)}}{\sqrt{a+a\cos(c+dx)}}\,dx$$
$$= -\left(\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx\right) + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx}{a}$$
$$= -\frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int\frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{ad} + \frac{\left(2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int\frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{d}$$
$$= \frac{2\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{\sqrt{a}d} - \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{\sqrt{a}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.34 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.65

$$\int\frac{1}{\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx = \frac{i\sqrt{2}e^{-\frac{1}{2}i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\sqrt{1+e^{2i(c+dx)}}\left(-\text{arcsinh}\left(e^{i(c+dx)}\right)+\sqrt{2}\text{arctanh}\left(\frac{-1+e^{i(c+dx)}}{\sqrt{2}\sqrt{1+e^{2i(c+dx)}}}\right)+\text{arctanh}\left(\sqrt{1\right.\right.}{d\sqrt{a(1+\cos(c+dx))}}$$

```
[In] Integrate[1/(Sqrt[a + a*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (I*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)))]*Sqrt[1 + E^((2*I
)*(c + d*x))]*(-ArcSinh[E^(I*(c + d*x))] + Sqrt[2]*ArcTanh[(-1 + E^(I*(c +
d*x)))/(Sqrt[2]*Sqrt[1 + E^((2*I)*(c + d*x))])] + ArcTanh[Sqrt[1 + E^((2*I)
*(c + d*x))]])*Cos[(c + d*x)/2])/(d*E^((I/2)*(c + d*x))*Sqrt[a*(1 + Cos[c +
 d*x])])
```

Maple [A] (verified)

Time = 3.98 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.03

method	result	size
default	$\frac{\sqrt{a(1+\cos(dx+c))}\left(\sqrt{2}\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)+\arcsin(\cot(dx+c)-\csc(dx+c))\right)\sqrt{2}}{d(1+\cos(dx+c))\sqrt{\sec(dx+c)}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,a}$	108

```
[In] int(1/sec(d*x+c)^(1/2)/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a*(1+cos(d*x+c)))^(1/2)*(2^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2))+arcsin(cot(d*x+c)-csc(d*x+c)))/(1+cos(d*x+c))/sec(d*x+c)^(1
/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)/a
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.85

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx = \frac{\sqrt{2}\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-2\sqrt{a}\arctan\left(\frac{\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)}{ad}$$

```
[In] integrate(1/sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] (sqrt(2)*sqrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))
/(sqrt(a)*sin(d*x + c))) - 2*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(c
os(d*x + c))/(sqrt(a)*sin(d*x + c))))/(a*d)
```

Sympy [F]

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{\sqrt{a\left(\cos\left(c+dx\right)+1\right)}\sqrt{\sec\left(c+dx\right)}}\,dx$$

```
[In] integrate(1/sec(d*x+c)**(1/2)/(a+a*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/(sqrt(a*(cos(c + d*x) + 1))*sqrt(sec(c + d*x))), x)
```

Maxima [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.60 (sec) , antiderivative size = 698, normalized size of antiderivative = 6.65

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx =$$

$$-\frac{\sqrt{2}\sqrt{a}\arctan\left(\frac{\left(\left|2\,e^{(i\,dx+i\,c)}+2\right|^{4}+16\,\cos(dx+c)^{4}+16\,\sin(dx+c)^{4}+8\,\left(\cos(dx+c)^{2}-\sin(dx+c)^{2}-2\,\cos(dx+c)+1\right)\left|2\,e^{(i\,dx+i\,c)}+2\right|^{2}-6\cdots}{\cdots}\right.}{\cdots}$$

```
[In] integrate(1/sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -(sqrt(2)*sqrt(a)*arctan2(((abs(2*e^(I*d*x + I*c) + 2)^4 + 16*cos(d*x + c)^
4 + 16*sin(d*x + c)^4 + 8*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos(d*x + c)
 + 1)*abs(2*e^(I*d*x + I*c) + 2)^2 - 64*cos(d*x + c)^3 + 32*(cos(d*x + c)^2
 - 2*cos(d*x + c) + 1)*sin(d*x + c)^2 + 96*cos(d*x + c)^2 - 64*cos(d*x + c)
 + 16)^(1/4)*sin(1/2*arctan2(8*(cos(d*x + c) - 1)*sin(d*x + c)/abs(2*e^(I*d
*x + I*c) + 2)^2, (abs(2*e^(I*d*x + I*c) + 2)^2 + 4*cos(d*x + c)^2 - 4*sin(
d*x + c)^2 - 8*cos(d*x + c) + 4)/abs(2*e^(I*d*x + I*c) + 2)^2)) + 2*sin(d*x
 + c))/abs(2*e^(I*d*x + I*c) + 2), ((abs(2*e^(I*d*x + I*c) + 2)^4 + 16*cos(
d*x + c)^4 + 16*sin(d*x + c)^4 + 8*(cos(d*x + c)^2 - sin(d*x + c)^2 - 2*cos
(d*x + c) + 1)*abs(2*e^(I*d*x + I*c) + 2)^2 - 64*cos(d*x + c)^3 + 32*(cos(d
*x + c)^2 - 2*cos(d*x + c) + 1)*sin(d*x + c)^2 + 96*cos(d*x + c)^2 - 64*cos
(d*x + c) + 16)^(1/4)*cos(1/2*arctan2(8*(cos(d*x + c) - 1)*sin(d*x + c)/abs
(2*e^(I*d*x + I*c) + 2)^2, (abs(2*e^(I*d*x + I*c) + 2)^2 + 4*cos(d*x + c)^2
 - 4*sin(d*x + c)^2 - 8*cos(d*x + c) + 4)/abs(2*e^(I*d*x + I*c) + 2)^2)) +
2*cos(d*x + c) - 2)/abs(2*e^(I*d*x + I*c) + 2)) - sqrt(a)*arctan2((cos(2*d*
x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + sin(d*x + c), (cos(2*d*x +
2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2
(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + cos(d*x + c)))/(a*d)
```

Giac [F]

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{\sqrt{a\cos\left(dx+c\right)+a}\sqrt{\sec\left(dx+c\right)}}\,dx$$

```
[In] integrate(1/sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a*cos(d*x + c) + a)*sqrt(sec(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{\sqrt{\frac{1}{\cos(c+d\,x)}}\,\sqrt{a+a\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^(1/2)),x)
[Out] int(1/((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^(1/2)), x)
```

3.372 $\int \frac{1}{\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 168

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx = -\frac{\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{\sqrt{a}d} + \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{\sqrt{a}d} + \frac{\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

```
[Out] sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2)-arcsin(sin(d*x+c)*a^(1
/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d/a^(1/2)+arc
tan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))
*2^(1/2)*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d/a^(1/2)
```

Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used

$= \{4307, 2857, 3061, 2861, 211, 2853, 222\}$

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx$$
$$= -\frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d}$$
$$+ \frac{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{\sqrt{a}d}$$
$$+ \frac{\sin(c+dx)}{d\sqrt{\sec(c+dx)}\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[1/(Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x]^(3/2)),x]
```

```
[Out] -((ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[Cos[c + d*x
]]*Sqrt[Sec[c + d*x]])/(Sqrt[a]*d)) + (Sqrt[2]*ArcTan[(Sqrt[a]*Sin[c + d*x]
)/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]])]*Sqrt[Cos[c + d*x]]
*Sqrt[Sec[c + d*x]])/(Sqrt[a]*d) + Sin[c + d*x]/(d*Sqrt[a + a*Cos[c + d*x]]
*Sqrt[Sec[c + d*x]])
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2857

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/Sqrt[(a_) + (b_.)*sin[(e_.
) + (f_.)*(x_)]], x_Symbol] :> Simp[-2*d*Cos[e + f*x]*((c + d*Sin[e + f*x])
^(n - 1)/(f*(2*n - 1)*Sqrt[a + b*Sin[e + f*x]])), x] - Dist[1/(b*(2*n - 1))
, Int[((c + d*Sin[e + f*x])^(n - 2)/Sqrt[a + b*Sin[e + f*x]])*Simp[a*c*d -
b*(2*d^2*(n - 1) + c^2*(2*n - 1)) + d*(a*d - b*c*(4*n - 3))*Sin[e + f*x], x
], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 -
 b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[n, 1] && IntegerQ[2*n]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx \\
&= \frac{\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} \\
&\quad - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-a+a\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{2a} \\
&= \frac{\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} \\
&\quad + \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx \\
&\quad - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx}{2a}
\end{aligned}
$$

$$= \frac{\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{ad} - \frac{\left(2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{d}$$

$$= -\frac{\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{\sqrt{a}d} + \frac{\sqrt{2}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{\sqrt{a}d} + \frac{\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.42 (sec) , antiderivative size = 259, normalized size of antiderivative = 1.54

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{ie^{-2i(c+dx)}\left(1+e^{i(c+dx)}\right)\left(1-e^{i(c+dx)}+e^{2i(c+dx)}-e^{3i(c+dx)}+e^{i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\text{arcsinh}\left(e^{i(c+dx)}\right)+2\sqrt{2}e\right.}{4d\sqrt{a(1+}}$$

```
[In] Integrate[1/(Sqrt[a + a*Cos[c + d*x]]*Sec[c + d*x]^(3/2)),x]
```

```
[Out] ((I/4)*(1 + E^(I*(c + d*x)))*(1 - E^(I*(c + d*x)) + E^((2*I)*(c + d*x)) - E
^((3*I)*(c + d*x)) + E^(I*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*ArcSinh[
E^(I*(c + d*x))] + 2*Sqrt[2]*E^(I*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*
ArcTanh[(1 - E^(I*(c + d*x)))/(Sqrt[2]*Sqrt[1 + E^((2*I)*(c + d*x))])] - E^
(I*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*ArcTanh[Sqrt[1 + E^((2*I)*(c +
d*x))]])*Sqrt[Sec[c + d*x]])/(d*E^((2*I)*(c + d*x))*Sqrt[a*(1 + Cos[c + d*x
])])
```

Maple [A] (verified)

Time = 13.82 (sec) , antiderivative size = 141, normalized size of antiderivative = 0.84

method	result
default	$-\frac{\left(-\sin(dx+c)\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+\sqrt{2}\,\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)+2\arcsin(\cot(dx+c)-\csc(dx+c))\right)\sqrt{a(1+\cos(dx+c))}\,\sqrt{2}}{2d\sqrt{\sec(dx+c)}\,(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,a}$

```
[In] int(1/sec(d*x+c)^(3/2)/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/2/d/sec(d*x+c)^(1/2)*(-sin(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)+2^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))+2*arcsin(c
ot(d*x+c)-csc(d*x+c)))*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))/(cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*2^(1/2)/a
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 143, normalized size of antiderivative = 0.85

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx$$
$$=\frac{\sqrt{a}(\cos{(dx+c)}+1)\arctan\left(\frac{\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-\frac{\sqrt{2}(a\cos(dx+c)+a)\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)}{\sqrt{a}}+\sqrt{}}{ad\cos{(dx+c)}+ad}$$

```
[In] integrate(1/sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] (sqrt(a)*(cos(d*x + c) + 1)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x +
c))/(sqrt(a)*sin(d*x + c))) - sqrt(2)*(a*cos(d*x + c) + a)*arctan(sqrt(2)*s
qrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c)))/sqrt(a)
+ sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*sin(d*x + c))/(a*d*cos(d*x +
c) + a*d)
```

Sympy [F]

$$\int \frac{1}{\sqrt{a+a\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{1}{\sqrt{a\,(\cos{(c+dx)}+1)}\sec^{\frac{3}{2}}{(c+dx)}}\,dx$$

```
[In] integrate(1/sec(d*x+c)**(3/2)/(a+a*cos(d*x+c))**(1/2),x)
[Out] Integral(1/(sqrt(a*(cos(c + d*x) + 1))*sec(c + d*x)**(3/2)), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{a + a\cos(c + dx)}\sec^{\frac{3}{2}}(c + dx)}\,dx = \int \frac{1}{\sqrt{a\cos(dx + c) + a}\sec(dx + c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(a*cos(d*x + c) + a)*sec(d*x + c)^(3/2)), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{a + a\cos(c + dx)}\sec^{\frac{3}{2}}(c + dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{a + a\cos(c + dx)}\sec^{\frac{3}{2}}(c + dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}\sqrt{a + a\,\cos(c + d\,x)}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^(1/2)),x)
[Out] int(1/((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^(1/2)), x)
```

3.373 $\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 197

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{11\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{2\sqrt{2}a^{3/2}d} - \frac{19\sqrt{\sec(c+dx)}\sin(c+dx)}{6ad\sqrt{a+a\cos(c+dx)}} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{7\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6ad\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -1/2*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(3/2)+7/6*sec(d*x+c)^(3
/2)*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^(1/2)+11/4*arctan(1/2*sin(d*x+c)*a^(1/2
)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x
+c)^(1/2)/a^(3/2)/d*2^(1/2)-19/6*sin(d*x+c)*sec(d*x+c)^(1/2)/a/d/(a+a*cos(d
*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.58 (sec) , antiderivative size = 197, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {4307, 2845, 3063, 12, 2861, 211}

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{11\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d} + \frac{7\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{6ad\sqrt{a\cos(c+dx)+a}} - \frac{\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{2d(a\cos(c+dx)+a)^{3/2}} - \frac{19\sin(c+dx)\sqrt{\sec(c+dx)}}{6ad\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[Sec[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (11*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Co
s[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(2*Sqrt[2]*a^(3/2)*d)
- (19*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(6*a*d*Sqrt[a + a*Cos[c + d*x]]) - (
Sec[c + d*x]^(3/2)*Sin[c + d*x])/(2*d*(a + a*Cos[c + d*x])^(3/2)) + (7*Sec[
c + d*x]^(3/2)*Sin[c + d*x])/(6*a*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx$$

$$= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{7a}{2}-2a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx}{2a^2}$$

$$= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{7\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6ad\sqrt{a+a\cos(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{19a^2}{4}+\frac{7}{2}a^2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx}{3a^3}$$

$$= -\frac{19\sqrt{\sec(c+dx)}\sin(c+dx)}{6ad\sqrt{a+a\cos(c+dx)}} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{7\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6ad\sqrt{a+a\cos(c+dx)}} + \frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{33a^3}{8\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{3a^4}$$

$$= -\frac{19\sqrt{\sec(c+dx)}\sin(c+dx)}{6ad\sqrt{a+a\cos(c+dx)}} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{7\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6ad\sqrt{a+a\cos(c+dx)}} + \frac{\left(11\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{4a}$$

$$= -\frac{19\sqrt{\sec(c+dx)}\sin(c+dx)}{6ad\sqrt{a+a\cos(c+dx)}} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{7\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6ad\sqrt{a+a\cos(c+dx)}} - \frac{\left(11\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2d}$$

$$= \frac{11\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{2\sqrt{2}a^{3/2}d} - \frac{19\sqrt{\sec(c+dx)}\sin(c+dx)}{6ad\sqrt{a+a\cos(c+dx)}} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{7\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6ad\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 7.00 (sec) , antiderivative size = 591, normalized size of antiderivative = 3.00

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{\cot^3\left(\frac{c}{2}+\frac{dx}{2}\right)\csc^4\left(\frac{c}{2}+\frac{dx}{2}\right)\sec^2\left(\frac{1}{2}(c+dx)\right)\left(\frac{1}{1-2\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}\right)^{7/2}\left(-80\cos^6\left(\frac{1}{2}(\right.\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (Cot[c/2 + (d*x)/2]^3*Csc[c/2 + (d*x)/2]^4*Sec[(c + d*x)/2]^2*((1 - 2*Sin[c
/2 + (d*x)/2]^2)^(-1))^(7/2)*(-80*Cos[(c + d*x)/2]^6*HypergeometricPFQ[{2,
2, 2, 7/2}, {1, 1, 11/2}, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2
)]*Sin[c/2 + (d*x)/2]^10 + 120*Cos[(c + d*x)/2]^4*HypergeometricPFQ[{2, 2,
7/2}, {1, 11/2}, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*Sin[c/
2 + (d*x)/2]^10*(-5 + 4*Sin[c/2 + (d*x)/2]^2) + 21*(1 - 2*Sin[c/2 + (d*x)/2
]^2)^3*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(-15*ArcTan
h[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]]*(-392 + 2347*Si
n[c/2 + (d*x)/2]^2 - 5391*Sin[c/2 + (d*x)/2]^4 + 5972*Sin[c/2 + (d*x)/2]^6
- 3232*Sin[c/2 + (d*x)/2]^8 + 696*Sin[c/2 + (d*x)/2]^10) + Sqrt[Sin[c/2 + (
d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(-5880 + 37165*Sin[c/2 + (d*x)/2]^
2 - 89856*Sin[c/2 + (d*x)/2]^4 + 103992*Sin[c/2 + (d*x)/2]^6 - 58336*Sin[c/
2 + (d*x)/2]^8 + 12960*Sin[c/2 + (d*x)/2]^10))))/(945*d*(a*(1 + Cos[c + d*x
]))^(3/2))
```

Maple [A] (verified)

Time = 6.64 (sec) , antiderivative size = 233, normalized size of antiderivative = 1.18

method	result
default	$-\frac{\left(\sec^{\frac{5}{2}}(dx+c)\right)\sqrt{a(1+\cos(dx+c))}\left(33\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\arcsin(\cot(dx+c)-\csc(dx+c))\left(\cos^4(dx+c)\right)+19\sqrt{2}\left(\cos^3(dx+c)\right)\sin(dx+c)+\right.}{}$

```
[In] int(sec(d*x+c)^(5/2)/(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/12/d*sec(d*x+c)^(5/2)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^2*(33*(cos
(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^4+19
*2^(1/2)*cos(d*x+c)^3*sin(d*x+c)+66*cos(d*x+c)^3*(cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))+12*2^(1/2)*cos(d*x+c)^2*sin(d*x+c)+33
*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*arcsin(cot(d*x+c)-csc(d*x+c
))-4*sin(d*x+c)*cos(d*x+c)*2^(1/2))*2^(1/2)/a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 161, normalized size of antiderivative = 0.82

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx =$$

$$-\frac{33\sqrt{2}\left(\cos(dx+c)^3+2\cos(dx+c)^2+\cos(dx+c)\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)+\frac{2\sqrt{a\cos(dx+c\cdots}}{\cdots}}{12\left(a^2d\cos(dx+c)^3+2a^2d\cos(dx+c)^2+a^2d\cos(dx+c)\right)}$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] -1/12*(33*sqrt(2)*(cos(d*x + c)^3 + 2*cos(d*x + c)^2 + cos(d*x + c))*sqrt(a
)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d
*x + c))) + 2*sqrt(a*cos(d*x + c) + a)*(19*cos(d*x + c)^2 + 12*cos(d*x + c)
 - 4)*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^2*d*cos(d*x + c)^3 + 2*a^2*d*cos(
d*x + c)^2 + a^2*d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(5/2)/(a+a*cos(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^(5/2)/(a*cos(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(5/2)/(a*cos(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^{3/2}}\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)/(a + a*cos(c + d*x))^(3/2),x)
[Out] int((1/cos(c + d*x))^(5/2)/(a + a*cos(c + d*x))^(3/2), x)
```

3.374 $\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 157

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = -\frac{7\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{2\sqrt{2}a^{3/2}d} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{5\sqrt{\sec(c+dx)}\sin(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -1/2*sin(d*x+c)*sec(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^(3/2)-7/4*arctan(1/2*si
n(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c
)^(1/2)*sec(d*x+c)^(1/2)/a^(3/2)/d*2^(1/2)+5/2*sin(d*x+c)*sec(d*x+c)^(1/2)/
a/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {4307, 2845, 3063, 12, 2861, 211}

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = -\frac{7\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d} + \frac{5\sin(c+dx)\sqrt{\sec(c+dx)}}{2ad\sqrt{a\cos(c+dx)+a}} - \frac{\sin(c+dx)\sqrt{\sec(c+dx)}}{2d(a\cos(c+dx)+a)^{3/2}}$$

```
[In] Int[Sec[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-7*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Co
s[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(2*Sqrt[2]*a^(3/2)*d)
- (Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(2*d*(a + a*Cos[c + d*x])^(3/2)) + (5*S
qrt[Sec[c + d*x]]*Sin[c + d*x])/(2*a*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{5a}{2}-a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx}{2a^2}$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{5\sqrt{\sec(c+dx)}\sin(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int -\frac{7a^2}{4\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{a^3}$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{5\sqrt{\sec(c+dx)}\sin(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}} - \frac{\left(7\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{4a}$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{5\sqrt{\sec(c+dx)}\sin(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}} + \frac{\left(7\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2d}$$

$$= -\frac{7\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{2\sqrt{2}a^{3/2}d} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}} + \frac{5\sqrt{\sec(c+dx)}\sin(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 6.31 (sec) , antiderivative size = 249, normalized size of antiderivative = 1.59

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{-\frac{35}{2}\cot\left(\frac{1}{2}(c+dx)\right)\csc^4\left(\frac{1}{2}(c+dx)\right)\left(78+108\cos(c+dx)+80\cos(2(c+dx)\right.}{}$$

[In] Integrate[Sec[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^(3/2),x]

[Out] ((-35*Cot[(c + d*x)/2]*Csc[(c + d*x)/2]^4*(78 + 108*Cos[c + d*x] + 80*Cos[2*(c + d*x)] - 204*Cos[3*(c + d*x)] - 62*Cos[4*(c + d*x)] + 12*ArcTanh[Sqrt[-(Sec[c + d*x]*Sin[(c + d*x)/2]^2)]]*Cos[(c + d*x)/2]^2*(64 + 55*Cos[c + d*x] + 64*Cos[2*(c + d*x)] + 17*Cos[3*(c + d*x)])*Sqrt[2 - 2*Sec[c + d*x]])*Sqrt[Sec[c + d*x]])/2 - 768*Cos[(c + d*x)/2]^5*HypergeometricPFQ[{2, 2, 5/2}, {1, 9/2}, -(Sec[c + d*x]*Sin[(c + d*x)/2]^2)]*Sec[c + d*x]^(5/2)*Sin[(c + d*x)/2]^3)/(3360*d*(a*(1 + Cos[c + d*x]))^(3/2))

Maple [A] (verified)

Time = 6.53 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.29

method	result
default	$\frac{\left(7\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,(\cos^2(dx+c))\arcsin(\cot(dx+c)-\csc(dx+c))+5\sin(dx+c)\cos(dx+c)\sqrt{2}+14\cos(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\arcsin(\cot(dx-\right.}{4d(1+\cos(d}$

[In] int(sec(d*x+c)^(3/2)/(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)

[Out] 1/4/d*(7*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*arcsin(cot(d*x+c)-csc(d*x+c))+5*sin(d*x+c)*cos(d*x+c)*2^(1/2)+14*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))+4*2^(1/2)*sin(d*x+c)+7*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c)))*sec(d*x+c)^(3/2)*(a*(1+cos(d*x+c)))^(1/2)*cos(d*x+c)/(1+cos(d*x+c))^2*2^(1/2)/a^2

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 136, normalized size of antiderivative = 0.87

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{7\sqrt{2}\left(\cos\left(dx+c\right)^{2}+2\,\cos\left(dx+c\right)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c}}{\sqrt{a}\sin(dx+c)}\right.}{4\left(a^{2}d\cos\left(dx+c\right)^{2}+2\,a^{2}d\cos\left(dx+c\right)+\right.}$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/4*(7*sqrt(2)*(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(2)
*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) + 2*sq
rt(a*cos(d*x + c) + a)*(5*cos(d*x + c) + 4)*sin(d*x + c)/sqrt(cos(d*x + c))
)/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)
```

Sympy [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec^{\frac{3}{2}}\left(c+dx\right)}{\left(a\left(\cos\left(c+dx\right)+1\right)\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)**(3/2)/(a+a*cos(d*x+c))**(3/2),x)
```

```
[Out] Integral(sec(c + d*x)**(3/2)/(a*(cos(c + d*x) + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{3}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(sec(d*x + c)^(3/2)/(a*cos(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{3}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(3/2)/(a*cos(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^{3/2}}\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)/(a + a*cos(c + d*x))^(3/2),x)
[Out] int((1/cos(c + d*x))^(3/2)/(a + a*cos(c + d*x))^(3/2), x)
```

3.375 $\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 117

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{3\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{2\sqrt{2}a^{3/2}d} - \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

```
[Out] -1/2*sin(d*x+c)/d/(a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2)+3/4*arctan(1/2*si
n(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c
)^(1/2)*sec(d*x+c)^(1/2)/a^(3/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4307, 2845, 12, 2861, 211}

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{3/2}}\,dx = \frac{3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\sin(c+dx)}{2d\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{3/2}}$$

```
[In] Int[Sqrt[Sec[c + d*x]]/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] (3*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos
[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(2*Sqrt[2]*a^(3/2)*d) -
 Sin[c + d*x]/(2*d*(a + a*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx$$

$$= -\frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{3a}{2\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{2a^2}$$

$$
\begin{aligned}
&= -\frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} \\
&\quad + \frac{\left(3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}dx}{4a} \\
&= -\frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} \\
&\quad - \frac{\left(3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2d} \\
&= \frac{3\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{2\sqrt{2}a^{3/2}d} \\
&\quad - \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.36 (sec) , antiderivative size = 99, normalized size of antiderivative = 0.85

$$
\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{3/2}}dx = -\frac{\left(2+3\text{arctanh}\left(\sqrt{-\sec(c+dx)\sin^2\left(\frac{1}{2}(c+dx)\right)}\right)\cot^2\left(\frac{1}{2}(c+dx)\right)\sqrt{2-2\sec(c+dx)}\right)\tan\left(\frac{1}{2}(c+dx)\right)}{4ad\sqrt{a(1+\cos(c+dx))}\sqrt{\sec(c+dx)}}
$$

```
[In] Integrate[Sqrt[Sec[c + d*x]]/(a + a*Cos[c + d*x])^(3/2),x]
```

```
[Out] -1/4*((2 + 3*ArcTanh[Sqrt[-(Sec[c + d*x]*Sin[(c + d*x)/2]^2)]]*Cot[(c + d*x
)/2]^2*Sqrt[2 - 2*Sec[c + d*x]])*Tan[(c + d*x)/2])/(a*d*Sqrt[a*(1 + Cos[c +
 d*x])]*Sqrt[Sec[c + d*x]])
```

Maple [A] (verified)

Time = 6.10 (sec) , antiderivative size = 139, normalized size of antiderivative = 1.19

method	result
default	$-\frac{\left(\sin(dx+c)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+3\arcsin(\cot(dx+c)-\csc(dx+c))\cos(dx+c)+3\arcsin(\cot(dx+c)-\csc(dx+c))\right)\sqrt{a(1+\cos(dx+c))}\,(}{4d(1+\cos(dx+c))^2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,a^2}$

```
[In] int(sec(d*x+c)^(1/2)/(a+cos(d*x+c)*a)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/d*(sin(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+3*arcsin(cot(d
*x+c)-csc(d*x+c))*cos(d*x+c)+3*arcsin(cot(d*x+c)-csc(d*x+c)))*(a*(1+cos(d*x
```

```
+c)))^(1/2)*sec(d*x+c)^(1/2)*cos(d*x+c)/(1+cos(d*x+c))^2/(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*2^(1/2)/a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.08

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{3/2}}\,dx = -\frac{3\sqrt{2}\left(\cos(dx+c)^2+2\cos(dx+c)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)+2\sqrt{a\cos(dx+c)+a}\sqrt{c}}{4\left(a^2d\cos(dx+c)^2+2a^2d\cos(dx+c)+a^2d\right)}$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="fricas")
[Out] -1/4*(3*sqrt(2)*(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(2
)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) + 2*s
qrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*sin(d*x + c))/(a^2*d*cos(d*x + c
)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)
```

Sympy [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\sqrt{\sec(c+dx)}}{(a(\cos(c+dx)+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)**(1/2)/(a+a*cos(d*x+c))**(3/2),x)
[Out] Integral(sqrt(sec(c + d*x))/(a*(cos(c + d*x) + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\sqrt{\sec(dx+c)}}{(a\cos(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(sqrt(sec(d*x + c))/(a*cos(d*x + c) + a)^(3/2), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{3/2}}\,dx = \int \frac{\sqrt{\frac{1}{\cos(c+d\,x)}}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^{3/2}}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)/(a + a*cos(c + d*x))^(3/2),x)
[Out] int((1/cos(c + d*x))^(1/2)/(a + a*cos(c + d*x))^(3/2), x)
```

3.376 $\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 117

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\,dx = \frac{\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{2\sqrt{2}a^{3/2}d} + \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

```
[Out] 1/2*sin(d*x+c)/d/(a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2)+1/4*arctan(1/2*sin
(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)
^(1/2)*sec(d*x+c)^(1/2)/a^(3/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4307, 2843, 12, 2861, 211}

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\,dx = \frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d} + \frac{\sin(c+dx)}{2d\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{3/2}}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c
 + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(2*Sqrt[2]*a^(3/2)*d) + S
in[c + d*x]/(2*d*(a + a*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2843

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*
((c + d*Sin[e + f*x])^n/(a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[a*d*n - b*c*
(m + 1) - b*d*(m + n + 1)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e,
 f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && L
tQ[m, -1] && LtQ[0, n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c,
 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{3/2}}\,dx\\
&= \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\\
&\quad+\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{a}{2\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{2a^2}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} \\
&\quad + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{4a} \\
&= \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} \\
&\quad - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2d} \\
&= \frac{\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{2\sqrt{2}a^{3/2}d} \\
&\quad + \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.29 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.20

$$
\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\,dx = \frac{\cos\left(\frac{1}{2}(c+dx)\right)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\sec(c+dx)}\left(\arcsin\left(\frac{\sin\left(\frac{1}{2}(c+dx)\right)}{\sqrt{\cos^2\left(\frac{1}{2}(c+dx\right.}}\right.\right.}{2ad\sqrt{a(1+\cos(\cdots}}
$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (Cos[(c + d*x)/2]*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[Sec[c + d*x]]*
(ArcSin[Sin[(c + d*x)/2]/Sqrt[Cos[(c + d*x)/2]^2]]*Sqrt[1 + Cos[c + d*x]] +
 2*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sin[(c + d*x)/2]))/(2*a*d*Sqrt[a*(
1 + Cos[c + d*x])])
```

Maple [A] (verified)

Time = 4.33 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.12

method	result
default	$-\frac{\left(-\sin(dx+c)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+\arcsin(\cot(dx+c)-\csc(dx+c))\cos(dx+c)+\arcsin(\cot(dx+c)-\csc(dx+c))\right)\sqrt{a(1+\cos(dx+c))}\sqrt{2}}{4d(1+\cos(dx+c))^2\sqrt{\sec(dx+c)}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,a^2}$

```
[In] int(1/(a+cos(d*x+c)*a)^(3/2)/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/d*(-sin(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+arcsin(cot(d*
x+c)-csc(d*x+c))*cos(d*x+c)+arcsin(cot(d*x+c)-csc(d*x+c)))*(a*(1+cos(d*x+c)
```

```
))^(1/2)/(1+cos(d*x+c))^2/sec(d*x+c)^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2
)*2^(1/2)/a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.07

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\,dx = -\frac{\sqrt{2}\left(\cos\left(dx+c\right)^{2}+2\cos\left(dx+c\right)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-2\sqrt{a\cos\left(dx+c\right)+a}\sqrt{c}}{4\left(a^{2}d\cos\left(dx+c\right)^{2}+2a^{2}d\cos\left(dx+c\right)+a^{2}d\right)}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/4*(sqrt(2)*(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(2)*
sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - 2*sqr
t(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))*sin(d*x + c))/(a^2*d*cos(d*x + c)^
2 + 2*a^2*d*cos(d*x + c) + a^2*d)
```

Sympy [F]

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{\left(a\left(\cos\left(c+dx\right)+1\right)\right)^{\frac{3}{2}}\sqrt{\sec\left(c+dx\right)}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))**(3/2)/sec(d*x+c)**(1/2),x)
```

```
[Out] Integral(1/((a*(cos(c + d*x) + 1))**(3/2)*sqrt(sec(c + d*x))), x)
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}\sqrt{\sec\left(dx+c\right)}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/((a*cos(d*x + c) + a)^(3/2)*sqrt(sec(d*x + c))), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{\sqrt{\frac{1}{\cos(c+d\,x)}}\,(a+a\,\cos(c+d\,x))^{3/2}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^(3/2)),x)
[Out] int(1/((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^(3/2)), x)
```

3.377 $\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 174

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{a^{3/2}d} - \frac{5\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{2\sqrt{2}a^{3/2}d} - \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

```
[Out] -1/2*sin(d*x+c)/d/(a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2)+2*arcsin(sin(d*x+
c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^(3/2
)/d-5/4*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x
+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^(3/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 174, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {4307, 2844, 3061, 2861, 211, 2853, 222}

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{a^{3/2}d} - \frac{5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\sin(c+dx)}{2d\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{3/2}}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(3/2)),x]
```

```
[Out] (2*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[Cos[c + d*x
]]*Sqrt[Sec[c + d*x]])/(a^(3/2)*d) - (5*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt
[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[S
ec[c + d*x]])/(2*Sqrt[2]*a^(3/2)*d) - Sin[c + d*x]/(2*d*(a + a*Cos[c + d*x]
)^(3/2)*Sqrt[Sec[c + d*x]])
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
```

```
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx\\
&= -\frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\\
&\quad-\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\frac{a}{2}-2a\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{2a^2}\\
&= -\frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\\
&\quad+\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx}{a^2}\\
&\quad-\frac{\left(5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{4a}\\
&= -\frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\\
&\quad+\frac{\left(5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int\frac{1}{2a^2+ax^2}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2d}\\
&\quad-\frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int\frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^2d}\\
&= \frac{2\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{a^{3/2}d}\\
&\quad-\frac{5\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{2\sqrt{2}a^{3/2}d}\\
&\quad-\frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 4.67 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.43

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = -\frac{ie^{-\frac{1}{2}i(c+dx)}\cos^3\left(\frac{1}{2}(c+dx)\right)\left(4e^{i(c+dx)}\text{arcsinh}\left(e^{i(c+dx)}\right)+5\sqrt{2}e^{i(c+dx)}\text{arctanh}\left(\frac{1-e^{i(c+dx)}}{\sqrt{2}\sqrt{1+e^{2i(c+dx)}}}\right)-4e^{i(c+dx)}\text{arc}}{d\sqrt{1+e^{2i(c+dx)}}(a(1+\cos(c+dx)}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(3/2)),x]
```

```
[Out] ((-I)*Cos[(c + d*x)/2]^3*(4*E^(I*(c + d*x))*ArcSinh[E^(I*(c + d*x))] + 5*Sq
rt[2]*E^(I*(c + d*x))*ArcTanh[(1 - E^(I*(c + d*x)))/(Sqrt[2]*Sqrt[1 + E^((2
*I)*(c + d*x))])] - 4*E^(I*(c + d*x))*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]
] - I*Sqrt[1 + E^((2*I)*(c + d*x))]*Tan[(c + d*x)/2] + Sqrt[1 + E^((2*I)*(c
 + d*x))]*Tan[(c + d*x)/2]^2))/(d*E^((I/2)*(c + d*x))*Sqrt[1 + E^((2*I)*(c
+ d*x))]*(a*(1 + Cos[c + d*x]))^(3/2)*Sqrt[Sec[c + d*x]])
```

Maple [A] (verified)

Time = 4.76 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.17

method	result
default	$-\frac{\sqrt{a(1+\cos(dx+c))}\left(\tan(dx+c)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-4\sqrt{2}\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)-5\arcsin(\cot(dx+c)-\csc(dx+c))-4\sec}{4d(1+\cos(dx+c))^2\sec(dx+c)^{\frac{3}{2}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx}}}$

```
[In] int(1/(a+cos(d*x+c)*a)^(3/2)/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/d*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^2/sec(d*x+c)^(3/2)/(cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)*(tan(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)-4*2^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))-5*arcsin
(cot(d*x+c)-csc(d*x+c))-4*sec(d*x+c)*2^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/
(1+cos(d*x+c)))^(1/2))-5*sec(d*x+c)*arcsin(cot(d*x+c)-csc(d*x+c)))*2^(1/2)/
a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 182, normalized size of antiderivative = 1.05

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{5\sqrt{2}\left(\cos\left(dx+c\right)^{2}+2\cos\left(dx+c\right)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx\cdots}}{\sqrt{a}\,\mathrm{s}\cdots}\right.}{\cdots}$$

[In] integrate(1/(a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(3/2),x, algorithm="fricas")

[Out] 1/4*(5*sqrt(2)*(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(2)
*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - 8*(c
os(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)
*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - 2*sqrt(a*cos(d*x + c) + a)*sq
rt(cos(d*x + c))*sin(d*x + c))/(a^2*d*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c)
 + a^2*d)

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

[In] integrate(1/(a+a*cos(d*x+c))**(3/2)/sec(d*x+c)**(3/2),x)

[Out] Timed out

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}\sec\left(dx+c\right)^{\frac{3}{2}}}\,dx$$

[In] integrate(1/(a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(3/2),x, algorithm="maxima")

[Out] integrate(1/((a*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^(3/2)), x)

Giac [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}\,(a+a\,\cos\left(c+d\,x\right))^{3/2}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^(3/2)),x)
[Out] int(1/((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^(3/2)), x)
```

3.378 $\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 214

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = -\frac{3\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{a^{3/2}d} + \frac{9\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{2\sqrt{2}a^{3/2}d} - \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)} + \frac{3\sin(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

```
[Out] -1/2*sin(d*x+c)/d/(a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(3/2)+3/2*sin(d*x+c)/a/
d/(a+a*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2)-3*arcsin(sin(d*x+c)*a^(1/2)/(a+a*
cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^(3/2)/d+9/4*arctan(1
/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(
d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^(3/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.66 (sec) , antiderivative size = 214, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used

$= \{4307, 2844, 3062, 3061, 2861, 211, 2853, 222\}$

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = -\frac{3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{a^{3/2}d} + \frac{9\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{2\sqrt{2}a^{3/2}d} - \frac{\sin(c+dx)}{2d\sec^{\frac{3}{2}}(c+dx)(a\cos(c+dx)+a)^{3/2}} + \frac{3\sin(c+dx)}{2ad\sqrt{\sec(c+dx)}\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (-3*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[Cos[c + d*
x]]*Sqrt[Sec[c + d*x]])/(a^(3/2)*d) + (9*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqr
t[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[
Sec[c + d*x]])/(2*Sqrt[2]*a^(3/2)*d) - Sin[c + d*x]/(2*d*(a + a*Cos[c + d*x
])^(3/2)*Sec[c + d*x]^(3/2)) + (3*Sin[c + d*x])/(2*a*d*Sqrt[a + a*Cos[c + d
*x]]*Sqrt[Sec[c + d*x]])
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
```

```
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3062

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(-B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(f*(m +
n + 1))), x] + Dist[1/(b*(m + n + 1)), Int[(a + b*Sin[e + f*x])^m*(c + d*Si
n[e + f*x])^(n - 1)*Simp[A*b*c*(m + n + 1) + B*(a*c*m + b*d*n) + (A*b*d*(m
+ n + 1) + B*(a*d*m + b*c*n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 -
 d^2, 0] && GtQ[n, 0] && (IntegerQ[n] || EqQ[m + 1/2, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{3/2}}\,dx$$

$$= -\frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}\left(\frac{3a}{2}-3a\cos(c+dx)\right)}{\sqrt{a+a\cos(c+dx)}}\,dx}{2a^2}$$

$$= -\frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)} + \frac{3\sin(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{3a^2}{2}+3a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{2a^3}$$

$$= -\frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)} + \frac{3\sin(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} - \frac{\left(3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx}{2a^2} + \frac{\left(9\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{4a}$$

$$= -\frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)} + \frac{3\sin(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} - \frac{\left(9\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{2d} + \frac{\left(3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^2d}$$

$$= -\frac{3\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{a^{3/2}d} + \frac{9\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{2\sqrt{2}a^{3/2}d} - \frac{\sin(c+dx)}{2d(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)} + \frac{3\sin(c+dx)}{2ad\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 4.71 (sec) , antiderivative size = 243, normalized size of antiderivative = 1.14

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{\cos^3\left(\frac{1}{2}(c+dx)\right)\left(3i\sqrt{2}e^{-\frac{1}{2}i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\sqrt{1+e^{2i(c+dx)}}\left(2\text{arcs}\right.\right.}{}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (Cos[(c + d*x)/2]^3*(((3*I)*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c +
 d*x)))]*Sqrt[1 + E^((2*I)*(c + d*x))]*(2*ArcSinh[E^(I*(c + d*x))] + 3*Sqrt
[2]*ArcTanh[(1 - E^(I*(c + d*x)))/(Sqrt[2]*Sqrt[1 + E^((2*I)*(c + d*x))])]
```

```
- 2*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]]))/E^((I/2)*(c + d*x)) + Sec[(c +
 d*x)/2]^2*Sqrt[Sec[c + d*x]]*(-Sin[(c + d*x)/2] + 2*Sin[(3*(c + d*x))/2] +
 Sin[(5*(c + d*x))/2])))/(2*d*(a*(1 + Cos[c + d*x]))^(3/2))
```

Maple [A] (verified)

Time = 15.05 (sec) , antiderivative size = 240, normalized size of antiderivative = 1.12

method	result
default	$\frac{\left(2\sqrt{2}\,\cos(dx+c)\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+3\sin(dx+c)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-6\sqrt{2}\,\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)\cos(dx+c)-6\sqrt{2}}{4d\sqrt{\sec(dx+c)}\,(1+\cos}$

```
[In] int(1/(a+cos(d*x+c)*a)^(3/2)/sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/d/sec(d*x+c)^(1/2)*(2*2^(1/2)*cos(d*x+c)*sin(d*x+c)*(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)+3*sin(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-6*2^(
1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))*cos(d*x+c)-6*2^(1
/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))-9*arcsin(cot(d*x+c
)-csc(d*x+c))*cos(d*x+c)-9*arcsin(cot(d*x+c)-csc(d*x+c)))*(a*(1+cos(d*x+c))
)^(1/2)/(1+cos(d*x+c))^2/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)/a^2
```

Fricas [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 201, normalized size of antiderivative = 0.94

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)}\,dx =$$

$$-\frac{9\sqrt{2}\left(\cos\left(dx+c\right)^{2}+2\,\cos\left(dx+c\right)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-12\left(\cos\left(dx+c\right)^{2}+2\,\mathrm{co}}{4\left(a^{2}d\cos\left(dx+c\right)^{2}+2\,a^{2}d\right.}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] -1/4*(9*sqrt(2)*(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(2
)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - 12*
(cos(d*x + c)^2 + 2*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) +
a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - 2*sqrt(a*cos(d*x + c) + a)*
(2*cos(d*x + c)^2 + 3*cos(d*x + c))*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^2*d
*cos(d*x + c)^2 + 2*a^2*d*cos(d*x + c) + a^2*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**(3/2)/sec(d*x+c)**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^(5/2)), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}\,(a+a\,\cos(c+d\,x))^{3/2}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^(3/2)),x)
[Out] int(1/((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^(3/2)), x)
```

3.379 $\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 237

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{163\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{16\sqrt{2}a^{5/2}d} - \frac{299\sqrt{\sec(c+dx)}\sin(c+dx)}{48a^2d\sqrt{a+a\cos(c+dx)}} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{17\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{95\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48a^2d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -1/4*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(5/2)-17/16*sec(d*x+c)^
(3/2)*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^(3/2)+95/48*sec(d*x+c)^(3/2)*sin(d*x+
c)/a^2/d/(a+a*cos(d*x+c))^(1/2)+163/32*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2
)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2
)/a^(5/2)/d*2^(1/2)-299/48*sin(d*x+c)*sec(d*x+c)^(1/2)/a^2/d/(a+a*cos(d*x+c
))^(1/2)
```

Rubi [A] (verified)

Time = 0.74 (sec) , antiderivative size = 237, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used

$= \{4307, 2845, 3057, 3063, 12, 2861, 211\}$

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{163\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{95\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{48a^2d\sqrt{a\cos(c+dx)+a}} - \frac{299\sin(c+dx)\sqrt{\sec(c+dx)}}{48a^2d\sqrt{a\cos(c+dx)+a}} - \frac{17\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{16ad(a\cos(c+dx)+a)^{3/2}} - \frac{\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{4d(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[Sec[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (163*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*C
os[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(16*Sqrt[2]*a^(5/2)*d
) - (299*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(48*a^2*d*Sqrt[a + a*Cos[c + d*x]
]) - (Sec[c + d*x]^(3/2)*Sin[c + d*x])/(4*d*(a + a*Cos[c + d*x])^(5/2)) - (
17*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(16*a*d*(a + a*Cos[c + d*x])^(3/2)) + (
95*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(48*a^2*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
```

```
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx \\
&= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}}+\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{11a}{2}-3a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2} \\
&= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}}-\frac{17\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} \\
&\quad +\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{95a^2}{4}-17a^2\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx}{8a^4}
\end{aligned}$$

$$= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{17\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{95\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48a^2d\sqrt{a+a\cos(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{299a^3}{8}+\frac{95}{4}a^3\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}dx}{12a^5}$$

$$= -\frac{299\sqrt{\sec(c+dx)}\sin(c+dx)}{48a^2d\sqrt{a+a\cos(c+dx)}} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{17\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{95\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48a^2d\sqrt{a+a\cos(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{489a^4}{16\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}dx}{6a^6}$$

$$= -\frac{299\sqrt{\sec(c+dx)}\sin(c+dx)}{48a^2d\sqrt{a+a\cos(c+dx)}} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{17\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{95\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48a^2d\sqrt{a+a\cos(c+dx)}} + \frac{\left(163\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}dx}{32a^2}$$

$$= -\frac{299\sqrt{\sec(c+dx)}\sin(c+dx)}{48a^2d\sqrt{a+a\cos(c+dx)}} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{17\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{95\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48a^2d\sqrt{a+a\cos(c+dx)}} - \frac{\left(163\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16ad}$$

$$= \frac{163\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{16\sqrt{2}a^{5/2}d} - \frac{299\sqrt{\sec(c+dx)}\sin(c+dx)}{48a^2d\sqrt{a+a\cos(c+dx)}} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{17\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{95\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48a^2d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 7.37 (sec) , antiderivative size = 641, normalized size of antiderivative = 2.70

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx =$$

$$-\frac{\cot^5\left(\frac{c}{2}+\frac{dx}{2}\right)\csc^4\left(\frac{c}{2}+\frac{dx}{2}\right)\sec^4\left(\frac{1}{2}(c+dx)\right)\left(\frac{1}{1-2\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}\right)^{7/2}\left(640\cos^8\left(\frac{1}{2}(c+dx)\right)\,{}_5F_4\left(2,2,2,2,\frac{7}{2};1,\right.\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] -1/41580*(Cot[c/2 + (d*x)/2]^5*Csc[c/2 + (d*x)/2]^4*Sec[(c + d*x)/2]^4*((1
- 2*Sin[c/2 + (d*x)/2]^2)^(-1))^(7/2)*(640*Cos[(c + d*x)/2]^8*Hypergeometri
cPFQ[{2, 2, 2, 2, 7/2}, {1, 1, 1, 13/2}, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c
/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^12 - 1280*Cos[(c + d*x)/2]^6*Hypergeom
etricPFQ[{2, 2, 2, 7/2}, {1, 1, 13/2}, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2
 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^12*(-6 + 5*Sin[c/2 + (d*x)/2]^2) + 33*(1
 - 2*Sin[c/2 + (d*x)/2]^2)^3*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d
*x)/2]^2)]*(-105*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/
2]^2)]]*Cos[(c + d*x)/2]^4*(-10935 + 72902*Sin[c/2 + (d*x)/2]^2 - 188110*Si
n[c/2 + (d*x)/2]^4 + 234156*Sin[c/2 + (d*x)/2]^6 - 140732*Sin[c/2 + (d*x)/2
]^8 + 33208*Sin[c/2 + (d*x)/2]^10) + Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[
c/2 + (d*x)/2]^2)]*(-1148175 + 10333785*Sin[c/2 + (d*x)/2]^2 - 38990350*Sin
[c/2 + (d*x)/2]^4 + 79946462*Sin[c/2 + (d*x)/2]^6 - 96281836*Sin[c/2 + (d*x
)/2]^8 + 68243596*Sin[c/2 + (d*x)/2]^10 - 26448512*Sin[c/2 + (d*x)/2]^12 +
4344400*Sin[c/2 + (d*x)/2]^14))))/(d*(a*(1 + Cos[c + d*x]))^(5/2))
```

Maple [A] (verified)

Time = 6.40 (sec) , antiderivative size = 297, normalized size of antiderivative = 1.25

method	result
default	$-\frac{\left(\sec^{\frac{5}{2}}(dx+c)\right)\sqrt{a(1+\cos(dx+c))}\left(489\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\arcsin(\cot(dx+c)-\csc(dx+c))(\cos^5(dx+c))+1467\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\arcsin(\mathrm{co}\right.}{}$

```
[In] int(sec(d*x+c)^(5/2)/(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/96/d*sec(d*x+c)^(5/2)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^3*(489*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^5+1
467*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x
+c)^4+299*2^(1/2)*cos(d*x+c)^4*sin(d*x+c)+1467*cos(d*x+c)^3*(cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))+503*2^(1/2)*cos(d*x+c)^3*s
```

```
in(d*x+c)+489*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*arcsin(cot(d*x
+c)-csc(d*x+c))+160*2^(1/2)*cos(d*x+c)^2*sin(d*x+c)-32*sin(d*x+c)*cos(d*x+c
)*2^(1/2))*2^(1/2)/a^3
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 195, normalized size of antiderivative = 0.82

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = -\frac{489\sqrt{2}\left(\cos\left(dx+c\right)^4+3\cos\left(dx+c\right)^3+3\cos\left(dx+c\right)^2+\cos\left(dx+c\right)\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx-}}{\sqrt{a}\sin(dx+c)}\right.}{96\left(a^3d\cos\left(dx+c\right)^4+3a^3d\cos\left(dx+c\right)^3+3a^3d\cos\left(dx+\right.\right.}$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] -1/96*(489*sqrt(2)*(cos(d*x + c)^4 + 3*cos(d*x + c)^3 + 3*cos(d*x + c)^2 +
cos(d*x + c))*sqrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x
+ c))/(sqrt(a)*sin(d*x + c))) + 2*(299*cos(d*x + c)^3 + 503*cos(d*x + c)^2
+ 160*cos(d*x + c) - 32)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/sqrt(cos(d*x
 + c)))/(a^3*d*cos(d*x + c)^4 + 3*a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x +
c)^2 + a^3*d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(5/2)/(a+a*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(sec(d*x + c)^(5/2)/(a*cos(d*x + c) + a)^(5/2), x)
```

Giac [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\sec(dx+c)^{\frac{5}{2}}}{(a\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(5/2)/(a*cos(d*x + c) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}}{(a+a\,\cos(c+d\,x))^{5/2}}\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)/(a + a*cos(c + d*x))^(5/2),x)
[Out] int((1/cos(c + d*x))^(5/2)/(a + a*cos(c + d*x))^(5/2), x)
```

3.380 $\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 197

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = -\frac{75\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{16\sqrt{2}a^{5/2}d} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{13\sqrt{\sec(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{49\sqrt{\sec(c+dx)}\sin(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -1/4*sin(d*x+c)*sec(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^(5/2)-13/16*sin(d*x+c)*
sec(d*x+c)^(1/2)/a/d/(a+a*cos(d*x+c))^(3/2)-75/32*arctan(1/2*sin(d*x+c)*a^(
1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(
d*x+c)^(1/2)/a^(5/2)/d*2^(1/2)+49/16*sin(d*x+c)*sec(d*x+c)^(1/2)/a^2/d/(a+a
*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 197, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used

= {4307, 2845, 3057, 3063, 12, 2861, 211}

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = -\frac{75\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{49\sin(c+dx)\sqrt{\sec(c+dx)}}{16a^2d\sqrt{a\cos(c+dx)+a}} - \frac{13\sin(c+dx)\sqrt{\sec(c+dx)}}{16ad(a\cos(c+dx)+a)^{3/2}} - \frac{\sin(c+dx)\sqrt{\sec(c+dx)}}{4d(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[Sec[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (-75*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*C
os[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(16*Sqrt[2]*a^(5/2)*d
) - (Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(4*d*(a + a*Cos[c + d*x])^(5/2)) - (1
3*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(16*a*d*(a + a*Cos[c + d*x])^(3/2)) + (4
9*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(16*a^2*d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
```

```
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx \\
&= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}}+\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{9a}{2}-2a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2} \\
&= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}}-\frac{13\sqrt{\sec(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} \\
&\quad+\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{49a^2}{4}-\frac{13}{2}a^2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx}{8a^4}
\end{aligned}$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{13\sqrt{\sec(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{49\sqrt{\sec(c+dx)}\sin(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int -\frac{75a^3}{8\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{4a^5}$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{13\sqrt{\sec(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{49\sqrt{\sec(c+dx)}\sin(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}} - \frac{\left(75\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{32a^2}$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{13\sqrt{\sec(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{49\sqrt{\sec(c+dx)}\sin(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}} + \frac{\left(75\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16ad}$$

$$= -\frac{75\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{16\sqrt{2}a^{5/2}d} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}} - \frac{13\sqrt{\sec(c+dx)}\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}} + \frac{49\sqrt{\sec(c+dx)}\sin(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 6.53 (sec) , antiderivative size = 508, normalized size of antiderivative = 2.58

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{2\cos^5\left(\frac{c}{2}+\frac{dx}{2}\right)\sec^4\left(\frac{1}{2}(c+dx)\right)\sin\left(\frac{c}{2}+\frac{dx}{2}\right)\left(\frac{1}{1-2\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}\right)^{3/2}\left(\frac{8\cos^6\left(\frac{1}{2}(c+d\right.}{}\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*Cos[c/2 + (d*x)/2]^5*Sec[(c + d*x)/2]^4*Sin[c/2 + (d*x)/2]*((1 - 2*Sin[c
/2 + (d*x)/2]^2)^(-1))^(3/2)*((8*Cos[(c + d*x)/2]^6*HypergeometricPFQ[{2, 2
```

```
, 2, 5/2}, {1, 1, 11/2}, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)
]*Sin[c/2 + (d*x)/2]^2)/(315*(-1 + 2*Sin[c/2 + (d*x)/2]^2)) + (Csc[c/2 + (d
*x)/2]^8*(1 - 2*Sin[c/2 + (d*x)/2]^2)^2*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*S
in[c/2 + (d*x)/2]^2)]*(-15*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/
2 + (d*x)/2]^2)]]*Cos[(c + d*x)/2]^4*(-343 + 1465*Sin[c/2 + (d*x)/2]^2 - 20
21*Sin[c/2 + (d*x)/2]^4 + 824*Sin[c/2 + (d*x)/2]^6) + Sqrt[Sin[c/2 + (d*x)/
2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(-5145 + 33980*Sin[c/2 + (d*x)/2]^2 - 8
7764*Sin[c/2 + (d*x)/2]^4 + 109737*Sin[c/2 + (d*x)/2]^6 - 66122*Sin[c/2 + (
d*x)/2]^8 + 15344*Sin[c/2 + (d*x)/2]^10)))/120))/(d*(a*(1 + Cos[c + d*x]))^
(5/2))
```

Maple [A] (verified)

Time = 6.13 (sec) , antiderivative size = 266, normalized size of antiderivative = 1.35

method	result
default	$\frac{\left(75\left(\cos^{3}(dx+c)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\arcsin(\cot(dx+c)-\csc(dx+c))+49\sqrt{2}\left(\cos^{2}(dx+c)\right)\sin(dx+c)+225\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\left(\cos^{2}(dx+c)\right)\operatorname{arcsi}\right.}{}$

```
[In] int(sec(d*x+c)^(3/2)/(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/32/d*(75*cos(d*x+c)^3*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)
-csc(d*x+c))+49*2^(1/2)*cos(d*x+c)^2*sin(d*x+c)+225*(cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*cos(d*x+c)^2*arcsin(cot(d*x+c)-csc(d*x+c))+85*sin(d*x+c)*cos(d*x
+c)*2^(1/2)+225*cos(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x
+c)-csc(d*x+c))+32*2^(1/2)*sin(d*x+c)+75*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
arcsin(cot(d*x+c)-csc(d*x+c)))*sec(d*x+c)^(3/2)*(a*(1+cos(d*x+c)))^(1/2)*co
s(d*x+c)/(1+cos(d*x+c))^3*2^(1/2)/a^3
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 170, normalized size of antiderivative = 0.86

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{75\sqrt{2}\left(\cos\left(dx+c\right)^{3}+3\,\cos\left(dx+c\right)^{2}+3\,\cos\left(dx+c\right)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\,c}}{}\right.}{32\left(a^{3}d\cos\left(dx+c\right)^{3}+3\,a^{3}d\cos\left(dx+\right.\right.}$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/32*(75*sqrt(2)*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*s
qrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*
sin(d*x + c))) + 2*sqrt(a*cos(d*x + c) + a)*(49*cos(d*x + c)^2 + 85*cos(d*x
 + c) + 32)*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^3*d*cos(d*x + c)^3 + 3*a^3*
d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(3/2)/(a+a*cos(d*x+c))**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{3}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^(3/2)/(a*cos(d*x + c) + a)^(5/2), x)
```

Giac [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{3}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(3/2)/(a*cos(d*x + c) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)/(a + a*cos(c + d*x))^(5/2),x)
[Out] int((1/cos(c + d*x))^(3/2)/(a + a*cos(c + d*x))^(5/2), x)
```

3.381 $\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 157

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{19\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{16\sqrt{2}a^{5/2}d} - \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} - \frac{9\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

```
[Out] -1/4*sin(d*x+c)/d/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(1/2)-9/16*sin(d*x+c)/a
/d/(a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2)+19/32*arctan(1/2*sin(d*x+c)*a^(1
/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d
*x+c)^(1/2)/a^(5/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4307, 2845, 3057, 12, 2861, 211}

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{19\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{9\sin(c+dx)}{16ad\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{3/2}} - \frac{\sin(c+dx)}{4d\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[Sqrt[Sec[c + d*x]]/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (19*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Co
s[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(16*Sqrt[2]*a^(5/2)*d)
```

```
 - Sin[c + d*x]/(4*d*(a + a*Cos[c + d*x])^(5/2)*Sqrt[Sec[c + d*x]]) - (9*Si
n[c + d*x])/(16*a*d*(a + a*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
```

```
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}\,dx$$

$$= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\frac{7a}{2}-a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2}$$

$$= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} - \frac{9\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{19a^2}{4\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{8a^4}$$

$$= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} - \frac{9\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{\left(19\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{32a^2}$$

$$= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} - \frac{9\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{\left(19\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int\frac{1}{2a^2+ax^2}\,dx,x,-\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16ad}$$

$$= \frac{19\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{16\sqrt{2}a^{5/2}d} - \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} - \frac{9\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.68 (sec) , antiderivative size = 131, normalized size of antiderivative = 0.83

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{\left(76\text{arctanh}\left(\sqrt{-\sec(c+dx)\sin^2\left(\frac{1}{2}(c+dx)\right)}\right)-\cos(c+dx)(13+9\cos(c+\right.}{64\sqrt{2}a^2d\sqrt{a(1+\cos(c+dx}$$

[In] Integrate[Sqrt[Sec[c + d*x]]/(a + a*Cos[c + d*x])^(5/2),x]

[Out] ((76*ArcTanh[Sqrt[-(Sec[c + d*x]*Sin[(c + d*x)/2]^2)]] - Cos[c + d*x]*(13 + 9*Cos[c + d*x])*Sec[(c + d*x)/2]^4*Sqrt[2 - 2*Sec[c + d*x]])*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(64*Sqrt[2]*a^2*d*Sqrt[a*(1 + Cos[c + d*x])]*Sqrt[1 - Sec[c + d*x]])

Maple [A] (verified)

Time = 6.55 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.29

method	result
default	$-\frac{\left(9\sqrt{2}\,\cos(dx+c)\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+19\arcsin(\cot(dx+c)-\csc(dx+c))\left(\cos^2(dx+c)\right)+13\sin(dx+c)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+38\,a\right.}{32d(1+\cos(dx+c))^3\sqrt{}}$

[In] int(sec(d*x+c)^(1/2)/(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)

[Out] -1/32/d*(9*2^(1/2)*cos(d*x+c)*sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+19*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^2+13*sin(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+38*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)+19*arcsin(cot(d*x+c)-csc(d*x+c)))*sec(d*x+c)^(1/2)*(a*(1+cos(d*x+c)))^(1/2)*cos(d*x+c)/(1+cos(d*x+c))^3/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)/a^3

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.08

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{5/2}}\,dx =$$

$$-\frac{19\sqrt{2}\left(\cos(dx+c)^3+3\cos(dx+c)^2+3\cos(dx+c)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)+\frac{2\sqrt{a}}{}}{32\left(a^3d\cos(dx+c)^3+3a^3d\cos(dx+c)^2+3a^3d\cos(dx+c)+a^3\right.}$$

[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas")

```
[Out] -1/32*(19*sqrt(2)*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*
sqrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)
*sin(d*x + c))) + 2*sqrt(a*cos(d*x + c) + a)*(9*cos(d*x + c)^2 + 13*cos(d*x
 + c))*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos
(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(1/2)/(a+a*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\sqrt{\sec(dx+c)}}{(a\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(sec(d*x + c))/(a*cos(d*x + c) + a)^(5/2), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{5/2}}\,dx = \int \frac{\sqrt{\frac{1}{\cos(c+d\,x)}}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)/(a + a*cos(c + d*x))^(5/2),x)
[Out] int((1/cos(c + d*x))^(1/2)/(a + a*cos(c + d*x))^(5/2), x)
```

3.382 $\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 157

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\,dx = \frac{5\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{16\sqrt{2}a^{5/2}d} + \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

```
[Out] 1/4*sin(d*x+c)/d/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(1/2)+1/16*sin(d*x+c)/a/
d/(a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2)+5/32*arctan(1/2*sin(d*x+c)*a^(1/2
)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x
+c)^(1/2)/a^(5/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {4307, 2843, 3057, 12, 2861, 211}

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\,dx = \frac{5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{\sin(c+dx)}{16ad\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{3/2}} + \frac{\sin(c+dx)}{4d\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^(5/2)*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (5*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos
[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(16*Sqrt[2]*a^(5/2)*d)
```

```
+ Sin[c + d*x]/(4*d*(a + a*Cos[c + d*x])^(5/2)*Sqrt[Sec[c + d*x]]) + Sin[c
+ d*x]/(16*a*d*(a + a*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2843

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*
((c + d*Sin[e + f*x])^n/(a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[a*d*n - b*c*
(m + 1) - b*d*(m + n + 1)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e,
 f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && L
tQ[m, -1] && LtQ[0, n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c,
 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
```

```
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{5/2}}\,dx$$

$$= \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{a}{2}+a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2}$$

$$= \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{5a^2}{4\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{8a^4}$$

$$= \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{\left(5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{32a^2}$$

$$= \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{\left(5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16ad}$$

$$= \frac{5\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{16\sqrt{2}a^{5/2}d} + \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.48 (sec) , antiderivative size = 122, normalized size of antiderivative = 0.78

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\,dx = \frac{-5\text{arctanh}\left(\sqrt{-\sec(c+dx)\sin^2\left(\frac{1}{2}(c+dx)\right)}\right)\cot\left(\frac{1}{2}(c+dx)\right)}{32a^2d\sqrt{a(1+}}$$

[In] Integrate[1/((a + a*Cos[c + d*x])^(5/2)*Sqrt[Sec[c + d*x]]),x]

[Out] (-5*ArcTanh[Sqrt[-(Sec[c + d*x]*Sin[(c + d*x)/2]^2)]]*Cot[(c + d*x)/2]*Sqrt[2 - 2*Sec[c + d*x]] + 48*Csc[c + d*x]^3*Sin[(c + d*x)/2]^4 - 2*Tan[(c + d*x)/2]^3)/(32*a^2*d*Sqrt[a*(1 + Cos[c + d*x])]*Sqrt[Sec[c + d*x]])

Maple [A] (verified)

Time = 4.36 (sec) , antiderivative size = 195, normalized size of antiderivative = 1.24

method	result
default	$\frac{\left(\sqrt{2}\,\cos(dx+c)\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+5\sin(dx+c)\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-5\arcsin(\cot(dx+c)-\csc(dx+c))\left(\cos^2(dx+c)\right)-10\arcsin(\right.}{32d(1+\cos(dx+c))^3\sqrt{\sec(dx+c)}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+}}}$

[In] int(1/(a+cos(d*x+c)*a)^(5/2)/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)

[Out] 1/32/d*(2^(1/2)*cos(d*x+c)*sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+5*sin(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-5*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^2-10*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)-5*arcsin(cot(d*x+c)-csc(d*x+c)))*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^3/sec(d*x+c)^(1/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)/a^3

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 167, normalized size of antiderivative = 1.06

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\,dx =$$

$$-\frac{5\sqrt{2}\left(\cos\left(dx+c\right)^3+3\cos\left(dx+c\right)^2+3\cos\left(dx+c\right)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-\frac{2\sqrt{a\text{co}}}{}}{32\left(a^3d\cos\left(dx+c\right)^3+3a^3d\cos\left(dx+c\right)^2+3a^3d\cos\left(dx+c\right)+a^3d\right)}$$

[In] integrate(1/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(1/2),x, algorithm="fricas")

[Out] -1/32*(5*sqrt(2)*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*

```
sin(d*x + c))) - 2*sqrt(a*cos(d*x + c) + a)*(cos(d*x + c)^2 + 5*cos(d*x + c
))*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x
 + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**(5/2)/sec(d*x+c)**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{5}{2}}\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^(5/2)*sqrt(sec(d*x + c))), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{\sqrt{\frac{1}{\cos(c+dx)}}\,(a+a\cos(c+dx))^{5/2}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^(5/2)),x)
[Out] int(1/((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^(5/2)), x)
```

3.383 $\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 157

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{3\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{16\sqrt{2}a^{5/2}d} - \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{7\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

```
[Out] -1/4*sin(d*x+c)/d/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(1/2)+7/16*sin(d*x+c)/a
/d/(a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2)+3/32*arctan(1/2*sin(d*x+c)*a^(1/
2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*
x+c)^(1/2)/a^(5/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {4307, 2844, 3057, 12, 2861, 211}

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{7\sin(c+dx)}{16ad\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{3/2}} - \frac{\sin(c+dx)}{4d\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(3/2)),x]
```

```
[Out] (3*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos
[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(16*Sqrt[2]*a^(5/2)*d)
```

```
- Sin[c + d*x]/(4*d*(a + a*Cos[c + d*x])^(5/2)*Sqrt[Sec[c + d*x]]) + (7*Sin
[c + d*x])/(16*a*d*(a + a*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
```

```
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx$$

$$= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{a}{2}-3a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2}$$

$$= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{7\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int -\frac{3a^2}{4\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{8a^4}$$

$$= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{7\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{\left(3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{32a^2}$$

$$= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{7\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{\left(3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16ad}$$

$$= \frac{3\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{16\sqrt{2}a^{5/2}d} - \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{7\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.50 (sec) , antiderivative size = 164, normalized size of antiderivative = 1.04

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{\sqrt{\cos(c+dx)}(1+\cos(c+dx))^{3/2}\sec\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}\Big($$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(3/2)),x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*(1 + Cos[c + d*x])^(3/2)*Sec[(c + d*x)/2]*Sqrt[Sec[c +
d*x]]*(6*ArcSin[Sin[(c + d*x)/2]/Sqrt[Cos[(c + d*x)/2]^2]]*Cos[(c + d*x)/2]
^2*Sqrt[1 + Cos[c + d*x]] - Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*(Sin[(c +
 d*x)/2] - 7*Sin[(3*(c + d*x))/2])))/(32*d*(a*(1 + Cos[c + d*x]))^(5/2))
```

Maple [A] (verified)

Time = 4.31 (sec) , antiderivative size = 188, normalized size of antiderivative = 1.20

method	result
default	$\frac{\sqrt{a(1+\cos(dx+c))}\left(7\sin(dx+c)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+3\tan(dx+c)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-3\arcsin(\cot(dx+c)-\csc(dx+c))\cos(dx+c)-6\,\text{arcs}}{32d(1+\cos(dx+c))^3\sec(dx+c)^{\frac{3}{2}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,a^3}$

```
[In] int(1/(a+cos(d*x+c)*a)^(5/2)/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/32/d*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^3/sec(d*x+c)^(3/2)/(cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)*(7*sin(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)+3*tan(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-3*arcsin(cot(d
*x+c)-csc(d*x+c))*cos(d*x+c)-6*arcsin(cot(d*x+c)-csc(d*x+c))-3*sec(d*x+c)*a
rcsin(cot(d*x+c)-csc(d*x+c)))*2^(1/2)/a^3
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.08

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)}\,dx =$$

$$-\frac{3\sqrt{2}\left(\cos(dx+c)^3+3\cos(dx+c)^2+3\cos(dx+c)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-\frac{2\sqrt{a\cos(}{}}{32\left(a^3d\cos(dx+c)^3+3a^3d\cos(dx+c)^2+3a^3d\cos(dx+c)+a^3d\right)}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/32*(3*sqrt(2)*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*s
qrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*
sin(d*x + c))) - 2*sqrt(a*cos(d*x + c) + a)*(7*cos(d*x + c)^2 + 3*cos(d*x +
 c))*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d
*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**(5/2)/sec(d*x+c)**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^(3/2)), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}\,(a+a\,\cos\left(c+d\,x\right))^{5/2}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^(5/2)),x)
[Out] int(1/((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^(5/2)), x)
```

3.384 $\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 214

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{2\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{a^{5/2}d} - \frac{43\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{16\sqrt{2}a^{5/2}d} - \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{11\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

```
[Out] -1/4*sin(d*x+c)/d/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(3/2)-11/16*sin(d*x+c)/
a/d/(a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2)+2*arcsin(sin(d*x+c)*a^(1/2)/(a+
a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^(5/2)/d-43/32*arct
an(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*
cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^(5/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.64 (sec) , antiderivative size = 214, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used

$= \{4307, 2844, 3056, 3061, 2861, 211, 2853, 222\}$

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{a^{5/2}d} - \frac{43\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} - \frac{\sin(c+dx)}{4d\sec^{\frac{3}{2}}(c+dx)(a\cos(c+dx)+a)^{5/2}} - \frac{11\sin(c+dx)}{16ad\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{3/2}}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (2*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[Cos[c + d*x
]]*Sqrt[Sec[c + d*x]])/(a^(5/2)*d) - (43*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqr
t[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[
Sec[c + d*x]])/(16*Sqrt[2]*a^(5/2)*d) - Sin[c + d*x]/(4*d*(a + a*Cos[c + d*
x])^(5/2)*Sec[c + d*x]^(3/2)) - (11*Sin[c + d*x])/(16*a*d*(a + a*Cos[c + d*
x])^(3/2)*Sqrt[Sec[c + d*x]])
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx$$

$$= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}\left(\frac{3a}{2}-4a\cos(c+dx)\right)}{(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2}$$

$$= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{11\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{11a^2}{4}-8a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{8a^4}$$

$$= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{11\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx}{a^3} - \frac{\left(43\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{32a^2}$$

$$= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{11\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^3d} + \frac{\left(43\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16ad}$$

$$= \frac{2\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{a^{5/2}d} - \frac{43\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{16\sqrt{2}a^{5/2}d} - \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{11\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.87 (sec) , antiderivative size = 373, normalized size of antiderivative = 1.74

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{e^{-\frac{1}{2}i(c+dx)}\left(\frac{1}{16}ie^{-2i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(-43\left(1+e^{i(c+dx)}\right)^4\sqrt{1+e^{2i(c}}\right.\right.}{}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (((I/16)*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)))]*(-43*(1 + E^(I*(c
+ d*x)))^4*Sqrt[1 + E^((2*I)*(c + d*x))]*ArcTanh[(1 - E^(I*(c + d*x)))/(Sqr
t[2]*Sqrt[1 + E^((2*I)*(c + d*x))])] + Sqrt[2]*(-15 - 7*E^(I*(c + d*x)) - 8
```

```
*E^((2*I)*(c + d*x)) + 8*E^((3*I)*(c + d*x)) + 7*E^((4*I)*(c + d*x)) + 15*E
^((5*I)*(c + d*x)) + 16*(1 + E^(I*(c + d*x)))^4*Sqrt[1 + E^((2*I)*(c + d*x)
)]*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]]))*Cos[(c + d*x)/2])/E^((2*I)*(c +
 d*x)) - (16*I)*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)))]*Sqr
t[1 + E^((2*I)*(c + d*x))]*ArcSinh[E^(I*(c + d*x))]*Cos[(c + d*x)/2]^5)/(4*
d*E^((I/2)*(c + d*x))*(a*(1 + Cos[c + d*x]))^(5/2))
```

Maple [A] (verified)

Time = 4.56 (sec) , antiderivative size = 306, normalized size of antiderivative = 1.43

method	result
default	$-\frac{\sqrt{a(1+\cos(dx+c))}\left(15\tan(dx+c)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-32\sqrt{2}\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)+11\tan(dx+c)\sec(dx+c)\sqrt{2}\sqrt{\frac{c}{1+}}\right.}{}$

```
[In] int(1/(a+cos(d*x+c)*a)^(5/2)/sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/32/d*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^3/sec(d*x+c)^(5/2)/(cos(d*x
+c)/(1+cos(d*x+c)))^(1/2)*(15*tan(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)-32*2^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))+11*
tan(d*x+c)*sec(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-43*arcsin(c
ot(d*x+c)-csc(d*x+c))-64*sec(d*x+c)*2^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2))-86*sec(d*x+c)*arcsin(cot(d*x+c)-csc(d*x+c))-32*sec(d*
x+c)^2*2^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))-43*sec(
d*x+c)^2*arcsin(cot(d*x+c)-csc(d*x+c)))*2^(1/2)/a^3
```

Fricas [A] (verification not implemented)

none

Time = 0.41 (sec) , antiderivative size = 235, normalized size of antiderivative = 1.10

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\,dx=\frac{43\sqrt{2}\left(\cos(dx+c)^3+3\cos(dx+c)^2+3\cos(dx+c)+1\right)\sqrt{a}}{}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/32*(43*sqrt(2)*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)*s
qrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*
sin(d*x + c))) - 64*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1
)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d
*x + c))) - 2*sqrt(a*cos(d*x + c) + a)*(15*cos(d*x + c)^2 + 11*cos(d*x + c)
)*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x
+ c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**(5/2)/sec(d*x+c)**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^(5/2)), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}\,(a+a\,\cos(c+d\,x))^{5/2}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^(5/2)),x)
[Out] int(1/((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^(5/2)), x)
```

3.385 $\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 254

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)}\,dx = -\frac{5\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{a^{5/2}d} + \frac{115\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{16\sqrt{2}a^{5/2}d} - \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{15\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)} + \frac{35\sin(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

```
[Out] -1/4*sin(d*x+c)/d/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(5/2)-15/16*sin(d*x+c)/
a/d/(a+a*cos(d*x+c))^(3/2)/sec(d*x+c)^(3/2)+35/16*sin(d*x+c)/a^2/d/(a+a*cos
(d*x+c))^(1/2)/sec(d*x+c)^(1/2)-5*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c)
)^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^(5/2)/d+115/32*arctan(1/2*sin(
d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^
(1/2)*sec(d*x+c)^(1/2)/a^(5/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.82 (sec) , antiderivative size = 254, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {4307, 2844, 3056, 3062, 3061, 2861, 211, 2853, 222}

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)}\,dx = -\frac{5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{a^{5/2}d} + \frac{115\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{35\sin(c+dx)}{16a^2d\sqrt{\sec(c+dx)}\sqrt{a\cos(c+dx)+a}} - \frac{15\sin(c+dx)}{16ad\sec^{\frac{3}{2}}(c+dx)(a\cos(c+dx)+a)^{3/2}} - \frac{\sin(c+dx)}{4d\sec^{\frac{5}{2}}(c+dx)(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(7/2)),x]
```

```
[Out] (-5*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[Cos[c + d*
x]]*Sqrt[Sec[c + d*x]])/(a^(5/2)*d) + (115*ArcTan[(Sqrt[a]*Sin[c + d*x])/(S
qrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqr
t[Sec[c + d*x]])/(16*Sqrt[2]*a^(5/2)*d) - Sin[c + d*x]/(4*d*(a + a*Cos[c +
d*x])^(5/2)*Sec[c + d*x]^(5/2)) - (15*Sin[c + d*x])/(16*a*d*(a + a*Cos[c +
d*x])^(3/2)*Sec[c + d*x]^(3/2)) + (35*Sin[c + d*x])/(16*a^2*d*Sqrt[a + a*Co
s[c + d*x]]*Sqrt[Sec[c + d*x]])
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
```

```
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3062

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(-B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(f*(m +
n + 1))), x] + Dist[1/(b*(m + n + 1)), Int[(a + b*Sin[e + f*x])^m*(c + d*Si
n[e + f*x])^(n - 1)*Simp[A*b*c*(m + n + 1) + B*(a*c*m + b*d*n) + (A*b*d*(m
```

```
+ n + 1) + B*(a*d*m + b*c*n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 -
 d^2, 0] && GtQ[n, 0] && (IntegerQ[n] || EqQ[m + 1/2, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx \\
&= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)} \\
&\quad -\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{3}{2}}(c+dx)\left(\frac{5a}{2}-5a\cos(c+dx)\right)}{(a+a\cos(c+dx))^{3/2}}\,dx}{4a^2} \\
&= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{15\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)} \\
&\quad -\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}\left(\frac{45a^2}{4}-\frac{35}{2}a^2\cos(c+dx)\right)}{\sqrt{a+a\cos(c+dx)}}\,dx}{8a^4} \\
&= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{15\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)} \\
&\quad +\frac{35\sin(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} \\
&\quad -\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{35a^3}{4}+20a^3\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{8a^5} \\
&= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{15\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)} \\
&\quad +\frac{35\sin(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} \\
&\quad -\frac{\left(5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx}{2a^3} \\
&\quad +\frac{\left(115\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{32a^2}
\end{aligned}$$

$$
\begin{aligned}
&= -\frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{15\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)} \\
&\quad + \frac{35\sin(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} \\
&\quad + \frac{\left(5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^3d} \\
&\quad - \frac{\left(115\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{16ad} \\
&= -\frac{5\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{a^{5/2}d} \\
&\quad + \frac{115\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{16\sqrt{2}a^{5/2}d} \\
&\quad - \frac{\sin(c+dx)}{4d(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{15\sin(c+dx)}{16ad(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)} \\
&\quad + \frac{35\sin(c+dx)}{16a^2d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.50 (sec) , antiderivative size = 412, normalized size of antiderivative = 1.62

$$
\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)}\,dx = \frac{e^{-\frac{1}{2}i(c+dx)}\left(40i\sqrt{2}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\sqrt{1+e^{2i(c+dx)}}\text{arcsinh}\left(e^{i(c+dx)}\right)\cos
$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(7/2)),x]
```

```
[Out] ((40*I)*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)))]*Sqrt[1 + E^
((2*I)*(c + d*x))]*ArcSinh[E^(I*(c + d*x))]*Cos[(c + d*x)/2]^5 + (115*I)*Sq
rt[E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)))]*Sqrt[1 + E^((2*I)*(c + d*x))]
*ArcTanh[(1 - E^(I*(c + d*x)))/(Sqrt[2]*Sqrt[1 + E^((2*I)*(c + d*x))])]*Cos
[(c + d*x)/2]^5 - ((I/16)*(-8 - 47*E^(I*(c + d*x)) - 39*E^((2*I)*(c + d*x))
 - 16*E^((3*I)*(c + d*x)) + 16*E^((4*I)*(c + d*x)) + 39*E^((5*I)*(c + d*x))
 + 47*E^((6*I)*(c + d*x)) + 8*E^((7*I)*(c + d*x)) + 40*E^(I*(c + d*x))*(1 +
 E^(I*(c + d*x)))^4*Sqrt[1 + E^((2*I)*(c + d*x))]*ArcTanh[Sqrt[1 + E^((2*I)
*(c + d*x))]])*Cos[(c + d*x)/2]*Sqrt[Sec[c + d*x]])/E^((3*I)*(c + d*x)))/(4
*d*E^((I/2)*(c + d*x))*(a*(1 + Cos[c + d*x]))^(5/2))
```

Maple [A] (verified)

Time = 14.71 (sec) , antiderivative size = 344, normalized size of antiderivative = 1.35

method	result
default	$\frac{\left(16\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,(\cos^2(dx+c))\sin(dx+c)-80\sqrt{2}\,\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right)(\cos^2(dx+c))+55\sqrt{2}\,\cos(dx+c)\sin(dx+c)\sqrt{}}{}$

```
[In] int(1/(a+cos(d*x+c)*a)^(5/2)/sec(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/32/d/sec(d*x+c)^(1/2)*(16*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d
*x+c)^2*sin(d*x+c)-80*2^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2))*cos(d*x+c)^2+55*2^(1/2)*cos(d*x+c)*sin(d*x+c)*(cos(d*x+c)/(1+cos(d*
x+c)))^(1/2)-115*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^2-160*2^(1/2)*arc
tan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))*cos(d*x+c)+35*sin(d*x+c)*
2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-230*arcsin(cot(d*x+c)-csc(d*x+c))
*cos(d*x+c)-80*2^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))
-115*arcsin(cot(d*x+c)-csc(d*x+c)))*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))
^3/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)/a^3
```

Fricas [A] (verification not implemented)

none

Time = 0.41 (sec) , antiderivative size = 245, normalized size of antiderivative = 0.96

$$\int \frac{1}{(a+a\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)}\,dx =$$

$$-\frac{115\sqrt{2}\left(\cos\left(dx+c\right)^3+3\,\cos\left(dx+c\right)^2+3\,\cos\left(dx+c\right)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cos(dx+c)}}{\sqrt{a}\sin(dx+c)}\right)-160\,(}{32\,(a^3d\cos\,(d}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] -1/32*(115*sqrt(2)*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c) + 1)
*sqrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a
)*sin(d*x + c))) - 160*(cos(d*x + c)^3 + 3*cos(d*x + c)^2 + 3*cos(d*x + c)
+ 1)*sqrt(a)*arctan(sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*si
n(d*x + c))) - 2*(16*cos(d*x + c)^3 + 55*cos(d*x + c)^2 + 35*cos(d*x + c))*
sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^3*d*cos(d*x +
c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a + a\cos(c + dx))^{5/2}\sec^{\frac{7}{2}}(c + dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**(5/2)/sec(d*x+c)**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a + a\cos(c + dx))^{5/2}\sec^{\frac{7}{2}}(c + dx)}\,dx = \int \frac{1}{(a\cos(dx + c) + a)^{\frac{5}{2}}\sec(dx + c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(7/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^(7/2)), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{1}{(a + a\cos(c + dx))^{5/2}\sec^{\frac{7}{2}}(c + dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(7/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a + a\cos(c + dx))^{5/2}\sec^{\frac{7}{2}}(c + dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{7/2}(a + a\,\cos(c + d\,x))^{5/2}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))^(5/2)),x)
[Out] int(1/((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))^(5/2)), x)
```

3.386 $\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 277

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{1015\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{64\sqrt{2}a^{7/2}d} - \frac{629\sqrt{\sec(c+dx)}\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{23\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} - \frac{109\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{64a^2d(a+a\cos(c+dx))^{3/2}} + \frac{193\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -1/6*sec(d*x+c)^(3/2)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(7/2)-23/48*sec(d*x+c)^
(3/2)*sin(d*x+c)/a/d/(a+a*cos(d*x+c))^(5/2)-109/64*sec(d*x+c)^(3/2)*sin(d*x
+c)/a^2/d/(a+a*cos(d*x+c))^(3/2)+193/64*sec(d*x+c)^(3/2)*sin(d*x+c)/a^3/d/(
a+a*cos(d*x+c))^(1/2)+1015/128*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*
x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^(7/2
)/d*2^(1/2)-629/64*sin(d*x+c)*sec(d*x+c)^(1/2)/a^3/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 1.15 (sec) , antiderivative size = 277, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used

$= \{4307, 2845, 3057, 3063, 12, 2861, 211\}$

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{1015\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{64\sqrt{2}a^{7/2}d} + \frac{193\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{64a^3d\sqrt{a\cos(c+dx)+a}} - \frac{629\sin(c+dx)\sqrt{\sec(c+dx)}}{64a^3d\sqrt{a\cos(c+dx)+a}} - \frac{109\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{64a^2d(a\cos(c+dx)+a)^{3/2}} - \frac{23\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{48ad(a\cos(c+dx)+a)^{5/2}} - \frac{\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{6d(a\cos(c+dx)+a)^{7/2}}$$

```
[In] Int[Sec[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^(7/2),x]
```

```
[Out] (1015*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*
Cos[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(64*Sqrt[2]*a^(7/2)*
d) - (629*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(64*a^3*d*Sqrt[a + a*Cos[c + d*x
]]) - (Sec[c + d*x]^(3/2)*Sin[c + d*x])/(6*d*(a + a*Cos[c + d*x])^(7/2)) -
(23*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(48*a*d*(a + a*Cos[c + d*x])^(5/2)) -
(109*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(64*a^2*d*(a + a*Cos[c + d*x])^(3/2))
 + (193*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(64*a^3*d*Sqrt[a + a*Cos[c + d*x]]
)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
```

```
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx \\
&= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}}+\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{15a}{2}-4a\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx}{6a^2} \\
&= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}}-\frac{23\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} \\
&\quad+\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{189a^2}{4}-\frac{69}{2}a^2\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx}{24a^4}
\end{aligned}$$

$$= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{23\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} - \frac{109\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{64a^2d(a+a\cos(c+dx))^{3/2}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{1737a^3}{8}-\frac{327}{2}a^3\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}dx}{48a^6}$$

$$= -\frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{23\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} - \frac{109\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{64a^2d(a+a\cos(c+dx))^{3/2}} + \frac{193\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{5661a^4}{16}+\frac{1737}{8}a^4\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}dx}{72a^7}$$

$$= -\frac{629\sqrt{\sec(c+dx)}\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{23\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} - \frac{109\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{64a^2d(a+a\cos(c+dx))^{3/2}} + \frac{193\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{9135a^5}{32\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}dx}{36a^8}$$

$$= -\frac{629\sqrt{\sec(c+dx)}\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{23\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} - \frac{109\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{64a^2d(a+a\cos(c+dx))^{3/2}} + \frac{193\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}} + \frac{\left(1015\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}dx}{128a^3}$$

$$= -\frac{629\sqrt{\sec(c+dx)}\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{23\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} - \frac{109\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{64a^2d(a+a\cos(c+dx))^{3/2}} + \frac{193\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}} - \frac{\left(1015\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64a^2d}$$

$$= \frac{1015\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{64\sqrt{2}a^{7/2}d} - \frac{629\sqrt{\sec(c+dx)}\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}} - \frac{\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{23\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} - \frac{109\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{64a^2d(a+a\cos(c+dx))^{3/2}} + \frac{193\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 7.86 (sec) , antiderivative size = 696, normalized size of antiderivative = 2.51

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{\cot^7\left(\frac{c}{2}+\frac{dx}{2}\right)\csc^4\left(\frac{c}{2}+\frac{dx}{2}\right)\sec^6\left(\frac{1}{2}(c+dx)\right)\left(\frac{1}{1-2\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}\right)^{7/2}\left(-7680\cos^{10}\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^(5/2)/(a + a*Cos[c + d*x])^(7/2),x]
```

```
[Out] (Cot[c/2 + (d*x)/2]^7*Csc[c/2 + (d*x)/2]^4*Sec[(c + d*x)/2]^6*((1 - 2*Sin[c
/2 + (d*x)/2]^2)^(-1))^(7/2)*(-7680*Cos[(c + d*x)/2]^10*HypergeometricPFQ[{
2, 2, 2, 2, 2, 7/2}, {1, 1, 1, 1, 15/2}, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c
/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^14 + 19200*Cos[(c + d*x)/2]^8*Hypergeo
metricPFQ[{2, 2, 2, 2, 7/2}, {1, 1, 1, 15/2}, Sin[c/2 + (d*x)/2]^2/(-1 + 2*
Sin[c/2 + (d*x)/2]^2)]*Sin[c/2 + (d*x)/2]^14*(-7 + 6*Sin[c/2 + (d*x)/2]^2)
+ 143*(1 - 2*Sin[c/2 + (d*x)/2]^2)^3*Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[
c/2 + (d*x)/2]^2)]*(315*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 +
 (d*x)/2]^2)]]*Cos[(c + d*x)/2]^6*(351384 - 2928877*Sin[c/2 + (d*x)/2]^2 +
9953934*Sin[c/2 + (d*x)/2]^4 - 17629526*Sin[c/2 + (d*x)/2]^6 + 17139064*Sin
[c/2 + (d*x)/2]^8 - 8670660*Sin[c/2 + (d*x)/2]^10 + 1793816*Sin[c/2 + (d*x)
/2]^12) + Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(-110685
```

```
960 + 1291549455*Sin[c/2 + (d*x)/2]^2 - 6601900452*Sin[c/2 + (d*x)/2]^4 + 1
9406027859*Sin[c/2 + (d*x)/2]^6 - 36160322412*Sin[c/2 + (d*x)/2]^8 + 443132
22590*Sin[c/2 + (d*x)/2]^10 - 35736693140*Sin[c/2 + (d*x)/2]^12 + 183052542
12*Sin[c/2 + (d*x)/2]^14 - 5410719584*Sin[c/2 + (d*x)/2]^16 + 704274992*Sin
[c/2 + (d*x)/2]^18))))/(3243240*d*(a*(1 + Cos[c + d*x]))^(7/2))
```

Maple [A] (verified)

Time = 6.68 (sec) , antiderivative size = 361, normalized size of antiderivative = 1.30

method	result
default	$-\frac{\left(\sec^{\frac{5}{2}}(dx+c)\right)\sqrt{a(1+\cos(dx+c))}\left(3045(\cos^{6}(dx+c))\arcsin(\cot(dx+c)-\csc(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+12180\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\arcsin(\right.}{}$

```
[In] int(sec(d*x+c)^(5/2)/(a+cos(d*x+c)*a)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/384/d*sec(d*x+c)^(5/2)*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^4*(3045*c
os(d*x+c)^6*arcsin(cot(d*x+c)-csc(d*x+c))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
+12180*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))*cos(
d*x+c)^5+1887*cos(d*x+c)^5*2^(1/2)*sin(d*x+c)+18270*(cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^4+5082*2^(1/2)*cos(d*x+
c)^4*sin(d*x+c)+12180*cos(d*x+c)^3*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin
(cot(d*x+c)-csc(d*x+c))+4251*2^(1/2)*cos(d*x+c)^3*sin(d*x+c)+3045*(cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*arcsin(cot(d*x+c)-csc(d*x+c))+896*2^(
1/2)*cos(d*x+c)^2*sin(d*x+c)-128*sin(d*x+c)*cos(d*x+c)*2^(1/2))*2^(1/2)/a^4
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 229, normalized size of antiderivative = 0.83

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx =$$

$$-\frac{3045\sqrt{2}\left(\cos(dx+c)^{5}+4\cos(dx+c)^{4}+6\cos(dx+c)^{3}+4\cos(dx+c)^{2}+\cos(dx+c)\right)\sqrt{a}\arctan\left(\frac{\sqrt{}}{}\right.}{384\left(a^{4}d\cos(dx+c)^{5}+4a^{4}d\cos(dx+c)^{4}+6a^{4}d\cos\right.}$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] -1/384*(3045*sqrt(2)*(cos(d*x + c)^5 + 4*cos(d*x + c)^4 + 6*cos(d*x + c)^3
+ 4*cos(d*x + c)^2 + cos(d*x + c))*sqrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x +
c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) + 2*(1887*cos(d*x + c)^4
 + 5082*cos(d*x + c)^3 + 4251*cos(d*x + c)^2 + 896*cos(d*x + c) - 128)*sqrt
(a*cos(d*x + c) + a)*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^4*d*cos(d*x + c)^5
 + 4*a^4*d*cos(d*x + c)^4 + 6*a^4*d*cos(d*x + c)^3 + 4*a^4*d*cos(d*x + c)^2
 + a^4*d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(5/2)/(a+a*cos(d*x+c))**(7/2),x)
[Out] Timed out
```

Maxima [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="maxima")
[Out] Timed out
```

Giac [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(5/2)/(a*cos(d*x + c) + a)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^{7/2}}\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)/(a + a*cos(c + d*x))^(7/2),x)
[Out] int((1/cos(c + d*x))^(5/2)/(a + a*cos(c + d*x))^(7/2), x)
```

3.387 $\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 237

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = -\frac{363\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{64\sqrt{2}a^{7/2}d} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{19\sqrt{\sec(c+dx)}\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} - \frac{199\sqrt{\sec(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} + \frac{691\sqrt{\sec(c+dx)}\sin(c+dx)}{192a^3d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] -1/6*sin(d*x+c)*sec(d*x+c)^(1/2)/d/(a+a*cos(d*x+c))^(7/2)-19/48*sin(d*x+c)*
sec(d*x+c)^(1/2)/a/d/(a+a*cos(d*x+c))^(5/2)-199/192*sin(d*x+c)*sec(d*x+c)^(
1/2)/a^2/d/(a+a*cos(d*x+c))^(3/2)-363/128*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(
1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(
1/2)/a^(7/2)/d*2^(1/2)+691/192*sin(d*x+c)*sec(d*x+c)^(1/2)/a^3/d/(a+a*cos(d
*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 1.09 (sec) , antiderivative size = 237, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {4307, 2845, 3057, 3063, 12, 2861, 211}

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = -\frac{363\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{64\sqrt{2}a^{7/2}d} + \frac{691\sin(c+dx)\sqrt{\sec(c+dx)}}{192a^3d\sqrt{a\cos(c+dx)+a}} - \frac{199\sin(c+dx)\sqrt{\sec(c+dx)}}{192a^2d(a\cos(c+dx)+a)^{3/2}} - \frac{19\sin(c+dx)\sqrt{\sec(c+dx)}}{48ad(a\cos(c+dx)+a)^{5/2}} - \frac{\sin(c+dx)\sqrt{\sec(c+dx)}}{6d(a\cos(c+dx)+a)^{7/2}}$$

```
[In] Int[Sec[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^(7/2),x]
```

```
[Out] (-363*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*
Cos[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(64*Sqrt[2]*a^(7/2)*
d) - (Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(6*d*(a + a*Cos[c + d*x])^(7/2)) - (
19*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(48*a*d*(a + a*Cos[c + d*x])^(5/2)) - (
199*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(192*a^2*d*(a + a*Cos[c + d*x])^(3/2))
 + (691*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(192*a^3*d*Sqrt[a + a*Cos[c + d*x]
])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3063

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(B*c - A*d)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n
+ 1)/(f*(n + 1)*(c^2 - d^2))), x] + Dist[1/(b*(n + 1)*(c^2 - d^2)), Int[(a
+ b*Sin[e + f*x])^m*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*(a*d*m + b*c*(n + 1
)) - B*(a*c*m + b*d*(n + 1)) + b*(B*c - A*d)*(m + n + 2)*Sin[e + f*x], x],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ
[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[n, -1] && (IntegerQ[n] || EqQ[m
+ 1/2, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{7/2}}\,dx$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{13a}{2}-3a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{5/2}}\,dx}{6a^2}$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{19\sqrt{\sec(c+dx)}\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{123a^2}{4}-19a^2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(a+a\cos(c+dx))^{3/2}}\,dx}{24a^4}$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{19\sqrt{\sec(c+dx)}\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} - \frac{199\sqrt{\sec(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{691a^3}{8}-\frac{199}{4}a^3\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+a\cos(c+dx)}}\,dx}{48a^6}$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{19\sqrt{\sec(c+dx)}\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} - \frac{199\sqrt{\sec(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} + \frac{691\sqrt{\sec(c+dx)}\sin(c+dx)}{192a^3d\sqrt{a+a\cos(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int -\frac{1089a^4}{16\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{24a^7}$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{19\sqrt{\sec(c+dx)}\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} - \frac{199\sqrt{\sec(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} + \frac{691\sqrt{\sec(c+dx)}\sin(c+dx)}{192a^3d\sqrt{a+a\cos(c+dx)}} - \frac{\left(363\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{128a^3}$$

$$= -\frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{19\sqrt{\sec(c+dx)}\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} - \frac{199\sqrt{\sec(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} + \frac{691\sqrt{\sec(c+dx)}\sin(c+dx)}{192a^3d\sqrt{a+a\cos(c+dx)}} + \frac{\left(363\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64a^2d}$$

$$= -\frac{363\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{64\sqrt{2}a^{7/2}d} - \frac{\sqrt{\sec(c+dx)}\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}} - \frac{19\sqrt{\sec(c+dx)}\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}} - \frac{199\sqrt{\sec(c+dx)}\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}} + \frac{691\sqrt{\sec(c+dx)}\sin(c+dx)}{192a^3d\sqrt{a+a\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 6.64 (sec) , antiderivative size = 561, normalized size of antiderivative = 2.37

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{2\cos^7\left(\frac{c}{2}+\frac{dx}{2}\right)\sec^6\left(\frac{1}{2}(c+dx)\right)\sin\left(\frac{c}{2}+\frac{dx}{2}\right)\left(\frac{1}{1-2\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}\right)^{3/2}\left(\frac{16\cos^8\left(\frac{1}{2}(c+\right.}{}\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^(3/2)/(a + a*Cos[c + d*x])^(7/2),x]
```

```
[Out] (2*Cos[c/2 + (d*x)/2]^7*Sec[(c + d*x)/2]^6*Sin[c/2 + (d*x)/2]*((1 - 2*Sin[c
/2 + (d*x)/2]^2)^(-1))^(3/2)*((16*Cos[(c + d*x)/2]^8*HypergeometricPFQ[{2,
2, 2, 2, 5/2}, {1, 1, 1, 13/2}, Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x
)/2]^2)]*Sin[c/2 + (d*x)/2]^2)/(3465*(-1 + 2*Sin[c/2 + (d*x)/2]^2)) - (Csc[
c/2 + (d*x)/2]^10*(1 - 2*Sin[c/2 + (d*x)/2]^2)^2*Sqrt[Sin[c/2 + (d*x)/2]^2/
(-1 + 2*Sin[c/2 + (d*x)/2]^2)]*(105*ArcTanh[Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 +
 2*Sin[c/2 + (d*x)/2]^2)]]*Cos[(c + d*x)/2]^6*(2187 - 12908*Sin[c/2 + (d*x)
/2]^2 + 27986*Sin[c/2 + (d*x)/2]^4 - 26380*Sin[c/2 + (d*x)/2]^6 + 8752*Sin[
c/2 + (d*x)/2]^8) + Sqrt[Sin[c/2 + (d*x)/2]^2/(-1 + 2*Sin[c/2 + (d*x)/2]^2)
]*(-229635 + 2120790*Sin[c/2 + (d*x)/2]^2 - 8267707*Sin[c/2 + (d*x)/2]^4 +
17646926*Sin[c/2 + (d*x)/2]^6 - 22251094*Sin[c/2 + (d*x)/2]^8 + 16548816*Si
n[c/2 + (d*x)/2]^10 - 6712984*Sin[c/2 + (d*x)/2]^12 + 1144608*Sin[c/2 + (d*
x)/2]^14)))/1680))/(d*(a*(1 + Cos[c + d*x]))^(7/2))
```

Maple [A] (verified)

Time = 6.65 (sec) , antiderivative size = 330, normalized size of antiderivative = 1.39

method	result
default	$\frac{\left(1089\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\arcsin(\cot(dx+c)-\csc(dx+c))\left(\cos^4(dx+c)\right)+691\sqrt{2}\left(\cos^3(dx+c)\right)\sin(dx+c)+4356\left(\cos^3(dx+c)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right.}{}$

```
[In] int(sec(d*x+c)^(3/2)/(a+cos(d*x+c)*a)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/384/d*(1089*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c
))*cos(d*x+c)^4+691*2^(1/2)*cos(d*x+c)^3*sin(d*x+c)+4356*cos(d*x+c)^3*(cos(
d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))+1874*2^(1/2)*cos
(d*x+c)^2*sin(d*x+c)+6534*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*ar
csin(cot(d*x+c)-csc(d*x+c))+1599*sin(d*x+c)*cos(d*x+c)*2^(1/2)+4356*cos(d*x
+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-csc(d*x+c))+384*2^(
1/2)*sin(d*x+c)+1089*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcsin(cot(d*x+c)-cs
```

```
c(d*x+c)))*sec(d*x+c)^(3/2)*(a*(1+cos(d*x+c)))^(1/2)*cos(d*x+c)/(1+cos(d*x+
c))^4*2^(1/2)/a^4
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 204, normalized size of antiderivative = 0.86

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{1089\sqrt{2}\left(\cos\left(dx+c\right)^4+4\,\cos\left(dx+c\right)^3+6\,\cos\left(dx+c\right)^2+4\,\cos\left(dx+c\right)+1}{384\,\left(a^4d\cos\left(dx+c\right)^4+4\,a^4d\,c}$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/384*(1089*sqrt(2)*(cos(d*x + c)^4 + 4*cos(d*x + c)^3 + 6*cos(d*x + c)^2 +
 4*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(c
os(d*x + c))/(sqrt(a)*sin(d*x + c))) + 2*(691*cos(d*x + c)^3 + 1874*cos(d*x
 + c)^2 + 1599*cos(d*x + c) + 384)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/sq
rt(cos(d*x + c)))/(a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(d*x + c)^3 + 6*a^4*d*
cos(d*x + c)^2 + 4*a^4*d*cos(d*x + c) + a^4*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(3/2)/(a+a*cos(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{3}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] integrate(sec(d*x + c)^(3/2)/(a*cos(d*x + c) + a)^(7/2), x)
```

Giac [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{3}{2}}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(3/2)/(a*cos(d*x + c) + a)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^{7/2}}\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)/(a + a*cos(c + d*x))^(7/2),x)
[Out] int((1/cos(c + d*x))^(3/2)/(a + a*cos(c + d*x))^(7/2), x)
```

3.388 $\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 197

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{63\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{64\sqrt{2}a^{7/2}d} - \frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} - \frac{5\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} - \frac{103\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

```
[Out] -1/6*sin(d*x+c)/d/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(1/2)-5/16*sin(d*x+c)/a
/d/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(1/2)-103/192*sin(d*x+c)/a^2/d/(a+a*co
s(d*x+c))^(3/2)/sec(d*x+c)^(1/2)+63/128*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/
2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/
2)/a^(7/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.66 (sec) , antiderivative size = 197, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {4307, 2845, 3057, 12, 2861, 211}

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{63\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{64\sqrt{2}a^{7/2}d} - \frac{103\sin(c+dx)}{192a^2d\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{3/2}} - \frac{5\sin(c+dx)}{16ad\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{5/2}} - \frac{\sin(c+dx)}{6d\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{7/2}}$$

```
[In] Int[Sqrt[Sec[c + d*x]]/(a + a*Cos[c + d*x])^(7/2),x]
```

```
[Out] (63*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Co
s[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(64*Sqrt[2]*a^(7/2)*d)
 - Sin[c + d*x]/(6*d*(a + a*Cos[c + d*x])^(7/2)*Sqrt[Sec[c + d*x]]) - (5*Si
n[c + d*x])/(16*a*d*(a + a*Cos[c + d*x])^(5/2)*Sqrt[Sec[c + d*x]]) - (103*S
in[c + d*x])/(192*a^2*d*(a + a*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
```

```
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{7/2}}\,dx$$

$$= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{11a}{2}-2a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}\,dx}{6a^2}$$

$$= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} - \frac{5\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{73a^2}{4}-\frac{15}{2}a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx}{24a^4}$$

$$= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} - \frac{5\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} - \frac{103\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{189a^3}{8\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{48a^6}$$

$$= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} - \frac{5\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} - \frac{103\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{\left(63\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{128a^3}$$

$$= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} - \frac{5\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} - \frac{103\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{\left(63\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64a^2d}$$

$$= \frac{63 \arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{64\sqrt{2}a^{7/2}d} - \frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} - \frac{5\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} - \frac{103\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 2.48 (sec) , antiderivative size = 153, normalized size of antiderivative = 0.78

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{7/2}}\,dx = \frac{\sec^4\left(\frac{1}{2}(c+dx)\right)\left(-2(493+532\cos(c+dx)+103\cos(2(c+dx)))\sqrt{2-2\sec}\right.}{3072\sqrt{2}a^3d\sqrt{a(1+}}$$

```
[In] Integrate[Sqrt[Sec[c + d*x]]/(a + a*Cos[c + d*x])^(7/2),x]
```

```
[Out] (Sec[(c + d*x)/2]^4*(-2*(493 + 532*Cos[c + d*x] + 103*Cos[2*(c + d*x)])*Sqr
t[2 - 2*Sec[c + d*x]] + 6048*ArcTanh[Sqrt[-(Sec[c + d*x]*Sin[(c + d*x)/2]^2
)]]*Cos[(c + d*x)/2]^6*Sec[c + d*x])*Tan[(c + d*x)/2])/(3072*Sqrt[2]*a^3*d*
Sqrt[a*(1 + Cos[c + d*x])]*Sqrt[-((-1 + Sec[c + d*x])*Sec[c + d*x])])
```

Maple [A] (verified)

Time = 6.22 (sec) , antiderivative size = 266, normalized size of antiderivative = 1.35

method	result
default	$-\frac{\left(103\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\left(\cos^2(dx+c)\right)\sin(dx+c)+266\sqrt{2}\cos(dx+c)\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+189\arcsin(\cot(dx+c)-\csc(dx+c))\right.}{}$

```
[In] int(sec(d*x+c)^(1/2)/(a+cos(d*x+c)*a)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/384/d*(103*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*sin(d*
x+c)+266*2^(1/2)*cos(d*x+c)*sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+18
9*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^3+195*sin(d*x+c)*2^(1/2)*(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)+567*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^2+5
67*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)+189*arcsin(cot(d*x+c)-csc(d*x+c
)))*sec(d*x+c)^(1/2)*(a*(1+cos(d*x+c)))^(1/2)*cos(d*x+c)/(1+cos(d*x+c))^4/(
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)/a^4
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.03

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{7/2}}\,dx =$$

$$-\frac{189\sqrt{2}\left(\cos\left(dx+c\right)^4+4\cos\left(dx+c\right)^3+6\cos\left(dx+c\right)^2+4\cos\left(dx+c\right)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{\cdots}}{\sqrt{a}\sin(dx+\cdots}\right.}{384\left(a^4d\cos\left(dx+c\right)^4+4a^4d\cos\left(dx+c\right)^3+6a^4d\cos\left(dx+c\right)\cdots\right.}$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] -1/384*(189*sqrt(2)*(cos(d*x + c)^4 + 4*cos(d*x + c)^3 + 6*cos(d*x + c)^2 +
 4*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(c
os(d*x + c))/(sqrt(a)*sin(d*x + c))) + 2*(103*cos(d*x + c)^3 + 266*cos(d*x
+ c)^2 + 195*cos(d*x + c))*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/sqrt(cos(d
*x + c)))/(a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(d*x + c)^3 + 6*a^4*d*cos(d*x
+ c)^2 + 4*a^4*d*cos(d*x + c) + a^4*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(1/2)/(a+a*cos(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{\sqrt{\sec\left(dx+c\right)}}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(sec(d*x + c))/(a*cos(d*x + c) + a)^(7/2), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(7/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+a\cos(c+dx))^{7/2}}\,dx = \int \frac{\sqrt{\frac{1}{\cos(c+d\,x)}}}{\left(a+a\,\cos\left(c+d\,x\right)\right)^{7/2}}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)/(a + a*cos(c + d*x))^(7/2),x)
[Out] int((1/cos(c + d*x))^(1/2)/(a + a*cos(c + d*x))^(7/2), x)
```

3.389 $\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 197

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}}\,dx = \frac{13\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{64\sqrt{2}a^{7/2}d} + \frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} + \frac{\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} - \frac{5\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

```
[Out] 1/6*sin(d*x+c)/d/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(1/2)+1/16*sin(d*x+c)/a/
d/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(1/2)-5/192*sin(d*x+c)/a^2/d/(a+a*cos(d
*x+c))^(3/2)/sec(d*x+c)^(1/2)+13/128*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/
cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/
a^(7/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.63 (sec) , antiderivative size = 197, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4307, 2843, 3057, 12, 2861, 211}

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}}\,dx = \frac{13\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{64\sqrt{2}a^{7/2}d} - \frac{5\sin(c+dx)}{192a^2d\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{3/2}} + \frac{\sin(c+dx)}{16ad\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{5/2}} + \frac{\sin(c+dx)}{6d\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{7/2}}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^(7/2)*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (13*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Co
s[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(64*Sqrt[2]*a^(7/2)*d)
 + Sin[c + d*x]/(6*d*(a + a*Cos[c + d*x])^(7/2)*Sqrt[Sec[c + d*x]]) + Sin[c
 + d*x]/(16*a*d*(a + a*Cos[c + d*x])^(5/2)*Sqrt[Sec[c + d*x]]) - (5*Sin[c +
 d*x])/(192*a^2*d*(a + a*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2843

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*
((c + d*Sin[e + f*x])^n/(a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[a*d*n - b*c*
(m + 1) - b*d*(m + n + 1)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e,
 f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && L
tQ[m, -1] && LtQ[0, n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c,
 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
```

```
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{(a+a\cos(c+dx))^{7/2}}\,dx$$

$$= \frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{a}{2}+2a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}\,dx}{6a^2}$$

$$= \frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} + \frac{\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{11a^2}{4}+\frac{3}{2}a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx}{24a^4}$$

$$= \frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} + \frac{\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} - \frac{5\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{39a^3}{8\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{48a^6}$$

$$= \frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} + \frac{\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} - \frac{5\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{\left(13\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{128a^3}$$

$$= \frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} + \frac{\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} - \frac{5\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{\left(13\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64a^2d}$$

$$= \frac{13 \arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{64\sqrt{2}a^{7/2}d} + \frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} + \frac{\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} - \frac{5\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.80 (sec) , antiderivative size = 125, normalized size of antiderivative = 0.63

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}}\,dx = \frac{-312\text{arctanh}\left(\sqrt{-\sec(c+dx)\sin^2\left(\frac{1}{2}(c+dx)\right)}\right)\cot\left(\frac{1}{2}(c+dx\right.}{3072a^3}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^(7/2)*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (-312*ArcTanh[Sqrt[-(Sec[c + d*x]*Sin[(c + d*x)/2]^2)]]*Cot[(c + d*x)/2]*Sq
rt[2 - 2*Sec[c + d*x]] + (73 + 4*Cos[c + d*x] - 5*Cos[2*(c + d*x)])*Sec[(c
+ d*x)/2]^6*Sin[c + d*x])/(3072*a^3*d*Sqrt[a*(1 + Cos[c + d*x])]*Sqrt[Sec[c
 + d*x]])
```

Maple [A] (verified)

Time = 4.58 (sec) , antiderivative size = 260, normalized size of antiderivative = 1.32

method	result
default	$-\frac{\left(5\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,(\cos^2(dx+c))\sin(dx+c)-2\sqrt{2}\,\cos(dx+c)\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+39\arcsin(\cot(dx+c)-\csc(dx+c))(\cos^3(\right.}{}$

```
[In] int(1/(a+cos(d*x+c)*a)^(7/2)/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/384/d*(5*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*sin(d*x+
c)-2*2^(1/2)*cos(d*x+c)*sin(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+39*arc
sin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^3-39*sin(d*x+c)*2^(1/2)*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)+117*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^2+117*arc
sin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)+39*arcsin(cot(d*x+c)-csc(d*x+c)))*(a*
(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^4/sec(d*x+c)^(1/2)/(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)*2^(1/2)/a^4
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.03

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}}\,dx = -\frac{39\sqrt{2}\left(\cos(dx+c)^4+4\cos(dx+c)^3+6\cos(dx+c)^2+4\cos(dx+c)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{c}}{\sqrt{a}\sin(dx+c)}\right.}{384\left(a^4d\cos(dx+c)^4+4a^4d\cos(dx+c)^3+6a^4d\cos(dx+c)^2+\right.}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/384*(39*sqrt(2)*(cos(d*x + c)^4 + 4*cos(d*x + c)^3 + 6*cos(d*x + c)^2 +
4*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(co
s(d*x + c))/(sqrt(a)*sin(d*x + c))) + 2*(5*cos(d*x + c)^3 - 2*cos(d*x + c)^
2 - 39*cos(d*x + c))*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/sqrt(cos(d*x + c
)))/(a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(d*x + c)^3 + 6*a^4*d*cos(d*x + c)^2
 + 4*a^4*d*cos(d*x + c) + a^4*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**(7/2)/sec(d*x+c)**(1/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{7}{2}}\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/((a*cos(d*x + c) + a)^(7/2)*sqrt(sec(d*x + c))), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{\sqrt{\frac{1}{\cos(c+d\,x)}}\,\left(a+a\,\cos\left(c+d\,x\right)\right)^{7/2}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^(7/2)),x)
[Out] int(1/((1/cos(c + d*x))^(1/2)*(a + a*cos(c + d*x))^(7/2)), x)
```

3.390 $\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 197

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{7\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{64\sqrt{2}a^{7/2}d} - \frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} + \frac{3\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{17\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

```
[Out] -1/6*sin(d*x+c)/d/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(1/2)+3/16*sin(d*x+c)/a
/d/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(1/2)+17/192*sin(d*x+c)/a^2/d/(a+a*cos
(d*x+c))^(3/2)/sec(d*x+c)^(1/2)+7/128*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)
/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)
/a^(7/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.59 (sec) , antiderivative size = 197, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4307, 2844, 3057, 12, 2861, 211}

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{7\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{64\sqrt{2}a^{7/2}d} + \frac{17\sin(c+dx)}{192a^2d\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{3/2}} + \frac{3\sin(c+dx)}{16ad\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{5/2}} - \frac{\sin(c+dx)}{6d\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{7/2}}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^(7/2)*Sec[c + d*x]^(3/2)),x]
```

```
[Out] (7*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos
[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(64*Sqrt[2]*a^(7/2)*d)
- Sin[c + d*x]/(6*d*(a + a*Cos[c + d*x])^(7/2)*Sqrt[Sec[c + d*x]]) + (3*Sin
[c + d*x])/(16*a*d*(a + a*Cos[c + d*x])^(5/2)*Sqrt[Sec[c + d*x]]) + (17*Sin
[c + d*x])/(192*a^2*d*(a + a*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
```

```
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx$$

$$= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{a}{2}-4a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}\,dx}{6a^2}$$

$$= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} + \frac{3\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{a^2}{4}-\frac{9}{2}a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx}{24a^4}$$

$$= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} + \frac{3\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{17\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int -\frac{21a^3}{8\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{48a^6}$$

$$= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} + \frac{3\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{17\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{\left(7\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{128a^3}$$

$$= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} + \frac{3\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{17\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{\left(7\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64a^2d}$$

$$= \frac{7\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{64\sqrt{2}a^{7/2}d} - \frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} + \frac{3\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{17\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 2.51 (sec) , antiderivative size = 153, normalized size of antiderivative = 0.78

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{\sec^4\left(\frac{1}{2}(c+dx)\right)\left(2(59+140\cos(c+dx)+17\cos(2(c+dx)))\sqrt{\right.}{3072\sqrt{2}a^3}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^(7/2)*Sec[c + d*x]^(3/2)),x]
```

```
[Out] (Sec[(c + d*x)/2]^4*(2*(59 + 140*Cos[c + d*x] + 17*Cos[2*(c + d*x)])*Sqrt[2
 - 2*Sec[c + d*x]] + 672*ArcTanh[Sqrt[-(Sec[c + d*x]*Sin[(c + d*x)/2]^2)]]*
Cos[(c + d*x)/2]^6*Sec[c + d*x])*Tan[(c + d*x)/2])/(3072*Sqrt[2]*a^3*d*Sqrt
[a*(1 + Cos[c + d*x])]*Sqrt[-((-1 + Sec[c + d*x])*Sec[c + d*x])])
```

Maple [A] (verified)

Time = 4.63 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.27

method	result
default	$\frac{\sqrt{a(1+\cos(dx+c))}\left(17\sqrt{2}\cos(dx+c)\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+70\sin(dx+c)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-21\arcsin(\cot(dx+c)-\csc(dx+c))(c\right.}{384}$

```
[In] int(1/(a+cos(d*x+c)*a)^(7/2)/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/384/d*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^4/sec(d*x+c)^(3/2)/(cos(d*x
+c)/(1+cos(d*x+c)))^(1/2)*(17*2^(1/2)*cos(d*x+c)*sin(d*x+c)*(cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)+70*sin(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-
21*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^2+21*tan(d*x+c)*2^(1/2)*(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)-63*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)-63*a
rcsin(cot(d*x+c)-csc(d*x+c))-21*sec(d*x+c)*arcsin(cot(d*x+c)-csc(d*x+c)))*2
^(1/2)/a^4
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.03

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = -\frac{21\sqrt{2}\left(\cos(dx+c)^4+4\cos(dx+c)^3+6\cos(dx+c)^2+4\cos(dx+c)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{c}}{\sqrt{a}\sin(dx+c)}\right.}{384\left(a^4d\cos(dx+c)^4+4a^4d\cos(dx+c)^3+6a^4d\cos(dx+c)^2\right.}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/384*(21*sqrt(2)*(cos(d*x + c)^4 + 4*cos(d*x + c)^3 + 6*cos(d*x + c)^2 +
4*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(co
s(d*x + c))/(sqrt(a)*sin(d*x + c))) - 2*(17*cos(d*x + c)^3 + 70*cos(d*x + c
)^2 + 21*cos(d*x + c))*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/sqrt(cos(d*x +
 c)))/(a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(d*x + c)^3 + 6*a^4*d*cos(d*x + c)
^2 + 4*a^4*d*cos(d*x + c) + a^4*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**(7/2)/sec(d*x+c)**(3/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{7}{2}}\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(1/((a*cos(d*x + c) + a)^(7/2)*sec(d*x + c)^(3/2)), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}\,(a+a\,\cos(c+d\,x))^{7/2}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^(7/2)),x)
[Out] int(1/((1/cos(c + d*x))^(3/2)*(a + a*cos(c + d*x))^(7/2)), x)
```

3.391 $\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 197

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{5\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{64\sqrt{2}a^{7/2}d} - \frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{13\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{67\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

```
[Out] -1/6*sin(d*x+c)/d/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(3/2)-13/48*sin(d*x+c)/
a/d/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(1/2)+67/192*sin(d*x+c)/a^2/d/(a+a*co
s(d*x+c))^(3/2)/sec(d*x+c)^(1/2)+5/128*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2
)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2
)/a^(7/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.58 (sec) , antiderivative size = 197, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used = {4307, 2844, 3056, 3057, 12, 2861, 211}

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{64\sqrt{2}a^{7/2}d} + \frac{67\sin(c+dx)}{192a^2d\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{3/2}} - \frac{\sin(c+dx)}{6d\sec^{\frac{3}{2}}(c+dx)(a\cos(c+dx)+a)^{7/2}} - \frac{13\sin(c+dx)}{48ad\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^(7/2)*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (5*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos
[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(64*Sqrt[2]*a^(7/2)*d)
- Sin[c + d*x]/(6*d*(a + a*Cos[c + d*x])^(7/2)*Sec[c + d*x]^(3/2)) - (13*Si
n[c + d*x])/(48*a*d*(a + a*Cos[c + d*x])^(5/2)*Sqrt[Sec[c + d*x]]) + (67*Si
n[c + d*x])/(192*a^2*d*(a + a*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
```

```
egerQ[2*n] || EqQ[c, 0])
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx\\
&= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)}\\
&\quad -\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}\left(\frac{3a}{2}-5a\cos(c+dx)\right)}{(a+a\cos(c+dx))^{5/2}}\,dx}{6a^2}\\
&= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)}-\frac{13\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\\
&\quad -\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{13a^2}{4}-\frac{27}{2}a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx}{24a^4}\\
&= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)}-\frac{13\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\\
&\quad +\frac{67\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\\
&\quad -\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int -\frac{15a^3}{8\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{48a^6}
\end{aligned}$$

$$= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{13\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{67\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{\left(5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{128a^3}$$

$$= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{13\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{67\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{\left(5\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64a^2d}$$

$$= \frac{5\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{64\sqrt{2}a^{7/2}d} - \frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{13\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{67\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 2.85 (sec) , antiderivative size = 196, normalized size of antiderivative = 0.99

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{\cos^7\left(\frac{1}{2}(c+dx)\right)\sqrt{\cos(c+dx)}\sqrt{a(1+\cos(c+dx))}\sqrt{\sec(c+d}}{}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^(7/2)*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (Cos[(c + d*x)/2]^7*Sqrt[Cos[c + d*x]]*Sqrt[a*(1 + Cos[c + d*x])]*Sqrt[Sec[
c + d*x]]*(15*ArcSin[Sin[(c + d*x)/2]/Sqrt[Cos[(c + d*x)/2]^2]]*Sqrt[Cos[(c
 + d*x)/2]^2] + Sqrt[2]*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sin[(c + d*x)
/2]*(33 - 26*Tan[(c + d*x)/2]^2 + 8*Tan[(c + d*x)/2]^4)))/(24*a^4*d*Sqrt[Co
s[(c + d*x)/2]^2]*(1 + Cos[c + d*x])^4)
```

Maple [A] (verified)

Time = 4.00 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.27

method	result
default	$\frac{\sqrt{a(1+\cos(dx+c))}\left(67\sin(dx+c)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+50\tan(dx+c)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-15\arcsin(\cot(dx+c)-\csc(dx+c))\cos(dx+c)+1\right.}{384d(}$

[In] int(1/(a+cos(d*x+c)*a)^(7/2)/sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)

[Out] 1/384/d*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^4/sec(d*x+c)^(5/2)/(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(67*sin(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+50*tan(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-15*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)+15*tan(d*x+c)*sec(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-45*arcsin(cot(d*x+c)-csc(d*x+c))-45*sec(d*x+c)*arcsin(cot(d*x+c)-csc(d*x+c))-15*sec(d*x+c)^2*arcsin(cot(d*x+c)-csc(d*x+c)))*2^(1/2)/a^4

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.03

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{5}{2}}(c+dx)}\,dx =$$

$$-\frac{15\sqrt{2}\left(\cos(dx+c)^4+4\cos(dx+c)^3+6\cos(dx+c)^2+4\cos(dx+c)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+a}\sqrt{c}}{\sqrt{a}\sin(dx+c)}\right.}{384\left(a^4d\cos(dx+c)^4+4a^4d\cos(dx+c)^3+6a^4d\cos(dx+c)^2\right.}$$

[In] integrate(1/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(5/2),x, algorithm="fricas")

[Out] -1/384*(15*sqrt(2)*(cos(d*x + c)^4 + 4*cos(d*x + c)^3 + 6*cos(d*x + c)^2 + 4*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - 2*(67*cos(d*x + c)^3 + 50*cos(d*x + c)^2 + 15*cos(d*x + c))*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(d*x + c)^3 + 6*a^4*d*cos(d*x + c)^2 + 4*a^4*d*cos(d*x + c) + a^4*d)

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**(7/2)/sec(d*x+c)**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{7}{2}}\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^(7/2)*sec(d*x + c)^(5/2)), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}(a+a\,\cos(c+d\,x))^{7/2}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^(7/2)),x)
[Out] int(1/((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^(7/2)), x)
```

3.392 $\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 254

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{7}{2}}(c+dx)}\,dx = \frac{2\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{a^{7/2}d} - \frac{177\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{64\sqrt{2}a^{7/2}d} - \frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{17\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{49\sin(c+dx)}{64a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

```
[Out] -1/6*sin(d*x+c)/d/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(5/2)-17/48*sin(d*x+c)/
a/d/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(3/2)-49/64*sin(d*x+c)/a^2/d/(a+a*cos
(d*x+c))^(3/2)/sec(d*x+c)^(1/2)+2*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c)
)^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^(7/2)/d-177/128*arctan(1/2*sin
(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)
^(1/2)*sec(d*x+c)^(1/2)/a^(7/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.82 (sec) , antiderivative size = 254, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {4307, 2844, 3056, 3061, 2861, 211, 2853, 222}

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{7}{2}}(c+dx)}\,dx = \frac{2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{a^{7/2}d} - \frac{177\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{64\sqrt{2}a^{7/2}d} - \frac{49\sin(c+dx)}{64a^2d\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{3/2}} - \frac{17\sin(c+dx)}{48ad\sec^{\frac{3}{2}}(c+dx)(a\cos(c+dx)+a)^{5/2}} - \frac{\sin(c+dx)}{6d\sec^{\frac{5}{2}}(c+dx)(a\cos(c+dx)+a)^{7/2}}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^(7/2)*Sec[c + d*x]^(7/2)),x]
```

```
[Out] (2*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[Cos[c + d*x
]]*Sqrt[Sec[c + d*x]])/(a^(7/2)*d) - (177*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sq
rt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt
[Sec[c + d*x]])/(64*Sqrt[2]*a^(7/2)*d) - Sin[c + d*x]/(6*d*(a + a*Cos[c + d
*x])^(7/2)*Sec[c + d*x]^(5/2)) - (17*Sin[c + d*x])/(48*a*d*(a + a*Cos[c + d
*x])^(5/2)*Sec[c + d*x]^(3/2)) - (49*Sin[c + d*x])/(64*a^2*d*(a + a*Cos[c +
 d*x])^(3/2)*Sqrt[Sec[c + d*x]])
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
```

```
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx$$

$$= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{3}{2}}(c+dx)\left(\frac{5a}{2}-6a\cos(c+dx)\right)}{(a+a\cos(c+dx))^{5/2}}\,dx}{6a^2}$$

$$= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{17\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}\left(\frac{51a^2}{4}-24a^2\cos(c+dx)\right)}{(a+a\cos(c+dx))^{3/2}}\,dx}{24a^4}$$

$$= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{17\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{49\sin(c+dx)}{64a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{147a^3}{8}-48a^3\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{48a^6}$$

$$= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{17\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{49\sin(c+dx)}{64a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx}{a^4} - \frac{\left(177\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{128a^3}$$

$$= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{17\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{49\sin(c+dx)}{64a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\operatorname{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^4d} + \frac{\left(177\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\operatorname{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64a^2d}$$

$$= \frac{2\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{a^{7/2}d} - \frac{177\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{64\sqrt{2}a^{7/2}d} - \frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{17\sin(c+dx)}{48ad(a+a\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{49\sin(c+dx)}{64a^2d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.94 (sec) , antiderivative size = 454, normalized size of antiderivative = 1.79

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{7}{2}}(c+dx)}\,dx = -\frac{ie^{-\frac{1}{2}i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\sqrt{1+e^{2i(c+dx)}}\left(64\text{arcsinh}\left(e^{i(c+dx)}\right)+\frac{177\text{arctanh}\left(\frac{1-e^{i(c+dx)}}{\sqrt{2}\sqrt{1+e^{2i(c+dx)}}}\right)}{\sqrt{2}}-64\text{arctanh}\left(\sqrt{1+\right.\right.}{4\sqrt{2}d(a(1+\cos(c+dx)))^{7/2}} + \frac{\cos^7\left(\frac{c}{2}+\frac{dx}{2}\right)\sqrt{\sec(c+dx)}\left(-\frac{247\cos\left(\frac{dx}{2}\right)\sin\left(\frac{c}{2}\right)}{12d}-\frac{247\cos\left(\frac{c}{2}\right)\sin\left(\frac{dx}{2}\right)}{12d}+\frac{379\sec\left(\frac{c}{2}\right)\sec^2\left(\frac{c}{2}+\frac{dx}{2}\right)\sin\left(\frac{dx}{2}\right)}{24d}-\frac{41\sec\left(\frac{c}{2}\right)\sec^4\left(\frac{c}{2}\right.}{12\right.}}{(a(1+\cos(c+d}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^(7/2)*Sec[c + d*x]^(7/2)),x]
```

```
[Out] ((-1/4*I)*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)))]*Sqrt[1 + E^((2*I)
*(c + d*x))]*(64*ArcSinh[E^(I*(c + d*x))] + (177*ArcTanh[(1 - E^(I*(c + d*x
)))/(Sqrt[2]*Sqrt[1 + E^((2*I)*(c + d*x))])])/Sqrt[2] - 64*ArcTanh[Sqrt[1 +
 E^((2*I)*(c + d*x))]])*Cos[c/2 + (d*x)/2]^7)/(Sqrt[2]*d*E^((I/2)*(c + d*x)
)*(a*(1 + Cos[c + d*x]))^(7/2)) + (Cos[c/2 + (d*x)/2]^7*Sqrt[Sec[c + d*x]]*
((-247*Cos[(d*x)/2]*Sin[c/2])/(12*d) - (247*Cos[c/2]*Sin[(d*x)/2])/(12*d) +
 (379*Sec[c/2]*Sec[c/2 + (d*x)/2]^2*Sin[(d*x)/2])/(24*d) - (41*Sec[c/2]*Sec
[c/2 + (d*x)/2]^4*Sin[(d*x)/2])/(12*d) + (Sec[c/2]*Sec[c/2 + (d*x)/2]^6*Sin
[(d*x)/2])/(3*d) + (379*Sec[c/2 + (d*x)/2]*Tan[c/2])/(24*d) - (41*Sec[c/2 +
 (d*x)/2]^3*Tan[c/2])/(12*d) + (Sec[c/2 + (d*x)/2]^5*Tan[c/2])/(3*d)))/(a*(
1 + Cos[c + d*x]))^(7/2)
```

Maple [A] (warning: unable to verify)

Time = 4.38 (sec) , antiderivative size = 401, normalized size of antiderivative = 1.58

method	result
default	$\frac{\left(\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1\right)^4\left(\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2-1\right)\sqrt{\frac{a}{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1}}\left(8\left(\csc^5(dx+c)\right)\sqrt{-(\csc^2(}\right.}{}$

```
[In] int(1/(a+cos(d*x+c)*a)^(7/2)/sec(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/384/d/(-(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-
1))^(7/2)/(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(9/2)*(csc(d*x+c)^2*(1-cos(d*x
+c))^2+1)^4*(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)*(a/(csc(d*x+c)^2*(1-cos(d*x+c
))^2+1))^(1/2)*(8*csc(d*x+c)^5*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(1-
cos(d*x+c))^5-50*csc(d*x+c)^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(1-c
os(d*x+c))^3+384*2^(1/2)*arctan(2^(1/2)*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^
(1/2)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)*(csc(d*x+c)-cot(d*x+c)))+189*(-csc(
d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(csc(d*x+c)-cot(d*x+c))-531*arcsin(cot(d
*x+c)-csc(d*x+c)))*2^(1/2)/a^4
```

Fricas [A] (verification not implemented)

none

Time = 0.46 (sec) , antiderivative size = 279, normalized size of antiderivative = 1.10

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{7}{2}}(c+dx)}\,dx = \frac{531\sqrt{2}\left(\cos\left(dx+c\right)^4+4\cos\left(dx+c\right)^3+6\cos\left(dx+c\right)^2+4\,\mathrm{co}\right.}{}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] 1/384*(531*sqrt(2)*(cos(d*x + c)^4 + 4*cos(d*x + c)^3 + 6*cos(d*x + c)^2 +
4*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(co
s(d*x + c))/(sqrt(a)*sin(d*x + c))) - 768*(cos(d*x + c)^4 + 4*cos(d*x + c)^
3 + 6*cos(d*x + c)^2 + 4*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(a*cos(d*x +
c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - 2*(247*cos(d*x + c)^3
+ 362*cos(d*x + c)^2 + 147*cos(d*x + c))*sqrt(a*cos(d*x + c) + a)*sin(d*x +
 c)/sqrt(cos(d*x + c)))/(a^4*d*cos(d*x + c)^4 + 4*a^4*d*cos(d*x + c)^3 + 6*
a^4*d*cos(d*x + c)^2 + 4*a^4*d*cos(d*x + c) + a^4*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**(7/2)/sec(d*x+c)**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{7}{2}}\sec(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(7/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^(7/2)*sec(d*x + c)^(7/2)), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(7/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{7/2}(a+a\,\cos(c+d\,x))^{7/2}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))^(7/2)),x)
[Out] int(1/((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))^(7/2)), x)
```

3.393 $\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{9}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 294

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{9}{2}}(c+dx)}\,dx = -\frac{7\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{a^{7/2}d} + \frac{637\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{64\sqrt{2}a^{7/2}d} - \frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{7}{2}}(c+dx)} - \frac{7\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{259\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)} + \frac{189\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

```
[Out] -1/6*sin(d*x+c)/d/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(7/2)-7/16*sin(d*x+c)/a
/d/(a+a*cos(d*x+c))^(5/2)/sec(d*x+c)^(5/2)-259/192*sin(d*x+c)/a^2/d/(a+a*co
s(d*x+c))^(3/2)/sec(d*x+c)^(3/2)+189/64*sin(d*x+c)/a^3/d/(a+a*cos(d*x+c))^(
1/2)/sec(d*x+c)^(1/2)-7*arcsin(sin(d*x+c)*a^(1/2)/(a+a*cos(d*x+c))^(1/2))*c
os(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^(7/2)/d+637/128*arctan(1/2*sin(d*x+c)*a^
(1/2)*2^(1/2)/cos(d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec
(d*x+c)^(1/2)/a^(7/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 1.00 (sec) , antiderivative size = 294, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {4307, 2844, 3056, 3062, 3061, 2861, 211, 2853, 222}

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{9}{2}}(c+dx)}\,dx = -\frac{7\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a\cos(c+dx)+a}}\right)}{a^{7/2}d} + \frac{637\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{64\sqrt{2}a^{7/2}d} + \frac{189\sin(c+dx)}{64a^3d\sqrt{\sec(c+dx)}\sqrt{a\cos(c+dx)+a}} - \frac{259\sin(c+dx)}{192a^2d\sec^{\frac{3}{2}}(c+dx)(a\cos(c+dx)+a)^{3/2}} - \frac{7\sin(c+dx)}{16ad\sec^{\frac{5}{2}}(c+dx)(a\cos(c+dx)+a)^{5/2}} - \frac{\sin(c+dx)}{6d\sec^{\frac{7}{2}}(c+dx)(a\cos(c+dx)+a)^{7/2}}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^(7/2)*Sec[c + d*x]^(9/2)),x]
```

```
[Out] (-7*ArcSin[(Sqrt[a]*Sin[c + d*x])/Sqrt[a + a*Cos[c + d*x]]]*Sqrt[Cos[c + d*
x]]*Sqrt[Sec[c + d*x]])/(a^(7/2)*d) + (637*ArcTan[(Sqrt[a]*Sin[c + d*x])/(S
qrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Cos[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqr
t[Sec[c + d*x]])/(64*Sqrt[2]*a^(7/2)*d) - Sin[c + d*x]/(6*d*(a + a*Cos[c +
d*x])^(7/2)*Sec[c + d*x]^(7/2)) - (7*Sin[c + d*x])/(16*a*d*(a + a*Cos[c + d
*x])^(5/2)*Sec[c + d*x]^(5/2)) - (259*Sin[c + d*x])/(192*a^2*d*(a + a*Cos[c
 + d*x])^(3/2)*Sec[c + d*x]^(3/2)) + (189*Sin[c + d*x])/(64*a^3*d*Sqrt[a +
a*Cos[c + d*x]]*Sqrt[Sec[c + d*x]])
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
```

```
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2853

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[-2/f, Subst[Int[1/Sqrt[1 - x^2/a], x], x, b*(Cos
[e + f*x]/Sqrt[a + b*Sin[e + f*x]])], x] /; FreeQ[{a, b, d, e, f}, x] && Eq
Q[a^2 - b^2, 0] && EqQ[d, a/b]
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3061

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dis
t[(A*b - a*B)/b, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]),
 x], x] + Dist[B/b, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]],
x], x] /; FreeQ[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^
2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3062

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(-B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(f*(m +
n + 1))), x] + Dist[1/(b*(m + n + 1)), Int[(a + b*Sin[e + f*x])^m*(c + d*Si
```

```
n[e + f*x])^(n - 1)*Simp[A*b*c*(m + n + 1) + B*(a*c*m + b*d*n) + (A*b*d*(m
+ n + 1) + B*(a*d*m + b*c*n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 -
 d^2, 0] && GtQ[n, 0] && (IntegerQ[n] || EqQ[m + 1/2, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+a\cos(c+dx))^{7/2}}\,dx\\
&= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{7}{2}}(c+dx)}\\
&\quad -\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{5}{2}}(c+dx)\left(\frac{7a}{2}-7a\cos(c+dx)\right)}{(a+a\cos(c+dx))^{5/2}}\,dx}{6a^2}\\
&= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{7}{2}}(c+dx)}-\frac{7\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\\
&\quad -\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{3}{2}}(c+dx)\left(\frac{105a^2}{4}-\frac{77}{2}a^2\cos(c+dx)\right)}{(a+a\cos(c+dx))^{3/2}}\,dx}{24a^4}\\
&= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{7}{2}}(c+dx)}-\frac{7\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\\
&\quad -\frac{259\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\\
&\quad -\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}\left(\frac{777a^3}{8}-\frac{567}{4}a^3\cos(c+dx)\right)}{\sqrt{a+a\cos(c+dx)}}\,dx}{48a^6}\\
&= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{7}{2}}(c+dx)}-\frac{7\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\\
&\quad -\frac{259\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\\
&\quad +\frac{189\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}\\
&\quad -\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{567a^4}{8}+168a^4\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{48a^7}
\end{aligned}$$

$$= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{7}{2}}(c+dx)} - \frac{7\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{259\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)} + \frac{189\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} - \frac{\left(7\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{a+a\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx}{2a^4} + \frac{\left(637\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{128a^3}$$

$$= -\frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{7}{2}}(c+dx)} - \frac{7\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{259\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)} + \frac{189\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}} + \frac{\left(7\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\mathrm{Subst}\left(\int\frac{1}{\sqrt{1-\frac{x^2}{a}}}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)}{a^4d} - \frac{\left(637\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\mathrm{Subst}\left(\int\frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{64a^2d}$$

$$= -\frac{7\arcsin\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{a^{7/2}d} + \frac{637\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{64\sqrt{2}a^{7/2}d} - \frac{\sin(c+dx)}{6d(a+a\cos(c+dx))^{7/2}\sec^{\frac{7}{2}}(c+dx)} - \frac{7\sin(c+dx)}{16ad(a+a\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{259\sin(c+dx)}{192a^2d(a+a\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)} + \frac{189\sin(c+dx)}{64a^3d\sqrt{a+a\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.68 (sec) , antiderivative size = 460, normalized size of antiderivative = 1.56

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{9}{2}}(c+dx)}\,dx = \frac{e^{-\frac{1}{2}i(c+dx)}\left(-\frac{1}{64}ie^{-4i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(-1911e^{i(c+dx)}\left(1+e^{i(c+dx)}\right)\right.\right.}{}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^(7/2)*Sec[c + d*x]^(9/2)),x]
```

```
[Out] ((((-1/64*I)*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)))]*(-1911*E^(I*(c
 + d*x))*(1 + E^(I*(c + d*x)))^6*Sqrt[1 + E^((2*I)*(c + d*x))]*ArcTanh[(1 -
 E^(I*(c + d*x)))/(Sqrt[2]*Sqrt[1 + E^((2*I)*(c + d*x))])] + Sqrt[2]*(-96 -
 1003*E^(I*(c + d*x)) - 2169*E^((2*I)*(c + d*x)) - 2297*E^((3*I)*(c + d*x))
 - 779*E^((4*I)*(c + d*x)) + 779*E^((5*I)*(c + d*x)) + 2297*E^((6*I)*(c + d
*x)) + 2169*E^((7*I)*(c + d*x)) + 1003*E^((8*I)*(c + d*x)) + 96*E^((9*I)*(c
 + d*x)) + 672*E^(I*(c + d*x))*(1 + E^(I*(c + d*x)))^6*Sqrt[1 + E^((2*I)*(c
 + d*x))]*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]]))*Cos[(c + d*x)/2])/E^((4*
I)*(c + d*x)) + (672*I)*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x
)))]*Sqrt[1 + E^((2*I)*(c + d*x))]*ArcSinh[E^(I*(c + d*x))]*Cos[(c + d*x)/2
]^7)*Sqrt[a*(1 + Cos[c + d*x])])/(24*a^4*d*E^((I/2)*(c + d*x))*(1 + Cos[c +
 d*x])^4)
```

Maple [A] (verified)

Time = 15.02 (sec) , antiderivative size = 448, normalized size of antiderivative = 1.52

method	result
default	$\frac{\left(192\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\left(\cos^3(dx+c)\right)\sin(dx+c)+1099\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\left(\cos^2(dx+c)\right)\sin(dx+c)-1344\sqrt{2}\arctan\left(\tan(dx+c)\sqrt{\frac{\cos(}{1+\cos}}\right.\right.}{}$

```
[In] int(1/(a+cos(d*x+c)*a)^(7/2)/sec(d*x+c)^(9/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/384/d/sec(d*x+c)^(1/2)*(192*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos
(d*x+c)^3*sin(d*x+c)+1099*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x
+c)^2*sin(d*x+c)-1344*2^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2))*cos(d*x+c)^3+1442*2^(1/2)*cos(d*x+c)*sin(d*x+c)*(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)-1911*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^3-4032*2^(1/2)
*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))*cos(d*x+c)^2+567*sin(
d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-5733*arcsin(cot(d*x+c)-csc
(d*x+c))*cos(d*x+c)^2-4032*2^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x
+c)))^(1/2))*cos(d*x+c)-5733*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)-1344*
2^(1/2)*arctan(tan(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2))-1911*arcsin(co
```

```
t(d*x+c)-csc(d*x+c)))*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^4/(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*2^(1/2)/a^4
```

Fricas [A] (verification not implemented)

none

Time = 0.52 (sec) , antiderivative size = 289, normalized size of antiderivative = 0.98

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{9}{2}}(c+dx)}\,dx =$$

$$-\frac{1911\sqrt{2}\left(\cos\left(dx+c\right)^4+4\cos\left(dx+c\right)^3+6\cos\left(dx+c\right)^2+4\cos\left(dx+c\right)+1\right)\sqrt{a}\arctan\left(\frac{\sqrt{2}\sqrt{a\cos(dx+c)+}}{\sqrt{a}\sin(d}\right.}{}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(9/2),x, algorithm="fricas")
```

```
[Out] -1/384*(1911*sqrt(2)*(cos(d*x + c)^4 + 4*cos(d*x + c)^3 + 6*cos(d*x + c)^2
+ 4*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(2)*sqrt(a*cos(d*x + c) + a)*sqrt(
cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - 2688*(cos(d*x + c)^4 + 4*cos(d*x +
c)^3 + 6*cos(d*x + c)^2 + 4*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(a*cos(d*x
 + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - 2*(192*cos(d*x + c)
^4 + 1099*cos(d*x + c)^3 + 1442*cos(d*x + c)^2 + 567*cos(d*x + c))*sqrt(a*c
os(d*x + c) + a)*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^4*d*cos(d*x + c)^4 + 4
*a^4*d*cos(d*x + c)^3 + 6*a^4*d*cos(d*x + c)^2 + 4*a^4*d*cos(d*x + c) + a^4
*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{9}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**(7/2)/sec(d*x+c)**(9/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{7}{2}}\sec(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(9/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^(7/2)*sec(d*x + c)^(9/2)), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{9}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(9/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{7/2}\sec^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{9/2}\,(a+a\,\cos(c+d\,x))^{7/2}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(9/2)*(a + a*cos(c + d*x))^(7/2)),x)
[Out] int(1/((1/cos(c + d*x))^(9/2)*(a + a*cos(c + d*x))^(7/2)), x)
```

3.394 $\int \frac{1}{(a+a\cos(c+dx))^{9/2}\sec^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 237

$$\int \frac{1}{(a+a\cos(c+dx))^{9/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{45\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+d}{1024\sqrt{2}a^{9/2}d}$$
$$-\frac{\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}\sec^{\frac{3}{2}}(c+dx)}-\frac{5\sin(c+dx)}{32ad(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}}$$
$$+\frac{33\sin(c+dx)}{256a^2d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}+\frac{73\sin(c+dx)}{1024a^3d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

```
[Out] -1/8*sin(d*x+c)/d/(a+a*cos(d*x+c))^(9/2)/sec(d*x+c)^(3/2)-5/32*sin(d*x+c)/a
/d/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(1/2)+33/256*sin(d*x+c)/a^2/d/(a+a*cos
(d*x+c))^(5/2)/sec(d*x+c)^(1/2)+73/1024*sin(d*x+c)/a^3/d/(a+a*cos(d*x+c))^(
3/2)/sec(d*x+c)^(1/2)+45/2048*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(d*x
+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^(9/2)
/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.77 (sec) , antiderivative size = 237, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used

$= \{4307, 2844, 3056, 3057, 12, 2861, 211\}$

$$\int \frac{1}{(a+a\cos(c+dx))^{9/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{45\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{1024\sqrt{2}a^{9/2}d} + \frac{73\sin(c+dx)}{1024a^3d\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{3/2}} + \frac{33\sin(c+dx)}{256a^2d\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{5/2}} - \frac{\sin(c+dx)}{8d\sec^{\frac{3}{2}}(c+dx)(a\cos(c+dx)+a)^{9/2}} - \frac{5\sin(c+dx)}{32ad\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{7/2}}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^(9/2)*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (45*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Co
s[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(1024*Sqrt[2]*a^(9/2)*
d) - Sin[c + d*x]/(8*d*(a + a*Cos[c + d*x])^(9/2)*Sec[c + d*x]^(3/2)) - (5*
Sin[c + d*x])/(32*a*d*(a + a*Cos[c + d*x])^(7/2)*Sqrt[Sec[c + d*x]]) + (33*
Sin[c + d*x])/(256*a^2*d*(a + a*Cos[c + d*x])^(5/2)*Sqrt[Sec[c + d*x]]) + (
73*Sin[c + d*x])/(1024*a^3*d*(a + a*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
```

```
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\cos^{\frac{5}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx\\ &= -\frac{\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}\sec^{\frac{3}{2}}(c+dx)}\\ &\quad-\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{\cos(c+dx)}\left(\frac{3a}{2}-6a\cos(c+dx)\right)}{(a+a\cos(c+dx))^{7/2}}\,dx}{8a^2}\end{aligned}$$

$$= -\frac{\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{5\sin(c+dx)}{32ad(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{15a^2}{4}-21a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{5/2}}\,dx}{48a^4}$$

$$= -\frac{\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{5\sin(c+dx)}{32ad(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} + \frac{33\sin(c+dx)}{256a^2d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{21a^3}{8}-\frac{99}{4}a^3\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx}{192a^6}$$

$$= -\frac{\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{5\sin(c+dx)}{32ad(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} + \frac{33\sin(c+dx)}{256a^2d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{73\sin(c+dx)}{1024a^3d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int -\frac{135a^4}{16\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{384a^8}$$

$$= -\frac{\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{5\sin(c+dx)}{32ad(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} + \frac{33\sin(c+dx)}{256a^2d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{73\sin(c+dx)}{1024a^3d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{\left(45\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{2048a^4}$$

$$= -\frac{\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{5\sin(c+dx)}{32ad(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} + \frac{33\sin(c+dx)}{256a^2d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{73\sin(c+dx)}{1024a^3d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{\left(45\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{1024a^3d}$$

$$= \frac{45 \arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{1024\sqrt{2}a^{9/2}d} - \frac{\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{5\sin(c+dx)}{32ad(a+a\cos(c+dx))^{7/2}\sqrt{\sec(c+dx)}} + \frac{33\sin(c+dx)}{256a^2d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{73\sin(c+dx)}{1024a^3d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 2.94 (sec) , antiderivative size = 163, normalized size of antiderivative = 0.69

$$\int \frac{1}{(a+a\cos(c+dx))^{9/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{\sec^6\left(\frac{1}{2}(c+dx)\right)\left(2(882+999\cos(c+dx)+702\cos(2(c+dx))\right.}{}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^(9/2)*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (Sec[(c + d*x)/2]^6*(2*(882 + 999*Cos[c + d*x] + 702*Cos[2*(c + d*x)] + 73*
Cos[3*(c + d*x)])*Sqrt[2 - 2*Sec[c + d*x]] + 5760*ArcTanh[Sqrt[-(Sec[c + d*
x]*Sin[(c + d*x)/2]^2)]]*Cos[(c + d*x)/2]^8*Sec[c + d*x])*Tan[(c + d*x)/2])
/(65536*Sqrt[2]*a^4*d*Sqrt[a*(1 + Cos[c + d*x])]*Sqrt[-((-1 + Sec[c + d*x])
*Sec[c + d*x])])
```

Maple [A] (verified)

Time = 4.42 (sec) , antiderivative size = 312, normalized size of antiderivative = 1.32

method	result
default	$\frac{\sqrt{a(1+\cos(dx+c))}\left(73\sqrt{2}\cos(dx+c)\sin(dx+c)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+351\sin(dx+c)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-45\arcsin(\cot(dx+c)-\csc(dx+c))\right.}{}$

```
[In] int(1/(a+cos(d*x+c)*a)^(9/2)/sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2048/d*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^5/sec(d*x+c)^(5/2)/(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*(73*2^(1/2)*cos(d*x+c)*sin(d*x+c)*(cos(d*x+c)/(1
+cos(d*x+c)))^(1/2)+351*sin(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2
)-45*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)^2+195*tan(d*x+c)*2^(1/2)*(cos
(d*x+c)/(1+cos(d*x+c)))^(1/2)-180*arcsin(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)+
45*tan(d*x+c)*sec(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-270*arcs
in(cot(d*x+c)-csc(d*x+c))-180*sec(d*x+c)*arcsin(cot(d*x+c)-csc(d*x+c))-45*s
ec(d*x+c)^2*arcsin(cot(d*x+c)-csc(d*x+c)))*2^(1/2)/a^5
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 237, normalized size of antiderivative = 1.00

$$\int \frac{1}{(a+a\cos(c+dx))^{9/2}\sec^{\frac{5}{2}}(c+dx)}\,dx =$$

$$-\frac{45\sqrt{2}\left(\cos(dx+c)^5+5\cos(dx+c)^4+10\cos(dx+c)^3+10\cos(dx+c)^2+5\cos(dx+c)+1\right)\sqrt{a}\arctan}{2048\left(a^5d\cos(dx+c)^5+5a^5d\cos(dx+c)^4+10a^5d\cos(dx\right.}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(9/2)/sec(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] -1/2048*(45*sqrt(2)*(cos(d*x + c)^5 + 5*cos(d*x + c)^4 + 10*cos(d*x + c)^3
+ 10*cos(d*x + c)^2 + 5*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(2)*sqrt(a*cos
(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - 2*(73*cos(d*x +
 c)^4 + 351*cos(d*x + c)^3 + 195*cos(d*x + c)^2 + 45*cos(d*x + c))*sqrt(a*c
os(d*x + c) + a)*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^5*d*cos(d*x + c)^5 + 5
*a^5*d*cos(d*x + c)^4 + 10*a^5*d*cos(d*x + c)^3 + 10*a^5*d*cos(d*x + c)^2 +
 5*a^5*d*cos(d*x + c) + a^5*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{9/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**(9/2)/sec(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^{9/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{9}{2}}\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(9/2)/sec(d*x+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(1/((a*cos(d*x + c) + a)^(9/2)*sec(d*x + c)^(5/2)), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{9/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(9/2)/sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{9/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}\,(a+a\,\cos(c+d\,x))^{9/2}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^(9/2)),x)
[Out] int(1/((1/cos(c + d*x))^(5/2)*(a + a*cos(c + d*x))^(9/2)), x)
```

3.395 $\int \frac{1}{(a+a\cos(c+dx))^{9/2}\sec^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 237

$$\int \frac{1}{(a+a\cos(c+dx))^{9/2}\sec^{\frac{7}{2}}(c+dx)}\,dx = \frac{35\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{1024\sqrt{2}a^{9/2}d}$$
$$-\frac{\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}\sec^{\frac{5}{2}}(c+dx)}-\frac{19\sin(c+dx)}{96ad(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)}$$
$$-\frac{187\sin(c+dx)}{768a^2d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}+\frac{853\sin(c+dx)}{3072a^3d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

```
[Out] -1/8*sin(d*x+c)/d/(a+a*cos(d*x+c))^(9/2)/sec(d*x+c)^(5/2)-19/96*sin(d*x+c)/
a/d/(a+a*cos(d*x+c))^(7/2)/sec(d*x+c)^(3/2)-187/768*sin(d*x+c)/a^2/d/(a+a*c
os(d*x+c))^(5/2)/sec(d*x+c)^(1/2)+853/3072*sin(d*x+c)/a^3/d/(a+a*cos(d*x+c)
)^(3/2)/sec(d*x+c)^(1/2)+35/2048*arctan(1/2*sin(d*x+c)*a^(1/2)*2^(1/2)/cos(
d*x+c)^(1/2)/(a+a*cos(d*x+c))^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^(9
/2)/d*2^(1/2)
```

Rubi [A] (verified)

Time = 0.76 (sec) , antiderivative size = 237, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used

$= \{4307, 2844, 3056, 3057, 12, 2861, 211\}$

$$\int \frac{1}{(a+a\cos(c+dx))^{9/2}\sec^{\frac{7}{2}}(c+dx)}\,dx = \frac{35\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a\cos(c+dx)+a}}\right)}{1024\sqrt{2}a^{9/2}d} + \frac{853\sin(c+dx)}{3072a^3d\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{3/2}} - \frac{187\sin(c+dx)}{768a^2d\sqrt{\sec(c+dx)}(a\cos(c+dx)+a)^{5/2}} - \frac{19\sin(c+dx)}{96ad\sec^{\frac{3}{2}}(c+dx)(a\cos(c+dx)+a)^{7/2}} - \frac{\sin(c+dx)}{8d\sec^{\frac{5}{2}}(c+dx)(a\cos(c+dx)+a)^{9/2}}$$

```
[In] Int[1/((a + a*Cos[c + d*x])^(9/2)*Sec[c + d*x]^(7/2)),x]
```

```
[Out] (35*ArcTan[(Sqrt[a]*Sin[c + d*x])/(Sqrt[2]*Sqrt[Cos[c + d*x]]*Sqrt[a + a*Co
s[c + d*x]])]*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]])/(1024*Sqrt[2]*a^(9/2)*
d) - Sin[c + d*x]/(8*d*(a + a*Cos[c + d*x])^(9/2)*Sec[c + d*x]^(5/2)) - (19
*Sin[c + d*x])/(96*a*d*(a + a*Cos[c + d*x])^(7/2)*Sec[c + d*x]^(3/2)) - (18
7*Sin[c + d*x])/(768*a^2*d*(a + a*Cos[c + d*x])^(5/2)*Sqrt[Sec[c + d*x]]) +
 (853*Sin[c + d*x])/(3072*a^3*d*(a + a*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x
]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2844

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*(a + b*Sin[e
+ f*x])^m*((c + d*Sin[e + f*x])^(n - 1)/(a*f*(2*m + 1))), x] + Dist[1/(a*b*
(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(n - 2)*S
imp[b*(c^2*(m + 1) + d^2*(n - 1)) + a*c*d*(m - n + 1) + d*(a*d*(m - n + 1)
+ b*c*(m + n))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &&
NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &
& GtQ[n, 1] && (IntegersQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 2861

```
Int[1/(Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[-2*(a/f), Subst[Int[1/(2*b^2 - (a*c
- b*d)*x^2), x], x, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Si
n[e + f*x]]))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
```

```
EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3056

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^n/(
a*f*(2*m + 1))), x] - Dist[1/(a*b*(2*m + 1)), Int[(a + b*Sin[e + f*x])^(m +
 1)*(c + d*Sin[e + f*x])^(n - 1)*Simp[A*(a*d*n - b*c*(m + 1)) - B*(a*c*m +
b*d*n) - d*(a*B*(m - n) + A*b*(m + n + 1))*Sin[e + f*x], x], x], x] /; Free
Q[{a, b, c, d, e, f, A, B}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] &&
 NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)] && GtQ[n, 0] && IntegerQ[2*m] && (Int
egerQ[2*n] || EqQ[c, 0])
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+a\cos(c+dx))^{9/2}}\,dx \\
&= -\frac{\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}\sec^{\frac{5}{2}}(c+dx)} \\
&\quad -\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{3}{2}}(c+dx)\left(\frac{5a}{2}-7a\cos(c+dx)\right)}{(a+a\cos(c+dx))^{7/2}}\,dx}{8a^2}
\end{aligned}$$

$$= -\frac{\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{19\sin(c+dx)}{96ad(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}\left(\frac{57a^2}{4}-\frac{65}{2}a^2\cos(c+dx)\right)}{(a+a\cos(c+dx))^{5/2}}\,dx}{48a^4}$$

$$= -\frac{\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{19\sin(c+dx)}{96ad(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{187\sin(c+dx)}{768a^2d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{187a^3}{8}-\frac{333}{4}a^3\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+a\cos(c+dx))^{3/2}}\,dx}{192a^6}$$

$$= -\frac{\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{19\sin(c+dx)}{96ad(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{187\sin(c+dx)}{768a^2d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{853\sin(c+dx)}{3072a^3d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int -\frac{105a^4}{16\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{384a^8}$$

$$= -\frac{\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{19\sin(c+dx)}{96ad(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{187\sin(c+dx)}{768a^2d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{853\sin(c+dx)}{3072a^3d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{\left(35\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\,dx}{2048a^4}$$

$$= -\frac{\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{19\sin(c+dx)}{96ad(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{187\sin(c+dx)}{768a^2d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{853\sin(c+dx)}{3072a^3d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{\left(35\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{2a^2+ax^2}\,dx, x, -\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)}{1024a^3d}$$

$$= \frac{35 \arctan\left(\frac{\sqrt{a}\sin(c+dx)}{\sqrt{2}\sqrt{\cos(c+dx)}\sqrt{a+a\cos(c+dx)}}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}}{1024\sqrt{2}a^{9/2}d} - \frac{\sin(c+dx)}{8d(a+a\cos(c+dx))^{9/2}\sec^{\frac{5}{2}}(c+dx)} - \frac{19\sin(c+dx)}{96ad(a+a\cos(c+dx))^{7/2}\sec^{\frac{3}{2}}(c+dx)} - \frac{187\sin(c+dx)}{768a^2d(a+a\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}} + \frac{853\sin(c+dx)}{3072a^3d(a+a\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 6.06 (sec) , antiderivative size = 396, normalized size of antiderivative = 1.67

$$\int \frac{1}{(a+a\cos(c+dx))^{9/2}\sec^{\frac{7}{2}}(c+dx)}\,dx = \frac{2\cos^9\left(\frac{c}{2}+\frac{dx}{2}\right)\sqrt{\frac{1}{1-2\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}}\sqrt{1-2\sin^2\left(\frac{c}{2}+\frac{dx}{2}\right)}\left(\frac{35}{128}\arcsin\left(\right.\right.}{}$$

```
[In] Integrate[1/((a + a*Cos[c + d*x])^(9/2)*Sec[c + d*x]^(7/2)),x]
```

```
[Out] (2*Cos[c/2 + (d*x)/2]^9*Sqrt[(1 - 2*Sin[c/2 + (d*x)/2]^2)^(-1)]*Sqrt[1 - 2*
Sin[c/2 + (d*x)/2]^2]*((35*ArcSin[Sin[c/2 + (d*x)/2]/Sqrt[Cos[(c + d*x)/2]^
2]])/128 + (93*Sin[c/2 + (d*x)/2]*Sqrt[1 - Sec[(c + d*x)/2]^2*Sin[c/2 + (d*
x)/2]^2])/(128*Sqrt[Cos[(c + d*x)/2]^2]) - (163*Sin[c/2 + (d*x)/2]^3*Sqrt[1
 - Sec[(c + d*x)/2]^2*Sin[c/2 + (d*x)/2]^2])/(192*(Cos[(c + d*x)/2]^2)^(3/2
)) + (25*Sin[c/2 + (d*x)/2]^5*Sqrt[1 - Sec[(c + d*x)/2]^2*Sin[c/2 + (d*x)/2
]^2])/(48*(Cos[(c + d*x)/2]^2)^(5/2)) - (Sin[c/2 + (d*x)/2]^7*Sqrt[1 - Sec[
(c + d*x)/2]^2*Sin[c/2 + (d*x)/2]^2])/(8*(Cos[(c + d*x)/2]^2)^(7/2))))/(d*(
a*(1 + Cos[c + d*x]))^(9/2))
```

Maple [A] (verified)

Time = 4.17 (sec) , antiderivative size = 314, normalized size of antiderivative = 1.32

method	result
default	$\frac{\sqrt{a(1+\cos(dx+c))}\left(853\sin(dx+c)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}+819\tan(dx+c)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}-105\arcsin(\cot(dx+c)-\csc(dx+c))\cos(dx+c)\right.}{}$

```
[In] int(1/(a+cos(d*x+c)*a)^(9/2)/sec(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/6144/d*(a*(1+cos(d*x+c)))^(1/2)/(1+cos(d*x+c))^5/sec(d*x+c)^(7/2)/(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*(853*sin(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)+819*tan(d*x+c)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-105*arcs
```

```
in(cot(d*x+c)-csc(d*x+c))*cos(d*x+c)+455*tan(d*x+c)*sec(d*x+c)*2^(1/2)*(cos
(d*x+c)/(1+cos(d*x+c)))^(1/2)-420*arcsin(cot(d*x+c)-csc(d*x+c))+105*tan(d*x
+c)*sec(d*x+c)^2*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-630*sec(d*x+c)*a
rcsin(cot(d*x+c)-csc(d*x+c))-420*sec(d*x+c)^2*arcsin(cot(d*x+c)-csc(d*x+c))
-105*sec(d*x+c)^3*arcsin(cot(d*x+c)-csc(d*x+c)))*2^(1/2)/a^5
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 237, normalized size of antiderivative = 1.00

$$\int \frac{1}{(a+a\cos(c+dx))^{9/2}\sec^{\frac{7}{2}}(c+dx)}\,dx =$$

$$-\frac{105\sqrt{2}\left(\cos\left(dx+c\right)^5+5\cos\left(dx+c\right)^4+10\cos\left(dx+c\right)^3+10\cos\left(dx+c\right)^2+5\cos\left(dx+c\right)+1\right)\sqrt{a}\,\mathrm{arc}}{6144\left(a^5d\cos\left(dx+c\right)^5+5\,a^5d\cos\left(dx+c\right)^4+10\,a^5d\cos\right.}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(9/2)/sec(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] -1/6144*(105*sqrt(2)*(cos(d*x + c)^5 + 5*cos(d*x + c)^4 + 10*cos(d*x + c)^3
 + 10*cos(d*x + c)^2 + 5*cos(d*x + c) + 1)*sqrt(a)*arctan(sqrt(2)*sqrt(a*co
s(d*x + c) + a)*sqrt(cos(d*x + c))/(sqrt(a)*sin(d*x + c))) - 2*(853*cos(d*x
 + c)^4 + 819*cos(d*x + c)^3 + 455*cos(d*x + c)^2 + 105*cos(d*x + c))*sqrt(
a*cos(d*x + c) + a)*sin(d*x + c)/sqrt(cos(d*x + c)))/(a^5*d*cos(d*x + c)^5
+ 5*a^5*d*cos(d*x + c)^4 + 10*a^5*d*cos(d*x + c)^3 + 10*a^5*d*cos(d*x + c)^
2 + 5*a^5*d*cos(d*x + c) + a^5*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{9/2}\sec^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))**(9/2)/sec(d*x+c)**(7/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+a\cos(c+dx))^{9/2}\sec^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{1}{(a\cos(dx+c)+a)^{\frac{9}{2}}\sec(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(9/2)/sec(d*x+c)^(7/2),x, algorithm="maxima")
[Out] integrate(1/((a*cos(d*x + c) + a)^(9/2)*sec(d*x + c)^(7/2)), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{9/2}\sec^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+a*cos(d*x+c))^(9/2)/sec(d*x+c)^(7/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+a\cos(c+dx))^{9/2}\sec^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+dx)}\right)^{7/2}(a+a\cos(c+dx))^{9/2}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))^(9/2)),x)
[Out] int(1/((1/cos(c + d*x))^(7/2)*(a + a*cos(c + d*x))^(9/2)), x)
```

3.396 $\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{4}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 38

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{4}}(c+dx)\,dx=\frac{4a^2\sqrt[4]{\sec(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 4*a^2*sec(d*x+c)^(1/4)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {4307, 2841, 8}

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{4}}(c+dx)\,dx=\frac{4a^2\sin(c+dx)\sqrt[4]{\sec(c+dx)}}{d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(5/4),x]
[Out] (4*a^2*Sec[c + d*x]^(1/4)*Sin[c + d*x])/(d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2841

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*(b*c - a*d)*Cos[e + f*x]*(a + b
*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(b*c + a*
d))), x] + Dist[b^2/(d*(n + 1)*(b*c + a*d)), Int[(a + b*Sin[e + f*x])^(m -
```

```
2)*(c + d*Sin[e + f*x])^(n + 1)*Simp[a*c*(m - 2) - b*d*(m - 2*n - 4) - (b*c
*(m - 1) - a*d*(m + 2*n + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d
, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
&& GtQ[m, 1] && LtQ[n, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] ||
(IntegerQ[m] && EqQ[c, 0]))
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \left(\sqrt[4]{\cos(c+dx)}\sqrt[4]{\sec(c+dx)}\right)\int \frac{(a+a\cos(c+dx))^{3/2}}{\cos^{\frac{5}{4}}(c+dx)}\,dx\\ &= \frac{4a^2\sqrt[4]{\sec(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}} - \left(4a\sqrt[4]{\cos(c+dx)}\sqrt[4]{\sec(c+dx)}\right)\int 0\,dx\\ &= \frac{4a^2\sqrt[4]{\sec(c+dx)}\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 51, normalized size of antiderivative = 1.34

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{4}}(c+dx)\,dx = \frac{2(a(1+\cos(c+dx)))^{3/2}\sec^2\left(\frac{1}{2}(c+dx)\right)\sqrt[4]{\sec(c+dx)}\tan\left(\frac{1}{2}(c+dx)\right)}{d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(5/4),x]
[Out] (2*(a*(1 + Cos[c + d*x]))^(3/2)*Sec[(c + d*x)/2]^2*Sec[c + d*x]^(1/4)*Tan[(
c + d*x)/2])/d
```

Maple [F]

$$\int (a+\cos (dx+c)\, a)^{\frac{3}{2}} \left(\sec^{\frac{5}{4}} (dx+c)\right) dx$$

```
[In] int((a+cos(d*x+c)*a)^(3/2)*sec(d*x+c)^(5/4),x)
[Out] int((a+cos(d*x+c)*a)^(3/2)*sec(d*x+c)^(5/4),x)
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 41, normalized size of antiderivative = 1.08

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{4}}(c+dx)\,dx = \frac{4\sqrt{a\cos(dx+c)+a}\,a\sin(dx+c)}{(d\cos(dx+c)+d)\cos(dx+c)^{\frac{1}{4}}}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^(5/4),x, algorithm="fricas")
[Out] 4*sqrt(a*cos(d*x + c) + a)*a*sin(d*x + c)/((d*cos(d*x + c) + d)*cos(d*x + c
)^(1/4))
```

Sympy [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{4}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))**(3/2)*sec(d*x+c)**(5/4),x)
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 121 vs. 2(34) = 68.

Time = 0.30 (sec) , antiderivative size = 121, normalized size of antiderivative = 3.18

$$\int (a+a\cos(c+dx))^{3/2}\sec^{\frac{5}{4}}(c+dx)\,dx = \frac{4\left(\frac{\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)}{\cos(dx+c)+1} - \frac{\sqrt{2}a^{\frac{3}{2}}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}\right)}{d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{5}{4}}\left(-\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{5}{4}}\left(\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+1\right)^{\frac{1}{4}}}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^(5/4),x, algorithm="maxima")
```

```
[Out] 4*(sqrt(2)*a^(3/2)*sin(d*x + c)/(cos(d*x + c) + 1) - sqrt(2)*a^(3/2)*sin(d*
x + c)^3/(cos(d*x + c) + 1)^3)/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(5/
4)*(-sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(5/4)*(sin(d*x + c)^2/(cos(d*x +
c) + 1)^2 + 1)^(1/4))
```

Giac [F(-1)]

Timed out.

$$\int (a + a\cos(c + dx))^{3/2} \sec^{\frac{5}{4}}(c + dx)\, dx = \text{Timed out}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*sec(d*x+c)^(5/4),x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [B] (verification not implemented)

Time = 14.66 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.16

$$\int (a+a\cos(c+dx))^{3/2} \sec^{\frac{5}{4}}(c+dx)\, dx = \frac{4\, a\, \sin\left(c+d\, x\right)\, \sqrt{a\, \left(\cos\left(c+d\, x\right)+1\right)}\, {\left(\frac{1}{\cos\left(c+d\, x\right)}\right)}^{1/4}}{d\, \left(\cos\left(c+d\, x\right)+1\right)}$$

```
[In] int((1/cos(c + d*x))^(5/4)*(a + a*cos(c + d*x))^(3/2),x)
```

```
[Out] (4*a*sin(c + d*x)*(a*(cos(c + d*x) + 1))^(1/2)*(1/cos(c + d*x))^(1/4))/(d*(
cos(c + d*x) + 1))
```

3.397 $\int \cos^m(c+dx)(a+a\cos(c+dx))^4\,dx$

Optimal result

Integrand size = 21, antiderivative size = 302

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^4\,dx = \frac{a^4(55+29m+4m^2)\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)(3+m)(4+m)} + \frac{\cos^{1+m}(c+dx)\left(a^2+a^2\cos(c+dx)\right)^2\sin(c+dx)}{d(4+m)} + \frac{2(5+m)\cos^{1+m}(c+dx)\left(a^4+a^4\cos(c+dx)\right)\sin(c+dx)}{d(3+m)(4+m)} - \frac{a^4(35+40m+8m^2)\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(1+m)(2+m)(4+m)\sqrt{\sin^2(c+dx)}} - \frac{4a^4(5+2m)\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2+m)(3+m)\sqrt{\sin^2(c+dx)}}$$

```
[Out] a^4*(4*m^2+29*m+55)*cos(d*x+c)^(1+m)*sin(d*x+c)/d/(4+m)/(m^2+5*m+6)+cos(d*x
+c)^(1+m)*(a^2+a^2*cos(d*x+c))^2*sin(d*x+c)/d/(4+m)+2*(5+m)*cos(d*x+c)^(1+m
)*(a^4+a^4*cos(d*x+c))*sin(d*x+c)/d/(3+m)/(4+m)-a^4*(8*m^2+40*m+35)*cos(d*x
+c)^(1+m)*hypergeom([1/2, 1/2+1/2*m],[3/2+1/2*m],cos(d*x+c)^2)*sin(d*x+c)/d
/(m^3+7*m^2+14*m+8)/(sin(d*x+c)^2)^(1/2)-4*a^4*(5+2*m)*cos(d*x+c)^(2+m)*hyp
ergeom([1/2, 1+1/2*m],[2+1/2*m],cos(d*x+c)^2)*sin(d*x+c)/d/(2+m)/(3+m)/(sin
(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.60 (sec) , antiderivative size = 302, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {2842, 3055, 3047, 3102, 2827, 2722}

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^4\,dx = -\frac{a^4(8m^2+40m+35)\sin(c+dx)\cos^{m+1}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},\cos^2(c+dx)\right)}{d(m+1)(m+2)(m+4)\sqrt{\sin^2(c+dx)}} - \frac{4a^4(2m+5)\sin(c+dx)\cos^{m+2}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},\cos^2(c+dx)\right)}{d(m+2)(m+3)\sqrt{\sin^2(c+dx)}} + \frac{a^4(4m^2+29m+55)\sin(c+dx)\cos^{m+1}(c+dx)}{d(m+2)(m+3)(m+4)} + \frac{2(m+5)\sin(c+dx)\left(a^4\cos(c+dx)+a^4\right)\cos^{m+1}(c+dx)}{d(m+3)(m+4)} + \frac{\sin(c+dx)\left(a^2\cos(c+dx)+a^2\right)^2\cos^{m+1}(c+dx)}{d(m+4)}$$

```
[In] Int[Cos[c + d*x]^m*(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (a^4*(55 + 29*m + 4*m^2)*Cos[c + d*x]^(1 + m)*Sin[c + d*x])/(d*(2 + m)*(3 +
 m)*(4 + m)) + (Cos[c + d*x]^(1 + m)*(a^2 + a^2*Cos[c + d*x])^2*Sin[c + d*x
])/(d*(4 + m)) + (2*(5 + m)*Cos[c + d*x]^(1 + m)*(a^4 + a^4*Cos[c + d*x])*S
in[c + d*x])/(d*(3 + m)*(4 + m)) - (a^4*(35 + 40*m + 8*m^2)*Cos[c + d*x]^(1
 + m)*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, Cos[c + d*x]^2]*Sin[c +
d*x])/(d*(1 + m)*(2 + m)*(4 + m)*Sqrt[Sin[c + d*x]^2]) - (4*a^4*(5 + 2*m)*C
os[c + d*x]^(2 + m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, Cos[c + d*
x]^2]*Sin[c + d*x])/(d*(2 + m)*(3 + m)*Sqrt[Sin[c + d*x]^2])
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2842

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
+ n)), Int[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^n*Simp[a*b*c*(
m - 2) + b^2*d*(n + 1) + a^2*d*(m + n) - b*(b*c*(m - 1) - a*d*(3*m + 2*n -
2))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c
- a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1] &&  !LtQ[n
, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] || (IntegerQ[m] && EqQ[c
, 0]))
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3055

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[(-b)*B*Cos[e + f*x]*(a + b*Sin[e + f*x])^(m - 1)*((c + d*Sin[e + f*x])^(n
 + 1)/(d*f*(m + n + 1))), x] + Dist[1/(d*(m + n + 1)), Int[(a + b*Sin[e + f
*x])^(m - 1)*(c + d*Sin[e + f*x])^n*Simp[a*A*d*(m + n + 1) + B*(a*c*(m - 1)
 + b*d*(n + 1)) + (A*b*d*(m + n + 1) - B*(b*c*m - a*d*(2*m + n)))*Sin[e + f
*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[b*c - a*d,
0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1/2] &&  !LtQ[n, -1]
 && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\text{integral} = \frac{\cos^{1+m}(c+dx)\left(a^2+a^2\cos(c+dx)\right)^2\sin(c+dx)}{d(4+m)} + \frac{\int \cos^m(c+dx)(a+a\cos(c+dx))^2\left(a^2(5+2m)+2a^2(5+m)\cos(c+dx)\right)\,dx}{4+m}$$

$$= \frac{\cos^{1+m}(c+dx)\left(a^2+a^2\cos(c+dx)\right)^2\sin(c+dx)}{d(4+m)} + \frac{2(5+m)\cos^{1+m}(c+dx)\left(a^4+a^4\cos(c+dx)\right)\sin(c+dx)}{d(3+m)(4+m)} + \frac{\int\cos^m(c+dx)(a+a\cos(c+dx))\left(a^3\left(25+23m+4m^2\right)+a^3\left(55+29m+4m^2\right)\cos(c+dx)\right)\,dx}{12+7m+m^2}$$

$$= \frac{\cos^{1+m}(c+dx)\left(a^2+a^2\cos(c+dx)\right)^2\sin(c+dx)}{d(4+m)} + \frac{2(5+m)\cos^{1+m}(c+dx)\left(a^4+a^4\cos(c+dx)\right)\sin(c+dx)}{d(3+m)(4+m)} + \frac{\int\cos^m(c+dx)\left(a^4\left(25+23m+4m^2\right)+\left(a^4\left(25+23m+4m^2\right)+a^4\left(55+29m+4m^2\right)\right)\cos(c+d\right.}{12+7m+m^2}$$

$$= \frac{a^4\left(55+29m+4m^2\right)\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)\left(12+7m+m^2\right)} + \frac{\cos^{1+m}(c+dx)\left(a^2+a^2\cos(c+dx)\right)^2\sin(c+dx)}{d(4+m)} + \frac{2(5+m)\cos^{1+m}(c+dx)\left(a^4+a^4\cos(c+dx)\right)\sin(c+dx)}{d(3+m)(4+m)} + \frac{\int\cos^m(c+dx)\left(a^4(3+m)\left(35+40m+8m^2\right)+4a^4(2+m)(4+m)(5+2m)\cos(c+dx)\right)\,dx}{24+26m+9m^2+m^3}$$

$$= \frac{a^4\left(55+29m+4m^2\right)\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)\left(12+7m+m^2\right)} + \frac{\cos^{1+m}(c+dx)\left(a^2+a^2\cos(c+dx)\right)^2\sin(c+dx)}{d(4+m)} + \frac{2(5+m)\cos^{1+m}(c+dx)\left(a^4+a^4\cos(c+dx)\right)\sin(c+dx)}{d(3+m)(4+m)} + \frac{\left(4a^4(5+2m)\right)\int\cos^{1+m}(c+dx)\,dx}{3+m} + \frac{\left(a^4\left(35+40m+8m^2\right)\right)\int\cos^m(c+dx)\,dx}{8+6m+m^2}$$

$$= \frac{a^4\left(55+29m+4m^2\right)\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)\left(12+7m+m^2\right)} + \frac{\cos^{1+m}(c+dx)\left(a^2+a^2\cos(c+dx)\right)^2\sin(c+dx)}{d(4+m)} + \frac{2(5+m)\cos^{1+m}(c+dx)\left(a^4+a^4\cos(c+dx)\right)\sin(c+dx)}{d(3+m)(4+m)} - \frac{a^4\left(35+40m+8m^2\right)\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)\sin(c+dx}{d(1+m)\left(8+6m+m^2\right)\sqrt{\sin^2(c+dx)}} - \frac{4a^4(5+2m)\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2+m)(3+m)\sqrt{\sin^2(c+dx)}}$$

Mathematica [A] (verified)

Time = 1.64 (sec) , antiderivative size = 282, normalized size of antiderivative = 0.93

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^4\,dx$$
$$=\frac{a^2\cos^{1+m}(c+dx)\csc(c+dx)\left((a+a\cos(c+dx))^2\sin^2(c+dx)-\frac{a^2(5+2m)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c\right.}{1+m}\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^m*(a + a*Cos[c + d*x])^4,x]
```

```
[Out] (a^2*Cos[c + d*x]^(1 + m)*Csc[c + d*x]*((a + a*Cos[c + d*x])^2*Sin[c + d*x]
^2 - (a^2*(5 + 2*m)*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, Cos[c + d*
x]^2]*Sqrt[Sin[c + d*x]^2])/(1 + m) - (2*a^2*(10 + 3*m)*Cos[c + d*x]*Hyperg
eometric2F1[1/2, (2 + m)/2, (4 + m)/2, Cos[c + d*x]^2]*Sqrt[Sin[c + d*x]^2]
)/(2 + m) - (a^2*(25 + 6*m)*Cos[c + d*x]^2*Hypergeometric2F1[1/2, (3 + m)/2
, (5 + m)/2, Cos[c + d*x]^2]*Sqrt[Sin[c + d*x]^2])/(3 + m) - (2*a^2*(5 + m)
*Cos[c + d*x]^3*Hypergeometric2F1[1/2, (4 + m)/2, (6 + m)/2, Cos[c + d*x]^2
]*Sqrt[Sin[c + d*x]^2])/(4 + m)))/(d*(4 + m))
```

Maple [F]

$$\int (\cos^m(dx+c))\,(a+\cos(dx+c)\,a)^4\,dx$$

```
[In] int(cos(d*x+c)^m*(a+cos(d*x+c)*a)^4,x)
```

```
[Out] int(cos(d*x+c)^m*(a+cos(d*x+c)*a)^4,x)
```

Fricas [F]

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^4\,dx=\int (a\cos(dx+c)+a)^4\cos(dx+c)^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(a+a*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] integral((a^4*cos(d*x + c)^4 + 4*a^4*cos(d*x + c)^3 + 6*a^4*cos(d*x + c)^2
+ 4*a^4*cos(d*x + c) + a^4)*cos(d*x + c)^m, x)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^4\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**m*(a+a*cos(d*x+c))**4,x)
[Out] Timed out
```

Maxima [F]

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^4\,dx = \int (a\cos(dx+c)+a)^4\cos(dx+c)^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(a+a*cos(d*x+c))^4,x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^4*cos(d*x + c)^m, x)
```

Giac [F]

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^4\,dx = \int (a\cos(dx+c)+a)^4\cos(dx+c)^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(a+a*cos(d*x+c))^4,x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^4*cos(d*x + c)^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^4\,dx = \int \cos(c+d\,x)^m\,(a+a\,\cos(c+d\,x))^4\,dx$$

```
[In] int(cos(c + d*x)^m*(a + a*cos(c + d*x))^4,x)
[Out] int(cos(c + d*x)^m*(a + a*cos(c + d*x))^4, x)
```

3.398 $\int \cos^m(c+dx)(a+a\cos(c+dx))^3\,dx$

Optimal result

Integrand size = 21, antiderivative size = 232

$$\begin{aligned}&\int \cos^m(c+dx)(a+a\cos(c+dx))^3\,dx\\&=\frac{a^3(7+2m)\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)(3+m)}+\frac{\cos^{1+m}(c+dx)\left(a^3+a^3\cos(c+dx)\right)\sin(c+dx)}{d(3+m)}\\&\quad-\frac{a^3(5+4m)\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(1+m)(2+m)\sqrt{\sin^2(c+dx)}}\\&\quad-\frac{a^3(11+4m)\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2+m)(3+m)\sqrt{\sin^2(c+dx)}}\end{aligned}$$

```
[Out] a^3*(7+2*m)*cos(d*x+c)^(1+m)*sin(d*x+c)/d/(2+m)/(3+m)+cos(d*x+c)^(1+m)*(a^3
+a^3*cos(d*x+c))*sin(d*x+c)/d/(3+m)-a^3*(5+4*m)*cos(d*x+c)^(1+m)*hypergeom(
[1/2, 1/2+1/2*m],[3/2+1/2*m],cos(d*x+c)^2)*sin(d*x+c)/d/(1+m)/(2+m)/(sin(d*
x+c)^2)^(1/2)-a^3*(11+4*m)*cos(d*x+c)^(2+m)*hypergeom([1/2, 1+1/2*m],[2+1/2
*m],cos(d*x+c)^2)*sin(d*x+c)/d/(2+m)/(3+m)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 232, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used

$= \{2842, 3047, 3102, 2827, 2722\}$

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^3\,dx$$
$$= -\frac{a^3(4m+5)\sin(c+dx)\cos^{m+1}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},\cos^2(c+dx)\right)}{d(m+1)(m+2)\sqrt{\sin^2(c+dx)}}$$
$$-\frac{a^3(4m+11)\sin(c+dx)\cos^{m+2}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},\cos^2(c+dx)\right)}{d(m+2)(m+3)\sqrt{\sin^2(c+dx)}}$$
$$+\frac{a^3(2m+7)\sin(c+dx)\cos^{m+1}(c+dx)}{d(m+2)(m+3)}$$
$$+\frac{\sin(c+dx)\left(a^3\cos(c+dx)+a^3\right)\cos^{m+1}(c+dx)}{d(m+3)}$$

```
[In] Int[Cos[c + d*x]^m*(a + a*Cos[c + d*x])^3,x]
```

```
[Out] (a^3*(7 + 2*m)*Cos[c + d*x]^(1 + m)*Sin[c + d*x])/(d*(2 + m)*(3 + m)) + (Co
s[c + d*x]^(1 + m)*(a^3 + a^3*Cos[c + d*x])*Sin[c + d*x])/(d*(3 + m)) - (a^
3*(5 + 4*m)*Cos[c + d*x]^(1 + m)*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/
2, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(1 + m)*(2 + m)*Sqrt[Sin[c + d*x]^2]) -
 (a^3*(11 + 4*m)*Cos[c + d*x]^(2 + m)*Hypergeometric2F1[1/2, (2 + m)/2, (4
+ m)/2, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(2 + m)*(3 + m)*Sqrt[Sin[c + d*x]^
2])
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2842

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
+ n)), Int[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^n*Simp[a*b*c*(
m - 2) + b^2*d*(n + 1) + a^2*d*(m + n) - b*(b*c*(m - 1) - a*d*(3*m + 2*n -
2))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c
- a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1] &&  !LtQ[n
, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] || (IntegerQ[m] && EqQ[c
```

```
, 0]))
```

Rule 3047

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Int[(a
 + b*Sin[e + f*x])^m*(A*c + (B*c + A*d)*Sin[e + f*x] + B*d*Sin[e + f*x]^2),
 x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0]
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\cos^{1+m}(c+dx)\left(a^3+a^3\cos(c+dx)\right)\sin(c+dx)}{d(3+m)} \\
&\quad+\frac{\int \cos^m(c+dx)(a+a\cos(c+dx))\left(2a^2(2+m)+a^2(7+2m)\cos(c+dx)\right)\,dx}{3+m} \\
&= \frac{\cos^{1+m}(c+dx)\left(a^3+a^3\cos(c+dx)\right)\sin(c+dx)}{d(3+m)} \\
&\quad+\frac{\int \cos^m(c+dx)\left(2a^3(2+m)+\left(2a^3(2+m)+a^3(7+2m)\right)\cos(c+dx)+a^3(7+2m)\cos^2(c+d\right.}{3+m} \\
&= \frac{a^3(7+2m)\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)(3+m)}+\frac{\cos^{1+m}(c+dx)\left(a^3+a^3\cos(c+dx)\right)\sin(c+dx)}{d(3+m)} \\
&\quad+\frac{\int \cos^m(c+dx)\left(a^3(3+m)(5+4m)+a^3(2+m)(11+4m)\cos(c+dx)\right)\,dx}{6+5m+m^2} \\
&= \frac{a^3(7+2m)\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)(3+m)}+\frac{\cos^{1+m}(c+dx)\left(a^3+a^3\cos(c+dx)\right)\sin(c+dx)}{d(3+m)} \\
&\quad+\frac{\left(a^3(5+4m)\right)\int \cos^m(c+dx)\,dx}{2+m}+\frac{\left(a^3(11+4m)\right)\int \cos^{1+m}(c+dx)\,dx}{3+m} \\
&= \frac{a^3(7+2m)\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)(3+m)}+\frac{\cos^{1+m}(c+dx)\left(a^3+a^3\cos(c+dx)\right)\sin(c+dx)}{d(3+m)} \\
&\quad-\frac{a^3(5+4m)\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(1+m)(2+m)\sqrt{\sin^2(c+dx)}} \\
&\quad-\frac{a^3(11+4m)\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2+m)(3+m)\sqrt{\sin^2(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.90 (sec) , antiderivative size = 167, normalized size of antiderivative = 0.72

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^3\,dx = -\frac{a^3\cos^{1+m}(c+dx)\sin(c+dx)\left(\frac{(15+17m+4m^2)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)}{\sqrt{\sin^2(c+dx)}}-(1+m)\left(3(3+m)+\right.\right.}{d(1}$$

[In] Integrate[Cos[c + d*x]^m*(a + a*Cos[c + d*x])^3,x]

[Out] -((a^3*Cos[c + d*x]^(1 + m)*Sin[c + d*x]*(((15 + 17*m + 4*m^2)*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, Cos[c + d*x]^2])/Sqrt[Sin[c + d*x]^2] - (1 + m)*(3*(3 + m) + (2 + m)*Cos[c + d*x] - (11 + 4*m)*Cot[c + d*x]*Csc[c + d*x]*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, Cos[c + d*x]^2]*Sqrt[Sin[c + d*x]^2])))/(d*(1 + m)*(2 + m)*(3 + m)))

Maple [F]

$$\int \left(\cos^m(dx+c)\right)\left(a+\cos(dx+c)\,a\right)^3\,dx$$

[In] int(cos(d*x+c)^m*(a+cos(d*x+c)*a)^3,x)

[Out] int(cos(d*x+c)^m*(a+cos(d*x+c)*a)^3,x)

Fricas [F]

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^3\,dx = \int (a\cos(dx+c)+a)^3\cos(dx+c)^m\,dx$$

[In] integrate(cos(d*x+c)^m*(a+a*cos(d*x+c))^3,x, algorithm="fricas")

[Out] integral((a^3*cos(d*x + c)^3 + 3*a^3*cos(d*x + c)^2 + 3*a^3*cos(d*x + c) + a^3)*cos(d*x + c)^m, x)

Sympy [F(-1)]

Timed out.

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^3\,dx=\text{Timed out}$$

```
[In] integrate(cos(d*x+c)**m*(a+a*cos(d*x+c))**3,x)
[Out] Timed out
```

Maxima [F]

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^3\,dx=\int (a\cos(dx+c)+a)^3\cos(dx+c)^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(a+a*cos(d*x+c))^3,x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)^3*cos(d*x + c)^m, x)
```

Giac [F]

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^3\,dx=\int (a\cos(dx+c)+a)^3\cos(dx+c)^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(a+a*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)^3*cos(d*x + c)^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^3\,dx=\int \cos(c+d\,x)^m\,(a+a\,\cos(c+d\,x))^3\,dx$$

```
[In] int(cos(c + d*x)^m*(a + a*cos(c + d*x))^3,x)
[Out] int(cos(c + d*x)^m*(a + a*cos(c + d*x))^3, x)
```

3.399 $\int \cos^m(c+dx)(a+a\cos(c+dx))^2\,dx$

Optimal result

Integrand size = 21, antiderivative size = 173

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^2\,dx = \frac{a^2\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)} - \frac{a^2(3+2m)\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(1+m)(2+m)\sqrt{\sin^2(c+dx)}} - \frac{2a^2\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2+m)\sqrt{\sin^2(c+dx)}}$$

```
[Out] a^2*cos(d*x+c)^(1+m)*sin(d*x+c)/d/(2+m)-a^2*(3+2*m)*cos(d*x+c)^(1+m)*hyperg
eom([1/2, 1/2+1/2*m],[3/2+1/2*m],cos(d*x+c)^2)*sin(d*x+c)/d/(1+m)/(2+m)/(si
n(d*x+c)^2)^(1/2)-2*a^2*cos(d*x+c)^(2+m)*hypergeom([1/2, 1+1/2*m],[2+1/2*m]
,cos(d*x+c)^2)*sin(d*x+c)/d/(2+m)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used

$= \{2842, 2827, 2722\}$

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^2\,dx = -\frac{a^2(2m+3)\sin(c+dx)\cos^{m+1}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},\cos^2(c+dx)\right)}{d(m+1)(m+2)\sqrt{\sin^2(c+dx)}} - \frac{2a^2\sin(c+dx)\cos^{m+2}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},\cos^2(c+dx)\right)}{d(m+2)\sqrt{\sin^2(c+dx)}} + \frac{a^2\sin(c+dx)\cos^{m+1}(c+dx)}{d(m+2)}$$

```
[In] Int[Cos[c + d*x]^m*(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (a^2*Cos[c + d*x]^(1 + m)*Sin[c + d*x])/(d*(2 + m)) - (a^2*(3 + 2*m)*Cos[c
+ d*x]^(1 + m)*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, Cos[c + d*x]^2]
*Sin[c + d*x])/(d*(1 + m)*(2 + m)*Sqrt[Sin[c + d*x]^2]) - (2*a^2*Cos[c + d*
x]^(2 + m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, Cos[c + d*x]^2]*Sin
[c + d*x])/(d*(2 + m)*Sqrt[Sin[c + d*x]^2])
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2842

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
+ n)), Int[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^n*Simp[a*b*c*(
m - 2) + b^2*d*(n + 1) + a^2*d*(m + n) - b*(b*c*(m - 1) - a*d*(3*m + 2*n -
2))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c
- a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 1] &&  !LtQ[n
, -1] && (IntegersQ[2*m, 2*n] || IntegerQ[m + 1/2] || (IntegerQ[m] && EqQ[c
, 0]))
```

Rubi steps

$$\text{integral} = \frac{a^2 \cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)} + \frac{\int \cos^m(c+dx)\left(a^2(3+2m)+2a^2(2+m)\cos(c+dx)\right)\,dx}{2+m}$$

$$= \frac{a^2 \cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)} + (2a^2)\int \cos^{1+m}(c+dx)\,dx + \frac{(a^2(3+2m))\int \cos^m(c+dx)\,dx}{2+m}$$

$$= \frac{a^2 \cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)} - \frac{a^2(3+2m)\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(1+m)(2+m)\sqrt{\sin^2(c+dx)}} - \frac{2a^2\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2+m)\sqrt{\sin^2(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 138, normalized size of antiderivative = 0.80

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^2\,dx$$
$$= \frac{a^2\cos^{1+m}(c+dx)\csc(c+dx)\left(-\left((3+2m)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)\sqrt{\sin^2(c+dx}\right.\right.}{d(1+r}$$

```
[In] Integrate[Cos[c + d*x]^m*(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (a^2*Cos[c + d*x]^(1 + m)*Csc[c + d*x]*(-((3 + 2*m)*Hypergeometric2F1[1/2,
(1 + m)/2, (3 + m)/2, Cos[c + d*x]^2]*Sqrt[Sin[c + d*x]^2]) + (1 + m)*(Sin[
c + d*x]^2 - 2*Cos[c + d*x]*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, Co
s[c + d*x]^2]*Sqrt[Sin[c + d*x]^2])))/(d*(1 + m)*(2 + m))
```

Maple [F]

$$\int (\cos^m(dx+c))\,(a+\cos(dx+c)\,a)^2\,dx$$

```
[In] int(cos(d*x+c)^m*(a+cos(d*x+c)*a)^2,x)
```

```
[Out] int(cos(d*x+c)^m*(a+cos(d*x+c)*a)^2,x)
```

Fricas [F]

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^2\,dx = \int (a\cos(dx+c)+a)^2\cos(dx+c)^m\,dx$$

[In] integrate(cos(d*x+c)^m*(a+a*cos(d*x+c))^2,x, algorithm="fricas")

[Out] integral((a^2*cos(d*x + c)^2 + 2*a^2*cos(d*x + c) + a^2)*cos(d*x + c)^m, x)

Sympy [F]

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^2\,dx = a^2\left(\int 2\cos(c+dx)\cos^m(c+dx)\,dx + \int \cos^2(c+dx)\cos^m(c+dx)\,dx + \int \cos^m(c+dx)\,dx\right)$$

[In] integrate(cos(d*x+c)**m*(a+a*cos(d*x+c))**2,x)

[Out] a**2*(Integral(2*cos(c + d*x)*cos(c + d*x)**m, x) + Integral(cos(c + d*x)**2*cos(c + d*x)**m, x) + Integral(cos(c + d*x)**m, x))

Maxima [F]

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^2\,dx = \int (a\cos(dx+c)+a)^2\cos(dx+c)^m\,dx$$

[In] integrate(cos(d*x+c)^m*(a+a*cos(d*x+c))^2,x, algorithm="maxima")

[Out] integrate((a*cos(d*x + c) + a)^2*cos(d*x + c)^m, x)

Giac [F]

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^2\,dx = \int (a\cos(dx+c)+a)^2\cos(dx+c)^m\,dx$$

[In] integrate(cos(d*x+c)^m*(a+a*cos(d*x+c))^2,x, algorithm="giac")

[Out] integrate((a*cos(d*x + c) + a)^2*cos(d*x + c)^m, x)

Mupad [F(-1)]

Timed out.

$$\int \cos^m(c+dx)(a+a\cos(c+dx))^2\,dx=\int \cos\left(c+d\,x\right)^m\,\left(a+a\,\cos\left(c+d\,x\right)\right)^2\,dx$$

```
[In] int(cos(c + d*x)^m*(a + a*cos(c + d*x))^2,x)
[Out] int(cos(c + d*x)^m*(a + a*cos(c + d*x))^2, x)
```

3.400 $\int \cos^m(c+dx)(a+a\cos(c+dx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 131

$$\int \cos^m(c+dx)(a+a\cos(c+dx))\,dx = -\frac{a\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(1+m)\sqrt{\sin^2(c+dx)}} - \frac{a\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2+m)\sqrt{\sin^2(c+dx)}}$$

```
[Out] -a*cos(d*x+c)^(1+m)*hypergeom([1/2, 1/2+1/2*m],[3/2+1/2*m],cos(d*x+c)^2)*si
n(d*x+c)/d/(1+m)/(sin(d*x+c)^2)^(1/2)-a*cos(d*x+c)^(2+m)*hypergeom([1/2, 1+
1/2*m],[2+1/2*m],cos(d*x+c)^2)*sin(d*x+c)/d/(2+m)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2827, 2722}

$$\int \cos^m(c+dx)(a+a\cos(c+dx))\,dx = -\frac{a\sin(c+dx)\cos^{m+1}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},\cos^2(c+dx)\right)}{d(m+1)\sqrt{\sin^2(c+dx)}} - \frac{a\sin(c+dx)\cos^{m+2}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},\cos^2(c+dx)\right)}{d(m+2)\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^m*(a + a*Cos[c + d*x]),x]
```

```
[Out] -((a*Cos[c + d*x]^(1 + m)*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, Cos[
c + d*x]^2]*Sin[c + d*x])/(d*(1 + m)*Sqrt[Sin[c + d*x]^2])) - (a*Cos[c + d*
x]^(2 + m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, Cos[c + d*x]^2]*Sin
[c + d*x])/(d*(2 + m)*Sqrt[Sin[c + d*x]^2])
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= a\int \cos^m(c+dx)\,dx + a\int \cos^{1+m}(c+dx)\,dx\\ &= -\frac{a\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(1+m)\sqrt{\sin^2(c+dx)}}\\ &\quad -\frac{a\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2+m)\sqrt{\sin^2(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.85

$$\int \cos^m(c+dx)(a+a\cos(c+dx))\,dx =$$

$$-\frac{a\cos^{1+m}(c+dx)\csc(c+dx)\left((2+m)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)+(1+m)\cos(c+\right.}{d(1+m)(2+m)}$$

```
[In] Integrate[Cos[c + d*x]^m*(a + a*Cos[c + d*x]),x]
```

```
[Out] -((a*Cos[c + d*x]^(1 + m)*Csc[c + d*x]*((2 + m)*Hypergeometric2F1[1/2, (1 +
 m)/2, (3 + m)/2, Cos[c + d*x]^2] + (1 + m)*Cos[c + d*x]*Hypergeometric2F1[
1/2, (2 + m)/2, (4 + m)/2, Cos[c + d*x]^2])*Sqrt[Sin[c + d*x]^2])/(d*(1 + m
)*(2 + m)))
```

Maple [F]

$$\int \left(\cos^{m}\left(dx+c\right)\right)\left(a+\cos\left(dx+c\right)a\right)dx$$

```
[In] int(cos(d*x+c)^m*(a+cos(d*x+c)*a),x)
[Out] int(cos(d*x+c)^m*(a+cos(d*x+c)*a),x)
```

Fricas [F]

$$\int \cos^{m}(c+dx)(a+a\cos(c+dx))\,dx=\int \left(a\cos\left(dx+c\right)+a\right)\cos\left(dx+c\right)^{m}\,dx$$

```
[In] integrate(cos(d*x+c)^m*(a+a*cos(d*x+c)),x, algorithm="fricas")
[Out] integral((a*cos(d*x + c) + a)*cos(d*x + c)^m, x)
```

Sympy [F]

$$\int \cos^{m}(c+dx)(a+a\cos(c+dx))\,dx=a\left(\int \cos\left(c+dx\right)\cos^{m}\left(c+dx\right)dx+\int \cos^{m}\left(c+dx\right)dx\right)$$

```
[In] integrate(cos(d*x+c)**m*(a+a*cos(d*x+c)),x)
[Out] a*(Integral(cos(c + d*x)*cos(c + d*x)**m, x) + Integral(cos(c + d*x)**m, x)
)
```

Maxima [F]

$$\int \cos^{m}(c+dx)(a+a\cos(c+dx))\,dx=\int \left(a\cos\left(dx+c\right)+a\right)\cos\left(dx+c\right)^{m}\,dx$$

```
[In] integrate(cos(d*x+c)^m*(a+a*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate((a*cos(d*x + c) + a)*cos(d*x + c)^m, x)
```

Giac [F]

$$\int \cos^m(c+dx)(a+a\cos(c+dx))\,dx = \int (a\cos(dx+c)+a)\cos(dx+c)^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(a+a*cos(d*x+c)),x, algorithm="giac")
[Out] integrate((a*cos(d*x + c) + a)*cos(d*x + c)^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^m(c+dx)(a+a\cos(c+dx))\,dx = \int \cos(c+d\,x)^m\,(a+a\,\cos(c+d\,x))\,dx$$

```
[In] int(cos(c + d*x)^m*(a + a*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^m*(a + a*cos(c + d*x)), x)
```

3.401 $\int \frac{\cos^m(c+dx)}{a+a\cos(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 156

$$\int \frac{\cos^m(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\cos^m(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} - \frac{\cos^m(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m}{2},\frac{2+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{ad\sqrt{\sin^2(c+dx)}} + \frac{m\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{ad(1+m)\sqrt{\sin^2(c+dx)}}$$

```
[Out] cos(d*x+c)^m*sin(d*x+c)/d/(a+a*cos(d*x+c))-cos(d*x+c)^m*hypergeom([1/2, 1/2
*m],[1+1/2*m],cos(d*x+c)^2)*sin(d*x+c)/a/d/(sin(d*x+c)^2)^(1/2)+m*cos(d*x+c
)^(1+m)*hypergeom([1/2, 1/2+1/2*m],[3/2+1/2*m],cos(d*x+c)^2)*sin(d*x+c)/a/d
/(1+m)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used

$= \{2848, 2827, 2722\}$

$$\int \frac{\cos^m(c+dx)}{a+a\cos(c+dx)}\,dx$$
$$= \frac{m\sin(c+dx)\cos^{m+1}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},\cos^2(c+dx)\right)}{ad(m+1)\sqrt{\sin^2(c+dx)}}$$
$$- \frac{\sin(c+dx)\cos^m(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m}{2},\frac{m+2}{2},\cos^2(c+dx)\right)}{ad\sqrt{\sin^2(c+dx)}}$$
$$+ \frac{\sin(c+dx)\cos^m(c+dx)}{d(a\cos(c+dx)+a)}$$

```
[In] Int[Cos[c + d*x]^m/(a + a*Cos[c + d*x]),x]
```

```
[Out] (Cos[c + d*x]^m*Sin[c + d*x])/(d*(a + a*Cos[c + d*x])) - (Cos[c + d*x]^m*Hy
pergeometric2F1[1/2, m/2, (2 + m)/2, Cos[c + d*x]^2]*Sin[c + d*x])/(a*d*Sqr
t[Sin[c + d*x]^2]) + (m*Cos[c + d*x]^(1 + m)*Hypergeometric2F1[1/2, (1 + m)
/2, (3 + m)/2, Cos[c + d*x]^2]*Sin[c + d*x])/(a*d*(1 + m)*Sqrt[Sin[c + d*x]
^2])
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2848

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_)/((a_) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*((c + d*Sin[e + f*x])^n/(
a*f*(a + b*Sin[e + f*x]))), x] + Dist[d*(n/(a*b)), Int[(c + d*Sin[e + f*x])
^(n - 1)*(a - b*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] &&
 NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && (IntegerQ[2
*n] || EqQ[c, 0])
```

Rubi steps

$$\text{integral} = \frac{\cos^m(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} + \frac{m\int\cos^{-1+m}(c+dx)(a-a\cos(c+dx))\,dx}{a^2}$$

$$
\begin{aligned}
&= \frac{\cos^m(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} + \frac{m\int\cos^{-1+m}(c+dx)\,dx}{a} - \frac{m\int\cos^m(c+dx)\,dx}{a} \\
&= \frac{\cos^m(c+dx)\sin(c+dx)}{d(a+a\cos(c+dx))} \\
&\quad - \frac{\cos^m(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m}{2},\frac{2+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{ad\sqrt{\sin^2(c+dx)}} \\
&\quad + \frac{m\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{ad(1+m)\sqrt{\sin^2(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.41 (sec) , antiderivative size = 141, normalized size of antiderivative = 0.90

$$
\int\frac{\cos^m(c+dx)}{a+a\cos(c+dx)}\,dx
$$

$$
= \frac{\cos^m(c+dx)\cot\left(\frac{1}{2}(c+dx)\right)\left(-((1+m)(-1+\cos(c+dx))) - (1+m)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m}{2},\frac{2+m}{2},\right.\right.}{ad(1+m)(}
$$

```
[In] Integrate[Cos[c + d*x]^m/(a + a*Cos[c + d*x]),x]
```

```
[Out] (Cos[c + d*x]^m*Cot[(c + d*x)/2]*(-((1 + m)*(-1 + Cos[c + d*x])) - (1 + m)*
Hypergeometric2F1[1/2, m/2, (2 + m)/2, Cos[c + d*x]^2]*Sqrt[Sin[c + d*x]^2]
 + m*Cos[c + d*x]*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, Cos[c + d*x]
^2]*Sqrt[Sin[c + d*x]^2]))/(a*d*(1 + m)*(1 + Cos[c + d*x]))
```

Maple [F]

$$
\int\frac{\cos^m(dx+c)}{a+\cos(dx+c)\,a}dx
$$

```
[In] int(cos(d*x+c)^m/(a+cos(d*x+c)*a),x)
```

```
[Out] int(cos(d*x+c)^m/(a+cos(d*x+c)*a),x)
```

Fricas [F]

$$
\int\frac{\cos^m(c+dx)}{a+a\cos(c+dx)}\,dx = \int\frac{\cos(dx+c)^m}{a\cos(dx+c)+a}\,dx
$$

```
[In] integrate(cos(d*x+c)^m/(a+a*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] integral(cos(d*x + c)^m/(a*cos(d*x + c) + a), x)
```

Sympy [F]

$$\int \frac{\cos^m(c+dx)}{a+a\cos(c+dx)}\,dx = \frac{\int \frac{\cos^m(c+dx)}{\cos(c+dx)+1}\,dx}{a}$$

```
[In] integrate(cos(d*x+c)**m/(a+a*cos(d*x+c)),x)
[Out] Integral(cos(c + d*x)**m/(cos(c + d*x) + 1), x)/a
```

Maxima [F]

$$\int \frac{\cos^m(c+dx)}{a+a\cos(c+dx)}\,dx = \int \frac{\cos(dx+c)^m}{a\cos(dx+c)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^m/(a+a*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^m/(a*cos(d*x + c) + a), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\cos^m(c+dx)}{a+a\cos(c+dx)}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(cos(d*x+c)^m/(a+a*cos(d*x+c)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:Unable to divide, perhaps due to roun
ding error%%%{1,[0,1,0]%%%} / %%%{2,[0,0,1]%%%} Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^m(c+dx)}{a+a\cos(c+dx)}\,dx = \int \frac{\cos(c+d\,x)^m}{a+a\,\cos(c+d\,x)}\,dx$$

```
[In] int(cos(c + d*x)^m/(a + a*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^m/(a + a*cos(c + d*x)), x)
```

3.402 $\int \frac{\cos^m(c+dx)}{(a+a\cos(c+dx))^2} dx$

Optimal result

Integrand size = 21, antiderivative size = 229

$$\int \frac{\cos^m(c+dx)}{(a+a\cos(c+dx))^2} dx = -\frac{2(1-m)\cos^{1+m}(c+dx)\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^{1+m}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} + \frac{(1-2m)m\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{3a^2d(1+m)\sqrt{\sin^2(c+dx)}} - \frac{2(1-m)(1+m)\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{3a^2d(2+m)\sqrt{\sin^2(c+dx)}}$$

```
[Out] -2/3*(1-m)*cos(d*x+c)^(1+m)*sin(d*x+c)/a^2/d/(1+cos(d*x+c))-1/3*cos(d*x+c)^
(1+m)*sin(d*x+c)/d/(a+a*cos(d*x+c))^2+1/3*(1-2*m)*m*cos(d*x+c)^(1+m)*hyperg
eom([1/2, 1/2+1/2*m],[3/2+1/2*m],cos(d*x+c)^2)*sin(d*x+c)/a^2/d/(1+m)/(sin(
d*x+c)^2)^(1/2)-2/3*(1-m)*(1+m)*cos(d*x+c)^(2+m)*hypergeom([1/2, 1+1/2*m],[
2+1/2*m],cos(d*x+c)^2)*sin(d*x+c)/a^2/d/(2+m)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used

$= \{2845, 3057, 2827, 2722\}$

$$\int \frac{\cos^m(c+dx)}{(a+a\cos(c+dx))^2}\,dx$$
$$= \frac{(1-2m)m\sin(c+dx)\cos^{m+1}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},\cos^2(c+dx)\right)}{3a^2d(m+1)\sqrt{\sin^2(c+dx)}}$$
$$-\frac{2(1-m)(m+1)\sin(c+dx)\cos^{m+2}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},\cos^2(c+dx)\right)}{3a^2d(m+2)\sqrt{\sin^2(c+dx)}}$$
$$-\frac{2(1-m)\sin(c+dx)\cos^{m+1}(c+dx)}{3a^2d(\cos(c+dx)+1)}-\frac{\sin(c+dx)\cos^{m+1}(c+dx)}{3d(a\cos(c+dx)+a)^2}$$

```
[In] Int[Cos[c + d*x]^m/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (-2*(1 - m)*Cos[c + d*x]^(1 + m)*Sin[c + d*x])/(3*a^2*d*(1 + Cos[c + d*x]))
 - (Cos[c + d*x]^(1 + m)*Sin[c + d*x])/(3*d*(a + a*Cos[c + d*x])^2) + ((1 -
 2*m)*m*Cos[c + d*x]^(1 + m)*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, C
os[c + d*x]^2]*Sin[c + d*x])/(3*a^2*d*(1 + m)*Sqrt[Sin[c + d*x]^2]) - (2*(1
 - m)*(1 + m)*Cos[c + d*x]^(2 + m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m
)/2, Cos[c + d*x]^2]*Sin[c + d*x])/(3*a^2*d*(2 + m)*Sqrt[Sin[c + d*x]^2])
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2845

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> Simp[b^2*Cos[e + f*x]*(a + b*Sin[e + f*x])^
m*((c + d*Sin[e + f*x])^(n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(
a*(2*m + 1)*(b*c - a*d)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f
*x])^n*Simp[b*c*(m + 1) - a*d*(2*m + n + 2) + b*d*(m + n + 2)*Sin[e + f*x],
 x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && EqQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] &&  !GtQ[n, 0] && (Integer
sQ[2*m, 2*n] || (IntegerQ[m] && EqQ[c, 0]))
```

Rule 3057

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[b*(A*b - a*B)*Cos[e + f*x]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(
n + 1)/(a*f*(2*m + 1)*(b*c - a*d))), x] + Dist[1/(a*(2*m + 1)*(b*c - a*d)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[B*(a*c*m + b*
d*(n + 1)) + A*(b*c*(m + 1) - a*d*(2*m + n + 2)) + d*(A*b - a*B)*(m + n + 2
)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, n}, x] && NeQ[
b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -2^(-1)]
&&  !GtQ[n, 0] && IntegerQ[2*m] && (IntegerQ[2*n] || EqQ[c, 0])
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\cos^{1+m}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} + \frac{\int \frac{\cos^m(c+dx)(a(2-m)+am\cos(c+dx))}{a+a\cos(c+dx)}\,dx}{3a^2} \\
&= -\frac{2(1-m)\cos^{1+m}(c+dx)\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^{1+m}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} \\
&\quad + \frac{\int \cos^m(c+dx)\left(-a^2(1-2m)m+2a^2(1-m)(1+m)\cos(c+dx)\right)\,dx}{3a^4} \\
&= -\frac{2(1-m)\cos^{1+m}(c+dx)\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^{1+m}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} \\
&\quad - \frac{((1-2m)m)\int \cos^m(c+dx)\,dx}{3a^2} + \frac{(2(1-m)(1+m))\int \cos^{1+m}(c+dx)\,dx}{3a^2} \\
&= -\frac{2(1-m)\cos^{1+m}(c+dx)\sin(c+dx)}{3a^2d(1+\cos(c+dx))} - \frac{\cos^{1+m}(c+dx)\sin(c+dx)}{3d(a+a\cos(c+dx))^2} \\
&\quad + \frac{(1-2m)m\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{3a^2d(1+m)\sqrt{\sin^2(c+dx)}} \\
&\quad - \frac{2(1-m)(1+m)\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{3a^2d(2+m)\sqrt{\sin^2(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.94 (sec) , antiderivative size = 188, normalized size of antiderivative = 0.82

$$
\int \frac{\cos^m(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \frac{\cos^{1+m}(c+dx)\csc(c+dx)\left(-\sin^2(c+dx) - \frac{(1+\cos(c+dx))\left(-2(-1+m)(1+m)(2+m)\sin^2(c+dx)-(1+\cos(c+dx))((1-2m)\right.}{\cdots}\right.}{3a^2d(1 \cdots}
$$

```
[In] Integrate[Cos[c + d*x]^m/(a + a*Cos[c + d*x])^2,x]
```

```
[Out] (Cos[c + d*x]^(1 + m)*Csc[c + d*x]*(-Sin[c + d*x]^2 - ((1 + Cos[c + d*x])*(
-2*(-1 + m)*(1 + m)*(2 + m)*Sin[c + d*x]^2 - (1 + Cos[c + d*x])*((1 - 2*m)*
m*(2 + m)*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, Cos[c + d*x]^2] + 2*
(-1 + m)*(1 + m)^2*Cos[c + d*x]*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2
, Cos[c + d*x]^2])*Sqrt[Sin[c + d*x]^2]))/((1 + m)*(2 + m))))/(3*a^2*d*(1 +
 Cos[c + d*x])^2)
```

Maple [F]

$$\int \frac{\cos^{m}\left(dx+c\right)}{\left(a+\cos\left(dx+c\right)a\right)^{2}}dx$$

```
[In] int(cos(d*x+c)^m/(a+cos(d*x+c)*a)^2,x)
```

```
[Out] int(cos(d*x+c)^m/(a+cos(d*x+c)*a)^2,x)
```

Fricas [F]

$$\int \frac{\cos^m(c+dx)}{(a+a\cos(c+dx))^2}\,dx=\int \frac{\cos\left(dx+c\right)^{m}}{\left(a\cos\left(dx+c\right)+a\right)^{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^m/(a+a*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] integral(cos(d*x + c)^m/(a^2*cos(d*x + c)^2 + 2*a^2*cos(d*x + c) + a^2), x)
```

Sympy [F]

$$\int \frac{\cos^m(c+dx)}{(a+a\cos(c+dx))^2}\,dx=\frac{\int \frac{\cos^{m}\left(c+dx\right)}{\cos^{2}\left(c+dx\right)+2\cos\left(c+dx\right)+1}\,dx}{a^{2}}$$

```
[In] integrate(cos(d*x+c)**m/(a+a*cos(d*x+c))**2,x)
```

```
[Out] Integral(cos(c + d*x)**m/(cos(c + d*x)**2 + 2*cos(c + d*x) + 1), x)/a**2
```

Maxima [F]

$$\int \frac{\cos^m(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\cos(dx+c)^m}{(a\cos(dx+c)+a)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^m/(a+a*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] integrate(cos(d*x + c)^m/(a*cos(d*x + c) + a)^2, x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\cos^m(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(cos(d*x+c)^m/(a+a*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:Unable to divide, perhaps due to roun
ding error%%%{1,[0,1,2,0]%%%}+%%%{1,[0,1,0,0]%%%} / %%%{4,[0,0,0,2]%%%} Err
or: Ba
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^m(c+dx)}{(a+a\cos(c+dx))^2}\,dx = \int \frac{\cos(c+d\,x)^m}{(a+a\,\cos(c+d\,x))^2}\,dx$$

```
[In] int(cos(c + d*x)^m/(a + a*cos(c + d*x))^2,x)
```

```
[Out] int(cos(c + d*x)^m/(a + a*cos(c + d*x))^2, x)
```

3.403 $\int \cos^7(c+dx)(a+b\cos(c+dx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 150

$$\int \cos^7(c+dx)(a+b\cos(c+dx))\,dx = \frac{35bx}{128}+\frac{a\sin(c+dx)}{d}+\frac{35b\cos(c+dx)\sin(c+dx)}{128d}+\frac{35b\cos^3(c+dx)\sin(c+dx)}{192d}+\frac{7b\cos^5(c+dx)\sin(c+dx)}{48d}+\frac{b\cos^7(c+dx)\sin(c+dx)}{8d}-\frac{a\sin^3(c+dx)}{d}+\frac{3a\sin^5(c+dx)}{5d}-\frac{a\sin^7(c+dx)}{7d}$$

```
[Out] 35/128*b*x+a*sin(d*x+c)/d+35/128*b*cos(d*x+c)*sin(d*x+c)/d+35/192*b*cos(d*x
+c)^3*sin(d*x+c)/d+7/48*b*cos(d*x+c)^5*sin(d*x+c)/d+1/8*b*cos(d*x+c)^7*sin(
d*x+c)/d-a*sin(d*x+c)^3/d+3/5*a*sin(d*x+c)^5/d-1/7*a*sin(d*x+c)^7/d
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used

$= \{2827, 2713, 2715, 8\}$

$$\int \cos^7(c+dx)(a+b\cos(c+dx))\,dx = -\frac{a\sin^7(c+dx)}{7d}+\frac{3a\sin^5(c+dx)}{5d}-\frac{a\sin^3(c+dx)}{d}+\frac{a\sin(c+dx)}{d}+\frac{b\sin(c+dx)\cos^7(c+dx)}{8d}+\frac{7b\sin(c+dx)\cos^5(c+dx)}{48d}+\frac{35b\sin(c+dx)\cos^3(c+dx)}{192d}+\frac{35b\sin(c+dx)\cos(c+dx)}{128d}+\frac{35bx}{128}$$

```
[In] Int[Cos[c + d*x]^7*(a + b*Cos[c + d*x]),x]
```

```
[Out] (35*b*x)/128 + (a*Sin[c + d*x])/d + (35*b*Cos[c + d*x]*Sin[c + d*x])/(128*d
) + (35*b*Cos[c + d*x]^3*Sin[c + d*x])/(192*d) + (7*b*Cos[c + d*x]^5*Sin[c
+ d*x])/(48*d) + (b*Cos[c + d*x]^7*Sin[c + d*x])/(8*d) - (a*Sin[c + d*x]^3)
/d + (3*a*Sin[c + d*x]^5)/(5*d) - (a*Sin[c + d*x]^7)/(7*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= a\int \cos^7(c+dx)\,dx + b\int \cos^8(c+dx)\,dx \\
&= \frac{b\cos^7(c+dx)\sin(c+dx)}{8d} + \frac{1}{8}(7b)\int \cos^6(c+dx)\,dx \\
&\quad - \frac{a\text{Subst}\left(\int \left(1-3x^2+3x^4-x^6\right)\,dx, x, -\sin(c+dx)\right)}{d} \\
&= \frac{a\sin(c+dx)}{d} + \frac{7b\cos^5(c+dx)\sin(c+dx)}{48d} + \frac{b\cos^7(c+dx)\sin(c+dx)}{8d} \\
&\quad - \frac{a\sin^3(c+dx)}{d} + \frac{3a\sin^5(c+dx)}{5d} - \frac{a\sin^7(c+dx)}{7d} + \frac{1}{48}(35b)\int \cos^4(c+dx)\,dx \\
&= \frac{a\sin(c+dx)}{d} + \frac{35b\cos^3(c+dx)\sin(c+dx)}{192d} + \frac{7b\cos^5(c+dx)\sin(c+dx)}{48d} \\
&\quad + \frac{b\cos^7(c+dx)\sin(c+dx)}{8d} - \frac{a\sin^3(c+dx)}{d} + \frac{3a\sin^5(c+dx)}{5d} \\
&\quad - \frac{a\sin^7(c+dx)}{7d} + \frac{1}{64}(35b)\int \cos^2(c+dx)\,dx \\
&= \frac{a\sin(c+dx)}{d} + \frac{35b\cos(c+dx)\sin(c+dx)}{128d} + \frac{35b\cos^3(c+dx)\sin(c+dx)}{192d} \\
&\quad + \frac{7b\cos^5(c+dx)\sin(c+dx)}{48d} + \frac{b\cos^7(c+dx)\sin(c+dx)}{8d} \\
&\quad - \frac{a\sin^3(c+dx)}{d} + \frac{3a\sin^5(c+dx)}{5d} - \frac{a\sin^7(c+dx)}{7d} + \frac{1}{128}(35b)\int 1\,dx \\
&= \frac{35bx}{128} + \frac{a\sin(c+dx)}{d} + \frac{35b\cos(c+dx)\sin(c+dx)}{128d} + \frac{35b\cos^3(c+dx)\sin(c+dx)}{192d} \\
&\quad + \frac{7b\cos^5(c+dx)\sin(c+dx)}{48d} + \frac{b\cos^7(c+dx)\sin(c+dx)}{8d} \\
&\quad - \frac{a\sin^3(c+dx)}{d} + \frac{3a\sin^5(c+dx)}{5d} - \frac{a\sin^7(c+dx)}{7d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 135, normalized size of antiderivative = 0.90

$$\begin{aligned}
\int \cos^7(c+dx)(a+b\cos(c+dx))\,dx &= \frac{35b(c+dx)}{128d} + \frac{a\sin(c+dx)}{d} - \frac{a\sin^3(c+dx)}{d} \\
&\quad + \frac{3a\sin^5(c+dx)}{5d} - \frac{a\sin^7(c+dx)}{7d} \\
&\quad + \frac{7b\sin(2(c+dx))}{32d} + \frac{7b\sin(4(c+dx))}{128d} \\
&\quad + \frac{b\sin(6(c+dx))}{96d} + \frac{b\sin(8(c+dx))}{1024d}
\end{aligned}$$

```
[In] Integrate[Cos[c + d*x]^7*(a + b*Cos[c + d*x]),x]
```

```
[Out] (35*b*(c + d*x))/(128*d) + (a*Sin[c + d*x])/d - (a*Sin[c + d*x]^3)/d + (3*a
*Sin[c + d*x]^5)/(5*d) - (a*Sin[c + d*x]^7)/(7*d) + (7*b*Sin[2*(c + d*x)])/
(32*d) + (7*b*Sin[4*(c + d*x)])/(128*d) + (b*Sin[6*(c + d*x)])/(96*d) + (b*
Sin[8*(c + d*x)])/(1024*d)
```

Maple [A] (verified)

Time = 3.05 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.67

method	result
derivativedivides	$\frac{b\left(\frac{\left(\cos^7(dx+c)+\frac{7\left(\cos^5(dx+c)\right)}{6}+\frac{35\left(\cos^3(dx+c)\right)}{24}+\frac{35\cos(dx+c)}{16}\right)\sin(dx+c)}{8}+\frac{35dx}{128}+\frac{35c}{128}\right)+\frac{a\left(\frac{16}{5}+\cos^6(dx+c)+\frac{6\left(\cos^4(dx+ \cdots\right.}{5}\cdots}{7\cdots}}{d}$
default	$\frac{b\left(\frac{\left(\cos^7(dx+c)+\frac{7\left(\cos^5(dx+c)\right)}{6}+\frac{35\left(\cos^3(dx+c)\right)}{24}+\frac{35\cos(dx+c)}{16}\right)\sin(dx+c)}{8}+\frac{35dx}{128}+\frac{35c}{128}\right)+\frac{a\left(\frac{16}{5}+\cos^6(dx+c)+\frac{6\left(\cos^4(dx+ \cdots\right.}{5}\cdots}{7\cdots}}{d}$
parts	$\frac{a\left(\frac{16}{5}+\cos^6(dx+c)+\frac{6\left(\cos^4(dx+c)\right)}{5}+\frac{8\left(\cos^2(dx+c)\right)}{5}\right)\sin(dx+c)}{7d}+\frac{b\left(\frac{\left(\cos^7(dx+c)+\frac{7\left(\cos^5(dx+c)\right)}{6}+\frac{35\left(\cos^3(dx+c)\right)}{24}+\frac{3\cdots}{\cdots}\right.}{8}\cdots\right.}{d}$
parallelrisch	$\frac{29400bxd+58800a\sin(dx+c)+105b\sin(8dx+8c)+240a\sin(7dx+7c)+1120b\sin(6dx+6c)+2352a\sin(5dx+5c)+5880\sin(\cdots}{107520d}$
risch	$\frac{35bx}{128}+\frac{35a\sin(dx+c)}{64d}+\frac{b\sin(8dx+8c)}{1024d}+\frac{a\sin(7dx+7c)}{448d}+\frac{b\sin(6dx+6c)}{96d}+\frac{7a\sin(5dx+5c)}{320d}+\frac{7b\sin(4dx+4c)}{128d}\cdots$
norman	$\frac{35bx}{128}+\frac{35bx\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{16}+\frac{245bx\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{32}+\frac{245bx\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{16}+\frac{1225bx\left(\tan^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{64}+\frac{245bx\left(\tan^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{16}+\cdots$

```
[In] int(cos(d*x+c)^7*(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(b*(1/8*(cos(d*x+c)^7+7/6*cos(d*x+c)^5+35/24*cos(d*x+c)^3+35/16*cos(d*x
+c))*sin(d*x+c)+35/128*d*x+35/128*c)+1/7*a*(16/5+cos(d*x+c)^6+6/5*cos(d*x+c
)^4+8/5*cos(d*x+c)^2)*sin(d*x+c))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 97, normalized size of antiderivative = 0.65

$$\int \cos^7(c+dx)(a+b\cos(c+dx))\,dx = \frac{3675\,bdx + \left(1680\,b\cos\left(dx+c\right)^7 + 1920\,a\cos\left(dx+c\right)^6 + 1960\,b\cos\left(dx+c\right)^5 + 2304\,a\cos\left(dx+c\right)^4 + 2450}{13440\,d}$$

```
[In] integrate(cos(d*x+c)^7*(a+b*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/13440*(3675*b*d*x + (1680*b*cos(d*x + c)^7 + 1920*a*cos(d*x + c)^6 + 1960
*b*cos(d*x + c)^5 + 2304*a*cos(d*x + c)^4 + 2450*b*cos(d*x + c)^3 + 3072*a*
cos(d*x + c)^2 + 3675*b*cos(d*x + c) + 6144*a)*sin(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 286 vs. $2(141) = 282$.

Time = 0.67 (sec) , antiderivative size = 286, normalized size of antiderivative = 1.91

$$\int \cos^7(c+dx)(a+b\cos(c+dx))\,dx = \begin{cases} \frac{16a\sin^7(c+dx)}{35d} + \frac{8a\sin^5(c+dx)\cos^2(c+dx)}{5d} + \frac{2a\sin^3(c+dx)\cos^4(c+dx)}{d} + \frac{a\sin(c+dx)\cos^6(c+dx)}{d} + \frac{35bx\sin^8(c+dx)}{128} + \frac{35bx\sin^6(}{} \\ x(a+b\cos(c))\cos^7(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)**7*(a+b*cos(d*x+c)),x)
```

```
[Out] Piecewise((16*a*sin(c + d*x)**7/(35*d) + 8*a*sin(c + d*x)**5*cos(c + d*x)**
2/(5*d) + 2*a*sin(c + d*x)**3*cos(c + d*x)**4/d + a*sin(c + d*x)*cos(c + d*
x)**6/d + 35*b*x*sin(c + d*x)**8/128 + 35*b*x*sin(c + d*x)**6*cos(c + d*x)*
*2/32 + 105*b*x*sin(c + d*x)**4*cos(c + d*x)**4/64 + 35*b*x*sin(c + d*x)**2
*cos(c + d*x)**6/32 + 35*b*x*cos(c + d*x)**8/128 + 35*b*sin(c + d*x)**7*cos
(c + d*x)/(128*d) + 385*b*sin(c + d*x)**5*cos(c + d*x)**3/(384*d) + 511*b*s
in(c + d*x)**3*cos(c + d*x)**5/(384*d) + 93*b*sin(c + d*x)*cos(c + d*x)**7/
(128*d), Ne(d, 0)), (x*(a + b*cos(c))*cos(c)**7, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.19 (sec) , antiderivative size = 105, normalized size of antiderivative = 0.70

$$\int \cos^7(c+dx)(a+b\cos(c+dx))\,dx = -\frac{3072\left(5\sin\left(dx+c\right)^7-21\sin\left(dx+c\right)^5+35\sin\left(dx+c\right)^3-35\sin\left(dx+c\right)\right)a+35\left(128\sin\left(2\,dx+2\,c\right.\right.}{107520\,d}$$

[In] integrate(cos(d*x+c)^7*(a+b*cos(d*x+c)),x, algorithm="maxima")

[Out] -1/107520*(3072*(5*sin(d*x + c)^7 - 21*sin(d*x + c)^5 + 35*sin(d*x + c)^3 - 35*sin(d*x + c))*a + 35*(128*sin(2*d*x + 2*c)^3 - 840*d*x - 840*c - 3*sin(8*d*x + 8*c) - 168*sin(4*d*x + 4*c) - 768*sin(2*d*x + 2*c))*b)/d

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 122, normalized size of antiderivative = 0.81

$$\int \cos^7(c+dx)(a+b\cos(c+dx))\,dx = \frac{35}{128}\,bx+\frac{b\sin\left(8\,dx+8\,c\right)}{1024\,d}+\frac{a\sin\left(7\,dx+7\,c\right)}{448\,d}+\frac{b\sin\left(6\,dx+6\,c\right)}{96\,d}+\frac{7\,a\sin\left(5\,dx+5\,c\right)}{320\,d}+\frac{7\,b\sin\left(4\,dx+4\,c\right)}{128\,d}+\frac{7\,a\sin\left(3\,dx+3\,c\right)}{64\,d}+\frac{7\,b\sin\left(2\,dx+2\,c\right)}{32\,d}+\frac{35\,a\sin\left(dx+c\right)}{64\,d}$$

[In] integrate(cos(d*x+c)^7*(a+b*cos(d*x+c)),x, algorithm="giac")

[Out] 35/128*b*x + 1/1024*b*sin(8*d*x + 8*c)/d + 1/448*a*sin(7*d*x + 7*c)/d + 1/96*b*sin(6*d*x + 6*c)/d + 7/320*a*sin(5*d*x + 5*c)/d + 7/128*b*sin(4*d*x + 4*c)/d + 7/64*a*sin(3*d*x + 3*c)/d + 7/32*b*sin(2*d*x + 2*c)/d + 35/64*a*sin(d*x + c)/d

Mupad [B] (verification not implemented)

Time = 17.24 (sec) , antiderivative size = 175, normalized size of antiderivative = 1.17

$$\int \cos^7(c+dx)(a+b\cos(c+dx))\,dx = \frac{35\,b\,x}{128} + \frac{\left(2\,a-\frac{93\,b}{64}\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{15}+\left(6\,a-\frac{91\,b}{192}\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{13}+\left(\frac{106\,a}{5}-\frac{1799\,b}{192}\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{11}+\left(\frac{1026\,a}{35}+\frac{1085\,b}{192}\right.}{}$$

```
[In] int(cos(c + d*x)^7*(a + b*cos(c + d*x)),x)
```

```
[Out] (35*b*x)/128 + (tan(c/2 + (d*x)/2)*(2*a + (93*b)/64) + tan(c/2 + (d*x)/2)^1
5*(2*a - (93*b)/64) + tan(c/2 + (d*x)/2)^3*(6*a + (91*b)/192) + tan(c/2 + (
d*x)/2)^13*(6*a - (91*b)/192) + tan(c/2 + (d*x)/2)^5*((106*a)/5 + (1799*b)/
192) + tan(c/2 + (d*x)/2)^11*((106*a)/5 - (1799*b)/192) + tan(c/2 + (d*x)/2
)^7*((1026*a)/35 - (1085*b)/192) + tan(c/2 + (d*x)/2)^9*((1026*a)/35 + (108
5*b)/192))/(d*(tan(c/2 + (d*x)/2)^2 + 1)^8)
```

3.404 $\int \cos^6(c+dx)(a+b\cos(c+dx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 128

$$\int \cos^6(c+dx)(a+b\cos(c+dx))\,dx = \frac{5ax}{16}+\frac{b\sin(c+dx)}{d}+\frac{5a\cos(c+dx)\sin(c+dx)}{16d}+\frac{5a\cos^3(c+dx)\sin(c+dx)}{24d}+\frac{a\cos^5(c+dx)\sin(c+dx)}{6d}-\frac{b\sin^3(c+dx)}{d}+\frac{3b\sin^5(c+dx)}{5d}-\frac{b\sin^7(c+dx)}{7d}$$

```
[Out] 5/16*a*x+b*sin(d*x+c)/d+5/16*a*cos(d*x+c)*sin(d*x+c)/d+5/24*a*cos(d*x+c)^3*
sin(d*x+c)/d+1/6*a*cos(d*x+c)^5*sin(d*x+c)/d-b*sin(d*x+c)^3/d+3/5*b*sin(d*x
+c)^5/d-1/7*b*sin(d*x+c)^7/d
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2827, 2715, 8, 2713}

$$\int \cos^6(c+dx)(a+b\cos(c+dx))\,dx = \frac{a\sin(c+dx)\cos^5(c+dx)}{6d}+\frac{5a\sin(c+dx)\cos^3(c+dx)}{24d}+\frac{5a\sin(c+dx)\cos(c+dx)}{16d}+\frac{5ax}{16}-\frac{b\sin^7(c+dx)}{7d}+\frac{3b\sin^5(c+dx)}{5d}-\frac{b\sin^3(c+dx)}{d}+\frac{b\sin(c+dx)}{d}$$

```
[In] Int[Cos[c + d*x]^6*(a + b*Cos[c + d*x]),x]
```

```
[Out] (5*a*x)/16 + (b*Sin[c + d*x])/d + (5*a*Cos[c + d*x]*Sin[c + d*x])/(16*d) +
(5*a*Cos[c + d*x]^3*Sin[c + d*x])/(24*d) + (a*Cos[c + d*x]^5*Sin[c + d*x])/
(6*d) - (b*Sin[c + d*x]^3)/d + (3*b*Sin[c + d*x]^5)/(5*d) - (b*Sin[c + d*x]
^7)/(7*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= a\int \cos^6(c+dx)\,dx + b\int \cos^7(c+dx)\,dx\\
&= \frac{a\cos^5(c+dx)\sin(c+dx)}{6d} + \frac{1}{6}(5a)\int \cos^4(c+dx)\,dx\\
&\quad - \frac{b\text{Subst}\left(\int \left(1-3x^2+3x^4-x^6\right)\,dx, x, -\sin(c+dx)\right)}{d}\\
&= \frac{b\sin(c+dx)}{d} + \frac{5a\cos^3(c+dx)\sin(c+dx)}{24d} + \frac{a\cos^5(c+dx)\sin(c+dx)}{6d}\\
&\quad - \frac{b\sin^3(c+dx)}{d} + \frac{3b\sin^5(c+dx)}{5d} - \frac{b\sin^7(c+dx)}{7d} + \frac{1}{8}(5a)\int \cos^2(c+dx)\,dx
\end{aligned}
$$

$$= \frac{b\sin(c+dx)}{d} + \frac{5a\cos(c+dx)\sin(c+dx)}{16d} + \frac{5a\cos^3(c+dx)\sin(c+dx)}{24d} + \frac{a\cos^5(c+dx)\sin(c+dx)}{6d} - \frac{b\sin^3(c+dx)}{d} + \frac{3b\sin^5(c+dx)}{5d} - \frac{b\sin^7(c+dx)}{7d} + \frac{1}{16}(5a)\int 1\,dx$$

$$= \frac{5ax}{16} + \frac{b\sin(c+dx)}{d} + \frac{5a\cos(c+dx)\sin(c+dx)}{16d} + \frac{5a\cos^3(c+dx)\sin(c+dx)}{24d} + \frac{a\cos^5(c+dx)\sin(c+dx)}{6d} - \frac{b\sin^3(c+dx)}{d} + \frac{3b\sin^5(c+dx)}{5d} - \frac{b\sin^7(c+dx)}{7d}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.70

$$\int \cos^6(c+dx)(a+b\cos(c+dx))\,dx = \frac{6720b\sin(c+dx) - 6720b\sin^3(c+dx) + 4032b\sin^5(c+dx) - 960b\sin^7(c+dx) + 35a(60c + 60dx + 45\,\mathrm{s}}{6720d}$$

```
[In] Integrate[Cos[c + d*x]^6*(a + b*Cos[c + d*x]),x]
[Out] (6720*b*Sin[c + d*x] - 6720*b*Sin[c + d*x]^3 + 4032*b*Sin[c + d*x]^5 - 960*
b*Sin[c + d*x]^7 + 35*a*(60*c + 60*d*x + 45*Sin[2*(c + d*x)] + 9*Sin[4*(c +
 d*x)] + Sin[6*(c + d*x)]))/(6720*d)
```

Maple [A] (verified)

Time = 2.93 (sec) , antiderivative size = 90, normalized size of antiderivative = 0.70

method	result
derivativedivides	$\frac{\frac{b\left(\frac{16}{5}+\cos^6(dx+c)+\frac{6\left(\cos^4(dx+c)\right)}{5}+\frac{8\left(\cos^2(dx+c)\right)}{5}\right)\sin(dx+c)}{7}+a\left(\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{6}+\frac{5}{}\right.}{d}$
default	$\frac{\frac{b\left(\frac{16}{5}+\cos^6(dx+c)+\frac{6\left(\cos^4(dx+c)\right)}{5}+\frac{8\left(\cos^2(dx+c)\right)}{5}\right)\sin(dx+c)}{7}+a\left(\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{6}+\frac{5}{}\right.}{d}$
parts	$\frac{a\left(\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{6}+\frac{5dx}{16}+\frac{5c}{16}\right)}{d}+\frac{b\left(\frac{16}{5}+\cos^6(dx+c)+\frac{6\left(\cos^4(dx+c)\right)}{5}+\frac{8\left(\cos^2(dx+\right.}{5}\right.}{7d}$
parallelrisch	$\frac{2100axd+3675b\sin(dx+c)+15b\sin(7dx+7c)+35a\sin(6dx+6c)+147b\sin(5dx+5c)+315\sin(4dx+4c)a+735b\sin(3dx+3c)}{6720d}$
risch	$\frac{5ax}{16}+\frac{35b\sin(dx+c)}{64d}+\frac{b\sin(7dx+7c)}{448d}+\frac{a\sin(6dx+6c)}{192d}+\frac{7b\sin(5dx+5c)}{320d}+\frac{3a\sin(4dx+4c)}{64d}+\frac{7b\sin(3dx+3c)}{64d}$
norman	$\frac{5ax}{16}+\frac{35ax\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{16}+\frac{105ax\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{16}+\frac{175ax\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{16}+\frac{175ax\left(\tan^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{16}+\frac{105ax\left(\tan^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{16}+\frac{35}{}$

```
[In] int(cos(d*x+c)^6*(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(1/7*b*(16/5+cos(d*x+c)^6+6/5*cos(d*x+c)^4+8/5*cos(d*x+c)^2)*sin(d*x+c)
+a*(1/6*(cos(d*x+c)^5+5/4*cos(d*x+c)^3+15/8*cos(d*x+c))*sin(d*x+c)+5/16*d*x
+5/16*c))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.67

$$\int \cos^6(c+dx)(a+b\cos(c+dx))\,dx$$
$$=\frac{525\,adx+\left(240\,b\cos\left(dx+c\right)^6+280\,a\cos\left(dx+c\right)^5+288\,b\cos\left(dx+c\right)^4+350\,a\cos\left(dx+c\right)^3+384\,b\cos\left(\right.\right.}{1680\,d}$$

```
[In] integrate(cos(d*x+c)^6*(a+b*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/1680*(525*a*d*x + (240*b*cos(d*x + c)^6 + 280*a*cos(d*x + c)^5 + 288*b*co
s(d*x + c)^4 + 350*a*cos(d*x + c)^3 + 384*b*cos(d*x + c)^2 + 525*a*cos(d*x
+ c) + 768*b)*sin(d*x + c))/d
```

Sympy [A] (verification not implemented)

Time = 0.48 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.86

$$\int \cos^6(c+dx)(a+b\cos(c+dx))\,dx$$
$$=\begin{cases} \frac{5ax\sin^6(c+dx)}{16}+\frac{15ax\sin^4(c+dx)\cos^2(c+dx)}{16}+\frac{15ax\sin^2(c+dx)\cos^4(c+dx)}{16}+\frac{5ax\cos^6(c+dx)}{16}+\frac{5a\sin^5(c+dx)\cos(c+dx)}{16d}+5a \\ x(a+b\cos(c))\cos^6(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)**6*(a+b*cos(d*x+c)),x)
```

```
[Out] Piecewise((5*a*x*sin(c + d*x)**6/16 + 15*a*x*sin(c + d*x)**4*cos(c + d*x)**
2/16 + 15*a*x*sin(c + d*x)**2*cos(c + d*x)**4/16 + 5*a*x*cos(c + d*x)**6/16
 + 5*a*sin(c + d*x)**5*cos(c + d*x)/(16*d) + 5*a*sin(c + d*x)**3*cos(c + d*
x)**3/(6*d) + 11*a*sin(c + d*x)*cos(c + d*x)**5/(16*d) + 16*b*sin(c + d*x)*
*7/(35*d) + 8*b*sin(c + d*x)**5*cos(c + d*x)**2/(5*d) + 2*b*sin(c + d*x)**3
*cos(c + d*x)**4/d + b*sin(c + d*x)*cos(c + d*x)**6/d, Ne(d, 0)), (x*(a + b
*cos(c))*cos(c)**6, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.73

$$\int \cos^6(c+dx)(a+b\cos(c+dx))\,dx =$$
$$-\frac{35\left(4\sin\left(2dx+2c\right)^3-60dx-60c-9\sin\left(4dx+4c\right)-48\sin\left(2dx+2c\right)\right)a+192\left(5\sin\left(dx+c\right)^7\right.}{6720d}$$

```
[In] integrate(cos(d*x+c)^6*(a+b*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/6720*(35*(4*sin(2*d*x + 2*c)^3 - 60*d*x - 60*c - 9*sin(4*d*x + 4*c) - 48
*sin(2*d*x + 2*c))*a + 192*(5*sin(d*x + c)^7 - 21*sin(d*x + c)^5 + 35*sin(d
*x + c)^3 - 35*sin(d*x + c))*b)/d
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.84

$$\int \cos^6(c+dx)(a+b\cos(c+dx))\,dx = \frac{5}{16}ax + \frac{b\sin(7dx+7c)}{448d} + \frac{a\sin(6dx+6c)}{192d} + \frac{7b\sin(5dx+5c)}{320d} + \frac{3a\sin(4dx+4c)}{64d} + \frac{7b\sin(3dx+3c)}{64d} + \frac{15a\sin(2dx+2c)}{64d} + \frac{35b\sin(dx+c)}{64d}$$

```
[In] integrate(cos(d*x+c)^6*(a+b*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] 5/16*a*x + 1/448*b*sin(7*d*x + 7*c)/d + 1/192*a*sin(6*d*x + 6*c)/d + 7/320*
b*sin(5*d*x + 5*c)/d + 3/64*a*sin(4*d*x + 4*c)/d + 7/64*b*sin(3*d*x + 3*c)/
d + 15/64*a*sin(2*d*x + 2*c)/d + 35/64*b*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 17.38 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.20

$$\int \cos^6(c+dx)(a+b\cos(c+dx))\,dx = \frac{5ax}{16} + \frac{\left(2b-\frac{11a}{8}\right)\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{13} + \left(4b-\frac{7a}{6}\right)\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{11} + \left(\frac{86b}{5}-\frac{85a}{24}\right)\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{9} + \frac{424b\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{7}}{35} + \cdots}{d\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2+1\right)^7}$$

```
[In] int(cos(c + d*x)^6*(a + b*cos(c + d*x)),x)
```

```
[Out] (5*a*x)/16 + (tan(c/2 + (d*x)/2)*((11*a)/8 + 2*b) + tan(c/2 + (d*x)/2)^3*((
7*a)/6 + 4*b) - tan(c/2 + (d*x)/2)^11*((7*a)/6 - 4*b) - tan(c/2 + (d*x)/2)^
13*((11*a)/8 - 2*b) + tan(c/2 + (d*x)/2)^5*((85*a)/24 + (86*b)/5) - tan(c/2
 + (d*x)/2)^9*((85*a)/24 - (86*b)/5) + (424*b*tan(c/2 + (d*x)/2)^7)/35)/(d*
(tan(c/2 + (d*x)/2)^2 + 1)^7)
```

3.405 $\int \cos^5(c+dx)(a+b\cos(c+dx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 114

$$\int \cos^5(c+dx)(a+b\cos(c+dx))\,dx = \frac{5bx}{16}+\frac{a\sin(c+dx)}{d}+\frac{5b\cos(c+dx)\sin(c+dx)}{16d}+\frac{5b\cos^3(c+dx)\sin(c+dx)}{24d}+\frac{b\cos^5(c+dx)\sin(c+dx)}{6d}-\frac{2a\sin^3(c+dx)}{3d}+\frac{a\sin^5(c+dx)}{5d}$$

```
[Out] 5/16*b*x+a*sin(d*x+c)/d+5/16*b*cos(d*x+c)*sin(d*x+c)/d+5/24*b*cos(d*x+c)^3*
sin(d*x+c)/d+1/6*b*cos(d*x+c)^5*sin(d*x+c)/d-2/3*a*sin(d*x+c)^3/d+1/5*a*sin
(d*x+c)^5/d
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2827, 2713, 2715, 8}

$$\int \cos^5(c+dx)(a+b\cos(c+dx))\,dx = \frac{a\sin^5(c+dx)}{5d}-\frac{2a\sin^3(c+dx)}{3d}+\frac{a\sin(c+dx)}{d}+\frac{b\sin(c+dx)\cos^5(c+dx)}{6d}+\frac{5b\sin(c+dx)\cos^3(c+dx)}{24d}+\frac{5b\sin(c+dx)\cos(c+dx)}{16d}+\frac{5bx}{16}$$

```
[In] Int[Cos[c + d*x]^5*(a + b*Cos[c + d*x]),x]
```

```
[Out] (5*b*x)/16 + (a*Sin[c + d*x])/d + (5*b*Cos[c + d*x]*Sin[c + d*x])/(16*d) +
(5*b*Cos[c + d*x]^3*Sin[c + d*x])/(24*d) + (b*Cos[c + d*x]^5*Sin[c + d*x])/
(6*d) - (2*a*Sin[c + d*x]^3)/(3*d) + (a*Sin[c + d*x]^5)/(5*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= a\int \cos^5(c+dx)\,dx + b\int \cos^6(c+dx)\,dx\\
&= \frac{b\cos^5(c+dx)\sin(c+dx)}{6d} + \frac{1}{6}(5b)\int \cos^4(c+dx)\,dx\\
&\quad - \frac{a\text{Subst}\left(\int \left(1-2x^2+x^4\right)\,dx, x, -\sin(c+dx)\right)}{d}\\
&= \frac{a\sin(c+dx)}{d} + \frac{5b\cos^3(c+dx)\sin(c+dx)}{24d} + \frac{b\cos^5(c+dx)\sin(c+dx)}{6d}\\
&\quad - \frac{2a\sin^3(c+dx)}{3d} + \frac{a\sin^5(c+dx)}{5d} + \frac{1}{8}(5b)\int \cos^2(c+dx)\,dx\\
&= \frac{a\sin(c+dx)}{d} + \frac{5b\cos(c+dx)\sin(c+dx)}{16d} + \frac{5b\cos^3(c+dx)\sin(c+dx)}{24d}\\
&\quad + \frac{b\cos^5(c+dx)\sin(c+dx)}{6d} - \frac{2a\sin^3(c+dx)}{3d} + \frac{a\sin^5(c+dx)}{5d} + \frac{1}{16}(5b)\int 1\,dx
\end{aligned}$$

$$= \frac{5bx}{16} + \frac{a\sin(c+dx)}{d} + \frac{5b\cos(c+dx)\sin(c+dx)}{16d} + \frac{5b\cos^3(c+dx)\sin(c+dx)}{24d} + \frac{b\cos^5(c+dx)\sin(c+dx)}{6d} - \frac{2a\sin^3(c+dx)}{3d} + \frac{a\sin^5(c+dx)}{5d}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 78, normalized size of antiderivative = 0.68

$$\int \cos^5(c+dx)(a+b\cos(c+dx))\,dx = \frac{960a\sin(c+dx) - 640a\sin^3(c+dx) + 192a\sin^5(c+dx) + 5b(60c+60dx+45\sin(2(c+dx))+9\sin(4(c}{960d}$$

```
[In] Integrate[Cos[c + d*x]^5*(a + b*Cos[c + d*x]),x]
[Out] (960*a*Sin[c + d*x] - 640*a*Sin[c + d*x]^3 + 192*a*Sin[c + d*x]^5 + 5*b*(60
*c + 60*d*x + 45*Sin[2*(c + d*x)] + 9*Sin[4*(c + d*x)] + Sin[6*(c + d*x)]))
/(960*d)
```

Maple [A] (verified)

Time = 2.57 (sec) , antiderivative size = 80, normalized size of antiderivative = 0.70

method	result
derivativedivides	$\frac{b\left(\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{6}+\frac{5dx}{16}+\frac{5c}{16}\right)+\frac{a\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}}{d}$
default	$\frac{b\left(\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{6}+\frac{5dx}{16}+\frac{5c}{16}\right)+\frac{a\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}}{d}$
parallelrisch	$\frac{300bxd+600a\sin(dx+c)+5b\sin(6dx+6c)+12a\sin(5dx+5c)+45\sin(4dx+4c)b+100a\sin(3dx+3c)+225\sin(2dx+2c)b}{960d}$
parts	$\frac{a\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5d}+\frac{b\left(\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{6}+\frac{5dx}{16}+\frac{5c}{16}\right)}{d}$
risch	$\frac{5bx}{16}+\frac{5a\sin(dx+c)}{8d}+\frac{b\sin(6dx+6c)}{192d}+\frac{a\sin(5dx+5c)}{80d}+\frac{3b\sin(4dx+4c)}{64d}+\frac{5a\sin(3dx+3c)}{48d}+\frac{15b\sin(2dx+2c)}{64d}$
norman	$\frac{5bx}{16}+\frac{15bx\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8}+\frac{75bx\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{16}+\frac{25bx\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4}+\frac{75bx\left(\tan^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{16}+\frac{15bx\left(\tan^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8}+\frac{5bx(t}{}$

```
[In] int(cos(d*x+c)^5*(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(b*(1/6*(cos(d*x+c)^5+5/4*cos(d*x+c)^3+15/8*cos(d*x+c))*sin(d*x+c)+5/16
*d*x+5/16*c)+1/5*a*(8/3+cos(d*x+c)^4+4/3*cos(d*x+c)^2)*sin(d*x+c))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.66

$$\int \cos^5(c+dx)(a+b\cos(c+dx))\,dx = \frac{75\,bdx + \left(40\,b\cos\left(dx+c\right)^5 + 48\,a\cos\left(dx+c\right)^4 + 50\,b\cos\left(dx+c\right)^3 + 64\,a\cos\left(dx+c\right)^2 + 75\,b\cos\left(dx+c\right)}{240\,d}$$

```
[In] integrate(cos(d*x+c)^5*(a+b*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/240*(75*b*d*x + (40*b*cos(d*x + c)^5 + 48*a*cos(d*x + c)^4 + 50*b*cos(d*x
 + c)^3 + 64*a*cos(d*x + c)^2 + 75*b*cos(d*x + c) + 128*a)*sin(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 216 vs. 2(107) = 214.

Time = 0.34 (sec) , antiderivative size = 216, normalized size of antiderivative = 1.89

$$\int \cos^5(c+dx)(a+b\cos(c+dx))\,dx = \begin{cases} \frac{8a\sin^5(c+dx)}{15d} + \frac{4a\sin^3(c+dx)\cos^2(c+dx)}{3d} + \frac{a\sin(c+dx)\cos^4(c+dx)}{d} + \frac{5bx\sin^6(c+dx)}{16} + \frac{15bx\sin^4(c+dx)\cos^2(c+dx)}{16} + \frac{15bx\sin^2(} \\ x(a+b\cos(c))\cos^5(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)**5*(a+b*cos(d*x+c)),x)
```

```
[Out] Piecewise((8*a*sin(c + d*x)**5/(15*d) + 4*a*sin(c + d*x)**3*cos(c + d*x)**2
/(3*d) + a*sin(c + d*x)*cos(c + d*x)**4/d + 5*b*x*sin(c + d*x)**6/16 + 15*b
*x*sin(c + d*x)**4*cos(c + d*x)**2/16 + 15*b*x*sin(c + d*x)**2*cos(c + d*x)
**4/16 + 5*b*x*cos(c + d*x)**6/16 + 5*b*sin(c + d*x)**5*cos(c + d*x)/(16*d)
 + 5*b*sin(c + d*x)**3*cos(c + d*x)**3/(6*d) + 11*b*sin(c + d*x)*cos(c + d*
x)**5/(16*d), Ne(d, 0)), (x*(a + b*cos(c))*cos(c)**5, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.21 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.74

$$\int \cos^5(c+dx)(a+b\cos(c+dx))\,dx$$
$$= \frac{64\left(3\sin\left(dx+c\right)^5-10\sin\left(dx+c\right)^3+15\sin\left(dx+c\right)\right)a-5\left(4\sin\left(2\,dx+2\,c\right)^3-60\,dx-60\,c-9\sin\left(\right.\right.}{960\,d}$$

```
[In] integrate(cos(d*x+c)^5*(a+b*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/960*(64*(3*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*sin(d*x + c))*a - 5*(4
*sin(2*d*x + 2*c)^3 - 60*d*x - 60*c - 9*sin(4*d*x + 4*c) - 48*sin(2*d*x + 2
*c))*b)/d
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 92, normalized size of antiderivative = 0.81

$$\int \cos^5(c+dx)(a+b\cos(c+dx))\,dx = \frac{5}{16}\,bx + \frac{b\sin\left(6\,dx+6\,c\right)}{192\,d} + \frac{a\sin\left(5\,dx+5\,c\right)}{80\,d} + \frac{3\,b\sin\left(4\,dx+4\,c\right)}{64\,d} + \frac{5\,a\sin\left(3\,dx+3\,c\right)}{48\,d} + \frac{15\,b\sin\left(2\,dx+2\,c\right)}{64\,d} + \frac{5\,a\sin\left(dx+c\right)}{8\,d}$$

```
[In] integrate(cos(d*x+c)^5*(a+b*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] 5/16*b*x + 1/192*b*sin(6*d*x + 6*c)/d + 1/80*a*sin(5*d*x + 5*c)/d + 3/64*b*
sin(4*d*x + 4*c)/d + 5/48*a*sin(3*d*x + 3*c)/d + 15/64*b*sin(2*d*x + 2*c)/d
 + 5/8*a*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 14.31 (sec) , antiderivative size = 115, normalized size of antiderivative = 1.01

$$\int \cos^5(c+dx)(a+b\cos(c+dx))\,dx = \frac{5\,b\,x}{16}+\frac{8\,a\,\sin\left(c+d\,x\right)}{15\,d}+\frac{5\,b\,\cos\left(c+d\,x\right)\,\sin\left(c+d\,x\right)}{16\,d}+\frac{4\,a\cos\left(c+d\,x\right)^2\,\sin\left(c+d\,x\right)}{15\,d}+\frac{a\cos\left(c+d\,x\right)^4\,\sin\left(c+d\,x\right)}{5\,d}+\frac{5\,b\cos\left(c+d\,x\right)^3\,\sin\left(c+d\,x\right)}{24\,d}+\frac{b\cos\left(c+d\,x\right)^5\,\sin\left(c+d\,x\right)}{6\,d}$$

```
[In] int(cos(c + d*x)^5*(a + b*cos(c + d*x)),x)
```

```
[Out] (5*b*x)/16 + (8*a*sin(c + d*x))/(15*d) + (5*b*cos(c + d*x)*sin(c + d*x))/(1
6*d) + (4*a*cos(c + d*x)^2*sin(c + d*x))/(15*d) + (a*cos(c + d*x)^4*sin(c +
 d*x))/(5*d) + (5*b*cos(c + d*x)^3*sin(c + d*x))/(24*d) + (b*cos(c + d*x)^5
*sin(c + d*x))/(6*d)
```

3.406 $\int \cos^4(c+dx)(a+b\cos(c+dx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 92

$$\int \cos^4(c+dx)(a+b\cos(c+dx))\,dx = \frac{3ax}{8}+\frac{b\sin(c+dx)}{d}+\frac{3a\cos(c+dx)\sin(c+dx)}{8d}+\frac{a\cos^3(c+dx)\sin(c+dx)}{4d}-\frac{2b\sin^3(c+dx)}{3d}+\frac{b\sin^5(c+dx)}{5d}$$

```
[Out] 3/8*a*x+b*sin(d*x+c)/d+3/8*a*cos(d*x+c)*sin(d*x+c)/d+1/4*a*cos(d*x+c)^3*sin
(d*x+c)/d-2/3*b*sin(d*x+c)^3/d+1/5*b*sin(d*x+c)^5/d
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2827, 2715, 8, 2713}

$$\int \cos^4(c+dx)(a+b\cos(c+dx))\,dx = \frac{a\sin(c+dx)\cos^3(c+dx)}{4d}+\frac{3a\sin(c+dx)\cos(c+dx)}{8d}+\frac{3ax}{8}+\frac{b\sin^5(c+dx)}{5d}-\frac{2b\sin^3(c+dx)}{3d}+\frac{b\sin(c+dx)}{d}$$

```
[In] Int[Cos[c + d*x]^4*(a + b*Cos[c + d*x]),x]
```

```
[Out] (3*a*x)/8 + (b*Sin[c + d*x])/d + (3*a*Cos[c + d*x]*Sin[c + d*x])/(8*d) + (a
*Cos[c + d*x]^3*Sin[c + d*x])/(4*d) - (2*b*Sin[c + d*x]^3)/(3*d) + (b*Sin[c
 + d*x]^5)/(5*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= a\int \cos^4(c+dx)\,dx+b\int \cos^5(c+dx)\,dx\\
&= \frac{a\cos^3(c+dx)\sin(c+dx)}{4d}+\frac{1}{4}(3a)\int \cos^2(c+dx)\,dx\\
&\quad-\frac{b\text{Subst}\left(\int \left(1-2x^2+x^4\right)\,dx,x,-\sin(c+dx)\right)}{d}\\
&= \frac{b\sin(c+dx)}{d}+\frac{3a\cos(c+dx)\sin(c+dx)}{8d}+\frac{a\cos^3(c+dx)\sin(c+dx)}{4d}\\
&\quad-\frac{2b\sin^3(c+dx)}{3d}+\frac{b\sin^5(c+dx)}{5d}+\frac{1}{8}(3a)\int 1\,dx\\
&= \frac{3ax}{8}+\frac{b\sin(c+dx)}{d}+\frac{3a\cos(c+dx)\sin(c+dx)}{8d}\\
&\quad+\frac{a\cos^3(c+dx)\sin(c+dx)}{4d}-\frac{2b\sin^3(c+dx)}{3d}+\frac{b\sin^5(c+dx)}{5d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.97

$$\int \cos^4(c+dx)(a+b\cos(c+dx))\,dx = \frac{3a(c+dx)}{8d}+\frac{b\sin(c+dx)}{d}-\frac{2b\sin^3(c+dx)}{3d}+\frac{b\sin^5(c+dx)}{5d}+\frac{a\sin(2(c+dx))}{4d}+\frac{a\sin(4(c+dx))}{32d}$$

```
[In] Integrate[Cos[c + d*x]^4*(a + b*Cos[c + d*x]),x]
```

```
[Out] (3*a*(c + d*x))/(8*d) + (b*Sin[c + d*x])/d - (2*b*Sin[c + d*x]^3)/(3*d) + (
b*Sin[c + d*x]^5)/(5*d) + (a*Sin[2*(c + d*x)])/(4*d) + (a*Sin[4*(c + d*x)])
/(32*d)
```

Maple [A] (verified)

Time = 2.68 (sec) , antiderivative size = 69, normalized size of antiderivative = 0.75

method	result
parallelrisch	$\frac{180axd+300b\sin(dx+c)+6b\sin(5dx+5c)+15\sin(4dx+4c)a+50b\sin(3dx+3c)+120\sin(2dx+2c)a}{480d}$
derivativedivides	$\frac{\frac{b\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}+a\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}$
default	$\frac{\frac{b\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}+a\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}$
parts	$\frac{a\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}+\frac{b\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5d}$
risch	$\frac{3ax}{8}+\frac{5b\sin(dx+c)}{8d}+\frac{b\sin(5dx+5c)}{80d}+\frac{a\sin(4dx+4c)}{32d}+\frac{5b\sin(3dx+3c)}{48d}+\frac{a\sin(2dx+2c)}{4d}$
norman	$\frac{\frac{3ax}{8}+\frac{15ax\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8}+\frac{15ax\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4}+\frac{15ax\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4}+\frac{15ax\left(\tan^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8}+\frac{3ax\left(\tan^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8}+\frac{116b(\cdots}{\cdots}}{\left(1+\tan^2\left(\frac{dx}{2}\cdots\right.\right.}$

```
[In] int(cos(d*x+c)^4*(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
```

```
[Out] 1/480*(180*a*x*d+300*b*sin(d*x+c)+6*b*sin(5*d*x+5*c)+15*sin(4*d*x+4*c)*a+50
*b*sin(3*d*x+3*c)+120*sin(2*d*x+2*c)*a)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.70

$$\int \cos^4(c+dx)(a+b\cos(c+dx))\,dx = \frac{45\,adx + \left(24\,b\cos\left(dx+c\right)^4 + 30\,a\cos\left(dx+c\right)^3 + 32\,b\cos\left(dx+c\right)^2 + 45\,a\cos\left(dx+c\right) + 64\,b\right)\sin\left(dx+c\right)}{120\,d}$$

```
[In] integrate(cos(d*x+c)^4*(a+b*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/120*(45*a*d*x + (24*b*cos(d*x + c)^4 + 30*a*cos(d*x + c)^3 + 32*b*cos(d*x
 + c)^2 + 45*a*cos(d*x + c) + 64*b)*sin(d*x + c))/d
```

Sympy [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.83

$$\int \cos^4(c+dx)(a+b\cos(c+dx))\,dx = \begin{cases} \frac{3ax\sin^4(c+dx)}{8} + \frac{3ax\sin^2(c+dx)\cos^2(c+dx)}{4} + \frac{3ax\cos^4(c+dx)}{8} + \frac{3a\sin^3(c+dx)\cos(c+dx)}{8d} + \frac{5a\sin(c+dx)\cos^3(c+dx)}{8d} + \frac{8b\sin^5(c}{15d} \\ x(a+b\cos(c))\cos^4(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)**4*(a+b*cos(d*x+c)),x)
```

```
[Out] Piecewise((3*a*x*sin(c + d*x)**4/8 + 3*a*x*sin(c + d*x)**2*cos(c + d*x)**2/
4 + 3*a*x*cos(c + d*x)**4/8 + 3*a*sin(c + d*x)**3*cos(c + d*x)/(8*d) + 5*a*
sin(c + d*x)*cos(c + d*x)**3/(8*d) + 8*b*sin(c + d*x)**5/(15*d) + 4*b*sin(c
 + d*x)**3*cos(c + d*x)**2/(3*d) + b*sin(c + d*x)*cos(c + d*x)**4/d, Ne(d,
0)), (x*(a + b*cos(c))*cos(c)**4, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 69, normalized size of antiderivative = 0.75

$$\int \cos^4(c+dx)(a+b\cos(c+dx))\,dx = \frac{15\left(12\,dx + 12\,c + \sin\left(4\,dx+4\,c\right) + 8\,\sin\left(2\,dx+2\,c\right)\right)a + 32\left(3\,\sin\left(dx+c\right)^5 - 10\,\sin\left(dx+c\right)^3 + 15\,\sin\left(a\right.\right.}{480\,d}$$

```
[In] integrate(cos(d*x+c)^4*(a+b*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/480*(15*(12*d*x + 12*c + sin(4*d*x + 4*c) + 8*sin(2*d*x + 2*c))*a + 32*(3
*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*sin(d*x + c))*b)/d
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.84

$$\int \cos^4(c+dx)(a+b\cos(c+dx))\,dx = \frac{3}{8}\,ax + \frac{b\sin\left(5\,dx+5\,c\right)}{80\,d} + \frac{a\sin\left(4\,dx+4\,c\right)}{32\,d} + \frac{5\,b\sin\left(3\,dx+3\,c\right)}{48\,d} + \frac{a\sin\left(2\,dx+2\,c\right)}{4\,d} + \frac{5\,b\sin\left(dx+c\right)}{8\,d}$$

```
[In] integrate(cos(d*x+c)^4*(a+b*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] 3/8*a*x + 1/80*b*sin(5*d*x + 5*c)/d + 1/32*a*sin(4*d*x + 4*c)/d + 5/48*b*si
n(3*d*x + 3*c)/d + 1/4*a*sin(2*d*x + 2*c)/d + 5/8*b*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 18.03 (sec) , antiderivative size = 115, normalized size of antiderivative = 1.25

$$\int \cos^4(c+dx)(a+b\cos(c+dx))\,dx = \frac{3\,a\,x}{8} + \frac{\left(2\,b-\frac{5\,a}{4}\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9+\left(\frac{8\,b}{3}-\frac{a}{2}\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7+\frac{116\,b\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{15}+\left(\frac{a}{2}+\frac{8\,b}{3}\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3+\left(\frac{5\,a}{4}+\right.}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)^5}$$

```
[In] int(cos(c + d*x)^4*(a + b*cos(c + d*x)),x)
```

```
[Out] (3*a*x)/8 + (tan(c/2 + (d*x)/2)*((5*a)/4 + 2*b) + tan(c/2 + (d*x)/2)^3*(a/2
 + (8*b)/3) - tan(c/2 + (d*x)/2)^9*((5*a)/4 - 2*b) - tan(c/2 + (d*x)/2)^7*(
a/2 - (8*b)/3) + (116*b*tan(c/2 + (d*x)/2)^5)/15)/(d*(tan(c/2 + (d*x)/2)^2
+ 1)^5)
```

3.407 $\int \cos^3(c+dx)(a+b\cos(c+dx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 76

$$\int \cos^3(c+dx)(a+b\cos(c+dx))\,dx=\frac{3bx}{8}+\frac{a\sin(c+dx)}{d}+\frac{3b\cos(c+dx)\sin(c+dx)}{8d}+\frac{b\cos^3(c+dx)\sin(c+dx)}{4d}-\frac{a\sin^3(c+dx)}{3d}$$

```
[Out] 3/8*b*x+a*sin(d*x+c)/d+3/8*b*cos(d*x+c)*sin(d*x+c)/d+1/4*b*cos(d*x+c)^3*sin
(d*x+c)/d-1/3*a*sin(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 76, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2827, 2713, 2715, 8}

$$\int \cos^3(c+dx)(a+b\cos(c+dx))\,dx=-\frac{a\sin^3(c+dx)}{3d}+\frac{a\sin(c+dx)}{d}+\frac{b\sin(c+dx)\cos^3(c+dx)}{4d}+\frac{3b\sin(c+dx)\cos(c+dx)}{8d}+\frac{3bx}{8}$$

```
[In] Int[Cos[c + d*x]^3*(a + b*Cos[c + d*x]),x]
```

```
[Out] (3*b*x)/8 + (a*Sin[c + d*x])/d + (3*b*Cos[c + d*x]*Sin[c + d*x])/(8*d) + (b
*Cos[c + d*x]^3*Sin[c + d*x])/(4*d) - (a*Sin[c + d*x]^3)/(3*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= a\int \cos^3(c+dx)\,dx + b\int \cos^4(c+dx)\,dx\\
&= \frac{b\cos^3(c+dx)\sin(c+dx)}{4d} + \frac{1}{4}(3b)\int \cos^2(c+dx)\,dx\\
&\quad - \frac{a\text{Subst}\left(\int \left(1-x^2\right)\,dx, x, -\sin(c+dx)\right)}{d}\\
&= \frac{a\sin(c+dx)}{d} + \frac{3b\cos(c+dx)\sin(c+dx)}{8d}\\
&\quad + \frac{b\cos^3(c+dx)\sin(c+dx)}{4d} - \frac{a\sin^3(c+dx)}{3d} + \frac{1}{8}(3b)\int 1\,dx\\
&= \frac{3bx}{8} + \frac{a\sin(c+dx)}{d} + \frac{3b\cos(c+dx)\sin(c+dx)}{8d}\\
&\quad + \frac{b\cos^3(c+dx)\sin(c+dx)}{4d} - \frac{a\sin^3(c+dx)}{3d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.96

$$\int \cos^3(c+dx)(a+b\cos(c+dx))\,dx = \frac{3b(c+dx)}{8d} + \frac{a\sin(c+dx)}{d} - \frac{a\sin^3(c+dx)}{3d} + \frac{b\sin(2(c+dx))}{4d} + \frac{b\sin(4(c+dx))}{32d}$$

```
[In] Integrate[Cos[c + d*x]^3*(a + b*Cos[c + d*x]),x]
```

```
[Out] (3*b*(c + d*x))/(8*d) + (a*Sin[c + d*x])/d - (a*Sin[c + d*x]^3)/(3*d) + (b*
Sin[2*(c + d*x)])/(4*d) + (b*Sin[4*(c + d*x)])/(32*d)
```

Maple [A] (verified)

Time = 2.68 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.75

method	result
parallelrisch	$\frac{36bxd+72a\sin(dx+c)+3\sin(4dx+4c)b+8a\sin(3dx+3c)+24\sin(2dx+2c)b}{96d}$
derivativedivides	$\frac{b\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{a\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}}{d}$
default	$\frac{b\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{a\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}}{d}$
parts	$\frac{a(2+\cos^2(dx+c))\sin(dx+c)}{3d}+\frac{b\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}$
risch	$\frac{3bx}{8}+\frac{3a\sin(dx+c)}{4d}+\frac{b\sin(4dx+4c)}{32d}+\frac{a\sin(3dx+3c)}{12d}+\frac{b\sin(2dx+2c)}{4d}$
norman	$\frac{\frac{3bx}{8}+\frac{3bx\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}+\frac{9bx\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4}+\frac{3bx\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}+\frac{3bx\left(\tan^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8}+\frac{(8a-5b)\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}+\frac{(8a+5b)\,\mathrm{ta}\cdots}{4\cdots}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^4}$

```
[In] int(cos(d*x+c)^3*(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
```

```
[Out] 1/96*(36*b*x*d+72*a*sin(d*x+c)+3*sin(4*d*x+4*c)*b+8*a*sin(3*d*x+3*c)+24*sin
(2*d*x+2*c)*b)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.70

$$\int \cos^3(c+dx)(a+b\cos(c+dx))\,dx = \frac{9\,bdx + \left(6\,b\cos\left(dx+c\right)^3 + 8\,a\cos\left(dx+c\right)^2 + 9\,b\cos\left(dx+c\right) + 16\,a\right)\sin\left(dx+c\right)}{24\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c)),x, algorithm="fricas")
[Out] 1/24*(9*b*d*x + (6*b*cos(d*x + c)^3 + 8*a*cos(d*x + c)^2 + 9*b*cos(d*x + c)
 + 16*a)*sin(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 144 vs. $2(70) = 140$.

Time = 0.18 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.89

$$\int \cos^3(c+dx)(a+b\cos(c+dx))\,dx = \begin{cases} \frac{2a\sin^3(c+dx)}{3d} + \frac{a\sin(c+dx)\cos^2(c+dx)}{d} + \frac{3bx\sin^4(c+dx)}{8} + \frac{3bx\sin^2(c+dx)\cos^2(c+dx)}{4} + \frac{3bx\cos^4(c+dx)}{8} + \frac{3b\sin^3(c+dx)\cos(c}{8d} \\ x(a+b\cos(c))\cos^3(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)**3*(a+b*cos(d*x+c)),x)
[Out] Piecewise((2*a*sin(c + d*x)**3/(3*d) + a*sin(c + d*x)*cos(c + d*x)**2/d + 3
*b*x*sin(c + d*x)**4/8 + 3*b*x*sin(c + d*x)**2*cos(c + d*x)**2/4 + 3*b*x*co
s(c + d*x)**4/8 + 3*b*sin(c + d*x)**3*cos(c + d*x)/(8*d) + 5*b*sin(c + d*x)
*cos(c + d*x)**3/(8*d), Ne(d, 0)), (x*(a + b*cos(c))*cos(c)**3, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.21 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.75

$$\int \cos^3(c+dx)(a+b\cos(c+dx))\,dx = -\frac{32\left(\sin\left(dx+c\right)^3 - 3\,\sin\left(dx+c\right)\right)a - 3\left(12\,dx + 12\,c + \sin\left(4\,dx+4\,c\right) + 8\,\sin\left(2\,dx+2\,c\right)\right)b}{96\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c)),x, algorithm="maxima")
[Out] -1/96*(32*(sin(d*x + c)^3 - 3*sin(d*x + c))*a - 3*(12*d*x + 12*c + sin(4*d*
x + 4*c) + 8*sin(2*d*x + 2*c))*b)/d
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 62, normalized size of antiderivative = 0.82

$$\int \cos^3(c+dx)(a+b\cos(c+dx))\,dx = \frac{3}{8}\,bx + \frac{b\sin\left(4\,dx+4\,c\right)}{32\,d} + \frac{a\sin\left(3\,dx+3\,c\right)}{12\,d} + \frac{b\sin\left(2\,dx+2\,c\right)}{4\,d} + \frac{3\,a\sin\left(dx+c\right)}{4\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] 3/8*b*x + 1/32*b*sin(4*d*x + 4*c)/d + 1/12*a*sin(3*d*x + 3*c)/d + 1/4*b*sin
(2*d*x + 2*c)/d + 3/4*a*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 14.19 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.99

$$\int \cos^3(c+dx)(a+b\cos(c+dx))\,dx = \frac{3\,b\,x}{8} + \frac{2\,a\,\sin\left(c+d\,x\right)}{3\,d} + \frac{3\,b\,\cos\left(c+d\,x\right)\,\sin\left(c+d\,x\right)}{8\,d} + \frac{a\cos\left(c+d\,x\right)^2\,\sin\left(c+d\,x\right)}{3\,d} + \frac{b\cos\left(c+d\,x\right)^3\,\sin\left(c+d\,x\right)}{4\,d}$$

```
[In] int(cos(c + d*x)^3*(a + b*cos(c + d*x)),x)
```

```
[Out] (3*b*x)/8 + (2*a*sin(c + d*x))/(3*d) + (3*b*cos(c + d*x)*sin(c + d*x))/(8*d
) + (a*cos(c + d*x)^2*sin(c + d*x))/(3*d) + (b*cos(c + d*x)^3*sin(c + d*x))
/(4*d)
```

3.408 $\int \cos^2(c+dx)(a+b\cos(c+dx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 54

$$\int \cos^2(c+dx)(a+b\cos(c+dx))\,dx=\frac{ax}{2}+\frac{b\sin(c+dx)}{d}+\frac{a\cos(c+dx)\sin(c+dx)}{2d}-\frac{b\sin^3(c+dx)}{3d}$$

```
[Out] 1/2*a*x+b*sin(d*x+c)/d+1/2*a*cos(d*x+c)*sin(d*x+c)/d-1/3*b*sin(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2827, 2715, 8, 2713}

$$\int \cos^2(c+dx)(a+b\cos(c+dx))\,dx=\frac{a\sin(c+dx)\cos(c+dx)}{2d}+\frac{ax}{2}-\frac{b\sin^3(c+dx)}{3d}+\frac{b\sin(c+dx)}{d}$$

```
[In] Int[Cos[c + d*x]^2*(a + b*Cos[c + d*x]),x]
```

```
[Out] (a*x)/2 + (b*Sin[c + d*x])/d + (a*Cos[c + d*x]*Sin[c + d*x])/(2*d) - (b*Sin
[c + d*x]^3)/(3*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= a\int \cos^2(c+dx)\,dx + b\int \cos^3(c+dx)\,dx\\ &= \frac{a\cos(c+dx)\sin(c+dx)}{2d} + \frac{1}{2}a\int 1\,dx - \frac{b\text{Subst}\left(\int \left(1-x^2\right)\,dx, x, -\sin(c+dx)\right)}{d}\\ &= \frac{ax}{2} + \frac{b\sin(c+dx)}{d} + \frac{a\cos(c+dx)\sin(c+dx)}{2d} - \frac{b\sin^3(c+dx)}{3d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.06

$$\int \cos^2(c+dx)(a+b\cos(c+dx))\,dx = \frac{a(c+dx)}{2d} + \frac{b\sin(c+dx)}{d} - \frac{b\sin^3(c+dx)}{3d} + \frac{a\sin(2(c+dx))}{4d}$$

```
[In] Integrate[Cos[c + d*x]^2*(a + b*Cos[c + d*x]),x]
[Out] (a*(c + d*x))/(2*d) + (b*Sin[c + d*x])/d - (b*Sin[c + d*x]^3)/(3*d) + (a*Si
n[2*(c + d*x)])/(4*d)
```

Maple [A] (verified)

Time = 1.81 (sec) , antiderivative size = 44, normalized size of antiderivative = 0.81

method	result
parallelrisch	$\frac{6axd+b\sin(3dx+3c)+3\sin(2dx+2c)a+9b\sin(dx+c)}{12d}$
risch	$\frac{ax}{2}+\frac{3b\sin(dx+c)}{4d}+\frac{b\sin(3dx+3c)}{12d}+\frac{a\sin(2dx+2c)}{4d}$
derivativedivides	$\frac{\frac{b\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+a\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}$
default	$\frac{\frac{b\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+a\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}$
parts	$\frac{a\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{b(2+\cos^2(dx+c))\sin(dx+c)}{3d}$
norman	$\frac{\frac{(a+2b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{ax}{2}+\frac{3ax\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}+\frac{3ax\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}+\frac{ax\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}+\frac{4b\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}-\frac{(a-2b)\left(\tan^5\left(\right.\right.}{d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3}$

```
[In] int(cos(d*x+c)^2*(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
[Out] 1/12*(6*a*x*d+b*sin(3*d*x+3*c)+3*sin(2*d*x+2*c)*a+9*b*sin(d*x+c))/d
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.78

$$\int \cos^2(c+dx)(a+b\cos(c+dx))\,dx = \frac{3\,adx+\left(2\,b\cos\left(dx+c\right)^2+3\,a\cos\left(dx+c\right)+4\,b\right)\sin\left(dx+c\right)}{6\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c)),x, algorithm="fricas")
[Out] 1/6*(3*a*d*x + (2*b*cos(d*x + c)^2 + 3*a*cos(d*x + c) + 4*b)*sin(d*x + c))/
d
```

Sympy [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 92, normalized size of antiderivative = 1.70

$$\int \cos^2(c+dx)(a+b\cos(c+dx))\,dx$$
$$=\begin{cases} \frac{ax\sin^2(c+dx)}{2}+\frac{ax\cos^2(c+dx)}{2}+\frac{a\sin(c+dx)\cos(c+dx)}{2d}+\frac{2b\sin^3(c+dx)}{3d}+\frac{b\sin(c+dx)\cos^2(c+dx)}{d} & \text{for } d\neq 0 \\ x(a+b\cos(c))\cos^2(c) & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)**2*(a+b*cos(d*x+c)),x)
```

```
[Out] Piecewise((a*x*sin(c + d*x)**2/2 + a*x*cos(c + d*x)**2/2 + a*sin(c + d*x)*c
os(c + d*x)/(2*d) + 2*b*sin(c + d*x)**3/(3*d) + b*sin(c + d*x)*cos(c + d*x)
**2/d, Ne(d, 0)), (x*(a + b*cos(c))*cos(c)**2, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 46, normalized size of antiderivative = 0.85

$$\int \cos^2(c+dx)(a+b\cos(c+dx))\,dx$$
$$=\frac{3\,(2\,dx+2\,c+\sin(2\,dx+2\,c))a-4\,\big(\sin(dx+c)^3-3\,\sin(dx+c)\big)b}{12\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/12*(3*(2*d*x + 2*c + sin(2*d*x + 2*c))*a - 4*(sin(d*x + c)^3 - 3*sin(d*x
+ c))*b)/d
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 47, normalized size of antiderivative = 0.87

$$\int \cos^2(c+dx)(a+b\cos(c+dx))\,dx=\frac{1}{2}\,ax+\frac{b\sin(3\,dx+3\,c)}{12\,d}+\frac{a\sin(2\,dx+2\,c)}{4\,d}+\frac{3\,b\sin(dx+c)}{4\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/2*a*x + 1/12*b*sin(3*d*x + 3*c)/d + 1/4*a*sin(2*d*x + 2*c)/d + 3/4*b*sin(
d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 14.05 (sec) , antiderivative size = 55, normalized size of antiderivative = 1.02

$$\int \cos^2(c+dx)(a+b\cos(c+dx))\,dx=\frac{a\,x}{2}+\frac{2\,b\,\sin\left(c+d\,x\right)}{3\,d}+\frac{a\,\cos\left(c+d\,x\right)\,\sin\left(c+d\,x\right)}{2\,d}+\frac{b\cos\left(c+d\,x\right)^2\,\sin\left(c+d\,x\right)}{3\,d}$$

```
[In] int(cos(c + d*x)^2*(a + b*cos(c + d*x)),x)
```

```
[Out] (a*x)/2 + (2*b*sin(c + d*x))/(3*d) + (a*cos(c + d*x)*sin(c + d*x))/(2*d) +
(b*cos(c + d*x)^2*sin(c + d*x))/(3*d)
```

3.409 $\int \cos(c+dx)(a+b\cos(c+dx))\,dx$

Optimal result

Integrand size = 17, antiderivative size = 38

$$\int \cos(c+dx)(a+b\cos(c+dx))\,dx=\frac{bx}{2}+\frac{a\sin(c+dx)}{d}+\frac{b\cos(c+dx)\sin(c+dx)}{2d}$$

```
[Out] 1/2*b*x+a*sin(d*x+c)/d+1/2*b*cos(d*x+c)*sin(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059, Rules used = {2813}

$$\int \cos(c+dx)(a+b\cos(c+dx))\,dx=\frac{a\sin(c+dx)}{d}+\frac{b\sin(c+dx)\cos(c+dx)}{2d}+\frac{bx}{2}$$

```
[In] Int[Cos[c + d*x]*(a + b*Cos[c + d*x]),x]
```

```
[Out] (b*x)/2 + (a*Sin[c + d*x])/d + (b*Cos[c + d*x]*Sin[c + d*x])/(2*d)
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rubi steps

$$\text{integral}=\frac{bx}{2}+\frac{a\sin(c+dx)}{d}+\frac{b\cos(c+dx)\sin(c+dx)}{2d}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 35, normalized size of antiderivative = 0.92

$$\int \cos(c+dx)(a+b\cos(c+dx))\,dx=\frac{4a\sin(c+dx)+b(2(c+dx)+\sin(2(c+dx)))}{4d}$$

```
[In] Integrate[Cos[c + d*x]*(a + b*Cos[c + d*x]),x]
[Out] (4*a*Sin[c + d*x] + b*(2*(c + d*x) + Sin[2*(c + d*x)]))/(4*d)
```

Maple [A] (verified)

Time = 0.80 (sec) , antiderivative size = 32, normalized size of antiderivative = 0.84

method	result	size
risch	$\frac{bx}{2}+\frac{a\sin(dx+c)}{d}+\frac{b\sin(2dx+2c)}{4d}$	32
parallelrisch	$\frac{2bxd+\sin(2dx+2c)b+4a\sin(dx+c)}{4d}$	32
derivativedivides	$\frac{b\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+a\sin(dx+c)}{d}$	38
default	$\frac{b\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+a\sin(dx+c)}{d}$	38
parts	$\frac{b\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{a\sin(dx+c)}{d}$	40
norman	$\frac{bx\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\frac{(2a-b)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{(2a+b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{bx}{2}+\frac{bx\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}$	91

```
[In] int(cos(d*x+c)*(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
[Out] 1/2*b*x+a*sin(d*x+c)/d+1/4*b/d*sin(2*d*x+2*c)
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 29, normalized size of antiderivative = 0.76

$$\int \cos(c+dx)(a+b\cos(c+dx))\,dx=\frac{bdx+(b\cos(dx+c)+2\,a)\sin(dx+c)}{2\,d}$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c)),x, algorithm="fricas")
[Out] 1/2*(b*d*x + (b*cos(d*x + c) + 2*a)*sin(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 66 vs. $2(32) = 64$.

Time = 0.09 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.74

$$\int \cos(c+dx)(a+b\cos(c+dx))\,dx = \begin{cases} \frac{a\sin(c+dx)}{d} + \frac{bx\sin^2(c+dx)}{2} + \frac{bx\cos^2(c+dx)}{2} + \frac{b\sin(c+dx)\cos(c+dx)}{2d} & \text{for } d \neq 0 \\ x(a+b\cos(c))\cos(c) & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c)),x)
[Out] Piecewise((a*sin(c + d*x)/d + b*x*sin(c + d*x)**2/2 + b*x*cos(c + d*x)**2/2
 + b*sin(c + d*x)*cos(c + d*x)/(2*d), Ne(d, 0)), (x*(a + b*cos(c))*cos(c),
True))
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 34, normalized size of antiderivative = 0.89

$$\int \cos(c+dx)(a+b\cos(c+dx))\,dx = \frac{(2\,dx+2\,c+\sin(2\,dx+2\,c))b+4\,a\sin(dx+c)}{4\,d}$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c)),x, algorithm="maxima")
[Out] 1/4*((2*d*x + 2*c + sin(2*d*x + 2*c))*b + 4*a*sin(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.82

$$\int \cos(c+dx)(a+b\cos(c+dx))\,dx = \frac{1}{2}bx + \frac{b\sin(2\,dx+2\,c)}{4\,d} + \frac{a\sin(dx+c)}{d}$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c)),x, algorithm="giac")
[Out] 1/2*b*x + 1/4*b*sin(2*d*x + 2*c)/d + a*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 14.37 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.82

$$\int \cos(c + dx)(a + b\cos(c + dx))\,dx = \frac{b\,x}{2} + \frac{b\,\sin\left(2\,c + 2\,d\,x\right)}{4\,d} + \frac{a\,\sin\left(c + d\,x\right)}{d}$$

```
[In] int(cos(c + d*x)*(a + b*cos(c + d*x)),x)
[Out] (b*x)/2 + (b*sin(2*c + 2*d*x))/(4*d) + (a*sin(c + d*x))/d
```

3.410 $\int (a+b\cos(c+dx))\,dx$

Optimal result

Integrand size = 10, antiderivative size = 15

$$\int (a+b\cos(c+dx))\,dx=ax+\frac{b\sin(c+dx)}{d}$$

```
[Out] a*x+b*sin(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.01 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2717}

$$\int (a+b\cos(c+dx))\,dx=ax+\frac{b\sin(c+dx)}{d}$$

```
[In] Int[a + b*Cos[c + d*x],x]
```

```
[Out] a*x + (b*Sin[c + d*x])/d
```

Rule 2717

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\text{integral}&=ax+b\int \cos(c+dx)\,dx\\&=ax+\frac{b\sin(c+dx)}{d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.73

$$\int (a+b\cos(c+dx))\,dx = ax+\frac{b\cos(dx)\sin(c)}{d}+\frac{b\cos(c)\sin(dx)}{d}$$

```
[In] Integrate[a + b*Cos[c + d*x],x]
[Out] a*x + (b*Cos[d*x]*Sin[c])/d + (b*Cos[c]*Sin[d*x])/d
```

Maple [A] (verified)

Time = 0.58 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.07

method	result	size
default	$ax+\frac{b\sin(dx+c)}{d}$	16
risch	$ax+\frac{b\sin(dx+c)}{d}$	16
parallelrisch	$ax+\frac{b\sin(dx+c)}{d}$	16
parts	$ax+\frac{b\sin(dx+c)}{d}$	16
derivativedivides	$\frac{a(dx+c)+b\sin(dx+c)}{d}$	21
norman	$\frac{ax+ax\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\frac{2b\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}$	50

```
[In] int(a+cos(d*x+c)*b,x,method=_RETURNVERBOSE)
[Out] a*x+b*sin(d*x+c)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 17, normalized size of antiderivative = 1.13

$$\int (a+b\cos(c+dx))\,dx = \frac{adx+b\sin(dx+c)}{d}$$

```
[In] integrate(a+b*cos(d*x+c),x, algorithm="fricas")
[Out] (a*d*x + b*sin(d*x + c))/d
```

Sympy [A] (verification not implemented)

Time = 0.05 (sec) , antiderivative size = 17, normalized size of antiderivative = 1.13

$$\int (a + b\cos(c + dx))\,dx = ax + b\left(\begin{cases} \frac{\sin(c+dx)}{d} & \text{for } d \neq 0 \\ x\cos(c) & \text{otherwise} \end{cases}\right)$$

```
[In] integrate(a+b*cos(d*x+c),x)
[Out] a*x + b*Piecewise((sin(c + d*x)/d, Ne(d, 0)), (x*cos(c), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.18 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.00

$$\int (a + b\cos(c + dx))\,dx = ax + \frac{b\sin(dx + c)}{d}$$

```
[In] integrate(a+b*cos(d*x+c),x, algorithm="maxima")
[Out] a*x + b*sin(d*x + c)/d
```

Giac [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.00

$$\int (a + b\cos(c + dx))\,dx = ax + \frac{b\sin(dx + c)}{d}$$

```
[In] integrate(a+b*cos(d*x+c),x, algorithm="giac")
[Out] a*x + b*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 13.69 (sec) , antiderivative size = 17, normalized size of antiderivative = 1.13

$$\int (a + b\cos(c + dx))\,dx = \frac{b\,\sin(c + d\,x) + a\,d\,x}{d}$$

```
[In] int(a + b*cos(c + d*x),x)
[Out] (b*sin(c + d*x) + a*d*x)/d
```

3.411 $\int (a+b\cos(c+dx))\sec(c+dx)\,dx$

Optimal result

Integrand size = 17, antiderivative size = 16

$$\int (a+b\cos(c+dx))\sec(c+dx)\,dx = bx + \frac{a\text{arctanh}(\sin(c+dx))}{d}$$

```
[Out] b*x+a*arctanh(sin(d*x+c))/d
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2814, 3855}

$$\int (a+b\cos(c+dx))\sec(c+dx)\,dx = \frac{a\text{arctanh}(\sin(c+dx))}{d} + bx$$

```
[In] Int[(a + b*Cos[c + d*x])*Sec[c + d*x],x]
```

```
[Out] b*x + (a*ArcTanh[Sin[c + d*x]])/d
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = bx + a\int \sec(c+dx)\,dx$$
$$= bx + \frac{a\text{arctanh}(\sin(c+dx))}{d}$$

Mathematica [A] (verified)

Time = 0.00 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00

$$\int (a+b\cos(c+dx))\sec(c+dx)\,dx = bx + \frac{a\text{arctanh}(\sin(c+dx))}{d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])*Sec[c + d*x],x]
[Out] b*x + (a*ArcTanh[Sin[c + d*x]])/d
```

Maple [A] (verified)

Time = 1.32 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.81

method	result	size
derivativedivides	$\frac{a\ln(\sec(dx+c)+\tan(dx+c))+b(dx+c)}{d}$	29
default	$\frac{a\ln(\sec(dx+c)+\tan(dx+c))+b(dx+c)}{d}$	29
parts	$\frac{a\ln(\sec(dx+c)+\tan(dx+c))}{d}+\frac{b(dx+c)}{d}$	31
parallelrisch	$\frac{bxd-a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{d}$	39
risch	$bx+\frac{a\ln\left(e^{i(dx+c)}+i\right)}{d}-\frac{a\ln\left(e^{i(dx+c)}-i\right)}{d}$	42
norman	$\frac{bx+bx\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}+\frac{a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{d}-\frac{a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{d}$	71

```
[In] int((a+cos(d*x+c)*b)*sec(d*x+c),x,method=_RETURNVERBOSE)
[Out] 1/d*(a*ln(sec(d*x+c)+tan(d*x+c))+b*(d*x+c))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 36 vs. $2(16) = 32$.

Time = 0.27 (sec) , antiderivative size = 36, normalized size of antiderivative = 2.25

$$\int (a+b\cos(c+dx))\sec(c+dx)\,dx = \frac{2\,bdx + a\log\left(\sin\left(dx+c\right)+1\right) - a\log\left(-\sin\left(dx+c\right)+1\right)}{2\,d}$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c),x, algorithm="fricas")
[Out] 1/2*(2*b*d*x + a*log(sin(d*x + c) + 1) - a*log(-sin(d*x + c) + 1))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 46 vs. $2(14) = 28$.

Time = 2.52 (sec) , antiderivative size = 49, normalized size of antiderivative = 3.06

$$\int (a+b\cos(c+dx))\sec(c+dx)\,dx = a\left(\begin{cases} \frac{x\tan\left(c\right)\sec\left(c\right)}{\tan\left(c\right)+\sec\left(c\right)} + \frac{x\sec^{2}\left(c\right)}{\tan\left(c\right)+\sec\left(c\right)} & \text{for}\: d = 0 \\ \frac{\log\left(\tan\left(c+dx\right)+\sec\left(c+dx\right)\right)}{d} & \text{otherwise} \end{cases}\right) + bx$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c),x)
[Out] a*Piecewise((x*tan(c)*sec(c)/(tan(c) + sec(c)) + x*sec(c)**2/(tan(c) + sec(
c)), Eq(d, 0)), (log(tan(c + d*x) + sec(c + d*x))/d, True)) + b*x
```

Maxima [A] (verification not implemented)

none

Time = 0.19 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.75

$$\int (a+b\cos(c+dx))\sec(c+dx)\,dx = \frac{(dx+c)b + a\log\left(\sec\left(dx+c\right)+\tan\left(dx+c\right)\right)}{d}$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c),x, algorithm="maxima")
[Out] ((d*x + c)*b + a*log(sec(d*x + c) + tan(d*x + c)))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 43 vs. $2(16) = 32$.

Time = 0.29 (sec) , antiderivative size = 43, normalized size of antiderivative = 2.69

$$\int (a+b\cos(c+dx))\sec(c+dx)\,dx = \frac{(dx+c)b + a\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right) - a\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)}{d}$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c),x, algorithm="giac")
```

```
[Out] ((d*x + c)*b + a*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - a*log(abs(tan(1/2*d*x
 + 1/2*c) - 1)))/d
```

Mupad [B] (verification not implemented)

Time = 13.89 (sec) , antiderivative size = 57, normalized size of antiderivative = 3.56

$$\int (a+b\cos(c+dx))\sec(c+dx)\,dx = \frac{2\,a\,\mathrm{atanh}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d} + \frac{2\,b\,\mathrm{atan}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d}$$

```
[In] int((a + b*cos(c + d*x))/cos(c + d*x),x)
```

```
[Out] (2*a*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/d + (2*b*atan(sin(c/2 +
(d*x)/2)/cos(c/2 + (d*x)/2)))/d
```

3.412 $\int (a+b\cos(c+dx))\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 19, antiderivative size = 24

$$\int (a+b\cos(c+dx))\sec^2(c+dx)\,dx=\frac{b\text{arctanh}(\sin(c+dx))}{d}+\frac{a\tan(c+dx)}{d}$$

```
[Out] b*arctanh(sin(d*x+c))/d+a*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2827, 3852, 8, 3855}

$$\int (a+b\cos(c+dx))\sec^2(c+dx)\,dx=\frac{a\tan(c+dx)}{d}+\frac{b\text{arctanh}(\sin(c+dx))}{d}$$

```
[In] Int[(a + b*Cos[c + d*x])*Sec[c + d*x]^2,x]
[Out] (b*ArcTanh[Sin[c + d*x]])/d + (a*Tan[c + d*x])/d
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= a\int \sec^2(c+dx)\,dx + b\int \sec(c+dx)\,dx \\
&= \frac{b\text{arctanh}(\sin(c+dx))}{d} - \frac{a\text{Subst}\left(\int 1\,dx, x, -\tan(c+dx)\right)}{d} \\
&= \frac{b\text{arctanh}(\sin(c+dx))}{d} + \frac{a\tan(c+dx)}{d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int (a+b\cos(c+dx))\sec^2(c+dx)\,dx = \frac{b\text{arctanh}(\sin(c+dx))}{d} + \frac{a\tan(c+dx)}{d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])*Sec[c + d*x]^2,x]
[Out] (b*ArcTanh[Sin[c + d*x]])/d + (a*Tan[c + d*x])/d
```

Maple [A] (verified)

Time = 2.21 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.25

method	result	size
derivativedivides	$\frac{\tan(dx+c)a+b\ln(\sec(dx+c)+\tan(dx+c))}{d}$	30
default	$\frac{\tan(dx+c)a+b\ln(\sec(dx+c)+\tan(dx+c))}{d}$	30
parts	$\frac{a\tan(dx+c)}{d}+\frac{b\ln(\sec(dx+c)+\tan(dx+c))}{d}$	32
risch	$\frac{2ia}{d(\mathrm{e}^{2i(dx+c)}+1)}+\frac{\ln(\mathrm{e}^{i(dx+c)}+i)b}{d}-\frac{\ln(\mathrm{e}^{i(dx+c)}-i)b}{d}$	59
parallelrisch	$\frac{-b\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(dx+c)+b\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)\cos(dx+c)+a\sin(dx+c)}{d\cos(dx+c)}$	63
norman	$\frac{-\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}-\frac{2a\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{b\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{d}-\frac{b\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{d}$	101

```
[In] int((a+cos(d*x+c)*b)*sec(d*x+c)^2,x,method=_RETURNVERBOSE)
[Out] 1/d*(tan(d*x+c)*a+b*ln(sec(d*x+c)+tan(d*x+c)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 60 vs. $2(24) = 48$.

Time = 0.28 (sec) , antiderivative size = 60, normalized size of antiderivative = 2.50

$$\int (a+b\cos(c+dx))\sec^2(c+dx)\,dx = \frac{b\cos(dx+c)\log(\sin(dx+c)+1)-b\cos(dx+c)\log(-\sin(dx+c)+1)+2\,a\sin(dx+c)}{2\,d\cos(dx+c)}$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="fricas")
[Out] 1/2*(b*cos(d*x + c)*log(sin(d*x + c) + 1) - b*cos(d*x + c)*log(-sin(d*x + c
) + 1) + 2*a*sin(d*x + c))/(d*cos(d*x + c))
```

Sympy [F]

$$\int (a+b\cos(c+dx))\sec^2(c+dx)\,dx = \int (a+b\cos(c+dx))\sec^2(c+dx)\,dx$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)**2,x)
[Out] Integral((a + b*cos(c + d*x))*sec(c + d*x)**2, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.21 (sec) , antiderivative size = 38, normalized size of antiderivative = 1.58

$$\int (a+b\cos(c+dx))\sec^2(c+dx)\,dx = \frac{b(\log(\sin(dx+c)+1)-\log(\sin(dx+c)-1))+2\,a\tan(dx+c)}{2\,d}$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] 1/2*(b*(log(sin(d*x + c) + 1) - log(sin(d*x + c) - 1)) + 2*a*tan(d*x + c))/
d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 63 vs. 2(24) = 48.

Time = 0.30 (sec) , antiderivative size = 63, normalized size of antiderivative = 2.62

$$\int (a+b\cos(c+dx))\sec^2(c+dx)\,dx = \frac{b\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-b\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)-\frac{2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1}}{d}$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="giac")
```

```
[Out] (b*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - b*log(abs(tan(1/2*d*x + 1/2*c) - 1)
) - 2*a*tan(1/2*d*x + 1/2*c)/(tan(1/2*d*x + 1/2*c)^2 - 1))/d
```

Mupad [B] (verification not implemented)

Time = 13.81 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.96

$$\int (a+b\cos(c+dx))\sec^2(c+dx)\,dx = \frac{2\,b\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}-\frac{2\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{d\,\left({\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^2-1\right)}$$

```
[In] int((a + b*cos(c + d*x))/cos(c + d*x)^2,x)
```

```
[Out] (2*b*atanh(tan(c/2 + (d*x)/2)))/d - (2*a*tan(c/2 + (d*x)/2))/(d*(tan(c/2 +
(d*x)/2)^2 - 1))
```

3.413 $\int (a+b\cos(c+dx))\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 19, antiderivative size = 47

$$\int (a+b\cos(c+dx))\sec^3(c+dx)\,dx=\frac{a\text{arctanh}(\sin(c+dx))}{2d}+\frac{b\tan(c+dx)}{d}+\frac{a\sec(c+dx)\tan(c+dx)}{2d}$$

```
[Out] 1/2*a*arctanh(sin(d*x+c))/d+b*tan(d*x+c)/d+1/2*a*sec(d*x+c)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {2827, 3853, 3855, 3852, 8}

$$\int (a+b\cos(c+dx))\sec^3(c+dx)\,dx=\frac{a\text{arctanh}(\sin(c+dx))}{2d}+\frac{a\tan(c+dx)\sec(c+dx)}{2d}+\frac{b\tan(c+dx)}{d}$$

```
[In] Int[(a + b*Cos[c + d*x])*Sec[c + d*x]^3,x]
```

```
[Out] (a*ArcTanh[Sin[c + d*x]])/(2*d) + (b*Tan[c + d*x])/d + (a*Sec[c + d*x]*Tan[
c + d*x])/(2*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= a\int \sec^3(c+dx)\,dx + b\int \sec^2(c+dx)\,dx\\ &= \frac{a\sec(c+dx)\tan(c+dx)}{2d} + \frac{1}{2}a\int \sec(c+dx)\,dx - \frac{b\text{Subst}(\int 1\,dx, x, -\tan(c+dx))}{d}\\ &= \frac{a\text{arctanh}(\sin(c+dx))}{2d} + \frac{b\tan(c+dx)}{d} + \frac{a\sec(c+dx)\tan(c+dx)}{2d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00

$$\int (a+b\cos(c+dx))\sec^3(c+dx)\,dx = \frac{a\text{arctanh}(\sin(c+dx))}{2d} + \frac{b\tan(c+dx)}{d} + \frac{a\sec(c+dx)\tan(c+dx)}{2d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])*Sec[c + d*x]^3,x]
[Out] (a*ArcTanh[Sin[c + d*x]])/(2*d) + (b*Tan[c + d*x])/d + (a*Sec[c + d*x]*Tan[
c + d*x])/(2*d)
```

Maple [A] (verified)

Time = 2.99 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00

method	result
derivativedivides	$\frac{a\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)+\tan(dx+c)b}{d}$
default	$\frac{a\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)+\tan(dx+c)b}{d}$
parts	$\frac{a\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}+\frac{b\tan(dx+c)}{d}$
parallelrisch	$\frac{-a(1+\cos(2dx+2c))\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+a(1+\cos(2dx+2c))\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)+2a\sin(dx+c)+2\sin(2dx+2c)b}{2d(1+\cos(2dx+2c))}$
risch	$-\frac{i\left(a\,\mathrm{e}^{3i(dx+c)}-2b\,\mathrm{e}^{2i(dx+c)}-a\,\mathrm{e}^{i(dx+c)}-2b\right)}{d\left(\mathrm{e}^{2i(dx+c)}+1\right)^{2}}+\frac{a\ln\left(\mathrm{e}^{i(dx+c)}+i\right)}{2d}-\frac{a\ln\left(\mathrm{e}^{i(dx+c)}-i\right)}{2d}$
norman	$\frac{\frac{(a-2b)\left(\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{(a+2b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{2a\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}}{\left(1+\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\left(\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^{2}}-\frac{a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2d}+\frac{a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{2d}$

```
[In] int((a+cos(d*x+c)*b)*sec(d*x+c)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a*(1/2*sec(d*x+c)*tan(d*x+c)+1/2*ln(sec(d*x+c)+tan(d*x+c)))+tan(d*x+c)
*b)
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 74, normalized size of antiderivative = 1.57

$$\int (a+b\cos(c+dx))\sec^3(c+dx)\,dx = \frac{a\cos(dx+c)^2\log(\sin(dx+c)+1)-a\cos(dx+c)^2\log(-\sin(dx+c)+1)+2\,(2\,b\cos(dx+c)+a)\sin}{4\,d\cos(dx+c)^2}$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] 1/4*(a*cos(d*x + c)^2*log(sin(d*x + c) + 1) - a*cos(d*x + c)^2*log(-sin(d*x
 + c) + 1) + 2*(2*b*cos(d*x + c) + a)*sin(d*x + c))/(d*cos(d*x + c)^2)
```

Sympy [F]

$$\int (a+b\cos(c+dx))\sec^3(c+dx)\,dx = \int (a+b\cos{(c+dx)})\sec^3{(c+dx)}\,dx$$

[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)**3,x)

[Out] Integral((a + b*cos(c + d*x))*sec(c + d*x)**3, x)

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 58, normalized size of antiderivative = 1.23

$$\int (a+b\cos(c+dx))\sec^3(c+dx)\,dx = -\frac{a\left(\frac{2\sin(dx+c)}{\sin(dx+c)^2-1} - \log{(\sin{(dx+c)}+1)} + \log{(\sin{(dx+c)}-1)}\right) - 4\,b\tan{(dx+c)}}{4\,d}$$

[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="maxima")

[Out] -1/4*(a*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)) - 4*b*tan(d*x + c))/d

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 105 vs. 2(43) = 86.

Time = 0.29 (sec) , antiderivative size = 105, normalized size of antiderivative = 2.23

$$\int (a+b\cos(c+dx))\sec^3(c+dx)\,dx = \frac{a\log{\left(\left|\tan{\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}+1\right|\right)} - a\log{\left(\left|\tan{\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}-1\right|\right)} + \frac{2\left(a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3 - 2\,b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3 + a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\right.}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)^2}}{2\,d}$$

[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="giac")

[Out] 1/2*(a*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - a*log(abs(tan(1/2*d*x + 1/2*c) - 1)) + 2*(a*tan(1/2*d*x + 1/2*c)^3 - 2*b*tan(1/2*d*x + 1/2*c)^3 + a*tan(1/2*d*x + 1/2*c) + 2*b*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2 - 1)^2)/d

Mupad [B] (verification not implemented)

Time = 14.66 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.72

$$\int (a+b\cos(c+dx))\sec^3(c+dx)\,dx = \frac{a\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d} + \frac{(a-2\,b)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3+(a+2\,b)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)}$$

```
[In] int((a + b*cos(c + d*x))/cos(c + d*x)^3,x)
```

```
[Out] (a*atanh(tan(c/2 + (d*x)/2)))/d + (tan(c/2 + (d*x)/2)^3*(a - 2*b) + tan(c/2
 + (d*x)/2)*(a + 2*b))/(d*(tan(c/2 + (d*x)/2)^4 - 2*tan(c/2 + (d*x)/2)^2 +
1))
```

3.414 $\int (a+b\cos(c+dx))\sec^4(c+dx)\,dx$

Optimal result

Integrand size = 19, antiderivative size = 63

$$\int (a+b\cos(c+dx))\sec^4(c+dx)\,dx=\frac{b\,\text{arctanh}(\sin(c+dx))}{2d}+\frac{a\tan(c+dx)}{d}+\frac{b\sec(c+dx)\tan(c+dx)}{2d}+\frac{a\tan^3(c+dx)}{3d}$$

```
[Out] 1/2*b*arctanh(sin(d*x+c))/d+a*tan(d*x+c)/d+1/2*b*sec(d*x+c)*tan(d*x+c)/d+1/
3*a*tan(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2827, 3852, 3853, 3855}

$$\int (a+b\cos(c+dx))\sec^4(c+dx)\,dx=\frac{a\tan^3(c+dx)}{3d}+\frac{a\tan(c+dx)}{d}+\frac{b\,\text{arctanh}(\sin(c+dx))}{2d}+\frac{b\tan(c+dx)\sec(c+dx)}{2d}$$

```
[In] Int[(a + b*Cos[c + d*x])*Sec[c + d*x]^4,x]
```

```
[Out] (b*ArcTanh[Sin[c + d*x]])/(2*d) + (a*Tan[c + d*x])/d + (b*Sec[c + d*x]*Tan[
c + d*x])/(2*d) + (a*Tan[c + d*x]^3)/(3*d)
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
```

```
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= a\int \sec^4(c+dx)\,dx + b\int \sec^3(c+dx)\,dx\\ &= \frac{b\sec(c+dx)\tan(c+dx)}{2d}+\frac{1}{2}b\int \sec(c+dx)\,dx-\frac{a\text{Subst}\left(\int \left(1+x^2\right)\,dx,x,-\tan(c+dx)\right)}{d}\\ &= \frac{b\text{arctanh}(\sin(c+dx))}{2d}+\frac{a\tan(c+dx)}{d}+\frac{b\sec(c+dx)\tan(c+dx)}{2d}+\frac{a\tan^3(c+dx)}{3d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.95

$$\int (a+b\cos(c+dx))\sec^4(c+dx)\,dx = \frac{b\text{arctanh}(\sin(c+dx))}{2d}+\frac{b\sec(c+dx)\tan(c+dx)}{2d}+\frac{a\left(\tan(c+dx)+\frac{1}{3}\tan^3(c+dx)\right)}{d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])*Sec[c + d*x]^4,x]
```

```
[Out] (b*ArcTanh[Sin[c + d*x]])/(2*d) + (b*Sec[c + d*x]*Tan[c + d*x])/(2*d) + (a*
(Tan[c + d*x] + Tan[c + d*x]^3/3))/d
```

Maple [A] (verified)

Time = 3.06 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.95

method	result
derivativedivides	$\frac{-a\left(-\frac{2}{3}-\frac{\left(\sec^{2}(dx+c)\right)}{3}\right)\tan(dx+c)+b\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}$
default	$\frac{-a\left(-\frac{2}{3}-\frac{\left(\sec^{2}(dx+c)\right)}{3}\right)\tan(dx+c)+b\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}$
parts	$-\frac{a\left(-\frac{2}{3}-\frac{\left(\sec^{2}(dx+c)\right)}{3}\right)\tan(dx+c)}{d}+\frac{b\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}$
risch	$-\frac{i\left(3b\,e^{5i(dx+c)}-12a\,e^{2i(dx+c)}-3b\,e^{i(dx+c)}-4a\right)}{3d\left(e^{2i(dx+c)}+1\right)^{3}}+\frac{\ln\left(e^{i(dx+c)}+i\right)b}{2d}-\frac{\ln\left(e^{i(dx+c)}-i\right)b}{2d}$
parallelrisch	$\frac{-9b\left(\frac{\cos(3dx+3c)}{3}+\cos(dx+c)\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+9b\left(\frac{\cos(3dx+3c)}{3}+\cos(dx+c)\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)+6\sin(2dx+2c)b+}{6d(\cos(3dx+3c)+3\cos(dx+c))}$
norman	$\frac{-\frac{(2a-3b)\left(\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}-\frac{(2a-b)\left(\tan^{7}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-\frac{(2a+b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}-\frac{(2a+3b)\left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}}{\left(1+\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\left(\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^{3}}-\frac{b\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2d}$

```
[In] int((a+cos(d*x+c)*b)*sec(d*x+c)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-a*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c)+b*(1/2*sec(d*x+c)*tan(d*x+c)+1/2
*ln(sec(d*x+c)+tan(d*x+c))))
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.40

$$\int(a+b\cos(c+dx))\sec^{4}(c+dx)\,dx$$
$$=\frac{3\,b\cos(dx+c)^{3}\log(\sin(dx+c)+1)-3\,b\cos(dx+c)^{3}\log(-\sin(dx+c)+1)+2\left(4\,a\cos(dx+c)^{2}+3\,b\right.}{12\,d\cos(dx+c)^{3}}$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] 1/12*(3*b*cos(d*x + c)^3*log(sin(d*x + c) + 1) - 3*b*cos(d*x + c)^3*log(-si
n(d*x + c) + 1) + 2*(4*a*cos(d*x + c)^2 + 3*b*cos(d*x + c) + 2*a)*sin(d*x +
 c))/(d*cos(d*x + c)^3)
```

Sympy [F]

$$\int (a+b\cos(c+dx))\sec^4(c+dx)\,dx=\int (a+b\cos(c+dx))\sec^4(c+dx)\,dx$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)**4,x)
[Out] Integral((a + b*cos(c + d*x))*sec(c + d*x)**4, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.11

$$\int (a+b\cos(c+dx))\sec^4(c+dx)\,dx = \frac{4\left(\tan(dx+c)^3+3\tan(dx+c)\right)a-3\,b\left(\frac{2\sin(dx+c)}{\sin(dx+c)^2-1}-\log(\sin(dx+c)+1)+\log(\sin(dx+c)-1)\right)}{12\,d}$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)^4,x, algorithm="maxima")
[Out] 1/12*(4*(tan(d*x + c)^3 + 3*tan(d*x + c))*a - 3*b*(2*sin(d*x + c)/(sin(d*x
+ c)^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 122 vs. 2(57) = 114.

Time = 0.30 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.94

$$\int (a+b\cos(c+dx))\sec^4(c+dx)\,dx = \frac{3\,b\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-3\,b\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)-\frac{2\left(6\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-3\,b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-4\,a\tan(\cdots}{\left(\tan\left(\frac{1}{2}\,dx\cdots\right.}}{6\,d}$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)^4,x, algorithm="giac")
[Out] 1/6*(3*b*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 3*b*log(abs(tan(1/2*d*x + 1/2
*c) - 1)) - 2*(6*a*tan(1/2*d*x + 1/2*c)^5 - 3*b*tan(1/2*d*x + 1/2*c)^5 - 4*
a*tan(1/2*d*x + 1/2*c)^3 + 6*a*tan(1/2*d*x + 1/2*c) + 3*b*tan(1/2*d*x + 1/2
*c))/(tan(1/2*d*x + 1/2*c)^2 - 1)^3)/d
```

Mupad [B] (verification not implemented)

Time = 16.44 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.76

$$\int (a+b\cos(c+dx))\sec^4(c+dx)\,dx$$
$$=\frac{b\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}-\frac{(2\,a-b)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5-\frac{4\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{3}+(2\,a+b)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6-3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-1\right)}$$

```
[In] int((a + b*cos(c + d*x))/cos(c + d*x)^4,x)
```

```
[Out] (b*atanh(tan(c/2 + (d*x)/2)))/d - (tan(c/2 + (d*x)/2)^5*(2*a - b) + tan(c/2
 + (d*x)/2)*(2*a + b) - (4*a*tan(c/2 + (d*x)/2)^3)/3)/(d*(3*tan(c/2 + (d*x)
/2)^2 - 3*tan(c/2 + (d*x)/2)^4 + tan(c/2 + (d*x)/2)^6 - 1))
```

3.415 $\int (a+b\cos(c+dx))\sec^5(c+dx)\,dx$

Optimal result

Integrand size = 19, antiderivative size = 85

$$\int (a+b\cos(c+dx))\sec^5(c+dx)\,dx = \frac{3a\text{arctanh}(\sin(c+dx))}{8d}+\frac{b\tan(c+dx)}{d}+\frac{3a\sec(c+dx)\tan(c+dx)}{8d}+\frac{a\sec^3(c+dx)\tan(c+dx)}{4d}+\frac{b\tan^3(c+dx)}{3d}$$

```
[Out] 3/8*a*arctanh(sin(d*x+c))/d+b*tan(d*x+c)/d+3/8*a*sec(d*x+c)*tan(d*x+c)/d+1/
4*a*sec(d*x+c)^3*tan(d*x+c)/d+1/3*b*tan(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2827, 3853, 3855, 3852}

$$\int (a+b\cos(c+dx))\sec^5(c+dx)\,dx = \frac{3a\text{arctanh}(\sin(c+dx))}{8d}+\frac{a\tan(c+dx)\sec^3(c+dx)}{4d}+\frac{3a\tan(c+dx)\sec(c+dx)}{8d}+\frac{b\tan^3(c+dx)}{3d}+\frac{b\tan(c+dx)}{d}$$

```
[In] Int[(a + b*Cos[c + d*x])*Sec[c + d*x]^5,x]
```

```
[Out] (3*a*ArcTanh[Sin[c + d*x]])/(8*d) + (b*Tan[c + d*x])/d + (3*a*Sec[c + d*x]*
Tan[c + d*x])/(8*d) + (a*Sec[c + d*x]^3*Tan[c + d*x])/(4*d) + (b*Tan[c + d*
x]^3)/(3*d)
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= a\int \sec^5(c+dx)\,dx + b\int \sec^4(c+dx)\,dx \\
&= \frac{a\sec^3(c+dx)\tan(c+dx)}{4d} + \frac{1}{4}(3a)\int \sec^3(c+dx)\,dx \\
&\quad - \frac{b\text{Subst}\left(\int \left(1+x^2\right)\,dx, x, -\tan(c+dx)\right)}{d} \\
&= \frac{b\tan(c+dx)}{d} + \frac{3a\sec(c+dx)\tan(c+dx)}{8d} + \frac{a\sec^3(c+dx)\tan(c+dx)}{4d} \\
&\quad + \frac{b\tan^3(c+dx)}{3d} + \frac{1}{8}(3a)\int \sec(c+dx)\,dx \\
&= \frac{3a\text{arctanh}(\sin(c+dx))}{8d} + \frac{b\tan(c+dx)}{d} + \frac{3a\sec(c+dx)\tan(c+dx)}{8d} \\
&\quad + \frac{a\sec^3(c+dx)\tan(c+dx)}{4d} + \frac{b\tan^3(c+dx)}{3d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.69

$$\int (a+b\cos(c+dx))\sec^5(c+dx)\,dx$$
$$=\frac{9a\text{arctanh}(\sin(c+dx))+\tan(c+dx)\left(9a\sec(c+dx)+6a\sec^3(c+dx)+8b(3+\tan^2(c+dx))\right)}{24d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])*Sec[c + d*x]^5,x]
```

```
[Out] (9*a*ArcTanh[Sin[c + d*x]] + Tan[c + d*x]*(9*a*Sec[c + d*x] + 6*a*Sec[c + d
*x]^3 + 8*b*(3 + Tan[c + d*x]^2)))/(24*d)
```

Maple [A] (verified)

Time = 3.07 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.86

method	result
derivativedivides	$\frac{a\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)-b\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)}{d}$
default	$\frac{a\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)-b\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)}{d}$
parts	$\frac{a\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)}{d}-\frac{b\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)}{d}$
risch	$-\frac{i\left(9a\,e^{7i(dx+c)}+33a\,e^{5i(dx+c)}-48b\,e^{4i(dx+c)}-33a\,e^{3i(dx+c)}-64b\,e^{2i(dx+c)}-9a\,e^{i(dx+c)}-16b\right)}{12d\left(e^{2i(dx+c)}+1\right)^4}-\frac{3a\ln\left(e^{i(dx+c)}-i\right)}{8d}$
parallelrisch	$\frac{-18\left(\frac{3}{4}+\frac{\cos(4dx+4c)}{4}+\cos(2dx+2c)\right)a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+18\left(\frac{3}{4}+\frac{\cos(4dx+4c)}{4}+\cos(2dx+2c)\right)a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)+}{12d(\cos(4dx+4c)+4\cos(2dx+2c)+3)}$
norman	$\frac{\frac{3a\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2d}+\frac{2(3a-2b)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}+\frac{2(3a+2b)\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}+\frac{(5a-8b)\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}+\frac{(8b+5a)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^4}-$

```
[In] int((a+cos(d*x+c)*b)*sec(d*x+c)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a*(-(-1/4*sec(d*x+c)^3-3/8*sec(d*x+c))*tan(d*x+c)+3/8*ln(sec(d*x+c)+ta
n(d*x+c)))-b*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c))
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.16

$$\int (a+b\cos(c+dx))\sec^5(c+dx)\,dx = \frac{9\,a\cos\left(dx+c\right)^4\log\left(\sin\left(dx+c\right)+1\right)-9\,a\cos\left(dx+c\right)^4\log\left(-\sin\left(dx+c\right)+1\right)+2\left(16\,b\cos\left(dx+c\right)^3+9\cdots}{48\,d\cos\left(dx+c\right)^4}$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)^5,x, algorithm="fricas")
[Out] 1/48*(9*a*cos(d*x + c)^4*log(sin(d*x + c) + 1) - 9*a*cos(d*x + c)^4*log(-si
n(d*x + c) + 1) + 2*(16*b*cos(d*x + c)^3 + 9*a*cos(d*x + c)^2 + 8*b*cos(d*x
 + c) + 6*a)*sin(d*x + c))/(d*cos(d*x + c)^4)
```

Sympy [F]

$$\int (a+b\cos(c+dx))\sec^5(c+dx)\,dx = \int \left(a+b\cos\left(c+dx\right)\right)\sec^5\left(c+dx\right)\,dx$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)**5,x)
[Out] Integral((a + b*cos(c + d*x))*sec(c + d*x)**5, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.12

$$\int (a+b\cos(c+dx))\sec^5(c+dx)\,dx = \frac{16\left(\tan\left(dx+c\right)^3+3\,\tan\left(dx+c\right)\right)b-3\,a\left(\frac{2\left(3\,\sin(dx+c)^3-5\,\sin(dx+c)\right)}{\sin(dx+c)^4-2\,\sin(dx+c)^2+1}-3\,\log\left(\sin\left(dx+c\right)+1\right)+3\,\log\left(\sin\left(\cdots\right.\right.\right.}{48\,d}$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)^5,x, algorithm="maxima")
[Out] 1/48*(16*(tan(d*x + c)^3 + 3*tan(d*x + c))*b - 3*a*(2*(3*sin(d*x + c)^3 - 5
*sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2 + 1) - 3*log(sin(d*x + c)
 + 1) + 3*log(sin(d*x + c) - 1)))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 164 vs. 2(77) = 154.

Time = 0.29 (sec) , antiderivative size = 164, normalized size of antiderivative = 1.93

$$\int (a+b\cos(c+dx))\sec^5(c+dx)\,dx$$
$$=\frac{9\,a\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-9\,a\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)+\frac{2\left(15\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7-24\,b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7+9\,a\,\mathrm{t}}{}}{24\,d}$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)^5,x, algorithm="giac")
```

```
[Out] 1/24*(9*a*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 9*a*log(abs(tan(1/2*d*x + 1/
2*c) - 1)) + 2*(15*a*tan(1/2*d*x + 1/2*c)^7 - 24*b*tan(1/2*d*x + 1/2*c)^7 +
 9*a*tan(1/2*d*x + 1/2*c)^5 + 40*b*tan(1/2*d*x + 1/2*c)^5 + 9*a*tan(1/2*d*x
 + 1/2*c)^3 - 40*b*tan(1/2*d*x + 1/2*c)^3 + 15*a*tan(1/2*d*x + 1/2*c) + 24*
b*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2 - 1)^4)/d
```

Mupad [B] (verification not implemented)

Time = 16.75 (sec) , antiderivative size = 150, normalized size of antiderivative = 1.76

$$\int (a+b\cos(c+dx))\sec^5(c+dx)\,dx$$
$$=\frac{\left(\frac{5\,a}{4}-2\,b\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7+\left(\frac{3\,a}{4}+\frac{10\,b}{3}\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5+\left(\frac{3\,a}{4}-\frac{10\,b}{3}\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3+\left(\frac{5\,a}{4}+2\,b\right)\,\tan\left(\frac{c}{2}+\frac{d}{2}\right.}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8-4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6+6\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)}$$
$$+\frac{3\,a\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{4\,d}$$

```
[In] int((a + b*cos(c + d*x))/cos(c + d*x)^5,x)
```

```
[Out] (tan(c/2 + (d*x)/2)*((5*a)/4 + 2*b) + tan(c/2 + (d*x)/2)^7*((5*a)/4 - 2*b)
+ tan(c/2 + (d*x)/2)^3*((3*a)/4 - (10*b)/3) + tan(c/2 + (d*x)/2)^5*((3*a)/4
 + (10*b)/3))/(d*(6*tan(c/2 + (d*x)/2)^4 - 4*tan(c/2 + (d*x)/2)^2 - 4*tan(c
/2 + (d*x)/2)^6 + tan(c/2 + (d*x)/2)^8 + 1)) + (3*a*atanh(tan(c/2 + (d*x)/2
)))/(4*d)
```

3.416 $\int (a+b\cos(c+dx))\sec^6(c+dx)\,dx$

Optimal result

Integrand size = 19, antiderivative size = 101

$$\int (a+b\cos(c+dx))\sec^6(c+dx)\,dx=\frac{3b\text{arctanh}(\sin(c+dx))}{8d}+\frac{a\tan(c+dx)}{d}+\frac{3b\sec(c+dx)\tan(c+dx)}{8d}+\frac{b\sec^3(c+dx)\tan(c+dx)}{4d}+\frac{2a\tan^3(c+dx)}{3d}+\frac{a\tan^5(c+dx)}{5d}$$

```
[Out] 3/8*b*arctanh(sin(d*x+c))/d+a*tan(d*x+c)/d+3/8*b*sec(d*x+c)*tan(d*x+c)/d+1/
4*b*sec(d*x+c)^3*tan(d*x+c)/d+2/3*a*tan(d*x+c)^3/d+1/5*a*tan(d*x+c)^5/d
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2827, 3852, 3853, 3855}

$$\int (a+b\cos(c+dx))\sec^6(c+dx)\,dx=\frac{a\tan^5(c+dx)}{5d}+\frac{2a\tan^3(c+dx)}{3d}+\frac{a\tan(c+dx)}{d}+\frac{3b\text{arctanh}(\sin(c+dx))}{8d}+\frac{b\tan(c+dx)\sec^3(c+dx)}{4d}+\frac{3b\tan(c+dx)\sec(c+dx)}{8d}$$

```
[In] Int[(a + b*Cos[c + d*x])*Sec[c + d*x]^6,x]
```

```
[Out] (3*b*ArcTanh[Sin[c + d*x]])/(8*d) + (a*Tan[c + d*x])/d + (3*b*Sec[c + d*x]*
Tan[c + d*x])/(8*d) + (b*Sec[c + d*x]^3*Tan[c + d*x])/(4*d) + (2*a*Tan[c +
d*x]^3)/(3*d) + (a*Tan[c + d*x]^5)/(5*d)
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= a\int \sec^6(c+dx)\,dx + b\int \sec^5(c+dx)\,dx \\
&= \frac{b\sec^3(c+dx)\tan(c+dx)}{4d} + \frac{1}{4}(3b)\int \sec^3(c+dx)\,dx \\
&\quad - \frac{a\text{Subst}\left(\int \left(1+2x^2+x^4\right)\,dx, x, -\tan(c+dx)\right)}{d} \\
&= \frac{a\tan(c+dx)}{d} + \frac{3b\sec(c+dx)\tan(c+dx)}{8d} + \frac{b\sec^3(c+dx)\tan(c+dx)}{4d} \\
&\quad + \frac{2a\tan^3(c+dx)}{3d} + \frac{a\tan^5(c+dx)}{5d} + \frac{1}{8}(3b)\int \sec(c+dx)\,dx \\
&= \frac{3b\text{arctanh}(\sin(c+dx))}{8d} + \frac{a\tan(c+dx)}{d} + \frac{3b\sec(c+dx)\tan(c+dx)}{8d} \\
&\quad + \frac{b\sec^3(c+dx)\tan(c+dx)}{4d} + \frac{2a\tan^3(c+dx)}{3d} + \frac{a\tan^5(c+dx)}{5d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.93

$$\int (a+b\cos(c+dx))\sec^6(c+dx)\,dx = \frac{3b\text{arctanh}(\sin(c+dx))}{8d}+\frac{3b\sec(c+dx)\tan(c+dx)}{8d}+\frac{b\sec^3(c+dx)\tan(c+dx)}{4d}+\frac{a\left(\tan(c+dx)+\frac{2}{3}\tan^3(c+dx)+\frac{1}{5}\tan^5(c+dx)\right)}{d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])*Sec[c + d*x]^6,x]
```

```
[Out] (3*b*ArcTanh[Sin[c + d*x]])/(8*d) + (3*b*Sec[c + d*x]*Tan[c + d*x])/(8*d) +
 (b*Sec[c + d*x]^3*Tan[c + d*x])/(4*d) + (a*(Tan[c + d*x] + (2*Tan[c + d*x]
^3)/3 + Tan[c + d*x]^5/5))/d
```

Maple [A] (verified)

Time = 3.28 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.82

method	result
derivativedivides	$\frac{-a\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c)\right)}{5}-\frac{4\left(\sec^2(dx+c)\right)}{15}\right)\tan(dx+c)+b\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan \cdots}{8}\right.}{d}$
default	$\frac{-a\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c)\right)}{5}-\frac{4\left(\sec^2(dx+c)\right)}{15}\right)\tan(dx+c)+b\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan \cdots}{8}\right.}{d}$
parts	$-\frac{a\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c)\right)}{5}-\frac{4\left(\sec^2(dx+c)\right)}{15}\right)\tan(dx+c)}{d}+\frac{b\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)\cdots}{8}\right.}{d}$
risch	$-\frac{i\left(45b\,e^{9i(dx+c)}+210b\,e^{7i(dx+c)}-640a\,e^{4i(dx+c)}-210b\,e^{3i(dx+c)}-320a\,e^{2i(dx+c)}-45b\,e^{i(dx+c)}-64a\right)}{60d\left(e^{2i(dx+c)}+1\right)^5}-\frac{3\ln\left(e^{i(dx+c)}-\cdots\right.}{8d}$
parallelrisch	$\frac{-225b\left(\frac{\cos(5dx+5c)}{10}+\frac{\cos(3dx+3c)}{2}+\cos(dx+c)\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+225b\left(\frac{\cos(5dx+5c)}{10}+\frac{\cos(3dx+3c)}{2}+\cos(dx+c)\right)\ln\left(\tan \cdots\right.}{60d(\cos(5dx+5c)+5\cos(3dx+3c \cdots}$
norman	$\frac{\frac{(8a-9b)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12d}-\frac{(8a-5b)\left(\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}-\frac{(8a+5b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d}+\frac{(8a+9b)\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{12d}-\frac{(152a-15b)\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\cdots\right.}{30d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^5}$

```
[In] int((a+cos(d*x+c)*b)*sec(d*x+c)^6,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-a*(-8/15-1/5*sec(d*x+c)^4-4/15*sec(d*x+c)^2)*tan(d*x+c)+b*(-(-1/4*sec
(d*x+c)^3-3/8*sec(d*x+c))*tan(d*x+c)+3/8*ln(sec(d*x+c)+tan(d*x+c))))
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.09

$$\int (a + b\cos(c + dx)) \sec^6(c + dx) \, dx = \frac{45 \, b \cos(dx + c)^5 \log(\sin(dx + c) + 1) - 45 \, b \cos(dx + c)^5 \log(-\sin(dx + c) + 1) + 2 \, (64 \, a \cos(dx + c)^4}{240 \, d \cos(dx + c)^5}$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)^6,x, algorithm="fricas")
[Out] 1/240*(45*b*cos(d*x + c)^5*log(sin(d*x + c) + 1) - 45*b*cos(d*x + c)^5*log(
-sin(d*x + c) + 1) + 2*(64*a*cos(d*x + c)^4 + 45*b*cos(d*x + c)^3 + 32*a*co
s(d*x + c)^2 + 30*b*cos(d*x + c) + 24*a)*sin(d*x + c))/(d*cos(d*x + c)^5)
```

Sympy [F]

$$\int (a + b\cos(c + dx)) \sec^6(c + dx) \, dx = \int (a + b\cos(c + dx)) \sec^6(c + dx) \, dx$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)**6,x)
[Out] Integral((a + b*cos(c + d*x))*sec(c + d*x)**6, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.21 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.06

$$\int (a + b\cos(c + dx)) \sec^6(c + dx) \, dx = \frac{16 \, \left(3 \, \tan(dx + c)^5 + 10 \, \tan(dx + c)^3 + 15 \, \tan(dx + c)\right) a - 15 \, b \left(\frac{2 \, \left(3 \, \sin(dx + c)^3 - 5 \, \sin(dx + c)\right)}{\sin(dx + c)^4 - 2 \, \sin(dx + c)^2 + 1} - 3 \, \log(\sin(d\right.}{240 \, d}$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)^6,x, algorithm="maxima")
[Out] 1/240*(16*(3*tan(d*x + c)^5 + 10*tan(d*x + c)^3 + 15*tan(d*x + c))*a - 15*b
*(2*(3*sin(d*x + c)^3 - 5*sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2
+ 1) - 3*log(sin(d*x + c) + 1) + 3*log(sin(d*x + c) - 1)))/d
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 178, normalized size of antiderivative = 1.76

$$\int (a + b\cos(c + dx))\sec^6(c + dx)\,dx$$
$$= \frac{45\,b\log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) + 1\right|\right) - 45\,b\log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) - 1\right|\right) - \frac{2\left(120\,a\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)^9 - 75\,b\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)^9 - 16\cdots}{\cdots}}{\cdots}$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)^6,x, algorithm="giac")
```

```
[Out] 1/120*(45*b*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 45*b*log(abs(tan(1/2*d*x +
 1/2*c) - 1)) - 2*(120*a*tan(1/2*d*x + 1/2*c)^9 - 75*b*tan(1/2*d*x + 1/2*c)
^9 - 160*a*tan(1/2*d*x + 1/2*c)^7 + 30*b*tan(1/2*d*x + 1/2*c)^7 + 464*a*tan
(1/2*d*x + 1/2*c)^5 - 160*a*tan(1/2*d*x + 1/2*c)^3 - 30*b*tan(1/2*d*x + 1/2
*c)^3 + 120*a*tan(1/2*d*x + 1/2*c) + 75*b*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*
x + 1/2*c)^2 - 1)^5)/d
```

Mupad [B] (verification not implemented)

Time = 17.21 (sec) , antiderivative size = 180, normalized size of antiderivative = 1.78

$$\int (a + b\cos(c + dx))\sec^6(c + dx)\,dx = \frac{3\,b\,\mathrm{atanh}\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)\right)}{4\,d}$$
$$- \frac{\left(2\,a - \frac{5\,b}{4}\right)\,\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^9 + \left(\frac{b}{2} - \frac{8\,a}{3}\right)\,\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^7 + \frac{116\,a\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^5}{15} + \left(-\frac{8\,a}{3} - \frac{b}{2}\right)\,\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^3 + \left(2\,a\cdots\right.}{d\,\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^{10} - 5\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^8 + 10\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^6 - 10\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^4 + 5\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)\cdots\right.}$$

```
[In] int((a + b*cos(c + d*x))/cos(c + d*x)^6,x)
```

```
[Out] (3*b*atanh(tan(c/2 + (d*x)/2)))/(4*d) - (tan(c/2 + (d*x)/2)*(2*a + (5*b)/4)
 - tan(c/2 + (d*x)/2)^3*((8*a)/3 + b/2) + tan(c/2 + (d*x)/2)^9*(2*a - (5*b)
/4) - tan(c/2 + (d*x)/2)^7*((8*a)/3 - b/2) + (116*a*tan(c/2 + (d*x)/2)^5)/1
5)/(d*(5*tan(c/2 + (d*x)/2)^2 - 10*tan(c/2 + (d*x)/2)^4 + 10*tan(c/2 + (d*x
)/2)^6 - 5*tan(c/2 + (d*x)/2)^8 + tan(c/2 + (d*x)/2)^10 - 1))
```

3.417 $\int \cos^4(c+dx)(a+b\cos(c+dx))^2\,dx$

Optimal result

Integrand size = 21, antiderivative size = 150

$$\int \cos^4(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{1}{16}\left(6a^2+5b^2\right)x+\frac{2ab\sin(c+dx)}{d} + \frac{(6a^2+5b^2)\cos(c+dx)\sin(c+dx)}{16d} + \frac{(6a^2+5b^2)\cos^3(c+dx)\sin(c+dx)}{24d} + \frac{b^2\cos^5(c+dx)\sin(c+dx)}{6d} - \frac{4ab\sin^3(c+dx)}{3d}+\frac{2ab\sin^5(c+dx)}{5d}$$

```
[Out] 1/16*(6*a^2+5*b^2)*x+2*a*b*sin(d*x+c)/d+1/16*(6*a^2+5*b^2)*cos(d*x+c)*sin(d
*x+c)/d+1/24*(6*a^2+5*b^2)*cos(d*x+c)^3*sin(d*x+c)/d+1/6*b^2*cos(d*x+c)^5*s
in(d*x+c)/d-4/3*a*b*sin(d*x+c)^3/d+2/5*a*b*sin(d*x+c)^5/d
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used

$= \{2868, 2713, 3093, 2715, 8\}$

$$\int \cos^4(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{(6a^2+5b^2)\sin(c+dx)\cos^3(c+dx)}{24d} + \frac{(6a^2+5b^2)\sin(c+dx)\cos(c+dx)}{16d} + \frac{1}{16}x(6a^2+5b^2) + \frac{2ab\sin^5(c+dx)}{5d} - \frac{4ab\sin^3(c+dx)}{3d} + \frac{2ab\sin(c+dx)}{d} + \frac{b^2\sin(c+dx)\cos^5(c+dx)}{6d}$$

```
[In] Int[Cos[c + d*x]^4*(a + b*Cos[c + d*x])^2,x]
```

```
[Out] ((6*a^2 + 5*b^2)*x)/16 + (2*a*b*Sin[c + d*x])/d + ((6*a^2 + 5*b^2)*Cos[c +
d*x]*Sin[c + d*x])/(16*d) + ((6*a^2 + 5*b^2)*Cos[c + d*x]^3*Sin[c + d*x])/(
24*d) + (b^2*Cos[c + d*x]^5*Sin[c + d*x])/(6*d) - (4*a*b*Sin[c + d*x]^3)/(3
*d) + (2*a*b*Sin[c + d*x]^5)/(5*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2868

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)])^2, x_Symbol] :> Dist[2*c*(d/b), Int[(b*Sin[e + f*x])^(m + 1), x], x] +
 Int[(b*Sin[e + f*x])^m*(c^2 + d^2*Sin[e + f*x]^2), x] /; FreeQ[{b, c, d, e
, f, m}, x]
```

Rule 3093

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_) + (C_.)*sin[(e_.) + (f_.)*(
x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*((b*Sin[e + f*x])^(m + 1)/(b*f
```

```
*(m + 2))), x] + Dist[(A*(m + 2) + C*(m + 1))/(m + 2), Int[(b*Sin[e + f*x])
^m, x], x] /; FreeQ[{b, e, f, A, C, m}, x] &&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= (2ab)\int \cos^5(c+dx)\,dx+\int \cos^4(c+dx)\left(a^2+b^2\cos^2(c+dx)\right)\,dx\\
&= \frac{b^2\cos^5(c+dx)\sin(c+dx)}{6d}+\frac{1}{6}\left(6a^2+5b^2\right)\int \cos^4(c+dx)\,dx\\
&\quad -\frac{(2ab)\text{Subst}\left(\int\left(1-2x^2+x^4\right)\,dx,x,-\sin(c+dx)\right)}{d}\\
&= \frac{2ab\sin(c+dx)}{d}+\frac{\left(6a^2+5b^2\right)\cos^3(c+dx)\sin(c+dx)}{24d}+\frac{b^2\cos^5(c+dx)\sin(c+dx)}{6d}\\
&\quad -\frac{4ab\sin^3(c+dx)}{3d}+\frac{2ab\sin^5(c+dx)}{5d}+\frac{1}{8}\left(6a^2+5b^2\right)\int \cos^2(c+dx)\,dx\\
&= \frac{2ab\sin(c+dx)}{d}+\frac{\left(6a^2+5b^2\right)\cos(c+dx)\sin(c+dx)}{16d}+\frac{\left(6a^2+5b^2\right)\cos^3(c+dx)\sin(c+dx)}{24d}\\
&\quad +\frac{b^2\cos^5(c+dx)\sin(c+dx)}{6d}-\frac{4ab\sin^3(c+dx)}{3d}+\frac{2ab\sin^5(c+dx)}{5d}+\frac{1}{16}\left(6a^2+5b^2\right)\int 1\,dx\\
&= \frac{1}{16}\left(6a^2+5b^2\right)x+\frac{2ab\sin(c+dx)}{d}+\frac{\left(6a^2+5b^2\right)\cos(c+dx)\sin(c+dx)}{16d}\\
&\quad +\frac{\left(6a^2+5b^2\right)\cos^3(c+dx)\sin(c+dx)}{24d}\\
&\quad +\frac{b^2\cos^5(c+dx)\sin(c+dx)}{6d}-\frac{4ab\sin^3(c+dx)}{3d}+\frac{2ab\sin^5(c+dx)}{5d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.28 (sec) , antiderivative size = 123, normalized size of antiderivative = 0.82

$$\int \cos^4(c+dx)(a+b\cos(c+dx))^2\,dx$$
$$=\frac{1920ab\sin(c+dx)-1280ab\sin^3(c+dx)+384ab\sin^5(c+dx)+5(72a^2c+60b^2c+72a^2dx+60b^2dx+(\cdots}{960d}$$

```
[In] Integrate[Cos[c + d*x]^4*(a + b*Cos[c + d*x])^2,x]
[Out] (1920*a*b*Sin[c + d*x] - 1280*a*b*Sin[c + d*x]^3 + 384*a*b*Sin[c + d*x]^5 +
 5*(72*a^2*c + 60*b^2*c + 72*a^2*d*x + 60*b^2*d*x + (48*a^2 + 45*b^2)*Sin[2
*(c + d*x)] + (6*a^2 + 9*b^2)*Sin[4*(c + d*x)] + b^2*Sin[6*(c + d*x)]))/(96
0*d)
```

Maple [A] (verified)

Time = 3.46 (sec) , antiderivative size = 112, normalized size of antiderivative = 0.75

method	result
parallelrisch	$\frac{(240a^2+225b^2)\sin(2dx+2c)+(30a^2+45b^2)\sin(4dx+4c)+200ab\sin(3dx+3c)+24ab\sin(5dx+5c)+5b^2\sin(6dx+6c)+1200}{960d}$
derivativedivides	$\frac{a^2\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{2ab\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}+b^2\left(\frac{\left(\cos^5(dx+c)+\frac{5}{}\right.}{}\right.}{d}$
default	$\frac{a^2\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{2ab\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}+b^2\left(\frac{\left(\cos^5(dx+c)+\frac{5}{}\right.}{}\right.}{d}$
parts	$\frac{a^2\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}+\frac{b^2\left(\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{6}+\frac{5dx}{16}+\right.}{d}$
risch	$\frac{3a^2x}{8}+\frac{5b^2x}{16}+\frac{5ab\sin(dx+c)}{4d}+\frac{b^2\sin(6dx+6c)}{192d}+\frac{ab\sin(5dx+5c)}{40d}+\frac{\sin(4dx+4c)a^2}{32d}+\frac{3\sin(4dx+4c)b^2}{64d}+\frac{5ab}{}$
norman	$\left(\frac{3a^2}{8}+\frac{5b^2}{16}\right)x+\left(\frac{3a^2}{8}+\frac{5b^2}{16}\right)x\left(\tan^{12}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(\frac{9a^2}{4}+\frac{15b^2}{8}\right)x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(\frac{9a^2}{4}+\frac{15b^2}{8}\right)x\left(\tan^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(\frac{15a}{2}\right.$

```
[In] int(cos(d*x+c)^4*(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/960*((240*a^2+225*b^2)*sin(2*d*x+2*c)+(30*a^2+45*b^2)*sin(4*d*x+4*c)+200*
a*b*sin(3*d*x+3*c)+24*a*b*sin(5*d*x+5*c)+5*b^2*sin(6*d*x+6*c)+1200*a*b*sin(
d*x+c)+360*d*x*(a^2+5/6*b^2))/d
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 110, normalized size of antiderivative = 0.73

$$\int \cos^4(c+dx)(a+b\cos(c+dx))^2\,dx$$
$$=\frac{15\,(6\,a^2+5\,b^2)dx+\left(40\,b^2\cos\left(dx+c\right)^5+96\,ab\cos\left(dx+c\right)^4+128\,ab\cos\left(dx+c\right)^2+10\,(6\,a^2+5\,b^2)\cos\left(d\right.\right.}{240\,d}$$

```
[In] integrate(cos(d*x+c)^4*(a+b*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/240*(15*(6*a^2 + 5*b^2)*d*x + (40*b^2*cos(d*x + c)^5 + 96*a*b*cos(d*x + c
)^4 + 128*a*b*cos(d*x + c)^2 + 10*(6*a^2 + 5*b^2)*cos(d*x + c)^3 + 256*a*b
+ 15*(6*a^2 + 5*b^2)*cos(d*x + c))*sin(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 343 vs. $2(141) = 282$.

Time = 0.37 (sec) , antiderivative size = 343, normalized size of antiderivative = 2.29

$$\int \cos^4(c+dx)(a+b\cos(c+dx))^2\,dx$$
$$= \begin{cases} \frac{3a^2x\sin^4(c+dx)}{8} + \frac{3a^2x\sin^2(c+dx)\cos^2(c+dx)}{4} + \frac{3a^2x\cos^4(c+dx)}{8} + \frac{3a^2\sin^3(c+dx)\cos(c+dx)}{8d} + \frac{5a^2\sin(c+dx)\cos^3(c+dx)}{8d} + \frac{1\ldots}{} \\ x(a+b\cos(c))^2\cos^4(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)**4*(a+b*cos(d*x+c))**2,x)
```

```
[Out] Piecewise((3*a**2*x*sin(c + d*x)**4/8 + 3*a**2*x*sin(c + d*x)**2*cos(c + d*
x)**2/4 + 3*a**2*x*cos(c + d*x)**4/8 + 3*a**2*sin(c + d*x)**3*cos(c + d*x)/
(8*d) + 5*a**2*sin(c + d*x)*cos(c + d*x)**3/(8*d) + 16*a*b*sin(c + d*x)**5/
(15*d) + 8*a*b*sin(c + d*x)**3*cos(c + d*x)**2/(3*d) + 2*a*b*sin(c + d*x)*c
os(c + d*x)**4/d + 5*b**2*x*sin(c + d*x)**6/16 + 15*b**2*x*sin(c + d*x)**4*
cos(c + d*x)**2/16 + 15*b**2*x*sin(c + d*x)**2*cos(c + d*x)**4/16 + 5*b**2*
x*cos(c + d*x)**6/16 + 5*b**2*sin(c + d*x)**5*cos(c + d*x)/(16*d) + 5*b**2*
sin(c + d*x)**3*cos(c + d*x)**3/(6*d) + 11*b**2*sin(c + d*x)*cos(c + d*x)**
5/(16*d), Ne(d, 0)), (x*(a + b*cos(c))**2*cos(c)**4, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 120, normalized size of antiderivative = 0.80

$$\int \cos^4(c+dx)(a+b\cos(c+dx))^2\,dx$$
$$= \frac{30\,(12\,dx+12\,c+\sin(4\,dx+4\,c)+8\,\sin(2\,dx+2\,c))a^2+128\,(3\,\sin(dx+c)^5-10\,\sin(dx+c)^3+15\,\mathrm{si}\ldots}{960\,d}$$

```
[In] integrate(cos(d*x+c)^4*(a+b*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/960*(30*(12*d*x + 12*c + sin(4*d*x + 4*c) + 8*sin(2*d*x + 2*c))*a^2 + 128
*(3*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*sin(d*x + c))*a*b - 5*(4*sin(2*
d*x + 2*c)^3 - 60*d*x - 60*c - 9*sin(4*d*x + 4*c) - 48*sin(2*d*x + 2*c))*b^
2)/d
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 127, normalized size of antiderivative = 0.85

$$\int \cos^4(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{1}{16}\left(6\,a^2+5\,b^2\right)x + \frac{b^2\sin\left(6\,dx+6\,c\right)}{192\,d} + \frac{ab\sin\left(5\,dx+5\,c\right)}{40\,d} + \frac{5\,ab\sin\left(3\,dx+3\,c\right)}{24\,d} + \frac{5\,ab\sin\left(dx+c\right)}{4\,d} + \frac{\left(2\,a^2+3\,b^2\right)\sin\left(4\,dx+4\,c\right)}{64\,d} + \frac{\left(16\,a^2+15\,b^2\right)\sin\left(2\,dx+2\,c\right)}{64\,d}$$

```
[In] integrate(cos(d*x+c)^4*(a+b*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/16*(6*a^2 + 5*b^2)*x + 1/192*b^2*sin(6*d*x + 6*c)/d + 1/40*a*b*sin(5*d*x
+ 5*c)/d + 5/24*a*b*sin(3*d*x + 3*c)/d + 5/4*a*b*sin(d*x + c)/d + 1/64*(2*a
^2 + 3*b^2)*sin(4*d*x + 4*c)/d + 1/64*(16*a^2 + 15*b^2)*sin(2*d*x + 2*c)/d
```

Mupad [B] (verification not implemented)

Time = 14.39 (sec) , antiderivative size = 143, normalized size of antiderivative = 0.95

$$\int \cos^4(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{3\,a^2\,x}{8} + \frac{5\,b^2\,x}{16} + \frac{a^2\,\sin\left(2\,c+2\,d\,x\right)}{4\,d} + \frac{a^2\,\sin\left(4\,c+4\,d\,x\right)}{32\,d} + \frac{15\,b^2\,\sin\left(2\,c+2\,d\,x\right)}{64\,d} + \frac{3\,b^2\,\sin\left(4\,c+4\,d\,x\right)}{64\,d} + \frac{b^2\,\sin\left(6\,c+6\,d\,x\right)}{192\,d} + \frac{5\,a\,b\,\sin\left(c+d\,x\right)}{4\,d} + \frac{5\,a\,b\,\sin\left(3\,c+3\,d\,x\right)}{24\,d} + \frac{a\,b\,\sin\left(5\,c+5\,d\,x\right)}{40\,d}$$

```
[In] int(cos(c + d*x)^4*(a + b*cos(c + d*x))^2,x)
```

```
[Out] (3*a^2*x)/8 + (5*b^2*x)/16 + (a^2*sin(2*c + 2*d*x))/(4*d) + (a^2*sin(4*c +
4*d*x))/(32*d) + (15*b^2*sin(2*c + 2*d*x))/(64*d) + (3*b^2*sin(4*c + 4*d*x)
)/(64*d) + (b^2*sin(6*c + 6*d*x))/(192*d) + (5*a*b*sin(c + d*x))/(4*d) + (5
*a*b*sin(3*c + 3*d*x))/(24*d) + (a*b*sin(5*c + 5*d*x))/(40*d)
```

3.418 $\int \cos^3(c+dx)(a+b\cos(c+dx))^2\,dx$

Optimal result

Integrand size = 21, antiderivative size = 111

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{3abx}{4}+\frac{(a^2+b^2)\sin(c+dx)}{d}+\frac{3ab\cos(c+dx)\sin(c+dx)}{4d}+\frac{ab\cos^3(c+dx)\sin(c+dx)}{2d}-\frac{(a^2+2b^2)\sin^3(c+dx)}{3d}+\frac{b^2\sin^5(c+dx)}{5d}$$

```
[Out] 3/4*a*b*x+(a^2+b^2)*sin(d*x+c)/d+3/4*a*b*cos(d*x+c)*sin(d*x+c)/d+1/2*a*b*co
s(d*x+c)^3*sin(d*x+c)/d-1/3*(a^2+2*b^2)*sin(d*x+c)^3/d+1/5*b^2*sin(d*x+c)^5
/d
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2868, 2715, 8, 3092, 380}

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^2\,dx = -\frac{(a^2+2b^2)\sin^3(c+dx)}{3d}+\frac{(a^2+b^2)\sin(c+dx)}{d}+\frac{ab\sin(c+dx)\cos^3(c+dx)}{2d}+\frac{3ab\sin(c+dx)\cos(c+dx)}{4d}+\frac{3abx}{4}+\frac{b^2\sin^5(c+dx)}{5d}$$

```
[In] Int[Cos[c + d*x]^3*(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (3*a*b*x)/4 + ((a^2 + b^2)*Sin[c + d*x])/d + (3*a*b*Cos[c + d*x]*Sin[c + d*
x])/(4*d) + (a*b*Cos[c + d*x]^3*Sin[c + d*x])/(2*d) - ((a^2 + 2*b^2)*Sin[c
+ d*x]^3)/(3*d) + (b^2*Sin[c + d*x]^5)/(5*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 380

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.), x_Symbol
] :> Int[ExpandIntegrand[(a + b*x^n)^p*(c + d*x^n)^q, x], x] /; FreeQ[{a, b
, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[p, 0] && IGtQ[q, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2868

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)])^2, x_Symbol] :> Dist[2*c*(d/b), Int[(b*Sin[e + f*x])^(m + 1), x], x] +
 Int[(b*Sin[e + f*x])^m*(c^2 + d^2*Sin[e + f*x]^2), x] /; FreeQ[{b, c, d, e
, f, m}, x]
```

Rule 3092

```
Int[sin[(e_.) + (f_.)*(x_)]^(m_.)*((A_) + (C_.)*sin[(e_.) + (f_.)*(x_)]^2),
 x_Symbol] :> Dist[-f^(-1), Subst[Int[(1 - x^2)^((m - 1)/2)*(A + C - C*x^2)
, x], x, Cos[e + f*x]], x] /; FreeQ[{e, f, A, C}, x] && IGtQ[(m + 1)/2, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= (2ab)\int \cos^4(c+dx)\,dx+\int \cos^3(c+dx)\left(a^2+b^2\cos^2(c+dx)\right)\,dx\\ &= \frac{ab\cos^3(c+dx)\sin(c+dx)}{2d}+\frac{1}{2}(3ab)\int \cos^2(c+dx)\,dx\\ &\quad -\frac{\text{Subst}\left(\int \left(1-x^2\right)\left(a^2+b^2-b^2x^2\right)\,dx,x,-\sin(c+dx)\right)}{d}\end{aligned}$$

$$= \frac{3ab\cos(c+dx)\sin(c+dx)}{4d} + \frac{ab\cos^3(c+dx)\sin(c+dx)}{2d} + \frac{1}{4}(3ab)\int 1\,dx - \frac{\text{Subst}\left(\int \left(a^2\left(1+\frac{b^2}{a^2}\right) - (a^2+2b^2)\,x^2 + b^2x^4\right)\,dx, x, -\sin(c+dx)\right)}{d}$$

$$= \frac{3abx}{4} + \frac{(a^2+b^2)\sin(c+dx)}{d} + \frac{3ab\cos(c+dx)\sin(c+dx)}{4d} + \frac{ab\cos^3(c+dx)\sin(c+dx)}{2d} - \frac{(a^2+2b^2)\sin^3(c+dx)}{3d} + \frac{b^2\sin^5(c+dx)}{5d}$$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.77

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{240(a^2+b^2)\sin(c+dx) - 80(a^2+2b^2)\sin^3(c+dx) + 48b^2\sin^5(c+dx) + 15ab(12(c+dx) + 8\sin(2(c+}{240d}$$

```
[In] Integrate[Cos[c + d*x]^3*(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (240*(a^2 + b^2)*Sin[c + d*x] - 80*(a^2 + 2*b^2)*Sin[c + d*x]^3 + 48*b^2*Si
n[c + d*x]^5 + 15*a*b*(12*(c + d*x) + 8*Sin[2*(c + d*x)] + Sin[4*(c + d*x)]
))/(240*d)
```

Maple [A] (verified)

Time = 3.87 (sec) , antiderivative size = 95, normalized size of antiderivative = 0.86

method	result
derivativedivides	$\frac{\frac{a^2(2+\cos^2(dx+c))\sin(dx+c)}{3}+2ab\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{b^2\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4(\cos^2(dx+c))}{3}\right)\sin}{5}}{d}$
default	$\frac{\frac{a^2(2+\cos^2(dx+c))\sin(dx+c)}{3}+2ab\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{b^2\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4(\cos^2(dx+c))}{3}\right)\sin}{5}}{d}$
parts	$\frac{a^2(2+\cos^2(dx+c))\sin(dx+c)}{3d}+\frac{b^2\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4(\cos^2(dx+c))}{3}\right)\sin(dx+c)}{5d}+\frac{2ab\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin}{4}\right.}{d}$
parallelrisch	$\frac{180abxd+180a^2\sin(dx+c)+150\sin(dx+c)b^2+3b^2\sin(5dx+5c)+15ab\sin(4dx+4c)+20a^2\sin(3dx+3c)+25b^2\sin(3dx+3c)}{240d}$
risch	$\frac{3abx}{4}+\frac{3a^2\sin(dx+c)}{4d}+\frac{5b^2\sin(dx+c)}{8d}+\frac{b^2\sin(5dx+5c)}{80d}+\frac{ab\sin(4dx+4c)}{16d}+\frac{a^2\sin(3dx+3c)}{12d}+\frac{5\sin(3dx+3c)b}{48d}$
norman	$\frac{3abx}{4}+\frac{4(25a^2+29b^2)\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{15d}+\frac{(4a^2-5ab+4b^2)\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2d}+\frac{(4a^2+5ab+4b^2)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2d}+\frac{(16a^2-3ab+8b^2)\left(\tan^7\right.}{3d}$

```
[In] int(cos(d*x+c)^3*(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(1/3*a^2*(2+cos(d*x+c)^2)*sin(d*x+c)+2*a*b*(1/4*(cos(d*x+c)^3+3/2*cos(d
*x+c))*sin(d*x+c)+3/8*d*x+3/8*c)+1/5*b^2*(8/3+cos(d*x+c)^4+4/3*cos(d*x+c)^2
)*sin(d*x+c))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.77

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{45\,abdx+\left(12\,b^2\cos\left(dx+c\right)^4+30\,ab\cos\left(dx+c\right)^3+45\,ab\cos\left(dx+c\right)+4\left(5\,a^2+4\,b^2\right)\cos\left(dx+c\right)^2+40\right.}{60\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/60*(45*a*b*d*x + (12*b^2*cos(d*x + c)^4 + 30*a*b*cos(d*x + c)^3 + 45*a*b*
cos(d*x + c) + 4*(5*a^2 + 4*b^2)*cos(d*x + c)^2 + 40*a^2 + 32*b^2)*sin(d*x
+ c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 221 vs. $2(104) = 208$.

Time = 0.25 (sec) , antiderivative size = 221, normalized size of antiderivative = 1.99

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^2\,dx$$
$$= \begin{cases} \frac{2a^2\sin^3(c+dx)}{3d} + \frac{a^2\sin(c+dx)\cos^2(c+dx)}{d} + \frac{3abx\sin^4(c+dx)}{4} + \frac{3abx\sin^2(c+dx)\cos^2(c+dx)}{2} + \frac{3abx\cos^4(c+dx)}{4} + \frac{3ab\sin^3(c+dx)}{4d} \\ x(a+b\cos(c))^2\cos^3(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)**3*(a+b*cos(d*x+c))**2,x)
```

```
[Out] Piecewise((2*a**2*sin(c + d*x)**3/(3*d) + a**2*sin(c + d*x)*cos(c + d*x)**2
/d + 3*a*b*x*sin(c + d*x)**4/4 + 3*a*b*x*sin(c + d*x)**2*cos(c + d*x)**2/2
+ 3*a*b*x*cos(c + d*x)**4/4 + 3*a*b*sin(c + d*x)**3*cos(c + d*x)/(4*d) + 5*
a*b*sin(c + d*x)*cos(c + d*x)**3/(4*d) + 8*b**2*sin(c + d*x)**5/(15*d) + 4*
b**2*sin(c + d*x)**3*cos(c + d*x)**2/(3*d) + b**2*sin(c + d*x)*cos(c + d*x)
**4/d, Ne(d, 0)), (x*(a + b*cos(c))**2*cos(c)**3, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.85

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^2\,dx =$$
$$-\frac{80\left(\sin\left(dx+c\right)^3-3\,\sin\left(dx+c\right)\right)a^2-15\left(12\,dx+12\,c+\sin\left(4\,dx+4\,c\right)+8\,\sin\left(2\,dx+2\,c\right)\right)ab-16\,(}{240\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/240*(80*(sin(d*x + c)^3 - 3*sin(d*x + c))*a^2 - 15*(12*d*x + 12*c + sin(
4*d*x + 4*c) + 8*sin(2*d*x + 2*c))*a*b - 16*(3*sin(d*x + c)^5 - 10*sin(d*x
+ c)^3 + 15*sin(d*x + c))*b^2)/d
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 102, normalized size of antiderivative = 0.92

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{3}{4}\,abx + \frac{b^2\sin\left(5\,dx+5\,c\right)}{80\,d} + \frac{ab\sin\left(4\,dx+4\,c\right)}{16\,d} + \frac{ab\sin\left(2\,dx+2\,c\right)}{2\,d} + \frac{\left(4\,a^2+5\,b^2\right)\sin\left(3\,dx+3\,c\right)}{48\,d} + \frac{\left(6\,a^2+5\,b^2\right)\sin\left(dx+c\right)}{8\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 3/4*a*b*x + 1/80*b^2*sin(5*d*x + 5*c)/d + 1/16*a*b*sin(4*d*x + 4*c)/d + 1/2
*a*b*sin(2*d*x + 2*c)/d + 1/48*(4*a^2 + 5*b^2)*sin(3*d*x + 3*c)/d + 1/8*(6*
a^2 + 5*b^2)*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 14.09 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.05

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{3\,a^2\,\sin\left(c+d\,x\right)}{4\,d} + \frac{5\,b^2\,\sin\left(c+d\,x\right)}{8\,d} + \frac{3\,a\,b\,x}{4} + \frac{a^2\,\sin\left(3\,c+3\,d\,x\right)}{12\,d} + \frac{5\,b^2\,\sin\left(3\,c+3\,d\,x\right)}{48\,d} + \frac{b^2\,\sin\left(5\,c+5\,d\,x\right)}{80\,d} + \frac{a\,b\,\sin\left(2\,c+2\,d\,x\right)}{2\,d} + \frac{a\,b\,\sin\left(4\,c+4\,d\,x\right)}{16\,d}$$

```
[In] int(cos(c + d*x)^3*(a + b*cos(c + d*x))^2,x)
```

```
[Out] (3*a^2*sin(c + d*x))/(4*d) + (5*b^2*sin(c + d*x))/(8*d) + (3*a*b*x)/4 + (a^
2*sin(3*c + 3*d*x))/(12*d) + (5*b^2*sin(3*c + 3*d*x))/(48*d) + (b^2*sin(5*c
 + 5*d*x))/(80*d) + (a*b*sin(2*c + 2*d*x))/(2*d) + (a*b*sin(4*c + 4*d*x))/(
16*d)
```

3.419 $\int \cos^2(c+dx)(a+b\cos(c+dx))^2\,dx$

Optimal result

Integrand size = 21, antiderivative size = 101

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{1}{8}(4a^2+3b^2)\,x+\frac{2ab\sin(c+dx)}{d} + \frac{(4a^2+3b^2)\cos(c+dx)\sin(c+dx)}{8d} + \frac{b^2\cos^3(c+dx)\sin(c+dx)}{4d}-\frac{2ab\sin^3(c+dx)}{3d}$$

```
[Out] 1/8*(4*a^2+3*b^2)*x+2*a*b*sin(d*x+c)/d+1/8*(4*a^2+3*b^2)*cos(d*x+c)*sin(d*x
+c)/d+1/4*b^2*cos(d*x+c)^3*sin(d*x+c)/d-2/3*a*b*sin(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2868, 2713, 3093, 2715, 8}

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{(4a^2+3b^2)\sin(c+dx)\cos(c+dx)}{8d} + \frac{1}{8}x(4a^2+3b^2)-\frac{2ab\sin^3(c+dx)}{3d} + \frac{2ab\sin(c+dx)}{d}+\frac{b^2\sin(c+dx)\cos^3(c+dx)}{4d}$$

```
[In] Int[Cos[c + d*x]^2*(a + b*Cos[c + d*x])^2,x]
```

```
[Out] ((4*a^2 + 3*b^2)*x)/8 + (2*a*b*Sin[c + d*x])/d + ((4*a^2 + 3*b^2)*Cos[c + d
*x]*Sin[c + d*x])/(8*d) + (b^2*Cos[c + d*x]^3*Sin[c + d*x])/(4*d) - (2*a*b*
Sin[c + d*x]^3)/(3*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2868

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)])^2, x_Symbol] :> Dist[2*c*(d/b), Int[(b*Sin[e + f*x])^(m + 1), x], x] +
 Int[(b*Sin[e + f*x])^m*(c^2 + d^2*Sin[e + f*x]^2), x] /; FreeQ[{b, c, d, e
, f, m}, x]
```

Rule 3093

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_) + (C_.)*sin[(e_.) + (f_.)*(
x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*((b*Sin[e + f*x])^(m + 1)/(b*f
*(m + 2))), x] + Dist[(A*(m + 2) + C*(m + 1))/(m + 2), Int[(b*Sin[e + f*x])
^m, x], x] /; FreeQ[{b, e, f, A, C, m}, x] &&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= (2ab)\int \cos^3(c+dx)\,dx+\int \cos^2(c+dx)\left(a^2+b^2\cos^2(c+dx)\right)\,dx\\
&= \frac{b^2\cos^3(c+dx)\sin(c+dx)}{4d}+\frac{1}{4}\left(4a^2+3b^2\right)\int \cos^2(c+dx)\,dx\\
&\quad -\frac{(2ab)\text{Subst}\left(\int \left(1-x^2\right)\,dx,x,-\sin(c+dx)\right)}{d}\\
&= \frac{2ab\sin(c+dx)}{d}+\frac{\left(4a^2+3b^2\right)\cos(c+dx)\sin(c+dx)}{8d}\\
&\quad +\frac{b^2\cos^3(c+dx)\sin(c+dx)}{4d}-\frac{2ab\sin^3(c+dx)}{3d}+\frac{1}{8}\left(4a^2+3b^2\right)\int 1\,dx
\end{aligned}$$

$$= \frac{1}{8}\left(4a^2+3b^2\right)x + \frac{2ab\sin(c+dx)}{d} + \frac{(4a^2+3b^2)\cos(c+dx)\sin(c+dx)}{8d} + \frac{b^2\cos^3(c+dx)\sin(c+dx)}{4d} - \frac{2ab\sin^3(c+dx)}{3d}$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.85

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{48a^2c+36b^2c+48a^2dx+36b^2dx+192ab\sin(c+dx)-64ab\sin^3(c+dx)+24(a^2+b^2)\sin(2(c+dx))+}{96d}$$

```
[In] Integrate[Cos[c + d*x]^2*(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (48*a^2*c + 36*b^2*c + 48*a^2*d*x + 36*b^2*d*x + 192*a*b*Sin[c + d*x] - 64*
a*b*Sin[c + d*x]^3 + 24*(a^2 + b^2)*Sin[2*(c + d*x)] + 3*b^2*Sin[4*(c + d*x
)]])/(96*d)
```

Maple [A] (verified)

Time = 2.72 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.74

method	result
parallelrisch	$\frac{24(a^2+b^2)\sin(2dx+2c)+16ab\sin(3dx+3c)+3\sin(4dx+4c)b^2+144ab\sin(dx+c)+48d\left(a^2+\frac{3b^2}{4}\right)x}{96d}$
derivativedivides	$\frac{a^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+\frac{2ab\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+b^2\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}$
default	$\frac{a^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+\frac{2ab\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+b^2\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}$
risch	$\frac{a^2x}{2}+\frac{3b^2x}{8}+\frac{3ab\sin(dx+c)}{2d}+\frac{\sin(4dx+4c)b^2}{32d}+\frac{ab\sin(3dx+3c)}{6d}+\frac{\sin(2dx+2c)a^2}{4d}+\frac{\sin(2dx+2c)b^2}{4d}$
parts	$\frac{a^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{b^2\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}+\frac{2ab(2+\cos^2(dx+c))\sin(d}{3d}$
norman	$\frac{\left(\frac{a^2}{2}+\frac{3b^2}{8}\right)x+\left(2a^2+\frac{3b^2}{2}\right)x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(2a^2+\frac{3b^2}{2}\right)x\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(3a^2+\frac{9b^2}{4}\right)x\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(\frac{a^2}{2}+\frac{3b^2}{8}\right.}{}$

```
[In] int(cos(d*x+c)^2*(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/96*(24*(a^2+b^2)*sin(2*d*x+2*c)+16*a*b*sin(3*d*x+3*c)+3*sin(4*d*x+4*c)*b^
2+144*a*b*sin(d*x+c)+48*d*(a^2+3/4*b^2)*x)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.76

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{3\,(4\,a^2+3\,b^2)dx+\left(6\,b^2\cos\left(dx+c\right)^3+16\,ab\cos\left(dx+c\right)^2+32\,ab+3\,(4\,a^2+3\,b^2)\cos\left(dx+c\right)\right)\sin\left(dx+c\right)}{24\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/24*(3*(4*a^2 + 3*b^2)*d*x + (6*b^2*cos(d*x + c)^3 + 16*a*b*cos(d*x + c)^2
 + 32*a*b + 3*(4*a^2 + 3*b^2)*cos(d*x + c))*sin(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 211 vs. 2(92) = 184.

Time = 0.18 (sec) , antiderivative size = 211, normalized size of antiderivative = 2.09

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^2\,dx = \begin{cases} \frac{a^2x\sin^2(c+dx)}{2}+\frac{a^2x\cos^2(c+dx)}{2}+\frac{a^2\sin(c+dx)\cos(c+dx)}{2d}+\frac{4ab\sin^3(c+dx)}{3d}+\frac{2ab\sin(c+dx)\cos^2(c+dx)}{d}+\frac{3b^2x\sin^4(c+dx)}{8}+\cdots \\ x(a+b\cos(c))^2\cos^2(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)**2*(a+b*cos(d*x+c))**2,x)
```

```
[Out] Piecewise((a**2*x*sin(c + d*x)**2/2 + a**2*x*cos(c + d*x)**2/2 + a**2*sin(c
 + d*x)*cos(c + d*x)/(2*d) + 4*a*b*sin(c + d*x)**3/(3*d) + 2*a*b*sin(c + d*
x)*cos(c + d*x)**2/d + 3*b**2*x*sin(c + d*x)**4/8 + 3*b**2*x*sin(c + d*x)**
2*cos(c + d*x)**2/4 + 3*b**2*x*cos(c + d*x)**4/8 + 3*b**2*sin(c + d*x)**3*c
os(c + d*x)/(8*d) + 5*b**2*sin(c + d*x)*cos(c + d*x)**3/(8*d), Ne(d, 0)), (
x*(a + b*cos(c))**2*cos(c)**2, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.21 (sec) , antiderivative size = 82, normalized size of antiderivative = 0.81

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{24\,(2\,dx+2\,c+\sin\left(2\,dx+2\,c\right))a^2-64\,\left(\sin\left(dx+c\right)^3-3\,\sin\left(dx+c\right)\right)ab+3\,(12\,dx+12\,c+\sin\left(4\,dx+4\right.\cdots}{96\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/96*(24*(2*d*x + 2*c + sin(2*d*x + 2*c))*a^2 - 64*(sin(d*x + c)^3 - 3*sin(
d*x + c))*a*b + 3*(12*d*x + 12*c + sin(4*d*x + 4*c) + 8*sin(2*d*x + 2*c))*b
^2)/d
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 82, normalized size of antiderivative = 0.81

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{1}{8}\left(4\,a^2+3\,b^2\right)x + \frac{b^2\sin\left(4\,dx+4\,c\right)}{32\,d} + \frac{ab\sin\left(3\,dx+3\,c\right)}{6\,d} + \frac{3\,ab\sin\left(dx+c\right)}{2\,d} + \frac{\left(a^2+b^2\right)\sin\left(2\,dx+2\,c\right)}{4\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/8*(4*a^2 + 3*b^2)*x + 1/32*b^2*sin(4*d*x + 4*c)/d + 1/6*a*b*sin(3*d*x + 3
*c)/d + 3/2*a*b*sin(d*x + c)/d + 1/4*(a^2 + b^2)*sin(2*d*x + 2*c)/d
```

Mupad [B] (verification not implemented)

Time = 14.97 (sec) , antiderivative size = 93, normalized size of antiderivative = 0.92

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{a^2\,x}{2} + \frac{3\,b^2\,x}{8} + \frac{a^2\,\sin\left(2\,c+2\,d\,x\right)}{4\,d} + \frac{b^2\,\sin\left(2\,c+2\,d\,x\right)}{4\,d} + \frac{b^2\,\sin\left(4\,c+4\,d\,x\right)}{32\,d} + \frac{3\,a\,b\,\sin\left(c+d\,x\right)}{2\,d} + \frac{a\,b\,\sin\left(3\,c+3\,d\,x\right)}{6\,d}$$

```
[In] int(cos(c + d*x)^2*(a + b*cos(c + d*x))^2,x)
```

```
[Out] (a^2*x)/2 + (3*b^2*x)/8 + (a^2*sin(2*c + 2*d*x))/(4*d) + (b^2*sin(2*c + 2*d
*x))/(4*d) + (b^2*sin(4*c + 4*d*x))/(32*d) + (3*a*b*sin(c + d*x))/(2*d) + (
a*b*sin(3*c + 3*d*x))/(6*d)
```

3.420 $\int \cos(c+dx)(a+b\cos(c+dx))^2\,dx$

Optimal result

Integrand size = 19, antiderivative size = 71

$$\int \cos(c+dx)(a+b\cos(c+dx))^2\,dx = abx+\frac{2(a^2+b^2)\sin(c+dx)}{3d}+\frac{ab\cos(c+dx)\sin(c+dx)}{3d}+\frac{(a+b\cos(c+dx))^2\sin(c+dx)}{3d}$$

```
[Out] a*b*x+2/3*(a^2+b^2)*sin(d*x+c)/d+1/3*a*b*cos(d*x+c)*sin(d*x+c)/d+1/3*(a+b*c
os(d*x+c))^2*sin(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2832, 2813}

$$\int \cos(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{2(a^2+b^2)\sin(c+dx)}{3d}+\frac{\sin(c+dx)(a+b\cos(c+dx))^2}{3d}+\frac{ab\sin(c+dx)\cos(c+dx)}{3d}+abx$$

```
[In] Int[Cos[c + d*x]*(a + b*Cos[c + d*x])^2,x]
```

```
[Out] a*b*x + (2*(a^2 + b^2)*Sin[c + d*x])/(3*d) + (a*b*Cos[c + d*x]*Sin[c + d*x]
)/(3*d) + ((a + b*Cos[c + d*x])^2*Sin[c + d*x])/(3*d)
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rubi steps

$$\text{integral} = \frac{(a+b\cos(c+dx))^2\sin(c+dx)}{3d} + \frac{1}{3}\int (2b+2a\cos(c+dx))(a+b\cos(c+dx))\,dx$$
$$= abx + \frac{2(a^2+b^2)\sin(c+dx)}{3d} + \frac{ab\cos(c+dx)\sin(c+dx)}{3d} + \frac{(a+b\cos(c+dx))^2\sin(c+dx)}{3d}$$

Mathematica [A] (verified)

Time = 0.28 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.83

$$\int \cos(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{3(4a^2+3b^2)\sin(c+dx)+b(12a(c+dx)+6a\sin(2(c+dx))+b\sin(3(c+dx)))}{12d}$$

```
[In] Integrate[Cos[c + d*x]*(a + b*Cos[c + d*x])^2,x]
[Out] (3*(4*a^2 + 3*b^2)*Sin[c + d*x] + b*(12*a*(c + d*x) + 6*a*Sin[2*(c + d*x)]
+ b*Sin[3*(c + d*x)]))/(12*d)
```

Maple [A] (verified)

Time = 1.94 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.86

method	result
parallelrisch	$\frac{12abxd+b^{2} \sin \left(3dx+3c\right)+6ab \sin \left(2dx+2c\right)+12a^{2} \sin \left(dx+c\right)+9 \sin \left(dx+c\right) b^{2}}{12d}$
derivativedivides	$\frac{a^{2} \sin \left(dx+c\right)+2ab \left(\frac{\cos \left(dx+c\right) \sin \left(dx+c\right)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+\frac{b^{2} \left(2+\cos^{2}\left(dx+c\right)\right) \sin \left(dx+c\right)}{3}}{d}$
default	$\frac{a^{2} \sin \left(dx+c\right)+2ab \left(\frac{\cos \left(dx+c\right) \sin \left(dx+c\right)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+\frac{b^{2} \left(2+\cos^{2}\left(dx+c\right)\right) \sin \left(dx+c\right)}{3}}{d}$
risch	$abx+\frac{a^{2} \sin \left(dx+c\right)}{d}+\frac{3b^{2} \sin \left(dx+c\right)}{4d}+\frac{\sin \left(3dx+3c\right) b^{2}}{12d}+\frac{ab \sin \left(2dx+2c\right)}{2d}$
parts	$\frac{b^{2} \left(2+\cos^{2}\left(dx+c\right)\right) \sin \left(dx+c\right)}{3d}+\frac{a^{2} \sin \left(dx+c\right)}{d}+\frac{2ab \left(\frac{\cos \left(dx+c\right) \sin \left(dx+c\right)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}$
norman	$\frac{abx+abx \left(\tan^{6}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\frac{4 \left(3a^{2}+b^{2}\right) \left(\tan^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}+\frac{2 \left(a^{2}-ab+b^{2}\right) \left(\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{2 \left(a^{2}+ab+b^{2}\right) \tan \left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+3abx \left(\tan\right.}{\left(1+\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^{3}}$

```
[In] int(cos(d*x+c)*(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/12*(12*a*b*x*d+b^2*sin(3*d*x+3*c)+6*a*b*sin(2*d*x+2*c)+12*a^2*sin(d*x+c)+
9*sin(d*x+c)*b^2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.73

$$\int \cos(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{3\,abdx + \left(b^2\cos\left(dx+c\right)^2 + 3\,ab\cos\left(dx+c\right) + 3\,a^2 + 2\,b^2\right)\sin\left(dx+c\right)}{3\,d}$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/3*(3*a*b*d*x + (b^2*cos(d*x + c)^2 + 3*a*b*cos(d*x + c) + 3*a^2 + 2*b^2)*
sin(d*x + c))/d
```

Sympy [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.51

$$\int \cos(c+dx)(a+b\cos(c+dx))^2\,dx$$
$$= \begin{cases} \frac{a^2\sin(c+dx)}{d} + abx\sin^2(c+dx) + abx\cos^2(c+dx) + \frac{ab\sin(c+dx)\cos(c+dx)}{d} + \frac{2b^2\sin^3(c+dx)}{3d} + \frac{b^2\sin(c+dx)\cos^2(c-}{d} \\ x(a+b\cos(c))^2\cos(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))**2,x)
```

```
[Out] Piecewise((a**2*sin(c + d*x)/d + a*b*x*sin(c + d*x)**2 + a*b*x*cos(c + d*x)
**2 + a*b*sin(c + d*x)*cos(c + d*x)/d + 2*b**2*sin(c + d*x)**3/(3*d) + b**2
*sin(c + d*x)*cos(c + d*x)**2/d, Ne(d, 0)), (x*(a + b*cos(c))**2*cos(c), Tr
ue))
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.85

$$\int \cos(c+dx)(a+b\cos(c+dx))^2\,dx$$
$$= \frac{3\,(2\,dx+2\,c+\sin(2\,dx+2\,c))ab - 2\,\left(\sin(dx+c)^3 - 3\,\sin(dx+c)\right)b^2 + 6\,a^2\sin(dx+c)}{6\,d}$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/6*(3*(2*d*x + 2*c + sin(2*d*x + 2*c))*a*b - 2*(sin(d*x + c)^3 - 3*sin(d*x
 + c))*b^2 + 6*a^2*sin(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.85

$$\int \cos(c+dx)(a+b\cos(c+dx))^2\,dx = abx + \frac{b^2\sin(3\,dx+3\,c)}{12\,d} + \frac{ab\sin(2\,dx+2\,c)}{2\,d} + \frac{(4\,a^2+3\,b^2)\sin(dx+c)}{4\,d}$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] a*b*x + 1/12*b^2*sin(3*d*x + 3*c)/d + 1/2*a*b*sin(2*d*x + 2*c)/d + 1/4*(4*a
^2 + 3*b^2)*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 14.69 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.01

$$\int \cos(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{a^2\,\sin\left(c+d\,x\right)}{d}+\frac{2\,b^2\,\sin\left(c+d\,x\right)}{3\,d}+a\,b\,x+\frac{b^2\cos\left(c+d\,x\right)^2\,\sin\left(c+d\,x\right)}{3\,d}+\frac{a\,b\,\cos\left(c+d\,x\right)\,\sin\left(c+d\,x\right)}{d}$$

```
[In] int(cos(c + d*x)*(a + b*cos(c + d*x))^2,x)
```

```
[Out] (a^2*sin(c + d*x))/d + (2*b^2*sin(c + d*x))/(3*d) + a*b*x + (b^2*cos(c + d*
x)^2*sin(c + d*x))/(3*d) + (a*b*cos(c + d*x)*sin(c + d*x))/d
```

3.421 $\int (a+b\cos(c+dx))^2\,dx$

Optimal result

Integrand size = 12, antiderivative size = 50

$$\int (a+b\cos(c+dx))^2\,dx=\frac{1}{2}\left(2a^2+b^2\right)x+\frac{2ab\sin(c+dx)}{d}+\frac{b^2\cos(c+dx)\sin(c+dx)}{2d}$$

```
[Out] 1/2*(2*a^2+b^2)*x+2*a*b*sin(d*x+c)/d+1/2*b^2*cos(d*x+c)*sin(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {2723}

$$\int (a+b\cos(c+dx))^2\,dx=\frac{1}{2}x\left(2a^2+b^2\right)+\frac{2ab\sin(c+dx)}{d}+\frac{b^2\sin(c+dx)\cos(c+dx)}{2d}$$

```
[In] Int[(a + b*Cos[c + d*x])^2,x]
```

```
[Out] ((2*a^2 + b^2)*x)/2 + (2*a*b*Sin[c + d*x])/d + (b^2*Cos[c + d*x]*Sin[c + d*
x])/(2*d)
```

Rule 2723

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^2, x_Symbol] :> Simp[(2*a^2 + b^
2)*(x/2), x] + (-Simp[2*a*b*(Cos[c + d*x]/d), x] - Simp[b^2*Cos[c + d*x]*(S
in[c + d*x]/(2*d)), x]) /; FreeQ[{a, b, c, d}, x]
```

Rubi steps

$$\text{integral}=\frac{1}{2}\left(2a^2+b^2\right)x+\frac{2ab\sin(c+dx)}{d}+\frac{b^2\cos(c+dx)\sin(c+dx)}{2d}$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 46, normalized size of antiderivative = 0.92

$$\int (a+b\cos(c+dx))^2\,dx=\frac{2(2a^2+b^2)(c+dx)+8ab\sin(c+dx)+b^2\sin(2(c+dx))}{4d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (2*(2*a^2 + b^2)*(c + d*x) + 8*a*b*Sin[c + d*x] + b^2*Sin[2*(c + d*x)])/(4*
d)
```

Maple [A] (verified)

Time = 0.95 (sec) , antiderivative size = 43, normalized size of antiderivative = 0.86

method	result	s
risch	$a^2x+\frac{b^2x}{2}+\frac{2ab\sin(dx+c)}{d}+\frac{\sin(2dx+2c)b^2}{4d}$	4
parallelrisch	$\frac{\sin(2dx+2c)b^2+8ab\sin(dx+c)+4d\left(a^2+\frac{b^2}{2}\right)x}{4d}$	4
parts	$a^2x+\frac{b^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{2ab\sin(dx+c)}{d}$	4
derivativedivides	$\frac{b^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+2ab\sin(dx+c)+a^2(dx+c)}{d}$	5
default	$\frac{b^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+2ab\sin(dx+c)+a^2(dx+c)}{d}$	5
norman	$\frac{\left(a^2+\frac{b^2}{2}\right)x+\left(a^2+\frac{b^2}{2}\right)x\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(2a^2+b^2)x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\frac{b(4a-b)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{b(4a+b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}$	1

```
[In] int((a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] a^2*x+1/2*b^2*x+2*a*b*sin(d*x+c)/d+1/4/d*sin(2*d*x+2*c)*b^2
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.80

$$\int (a+b\cos(c+dx))^2\,dx=\frac{(2\,a^2+b^2)dx+(b^2\cos{(dx+c)}+4\,ab)\sin{(dx+c)}}{2\,d}$$

```
[In] integrate((a+b*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/2*((2*a^2 + b^2)*d*x + (b^2*cos(d*x + c) + 4*a*b)*sin(d*x + c))/d
```

Sympy [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 78, normalized size of antiderivative = 1.56

$$\int (a+b\cos(c+dx))^2\,dx = \begin{cases} a^2x + \frac{2ab\sin(c+dx)}{d} + \frac{b^2x\sin^2(c+dx)}{2} + \frac{b^2x\cos^2(c+dx)}{2} + \frac{b^2\sin(c+dx)\cos(c+dx)}{2d} & \text{for } d \neq 0 \\ x(a+b\cos(c))^2 & \text{otherwise} \end{cases}$$

```
[In] integrate((a+b*cos(d*x+c))**2,x)
```

```
[Out] Piecewise((a**2*x + 2*a*b*sin(c + d*x)/d + b**2*x*sin(c + d*x)**2/2 + b**2*
x*cos(c + d*x)**2/2 + b**2*sin(c + d*x)*cos(c + d*x)/(2*d), Ne(d, 0)), (x*(
a + b*cos(c))**2, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 44, normalized size of antiderivative = 0.88

$$\int (a+b\cos(c+dx))^2\,dx = a^2x + \frac{(2\,dx + 2\,c + \sin(2\,dx + 2\,c))b^2}{4\,d} + \frac{2\,ab\sin(dx + c)}{d}$$

```
[In] integrate((a+b*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] a^2*x + 1/4*(2*d*x + 2*c + sin(2*d*x + 2*c))*b^2/d + 2*a*b*sin(d*x + c)/d
```

Giac [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 43, normalized size of antiderivative = 0.86

$$\int (a+b\cos(c+dx))^2\,dx = \frac{1}{2}\left(2\,a^2 + b^2\right)x + \frac{b^2\sin(2\,dx + 2\,c)}{4\,d} + \frac{2\,ab\sin(dx + c)}{d}$$

```
[In] integrate((a+b*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/2*(2*a^2 + b^2)*x + 1/4*b^2*sin(2*d*x + 2*c)/d + 2*a*b*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 14.41 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.84

$$\int (a+b\cos(c+dx))^2\,dx = a^2\,x+\frac{b^2\,x}{2}+\frac{b^2\,\sin\left(2\,c+2\,d\,x\right)}{4\,d}+\frac{2\,a\,b\,\sin\left(c+d\,x\right)}{d}$$

```
[In] int((a + b*cos(c + d*x))^2,x)
[Out] a^2*x + (b^2*x)/2 + (b^2*sin(2*c + 2*d*x))/(4*d) + (2*a*b*sin(c + d*x))/d
```

3.422 $\int (a+b\cos(c+dx))^2\sec(c+dx)\,dx$

Optimal result

Integrand size = 19, antiderivative size = 33

$$\int (a+b\cos(c+dx))^2\sec(c+dx)\,dx = 2abx+\frac{a^2\text{arctanh}(\sin(c+dx))}{d}+\frac{b^2\sin(c+dx)}{d}$$

```
[Out] 2*a*b*x+a^2*arctanh(sin(d*x+c))/d+b^2*sin(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2825, 2814, 3855}

$$\int (a+b\cos(c+dx))^2\sec(c+dx)\,dx = \frac{a^2\text{arctanh}(\sin(c+dx))}{d}+2abx+\frac{b^2\sin(c+dx)}{d}$$

```
[In] Int[(a + b*Cos[c + d*x])^2*Sec[c + d*x],x]
```

```
[Out] 2*a*b*x + (a^2*ArcTanh[Sin[c + d*x]])/d + (b^2*Sin[c + d*x])/d
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2825

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^2/((c_.) + (d_.)*sin[(e_.) + (f
_.)*(x_)]), x_Symbol] :> Simp[(-b^2)*(Cos[e + f*x]/(d*f)), x] + Dist[1/d, I
nt[Simp[a^2*d - b*(b*c - 2*a*d)*Sin[e + f*x], x]/(c + d*Sin[e + f*x]), x],
```

```
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{b^2 \sin(c+dx)}{d} + \int \left(a^2 + 2ab\cos(c+dx)\right)\sec(c+dx)\,dx \\
&= 2abx + \frac{b^2 \sin(c+dx)}{d} + a^2 \int \sec(c+dx)\,dx \\
&= 2abx + \frac{a^2 \operatorname{arctanh}(\sin(c+dx))}{d} + \frac{b^2 \sin(c+dx)}{d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.39

$$
\int (a+b\cos(c+dx))^2\sec(c+dx)\,dx = 2abx + \frac{a^2\operatorname{arctanh}(\sin(c+dx))}{d} + \frac{b^2\cos(dx)\sin(c)}{d} + \frac{b^2\cos(c)\sin(dx)}{d}
$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2*Sec[c + d*x],x]
[Out] 2*a*b*x + (a^2*ArcTanh[Sin[c + d*x]])/d + (b^2*Cos[d*x]*Sin[c])/d + (b^2*Co
s[c]*Sin[d*x])/d
```

Maple [A] (verified)

Time = 1.52 (sec) , antiderivative size = 43, normalized size of antiderivative = 1.30

method	result
derivativedivides	$\frac{a^2 \ln(\sec(dx+c)+\tan(dx+c))+2ab(dx+c)+\sin(dx+c)b^2}{d}$
default	$\frac{a^2 \ln(\sec(dx+c)+\tan(dx+c))+2ab(dx+c)+\sin(dx+c)b^2}{d}$
parts	$\frac{a^2 \ln(\sec(dx+c)+\tan(dx+c))}{d}+\frac{b^2 \sin(dx+c)}{d}+\frac{2ab(dx+c)}{d}$
parallelrisch	$\frac{2abxd-a^2 \ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+a^2 \ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)+\sin(dx+c)b^2}{d}$
risch	$2abx-\frac{ib^2 e^{i(dx+c)}}{2d}+\frac{ib^2 e^{-i(dx+c)}}{2d}+\frac{a^2 \ln(e^{i(dx+c)}+i)}{d}-\frac{a^2 \ln(e^{i(dx+c)}-i)}{d}$
norman	$\frac{2abx+\frac{2b^2 \tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{2b^2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+4abx\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+2abx\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}+\frac{a^2 \ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{d}$ -

```
[In] int((a+cos(d*x+c)*b)^2*sec(d*x+c),x,method=_RETURNVERBOSE)
[Out] 1/d*(a^2*ln(sec(d*x+c)+tan(d*x+c))+2*a*b*(d*x+c)+sin(d*x+c)*b^2)
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 52, normalized size of antiderivative = 1.58

$$\int (a+b\cos(c+dx))^2 \sec(c+dx)\,dx = \frac{4\,abdx + a^2 \log(\sin(dx+c)+1) - a^2 \log(-\sin(dx+c)+1) + 2\,b^2 \sin(dx+c)}{2\,d}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c),x, algorithm="fricas")
[Out] 1/2*(4*a*b*d*x + a^2*log(sin(d*x + c) + 1) - a^2*log(-sin(d*x + c) + 1) + 2
*b^2*sin(d*x + c))/d
```

Sympy [F]

$$\int (a+b\cos(c+dx))^2 \sec(c+dx)\,dx = \int (a+b\cos(c+dx))^2 \sec(c+dx)\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**2*sec(d*x+c),x)
[Out] Integral((a + b*cos(c + d*x))**2*sec(c + d*x), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.27

$$\int (a+b\cos(c+dx))^2\sec(c+dx)\,dx = \frac{2\,(dx+c)ab + a^2\log\left(\sec\left(dx+c\right)+\tan\left(dx+c\right)\right) + b^2\sin\left(dx+c\right)}{d}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c),x, algorithm="maxima")
[Out] (2*(d*x + c)*a*b + a^2*log(sec(d*x + c) + tan(d*x + c)) + b^2*sin(d*x + c))
/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 78 vs. 2(33) = 66.

Time = 0.31 (sec) , antiderivative size = 78, normalized size of antiderivative = 2.36

$$\int (a+b\cos(c+dx))^2\sec(c+dx)\,dx = \frac{2\,(dx+c)ab + a^2\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right) - a^2\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right) + \frac{2\,b^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+1}}{d}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c),x, algorithm="giac")
[Out] (2*(d*x + c)*a*b + a^2*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - a^2*log(abs(tan
(1/2*d*x + 1/2*c) - 1)) + 2*b^2*tan(1/2*d*x + 1/2*c)/(tan(1/2*d*x + 1/2*c)^
2 + 1))/d
```

Mupad [B] (verification not implemented)

Time = 14.45 (sec) , antiderivative size = 73, normalized size of antiderivative = 2.21

$$\int (a+b\cos(c+dx))^2\sec(c+dx)\,dx = \frac{b^2\,\sin\left(c+d\,x\right)}{d} + \frac{2\,a^2\,\mathrm{atanh}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d} + \frac{4\,a\,b\,\mathrm{atan}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d}$$

```
[In] int((a + b*cos(c + d*x))^2/cos(c + d*x),x)
[Out] (b^2*sin(c + d*x))/d + (2*a^2*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))
/d + (4*a*b*atan(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/d
```

3.423 $\int (a+b\cos(c+dx))^2\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 33

$$\int (a+b\cos(c+dx))^2\sec^2(c+dx)\,dx=b^2x+\frac{2ab\text{arctanh}(\sin(c+dx))}{d}+\frac{a^2\tan(c+dx)}{d}$$

```
[Out] b^2*x+2*a*b*arctanh(sin(d*x+c))/d+a^2*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2868, 3855, 3091, 8}

$$\int (a+b\cos(c+dx))^2\sec^2(c+dx)\,dx=\frac{a^2\tan(c+dx)}{d}+\frac{2ab\text{arctanh}(\sin(c+dx))}{d}+b^2x$$

```
[In] Int[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^2,x]
```

```
[Out] b^2*x + (2*a*b*ArcTanh[Sin[c + d*x]])/d + (a^2*Tan[c + d*x])/d
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2868

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)])^2, x_Symbol] :> Dist[2*c*(d/b), Int[(b*Sin[e + f*x])^(m + 1), x], x] +
 Int[(b*Sin[e + f*x])^m*(c^2 + d^2*Sin[e + f*x]^2), x] /; FreeQ[{b, c, d, e
, f, m}, x]
```

Rule 3091

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_) + (C_.)*sin[(e_.) + (f_.)*(x
_)]^2), x_Symbol] :> Simp[A*Cos[e + f*x]*((b*Sin[e + f*x])^(m + 1)/(b*f*(m
+ 1))), x] + Dist[(A*(m + 2) + C*(m + 1))/(b^2*(m + 1)), Int[(b*Sin[e + f*x
])^(m + 2), x], x] /; FreeQ[{b, e, f, A, C}, x] && LtQ[m, -1]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= (2ab)\int \sec(c+dx)\,dx + \int \left(a^2+b^2\cos^2(c+dx)\right)\sec^2(c+dx)\,dx\\ &= \frac{2ab\text{arctanh}(\sin(c+dx))}{d} + \frac{a^2\tan(c+dx)}{d} + b^2\int 1\,dx\\ &= b^2x + \frac{2ab\text{arctanh}(\sin(c+dx))}{d} + \frac{a^2\tan(c+dx)}{d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 32, normalized size of antiderivative = 0.97

$$\int (a+b\cos(c+dx))^2\sec^2(c+dx)\,dx = \frac{b^2dx + 2ab\text{arctanh}(\sin(c+dx)) + a^2\tan(c+dx)}{d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^2,x]
[Out] (b^2*d*x + 2*a*b*ArcTanh[Sin[c + d*x]] + a^2*Tan[c + d*x])/d
```

Maple [A] (verified)

Time = 2.37 (sec) , antiderivative size = 43, normalized size of antiderivative = 1.30

method	result
derivativedivides	$\frac{a^2\tan(dx+c)+2ab\ln(\sec(dx+c)+\tan(dx+c))+b^2(dx+c)}{d}$
default	$\frac{a^2\tan(dx+c)+2ab\ln(\sec(dx+c)+\tan(dx+c))+b^2(dx+c)}{d}$
parts	$\frac{a^2\tan(dx+c)}{d}+\frac{b^2(dx+c)}{d}+\frac{2ab\ln(\sec(dx+c)+\tan(dx+c))}{d}$
risch	$b^2x+\frac{2ia^2}{d(e^{2i(dx+c)}+1)}+\frac{2\ln(e^{i(dx+c)}+i)ab}{d}-\frac{2\ln(e^{i(dx+c)}-i)ab}{d}$
parallelrisch	$\frac{b^2dx\cos(dx+c)-2ab\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(dx+c)+2ab\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)\cos(dx+c)+a^2\sin(dx+c)}{d\cos(dx+c)}$
norman	$\frac{b^2x\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+b^2x\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-b^2x-\frac{2a^2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}-\frac{4a^2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-\frac{2a^2\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-b^2x\left(\tan^2\left(\right.\right.}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}$

```
[In] int((a+cos(d*x+c)*b)^2*sec(d*x+c)^2,x,method=_RETURNVERBOSE)
[Out] 1/d*(a^2*tan(d*x+c)+2*a*b*ln(sec(d*x+c)+tan(d*x+c))+b^2*(d*x+c))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 74 vs. $2(33) = 66$.

Time = 0.26 (sec) , antiderivative size = 74, normalized size of antiderivative = 2.24

$$\int (a+b\cos(c+dx))^2\sec^2(c+dx)\,dx$$
$$=\frac{b^2dx\cos(dx+c)+ab\cos(dx+c)\log(\sin(dx+c)+1)-ab\cos(dx+c)\log(-\sin(dx+c)+1)+a^2\sin}{d\cos(dx+c)}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^2,x, algorithm="fricas")
[Out] (b^2*d*x*cos(d*x + c) + a*b*cos(d*x + c)*log(sin(d*x + c) + 1) - a*b*cos(d*
x + c)*log(-sin(d*x + c) + 1) + a^2*sin(d*x + c))/(d*cos(d*x + c))
```

Sympy [F]

$$\int (a+b\cos(c+dx))^2\sec^2(c+dx)\,dx=\int (a+b\cos(c+dx))^2\sec^2(c+dx)\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**2*sec(d*x+c)**2,x)
[Out] Integral((a + b*cos(c + d*x))**2*sec(c + d*x)**2, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.45

$$\int (a+b\cos(c+dx))^2\sec^2(c+dx)\,dx = \frac{(dx+c)b^2+ab(\log(\sin(dx+c)+1)-\log(\sin(dx+c)-1))+a^2\tan(dx+c)}{d}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] ((d*x + c)*b^2 + a*b*(log(sin(d*x + c) + 1) - log(sin(d*x + c) - 1)) + a^2*
tan(d*x + c))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 77 vs. 2(33) = 66.

Time = 0.30 (sec) , antiderivative size = 77, normalized size of antiderivative = 2.33

$$\int (a+b\cos(c+dx))^2\sec^2(c+dx)\,dx = \frac{(dx+c)b^2+2\,ab\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-2\,ab\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)-\frac{2\,a^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1}}{d}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^2,x, algorithm="giac")
```

```
[Out] ((d*x + c)*b^2 + 2*a*b*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 2*a*b*log(abs(t
an(1/2*d*x + 1/2*c) - 1)) - 2*a^2*tan(1/2*d*x + 1/2*c)/(tan(1/2*d*x + 1/2*c
)^2 - 1))/d
```

Mupad [B] (verification not implemented)

Time = 14.69 (sec) , antiderivative size = 181, normalized size of antiderivative = 5.48

$$\int (a+b\cos(c+dx))^2\sec^2(c+dx)\,dx = \frac{2\,b^2\,\mathrm{atan}\left(\frac{64\,b^6\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{256\,a^2\,b^4+64\,b^6}+\frac{256\,a^2\,b^4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{256\,a^2\,b^4+64\,b^6}\right)}{d} - \frac{2\,a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{d\,\left({\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^2-1\right)} + \frac{4\,a\,b\,\mathrm{atanh}\left(\frac{128\,a\,b^5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{512\,a^3\,b^3+128\,a\,b^5}+\frac{512\,a^3\,b^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{512\,a^3\,b^3+128\,a\,b^5}\right)}{d}$$

```
[In] int((a + b*cos(c + d*x))^2/cos(c + d*x)^2,x)
```

```
[Out] (2*b^2*atan((64*b^6*tan(c/2 + (d*x)/2))/(64*b^6 + 256*a^2*b^4) + (256*a^2*b
^4*tan(c/2 + (d*x)/2))/(64*b^6 + 256*a^2*b^4)))/d - (2*a^2*tan(c/2 + (d*x)/
2))/(d*(tan(c/2 + (d*x)/2)^2 - 1)) + (4*a*b*atanh((128*a*b^5*tan(c/2 + (d*x
)/2))/(128*a*b^5 + 512*a^3*b^3) + (512*a^3*b^3*tan(c/2 + (d*x)/2))/(128*a*b
^5 + 512*a^3*b^3)))/d
```

3.424 $\int (a+b\cos(c+dx))^2\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 59

$$\int (a+b\cos(c+dx))^2\sec^3(c+dx)\,dx = \frac{(a^2+2b^2)\operatorname{arctanh}(\sin(c+dx))}{2d} + \frac{2ab\tan(c+dx)}{d} + \frac{a^2\sec(c+dx)\tan(c+dx)}{2d}$$

```
[Out] 1/2*(a^2+2*b^2)*arctanh(sin(d*x+c))/d+2*a*b*tan(d*x+c)/d+1/2*a^2*sec(d*x+c)
*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2868, 3852, 8, 3091, 3855}

$$\int (a+b\cos(c+dx))^2\sec^3(c+dx)\,dx = \frac{(a^2+2b^2)\operatorname{arctanh}(\sin(c+dx))}{2d} + \frac{a^2\tan(c+dx)\sec(c+dx)}{2d} + \frac{2ab\tan(c+dx)}{d}$$

```
[In] Int[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^3,x]
```

```
[Out] ((a^2 + 2*b^2)*ArcTanh[Sin[c + d*x]])/(2*d) + (2*a*b*Tan[c + d*x])/d + (a^2
*Sec[c + d*x]*Tan[c + d*x])/(2*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2868

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)])^2, x_Symbol] :> Dist[2*c*(d/b), Int[(b*Sin[e + f*x])^(m + 1), x], x] +
 Int[(b*Sin[e + f*x])^m*(c^2 + d^2*Sin[e + f*x]^2), x] /; FreeQ[{b, c, d, e
, f, m}, x]
```

Rule 3091

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_) + (C_.)*sin[(e_.) + (f_.)*(x
_)]^2), x_Symbol] :> Simp[A*Cos[e + f*x]*((b*Sin[e + f*x])^(m + 1)/(b*f*(m
+ 1))), x] + Dist[(A*(m + 2) + C*(m + 1))/(b^2*(m + 1)), Int[(b*Sin[e + f*x
])^(m + 2), x], x] /; FreeQ[{b, e, f, A, C}, x] && LtQ[m, -1]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= (2ab)\int \sec^2(c+dx)\,dx + \int \left(a^2+b^2\cos^2(c+dx)\right)\sec^3(c+dx)\,dx \\
&= \frac{a^2\sec(c+dx)\tan(c+dx)}{2d} + \frac{1}{2}\left(a^2+2b^2\right)\int \sec(c+dx)\,dx \\
&\quad - \frac{(2ab)\text{Subst}\left(\int 1\,dx, x, -\tan(c+dx)\right)}{d} \\
&= \frac{\left(a^2+2b^2\right)\operatorname{arctanh}(\sin(c+dx))}{2d} + \frac{2ab\tan(c+dx)}{d} + \frac{a^2\sec(c+dx)\tan(c+dx)}{2d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 67, normalized size of antiderivative = 1.14

$$
\begin{aligned}
\int (a+b\cos(c+dx))^2\sec^3(c+dx)\,dx &= \frac{a^2\operatorname{arctanh}(\sin(c+dx))}{2d} + \frac{b^2\operatorname{arctanh}(\sin(c+dx))}{d} \\
&\quad + \frac{2ab\tan(c+dx)}{d} + \frac{a^2\sec(c+dx)\tan(c+dx)}{2d}
\end{aligned}
$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^3,x]
```

```
[Out] (a^2*ArcTanh[Sin[c + d*x]])/(2*d) + (b^2*ArcTanh[Sin[c + d*x]])/d + (2*a*b*
Tan[c + d*x])/d + (a^2*Sec[c + d*x]*Tan[c + d*x])/(2*d)
```

Maple [A] (verified)

Time = 3.08 (sec) , antiderivative size = 69, normalized size of antiderivative = 1.17

method	result
derivativedivides	$\frac{a^2\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)+2ab\tan(dx+c)+b^2\ln(\sec(dx+c)+\tan(dx+c))}{d}$
default	$\frac{a^2\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)+2ab\tan(dx+c)+b^2\ln(\sec(dx+c)+\tan(dx+c))}{d}$
parts	$\frac{a^2\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}+\frac{b^2\ln(\sec(dx+c)+\tan(dx+c))}{d}+\frac{2ab\tan(dx+c)}{d}$
parallelrisch	$\frac{-(a^2+2b^2)(1+\cos(2dx+2c))\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+(a^2+2b^2)(1+\cos(2dx+2c))\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)+2a^2\sin(dx+c)+4ab}{2d(1+\cos(2dx+2c))}$
risch	$-\frac{ia(a\,e^{3i(dx+c)}-4b\,e^{2i(dx+c)}-a\,e^{i(dx+c)}-4b)}{d(e^{2i(dx+c)}+1)^2}+\frac{a^2\ln(e^{i(dx+c)}+i)}{2d}+\frac{\ln(e^{i(dx+c)}+i)b^2}{d}-\frac{a^2\ln(e^{i(dx+c)}-i)}{2d}-\ln$
norman	$\frac{\frac{a(a-4b)\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{a(a+4b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{a(3a-4b)\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{a(3a+4b)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}-\frac{(a^2+2b^2)\ln\left(\tan\left(\frac{dx}{2}\right.\right.}{2d}$

```
[In] int((a+cos(d*x+c)*b)^2*sec(d*x+c)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a^2*(1/2*sec(d*x+c)*tan(d*x+c)+1/2*ln(sec(d*x+c)+tan(d*x+c)))+2*a*b*ta
n(d*x+c)+b^2*ln(sec(d*x+c)+tan(d*x+c)))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 93, normalized size of antiderivative = 1.58

$$\int (a+b\cos(c+dx))^2\sec^3(c+dx)\,dx$$
$$=\frac{(a^2+2\,b^2)\cos{(dx+c)}^2\log{(\sin{(dx+c)}+1)}-(a^2+2\,b^2)\cos{(dx+c)}^2\log{(-\sin{(dx+c)}+1)}+2\,(4\,ab\,c}{4\,d\cos{(dx+c)}^2}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] 1/4*((a^2 + 2*b^2)*cos(d*x + c)^2*log(sin(d*x + c) + 1) - (a^2 + 2*b^2)*cos
(d*x + c)^2*log(-sin(d*x + c) + 1) + 2*(4*a*b*cos(d*x + c) + a^2)*sin(d*x +
 c))/(d*cos(d*x + c)^2)
```

Sympy [F]

$$\int (a+b\cos(c+dx))^2\sec^3(c+dx)\,dx = \int (a+b\cos(c+dx))^2\sec^3(c+dx)\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**2*sec(d*x+c)**3,x)
[Out] Integral((a + b*cos(c + d*x))**2*sec(c + d*x)**3, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.19 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.47

$$\int (a+b\cos(c+dx))^2\sec^3(c+dx)\,dx =$$
$$-\frac{a^2\left(\frac{2\sin(dx+c)}{\sin(dx+c)^2-1}-\log(\sin(dx+c)+1)+\log(\sin(dx+c)-1)\right)-2b^2(\log(\sin(dx+c)+1)-\log(\sin}{4d}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^3,x, algorithm="maxima")
[Out] -1/4*(a^2*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(d*x + c) + 1) + lo
g(sin(d*x + c) - 1)) - 2*b^2*(log(sin(d*x + c) + 1) - log(sin(d*x + c) - 1)
) - 8*a*b*tan(d*x + c))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 127 vs. 2(55) = 110.

Time = 0.30 (sec) , antiderivative size = 127, normalized size of antiderivative = 2.15

$$\int (a+b\cos(c+dx))^2\sec^3(c+dx)\,dx$$
$$=\frac{(a^2+2b^2)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)-(a^2+2b^2)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right)+\frac{2\left(a^2\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-4ab\tan}{}}{2d}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^3,x, algorithm="giac")
[Out] 1/2*((a^2 + 2*b^2)*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - (a^2 + 2*b^2)*log(a
bs(tan(1/2*d*x + 1/2*c) - 1)) + 2*(a^2*tan(1/2*d*x + 1/2*c)^3 - 4*a*b*tan(1
/2*d*x + 1/2*c)^3 + a^2*tan(1/2*d*x + 1/2*c) + 4*a*b*tan(1/2*d*x + 1/2*c))/
(tan(1/2*d*x + 1/2*c)^2 - 1)^2)/d
```

Mupad [B] (verification not implemented)

Time = 15.29 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.68

$$\int (a+b\cos(c+dx))^2\sec^3(c+dx)\,dx$$
$$=\frac{\operatorname{atanh}\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)\,(a^2+2b^2)}{d}-\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^3(4ab-a^2)-\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\,(a^2+4ba)}{d\,\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^4-2\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2+1\right)}$$

```
[In] int((a + b*cos(c + d*x))^2/cos(c + d*x)^3,x)
```

```
[Out] (atanh(tan(c/2 + (d*x)/2))*(a^2 + 2*b^2))/d - (tan(c/2 + (d*x)/2)^3*(4*a*b
- a^2) - tan(c/2 + (d*x)/2)*(4*a*b + a^2))/(d*(tan(c/2 + (d*x)/2)^4 - 2*tan
(c/2 + (d*x)/2)^2 + 1))
```

3.425 $\int (a+b\cos(c+dx))^2\sec^4(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 80

$$\int (a+b\cos(c+dx))^2\sec^4(c+dx)\,dx=\frac{ab\text{arctanh}(\sin(c+dx))}{d}+\frac{(2a^2+3b^2)\tan(c+dx)}{3d}+\frac{ab\sec(c+dx)\tan(c+dx)}{d}+\frac{a^2\sec^2(c+dx)\tan(c+dx)}{3d}$$

```
[Out] a*b*arctanh(sin(d*x+c))/d+1/3*(2*a^2+3*b^2)*tan(d*x+c)/d+a*b*sec(d*x+c)*tan
(d*x+c)/d+1/3*a^2*sec(d*x+c)^2*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2868, 3853, 3855, 3091, 3852, 8}

$$\int (a+b\cos(c+dx))^2\sec^4(c+dx)\,dx=\frac{(2a^2+3b^2)\tan(c+dx)}{3d}+\frac{a^2\tan(c+dx)\sec^2(c+dx)}{3d}+\frac{ab\text{arctanh}(\sin(c+dx))}{d}+\frac{ab\tan(c+dx)\sec(c+dx)}{d}$$

```
[In] Int[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^4,x]
```

```
[Out] (a*b*ArcTanh[Sin[c + d*x]])/d + ((2*a^2 + 3*b^2)*Tan[c + d*x])/(3*d) + (a*b
*Sec[c + d*x]*Tan[c + d*x])/d + (a^2*Sec[c + d*x]^2*Tan[c + d*x])/(3*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2868

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)])^2, x_Symbol] :> Dist[2*c*(d/b), Int[(b*Sin[e + f*x])^(m + 1), x], x] +
 Int[(b*Sin[e + f*x])^m*(c^2 + d^2*Sin[e + f*x]^2), x] /; FreeQ[{b, c, d, e
, f, m}, x]
```

Rule 3091

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_) + (C_.)*sin[(e_.) + (f_.)*(x
_)]^2), x_Symbol] :> Simp[A*Cos[e + f*x]*((b*Sin[e + f*x])^(m + 1)/(b*f*(m
+ 1))), x] + Dist[(A*(m + 2) + C*(m + 1))/(b^2*(m + 1)), Int[(b*Sin[e + f*x
])^(m + 2), x], x] /; FreeQ[{b, e, f, A, C}, x] && LtQ[m, -1]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= (2ab)\int \sec^3(c+dx)\,dx + \int \left(a^2+b^2\cos^2(c+dx)\right)\sec^4(c+dx)\,dx \\
&= \frac{ab\sec(c+dx)\tan(c+dx)}{d} + \frac{a^2\sec^2(c+dx)\tan(c+dx)}{3d} \\
&\quad + (ab)\int \sec(c+dx)\,dx + \frac{1}{3}\left(2a^2+3b^2\right)\int \sec^2(c+dx)\,dx
\end{aligned}$$

$$
\begin{aligned}
&= \frac{ab\text{arctanh}(\sin(c+dx))}{d} + \frac{ab\sec(c+dx)\tan(c+dx)}{d} \\
&\quad + \frac{a^2\sec^2(c+dx)\tan(c+dx)}{3d} - \frac{(2a^2+3b^2)\,\text{Subst}(\int 1\,dx, x, -\tan(c+dx))}{3d} \\
&= \frac{ab\text{arctanh}(\sin(c+dx))}{d} + \frac{(2a^2+3b^2)\tan(c+dx)}{3d} \\
&\quad + \frac{ab\sec(c+dx)\tan(c+dx)}{d} + \frac{a^2\sec^2(c+dx)\tan(c+dx)}{3d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.89

$$
\begin{aligned}
\int (a+b\cos(c+dx))^2\sec^4(c+dx)\,dx &= \frac{ab\text{arctanh}(\sin(c+dx))}{d} + \frac{b^2\tan(c+dx)}{d} \\
&\quad + \frac{ab\sec(c+dx)\tan(c+dx)}{d} \\
&\quad + \frac{a^2\left(\tan(c+dx)+\frac{1}{3}\tan^3(c+dx)\right)}{d}
\end{aligned}
$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^4,x]
```

```
[Out] (a*b*ArcTanh[Sin[c + d*x]])/d + (b^2*Tan[c + d*x])/d + (a*b*Sec[c + d*x]*Ta
n[c + d*x])/d + (a^2*(Tan[c + d*x] + Tan[c + d*x]^3/3))/d
```

Maple [A] (verified)

Time = 4.02 (sec) , antiderivative size = 74, normalized size of antiderivative = 0.92

method	result
derivativedivides	$\frac{-a^2\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+2ab\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)+b^2\tan(dx+c)}{d}$
default	$\frac{-a^2\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+2ab\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)+b^2\tan(dx+c)}{d}$
parts	$-\frac{a^2\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)}{d}+\frac{b^2\tan(dx+c)}{d}+\frac{ab\sec(dx+c)\tan(dx+c)}{d}+\frac{ab\ln(\sec(dx+c)+\tan(dx+c))}{d}$
risch	$-\frac{2i\left(3ab\,e^{5i(dx+c)}-3b^2e^{4i(dx+c)}-6a^2e^{2i(dx+c)}-6b^2e^{2i(dx+c)}-3ab\,e^{i(dx+c)}-2a^2-3b^2\right)}{3d\left(e^{2i(dx+c)}+1\right)^3}+\frac{\ln\left(e^{i(dx+c)}+i\right)ab}{d}-\frac{\ln(e^{i(d}}{}$
parallelrisch	$\frac{-9b\left(\frac{\cos(3dx+3c)}{3}+\cos(dx+c)\right)a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+9b\left(\frac{\cos(3dx+3c)}{3}+\cos(dx+c)\right)a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)+(2a^2+3b^2)\sin}{3d(\cos(3dx+3c)+3\cos(dx+c))}$
norman	$\frac{-\frac{4\left(a^2-3b^2\right)\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}-\frac{2\left(a^2-ab+b^2\right)\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-\frac{2\left(a^2+ab+b^2\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}-\frac{4a(2a-3b)\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}-\frac{4a(2a+3}{}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^3}$

[In] int((a+cos(d*x+c)*b)^2*sec(d*x+c)^4,x,method=_RETURNVERBOSE)

[Out] 1/d*(-a^2*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c)+2*a*b*(1/2*sec(d*x+c)*tan(d*x+c)+1/2*ln(sec(d*x+c)+tan(d*x+c)))+b^2*tan(d*x+c))

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 100, normalized size of antiderivative = 1.25

$$\int (a+b\cos(c+dx))^2\sec^4(c+dx)\,dx$$

$$=\frac{3\,ab\cos(dx+c)^3\log(\sin(dx+c)+1)-3\,ab\cos(dx+c)^3\log(-\sin(dx+c)+1)+2\left(3\,ab\cos(dx+c)+\right.}{6\,d\cos(dx+c)^3}$$

[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^4,x, algorithm="fricas")

[Out] 1/6*(3*a*b*cos(d*x + c)^3*log(sin(d*x + c) + 1) - 3*a*b*cos(d*x + c)^3*log(-sin(d*x + c) + 1) + 2*(3*a*b*cos(d*x + c) + (2*a^2 + 3*b^2)*cos(d*x + c)^2 + a^2)*sin(d*x + c))/(d*cos(d*x + c)^3)

Sympy [F]

$$\int (a+b\cos(c+dx))^2\sec^4(c+dx)\,dx=\int (a+b\cos(c+dx))^2\sec^4(c+dx)\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**2*sec(d*x+c)**4,x)
[Out] Integral((a + b*cos(c + d*x))**2*sec(c + d*x)**4, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.19 (sec) , antiderivative size = 84, normalized size of antiderivative = 1.05

$$\int (a+b\cos(c+dx))^2\sec^4(c+dx)\,dx$$
$$=\frac{2\left(\tan(dx+c)^3+3\tan(dx+c)\right)a^2-3\,ab\left(\frac{2\sin(dx+c)}{\sin(dx+c)^2-1}-\log(\sin(dx+c)+1)+\log(\sin(dx+c)-1)\right)}{6\,d}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^4,x, algorithm="maxima")
[Out] 1/6*(2*(tan(d*x + c)^3 + 3*tan(d*x + c))*a^2 - 3*a*b*(2*sin(d*x + c)/(sin(d
*x + c)^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)) + 6*b^2*tan
(d*x + c))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 178 vs. 2(76) = 152.

Time = 0.30 (sec) , antiderivative size = 178, normalized size of antiderivative = 2.22

$$\int (a+b\cos(c+dx))^2\sec^4(c+dx)\,dx$$
$$=\frac{3\,ab\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-3\,ab\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)-\frac{2\left(3\,a^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-3\,ab\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5+3}{}}{3\,d}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^4,x, algorithm="giac")
[Out] 1/3*(3*a*b*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 3*a*b*log(abs(tan(1/2*d*x +
 1/2*c) - 1)) - 2*(3*a^2*tan(1/2*d*x + 1/2*c)^5 - 3*a*b*tan(1/2*d*x + 1/2*c
)^5 + 3*b^2*tan(1/2*d*x + 1/2*c)^5 - 2*a^2*tan(1/2*d*x + 1/2*c)^3 - 6*b^2*t
an(1/2*d*x + 1/2*c)^3 + 3*a^2*tan(1/2*d*x + 1/2*c) + 3*a*b*tan(1/2*d*x + 1/
2*c) + 3*b^2*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2 - 1)^3)/d
```

Mupad [B] (verification not implemented)

Time = 17.13 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.76

$$\int (a+b\cos(c+dx))^2\sec^4(c+dx)\,dx = \frac{2\,a\,b\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d} - \frac{\left(2\,a^2-2\,a\,b+2\,b^2\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5+\left(-\frac{4\,a^2}{3}-4\,b^2\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3+\left(2\,a^2+2\,a\,b+2\,b^2\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6-3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-1\right)}$$

```
[In] int((a + b*cos(c + d*x))^2/cos(c + d*x)^4,x)
```

```
[Out] (2*a*b*atanh(tan(c/2 + (d*x)/2)))/d - (tan(c/2 + (d*x)/2)^5*(2*a^2 - 2*a*b
+ 2*b^2) - tan(c/2 + (d*x)/2)^3*((4*a^2)/3 + 4*b^2) + tan(c/2 + (d*x)/2)*(2
*a*b + 2*a^2 + 2*b^2))/(d*(3*tan(c/2 + (d*x)/2)^2 - 3*tan(c/2 + (d*x)/2)^4
+ tan(c/2 + (d*x)/2)^6 - 1))
```

3.426 $\int (a+b\cos(c+dx))^2\sec^5(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 110

$$\int (a+b\cos(c+dx))^2\sec^5(c+dx)\,dx=\frac{(3a^2+4b^2)\operatorname{arctanh}(\sin(c+dx))}{8d}+\frac{2ab\tan(c+dx)}{d}+\frac{(3a^2+4b^2)\sec(c+dx)\tan(c+dx)}{8d}+\frac{a^2\sec^3(c+dx)\tan(c+dx)}{4d}+\frac{2ab\tan^3(c+dx)}{3d}$$

```
[Out] 1/8*(3*a^2+4*b^2)*arctanh(sin(d*x+c))/d+2*a*b*tan(d*x+c)/d+1/8*(3*a^2+4*b^2
)*sec(d*x+c)*tan(d*x+c)/d+1/4*a^2*sec(d*x+c)^3*tan(d*x+c)/d+2/3*a*b*tan(d*x
+c)^3/d
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2868, 3852, 3091, 3853, 3855}

$$\int (a+b\cos(c+dx))^2\sec^5(c+dx)\,dx=\frac{(3a^2+4b^2)\operatorname{arctanh}(\sin(c+dx))}{8d}+\frac{(3a^2+4b^2)\tan(c+dx)\sec(c+dx)}{8d}+\frac{a^2\tan(c+dx)\sec^3(c+dx)}{4d}+\frac{2ab\tan^3(c+dx)}{3d}+\frac{2ab\tan(c+dx)}{d}$$

```
[In] Int[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^5,x]
```

```
[Out] ((3*a^2 + 4*b^2)*ArcTanh[Sin[c + d*x]])/(8*d) + (2*a*b*Tan[c + d*x])/d + ((
3*a^2 + 4*b^2)*Sec[c + d*x]*Tan[c + d*x])/(8*d) + (a^2*Sec[c + d*x]^3*Tan[c
 + d*x])/(4*d) + (2*a*b*Tan[c + d*x]^3)/(3*d)
```

Rule 2868

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)])^2, x_Symbol] :> Dist[2*c*(d/b), Int[(b*Sin[e + f*x])^(m + 1), x], x] +
 Int[(b*Sin[e + f*x])^m*(c^2 + d^2*Sin[e + f*x]^2), x] /; FreeQ[{b, c, d, e
, f, m}, x]
```

Rule 3091

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_) + (C_.)*sin[(e_.) + (f_.)*(x
_)]^2), x_Symbol] :> Simp[A*Cos[e + f*x]*((b*Sin[e + f*x])^(m + 1)/(b*f*(m
+ 1))), x] + Dist[(A*(m + 2) + C*(m + 1))/(b^2*(m + 1)), Int[(b*Sin[e + f*x
])^(m + 2), x], x] /; FreeQ[{b, e, f, A, C}, x] && LtQ[m, -1]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= (2ab)\int \sec^4(c+dx)\,dx+\int \left(a^2+b^2\cos^2(c+dx)\right)\sec^5(c+dx)\,dx\\ &= \frac{a^2\sec^3(c+dx)\tan(c+dx)}{4d}+\frac{1}{4}\left(3a^2+4b^2\right)\int \sec^3(c+dx)\,dx\\ &\quad -\frac{(2ab)\text{Subst}\left(\int \left(1+x^2\right)\,dx,x,-\tan(c+dx)\right)}{d}\end{aligned}$$

$$= \frac{2ab\tan(c+dx)}{d} + \frac{(3a^2+4b^2)\sec(c+dx)\tan(c+dx)}{8d} + \frac{a^2\sec^3(c+dx)\tan(c+dx)}{4d} + \frac{2ab\tan^3(c+dx)}{3d} + \frac{1}{8}(3a^2+4b^2)\int\sec(c+dx)\,dx$$

$$= \frac{(3a^2+4b^2)\,\text{arctanh}(\sin(c+dx))}{8d} + \frac{2ab\tan(c+dx)}{d} + \frac{(3a^2+4b^2)\sec(c+dx)\tan(c+dx)}{8d} + \frac{a^2\sec^3(c+dx)\tan(c+dx)}{4d} + \frac{2ab\tan^3(c+dx)}{3d}$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 82, normalized size of antiderivative = 0.75

$$\int(a+b\cos(c+dx))^2\sec^5(c+dx)\,dx = \frac{3(3a^2+4b^2)\,\text{arctanh}(\sin(c+dx)) + \tan(c+dx)\,(3(3a^2+4b^2)\sec(c+dx) + 6a^2\sec^3(c+dx) + 16ab(3+}{24d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^5,x]
```

```
[Out] (3*(3*a^2 + 4*b^2)*ArcTanh[Sin[c + d*x]] + Tan[c + d*x]*(3*(3*a^2 + 4*b^2)*
Sec[c + d*x] + 6*a^2*Sec[c + d*x]^3 + 16*a*b*(3 + Tan[c + d*x]^2)))/(24*d)
```

Maple [A] (verified)

Time = 3.76 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.01

method	result
derivativedivides	$\frac{a^2\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)-2ab\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+b^2\left(\right.}{d}$
default	$\frac{a^2\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)-2ab\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+b^2\left(\right.}{d}$
parts	$\frac{a^2\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)}{d}+\frac{b^2\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\mathrm{ta}}{2}\right.}{d}$
parallelrisch	$\frac{-36\left(a^2+\frac{4b^2}{3}\right)\left(\frac{3}{4}+\frac{\cos(4dx+4c)}{4}+\cos(2dx+2c)\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+36\left(a^2+\frac{4b^2}{3}\right)\left(\frac{3}{4}+\frac{\cos(4dx+4c)}{4}+\cos(2dx+2c)\right)\ln\left(\mathrm{ta}\right.}{24d(\cos(4dx+4c)+4\cos(}$
risch	$-\frac{i\left(9a^2\mathrm{e}^{7i(dx+c)}+12b^2\mathrm{e}^{7i(dx+c)}+33a^2\mathrm{e}^{5i(dx+c)}+12b^2\mathrm{e}^{5i(dx+c)}-96ab\,\mathrm{e}^{4i(dx+c)}-33a^2\mathrm{e}^{3i(dx+c)}-12b^2\mathrm{e}^{3i(dx+c)}-128ab\,\mathrm{e}\right.}{12d\left(\mathrm{e}^{2i(dx+c)}+1\right)^4}$
norman	$\frac{\frac{\left(5a^2-16ab+4b^2\right)\left(\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}+\frac{\left(5a^2+16ab+4b^2\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d}+\frac{\left(21a^2-16ab-12b^2\right)\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{6d}+\frac{\left(21a^2+16ab-12b^2\right)\left(\mathrm{ta}\right.}{6d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}$

```
[In] int((a+cos(d*x+c)*b)^2*sec(d*x+c)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a^2*(-(-1/4*sec(d*x+c)^3-3/8*sec(d*x+c))*tan(d*x+c)+3/8*ln(sec(d*x+c)+
tan(d*x+c)))-2*a*b*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c)+b^2*(1/2*sec(d*x+c)*t
an(d*x+c)+1/2*ln(sec(d*x+c)+tan(d*x+c))))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 133, normalized size of antiderivative = 1.21

$$\int (a+b\cos(c+dx))^2\sec^5(c+dx)\,dx$$
$$=\frac{3\left(3a^2+4b^2\right)\cos\left(dx+c\right)^4\log\left(\sin\left(dx+c\right)+1\right)-3\left(3a^2+4b^2\right)\cos\left(dx+c\right)^4\log\left(-\sin\left(dx+c\right)+1\right)+2}{48\,d\cos\left(dx+c\right)^4}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] 1/48*(3*(3*a^2 + 4*b^2)*cos(d*x + c)^4*log(sin(d*x + c) + 1) - 3*(3*a^2 + 4
*b^2)*cos(d*x + c)^4*log(-sin(d*x + c) + 1) + 2*(32*a*b*cos(d*x + c)^3 + 16
*a*b*cos(d*x + c) + 3*(3*a^2 + 4*b^2)*cos(d*x + c)^2 + 6*a^2)*sin(d*x + c))
/(d*cos(d*x + c)^4)
```

Sympy [F]

$$\int (a+b\cos(c+dx))^2\sec^5(c+dx)\,dx = \int (a+b\cos{(c+dx)})^2\sec^5{(c+dx)}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**2*sec(d*x+c)**5,x)
[Out] Integral((a + b*cos(c + d*x))**2*sec(c + d*x)**5, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.21 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.31

$$\int (a+b\cos(c+dx))^2\sec^5(c+dx)\,dx$$
$$= \frac{32\left(\tan{(dx+c)}^3+3\tan{(dx+c)}\right)ab-3a^2\left(\frac{2\left(3\sin(dx+c)^3-5\sin(dx+c)\right)}{\sin(dx+c)^4-2\sin(dx+c)^2+1}-3\log{(\sin{(dx+c)}+1)}+3\log{(\mathrm{s}}\right.}{48\,d}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^5,x, algorithm="maxima")
[Out] 1/48*(32*(tan(d*x + c)^3 + 3*tan(d*x + c))*a*b - 3*a^2*(2*(3*sin(d*x + c)^3
 - 5*sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2 + 1) - 3*log(sin(d*x
+ c) + 1) + 3*log(sin(d*x + c) - 1)) - 12*b^2*(2*sin(d*x + c)/(sin(d*x + c)
^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 258 vs. $2(102) = 204$.

Time = 0.32 (sec) , antiderivative size = 258, normalized size of antiderivative = 2.35

$$\int (a+b\cos(c+dx))^2\sec^5(c+dx)\,dx$$
$$= \frac{3\left(3a^2+4b^2\right)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)-3\left(3a^2+4b^2\right)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right)+\frac{2\left(15a^2\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right.\right.}{}}{}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^5,x, algorithm="giac")
[Out] 1/24*(3*(3*a^2 + 4*b^2)*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 3*(3*a^2 + 4*b
^2)*log(abs(tan(1/2*d*x + 1/2*c) - 1)) + 2*(15*a^2*tan(1/2*d*x + 1/2*c)^7 -
 48*a*b*tan(1/2*d*x + 1/2*c)^7 + 12*b^2*tan(1/2*d*x + 1/2*c)^7 + 9*a^2*tan(
```

```
1/2*d*x + 1/2*c)^5 + 80*a*b*tan(1/2*d*x + 1/2*c)^5 - 12*b^2*tan(1/2*d*x + 1
/2*c)^5 + 9*a^2*tan(1/2*d*x + 1/2*c)^3 - 80*a*b*tan(1/2*d*x + 1/2*c)^3 - 12
*b^2*tan(1/2*d*x + 1/2*c)^3 + 15*a^2*tan(1/2*d*x + 1/2*c) + 48*a*b*tan(1/2*
d*x + 1/2*c) + 12*b^2*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2 - 1)^4)
/d
```

Mupad [B] (verification not implemented)

Time = 18.04 (sec) , antiderivative size = 184, normalized size of antiderivative = 1.67

$$\int (a+b\cos(c+dx))^2\sec^5(c+dx)\,dx = \frac{\operatorname{atanh}\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)\,\left(\frac{3a^2}{4}+b^2\right)}{d} + \frac{\left(\frac{5a^2}{4}-4ab+b^2\right)\,\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^7+\left(\frac{3a^2}{4}+\frac{20ab}{3}-b^2\right)\,\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^5+\left(\frac{3a^2}{4}-\frac{20ab}{3}-b^2\right)\,\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^3}{d\,\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^8-4\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^6+6\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^4-4\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2+\right.}$$

```
[In] int((a + b*cos(c + d*x))^2/cos(c + d*x)^5,x)
```

```
[Out] (atanh(tan(c/2 + (d*x)/2))*((3*a^2)/4 + b^2))/d + (tan(c/2 + (d*x)/2)^5*((2
0*a*b)/3 + (3*a^2)/4 - b^2) + tan(c/2 + (d*x)/2)*(4*a*b + (5*a^2)/4 + b^2)
+ tan(c/2 + (d*x)/2)^7*((5*a^2)/4 - 4*a*b + b^2) - tan(c/2 + (d*x)/2)^3*((2
0*a*b)/3 - (3*a^2)/4 + b^2))/(d*(6*tan(c/2 + (d*x)/2)^4 - 4*tan(c/2 + (d*x)
/2)^2 - 4*tan(c/2 + (d*x)/2)^6 + tan(c/2 + (d*x)/2)^8 + 1))
```

3.427 $\int (a+b\cos(c+dx))^2\sec^6(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 135

$$\int (a+b\cos(c+dx))^2\sec^6(c+dx)\,dx = \frac{3ab\text{arctanh}(\sin(c+dx))}{4d} + \frac{(4a^2+5b^2)\tan(c+dx)}{5d} + \frac{3ab\sec(c+dx)\tan(c+dx)}{4d} + \frac{ab\sec^3(c+dx)\tan(c+dx)}{2d} + \frac{a^2\sec^4(c+dx)\tan(c+dx)}{5d} + \frac{(4a^2+5b^2)\tan^3(c+dx)}{15d}$$

```
[Out] 3/4*a*b*arctanh(sin(d*x+c))/d+1/5*(4*a^2+5*b^2)*tan(d*x+c)/d+3/4*a*b*sec(d*
x+c)*tan(d*x+c)/d+1/2*a*b*sec(d*x+c)^3*tan(d*x+c)/d+1/5*a^2*sec(d*x+c)^4*ta
n(d*x+c)/d+1/15*(4*a^2+5*b^2)*tan(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used

$= \{2868, 3853, 3855, 3091, 3852\}$

$$\int (a+b\cos(c+dx))^2\sec^6(c+dx)\,dx = \frac{(4a^2+5b^2)\tan^3(c+dx)}{15d} + \frac{(4a^2+5b^2)\tan(c+dx)}{5d} + \frac{a^2\tan(c+dx)\sec^4(c+dx)}{5d} + \frac{3ab\text{arctanh}(\sin(c+dx))}{4d} + \frac{ab\tan(c+dx)\sec^3(c+dx)}{2d} + \frac{3ab\tan(c+dx)\sec(c+dx)}{4d}$$

```
[In] Int[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^6,x]
```

```
[Out] (3*a*b*ArcTanh[Sin[c + d*x]])/(4*d) + ((4*a^2 + 5*b^2)*Tan[c + d*x])/(5*d)
+ (3*a*b*Sec[c + d*x]*Tan[c + d*x])/(4*d) + (a*b*Sec[c + d*x]^3*Tan[c + d*x
])/(2*d) + (a^2*Sec[c + d*x]^4*Tan[c + d*x])/(5*d) + ((4*a^2 + 5*b^2)*Tan[c
 + d*x]^3)/(15*d)
```

Rule 2868

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)])^2, x_Symbol] :> Dist[2*c*(d/b), Int[(b*Sin[e + f*x])^(m + 1), x], x] +
 Int[(b*Sin[e + f*x])^m*(c^2 + d^2*Sin[e + f*x]^2), x] /; FreeQ[{b, c, d, e
, f, m}, x]
```

Rule 3091

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_) + (C_.)*sin[(e_.) + (f_.)*(x
_)]^2), x_Symbol] :> Simp[A*Cos[e + f*x]*((b*Sin[e + f*x])^(m + 1)/(b*f*(m
+ 1))), x] + Dist[(A*(m + 2) + C*(m + 1))/(b^2*(m + 1)), Int[(b*Sin[e + f*x
])^(m + 2), x], x] /; FreeQ[{b, e, f, A, C}, x] && LtQ[m, -1]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= (2ab)\int \sec^5(c+dx)\,dx + \int \left(a^2+b^2\cos^2(c+dx)\right)\sec^6(c+dx)\,dx \\
&= \frac{ab\sec^3(c+dx)\tan(c+dx)}{2d} + \frac{a^2\sec^4(c+dx)\tan(c+dx)}{5d} \\
&\quad + \frac{1}{2}(3ab)\int \sec^3(c+dx)\,dx + \frac{1}{5}\left(4a^2+5b^2\right)\int \sec^4(c+dx)\,dx \\
&= \frac{3ab\sec(c+dx)\tan(c+dx)}{4d} + \frac{ab\sec^3(c+dx)\tan(c+dx)}{2d} + \frac{a^2\sec^4(c+dx)\tan(c+dx)}{5d} \\
&\quad + \frac{1}{4}(3ab)\int \sec(c+dx)\,dx - \frac{(4a^2+5b^2)\,\text{Subst}\left(\int (1+x^2)\,dx, x, -\tan(c+dx)\right)}{5d} \\
&= \frac{3ab\text{arctanh}(\sin(c+dx))}{4d} + \frac{(4a^2+5b^2)\tan(c+dx)}{5d} + \frac{3ab\sec(c+dx)\tan(c+dx)}{4d} \\
&\quad + \frac{ab\sec^3(c+dx)\tan(c+dx)}{2d} + \frac{a^2\sec^4(c+dx)\tan(c+dx)}{5d} + \frac{(4a^2+5b^2)\tan^3(c+dx)}{15d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.39 (sec) , antiderivative size = 90, normalized size of antiderivative = 0.67

$$\int (a+b\cos(c+dx))^2\sec^6(c+dx)\,dx = \frac{45ab\text{arctanh}(\sin(c+dx)) + \tan(c+dx)\left(60(a^2+b^2) + 45ab\sec(c+dx) + 30ab\sec^3(c+dx) + 20(2a^2+ \right.}{60d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^6,x]
```

```
[Out] (45*a*b*ArcTanh[Sin[c + d*x]] + Tan[c + d*x]*(60*(a^2 + b^2) + 45*a*b*Sec[c
 + d*x] + 30*a*b*Sec[c + d*x]^3 + 20*(2*a^2 + b^2)*Tan[c + d*x]^2 + 12*a^2*
Tan[c + d*x]^4))/(60*d)
```

Maple [A] (verified)

Time = 4.33 (sec) , antiderivative size = 110, normalized size of antiderivative = 0.81

method	result
derivativedivides	$\frac{-a^2\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c)\right)}{5}-\frac{4\left(\sec^2(dx+c)\right)}{15}\right)\tan(dx+c)+2ab\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)}{8}\right.}{d}$
default	$\frac{-a^2\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c)\right)}{5}-\frac{4\left(\sec^2(dx+c)\right)}{15}\right)\tan(dx+c)+2ab\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)}{8}\right.}{d}$
parts	$-\frac{a^2\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c)\right)}{5}-\frac{4\left(\sec^2(dx+c)\right)}{15}\right)\tan(dx+c)}{d}-\frac{b^2\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)}{d}+\frac{2ab\left(-\left(-\frac{\left(\sec^3(dx+c\right.}{4}\right.\right.}{}$
risch	$-\frac{i\left(45ab\,\mathrm{e}^{9i(dx+c)}+210ab\,\mathrm{e}^{7i(dx+c)}-120b^2\mathrm{e}^{6i(dx+c)}-320a^2\mathrm{e}^{4i(dx+c)}-280b^2\mathrm{e}^{4i(dx+c)}-210ab\,\mathrm{e}^{3i(dx+c)}-160a^2\mathrm{e}^{2i(dx+c)}\right.}{30d\left(\mathrm{e}^{2i(dx+c)}+1\right)^5}$
parallelrisch	$\frac{-450b\left(\frac{\cos(5dx+5c)}{10}+\frac{\cos(3dx+3c)}{2}+\cos(dx+c)\right)a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+450b\left(\frac{\cos(5dx+5c)}{10}+\frac{\cos(3dx+3c)}{2}+\cos(dx+c)\right)a\ln\left(\mathrm{t}\right.}{60d(\cos(5dx+}$
norman	$\frac{-\frac{8\left(19a^2+5b^2\right)\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{15d}-\frac{4\left(a^2-3ab-b^2\right)\left(\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}-\frac{4\left(a^2+3ab-b^2\right)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3d}-\frac{\left(4a^2-5ab+4b^2\right)\left(\tan^{13}\left(\frac{dx}{2}\right.\right.}{2d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2\left(\tan^2\left(\frac{d}{2}\right.\right.}$

```
[In] int((a+cos(d*x+c)*b)^2*sec(d*x+c)^6,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-a^2*(-8/15-1/5*sec(d*x+c)^4-4/15*sec(d*x+c)^2)*tan(d*x+c)+2*a*b*(-(-1
/4*sec(d*x+c)^3-3/8*sec(d*x+c))*tan(d*x+c)+3/8*ln(sec(d*x+c)+tan(d*x+c)))-b
^2*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.01

$$\int (a+b\cos(c+dx))^2\sec^6(c+dx)\,dx$$
$$=\frac{45\,ab\cos\left(dx+c\right)^5\log\left(\sin\left(dx+c\right)+1\right)-45\,ab\cos\left(dx+c\right)^5\log\left(-\sin\left(dx+c\right)+1\right)+2\left(45\,ab\cos\left(dx+c\right.\right.}{120\,d\cos\left(d\right.}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^6,x, algorithm="fricas")
```

```
[Out] 1/120*(45*a*b*cos(d*x + c)^5*log(sin(d*x + c) + 1) - 45*a*b*cos(d*x + c)^5*
log(-sin(d*x + c) + 1) + 2*(45*a*b*cos(d*x + c)^3 + 8*(4*a^2 + 5*b^2)*cos(d
*x + c)^4 + 30*a*b*cos(d*x + c) + 4*(4*a^2 + 5*b^2)*cos(d*x + c)^2 + 12*a^2
)*sin(d*x + c))/(d*cos(d*x + c)^5)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^2\sec^6(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**2*sec(d*x+c)**6,x)
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 132, normalized size of antiderivative = 0.98

$$\int (a+b\cos(c+dx))^2\sec^6(c+dx)\,dx$$
$$= \frac{8\left(3\tan(dx+c)^5+10\tan(dx+c)^3+15\tan(dx+c)\right)a^2+40\left(\tan(dx+c)^3+3\tan(dx+c)\right)b^2-15a}{120\,d}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^6,x, algorithm="maxima")
[Out] 1/120*(8*(3*tan(d*x + c)^5 + 10*tan(d*x + c)^3 + 15*tan(d*x + c))*a^2 + 40*
(tan(d*x + c)^3 + 3*tan(d*x + c))*b^2 - 15*a*b*(2*(3*sin(d*x + c)^3 - 5*sin
(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2 + 1) - 3*log(sin(d*x + c) + 1
) + 3*log(sin(d*x + c) - 1)))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 272 vs. 2(123) = 246.

Time = 0.33 (sec) , antiderivative size = 272, normalized size of antiderivative = 2.01

$$\int (a+b\cos(c+dx))^2\sec^6(c+dx)\,dx$$
$$= \frac{45\,ab\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-45\,ab\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)-\frac{2\left(60\,a^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^9-75\,ab\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right.}{}}{}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^6,x, algorithm="giac")
[Out] 1/60*(45*a*b*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 45*a*b*log(abs(tan(1/2*d*
x + 1/2*c) - 1)) - 2*(60*a^2*tan(1/2*d*x + 1/2*c)^9 - 75*a*b*tan(1/2*d*x +
1/2*c)^9 + 60*b^2*tan(1/2*d*x + 1/2*c)^9 - 80*a^2*tan(1/2*d*x + 1/2*c)^7 +
```

```
30*a*b*tan(1/2*d*x + 1/2*c)^7 - 160*b^2*tan(1/2*d*x + 1/2*c)^7 + 232*a^2*ta
n(1/2*d*x + 1/2*c)^5 + 200*b^2*tan(1/2*d*x + 1/2*c)^5 - 80*a^2*tan(1/2*d*x
+ 1/2*c)^3 - 30*a*b*tan(1/2*d*x + 1/2*c)^3 - 160*b^2*tan(1/2*d*x + 1/2*c)^3
 + 60*a^2*tan(1/2*d*x + 1/2*c) + 75*a*b*tan(1/2*d*x + 1/2*c) + 60*b^2*tan(1
/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2 - 1)^5)/d
```

Mupad [B] (verification not implemented)

Time = 18.54 (sec) , antiderivative size = 221, normalized size of antiderivative = 1.64

$$\int (a+b\cos(c+dx))^2\sec^6(c+dx)\,dx = \frac{3\,a\,b\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{2\,d} - \frac{\left(2\,a^2-\frac{5\,a\,b}{2}+2\,b^2\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9+\left(-\frac{8\,a^2}{3}+a\,b-\frac{16\,b^2}{3}\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7+\left(\frac{116\,a^2}{15}+\frac{20\,b^2}{3}\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}-5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8+10\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6-10\tan\right.}$$

```
[In] int((a + b*cos(c + d*x))^2/cos(c + d*x)^6,x)
```

```
[Out] (3*a*b*atanh(tan(c/2 + (d*x)/2)))/(2*d) - (tan(c/2 + (d*x)/2)^5*((116*a^2)/
15 + (20*b^2)/3) + tan(c/2 + (d*x)/2)^9*(2*a^2 - (5*a*b)/2 + 2*b^2) - tan(c
/2 + (d*x)/2)^3*(a*b + (8*a^2)/3 + (16*b^2)/3) - tan(c/2 + (d*x)/2)^7*((8*a
^2)/3 - a*b + (16*b^2)/3) + tan(c/2 + (d*x)/2)*((5*a*b)/2 + 2*a^2 + 2*b^2))
/(d*(5*tan(c/2 + (d*x)/2)^2 - 10*tan(c/2 + (d*x)/2)^4 + 10*tan(c/2 + (d*x)/
2)^6 - 5*tan(c/2 + (d*x)/2)^8 + tan(c/2 + (d*x)/2)^10 - 1))
```

3.428 $\int \cos^3(c+dx)(a+b\cos(c+dx))^3\,dx$

Optimal result

Integrand size = 21, antiderivative size = 170

$$\begin{aligned}\int \cos^3(c+dx)(a+b\cos(c+dx))^3\,dx = {} & \frac{9}{8}a^2bx+\frac{5b^3x}{16}+\frac{a(a^2+3b^2)\sin(c+dx)}{d}\\ & +\frac{b(18a^2+5b^2)\cos(c+dx)\sin(c+dx)}{16d}\\ & +\frac{b(18a^2+5b^2)\cos^3(c+dx)\sin(c+dx)}{24d}\\ & +\frac{b^3\cos^5(c+dx)\sin(c+dx)}{6d}\\ & -\frac{a(a^2+6b^2)\sin^3(c+dx)}{3d}+\frac{3ab^2\sin^5(c+dx)}{5d}\end{aligned}$$

```
[Out] 9/8*a^2*b*x+5/16*b^3*x+a*(a^2+3*b^2)*sin(d*x+c)/d+1/16*b*(18*a^2+5*b^2)*cos
(d*x+c)*sin(d*x+c)/d+1/24*b*(18*a^2+5*b^2)*cos(d*x+c)^3*sin(d*x+c)/d+1/6*b^
3*cos(d*x+c)^5*sin(d*x+c)/d-1/3*a*(a^2+6*b^2)*sin(d*x+c)^3/d+3/5*a*b^2*sin(
d*x+c)^5/d
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 193, normalized size of antiderivative = 1.14, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used

$= \{2872, 3102, 2827, 2713, 2715, 8\}$

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^3\,dx = -\frac{a(5a^2+12b^2)\sin^3(c+dx)}{15d} + \frac{a(5a^2+12b^2)\sin(c+dx)}{5d} + \frac{b(18a^2+5b^2)\sin(c+dx)\cos^3(c+dx)}{24d} + \frac{b(18a^2+5b^2)\sin(c+dx)\cos(c+dx)}{16d} + \frac{1}{16}bx\left(18a^2+5b^2\right) + \frac{b^2\sin(c+dx)\cos^4(c+dx)(a+b\cos(c+dx))}{6d} + \frac{13ab^2\sin(c+dx)\cos^4(c+dx)}{30d}$$

```
[In] Int[Cos[c + d*x]^3*(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (b*(18*a^2 + 5*b^2)*x)/16 + (a*(5*a^2 + 12*b^2)*Sin[c + d*x])/(5*d) + (b*(1
8*a^2 + 5*b^2)*Cos[c + d*x]*Sin[c + d*x])/(16*d) + (b*(18*a^2 + 5*b^2)*Cos[
c + d*x]^3*Sin[c + d*x])/(24*d) + (13*a*b^2*Cos[c + d*x]^4*Sin[c + d*x])/(3
0*d) + (b^2*Cos[c + d*x]^4*(a + b*Cos[c + d*x])*Sin[c + d*x])/(6*d) - (a*(5
*a^2 + 12*b^2)*Sin[c + d*x]^3)/(15*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{b^2\cos^4(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{6d}+\frac{1}{6}\int\cos^3(c+dx)\left(2a\left(3a^2+2b^2\right)\right.\\
&\qquad\left.+b\left(18a^2+5b^2\right)\cos(c+dx)+13ab^2\cos^2(c+dx)\right)\,dx\\
&= \frac{13ab^2\cos^4(c+dx)\sin(c+dx)}{30d}+\frac{b^2\cos^4(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{6d}\\
&\quad+\frac{1}{30}\int\cos^3(c+dx)\left(6a\left(5a^2+12b^2\right)+5b\left(18a^2+5b^2\right)\cos(c+dx)\right)\,dx\\
&= \frac{13ab^2\cos^4(c+dx)\sin(c+dx)}{30d}+\frac{b^2\cos^4(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{6d}\\
&\quad+\frac{1}{6}\left(b\left(18a^2+5b^2\right)\right)\int\cos^4(c+dx)\,dx+\frac{1}{5}\left(a\left(5a^2+12b^2\right)\right)\int\cos^3(c+dx)\,dx\\
&= \frac{b(18a^2+5b^2)\cos^3(c+dx)\sin(c+dx)}{24d}+\frac{13ab^2\cos^4(c+dx)\sin(c+dx)}{30d}\\
&\quad+\frac{b^2\cos^4(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{6d}\\
&\quad+\frac{1}{8}\left(b\left(18a^2+5b^2\right)\right)\int\cos^2(c+dx)\,dx\\
&\quad-\frac{(a(5a^2+12b^2))\,\text{Subst}\left(\int\left(1-x^2\right)\,dx,x,-\sin(c+dx)\right)}{5d}
\end{aligned}$$

$$
\begin{aligned}
&= \frac{a(5a^2+12b^2)\sin(c+dx)}{5d} + \frac{b(18a^2+5b^2)\cos(c+dx)\sin(c+dx)}{16d} \\
&\quad + \frac{b(18a^2+5b^2)\cos^3(c+dx)\sin(c+dx)}{24d} + \frac{13ab^2\cos^4(c+dx)\sin(c+dx)}{30d} \\
&\quad + \frac{b^2\cos^4(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{6d} \\
&\quad - \frac{a(5a^2+12b^2)\sin^3(c+dx)}{15d} + \frac{1}{16}\left(b\left(18a^2+5b^2\right)\right)\int 1\,dx \\
&= \frac{1}{16}b\left(18a^2+5b^2\right)x + \frac{a(5a^2+12b^2)\sin(c+dx)}{5d} + \frac{b(18a^2+5b^2)\cos(c+dx)\sin(c+dx)}{16d} \\
&\quad + \frac{b(18a^2+5b^2)\cos^3(c+dx)\sin(c+dx)}{24d} + \frac{13ab^2\cos^4(c+dx)\sin(c+dx)}{30d} \\
&\quad + \frac{b^2\cos^4(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{6d} - \frac{a(5a^2+12b^2)\sin^3(c+dx)}{15d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.52 (sec) , antiderivative size = 159, normalized size of antiderivative = 0.94

$$
\int \cos^3(c+dx)(a+b\cos(c+dx))^3\,dx
= \frac{1080a^2bc+300b^3c+1080a^2bdx+300b^3dx+360a(2a^2+5b^2)\sin(c+dx)+45(16a^2b+5b^3)\sin(2(c+dx))}{}
$$

```
[In] Integrate[Cos[c + d*x]^3*(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (1080*a^2*b*c + 300*b^3*c + 1080*a^2*b*d*x + 300*b^3*d*x + 360*a*(2*a^2 + 5
*b^2)*Sin[c + d*x] + 45*(16*a^2*b + 5*b^3)*Sin[2*(c + d*x)] + 80*a^3*Sin[3*
(c + d*x)] + 300*a*b^2*Sin[3*(c + d*x)] + 90*a^2*b*Sin[4*(c + d*x)] + 45*b^
3*Sin[4*(c + d*x)] + 36*a*b^2*Sin[5*(c + d*x)] + 5*b^3*Sin[6*(c + d*x)])/(9
60*d)
```

Maple [A] (verified)

Time = 4.43 (sec) , antiderivative size = 135, normalized size of antiderivative = 0.79

method	result
parallelrisch	$\frac{(720a^2b+225b^3)\sin(2dx+2c)+(80a^3+300a\,b^2)\sin(3dx+3c)+(90a^2b+45b^3)\sin(4dx+4c)+36a\,b^2\sin(5dx+5c)+5b^3\sin(}{960d}$
derivativedivides	$\frac{\frac{a^3\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+3a^2b\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{3a\,b^2\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c\right.}{3}\right.}{5}}{d}$
default	$\frac{\frac{a^3\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+3a^2b\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{3a\,b^2\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c\right.}{3}\right.}{5}}{d}$
parts	$\frac{a^3(2+\cos^2(dx+c))\sin(dx+c)}{3d}+\frac{b^3\left(\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{6}+\frac{5dx}{16}+\frac{5c}{16}\right)}{d}+\frac{3a\,b^2\left(\frac{8}{3}+\right.}{}$
risch	$\frac{9a^2bx}{8}+\frac{5b^3x}{16}+\frac{3a^3\sin(dx+c)}{4d}+\frac{15a\,b^2\sin(dx+c)}{8d}+\frac{b^3\sin(6dx+6c)}{192d}+\frac{3a\,b^2\sin(5dx+5c)}{80d}+\frac{3\sin(4dx+4c)a^2}{32d}$
norman	$\frac{(\frac{9}{8}a^2b+\frac{5}{16}b^3)x+(\frac{9}{8}a^2b+\frac{5}{16}b^3)x\left(\tan^{12}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(\frac{27}{4}a^2b+\frac{15}{8}b^3)x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(\frac{27}{4}a^2b+\frac{15}{8}b^3)x\left(\tan^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right.}{}$

```
[In] int(cos(d*x+c)^3*(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/960*((720*a^2*b+225*b^3)*sin(2*d*x+2*c)+(80*a^3+300*a*b^2)*sin(3*d*x+3*c)
+(90*a^2*b+45*b^3)*sin(4*d*x+4*c)+36*a*b^2*sin(5*d*x+5*c)+5*b^3*sin(6*d*x+6
*c)+(720*a^3+1800*a*b^2)*sin(d*x+c)+1080*b*d*(a^2+5/18*b^2)*x)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 132, normalized size of antiderivative = 0.78

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^3\,dx$$
$$=\frac{15\,(18\,a^2b+5\,b^3)dx+\left(40\,b^3\cos{(dx+c)}^5+144\,ab^2\cos{(dx+c)}^4+10\,(18\,a^2b+5\,b^3)\cos{(dx+c)}^3+160\right.}{240\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/240*(15*(18*a^2*b + 5*b^3)*d*x + (40*b^3*cos(d*x + c)^5 + 144*a*b^2*cos(d
*x + c)^4 + 10*(18*a^2*b + 5*b^3)*cos(d*x + c)^3 + 160*a^3 + 384*a*b^2 + 16
*(5*a^3 + 12*a*b^2)*cos(d*x + c)^2 + 15*(18*a^2*b + 5*b^3)*cos(d*x + c))*si
n(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 393 vs. 2(158) = 316.

Time = 0.37 (sec) , antiderivative size = 393, normalized size of antiderivative = 2.31

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^3\,dx$$
$$= \begin{cases} \frac{2a^3\sin^3(c+dx)}{3d} + \frac{a^3\sin(c+dx)\cos^2(c+dx)}{d} + \frac{9a^2bx\sin^4(c+dx)}{8} + \frac{9a^2bx\sin^2(c+dx)\cos^2(c+dx)}{4} + \frac{9a^2bx\cos^4(c+dx)}{8} + \frac{9a^2b\sin^3(c+ \\ x(a+b\cos(c))^3\cos^3(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)**3*(a+b*cos(d*x+c))**3,x)
```

```
[Out] Piecewise((2*a**3*sin(c + d*x)**3/(3*d) + a**3*sin(c + d*x)*cos(c + d*x)**2
/d + 9*a**2*b*x*sin(c + d*x)**4/8 + 9*a**2*b*x*sin(c + d*x)**2*cos(c + d*x)
**2/4 + 9*a**2*b*x*cos(c + d*x)**4/8 + 9*a**2*b*sin(c + d*x)**3*cos(c + d*x
)/(8*d) + 15*a**2*b*sin(c + d*x)*cos(c + d*x)**3/(8*d) + 8*a*b**2*sin(c + d
*x)**5/(5*d) + 4*a*b**2*sin(c + d*x)**3*cos(c + d*x)**2/d + 3*a*b**2*sin(c
+ d*x)*cos(c + d*x)**4/d + 5*b**3*x*sin(c + d*x)**6/16 + 15*b**3*x*sin(c +
d*x)**4*cos(c + d*x)**2/16 + 15*b**3*x*sin(c + d*x)**2*cos(c + d*x)**4/16 +
 5*b**3*x*cos(c + d*x)**6/16 + 5*b**3*sin(c + d*x)**5*cos(c + d*x)/(16*d) +
 5*b**3*sin(c + d*x)**3*cos(c + d*x)**3/(6*d) + 11*b**3*sin(c + d*x)*cos(c
+ d*x)**5/(16*d), Ne(d, 0)), (x*(a + b*cos(c))**3*cos(c)**3, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.22 (sec) , antiderivative size = 145, normalized size of antiderivative = 0.85

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^3\,dx =$$
$$-\frac{320\left(\sin(dx+c)^3 - 3\sin(dx+c)\right)a^3 - 90\,(12\,dx + 12\,c + \sin(4\,dx+4\,c) + 8\,\sin(2\,dx+2\,c))a^2b - 192}{}$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/960*(320*(sin(d*x + c)^3 - 3*sin(d*x + c))*a^3 - 90*(12*d*x + 12*c + sin
(4*d*x + 4*c) + 8*sin(2*d*x + 2*c))*a^2*b - 192*(3*sin(d*x + c)^5 - 10*sin(
d*x + c)^3 + 15*sin(d*x + c))*a*b^2 + 5*(4*sin(2*d*x + 2*c)^3 - 60*d*x - 60
*c - 9*sin(4*d*x + 4*c) - 48*sin(2*d*x + 2*c))*b^3)/d
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 150, normalized size of antiderivative = 0.88

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^3\,dx = \frac{b^3\sin(6\,dx+6\,c)}{192\,d} + \frac{3\,ab^2\sin(5\,dx+5\,c)}{80\,d} + \frac{1}{16}\left(18\,a^2b+5\,b^3\right)x + \frac{3\left(2\,a^2b+b^3\right)\sin(4\,dx+4\,c)}{64\,d} + \frac{\left(4\,a^3+15\,ab^2\right)\sin(3\,dx+3\,c)}{48\,d} + \frac{3\left(16\,a^2b+5\,b^3\right)\sin(2\,dx+2\,c)}{64\,d} + \frac{3\left(2\,a^3+5\,ab^2\right)\sin(dx+c)}{8\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/192*b^3*sin(6*d*x + 6*c)/d + 3/80*a*b^2*sin(5*d*x + 5*c)/d + 1/16*(18*a^2
*b + 5*b^3)*x + 3/64*(2*a^2*b + b^3)*sin(4*d*x + 4*c)/d + 1/48*(4*a^3 + 15*
a*b^2)*sin(3*d*x + 3*c)/d + 3/64*(16*a^2*b + 5*b^3)*sin(2*d*x + 2*c)/d + 3/
8*(2*a^3 + 5*a*b^2)*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 15.87 (sec) , antiderivative size = 380, normalized size of antiderivative = 2.24

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^3\,dx = \frac{\left(2\,a^3-\frac{15\,a^2\,b}{4}+6\,a\,b^2-\frac{11\,b^3}{8}\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{11}+\left(\frac{22\,a^3}{3}-\frac{21\,a^2\,b}{4}+14\,a\,b^2+\frac{5\,b^3}{24}\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9+\left(12\,a^3-\right.}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{12}+6\,\mathrm{t}\right.} + \frac{b\,\mathrm{atan}\left(\frac{b\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(18\,a^2+5\,b^2\right)}{8\,\left(\frac{9\,a^2\,b}{4}+\frac{5\,b^3}{8}\right)}\right)\,\left(18\,a^2+5\,b^2\right)}{8\,d} - \frac{b\,\left(18\,a^2+5\,b^2\right)\,\left(\mathrm{atan}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)-\frac{d\,x}{2}\right)}{8\,d}$$

```
[In] int(cos(c + d*x)^3*(a + b*cos(c + d*x))^3,x)
```

```
[Out] (tan(c/2 + (d*x)/2)^11*(6*a*b^2 - (15*a^2*b)/4 + 2*a^3 - (11*b^3)/8) + tan(
c/2 + (d*x)/2)^3*(14*a*b^2 + (21*a^2*b)/4 + (22*a^3)/3 - (5*b^3)/24) + tan(
```

```
c/2 + (d*x)/2)^9*(14*a*b^2 - (21*a^2*b)/4 + (22*a^3)/3 + (5*b^3)/24) + tan(
c/2 + (d*x)/2)^5*((156*a*b^2)/5 + (3*a^2*b)/2 + 12*a^3 + (15*b^3)/4) + tan(
c/2 + (d*x)/2)^7*((156*a*b^2)/5 - (3*a^2*b)/2 + 12*a^3 - (15*b^3)/4) + tan(
c/2 + (d*x)/2)*(6*a*b^2 + (15*a^2*b)/4 + 2*a^3 + (11*b^3)/8))/(d*(6*tan(c/2
 + (d*x)/2)^2 + 15*tan(c/2 + (d*x)/2)^4 + 20*tan(c/2 + (d*x)/2)^6 + 15*tan(
c/2 + (d*x)/2)^8 + 6*tan(c/2 + (d*x)/2)^10 + tan(c/2 + (d*x)/2)^12 + 1)) +
(b*atan((b*tan(c/2 + (d*x)/2)*(18*a^2 + 5*b^2))/(8*((9*a^2*b)/4 + (5*b^3)/8
)))*(18*a^2 + 5*b^2))/(8*d) - (b*(18*a^2 + 5*b^2)*(atan(tan(c/2 + (d*x)/2))
 - (d*x)/2))/(8*d)
```

3.429 $\int \cos^2(c+dx)(a+b\cos(c+dx))^3\,dx$

Optimal result

Integrand size = 21, antiderivative size = 180

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^3\,dx = \frac{1}{8}a(4a^2+9b^2)\,x-\frac{(3a^4-52a^2b^2-16b^4)\sin(c+dx)}{30bd} - \frac{a(6a^2-71b^2)\cos(c+dx)\sin(c+dx)}{120d} - \frac{(3a^2-16b^2)\,(a+b\cos(c+dx))^2\sin(c+dx)}{60bd} - \frac{a(a+b\cos(c+dx))^3\sin(c+dx)}{20bd} + \frac{(a+b\cos(c+dx))^4\sin(c+dx)}{5bd}$$

```
[Out] 1/8*a*(4*a^2+9*b^2)*x-1/30*(3*a^4-52*a^2*b^2-16*b^4)*sin(d*x+c)/b/d-1/120*a
*(6*a^2-71*b^2)*cos(d*x+c)*sin(d*x+c)/d-1/60*(3*a^2-16*b^2)*(a+b*cos(d*x+c)
)^2*sin(d*x+c)/b/d-1/20*a*(a+b*cos(d*x+c))^3*sin(d*x+c)/b/d+1/5*(a+b*cos(d*
x+c))^4*sin(d*x+c)/b/d
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 180, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used

$= \{2870, 2832, 2813\}$

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^3\,dx = -\frac{(3a^2-16b^2)\sin(c+dx)(a+b\cos(c+dx))^2}{60bd} - \frac{a(6a^2-71b^2)\sin(c+dx)\cos(c+dx)}{120d} + \frac{1}{8}ax(4a^2+9b^2) - \frac{(3a^4-52a^2b^2-16b^4)\sin(c+dx)}{30bd} + \frac{\sin(c+dx)(a+b\cos(c+dx))^4}{5bd} - \frac{a\sin(c+dx)(a+b\cos(c+dx))^3}{20bd}$$

```
[In] Int[Cos[c + d*x]^2*(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (a*(4*a^2 + 9*b^2)*x)/8 - ((3*a^4 - 52*a^2*b^2 - 16*b^4)*Sin[c + d*x])/(30*
b*d) - (a*(6*a^2 - 71*b^2)*Cos[c + d*x]*Sin[c + d*x])/(120*d) - ((3*a^2 - 1
6*b^2)*(a + b*Cos[c + d*x])^2*Sin[c + d*x])/(60*b*d) - (a*(a + b*Cos[c + d*
x])^3*Sin[c + d*x])/(20*b*d) + ((a + b*Cos[c + d*x])^4*Sin[c + d*x])/(5*b*d
)
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rule 2870

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^2, x_Symbol] :> Simp[(-d^2)*Cos[e + f*x]*((a + b*Sin[e + f*x])
^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m + 2)), Int[(a + b*Sin[e + f*x])^
m*Simp[b*(d^2*(m + 1) + c^2*(m + 2)) - d*(a*d - 2*b*c*(m + 2))*Sin[e + f*x]
, x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] && NeQ
[a^2 - b^2, 0] &&  !LtQ[m, -1]
```

Rubi steps

$$\text{integral} = \frac{(a+b\cos(c+dx))^4\sin(c+dx)}{5bd} + \frac{\int (4b-a\cos(c+dx))(a+b\cos(c+dx))^3\,dx}{5b}$$
$$= -\frac{a(a+b\cos(c+dx))^3\sin(c+dx)}{20bd} + \frac{(a+b\cos(c+dx))^4\sin(c+dx)}{5bd} + \frac{\int (a+b\cos(c+dx))^2\left(13ab-\left(3a^2-16b^2\right)\cos(c+dx)\right)\,dx}{20b}$$
$$= -\frac{\left(3a^2-16b^2\right)(a+b\cos(c+dx))^2\sin(c+dx)}{60bd} - \frac{a(a+b\cos(c+dx))^3\sin(c+dx)}{20bd} + \frac{(a+b\cos(c+dx))^4\sin(c+dx)}{5bd} + \frac{\int (a+b\cos(c+dx))\left(b\left(33a^2+32b^2\right)-a\left(6a^2-71b^2\right)\cos(c+dx)\right)\,dx}{60b}$$
$$= \frac{1}{8}a\left(4a^2+9b^2\right)x - \frac{\left(3a^4-52a^2b^2-16b^4\right)\sin(c+dx)}{30bd} - \frac{a\left(6a^2-71b^2\right)\cos(c+dx)\sin(c+dx)}{120d} - \frac{\left(3a^2-16b^2\right)(a+b\cos(c+dx))^2\sin(c+dx)}{60bd} - \frac{a(a+b\cos(c+dx))^3\sin(c+dx)}{20bd} + \frac{(a+b\cos(c+dx))^4\sin(c+dx)}{5bd}$$

Mathematica [A] (verified)

Time = 0.43 (sec) , antiderivative size = 130, normalized size of antiderivative = 0.72

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^3\,dx = \frac{240a^3c+540ab^2c+240a^3dx+540ab^2dx+60b\left(18a^2+5b^2\right)\sin(c+dx)+120\left(a^3+3ab^2\right)\sin(2(c+dx)) -}{480d}$$

```
[In] Integrate[Cos[c + d*x]^2*(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (240*a^3*c + 540*a*b^2*c + 240*a^3*d*x + 540*a*b^2*d*x + 60*b*(18*a^2 + 5*b
^2)*Sin[c + d*x] + 120*(a^3 + 3*a*b^2)*Sin[2*(c + d*x)] + 120*a^2*b*Sin[3*(
c + d*x)] + 50*b^3*Sin[3*(c + d*x)] + 45*a*b^2*Sin[4*(c + d*x)] + 6*b^3*Sin
[5*(c + d*x)])/(480*d)
```

Maple [A] (verified)

Time = 3.54 (sec) , antiderivative size = 113, normalized size of antiderivative = 0.63

method	result
parallelrisch	$\frac{(120a^3+360a b^2)\sin(2dx+2c)+(120a^2b+50b^3)\sin(3dx+3c)+45a b^2\sin(4dx+4c)+6b^3\sin(5dx+5c)+(1080a^2b+300b^3)\sin}{480d}$
derivativedivides	$\frac{a^3\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+a^2b(2+\cos^2(dx+c))\sin(dx+c)+3a b^2\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}$
default	$\frac{a^3\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+a^2b(2+\cos^2(dx+c))\sin(dx+c)+3a b^2\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}$
parts	$\frac{a^3\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{b^3\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5d}+\frac{3a b^2\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)}{4}\right.}{d}$
risch	$\frac{a^3x}{2}+\frac{9a b^2x}{8}+\frac{9\sin(dx+c)a^2b}{4d}+\frac{5\sin(dx+c)b^3}{8d}+\frac{b^3\sin(5dx+5c)}{80d}+\frac{3a b^2\sin(4dx+4c)}{32d}+\frac{\sin(3dx+3c)a^2b}{4d}+$
norman	$\left(\frac{1}{2}a^3+\frac{9}{8}a b^2\right)x+\left(5a^3+\frac{45}{4}a b^2\right)x\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(5a^3+\frac{45}{4}a b^2\right)x\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(\frac{1}{2}a^3+\frac{9}{8}a b^2\right)x\left(\tan^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(\frac{5}{2}\right.$

```
[In] int(cos(d*x+c)^2*(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/480*((120*a^3+360*a*b^2)*sin(2*d*x+2*c)+(120*a^2*b+50*b^3)*sin(3*d*x+3*c)
+45*a*b^2*sin(4*d*x+4*c)+6*b^3*sin(5*d*x+5*c)+(1080*a^2*b+300*b^3)*sin(d*x+
c)+240*(a^2+9/4*b^2)*d*x*a)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 110, normalized size of antiderivative = 0.61

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^3\,dx$$
$$=\frac{15\,(4\,a^3+9\,ab^2)dx+\left(24\,b^3\cos\left(dx+c\right)^4+90\,ab^2\cos\left(dx+c\right)^3+240\,a^2b+64\,b^3+8\,(15\,a^2b+4\,b^3)\cos\left(dx\right.\right.}{120\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/120*(15*(4*a^3 + 9*a*b^2)*d*x + (24*b^3*cos(d*x + c)^4 + 90*a*b^2*cos(d*x
 + c)^3 + 240*a^2*b + 64*b^3 + 8*(15*a^2*b + 4*b^3)*cos(d*x + c)^2 + 15*(4*
a^3 + 9*a*b^2)*cos(d*x + c))*sin(d*x + c))/d
```

Sympy [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 284, normalized size of antiderivative = 1.58

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^3\,dx$$
$$= \begin{cases} \frac{a^3x\sin^2(c+dx)}{2} + \frac{a^3x\cos^2(c+dx)}{2} + \frac{a^3\sin(c+dx)\cos(c+dx)}{2d} + \frac{2a^2b\sin^3(c+dx)}{d} + \frac{3a^2b\sin(c+dx)\cos^2(c+dx)}{d} + \frac{9ab^2x\sin^4(c+dx)}{8} \\ x(a+b\cos(c))^3\cos^2(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)**2*(a+b*cos(d*x+c))**3,x)
```

```
[Out] Piecewise((a**3*x*sin(c + d*x)**2/2 + a**3*x*cos(c + d*x)**2/2 + a**3*sin(c
 + d*x)*cos(c + d*x)/(2*d) + 2*a**2*b*sin(c + d*x)**3/d + 3*a**2*b*sin(c +
d*x)*cos(c + d*x)**2/d + 9*a*b**2*x*sin(c + d*x)**4/8 + 9*a*b**2*x*sin(c +
d*x)**2*cos(c + d*x)**2/4 + 9*a*b**2*x*cos(c + d*x)**4/8 + 9*a*b**2*sin(c +
 d*x)**3*cos(c + d*x)/(8*d) + 15*a*b**2*sin(c + d*x)*cos(c + d*x)**3/(8*d)
+ 8*b**3*sin(c + d*x)**5/(15*d) + 4*b**3*sin(c + d*x)**3*cos(c + d*x)**2/(3
*d) + b**3*sin(c + d*x)*cos(c + d*x)**4/d, Ne(d, 0)), (x*(a + b*cos(c))**3*
cos(c)**2, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.21 (sec) , antiderivative size = 119, normalized size of antiderivative = 0.66

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^3\,dx$$
$$= \frac{120\,(2\,dx+2\,c+\sin(2\,dx+2\,c))a^3 - 480\,\left(\sin(dx+c)^3 - 3\,\sin(dx+c)\right)a^2b + 45\,(12\,dx+12\,c+\sin(4\,a}{480\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/480*(120*(2*d*x + 2*c + sin(2*d*x + 2*c))*a^3 - 480*(sin(d*x + c)^3 - 3*s
in(d*x + c))*a^2*b + 45*(12*d*x + 12*c + sin(4*d*x + 4*c) + 8*sin(2*d*x + 2
*c))*a*b^2 + 32*(3*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*sin(d*x + c))*b^
3)/d
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 124, normalized size of antiderivative = 0.69

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^3\,dx = \frac{b^3\sin(5\,dx+5\,c)}{80\,d} + \frac{3\,ab^2\sin(4\,dx+4\,c)}{32\,d} + \frac{1}{8}\,(4\,a^3+9\,ab^2)x + \frac{(12\,a^2b+5\,b^3)\sin(3\,dx+3\,c)}{48\,d} + \frac{(a^3+3\,ab^2)\sin(2\,dx+2\,c)}{4\,d} + \frac{(18\,a^2b+5\,b^3)\sin(dx+c)}{8\,d}$$

```
[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/80*b^3*sin(5*d*x + 5*c)/d + 3/32*a*b^2*sin(4*d*x + 4*c)/d + 1/8*(4*a^3 +
9*a*b^2)*x + 1/48*(12*a^2*b + 5*b^3)*sin(3*d*x + 3*c)/d + 1/4*(a^3 + 3*a*b^
2)*sin(2*d*x + 2*c)/d + 1/8*(18*a^2*b + 5*b^3)*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 15.87 (sec) , antiderivative size = 319, normalized size of antiderivative = 1.77

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^3\,dx$$

$$= \frac{\left(-a^3+6\,a^2\,b-\frac{15\,a\,b^2}{4}+2\,b^3\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9+\left(-2\,a^3+16\,a^2\,b-\frac{3\,a\,b^2}{2}+\frac{8\,b^3}{3}\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7+\left(20\,a^2\,b+\cdots\right.}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}+5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8+10\tan\left(\cdots\right.\right.}$$

$$+\frac{a\,\mathrm{atan}\left(\frac{a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(4\,a^2+9\,b^2\right)}{4\,\left(a^3+\frac{9\,a\,b^2}{4}\right)}\right)\,\left(4\,a^2+9\,b^2\right)}{4\,d}-\frac{a\,\left(4\,a^2+9\,b^2\right)\,\left(\mathrm{atan}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)-\frac{d\,x}{2}\right)}{4\,d}$$

```
[In] int(cos(c + d*x)^2*(a + b*cos(c + d*x))^3,x)
```

```
[Out] (tan(c/2 + (d*x)/2)^3*((3*a*b^2)/2 + 16*a^2*b + 2*a^3 + (8*b^3)/3) - tan(c/
2 + (d*x)/2)^7*((3*a*b^2)/2 - 16*a^2*b + 2*a^3 - (8*b^3)/3) + tan(c/2 + (d*
x)/2)*((15*a*b^2)/4 + 6*a^2*b + a^3 + 2*b^3) + tan(c/2 + (d*x)/2)^5*(20*a^2
*b + (116*b^3)/15) - tan(c/2 + (d*x)/2)^9*((15*a*b^2)/4 - 6*a^2*b + a^3 - 2
*b^3))/(d*(5*tan(c/2 + (d*x)/2)^2 + 10*tan(c/2 + (d*x)/2)^4 + 10*tan(c/2 +
(d*x)/2)^6 + 5*tan(c/2 + (d*x)/2)^8 + tan(c/2 + (d*x)/2)^10 + 1)) + (a*atan
((a*tan(c/2 + (d*x)/2)*(4*a^2 + 9*b^2))/(4*((9*a*b^2)/4 + a^3)))*(4*a^2 + 9
*b^2))/(4*d) - (a*(4*a^2 + 9*b^2)*(atan(tan(c/2 + (d*x)/2)) - (d*x)/2))/(4*
d)
```

3.430 $\int \cos(c+dx)(a+b\cos(c+dx))^3\,dx$

Optimal result

Integrand size = 19, antiderivative size = 121

$$\int \cos(c+dx)(a+b\cos(c+dx))^3\,dx = \frac{3}{8}b\left(4a^2+b^2\right)x+\frac{a(a^2+4b^2)\sin(c+dx)}{2d} + \frac{b(2a^2+3b^2)\cos(c+dx)\sin(c+dx)}{8d} + \frac{a(a+b\cos(c+dx))^2\sin(c+dx)}{4d} + \frac{(a+b\cos(c+dx))^3\sin(c+dx)}{4d}$$

```
[Out] 3/8*b*(4*a^2+b^2)*x+1/2*a*(a^2+4*b^2)*sin(d*x+c)/d+1/8*b*(2*a^2+3*b^2)*cos(
d*x+c)*sin(d*x+c)/d+1/4*a*(a+b*cos(d*x+c))^2*sin(d*x+c)/d+1/4*(a+b*cos(d*x+
c))^3*sin(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2832, 2813}

$$\int \cos(c+dx)(a+b\cos(c+dx))^3\,dx = \frac{a(a^2+4b^2)\sin(c+dx)}{2d} + \frac{b(2a^2+3b^2)\sin(c+dx)\cos(c+dx)}{8d} + \frac{3}{8}bx\left(4a^2+b^2\right)+\frac{\sin(c+dx)(a+b\cos(c+dx))^3}{4d} + \frac{a\sin(c+dx)(a+b\cos(c+dx))^2}{4d}$$

```
[In] Int[Cos[c + d*x]*(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (3*b*(4*a^2 + b^2)*x)/8 + (a*(a^2 + 4*b^2)*Sin[c + d*x])/(2*d) + (b*(2*a^2
+ 3*b^2)*Cos[c + d*x]*Sin[c + d*x])/(8*d) + (a*(a + b*Cos[c + d*x])^2*Sin[c
 + d*x])/(4*d) + ((a + b*Cos[c + d*x])^3*Sin[c + d*x])/(4*d)
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(a+b\cos(c+dx))^3\sin(c+dx)}{4d}+\frac{1}{4}\int(3b+3a\cos(c+dx))(a+b\cos(c+dx))^2\,dx\\
&= \frac{a(a+b\cos(c+dx))^2\sin(c+dx)}{4d}+\frac{(a+b\cos(c+dx))^3\sin(c+dx)}{4d}\\
&\quad+\frac{1}{12}\int(a+b\cos(c+dx))\left(15ab+3\left(2a^2+3b^2\right)\cos(c+dx)\right)\,dx\\
&= \frac{3}{8}b\left(4a^2+b^2\right)x+\frac{a\left(a^2+4b^2\right)\sin(c+dx)}{2d}+\frac{b\left(2a^2+3b^2\right)\cos(c+dx)\sin(c+dx)}{8d}\\
&\quad+\frac{a(a+b\cos(c+dx))^2\sin(c+dx)}{4d}+\frac{(a+b\cos(c+dx))^3\sin(c+dx)}{4d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.34 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.83

$$\int\cos(c+dx)(a+b\cos(c+dx))^3\,dx$$
$$=\frac{8a\left(4a^2+9b^2\right)\sin(c+dx)+b\left(48a^2c+12b^2c+48a^2dx+12b^2dx+8\left(3a^2+b^2\right)\sin(2(c+dx))+8ab\sin(3(c\right.}{32d}$$

```
[In] Integrate[Cos[c + d*x]*(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (8*a*(4*a^2 + 9*b^2)*Sin[c + d*x] + b*(48*a^2*c + 12*b^2*c + 48*a^2*d*x + 1
2*b^2*d*x + 8*(3*a^2 + b^2)*Sin[2*(c + d*x)] + 8*a*b*Sin[3*(c + d*x)] + b^2
*Sin[4*(c + d*x)]))/(32*d)
```

Maple [A] (verified)

Time = 2.63 (sec) , antiderivative size = 102, normalized size of antiderivative = 0.84

method	result
derivativedivides	$\frac{a^3 \sin(dx+c)+3a^2b\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+a\,b^2(2+\cos^2(dx+c))\sin(dx+c)+b^3\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(d}{4}\right.}{d}$
default	$\frac{a^3 \sin(dx+c)+3a^2b\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+a\,b^2(2+\cos^2(dx+c))\sin(dx+c)+b^3\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(d}{4}\right.}{d}$
parallelrisch	$\frac{48a^2bdx+12b^3dx+32a^3\sin(dx+c)+72\sin(dx+c)a\,b^2+\sin(4dx+4c)b^3+8\sin(3dx+3c)a\,b^2+24\sin(2dx+2c)a^2b+8\sin(2d}{32d}$
parts	$\frac{a^3\sin(dx+c)}{d}+\frac{b^3\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}+\frac{a\,b^2(2+\cos^2(dx+c))\sin(dx+c)}{d}+\frac{3a^2b\left(\frac{\cos}{}\right.}{}$
risch	$\frac{3a^2bx}{2}+\frac{3b^3x}{8}+\frac{a^3\sin(dx+c)}{d}+\frac{9a\,b^2\sin(dx+c)}{4d}+\frac{\sin(4dx+4c)b^3}{32d}+\frac{\sin(3dx+3c)a\,b^2}{4d}+\frac{3\sin(2dx+2c)a^2b}{4d}+$
norman	$\frac{(\frac{3}{2}a^2b+\frac{3}{8}b^3)x+(6a^2b+\frac{3}{2}b^3)x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(6a^2b+\frac{3}{2}b^3)x\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(9a^2b+\frac{9}{4}b^3)x\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(\frac{3}{2}a^2b}{}$

```
[In] int(cos(d*x+c)*(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a^3*sin(d*x+c)+3*a^2*b*(1/2*cos(d*x+c)*sin(d*x+c)+1/2*d*x+1/2*c)+a*b^2
*(2+cos(d*x+c)^2)*sin(d*x+c)+b^3*(1/4*(cos(d*x+c)^3+3/2*cos(d*x+c))*sin(d*x
+c)+3/8*d*x+3/8*c))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.69

$$\int \cos(c+dx)(a+b\cos(c+dx))^3\,dx = \frac{3\,(4\,a^2b+b^3)dx+\left(2\,b^3\cos{(dx+c)}^3+8\,ab^2\cos{(dx+c)}^2+8\,a^3+16\,ab^2+3\,(4\,a^2b+b^3)\cos{(dx+c)}\right)\sin}{8\,d}$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/8*(3*(4*a^2*b + b^3)*d*x + (2*b^3*cos(d*x + c)^3 + 8*a*b^2*cos(d*x + c)^2
 + 8*a^3 + 16*a*b^2 + 3*(4*a^2*b + b^3)*cos(d*x + c))*sin(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 233 vs. 2(109) = 218.

Time = 0.18 (sec) , antiderivative size = 233, normalized size of antiderivative = 1.93

$$\int \cos(c+dx)(a+b\cos(c+dx))^3\,dx$$
$$= \begin{cases} \frac{a^3\sin(c+dx)}{d} + \frac{3a^2bx\sin^2(c+dx)}{2} + \frac{3a^2bx\cos^2(c+dx)}{2} + \frac{3a^2b\sin(c+dx)\cos(c+dx)}{2d} + \frac{2ab^2\sin^3(c+dx)}{d} + \frac{3ab^2\sin(c+dx)\cos^2(c+dx)}{d} \\ x(a+b\cos(c))^3\cos(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))**3,x)
```

```
[Out] Piecewise((a**3*sin(c + d*x)/d + 3*a**2*b*x*sin(c + d*x)**2/2 + 3*a**2*b*x*
cos(c + d*x)**2/2 + 3*a**2*b*sin(c + d*x)*cos(c + d*x)/(2*d) + 2*a*b**2*sin
(c + d*x)**3/d + 3*a*b**2*sin(c + d*x)*cos(c + d*x)**2/d + 3*b**3*x*sin(c +
 d*x)**4/8 + 3*b**3*x*sin(c + d*x)**2*cos(c + d*x)**2/4 + 3*b**3*x*cos(c +
d*x)**4/8 + 3*b**3*sin(c + d*x)**3*cos(c + d*x)/(8*d) + 5*b**3*sin(c + d*x)
*cos(c + d*x)**3/(8*d), Ne(d, 0)), (x*(a + b*cos(c))**3*cos(c), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 95, normalized size of antiderivative = 0.79

$$\int \cos(c+dx)(a+b\cos(c+dx))^3\,dx$$
$$= \frac{24\,(2\,dx+2\,c+\sin(2\,dx+2\,c))a^2b - 32\,\left(\sin(dx+c)^3 - 3\,\sin(dx+c)\right)ab^2 + (12\,dx+12\,c+\sin(4\,dx+4}{32\,d}$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/32*(24*(2*d*x + 2*c + sin(2*d*x + 2*c))*a^2*b - 32*(sin(d*x + c)^3 - 3*si
n(d*x + c))*a*b^2 + (12*d*x + 12*c + sin(4*d*x + 4*c) + 8*sin(2*d*x + 2*c))
*b^3 + 32*a^3*sin(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.79

$$\int \cos(c+dx)(a+b\cos(c+dx))^3\,dx=\frac{b^3\sin(4\,dx+4\,c)}{32\,d}+\frac{ab^2\sin(3\,dx+3\,c)}{4\,d}+\frac{3}{8}\,(4\,a^2b+b^3)x+\frac{(3\,a^2b+b^3)\sin(2\,dx+2\,c)}{4\,d}+\frac{(4\,a^3+9\,ab^2)\sin(dx+c)}{4\,d}$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/32*b^3*sin(4*d*x + 4*c)/d + 1/4*a*b^2*sin(3*d*x + 3*c)/d + 3/8*(4*a^2*b +
 b^3)*x + 1/4*(3*a^2*b + b^3)*sin(2*d*x + 2*c)/d + 1/4*(4*a^3 + 9*a*b^2)*si
n(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 16.29 (sec) , antiderivative size = 279, normalized size of antiderivative = 2.31

$$\int \cos(c+dx)(a+b\cos(c+dx))^3\,dx$$
$$=\frac{\left(2\,a^3-3\,a^2\,b+6\,a\,b^2-\frac{5\,b^3}{4}\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7+\left(6\,a^3-3\,a^2\,b+10\,a\,b^2+\frac{3\,b^3}{4}\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5+\left(6\,a^3+3\,a^2\right.}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8+4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6+6\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right.\right.}$$
$$+\frac{3\,b\,\mathrm{atan}\left(\frac{3\,b\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(4\,a^2+b^2\right)}{4\,\left(3\,a^2\,b+\frac{3\,b^3}{4}\right)}\right)\,\left(4\,a^2+b^2\right)}{4\,d}-\frac{3\,b\,\left(4\,a^2+b^2\right)\,\left(\mathrm{atan}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)-\frac{d\,x}{2}\right)}{4\,d}$$

```
[In] int(cos(c + d*x)*(a + b*cos(c + d*x))^3,x)
```

```
[Out] (tan(c/2 + (d*x)/2)^7*(6*a*b^2 - 3*a^2*b + 2*a^3 - (5*b^3)/4) + tan(c/2 + (
d*x)/2)^3*(10*a*b^2 + 3*a^2*b + 6*a^3 - (3*b^3)/4) + tan(c/2 + (d*x)/2)^5*(
10*a*b^2 - 3*a^2*b + 6*a^3 + (3*b^3)/4) + tan(c/2 + (d*x)/2)*(6*a*b^2 + 3*a
^2*b + 2*a^3 + (5*b^3)/4))/(d*(4*tan(c/2 + (d*x)/2)^2 + 6*tan(c/2 + (d*x)/2
)^4 + 4*tan(c/2 + (d*x)/2)^6 + tan(c/2 + (d*x)/2)^8 + 1)) + (3*b*atan((3*b*
tan(c/2 + (d*x)/2)*(4*a^2 + b^2))/(4*(3*a^2*b + (3*b^3)/4)))*(4*a^2 + b^2))
/(4*d) - (3*b*(4*a^2 + b^2)*(atan(tan(c/2 + (d*x)/2)) - (d*x)/2))/(4*d)
```

3.431 $\int (a+b\cos(c+dx))^3\,dx$

Optimal result

Integrand size = 12, antiderivative size = 76

$$\int (a+b\cos(c+dx))^3\,dx = a^3x+\frac{3}{2}ab^2x+\frac{b(3a^2+b^2)\sin(c+dx)}{d} + \frac{3ab^2\cos(c+dx)\sin(c+dx)}{2d}-\frac{b^3\sin^3(c+dx)}{3d}$$

```
[Out] a^3*x+3/2*a*b^2*x+b*(3*a^2+b^2)*sin(d*x+c)/d+3/2*a*b^2*cos(d*x+c)*sin(d*x+c
)/d-1/3*b^3*sin(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 90, normalized size of antiderivative = 1.18, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {2735, 2813}

$$\int (a+b\cos(c+dx))^3\,dx = \frac{2b(4a^2+b^2)\sin(c+dx)}{3d}+\frac{1}{2}ax(2a^2+3b^2) + \frac{5ab^2\sin(c+dx)\cos(c+dx)}{6d} + \frac{b\sin(c+dx)(a+b\cos(c+dx))^2}{3d}$$

```
[In] Int[(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (a*(2*a^2 + 3*b^2)*x)/2 + (2*b*(4*a^2 + b^2)*Sin[c + d*x])/(3*d) + (5*a*b^2
*Cos[c + d*x]*Sin[c + d*x])/(6*d) + (b*(a + b*Cos[c + d*x])^2*Sin[c + d*x])
/(3*d)
```

Rule 2735

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos
[c + d*x]*((a + b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[1/n, Int[(a + b*S
in[c + d*x])^(n - 2)*Simp[a^2*n + b^2*(n - 1) + a*b*(2*n - 1)*Sin[c + d*x],
 x], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{b(a+b\cos(c+dx))^2\sin(c+dx)}{3d} \\
&\quad +\frac{1}{3}\int(a+b\cos(c+dx))\left(3a^2+2b^2+5ab\cos(c+dx)\right)\,dx \\
&= \frac{1}{2}a\left(2a^2+3b^2\right)x+\frac{2b(4a^2+b^2)\sin(c+dx)}{3d} \\
&\quad +\frac{5ab^2\cos(c+dx)\sin(c+dx)}{6d}+\frac{b(a+b\cos(c+dx))^2\sin(c+dx)}{3d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.05

$$\int(a+b\cos(c+dx))^3\,dx = \frac{12a^3c+18ab^2c+12a^3dx+18ab^2dx+9b(4a^2+b^2)\sin(c+dx)+9ab^2\sin(2(c+dx))+b^3\sin(3(c+dx))}{12d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (12*a^3*c + 18*a*b^2*c + 12*a^3*d*x + 18*a*b^2*d*x + 9*b*(4*a^2 + b^2)*Sin[
c + d*x] + 9*a*b^2*Sin[2*(c + d*x)] + b^3*Sin[3*(c + d*x)])/(12*d)
```

Maple [A] (verified)

Time = 2.00 (sec) , antiderivative size = 67, normalized size of antiderivative = 0.88

method	result
parallelrisch	$\frac{9 \sin(2dx+2c) a b^2+b^3 \sin(3dx+3c)+9(4a^2 b+b^3) \sin(dx+c)+12\left(a^2+\frac{3b^2}{2}\right) dxa}{12d}$
derivativedivides	$\frac{\frac{b^3\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+3a b^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+3\sin(dx+c)a^2 b+a^3(dx+c)}{d}$
default	$\frac{\frac{b^3\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+3a b^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+3\sin(dx+c)a^2 b+a^3(dx+c)}{d}$
parts	$a^3 x+\frac{b^3(2+\cos^2(dx+c))\sin(dx+c)}{3d}+\frac{3a b^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{3\sin(dx+c)a^2 b}{d}$
risch	$a^3 x+\frac{3a b^2 x}{2}+\frac{3\sin(dx+c)a^2 b}{d}+\frac{3\sin(dx+c)b^3}{4d}+\frac{\sin(3dx+3c)b^3}{12d}+\frac{3\sin(2dx+2c)a b^2}{4d}$
norman	$\frac{(a^3+\frac{3}{2}a b^2)x+(a^3+\frac{3}{2}a b^2)x\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(3a^3+\frac{9}{2}a b^2)x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(3a^3+\frac{9}{2}a b^2)x\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\frac{b\left(6a^2-3a\right.}{}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3}$

[In] int((a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)

[Out] 1/12*(9*sin(2*d*x+2*c)*a*b^2+b^3*sin(3*d*x+3*c)+9*(4*a^2*b+b^3)*sin(d*x+c)+12*(a^2+3/2*b^2)*d*x*a)/d

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.87

$$\int (a+b\cos(c+dx))^3\,dx = \frac{3\,(2\,a^3+3\,ab^2)dx+\left(2\,b^3\cos\left(dx+c\right)^2+9\,ab^2\cos\left(dx+c\right)+18\,a^2b+4\,b^3\right)\sin\left(dx+c\right)}{6\,d}$$

[In] integrate((a+b*cos(d*x+c))^3,x, algorithm="fricas")

[Out] 1/6*(3*(2*a^3 + 3*a*b^2)*d*x + (2*b^3*cos(d*x + c)^2 + 9*a*b^2*cos(d*x + c) + 18*a^2*b + 4*b^3)*sin(d*x + c))/d

Sympy [A] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.68

$$\int (a+b\cos(c+dx))^3\,dx = \begin{cases} a^3x+\frac{3a^2b\sin{(c+dx)}}{d}+\frac{3ab^2x\sin^2{(c+dx)}}{2}+\frac{3ab^2x\cos^2{(c+dx)}}{2}+\frac{3ab^2\sin{(c+dx)}\cos{(c+dx)}}{2d}+\frac{2b^3\sin^3{(c+dx)}}{3d}+\frac{b^3\sin{(c+dx)}\cos}{d} \\ x(a+b\cos{(c)})^3 \end{cases}$$

```
[In] integrate((a+b*cos(d*x+c))**3,x)
```

```
[Out] Piecewise((a**3*x + 3*a**2*b*sin(c + d*x)/d + 3*a*b**2*x*sin(c + d*x)**2/2
+ 3*a*b**2*x*cos(c + d*x)**2/2 + 3*a*b**2*sin(c + d*x)*cos(c + d*x)/(2*d) +
 2*b**3*sin(c + d*x)**3/(3*d) + b**3*sin(c + d*x)*cos(c + d*x)**2/d, Ne(d,
0)), (x*(a + b*cos(c))**3, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.95

$$\int (a+b\cos(c+dx))^3\,dx = a^3x+\frac{3\,(2\,dx+2\,c+\sin{(2\,dx+2\,c)})ab^2}{4\,d} - \frac{\left(\sin{(dx+c)}^3-3\,\sin{(dx+c)}\right)b^3}{3\,d}+\frac{3\,a^2b\sin{(dx+c)}}{d}$$

```
[In] integrate((a+b*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] a^3*x + 3/4*(2*d*x + 2*c + sin(2*d*x + 2*c))*a*b^2/d - 1/3*(sin(d*x + c)^3
- 3*sin(d*x + c))*b^3/d + 3*a^2*b*sin(d*x + c)/d
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.95

$$\int (a+b\cos(c+dx))^3\,dx = \frac{b^3\sin{(3\,dx+3\,c)}}{12\,d}+\frac{3\,ab^2\sin{(2\,dx+2\,c)}}{4\,d} + \frac{1}{2}\,(2\,a^3+3\,ab^2)x+\frac{3\,(4\,a^2b+b^3)\sin{(dx+c)}}{4\,d}$$

```
[In] integrate((a+b*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/12*b^3*sin(3*d*x + 3*c)/d + 3/4*a*b^2*sin(2*d*x + 2*c)/d + 1/2*(2*a^3 + 3
*a*b^2)*x + 3/4*(4*a^2*b + b^3)*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 14.44 (sec) , antiderivative size = 77, normalized size of antiderivative = 1.01

$$\int (a+b\cos(c+dx))^3\,dx = a^3\,x+\frac{3\,b^3\,\sin\left(c+d\,x\right)}{4\,d}+\frac{b^3\,\sin\left(3\,c+3\,d\,x\right)}{12\,d}+\frac{3\,a\,b^2\,x}{2}+\frac{3\,a\,b^2\,\sin\left(2\,c+2\,d\,x\right)}{4\,d}+\frac{3\,a^2\,b\,\sin\left(c+d\,x\right)}{d}$$

```
[In] int((a + b*cos(c + d*x))^3,x)
```

```
[Out] a^3*x + (3*b^3*sin(c + d*x))/(4*d) + (b^3*sin(3*c + 3*d*x))/(12*d) + (3*a*b
^2*x)/2 + (3*a*b^2*sin(2*c + 2*d*x))/(4*d) + (3*a^2*b*sin(c + d*x))/d
```

3.432 $\int (a+b\cos(c+dx))^3\sec(c+dx)\,dx$

Optimal result

Integrand size = 19, antiderivative size = 73

$$\int (a+b\cos(c+dx))^3\sec(c+dx)\,dx=\frac{1}{2}b\left(6a^2+b^2\right)x+\frac{a^3\text{arctanh}(\sin(c+dx))}{d}+\frac{5ab^2\sin(c+dx)}{2d}+\frac{b^2(a+b\cos(c+dx))\sin(c+dx)}{2d}$$

```
[Out] 1/2*b*(6*a^2+b^2)*x+a^3*arctanh(sin(d*x+c))/d+5/2*a*b^2*sin(d*x+c)/d+1/2*b^
2*(a+b*cos(d*x+c))*sin(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2872, 3102, 2814, 3855}

$$\int (a+b\cos(c+dx))^3\sec(c+dx)\,dx=\frac{a^3\text{arctanh}(\sin(c+dx))}{d}+\frac{1}{2}bx\left(6a^2+b^2\right)+\frac{5ab^2\sin(c+dx)}{2d}+\frac{b^2\sin(c+dx)(a+b\cos(c+dx))}{2d}$$

```
[In] Int[(a + b*Cos[c + d*x])^3*Sec[c + d*x],x]
```

```
[Out] (b*(6*a^2 + b^2)*x)/2 + (a^3*ArcTanh[Sin[c + d*x]])/d + (5*a*b^2*Sin[c + d*
x])/(2*d) + (b^2*(a + b*Cos[c + d*x])*Sin[c + d*x])/(2*d)
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{b^2(a+b\cos(c+dx))\sin(c+dx)}{2d} \\ &\quad+\frac{1}{2}\int\left(2a^3+b\left(6a^2+b^2\right)\cos(c+dx)+5ab^2\cos^2(c+dx)\right)\sec(c+dx)\,dx \\ &= \frac{5ab^2\sin(c+dx)}{2d}+\frac{b^2(a+b\cos(c+dx))\sin(c+dx)}{2d} \\ &\quad+\frac{1}{2}\int\left(2a^3+b\left(6a^2+b^2\right)\cos(c+dx)\right)\sec(c+dx)\,dx \\ &= \frac{1}{2}b\left(6a^2+b^2\right)x+\frac{5ab^2\sin(c+dx)}{2d}+\frac{b^2(a+b\cos(c+dx))\sin(c+dx)}{2d}+a^3\int\sec(c+dx)\,dx\end{aligned}$$

$$= \frac{1}{2}b(6a^2 + b^2)\,x + \frac{a^3\text{arctanh}(\sin(c + dx))}{d} + \frac{5ab^2\sin(c + dx)}{2d} + \frac{b^2(a + b\cos(c + dx))\sin(c + dx)}{2d}$$

Mathematica [A] (verified)

Time = 0.39 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.44

$$\int (a + b\cos(c + dx))^3 \sec(c + dx)\,dx$$
$$= \frac{2b(6a^2 + b^2)(c + dx) - 4a^3\log\left(\cos\left(\frac{1}{2}(c + dx)\right) - \sin\left(\frac{1}{2}(c + dx)\right)\right) + 4a^3\log\left(\cos\left(\frac{1}{2}(c + dx)\right) + \sin\left(\frac{1}{2}(c\right.\right.}{4d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^3*Sec[c + d*x],x]
[Out] (2*b*(6*a^2 + b^2)*(c + d*x) - 4*a^3*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2
]] + 4*a^3*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] + 12*a*b^2*Sin[c + d*x]
 + b^3*Sin[2*(c + d*x)])/(4*d)
```

Maple [A] (verified)

Time = 1.57 (sec) , antiderivative size = 73, normalized size of antiderivative = 1.00

method	result
derivativedivides	$\frac{a^3\ln(\sec(dx+c)+\tan(dx+c))+3a^2b(dx+c)+3\sin(dx+c)a\,b^2+b^3\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}$
default	$\frac{a^3\ln(\sec(dx+c)+\tan(dx+c))+3a^2b(dx+c)+3\sin(dx+c)a\,b^2+b^3\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}$
parallelrisch	$\frac{12a^2bdx+2b^3dx+12\sin(dx+c)a\,b^2+4\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)a^3-4\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)a^3+\sin(2dx+2c)b^3}{4d}$
parts	$\frac{a^3\ln(\sec(dx+c)+\tan(dx+c))}{d}+\frac{b^3\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{3a\,b^2\sin(dx+c)}{d}+\frac{3a^2b(dx+c)}{d}$
risch	$3a^2bx+\frac{b^3x}{2}-\frac{3ia\,b^2e^{i(dx+c)}}{2d}+\frac{3ia\,b^2e^{-i(dx+c)}}{2d}+\frac{a^3\ln(e^{i(dx+c)}+i)}{d}-\frac{a^3\ln(e^{i(dx+c)}-i)}{d}+\frac{\sin(2dx+2c)b^3}{4d}$
norman	$\frac{(3a^2b+\frac{1}{2}b^3)x+(3a^2b+\frac{1}{2}b^3)x\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(9a^2b+\frac{3}{2}b^3)x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(9a^2b+\frac{3}{2}b^3)x\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\frac{b^2(6a-}{}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3}$

```
[In] int((a+cos(d*x+c)*b)^3*sec(d*x+c),x,method=_RETURNVERBOSE)
[Out] 1/d*(a^3*ln(sec(d*x+c)+tan(d*x+c))+3*a^2*b*(d*x+c)+3*sin(d*x+c)*a*b^2+b^3*(
1/2*cos(d*x+c)*sin(d*x+c)+1/2*d*x+1/2*c))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.99

$$\int (a+b\cos(c+dx))^3\sec(c+dx)\,dx$$
$$=\frac{a^3\log\left(\sin\left(dx+c\right)+1\right)-a^3\log\left(-\sin\left(dx+c\right)+1\right)+(6\,a^2b+b^3)dx+(b^3\cos\left(dx+c\right)+6\,ab^2)\sin\left(dx+c\right)}{2\,d}$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c),x, algorithm="fricas")
```

```
[Out] 1/2*(a^3*log(sin(d*x + c) + 1) - a^3*log(-sin(d*x + c) + 1) + (6*a^2*b + b^
3)*d*x + (b^3*cos(d*x + c) + 6*a*b^2)*sin(d*x + c))/d
```

Sympy [F]

$$\int (a+b\cos(c+dx))^3\sec(c+dx)\,dx=\int \left(a+b\cos\left(c+dx\right)\right)^3\sec\left(c+dx\right)\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**3*sec(d*x+c),x)
```

```
[Out] Integral((a + b*cos(c + d*x))**3*sec(c + d*x), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.22 (sec) , antiderivative size = 69, normalized size of antiderivative = 0.95

$$\int (a+b\cos(c+dx))^3\sec(c+dx)\,dx$$
$$=\frac{12\,(dx+c)a^2b+(2\,dx+2\,c+\sin\left(2\,dx+2\,c\right))b^3+4\,a^3\log\left(\sec\left(dx+c\right)+\tan\left(dx+c\right)\right)+12\,ab^2\sin\left(dx+c\right)}{4\,d}$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c),x, algorithm="maxima")
```

```
[Out] 1/4*(12*(d*x + c)*a^2*b + (2*d*x + 2*c + sin(2*d*x + 2*c))*b^3 + 4*a^3*log(
sec(d*x + c) + tan(d*x + c)) + 12*a*b^2*sin(d*x + c))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 137 vs. 2(67) = 134.

Time = 0.31 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.88

$$\int (a+b\cos(c+dx))^3\sec(c+dx)\,dx$$
$$=\frac{2\,a^3\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-2\,a^3\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)+(6\,a^2b+b^3)(dx+c)+\frac{2\left(6\,ab^2\tan\left(\frac{1}{2}\,dx\right.\right.}{}}{2\,d}$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c),x, algorithm="giac")
```

```
[Out] 1/2*(2*a^3*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 2*a^3*log(abs(tan(1/2*d*x +
 1/2*c) - 1)) + (6*a^2*b + b^3)*(d*x + c) + 2*(6*a*b^2*tan(1/2*d*x + 1/2*c)
^3 - b^3*tan(1/2*d*x + 1/2*c)^3 + 6*a*b^2*tan(1/2*d*x + 1/2*c) + b^3*tan(1/
2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2 + 1)^2)/d
```

Mupad [B] (verification not implemented)

Time = 14.79 (sec) , antiderivative size = 123, normalized size of antiderivative = 1.68

$$\int (a+b\cos(c+dx))^3\sec(c+dx)\,dx=\frac{2\,a^3\,\mathrm{atanh}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d}+\frac{b^3\,\mathrm{atan}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d}+\frac{b^3\,\sin\left(2\,c+2\,d\,x\right)}{4\,d}+\frac{3\,a\,b^2\,\sin\left(c+d\,x\right)}{d}+\frac{6\,a^2\,b\,\mathrm{atan}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d}$$

```
[In] int((a + b*cos(c + d*x))^3/cos(c + d*x),x)
```

```
[Out] (2*a^3*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/d + (b^3*atan(sin(c/2
+ (d*x)/2)/cos(c/2 + (d*x)/2)))/d + (b^3*sin(2*c + 2*d*x))/(4*d) + (3*a*b^2
*sin(c + d*x))/d + (6*a^2*b*atan(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/d
```

3.433 $\int (a+b\cos(c+dx))^3\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 68

$$\int (a+b\cos(c+dx))^3\sec^2(c+dx)\,dx = 3ab^2x+\frac{3a^2b\operatorname{arctanh}(\sin(c+dx))}{d}-\frac{b(a^2-b^2)\sin(c+dx)}{d}+\frac{a^2(a+b\cos(c+dx))\tan(c+dx)}{d}$$

```
[Out] 3*a*b^2*x+3*a^2*b*arctanh(sin(d*x+c))/d-b*(a^2-b^2)*sin(d*x+c)/d+a^2*(a+b*c
os(d*x+c))*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2871, 3102, 2814, 3855}

$$\int (a+b\cos(c+dx))^3\sec^2(c+dx)\,dx = \frac{3a^2b\operatorname{arctanh}(\sin(c+dx))}{d}-\frac{b(a^2-b^2)\sin(c+dx)}{d}+\frac{a^2\tan(c+dx)(a+b\cos(c+dx))}{d}+3ab^2x$$

```
[In] Int[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^2,x]
```

```
[Out] 3*a*b^2*x + (3*a^2*b*ArcTanh[Sin[c + d*x]])/d - (b*(a^2 - b^2)*Sin[c + d*x]
)/d + (a^2*(a + b*Cos[c + d*x])*Tan[c + d*x])/d
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{a^2(a+b\cos(c+dx))\tan(c+dx)}{d} \\
&\quad + \int \left(3a^2b+3ab^2\cos(c+dx)-b\left(a^2-b^2\right)\cos^2(c+dx)\right)\sec(c+dx)\,dx \\
&= -\frac{b(a^2-b^2)\sin(c+dx)}{d}+\frac{a^2(a+b\cos(c+dx))\tan(c+dx)}{d} \\
&\quad + \int \left(3a^2b+3ab^2\cos(c+dx)\right)\sec(c+dx)\,dx \\
&= 3ab^2x-\frac{b(a^2-b^2)\sin(c+dx)}{d}+\frac{a^2(a+b\cos(c+dx))\tan(c+dx)}{d}+\left(3a^2b\right)\int \sec(c+dx)\,dx
\end{aligned}
$$

$$= 3ab^2x + \frac{3a^2b\text{arctanh}(\sin(c+dx))}{d} - \frac{b(a^2-b^2)\sin(c+dx)}{d} + \frac{a^2(a+b\cos(c+dx))\tan(c+dx)}{d}$$

Mathematica [A] (verified)

Time = 0.53 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.29

$$\int (a+b\cos(c+dx))^3 \sec^2(c+dx)\,dx = \frac{3ab\left(bc+bdx-a\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)+a\log\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)\right)+b^3}{d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^2,x]
```

```
[Out] (3*a*b*(b*c + b*d*x - a*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + a*Log[Co
s[(c + d*x)/2] + Sin[(c + d*x)/2]]) + b^3*Sin[c + d*x] + a^3*Tan[c + d*x])/
d
```

Maple [A] (verified)

Time = 2.69 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.84

method	result
derivativedivides	$\frac{a^3\tan(dx+c)+3a^2b\ln(\sec(dx+c)+\tan(dx+c))+3a\,b^2(dx+c)+b^3\sin(dx+c)}{d}$
default	$\frac{a^3\tan(dx+c)+3a^2b\ln(\sec(dx+c)+\tan(dx+c))+3a\,b^2(dx+c)+b^3\sin(dx+c)}{d}$
parts	$\frac{a^3\tan(dx+c)}{d}+\frac{\sin(dx+c)b^3}{d}+\frac{3a^2b\ln(\sec(dx+c)+\tan(dx+c))}{d}+\frac{3a\,b^2(dx+c)}{d}$
parallelrisch	$\frac{6a\,b^2dx\cos(dx+c)-6\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)a^2b\cos(dx+c)+6\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)a^2b\cos(dx+c)+2a^3\sin(dx+c)+\sin(2dx+}{2d\cos(dx+c)}$
risch	$3a\,b^2x-\frac{ib^3e^{i(dx+c)}}{2d}+\frac{ib^3e^{-i(dx+c)}}{2d}+\frac{2ia^3}{d\left(e^{2i(dx+c)}+1\right)}-\frac{3a^2b\ln\left(e^{i(dx+c)}-i\right)}{d}+\frac{3a^2b\ln\left(e^{i(dx+c)}+i\right)}{d}$
norman	$\frac{-3a\,b^2x-\frac{2\left(a^3-b^3\right)\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-\frac{2\left(a^3+b^3\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}-\frac{2\left(3a^3-b^3\right)\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-\frac{2\left(3a^3+b^3\right)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-6a\,b^2x}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}$

```
[In] int((a+cos(d*x+c)*b)^3*sec(d*x+c)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a^3*tan(d*x+c)+3*a^2*b*ln(sec(d*x+c)+tan(d*x+c))+3*a*b^2*(d*x+c)+b^3*s
in(d*x+c))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 94, normalized size of antiderivative = 1.38

$$\int (a+b\cos(c+dx))^3\sec^2(c+dx)\,dx = \frac{6\,ab^2dx\cos(dx+c)+3\,a^2b\cos(dx+c)\log(\sin(dx+c)+1)-3\,a^2b\cos(dx+c)\log(-\sin(dx+c)+1)}{2\,d\cos(dx+c)}$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^2,x, algorithm="fricas")
[Out] 1/2*(6*a*b^2*d*x*cos(d*x + c) + 3*a^2*b*cos(d*x + c)*log(sin(d*x + c) + 1)
- 3*a^2*b*cos(d*x + c)*log(-sin(d*x + c) + 1) + 2*(b^3*cos(d*x + c) + a^3)*
sin(d*x + c))/(d*cos(d*x + c))
```

Sympy [F]

$$\int (a+b\cos(c+dx))^3\sec^2(c+dx)\,dx = \int (a+b\cos(c+dx))^3\sec^2(c+dx)\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**3*sec(d*x+c)**2,x)
[Out] Integral((a + b*cos(c + d*x))**3*sec(c + d*x)**2, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.97

$$\int (a+b\cos(c+dx))^3\sec^2(c+dx)\,dx = \frac{6\,(dx+c)ab^2+3\,a^2b(\log(\sin(dx+c)+1)-\log(\sin(dx+c)-1))+2\,b^3\sin(dx+c)+2\,a^3\tan(dx+c)}{2\,d}$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^2,x, algorithm="maxima")
[Out] 1/2*(6*(d*x + c)*a*b^2 + 3*a^2*b*(log(sin(d*x + c) + 1) - log(sin(d*x + c)
- 1)) + 2*b^3*sin(d*x + c) + 2*a^3*tan(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 129, normalized size of antiderivative = 1.90

$$\int (a+b\cos(c+dx))^3\sec^2(c+dx)\,dx$$
$$= \frac{3\,(dx+c)ab^2+3\,a^2b\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-3\,a^2b\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)-\frac{2\left(a^3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-b^3\right.}{}}{d}$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^2,x, algorithm="giac")
```

```
[Out] (3*(d*x + c)*a*b^2 + 3*a^2*b*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 3*a^2*b*l
og(abs(tan(1/2*d*x + 1/2*c) - 1)) - 2*(a^3*tan(1/2*d*x + 1/2*c)^3 - b^3*tan
(1/2*d*x + 1/2*c)^3 + a^3*tan(1/2*d*x + 1/2*c) + b^3*tan(1/2*d*x + 1/2*c))/
(tan(1/2*d*x + 1/2*c)^4 - 1))/d
```

Mupad [B] (verification not implemented)

Time = 14.83 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.43

$$\int (a+b\cos(c+dx))^3\sec^2(c+dx)\,dx = \frac{b^3\,\sin\left(c+d\,x\right)}{d}+\frac{a^3\,\sin\left(c+d\,x\right)}{d\,\cos\left(c+d\,x\right)} + \frac{6\,a\,b^2\,\mathrm{atan}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d} + \frac{6\,a^2\,b\,\mathrm{atanh}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d}$$

```
[In] int((a + b*cos(c + d*x))^3/cos(c + d*x)^2,x)
```

```
[Out] (b^3*sin(c + d*x))/d + (a^3*sin(c + d*x))/(d*cos(c + d*x)) + (6*a*b^2*atan(
sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/d + (6*a^2*b*atanh(sin(c/2 + (d*x)/
2)/cos(c/2 + (d*x)/2)))/d
```

3.434 $\int (a+b\cos(c+dx))^3\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 79

$$\int (a+b\cos(c+dx))^3\sec^3(c+dx)\,dx = b^3x+\frac{a(a^2+6b^2)\operatorname{arctanh}(\sin(c+dx))}{2d} + \frac{5a^2b\tan(c+dx)}{2d} + \frac{a^2(a+b\cos(c+dx))\sec(c+dx)\tan(c+dx)}{2d}$$

```
[Out] b^3*x+1/2*a*(a^2+6*b^2)*arctanh(sin(d*x+c))/d+5/2*a^2*b*tan(d*x+c)/d+1/2*a^
2*(a+b*cos(d*x+c))*sec(d*x+c)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 79, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2871, 3100, 2814, 3855}

$$\int (a+b\cos(c+dx))^3\sec^3(c+dx)\,dx = \frac{a(a^2+6b^2)\operatorname{arctanh}(\sin(c+dx))}{2d} + \frac{5a^2b\tan(c+dx)}{2d} + \frac{a^2\tan(c+dx)\sec(c+dx)(a+b\cos(c+dx))}{2d} + b^3x$$

```
[In] Int[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^3,x]
```

```
[Out] b^3*x + (a*(a^2 + 6*b^2)*ArcTanh[Sin[c + d*x]])/(2*d) + (5*a^2*b*Tan[c + d*
x])/(2*d) + (a^2*(a + b*Cos[c + d*x])*Sec[c + d*x]*Tan[c + d*x])/(2*d)
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3100

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
 (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2
 - a*b*B + a^2*C))*Cos[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*
(a^2 - b^2))), x] + Dist[1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*Simp[b*(a*A - b*B + a*C)*(m + 1) - (A*b^2 - a*b*B + a^2*C + b*(A*
b - a*B + b*C)*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B
, C}, x] && LtQ[m, -1] && NeQ[a^2 - b^2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{a^2(a+b\cos(c+dx))\sec(c+dx)\tan(c+dx)}{2d} \\
&\quad + \frac{1}{2}\int \left(5a^2b + a\left(a^2+6b^2\right)\cos(c+dx) + 2b^3\cos^2(c+dx)\right)\sec^2(c+dx)\,dx \\
&= \frac{5a^2b\tan(c+dx)}{2d} + \frac{a^2(a+b\cos(c+dx))\sec(c+dx)\tan(c+dx)}{2d} \\
&\quad + \frac{1}{2}\int \left(a\left(a^2+6b^2\right) + 2b^3\cos(c+dx)\right)\sec(c+dx)\,dx
\end{aligned}
$$

$$
\begin{aligned}
&= b^3x + \frac{5a^2b\tan(c+dx)}{2d} + \frac{a^2(a+b\cos(c+dx))\sec(c+dx)\tan(c+dx)}{2d} \\
&\quad + \frac{1}{2}\left(a\left(a^2+6b^2\right)\right)\int \sec(c+dx)\,dx \\
&= b^3x + \frac{a(a^2+6b^2)\operatorname{arctanh}(\sin(c+dx))}{2d} + \frac{5a^2b\tan(c+dx)}{2d} \\
&\quad + \frac{a^2(a+b\cos(c+dx))\sec(c+dx)\tan(c+dx)}{2d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.70

$$
\begin{aligned}
&\int (a+b\cos(c+dx))^3\sec^3(c+dx)\,dx \\
&= \frac{2b^3dx + a(a^2+6b^2)\operatorname{arctanh}(\sin(c+dx)) + a^2(6b+a\sec(c+dx))\tan(c+dx)}{2d}
\end{aligned}
$$

```
[In] Integrate[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^3,x]
```

```
[Out] (2*b^3*d*x + a*(a^2 + 6*b^2)*ArcTanh[Sin[c + d*x]] + a^2*(6*b + a*Sec[c + d
*x])*Tan[c + d*x])/(2*d)
```

Maple [A] (verified)

Time = 3.59 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.04

method	result
derivativedivides	$\frac{a^3\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)+3a^2b\tan(dx+c)+3a\,b^2\ln(\sec(dx+c)+\tan(dx+c))+b^3(dx+c)}{d}$
default	$\frac{a^3\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)+3a^2b\tan(dx+c)+3a\,b^2\ln(\sec(dx+c)+\tan(dx+c))+b^3(dx+c)}{d}$
parts	$\frac{a^3\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}+\frac{b^3(dx+c)}{d}+\frac{3a^2b\tan(dx+c)}{d}+\frac{3a\,b^2\ln(\sec(dx+c)+\tan(dx+c}{d}$
parallelrisch	$\frac{-a\left(a^2+6b^2\right)(1+\cos(2dx+2c))\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+a\left(a^2+6b^2\right)(1+\cos(2dx+2c))\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)+2b^3dx\cos(2dx-}{2d(1+\cos(2dx+2c))}$
risch	$b^3x-\frac{ia^2\left(a\,\mathrm{e}^{3i(dx+c)}-6b\,\mathrm{e}^{2i(dx+c)}-a\,\mathrm{e}^{i(dx+c)}-6b\right)}{d\left(\mathrm{e}^{2i(dx+c)}+1\right)^2}+\frac{a^3\ln\left(\mathrm{e}^{i(dx+c)}+i\right)}{2d}+\frac{3a\ln\left(\mathrm{e}^{i(dx+c)}+i\right)b^2}{d}-\frac{a^3\ln\left(\mathrm{e}^{i(dx+c}{2d}$
norman	$\frac{b^3x+b^3x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+b^3x\left(\tan^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+b^3x\left(\tan^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\frac{a^2(a-6b)\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{a^2(a+6b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3}$

```
[In] int((a+cos(d*x+c)*b)^3*sec(d*x+c)^3,x,method=_RETURNVERBOSE)
```

[Out] 1/d*(a^3*(1/2*sec(d*x+c)*tan(d*x+c)+1/2*ln(sec(d*x+c)+tan(d*x+c)))+3*a^2*b*
tan(d*x+c)+3*a*b^2*ln(sec(d*x+c)+tan(d*x+c))+b^3*(d*x+c))

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.42

$$\int (a+b\cos(c+dx))^3\sec^3(c+dx)\,dx$$
$$=\frac{4\,b^3dx\cos\left(dx+c\right)^2+\left(a^3+6\,ab^2\right)\cos\left(dx+c\right)^2\log\left(\sin\left(dx+c\right)+1\right)-\left(a^3+6\,ab^2\right)\cos\left(dx+c\right)^2\log\left(-\sin\right.}{4\,d\cos\left(dx+c\right)^2}$$

[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^3,x, algorithm="fricas")

[Out] 1/4*(4*b^3*d*x*cos(d*x + c)^2 + (a^3 + 6*a*b^2)*cos(d*x + c)^2*log(sin(d*x
+ c) + 1) - (a^3 + 6*a*b^2)*cos(d*x + c)^2*log(-sin(d*x + c) + 1) + 2*(6*a^
2*b*cos(d*x + c) + a^3)*sin(d*x + c))/(d*cos(d*x + c)^2)

Sympy [F]

$$\int (a+b\cos(c+dx))^3\sec^3(c+dx)\,dx=\int \left(a+b\cos\left(c+dx\right)\right)^3\sec^3\left(c+dx\right)dx$$

[In] integrate((a+b*cos(d*x+c))**3*sec(d*x+c)**3,x)

[Out] Integral((a + b*cos(c + d*x))**3*sec(c + d*x)**3, x)

Maxima [A] (verification not implemented)

none

Time = 0.19 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.28

$$\int (a+b\cos(c+dx))^3\sec^3(c+dx)\,dx$$
$$=\frac{4\left(dx+c\right)b^3-a^3\left(\frac{2\sin(dx+c)}{\sin(dx+c)^2-1}-\log\left(\sin\left(dx+c\right)+1\right)+\log\left(\sin\left(dx+c\right)-1\right)\right)+6\,ab^2(\log\left(\sin\left(dx+c\right)+\right.}{4\,d}$$

[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^3,x, algorithm="maxima")

[Out] 1/4*(4*(d*x + c)*b^3 - a^3*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(d
*x + c) + 1) + log(sin(d*x + c) - 1)) + 6*a*b^2*(log(sin(d*x + c) + 1) - lo
g(sin(d*x + c) - 1)) + 12*a^2*b*tan(d*x + c))/d

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 143, normalized size of antiderivative = 1.81

$$\int (a+b\cos(c+dx))^3\sec^3(c+dx)\,dx$$

$$= \frac{2\,(dx+c)b^3 + (a^3+6\,ab^2)\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right) - (a^3+6\,ab^2)\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right) + \frac{2\,(a^3\,\mathrm{ta}}{}}{2\,d}$$

[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^3,x, algorithm="giac")

[Out] 1/2*(2*(d*x + c)*b^3 + (a^3 + 6*a*b^2)*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - (a^3 + 6*a*b^2)*log(abs(tan(1/2*d*x + 1/2*c) - 1)) + 2*(a^3*tan(1/2*d*x + 1/2*c)^3 - 6*a^2*b*tan(1/2*d*x + 1/2*c)^3 + a^3*tan(1/2*d*x + 1/2*c) + 6*a^2*b*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2 - 1)^2)/d

Mupad [B] (verification not implemented)

Time = 14.49 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.72

$$\int (a+b\cos(c+dx))^3\sec^3(c+dx)\,dx = \frac{a^3\,\mathrm{atanh}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d} + \frac{2\,b^3\,\mathrm{atan}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d} + \frac{a^3\,\sin\left(c+d\,x\right)}{2\,d\cos\left(c+d\,x\right)^2} + \frac{6\,a\,b^2\,\mathrm{atanh}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d} + \frac{3\,a^2\,b\,\sin\left(c+d\,x\right)}{d\,\cos\left(c+d\,x\right)}$$

[In] int((a + b*cos(c + d*x))^3/cos(c + d*x)^3,x)

[Out] (a^3*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/d + (2*b^3*atan(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/d + (a^3*sin(c + d*x))/(2*d*cos(c + d*x)^2) + (6*a*b^2*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/d + (3*a^2*b*sin(c + d*x))/(d*cos(c + d*x))

3.435 $\int (a+b\cos(c+dx))^3\sec^4(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 109

$$\int (a+b\cos(c+dx))^3\sec^4(c+dx)\,dx=\frac{b(3a^2+2b^2)\operatorname{arctanh}(\sin(c+dx))}{2d}+\frac{a(2a^2+9b^2)\tan(c+dx)}{3d}+\frac{7a^2b\sec(c+dx)\tan(c+dx)}{6d}+\frac{a^2(a+b\cos(c+dx))\sec^2(c+dx)\tan(c+dx)}{3d}$$

```
[Out] 1/2*b*(3*a^2+2*b^2)*arctanh(sin(d*x+c))/d+1/3*a*(2*a^2+9*b^2)*tan(d*x+c)/d+
7/6*a^2*b*sec(d*x+c)*tan(d*x+c)/d+1/3*a^2*(a+b*cos(d*x+c))*sec(d*x+c)^2*tan
(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2871, 3100, 2827, 3852, 8, 3855}

$$\int (a+b\cos(c+dx))^3\sec^4(c+dx)\,dx=\frac{b(3a^2+2b^2)\operatorname{arctanh}(\sin(c+dx))}{2d}+\frac{a(2a^2+9b^2)\tan(c+dx)}{3d}+\frac{7a^2b\tan(c+dx)\sec(c+dx)}{6d}+\frac{a^2\tan(c+dx)\sec^2(c+dx)(a+b\cos(c+dx))}{3d}$$

```
[In] Int[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^4,x]
```

```
[Out] (b*(3*a^2 + 2*b^2)*ArcTanh[Sin[c + d*x]])/(2*d) + (a*(2*a^2 + 9*b^2)*Tan[c
+ d*x])/(3*d) + (7*a^2*b*Sec[c + d*x]*Tan[c + d*x])/(6*d) + (a^2*(a + b*Cos
[c + d*x])*Sec[c + d*x]^2*Tan[c + d*x])/(3*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3100

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
 (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2
 - a*b*B + a^2*C))*Cos[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*
(a^2 - b^2))), x] + Dist[1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*Simp[b*(a*A - b*B + a*C)*(m + 1) - (A*b^2 - a*b*B + a^2*C + b*(A*
b - a*B + b*C)*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B
, C}, x] && LtQ[m, -1] && NeQ[a^2 - b^2, 0]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{a^2(a+b\cos(c+dx))\sec^2(c+dx)\tan(c+dx)}{3d} \\
&\quad+\frac{1}{3}\int\left(7a^2b+a\left(2a^2+9b^2\right)\cos(c+dx)+b\left(a^2+3b^2\right)\cos^2(c+dx)\right)\sec^3(c+dx)\,dx \\
&= \frac{7a^2b\sec(c+dx)\tan(c+dx)}{6d}+\frac{a^2(a+b\cos(c+dx))\sec^2(c+dx)\tan(c+dx)}{3d} \\
&\quad+\frac{1}{6}\int\left(2a\left(2a^2+9b^2\right)+3b\left(3a^2+2b^2\right)\cos(c+dx)\right)\sec^2(c+dx)\,dx \\
&= \frac{7a^2b\sec(c+dx)\tan(c+dx)}{6d}+\frac{a^2(a+b\cos(c+dx))\sec^2(c+dx)\tan(c+dx)}{3d} \\
&\quad+\frac{1}{2}\left(b\left(3a^2+2b^2\right)\right)\int\sec(c+dx)\,dx+\frac{1}{3}\left(a\left(2a^2+9b^2\right)\right)\int\sec^2(c+dx)\,dx \\
&= \frac{b(3a^2+2b^2)\operatorname{arctanh}(\sin(c+dx))}{2d}+\frac{7a^2b\sec(c+dx)\tan(c+dx)}{6d} \\
&\quad+\frac{a^2(a+b\cos(c+dx))\sec^2(c+dx)\tan(c+dx)}{3d} \\
&\quad-\frac{(a(2a^2+9b^2))\operatorname{Subst}(\int 1\,dx,x,-\tan(c+dx))}{3d} \\
&= \frac{b(3a^2+2b^2)\operatorname{arctanh}(\sin(c+dx))}{2d}+\frac{a(2a^2+9b^2)\tan(c+dx)}{3d} \\
&\quad+\frac{7a^2b\sec(c+dx)\tan(c+dx)}{6d}+\frac{a^2(a+b\cos(c+dx))\sec^2(c+dx)\tan(c+dx)}{3d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 70, normalized size of antiderivative = 0.64

$$\int(a+b\cos(c+dx))^3\sec^4(c+dx)\,dx = \frac{(9a^2b+6b^3)\operatorname{arctanh}(\sin(c+dx))+a\tan(c+dx)\left(6a^2+18b^2+9ab\sec(c+dx)+2a^2\tan^2(c+dx)\right)}{6d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^4,x]
[Out] ((9*a^2*b + 6*b^3)*ArcTanh[Sin[c + d*x]] + a*Tan[c + d*x]*(6*a^2 + 18*b^2 +
 9*a*b*Sec[c + d*x] + 2*a^2*Tan[c + d*x]^2))/(6*d)
```

Maple [A] (verified)

Time = 4.37 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.88

method	result
derivativedivides	$\frac{-a^3\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+3a^2b\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)+3a\,b^2\tan(dx+c)+b^3\ln(\sec}{d}$
default	$\frac{-a^3\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+3a^2b\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)+3a\,b^2\tan(dx+c)+b^3\ln(\sec}{d}$
parts	$-\frac{a^3\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)}{d}+\frac{b^3\ln(\sec(dx+c)+\tan(dx+c))}{d}+\frac{3a^2b\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan}{2}\right.}{d}$
parallelrisch	$\frac{-27b\left(a^2+\frac{2b^2}{3}\right)\left(\frac{\cos(3dx+3c)}{3}+\cos(dx+c)\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+27b\left(a^2+\frac{2b^2}{3}\right)\left(\frac{\cos(3dx+3c)}{3}+\cos(dx+c)\right)\ln\left(\tan\left(\frac{dx}{2}+\right.\right.}{6d(\cos(3dx+3c)+3\cos(dx+c))}$
risch	$-\frac{ia\left(9ab\,e^{5i(dx+c)}-18b^2e^{4i(dx+c)}-12a^2e^{2i(dx+c)}-36b^2e^{2i(dx+c)}-9ab\,e^{i(dx+c)}-4a^2-18b^2\right)}{3d\left(e^{2i(dx+c)}+1\right)^3}-\frac{3a^2b\ln\left(e^{i(dx+c)}-i\right)}{2d}$
norman	$\frac{-\frac{2a\left(2a^2-3ab-6b^2\right)\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-\frac{a\left(2a^2-3ab+6b^2\right)\left(\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-\frac{2a\left(2a^2+3ab-6b^2\right)\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}-\frac{a\left(2a^2+3ab+6b\right.}{}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)-\right.}$

```
[In] int((a+cos(d*x+c)*b)^3*sec(d*x+c)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-a^3*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c)+3*a^2*b*(1/2*sec(d*x+c)*tan(d*
x+c)+1/2*ln(sec(d*x+c)+tan(d*x+c)))+3*a*b^2*tan(d*x+c)+b^3*ln(sec(d*x+c)+ta
n(d*x+c)))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.16

$$\int (a+b\cos(c+dx))^3\sec^4(c+dx)\,dx$$
$$=\frac{3\left(3a^2b+2b^3\right)\cos(dx+c)^3\log(\sin(dx+c)+1)-3\left(3a^2b+2b^3\right)\cos(dx+c)^3\log(-\sin(dx+c)+1)-}{12\,d\cos(dx+c)^3}$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] 1/12*(3*(3*a^2*b + 2*b^3)*cos(d*x + c)^3*log(sin(d*x + c) + 1) - 3*(3*a^2*b
 + 2*b^3)*cos(d*x + c)^3*log(-sin(d*x + c) + 1) + 2*(9*a^2*b*cos(d*x + c) +
 2*a^3 + 2*(2*a^3 + 9*a*b^2)*cos(d*x + c)^2)*sin(d*x + c))/(d*cos(d*x + c)^
3)
```

Sympy [F]

$$\int (a+b\cos(c+dx))^3\sec^4(c+dx)\,dx = \int (a+b\cos{(c+dx)})^3\sec^4{(c+dx)}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**3*sec(d*x+c)**4,x)
[Out] Integral((a + b*cos(c + d*x))**3*sec(c + d*x)**4, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 113, normalized size of antiderivative = 1.04

$$\int (a+b\cos(c+dx))^3\sec^4(c+dx)\,dx = \frac{4\left(\tan{(dx+c)}^3+3\tan{(dx+c)}\right)a^3-9a^2b\left(\frac{2\sin(dx+c)}{\sin(dx+c)^2-1}-\log{(\sin{(dx+c)}+1)}+\log{(\sin{(dx+c)}-1)}\right)}{12d}$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^4,x, algorithm="maxima")
[Out] 1/12*(4*(tan(d*x + c)^3 + 3*tan(d*x + c))*a^3 - 9*a^2*b*(2*sin(d*x + c)/(si
n(d*x + c)^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)) + 6*b^3*
(log(sin(d*x + c) + 1) - log(sin(d*x + c) - 1)) + 36*a*b^2*tan(d*x + c))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 205 vs. 2(101) = 202.

Time = 0.31 (sec) , antiderivative size = 205, normalized size of antiderivative = 1.88

$$\int (a+b\cos(c+dx))^3\sec^4(c+dx)\,dx = \frac{3\left(3a^2b+2b^3\right)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)-3\left(3a^2b+2b^3\right)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right)-\frac{2\left(6a^3\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right.\right.}{}}{}$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^4,x, algorithm="giac")
[Out] 1/6*(3*(3*a^2*b + 2*b^3)*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 3*(3*a^2*b +
2*b^3)*log(abs(tan(1/2*d*x + 1/2*c) - 1)) - 2*(6*a^3*tan(1/2*d*x + 1/2*c)^5
 - 9*a^2*b*tan(1/2*d*x + 1/2*c)^5 + 18*a*b^2*tan(1/2*d*x + 1/2*c)^5 - 4*a^3
*tan(1/2*d*x + 1/2*c)^3 - 36*a*b^2*tan(1/2*d*x + 1/2*c)^3 + 6*a^3*tan(1/2*d
*x + 1/2*c) + 9*a^2*b*tan(1/2*d*x + 1/2*c) + 18*a*b^2*tan(1/2*d*x + 1/2*c))
/(tan(1/2*d*x + 1/2*c)^2 - 1)^3)/d
```

Mupad [B] (verification not implemented)

Time = 16.34 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.44

$$\int (a+b\cos(c+dx))^3\sec^4(c+dx)\,dx = \frac{\operatorname{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)\,\left(3\,a^2\,b+2\,b^3\right)}{d} - \frac{\left(2\,a^3-3\,a^2\,b+6\,a\,b^2\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5+\left(-\frac{4\,a^3}{3}-12\,a\,b^2\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3+\left(2\,a^3+3\,a^2\,b+6\,a\,b^2\right)\,\tan\left(\frac{c}{2}\right.}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6-3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-1\right)}$$

```
[In] int((a + b*cos(c + d*x))^3/cos(c + d*x)^4,x)
```

```
[Out] (atanh(tan(c/2 + (d*x)/2))*(3*a^2*b + 2*b^3))/d - (tan(c/2 + (d*x)/2)^5*(6*
a*b^2 - 3*a^2*b + 2*a^3) - tan(c/2 + (d*x)/2)^3*(12*a*b^2 + (4*a^3)/3) + ta
n(c/2 + (d*x)/2)*(6*a*b^2 + 3*a^2*b + 2*a^3))/(d*(3*tan(c/2 + (d*x)/2)^2 -
3*tan(c/2 + (d*x)/2)^4 + tan(c/2 + (d*x)/2)^6 - 1))
```

3.436 $\int (a+b\cos(c+dx))^3 \sec^5(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 133

$$\int (a+b\cos(c+dx))^3 \sec^5(c+dx)\,dx = \frac{3a(a^2+4b^2)\,\text{arctanh}(\sin(c+dx))}{8d} + \frac{b(2a^2+b^2)\tan(c+dx)}{d} + \frac{3a(a^2+4b^2)\sec(c+dx)\tan(c+dx)}{8d} + \frac{3a^2b\sec^2(c+dx)\tan(c+dx)}{4d} + \frac{a^2(a+b\cos(c+dx))\sec^3(c+dx)\tan(c+dx)}{4d}$$

```
[Out] 3/8*a*(a^2+4*b^2)*arctanh(sin(d*x+c))/d+b*(2*a^2+b^2)*tan(d*x+c)/d+3/8*a*(a
^2+4*b^2)*sec(d*x+c)*tan(d*x+c)/d+3/4*a^2*b*sec(d*x+c)^2*tan(d*x+c)/d+1/4*a
^2*(a+b*cos(d*x+c))*sec(d*x+c)^3*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 133, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used

$= \{2871, 3100, 2827, 3853, 3855, 3852, 8\}$

$$\int (a+b\cos(c+dx))^3\sec^5(c+dx)\,dx = \frac{3a(a^2+4b^2)\,\text{arctanh}(\sin(c+dx))}{8d} + \frac{b(2a^2+b^2)\tan(c+dx)}{d} + \frac{3a(a^2+4b^2)\tan(c+dx)\sec(c+dx)}{8d} + \frac{3a^2b\tan(c+dx)\sec^2(c+dx)}{4d} + \frac{a^2\tan(c+dx)\sec^3(c+dx)(a+b\cos(c+dx))}{4d}$$

```
[In] Int[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^5,x]
```

```
[Out] (3*a*(a^2 + 4*b^2)*ArcTanh[Sin[c + d*x]])/(8*d) + (b*(2*a^2 + b^2)*Tan[c +
d*x])/d + (3*a*(a^2 + 4*b^2)*Sec[c + d*x]*Tan[c + d*x])/(8*d) + (3*a^2*b*Se
c[c + d*x]^2*Tan[c + d*x])/(4*d) + (a^2*(a + b*Cos[c + d*x])*Sec[c + d*x]^3
*Tan[c + d*x])/(4*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3100

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
 (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2
```

```
- a*b*B + a^2*C))*Cos[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*
(a^2 - b^2))), x] + Dist[1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*Simp[b*(a*A - b*B + a*C)*(m + 1) - (A*b^2 - a*b*B + a^2*C + b*(A*
b - a*B + b*C)*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B
, C}, x] && LtQ[m, -1] && NeQ[a^2 - b^2, 0]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{a^2(a+b\cos(c+dx))\sec^3(c+dx)\tan(c+dx)}{4d} \\
&\quad +\frac{1}{4}\int \left(9a^2b+3a\left(a^2+4b^2\right)\cos(c+dx)+2b\left(a^2+2b^2\right)\cos^2(c+dx)\right)\sec^4(c+dx)\,dx \\
&= \frac{3a^2b\sec^2(c+dx)\tan(c+dx)}{4d}+\frac{a^2(a+b\cos(c+dx))\sec^3(c+dx)\tan(c+dx)}{4d} \\
&\quad +\frac{1}{12}\int \left(9a\left(a^2+4b^2\right)+12b\left(2a^2+b^2\right)\cos(c+dx)\right)\sec^3(c+dx)\,dx \\
&= \frac{3a^2b\sec^2(c+dx)\tan(c+dx)}{4d}+\frac{a^2(a+b\cos(c+dx))\sec^3(c+dx)\tan(c+dx)}{4d} \\
&\quad +\left(b\left(2a^2+b^2\right)\right)\int \sec^2(c+dx)\,dx+\frac{1}{4}\left(3a\left(a^2+4b^2\right)\right)\int \sec^3(c+dx)\,dx \\
&= \frac{3a(a^2+4b^2)\sec(c+dx)\tan(c+dx)}{8d}+\frac{3a^2b\sec^2(c+dx)\tan(c+dx)}{4d} \\
&\quad +\frac{a^2(a+b\cos(c+dx))\sec^3(c+dx)\tan(c+dx)}{4d} \\
&\quad +\frac{1}{8}\left(3a\left(a^2+4b^2\right)\right)\int \sec(c+dx)\,dx-\frac{(b(2a^2+b^2))\,\text{Subst}(\int 1\,dx,x,-\tan(c+dx))}{d}
\end{aligned}$$

$$= \frac{3a(a^2+4b^2)\operatorname{arctanh}(\sin(c+dx))}{8d} + \frac{b(2a^2+b^2)\tan(c+dx)}{d} + \frac{3a(a^2+4b^2)\sec(c+dx)\tan(c+dx)}{8d} + \frac{3a^2b\sec^2(c+dx)\tan(c+dx)}{4d} + \frac{a^2(a+b\cos(c+dx))\sec^3(c+dx)\tan(c+dx)}{4d}$$

Mathematica [A] (verified)

Time = 0.32 (sec) , antiderivative size = 90, normalized size of antiderivative = 0.68

$$\int (a+b\cos(c+dx))^3\sec^5(c+dx)\,dx = \frac{3a(a^2+4b^2)\operatorname{arctanh}(\sin(c+dx)) + \tan(c+dx)\left(3a(a^2+4b^2)\sec(c+dx) + 2a^3\sec^3(c+dx) + 8b(3a^2+\right.}{8d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^5,x]
[Out] (3*a*(a^2 + 4*b^2)*ArcTanh[Sin[c + d*x]] + Tan[c + d*x]*(3*a*(a^2 + 4*b^2)*
Sec[c + d*x] + 2*a^3*Sec[c + d*x]^3 + 8*b*(3*a^2 + b^2 + a^2*Tan[c + d*x]^2
)))/(8*d)
```

Maple [A] (verified)

Time = 5.00 (sec) , antiderivative size = 125, normalized size of antiderivative = 0.94

method	result
derivativedivides	$\frac{a^3\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)-3a^2b\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+}{d}$
default	$\frac{a^3\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)-3a^2b\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+}{d}$
parts	$\frac{a^3\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)}{d}+\frac{b^3\tan(dx+c)}{d}-\frac{3a^2b\left(-\frac{2}{3}-\frac{\left(\sec^2(d\right.}{3}\right.}{}$
parallelrisch	$\frac{-6\left(\frac{3}{4}+\frac{\cos(4dx+4c)}{4}+\cos(2dx+2c)\right)(a^2+4b^2)a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+6\left(\frac{3}{4}+\frac{\cos(4dx+4c)}{4}+\cos(2dx+2c)\right)(a^2+4b^2)a\ln\left(\tan\right.}{4d(\cos(4dx+4c)}$
risch	$-\frac{i\left(3a^3e^{7i(dx+c)}+12ab^2e^{7i(dx+c)}-8b^3e^{6i(dx+c)}+11a^3e^{5i(dx+c)}+12ab^2e^{5i(dx+c)}-48a^2be^{4i(dx+c)}-24b^3e^{4i(dx+c)}-11\right.}{4d(e^{2i(dx+c)}+}$
norman	$\frac{\frac{a(7a^2-12b^2)\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{(5a^3-24a^2b+12ab^2-8b^3)\left(\tan^{13}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}+\frac{(5a^3+24a^2b+12ab^2+8b^3)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d}+\frac{(27a^3-8}{}}{\left(1+\tan\right.}$

```
[In] int((a+cos(d*x+c)*b)^3*sec(d*x+c)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a^3*(-(-1/4*sec(d*x+c)^3-3/8*sec(d*x+c))*tan(d*x+c)+3/8*ln(sec(d*x+c)+
tan(d*x+c)))-3*a^2*b*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c)+3*a*b^2*(1/2*sec(d*
x+c)*tan(d*x+c)+1/2*ln(sec(d*x+c)+tan(d*x+c)))+tan(d*x+c)*b^3)
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.05

$$\int (a+b\cos(c+dx))^3\sec^5(c+dx)\,dx$$
$$= \frac{3\,(a^3+4\,ab^2)\cos{(dx+c)}^4\log{(\sin{(dx+c)}+1)}-3\,(a^3+4\,ab^2)\cos{(dx+c)}^4\log{(-\sin{(dx+c)}+1)}+2\,(}{16\,d\cos{(dx+}}$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] 1/16*(3*(a^3 + 4*a*b^2)*cos(d*x + c)^4*log(sin(d*x + c) + 1) - 3*(a^3 + 4*a
*b^2)*cos(d*x + c)^4*log(-sin(d*x + c) + 1) + 2*(8*a^2*b*cos(d*x + c) + 8*(
2*a^2*b + b^3)*cos(d*x + c)^3 + 2*a^3 + 3*(a^3 + 4*a*b^2)*cos(d*x + c)^2)*s
in(d*x + c))/(d*cos(d*x + c)^4)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^3\sec^5(c+dx)\,dx=\text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**3*sec(d*x+c)**5,x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.19

$$\int (a+b\cos(c+dx))^3\sec^5(c+dx)\,dx$$
$$= \frac{16\left(\tan{(dx+c)}^3+3\,\tan{(dx+c)}\right)a^2b-a^3\left(\frac{2\left(3\,\sin(dx+c)^3-5\,\sin(dx+c)\right)}{\sin(dx+c)^4-2\,\sin(dx+c)^2+1}-3\,\log{(\sin{(dx+c)}+1)}+3\,\log{(\sin}\right.}{16}$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^5,x, algorithm="maxima")
```

[Out] 1/16*(16*(tan(d*x + c)^3 + 3*tan(d*x + c))*a^2*b - a^3*(2*(3*sin(d*x + c)^3 - 5*sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2 + 1) - 3*log(sin(d*x + c) + 1) + 3*log(sin(d*x + c) - 1)) - 12*a*b^2*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)) + 16*b^3*tan(d*x + c))/d

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 330 vs. $2(125) = 250$.

Time = 0.31 (sec) , antiderivative size = 330, normalized size of antiderivative = 2.48

$$\int (a+b\cos(c+dx))^3\sec^5(c+dx)\,dx$$
$$= \frac{3\,(a^3+4\,ab^2)\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-3\,(a^3+4\,ab^2)\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)+\frac{2\left(5\,a^3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7}{}}{}$$

[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^5,x, algorithm="giac")

[Out] 1/8*(3*(a^3 + 4*a*b^2)*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 3*(a^3 + 4*a*b^2)*log(abs(tan(1/2*d*x + 1/2*c) - 1)) + 2*(5*a^3*tan(1/2*d*x + 1/2*c)^7 - 24*a^2*b*tan(1/2*d*x + 1/2*c)^7 + 12*a*b^2*tan(1/2*d*x + 1/2*c)^7 - 8*b^3*tan(1/2*d*x + 1/2*c)^7 + 3*a^3*tan(1/2*d*x + 1/2*c)^5 + 40*a^2*b*tan(1/2*d*x + 1/2*c)^5 - 12*a*b^2*tan(1/2*d*x + 1/2*c)^5 + 24*b^3*tan(1/2*d*x + 1/2*c)^5 + 3*a^3*tan(1/2*d*x + 1/2*c)^3 - 40*a^2*b*tan(1/2*d*x + 1/2*c)^3 - 12*a*b^2*tan(1/2*d*x + 1/2*c)^3 - 24*b^3*tan(1/2*d*x + 1/2*c)^3 + 5*a^3*tan(1/2*d*x + 1/2*c) + 24*a^2*b*tan(1/2*d*x + 1/2*c) + 12*a*b^2*tan(1/2*d*x + 1/2*c) + 8*b^3*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2 - 1)^4)/d

Mupad [B] (verification not implemented)

Time = 17.99 (sec) , antiderivative size = 224, normalized size of antiderivative = 1.68

$$\int (a+b\cos(c+dx))^3\sec^5(c+dx)\,dx$$
$$= \frac{\left(\frac{5\,a^3}{4}-6\,a^2\,b+3\,a\,b^2-2\,b^3\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7+\left(\frac{3\,a^3}{4}+10\,a^2\,b-3\,a\,b^2+6\,b^3\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5+\left(\frac{3\,a^3}{4}-10\,a\right.}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8-4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6+6\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right.}$$
$$+\frac{3\,a\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)\,\left(a^2+4\,b^2\right)}{4\,d}$$

[In] int((a + b*cos(c + d*x))^3/cos(c + d*x)^5,x)

[Out] (tan(c/2 + (d*x)/2)^7*(3*a*b^2 - 6*a^2*b + (5*a^3)/4 - 2*b^3) - tan(c/2 + (d*x)/2)^3*(3*a*b^2 + 10*a^2*b - (3*a^3)/4 + 6*b^3) + tan(c/2 + (d*x)/2)^5*(

```
10*a^2*b - 3*a*b^2 + (3*a^3)/4 + 6*b^3) + tan(c/2 + (d*x)/2)*(3*a*b^2 + 6*a
^2*b + (5*a^3)/4 + 2*b^3))/(d*(6*tan(c/2 + (d*x)/2)^4 - 4*tan(c/2 + (d*x)/2
)^2 - 4*tan(c/2 + (d*x)/2)^6 + tan(c/2 + (d*x)/2)^8 + 1)) + (3*a*atanh(tan(
c/2 + (d*x)/2))*(a^2 + 4*b^2))/(4*d)
```

3.437 $\int (a+b\cos(c+dx))^3\sec^6(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 169

$$\int (a+b\cos(c+dx))^3\sec^6(c+dx)\,dx = \frac{b(9a^2+4b^2)\operatorname{arctanh}(\sin(c+dx))}{8d} + \frac{a(4a^2+15b^2)\tan(c+dx)}{5d} + \frac{b(9a^2+4b^2)\sec(c+dx)\tan(c+dx)}{8d} + \frac{11a^2b\sec^3(c+dx)\tan(c+dx)}{20d} + \frac{a^2(a+b\cos(c+dx))\sec^4(c+dx)\tan(c+dx)}{5d} + \frac{a(4a^2+15b^2)\tan^3(c+dx)}{15d}$$

```
[Out] 1/8*b*(9*a^2+4*b^2)*arctanh(sin(d*x+c))/d+1/5*a*(4*a^2+15*b^2)*tan(d*x+c)/d
+1/8*b*(9*a^2+4*b^2)*sec(d*x+c)*tan(d*x+c)/d+11/20*a^2*b*sec(d*x+c)^3*tan(d
*x+c)/d+1/5*a^2*(a+b*cos(d*x+c))*sec(d*x+c)^4*tan(d*x+c)/d+1/15*a*(4*a^2+15
*b^2)*tan(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used

$= \{2871, 3100, 2827, 3852, 3853, 3855\}$

$$\int (a+b\cos(c+dx))^3\sec^6(c+dx)\,dx = \frac{b(9a^2+4b^2)\,\text{arctanh}(\sin(c+dx))}{8d} + \frac{a(4a^2+15b^2)\tan^3(c+dx)}{15d} + \frac{a(4a^2+15b^2)\tan(c+dx)}{5d} + \frac{b(9a^2+4b^2)\tan(c+dx)\sec(c+dx)}{8d} + \frac{11a^2b\tan(c+dx)\sec^3(c+dx)}{20d} + \frac{a^2\tan(c+dx)\sec^4(c+dx)(a+b\cos(c+dx))}{5d}$$

```
[In] Int[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^6,x]
```

```
[Out] (b*(9*a^2 + 4*b^2)*ArcTanh[Sin[c + d*x]])/(8*d) + (a*(4*a^2 + 15*b^2)*Tan[c
 + d*x])/(5*d) + (b*(9*a^2 + 4*b^2)*Sec[c + d*x]*Tan[c + d*x])/(8*d) + (11*
a^2*b*Sec[c + d*x]^3*Tan[c + d*x])/(20*d) + (a^2*(a + b*Cos[c + d*x])*Sec[c
 + d*x]^4*Tan[c + d*x])/(5*d) + (a*(4*a^2 + 15*b^2)*Tan[c + d*x]^3)/(15*d)
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3100

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
 (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2
 - a*b*B + a^2*C))*Cos[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*
```

```
(a^2 - b^2))), x] + Dist[1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*Simp[b*(a*A - b*B + a*C)*(m + 1) - (A*b^2 - a*b*B + a^2*C + b*(A*
b - a*B + b*C)*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B
, C}, x] && LtQ[m, -1] && NeQ[a^2 - b^2, 0]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{a^2(a+b\cos(c+dx))\sec^4(c+dx)\tan(c+dx)}{5d} \\
&\quad+\frac{1}{5}\int\left(11a^2b+a\left(4a^2+15b^2\right)\cos(c+dx)+b\left(3a^2+5b^2\right)\cos^2(c+dx)\right)\sec^5(c+dx)\,dx \\
&= \frac{11a^2b\sec^3(c+dx)\tan(c+dx)}{20d}+\frac{a^2(a+b\cos(c+dx))\sec^4(c+dx)\tan(c+dx)}{5d} \\
&\quad+\frac{1}{20}\int\left(4a\left(4a^2+15b^2\right)+5b\left(9a^2+4b^2\right)\cos(c+dx)\right)\sec^4(c+dx)\,dx \\
&= \frac{11a^2b\sec^3(c+dx)\tan(c+dx)}{20d}+\frac{a^2(a+b\cos(c+dx))\sec^4(c+dx)\tan(c+dx)}{5d} \\
&\quad+\frac{1}{4}\left(b\left(9a^2+4b^2\right)\right)\int\sec^3(c+dx)\,dx+\frac{1}{5}\left(a\left(4a^2+15b^2\right)\right)\int\sec^4(c+dx)\,dx \\
&= \frac{b(9a^2+4b^2)\sec(c+dx)\tan(c+dx)}{8d}+\frac{11a^2b\sec^3(c+dx)\tan(c+dx)}{20d} \\
&\quad+\frac{a^2(a+b\cos(c+dx))\sec^4(c+dx)\tan(c+dx)}{5d} \\
&\quad+\frac{1}{8}\left(b\left(9a^2+4b^2\right)\right)\int\sec(c+dx)\,dx \\
&\quad-\frac{(a(4a^2+15b^2))\operatorname{Subst}\left(\int\left(1+x^2\right)\,dx,x,-\tan(c+dx)\right)}{5d}
\end{aligned}
$$

$$= \frac{b(9a^2+4b^2)\operatorname{arctanh}(\sin(c+dx))}{8d} + \frac{a(4a^2+15b^2)\tan(c+dx)}{5d} + \frac{b(9a^2+4b^2)\sec(c+dx)\tan(c+dx)}{8d} + \frac{11a^2b\sec^3(c+dx)\tan(c+dx)}{20d} + \frac{a^2(a+b\cos(c+dx))\sec^4(c+dx)\tan(c+dx)}{5d} + \frac{a(4a^2+15b^2)\tan^3(c+dx)}{15d}$$

Mathematica [A] (verified)

Time = 0.57 (sec) , antiderivative size = 120, normalized size of antiderivative = 0.71

$$\int (a+b\cos(c+dx))^3\sec^6(c+dx)\,dx = \frac{15b(9a^2+4b^2)\operatorname{arctanh}(\sin(c+dx)) + \tan(c+dx)\left(15b(9a^2+4b^2)\sec(c+dx) + 90a^2b\sec^3(c+dx) + 8a(1\right.}{120d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^6,x]
```

```
[Out] (15*b*(9*a^2 + 4*b^2)*ArcTanh[Sin[c + d*x]] + Tan[c + d*x]*(15*b*(9*a^2 + 4
*b^2)*Sec[c + d*x] + 90*a^2*b*Sec[c + d*x]^3 + 8*a*(15*(a^2 + 3*b^2) + 5*(2
*a^2 + 3*b^2)*Tan[c + d*x]^2 + 3*a^2*Tan[c + d*x]^4)))/(120*d)
```

Maple [A] (verified)

Time = 4.91 (sec) , antiderivative size = 148, normalized size of antiderivative = 0.88

method	result
derivativedivides	$\frac{-a^3\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c)\right)}{5}-\frac{4\left(\sec^2(dx+c)\right)}{15}\right)\tan(dx+c)+3a^2b\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c}{}\right.}{d}$
default	$\frac{-a^3\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c)\right)}{5}-\frac{4\left(\sec^2(dx+c)\right)}{15}\right)\tan(dx+c)+3a^2b\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c}{}\right.}{d}$
parts	$-\frac{a^3\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c)\right)}{5}-\frac{4\left(\sec^2(dx+c)\right)}{15}\right)\tan(dx+c)}{d}+\frac{b^3\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}+\frac{3a^2b\left(\right.}{}$
parallelrisch	$\frac{-1350b\left(a^2+\frac{4b^2}{9}\right)\left(\frac{\cos(5dx+5c)}{10}+\frac{\cos(3dx+3c)}{2}+\cos(dx+c)\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+1350b\left(a^2+\frac{4b^2}{9}\right)\left(\frac{\cos(5dx+5c)}{10}+\frac{\cos(3dx+}{2}\right.\right.}{}$
risch	$-\frac{i\left(135a^2b\,e^{9i(dx+c)}+60b^3e^{9i(dx+c)}+630a^2b\,e^{7i(dx+c)}+120b^3e^{7i(dx+c)}-720a\,b^2e^{6i(dx+c)}-640a^3e^{4i(dx+c)}-1680a\,b^2e^{4i(}\right.}{60d(e}$
norman	$\frac{-\frac{\left(8a^3-15a^2b+24a\,b^2-4b^3\right)\left(\tan^{15}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}-\frac{\left(8a^3+15a^2b+24a\,b^2+4b^3\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d}-\frac{\left(40a^3-117a^2b+24a\,b^2-12b^3\right)\left(\tan^{13}\left(\frac{dx}{2}\right.\right.}{12d}}{}$

```
[In] int((a+cos(d*x+c)*b)^3*sec(d*x+c)^6,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-a^3*(-8/15-1/5*sec(d*x+c)^4-4/15*sec(d*x+c)^2)*tan(d*x+c)+3*a^2*b*(-(
-1/4*sec(d*x+c)^3-3/8*sec(d*x+c))*tan(d*x+c)+3/8*ln(sec(d*x+c)+tan(d*x+c)))
-3*a*b^2*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c)+b^3*(1/2*sec(d*x+c)*tan(d*x+c)+
1/2*ln(sec(d*x+c)+tan(d*x+c))))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.01

$$\int (a+b\cos(c+dx))^3\sec^6(c+dx)\,dx$$
$$= \frac{15\,(9\,a^2b+4\,b^3)\cos{(dx+c)}^5\log{(\sin{(dx+c)}+1)}-15\,(9\,a^2b+4\,b^3)\cos{(dx+c)}^5\log{(-\sin{(dx+c)}+1}}{}$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^6,x, algorithm="fricas")
```

```
[Out] 1/240*(15*(9*a^2*b + 4*b^3)*cos(d*x + c)^5*log(sin(d*x + c) + 1) - 15*(9*a^
2*b + 4*b^3)*cos(d*x + c)^5*log(-sin(d*x + c) + 1) + 2*(16*(4*a^3 + 15*a*b^
2)*cos(d*x + c)^4 + 90*a^2*b*cos(d*x + c) + 15*(9*a^2*b + 4*b^3)*cos(d*x +
c)^3 + 24*a^3 + 8*(4*a^3 + 15*a*b^2)*cos(d*x + c)^2)*sin(d*x + c))/(d*cos(d
*x + c)^5)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^3\sec^6(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**3*sec(d*x+c)**6,x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 181, normalized size of antiderivative = 1.07

$$\int (a+b\cos(c+dx))^3\sec^6(c+dx)\,dx$$
$$= \frac{16\,\left(3\,\tan{(dx+c)}^5+10\,\tan{(dx+c)}^3+15\,\tan{(dx+c)}\right)a^3+240\,\left(\tan{(dx+c)}^3+3\,\tan{(dx+c)}\right)ab^2-}{}$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^6,x, algorithm="maxima")
```

```
[Out] 1/240*(16*(3*tan(d*x + c)^5 + 10*tan(d*x + c)^3 + 15*tan(d*x + c))*a^3 + 24
0*(tan(d*x + c)^3 + 3*tan(d*x + c))*a*b^2 - 45*a^2*b*(2*(3*sin(d*x + c)^3 -
 5*sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2 + 1) - 3*log(sin(d*x +
c) + 1) + 3*log(sin(d*x + c) - 1)) - 60*b^3*(2*sin(d*x + c)/(sin(d*x + c)^2
 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 367 vs. $2(157) = 314$.

Time = 0.35 (sec) , antiderivative size = 367, normalized size of antiderivative = 2.17

$$\int (a+b\cos(c+dx))^3\sec^6(c+dx)\,dx$$
$$= \frac{15\,(9\,a^2b+4\,b^3)\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-15\,(9\,a^2b+4\,b^3)\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)-\frac{2\left(120\,a^3\tan\left(\frac{1}{2}\,dx\right.\right.}{}}{}$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^6,x, algorithm="giac")
```

```
[Out] 1/120*(15*(9*a^2*b + 4*b^3)*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 15*(9*a^2*
b + 4*b^3)*log(abs(tan(1/2*d*x + 1/2*c) - 1)) - 2*(120*a^3*tan(1/2*d*x + 1/
2*c)^9 - 225*a^2*b*tan(1/2*d*x + 1/2*c)^9 + 360*a*b^2*tan(1/2*d*x + 1/2*c)^
9 - 60*b^3*tan(1/2*d*x + 1/2*c)^9 - 160*a^3*tan(1/2*d*x + 1/2*c)^7 + 90*a^2
*b*tan(1/2*d*x + 1/2*c)^7 - 960*a*b^2*tan(1/2*d*x + 1/2*c)^7 + 120*b^3*tan(
1/2*d*x + 1/2*c)^7 + 464*a^3*tan(1/2*d*x + 1/2*c)^5 + 1200*a*b^2*tan(1/2*d*
x + 1/2*c)^5 - 160*a^3*tan(1/2*d*x + 1/2*c)^3 - 90*a^2*b*tan(1/2*d*x + 1/2*
c)^3 - 960*a*b^2*tan(1/2*d*x + 1/2*c)^3 - 120*b^3*tan(1/2*d*x + 1/2*c)^3 +
120*a^3*tan(1/2*d*x + 1/2*c) + 225*a^2*b*tan(1/2*d*x + 1/2*c) + 360*a*b^2*t
an(1/2*d*x + 1/2*c) + 60*b^3*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2
- 1)^5)/d
```

Mupad [B] (verification not implemented)

Time = 17.67 (sec) , antiderivative size = 260, normalized size of antiderivative = 1.54

$$\int (a+b\cos(c+dx))^3\sec^6(c+dx)\,dx = \frac{\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)\,\left(\frac{9\,a^2\,b}{4}+b^3\right)}{d}$$
$$-\frac{\left(2\,a^3-\frac{15\,a^2\,b}{4}+6\,a\,b^2-b^3\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9+\left(-\frac{8\,a^3}{3}+\frac{3\,a^2\,b}{2}-16\,a\,b^2+2\,b^3\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7+\left(\frac{116\,a^3}{15}+2\right.}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}-5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8+10\tan\right.}$$

```
[In] int((a + b*cos(c + d*x))^3/cos(c + d*x)^6,x)
```

```
[Out] (atanh(tan(c/2 + (d*x)/2))*((9*a^2*b)/4 + b^3))/d - (tan(c/2 + (d*x)/2)^9*(
6*a*b^2 - (15*a^2*b)/4 + 2*a^3 - b^3) - tan(c/2 + (d*x)/2)^3*(16*a*b^2 + (3
*a^2*b)/2 + (8*a^3)/3 + 2*b^3) - tan(c/2 + (d*x)/2)^7*(16*a*b^2 - (3*a^2*b)
/2 + (8*a^3)/3 - 2*b^3) + tan(c/2 + (d*x)/2)*(6*a*b^2 + (15*a^2*b)/4 + 2*a^
3 + b^3) + tan(c/2 + (d*x)/2)^5*(20*a*b^2 + (116*a^3)/15))/(d*(5*tan(c/2 +
(d*x)/2)^2 - 10*tan(c/2 + (d*x)/2)^4 + 10*tan(c/2 + (d*x)/2)^6 - 5*tan(c/2
+ (d*x)/2)^8 + tan(c/2 + (d*x)/2)^10 - 1))
```

3.438 $\int \cos^3(c+dx)(a+b\cos(c+dx))^4\,dx$

Optimal result

Integrand size = 21, antiderivative size = 247

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^4\,dx = \frac{1}{4}ab(6a^2+5b^2)\,x + \frac{(35a^4+168a^2b^2+24b^4)\sin(c+dx)}{35d} + \frac{ab(6a^2+5b^2)\cos(c+dx)\sin(c+dx)}{4d} + \frac{ab(6a^2+5b^2)\cos^3(c+dx)\sin(c+dx)}{6d} + \frac{b^2(37a^2+6b^2)\cos^4(c+dx)\sin(c+dx)}{35d} + \frac{8ab^3\cos^5(c+dx)\sin(c+dx)}{21d} + \frac{b^2\cos^4(c+dx)(a+b\cos(c+dx))^2\sin(c+dx)}{7d} - \frac{(35a^4+168a^2b^2+24b^4)\sin^3(c+dx)}{105d}$$

```
[Out] 1/4*a*b*(6*a^2+5*b^2)*x+1/35*(35*a^4+168*a^2*b^2+24*b^4)*sin(d*x+c)/d+1/4*a
*b*(6*a^2+5*b^2)*cos(d*x+c)*sin(d*x+c)/d+1/6*a*b*(6*a^2+5*b^2)*cos(d*x+c)^3
*sin(d*x+c)/d+1/35*b^2*(37*a^2+6*b^2)*cos(d*x+c)^4*sin(d*x+c)/d+8/21*a*b^3*
cos(d*x+c)^5*sin(d*x+c)/d+1/7*b^2*cos(d*x+c)^4*(a+b*cos(d*x+c))^2*sin(d*x+c
)/d-1/105*(35*a^4+168*a^2*b^2+24*b^4)*sin(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 247, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2872, 3112, 3102, 2827, 2713, 2715, 8}

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^4\,dx = \frac{b^2(37a^2+6b^2)\sin(c+dx)\cos^4(c+dx)}{35d} + \frac{ab(6a^2+5b^2)\sin(c+dx)\cos^3(c+dx)}{6d} + \frac{ab(6a^2+5b^2)\sin(c+dx)\cos(c+dx)}{4d} + \frac{1}{4}abx(6a^2+5b^2) - \frac{(35a^4+168a^2b^2+24b^4)\sin^3(c+dx)}{105d} + \frac{(35a^4+168a^2b^2+24b^4)\sin(c+dx)}{35d} + \frac{8ab^3\sin(c+dx)\cos^5(c+dx)}{21d} + \frac{b^2\sin(c+dx)\cos^4(c+dx)(a+b\cos(c+dx))^2}{7d}$$

```
[In] Int[Cos[c + d*x]^3*(a + b*Cos[c + d*x])^4,x]
```

```
[Out] (a*b*(6*a^2 + 5*b^2)*x)/4 + ((35*a^4 + 168*a^2*b^2 + 24*b^4)*Sin[c + d*x])/
(35*d) + (a*b*(6*a^2 + 5*b^2)*Cos[c + d*x]*Sin[c + d*x])/(4*d) + (a*b*(6*a^
2 + 5*b^2)*Cos[c + d*x]^3*Sin[c + d*x])/(6*d) + (b^2*(37*a^2 + 6*b^2)*Cos[c
 + d*x]^4*Sin[c + d*x])/(35*d) + (8*a*b^3*Cos[c + d*x]^5*Sin[c + d*x])/(21*
d) + (b^2*Cos[c + d*x]^4*(a + b*Cos[c + d*x])^2*Sin[c + d*x])/(7*d) - ((35*
a^4 + 168*a^2*b^2 + 24*b^4)*Sin[c + d*x]^3)/(105*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
```

```
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rule 3112

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((c_) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f
_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*d*Cos[e + f*x]*Sin[e + f*x]*((a + b*Si
n[e + f*x])^(m + 1)/(b*f*(m + 3))), x] + Dist[1/(b*(m + 3)), Int[(a + b*Sin
[e + f*x])^m*Simp[a*C*d + A*b*c*(m + 3) + b*(B*c*(m + 3) + d*(C*(m + 2) + A
*(m + 3)))*Sin[e + f*x] - (2*a*C*d - b*(c*C + B*d)*(m + 3))*Sin[e + f*x]^2,
 x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, m}, x] && NeQ[b*c - a*d, 0
] && NeQ[a^2 - b^2, 0] &&  !LtQ[m, -1]
```

Rubi steps

$$\text{integral} = \frac{b^2\cos^4(c+dx)(a+b\cos(c+dx))^2\sin(c+dx)}{7d} + \frac{1}{7}\int \cos^3(c+dx)(a+b\cos(c+dx))\left(a\left(7a^2+4b^2\right)+3b\left(7a^2+2b^2\right)\cos(c+dx)+16ab^2\cos^2(c+dx)\right)\,dx$$

$$= \frac{8ab^3\cos^5(c+dx)\sin(c+dx)}{21d} + \frac{b^2\cos^4(c+dx)(a+b\cos(c+dx))^2\sin(c+dx)}{7d} + \frac{1}{42}\int \cos^3(c+dx)\left(6a^2(7a^2+4b^2)+28ab(6a^2+5b^2)\cos(c+dx) + 6b^2(37a^2+6b^2)\cos^2(c+dx)\right)\,dx$$

$$= \frac{b^2(37a^2+6b^2)\cos^4(c+dx)\sin(c+dx)}{35d} + \frac{8ab^3\cos^5(c+dx)\sin(c+dx)}{21d} + \frac{b^2\cos^4(c+dx)(a+b\cos(c+dx))^2\sin(c+dx)}{7d} + \frac{1}{210}\int \cos^3(c+dx)\left(6(35a^4+168a^2b^2+24b^4)+140ab(6a^2+5b^2)\cos(c+dx)\right)\,dx$$

$$= \frac{b^2(37a^2+6b^2)\cos^4(c+dx)\sin(c+dx)}{35d} + \frac{8ab^3\cos^5(c+dx)\sin(c+dx)}{21d} + \frac{b^2\cos^4(c+dx)(a+b\cos(c+dx))^2\sin(c+dx)}{7d} + \frac{1}{3}\left(2ab(6a^2+5b^2)\right)\int \cos^4(c+dx)\,dx + \frac{1}{35}(35a^4+168a^2b^2+24b^4)\int \cos^3(c+dx)\,dx$$

$$= \frac{ab(6a^2+5b^2)\cos^3(c+dx)\sin(c+dx)}{6d} + \frac{b^2(37a^2+6b^2)\cos^4(c+dx)\sin(c+dx)}{35d} + \frac{8ab^3\cos^5(c+dx)\sin(c+dx)}{21d} + \frac{b^2\cos^4(c+dx)(a+b\cos(c+dx))^2\sin(c+dx)}{7d} + \frac{1}{2}\left(ab(6a^2+5b^2)\right)\int \cos^2(c+dx)\,dx - \frac{(35a^4+168a^2b^2+24b^4)\,\text{Subst}\left(\int (1-x^2)\,dx, x, -\sin(c+dx)\right)}{35d}$$

$$= \frac{(35a^4+168a^2b^2+24b^4)\sin(c+dx)}{35d} + \frac{ab(6a^2+5b^2)\cos(c+dx)\sin(c+dx)}{4d} + \frac{ab(6a^2+5b^2)\cos^3(c+dx)\sin(c+dx)}{6d} + \frac{b^2(37a^2+6b^2)\cos^4(c+dx)\sin(c+dx)}{35d} + \frac{8ab^3\cos^5(c+dx)\sin(c+dx)}{21d} + \frac{b^2\cos^4(c+dx)(a+b\cos(c+dx))^2\sin(c+dx)}{7d} - \frac{(35a^4+168a^2b^2+24b^4)\sin^3(c+dx)}{105d} + \frac{1}{4}\left(ab(6a^2+5b^2)\right)\int 1\,dx$$

$$
\begin{aligned}
&= \frac{1}{4}ab(6a^2+5b^2)\,x + \frac{(35a^4+168a^2b^2+24b^4)\sin(c+dx)}{35d} \\
&\quad + \frac{ab(6a^2+5b^2)\cos(c+dx)\sin(c+dx)}{4d} + \frac{ab(6a^2+5b^2)\cos^3(c+dx)\sin(c+dx)}{6d} \\
&\quad + \frac{b^2(37a^2+6b^2)\cos^4(c+dx)\sin(c+dx)}{35d} + \frac{8ab^3\cos^5(c+dx)\sin(c+dx)}{21d} \\
&\quad + \frac{b^2\cos^4(c+dx)(a+b\cos(c+dx))^2\sin(c+dx)}{7d} \\
&\quad - \frac{(35a^4+168a^2b^2+24b^4)\sin^3(c+dx)}{105d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.71 (sec) , antiderivative size = 181, normalized size of antiderivative = 0.73

$$
\int \cos^3(c+dx)(a+b\cos(c+dx))^4\,dx
$$
$$
= \frac{1680ab(6a^2+5b^2)(c+dx)+105(48a^4+240a^2b^2+35b^4)\sin(c+dx)+420ab(16a^2+15b^2)\sin(2(c+dx))}{}
$$

```
[In] Integrate[Cos[c + d*x]^3*(a + b*Cos[c + d*x])^4,x]
```

```
[Out] (1680*a*b*(6*a^2 + 5*b^2)*(c + d*x) + 105*(48*a^4 + 240*a^2*b^2 + 35*b^4)*S
in[c + d*x] + 420*a*b*(16*a^2 + 15*b^2)*Sin[2*(c + d*x)] + 35*(16*a^4 + 120
*a^2*b^2 + 21*b^4)*Sin[3*(c + d*x)] + 420*a*b*(2*a^2 + 3*b^2)*Sin[4*(c + d*
x)] + 21*b^2*(24*a^2 + 7*b^2)*Sin[5*(c + d*x)] + 140*a*b^3*Sin[6*(c + d*x)]
 + 15*b^4*Sin[7*(c + d*x)])/(6720*d)
```

Maple [A] (verified)

Time = 5.95 (sec) , antiderivative size = 176, normalized size of antiderivative = 0.71

method	result
parallelrisch	$\frac{(560a^4+4200a^2b^2+735b^4)\sin(3dx+3c)+(6720a^3b+6300a\,b^3)\sin(2dx+2c)+(840a^3b+1260a\,b^3)\sin(4dx+4c)+(504a^2b}{}$
derivativedivides	$\frac{\frac{a^4\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+4a^3b\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{6a^2b^2\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c\right.}{3}\right.}{5}}{}$
default	$\frac{\frac{a^4\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+4a^3b\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{6a^2b^2\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c\right.}{3}\right.}{5}}{}$
parts	$\frac{a^4(2+\cos^2(dx+c))\sin(dx+c)}{3d}+\frac{b^4\left(\frac{16}{5}+\cos^6(dx+c)+\frac{6\left(\cos^4(dx+c)\right)}{5}+\frac{8\left(\cos^2(dx+c)\right)}{5}\right)\sin(dx+c)}{7d}+\frac{4a\,b^3\left(\left(\cos^5(dx\right.\right.}{}$
risch	$\frac{3a^3bx}{2}+\frac{5a\,b^3x}{4}+\frac{3a^4\sin(dx+c)}{4d}+\frac{15\sin(dx+c)a^2b^2}{4d}+\frac{35\sin(dx+c)b^4}{64d}+\frac{b^4\sin(7dx+7c)}{448d}+\frac{a\,b^3\sin(6dx+6c)}{48d}$
norman	$\frac{(\frac{3}{2}a^3b+\frac{5}{4}a\,b^3)x+(\frac{3}{2}a^3b+\frac{5}{4}a\,b^3)x\left(\tan^{14}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(\frac{21}{2}a^3b+\frac{35}{4}a\,b^3)x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(\frac{21}{2}a^3b+\frac{35}{4}a\,b^3)x\left(\tan^{12}\left(\frac{dx}{2}\right.\right.}{}$

```
[In] int(cos(d*x+c)^3*(a+cos(d*x+c)*b)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/6720*((560*a^4+4200*a^2*b^2+735*b^4)*sin(3*d*x+3*c)+(6720*a^3*b+6300*a*b^
3)*sin(2*d*x+2*c)+(840*a^3*b+1260*a*b^3)*sin(4*d*x+4*c)+(504*a^2*b^2+147*b^
4)*sin(5*d*x+5*c)+140*a*b^3*sin(6*d*x+6*c)+15*b^4*sin(7*d*x+7*c)+(5040*a^4+
25200*a^2*b^2+3675*b^4)*sin(d*x+c)+10080*b*(a^2+5/6*b^2)*d*x*a)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 171, normalized size of antiderivative = 0.69

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^4\,dx$$
$$=\frac{105\,(6\,a^3b+5\,ab^3)dx+\left(60\,b^4\cos{(dx+c)}^6+280\,ab^3\cos{(dx+c)}^5+72\,(7\,a^2b^2+b^4)\cos{(dx+c)}^4+280\,a\right.}{}$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/420*(105*(6*a^3*b + 5*a*b^3)*d*x + (60*b^4*cos(d*x + c)^6 + 280*a*b^3*cos
(d*x + c)^5 + 72*(7*a^2*b^2 + b^4)*cos(d*x + c)^4 + 280*a^4 + 1344*a^2*b^2
```

```
+ 192*b^4 + 70*(6*a^3*b + 5*a*b^3)*cos(d*x + c)^3 + 4*(35*a^4 + 168*a^2*b^2
 + 24*b^4)*cos(d*x + c)^2 + 105*(6*a^3*b + 5*a*b^3)*cos(d*x + c))*sin(d*x +
 c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 495 vs. $2(231) = 462$.

Time = 0.52 (sec) , antiderivative size = 495, normalized size of antiderivative = 2.00

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^4\,dx$$
$$= \begin{cases} \frac{2a^4\sin^3(c+dx)}{3d} + \frac{a^4\sin(c+dx)\cos^2(c+dx)}{d} + \frac{3a^3bx\sin^4(c+dx)}{2} + 3a^3bx\sin^2(c+dx)\cos^2(c+dx) + \frac{3a^3bx\cos^4(c+dx)}{2} + \\ x(a+b\cos(c))^4\cos^3(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)**3*(a+b*cos(d*x+c))**4,x)
```

```
[Out] Piecewise((2*a**4*sin(c + d*x)**3/(3*d) + a**4*sin(c + d*x)*cos(c + d*x)**2
/d + 3*a**3*b*x*sin(c + d*x)**4/2 + 3*a**3*b*x*sin(c + d*x)**2*cos(c + d*x)
**2 + 3*a**3*b*x*cos(c + d*x)**4/2 + 3*a**3*b*sin(c + d*x)**3*cos(c + d*x)/
(2*d) + 5*a**3*b*sin(c + d*x)*cos(c + d*x)**3/(2*d) + 16*a**2*b**2*sin(c +
d*x)**5/(5*d) + 8*a**2*b**2*sin(c + d*x)**3*cos(c + d*x)**2/d + 6*a**2*b**2
*sin(c + d*x)*cos(c + d*x)**4/d + 5*a*b**3*x*sin(c + d*x)**6/4 + 15*a*b**3*
x*sin(c + d*x)**4*cos(c + d*x)**2/4 + 15*a*b**3*x*sin(c + d*x)**2*cos(c + d
*x)**4/4 + 5*a*b**3*x*cos(c + d*x)**6/4 + 5*a*b**3*sin(c + d*x)**5*cos(c +
d*x)/(4*d) + 10*a*b**3*sin(c + d*x)**3*cos(c + d*x)**3/(3*d) + 11*a*b**3*si
n(c + d*x)*cos(c + d*x)**5/(4*d) + 16*b**4*sin(c + d*x)**7/(35*d) + 8*b**4*
sin(c + d*x)**5*cos(c + d*x)**2/(5*d) + 2*b**4*sin(c + d*x)**3*cos(c + d*x)
**4/d + b**4*sin(c + d*x)*cos(c + d*x)**6/d, Ne(d, 0)), (x*(a + b*cos(c))**
4*cos(c)**3, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 192, normalized size of antiderivative = 0.78

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^4\,dx =$$
$$-\frac{560\left(\sin(dx+c)^3-3\sin(dx+c)\right)a^4-210\left(12\,dx+12\,c+\sin(4\,dx+4\,c)+8\,\sin(2\,dx+2\,c)\right)a^3b-67}{}$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] -1/1680*(560*(sin(d*x + c)^3 - 3*sin(d*x + c))*a^4 - 210*(12*d*x + 12*c + s
in(4*d*x + 4*c) + 8*sin(2*d*x + 2*c))*a^3*b - 672*(3*sin(d*x + c)^5 - 10*si
```

```
n(d*x + c)^3 + 15*sin(d*x + c))*a^2*b^2 + 35*(4*sin(2*d*x + 2*c)^3 - 60*d*x
 - 60*c - 9*sin(4*d*x + 4*c) - 48*sin(2*d*x + 2*c))*a*b^3 + 48*(5*sin(d*x +
 c)^7 - 21*sin(d*x + c)^5 + 35*sin(d*x + c)^3 - 35*sin(d*x + c))*b^4)/d
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 197, normalized size of antiderivative = 0.80

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^4\,dx = \frac{b^4\sin(7\,dx+7\,c)}{448\,d} + \frac{ab^3\sin(6\,dx+6\,c)}{48\,d} + \frac{1}{4}\left(6\,a^3b+5\,ab^3\right)x + \frac{\left(24\,a^2b^2+7\,b^4\right)\sin(5\,dx+5\,c)}{320\,d} + \frac{\left(2\,a^3b+3\,ab^3\right)\sin(4\,dx+4\,c)}{16\,d} + \frac{\left(16\,a^4+120\,a^2b^2+21\,b^4\right)\sin(3\,dx+3\,c)}{192\,d} + \frac{\left(16\,a^3b+15\,ab^3\right)\sin(2\,dx+2\,c)}{16\,d} + \frac{\left(48\,a^4+240\,a^2b^2+35\,b^4\right)\sin(dx+c)}{64\,d}$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/448*b^4*sin(7*d*x + 7*c)/d + 1/48*a*b^3*sin(6*d*x + 6*c)/d + 1/4*(6*a^3*b
 + 5*a*b^3)*x + 1/320*(24*a^2*b^2 + 7*b^4)*sin(5*d*x + 5*c)/d + 1/16*(2*a^3
*b + 3*a*b^3)*sin(4*d*x + 4*c)/d + 1/192*(16*a^4 + 120*a^2*b^2 + 21*b^4)*si
n(3*d*x + 3*c)/d + 1/16*(16*a^3*b + 15*a*b^3)*sin(2*d*x + 2*c)/d + 1/64*(48
*a^4 + 240*a^2*b^2 + 35*b^4)*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 15.71 (sec) , antiderivative size = 476, normalized size of antiderivative = 1.93

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^4\,dx = \frac{\left(2\,a^4-5\,a^3\,b+12\,a^2\,b^2-\frac{11\,a\,b^3}{2}+2\,b^4\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{13}+\left(\frac{28\,a^4}{3}-12\,a^3\,b+40\,a^2\,b^2-\frac{14\,a\,b^3}{3}+4\,b^4\right)\,\tan\left(\frac{c}{2}\right.}{}$$

$$+\frac{a\,b\,\mathrm{atan}\left(\frac{a\,b\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(6\,a^2+5\,b^2\right)}{2\,\left(3\,a^3\,b+\frac{5\,a\,b^3}{2}\right)}\right)\,\left(6\,a^2+5\,b^2\right)}{2\,d} - \frac{a\,b\,\left(6\,a^2+5\,b^2\right)\,\left(\mathrm{atan}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)-\frac{d\,x}{2}\right)}{2\,d}$$

```
[In] int(cos(c + d*x)^3*(a + b*cos(c + d*x))^4,x)
```

```
[Out] (tan(c/2 + (d*x)/2)^7*(24*a^4 + (424*b^4)/35 + (624*a^2*b^2)/5) + tan(c/2 +
 (d*x)/2)^13*(2*a^4 - 5*a^3*b - (11*a*b^3)/2 + 2*b^4 + 12*a^2*b^2) + tan(c/
2 + (d*x)/2)^3*((14*a*b^3)/3 + 12*a^3*b + (28*a^4)/3 + 4*b^4 + 40*a^2*b^2)
+ tan(c/2 + (d*x)/2)^11*((28*a^4)/3 - 12*a^3*b - (14*a*b^3)/3 + 4*b^4 + 40*
a^2*b^2) + tan(c/2 + (d*x)/2)^5*((85*a*b^3)/6 + 9*a^3*b + (58*a^4)/3 + (86*
b^4)/5 + (452*a^2*b^2)/5) + tan(c/2 + (d*x)/2)^9*((58*a^4)/3 - 9*a^3*b - (8
5*a*b^3)/6 + (86*b^4)/5 + (452*a^2*b^2)/5) + tan(c/2 + (d*x)/2)*((11*a*b^3)
/2 + 5*a^3*b + 2*a^4 + 2*b^4 + 12*a^2*b^2))/(d*(7*tan(c/2 + (d*x)/2)^2 + 21
*tan(c/2 + (d*x)/2)^4 + 35*tan(c/2 + (d*x)/2)^6 + 35*tan(c/2 + (d*x)/2)^8 +
 21*tan(c/2 + (d*x)/2)^10 + 7*tan(c/2 + (d*x)/2)^12 + tan(c/2 + (d*x)/2)^14
 + 1)) + (a*b*atan((a*b*tan(c/2 + (d*x)/2)*(6*a^2 + 5*b^2))/(2*((5*a*b^3)/2
 + 3*a^3*b)))*(6*a^2 + 5*b^2))/(2*d) - (a*b*(6*a^2 + 5*b^2)*(atan(tan(c/2 +
 (d*x)/2)) - (d*x)/2))/(2*d)
```

3.439 $\int \cos^2(c+dx)(a+b\cos(c+dx))^4\,dx$

Optimal result

Integrand size = 21, antiderivative size = 235

$$\begin{aligned}\int \cos^2(c+dx)(a+b\cos(c+dx))^4\,dx = {} & \frac{1}{16}\left(8a^4+36a^2b^2+5b^4\right)x \\ & - \frac{a(4a^4-121a^2b^2-128b^4)\sin(c+dx)}{60bd} \\ & - \frac{(8a^4-178a^2b^2-75b^4)\cos(c+dx)\sin(c+dx)}{240d} \\ & - \frac{a(4a^2-53b^2)\,(a+b\cos(c+dx))^2\sin(c+dx)}{120bd} \\ & - \frac{(4a^2-25b^2)\,(a+b\cos(c+dx))^3\sin(c+dx)}{120bd} \\ & - \frac{a(a+b\cos(c+dx))^4\sin(c+dx)}{30bd} \\ & + \frac{(a+b\cos(c+dx))^5\sin(c+dx)}{6bd}\end{aligned}$$

```
[Out] 1/16*(8*a^4+36*a^2*b^2+5*b^4)*x-1/60*a*(4*a^4-121*a^2*b^2-128*b^4)*sin(d*x+
c)/b/d-1/240*(8*a^4-178*a^2*b^2-75*b^4)*cos(d*x+c)*sin(d*x+c)/d-1/120*a*(4*
a^2-53*b^2)*(a+b*cos(d*x+c))^2*sin(d*x+c)/b/d-1/120*(4*a^2-25*b^2)*(a+b*cos
(d*x+c))^3*sin(d*x+c)/b/d-1/30*a*(a+b*cos(d*x+c))^4*sin(d*x+c)/b/d+1/6*(a+b
*cos(d*x+c))^5*sin(d*x+c)/b/d
```

Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 235, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {2870, 2832, 2813}

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^4\,dx = -\frac{(4a^2-25b^2)\sin(c+dx)(a+b\cos(c+dx))^3}{120bd} - \frac{a(4a^2-53b^2)\sin(c+dx)(a+b\cos(c+dx))^2}{120bd} - \frac{a(4a^4-121a^2b^2-128b^4)\sin(c+dx)}{60bd} - \frac{(8a^4-178a^2b^2-75b^4)\sin(c+dx)\cos(c+dx)}{240d} + \frac{1}{16}x(8a^4+36a^2b^2+5b^4) + \frac{\sin(c+dx)(a+b\cos(c+dx))^5}{6bd} - \frac{a\sin(c+dx)(a+b\cos(c+dx))^4}{30bd}$$

```
[In] Int[Cos[c + d*x]^2*(a + b*Cos[c + d*x])^4,x]
```

```
[Out] ((8*a^4 + 36*a^2*b^2 + 5*b^4)*x)/16 - (a*(4*a^4 - 121*a^2*b^2 - 128*b^4)*Si
n[c + d*x])/(60*b*d) - ((8*a^4 - 178*a^2*b^2 - 75*b^4)*Cos[c + d*x]*Sin[c +
 d*x])/(240*d) - (a*(4*a^2 - 53*b^2)*(a + b*Cos[c + d*x])^2*Sin[c + d*x])/(
120*b*d) - ((4*a^2 - 25*b^2)*(a + b*Cos[c + d*x])^3*Sin[c + d*x])/(120*b*d)
 - (a*(a + b*Cos[c + d*x])^4*Sin[c + d*x])/(30*b*d) + ((a + b*Cos[c + d*x])
^5*Sin[c + d*x])/(6*b*d)
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rule 2870

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^2, x_Symbol] :> Simp[(-d^2)*Cos[e + f*x]*((a + b*Sin[e + f*x])
^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m + 2)), Int[(a + b*Sin[e + f*x])^
m*Simp[b*(d^2*(m + 1) + c^2*(m + 2)) - d*(a*d - 2*b*c*(m + 2))*Sin[e + f*x]
, x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] && NeQ
[a^2 - b^2, 0] && !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(a+b\cos(c+dx))^5\sin(c+dx)}{6bd}+\frac{\int(5b-a\cos(c+dx))(a+b\cos(c+dx))^4\,dx}{6b}\\
&= -\frac{a(a+b\cos(c+dx))^4\sin(c+dx)}{30bd}+\frac{(a+b\cos(c+dx))^5\sin(c+dx)}{6bd}\\
&\quad+\frac{\int(a+b\cos(c+dx))^3\left(21ab-(4a^2-25b^2)\cos(c+dx)\right)\,dx}{30b}\\
&= -\frac{(4a^2-25b^2)(a+b\cos(c+dx))^3\sin(c+dx)}{120bd}\\
&\quad-\frac{a(a+b\cos(c+dx))^4\sin(c+dx)}{30bd}+\frac{(a+b\cos(c+dx))^5\sin(c+dx)}{6bd}\\
&\quad+\frac{\int(a+b\cos(c+dx))^2\left(3b(24a^2+25b^2)-3a(4a^2-53b^2)\cos(c+dx)\right)\,dx}{120b}\\
&= -\frac{a(4a^2-53b^2)(a+b\cos(c+dx))^2\sin(c+dx)}{120bd}\\
&\quad-\frac{(4a^2-25b^2)(a+b\cos(c+dx))^3\sin(c+dx)}{120bd}\\
&\quad-\frac{a(a+b\cos(c+dx))^4\sin(c+dx)}{30bd}+\frac{(a+b\cos(c+dx))^5\sin(c+dx)}{6bd}\\
&\quad+\frac{\int(a+b\cos(c+dx))\left(3ab(64a^2+181b^2)-3(8a^4-178a^2b^2-75b^4)\cos(c+dx)\right)\,dx}{360b}\\
&= \frac{1}{16}\left(8a^4+36a^2b^2+5b^4\right)x-\frac{a(4a^4-121a^2b^2-128b^4)\sin(c+dx)}{60bd}\\
&\quad-\frac{(8a^4-178a^2b^2-75b^4)\cos(c+dx)\sin(c+dx)}{240d}\\
&\quad-\frac{a(4a^2-53b^2)(a+b\cos(c+dx))^2\sin(c+dx)}{120bd}\\
&\quad-\frac{(4a^2-25b^2)(a+b\cos(c+dx))^3\sin(c+dx)}{120bd}\\
&\quad-\frac{a(a+b\cos(c+dx))^4\sin(c+dx)}{30bd}+\frac{(a+b\cos(c+dx))^5\sin(c+dx)}{6bd}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.62 (sec) , antiderivative size = 156, normalized size of antiderivative = 0.66

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^4\,dx$$
$$= \frac{60(8a^4+36a^2b^2+5b^4)(c+dx)+480ab(6a^2+5b^2)\sin(c+dx)+15(16a^4+96a^2b^2+15b^4)\sin(2(c+dx))}{9}$$

```
[In] Integrate[Cos[c + d*x]^2*(a + b*Cos[c + d*x])^4,x]
```

```
[Out] (60*(8*a^4 + 36*a^2*b^2 + 5*b^4)*(c + d*x) + 480*a*b*(6*a^2 + 5*b^2)*Sin[c
+ d*x] + 15*(16*a^4 + 96*a^2*b^2 + 15*b^4)*Sin[2*(c + d*x)] + 80*a*b*(4*a^2
 + 5*b^2)*Sin[3*(c + d*x)] + 45*b^2*(4*a^2 + b^2)*Sin[4*(c + d*x)] + 48*a*b
^3*Sin[5*(c + d*x)] + 5*b^4*Sin[6*(c + d*x)])/(960*d)
```

Maple [A] (verified)

Time = 4.31 (sec) , antiderivative size = 153, normalized size of antiderivative = 0.65

method	result
parallelrisch	$\frac{(240a^4+1440a^2b^2+225b^4)\sin(2dx+2c)+(320a^3b+400ab^3)\sin(3dx+3c)+(180a^2b^2+45b^4)\sin(4dx+4c)+48ab^3\sin(5dx+}{960d}$
derivativedivides	$\frac{a^4\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+\frac{4a^3b\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+6a^2b^2\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}$
default	$\frac{a^4\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+\frac{4a^3b\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+6a^2b^2\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}$
parts	$\frac{a^4\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{b^4\left(\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{6}+\frac{5dx}{16}+\frac{5c}{16}\right)}{d}+\frac{4ab^3\left(\frac{8}{3}+\right.}{}$
risch	$\frac{a^4x}{2}+\frac{9xa^2b^2}{4}+\frac{5b^4x}{16}+\frac{3\sin(dx+c)a^3b}{d}+\frac{5\sin(dx+c)ab^3}{2d}+\frac{b^4\sin(6dx+6c)}{192d}+\frac{ab^3\sin(5dx+5c)}{20d}+\frac{3\sin(4dx+}{16}$
norman	$\left(\frac{1}{2}a^4+\frac{9}{4}a^2b^2+\frac{5}{16}b^4\right)x+\left(3a^4+\frac{27}{2}a^2b^2+\frac{15}{8}b^4\right)x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(3a^4+\frac{27}{2}a^2b^2+\frac{15}{8}b^4\right)x\left(\tan^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(10a^4+45a^2b$

```
[In] int(cos(d*x+c)^2*(a+cos(d*x+c)*b)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/960*((240*a^4+1440*a^2*b^2+225*b^4)*sin(2*d*x+2*c)+(320*a^3*b+400*a*b^3)*
sin(3*d*x+3*c)+(180*a^2*b^2+45*b^4)*sin(4*d*x+4*c)+48*a*b^3*sin(5*d*x+5*c)+
5*b^4*sin(6*d*x+6*c)+(2880*a^3*b+2400*a*b^3)*sin(d*x+c)+480*d*(a^4+9/2*a^2*
b^2+5/8*b^4)*x)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 150, normalized size of antiderivative = 0.64

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^4\,dx = \frac{15\,(8\,a^4+36\,a^2b^2+5\,b^4)dx+\left(40\,b^4\cos\left(dx+c\right)^5+192\,ab^3\cos\left(dx+c\right)^4+640\,a^3b+512\,ab^3+10\,(36\,a^2b\right.}{2}$$

```
[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/240*(15*(8*a^4 + 36*a^2*b^2 + 5*b^4)*d*x + (40*b^4*cos(d*x + c)^5 + 192*a
*b^3*cos(d*x + c)^4 + 640*a^3*b + 512*a*b^3 + 10*(36*a^2*b^2 + 5*b^4)*cos(d
*x + c)^3 + 64*(5*a^3*b + 4*a*b^3)*cos(d*x + c)^2 + 15*(8*a^4 + 36*a^2*b^2
+ 5*b^4)*cos(d*x + c))*sin(d*x + c))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 459 vs. 2(211) = 422.

Time = 0.39 (sec) , antiderivative size = 459, normalized size of antiderivative = 1.95

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^4\,dx = \begin{cases} \frac{a^4x\sin^2{(c+dx)}}{2}+\frac{a^4x\cos^2{(c+dx)}}{2}+\frac{a^4\sin{(c+dx)}\cos{(c+dx)}}{2d}+\frac{8a^3b\sin^3{(c+dx)}}{3d}+\frac{4a^3b\sin{(c+dx)}\cos^2{(c+dx)}}{d}+\frac{9a^2b^2x\sin^4{(c+dx)}}{4} \\ x(a+b\cos{(c)})^4\cos^2{(c)} \end{cases}$$

```
[In] integrate(cos(d*x+c)**2*(a+b*cos(d*x+c))**4,x)
```

```
[Out] Piecewise((a**4*x*sin(c + d*x)**2/2 + a**4*x*cos(c + d*x)**2/2 + a**4*sin(c
 + d*x)*cos(c + d*x)/(2*d) + 8*a**3*b*sin(c + d*x)**3/(3*d) + 4*a**3*b*sin(
c + d*x)*cos(c + d*x)**2/d + 9*a**2*b**2*x*sin(c + d*x)**4/4 + 9*a**2*b**2*
x*sin(c + d*x)**2*cos(c + d*x)**2/2 + 9*a**2*b**2*x*cos(c + d*x)**4/4 + 9*a
**2*b**2*sin(c + d*x)**3*cos(c + d*x)/(4*d) + 15*a**2*b**2*sin(c + d*x)*cos
(c + d*x)**3/(4*d) + 32*a*b**3*sin(c + d*x)**5/(15*d) + 16*a*b**3*sin(c + d
*x)**3*cos(c + d*x)**2/(3*d) + 4*a*b**3*sin(c + d*x)*cos(c + d*x)**4/d + 5*
b**4*x*sin(c + d*x)**6/16 + 15*b**4*x*sin(c + d*x)**4*cos(c + d*x)**2/16 +
15*b**4*x*sin(c + d*x)**2*cos(c + d*x)**4/16 + 5*b**4*x*cos(c + d*x)**6/16
+ 5*b**4*sin(c + d*x)**5*cos(c + d*x)/(16*d) + 5*b**4*sin(c + d*x)**3*cos(c
 + d*x)**3/(6*d) + 11*b**4*sin(c + d*x)*cos(c + d*x)**5/(16*d), Ne(d, 0)),
(x*(a + b*cos(c))**4*cos(c)**2, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.19 (sec) , antiderivative size = 170, normalized size of antiderivative = 0.72

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^4\,dx = \frac{240\,(2\,dx+2\,c+\sin(2\,dx+2\,c))a^4 - 1280\,\left(\sin(dx+c)^3 - 3\,\sin(dx+c)\right)a^3b + 180\,(12\,dx+12\,c+\sin(4$$

[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c))^4,x, algorithm="maxima")

[Out] 1/960*(240*(2*d*x + 2*c + sin(2*d*x + 2*c))*a^4 - 1280*(sin(d*x + c)^3 - 3*sin(d*x + c))*a^3*b + 180*(12*d*x + 12*c + sin(4*d*x + 4*c) + 8*sin(2*d*x + 2*c))*a^2*b^2 + 256*(3*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*sin(d*x + c))*a*b^3 - 5*(4*sin(2*d*x + 2*c)^3 - 60*d*x - 60*c - 9*sin(4*d*x + 4*c) - 48*sin(2*d*x + 2*c))*b^4)/d

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 168, normalized size of antiderivative = 0.71

$$\begin{aligned}\int \cos^2(c+dx)(a+b\cos(c+dx))^4\,dx = {} & \frac{b^4\sin(6\,dx+6\,c)}{192\,d} + \frac{ab^3\sin(5\,dx+5\,c)}{20\,d} \\ & + \frac{1}{16}\,(8\,a^4+36\,a^2b^2+5\,b^4)x \\ & + \frac{3\,(4\,a^2b^2+b^4)\sin(4\,dx+4\,c)}{64\,d} \\ & + \frac{(4\,a^3b+5\,ab^3)\sin(3\,dx+3\,c)}{12\,d} \\ & + \frac{(16\,a^4+96\,a^2b^2+15\,b^4)\sin(2\,dx+2\,c)}{64\,d} \\ & + \frac{(6\,a^3b+5\,ab^3)\sin(dx+c)}{2\,d}\end{aligned}$$

[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c))^4,x, algorithm="giac")

[Out] 1/192*b^4*sin(6*d*x + 6*c)/d + 1/20*a*b^3*sin(5*d*x + 5*c)/d + 1/16*(8*a^4 + 36*a^2*b^2 + 5*b^4)*x + 3/64*(4*a^2*b^2 + b^4)*sin(4*d*x + 4*c)/d + 1/12*(4*a^3*b + 5*a*b^3)*sin(3*d*x + 3*c)/d + 1/64*(16*a^4 + 96*a^2*b^2 + 15*b^4)*sin(2*d*x + 2*c)/d + 1/2*(6*a^3*b + 5*a*b^3)*sin(d*x + c)/d

Mupad [B] (verification not implemented)

Time = 14.46 (sec) , antiderivative size = 214, normalized size of antiderivative = 0.91

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^4\,dx = \frac{a^4\,x}{2}+\frac{5\,b^4\,x}{16}+\frac{9\,a^2\,b^2\,x}{4}+\frac{a^4\,\sin\left(2\,c+2\,d\,x\right)}{4\,d}+\frac{15\,b^4\,\sin\left(2\,c+2\,d\,x\right)}{64\,d}+\frac{3\,b^4\,\sin\left(4\,c+4\,d\,x\right)}{64\,d}+\frac{b^4\,\sin\left(6\,c+6\,d\,x\right)}{192\,d}+\frac{5\,a\,b^3\,\sin\left(3\,c+3\,d\,x\right)}{12\,d}+\frac{a^3\,b\,\sin\left(3\,c+3\,d\,x\right)}{3\,d}+\frac{a\,b^3\,\sin\left(5\,c+5\,d\,x\right)}{20\,d}+\frac{3\,a^2\,b^2\,\sin\left(2\,c+2\,d\,x\right)}{2\,d}+\frac{3\,a^2\,b^2\,\sin\left(4\,c+4\,d\,x\right)}{16\,d}+\frac{5\,a\,b^3\,\sin\left(c+d\,x\right)}{2\,d}+\frac{3\,a^3\,b\,\sin\left(c+d\,x\right)}{d}$$

```
[In] int(cos(c + d*x)^2*(a + b*cos(c + d*x))^4,x)
```

```
[Out] (a^4*x)/2 + (5*b^4*x)/16 + (9*a^2*b^2*x)/4 + (a^4*sin(2*c + 2*d*x))/(4*d) +
 (15*b^4*sin(2*c + 2*d*x))/(64*d) + (3*b^4*sin(4*c + 4*d*x))/(64*d) + (b^4*
sin(6*c + 6*d*x))/(192*d) + (5*a*b^3*sin(3*c + 3*d*x))/(12*d) + (a^3*b*sin(
3*c + 3*d*x))/(3*d) + (a*b^3*sin(5*c + 5*d*x))/(20*d) + (3*a^2*b^2*sin(2*c
+ 2*d*x))/(2*d) + (3*a^2*b^2*sin(4*c + 4*d*x))/(16*d) + (5*a*b^3*sin(c + d*
x))/(2*d) + (3*a^3*b*sin(c + d*x))/d
```

3.440 $\int \cos(c+dx)(a+b\cos(c+dx))^4\,dx$

Optimal result

Integrand size = 19, antiderivative size = 170

$$\int \cos(c+dx)(a+b\cos(c+dx))^4\,dx = \frac{1}{2}ab\left(4a^2+3b^2\right)x+\frac{2(3a^4+28a^2b^2+4b^4)\sin(c+dx)}{15d} + \frac{ab(6a^2+29b^2)\cos(c+dx)\sin(c+dx)}{30d} + \frac{(3a^2+4b^2)\left(a+b\cos(c+dx)\right)^2\sin(c+dx)}{15d} + \frac{a(a+b\cos(c+dx))^3\sin(c+dx)}{5d} + \frac{(a+b\cos(c+dx))^4\sin(c+dx)}{5d}$$

```
[Out] 1/2*a*b*(4*a^2+3*b^2)*x+2/15*(3*a^4+28*a^2*b^2+4*b^4)*sin(d*x+c)/d+1/30*a*b
*(6*a^2+29*b^2)*cos(d*x+c)*sin(d*x+c)/d+1/15*(3*a^2+4*b^2)*(a+b*cos(d*x+c))
^2*sin(d*x+c)/d+1/5*a*(a+b*cos(d*x+c))^3*sin(d*x+c)/d+1/5*(a+b*cos(d*x+c))^
4*sin(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used

= {2832, 2813}

$$\int \cos(c+dx)(a+b\cos(c+dx))^4\,dx = \frac{(3a^2+4b^2)\sin(c+dx)(a+b\cos(c+dx))^2}{15d} + \frac{ab(6a^2+29b^2)\sin(c+dx)\cos(c+dx)}{30d} + \frac{1}{2}abx\left(4a^2+3b^2\right) + \frac{2(3a^4+28a^2b^2+4b^4)\sin(c+dx)}{15d} + \frac{\sin(c+dx)(a+b\cos(c+dx))^4}{5d} + \frac{a\sin(c+dx)(a+b\cos(c+dx))^3}{5d}$$

```
[In] Int[Cos[c + d*x]*(a + b*Cos[c + d*x])^4,x]
```

```
[Out] (a*b*(4*a^2 + 3*b^2)*x)/2 + (2*(3*a^4 + 28*a^2*b^2 + 4*b^4)*Sin[c + d*x])/(
15*d) + (a*b*(6*a^2 + 29*b^2)*Cos[c + d*x]*Sin[c + d*x])/(30*d) + ((3*a^2 +
 4*b^2)*(a + b*Cos[c + d*x])^2*Sin[c + d*x])/(15*d) + (a*(a + b*Cos[c + d*x
])^3*Sin[c + d*x])/(5*d) + ((a + b*Cos[c + d*x])^4*Sin[c + d*x])/(5*d)
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rubi steps

$$\text{integral} = \frac{(a+b\cos(c+dx))^4\sin(c+dx)}{5d} + \frac{1}{5}\int (4b+4a\cos(c+dx))(a+b\cos(c+dx))^3\,dx$$

$$= \frac{a(a+b\cos(c+dx))^3\sin(c+dx)}{5d} + \frac{(a+b\cos(c+dx))^4\sin(c+dx)}{5d} + \frac{1}{20}\int (a+b\cos(c+dx))^2\left(28ab+4\left(3a^2+4b^2\right)\cos(c+dx)\right)\,dx$$

$$
\begin{aligned}
&= \frac{(3a^2+4b^2)\,(a+b\cos(c+dx))^2\sin(c+dx)}{15d} \\
&\quad + \frac{a(a+b\cos(c+dx))^3\sin(c+dx)}{5d} + \frac{(a+b\cos(c+dx))^4\sin(c+dx)}{5d} \\
&\quad + \frac{1}{60}\int (a+b\cos(c+dx))\left(4b(27a^2+8b^2)+4a(6a^2+29b^2)\cos(c+dx)\right)\,dx \\
&= \frac{1}{2}ab(4a^2+3b^2)\,x + \frac{2(3a^4+28a^2b^2+4b^4)\sin(c+dx)}{15d} \\
&\quad + \frac{ab(6a^2+29b^2)\cos(c+dx)\sin(c+dx)}{30d} \\
&\quad + \frac{(3a^2+4b^2)\,(a+b\cos(c+dx))^2\sin(c+dx)}{15d} \\
&\quad + \frac{a(a+b\cos(c+dx))^3\sin(c+dx)}{5d} + \frac{(a+b\cos(c+dx))^4\sin(c+dx)}{5d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.61 (sec) , antiderivative size = 133, normalized size of antiderivative = 0.78

$$
\int \cos(c+dx)(a+b\cos(c+dx))^4\,dx
= \frac{30(8a^4+36a^2b^2+5b^4)\sin(c+dx)+b(480a^3c+360ab^2c+480a^3dx+360ab^2dx+240a(a^2+b^2)\sin(2(c+}{240d}
$$

```
[In] Integrate[Cos[c + d*x]*(a + b*Cos[c + d*x])^4,x]
```

```
[Out] (30*(8*a^4 + 36*a^2*b^2 + 5*b^4)*Sin[c + d*x] + b*(480*a^3*c + 360*a*b^2*c
+ 480*a^3*d*x + 360*a*b^2*d*x + 240*a*(a^2 + b^2)*Sin[2*(c + d*x)] + 5*(24*
a^2*b + 5*b^3)*Sin[3*(c + d*x)] + 30*a*b^2*Sin[4*(c + d*x)] + 3*b^3*Sin[5*(
c + d*x)]))/(240*d)
```

Maple [A] (verified)

Time = 3.74 (sec) , antiderivative size = 125, normalized size of antiderivative = 0.74

method	result
parallelrisch	$\frac{240(a^3b+a\,b^3)\sin(2dx+2c)+5(24a^2b^2+5b^4)\sin(3dx+3c)+30\sin(4dx+4c)a\,b^3+3\sin(5dx+5c)b^4+30(8a^4+36a^2b^2+5b^4}{240d}$
derivativedivides	$\frac{a^4\sin(dx+c)+4a^3b\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+2a^2b^2(2+\cos^2(dx+c))\sin(dx+c)+4a\,b^3\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)}{4}\right.}{d}$
default	$\frac{a^4\sin(dx+c)+4a^3b\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+2a^2b^2(2+\cos^2(dx+c))\sin(dx+c)+4a\,b^3\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)}{4}\right.}{d}$
parts	$\frac{b^4\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5d}+\frac{a^4\sin(dx+c)}{d}+\frac{4a\,b^3\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\right.}{d}$
risch	$2a^3bx+\frac{3a\,b^3x}{2}+\frac{a^4\sin(dx+c)}{d}+\frac{9\sin(dx+c)a^2b^2}{2d}+\frac{5\sin(dx+c)b^4}{8d}+\frac{\sin(5dx+5c)b^4}{80d}+\frac{\sin(4dx+4c)a\,b^3}{8d}+$
norman	$\frac{(2a^3b+\frac{3}{2}a\,b^3)x+(2a^3b+\frac{3}{2}a\,b^3)x\left(\tan^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(10a^3b+\frac{15}{2}a\,b^3)x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(10a^3b+\frac{15}{2}a\,b^3)x\left(\tan^8\left(\frac{dx}{2}+\frac{c}{2}\right.\right.}{}$

```
[In] int(cos(d*x+c)*(a+cos(d*x+c)*b)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/240*(240*(a^3*b+a*b^3)*sin(2*d*x+2*c)+5*(24*a^2*b^2+5*b^4)*sin(3*d*x+3*c)
+30*sin(4*d*x+4*c)*a*b^3+3*sin(5*d*x+5*c)*b^4+30*(8*a^4+36*a^2*b^2+5*b^4)*s
in(d*x+c)+480*b*(a^2+3/4*b^2)*d*x*a)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 121, normalized size of antiderivative = 0.71

$$\int \cos(c+dx)(a+b\cos(c+dx))^4\,dx$$
$$=\frac{15\,(4\,a^3b+3\,ab^3)dx+\left(6\,b^4\cos\left(dx+c\right)^4+30\,ab^3\cos\left(dx+c\right)^3+30\,a^4+120\,a^2b^2+16\,b^4+4\,(15\,a^2b^2+2\right.}{30\,d}$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/30*(15*(4*a^3*b + 3*a*b^3)*d*x + (6*b^4*cos(d*x + c)^4 + 30*a*b^3*cos(d*x
 + c)^3 + 30*a^4 + 120*a^2*b^2 + 16*b^4 + 4*(15*a^2*b^2 + 2*b^4)*cos(d*x +
c)^2 + 15*(4*a^3*b + 3*a*b^3)*cos(d*x + c))*sin(d*x + c))/d
```

Sympy [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 301, normalized size of antiderivative = 1.77

$$\int \cos(c+dx)(a+b\cos(c+dx))^4\,dx$$
$$= \begin{cases} \frac{a^4\sin(c+dx)}{d} + 2a^3bx\sin^2(c+dx) + 2a^3bx\cos^2(c+dx) + \frac{2a^3b\sin(c+dx)\cos(c+dx)}{d} + \frac{4a^2b^2\sin^3(c+dx)}{d} + \frac{6a^2b^2\sin(c-}{} \\ x(a+b\cos(c))^4\cos(c) \end{cases}$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))**4,x)
```

```
[Out] Piecewise((a**4*sin(c + d*x)/d + 2*a**3*b*x*sin(c + d*x)**2 + 2*a**3*b*x*co
s(c + d*x)**2 + 2*a**3*b*sin(c + d*x)*cos(c + d*x)/d + 4*a**2*b**2*sin(c +
d*x)**3/d + 6*a**2*b**2*sin(c + d*x)*cos(c + d*x)**2/d + 3*a*b**3*x*sin(c +
 d*x)**4/2 + 3*a*b**3*x*sin(c + d*x)**2*cos(c + d*x)**2 + 3*a*b**3*x*cos(c
+ d*x)**4/2 + 3*a*b**3*sin(c + d*x)**3*cos(c + d*x)/(2*d) + 5*a*b**3*sin(c
+ d*x)*cos(c + d*x)**3/(2*d) + 8*b**4*sin(c + d*x)**5/(15*d) + 4*b**4*sin(c
 + d*x)**3*cos(c + d*x)**2/(3*d) + b**4*sin(c + d*x)*cos(c + d*x)**4/d, Ne(
d, 0)), (x*(a + b*cos(c))**4*cos(c), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 133, normalized size of antiderivative = 0.78

$$\int \cos(c+dx)(a+b\cos(c+dx))^4\,dx$$
$$= \frac{120\,(2\,dx+2\,c+\sin(2\,dx+2\,c))a^3b - 240\,\left(\sin(dx+c)^3 - 3\,\sin(dx+c)\right)a^2b^2 + 15\,(12\,dx+12\,c+\sin(4\,}{}$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/120*(120*(2*d*x + 2*c + sin(2*d*x + 2*c))*a^3*b - 240*(sin(d*x + c)^3 - 3
*sin(d*x + c))*a^2*b^2 + 15*(12*d*x + 12*c + sin(4*d*x + 4*c) + 8*sin(2*d*x
 + 2*c))*a*b^3 + 8*(3*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*sin(d*x + c))
*b^4 + 120*a^4*sin(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 134, normalized size of antiderivative = 0.79

$$\int \cos(c+dx)(a+b\cos(c+dx))^4\,dx=\frac{b^4\sin(5\,dx+5\,c)}{80\,d}+\frac{ab^3\sin(4\,dx+4\,c)}{8\,d}+\frac{1}{2}\left(4\,a^3b+3\,ab^3\right)x+\frac{(24\,a^2b^2+5\,b^4)\sin(3\,dx+3\,c)}{48\,d}+\frac{(a^3b+ab^3)\sin(2\,dx+2\,c)}{d}+\frac{(8\,a^4+36\,a^2b^2+5\,b^4)\sin(dx+c)}{8\,d}$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/80*b^4*sin(5*d*x + 5*c)/d + 1/8*a*b^3*sin(4*d*x + 4*c)/d + 1/2*(4*a^3*b +
 3*a*b^3)*x + 1/48*(24*a^2*b^2 + 5*b^4)*sin(3*d*x + 3*c)/d + (a^3*b + a*b^3
)*sin(2*d*x + 2*c)/d + 1/8*(8*a^4 + 36*a^2*b^2 + 5*b^4)*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 15.58 (sec) , antiderivative size = 363, normalized size of antiderivative = 2.14

$$\int \cos(c+dx)(a+b\cos(c+dx))^4\,dx$$

$$=\frac{(2\,a^4-4\,a^3\,b+12\,a^2\,b^2-5\,a\,b^3+2\,b^4)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9+\left(8\,a^4-8\,a^3\,b+32\,a^2\,b^2-2\,a\,b^3+\frac{8\,b^4}{3}\right)\,\tan\left(\frac{c}{2}+\right.}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}+5\,\mathrm{t}\right.}$$

$$+\frac{a\,b\,\mathrm{atan}\left(\frac{a\,b\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,(4\,a^2+3\,b^2)}{4\,a^3\,b+3\,a\,b^3}\right)\,(4\,a^2+3\,b^2)}{d}-\frac{a\,b\,(4\,a^2+3\,b^2)\,\left(\mathrm{atan}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)-\frac{d\,x}{2}\right)}{d}$$

```
[In] int(cos(c + d*x)*(a + b*cos(c + d*x))^4,x)
```

```
[Out] (tan(c/2 + (d*x)/2)^5*(12*a^4 + (116*b^4)/15 + 40*a^2*b^2) + tan(c/2 + (d*x
)/2)^9*(2*a^4 - 4*a^3*b - 5*a*b^3 + 2*b^4 + 12*a^2*b^2) + tan(c/2 + (d*x)/2
)^3*(2*a*b^3 + 8*a^3*b + 8*a^4 + (8*b^4)/3 + 32*a^2*b^2) + tan(c/2 + (d*x)/
2)^7*(8*a^4 - 8*a^3*b - 2*a*b^3 + (8*b^4)/3 + 32*a^2*b^2) + tan(c/2 + (d*x)
/2)*(5*a*b^3 + 4*a^3*b + 2*a^4 + 2*b^4 + 12*a^2*b^2))/(d*(5*tan(c/2 + (d*x)
```

```
/2)^2 + 10*tan(c/2 + (d*x)/2)^4 + 10*tan(c/2 + (d*x)/2)^6 + 5*tan(c/2 + (d*
x)/2)^8 + tan(c/2 + (d*x)/2)^10 + 1)) + (a*b*atan((a*b*tan(c/2 + (d*x)/2)*(
4*a^2 + 3*b^2))/(3*a*b^3 + 4*a^3*b))*(4*a^2 + 3*b^2))/d - (a*b*(4*a^2 + 3*b
^2)*(atan(tan(c/2 + (d*x)/2)) - (d*x)/2))/d
```

3.441 $\int (a+b\cos(c+dx))^4\,dx$

Optimal result

Integrand size = 12, antiderivative size = 137

$$\begin{aligned}\int (a+b\cos(c+dx))^4\,dx = {} & \frac{1}{8}\left(8a^4+24a^2b^2+3b^4\right)x+\frac{ab(19a^2+16b^2)\sin(c+dx)}{6d} \\ & +\frac{b^2(26a^2+9b^2)\cos(c+dx)\sin(c+dx)}{24d} \\ & +\frac{7ab(a+b\cos(c+dx))^2\sin(c+dx)}{12d} \\ & +\frac{b(a+b\cos(c+dx))^3\sin(c+dx)}{4d}\end{aligned}$$

```
[Out] 1/8*(8*a^4+24*a^2*b^2+3*b^4)*x+1/6*a*b*(19*a^2+16*b^2)*sin(d*x+c)/d+1/24*b^
2*(26*a^2+9*b^2)*cos(d*x+c)*sin(d*x+c)/d+7/12*a*b*(a+b*cos(d*x+c))^2*sin(d*
x+c)/d+1/4*b*(a+b*cos(d*x+c))^3*sin(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {2735, 2832, 2813}

$$\begin{aligned}\int (a+b\cos(c+dx))^4\,dx = {} & \frac{ab(19a^2+16b^2)\sin(c+dx)}{6d} \\ & +\frac{b^2(26a^2+9b^2)\sin(c+dx)\cos(c+dx)}{24d} \\ & +\frac{1}{8}x\left(8a^4+24a^2b^2+3b^4\right)+\frac{b\sin(c+dx)(a+b\cos(c+dx))^3}{4d} \\ & +\frac{7ab\sin(c+dx)(a+b\cos(c+dx))^2}{12d}\end{aligned}$$

```
[In] Int[(a + b*Cos[c + d*x])^4,x]
```

```
[Out] ((8*a^4 + 24*a^2*b^2 + 3*b^4)*x)/8 + (a*b*(19*a^2 + 16*b^2)*Sin[c + d*x])/(
6*d) + (b^2*(26*a^2 + 9*b^2)*Cos[c + d*x]*Sin[c + d*x])/(24*d) + (7*a*b*(a
+ b*Cos[c + d*x])^2*Sin[c + d*x])/(12*d) + (b*(a + b*Cos[c + d*x])^3*Sin[c
+ d*x])/(4*d)
```

Rule 2735

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos
[c + d*x]*((a + b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[1/n, Int[(a + b*S
in[c + d*x])^(n - 2)*Simp[a^2*n + b^2*(n - 1) + a*b*(2*n - 1)*Sin[c + d*x],
 x], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{b(a+b\cos(c+dx))^3\sin(c+dx)}{4d} \\
&\quad + \frac{1}{4}\int (a+b\cos(c+dx))^2\left(4a^2+3b^2+7ab\cos(c+dx)\right)\,dx \\
&= \frac{7ab(a+b\cos(c+dx))^2\sin(c+dx)}{12d}+\frac{b(a+b\cos(c+dx))^3\sin(c+dx)}{4d} \\
&\quad + \frac{1}{12}\int (a+b\cos(c+dx))\left(a\left(12a^2+23b^2\right)+b\left(26a^2+9b^2\right)\cos(c+dx)\right)\,dx \\
&= \frac{1}{8}\left(8a^4+24a^2b^2+3b^4\right)x+\frac{ab\left(19a^2+16b^2\right)\sin(c+dx)}{6d} \\
&\quad + \frac{b^2\left(26a^2+9b^2\right)\cos(c+dx)\sin(c+dx)}{24d} \\
&\quad + \frac{7ab(a+b\cos(c+dx))^2\sin(c+dx)}{12d}+\frac{b(a+b\cos(c+dx))^3\sin(c+dx)}{4d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 104, normalized size of antiderivative = 0.76

$$\int (a+b\cos(c+dx))^4\,dx$$
$$=\frac{12(8a^4+24a^2b^2+3b^4)\,(c+dx)+96ab(4a^2+3b^2)\sin(c+dx)+24b^2(6a^2+b^2)\sin(2(c+dx))+32ab^3\sin}{96d}$$

[In] Integrate[(a + b*Cos[c + d*x])^4,x]

[Out] (12*(8*a^4 + 24*a^2*b^2 + 3*b^4)*(c + d*x) + 96*a*b*(4*a^2 + 3*b^2)*Sin[c + d*x] + 24*b^2*(6*a^2 + b^2)*Sin[2*(c + d*x)] + 32*a*b^3*Sin[3*(c + d*x)] + 3*b^4*Sin[4*(c + d*x)])/(96*d)

Maple [A] (verified)

Time = 2.43 (sec) , antiderivative size = 101, normalized size of antiderivative = 0.74

method	result
parallelrisch	$\frac{24(6a^2b^2+b^4)\sin(2dx+2c)+32\sin(3dx+3c)a\,b^3+3\sin(4dx+4c)b^4+96(4a^3b+3a\,b^3)\sin(dx+c)+96d\left(a^4+3a^2b^2+\frac{3}{8}b^4\right)x}{96d}$
derivativedivides	$\frac{b^4\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{4a\,b^3\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+6a^2b^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right.}{d}$
default	$\frac{b^4\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+\frac{4a\,b^3\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}+6a^2b^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right.}{d}$
parts	$a^4x+\frac{b^4\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}+\frac{6a^2b^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{4\sin(dx+c)a}{d}$
risch	$a^4x+3x\,a^2b^2+\frac{3b^4x}{8}+\frac{4\sin(dx+c)a^3b}{d}+\frac{3\sin(dx+c)a\,b^3}{d}+\frac{\sin(4dx+4c)b^4}{32d}+\frac{\sin(3dx+3c)a\,b^3}{3d}+\frac{3\sin(2}{}$
norman	$\frac{\left(a^4+3a^2b^2+\frac{3}{8}b^4\right)x+\left(a^4+3a^2b^2+\frac{3}{8}b^4\right)x\left(\tan^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(4a^4+12a^2b^2+\frac{3}{2}b^4\right)x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(4a^4+12a^2b^2+\frac{3}{2}b^4\right)}{}$

[In] int((a+cos(d*x+c)*b)^4,x,method=_RETURNVERBOSE)

[Out] 1/96*(24*(6*a^2*b^2+b^4)*sin(2*d*x+2*c)+32*sin(3*d*x+3*c)*a*b^3+3*sin(4*d*x+4*c)*b^4+96*(4*a^3*b+3*a*b^3)*sin(d*x+c)+96*d*(a^4+3*a^2*b^2+3/8*b^4)*x)/d

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.70

$$\int (a+b\cos(c+dx))^4\,dx = \frac{3\,(8\,a^4+24\,a^2b^2+3\,b^4)dx+\left(6\,b^4\cos\left(dx+c\right)^3+32\,ab^3\cos\left(dx+c\right)^2+96\,a^3b+64\,ab^3+9\,(8\,a^2b^2+b^4)\cos\right.}{24\,d}$$

```
[In] integrate((a+b*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/24*(3*(8*a^4 + 24*a^2*b^2 + 3*b^4)*d*x + (6*b^4*cos(d*x + c)^3 + 32*a*b^3
*cos(d*x + c)^2 + 96*a^3*b + 64*a*b^3 + 9*(8*a^2*b^2 + b^4)*cos(d*x + c))*s
in(d*x + c))/d
```

Sympy [A] (verification not implemented)

Time = 0.19 (sec) , antiderivative size = 240, normalized size of antiderivative = 1.75

$$\int (a+b\cos(c+dx))^4\,dx = \begin{cases} a^4x+\frac{4a^3b\sin\left(c+dx\right)}{d}+3a^2b^2x\sin^2\left(c+dx\right)+3a^2b^2x\cos^2\left(c+dx\right)+\frac{3a^2b^2\sin\left(c+dx\right)\cos\left(c+dx\right)}{d}+\frac{8ab^3\sin^3\left(c+dx\right)}{3d}+ \\ x(a+b\cos\left(c\right))^4 \end{cases}$$

```
[In] integrate((a+b*cos(d*x+c))**4,x)
```

```
[Out] Piecewise((a**4*x + 4*a**3*b*sin(c + d*x)/d + 3*a**2*b**2*x*sin(c + d*x)**2
 + 3*a**2*b**2*x*cos(c + d*x)**2 + 3*a**2*b**2*sin(c + d*x)*cos(c + d*x)/d
+ 8*a*b**3*sin(c + d*x)**3/(3*d) + 4*a*b**3*sin(c + d*x)*cos(c + d*x)**2/d
+ 3*b**4*x*sin(c + d*x)**4/8 + 3*b**4*x*sin(c + d*x)**2*cos(c + d*x)**2/4 +
 3*b**4*x*cos(c + d*x)**4/8 + 3*b**4*sin(c + d*x)**3*cos(c + d*x)/(8*d) + 5
*b**4*sin(c + d*x)*cos(c + d*x)**3/(8*d), Ne(d, 0)), (x*(a + b*cos(c))**4,
True))
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.81

$$\int (a+b\cos(c+dx))^4\,dx = a^4x + \frac{3\,(2\,dx+2\,c+\sin(2\,dx+2\,c))a^2b^2}{2\,d} - \frac{4\,\left(\sin(dx+c)^3-3\,\sin(dx+c)\right)ab^3}{3\,d} + \frac{(12\,dx+12\,c+\sin(4\,dx+4\,c)+8\,\sin(2\,dx+2\,c))b^4}{32\,d} + \frac{4\,a^3b\sin(dx+c)}{d}$$

```
[In] integrate((a+b*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] a^4*x + 3/2*(2*d*x + 2*c + sin(2*d*x + 2*c))*a^2*b^2/d - 4/3*(sin(d*x + c)^
3 - 3*sin(d*x + c))*a*b^3/d + 1/32*(12*d*x + 12*c + sin(4*d*x + 4*c) + 8*si
n(2*d*x + 2*c))*b^4/d + 4*a^3*b*sin(d*x + c)/d
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.78

$$\int (a+b\cos(c+dx))^4\,dx = \frac{b^4\sin(4\,dx+4\,c)}{32\,d} + \frac{ab^3\sin(3\,dx+3\,c)}{3\,d} + \frac{1}{8}\left(8\,a^4+24\,a^2b^2+3\,b^4\right)x + \frac{(6\,a^2b^2+b^4)\sin(2\,dx+2\,c)}{4\,d} + \frac{(4\,a^3b+3\,ab^3)\sin(dx+c)}{d}$$

```
[In] integrate((a+b*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/32*b^4*sin(4*d*x + 4*c)/d + 1/3*a*b^3*sin(3*d*x + 3*c)/d + 1/8*(8*a^4 + 2
4*a^2*b^2 + 3*b^4)*x + 1/4*(6*a^2*b^2 + b^4)*sin(2*d*x + 2*c)/d + (4*a^3*b
+ 3*a*b^3)*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 14.75 (sec) , antiderivative size = 123, normalized size of antiderivative = 0.90

$$\int (a+b\cos(c+dx))^4\,dx = a^4\,x + \frac{3\,b^4\,x}{8} + 3\,a^2\,b^2\,x + \frac{b^4\,\sin(2\,c+2\,d\,x)}{4\,d} + \frac{b^4\,\sin(4\,c+4\,d\,x)}{32\,d} + \frac{a\,b^3\,\sin(3\,c+3\,d\,x)}{3\,d} + \frac{3\,a^2\,b^2\,\sin(2\,c+2\,d\,x)}{2\,d} + \frac{3\,a\,b^3\,\sin(c+d\,x)}{d} + \frac{4\,a^3\,b\,\sin(c+d\,x)}{d}$$

```
[In] int((a + b*cos(c + d*x))^4,x)
```

```
[Out] a^4*x + (3*b^4*x)/8 + 3*a^2*b^2*x + (b^4*sin(2*c + 2*d*x))/(4*d) + (b^4*sin
(4*c + 4*d*x))/(32*d) + (a*b^3*sin(3*c + 3*d*x))/(3*d) + (3*a^2*b^2*sin(2*c
 + 2*d*x))/(2*d) + (3*a*b^3*sin(c + d*x))/d + (4*a^3*b*sin(c + d*x))/d
```

3.442 $\int (a+b\cos(c+dx))^4 \sec(c+dx)\,dx$

Optimal result

Integrand size = 19, antiderivative size = 107

$$\int (a+b\cos(c+dx))^4 \sec(c+dx)\,dx = 2ab\left(2a^2+b^2\right)x + \frac{a^4\text{arctanh}(\sin(c+dx))}{d} + \frac{b^2(17a^2+2b^2)\sin(c+dx)}{3d} + \frac{4ab^3\cos(c+dx)\sin(c+dx)}{3d} + \frac{b^2(a+b\cos(c+dx))^2\sin(c+dx)}{3d}$$

```
[Out] 2*a*b*(2*a^2+b^2)*x+a^4*arctanh(sin(d*x+c))/d+1/3*b^2*(17*a^2+2*b^2)*sin(d*
x+c)/d+4/3*a*b^3*cos(d*x+c)*sin(d*x+c)/d+1/3*b^2*(a+b*cos(d*x+c))^2*sin(d*x
+c)/d
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.263$, Rules used = {2872, 3112, 3102, 2814, 3855}

$$\int (a+b\cos(c+dx))^4 \sec(c+dx)\,dx = \frac{a^4\text{arctanh}(\sin(c+dx))}{d} + \frac{b^2(17a^2+2b^2)\sin(c+dx)}{3d} + 2abx\left(2a^2+b^2\right) + \frac{4ab^3\sin(c+dx)\cos(c+dx)}{3d} + \frac{b^2\sin(c+dx)(a+b\cos(c+dx))^2}{3d}$$

```
[In] Int[(a + b*Cos[c + d*x])^4*Sec[c + d*x],x]
```

```
[Out] 2*a*b*(2*a^2 + b^2)*x + (a^4*ArcTanh[Sin[c + d*x]])/d + (b^2*(17*a^2 + 2*b^
2)*Sin[c + d*x])/(3*d) + (4*a*b^3*Cos[c + d*x]*Sin[c + d*x])/(3*d) + (b^2*(
a + b*Cos[c + d*x])^2*Sin[c + d*x])/(3*d)
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rule 3112

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((c_) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f
_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*d*Cos[e + f*x]*Sin[e + f*x]*((a + b*Si
n[e + f*x])^(m + 1)/(b*f*(m + 3))), x] + Dist[1/(b*(m + 3)), Int[(a + b*Sin
[e + f*x])^m*Simp[a*C*d + A*b*c*(m + 3) + b*(B*c*(m + 3) + d*(C*(m + 2) + A
*(m + 3)))*Sin[e + f*x] - (2*a*C*d - b*(c*C + B*d)*(m + 3))*Sin[e + f*x]^2,
 x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, m}, x] && NeQ[b*c - a*d, 0
] && NeQ[a^2 - b^2, 0] &&  !LtQ[m, -1]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = \frac{b^2(a+b\cos(c+dx))^2\sin(c+dx)}{3d} + \frac{1}{3}\int(a+b\cos(c+dx))\left(3a^3 + b\left(9a^2+2b^2\right)\cos(c+dx) + 8ab^2\cos^2(c+dx)\right)\sec(c+dx)\,dx$$

$$= \frac{4ab^3\cos(c+dx)\sin(c+dx)}{3d} + \frac{b^2(a+b\cos(c+dx))^2\sin(c+dx)}{3d} + \frac{1}{6}\int\left(6a^4 + 12ab\left(2a^2+b^2\right)\cos(c+dx) + 2b^2\left(17a^2+2b^2\right)\cos^2(c+dx)\right)\sec(c+dx)\,dx$$

$$= \frac{b^2(17a^2+2b^2)\sin(c+dx)}{3d} + \frac{4ab^3\cos(c+dx)\sin(c+dx)}{3d} + \frac{b^2(a+b\cos(c+dx))^2\sin(c+dx)}{3d} + \frac{1}{6}\int\left(6a^4 + 12ab\left(2a^2+b^2\right)\cos(c+dx)\right)\sec(c+dx)\,dx$$

$$= 2ab\left(2a^2+b^2\right)x + \frac{b^2(17a^2+2b^2)\sin(c+dx)}{3d} + \frac{4ab^3\cos(c+dx)\sin(c+dx)}{3d} + \frac{b^2(a+b\cos(c+dx))^2\sin(c+dx)}{3d} + a^4\int\sec(c+dx)\,dx$$

$$= 2ab\left(2a^2+b^2\right)x + \frac{a^4\text{arctanh}(\sin(c+dx))}{d} + \frac{b^2(17a^2+2b^2)\sin(c+dx)}{3d} + \frac{4ab^3\cos(c+dx)\sin(c+dx)}{3d} + \frac{b^2(a+b\cos(c+dx))^2\sin(c+dx)}{3d}$$

Mathematica [A] (verified)

Time = 0.55 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.20

$$\int(a+b\cos(c+dx))^4\sec(c+dx)\,dx = \frac{24ab(2a^2+b^2)(c+dx) - 12a^4\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right) + 12a^4\log\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\right.}{12d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^4*Sec[c + d*x],x]
```

```
[Out] (24*a*b*(2*a^2 + b^2)*(c + d*x) - 12*a^4*Log[Cos[(c + d*x)/2] - Sin[(c + d*
x)/2]] + 12*a^4*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] + 9*b^2*(8*a^2 + b
^2)*Sin[c + d*x] + 12*a*b^3*Sin[2*(c + d*x)] + b^4*Sin[3*(c + d*x)])/(12*d)
```

Maple [A] (verified)

Time = 2.62 (sec) , antiderivative size = 98, normalized size of antiderivative = 0.92

method	result
derivativedivides	$\frac{a^4 \ln(\sec(dx+c)+\tan(dx+c))+4a^3b(dx+c)+6\sin(dx+c)a^2b^2+4a\,b^3\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+\frac{b^4\left(2+\cos^2(dx+c)\right)\sin(}{3}}{d}$
default	$\frac{a^4 \ln(\sec(dx+c)+\tan(dx+c))+4a^3b(dx+c)+6\sin(dx+c)a^2b^2+4a\,b^3\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+\frac{b^4\left(2+\cos^2(dx+c)\right)\sin(}{3}}{d}$
parallelrisch	$\frac{-12a^4\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+12a^4\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)+12\sin(2dx+2c)a\,b^3+\sin(3dx+3c)b^4+9\left(8a^2b^2+b^4\right)\sin(dx+c)+48}{12d}$
parts	$\frac{a^4\ln(\sec(dx+c)+\tan(dx+c))}{d}+\frac{b^4(2+\cos^2(dx+c))\sin(dx+c)}{3d}+\frac{4a\,b^3\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{6\sin(dx+c)a^2}{d}$
risch	$4a^3bx+2a\,b^3x-\frac{3i\mathrm{e}^{i(dx+c)}a^2b^2}{d}-\frac{3i\mathrm{e}^{i(dx+c)}b^4}{8d}+\frac{3i\mathrm{e}^{-i(dx+c)}a^2b^2}{d}+\frac{3i\mathrm{e}^{-i(dx+c)}b^4}{8d}+\frac{a^4\ln\left(\mathrm{e}^{i(dx+c)}+i\right)}{d}-$
norman	$\frac{(4a^3b+2a\,b^3)x+(4a^3b+2a\,b^3)x\left(\tan^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(16a^3b+8a\,b^3)x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(16a^3b+8a\,b^3)x\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(2}{}$

```
[In] int((a+cos(d*x+c)*b)^4*sec(d*x+c),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a^4*ln(sec(d*x+c)+tan(d*x+c))+4*a^3*b*(d*x+c)+6*sin(d*x+c)*a^2*b^2+4*a
*b^3*(1/2*cos(d*x+c)*sin(d*x+c)+1/2*d*x+1/2*c)+1/3*b^4*(2+cos(d*x+c)^2)*sin
(d*x+c))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 98, normalized size of antiderivative = 0.92

$$\int (a+b\cos(c+dx))^4\sec(c+dx)\,dx$$
$$=\frac{3\,a^4\log\left(\sin\left(dx+c\right)+1\right)-3\,a^4\log\left(-\sin\left(dx+c\right)+1\right)+12\left(2\,a^3b+ab^3\right)dx+2\left(b^4\cos\left(dx+c\right)^2+6\,ab^3\,\mathrm{c}\right.}{6\,d}$$

```
[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c),x, algorithm="fricas")
```

```
[Out] 1/6*(3*a^4*log(sin(d*x + c) + 1) - 3*a^4*log(-sin(d*x + c) + 1) + 12*(2*a^3
*b + a*b^3)*d*x + 2*(b^4*cos(d*x + c)^2 + 6*a*b^3*cos(d*x + c) + 18*a^2*b^2
 + 2*b^4)*sin(d*x + c))/d
```

Sympy [F]

$$\int (a+b\cos(c+dx))^4\sec(c+dx)\,dx=\int (a+b\cos{(c+dx)})^4\sec{(c+dx)}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**4*sec(d*x+c),x)
[Out] Integral((a + b*cos(c + d*x))**4*sec(c + d*x), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.20 (sec) , antiderivative size = 95, normalized size of antiderivative = 0.89

$$\int (a+b\cos(c+dx))^4\sec(c+dx)\,dx$$
$$=\frac{12\,(dx+c)a^3b+3\,(2\,dx+2\,c+\sin{(2\,dx+2\,c)})ab^3-\left(\sin{(dx+c)}^3-3\,\sin{(dx+c)}\right)b^4+3\,a^4\log{(\sec{(dx}}{3\,d}$$

```
[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c),x, algorithm="maxima")
[Out] 1/3*(12*(d*x + c)*a^3*b + 3*(2*d*x + 2*c + sin(2*d*x + 2*c))*a*b^3 - (sin(d
*x + c)^3 - 3*sin(d*x + c))*b^4 + 3*a^4*log(sec(d*x + c) + tan(d*x + c)) +
18*a^2*b^2*sin(d*x + c))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 212 vs. 2(101) = 202.

Time = 0.32 (sec) , antiderivative size = 212, normalized size of antiderivative = 1.98

$$\int (a+b\cos(c+dx))^4\sec(c+dx)\,dx$$
$$=\frac{3\,a^4\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-3\,a^4\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)+6\,(2\,a^3b+ab^3)(dx+c)+\frac{2\left(18\,a^2b^2\tan}{}}{}$$

```
[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c),x, algorithm="giac")
[Out] 1/3*(3*a^4*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 3*a^4*log(abs(tan(1/2*d*x +
 1/2*c) - 1)) + 6*(2*a^3*b + a*b^3)*(d*x + c) + 2*(18*a^2*b^2*tan(1/2*d*x +
 1/2*c)^5 - 6*a*b^3*tan(1/2*d*x + 1/2*c)^5 + 3*b^4*tan(1/2*d*x + 1/2*c)^5 +
 36*a^2*b^2*tan(1/2*d*x + 1/2*c)^3 + 2*b^4*tan(1/2*d*x + 1/2*c)^3 + 18*a^2*
b^2*tan(1/2*d*x + 1/2*c) + 6*a*b^3*tan(1/2*d*x + 1/2*c) + 3*b^4*tan(1/2*d*x
 + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2 + 1)^3)/d
```

Mupad [B] (verification not implemented)

Time = 14.75 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.48

$$\int (a+b\cos(c+dx))^4\sec(c+dx)\,dx = \frac{3\,b^4\,\sin\left(c+d\,x\right)}{4\,d}+\frac{2\,a^4\,\mathrm{atanh}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d}+\frac{b^4\,\sin\left(3\,c+3\,d\,x\right)}{12\,d}+\frac{a\,b^3\,\sin\left(2\,c+2\,d\,x\right)}{d}+\frac{6\,a^2\,b^2\,\sin\left(c+d\,x\right)}{d}+\frac{4\,a\,b^3\,\mathrm{atan}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d}+\frac{8\,a^3\,b\,\mathrm{atan}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d}$$

```
[In] int((a + b*cos(c + d*x))^4/cos(c + d*x),x)
```

```
[Out] (3*b^4*sin(c + d*x))/(4*d) + (2*a^4*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x
)/2)))/d + (b^4*sin(3*c + 3*d*x))/(12*d) + (a*b^3*sin(2*c + 2*d*x))/d + (6*
a^2*b^2*sin(c + d*x))/d + (4*a*b^3*atan(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/
2)))/d + (8*a^3*b*atan(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/d
```

3.443 $\int (a+b\cos(c+dx))^4\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 114

$$\int (a+b\cos(c+dx))^4\sec^2(c+dx)\,dx=\frac{1}{2}b^2\left(12a^2+b^2\right)x+\frac{4a^3b\,\text{arctanh}(\sin(c+dx))}{d}-\frac{2ab(a^2-2b^2)\sin(c+dx)}{d}-\frac{b^2(2a^2-b^2)\cos(c+dx)\sin(c+dx)}{2d}+\frac{a^2(a+b\cos(c+dx))^2\tan(c+dx)}{d}$$

```
[Out] 1/2*b^2*(12*a^2+b^2)*x+4*a^3*b*arctanh(sin(d*x+c))/d-2*a*b*(a^2-2*b^2)*sin(
d*x+c)/d-1/2*b^2*(2*a^2-b^2)*cos(d*x+c)*sin(d*x+c)/d+a^2*(a+b*cos(d*x+c))^2
*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2871, 3112, 3102, 2814, 3855}

$$\int (a+b\cos(c+dx))^4\sec^2(c+dx)\,dx=\frac{4a^3b\,\text{arctanh}(\sin(c+dx))}{d}-\frac{2ab(a^2-2b^2)\sin(c+dx)}{d}-\frac{b^2(2a^2-b^2)\sin(c+dx)\cos(c+dx)}{2d}+\frac{1}{2}b^2x\left(12a^2+b^2\right)+\frac{a^2\tan(c+dx)(a+b\cos(c+dx))^2}{d}$$

[In] Int[(a + b*Cos[c + d*x])^4*Sec[c + d*x]^2,x]

[Out] (b^2*(12*a^2 + b^2)*x)/2 + (4*a^3*b*ArcTanh[Sin[c + d*x]])/d - (2*a*b*(a^2 - 2*b^2)*Sin[c + d*x])/d - (b^2*(2*a^2 - b^2)*Cos[c + d*x]*Sin[c + d*x])/(2*d) + (a^2*(a + b*Cos[c + d*x])^2*Tan[c + d*x])/d

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rule 3112

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((c_) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f
_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*d*Cos[e + f*x]*Sin[e + f*x]*((a + b*Si
n[e + f*x])^(m + 1)/(b*f*(m + 3))), x] + Dist[1/(b*(m + 3)), Int[(a + b*Sin
[e + f*x])^m*Simp[a*C*d + A*b*c*(m + 3) + b*(B*c*(m + 3) + d*(C*(m + 2) + A
*(m + 3)))*Sin[e + f*x] - (2*a*C*d - b*(c*C + B*d)*(m + 3))*Sin[e + f*x]^2,
 x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, m}, x] && NeQ[b*c - a*d, 0
] && NeQ[a^2 - b^2, 0] &&  !LtQ[m, -1]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = \frac{a^2(a+b\cos(c+dx))^2\tan(c+dx)}{d} + \int (a+b\cos(c+dx))\left(4a^2b+3ab^2\cos(c+dx) - b\left(2a^2-b^2\right)\cos^2(c+dx)\right)\sec(c+dx)\,dx$$

$$= -\frac{b^2(2a^2-b^2)\cos(c+dx)\sin(c+dx)}{2d} + \frac{a^2(a+b\cos(c+dx))^2\tan(c+dx)}{d} + \frac{1}{2}\int \left(8a^3b+b^2\left(12a^2+b^2\right)\cos(c+dx)-4ab\left(a^2-2b^2\right)\cos^2(c+dx)\right)\sec(c+dx)\,dx$$

$$= -\frac{2ab(a^2-2b^2)\sin(c+dx)}{d} - \frac{b^2(2a^2-b^2)\cos(c+dx)\sin(c+dx)}{2d} + \frac{a^2(a+b\cos(c+dx))^2\tan(c+dx)}{d} + \frac{1}{2}\int \left(8a^3b+b^2\left(12a^2+b^2\right)\cos(c+dx)\right)\sec(c+dx)\,dx$$

$$= \frac{1}{2}b^2\left(12a^2+b^2\right)x - \frac{2ab(a^2-2b^2)\sin(c+dx)}{d} - \frac{b^2(2a^2-b^2)\cos(c+dx)\sin(c+dx)}{2d} + \frac{a^2(a+b\cos(c+dx))^2\tan(c+dx)}{d} + \left(4a^3b\right)\int \sec(c+dx)\,dx$$

$$= \frac{1}{2}b^2\left(12a^2+b^2\right)x + \frac{4a^3b\operatorname{arctanh}(\sin(c+dx))}{d} - \frac{2ab(a^2-2b^2)\sin(c+dx)}{d} - \frac{b^2(2a^2-b^2)\cos(c+dx)\sin(c+dx)}{2d} + \frac{a^2(a+b\cos(c+dx))^2\tan(c+dx)}{d}$$

Mathematica [A] (verified)

Time = 0.89 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.04

$$\int (a+b\cos(c+dx))^4\sec^2(c+dx)\,dx = \frac{2b\left(b(12a^2+b^2)(c+dx)-8a^3\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)+8a^3\log\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}\right.\right.\right.}{4d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^4*Sec[c + d*x]^2,x]
[Out] (2*b*(b*(12*a^2 + b^2)*(c + d*x) - 8*a^3*Log[Cos[(c + d*x)/2] - Sin[(c + d*
x)/2]] + 8*a^3*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) + 16*a*b^3*Sin[c +
 d*x] + b^4*Sin[2*(c + d*x)] + 4*a^4*Tan[c + d*x])/(4*d)
```

Maple [A] (verified)

Time = 2.48 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.76

method	result
derivativedivides	$\frac{a^4\tan(dx+c)+4a^3b\ln(\sec(dx+c)+\tan(dx+c))+6a^2b^2(dx+c)+4\sin(dx+c)ab^3+b^4\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}$
default	$\frac{a^4\tan(dx+c)+4a^3b\ln(\sec(dx+c)+\tan(dx+c))+6a^2b^2(dx+c)+4\sin(dx+c)ab^3+b^4\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}$
parts	$\frac{a^4\tan(dx+c)}{d}+\frac{b^4\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{4a^3b\ln(\sec(dx+c)+\tan(dx+c))}{d}+\frac{6a^2b^2(dx+c)}{d}+\frac{4\sin(dx+c)c}{d}$
parallelrisch	$\frac{-32a^3b\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)\cos(dx+c)+32a^3b\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)\cos(dx+c)+16\sin(2dx+2c)ab^3+\sin(3dx+3c)b^4+48(}{8d\cos(dx+c)}$
risch	$6xa^2b^2+\frac{b^4x}{2}-\frac{ib^4e^{2i(dx+c)}}{8d}-\frac{2iab^3e^{i(dx+c)}}{d}+\frac{2iab^3e^{-i(dx+c)}}{d}+\frac{ib^4e^{-2i(dx+c)}}{8d}+\frac{2ia^4}{d(e^{2i(dx+c)}+1)}+\frac{4a^3b}{}$
norman	$\frac{\left(-6a^2b^2-\frac{1}{2}b^4\right)x+\left(-18a^2b^2-\frac{3}{2}b^4\right)x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(6a^2b^2+\frac{1}{2}b^4\right)x\left(\tan^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(18a^2b^2+\frac{3}{2}b^4\right)x\left(\tan^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{}$

```
[In] int((a+cos(d*x+c)*b)^4*sec(d*x+c)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a^4*tan(d*x+c)+4*a^3*b*ln(sec(d*x+c)+tan(d*x+c))+6*a^2*b^2*(d*x+c)+4*s
in(d*x+c)*a*b^3+b^4*(1/2*cos(d*x+c)*sin(d*x+c)+1/2*d*x+1/2*c))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.02

$$\int (a+b\cos(c+dx))^4\sec^2(c+dx)\,dx$$
$$=\frac{4\,a^3b\cos(dx+c)\log(\sin(dx+c)+1)-4\,a^3b\cos(dx+c)\log(-\sin(dx+c)+1)+(12\,a^2b^2+b^4)dx\cos(}{2\,d\cos(dx+c)}$$

```
[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] 1/2*(4*a^3*b*cos(d*x + c)*log(sin(d*x + c) + 1) - 4*a^3*b*cos(d*x + c)*log(
-sin(d*x + c) + 1) + (12*a^2*b^2 + b^4)*d*x*cos(d*x + c) + (b^4*cos(d*x + c
)^2 + 8*a*b^3*cos(d*x + c) + 2*a^4)*sin(d*x + c))/(d*cos(d*x + c))
```

Sympy [F]

$$\int (a+b\cos(c+dx))^4\sec^2(c+dx)\,dx=\int (a+b\cos{(c+dx)})^4\sec^2{(c+dx)}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**4*sec(d*x+c)**2,x)
[Out] Integral((a + b*cos(c + d*x))**4*sec(c + d*x)**2, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.19 (sec) , antiderivative size = 90, normalized size of antiderivative = 0.79

$$\int (a+b\cos(c+dx))^4\sec^2(c+dx)\,dx = \frac{24\,(dx+c)a^2b^2+(2\,dx+2\,c+\sin{(2\,dx+2\,c)})b^4+8\,a^3b(\log{(\sin{(dx+c)}+1)}-\log{(\sin{(dx+c)}-1)})}{4\,d}$$

```
[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c)^2,x, algorithm="maxima")
[Out] 1/4*(24*(d*x + c)*a^2*b^2 + (2*d*x + 2*c + sin(2*d*x + 2*c))*b^4 + 8*a^3*b*
(log(sin(d*x + c) + 1) - log(sin(d*x + c) - 1)) + 16*a*b^3*sin(d*x + c) + 4
*a^4*tan(d*x + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.49

$$\int (a+b\cos(c+dx))^4\sec^2(c+dx)\,dx = \frac{8\,a^3b\log{\left(\left|\tan{\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}+1\right|\right)}-8\,a^3b\log{\left(\left|\tan{\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}-1\right|\right)}-\frac{4\,a^4\tan{\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}}{\tan{\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}^2-1}+(12\,a^2b^2+b^4)(dx}{2\,d}$$

```
[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c)^2,x, algorithm="giac")
[Out] 1/2*(8*a^3*b*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 8*a^3*b*log(abs(tan(1/2*d
*x + 1/2*c) - 1)) - 4*a^4*tan(1/2*d*x + 1/2*c)/(tan(1/2*d*x + 1/2*c)^2 - 1)
 + (12*a^2*b^2 + b^4)*(d*x + c) + 2*(8*a*b^3*tan(1/2*d*x + 1/2*c)^3 - b^4*t
an(1/2*d*x + 1/2*c)^3 + 8*a*b^3*tan(1/2*d*x + 1/2*c) + b^4*tan(1/2*d*x + 1/
2*c))/(tan(1/2*d*x + 1/2*c)^2 + 1)^2)/d
```

Mupad [B] (verification not implemented)

Time = 14.55 (sec) , antiderivative size = 150, normalized size of antiderivative = 1.32

$$\int (a+b\cos(c+dx))^4\sec^2(c+dx)\,dx=\frac{b^4\,\mathrm{atan}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d}+\frac{a^4\,\sin\left(c+d\,x\right)}{d\,\cos\left(c+d\,x\right)}+\frac{12\,a^2\,b^2\,\mathrm{atan}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d}+\frac{4\,a\,b^3\,\sin\left(c+d\,x\right)}{d}+\frac{b^4\,\cos\left(c+d\,x\right)\,\sin\left(c+d\,x\right)}{2\,d}+\frac{8\,a^3\,b\,\mathrm{atanh}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d}$$

```
[In] int((a + b*cos(c + d*x))^4/cos(c + d*x)^2,x)
```

```
[Out] (b^4*atan(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/d + (a^4*sin(c + d*x))/(d
*cos(c + d*x)) + (12*a^2*b^2*atan(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/d
 + (4*a*b^3*sin(c + d*x))/d + (b^4*cos(c + d*x)*sin(c + d*x))/(2*d) + (8*a^
3*b*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/d
```

3.444 $\int (a+b\cos(c+dx))^4\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 108

$$\int (a+b\cos(c+dx))^4\sec^3(c+dx)\,dx = 4ab^3x+\frac{a^2(a^2+12b^2)\operatorname{arctanh}(\sin(c+dx))}{2d} - \frac{b^2(a^2-2b^2)\sin(c+dx)}{2d}+\frac{3a^3b\tan(c+dx)}{d} + \frac{a^2(a+b\cos(c+dx))^2\sec(c+dx)\tan(c+dx)}{2d}$$

```
[Out] 4*a*b^3*x+1/2*a^2*(a^2+12*b^2)*arctanh(sin(d*x+c))/d-1/2*b^2*(a^2-2*b^2)*si
n(d*x+c)/d+3*a^3*b*tan(d*x+c)/d+1/2*a^2*(a+b*cos(d*x+c))^2*sec(d*x+c)*tan(d
*x+c)/d
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2871, 3110, 3102, 2814, 3855}

$$\int (a+b\cos(c+dx))^4\sec^3(c+dx)\,dx = \frac{3a^3b\tan(c+dx)}{d} + \frac{a^2(a^2+12b^2)\operatorname{arctanh}(\sin(c+dx))}{2d} - \frac{b^2(a^2-2b^2)\sin(c+dx)}{2d} + \frac{a^2\tan(c+dx)\sec(c+dx)(a+b\cos(c+dx))^2}{2d} + 4ab^3x$$

```
[In] Int[(a + b*Cos[c + d*x])^4*Sec[c + d*x]^3,x]
```

```
[Out] 4*a*b^3*x + (a^2*(a^2 + 12*b^2)*ArcTanh[Sin[c + d*x]])/(2*d) - (b^2*(a^2 -
2*b^2)*Sin[c + d*x])/(2*d) + (3*a^3*b*Tan[c + d*x])/d + (a^2*(a + b*Cos[c +
 d*x])^2*Sec[c + d*x]*Tan[c + d*x])/(2*d)
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rule 3110

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f
_.)*(x_)]^2), x_Symbol] :> Simp[(-(b*c - a*d))*(A*b^2 - a*b*B + a^2*C)*Cos[
e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b^2*f*(m + 1)*(a^2 - b^2))), x] - D
ist[1/(b^2*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[b*(m
 + 1)*((b*B - a*C)*(b*c - a*d) - A*b*(a*c - b*d)) + (b*B*(a^2*d + b^2*d*(m
+ 1) - a*b*c*(m + 2)) + (b*c - a*d)*(A*b^2*(m + 2) + C*(a^2 + b^2*(m + 1)))
)*Sin[e + f*x] - b*C*d*(m + 1)*(a^2 - b^2)*Sin[e + f*x]^2, x], x], x] /; Fr
eeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2,
0] && LtQ[m, -1]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = \frac{a^2(a+b\cos(c+dx))^2\sec(c+dx)\tan(c+dx)}{2d} + \frac{1}{2}\int (a+b\cos(c+dx))\left(6a^2b + a\left(a^2+6b^2\right)\cos(c+dx) - b\left(a^2-2b^2\right)\cos^2(c+dx)\right)\sec^2(c+dx)\,dx$$

$$= \frac{3a^3b\tan(c+dx)}{d} + \frac{a^2(a+b\cos(c+dx))^2\sec(c+dx)\tan(c+dx)}{2d} - \frac{1}{2}\int \left(-a^2\left(a^2+12b^2\right) - 8ab^3\cos(c+dx) + b^2\left(a^2-2b^2\right)\cos^2(c+dx)\right)\sec(c+dx)\,dx$$

$$= -\frac{b^2(a^2-2b^2)\sin(c+dx)}{2d} + \frac{3a^3b\tan(c+dx)}{d} + \frac{a^2(a+b\cos(c+dx))^2\sec(c+dx)\tan(c+dx)}{2d} - \frac{1}{2}\int \left(-a^2\left(a^2+12b^2\right) - 8ab^3\cos(c+dx)\right)\sec(c+dx)\,dx$$

$$= 4ab^3x - \frac{b^2(a^2-2b^2)\sin(c+dx)}{2d} + \frac{3a^3b\tan(c+dx)}{d} + \frac{a^2(a+b\cos(c+dx))^2\sec(c+dx)\tan(c+dx)}{2d} + \frac{1}{2}\left(a^2\left(a^2+12b^2\right)\right)\int \sec(c+dx)\,dx$$

$$= 4ab^3x + \frac{a^2(a^2+12b^2)\operatorname{arctanh}(\sin(c+dx))}{2d} - \frac{b^2(a^2-2b^2)\sin(c+dx)}{2d} + \frac{3a^3b\tan(c+dx)}{d} + \frac{a^2(a+b\cos(c+dx))^2\sec(c+dx)\tan(c+dx)}{2d}$$

Mathematica [A] (verified)

Time = 2.00 (sec) , antiderivative size = 174, normalized size of antiderivative = 1.61

$$\int (a+b\cos(c+dx))^4\sec^3(c+dx)\,dx$$

$$= \frac{a\Big(16b^3c + 16b^3dx - 2a(a^2+12b^2)\log\left(\cos\left(\frac{1}{2}(c+dx)\right) - \sin\left(\frac{1}{2}(c+dx)\right)\right) + 2a(a^2+12b^2)\log\left(\cos\left(\frac{1}{2}(c\right.\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^4*Sec[c + d*x]^3,x]
```

[Out] (a*(16*b^3*c + 16*b^3*d*x - 2*a*(a^2 + 12*b^2)*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + 2*a*(a^2 + 12*b^2)*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] + a^3/(Cos[(c + d*x)/2] - Sin[(c + d*x)/2])^2 - a^3/(Cos[(c + d*x)/2] + Sin[(c + d*x)/2])^2) + 4*b^4*Sin[c + d*x] + 16*a^3*b*Tan[c + d*x])/(4*d)

Maple [A] (verified)

Time = 3.34 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.89

method	result
derivativedivides	$\frac{a^4\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)+4a^3b\tan(dx+c)+6a^2b^2\ln(\sec(dx+c)+\tan(dx+c))+4a\,b^3(dx+c)+\sin}{d}$
default	$\frac{a^4\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)+4a^3b\tan(dx+c)+6a^2b^2\ln(\sec(dx+c)+\tan(dx+c))+4a\,b^3(dx+c)+\sin}{d}$
parts	$\frac{a^4\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)}{d}+\frac{\sin(dx+c)b^4}{d}+\frac{4a^3b\tan(dx+c)}{d}+\frac{6a^2b^2\ln(\sec(dx+c)+\tan(dx+}{d}$
parallelrisch	$\frac{-a^2(a^2+12b^2)(1+\cos(2dx+2c))\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+a^2(a^2+12b^2)(1+\cos(2dx+2c))\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)+8a\,b^3dx\cos(}{2d(1+\cos(2dx+2c))}$
risch	$4a\,b^3x-\frac{i\mathrm{e}^{i(dx+c)}b^4}{2d}+\frac{i\mathrm{e}^{-i(dx+c)}b^4}{2d}-\frac{ia^3\left(a\,\mathrm{e}^{3i(dx+c)}-8b\,\mathrm{e}^{2i(dx+c)}-a\,\mathrm{e}^{i(dx+c)}-8b\right)}{d\left(\mathrm{e}^{2i(dx+c)}+1\right)^2}+\frac{a^4\ln\left(\mathrm{e}^{i(dx+c)}+i\right)}{2d}+6a$
norman	$\frac{\frac{(a^4-8a^3b+2b^4)\left(\tan^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{(a^4+8a^3b+2b^4)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}+\frac{(5a^4-24a^3b+2b^4)\left(\tan^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}+\frac{(5a^4+24a^3b+2b^4)\left(\tan^3\right(}{d}}{}$

[In] int((a+cos(d*x+c)*b)^4*sec(d*x+c)^3,x,method=_RETURNVERBOSE)

[Out] 1/d*(a^4*(1/2*sec(d*x+c)*tan(d*x+c)+1/2*ln(sec(d*x+c)+tan(d*x+c)))+4*a^3*b*tan(d*x+c)+6*a^2*b^2*ln(sec(d*x+c)+tan(d*x+c))+4*a*b^3*(d*x+c)+sin(d*x+c)*b^4)

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.20

$$\int (a+b\cos(c+dx))^4\sec^3(c+dx)\,dx$$
$$=\frac{16\,ab^3dx\cos(dx+c)^2+(a^4+12\,a^2b^2)\cos(dx+c)^2\log(\sin(dx+c)+1)-(a^4+12\,a^2b^2)\cos(dx+c)^2\log}{4\,d\cos(dx+c)^2}$$

[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c)^3,x, algorithm="fricas")

[Out] 1/4*(16*a*b^3*d*x*cos(d*x + c)^2 + (a^4 + 12*a^2*b^2)*cos(d*x + c)^2*log(sin(d*x + c) + 1) - (a^4 + 12*a^2*b^2)*cos(d*x + c)^2*log(-sin(d*x + c) + 1) + 2*(2*b^4*cos(d*x + c)^2 + 8*a^3*b*cos(d*x + c) + a^4)*sin(d*x + c))/(d*cos(d*x + c)^2)

Sympy [F]

$$\int (a+b\cos(c+dx))^4\sec^3(c+dx)\,dx = \int (a+b\cos(c+dx))^4\sec^3(c+dx)\,dx$$

[In] integrate((a+b*cos(d*x+c))**4*sec(d*x+c)**3,x)

[Out] Integral((a + b*cos(c + d*x))**4*sec(c + d*x)**3, x)

Maxima [A] (verification not implemented)

none

Time = 0.18 (sec) , antiderivative size = 115, normalized size of antiderivative = 1.06

$$\int (a+b\cos(c+dx))^4\sec^3(c+dx)\,dx = \frac{16\,(dx+c)ab^3 - a^4\left(\frac{2\,\sin(dx+c)}{\sin(dx+c)^2-1} - \log(\sin(dx+c)+1) + \log(\sin(dx+c)-1)\right) + 12\,a^2b^2(\log(\sin(dx+ \ldots}{4\,d}$$

[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c)^3,x, algorithm="maxima")

[Out] 1/4*(16*(d*x + c)*a*b^3 - a^4*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)) + 12*a^2*b^2*(log(sin(d*x + c) + 1) - log(sin(d*x + c) - 1)) + 4*b^4*sin(d*x + c) + 16*a^3*b*tan(d*x + c))/d

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 177, normalized size of antiderivative = 1.64

$$\int (a+b\cos(c+dx))^4\sec^3(c+dx)\,dx = \frac{8\,(dx+c)ab^3 + \frac{4\,b^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+1} + (a^4+12\,a^2b^2)\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right) - (a^4+12\,a^2b^2)\log\left(\left|\tan\left(\frac{1}{2} \ldots\right.\right.\right.}{2\,d}$$

[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c)^3,x, algorithm="giac")

[Out] 1/2*(8*(d*x + c)*a*b^3 + 4*b^4*tan(1/2*d*x + 1/2*c)/(tan(1/2*d*x + 1/2*c)^2 + 1) + (a^4 + 12*a^2*b^2)*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - (a^4 + 12*a^2*b^2)*log(abs(tan(1/2*d*x + 1/2*c) - 1)) + 2*(a^4*tan(1/2*d*x + 1/2*c)^3 - 8*a^3*b*tan(1/2*d*x + 1/2*c)^3 + a^4*tan(1/2*d*x + 1/2*c) + 8*a^3*b*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2 - 1)^2)/d

Mupad [B] (verification not implemented)

Time = 14.53 (sec) , antiderivative size = 152, normalized size of antiderivative = 1.41

$$\int (a+b\cos(c+dx))^4\sec^3(c+dx)\,dx=\frac{b^4\,\sin\left(c+d\,x\right)}{d}+\frac{a^4\,\mathrm{atanh}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d}+\frac{a^4\,\sin\left(c+d\,x\right)}{2\,d\cos\left(c+d\,x\right)^2}+\frac{12\,a^2\,b^2\,\mathrm{atanh}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d}+\frac{8\,a\,b^3\,\mathrm{atan}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{d}+\frac{4\,a^3\,b\,\sin\left(c+d\,x\right)}{d\,\cos\left(c+d\,x\right)}$$

```
[In] int((a + b*cos(c + d*x))^4/cos(c + d*x)^3,x)
```

```
[Out] (b^4*sin(c + d*x))/d + (a^4*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/d
 + (a^4*sin(c + d*x))/(2*d*cos(c + d*x)^2) + (12*a^2*b^2*atanh(sin(c/2 + (d
*x)/2)/cos(c/2 + (d*x)/2)))/d + (8*a*b^3*atan(sin(c/2 + (d*x)/2)/cos(c/2 +
(d*x)/2)))/d + (4*a^3*b*sin(c + d*x))/(d*cos(c + d*x))
```

3.445 $\int (a+b\cos(c+dx))^4\sec^4(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 115

$$\int (a+b\cos(c+dx))^4\sec^4(c+dx)\,dx = b^4x + \frac{2ab(a^2+2b^2)\operatorname{arctanh}(\sin(c+dx))}{d} + \frac{a^2(2a^2+17b^2)\tan(c+dx)}{3d} + \frac{4a^3b\sec(c+dx)\tan(c+dx)}{3d} + \frac{a^2(a+b\cos(c+dx))^2\sec^2(c+dx)\tan(c+dx)}{3d}$$

```
[Out] b^4*x+2*a*b*(a^2+2*b^2)*arctanh(sin(d*x+c))/d+1/3*a^2*(2*a^2+17*b^2)*tan(d*
x+c)/d+4/3*a^3*b*sec(d*x+c)*tan(d*x+c)/d+1/3*a^2*(a+b*cos(d*x+c))^2*sec(d*x
+c)^2*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$, Rules used = {2871, 3110, 3100, 2814, 3855}

$$\int (a+b\cos(c+dx))^4\sec^4(c+dx)\,dx = \frac{4a^3b\tan(c+dx)\sec(c+dx)}{3d} + \frac{2ab(a^2+2b^2)\operatorname{arctanh}(\sin(c+dx))}{d} + \frac{a^2(2a^2+17b^2)\tan(c+dx)}{3d} + \frac{a^2\tan(c+dx)\sec^2(c+dx)(a+b\cos(c+dx))^2}{3d} + b^4x$$

```
[In] Int[(a + b*Cos[c + d*x])^4*Sec[c + d*x]^4,x]
```

```
[Out] b^4*x + (2*a*b*(a^2 + 2*b^2)*ArcTanh[Sin[c + d*x]])/d + (a^2*(2*a^2 + 17*b^
2)*Tan[c + d*x])/(3*d) + (4*a^3*b*Sec[c + d*x]*Tan[c + d*x])/(3*d) + (a^2*(
a + b*Cos[c + d*x])^2*Sec[c + d*x]^2*Tan[c + d*x])/(3*d)
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3100

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
 (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2
 - a*b*B + a^2*C))*Cos[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*
(a^2 - b^2))), x] + Dist[1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*Simp[b*(a*A - b*B + a*C)*(m + 1) - (A*b^2 - a*b*B + a^2*C + b*(A*
b - a*B + b*C)*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B
, C}, x] && LtQ[m, -1] && NeQ[a^2 - b^2, 0]
```

Rule 3110

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f
_.)*(x_)]^2), x_Symbol] :> Simp[(-(b*c - a*d))*(A*b^2 - a*b*B + a^2*C)*Cos[
e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b^2*f*(m + 1)*(a^2 - b^2))), x] - D
ist[1/(b^2*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[b*(m
 + 1)*((b*B - a*C)*(b*c - a*d) - A*b*(a*c - b*d)) + (b*B*(a^2*d + b^2*d*(m
+ 1) - a*b*c*(m + 2)) + (b*c - a*d)*(A*b^2*(m + 2) + C*(a^2 + b^2*(m + 1)))
)*Sin[e + f*x] - b*C*d*(m + 1)*(a^2 - b^2)*Sin[e + f*x]^2, x], x], x] /; Fr
eeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2,
```

```
0] && LtQ[m, -1]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = \frac{a^2(a+b\cos(c+dx))^2\sec^2(c+dx)\tan(c+dx)}{3d} + \frac{1}{3}\int (a+b\cos(c+dx))\left(8a^2b + a\left(2a^2+9b^2\right)\cos(c+dx) + 3b^3\cos^2(c+dx)\right)\sec^3(c+dx)\,dx$$

$$= \frac{4a^3b\sec(c+dx)\tan(c+dx)}{3d} + \frac{a^2(a+b\cos(c+dx))^2\sec^2(c+dx)\tan(c+dx)}{3d} - \frac{1}{6}\int \left(-2a^2\left(2a^2+17b^2\right) - 12ab\left(a^2+2b^2\right)\cos(c+dx) - 6b^4\cos^2(c+dx)\right)\sec^2(c+dx)\,dx$$

$$= \frac{a^2(2a^2+17b^2)\tan(c+dx)}{3d} + \frac{4a^3b\sec(c+dx)\tan(c+dx)}{3d} + \frac{a^2(a+b\cos(c+dx))^2\sec^2(c+dx)\tan(c+dx)}{3d} - \frac{1}{6}\int \left(-12ab\left(a^2+2b^2\right) - 6b^4\cos(c+dx)\right)\sec(c+dx)\,dx$$

$$= b^4x + \frac{a^2(2a^2+17b^2)\tan(c+dx)}{3d} + \frac{4a^3b\sec(c+dx)\tan(c+dx)}{3d} + \frac{a^2(a+b\cos(c+dx))^2\sec^2(c+dx)\tan(c+dx)}{3d} + \left(2ab\left(a^2+2b^2\right)\right)\int \sec(c+dx)\,dx$$

$$= b^4x + \frac{2ab(a^2+2b^2)\operatorname{arctanh}(\sin(c+dx))}{d} + \frac{a^2(2a^2+17b^2)\tan(c+dx)}{3d} + \frac{4a^3b\sec(c+dx)\tan(c+dx)}{3d} + \frac{a^2(a+b\cos(c+dx))^2\sec^2(c+dx)\tan(c+dx)}{3d}$$

Mathematica [A] (verified)

Time = 0.23 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.67

$$\int (a+b\cos(c+dx))^4\sec^4(c+dx)\,dx$$
$$=\frac{3b^4dx+6ab(a^2+2b^2)\operatorname{arctanh}(\sin(c+dx))+3a^2(a^2+6b^2+2ab\sec(c+dx))\tan(c+dx)+a^4\tan^3(c+dx)}{3d}$$

[In] Integrate[(a + b*Cos[c + d*x])^4*Sec[c + d*x]^4,x]

[Out] (3*b^4*d*x + 6*a*b*(a^2 + 2*b^2)*ArcTanh[Sin[c + d*x]] + 3*a^2*(a^2 + 6*b^2 + 2*a*b*Sec[c + d*x])*Tan[c + d*x] + a^4*Tan[c + d*x]^3)/(3*d)

Maple [A] (verified)

Time = 4.25 (sec) , antiderivative size = 109, normalized size of antiderivative = 0.95

method	result
derivativedivides	$\frac{-a^4\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+4a^3b\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)+6a^2b^2\tan(dx+c)+4a\,b^3\ln(s}{d}$
default	$\frac{-a^4\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+4a^3b\left(\frac{\sec(dx+c)\tan(dx+c)}{2}+\frac{\ln(\sec(dx+c)+\tan(dx+c))}{2}\right)+6a^2b^2\tan(dx+c)+4a\,b^3\ln(s}{d}$
parts	$-\frac{a^4\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)}{d}+\frac{b^4(dx+c)}{d}+\frac{2a^3b\sec(dx+c)\tan(dx+c)}{d}+\frac{2a^3b\ln(\sec(dx+c)+\tan(dx+c))}{d}$
risch	$b^4x-\frac{4ia^2\left(3ab\,e^{5i(dx+c)}-9b^2e^{4i(dx+c)}-3a^2e^{2i(dx+c)}-18b^2e^{2i(dx+c)}-3ab\,e^{i(dx+c)}-a^2-9b^2\right)}{3d\left(e^{2i(dx+c)}+1\right)^3}+\frac{2a^3b\ln\left(e^{i(dx+c)}+i\right)}{d}$
parallelrisch	$\frac{-18b\left(\frac{\cos(3dx+3c)}{3}+\cos(dx+c)\right)(a^2+2b^2)a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+18b\left(\frac{\cos(3dx+3c)}{3}+\cos(dx+c)\right)(a^2+2b^2)a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right.\right.}{3d(\cos(3dx+3c)}$
norman	$b^4x\left(\tan^{12}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+b^4x\left(\tan^{14}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-b^4x-b^4x\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+3b^4x\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+3b^4x\left(\tan^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-3b$

[In] int((a+cos(d*x+c)*b)^4*sec(d*x+c)^4,x,method=_RETURNVERBOSE)

[Out] 1/d*(-a^4*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c)+4*a^3*b*(1/2*sec(d*x+c)*tan(d*x+c)+1/2*ln(sec(d*x+c)+tan(d*x+c)))+6*a^2*b^2*tan(d*x+c)+4*a*b^3*ln(sec(d*x+c)+tan(d*x+c))+b^4*(d*x+c))

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.20

$$\int (a+b\cos(c+dx))^4\sec^4(c+dx)\,dx$$
$$= \frac{3\,b^4dx\cos\left(dx+c\right)^3+3\,(a^3b+2\,ab^3)\cos\left(dx+c\right)^3\log\left(\sin\left(dx+c\right)+1\right)-3\,(a^3b+2\,ab^3)\cos\left(dx+c\right)^3\log}{3\,d\cos\left(dx+c\right)^3}$$

```
[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] 1/3*(3*b^4*d*x*cos(d*x + c)^3 + 3*(a^3*b + 2*a*b^3)*cos(d*x + c)^3*log(sin(
d*x + c) + 1) - 3*(a^3*b + 2*a*b^3)*cos(d*x + c)^3*log(-sin(d*x + c) + 1) +
 (6*a^3*b*cos(d*x + c) + a^4 + 2*(a^4 + 9*a^2*b^2)*cos(d*x + c)^2)*sin(d*x
+ c))/(d*cos(d*x + c)^3)
```

Sympy [F]

$$\int (a+b\cos(c+dx))^4\sec^4(c+dx)\,dx=\int (a+b\cos\left(c+dx\right))^4\sec^4\left(c+dx\right)dx$$

```
[In] integrate((a+b*cos(d*x+c))**4*sec(d*x+c)**4,x)
```

```
[Out] Integral((a + b*cos(c + d*x))**4*sec(c + d*x)**4, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.19 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.09

$$\int (a+b\cos(c+dx))^4\sec^4(c+dx)\,dx$$
$$= \frac{\left(\tan\left(dx+c\right)^3+3\,\tan\left(dx+c\right)\right)a^4+3\,(dx+c)b^4-3\,a^3b\left(\frac{2\,\sin(dx+c)}{\sin(dx+c)^2-1}-\log\left(\sin\left(dx+c\right)+1\right)+\log\left(\sin\left(\right.\right.\right.}{3\,d}$$

```
[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] 1/3*((tan(d*x + c)^3 + 3*tan(d*x + c))*a^4 + 3*(d*x + c)*b^4 - 3*a^3*b*(2*s
in(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c)
 - 1)) + 6*a*b^3*(log(sin(d*x + c) + 1) - log(sin(d*x + c) - 1)) + 18*a^2*b
^2*tan(d*x + c))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 221 vs. $2(109) = 218$.

Time = 0.34 (sec) , antiderivative size = 221, normalized size of antiderivative = 1.92

$$\int (a + b\cos(c + dx))^4 \sec^4(c + dx)\, dx$$
$$= \frac{3\,(dx + c)b^4 + 6\,(a^3b + 2\,ab^3)\log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) + 1\right|\right) - 6\,(a^3b + 2\,ab^3)\log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) - 1\right|\right) - \frac{2}{\ }}{\ }$$

```
[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c)^4,x, algorithm="giac")
```

```
[Out] 1/3*(3*(d*x + c)*b^4 + 6*(a^3*b + 2*a*b^3)*log(abs(tan(1/2*d*x + 1/2*c) + 1
)) - 6*(a^3*b + 2*a*b^3)*log(abs(tan(1/2*d*x + 1/2*c) - 1)) - 2*(3*a^4*tan(
1/2*d*x + 1/2*c)^5 - 6*a^3*b*tan(1/2*d*x + 1/2*c)^5 + 18*a^2*b^2*tan(1/2*d*
x + 1/2*c)^5 - 2*a^4*tan(1/2*d*x + 1/2*c)^3 - 36*a^2*b^2*tan(1/2*d*x + 1/2*
c)^3 + 3*a^4*tan(1/2*d*x + 1/2*c) + 6*a^3*b*tan(1/2*d*x + 1/2*c) + 18*a^2*b
^2*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*x + 1/2*c)^2 - 1)^3)/d
```

Mupad [B] (verification not implemented)

Time = 14.88 (sec) , antiderivative size = 185, normalized size of antiderivative = 1.61

$$\int (a + b\cos(c + dx))^4 \sec^4(c + dx)\, dx = \frac{2\,b^4\,\mathrm{atan}\left(\frac{\sin\left(\frac{c}{2} + \frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2} + \frac{d\,x}{2}\right)}\right)}{d} + \frac{2\,a^4\,\sin\left(c + d\,x\right)}{3\,d\,\cos\left(c + d\,x\right)} + \frac{a^4\,\sin\left(c + d\,x\right)}{3\,d\cos\left(c + d\,x\right)^3} + \frac{8\,a\,b^3\,\mathrm{atanh}\left(\frac{\sin\left(\frac{c}{2} + \frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2} + \frac{d\,x}{2}\right)}\right)}{d} + \frac{4\,a^3\,b\,\mathrm{atanh}\left(\frac{\sin\left(\frac{c}{2} + \frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2} + \frac{d\,x}{2}\right)}\right)}{d} + \frac{2\,a^3\,b\,\sin\left(c + d\,x\right)}{d\cos\left(c + d\,x\right)^2} + \frac{6\,a^2\,b^2\,\sin\left(c + d\,x\right)}{d\,\cos\left(c + d\,x\right)}$$

```
[In] int((a + b*cos(c + d*x))^4/cos(c + d*x)^4,x)
```

```
[Out] (2*b^4*atan(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/d + (2*a^4*sin(c + d*x)
)/(3*d*cos(c + d*x)) + (a^4*sin(c + d*x))/(3*d*cos(c + d*x)^3) + (8*a*b^3*a
tanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/d + (4*a^3*b*atanh(sin(c/2 + (
d*x)/2)/cos(c/2 + (d*x)/2)))/d + (2*a^3*b*sin(c + d*x))/(d*cos(c + d*x)^2)
+ (6*a^2*b^2*sin(c + d*x))/(d*cos(c + d*x))
```

3.446 $\int (a+b\cos(c+dx))^4 \sec^5(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 154

$$\begin{aligned}\int (a+b\cos(c+dx))^4 \sec^5(c+dx)\,dx &= \frac{(3a^4+24a^2b^2+8b^4)\,\text{arctanh}(\sin(c+dx))}{8d} \\ &+ \frac{4ab(2a^2+3b^2)\tan(c+dx)}{3d} \\ &+ \frac{a^2(3a^2+22b^2)\sec(c+dx)\tan(c+dx)}{8d} \\ &+ \frac{5a^3b\sec^2(c+dx)\tan(c+dx)}{6d} \\ &+ \frac{a^2(a+b\cos(c+dx))^2\sec^3(c+dx)\tan(c+dx)}{4d}\end{aligned}$$

```
[Out] 1/8*(3*a^4+24*a^2*b^2+8*b^4)*arctanh(sin(d*x+c))/d+4/3*a*b*(2*a^2+3*b^2)*ta
n(d*x+c)/d+1/8*a^2*(3*a^2+22*b^2)*sec(d*x+c)*tan(d*x+c)/d+5/6*a^3*b*sec(d*x
+c)^2*tan(d*x+c)/d+1/4*a^2*(a+b*cos(d*x+c))^2*sec(d*x+c)^3*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used

= {2871, 3110, 3100, 2827, 3852, 8, 3855}

$$\int (a+b\cos(c+dx))^4\sec^5(c+dx)\,dx = \frac{5a^3b\tan(c+dx)\sec^2(c+dx)}{6d} + \frac{4ab(2a^2+3b^2)\tan(c+dx)}{3d} + \frac{a^2(3a^2+22b^2)\tan(c+dx)\sec(c+dx)}{8d} + \frac{a^2\tan(c+dx)\sec^3(c+dx)(a+b\cos(c+dx))^2}{4d} + \frac{(3a^4+24a^2b^2+8b^4)\,\mathrm{arctanh}(\sin(c+dx))}{8d}$$

```
[In] Int[(a + b*Cos[c + d*x])^4*Sec[c + d*x]^5,x]
```

```
[Out] ((3*a^4 + 24*a^2*b^2 + 8*b^4)*ArcTanh[Sin[c + d*x]])/(8*d) + (4*a*b*(2*a^2
+ 3*b^2)*Tan[c + d*x])/(3*d) + (a^2*(3*a^2 + 22*b^2)*Sec[c + d*x]*Tan[c + d
*x])/(8*d) + (5*a^3*b*Sec[c + d*x]^2*Tan[c + d*x])/(6*d) + (a^2*(a + b*Cos[
c + d*x])^2*Sec[c + d*x]^3*Tan[c + d*x])/(4*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3100

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
 (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2
```

```
 - a*b*B + a^2*C))*Cos[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*
(a^2 - b^2))), x] + Dist[1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*Simp[b*(a*A - b*B + a*C)*(m + 1) - (A*b^2 - a*b*B + a^2*C + b*(A*
b - a*B + b*C)*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B
, C}, x] && LtQ[m, -1] && NeQ[a^2 - b^2, 0]
```

Rule 3110

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f
_.)*(x_)]^2), x_Symbol] :> Simp[(-(b*c - a*d))*(A*b^2 - a*b*B + a^2*C)*Cos[
e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b^2*f*(m + 1)*(a^2 - b^2))), x] - D
ist[1/(b^2*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[b*(m
 + 1)*((b*B - a*C)*(b*c - a*d) - A*b*(a*c - b*d)) + (b*B*(a^2*d + b^2*d*(m
+ 1) - a*b*c*(m + 2)) + (b*c - a*d)*(A*b^2*(m + 2) + C*(a^2 + b^2*(m + 1)))
)*Sin[e + f*x] - b*C*d*(m + 1)*(a^2 - b^2)*Sin[e + f*x]^2, x], x], x] /; Fr
eeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2,
0] && LtQ[m, -1]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = \frac{a^2(a+b\cos(c+dx))^2\sec^3(c+dx)\tan(c+dx)}{4d} + \frac{1}{4}\int (a+b\cos(c+dx))\left(10a^2b + 3a\left(a^2+4b^2\right)\cos(c+dx) + b\left(a^2+4b^2\right)\cos^2(c+dx)\right)\sec^4(c+dx)\,dx$$

$$= \frac{5a^3b\sec^2(c+dx)\tan(c+dx)}{6d} + \frac{a^2(a+b\cos(c+dx))^2\sec^3(c+dx)\tan(c+dx)}{4d} - \frac{1}{12}\int \left(-3a^2\left(3a^2+22b^2\right) - 16ab\left(2a^2+3b^2\right)\cos(c+dx) - 3b^2\left(a^2+4b^2\right)\cos^2(c+dx)\right)\sec^3(c+dx)\,dx$$

$$
\begin{aligned}
&= \frac{a^2(3a^2+22b^2)\sec(c+dx)\tan(c+dx)}{8d} + \frac{5a^3b\sec^2(c+dx)\tan(c+dx)}{6d} \\
&\quad + \frac{a^2(a+b\cos(c+dx))^2\sec^3(c+dx)\tan(c+dx)}{4d} \\
&\quad - \frac{1}{24}\int \left(-32ab(2a^2+3b^2) - 3(3a^4+24a^2b^2+8b^4)\cos(c+dx)\right)\sec^2(c+dx)\,dx \\
&= \frac{a^2(3a^2+22b^2)\sec(c+dx)\tan(c+dx)}{8d} + \frac{5a^3b\sec^2(c+dx)\tan(c+dx)}{6d} \\
&\quad + \frac{a^2(a+b\cos(c+dx))^2\sec^3(c+dx)\tan(c+dx)}{4d} \\
&\quad + \frac{1}{3}\left(4ab(2a^2+3b^2)\right)\int \sec^2(c+dx)\,dx - \frac{1}{8}\left(-3a^4-24a^2b^2-8b^4\right)\int \sec(c+dx)\,dx \\
&= \frac{(3a^4+24a^2b^2+8b^4)\operatorname{arctanh}(\sin(c+dx))}{8d} + \frac{a^2(3a^2+22b^2)\sec(c+dx)\tan(c+dx)}{8d} \\
&\quad + \frac{5a^3b\sec^2(c+dx)\tan(c+dx)}{6d} + \frac{a^2(a+b\cos(c+dx))^2\sec^3(c+dx)\tan(c+dx)}{4d} \\
&\quad - \frac{(4ab(2a^2+3b^2))\,\text{Subst}(\int 1\,dx, x, -\tan(c+dx))}{3d} \\
&= \frac{(3a^4+24a^2b^2+8b^4)\operatorname{arctanh}(\sin(c+dx))}{8d} + \frac{4ab(2a^2+3b^2)\tan(c+dx)}{3d} \\
&\quad + \frac{a^2(3a^2+22b^2)\sec(c+dx)\tan(c+dx)}{8d} + \frac{5a^3b\sec^2(c+dx)\tan(c+dx)}{6d} \\
&\quad + \frac{a^2(a+b\cos(c+dx))^2\sec^3(c+dx)\tan(c+dx)}{4d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.34 (sec) , antiderivative size = 101, normalized size of antiderivative = 0.66

$$
\int (a+b\cos(c+dx))^4\sec^5(c+dx)\,dx
$$

$$
= \frac{3(3a^4+24a^2b^2+8b^4)\operatorname{arctanh}(\sin(c+dx)) + a\tan(c+dx)\left(9a(a^2+8b^2)\sec(c+dx)+6a^3\sec^3(c+dx)+\right.}{24d}
$$

```
[In] Integrate[(a + b*Cos[c + d*x])^4*Sec[c + d*x]^5,x]
```

```
[Out] (3*(3*a^4 + 24*a^2*b^2 + 8*b^4)*ArcTanh[Sin[c + d*x]] + a*Tan[c + d*x]*(9*a
*(a^2 + 8*b^2)*Sec[c + d*x] + 6*a^3*Sec[c + d*x]^3 + 32*b*(3*(a^2 + b^2) +
a^2*Tan[c + d*x]^2)))/(24*d)
```

Maple [A] (verified)

Time = 4.68 (sec) , antiderivative size = 147, normalized size of antiderivative = 0.95

method	result
derivativedivides	$\frac{a^4\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)-4a^3b\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+\cdots}{d}$
default	$\frac{a^4\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)-4a^3b\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan(dx+c)+\cdots}{d}$
parts	$\frac{a^4\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c)+\tan(dx+c))}{8}\right)}{d}+\frac{b^4\ln(\sec(dx+c)+\tan(dx+c))}{d}-\frac{4a^3\cdots}{}$
parallelrisch	$\frac{-36\left(\frac{3}{4}+\frac{\cos(4dx+4c)}{4}+\cos(2dx+2c)\right)\left(a^4+8a^2b^2+\frac{8}{3}b^4\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+36\left(\frac{3}{4}+\frac{\cos(4dx+4c)}{4}+\cos(2dx+2c)\right)\left(a^4+8\cdots\right.}{}$
risch	$-\frac{ia\left(9a^3e^{7i(dx+c)}+72a\,b^2e^{7i(dx+c)}-96b^3e^{6i(dx+c)}+33a^3e^{5i(dx+c)}+72a\,b^2e^{5i(dx+c)}-192a^2b\,e^{4i(dx+c)}-288b^3e^{4i(dx+c)}\cdots\right.}{12d\left(e^{2i(dx\cdots}\right.}$
norman	$\frac{a\left(5a^3-32a^2b+24a\,b^2-32b^3\right)\left(\tan^{15}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{4d}+\frac{a\left(5a^3+32a^2b+24a\,b^2+32b^3\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{4d}+\frac{a\left(45a^3-32a^2b+24a\,b^2+96b^3\right)\left(\tan^{11}\cdots\right.}{4d}$

```
[In] int((a+cos(d*x+c)*b)^4*sec(d*x+c)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a^4*(-(-1/4*sec(d*x+c)^3-3/8*sec(d*x+c))*tan(d*x+c)+3/8*ln(sec(d*x+c)+
tan(d*x+c)))-4*a^3*b*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c)+6*a^2*b^2*(1/2*sec(
d*x+c)*tan(d*x+c)+1/2*ln(sec(d*x+c)+tan(d*x+c)))+4*tan(d*x+c)*a*b^3+b^4*ln(
sec(d*x+c)+tan(d*x+c)))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.06

$$\int (a+b\cos(c+dx))^4\sec^5(c+dx)\,dx$$
$$=\frac{3\left(3\,a^4+24\,a^2b^2+8\,b^4\right)\cos\left(dx+c\right)^4\log\left(\sin\left(dx+c\right)+1\right)-3\left(3\,a^4+24\,a^2b^2+8\,b^4\right)\cos\left(dx+c\right)^4\log\left(-\cdots\right.}{}$$

```
[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] 1/48*(3*(3*a^4 + 24*a^2*b^2 + 8*b^4)*cos(d*x + c)^4*log(sin(d*x + c) + 1) -
 3*(3*a^4 + 24*a^2*b^2 + 8*b^4)*cos(d*x + c)^4*log(-sin(d*x + c) + 1) + 2*(
32*a^3*b*cos(d*x + c) + 6*a^4 + 32*(2*a^3*b + 3*a*b^3)*cos(d*x + c)^3 + 9*(
a^4 + 8*a^2*b^2)*cos(d*x + c)^2)*sin(d*x + c))/(d*cos(d*x + c)^4)
```

Sympy [F(-1)]

Timed out.

$$\int (a + b\cos(c + dx))^4 \sec^5(c + dx)\, dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**4*sec(d*x+c)**5,x)
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.21 (sec) , antiderivative size = 187, normalized size of antiderivative = 1.21

$$\int (a + b\cos(c + dx))^4 \sec^5(c + dx)\, dx = \frac{64\left(\tan(dx+c)^3 + 3\tan(dx+c)\right)a^3b - 3a^4\left(\frac{2\left(3\sin(dx+c)^3 - 5\sin(dx+c)\right)}{\sin(dx+c)^4 - 2\sin(dx+c)^2 + 1} - 3\log(\sin(dx+c)+1) + 3\log(\sin(dx+c)-1)\right) \ldots}{\ldots}$$

```
[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c)^5,x, algorithm="maxima")
[Out] 1/48*(64*(tan(d*x + c)^3 + 3*tan(d*x + c))*a^3*b - 3*a^4*(2*(3*sin(d*x + c)
^3 - 5*sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2 + 1) - 3*log(sin(d*
x + c) + 1) + 3*log(sin(d*x + c) - 1)) - 72*a^2*b^2*(2*sin(d*x + c)/(sin(d*
x + c)^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)) + 24*b^4*(lo
g(sin(d*x + c) + 1) - log(sin(d*x + c) - 1)) + 192*a*b^3*tan(d*x + c))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 360 vs. 2(144) = 288.

Time = 0.34 (sec) , antiderivative size = 360, normalized size of antiderivative = 2.34

$$\int (a + b\cos(c + dx))^4 \sec^5(c + dx)\, dx = \frac{3\left(3a^4 + 24a^2b^2 + 8b^4\right)\log\left(\left|\tan\left(\frac{1}{2}dx + \frac{1}{2}c\right) + 1\right|\right) - 3\left(3a^4 + 24a^2b^2 + 8b^4\right)\log\left(\left|\tan\left(\frac{1}{2}dx + \frac{1}{2}c\right) - 1\right|\right) \ldots}{\ldots}$$

```
[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c)^5,x, algorithm="giac")
[Out] 1/24*(3*(3*a^4 + 24*a^2*b^2 + 8*b^4)*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 3
*(3*a^4 + 24*a^2*b^2 + 8*b^4)*log(abs(tan(1/2*d*x + 1/2*c) - 1)) + 2*(15*a^
```

```
4*tan(1/2*d*x + 1/2*c)^7 - 96*a^3*b*tan(1/2*d*x + 1/2*c)^7 + 72*a^2*b^2*tan
(1/2*d*x + 1/2*c)^7 - 96*a*b^3*tan(1/2*d*x + 1/2*c)^7 + 9*a^4*tan(1/2*d*x +
 1/2*c)^5 + 160*a^3*b*tan(1/2*d*x + 1/2*c)^5 - 72*a^2*b^2*tan(1/2*d*x + 1/2
*c)^5 + 288*a*b^3*tan(1/2*d*x + 1/2*c)^5 + 9*a^4*tan(1/2*d*x + 1/2*c)^3 - 1
60*a^3*b*tan(1/2*d*x + 1/2*c)^3 - 72*a^2*b^2*tan(1/2*d*x + 1/2*c)^3 - 288*a
*b^3*tan(1/2*d*x + 1/2*c)^3 + 15*a^4*tan(1/2*d*x + 1/2*c) + 96*a^3*b*tan(1/
2*d*x + 1/2*c) + 72*a^2*b^2*tan(1/2*d*x + 1/2*c) + 96*a*b^3*tan(1/2*d*x + 1
/2*c))/(tan(1/2*d*x + 1/2*c)^2 - 1)^4)/d
```

Mupad [B] (verification not implemented)

Time = 18.02 (sec) , antiderivative size = 245, normalized size of antiderivative = 1.59

$$\int (a+b\cos(c+dx))^4\sec^5(c+dx)\,dx = \frac{\left(\frac{5a^4}{4}-8a^3b+6a^2b^2-8ab^3\right)\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^7+\left(\frac{3a^4}{4}+\frac{40a^3b}{3}-6a^2b^2+24ab^3\right)\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^5+\left(\frac{3a^4}{4}-\right.}{d\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^8-4\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^6+6\tan\left(\frac{c}{2}+\right.\right.} + \frac{\operatorname{atanh}\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)\left(\frac{3a^4}{4}+6a^2b^2+2b^4\right)}{d}$$

```
[In] int((a + b*cos(c + d*x))^4/cos(c + d*x)^5,x)
```

```
[Out] (tan(c/2 + (d*x)/2)*(8*a*b^3 + 8*a^3*b + (5*a^4)/4 + 6*a^2*b^2) - tan(c/2 +
 (d*x)/2)^7*(8*a*b^3 + 8*a^3*b - (5*a^4)/4 - 6*a^2*b^2) - tan(c/2 + (d*x)/2
)^3*(24*a*b^3 + (40*a^3*b)/3 - (3*a^4)/4 + 6*a^2*b^2) + tan(c/2 + (d*x)/2)^
5*(24*a*b^3 + (40*a^3*b)/3 + (3*a^4)/4 - 6*a^2*b^2))/(d*(6*tan(c/2 + (d*x)/
2)^4 - 4*tan(c/2 + (d*x)/2)^2 - 4*tan(c/2 + (d*x)/2)^6 + tan(c/2 + (d*x)/2)
^8 + 1)) + (atanh(tan(c/2 + (d*x)/2))*((3*a^4)/4 + 2*b^4 + 6*a^2*b^2))/d
```

3.447 $\int (a+b\cos(c+dx))^4\sec^6(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 188

$$\int (a+b\cos(c+dx))^4\sec^6(c+dx)\,dx = \frac{ab(3a^2+4b^2)\,\text{arctanh}(\sin(c+dx))}{2d} + \frac{(8a^4+60a^2b^2+15b^4)\tan(c+dx)}{15d} + \frac{ab(3a^2+4b^2)\sec(c+dx)\tan(c+dx)}{2d} + \frac{a^2(4a^2+27b^2)\sec^2(c+dx)\tan(c+dx)}{15d} + \frac{3a^3b\sec^3(c+dx)\tan(c+dx)}{5d} + \frac{a^2(a+b\cos(c+dx))^2\sec^4(c+dx)\tan(c+dx)}{5d}$$

```
[Out] 1/2*a*b*(3*a^2+4*b^2)*arctanh(sin(d*x+c))/d+1/15*(8*a^4+60*a^2*b^2+15*b^4)*
tan(d*x+c)/d+1/2*a*b*(3*a^2+4*b^2)*sec(d*x+c)*tan(d*x+c)/d+1/15*a^2*(4*a^2+
27*b^2)*sec(d*x+c)^2*tan(d*x+c)/d+3/5*a^3*b*sec(d*x+c)^3*tan(d*x+c)/d+1/5*a
^2*(a+b*cos(d*x+c))^2*sec(d*x+c)^4*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 188, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.381$, Rules used

$= \{2871, 3110, 3100, 2827, 3853, 3855, 3852, 8\}$

$$\int (a+b\cos(c+dx))^4\sec^6(c+dx)\,dx = \frac{3a^3b\tan(c+dx)\sec^3(c+dx)}{5d} + \frac{ab(3a^2+4b^2)\operatorname{arctanh}(\sin(c+dx))}{2d} + \frac{a^2(4a^2+27b^2)\tan(c+dx)\sec^2(c+dx)}{15d} + \frac{ab(3a^2+4b^2)\tan(c+dx)\sec(c+dx)}{2d} + \frac{a^2\tan(c+dx)\sec^4(c+dx)(a+b\cos(c+dx))^2}{5d} + \frac{(8a^4+60a^2b^2+15b^4)\tan(c+dx)}{15d}$$

```
[In] Int[(a + b*Cos[c + d*x])^4*Sec[c + d*x]^6,x]
```

```
[Out] (a*b*(3*a^2 + 4*b^2)*ArcTanh[Sin[c + d*x]])/(2*d) + ((8*a^4 + 60*a^2*b^2 +
15*b^4)*Tan[c + d*x])/(15*d) + (a*b*(3*a^2 + 4*b^2)*Sec[c + d*x]*Tan[c + d*
x])/(2*d) + (a^2*(4*a^2 + 27*b^2)*Sec[c + d*x]^2*Tan[c + d*x])/(15*d) + (3*
a^3*b*Sec[c + d*x]^3*Tan[c + d*x])/(5*d) + (a^2*(a + b*Cos[c + d*x])^2*Sec[
c + d*x]^4*Tan[c + d*x])/(5*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3100

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
 (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2
 - a*b*B + a^2*C))*Cos[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*
(a^2 - b^2))), x] + Dist[1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*Simp[b*(a*A - b*B + a*C)*(m + 1) - (A*b^2 - a*b*B + a^2*C + b*(A*
b - a*B + b*C)*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B
, C}, x] && LtQ[m, -1] && NeQ[a^2 - b^2, 0]
```

Rule 3110

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f
_.)*(x_)]^2), x_Symbol] :> Simp[(-(b*c - a*d))*(A*b^2 - a*b*B + a^2*C)*Cos[
e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b^2*f*(m + 1)*(a^2 - b^2))), x] - D
ist[1/(b^2*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[b*(m
 + 1)*((b*B - a*C)*(b*c - a*d) - A*b*(a*c - b*d)) + (b*B*(a^2*d + b^2*d*(m
+ 1) - a*b*c*(m + 2)) + (b*c - a*d)*(A*b^2*(m + 2) + C*(a^2 + b^2*(m + 1)))
)*Sin[e + f*x] - b*C*d*(m + 1)*(a^2 - b^2)*Sin[e + f*x]^2, x], x], x] /; Fr
eeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2,
0] && LtQ[m, -1]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = \frac{a^2(a+b\cos(c+dx))^2\sec^4(c+dx)\tan(c+dx)}{5d} + \frac{1}{5}\int(a+b\cos(c+dx))\left(12a^2b + a\left(4a^2+15b^2\right)\cos(c+dx) + b\left(2a^2+5b^2\right)\cos^2(c+dx)\right)\sec^5(c+dx)\,dx$$

$$= \frac{3a^3b\sec^3(c+dx)\tan(c+dx)}{5d} + \frac{a^2(a+b\cos(c+dx))^2\sec^4(c+dx)\tan(c+dx)}{5d} - \frac{1}{20}\int \left(-4a^2(4a^2+27b^2) - 20ab(3a^2+4b^2)\cos(c+dx) - 4b^2(2a^2+5b^2)\cos^2(c+dx)\right)\sec^4(c+dx)\,dx$$

$$= \frac{a^2(4a^2+27b^2)\sec^2(c+dx)\tan(c+dx)}{15d} + \frac{3a^3b\sec^3(c+dx)\tan(c+dx)}{5d} + \frac{a^2(a+b\cos(c+dx))^2\sec^4(c+dx)\tan(c+dx)}{5d} - \frac{1}{60}\int \left(-60ab(3a^2+4b^2) - 4(8a^4+60a^2b^2+15b^4)\cos(c+dx)\right)\sec^3(c+dx)\,dx$$

$$= \frac{a^2(4a^2+27b^2)\sec^2(c+dx)\tan(c+dx)}{15d} + \frac{3a^3b\sec^3(c+dx)\tan(c+dx)}{5d} + \frac{a^2(a+b\cos(c+dx))^2\sec^4(c+dx)\tan(c+dx)}{5d} + \left(ab(3a^2+4b^2)\right)\int \sec^3(c+dx)\,dx - \frac{1}{15}\left(-8a^4-60a^2b^2-15b^4\right)\int \sec^2(c+dx)\,dx$$

$$= \frac{ab(3a^2+4b^2)\sec(c+dx)\tan(c+dx)}{2d} + \frac{a^2(4a^2+27b^2)\sec^2(c+dx)\tan(c+dx)}{15d} + \frac{3a^3b\sec^3(c+dx)\tan(c+dx)}{5d} + \frac{a^2(a+b\cos(c+dx))^2\sec^4(c+dx)\tan(c+dx)}{5d} + \frac{1}{2}\left(ab(3a^2+4b^2)\right)\int \sec(c+dx)\,dx - \frac{(8a^4+60a^2b^2+15b^4)\,\text{Subst}(\int 1\,dx, x, -\tan(c+dx))}{15d}$$

$$= \frac{ab(3a^2+4b^2)\operatorname{arctanh}(\sin(c+dx))}{2d} + \frac{(8a^4+60a^2b^2+15b^4)\tan(c+dx)}{15d} + \frac{ab(3a^2+4b^2)\sec(c+dx)\tan(c+dx)}{2d} + \frac{a^2(4a^2+27b^2)\sec^2(c+dx)\tan(c+dx)}{15d} + \frac{3a^3b\sec^3(c+dx)\tan(c+dx)}{5d} + \frac{a^2(a+b\cos(c+dx))^2\sec^4(c+dx)\tan(c+dx)}{5d}$$

Mathematica [A] (verified)

Time = 0.50 (sec) , antiderivative size = 125, normalized size of antiderivative = 0.66

$$\int (a+b\cos(c+dx))^4\sec^6(c+dx)\,dx = \frac{15ab(3a^2+4b^2)\operatorname{arctanh}(\sin(c+dx)) + \tan(c+dx)\left(30(a^4+6a^2b^2+b^4) + 15ab(3a^2+4b^2)\sec(c+dx) + \right.}{30d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^4*Sec[c + d*x]^6,x]
```

[Out] (15*a*b*(3*a^2 + 4*b^2)*ArcTanh[Sin[c + d*x]] + Tan[c + d*x]*(30*(a^4 + 6*a
^2*b^2 + b^4) + 15*a*b*(3*a^2 + 4*b^2)*Sec[c + d*x] + 30*a^3*b*Sec[c + d*x]
^3 + 20*a^2*(a^2 + 3*b^2)*Tan[c + d*x]^2 + 6*a^4*Tan[c + d*x]^4))/(30*d)

Maple [A] (verified)

Time = 6.16 (sec) , antiderivative size = 162, normalized size of antiderivative = 0.86

method	result
derivativedivides	$\frac{-a^4\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c)\right)}{5}-\frac{4\left(\sec^2(dx+c)\right)}{15}\right)\tan(dx+c)+4a^3b\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c}{}\right.}{}$
default	$\frac{-a^4\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c)\right)}{5}-\frac{4\left(\sec^2(dx+c)\right)}{15}\right)\tan(dx+c)+4a^3b\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan(dx+c)+\frac{3\ln(\sec(dx+c}{}\right.}{}$
parts	$-\frac{a^4\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c)\right)}{5}-\frac{4\left(\sec^2(dx+c)\right)}{15}\right)\tan(dx+c)}{d}+\frac{b^4\tan(dx+c)}{d}+\frac{4a^3b\left(-\left(-\frac{\left(\sec^3(dx+c)\right)}{4}-\frac{3\sec(dx+c)}{8}\right)\tan\right.}{d}$
parallelrisch	$\frac{-450b\left(\frac{\cos(5dx+5c)}{10}+\frac{\cos(3dx+3c)}{2}+\cos(dx+c)\right)\left(a^2+\frac{4b^2}{3}\right)a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+450b\left(\frac{\cos(5dx+5c)}{10}+\frac{\cos(3dx+3c)}{2}+\cos(dx\right.}{}$
risch	$\frac{i\left(-45a^3b\,e^{9i(dx+c)}-60a\,b^3e^{9i(dx+c)}+30b^4e^{8i(dx+c)}-210a^3b\,e^{7i(dx+c)}-120b^3a\,e^{7i(dx+c)}+360a^2b^2e^{6i(dx+c)}+120b^4e^{6i(dx\right.}{}$

[In] int((a+cos(d*x+c)*b)^4*sec(d*x+c)^6,x,method=_RETURNVERBOSE)

[Out] 1/d*(-a^4*(-8/15-1/5*sec(d*x+c)^4-4/15*sec(d*x+c)^2)*tan(d*x+c)+4*a^3*b*(-(
-1/4*sec(d*x+c)^3-3/8*sec(d*x+c))*tan(d*x+c)+3/8*ln(sec(d*x+c)+tan(d*x+c)))
-6*a^2*b^2*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c)+4*a*b^3*(1/2*sec(d*x+c)*tan(d
*x+c)+1/2*ln(sec(d*x+c)+tan(d*x+c)))+tan(d*x+c)*b^4)

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 182, normalized size of antiderivative = 0.97

$$\int(a+b\cos(c+dx))^4\sec^6(c+dx)\,dx$$
$$=\frac{15\left(3\,a^3b+4\,ab^3\right)\cos\left(dx+c\right)^5\log\left(\sin\left(dx+c\right)+1\right)-15\left(3\,a^3b+4\,ab^3\right)\cos\left(dx+c\right)^5\log\left(-\sin\left(dx+c\right)+\right.}{}$$

[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c)^6,x, algorithm="fricas")

[Out] 1/60*(15*(3*a^3*b + 4*a*b^3)*cos(d*x + c)^5*log(sin(d*x + c) + 1) - 15*(3*a
^3*b + 4*a*b^3)*cos(d*x + c)^5*log(-sin(d*x + c) + 1) + 2*(30*a^3*b*cos(d*x
 + c) + 2*(8*a^4 + 60*a^2*b^2 + 15*b^4)*cos(d*x + c)^4 + 6*a^4 + 15*(3*a^3*
b + 4*a*b^3)*cos(d*x + c)^3 + 4*(2*a^4 + 15*a^2*b^2)*cos(d*x + c)^2)*sin(d*
x + c))/(d*cos(d*x + c)^5)

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^4\sec^6(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**4*sec(d*x+c)**6,x)
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.21 (sec) , antiderivative size = 195, normalized size of antiderivative = 1.04

$$\int (a+b\cos(c+dx))^4\sec^6(c+dx)\,dx$$
$$= \frac{4\left(3\tan(dx+c)^5+10\tan(dx+c)^3+15\tan(dx+c)\right)a^4+120\left(\tan(dx+c)^3+3\tan(dx+c)\right)a^2b^2-}{}$$

```
[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c)^6,x, algorithm="maxima")
[Out] 1/60*(4*(3*tan(d*x + c)^5 + 10*tan(d*x + c)^3 + 15*tan(d*x + c))*a^4 + 120*
(tan(d*x + c)^3 + 3*tan(d*x + c))*a^2*b^2 - 15*a^3*b*(2*(3*sin(d*x + c)^3 -
 5*sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2 + 1) - 3*log(sin(d*x +
c) + 1) + 3*log(sin(d*x + c) - 1)) - 60*a*b^3*(2*sin(d*x + c)/(sin(d*x + c)
^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)) + 60*b^4*tan(d*x +
 c))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 461 vs. 2(176) = 352.

Time = 0.33 (sec) , antiderivative size = 461, normalized size of antiderivative = 2.45

$$\int (a+b\cos(c+dx))^4\sec^6(c+dx)\,dx$$
$$= \frac{15\left(3a^3b+4ab^3\right)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)-15\left(3a^3b+4ab^3\right)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right)-\frac{2\left(30a^4\tan(\right.}{}}{}$$

```
[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c)^6,x, algorithm="giac")
[Out] 1/30*(15*(3*a^3*b + 4*a*b^3)*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 15*(3*a^3
*b + 4*a*b^3)*log(abs(tan(1/2*d*x + 1/2*c) - 1)) - 2*(30*a^4*tan(1/2*d*x +
```

```
1/2*c)^9 - 75*a^3*b*tan(1/2*d*x + 1/2*c)^9 + 180*a^2*b^2*tan(1/2*d*x + 1/2*
c)^9 - 60*a*b^3*tan(1/2*d*x + 1/2*c)^9 + 30*b^4*tan(1/2*d*x + 1/2*c)^9 - 40
*a^4*tan(1/2*d*x + 1/2*c)^7 + 30*a^3*b*tan(1/2*d*x + 1/2*c)^7 - 480*a^2*b^2
*tan(1/2*d*x + 1/2*c)^7 + 120*a*b^3*tan(1/2*d*x + 1/2*c)^7 - 120*b^4*tan(1/
2*d*x + 1/2*c)^7 + 116*a^4*tan(1/2*d*x + 1/2*c)^5 + 600*a^2*b^2*tan(1/2*d*x
 + 1/2*c)^5 + 180*b^4*tan(1/2*d*x + 1/2*c)^5 - 40*a^4*tan(1/2*d*x + 1/2*c)^
3 - 30*a^3*b*tan(1/2*d*x + 1/2*c)^3 - 480*a^2*b^2*tan(1/2*d*x + 1/2*c)^3 -
120*a*b^3*tan(1/2*d*x + 1/2*c)^3 - 120*b^4*tan(1/2*d*x + 1/2*c)^3 + 30*a^4*
tan(1/2*d*x + 1/2*c) + 75*a^3*b*tan(1/2*d*x + 1/2*c) + 180*a^2*b^2*tan(1/2*
d*x + 1/2*c) + 60*a*b^3*tan(1/2*d*x + 1/2*c) + 30*b^4*tan(1/2*d*x + 1/2*c))
/(tan(1/2*d*x + 1/2*c)^2 - 1)^5)/d
```

Mupad [B] (verification not implemented)

Time = 18.75 (sec) , antiderivative size = 304, normalized size of antiderivative = 1.62

$$\int (a+b\cos(c+dx))^4\sec^6(c+dx)\,dx = \frac{\operatorname{atanh}\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)\,\left(3\,a^3\,b+4\,a\,b^3\right)}{d} - \frac{\left(2\,a^4-5\,a^3\,b+12\,a^2\,b^2-4\,a\,b^3+2\,b^4\right)\,\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^9+\left(-\frac{8\,a^4}{3}+2\,a^3\,b-32\,a^2\,b^2+8\,a\,b^3-8\,b^4\right)\,\tan\left(\frac{c}{2}\right.}{d\,\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{10}-\right.}$$

```
[In] int((a + b*cos(c + d*x))^4/cos(c + d*x)^6,x)
```

```
[Out] (atanh(tan(c/2 + (d*x)/2))*(4*a*b^3 + 3*a^3*b))/d - (tan(c/2 + (d*x)/2)^5*(
(116*a^4)/15 + 12*b^4 + 40*a^2*b^2) + tan(c/2 + (d*x)/2)^9*(2*a^4 - 5*a^3*b
 - 4*a*b^3 + 2*b^4 + 12*a^2*b^2) - tan(c/2 + (d*x)/2)^3*(8*a*b^3 + 2*a^3*b
+ (8*a^4)/3 + 8*b^4 + 32*a^2*b^2) - tan(c/2 + (d*x)/2)^7*((8*a^4)/3 - 2*a^3
*b - 8*a*b^3 + 8*b^4 + 32*a^2*b^2) + tan(c/2 + (d*x)/2)*(4*a*b^3 + 5*a^3*b
+ 2*a^4 + 2*b^4 + 12*a^2*b^2))/(d*(5*tan(c/2 + (d*x)/2)^2 - 10*tan(c/2 + (d
*x)/2)^4 + 10*tan(c/2 + (d*x)/2)^6 - 5*tan(c/2 + (d*x)/2)^8 + tan(c/2 + (d*
x)/2)^10 - 1))
```

3.448 $\int (a+b\cos(c+dx))^4 \sec^7(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 222

$$\int (a+b\cos(c+dx))^4 \sec^7(c+dx)\,dx = \frac{(5a^4+36a^2b^2+8b^4)\operatorname{arctanh}(\sin(c+dx))}{16d} + \frac{4ab(4a^2+5b^2)\tan(c+dx)}{5d} + \frac{(5a^4+36a^2b^2+8b^4)\sec(c+dx)\tan(c+dx)}{16d} + \frac{a^2(5a^2+32b^2)\sec^3(c+dx)\tan(c+dx)}{24d} + \frac{7a^3b\sec^4(c+dx)\tan(c+dx)}{15d} + \frac{a^2(a+b\cos(c+dx))^2\sec^5(c+dx)\tan(c+dx)}{6d} + \frac{4ab(4a^2+5b^2)\tan^3(c+dx)}{15d}$$

```
[Out] 1/16*(5*a^4+36*a^2*b^2+8*b^4)*arctanh(sin(d*x+c))/d+4/5*a*b*(4*a^2+5*b^2)*t
an(d*x+c)/d+1/16*(5*a^4+36*a^2*b^2+8*b^4)*sec(d*x+c)*tan(d*x+c)/d+1/24*a^2*
(5*a^2+32*b^2)*sec(d*x+c)^3*tan(d*x+c)/d+7/15*a^3*b*sec(d*x+c)^4*tan(d*x+c)
/d+1/6*a^2*(a+b*cos(d*x+c))^2*sec(d*x+c)^5*tan(d*x+c)/d+4/15*a*b*(4*a^2+5*b
^2)*tan(d*x+c)^3/d
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 222, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {2871, 3110, 3100, 2827, 3852, 3853, 3855}

$$\int (a+b\cos(c+dx))^4\sec^7(c+dx)\,dx = \frac{7a^3b\tan(c+dx)\sec^4(c+dx)}{15d} + \frac{4ab(4a^2+5b^2)\tan^3(c+dx)}{15d} + \frac{4ab(4a^2+5b^2)\tan(c+dx)}{5d} + \frac{a^2(5a^2+32b^2)\tan(c+dx)\sec^3(c+dx)}{24d} + \frac{a^2\tan(c+dx)\sec^5(c+dx)(a+b\cos(c+dx))^2}{6d} + \frac{(5a^4+36a^2b^2+8b^4)\,\text{arctanh}(\sin(c+dx))}{16d} + \frac{(5a^4+36a^2b^2+8b^4)\tan(c+dx)\sec(c+dx)}{16d}$$

```
[In] Int[(a + b*Cos[c + d*x])^4*Sec[c + d*x]^7,x]
```

```
[Out] ((5*a^4 + 36*a^2*b^2 + 8*b^4)*ArcTanh[Sin[c + d*x]])/(16*d) + (4*a*b*(4*a^2
 + 5*b^2)*Tan[c + d*x])/(5*d) + ((5*a^4 + 36*a^2*b^2 + 8*b^4)*Sec[c + d*x]*
Tan[c + d*x])/(16*d) + (a^2*(5*a^2 + 32*b^2)*Sec[c + d*x]^3*Tan[c + d*x])/(
24*d) + (7*a^3*b*Sec[c + d*x]^4*Tan[c + d*x])/(15*d) + (a^2*(a + b*Cos[c +
d*x])^2*Sec[c + d*x]^5*Tan[c + d*x])/(6*d) + (4*a*b*(4*a^2 + 5*b^2)*Tan[c +
 d*x]^3)/(15*d)
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
```

```
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3100

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
 (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2
 - a*b*B + a^2*C))*Cos[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*
(a^2 - b^2))), x] + Dist[1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*Simp[b*(a*A - b*B + a*C)*(m + 1) - (A*b^2 - a*b*B + a^2*C + b*(A*
b - a*B + b*C)*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B
, C}, x] && LtQ[m, -1] && NeQ[a^2 - b^2, 0]
```

Rule 3110

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f
_.)*(x_)]^2), x_Symbol] :> Simp[(-(b*c - a*d))*(A*b^2 - a*b*B + a^2*C)*Cos[
e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b^2*f*(m + 1)*(a^2 - b^2))), x] - D
ist[1/(b^2*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[b*(m
 + 1)*((b*B - a*C)*(b*c - a*d) - A*b*(a*c - b*d)) + (b*B*(a^2*d + b^2*d*(m
+ 1) - a*b*c*(m + 2)) + (b*c - a*d)*(A*b^2*(m + 2) + C*(a^2 + b^2*(m + 1)))
)*Sin[e + f*x] - b*C*d*(m + 1)*(a^2 - b^2)*Sin[e + f*x]^2, x], x], x] /; Fr
eeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2,
0] && LtQ[m, -1]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = \frac{a^2(a+b\cos(c+dx))^2\sec^5(c+dx)\tan(c+dx)}{6d} + \frac{1}{6}\int (a+b\cos(c+dx))\left(14a^2b + a\left(5a^2+18b^2\right)\cos(c+dx) + 3b\left(a^2+2b^2\right)\cos^2(c+dx)\right)\sec^6(c+dx)\,dx$$

$$= \frac{7a^3b\sec^4(c+dx)\tan(c+dx)}{15d} + \frac{a^2(a+b\cos(c+dx))^2\sec^5(c+dx)\tan(c+dx)}{6d} - \frac{1}{30}\int \left(-5a^2\left(5a^2+32b^2\right) - 24ab\left(4a^2+5b^2\right)\cos(c+dx) - 15b^2\left(a^2+2b^2\right)\cos^2(c+dx)\right)\sec^5(c+dx)\,dx$$

$$= \frac{a^2(5a^2+32b^2)\sec^3(c+dx)\tan(c+dx)}{24d} + \frac{7a^3b\sec^4(c+dx)\tan(c+dx)}{15d} + \frac{a^2(a+b\cos(c+dx))^2\sec^5(c+dx)\tan(c+dx)}{6d} - \frac{1}{120}\int \left(-96ab\left(4a^2+5b^2\right) - 15\left(5a^4+36a^2b^2+8b^4\right)\cos(c+dx)\right)\sec^4(c+dx)\,dx$$

$$= \frac{a^2(5a^2+32b^2)\sec^3(c+dx)\tan(c+dx)}{24d} + \frac{7a^3b\sec^4(c+dx)\tan(c+dx)}{15d} + \frac{a^2(a+b\cos(c+dx))^2\sec^5(c+dx)\tan(c+dx)}{6d} + \frac{1}{5}\left(4ab\left(4a^2+5b^2\right)\right)\int \sec^4(c+dx)\,dx - \frac{1}{8}\left(-5a^4-36a^2b^2-8b^4\right)\int \sec^3(c+dx)\,dx$$

$$= \frac{(5a^4+36a^2b^2+8b^4)\sec(c+dx)\tan(c+dx)}{16d} + \frac{a^2(5a^2+32b^2)\sec^3(c+dx)\tan(c+dx)}{24d} + \frac{7a^3b\sec^4(c+dx)\tan(c+dx)}{15d} + \frac{a^2(a+b\cos(c+dx))^2\sec^5(c+dx)\tan(c+dx)}{6d} - \frac{1}{16}\left(-5a^4-36a^2b^2-8b^4\right)\int \sec(c+dx)\,dx - \frac{(4ab(4a^2+5b^2))\,\text{Subst}\left(\int (1+x^2)\,dx, x, -\tan(c+dx)\right)}{5d}$$

$$= \frac{(5a^4+36a^2b^2+8b^4)\,\text{arctanh}(\sin(c+dx))}{16d} + \frac{4ab(4a^2+5b^2)\tan(c+dx)}{5d} + \frac{(5a^4+36a^2b^2+8b^4)\sec(c+dx)\tan(c+dx)}{16d} + \frac{a^2(5a^2+32b^2)\sec^3(c+dx)\tan(c+dx)}{24d} + \frac{7a^3b\sec^4(c+dx)\tan(c+dx)}{15d} + \frac{a^2(a+b\cos(c+dx))^2\sec^5(c+dx)\tan(c+dx)}{6d} + \frac{4ab(4a^2+5b^2)\tan^3(c+dx)}{15d}$$

Mathematica [A] (verified)

Time = 0.65 (sec) , antiderivative size = 154, normalized size of antiderivative = 0.69

$$\int (a + b\cos(c + dx))^4 \sec^7(c + dx)\,dx$$
$$= \frac{15(5a^4 + 36a^2b^2 + 8b^4)\operatorname{arctanh}(\sin(c + dx)) + \tan(c + dx)\left(15(5a^4 + 36a^2b^2 + 8b^4)\sec(c + dx) + 10a^2(5a\right.}{}$$

[In] Integrate[(a + b*Cos[c + d*x])^4*Sec[c + d*x]^7,x]

[Out] (15*(5*a^4 + 36*a^2*b^2 + 8*b^4)*ArcTanh[Sin[c + d*x]] + Tan[c + d*x]*(15*(5*a^4 + 36*a^2*b^2 + 8*b^4)*Sec[c + d*x] + 10*a^2*(5*a^2 + 36*b^2)*Sec[c + d*x]^3 + 40*a^4*Sec[c + d*x]^5 + 64*a*b*(15*(a^2 + b^2) + 5*(2*a^2 + b^2)*Tan[c + d*x]^2 + 3*a^2*Tan[c + d*x]^4)))/(240*d)

Maple [A] (verified)

Time = 6.02 (sec) , antiderivative size = 209, normalized size of antiderivative = 0.94

method	result
derivativedivides	$\frac{a^4\left(-\left(-\frac{\left(\sec^5(dx+c)\right)}{6}-\frac{5\left(\sec^3(dx+c)\right)}{24}-\frac{5\sec(dx+c)}{16}\right)\tan(dx+c)+\frac{5\ln(\sec(dx+c)+\tan(dx+c))}{16}\right)-4a^3b\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c\right.}{5}\right.}{}$
default	$\frac{a^4\left(-\left(-\frac{\left(\sec^5(dx+c)\right)}{6}-\frac{5\left(\sec^3(dx+c)\right)}{24}-\frac{5\sec(dx+c)}{16}\right)\tan(dx+c)+\frac{5\ln(\sec(dx+c)+\tan(dx+c))}{16}\right)-4a^3b\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c\right.}{5}\right.}{}$
parts	$\frac{a^4\left(-\left(-\frac{\left(\sec^5(dx+c)\right)}{6}-\frac{5\left(\sec^3(dx+c)\right)}{24}-\frac{5\sec(dx+c)}{16}\right)\tan(dx+c)+\frac{5\ln(\sec(dx+c)+\tan(dx+c))}{16}\right)}{d}+\frac{b^4\left(\frac{\sec(dx+c)\tan(dx+c}{2}\right.}{}$
parallelrisch	$\frac{-1125\left(a^4+\frac{36}{5}a^2b^2+\frac{8}{5}b^4\right)\left(\frac{\cos(6dx+6c)}{15}+\frac{2\cos(4dx+4c)}{5}+\cos(2dx+2c)+\frac{2}{3}\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)+1125\left(a^4+\frac{36}{5}a^2b^2+\frac{8}{5}b^4\right.}{}$
risch	$-\frac{i\left(-640ab^3-512a^3b-3072a^3b\,e^{2i(dx+c)}-5120a^3b\,e^{6i(dx+c)}-3840ab^3e^{2i(dx+c)}-540a^2b^2e^{i(dx+c)}-3060a^2b^2e^{3i(dx+c}\right.}{}$

[In] int((a+cos(d*x+c)*b)^4*sec(d*x+c)^7,x,method=_RETURNVERBOSE)

[Out] 1/d*(a^4*(-(-1/6*sec(d*x+c)^5-5/24*sec(d*x+c)^3-5/16*sec(d*x+c))*tan(d*x+c)+5/16*ln(sec(d*x+c)+tan(d*x+c)))-4*a^3*b*(-8/15-1/5*sec(d*x+c)^4-4/15*sec(d*x+c)^2)*tan(d*x+c)+6*a^2*b^2*(-(-1/4*sec(d*x+c)^3-3/8*sec(d*x+c))*tan(d*x+c)+3/8*ln(sec(d*x+c)+tan(d*x+c)))-4*a*b^3*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c)+b^4*(1/2*sec(d*x+c)*tan(d*x+c)+1/2*ln(sec(d*x+c)+tan(d*x+c))))

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 217, normalized size of antiderivative = 0.98

$$\int (a+b\cos(c+dx))^4\sec^7(c+dx)\,dx$$
$$= \frac{15\,(5\,a^4+36\,a^2b^2+8\,b^4)\cos{(dx+c)}^6\log{(\sin{(dx+c)}+1)}-15\,(5\,a^4+36\,a^2b^2+8\,b^4)\cos{(dx+c)}^6\log{(-}}{}$$

```
[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c)^7,x, algorithm="fricas")
```

```
[Out] 1/480*(15*(5*a^4 + 36*a^2*b^2 + 8*b^4)*cos(d*x + c)^6*log(sin(d*x + c) + 1)
 - 15*(5*a^4 + 36*a^2*b^2 + 8*b^4)*cos(d*x + c)^6*log(-sin(d*x + c) + 1) +
2*(128*(4*a^3*b + 5*a*b^3)*cos(d*x + c)^5 + 192*a^3*b*cos(d*x + c) + 15*(5*
a^4 + 36*a^2*b^2 + 8*b^4)*cos(d*x + c)^4 + 40*a^4 + 64*(4*a^3*b + 5*a*b^3)*
cos(d*x + c)^3 + 10*(5*a^4 + 36*a^2*b^2)*cos(d*x + c)^2)*sin(d*x + c))/(d*c
os(d*x + c)^6)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^4\sec^7(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**4*sec(d*x+c)**7,x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.19 (sec) , antiderivative size = 275, normalized size of antiderivative = 1.24

$$\int (a+b\cos(c+dx))^4\sec^7(c+dx)\,dx$$
$$= \frac{128\,\left(3\,\tan{(dx+c)}^5+10\,\tan{(dx+c)}^3+15\,\tan{(dx+c)}\right)a^3b+640\,\left(\tan{(dx+c)}^3+3\,\tan{(dx+c)}\right)ab^3-}{}$$

```
[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c)^7,x, algorithm="maxima")
```

```
[Out] 1/480*(128*(3*tan(d*x + c)^5 + 10*tan(d*x + c)^3 + 15*tan(d*x + c))*a^3*b +
 640*(tan(d*x + c)^3 + 3*tan(d*x + c))*a*b^3 - 5*a^4*(2*(15*sin(d*x + c)^5
```

```
- 40*sin(d*x + c)^3 + 33*sin(d*x + c))/(sin(d*x + c)^6 - 3*sin(d*x + c)^4 +
 3*sin(d*x + c)^2 - 1) - 15*log(sin(d*x + c) + 1) + 15*log(sin(d*x + c) - 1
)) - 180*a^2*b^2*(2*(3*sin(d*x + c)^3 - 5*sin(d*x + c))/(sin(d*x + c)^4 - 2
*sin(d*x + c)^2 + 1) - 3*log(sin(d*x + c) + 1) + 3*log(sin(d*x + c) - 1)) -
 120*b^4*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(d*x + c) + 1) + log
(sin(d*x + c) - 1)))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 592 vs. $2(208) = 416$.

Time = 0.36 (sec) , antiderivative size = 592, normalized size of antiderivative = 2.67

$$\int (a + b\cos(c + dx))^4 \sec^7(c + dx)\, dx$$

$$= \frac{15\,(5\,a^4 + 36\,a^2b^2 + 8\,b^4)\log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) + 1\right|\right) - 15\,(5\,a^4 + 36\,a^2b^2 + 8\,b^4)\log\left(\left|\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) - 1\right|\right)}{}$$

```
[In] integrate((a+b*cos(d*x+c))^4*sec(d*x+c)^7,x, algorithm="giac")
```

```
[Out] 1/240*(15*(5*a^4 + 36*a^2*b^2 + 8*b^4)*log(abs(tan(1/2*d*x + 1/2*c) + 1)) -
 15*(5*a^4 + 36*a^2*b^2 + 8*b^4)*log(abs(tan(1/2*d*x + 1/2*c) - 1)) + 2*(16
5*a^4*tan(1/2*d*x + 1/2*c)^11 - 960*a^3*b*tan(1/2*d*x + 1/2*c)^11 + 900*a^2
*b^2*tan(1/2*d*x + 1/2*c)^11 - 960*a*b^3*tan(1/2*d*x + 1/2*c)^11 + 120*b^4*
tan(1/2*d*x + 1/2*c)^11 + 25*a^4*tan(1/2*d*x + 1/2*c)^9 + 2240*a^3*b*tan(1/
2*d*x + 1/2*c)^9 - 1260*a^2*b^2*tan(1/2*d*x + 1/2*c)^9 + 3520*a*b^3*tan(1/2
*d*x + 1/2*c)^9 - 360*b^4*tan(1/2*d*x + 1/2*c)^9 + 450*a^4*tan(1/2*d*x + 1/
2*c)^7 - 4992*a^3*b*tan(1/2*d*x + 1/2*c)^7 + 360*a^2*b^2*tan(1/2*d*x + 1/2*
c)^7 - 5760*a*b^3*tan(1/2*d*x + 1/2*c)^7 + 240*b^4*tan(1/2*d*x + 1/2*c)^7 +
 450*a^4*tan(1/2*d*x + 1/2*c)^5 + 4992*a^3*b*tan(1/2*d*x + 1/2*c)^5 + 360*a
^2*b^2*tan(1/2*d*x + 1/2*c)^5 + 5760*a*b^3*tan(1/2*d*x + 1/2*c)^5 + 240*b^4
*tan(1/2*d*x + 1/2*c)^5 + 25*a^4*tan(1/2*d*x + 1/2*c)^3 - 2240*a^3*b*tan(1/
2*d*x + 1/2*c)^3 - 1260*a^2*b^2*tan(1/2*d*x + 1/2*c)^3 - 3520*a*b^3*tan(1/2
*d*x + 1/2*c)^3 - 360*b^4*tan(1/2*d*x + 1/2*c)^3 + 165*a^4*tan(1/2*d*x + 1/
2*c) + 960*a^3*b*tan(1/2*d*x + 1/2*c) + 900*a^2*b^2*tan(1/2*d*x + 1/2*c) +
960*a*b^3*tan(1/2*d*x + 1/2*c) + 120*b^4*tan(1/2*d*x + 1/2*c))/(tan(1/2*d*x
 + 1/2*c)^2 - 1)^6)/d
```

Mupad [B] (verification not implemented)

Time = 18.89 (sec) , antiderivative size = 370, normalized size of antiderivative = 1.67

$$\int (a+b\cos(c+dx))^4\sec^7(c+dx)\,dx = \frac{\operatorname{atanh}\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)\,\left(\frac{5\,a^4}{8}+\frac{9\,a^2\,b^2}{2}+b^4\right)}{d} + \frac{\left(\frac{11\,a^4}{8}-8\,a^3\,b+\frac{15\,a^2\,b^2}{2}-8\,a\,b^3+b^4\right)\,\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{11}+\left(\frac{5\,a^4}{24}+\frac{56\,a^3\,b}{3}-\frac{21\,a^2\,b^2}{2}+\frac{88\,a\,b^3}{3}-3\,b^4\right)\,\tan\left(\frac{c}{2}+\frac{d}{2}\right.}{}$$

```
[In] int((a + b*cos(c + d*x))^4/cos(c + d*x)^7,x)
```

```
[Out] (atanh(tan(c/2 + (d*x)/2))*((5*a^4)/8 + b^4 + (9*a^2*b^2)/2))/d + (tan(c/2
+ (d*x)/2)^9*((88*a*b^3)/3 + (56*a^3*b)/3 + (5*a^4)/24 - 3*b^4 - (21*a^2*b^
2)/2) - tan(c/2 + (d*x)/2)^3*((88*a*b^3)/3 + (56*a^3*b)/3 - (5*a^4)/24 + 3*
b^4 + (21*a^2*b^2)/2) + tan(c/2 + (d*x)/2)^5*(48*a*b^3 + (208*a^3*b)/5 + (1
5*a^4)/4 + 2*b^4 + 3*a^2*b^2) + tan(c/2 + (d*x)/2)^7*((15*a^4)/4 - (208*a^3
*b)/5 - 48*a*b^3 + 2*b^4 + 3*a^2*b^2) + tan(c/2 + (d*x)/2)*(8*a*b^3 + 8*a^3
*b + (11*a^4)/8 + b^4 + (15*a^2*b^2)/2) + tan(c/2 + (d*x)/2)^11*((11*a^4)/8
 - 8*a^3*b - 8*a*b^3 + b^4 + (15*a^2*b^2)/2))/(d*(15*tan(c/2 + (d*x)/2)^4 -
 6*tan(c/2 + (d*x)/2)^2 - 20*tan(c/2 + (d*x)/2)^6 + 15*tan(c/2 + (d*x)/2)^8
 - 6*tan(c/2 + (d*x)/2)^10 + tan(c/2 + (d*x)/2)^12 + 1))
```

3.449 $\int \frac{\cos^5(c+dx)}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 193

$$\int \frac{\cos^5(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{(8a^4+4a^2b^2+3b^4)\,x}{8b^5} - \frac{2a^5\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{\sqrt{a-b}b^5\sqrt{a+b}d} - \frac{a(3a^2+2b^2)\sin(c+dx)}{3b^4d} + \frac{(4a^2+3b^2)\cos(c+dx)\sin(c+dx)}{8b^3d} - \frac{a\cos^2(c+dx)\sin(c+dx)}{3b^2d} + \frac{\cos^3(c+dx)\sin(c+dx)}{4bd}$$

```
[Out] 1/8*(8*a^4+4*a^2*b^2+3*b^4)*x/b^5-1/3*a*(3*a^2+2*b^2)*sin(d*x+c)/b^4/d+1/8*
(4*a^2+3*b^2)*cos(d*x+c)*sin(d*x+c)/b^3/d-1/3*a*cos(d*x+c)^2*sin(d*x+c)/b^2
/d+1/4*cos(d*x+c)^3*sin(d*x+c)/b/d-2*a^5*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2
*c)/(a+b)^(1/2))/b^5/d/(a-b)^(1/2)/(a+b)^(1/2)
```

Rubi [A] (verified)

Time = 0.65 (sec) , antiderivative size = 193, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2872, 3128, 3102, 2814, 2738, 211}

$$\int \frac{\cos^5(c+dx)}{a+b\cos(c+dx)}\,dx = -\frac{2a^5\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{b^5d\sqrt{a-b}\sqrt{a+b}} - \frac{a(3a^2+2b^2)\sin(c+dx)}{3b^4d} + \frac{(4a^2+3b^2)\sin(c+dx)\cos(c+dx)}{8b^3d} + \frac{x(8a^4+4a^2b^2+3b^4)}{8b^5} - \frac{a\sin(c+dx)\cos^2(c+dx)}{3b^2d} + \frac{\sin(c+dx)\cos^3(c+dx)}{4bd}$$

```
[In] Int[Cos[c + d*x]^5/(a + b*Cos[c + d*x]),x]
```

```
[Out] ((8*a^4 + 4*a^2*b^2 + 3*b^4)*x)/(8*b^5) - (2*a^5*ArcTan[(Sqrt[a - b]*Tan[(c
 + d*x)/2])/Sqrt[a + b]])/(Sqrt[a - b]*b^5*Sqrt[a + b]*d) - (a*(3*a^2 + 2*b
^2)*Sin[c + d*x])/(3*b^4*d) + ((4*a^2 + 3*b^2)*Cos[c + d*x]*Sin[c + d*x])/(
8*b^3*d) - (a*Cos[c + d*x]^2*Sin[c + d*x])/(3*b^2*d) + (Cos[c + d*x]^3*Sin[
c + d*x])/(4*b*d)
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rule 3128

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*sin[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_
.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n + 2))), x] + Dist[1/(d*(m +
n + 2)), Int[(a + b*Sin[e + f*x])^(m - 1)*(c + d*Sin[e + f*x])^n*Simp[a*A*d
*(m + n + 2) + C*(b*c*m + a*d*(n + 1)) + (d*(A*b + a*B)*(m + n + 2) - C*(a*
c - b*d*(m + n + 1)))*Sin[e + f*x] + (C*(a*d*m - b*c*(m + 1)) + b*B*d*(m +
n + 2))*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n},
 x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m
, 0] &&  !(IGtQ[n, 0] && ( !IntegerQ[m] || (EqQ[a, 0] && NeQ[c, 0])))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\cos^3(c+dx)\sin(c+dx)}{4bd} + \frac{\int \frac{\cos^2(c+dx)(3a+3b\cos(c+dx)-4a\cos^2(c+dx))}{a+b\cos(c+dx)}\,dx}{4b} \\
&= -\frac{a\cos^2(c+dx)\sin(c+dx)}{3b^2d} + \frac{\cos^3(c+dx)\sin(c+dx)}{4bd} \\
&\quad + \frac{\int \frac{\cos(c+dx)(-8a^2+ab\cos(c+dx)+3(4a^2+3b^2)\cos^2(c+dx))}{a+b\cos(c+dx)}\,dx}{12b^2} \\
&= \frac{(4a^2+3b^2)\cos(c+dx)\sin(c+dx)}{8b^3d} - \frac{a\cos^2(c+dx)\sin(c+dx)}{3b^2d} \\
&\quad + \frac{\cos^3(c+dx)\sin(c+dx)}{4bd} + \frac{\int \frac{3a(4a^2+3b^2)-b(4a^2-9b^2)\cos(c+dx)-8a(3a^2+2b^2)\cos^2(c+dx)}{a+b\cos(c+dx)}\,dx}{24b^3} \\
&= -\frac{a(3a^2+2b^2)\sin(c+dx)}{3b^4d} + \frac{(4a^2+3b^2)\cos(c+dx)\sin(c+dx)}{8b^3d} \\
&\quad - \frac{a\cos^2(c+dx)\sin(c+dx)}{3b^2d} + \frac{\cos^3(c+dx)\sin(c+dx)}{4bd} \\
&\quad + \frac{\int \frac{3ab(4a^2+3b^2)+3(8a^4+4a^2b^2+3b^4)\cos(c+dx)}{a+b\cos(c+dx)}\,dx}{24b^4} \\
&= \frac{(8a^4+4a^2b^2+3b^4)\,x}{8b^5} - \frac{a(3a^2+2b^2)\sin(c+dx)}{3b^4d} + \frac{(4a^2+3b^2)\cos(c+dx)\sin(c+dx)}{8b^3d} \\
&\quad - \frac{a\cos^2(c+dx)\sin(c+dx)}{3b^2d} + \frac{\cos^3(c+dx)\sin(c+dx)}{4bd} - \frac{a^5\int \frac{1}{a+b\cos(c+dx)}\,dx}{b^5} \\
&= \frac{(8a^4+4a^2b^2+3b^4)\,x}{8b^5} - \frac{a(3a^2+2b^2)\sin(c+dx)}{3b^4d} \\
&\quad + \frac{(4a^2+3b^2)\cos(c+dx)\sin(c+dx)}{8b^3d} - \frac{a\cos^2(c+dx)\sin(c+dx)}{3b^2d} \\
&\quad + \frac{\cos^3(c+dx)\sin(c+dx)}{4bd} - \frac{(2a^5)\,\text{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{b^5d}
\end{aligned}$$

$$= \frac{(8a^4+4a^2b^2+3b^4)\,x}{8b^5} - \frac{2a^5\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{\sqrt{a-b}b^5\sqrt{a+b}d} - \frac{a(3a^2+2b^2)\sin(c+dx)}{3b^4d} + \frac{(4a^2+3b^2)\cos(c+dx)\sin(c+dx)}{8b^3d} - \frac{a\cos^2(c+dx)\sin(c+dx)}{3b^2d} + \frac{\cos^3(c+dx)\sin(c+dx)}{4bd}$$

Mathematica [A] (verified)

Time = 0.63 (sec) , antiderivative size = 153, normalized size of antiderivative = 0.79

$$\int \frac{\cos^5(c+dx)}{a+b\cos(c+dx)}\,dx$$

$$= \frac{12(8a^4+4a^2b^2+3b^4)(c+dx) + \frac{192a^5\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}} - 24ab(4a^2+3b^2)\sin(c+dx) + 24b^2(a^2+}{96b^5d}$$

```
[In] Integrate[Cos[c + d*x]^5/(a + b*Cos[c + d*x]),x]
```

```
[Out] (12*(8*a^4 + 4*a^2*b^2 + 3*b^4)*(c + d*x) + (192*a^5*ArcTanh[((a - b)*Tan[(
c + d*x)/2])/Sqrt[-a^2 + b^2]])/Sqrt[-a^2 + b^2] - 24*a*b*(4*a^2 + 3*b^2)*S
in[c + d*x] + 24*b^2*(a^2 + b^2)*Sin[2*(c + d*x)] - 8*a*b^3*Sin[3*(c + d*x)
] + 3*b^4*Sin[4*(c + d*x)])/(96*b^5*d)
```

Maple [A] (verified)

Time = 1.32 (sec) , antiderivative size = 256, normalized size of antiderivative = 1.33

method	result
derivativedivides	$\frac{-\frac{2a^5\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{b^5\sqrt{(a-b)(a+b)}} + \frac{2\left(\left(-a^3b-\frac{1}{2}a^2b^2-a\,b^3-\frac{5}{8}b^4\right)\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(-3a^3b-\frac{5}{3}a\,b^3+\frac{3}{8}b^4-\frac{1}{2}a^2b^2\right)\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right.}{\left(1+\tan^2\left(\frac{dx}{2}\right.}}{d}$
default	$\frac{-\frac{2a^5\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{b^5\sqrt{(a-b)(a+b)}} + \frac{2\left(\left(-a^3b-\frac{1}{2}a^2b^2-a\,b^3-\frac{5}{8}b^4\right)\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(-3a^3b-\frac{5}{3}a\,b^3+\frac{3}{8}b^4-\frac{1}{2}a^2b^2\right)\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right.}{\left(1+\tan^2\left(\frac{dx}{2}\right.}}{d}$
risch	$\frac{x\,a^4}{b^5}+\frac{x\,a^2}{2b^3}+\frac{3x}{8b}+\frac{ia^3\mathrm{e}^{i(dx+c)}}{2b^4d}+\frac{3ia\,\mathrm{e}^{i(dx+c)}}{8b^2d}-\frac{ia^3\mathrm{e}^{-i(dx+c)}}{2b^4d}-\frac{3ia\,\mathrm{e}^{-i(dx+c)}}{8b^2d}-\frac{a^5\ln\left(\mathrm{e}^{i(dx+c)}+\frac{-ia^2+ib^2+}{\sqrt{-a^2}}\right.}{\sqrt{-a^2+b^2}\,d\,b^5}$

```
[In] int(cos(d*x+c)^5/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-2*a^5/b^5/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*
(a+b))^(1/2))+2/b^5*(((-a^3*b-1/2*a^2*b^2-a*b^3-5/8*b^4)*tan(1/2*d*x+1/2*c)
^7+(-3*a^3*b-5/3*a*b^3+3/8*b^4-1/2*a^2*b^2)*tan(1/2*d*x+1/2*c)^5+(1/2*a^2*b
```

```
^2-3/8*b^4-3*a^3*b-5/3*a*b^3)*tan(1/2*d*x+1/2*c)^3+(1/2*a^2*b^2+5/8*b^4-a^3
*b-a*b^3)*tan(1/2*d*x+1/2*c))/(1+tan(1/2*d*x+1/2*c)^2)^4+1/8*(8*a^4+4*a^2*b
^2+3*b^4)*arctan(tan(1/2*d*x+1/2*c))))
```

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 479, normalized size of antiderivative = 2.48

$$\int \frac{\cos^5(c+dx)}{a+b\cos(c+dx)}\,dx = \left[-\frac{12\sqrt{-a^2+b^2}a^5\log\left(\frac{2\,ab\cos(dx+c)+(2\,a^2-b^2)\cos(dx+c)^2-2\sqrt{-a^2+b^2}(a\cos(dx+c)+b)\sin(dx+c)-a^2+2\,b^2}{b^2\cos(dx+c)^2+2\,ab\cos(dx+c)+a^2}\right)-3\,(8\,a^6-4\right. \\ -\frac{24\sqrt{a^2-b^2}a^5\arctan\left(-\frac{a\cos(dx+c)+b}{\sqrt{a^2-b^2}\sin(dx+c)}\right)-3\,(8\,a^6-4\,a^4b^2-a^2b^4-3\,b^6)dx+\left(24\,a^5b-8\,a^3b^3-16\,ab^5\right.}{24\,(}$$

```
[In] integrate(cos(d*x+c)^5/(a+b*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] [-1/24*(12*sqrt(-a^2 + b^2)*a^5*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos
(d*x + c)^2 - 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 +
2*b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) - 3*(8*a^6 - 4*a^4*
b^2 - a^2*b^4 - 3*b^6)*d*x + (24*a^5*b - 8*a^3*b^3 - 16*a*b^5 - 6*(a^2*b^4
- b^6)*cos(d*x + c)^3 + 8*(a^3*b^3 - a*b^5)*cos(d*x + c)^2 - 3*(4*a^4*b^2 -
 a^2*b^4 - 3*b^6)*cos(d*x + c))*sin(d*x + c))/((a^2*b^5 - b^7)*d), -1/24*(2
4*sqrt(a^2 - b^2)*a^5*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x
 + c))) - 3*(8*a^6 - 4*a^4*b^2 - a^2*b^4 - 3*b^6)*d*x + (24*a^5*b - 8*a^3*b
^3 - 16*a*b^5 - 6*(a^2*b^4 - b^6)*cos(d*x + c)^3 + 8*(a^3*b^3 - a*b^5)*cos(
d*x + c)^2 - 3*(4*a^4*b^2 - a^2*b^4 - 3*b^6)*cos(d*x + c))*sin(d*x + c))/((
a^2*b^5 - b^7)*d)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^5(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**5/(a+b*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos^5(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)^5/(a+b*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 393 vs. $2(174) = 348$.

Time = 0.29 (sec) , antiderivative size = 393, normalized size of antiderivative = 2.04

$$\int \frac{\cos^5(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{\frac{48\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor\operatorname{sgn}(-2a+2b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{a^2-b^2}}\right)\right)a^5}{\sqrt{a^2-b^2}\,b^5}+\frac{3\,(8a^4+4a^2b^2+3b^4)(dx+c)}{b^5}-\frac{2\left(24a^3\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^7-\cdots\right.}{\cdots}}{\cdots}$$

```
[In] integrate(cos(d*x+c)^5/(a+b*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/24*(48*(pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan
(1/2*d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))*a^5/(sqrt(a^2
 - b^2)*b^5) + 3*(8*a^4 + 4*a^2*b^2 + 3*b^4)*(d*x + c)/b^5 - 2*(24*a^3*tan(
1/2*d*x + 1/2*c)^7 + 12*a^2*b*tan(1/2*d*x + 1/2*c)^7 + 24*a*b^2*tan(1/2*d*x
 + 1/2*c)^7 + 15*b^3*tan(1/2*d*x + 1/2*c)^7 + 72*a^3*tan(1/2*d*x + 1/2*c)^5
 + 12*a^2*b*tan(1/2*d*x + 1/2*c)^5 + 40*a*b^2*tan(1/2*d*x + 1/2*c)^5 - 9*b^
3*tan(1/2*d*x + 1/2*c)^5 + 72*a^3*tan(1/2*d*x + 1/2*c)^3 - 12*a^2*b*tan(1/2
*d*x + 1/2*c)^3 + 40*a*b^2*tan(1/2*d*x + 1/2*c)^3 + 9*b^3*tan(1/2*d*x + 1/2
*c)^3 + 24*a^3*tan(1/2*d*x + 1/2*c) - 12*a^2*b*tan(1/2*d*x + 1/2*c) + 24*a*
b^2*tan(1/2*d*x + 1/2*c) - 15*b^3*tan(1/2*d*x + 1/2*c))/((tan(1/2*d*x + 1/2
*c)^2 + 1)^4*b^4))/d
```

Mupad [B] (verification not implemented)

Time = 15.66 (sec) , antiderivative size = 474, normalized size of antiderivative = 2.46

$$\int \frac{\cos^5(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{\sin(2c+2dx)}{4bd}+\frac{\sin(4c+4dx)}{32bd}+\frac{3\,\mathrm{atan}\left(\frac{40\sin\left(\frac{c}{2}+\frac{dx}{2}\right)a^4b^6+15\sin\left(\frac{c}{2}+\frac{dx}{2}\right)a^2b^8+9\sin\left(\frac{c}{2}+\frac{dx}{2}\right)b^{10}}{b\cos\left(\frac{c}{2}+\frac{dx}{2}\right)(40a^4b^5+15a^2b^7+9b^9)}\right)}{4bd}-\frac{a\sin(3c+3dx)}{12b^2d}-\frac{a^3\sin(c+dx)}{b^4d}+\frac{a^2\sin(2c+2dx)}{4b^3d}+\frac{a^2\,\mathrm{atan}\left(\frac{40\sin\left(\frac{c}{2}+\frac{dx}{2}\right)a^4b^6+15\sin\left(\frac{c}{2}+\frac{dx}{2}\right)a^2b^8+9\sin\left(\frac{c}{2}+\frac{dx}{2}\right)b^{10}}{b\cos\left(\frac{c}{2}+\frac{dx}{2}\right)(40a^4b^5+15a^2b^7+9b^9)}\right)}{b^3d}+\frac{2a^4\,\mathrm{atan}\left(\frac{40\sin\left(\frac{c}{2}+\frac{dx}{2}\right)a^4b^6+15\sin\left(\frac{c}{2}+\frac{dx}{2}\right)a^2b^8+9\sin\left(\frac{c}{2}+\frac{dx}{2}\right)b^{10}}{b\cos\left(\frac{c}{2}+\frac{dx}{2}\right)(40a^4b^5+15a^2b^7+9b^9)}\right)}{b^5d}-\frac{3a\sin(c+dx)}{4b^2d}-\frac{a^5\,\mathrm{atan}\left(\frac{\left(a\sin\left(\frac{c}{2}+\frac{dx}{2}\right)-b\sin\left(\frac{c}{2}+\frac{dx}{2}\right)\right)1i}{\cos\left(\frac{c}{2}+\frac{dx}{2}\right)\sqrt{b^2-a^2}}\right)2i}{b^5d\sqrt{b^2-a^2}}$$

```
[In] int(cos(c + d*x)^5/(a + b*cos(c + d*x)),x)
```

```
[Out] sin(2*c + 2*d*x)/(4*b*d) + sin(4*c + 4*d*x)/(32*b*d) + (3*atan((9*b^10*sin(
c/2 + (d*x)/2) + 15*a^2*b^8*sin(c/2 + (d*x)/2) + 40*a^4*b^6*sin(c/2 + (d*x)
/2))/(b*cos(c/2 + (d*x)/2)*(9*b^9 + 15*a^2*b^7 + 40*a^4*b^5))))/(4*b*d) - (
a*sin(3*c + 3*d*x))/(12*b^2*d) - (a^3*sin(c + d*x))/(b^4*d) + (a^2*sin(2*c
+ 2*d*x))/(4*b^3*d) + (a^2*atan((9*b^10*sin(c/2 + (d*x)/2) + 15*a^2*b^8*sin
(c/2 + (d*x)/2) + 40*a^4*b^6*sin(c/2 + (d*x)/2))/(b*cos(c/2 + (d*x)/2)*(9*b
^9 + 15*a^2*b^7 + 40*a^4*b^5))))/(b^3*d) + (2*a^4*atan((9*b^10*sin(c/2 + (d
*x)/2) + 15*a^2*b^8*sin(c/2 + (d*x)/2) + 40*a^4*b^6*sin(c/2 + (d*x)/2))/(b*
cos(c/2 + (d*x)/2)*(9*b^9 + 15*a^2*b^7 + 40*a^4*b^5))))/(b^5*d) - (3*a*sin(
c + d*x))/(4*b^2*d) - (a^5*atan(((a*sin(c/2 + (d*x)/2) - b*sin(c/2 + (d*x)/
2))*1i)/(cos(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2)))*2i)/(b^5*d*(b^2 - a^2)^(1/2
))
```

3.450 $\int \frac{\cos^4(c+dx)}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 148

$$\int \frac{\cos^4(c+dx)}{a+b\cos(c+dx)}\,dx = -\frac{a(2a^2+b^2)\,x}{2b^4} + \frac{2a^4\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{\sqrt{a-b}b^4\sqrt{a+b}d} + \frac{(3a^2+2b^2)\sin(c+dx)}{3b^3d} - \frac{a\cos(c+dx)\sin(c+dx)}{2b^2d} + \frac{\cos^2(c+dx)\sin(c+dx)}{3bd}$$

```
[Out] -1/2*a*(2*a^2+b^2)*x/b^4+1/3*(3*a^2+2*b^2)*sin(d*x+c)/b^3/d-1/2*a*cos(d*x+c
)*sin(d*x+c)/b^2/d+1/3*cos(d*x+c)^2*sin(d*x+c)/b/d+2*a^4*arctan((a-b)^(1/2)
*tan(1/2*d*x+1/2*c)/(a+b)^(1/2))/b^4/d/(a-b)^(1/2)/(a+b)^(1/2)
```

Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2872, 3128, 3102, 2814, 2738, 211}

$$\int \frac{\cos^4(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{2a^4\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{b^4d\sqrt{a-b}\sqrt{a+b}} - \frac{ax(2a^2+b^2)}{2b^4} + \frac{(3a^2+2b^2)\sin(c+dx)}{3b^3d} - \frac{a\sin(c+dx)\cos(c+dx)}{2b^2d} + \frac{\sin(c+dx)\cos^2(c+dx)}{3bd}$$

```
[In] Int[Cos[c + d*x]^4/(a + b*Cos[c + d*x]),x]
```

```
[Out] -1/2*(a*(2*a^2 + b^2)*x)/b^4 + (2*a^4*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])
/Sqrt[a + b]])/(Sqrt[a - b]*b^4*Sqrt[a + b]*d) + ((3*a^2 + 2*b^2)*Sin[c + d
*x])/(3*b^3*d) - (a*Cos[c + d*x]*Sin[c + d*x])/(2*b^2*d) + (Cos[c + d*x]^2*
Sin[c + d*x])/(3*b*d)
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rule 3128

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*sin[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_
.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n + 2))), x] + Dist[1/(d*(m +
n + 2)), Int[(a + b*Sin[e + f*x])^(m - 1)*(c + d*Sin[e + f*x])^n*Simp[a*A*d
*(m + n + 2) + C*(b*c*m + a*d*(n + 1)) + (d*(A*b + a*B)*(m + n + 2) - C*(a*
c - b*d*(m + n + 1)))*Sin[e + f*x] + (C*(a*d*m - b*c*(m + 1)) + b*B*d*(m +
n + 2))*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n},
 x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m
, 0] &&  !(IGtQ[n, 0] && ( !IntegerQ[m] || (EqQ[a, 0] && NeQ[c, 0])))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\cos^2(c+dx)\sin(c+dx)}{3bd} + \frac{\int \frac{\cos(c+dx)(2a+2b\cos(c+dx)-3a\cos^2(c+dx))}{a+b\cos(c+dx)}\,dx}{3b} \\
&= -\frac{a\cos(c+dx)\sin(c+dx)}{2b^2d} + \frac{\cos^2(c+dx)\sin(c+dx)}{3bd} \\
&\quad + \frac{\int \frac{-3a^2+ab\cos(c+dx)+2(3a^2+2b^2)\cos^2(c+dx)}{a+b\cos(c+dx)}\,dx}{6b^2} \\
&= \frac{(3a^2+2b^2)\sin(c+dx)}{3b^3d} - \frac{a\cos(c+dx)\sin(c+dx)}{2b^2d} \\
&\quad + \frac{\cos^2(c+dx)\sin(c+dx)}{3bd} + \frac{\int \frac{-3a^2b-3a(2a^2+b^2)\cos(c+dx)}{a+b\cos(c+dx)}\,dx}{6b^3} \\
&= -\frac{a(2a^2+b^2)\,x}{2b^4} + \frac{(3a^2+2b^2)\sin(c+dx)}{3b^3d} - \frac{a\cos(c+dx)\sin(c+dx)}{2b^2d} \\
&\quad + \frac{\cos^2(c+dx)\sin(c+dx)}{3bd} + \frac{a^4\int \frac{1}{a+b\cos(c+dx)}\,dx}{b^4} \\
&= -\frac{a(2a^2+b^2)\,x}{2b^4} + \frac{(3a^2+2b^2)\sin(c+dx)}{3b^3d} - \frac{a\cos(c+dx)\sin(c+dx)}{2b^2d} \\
&\quad + \frac{\cos^2(c+dx)\sin(c+dx)}{3bd} + \frac{(2a^4)\,\text{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{b^4d} \\
&= -\frac{a(2a^2+b^2)\,x}{2b^4} + \frac{2a^4\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{\sqrt{a-b}\,b^4\sqrt{a+b}\,d} + \frac{(3a^2+2b^2)\sin(c+dx)}{3b^3d} \\
&\quad - \frac{a\cos(c+dx)\sin(c+dx)}{2b^2d} + \frac{\cos^2(c+dx)\sin(c+dx)}{3bd}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.40 (sec) , antiderivative size = 122, normalized size of antiderivative = 0.82

$$\int \frac{\cos^4(c+dx)}{a+b\cos(c+dx)}\,dx$$

$$= \frac{-6a(2a^2+b^2)(c+dx) - \frac{24a^4\operatorname{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}} + 3b(4a^2+3b^2)\sin(c+dx) - 3ab^2\sin(2(c+dx))}{12b^4d}$$

[In] Integrate[Cos[c + d*x]^4/(a + b*Cos[c + d*x]),x]

[Out] (-6*a*(2*a^2 + b^2)*(c + d*x) - (24*a^4*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/Sqrt[-a^2 + b^2] + 3*b*(4*a^2 + 3*b^2)*Sin[c + d*x] - 3*a*b^2*Sin[2*(c + d*x)] + b^3*Sin[3*(c + d*x)])/(12*b^4*d)

Maple [A] (verified)

Time = 1.18 (sec) , antiderivative size = 179, normalized size of antiderivative = 1.21

method	result
derivativedivides	$\frac{\frac{2a^4\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{b^4\sqrt{(a-b)(a+b)}} - \frac{2\left(\frac{\left(-a^2b-\frac{1}{2}ab^2-b^3\right)\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(-2a^2b-\frac{2}{3}b^3\right)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(-a^2b-b^3+\frac{1}{2}ab^2\right)\tan}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3}\right.}{b^4}}{d}$
default	$\frac{\frac{2a^4\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{b^4\sqrt{(a-b)(a+b)}} - \frac{2\left(\frac{\left(-a^2b-\frac{1}{2}ab^2-b^3\right)\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(-2a^2b-\frac{2}{3}b^3\right)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(-a^2b-b^3+\frac{1}{2}ab^2\right)\tan}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3}\right.}{b^4}}{d}$
risch	$-\frac{a^3x}{b^4} - \frac{ax}{2b^2} - \frac{ie^{i(dx+c)}a^2}{2b^3d} - \frac{3ie^{i(dx+c)}}{8bd} + \frac{ie^{-i(dx+c)}a^2}{2b^3d} + \frac{3ie^{-i(dx+c)}}{8bd} - \frac{a^4\ln\left(e^{i(dx+c)}+\frac{ia^2-ib^2+a\sqrt{-a^2+}}{b\sqrt{-a^2+b^2}}\right.}{\sqrt{-a^2+b^2}\,d\,b^4}$

[In] int(cos(d*x+c)^4/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)

[Out] 1/d*(2*a^4/b^4/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2))-2/b^4*(((-a^2*b-1/2*a*b^2-b^3)*tan(1/2*d*x+1/2*c)^5+(-2*a^2*b-2/3*b^3)*tan(1/2*d*x+1/2*c)^3+(-a^2*b-b^3+1/2*a*b^2)*tan(1/2*d*x+1/2*c))/(1+tan(1/2*d*x+1/2*c)^2)^3+1/2*a*(2*a^2+b^2)*arctan(tan(1/2*d*x+1/2*c))))

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 400, normalized size of antiderivative = 2.70

$$\int \frac{\cos^4(c+dx)}{a+b\cos(c+dx)}\,dx = \left[-\frac{3\sqrt{-a^2+b^2}a^4\log\left(\frac{2\,ab\cos(dx+c)+(2\,a^2-b^2)\cos(dx+c)^2+2\sqrt{-a^2+b^2}(a\cos(dx+c)+b)\sin(dx+c)-a^2+2\,b^2}{b^2\cos(dx+c)^2+2\,ab\cos(dx+c)+a^2}\right)+3\,(2\,a^5-a^3b^2}{6\,(a^2b^4}\right.$$

```
[In] integrate(cos(d*x+c)^4/(a+b*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] [-1/6*(3*sqrt(-a^2 + b^2)*a^4*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d
*x + c)^2 + 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*
b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) + 3*(2*a^5 - a^3*b^2
- a*b^4)*d*x - (6*a^4*b - 2*a^2*b^3 - 4*b^5 + 2*(a^2*b^3 - b^5)*cos(d*x + c
)^2 - 3*(a^3*b^2 - a*b^4)*cos(d*x + c))*sin(d*x + c))/((a^2*b^4 - b^6)*d),
1/6*(6*sqrt(a^2 - b^2)*a^4*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*si
n(d*x + c))) - 3*(2*a^5 - a^3*b^2 - a*b^4)*d*x + (6*a^4*b - 2*a^2*b^3 - 4*b
^5 + 2*(a^2*b^3 - b^5)*cos(d*x + c)^2 - 3*(a^3*b^2 - a*b^4)*cos(d*x + c))*s
in(d*x + c))/((a^2*b^4 - b^6)*d)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**4/(a+b*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos^4(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)^4/(a+b*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 249, normalized size of antiderivative = 1.68

$$\int \frac{\cos^4(c+dx)}{a+b\cos(c+dx)}\,dx = -\frac{\frac{12\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor\operatorname{sgn}(-2a+2b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{a^2-b^2}}\right)\right)a^4}{\sqrt{a^2-b^2}\,b^4}+\frac{3\,(2a^3+ab^2)(dx+c)}{b^4}-\frac{2\left(6a^2\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5+3a\cdots\right.}{\cdots}}{\cdots}$$

```
[In] integrate(cos(d*x+c)^4/(a+b*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/6*(12*(pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan
(1/2*d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))*a^4/(sqrt(a^2
 - b^2)*b^4) + 3*(2*a^3 + a*b^2)*(d*x + c)/b^4 - 2*(6*a^2*tan(1/2*d*x + 1/2
*c)^5 + 3*a*b*tan(1/2*d*x + 1/2*c)^5 + 6*b^2*tan(1/2*d*x + 1/2*c)^5 + 12*a^
2*tan(1/2*d*x + 1/2*c)^3 + 4*b^2*tan(1/2*d*x + 1/2*c)^3 + 6*a^2*tan(1/2*d*x
 + 1/2*c) - 3*a*b*tan(1/2*d*x + 1/2*c) + 6*b^2*tan(1/2*d*x + 1/2*c))/((tan(
1/2*d*x + 1/2*c)^2 + 1)^3*b^3))/d
```

Mupad [B] (verification not implemented)

Time = 15.34 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.37

$$\int \frac{\cos^4(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{3\,\sin(c+d\,x)}{4\,b\,d}+\frac{\sin(3\,c+3\,d\,x)}{12\,b\,d}-\frac{a\,\sin(2\,c+2\,d\,x)}{4\,b^2\,d}+\frac{a^2\,\sin(c+d\,x)}{b^3\,d}-\frac{2\,a^3\,\mathrm{atan}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{b^4\,d}-\frac{a\,\mathrm{atan}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{b^2\,d}+\frac{a^4\,\mathrm{atan}\left(\frac{\left(a\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)-b\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)\,1\mathrm{i}}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\sqrt{b^2-a^2}}\right)\,2\mathrm{i}}{b^4\,d\,\sqrt{b^2-a^2}}$$

```
[In] int(cos(c + d*x)^4/(a + b*cos(c + d*x)),x)
```

```
[Out] (3*sin(c + d*x))/(4*b*d) + sin(3*c + 3*d*x)/(12*b*d) - (a*sin(2*c + 2*d*x))
/(4*b^2*d) + (a^2*sin(c + d*x))/(b^3*d) - (2*a^3*atan(sin(c/2 + (d*x)/2)/co
s(c/2 + (d*x)/2)))/(b^4*d) - (a*atan(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2))
)/(b^2*d) + (a^4*atan(((a*sin(c/2 + (d*x)/2) - b*sin(c/2 + (d*x)/2))*1i)/(c
os(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2)))*2i)/(b^4*d*(b^2 - a^2)^(1/2))
```

3.451 $\int \frac{\cos^3(c+dx)}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 110

$$\int \frac{\cos^3(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{(2a^2+b^2)\,x}{2b^3} - \frac{2a^3\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{\sqrt{a-b}b^3\sqrt{a+b}d} - \frac{a\sin(c+dx)}{b^2d} + \frac{\cos(c+dx)\sin(c+dx)}{2bd}$$

```
[Out] 1/2*(2*a^2+b^2)*x/b^3-a*sin(d*x+c)/b^2/d+1/2*cos(d*x+c)*sin(d*x+c)/b/d-2*a^
3*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/2))/b^3/d/(a-b)^(1/2)/(a+b
)^(1/2)
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2872, 3102, 2814, 2738, 211}

$$\int \frac{\cos^3(c+dx)}{a+b\cos(c+dx)}\,dx = -\frac{2a^3\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{b^3d\sqrt{a-b}\sqrt{a+b}} + \frac{x(2a^2+b^2)}{2b^3} - \frac{a\sin(c+dx)}{b^2d} + \frac{\sin(c+dx)\cos(c+dx)}{2bd}$$

```
[In] Int[Cos[c + d*x]^3/(a + b*Cos[c + d*x]),x]
```

```
[Out] ((2*a^2 + b^2)*x)/(2*b^3) - (2*a^3*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sq
rt[a + b]])/(Sqrt[a - b]*b^3*Sqrt[a + b]*d) - (a*Sin[c + d*x])/(b^2*d) + (C
os[c + d*x]*Sin[c + d*x])/(2*b*d)
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\text{integral} = \frac{\cos(c+dx)\sin(c+dx)}{2bd} + \frac{\int \frac{a+b\cos(c+dx)-2a\cos^2(c+dx)}{a+b\cos(c+dx)}\,dx}{2b}$$

$$= -\frac{a\sin(c+dx)}{b^2d} + \frac{\cos(c+dx)\sin(c+dx)}{2bd} + \frac{\int \frac{ab+(2a^2+b^2)\cos(c+dx)}{a+b\cos(c+dx)}\,dx}{2b^2}$$

$$
\begin{aligned}
&= \frac{(2a^2+b^2)\,x}{2b^3} - \frac{a\sin(c+dx)}{b^2d} + \frac{\cos(c+dx)\sin(c+dx)}{2bd} - \frac{a^3\int\frac{1}{a+b\cos(c+dx)}\,dx}{b^3} \\
&= \frac{(2a^2+b^2)\,x}{2b^3} - \frac{a\sin(c+dx)}{b^2d} + \frac{\cos(c+dx)\sin(c+dx)}{2bd} \\
&\quad - \frac{(2a^3)\,\text{Subst}\left(\int\frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{b^3d} \\
&= \frac{(2a^2+b^2)\,x}{2b^3} - \frac{2a^3\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{\sqrt{a-b}b^3\sqrt{a+b}d} - \frac{a\sin(c+dx)}{b^2d} + \frac{\cos(c+dx)\sin(c+dx)}{2bd}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.30 (sec) , antiderivative size = 97, normalized size of antiderivative = 0.88

$$
\int\frac{\cos^3(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{2(2a^2+b^2)(c+dx) + \frac{8a^3\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}} - 4ab\sin(c+dx) + b^2\sin(2(c+dx))}{4b^3d}
$$

```
[In] Integrate[Cos[c + d*x]^3/(a + b*Cos[c + d*x]),x]
```

```
[Out] (2*(2*a^2 + b^2)*(c + d*x) + (8*a^3*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt
[-a^2 + b^2]])/Sqrt[-a^2 + b^2] - 4*a*b*Sin[c + d*x] + b^2*Sin[2*(c + d*x)]
)/(4*b^3*d)
```

Maple [A] (verified)

Time = 1.18 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.25

method	result
derivativedivides	$\frac{-\frac{2a^3\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{b^3\sqrt{(a-b)(a+b)}}+\frac{\frac{2\left(\left(-ab-\frac{1}{2}b^2\right)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(-ab+\frac{1}{2}b^2\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}+\left(2a^2+b^2\right)\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{b^3}}{d}$
default	$\frac{-\frac{2a^3\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{b^3\sqrt{(a-b)(a+b)}}+\frac{\frac{2\left(\left(-ab-\frac{1}{2}b^2\right)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(-ab+\frac{1}{2}b^2\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}+\left(2a^2+b^2\right)\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{b^3}}{d}$
risch	$\frac{x\,a^2}{b^3}+\frac{x}{2b}+\frac{ia\,\mathrm{e}^{i(dx+c)}}{2b^2d}-\frac{ia\,\mathrm{e}^{-i(dx+c)}}{2b^2d}-\frac{a^3\ln\left(\mathrm{e}^{i(dx+c)}-\frac{ia^2-ib^2-a\sqrt{-a^2+b^2}}{b\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}\,d\,b^3}+\frac{a^3\ln\left(\mathrm{e}^{i(dx+c)}+\frac{ia^2-ib^2+a\sqrt{-}}{b\sqrt{-a^2+}}\right.}{\sqrt{-a^2+b^2}\,d\,b^3}$

```
[In] int(cos(d*x+c)^3/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-2*a^3/b^3/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*
(a+b))^(1/2))+2/b^3*(((-a*b-1/2*b^2)*tan(1/2*d*x+1/2*c)^3+(-a*b+1/2*b^2)*ta
n(1/2*d*x+1/2*c))/(1+tan(1/2*d*x+1/2*c)^2)^2+1/2*(2*a^2+b^2)*arctan(tan(1/2
*d*x+1/2*c))))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 334, normalized size of antiderivative = 3.04

$$\int \frac{\cos^3(c+dx)}{a+b\cos(c+dx)}\,dx$$
$$= \left[-\frac{\sqrt{-a^2+b^2}a^3 \log\left(\frac{2\,ab\cos(dx+c)+(2\,a^2-b^2)\cos(dx+c)^2-2\,\sqrt{-a^2+b^2}(a\cos(dx+c)+b)\sin(dx+c)-a^2+2\,b^2}{b^2\cos(dx+c)^2+2\,ab\cos(dx+c)+a^2}\right) - (2\,a^4-a^2b^2-}{2\,(a^2b^3-b^5)d}\right.$$
$$-\frac{2\,\sqrt{a^2-b^2}a^3 \arctan\left(-\frac{a\cos(dx+c)+b}{\sqrt{a^2-b^2}\sin(dx+c)}\right) - (2\,a^4-a^2b^2-b^4)dx + (2\,a^3b-2\,ab^3-(a^2b^2-b^4)\cos(dx+}{2\,(a^2b^3-b^5)d}$$

```
[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] [-1/2*(sqrt(-a^2 + b^2)*a^3*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x
 + c)^2 - 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^
2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) - (2*a^4 - a^2*b^2 - b^
4)*d*x + (2*a^3*b - 2*a*b^3 - (a^2*b^2 - b^4)*cos(d*x + c))*sin(d*x + c))/(
(a^2*b^3 - b^5)*d), -1/2*(2*sqrt(a^2 - b^2)*a^3*arctan(-(a*cos(d*x + c) + b
)/(sqrt(a^2 - b^2)*sin(d*x + c))) - (2*a^4 - a^2*b^2 - b^4)*d*x + (2*a^3*b
- 2*a*b^3 - (a^2*b^2 - b^4)*cos(d*x + c))*sin(d*x + c))/((a^2*b^3 - b^5)*d)
]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3/(a+b*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos^3(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 177, normalized size of antiderivative = 1.61

$$\int \frac{\cos^3(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{\frac{4\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor\operatorname{sgn}(-2a+2b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{a^2-b^2}}\right)\right)a^3}{\sqrt{a^2-b^2}\,b^3}+\frac{(2a^2+b^2)(dx+c)}{b^3}-\frac{2\left(2a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3+b\tan\left(\frac{1}{2}dx+\frac{1}{2}\right.}{\left(\tan\left(\frac{1}{2}dx\right.\right.}}{2d}$$

```
[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/2*(4*(pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1
/2*d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))*a^3/(sqrt(a^2 -
 b^2)*b^3) + (2*a^2 + b^2)*(d*x + c)/b^3 - 2*(2*a*tan(1/2*d*x + 1/2*c)^3 +
b*tan(1/2*d*x + 1/2*c)^3 + 2*a*tan(1/2*d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c
))/((tan(1/2*d*x + 1/2*c)^2 + 1)^2*b^2))/d
```

Mupad [B] (verification not implemented)

Time = 15.56 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.53

$$\int \frac{\cos^3(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{\mathrm{atan}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{b\,d}+\frac{\sin\left(2\,c+2\,d\,x\right)}{4\,b\,d}+\frac{2\,a^2\,\mathrm{atan}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{b^3\,d} - \frac{a\,\sin\left(c+d\,x\right)}{b^2\,d}-\frac{a^3\,\mathrm{atan}\left(\frac{\left(a\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)-b\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)\,1{}\mathrm{i}}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\sqrt{b^2-a^2}}\right)\,2{}\mathrm{i}}{b^3\,d\,\sqrt{b^2-a^2}}$$

```
[In] int(cos(c + d*x)^3/(a + b*cos(c + d*x)),x)
```

```
[Out] atan(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2))/(b*d) + sin(2*c + 2*d*x)/(4*b*d
) + (2*a^2*atan(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/(b^3*d) - (a*sin(c
+ d*x))/(b^2*d) - (a^3*atan(((a*sin(c/2 + (d*x)/2) - b*sin(c/2 + (d*x)/2))*
1i)/(cos(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2)))*2i)/(b^3*d*(b^2 - a^2)^(1/2))
```

3.452 $\int \frac{\cos^2(c+dx)}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 76

$$\int \frac{\cos^2(c+dx)}{a+b\cos(c+dx)}\,dx=-\frac{ax}{b^2}+\frac{2a^2\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{\sqrt{a-b}b^2\sqrt{a+b}d}+\frac{\sin(c+dx)}{bd}$$

```
[Out] -a*x/b^2+sin(d*x+c)/b/d+2*a^2*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(
1/2))/b^2/d/(a-b)^(1/2)/(a+b)^(1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 76, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2825, 12, 2814, 2738, 211}

$$\int \frac{\cos^2(c+dx)}{a+b\cos(c+dx)}\,dx=\frac{2a^2\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{b^2d\sqrt{a-b}\sqrt{a+b}}-\frac{ax}{b^2}+\frac{\sin(c+dx)}{bd}$$

```
[In] Int[Cos[c + d*x]^2/(a + b*Cos[c + d*x]),x]
```

```
[Out] -((a*x)/b^2) + (2*a^2*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/(
Sqrt[a - b]*b^2*Sqrt[a + b]*d) + Sin[c + d*x]/(b*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2825

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^2/((c_.) + (d_.)*sin[(e_.) + (f
_.)*(x_)]), x_Symbol] :> Simp[(-b^2)*(Cos[e + f*x]/(d*f)), x] + Dist[1/d, I
nt[Simp[a^2*d - b*(b*c - 2*a*d)*Sin[e + f*x], x]/(c + d*Sin[e + f*x]), x],
x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sin(c+dx)}{bd} - \frac{\int \frac{a\cos(c+dx)}{a+b\cos(c+dx)}\,dx}{b} \\
&= \frac{\sin(c+dx)}{bd} - \frac{a\int \frac{\cos(c+dx)}{a+b\cos(c+dx)}\,dx}{b} \\
&= -\frac{ax}{b^2} + \frac{\sin(c+dx)}{bd} + \frac{a^2\int \frac{1}{a+b\cos(c+dx)}\,dx}{b^2} \\
&= -\frac{ax}{b^2} + \frac{\sin(c+dx)}{bd} + \frac{(2a^2)\,\text{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{b^2d} \\
&= -\frac{ax}{b^2} + \frac{2a^2\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{\sqrt{a-b}b^2\sqrt{a+b}d} + \frac{\sin(c+dx)}{bd}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.95

$$\int \frac{\cos^2(c+dx)}{a+b\cos(c+dx)}\,dx=\frac{-a(c+dx)-\frac{2a^2\operatorname{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}}+b\sin(c+dx)}{b^2d}$$

```
[In] Integrate[Cos[c + d*x]^2/(a + b*Cos[c + d*x]),x]
```

```
[Out] (-(a*(c + d*x)) - (2*a^2*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2
]])/Sqrt[-a^2 + b^2] + b*Sin[c + d*x])/(b^2*d)
```

Maple [A] (verified)

Time = 0.98 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.28

method	result
derivativedivides	$\frac{-\frac{2\left(-\frac{b\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}+a\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}{b^2}+\frac{2a^2\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{b^2\sqrt{(a-b)(a+b)}}}{d}$
default	$\frac{-\frac{2\left(-\frac{b\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}+a\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}{b^2}+\frac{2a^2\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{b^2\sqrt{(a-b)(a+b)}}}{d}$
risch	$-\frac{ax}{b^2}-\frac{i e^{i(dx+c)}}{2bd}+\frac{i e^{-i(dx+c)}}{2bd}-\frac{a^2\ln\left(e^{i(dx+c)}+\frac{ia^2-ib^2+a\sqrt{-a^2+b^2}}{b\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}\,d\,b^2}+\frac{a^2\ln\left(e^{i(dx+c)}-\frac{ia^2-ib^2-a\sqrt{-a^2+b^2}}{b\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}\,d\,b^2}$

```
[In] int(cos(d*x+c)^2/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-2/b^2*(-b*tan(1/2*d*x+1/2*c)/(1+tan(1/2*d*x+1/2*c)^2)+a*arctan(tan(1/
2*d*x+1/2*c)))+2*a^2/b^2/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c
)/((a-b)*(a+b))^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 269, normalized size of antiderivative = 3.54

$$\int \frac{\cos^2(c+dx)}{a+b\cos(c+dx)}\,dx$$
$$=\left[-\frac{\sqrt{-a^2+b^2}a^2\log\left(\frac{2\,ab\cos(dx+c)+(2\,a^2-b^2)\cos(dx+c)^2+2\sqrt{-a^2+b^2}(a\cos(dx+c)+b)\sin(dx+c)-a^2+2\,b^2}{b^2\cos(dx+c)^2+2\,ab\cos(dx+c)+a^2}\right)+2\,(a^3-ab^2)dx}{2\,(a^2b^2-b^4)d}\right.$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] [-1/2*(sqrt(-a^2 + b^2)*a^2*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x
 + c)^2 + 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^
2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) + 2*(a^3 - a*b^2)*d*x -
 2*(a^2*b - b^3)*sin(d*x + c))/((a^2*b^2 - b^4)*d), (sqrt(a^2 - b^2)*a^2*ar
ctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c))) - (a^3 - a*b^2)*
d*x + (a^2*b - b^3)*sin(d*x + c))/((a^2*b^2 - b^4)*d)]
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1744 vs. $2(65) = 130$.

Time = 65.92 (sec) , antiderivative size = 1744, normalized size of antiderivative = 22.95

$$\int \frac{\cos^2(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)**2/(a+b*cos(d*x+c)),x)
```

```
[Out] Piecewise((zoo*x*cos(c), Eq(a, 0) & Eq(b, 0) & Eq(d, 0)), (-d*x*tan(c/2 + d
*x/2)**2/(b*d*tan(c/2 + d*x/2)**2 + b*d) - d*x/(b*d*tan(c/2 + d*x/2)**2 + b
*d) + tan(c/2 + d*x/2)**3/(b*d*tan(c/2 + d*x/2)**2 + b*d) + 3*tan(c/2 + d*x
/2)/(b*d*tan(c/2 + d*x/2)**2 + b*d), Eq(a, b)), (d*x*tan(c/2 + d*x/2)**3/(b
*d*tan(c/2 + d*x/2)**3 + b*d*tan(c/2 + d*x/2)) + d*x*tan(c/2 + d*x/2)/(b*d*
tan(c/2 + d*x/2)**3 + b*d*tan(c/2 + d*x/2)) + 3*tan(c/2 + d*x/2)**2/(b*d*ta
n(c/2 + d*x/2)**3 + b*d*tan(c/2 + d*x/2)) + 1/(b*d*tan(c/2 + d*x/2)**3 + b*
d*tan(c/2 + d*x/2)), Eq(a, -b)), ((x*sin(c + d*x)**2/2 + x*cos(c + d*x)**2/
2 + sin(c + d*x)*cos(c + d*x)/(2*d))/a, Eq(b, 0)), (x*cos(c)**2/(a + b*cos(
c)), Eq(d, 0)), (-a**2*d*x*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2
/(a*b**2*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 + a*b**2*d*sqrt
(-a/(a - b) - b/(a - b)) - b**3*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*
x/2)**2 - b**3*d*sqrt(-a/(a - b) - b/(a - b))) - a**2*d*x*sqrt(-a/(a - b) -
 b/(a - b))/(a*b**2*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 + a*
b**2*d*sqrt(-a/(a - b) - b/(a - b)) - b**3*d*sqrt(-a/(a - b) - b/(a - b))*t
an(c/2 + d*x/2)**2 - b**3*d*sqrt(-a/(a - b) - b/(a - b))) + a**2*log(-sqrt(
-a/(a - b) - b/(a - b)) + tan(c/2 + d*x/2))*tan(c/2 + d*x/2)**2/(a*b**2*d*s
qrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 + a*b**2*d*sqrt(-a/(a - b)
- b/(a - b)) - b**3*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 - b*
*3*d*sqrt(-a/(a - b) - b/(a - b))) + a**2*log(-sqrt(-a/(a - b) - b/(a - b))
 + tan(c/2 + d*x/2))/(a*b**2*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2
)**2 + a*b**2*d*sqrt(-a/(a - b) - b/(a - b)) - b**3*d*sqrt(-a/(a - b) - b/(
a - b))*tan(c/2 + d*x/2)**2 - b**3*d*sqrt(-a/(a - b) - b/(a - b))) - a**2*l
og(sqrt(-a/(a - b) - b/(a - b)) + tan(c/2 + d*x/2))*tan(c/2 + d*x/2)**2/(a*
b**2*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 + a*b**2*d*sqrt(-a/
(a - b) - b/(a - b)) - b**3*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)
```

```
**2 - b**3*d*sqrt(-a/(a - b) - b/(a - b))) - a**2*log(sqrt(-a/(a - b) - b/(
a - b)) + tan(c/2 + d*x/2))/(a*b**2*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2
+ d*x/2)**2 + a*b**2*d*sqrt(-a/(a - b) - b/(a - b)) - b**3*d*sqrt(-a/(a - b
) - b/(a - b))*tan(c/2 + d*x/2)**2 - b**3*d*sqrt(-a/(a - b) - b/(a - b))) +
 a*b*d*x*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2/(a*b**2*d*sqrt(-a
/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 + a*b**2*d*sqrt(-a/(a - b) - b/(a
 - b)) - b**3*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 - b**3*d*s
qrt(-a/(a - b) - b/(a - b))) + a*b*d*x*sqrt(-a/(a - b) - b/(a - b))/(a*b**2
*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 + a*b**2*d*sqrt(-a/(a -
 b) - b/(a - b)) - b**3*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2
- b**3*d*sqrt(-a/(a - b) - b/(a - b))) + 2*a*b*sqrt(-a/(a - b) - b/(a - b))
*tan(c/2 + d*x/2)/(a*b**2*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**
2 + a*b**2*d*sqrt(-a/(a - b) - b/(a - b)) - b**3*d*sqrt(-a/(a - b) - b/(a -
 b))*tan(c/2 + d*x/2)**2 - b**3*d*sqrt(-a/(a - b) - b/(a - b))) - 2*b**2*sq
rt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)/(a*b**2*d*sqrt(-a/(a - b) - b/(
a - b))*tan(c/2 + d*x/2)**2 + a*b**2*d*sqrt(-a/(a - b) - b/(a - b)) - b**3*
d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 - b**3*d*sqrt(-a/(a - b)
 - b/(a - b))), True))
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos^2(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.66

$$\int \frac{\cos^2(c+dx)}{a+b\cos(c+dx)}\,dx = -\frac{\frac{2\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor\operatorname{sgn}(-2a+2b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{a^2-b^2}}\right)\right)a^2}{\sqrt{a^2-b^2}b^2}+\frac{(dx+c)a}{b^2}-\frac{2\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2+1\right)b}}{d}$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] -(2*(pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1/2*
d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))*a^2/(sqrt(a^2 - b^
2)*b^2) + (d*x + c)*a/b^2 - 2*tan(1/2*d*x + 1/2*c)/((tan(1/2*d*x + 1/2*c)^2
 + 1)*b))/d
```

Mupad [B] (verification not implemented)

Time = 14.41 (sec) , antiderivative size = 190, normalized size of antiderivative = 2.50

$$\int \frac{\cos^2(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{\sin(c+d\,x)}{b\,d} - \frac{2\,a\,\mathrm{atan}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{b^2\,d} - \frac{a^2\,\mathrm{atan}\left(\frac{1\mathrm{i}\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,a^2\,b-2\mathrm{i}\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,a\,b^2+1\mathrm{i}\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,b^3}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,{\left(b^2-a^2\right)}^{3/2}+a^2\,\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\sqrt{b^2-a^2}-a\,b\,\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\sqrt{b^2-a^2}}\right)\,2\mathrm{i}}{b^2\,d\,\sqrt{b^2-a^2}}$$

```
[In] int(cos(c + d*x)^2/(a + b*cos(c + d*x)),x)
```

```
[Out] sin(c + d*x)/(b*d) - (2*a*atan(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/(b^2
*d) - (a^2*atan((b^3*sin(c/2 + (d*x)/2)*1i - a*b^2*sin(c/2 + (d*x)/2)*2i +
a^2*b*sin(c/2 + (d*x)/2)*1i)/(cos(c/2 + (d*x)/2)*(b^2 - a^2)^(3/2) + a^2*co
s(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) - a*b*cos(c/2 + (d*x)/2)*(b^2 - a^2)^(1/
2)))*2i)/(b^2*d*(b^2 - a^2)^(1/2))
```

3.453 $\int \frac{\cos(c+dx)}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 59

$$\int \frac{\cos(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{x}{b} - \frac{2a\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{\sqrt{a-b}b\sqrt{a+b}d}$$

```
[Out] x/b-2*a*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/2))/b/d/(a-b)^(1/2)/
(a+b)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.158$, Rules used = {2814, 2738, 211}

$$\int \frac{\cos(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{x}{b} - \frac{2a\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{bd\sqrt{a-b}\sqrt{a+b}}$$

```
[In] Int[Cos[c + d*x]/(a + b*Cos[c + d*x]),x]
```

```
[Out] x/b - (2*a*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/(Sqrt[a - b]
*b*Sqrt[a + b]*d)
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
```

```
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{x}{b} - \frac{a\int \frac{1}{a+b\cos(c+dx)}\,dx}{b}\\ &= \frac{x}{b} - \frac{(2a)\text{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{bd}\\ &= \frac{x}{b} - \frac{2a\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{\sqrt{a-b}\,b\sqrt{a+b}\,d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.98

$$\int \frac{\cos(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{c+dx+\frac{2a\,\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}}}{bd}$$

```
[In] Integrate[Cos[c + d*x]/(a + b*Cos[c + d*x]),x]
```

```
[Out] (c + d*x + (2*a*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/Sqrt[
-a^2 + b^2])/(b*d)
```

Maple [A] (verified)

Time = 0.84 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.10

method	result	size
derivativedivides	$\frac{\frac{2\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{b}-\frac{2a\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{b\sqrt{(a-b)(a+b)}}}{d}$	65
default	$\frac{\frac{2\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{b}-\frac{2a\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{b\sqrt{(a-b)(a+b)}}}{d}$	65
risch	$\frac{x}{b}-\frac{a\ln\left(e^{i(dx+c)}-\frac{ia^2-ib^2-a\sqrt{-a^2+b^2}}{b\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}\,db}+\frac{a\ln\left(e^{i(dx+c)}+\frac{ia^2-ib^2+a\sqrt{-a^2+b^2}}{b\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}\,db}$	152

[In] int(cos(d*x+c)/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)

[Out] 1/d*(2/b*arctan(tan(1/2*d*x+1/2*c))-2/b*a/((a-b)*(a+b))^(1/2)*arctan((a-b)*
tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2)))

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 223, normalized size of antiderivative = 3.78

$$\int \frac{\cos(c+dx)}{a+b\cos(c+dx)}\,dx$$
$$=\left[\frac{2\,(a^2-b^2)dx-\sqrt{-a^2+b^2}a\log\left(\frac{2\,ab\cos(dx+c)+(2\,a^2-b^2)\cos(dx+c)^2-2\,\sqrt{-a^2+b^2}(a\cos(dx+c)+b)\sin(dx+c)-a^2+2\,b^2}{b^2\cos(dx+c)^2+2\,ab\cos(dx+c)+a^2}\right)}{2\,(a^2b-b^3)d},\ \frac{(a^2}{}\right.$$

[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c)),x, algorithm="fricas")

[Out] [1/2*(2*(a^2 - b^2)*d*x - sqrt(-a^2 + b^2)*a*log((2*a*b*cos(d*x + c) + (2*a
^2 - b^2)*cos(d*x + c)^2 - 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x
+ c) - a^2 + 2*b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)))/((a^2
*b - b^3)*d), ((a^2 - b^2)*d*x - sqrt(a^2 - b^2)*a*arctan(-(a*cos(d*x + c)
+ b)/(sqrt(a^2 - b^2)*sin(d*x + c))))/((a^2*b - b^3)*d)]

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 320 vs. $2(48) = 96$.

Time = 12.67 (sec) , antiderivative size = 320, normalized size of antiderivative = 5.42

$$\int \frac{\cos(c+dx)}{a+b\cos(c+dx)}\,dx = \begin{cases} \tilde{\infty}x \\ \frac{x}{b} - \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{bd} \\ \frac{x}{b} + \frac{1}{bd\tan\left(\frac{c}{2}+\frac{dx}{2}\right)} \\ \frac{\sin(c+dx)}{ad} \\ \frac{x\cos(c)}{a+b\cos(c)} \\ \frac{adx\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}}{abd\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}-b^2d\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}} - \frac{a\log\left(-\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}+\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}{abd\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}-b^2d\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}} + \frac{a\log\left(\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}+\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}{abd\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}-b^2d\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}} - \frac{bdx}{abd\sqrt{-\frac{a}{a-b}-}} \end{cases}$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c)),x)
```

```
[Out] Piecewise((zoo*x, Eq(a, 0) & Eq(b, 0) & Eq(d, 0)), (x/b - tan(c/2 + d*x/2)/
(b*d), Eq(a, b)), (x/b + 1/(b*d*tan(c/2 + d*x/2)), Eq(a, -b)), (sin(c + d*x
)/(a*d), Eq(b, 0)), (x*cos(c)/(a + b*cos(c)), Eq(d, 0)), (a*d*x*sqrt(-a/(a
- b) - b/(a - b))/(a*b*d*sqrt(-a/(a - b) - b/(a - b)) - b**2*d*sqrt(-a/(a -
 b) - b/(a - b))) - a*log(-sqrt(-a/(a - b) - b/(a - b)) + tan(c/2 + d*x/2))
/(a*b*d*sqrt(-a/(a - b) - b/(a - b)) - b**2*d*sqrt(-a/(a - b) - b/(a - b)))
 + a*log(sqrt(-a/(a - b) - b/(a - b)) + tan(c/2 + d*x/2))/(a*b*d*sqrt(-a/(a
 - b) - b/(a - b)) - b**2*d*sqrt(-a/(a - b) - b/(a - b))) - b*d*x*sqrt(-a/(
a - b) - b/(a - b))/(a*b*d*sqrt(-a/(a - b) - b/(a - b)) - b**2*d*sqrt(-a/(a
 - b) - b/(a - b))), True))
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 240 vs. $2(50) = 100$.

Time = 0.30 (sec) , antiderivative size = 240, normalized size of antiderivative = 4.07

$$\int \frac{\cos(c+dx)}{a+b\cos(c+dx)}\,dx =$$

$$-\frac{\frac{\left(\sqrt{a^2-b^2}(2a-b)|a-b|+\sqrt{a^2-b^2}|a-b||b|\right)\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor+\arctan\left(\frac{2\sqrt{\frac{1}{2}}\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{\frac{2a+\sqrt{-4(a+b)(a-b)+4a^2}}{a-b}}}\right)\right)}{(a^2-2ab+b^2)b^2+(a^3-2a^2b+ab^2)|b|}+\frac{\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor+\arctan\left(\frac{2\sqrt{\frac{1}{2}}\tan(\cdots}{\sqrt{\frac{2a-\sqrt{-4(a\cdots}}{a\cdots}}}\right.\right.}{b^2-a|b|\cdots}}{d}$$

[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c)),x, algorithm="giac")

[Out] -((sqrt(a^2 - b^2)*(2*a - b)*abs(a - b) + sqrt(a^2 - b^2)*abs(a - b)*abs(b)
)*(pi*floor(1/2*(d*x + c)/pi + 1/2) + arctan(2*sqrt(1/2)*tan(1/2*d*x + 1/2*
c)/sqrt((2*a + sqrt(-4*(a + b)*(a - b) + 4*a^2))/(a - b))))/((a^2 - 2*a*b +
b^2)*b^2 + (a^3 - 2*a^2*b + a*b^2)*abs(b)) + (pi*floor(1/2*(d*x + c)/pi +
1/2) + arctan(2*sqrt(1/2)*tan(1/2*d*x + 1/2*c)/sqrt((2*a - sqrt(-4*(a + b)*
(a - b) + 4*a^2))/(a - b))))*(2*a - b - abs(b))/(b^2 - a*abs(b)))/d

Mupad [B] (verification not implemented)

Time = 14.60 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.68

$$\int \frac{\cos(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{2\,\mathrm{atan}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{b\,d}+\frac{2\,a\,\mathrm{atanh}\left(\frac{a\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)-b\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)\sqrt{b^2-a^2}}\right)}{b\,d\,\sqrt{b^2-a^2}}$$

[In] int(cos(c + d*x)/(a + b*cos(c + d*x)),x)

[Out] (2*atan(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/(b*d) + (2*a*atanh((a*sin(c
/2 + (d*x)/2) - b*sin(c/2 + (d*x)/2))/(cos(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2)
)))/(b*d*(b^2 - a^2)^(1/2))

3.454 $\int \frac{1}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 49

$$\int \frac{1}{a+b\cos(c+dx)}\,dx = \frac{2\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{\sqrt{a-b}\sqrt{a+b}d}$$

```
[Out] 2*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/2))/d/(a-b)^(1/2)/(a+b)^(1
/2)
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {2738, 211}

$$\int \frac{1}{a+b\cos(c+dx)}\,dx = \frac{2\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{d\sqrt{a-b}\sqrt{a+b}}$$

```
[In] Int[(a + b*Cos[c + d*x])^(-1),x]
```

```
[Out] (2*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/(Sqrt[a - b]*Sqrt[a
+ b]*d)
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
```

```
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \frac{2\text{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{d}$$
$$= \frac{2\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{\sqrt{a-b}\sqrt{a+b}d}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 48, normalized size of antiderivative = 0.98

$$\int \frac{1}{a+b\cos(c+dx)}\,dx = -\frac{2\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(-1),x]
[Out] (-2*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/(Sqrt[-a^2 + b^2]
*d)
```

Maple [A] (verified)

Time = 0.89 (sec) , antiderivative size = 44, normalized size of antiderivative = 0.90

method	result	size
derivativedivides	$\frac{2\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{d\sqrt{(a-b)(a+b)}}$	44
default	$\frac{2\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{d\sqrt{(a-b)(a+b)}}$	44
risch	$-\frac{\ln\left(e^{i(dx+c)}+\frac{ia^2-ib^2+a\sqrt{-a^2+b^2}}{b\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}\,d}+\frac{\ln\left(e^{i(dx+c)}-\frac{ia^2-ib^2-a\sqrt{-a^2+b^2}}{b\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}\,d}$	139

```
[In] int(1/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
[Out] 2/d/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2)
)
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 175, normalized size of antiderivative = 3.57

$$\int \frac{1}{a+b\cos(c+dx)}\,dx = \left[-\frac{\sqrt{-a^2+b^2}\log\left(\frac{2\,ab\cos(dx+c)+(2\,a^2-b^2)\cos(dx+c)^2+2\,\sqrt{-a^2+b^2}(a\cos(dx+c)+b)\sin(dx+c)-a^2+2\,b^2}{b^2\cos(dx+c)^2+2\,ab\cos(dx+c)+a^2}\right)}{2\,(a^2-b^2)d},\ \frac{\arctan\left(-\frac{a\cos(dx+c)+b}{\sqrt{a^2-b^2}\sin(dx+c)}\right)}{\sqrt{a^2-b^2}d}\right]$$

```
[In] integrate(1/(a+b*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] [-1/2*sqrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x + c)
^2 + 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2)/(b
^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2))/((a^2 - b^2)*d), arctan(-(a*
cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c)))/(sqrt(a^2 - b^2)*d)]
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 172 vs. $2(41) = 82$.

Time = 1.98 (sec) , antiderivative size = 172, normalized size of antiderivative = 3.51

$$\int \frac{1}{a+b\cos(c+dx)}\,dx = \begin{cases} \frac{\tilde{\infty}x}{\cos(c)} & \text{for } a=0 \wedge b=0 \wedge d=0 \\ \frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{bd} & \text{for } a=b \\ \frac{1}{bd\tan\left(\frac{c}{2}+\frac{dx}{2}\right)} & \text{for } a=-b \\ \frac{x}{a+b\cos(c)} & \text{for } d=0 \\ \frac{\log\left(-\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}+\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}{ad\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}-bd\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}} - \frac{\log\left(\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}+\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}{ad\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}-bd\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}} & \text{otherwise} \end{cases}$$

```
[In] integrate(1/(a+b*cos(d*x+c)),x)
```

```
[Out] Piecewise((zoo*x/cos(c), Eq(a, 0) & Eq(b, 0) & Eq(d, 0)), (tan(c/2 + d*x/2)
/(b*d), Eq(a, b)), (1/(b*d*tan(c/2 + d*x/2)), Eq(a, -b)), (x/(a + b*cos(c))
, Eq(d, 0)), (log(-sqrt(-a/(a - b) - b/(a - b)) + tan(c/2 + d*x/2))/(a*d*sq
rt(-a/(a - b) - b/(a - b)) - b*d*sqrt(-a/(a - b) - b/(a - b))) - log(sqrt(-
a/(a - b) - b/(a - b)) + tan(c/2 + d*x/2))/(a*d*sqrt(-a/(a - b) - b/(a - b)
) - b*d*sqrt(-a/(a - b) - b/(a - b))), True))
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{a+b\cos(c+dx)}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(1/(a+b*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 78, normalized size of antiderivative = 1.59

$$\int \frac{1}{a+b\cos(c+dx)}\,dx = -\frac{2\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor\operatorname{sgn}(-2a+2b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{a^2-b^2}}\right)\right)}{\sqrt{a^2-b^2}\,d}$$

```
[In] integrate(1/(a+b*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] -2*(pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1/2*d
*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))/(sqrt(a^2 - b^2)*d)
```

Mupad [B] (verification not implemented)

Time = 14.51 (sec) , antiderivative size = 43, normalized size of antiderivative = 0.88

$$\int \frac{1}{a+b\cos(c+dx)}\,dx = \frac{2\,\mathrm{atan}\left(\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,(a-b)}{\sqrt{a^2-b^2}}\right)}{d\,\sqrt{a^2-b^2}}$$

```
[In] int(1/(a + b*cos(c + d*x)),x)
```

```
[Out] (2*atan((tan(c/2 + (d*x)/2)*(a - b))/(a^2 - b^2)^(1/2)))/(d*(a^2 - b^2)^(1/
2))
```

3.455 $\int \frac{\sec(c+dx)}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 68

$$\int \frac{\sec(c+dx)}{a+b\cos(c+dx)}\,dx = -\frac{2b\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a\sqrt{a-b}\sqrt{a+b}d}+\frac{\operatorname{arctanh}(\sin(c+dx))}{ad}$$

```
[Out] arctanh(sin(d*x+c))/a/d-2*b*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/
2))/a/d/(a-b)^(1/2)/(a+b)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2826, 3855, 2738, 211}

$$\int \frac{\sec(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{\operatorname{arctanh}(\sin(c+dx))}{ad}-\frac{2b\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{ad\sqrt{a-b}\sqrt{a+b}}$$

```
[In] Int[Sec[c + d*x]/(a + b*Cos[c + d*x]),x]
```

```
[Out] (-2*b*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/(a*Sqrt[a - b]*Sq
rt[a + b]*d) + ArcTanh[Sin[c + d*x]]/(a*d)
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2826

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])), x_Symbol] :> Dist[b/(b*c - a*d), Int[1/(a + b*Sin[e + f*x]),
x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a
, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\int \sec(c+dx)\,dx}{a} - \frac{b\int \frac{1}{a+b\cos(c+dx)}\,dx}{a} \\
&= \frac{\operatorname{arctanh}(\sin(c+dx))}{ad} - \frac{(2b)\text{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{ad} \\
&= -\frac{2b\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a\sqrt{a-b}\sqrt{a+b}d} + \frac{\operatorname{arctanh}(\sin(c+dx))}{ad}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 102, normalized size of antiderivative = 1.50

$$
\int \frac{\sec(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{\frac{2b\operatorname{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}} - \log\left(\cos\left(\frac{1}{2}(c+dx)\right) - \sin\left(\frac{1}{2}(c+dx)\right)\right) + \log\left(\cos\left(\frac{1}{2}(c+dx)\right) + \sin\left(\frac{1}{2}(c+d
$$

```
[In] Integrate[Sec[c + d*x]/(a + b*Cos[c + d*x]),x]
```

```
[Out] ((2*b*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/Sqrt[-a^2 + b^2
] - Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + Log[Cos[(c + d*x)/2] + Sin[(
c + d*x)/2]])/(a*d)
```

Maple [A] (verified)

Time = 0.94 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.22

method	result
derivativedivides	$\frac{-\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a}-\frac{2b\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{a\sqrt{(a-b)(a+b)}}+\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{a}}{d}$
default	$\frac{-\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a}-\frac{2b\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{a\sqrt{(a-b)(a+b)}}+\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{a}}{d}$
risch	$-\frac{b\ln\left(e^{i(dx+c)}+\frac{-ia^2+ib^2+a\sqrt{-a^2+b^2}}{\sqrt{-a^2+b^2}\,b}\right)}{\sqrt{-a^2+b^2}\,da}+\frac{b\ln\left(e^{i(dx+c)}+\frac{ia^2-ib^2+a\sqrt{-a^2+b^2}}{b\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}\,da}-\frac{\ln\left(e^{i(dx+c)}-i\right)}{da}+\frac{\ln(e^{i(dx+c)}}{ad}$

[In] int(sec(d*x+c)/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)

[Out] 1/d*(-1/a*ln(tan(1/2*d*x+1/2*c)-1)-2/a*b/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2))+1/a*ln(tan(1/2*d*x+1/2*c)+1))

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 278, normalized size of antiderivative = 4.09

$$\int \frac{\sec(c+dx)}{a+b\cos(c+dx)}\,dx$$
$$=\left[-\frac{\sqrt{-a^2+b^2}b\log\left(\frac{2\,ab\cos(dx+c)+(2\,a^2-b^2)\cos(dx+c)^2-2\,\sqrt{-a^2+b^2}(a\cos(dx+c)+b)\sin(dx+c)-a^2+2\,b^2}{b^2\cos(dx+c)^2+2\,ab\cos(dx+c)+a^2}\right)-(a^2-b^2)\log(\mathrm{s}}{2\,(a^3-ab^2)d}\right.$$
$$-\frac{2\,\sqrt{a^2-b^2}b\arctan\left(-\frac{a\cos(dx+c)+b}{\sqrt{a^2-b^2}\sin(dx+c)}\right)-(a^2-b^2)\log(\sin(dx+c)+1)+(a^2-b^2)\log(-\sin(dx+c)}{2\,(a^3-ab^2)d}$$

[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c)),x, algorithm="fricas")

[Out] [-1/2*(sqrt(-a^2 + b^2)*b*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x + c)^2 - 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) - (a^2 - b^2)*log(sin(d*x + c) + 1) + (a^2 - b^2)*log(-sin(d*x + c) + 1))/((a^3 - a*b^2)*d), -1/2*(2*sqrt(a^2 - b^2)*b*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c))) - (a^2 - b^2)*log(sin(d*x + c) + 1) + (a^2 - b^2)*log(-sin(d*x + c) + 1))/((a^3 - a*b^2)*d)]

Sympy [F]

$$\int \frac{\sec(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\sec{(c+dx)}}{a+b\cos{(c+dx)}}\,dx$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c)),x)
[Out] Integral(sec(c + d*x)/(a + b*cos(c + d*x)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sec(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c)),x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 119 vs. $2(59) = 118$.

Time = 0.29 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.75

$$\int \frac{\sec(c+dx)}{a+b\cos(c+dx)}\,dx = -\frac{\frac{2\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor\operatorname{sgn}(2a-2b)+\arctan\left(\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{a^2-b^2}}\right)\right)b}{\sqrt{a^2-b^2}\,a}-\frac{\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)}{a}+\frac{\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right)}{a}}{d}$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c)),x, algorithm="giac")
[Out] -(2*(pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(2*a - 2*b) + arctan((a*tan(1/2*d*
x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))*b/(sqrt(a^2 - b^2)*a
) - log(abs(tan(1/2*d*x + 1/2*c) + 1))/a + log(abs(tan(1/2*d*x + 1/2*c) - 1
))/a)/d
```

Mupad [B] (verification not implemented)

Time = 15.07 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.46

$$\int \frac{\sec(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{2\,\mathrm{atanh}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)}{a\,d}+\frac{2\,b\,\mathrm{atanh}\left(\frac{a\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)-b\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\sqrt{b^2-a^2}}\right)}{a\,d\,\sqrt{b^2-a^2}}$$

```
[In] int(1/(cos(c + d*x)*(a + b*cos(c + d*x))),x)
```

```
[Out] (2*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/(a*d) + (2*b*atanh((a*sin(
c/2 + (d*x)/2) - b*sin(c/2 + (d*x)/2))/(cos(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2
))))/(a*d*(b^2 - a^2)^(1/2))
```

3.456 $\int \frac{\sec^2(c+dx)}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 85

$$\int \frac{\sec^2(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{2b^2\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^2\sqrt{a-b}\sqrt{a+b}d} - \frac{b\,\text{arctanh}(\sin(c+dx))}{a^2d} + \frac{\tan(c+dx)}{ad}$$

```
[Out] -b*arctanh(sin(d*x+c))/a^2/d+2*b^2*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a
+b)^(1/2))/a^2/d/(a-b)^(1/2)/(a+b)^(1/2)+tan(d*x+c)/a/d
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2881, 12, 2826, 3855, 2738, 211}

$$\int \frac{\sec^2(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{2b^2\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^2d\sqrt{a-b}\sqrt{a+b}} - \frac{b\,\text{arctanh}(\sin(c+dx))}{a^2d} + \frac{\tan(c+dx)}{ad}$$

```
[In] Int[Sec[c + d*x]^2/(a + b*Cos[c + d*x]),x]
```

```
[Out] (2*b^2*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/(a^2*Sqrt[a - b]
*Sqrt[a + b]*d) - (b*ArcTanh[Sin[c + d*x]])/(a^2*d) + Tan[c + d*x]/(a*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2826

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (
f_.)*(x_)])), x_Symbol] :> Dist[b/(b*c - a*d), Int[1/(a + b*Sin[e + f*x]),
x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a
, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = \frac{\tan(c+dx)}{ad} - \frac{\int \frac{b\sec(c+dx)}{a+b\cos(c+dx)}\,dx}{a}$$

$$= \frac{\tan(c+dx)}{ad} - \frac{b\int \frac{\sec(c+dx)}{a+b\cos(c+dx)}\,dx}{a}$$

$$= \frac{\tan(c+dx)}{ad} - \frac{b\int \sec(c+dx)\,dx}{a^2} + \frac{b^2\int \frac{1}{a+b\cos(c+dx)}\,dx}{a^2}$$

$$= -\frac{b\text{arctanh}(\sin(c+dx))}{a^2d} + \frac{\tan(c+dx)}{ad} + \frac{(2b^2)\,\text{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{a^2d}$$

$$= \frac{2b^2\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^2\sqrt{a-b}\sqrt{a+b}d} - \frac{b\text{arctanh}(\sin(c+dx))}{a^2d} + \frac{\tan(c+dx)}{ad}$$

Mathematica [A] (verified)

Time = 0.45 (sec) , antiderivative size = 115, normalized size of antiderivative = 1.35

$$\int \frac{\sec^2(c+dx)}{a+b\cos(c+dx)}\,dx$$
$$= \frac{-\frac{2b^2\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}} + b\left(\log\left(\cos\left(\frac{1}{2}(c+dx)\right) - \sin\left(\frac{1}{2}(c+dx)\right)\right) - \log\left(\cos\left(\frac{1}{2}(c+dx)\right) + \sin\left(\frac{1}{2}(c\right.\right.\right.}{a^2d}$$

```
[In] Integrate[Sec[c + d*x]^2/(a + b*Cos[c + d*x]),x]
```

```
[Out] ((-2*b^2*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/Sqrt[-a^2 +
b^2] + b*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - Log[Cos[(c + d*x)/2] +
 Sin[(c + d*x)/2]]) + a*Tan[c + d*x])/(a^2*d)
```

Maple [A] (verified)

Time = 1.23 (sec) , antiderivative size = 123, normalized size of antiderivative = 1.45

method	result
derivativedivides	$\frac{-\frac{1}{a\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)} - \frac{b\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{a^2} + \frac{2b^2\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{a^2\sqrt{(a-b)(a+b)}} - \frac{1}{a\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)} + \frac{b\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^2}}{d}$
default	$\frac{-\frac{1}{a\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)} - \frac{b\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{a^2} + \frac{2b^2\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{a^2\sqrt{(a-b)(a+b)}} - \frac{1}{a\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)} + \frac{b\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^2}}{d}$
risch	$\frac{2i}{da\left(e^{2i(dx+c)}+1\right)} + \frac{b\ln\left(e^{i(dx+c)}-i\right)}{a^2d} - \frac{b^2\ln\left(e^{i(dx+c)}+\frac{ia^2-ib^2+a\sqrt{-a^2+b^2}}{b\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}\,d\,a^2} + \frac{b^2\ln\left(e^{i(dx+c)}-\frac{ia^2-ib^2-a\sqrt{-a^2+b^2}}{b\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}\,d\,a^2}$

```
[In] int(sec(d*x+c)^2/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-1/a/(tan(1/2*d*x+1/2*c)+1)-b/a^2*ln(tan(1/2*d*x+1/2*c)+1)+2*b^2/a^2/(
(a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2))-1/a
/(tan(1/2*d*x+1/2*c)-1)+b/a^2*ln(tan(1/2*d*x+1/2*c)-1))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 157 vs. 2(76) = 152.

Time = 0.31 (sec) , antiderivative size = 382, normalized size of antiderivative = 4.49

$$\int \frac{\sec^2(c+dx)}{a+b\cos(c+dx)}\,dx = \left[-\frac{\sqrt{-a^2+b^2}b^2\cos(dx+c)\log\left(\frac{2\,ab\cos(dx+c)+(2\,a^2-b^2)\cos(dx+c)^2+2\,\sqrt{-a^2+b^2}(a\cos(dx+c)+b)\sin(dx+c)-a^2+2\,b^2}{b^2\cos(dx+c)^2+2\,ab\cos(dx+c)+a^2}\right)+(c}{2\,(a^4}\right.$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] [-1/2*(sqrt(-a^2 + b^2)*b^2*cos(d*x + c)*log((2*a*b*cos(d*x + c) + (2*a^2 -
 b^2)*cos(d*x + c)^2 + 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c)
 - a^2 + 2*b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) + (a^2*b -
 b^3)*cos(d*x + c)*log(sin(d*x + c) + 1) - (a^2*b - b^3)*cos(d*x + c)*log(-
sin(d*x + c) + 1) - 2*(a^3 - a*b^2)*sin(d*x + c))/((a^4 - a^2*b^2)*d*cos(d*
x + c)), 1/2*(2*sqrt(a^2 - b^2)*b^2*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2
- b^2)*sin(d*x + c)))*cos(d*x + c) - (a^2*b - b^3)*cos(d*x + c)*log(sin(d*x
 + c) + 1) + (a^2*b - b^3)*cos(d*x + c)*log(-sin(d*x + c) + 1) + 2*(a^3 - a
*b^2)*sin(d*x + c))/((a^4 - a^2*b^2)*d*cos(d*x + c))]
```

Sympy [F]

$$\int \frac{\sec^2(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\sec^2{(c+dx)}}{a+b\cos{(c+dx)}}\,dx$$

```
[In] integrate(sec(d*x+c)**2/(a+b*cos(d*x+c)),x)
```

```
[Out] Integral(sec(c + d*x)**2/(a + b*cos(c + d*x)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sec^2(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 153 vs. $2(76) = 152$.

Time = 0.32 (sec) , antiderivative size = 153, normalized size of antiderivative = 1.80

$$\int \frac{\sec^2(c+dx)}{a+b\cos(c+dx)}\,dx = -\frac{\frac{2\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor\mathrm{sgn}(-2a+2b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{a^2-b^2}}\right)\right)b^2}{\sqrt{a^2-b^2}a^2}+\frac{b\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)}{a^2}-\frac{b\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right)}{a^2}}{d}$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] -(2*(pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1/2*
d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))*b^2/(sqrt(a^2 - b^
2)*a^2) + b*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^2 - b*log(abs(tan(1/2*d*x
+ 1/2*c) - 1))/a^2 + 2*tan(1/2*d*x + 1/2*c)/((tan(1/2*d*x + 1/2*c)^2 - 1)*a
))/d
```

Mupad [B] (verification not implemented)

Time = 14.72 (sec) , antiderivative size = 324, normalized size of antiderivative = 3.81

$$\int \frac{\sec^2(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{a^3\sin(c+dx)-a\,b^2\sin(c+dx)}{a^2\,d\,\cos(c+dx)\,(a^2-b^2)} - \frac{2\,a^2\,b\,\mathrm{atanh}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)-2\,b^3\,\mathrm{atanh}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)+2\,b^2\,\mathrm{atanh}\left(\frac{a^5\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\sqrt{b^2-a^2}+2\,b^3\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)(b^2-a^2)^3}{}\right.}{a^2\,d\,(a^2-}$$

```
[In] int(1/(cos(c + d*x)^2*(a + b*cos(c + d*x))),x)
```

```
[Out] (a^3*sin(c + d*x) - a*b^2*sin(c + d*x))/(a^2*d*cos(c + d*x)*(a^2 - b^2)) -
(2*a^2*b*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)) - 2*b^3*atanh(sin(c/2
 + (d*x)/2)/cos(c/2 + (d*x)/2)) + 2*b^2*atanh((a^5*sin(c/2 + (d*x)/2)*(b^2
- a^2)^(1/2) + 2*b^3*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(3/2) - 2*b^5*sin(c/2 +
 (d*x)/2)*(b^2 - a^2)^(1/2) + 3*a^2*b^3*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2
) - a^3*b^2*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) - a^4*b*sin(c/2 + (d*x)/2)
*(b^2 - a^2)^(1/2))/(cos(c/2 + (d*x)/2)*(a*b^2 - a^3)^2))*(b^2 - a^2)^(1/2)
)/(a^2*d*(a^2 - b^2))
```

3.457 $\int \frac{\sec^3(c+dx)}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 119

$$\int \frac{\sec^3(c+dx)}{a+b\cos(c+dx)}\,dx = -\frac{2b^3\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^3\sqrt{a-b}\sqrt{a+b}d}+\frac{(a^2+2b^2)\,\text{arctanh}(\sin(c+dx))}{2a^3d} - \frac{b\tan(c+dx)}{a^2d}+\frac{\sec(c+dx)\tan(c+dx)}{2ad}$$

```
[Out] 1/2*(a^2+2*b^2)*arctanh(sin(d*x+c))/a^3/d-2*b^3*arctan((a-b)^(1/2)*tan(1/2*
d*x+1/2*c)/(a+b)^(1/2))/a^3/d/(a-b)^(1/2)/(a+b)^(1/2)-b*tan(d*x+c)/a^2/d+1/
2*sec(d*x+c)*tan(d*x+c)/a/d
```

Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2881, 3134, 3080, 3855, 2738, 211}

$$\int \frac{\sec^3(c+dx)}{a+b\cos(c+dx)}\,dx = -\frac{2b^3\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^3d\sqrt{a-b}\sqrt{a+b}}-\frac{b\tan(c+dx)}{a^2d}+\frac{(a^2+2b^2)\,\text{arctanh}(\sin(c+dx))}{2a^3d}+\frac{\tan(c+dx)\sec(c+dx)}{2ad}$$

```
[In] Int[Sec[c + d*x]^3/(a + b*Cos[c + d*x]),x]
```

```
[Out] (-2*b^3*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/(a^3*Sqrt[a - b
]*Sqrt[a + b]*d) + ((a^2 + 2*b^2)*ArcTanh[Sin[c + d*x]])/(2*a^3*d) - (b*Tan
[c + d*x])/(a^2*d) + (Sec[c + d*x]*Tan[c + d*x])/(2*a*d)
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 3080

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[(A*b
- a*B)/(b*c - a*d), Int[1/(a + b*Sin[e + f*x]), x], x] + Dist[(B*c - A*d)/(
b*c - a*d), Int[1/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f,
A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
```

```
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0]))
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sec(c+dx)\tan(c+dx)}{2ad} + \frac{\int \frac{(-2b+a\cos(c+dx)+b\cos^2(c+dx))\sec^2(c+dx)}{a+b\cos(c+dx)}\,dx}{2a} \\
&= -\frac{b\tan(c+dx)}{a^2d} + \frac{\sec(c+dx)\tan(c+dx)}{2ad} + \frac{\int \frac{(a^2+2b^2+ab\cos(c+dx))\sec(c+dx)}{a+b\cos(c+dx)}\,dx}{2a^2} \\
&= -\frac{b\tan(c+dx)}{a^2d} + \frac{\sec(c+dx)\tan(c+dx)}{2ad} - \frac{b^3\int \frac{1}{a+b\cos(c+dx)}\,dx}{a^3} + \frac{(a^2+2b^2)\int \sec(c+dx)\,dx}{2a^3} \\
&= \frac{(a^2+2b^2)\operatorname{arctanh}(\sin(c+dx))}{2a^3d} - \frac{b\tan(c+dx)}{a^2d} + \frac{\sec(c+dx)\tan(c+dx)}{2ad} \\
&\quad - \frac{(2b^3)\operatorname{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{a^3d} \\
&= -\frac{2b^3\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^3\sqrt{a-b}\sqrt{a+b}d} + \frac{(a^2+2b^2)\operatorname{arctanh}(\sin(c+dx))}{2a^3d} \\
&\quad - \frac{b\tan(c+dx)}{a^2d} + \frac{\sec(c+dx)\tan(c+dx)}{2ad}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.94 (sec) , antiderivative size = 238, normalized size of antiderivative = 2.00

$$\int \frac{\sec^3(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{\frac{8b^3\operatorname{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}} - 2a^2\log\left(\cos\left(\frac{1}{2}(c+dx)\right) - \sin\left(\frac{1}{2}(c+dx)\right)\right) - 4b^2\log\left(\cos\left(\frac{1}{2}(c+dx)\right) - \sin\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^3/(a + b*Cos[c + d*x]),x]
```

```
[Out] ((8*b^3*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/Sqrt[-a^2 + b
^2] - 2*a^2*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - 4*b^2*Log[Cos[(c + d
*x)/2] - Sin[(c + d*x)/2]] + 2*a^2*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]
 + 4*b^2*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] + a^2/(Cos[(c + d*x)/2] -
 Sin[(c + d*x)/2])^2 - a^2/(Cos[(c + d*x)/2] + Sin[(c + d*x)/2])^2 - 4*a*b*
Tan[c + d*x])/(4*a^3*d)
```

Maple [A] (verified)

Time = 1.58 (sec) , antiderivative size = 192, normalized size of antiderivative = 1.61

method	result
derivativedivides	$\frac{-\frac{2b^3 \arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{a^3\sqrt{(a-b)(a+b)}}-\frac{1}{2a\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^2}-\frac{-a-2b}{2a^2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}+\frac{\left(a^2+2b^2\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{2a^3}+\frac{1}{2a\left(\tan\left(\frac{dx}{2}\right.\right.}}{d}$
default	$\frac{-\frac{2b^3 \arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{a^3\sqrt{(a-b)(a+b)}}-\frac{1}{2a\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^2}-\frac{-a-2b}{2a^2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}+\frac{\left(a^2+2b^2\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{2a^3}+\frac{1}{2a\left(\tan\left(\frac{dx}{2}\right.\right.}}{d}$
risch	$-\frac{i\left(a\,e^{3i(dx+c)}+2b\,e^{2i(dx+c)}-a\,e^{i(dx+c)}+2b\right)}{d\,a^2\left(e^{2i(dx+c)}+1\right)^2}-\frac{\ln\left(e^{i(dx+c)}-i\right)}{2da}-\frac{\ln\left(e^{i(dx+c)}-i\right)b^2}{a^3d}+\frac{\ln\left(e^{i(dx+c)}+i\right)}{2ad}+\frac{\ln\left(e^{i(dx\right.}}{}$

[In] int(sec(d*x+c)^3/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)

[Out] 1/d*(-2*b^3/a^3/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2))-1/2/a/(tan(1/2*d*x+1/2*c)+1)^2-1/2*(-a-2*b)/a^2/(tan(1/2*d*x+1/2*c)+1)+1/2*(a^2+2*b^2)/a^3*ln(tan(1/2*d*x+1/2*c)+1)+1/2/a/(tan(1/2*d*x+1/2*c)-1)^2-1/2*(-a-2*b)/a^2/(tan(1/2*d*x+1/2*c)-1)+1/2/a^3*(-a^2-2*b^2)*ln(tan(1/2*d*x+1/2*c)-1))

Fricas [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 459, normalized size of antiderivative = 3.86

$$\int \frac{\sec^3(c+dx)}{a+b\cos(c+dx)}\,dx$$
$$=\left[-\frac{2\sqrt{-a^2+b^2}b^3\cos(dx+c)^2\log\left(\frac{2ab\cos(dx+c)+(2a^2-b^2)\cos(dx+c)^2-2\sqrt{-a^2+b^2}(a\cos(dx+c)+b)\sin(dx+c)-a^2+2b^2}{b^2\cos(dx+c)^2+2ab\cos(dx+c)+a^2}\right)-}{}\right.$$
$$-\frac{4\sqrt{a^2-b^2}b^3\arctan\left(-\frac{a\cos(dx+c)+b}{\sqrt{a^2-b^2}\sin(dx+c)}\right)\cos(dx+c)^2-(a^4+a^2b^2-2b^4)\cos(dx+c)^2\log(\sin(dx+c)}{4(a^5}$$

[In] integrate(sec(d*x+c)^3/(a+b*cos(d*x+c)),x, algorithm="fricas")

[Out] [-1/4*(2*sqrt(-a^2 + b^2)*b^3*cos(d*x + c)^2*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x + c)^2 - 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) - (a^4 + a^2*b^2 - 2*b^4)*cos(d*x + c)^2*log(sin(d*x + c) + 1) + (a^4 + a^2*b^2 - 2*b^4)*cos(d*x + c)^2*log(-sin(d*x + c) + 1) - 2*(a^4 - a^2*b^2 - 2*(a^3*b

```
 - a*b^3)*cos(d*x + c))*sin(d*x + c))/((a^5 - a^3*b^2)*d*cos(d*x + c)^2), -
1/4*(4*sqrt(a^2 - b^2)*b^3*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*si
n(d*x + c)))*cos(d*x + c)^2 - (a^4 + a^2*b^2 - 2*b^4)*cos(d*x + c)^2*log(si
n(d*x + c) + 1) + (a^4 + a^2*b^2 - 2*b^4)*cos(d*x + c)^2*log(-sin(d*x + c)
+ 1) - 2*(a^4 - a^2*b^2 - 2*(a^3*b - a*b^3)*cos(d*x + c))*sin(d*x + c))/((a
^5 - a^3*b^2)*d*cos(d*x + c)^2)]
```

Sympy [F]

$$\int \frac{\sec^3(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\sec^3{(c+dx)}}{a+b\cos{(c+dx)}}\,dx$$

```
[In] integrate(sec(d*x+c)**3/(a+b*cos(d*x+c)),x)
[Out] Integral(sec(c + d*x)**3/(a + b*cos(c + d*x)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sec^3(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(sec(d*x+c)^3/(a+b*cos(d*x+c)),x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 211, normalized size of antiderivative = 1.77

$$\int \frac{\sec^3(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{\frac{4\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor\operatorname{sgn}(-2a+2b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{a^2-b^2}}\right)\right)b^3}{\sqrt{a^2-b^2}a^3}+\frac{(a^2+2b^2)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)}{a^3}-\frac{(a^2+2b^2)\log\left(\left|\tan\left(\right.\right.\right.}{a^3}}{2d}$$

```
[In] integrate(sec(d*x+c)^3/(a+b*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/2*(4*(pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1
/2*d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))*b^3/(sqrt(a^2 -
 b^2)*a^3) + (a^2 + 2*b^2)*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^3 - (a^2 +
2*b^2)*log(abs(tan(1/2*d*x + 1/2*c) - 1))/a^3 + 2*(a*tan(1/2*d*x + 1/2*c)^3
 + 2*b*tan(1/2*d*x + 1/2*c)^3 + a*tan(1/2*d*x + 1/2*c) - 2*b*tan(1/2*d*x +
1/2*c))/((tan(1/2*d*x + 1/2*c)^2 - 1)^2*a^2))/d
```

Mupad [B] (verification not implemented)

Time = 15.79 (sec) , antiderivative size = 1087, normalized size of antiderivative = 9.13

$$\int \frac{\sec^3(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Too large to display}$$

```
[In] int(1/(cos(c + d*x)^3*(a + b*cos(c + d*x))),x)
```

```
[Out] (a*(sin(c + d*x)/2 + atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2))/2 + (atan
h(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2))*cos(2*c + 2*d*x))/2))/(d*(a^2 - b^
2)*(cos(2*c + 2*d*x)/2 + 1/2)) + ((b^2*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (
d*x)/2)))/2 - (b^2*sin(c + d*x))/2 + (b^2*atanh(sin(c/2 + (d*x)/2)/cos(c/2
+ (d*x)/2))*cos(2*c + 2*d*x))/2)/(a*d*(a^2 - b^2)*(cos(2*c + 2*d*x)/2 + 1/2
)) - (b*sin(2*c + 2*d*x))/(2*d*(a^2 - b^2)*(cos(2*c + 2*d*x)/2 + 1/2)) - (b
^3*atan(((a^9*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) + 8*b^7*sin(c/2 + (d*x)/
2)*(b^2 - a^2)^(3/2) - 8*b^9*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) + 8*a^2*b
^7*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) + 3*a^4*b^5*sin(c/2 + (d*x)/2)*(b^2
 - a^2)^(1/2) - 3*a^5*b^4*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) - 2*a^6*b^3*
sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) + 2*a^7*b^2*sin(c/2 + (d*x)/2)*(b^2 -
a^2)^(1/2) - a^8*b*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2))*1i)/(cos(c/2 + (d*
x)/2)*(a*b^2 - a^3)*(a^7 - 3*a^3*b^4 + 2*a^5*b^2)))*1i)/(a^3*d*(b^2 - a^2)^
(1/2)*(cos(2*c + 2*d*x)/2 + 1/2)) - (b^4*atanh(sin(c/2 + (d*x)/2)/cos(c/2 +
 (d*x)/2)))/(a^3*d*(a^2 - b^2)*(cos(2*c + 2*d*x)/2 + 1/2)) + (b^3*sin(2*c +
 2*d*x))/(2*a^2*d*(a^2 - b^2)*(cos(2*c + 2*d*x)/2 + 1/2)) - (b^3*atan(((a^9
*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) + 8*b^7*sin(c/2 + (d*x)/2)*(b^2 - a^2
)^(3/2) - 8*b^9*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) + 8*a^2*b^7*sin(c/2 +
(d*x)/2)*(b^2 - a^2)^(1/2) + 3*a^4*b^5*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2)
 - 3*a^5*b^4*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) - 2*a^6*b^3*sin(c/2 + (d*
x)/2)*(b^2 - a^2)^(1/2) + 2*a^7*b^2*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) -
a^8*b*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2))*1i)/(cos(c/2 + (d*x)/2)*(a*b^2
- a^3)*(a^7 - 3*a^3*b^4 + 2*a^5*b^2)))*cos(2*c + 2*d*x)*1i)/(a^3*d*(b^2 - a
^2)^(1/2)*(cos(2*c + 2*d*x)/2 + 1/2)) - (b^4*atanh(sin(c/2 + (d*x)/2)/cos(c
/2 + (d*x)/2))*cos(2*c + 2*d*x))/(a^3*d*(a^2 - b^2)*(cos(2*c + 2*d*x)/2 + 1
/2))
```

3.458 $\int \frac{\sec^4(c+dx)}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 157

$$\int \frac{\sec^4(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{2b^4\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^4\sqrt{a-b}\sqrt{a+b}d} - \frac{b(a^2+2b^2)\operatorname{arctanh}(\sin(c+dx))}{2a^4d} + \frac{(2a^2+3b^2)\tan(c+dx)}{3a^3d} - \frac{b\sec(c+dx)\tan(c+dx)}{2a^2d} + \frac{\sec^2(c+dx)\tan(c+dx)}{3ad}$$

```
[Out] -1/2*b*(a^2+2*b^2)*arctanh(sin(d*x+c))/a^4/d+2*b^4*arctan((a-b)^(1/2)*tan(1
/2*d*x+1/2*c)/(a+b)^(1/2))/a^4/d/(a-b)^(1/2)/(a+b)^(1/2)+1/3*(2*a^2+3*b^2)*
tan(d*x+c)/a^3/d-1/2*b*sec(d*x+c)*tan(d*x+c)/a^2/d+1/3*sec(d*x+c)^2*tan(d*x
+c)/a/d
```

Rubi [A] (verified)

Time = 0.64 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2881, 3134, 3080, 3855, 2738, 211}

$$\int \frac{\sec^4(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{2b^4\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^4d\sqrt{a-b}\sqrt{a+b}} - \frac{b\tan(c+dx)\sec(c+dx)}{2a^2d} - \frac{b(a^2+2b^2)\operatorname{arctanh}(\sin(c+dx))}{2a^4d} + \frac{(2a^2+3b^2)\tan(c+dx)}{3a^3d} + \frac{\tan(c+dx)\sec^2(c+dx)}{3ad}$$

```
[In] Int[Sec[c + d*x]^4/(a + b*Cos[c + d*x]),x]
```

```
[Out] (2*b^4*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/(a^4*Sqrt[a - b]
*Sqrt[a + b]*d) - (b*(a^2 + 2*b^2)*ArcTanh[Sin[c + d*x]])/(2*a^4*d) + ((2*a
^2 + 3*b^2)*Tan[c + d*x])/(3*a^3*d) - (b*Sec[c + d*x]*Tan[c + d*x])/(2*a^2*
d) + (Sec[c + d*x]^2*Tan[c + d*x])/(3*a*d)
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 3080

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[(A*b
- a*B)/(b*c - a*d), Int[1/(a + b*Sin[e + f*x]), x], x] + Dist[(B*c - A*d)/(
b*c - a*d), Int[1/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f,
A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
```

```
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sec^2(c+dx)\tan(c+dx)}{3ad}+\frac{\int \frac{(-3b+2a\cos(c+dx)+2b\cos^2(c+dx))\sec^3(c+dx)}{a+b\cos(c+dx)}\,dx}{3a}\\
&= -\frac{b\sec(c+dx)\tan(c+dx)}{2a^2d}+\frac{\sec^2(c+dx)\tan(c+dx)}{3ad}\\
&\quad+\frac{\int \frac{(2(2a^2+3b^2)+ab\cos(c+dx)-3b^2\cos^2(c+dx))\sec^2(c+dx)}{a+b\cos(c+dx)}\,dx}{6a^2}\\
&= \frac{(2a^2+3b^2)\tan(c+dx)}{3a^3d}-\frac{b\sec(c+dx)\tan(c+dx)}{2a^2d}\\
&\quad+\frac{\sec^2(c+dx)\tan(c+dx)}{3ad}+\frac{\int \frac{(-3b(a^2+2b^2)-3ab^2\cos(c+dx))\sec(c+dx)}{a+b\cos(c+dx)}\,dx}{6a^3}\\
&= \frac{(2a^2+3b^2)\tan(c+dx)}{3a^3d}-\frac{b\sec(c+dx)\tan(c+dx)}{2a^2d}+\frac{\sec^2(c+dx)\tan(c+dx)}{3ad}\\
&\quad+\frac{b^4\int \frac{1}{a+b\cos(c+dx)}\,dx}{a^4}-\frac{(b(a^2+2b^2))\int \sec(c+dx)\,dx}{2a^4}\\
&= -\frac{b(a^2+2b^2)\operatorname{arctanh}(\sin(c+dx))}{2a^4d}+\frac{(2a^2+3b^2)\tan(c+dx)}{3a^3d}-\frac{b\sec(c+dx)\tan(c+dx)}{2a^2d}\\
&\quad+\frac{\sec^2(c+dx)\tan(c+dx)}{3ad}+\frac{(2b^4)\operatorname{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}\,dx,x,\tan\left(\frac{1}{2}(c+dx)\right)\right)}{a^4d}\\
&= \frac{2b^4\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^4\sqrt{a-b}\sqrt{a+b}d}-\frac{b(a^2+2b^2)\operatorname{arctanh}(\sin(c+dx))}{2a^4d}\\
&\quad+\frac{(2a^2+3b^2)\tan(c+dx)}{3a^3d}-\frac{b\sec(c+dx)\tan(c+dx)}{2a^2d}+\frac{\sec^2(c+dx)\tan(c+dx)}{3ad}
\end{aligned}$$

Mathematica [A] (verified)

Time = 1.83 (sec) , antiderivative size = 258, normalized size of antiderivative = 1.64

$$\int \frac{\sec^4(c+dx)}{a+b\cos(c+dx)}\,dx$$
$$= \frac{-\frac{24b^4\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}} + \frac{1}{2}\sec^3(c+dx)\left(9b(a^2+2b^2)\cos(c+dx)\left(\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c\right.\right.\right.\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^4/(a + b*Cos[c + d*x]),x]
```

```
[Out] ((-24*b^4*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/Sqrt[-a^2 +
 b^2] + (Sec[c + d*x]^3*(9*b*(a^2 + 2*b^2)*Cos[c + d*x]*(Log[Cos[(c + d*x)/
2] - Sin[(c + d*x)/2]] - Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) + 3*b*(a
^2 + 2*b^2)*Cos[3*(c + d*x)]*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - Lo
g[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) + 4*a*(4*a^2 + 3*b^2 - 3*a*b*Cos[c
+ d*x] + (2*a^2 + 3*b^2)*Cos[2*(c + d*x)])*Sin[c + d*x]))/2)/(12*a^4*d)
```

Maple [A] (verified)

Time = 1.53 (sec) , antiderivative size = 252, normalized size of antiderivative = 1.61

method	result
derivativedivides	$\frac{-\frac{1}{3a\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^3}-\frac{-a-b}{2a^2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^2}-\frac{2a^2+ab+2b^2}{2a^3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}-\frac{b\left(a^2+2b^2\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{2a^4}+\frac{2b^4\arctan\left(\frac{(a-b)\tan}{\sqrt{(a-}}\right.}{a^4\sqrt{(a-b)(}}}{d}$
default	$\frac{-\frac{1}{3a\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^3}-\frac{-a-b}{2a^2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^2}-\frac{2a^2+ab+2b^2}{2a^3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}-\frac{b\left(a^2+2b^2\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{2a^4}+\frac{2b^4\arctan\left(\frac{(a-b)\tan}{\sqrt{(a-}}\right.}{a^4\sqrt{(a-b)(}}}{d}$
risch	$\frac{i\left(3ab\,e^{5i(dx+c)}+6b^2e^{4i(dx+c)}+12a^2e^{2i(dx+c)}+12b^2e^{2i(dx+c)}-3ab\,e^{i(dx+c)}+4a^2+6b^2\right)}{3a^3d\left(e^{2i(dx+c)}+1\right)^3}+\frac{b\ln\left(e^{i(dx+c)}-i\right)}{2a^2d}+\frac{b^3\ln(e}{}$

```
[In] int(sec(d*x+c)^4/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-1/3/a/(tan(1/2*d*x+1/2*c)+1)^3-1/2*(-a-b)/a^2/(tan(1/2*d*x+1/2*c)+1)^
2-1/2*(2*a^2+a*b+2*b^2)/a^3/(tan(1/2*d*x+1/2*c)+1)-1/2*b*(a^2+2*b^2)/a^4*ln
(tan(1/2*d*x+1/2*c)+1)+2*b^4/a^4/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d
*x+1/2*c)/((a-b)*(a+b))^(1/2))-1/3/a/(tan(1/2*d*x+1/2*c)-1)^3-1/2*(a+b)/a^2
/(tan(1/2*d*x+1/2*c)-1)^2-1/2*(2*a^2+a*b+2*b^2)/a^3/(tan(1/2*d*x+1/2*c)-1)+
1/2*b*(a^2+2*b^2)/a^4*ln(tan(1/2*d*x+1/2*c)-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.40 (sec) , antiderivative size = 535, normalized size of antiderivative = 3.41

$$\int \frac{\sec^4(c+dx)}{a+b\cos(c+dx)}\,dx = \left[-\frac{6\sqrt{-a^2+b^2}b^4\cos(dx+c)^3\log\left(\frac{2\,ab\cos(dx+c)+(2\,a^2-b^2)\cos(dx+c)^2+2\,\sqrt{-a^2+b^2}(a\cos(dx+c)+b)\sin(dx+c)-a^2+2\,b^2}{b^2\cos(dx+c)^2+2\,ab\cos(dx+c)+a^2}\right)+3\right.$$

```
[In] integrate(sec(d*x+c)^4/(a+b*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] [-1/12*(6*sqrt(-a^2 + b^2)*b^4*cos(d*x + c)^3*log((2*a*b*cos(d*x + c) + (2*
a^2 - b^2)*cos(d*x + c)^2 + 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x
 + c) - a^2 + 2*b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) + 3*(
a^4*b + a^2*b^3 - 2*b^5)*cos(d*x + c)^3*log(sin(d*x + c) + 1) - 3*(a^4*b +
a^2*b^3 - 2*b^5)*cos(d*x + c)^3*log(-sin(d*x + c) + 1) - 2*(2*a^5 - 2*a^3*b
^2 + 2*(2*a^5 + a^3*b^2 - 3*a*b^4)*cos(d*x + c)^2 - 3*(a^4*b - a^2*b^3)*cos
(d*x + c))*sin(d*x + c))/((a^6 - a^4*b^2)*d*cos(d*x + c)^3), 1/12*(12*sqrt(
a^2 - b^2)*b^4*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c)))
*cos(d*x + c)^3 - 3*(a^4*b + a^2*b^3 - 2*b^5)*cos(d*x + c)^3*log(sin(d*x +
c) + 1) + 3*(a^4*b + a^2*b^3 - 2*b^5)*cos(d*x + c)^3*log(-sin(d*x + c) + 1)
 + 2*(2*a^5 - 2*a^3*b^2 + 2*(2*a^5 + a^3*b^2 - 3*a*b^4)*cos(d*x + c)^2 - 3*
(a^4*b - a^2*b^3)*cos(d*x + c))*sin(d*x + c))/((a^6 - a^4*b^2)*d*cos(d*x +
c)^3)]
```

Sympy [F]

$$\int \frac{\sec^4(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\sec^4{(c+dx)}}{a+b\cos{(c+dx)}}\,dx$$

```
[In] integrate(sec(d*x+c)**4/(a+b*cos(d*x+c)),x)
```

```
[Out] Integral(sec(c + d*x)**4/(a + b*cos(c + d*x)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sec^4(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(sec(d*x+c)^4/(a+b*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 286 vs. $2(140) = 280$.

Time = 0.34 (sec) , antiderivative size = 286, normalized size of antiderivative = 1.82

$$\int \frac{\sec^4(c+dx)}{a+b\cos(c+dx)}\,dx = -\frac{\frac{12\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor\operatorname{sgn}(-2a+2b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{a^2-b^2}}\right)\right)b^4}{\sqrt{a^2-b^2}a^4}+\frac{3(a^2b+2b^3)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)}{a^4}-\frac{3(a^2b+2b^3}{}}{}$$

```
[In] integrate(sec(d*x+c)^4/(a+b*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/6*(12*(pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan
(1/2*d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))*b^4/(sqrt(a^2
 - b^2)*a^4) + 3*(a^2*b + 2*b^3)*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^4 - 3
*(a^2*b + 2*b^3)*log(abs(tan(1/2*d*x + 1/2*c) - 1))/a^4 + 2*(6*a^2*tan(1/2*
d*x + 1/2*c)^5 + 3*a*b*tan(1/2*d*x + 1/2*c)^5 + 6*b^2*tan(1/2*d*x + 1/2*c)^
5 - 4*a^2*tan(1/2*d*x + 1/2*c)^3 - 12*b^2*tan(1/2*d*x + 1/2*c)^3 + 6*a^2*ta
n(1/2*d*x + 1/2*c) - 3*a*b*tan(1/2*d*x + 1/2*c) + 6*b^2*tan(1/2*d*x + 1/2*c
))/((tan(1/2*d*x + 1/2*c)^2 - 1)^3*a^3))/d
```

Mupad [B] (verification not implemented)

Time = 17.28 (sec) , antiderivative size = 991, normalized size of antiderivative = 6.31

$$\int \frac{\sec^4(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Too large to display}$$

```
[In] int(1/(cos(c + d*x)^4*(a + b*cos(c + d*x))),x)
```

```
[Out] (a^5*(sin(c + d*x)/2 + sin(3*c + 3*d*x)/6) - a^4*((b*sin(2*c + 2*d*x))/4 +
(b*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2))*cos(3*c + 3*d*x))/4 + (3*b*
cos(c + d*x)*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/4) - a^2*((3*b^3
*cos(c + d*x)*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/4 - (b^3*sin(2*
c + 2*d*x))/4 + (b^3*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2))*cos(3*c +
 3*d*x))/4) - a^3*((b^2*sin(c + d*x))/4 - (b^2*sin(3*c + 3*d*x))/12) - a*((
b^4*sin(c + d*x))/4 + (b^4*sin(3*c + 3*d*x))/4) + (3*b^5*cos(c + d*x)*atanh
(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/2 + (b^5*atanh(sin(c/2 + (d*x)/2)/
cos(c/2 + (d*x)/2))*cos(3*c + 3*d*x))/2 + (3*b^4*atanh((a^9*sin(c/2 + (d*x)
/2)*(b^2 - a^2)^(1/2) + 8*b^7*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(3/2) - 8*b^9*
sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) + 8*a^2*b^7*sin(c/2 + (d*x)/2)*(b^2 -
a^2)^(1/2) + 3*a^4*b^5*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) - 3*a^5*b^4*sin
(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) - 2*a^6*b^3*sin(c/2 + (d*x)/2)*(b^2 - a^2
)^(1/2) + 2*a^7*b^2*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) - a^8*b*sin(c/2 +
(d*x)/2)*(b^2 - a^2)^(1/2))/(cos(c/2 + (d*x)/2)*(a*b^2 - a^3)*(a^7 - 3*a^3*
b^4 + 2*a^5*b^2)))*cos(c + d*x)*(b^2 - a^2)^(1/2))/2 + (b^4*atanh((a^9*sin(
c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) + 8*b^7*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(3/
2) - 8*b^9*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) + 8*a^2*b^7*sin(c/2 + (d*x)
/2)*(b^2 - a^2)^(1/2) + 3*a^4*b^5*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) - 3*
a^5*b^4*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) - 2*a^6*b^3*sin(c/2 + (d*x)/2)
*(b^2 - a^2)^(1/2) + 2*a^7*b^2*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2) - a^8*b
*sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2))/(cos(c/2 + (d*x)/2)*(a*b^2 - a^3)*(a
^7 - 3*a^3*b^4 + 2*a^5*b^2)))*cos(3*c + 3*d*x)*(b^2 - a^2)^(1/2))/2)/(a^4*d
*((3*cos(c + d*x))/4 + cos(3*c + 3*d*x)/4)*(a^2 - b^2))
```

3.459 $\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^2} dx$

Optimal result

Integrand size = 21, antiderivative size = 266

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^2} dx = -\frac{a(4a^2+b^2)x}{b^5} + \frac{2a^4(4a^2-5b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{3/2}b^5(a+b)^{3/2}d} + \frac{(12a^4-7a^2b^2-2b^4)\sin(c+dx)}{3b^4(a^2-b^2)d} - \frac{a(2a^2-b^2)\cos(c+dx)\sin(c+dx)}{b^3(a^2-b^2)d} + \frac{(4a^2-b^2)\cos^2(c+dx)\sin(c+dx)}{3b^2(a^2-b^2)d} - \frac{a^2\cos^3(c+dx)\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))}$$

```
[Out] -a*(4*a^2+b^2)*x/b^5+2*a^4*(4*a^2-5*b^2)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2
*c)/(a+b)^(1/2))/(a-b)^(3/2)/b^5/(a+b)^(3/2)/d+1/3*(12*a^4-7*a^2*b^2-2*b^4)
*sin(d*x+c)/b^4/(a^2-b^2)/d-a*(2*a^2-b^2)*cos(d*x+c)*sin(d*x+c)/b^3/(a^2-b^
2)/d+1/3*(4*a^2-b^2)*cos(d*x+c)^2*sin(d*x+c)/b^2/(a^2-b^2)/d-a^2*cos(d*x+c)
^3*sin(d*x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.79 (sec) , antiderivative size = 266, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {2871, 3128, 3102, 2814, 2738, 211}

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^2}\,dx = -\frac{a^2\sin(c+dx)\cos^3(c+dx)}{bd\,(a^2-b^2)\,(a+b\cos(c+dx))} + \frac{(4a^2-b^2)\sin(c+dx)\cos^2(c+dx)}{3b^2d\,(a^2-b^2)} - \frac{ax(4a^2+b^2)}{b^5} - \frac{a(2a^2-b^2)\sin(c+dx)\cos(c+dx)}{b^3d\,(a^2-b^2)} + \frac{2a^4(4a^2-5b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{b^5d(a-b)^{3/2}(a+b)^{3/2}} + \frac{(12a^4-7a^2b^2-2b^4)\sin(c+dx)}{3b^4d\,(a^2-b^2)}$$

```
[In] Int[Cos[c + d*x]^5/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] -((a*(4*a^2 + b^2)*x)/b^5) + (2*a^4*(4*a^2 - 5*b^2)*ArcTan[(Sqrt[a - b]*Tan
[(c + d*x)/2])/Sqrt[a + b]])/((a - b)^(3/2)*b^5*(a + b)^(3/2)*d) + ((12*a^4
 - 7*a^2*b^2 - 2*b^4)*Sin[c + d*x])/(3*b^4*(a^2 - b^2)*d) - (a*(2*a^2 - b^2
)*Cos[c + d*x]*Sin[c + d*x])/(b^3*(a^2 - b^2)*d) + ((4*a^2 - b^2)*Cos[c + d
*x]^2*Sin[c + d*x])/(3*b^2*(a^2 - b^2)*d) - (a^2*Cos[c + d*x]^3*Sin[c + d*x
])/(b*(a^2 - b^2)*d*(a + b*Cos[c + d*x]))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rule 3128

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*sin[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_
.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n + 2))), x] + Dist[1/(d*(m +
n + 2)), Int[(a + b*Sin[e + f*x])^(m - 1)*(c + d*Sin[e + f*x])^n*Simp[a*A*d
*(m + n + 2) + C*(b*c*m + a*d*(n + 1)) + (d*(A*b + a*B)*(m + n + 2) - C*(a*
c - b*d*(m + n + 1)))*Sin[e + f*x] + (C*(a*d*m - b*c*(m + 1)) + b*B*d*(m +
n + 2))*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n},
 x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m
, 0] &&  !(IGtQ[n, 0] && ( !IntegerQ[m] || (EqQ[a, 0] && NeQ[c, 0])))
```

Rubi steps

$$\text{integral} = -\frac{a^2\cos^3(c+dx)\sin(c+dx)}{b(a^2-b^2)\,d(a+b\cos(c+dx))} - \frac{\int \frac{\cos^2(c+dx)\left(3a^2-ab\cos(c+dx)-(4a^2-b^2)\cos^2(c+dx)\right)}{a+b\cos(c+dx)}\,dx}{b(a^2-b^2)}$$

$$= \frac{(4a^2-b^2)\cos^2(c+dx)\sin(c+dx)}{3b^2(a^2-b^2)\,d} - \frac{a^2\cos^3(c+dx)\sin(c+dx)}{b(a^2-b^2)\,d(a+b\cos(c+dx))} - \frac{\int \frac{\cos(c+dx)\left(-2a(4a^2-b^2)+b(a^2+2b^2)\cos(c+dx)+6a(2a^2-b^2)\cos^2(c+dx)\right)}{a+b\cos(c+dx)}\,dx}{3b^2(a^2-b^2)}$$

$$= -\frac{a(2a^2-b^2)\cos(c+dx)\sin(c+dx)}{b^3(a^2-b^2)d} + \frac{(4a^2-b^2)\cos^2(c+dx)\sin(c+dx)}{3b^2(a^2-b^2)d} - \frac{a^2\cos^3(c+dx)\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))} - \frac{\int \frac{6a^2(2a^2-b^2)-2ab(2a^2+b^2)\cos(c+dx)-2(12a^4-7a^2b^2-2b^4)\cos^2(c+dx)}{a+b\cos(c+dx)}dx}{6b^3(a^2-b^2)}$$

$$= \frac{(12a^4-7a^2b^2-2b^4)\sin(c+dx)}{3b^4(a^2-b^2)d} - \frac{a(2a^2-b^2)\cos(c+dx)\sin(c+dx)}{b^3(a^2-b^2)d} + \frac{(4a^2-b^2)\cos^2(c+dx)\sin(c+dx)}{3b^2(a^2-b^2)d} - \frac{a^2\cos^3(c+dx)\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))} - \frac{\int \frac{6a^2b(2a^2-b^2)+6a(a^2-b^2)(4a^2+b^2)\cos(c+dx)}{a+b\cos(c+dx)}dx}{6b^4(a^2-b^2)}$$

$$= -\frac{a(4a^2+b^2)x}{b^5} + \frac{(12a^4-7a^2b^2-2b^4)\sin(c+dx)}{3b^4(a^2-b^2)d} - \frac{a(2a^2-b^2)\cos(c+dx)\sin(c+dx)}{b^3(a^2-b^2)d} + \frac{(4a^2-b^2)\cos^2(c+dx)\sin(c+dx)}{3b^2(a^2-b^2)d} - \frac{a^2\cos^3(c+dx)\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))} + \frac{(a^4(4a^2-5b^2))\int \frac{1}{a+b\cos(c+dx)}dx}{b^5(a^2-b^2)}$$

$$= -\frac{a(4a^2+b^2)x}{b^5} + \frac{(12a^4-7a^2b^2-2b^4)\sin(c+dx)}{3b^4(a^2-b^2)d} - \frac{a(2a^2-b^2)\cos(c+dx)\sin(c+dx)}{b^3(a^2-b^2)d} + \frac{(4a^2-b^2)\cos^2(c+dx)\sin(c+dx)}{3b^2(a^2-b^2)d} - \frac{a^2\cos^3(c+dx)\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))} + \frac{(2a^4(4a^2-5b^2))\,\text{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{b^5(a^2-b^2)d}$$

$$= -\frac{a(4a^2+b^2)x}{b^5} + \frac{2a^4(4a^2-5b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{3/2}b^5(a+b)^{3/2}d} + \frac{(12a^4-7a^2b^2-2b^4)\sin(c+dx)}{3b^4(a^2-b^2)d} - \frac{a(2a^2-b^2)\cos(c+dx)\sin(c+dx)}{b^3(a^2-b^2)d} + \frac{(4a^2-b^2)\cos^2(c+dx)\sin(c+dx)}{3b^2(a^2-b^2)d} - \frac{a^2\cos^3(c+dx)\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.91 (sec) , antiderivative size = 176, normalized size of antiderivative = 0.66

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$
$$=\frac{-12a(2a-ib)(2a+ib)(c+dx)+\frac{24a^4(4a^2-5b^2)\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{3/2}}+9b(4a^2+b^2)\sin(c+dx)+\frac{\ldots}{(a-b)\ldots}}{12b^5d}$$

```
[In] Integrate[Cos[c + d*x]^5/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (-12*a*(2*a - I*b)*(2*a + I*b)*(c + d*x) + (24*a^4*(4*a^2 - 5*b^2)*ArcTanh[
((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/(-a^2 + b^2)^(3/2) + 9*b*(4*a
^2 + b^2)*Sin[c + d*x] + (12*a^5*b*Sin[c + d*x])/((a - b)*(a + b)*(a + b*Co
s[c + d*x])) - 6*a*b^2*Sin[2*(c + d*x)] + b^3*Sin[3*(c + d*x)])/(12*b^5*d)
```

Maple [A] (verified)

Time = 1.52 (sec) , antiderivative size = 257, normalized size of antiderivative = 0.97

method	result
derivativedivides	$\frac{\frac{2a^4\left(\frac{ab\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{(a^2-b^2)\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)}+\frac{(4a^2-5b^2)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{(a-b)(a+b)\sqrt{(a-b)(a+b)}}\right)}{b^5}-\frac{2\left(\left(-3a^2b-a\,b^2-b^3\right)\ldots\right.}{\ldots}}{d}$
default	$\frac{\frac{2a^4\left(\frac{ab\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{(a^2-b^2)\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)}+\frac{(4a^2-5b^2)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{(a-b)(a+b)\sqrt{(a-b)(a+b)}}\right)}{b^5}-\frac{2\left(\left(-3a^2b-a\,b^2-b^3\right)\ldots\right.}{\ldots}}{d}$
risch	$-\frac{4a^3x}{b^5}-\frac{ax}{b^3}+\frac{ia\,e^{2i(dx+c)}}{4b^3d}-\frac{3ie^{i(dx+c)}a^2}{2b^4d}-\frac{3ie^{i(dx+c)}}{8b^2d}+\frac{3ie^{-i(dx+c)}a^2}{2b^4d}+\frac{3ie^{-i(dx+c)}}{8b^2d}-\frac{ia\,e^{-2i(dx+c)}}{4b^3d}-\ldots$

```
[In] int(cos(d*x+c)^5/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(2/b^5*a^4*(a*b/(a^2-b^2)*tan(1/2*d*x+1/2*c)/(tan(1/2*d*x+1/2*c)^2*a-b*
tan(1/2*d*x+1/2*c)^2+a+b)+(4*a^2-5*b^2)/(a-b)/(a+b)/((a-b)*(a+b))^(1/2)*arc
tan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2)))-2/b^5*(((-3*a^2*b-a*b^2-
b^3)*tan(1/2*d*x+1/2*c)^5+(-6*a^2*b-2/3*b^3)*tan(1/2*d*x+1/2*c)^3+(-3*a^2*b
+a*b^2-b^3)*tan(1/2*d*x+1/2*c))/(1+tan(1/2*d*x+1/2*c)^2)^3+a*(4*a^2+b^2)*ar
ctan(tan(1/2*d*x+1/2*c))))
```

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 747, normalized size of antiderivative = 2.81

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$
$$= \left[-\frac{6\,(4\,a^7b-7\,a^5b^3+2\,a^3b^5+ab^7)dx\cos{(dx+c)}+6\,(4\,a^8-7\,a^6b^2+2\,a^4b^4+a^2b^6)dx+3\,(4\,a^7-5\,a^5b^2+\cdots}{\cdots} \right.$$
$$-\frac{3\,(4\,a^7b-7\,a^5b^3+2\,a^3b^5+ab^7)dx\cos{(dx+c)}+3\,(4\,a^8-7\,a^6b^2+2\,a^4b^4+a^2b^6)dx-3\,(4\,a^7-5\,a^5b^2+\cdots}{\cdots}$$

```
[In] integrate(cos(d*x+c)^5/(a+b*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] [-1/6*(6*(4*a^7*b - 7*a^5*b^3 + 2*a^3*b^5 + a*b^7)*d*x*cos(d*x + c) + 6*(4*
a^8 - 7*a^6*b^2 + 2*a^4*b^4 + a^2*b^6)*d*x + 3*(4*a^7 - 5*a^5*b^2 + (4*a^6*
b - 5*a^4*b^3)*cos(d*x + c))*sqrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (2*
a^2 - b^2)*cos(d*x + c)^2 + 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x
 + c) - a^2 + 2*b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) - 2*(
12*a^7*b - 19*a^5*b^3 + 5*a^3*b^5 + 2*a*b^7 + (a^4*b^4 - 2*a^2*b^6 + b^8)*c
os(d*x + c)^3 - 2*(a^5*b^3 - 2*a^3*b^5 + a*b^7)*cos(d*x + c)^2 + 2*(3*a^6*b
^2 - 5*a^4*b^4 + a^2*b^6 + b^8)*cos(d*x + c))*sin(d*x + c))/((a^4*b^6 - 2*a
^2*b^8 + b^10)*d*cos(d*x + c) + (a^5*b^5 - 2*a^3*b^7 + a*b^9)*d), -1/3*(3*(
4*a^7*b - 7*a^5*b^3 + 2*a^3*b^5 + a*b^7)*d*x*cos(d*x + c) + 3*(4*a^8 - 7*a^
6*b^2 + 2*a^4*b^4 + a^2*b^6)*d*x - 3*(4*a^7 - 5*a^5*b^2 + (4*a^6*b - 5*a^4*
b^3)*cos(d*x + c))*sqrt(a^2 - b^2)*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 -
 b^2)*sin(d*x + c))) - (12*a^7*b - 19*a^5*b^3 + 5*a^3*b^5 + 2*a*b^7 + (a^4*
b^4 - 2*a^2*b^6 + b^8)*cos(d*x + c)^3 - 2*(a^5*b^3 - 2*a^3*b^5 + a*b^7)*cos
(d*x + c)^2 + 2*(3*a^6*b^2 - 5*a^4*b^4 + a^2*b^6 + b^8)*cos(d*x + c))*sin(d
*x + c))/((a^4*b^6 - 2*a^2*b^8 + b^10)*d*cos(d*x + c) + (a^5*b^5 - 2*a^3*b^
7 + a*b^9)*d)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**5/(a+b*cos(d*x+c))**2,x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)^5/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 333, normalized size of antiderivative = 1.25

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \frac{\frac{6\,a^5\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{(a^2b^4-b^6)\left(a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+a+b\right)} - \frac{6\,(4\,a^6-5\,a^4b^2)\left(\pi\left\lfloor\frac{dx+c}{2\,\pi}+\frac{1}{2}\right\rfloor\mathrm{sgn}(-2\,a+2\,b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-b\tan\left(\frac{1}{2}\,dx\right.}{\sqrt{a^2-b^2}}\right.\right.}{(a^2b^5-b^7)\sqrt{a^2-b^2}}}{}$$

```
[In] integrate(cos(d*x+c)^5/(a+b*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/3*(6*a^5*tan(1/2*d*x + 1/2*c)/((a^2*b^4 - b^6)*(a*tan(1/2*d*x + 1/2*c)^2
- b*tan(1/2*d*x + 1/2*c)^2 + a + b)) - 6*(4*a^6 - 5*a^4*b^2)*(pi*floor(1/2*
(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1/2*d*x + 1/2*c) - b*t
an(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))/((a^2*b^5 - b^7)*sqrt(a^2 - b^2)) -
3*(4*a^3 + a*b^2)*(d*x + c)/b^5 + 2*(9*a^2*tan(1/2*d*x + 1/2*c)^5 + 3*a*b*t
an(1/2*d*x + 1/2*c)^5 + 3*b^2*tan(1/2*d*x + 1/2*c)^5 + 18*a^2*tan(1/2*d*x +
 1/2*c)^3 + 2*b^2*tan(1/2*d*x + 1/2*c)^3 + 9*a^2*tan(1/2*d*x + 1/2*c) - 3*a
*b*tan(1/2*d*x + 1/2*c) + 3*b^2*tan(1/2*d*x + 1/2*c))/((tan(1/2*d*x + 1/2*c
)^2 + 1)^3*b^4))/d
```

Mupad [B] (verification not implemented)

Time = 22.00 (sec) , antiderivative size = 3852, normalized size of antiderivative = 14.48

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Too large to display}$$

[In] int(cos(c + d*x)^5/(a + b*cos(c + d*x))^2,x)

[Out] - ((2*tan(c/2 + (d*x)/2)^3*(8*a*b^4 - 6*a^4*b - 36*a^5 - b^5 + 7*a^2*b^3 + 19*a^3*b^2))/(3*b^4*(a + b)*(a - b)) - (2*tan(c/2 + (d*x)/2)^7*(4*a^5 - 2*a^4*b + b^5 + a^2*b^3 - 3*a^3*b^2))/(b^4*(a + b)*(a - b)) + (2*tan(c/2 + (d*x)/2)^5*(8*a*b^4 + 6*a^4*b - 36*a^5 + b^5 - 7*a^2*b^3 + 19*a^3*b^2))/(3*b^4*(a + b)*(a - b)) + (2*tan(c/2 + (d*x)/2)*(b^5 - 4*a^5 - 2*a^4*b + a^2*b^3 + 3*a^3*b^2))/(b^4*(a + b)*(a - b)))/(d*(a + b + tan(c/2 + (d*x)/2)^8*(a - b) + tan(c/2 + (d*x)/2)^2*(4*a + 2*b) + tan(c/2 + (d*x)/2)^6*(4*a - 2*b) + 6*a*tan(c/2 + (d*x)/2)^4)) - (2*a*atan(((a*(4*a^2 + b^2)*((32*tan(c/2 + (d*x)/2)*(32*a^12 - 32*a^11*b + a^2*b^10 - 2*a^3*b^9 + 7*a^4*b^8 - 12*a^5*b^7 + 7*a^6*b^6 - 2*a^7*b^5 + 2*a^8*b^4 + 48*a^9*b^3 - 48*a^10*b^2))/(a*b^10 + b^11 - a^2*b^9 - a^3*b^8) + (a*(4*a^2 + b^2)*((32*(a*b^17 + a^3*b^15 - 5*a^4*b^14 - 4*a^5*b^13 + 9*a^6*b^12 + 2*a^7*b^11 - 4*a^8*b^10))/(a*b^14 + b^15 - a^2*b^13 - a^3*b^12) - (a*tan(c/2 + (d*x)/2)*(4*a^2 + b^2)*(2*a*b^15 - 2*a^2*b^14 - 4*a^3*b^13 + 4*a^4*b^12 + 2*a^5*b^11 - 2*a^6*b^10)*32i)/(b^5*(a*b^10 + b^11 - a^2*b^9 - a^3*b^8)))*1i)/b^5))/b^5 + (a*(4*a^2 + b^2)*((32*tan(c/2 + (d*x)/2)*(32*a^12 - 32*a^11*b + a^2*b^10 - 2*a^3*b^9 + 7*a^4*b^8 - 12*a^5*b^7 + 7*a^6*b^6 - 2*a^7*b^5 + 2*a^8*b^4 + 48*a^9*b^3 - 48*a^10*b^2))/(a*b^10 + b^11 - a^2*b^9 - a^3*b^8) - (a*(4*a^2 + b^2)*((32*(a*b^17 + a^3*b^15 - 5*a^4*b^14 - 4*a^5*b^13 + 9*a^6*b^12 + 2*a^7*b^11 - 4*a^8*b^10))/(a*b^14 + b^15 - a^2*b^13 - a^3*b^12) + (a*tan(c/2 + (d*x)/2)*(4*a^2 + b^2)*(2*a*b^15 - 2*a^2*b^14 - 4*a^3*b^13 + 4*a^4*b^12 + 2*a^5*b^11 - 2*a^6*b^10)*32i)/(b^5*(a*b^10 + b^11 - a^2*b^9 - a^3*b^8)))*1i)/b^5))/b^5)/((64*(64*a^14 - 32*a^13*b + 5*a^6*b^8 - 5*a^7*b^7 + 31*a^8*b^6 - 6*a^9*b^5 + 12*a^10*b^4 + 48*a^11*b^3 - 112*a^12*b^2))/(a*b^14 + b^15 - a^2*b^13 - a^3*b^12) - (a*(4*a^2 + b^2)*((32*tan(c/2 + (d*x)/2)*(32*a^12 - 32*a^11*b + a^2*b^10 - 2*a^3*b^9 + 7*a^4*b^8 - 12*a^5*b^7 + 7*a^6*b^6 - 2*a^7*b^5 + 2*a^8*b^4 + 48*a^9*b^3 - 48*a^10*b^2))/(a*b^10 + b^11 - a^2*b^9 - a^3*b^8) + (a*(4*a^2 + b^2)*((32*(a*b^17 + a^3*b^15 - 5*a^4*b^14 - 4*a^5*b^13 + 9*a^6*b^12 + 2*a^7*b^11 - 4*a^8*b^10))/(a*b^14 + b^15 - a^2*b^13 - a^3*b^12) - (a*tan(c/2 + (d*x)/2)*(4*a^2 + b^2)*(2*a*b^15 - 2*a^2*b^14 - 4*a^3*b^13 + 4*a^4*b^12 + 2*a^5*b^11 - 2*a^6*b^10)*32i)/(b^5*(a*b^10 + b^11 - a^2*b^9 - a^3*b^8)))*1i)/b^5)*1i)/b^5 + (a*(4*a^2 + b^2)*((32*tan(c/2 + (d*x)/2)*(32*a^12 - 32*a^11*b + a^2*b^10 - 2*a^3*b^9 + 7*a^4*b^8 - 12*a^5*b^7 + 7*a^6*b^6 - 2*a^7*b^5 + 2*a^8*b^4 + 48*a^9*b^3 - 48*a^10*b^2))/(a*b^10 + b^11 - a^2*b^9 - a^3*b^8) - (a*(4*a^2 + b^2)*((32*(a*b^17 + a^3*b^15 - 5*a^4*b^14 - 4*a^5*b^13 + 9*a^6*b^12 + 2*a^7*b^11 - 4*a^8*b^10))/(a*b^14 + b^15 - a^2*b^13 - a^3*b^12) + (

a*tan(c/2 + (d*x)/2)*(4*a^2 + b^2)*(2*a*b^15 - 2*a^2*b^14 - 4*a^3*b^13 + 4*a^4*b^12 + 2*a^5*b^11 - 2*a^6*b^10)*32i)/(b^5*(a*b^10 + b^11 - a^2*b^9 - a^3*b^8)))*1i)/b^5)*1i)/b^5))*(4*a^2 + b^2))/(b^5*d) - (a^4*atan(((a^4*(4*a^2 - 5*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*((32*tan(c/2 + (d*x)/2)*(32*a^12 - 32*a^11*b + a^2*b^10 - 2*a^3*b^9 + 7*a^4*b^8 - 12*a^5*b^7 + 7*a^6*b^6 - 2*a^7*b^5 + 2*a^8*b^4 + 48*a^9*b^3 - 48*a^10*b^2))/(a*b^10 + b^11 - a^2*b^9 - a^3*b^8) + (a^4*((32*(a*b^17 + a^3*b^15 - 5*a^4*b^14 - 4*a^5*b^13 + 9*a^6*b^12 + 2*a^7*b^11 - 4*a^8*b^10))/(a*b^14 + b^15 - a^2*b^13 - a^3*b^12) - (32*a^4*tan(c/2 + (d*x)/2)*(4*a^2 - 5*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a*b^15 - 2*a^2*b^14 - 4*a^3*b^13 + 4*a^4*b^12 + 2*a^5*b^11 - 2*a^6*b^10))/((a*b^10 + b^11 - a^2*b^9 - a^3*b^8)*(b^11 - 3*a^2*b^9 + 3*a^4*b^7 - a^6*b^5)))*(4*a^2 - 5*b^2)*(-(a + b)^3*(a - b)^3)^(1/2))/(b^11 - 3*a^2*b^9 + 3*a^4*b^7 - a^6*b^5))*1i)/(b^11 - 3*a^2*b^9 + 3*a^4*b^7 - a^6*b^5) + (a^4*(4*a^2 - 5*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*((32*tan(c/2 + (d*x)/2)*(32*a^12 - 32*a^11*b + a^2*b^10 - 2*a^3*b^9 + 7*a^4*b^8 - 12*a^5*b^7 + 7*a^6*b^6 - 2*a^7*b^5 + 2*a^8*b^4 + 48*a^9*b^3 - 48*a^10*b^2))/(a*b^10 + b^11 - a^2*b^9 - a^3*b^8) - (a^4*((32*(a*b^17 + a^3*b^15 - 5*a^4*b^14 - 4*a^5*b^13 + 9*a^6*b^12 + 2*a^7*b^11 - 4*a^8*b^10))/(a*b^14 + b^15 - a^2*b^13 - a^3*b^12) + (32*a^4*tan(c/2 + (d*x)/2)*(4*a^2 - 5*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a*b^15 - 2*a^2*b^14 - 4*a^3*b^13 + 4*a^4*b^12 + 2*a^5*b^11 - 2*a^6*b^10))/((a*b^10 + b^11 - a^2*b^9 - a^3*b^8)*(b^11 - 3*a^2*b^9 + 3*a^4*b^7 - a^6*b^5)))*(4*a^2 - 5*b^2)*(-(a + b)^3*(a - b)^3)^(1/2))/(b^11 - 3*a^2*b^9 + 3*a^4*b^7 - a^6*b^5))*1i)/(b^11 - 3*a^2*b^9 + 3*a^4*b^7 - a^6*b^5))/((64*(64*a^14 - 32*a^13*b + 5*a^6*b^8 - 5*a^7*b^7 + 31*a^8*b^6 - 6*a^9*b^5 + 12*a^10*b^4 + 48*a^11*b^3 - 112*a^12*b^2))/(a*b^14 + b^15 - a^2*b^13 - a^3*b^12) - (a^4*(4*a^2 - 5*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*((32*tan(c/2 + (d*x)/2)*(32*a^12 - 32*a^11*b + a^2*b^10 - 2*a^3*b^9 + 7*a^4*b^8 - 12*a^5*b^7 + 7*a^6*b^6 - 2*a^7*b^5 + 2*a^8*b^4 + 48*a^9*b^3 - 48*a^10*b^2))/(a*b^10 + b^11 - a^2*b^9 - a^3*b^8) + (a^4*((32*(a*b^17 + a^3*b^15 - 5*a^4*b^14 - 4*a^5*b^13 + 9*a^6*b^12 + 2*a^7*b^11 - 4*a^8*b^10))/(a*b^14 + b^15 - a^2*b^13 - a^3*b^12) - (32*a^4*tan(c/2 + (d*x)/2)*(4*a^2 - 5*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a*b^15 - 2*a^2*b^14 - 4*a^3*b^13 + 4*a^4*b^12 + 2*a^5*b^11 - 2*a^6*b^10))/((a*b^10 + b^11 - a^2*b^9 - a^3*b^8)*(b^11 - 3*a^2*b^9 + 3*a^4*b^7 - a^6*b^5)))*(4*a^2 - 5*b^2)*(-(a + b)^3*(a - b)^3)^(1/2))/(b^11 - 3*a^2*b^9 + 3*a^4*b^7 - a^6*b^5)))/(b^11 - 3*a^2*b^9 + 3*a^4*b^7 - a^6*b^5) + (a^4*(4*a^2 - 5*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*((32*tan(c/2 + (d*x)/2)*(32*a^12 - 32*a^11*b + a^2*b^10 - 2*a^3*b^9 + 7*a^4*b^8 - 12*a^5*b^7 + 7*a^6*b^6 - 2*a^7*b^5 + 2*a^8*b^4 + 48*a^9*b^3 - 48*a^10*b^2))/(a*b^10 + b^11 - a^2*b^9 - a^3*b^8) - (a^4*((32*(a*b^17 + a^3*b^15 - 5*a^4*b^14 - 4*a^5*b^13 + 9*a^6*b^12 + 2*a^7*b^11 - 4*a^8*b^10))/(a*b^14 + b^15 - a^2*b^13 - a^3*b^12) + (32*a^4*tan(c/2 + (d*x)/2)*(4*a^2 - 5*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a*b^15 - 2*a^2*b^14 - 4*a^3*b^13 + 4*a^4*b^12 + 2*a^5*b^11 - 2*a^6*b^10))/((a*b^10 + b^11 - a^2*b^9 - a^3*b^8)*(b^11 - 3*a^2*b^9 + 3*a^4*b^7 - a^6*b^5)))*(4*a^2 - 5*b^2)*(-(a + b)^3*(a - b)^3)^(1/2))/(b^11 - 3*a^2*b^9 + 3*a^4*b^7 - a^6*b^5)))/(b^11 - 3*a^2*b^9 + 3*a^4*b^7 - a^6*b^5)))*(4*a^2 - 5*b^2)*(-(a + b

```
)^3*(a - b)^3)^(1/2)*2i)/(d*(b^11 - 3*a^2*b^9 + 3*a^4*b^7 - a^6*b^5))
```

3.460 $\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 166

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \frac{(6a^2+b^2)\,x}{2b^4} - \frac{2a^3(3a^2-4b^2)\,\mathrm{arctanh}\left(\frac{(a-b)\sin(c+dx)}{\sqrt{-a^2+b^2}(1+\cos(c+dx))}\right)}{b^4\,(-a^2+b^2)^{3/2}\,d} - \frac{2a\sin(c+dx)}{b^3d} + \frac{\cos(c+dx)\sin(c+dx)}{2b^2d} - \frac{a^4\sin(c+dx)}{b^3\,(a^2-b^2)\,d(a+b\cos(c+dx))}$$

```
[Out] 1/2*(6*a^2+b^2)*x/b^4-2*a^3*(3*a^2-4*b^2)*arctanh((a-b)*sin(d*x+c)/(1+cos(d
*x+c))/(-a^2+b^2)^(1/2))/b^4/(-a^2+b^2)^(3/2)/d-2*a*sin(d*x+c)/b^3/d+1/2*co
s(d*x+c)*sin(d*x+c)/b^2/d-a^4*sin(d*x+c)/b^3/(a^2-b^2)/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.49 (sec) , antiderivative size = 213, normalized size of antiderivative = 1.28, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2871, 3128, 3102, 2814, 2738, 211}

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^2}\,dx = -\frac{a^2\sin(c+dx)\cos^2(c+dx)}{bd\,(a^2-b^2)\,(a+b\cos(c+dx))} + \frac{(3a^2-b^2)\sin(c+dx)\cos(c+dx)}{2b^2d\,(a^2-b^2)} + \frac{x(6a^2+b^2)}{2b^4} - \frac{a(3a^2-2b^2)\sin(c+dx)}{b^3d\,(a^2-b^2)} - \frac{2a^3(3a^2-4b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{b^4d(a-b)^{3/2}(a+b)^{3/2}}$$

```
[In] Int[Cos[c + d*x]^4/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] ((6*a^2 + b^2)*x)/(2*b^4) - (2*a^3*(3*a^2 - 4*b^2)*ArcTan[(Sqrt[a - b]*Tan[
(c + d*x)/2])/Sqrt[a + b]])/((a - b)^(3/2)*b^4*(a + b)^(3/2)*d) - (a*(3*a^2
 - 2*b^2)*Sin[c + d*x])/(b^3*(a^2 - b^2)*d) + ((3*a^2 - b^2)*Cos[c + d*x]*S
in[c + d*x])/(2*b^2*(a^2 - b^2)*d) - (a^2*Cos[c + d*x]^2*Sin[c + d*x])/(b*(
a^2 - b^2)*d*(a + b*Cos[c + d*x]))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
```

```
&& !LtQ[m, -1]
```

Rule 3128

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*sin[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_
.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n + 2))), x] + Dist[1/(d*(m +
n + 2)), Int[(a + b*Sin[e + f*x])^(m - 1)*(c + d*Sin[e + f*x])^n*Simp[a*A*d
*(m + n + 2) + C*(b*c*m + a*d*(n + 1)) + (d*(A*b + a*B)*(m + n + 2) - C*(a*
c - b*d*(m + n + 1)))*Sin[e + f*x] + (C*(a*d*m - b*c*(m + 1)) + b*B*d*(m +
n + 2))*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n},
 x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m
, 0] && !(IGtQ[n, 0] && ( !IntegerQ[m] || (EqQ[a, 0] && NeQ[c, 0])))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a^2\cos^2(c+dx)\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))} - \frac{\int \frac{\cos(c+dx)(2a^2-ab\cos(c+dx)-(3a^2-b^2)\cos^2(c+dx))}{a+b\cos(c+dx)}\,dx}{b(a^2-b^2)} \\
&= \frac{(3a^2-b^2)\cos(c+dx)\sin(c+dx)}{2b^2(a^2-b^2)d} - \frac{a^2\cos^2(c+dx)\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))} \\
&\quad - \frac{\int \frac{-a(3a^2-b^2)+b(a^2+b^2)\cos(c+dx)+2a(3a^2-2b^2)\cos^2(c+dx)}{a+b\cos(c+dx)}\,dx}{2b^2(a^2-b^2)} \\
&= -\frac{a(3a^2-2b^2)\sin(c+dx)}{b^3(a^2-b^2)d} + \frac{(3a^2-b^2)\cos(c+dx)\sin(c+dx)}{2b^2(a^2-b^2)d} \\
&\quad - \frac{a^2\cos^2(c+dx)\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))} - \frac{\int \frac{-ab(3a^2-b^2)-(a^2-b^2)(6a^2+b^2)\cos(c+dx)}{a+b\cos(c+dx)}\,dx}{2b^3(a^2-b^2)} \\
&= \frac{(6a^2+b^2)x}{2b^4} - \frac{a(3a^2-2b^2)\sin(c+dx)}{b^3(a^2-b^2)d} + \frac{(3a^2-b^2)\cos(c+dx)\sin(c+dx)}{2b^2(a^2-b^2)d} \\
&\quad - \frac{a^2\cos^2(c+dx)\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))} - \frac{(a^3(3a^2-4b^2))\int \frac{1}{a+b\cos(c+dx)}\,dx}{b^4(a^2-b^2)} \\
&= \frac{(6a^2+b^2)x}{2b^4} - \frac{a(3a^2-2b^2)\sin(c+dx)}{b^3(a^2-b^2)d} \\
&\quad + \frac{(3a^2-b^2)\cos(c+dx)\sin(c+dx)}{2b^2(a^2-b^2)d} - \frac{a^2\cos^2(c+dx)\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))} \\
&\quad - \frac{(2a^3(3a^2-4b^2))\,\text{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{b^4(a^2-b^2)d}
\end{aligned}$$

$$= \frac{(6a^2+b^2)\,x}{2b^4} - \frac{2a^3(3a^2-4b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{3/2}b^4(a+b)^{3/2}d} - \frac{a(3a^2-2b^2)\sin(c+dx)}{b^3\,(a^2-b^2)\,d} + \frac{(3a^2-b^2)\cos(c+dx)\sin(c+dx)}{2b^2\,(a^2-b^2)\,d} - \frac{a^2\cos^2(c+dx)\sin(c+dx)}{b\,(a^2-b^2)\,d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 0.72 (sec) , antiderivative size = 144, normalized size of antiderivative = 0.87

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$

$$= \frac{2(6a^2+b^2)\,(c+dx) - \frac{8a^3(3a^2-4b^2)\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{3/2}} - 8ab\sin(c+dx) - \frac{4a^4b\sin(c+dx)}{(a-b)(a+b)(a+b\cos(c+dx))} + b^2 \text{s}}{4b^4d}$$

```
[In] Integrate[Cos[c + d*x]^4/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (2*(6*a^2 + b^2)*(c + d*x) - (8*a^3*(3*a^2 - 4*b^2)*ArcTanh[((a - b)*Tan[(c
 + d*x)/2])/Sqrt[-a^2 + b^2]])/(-a^2 + b^2)^(3/2) - 8*a*b*Sin[c + d*x] - (4
*a^4*b*Sin[c + d*x])/((a - b)*(a + b)*(a + b*Cos[c + d*x])) + b^2*Sin[2*(c
+ d*x)])/(4*b^4*d)
```

Maple [A] (verified)

Time = 1.56 (sec) , antiderivative size = 218, normalized size of antiderivative = 1.31

method	result
derivativedivides	$\frac{-\frac{2a^3\left(\frac{ab\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{(a^2-b^2)\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)}+\frac{(3a^2-4b^2)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{(a-b)(a+b)\sqrt{(a-b)(a+b)}}\right)}{b^4}+\frac{2\left(\left(-2ab-\frac{1}{2}b^2\right)\left(\tan^3\right.\right.}{(}}{d}$
default	$\frac{-\frac{2a^3\left(\frac{ab\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{(a^2-b^2)\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)}+\frac{(3a^2-4b^2)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{(a-b)(a+b)\sqrt{(a-b)(a+b)}}\right)}{b^4}+\frac{2\left(\left(-2ab-\frac{1}{2}b^2\right)\left(\tan^3\right.\right.}{(}}{d}$
risch	$\frac{3xa^2}{b^4}+\frac{x}{2b^2}-\frac{ie^{2i(dx+c)}}{8b^2d}+\frac{ia\,e^{i(dx+c)}}{b^3d}-\frac{ia\,e^{-i(dx+c)}}{b^3d}+\frac{ie^{-2i(dx+c)}}{8b^2d}-\frac{2ia^4\left(a\,e^{i(dx+c)}+b\right)}{b^4(a^2-b^2)d\left(b\,e^{2i(dx+c)}+2a\,e^{i(dx+c)}+b\right)}$

```
[In] int(cos(d*x+c)^4/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-2*a^3/b^4*(a*b/(a^2-b^2)*tan(1/2*d*x+1/2*c)/(tan(1/2*d*x+1/2*c)^2*a-b
*tan(1/2*d*x+1/2*c)^2+a+b)+(3*a^2-4*b^2)/(a-b)/(a+b)/((a-b)*(a+b))^(1/2)*ar
```

```
ctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2)))+2/b^4*(((-2*a*b-1/2*b^2
)*tan(1/2*d*x+1/2*c)^3+(-2*a*b+1/2*b^2)*tan(1/2*d*x+1/2*c))/(1+tan(1/2*d*x+
1/2*c)^2)^2+1/2*(6*a^2+b^2)*arctan(tan(1/2*d*x+1/2*c))))
```

Fricas [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 651, normalized size of antiderivative = 3.92

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \left[\frac{(6a^6b-11a^4b^3+4a^2b^5+b^7)dx\cos(dx+c)+(6a^7-11a^5b^2+4a^3b^4+ab^6)dx-(3a^6-4a^4b^2+(3a\right.$$

```
[In] integrate(cos(d*x+c)^4/(a+b*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] [1/2*((6*a^6*b - 11*a^4*b^3 + 4*a^2*b^5 + b^7)*d*x*cos(d*x + c) + (6*a^7 -
11*a^5*b^2 + 4*a^3*b^4 + a*b^6)*d*x - (3*a^6 - 4*a^4*b^2 + (3*a^5*b - 4*a^3
*b^3)*cos(d*x + c))*sqrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2
)*cos(d*x + c)^2 - 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a
^2 + 2*b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) - (6*a^6*b - 1
0*a^4*b^3 + 4*a^2*b^5 - (a^4*b^3 - 2*a^2*b^5 + b^7)*cos(d*x + c)^2 + 3*(a^5
*b^2 - 2*a^3*b^4 + a*b^6)*cos(d*x + c))*sin(d*x + c))/((a^4*b^5 - 2*a^2*b^7
 + b^9)*d*cos(d*x + c) + (a^5*b^4 - 2*a^3*b^6 + a*b^8)*d), 1/2*((6*a^6*b -
11*a^4*b^3 + 4*a^2*b^5 + b^7)*d*x*cos(d*x + c) + (6*a^7 - 11*a^5*b^2 + 4*a^
3*b^4 + a*b^6)*d*x - 2*(3*a^6 - 4*a^4*b^2 + (3*a^5*b - 4*a^3*b^3)*cos(d*x +
 c))*sqrt(a^2 - b^2)*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x
+ c))) - (6*a^6*b - 10*a^4*b^3 + 4*a^2*b^5 - (a^4*b^3 - 2*a^2*b^5 + b^7)*co
s(d*x + c)^2 + 3*(a^5*b^2 - 2*a^3*b^4 + a*b^6)*cos(d*x + c))*sin(d*x + c))/
((a^4*b^5 - 2*a^2*b^7 + b^9)*d*cos(d*x + c) + (a^5*b^4 - 2*a^3*b^6 + a*b^8)
*d)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**4/(a+b*cos(d*x+c))**2,x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)^4/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 262, normalized size of antiderivative = 1.58

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^2}\,dx = -\frac{\frac{4a^4\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{(a^2b^3-b^5)\left(a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2+a+b\right)} - \frac{4(3a^5-4a^3b^2)\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor\mathrm{sgn}(-2a+2b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-b\tan\left(\frac{1}{2}\right.}{\sqrt{a^2-b^2}}\right.\right.}{(a^2b^4-b^6)\sqrt{a^2-b^2}}}{2d}$$

```
[In] integrate(cos(d*x+c)^4/(a+b*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/2*(4*a^4*tan(1/2*d*x + 1/2*c)/((a^2*b^3 - b^5)*(a*tan(1/2*d*x + 1/2*c)^2
 - b*tan(1/2*d*x + 1/2*c)^2 + a + b)) - 4*(3*a^5 - 4*a^3*b^2)*(pi*floor(1/2
*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1/2*d*x + 1/2*c) - b*
tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))/((a^2*b^4 - b^6)*sqrt(a^2 - b^2)) -
 (6*a^2 + b^2)*(d*x + c)/b^4 + 2*(4*a*tan(1/2*d*x + 1/2*c)^3 + b*tan(1/2*d*
x + 1/2*c)^3 + 4*a*tan(1/2*d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/((tan(1/2
*d*x + 1/2*c)^2 + 1)^2*b^3))/d
```

Mupad [B] (verification not implemented)

Time = 21.50 (sec) , antiderivative size = 3751, normalized size of antiderivative = 22.60

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Too large to display}$$

```
[In] int(cos(c + d*x)^4/(a + b*cos(c + d*x))^2,x)
```

[Out] (atan(((((8*tan(c/2 + (d*x)/2)*(72*a^10 - 72*a^9*b - 2*a*b^9 + b^10 + 11*a^
2*b^8 - 20*a^3*b^7 + 23*a^4*b^6 - 26*a^5*b^5 + 17*a^6*b^4 + 120*a^7*b^3 - 1
20*a^8*b^2))/(a*b^8 + b^9 - a^2*b^7 - a^3*b^6) + ((a^2*6i + b^2*1i)*((8*(2*
b^15 + 6*a^2*b^13 - 16*a^3*b^12 - 14*a^4*b^11 + 28*a^5*b^10 + 6*a^6*b^9 - 1
2*a^7*b^8))/(a*b^11 + b^12 - a^2*b^10 - a^3*b^9) - (4*tan(c/2 + (d*x)/2)*(a
^2*6i + b^2*1i)*(8*a*b^13 - 8*a^2*b^12 - 16*a^3*b^11 + 16*a^4*b^10 + 8*a^5*
b^9 - 8*a^6*b^8))/(b^4*(a*b^8 + b^9 - a^2*b^7 - a^3*b^6))))/(2*b^4))*(a^2*6
i + b^2*1i)*1i)/(2*b^4) + (((8*tan(c/2 + (d*x)/2)*(72*a^10 - 72*a^9*b - 2*a
*b^9 + b^10 + 11*a^2*b^8 - 20*a^3*b^7 + 23*a^4*b^6 - 26*a^5*b^5 + 17*a^6*b^
4 + 120*a^7*b^3 - 120*a^8*b^2))/(a*b^8 + b^9 - a^2*b^7 - a^3*b^6) - ((a^2*6
i + b^2*1i)*((8*(2*b^15 + 6*a^2*b^13 - 16*a^3*b^12 - 14*a^4*b^11 + 28*a^5*b
^10 + 6*a^6*b^9 - 12*a^7*b^8))/(a*b^11 + b^12 - a^2*b^10 - a^3*b^9) + (4*ta
n(c/2 + (d*x)/2)*(a^2*6i + b^2*1i)*(8*a*b^13 - 8*a^2*b^12 - 16*a^3*b^11 + 1
6*a^4*b^10 + 8*a^5*b^9 - 8*a^6*b^8))/(b^4*(a*b^8 + b^9 - a^2*b^7 - a^3*b^6)
)))/(2*b^4))*(a^2*6i + b^2*1i)*1i)/(2*b^4))/((16*(108*a^11 - 54*a^10*b + 4*
a^3*b^8 - 4*a^4*b^7 + 41*a^5*b^6 - 9*a^6*b^5 + 63*a^7*b^4 + 81*a^8*b^3 - 21
6*a^9*b^2))/(a*b^11 + b^12 - a^2*b^10 - a^3*b^9) - (((8*tan(c/2 + (d*x)/2)*
(72*a^10 - 72*a^9*b - 2*a*b^9 + b^10 + 11*a^2*b^8 - 20*a^3*b^7 + 23*a^4*b^6
 - 26*a^5*b^5 + 17*a^6*b^4 + 120*a^7*b^3 - 120*a^8*b^2))/(a*b^8 + b^9 - a^2
*b^7 - a^3*b^6) + ((a^2*6i + b^2*1i)*((8*(2*b^15 + 6*a^2*b^13 - 16*a^3*b^12
 - 14*a^4*b^11 + 28*a^5*b^10 + 6*a^6*b^9 - 12*a^7*b^8))/(a*b^11 + b^12 - a^
2*b^10 - a^3*b^9) - (4*tan(c/2 + (d*x)/2)*(a^2*6i + b^2*1i)*(8*a*b^13 - 8*a
^2*b^12 - 16*a^3*b^11 + 16*a^4*b^10 + 8*a^5*b^9 - 8*a^6*b^8))/(b^4*(a*b^8 +
 b^9 - a^2*b^7 - a^3*b^6))))/(2*b^4))*(a^2*6i + b^2*1i))/(2*b^4) + (((8*tan
(c/2 + (d*x)/2)*(72*a^10 - 72*a^9*b - 2*a*b^9 + b^10 + 11*a^2*b^8 - 20*a^3*
b^7 + 23*a^4*b^6 - 26*a^5*b^5 + 17*a^6*b^4 + 120*a^7*b^3 - 120*a^8*b^2))/(a
*b^8 + b^9 - a^2*b^7 - a^3*b^6) - ((a^2*6i + b^2*1i)*((8*(2*b^15 + 6*a^2*b^
13 - 16*a^3*b^12 - 14*a^4*b^11 + 28*a^5*b^10 + 6*a^6*b^9 - 12*a^7*b^8))/(a*
b^11 + b^12 - a^2*b^10 - a^3*b^9) + (4*tan(c/2 + (d*x)/2)*(a^2*6i + b^2*1i)
*(8*a*b^13 - 8*a^2*b^12 - 16*a^3*b^11 + 16*a^4*b^10 + 8*a^5*b^9 - 8*a^6*b^8
))/(b^4*(a*b^8 + b^9 - a^2*b^7 - a^3*b^6))))/(2*b^4))*(a^2*6i + b^2*1i))/(2
b^4)))(a^2*6i + b^2*1i)*1i)/(b^4*d) - ((tan(c/2 + (d*x)/2)*(3*a^3*b - 3*a
*b^3 + 6*a^4 + b^4 - 5*a^2*b^2))/((a*b^3 - b^4)*(a + b)) + (tan(c/2 + (d*x)
/2)^5*(3*a*b^3 - 3*a^3*b + 6*a^4 + b^4 - 5*a^2*b^2))/((a*b^3 - b^4)*(a + b)
) - (2*tan(c/2 + (d*x)/2)^3*(b^4 - 6*a^4 + 3*a^2*b^2))/(b*(a*b^2 - b^3)*(a
+ b)))/(d*(a + b + tan(c/2 + (d*x)/2)^2*(3*a + b) + tan(c/2 + (d*x)/2)^6*(a
 - b) + tan(c/2 + (d*x)/2)^4*(3*a - b))) + (a^3*atan(((a^3*(3*a^2 - 4*b^2)*
(-(a + b)^3*(a - b)^3)^(1/2)*((8*tan(c/2 + (d*x)/2)*(72*a^10 - 72*a^9*b - 2
*a*b^9 + b^10 + 11*a^2*b^8 - 20*a^3*b^7 + 23*a^4*b^6 - 26*a^5*b^5 + 17*a^6*
b^4 + 120*a^7*b^3 - 120*a^8*b^2))/(a*b^8 + b^9 - a^2*b^7 - a^3*b^6) + (a^3*
((8*(2*b^15 + 6*a^2*b^13 - 16*a^3*b^12 - 14*a^4*b^11 + 28*a^5*b^10 + 6*a^6*
b^9 - 12*a^7*b^8))/(a*b^11 + b^12 - a^2*b^10 - a^3*b^9) - (8*a^3*tan(c/2 +
(d*x)/2)*(3*a^2 - 4*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(8*a*b^13 - 8*a^2*b^1
2 - 16*a^3*b^11 + 16*a^4*b^10 + 8*a^5*b^9 - 8*a^6*b^8))/((a*b^8 + b^9 - a^2
*b^7 - a^3*b^6)*(b^10 - 3*a^2*b^8 + 3*a^4*b^6 - a^6*b^4)))*(3*a^2 - 4*b^2)*

(-(a + b)^3*(a - b)^3)^(1/2))/(b^10 - 3*a^2*b^8 + 3*a^4*b^6 - a^6*b^4))*1i)
/(b^10 - 3*a^2*b^8 + 3*a^4*b^6 - a^6*b^4) + (a^3*(3*a^2 - 4*b^2)*(-(a + b)^
3*(a - b)^3)^(1/2)*((8*tan(c/2 + (d*x)/2)*(72*a^10 - 72*a^9*b - 2*a*b^9 + b
^10 + 11*a^2*b^8 - 20*a^3*b^7 + 23*a^4*b^6 - 26*a^5*b^5 + 17*a^6*b^4 + 120*
a^7*b^3 - 120*a^8*b^2))/(a*b^8 + b^9 - a^2*b^7 - a^3*b^6) - (a^3*((8*(2*b^1
5 + 6*a^2*b^13 - 16*a^3*b^12 - 14*a^4*b^11 + 28*a^5*b^10 + 6*a^6*b^9 - 12*a
^7*b^8))/(a*b^11 + b^12 - a^2*b^10 - a^3*b^9) + (8*a^3*tan(c/2 + (d*x)/2)*(
3*a^2 - 4*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(8*a*b^13 - 8*a^2*b^12 - 16*a^3
*b^11 + 16*a^4*b^10 + 8*a^5*b^9 - 8*a^6*b^8))/((a*b^8 + b^9 - a^2*b^7 - a^3
b^6)(b^10 - 3*a^2*b^8 + 3*a^4*b^6 - a^6*b^4)))*(3*a^2 - 4*b^2)*(-(a + b)^
3*(a - b)^3)^(1/2))/(b^10 - 3*a^2*b^8 + 3*a^4*b^6 - a^6*b^4))*1i)/(b^10 - 3
*a^2*b^8 + 3*a^4*b^6 - a^6*b^4))/((16*(108*a^11 - 54*a^10*b + 4*a^3*b^8 - 4
*a^4*b^7 + 41*a^5*b^6 - 9*a^6*b^5 + 63*a^7*b^4 + 81*a^8*b^3 - 216*a^9*b^2))
/(a*b^11 + b^12 - a^2*b^10 - a^3*b^9) - (a^3*(3*a^2 - 4*b^2)*(-(a + b)^3*(a
 - b)^3)^(1/2)*((8*tan(c/2 + (d*x)/2)*(72*a^10 - 72*a^9*b - 2*a*b^9 + b^10
+ 11*a^2*b^8 - 20*a^3*b^7 + 23*a^4*b^6 - 26*a^5*b^5 + 17*a^6*b^4 + 120*a^7*
b^3 - 120*a^8*b^2))/(a*b^8 + b^9 - a^2*b^7 - a^3*b^6) + (a^3*((8*(2*b^15 +
6*a^2*b^13 - 16*a^3*b^12 - 14*a^4*b^11 + 28*a^5*b^10 + 6*a^6*b^9 - 12*a^7*b
^8))/(a*b^11 + b^12 - a^2*b^10 - a^3*b^9) - (8*a^3*tan(c/2 + (d*x)/2)*(3*a^
2 - 4*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(8*a*b^13 - 8*a^2*b^12 - 16*a^3*b^1
1 + 16*a^4*b^10 + 8*a^5*b^9 - 8*a^6*b^8))/((a*b^8 + b^9 - a^2*b^7 - a^3*b^6
)*(b^10 - 3*a^2*b^8 + 3*a^4*b^6 - a^6*b^4)))*(3*a^2 - 4*b^2)*(-(a + b)^3*(a
 - b)^3)^(1/2))/(b^10 - 3*a^2*b^8 + 3*a^4*b^6 - a^6*b^4)))/(b^10 - 3*a^2*b^
8 + 3*a^4*b^6 - a^6*b^4) + (a^3*(3*a^2 - 4*b^2)*(-(a + b)^3*(a - b)^3)^(1/2
)*((8*tan(c/2 + (d*x)/2)*(72*a^10 - 72*a^9*b - 2*a*b^9 + b^10 + 11*a^2*b^8
- 20*a^3*b^7 + 23*a^4*b^6 - 26*a^5*b^5 + 17*a^6*b^4 + 120*a^7*b^3 - 120*a^8
*b^2))/(a*b^8 + b^9 - a^2*b^7 - a^3*b^6) - (a^3*((8*(2*b^15 + 6*a^2*b^13 -
16*a^3*b^12 - 14*a^4*b^11 + 28*a^5*b^10 + 6*a^6*b^9 - 12*a^7*b^8))/(a*b^11
+ b^12 - a^2*b^10 - a^3*b^9) + (8*a^3*tan(c/2 + (d*x)/2)*(3*a^2 - 4*b^2)*(-
(a + b)^3*(a - b)^3)^(1/2)*(8*a*b^13 - 8*a^2*b^12 - 16*a^3*b^11 + 16*a^4*b^
10 + 8*a^5*b^9 - 8*a^6*b^8))/((a*b^8 + b^9 - a^2*b^7 - a^3*b^6)*(b^10 - 3*a
^2*b^8 + 3*a^4*b^6 - a^6*b^4)))*(3*a^2 - 4*b^2)*(-(a + b)^3*(a - b)^3)^(1/2
))/(b^10 - 3*a^2*b^8 + 3*a^4*b^6 - a^6*b^4)))/(b^10 - 3*a^2*b^8 + 3*a^4*b^6
 - a^6*b^4)))*(3*a^2 - 4*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*2i)/(d*(b^10 - 3
*a^2*b^8 + 3*a^4*b^6 - a^6*b^4))

3.461 $\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 155

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^2}\,dx = -\frac{2ax}{b^3}+\frac{2a^2(2a^2-3b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{3/2}b^3(a+b)^{3/2}d} + \frac{(2a^2-b^2)\sin(c+dx)}{b^2(a^2-b^2)\,d}-\frac{a^2\cos(c+dx)\sin(c+dx)}{b\,(a^2-b^2)\,d(a+b\cos(c+dx))}$$

```
[Out] -2*a*x/b^3+2*a^2*(2*a^2-3*b^2)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^
(1/2))/(a-b)^(3/2)/b^3/(a+b)^(3/2)/d+(2*a^2-b^2)*sin(d*x+c)/b^2/(a^2-b^2)/d
-a^2*cos(d*x+c)*sin(d*x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 155, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2871, 3102, 2814, 2738, 211}

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \frac{2a^2(2a^2-3b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{b^3d(a-b)^{3/2}(a+b)^{3/2}} + \frac{(2a^2-b^2)\sin(c+dx)}{b^2d\,(a^2-b^2)} - \frac{a^2\sin(c+dx)\cos(c+dx)}{bd\,(a^2-b^2)\,(a+b\cos(c+dx))}-\frac{2ax}{b^3}$$

```
[In] Int[Cos[c + d*x]^3/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (-2*a*x)/b^3 + (2*a^2*(2*a^2 - 3*b^2)*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])
/Sqrt[a + b]])/((a - b)^(3/2)*b^3*(a + b)^(3/2)*d) + ((2*a^2 - b^2)*Sin[c +
```

```
 d*x])/(b^2*(a^2 - b^2)*d) - (a^2*Cos[c + d*x]*Sin[c + d*x])/(b*(a^2 - b^2)
*d*(a + b*Cos[c + d*x]))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\text{integral} = -\frac{a^2\cos(c+dx)\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))} - \frac{\int \frac{a^2-ab\cos(c+dx)-(2a^2-b^2)\cos^2(c+dx)}{a+b\cos(c+dx)}\,dx}{b(a^2-b^2)}$$

$$= \frac{(2a^2-b^2)\sin(c+dx)}{b^2(a^2-b^2)d} - \frac{a^2\cos(c+dx)\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))} - \frac{\int \frac{a^2b+2a(a^2-b^2)\cos(c+dx)}{a+b\cos(c+dx)}\,dx}{b^2(a^2-b^2)}$$

$$= -\frac{2ax}{b^3} + \frac{(2a^2-b^2)\sin(c+dx)}{b^2(a^2-b^2)d} - \frac{a^2\cos(c+dx)\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))} + \frac{(a^2(2a^2-3b^2))\int \frac{1}{a+b\cos(c+dx)}\,dx}{b^3(a^2-b^2)}$$

$$= -\frac{2ax}{b^3} + \frac{(2a^2-b^2)\sin(c+dx)}{b^2(a^2-b^2)d} - \frac{a^2\cos(c+dx)\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))} + \frac{(2a^2(2a^2-3b^2))\,\text{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{b^3(a^2-b^2)d}$$

$$= -\frac{2ax}{b^3} + \frac{2a^2(2a^2-3b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{3/2}b^3(a+b)^{3/2}d} + \frac{(2a^2-b^2)\sin(c+dx)}{b^2(a^2-b^2)d} - \frac{a^2\cos(c+dx)\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 0.64 (sec) , antiderivative size = 113, normalized size of antiderivative = 0.73

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \frac{-2a(c+dx) + \frac{2a^2(2a^2-3b^2)\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{3/2}} + \left(b + \frac{a^3b}{(a-b)(a+b)(a+b\cos(c+dx))}\right)\sin(c+dx)}{b^3d}$$

```
[In] Integrate[Cos[c + d*x]^3/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (-2*a*(c + d*x) + (2*a^2*(2*a^2 - 3*b^2)*ArcTanh[((a - b)*Tan[(c + d*x)/2])
/Sqrt[-a^2 + b^2]])/(-a^2 + b^2)^(3/2) + (b + (a^3*b)/((a - b)*(a + b)*(a +
 b*Cos[c + d*x])))*Sin[c + d*x])/(b^3*d)
```

Maple [A] (verified)

Time = 1.20 (sec) , antiderivative size = 178, normalized size of antiderivative = 1.15

method	result
derivativedivides	$\frac{\frac{2a^2\left(\frac{ab\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{(a^2-b^2)\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)}+\frac{(2a^2-3b^2)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{(a-b)(a+b)\sqrt{(a-b)(a+b)}}\right)}{b^3}-\frac{2\left(-\frac{b\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}+2\right.}{b}}{d}$
default	$\frac{\frac{2a^2\left(\frac{ab\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{(a^2-b^2)\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)}+\frac{(2a^2-3b^2)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{(a-b)(a+b)\sqrt{(a-b)(a+b)}}\right)}{b^3}-\frac{2\left(-\frac{b\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}+2\right.}{b}}{d}$
risch	$-\frac{2ax}{b^3}-\frac{i e^{i(dx+c)}}{2b^2d}+\frac{i e^{-i(dx+c)}}{2b^2d}+\frac{2ia^3\left(a\,e^{i(dx+c)}+b\right)}{b^3(a^2-b^2)d\left(b\,e^{2i(dx+c)}+2a\,e^{i(dx+c)}+b\right)}-\frac{2a^4\ln\left(e^{i(dx+c)}+\frac{ia^2-ib^2+a\sqrt{-a^2+b}}{b\sqrt{-a^2+b^2}}\right.}{\sqrt{-a^2+b^2}\,(a+b)(a-b)d\,b^3}$

[In] int(cos(d*x+c)^3/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)

[Out] 1/d*(2/b^3*a^2*(a*b/(a^2-b^2)*tan(1/2*d*x+1/2*c)/(tan(1/2*d*x+1/2*c)^2*a-b*
tan(1/2*d*x+1/2*c)^2+a+b)+(2*a^2-3*b^2)/(a-b)/(a+b)/((a-b)*(a+b))^(1/2)*arc
tan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2)))-2/b^3*(-b*tan(1/2*d*x+1/
2*c)/(1+tan(1/2*d*x+1/2*c)^2)+2*a*arctan(tan(1/2*d*x+1/2*c))))

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 554, normalized size of antiderivative = 3.57

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$
$$=\left[-\frac{4\left(a^5b-2\,a^3b^3+ab^5\right)dx\cos\left(dx+c\right)+4\left(a^6-2\,a^4b^2+a^2b^4\right)dx+\left(2\,a^5-3\,a^3b^2+\left(2\,a^4b-3\,a^2b^3\right)\cos\left(d\right.\right.}{2}\right.$$
$$-\frac{2\left(a^5b-2\,a^3b^3+ab^5\right)dx\cos\left(dx+c\right)+2\left(a^6-2\,a^4b^2+a^2b^4\right)dx-\left(2\,a^5-3\,a^3b^2+\left(2\,a^4b-3\,a^2b^3\right)\cos\left(d\right.\right.}{\left(a^4b^4-2\,a^2b^6+b^8\right)d\cos}$$

[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c))^2,x, algorithm="fricas")

[Out] [-1/2*(4*(a^5*b - 2*a^3*b^3 + a*b^5)*d*x*cos(d*x + c) + 4*(a^6 - 2*a^4*b^2
+ a^2*b^4)*d*x + (2*a^5 - 3*a^3*b^2 + (2*a^4*b - 3*a^2*b^3)*cos(d*x + c))*s
qrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x + c)^2 + 2*
sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2)/(b^2*cos(

```
d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) - 2*(2*a^5*b - 3*a^3*b^3 + a*b^5 +
(a^4*b^2 - 2*a^2*b^4 + b^6)*cos(d*x + c))*sin(d*x + c))/((a^4*b^4 - 2*a^2*b
^6 + b^8)*d*cos(d*x + c) + (a^5*b^3 - 2*a^3*b^5 + a*b^7)*d), -(2*(a^5*b - 2
*a^3*b^3 + a*b^5)*d*x*cos(d*x + c) + 2*(a^6 - 2*a^4*b^2 + a^2*b^4)*d*x - (2
*a^5 - 3*a^3*b^2 + (2*a^4*b - 3*a^2*b^3)*cos(d*x + c))*sqrt(a^2 - b^2)*arct
an(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c))) - (2*a^5*b - 3*a^3
*b^3 + a*b^5 + (a^4*b^2 - 2*a^2*b^4 + b^6)*cos(d*x + c))*sin(d*x + c))/((a^
4*b^4 - 2*a^2*b^6 + b^8)*d*cos(d*x + c) + (a^5*b^3 - 2*a^3*b^5 + a*b^7)*d)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3/(a+b*cos(d*x+c))**2,x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 847 vs. $2(146) = 292$.

Time = 0.37 (sec) , antiderivative size = 847, normalized size of antiderivative = 5.46

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$

$$= \frac{\frac{(4a^6b^2-2a^5b^3-9a^4b^4+4a^3b^5+5a^2b^6-2ab^7+2a^3|-a^2b^3+b^5|-a^2b|-a^2b^3+b^5|-2ab^2|-a^2b^3+b^5|)\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor+\arctan\left(\frac{\cdots}{\sqrt{\frac{2a^3b^2-2ab^4+\sqrt{\cdots}}{\cdots}}}\right.\right.}{a^3b^2|-a^2b^3+b^5|-ab^4|-a^2b^3+b^5|+(a^2b^3-b^5)^2}}{\cdots}$$

```
[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] ((4*a^6*b^2 - 2*a^5*b^3 - 9*a^4*b^4 + 4*a^3*b^5 + 5*a^2*b^6 - 2*a*b^7 + 2*a
^3*abs(-a^2*b^3 + b^5) - a^2*b*abs(-a^2*b^3 + b^5) - 2*a*b^2*abs(-a^2*b^3 +
 b^5))*(pi*floor(1/2*(d*x + c)/pi + 1/2) + arctan(2*sqrt(1/2)*tan(1/2*d*x +
 1/2*c)/sqrt((2*a^3*b^2 - 2*a*b^4 + sqrt(-4*(a^3*b^2 + a^2*b^3 - a*b^4 - b^
5)*(a^3*b^2 - a^2*b^3 - a*b^4 + b^5) + 4*(a^3*b^2 - a*b^4)^2))/(a^3*b^2 - a
^2*b^3 - a*b^4 + b^5))))/(a^3*b^2*abs(-a^2*b^3 + b^5) - a*b^4*abs(-a^2*b^3
+ b^5) + (a^2*b^3 - b^5)^2) - ((2*a^3 - a^2*b - 2*a*b^2)*sqrt(a^2 - b^2)*ab
s(-a^2*b^3 + b^5)*abs(-a + b) - (4*a^6*b^2 - 2*a^5*b^3 - 9*a^4*b^4 + 4*a^3*
b^5 + 5*a^2*b^6 - 2*a*b^7)*sqrt(a^2 - b^2)*abs(-a + b))*(pi*floor(1/2*(d*x
+ c)/pi + 1/2) + arctan(2*sqrt(1/2)*tan(1/2*d*x + 1/2*c)/sqrt((2*a^3*b^2 -
2*a*b^4 - sqrt(-4*(a^3*b^2 + a^2*b^3 - a*b^4 - b^5)*(a^3*b^2 - a^2*b^3 - a*
b^4 + b^5) + 4*(a^3*b^2 - a*b^4)^2))/(a^3*b^2 - a^2*b^3 - a*b^4 + b^5))))/(
(a^2*b^3 - b^5)^2*(a^2 - 2*a*b + b^2) - (a^5*b^2 - 2*a^4*b^3 + 2*a^2*b^5 -
a*b^6)*abs(-a^2*b^3 + b^5)) + 2*(2*a^3*tan(1/2*d*x + 1/2*c)^3 - a^2*b*tan(1
/2*d*x + 1/2*c)^3 - a*b^2*tan(1/2*d*x + 1/2*c)^3 + b^3*tan(1/2*d*x + 1/2*c)
^3 + 2*a^3*tan(1/2*d*x + 1/2*c) + a^2*b*tan(1/2*d*x + 1/2*c) - a*b^2*tan(1/
2*d*x + 1/2*c) - b^3*tan(1/2*d*x + 1/2*c))/((a*tan(1/2*d*x + 1/2*c)^4 - b*t
an(1/2*d*x + 1/2*c)^4 + 2*a*tan(1/2*d*x + 1/2*c)^2 + a + b)*(a^2*b^2 - b^4)
))/d
```

Mupad [B] (verification not implemented)

Time = 20.65 (sec) , antiderivative size = 3180, normalized size of antiderivative = 20.52

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Too large to display}$$

```
[In] int(cos(c + d*x)^3/(a + b*cos(c + d*x))^2,x)
```

```
[Out] - ((2*tan(c/2 + (d*x)/2)^3*(a*b^2 + a^2*b - 2*a^3 - b^3))/(b^2*(a + b)*(a -
 b)) + (2*tan(c/2 + (d*x)/2)*(a*b^2 - a^2*b - 2*a^3 + b^3))/(b^2*(a + b)*(a
 - b)))/(d*(a + b + tan(c/2 + (d*x)/2)^4*(a - b) + 2*a*tan(c/2 + (d*x)/2)^2
)) - (4*a*atan(((2*a*((32*tan(c/2 + (d*x)/2)*(8*a^8 - 8*a^7*b + 4*a^2*b^6 -
 8*a^3*b^5 + 5*a^4*b^4 + 16*a^5*b^3 - 16*a^6*b^2))/(a*b^6 + b^7 - a^2*b^5 -
 a^3*b^4) + (a*((32*(2*a*b^11 - 3*a^2*b^10 - 3*a^3*b^9 + 5*a^4*b^8 + a^5*b^
7 - 2*a^6*b^6))/(a*b^8 + b^9 - a^2*b^7 - a^3*b^6) - (a*tan(c/2 + (d*x)/2)*(
2*a*b^11 - 2*a^2*b^10 - 4*a^3*b^9 + 4*a^4*b^8 + 2*a^5*b^7 - 2*a^6*b^6)*64i)
/(b^3*(a*b^6 + b^7 - a^2*b^5 - a^3*b^4)))*2i)/b^3))/b^3 + (2*a*((32*tan(c/2
 + (d*x)/2)*(8*a^8 - 8*a^7*b + 4*a^2*b^6 - 8*a^3*b^5 + 5*a^4*b^4 + 16*a^5*b
^3 - 16*a^6*b^2))/(a*b^6 + b^7 - a^2*b^5 - a^3*b^4) - (a*((32*(2*a*b^11 - 3
*a^2*b^10 - 3*a^3*b^9 + 5*a^4*b^8 + a^5*b^7 - 2*a^6*b^6))/(a*b^8 + b^9 - a^
2*b^7 - a^3*b^6) + (a*tan(c/2 + (d*x)/2)*(2*a*b^11 - 2*a^2*b^10 - 4*a^3*b^9
 + 4*a^4*b^8 + 2*a^5*b^7 - 2*a^6*b^6)*64i)/(b^3*(a*b^6 + b^7 - a^2*b^5 - a^
3*b^4)))*2i)/b^3))/b^3)/((64*(8*a^8 - 4*a^7*b + 12*a^4*b^4 + 6*a^5*b^3 - 20
```

*a^6*b^2))/(a*b^8 + b^9 - a^2*b^7 - a^3*b^6) - (a*((32*tan(c/2 + (d*x)/2)*(
8*a^8 - 8*a^7*b + 4*a^2*b^6 - 8*a^3*b^5 + 5*a^4*b^4 + 16*a^5*b^3 - 16*a^6*b
^2))/(a*b^6 + b^7 - a^2*b^5 - a^3*b^4) + (a*((32*(2*a*b^11 - 3*a^2*b^10 - 3
*a^3*b^9 + 5*a^4*b^8 + a^5*b^7 - 2*a^6*b^6))/(a*b^8 + b^9 - a^2*b^7 - a^3*b
^6) - (a*tan(c/2 + (d*x)/2)*(2*a*b^11 - 2*a^2*b^10 - 4*a^3*b^9 + 4*a^4*b^8
+ 2*a^5*b^7 - 2*a^6*b^6)*64i)/(b^3*(a*b^6 + b^7 - a^2*b^5 - a^3*b^4)))*2i)/
b^3)*2i)/b^3 + (a*((32*tan(c/2 + (d*x)/2)*(8*a^8 - 8*a^7*b + 4*a^2*b^6 - 8*
a^3*b^5 + 5*a^4*b^4 + 16*a^5*b^3 - 16*a^6*b^2))/(a*b^6 + b^7 - a^2*b^5 - a^
3*b^4) - (a*((32*(2*a*b^11 - 3*a^2*b^10 - 3*a^3*b^9 + 5*a^4*b^8 + a^5*b^7 -
 2*a^6*b^6))/(a*b^8 + b^9 - a^2*b^7 - a^3*b^6) + (a*tan(c/2 + (d*x)/2)*(2*a
*b^11 - 2*a^2*b^10 - 4*a^3*b^9 + 4*a^4*b^8 + 2*a^5*b^7 - 2*a^6*b^6)*64i)/(b
^3*(a*b^6 + b^7 - a^2*b^5 - a^3*b^4)))*2i)/b^3)*2i)/b^3)))/(b^3*d) - (a^2*a
tan(((a^2*((32*tan(c/2 + (d*x)/2)*(8*a^8 - 8*a^7*b + 4*a^2*b^6 - 8*a^3*b^5
+ 5*a^4*b^4 + 16*a^5*b^3 - 16*a^6*b^2))/(a*b^6 + b^7 - a^2*b^5 - a^3*b^4) +
 (a^2*(2*a^2 - 3*b^2)*((32*(2*a*b^11 - 3*a^2*b^10 - 3*a^3*b^9 + 5*a^4*b^8 +
 a^5*b^7 - 2*a^6*b^6))/(a*b^8 + b^9 - a^2*b^7 - a^3*b^6) - (32*a^2*tan(c/2
+ (d*x)/2)*(2*a^2 - 3*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a*b^11 - 2*a^2*b
^10 - 4*a^3*b^9 + 4*a^4*b^8 + 2*a^5*b^7 - 2*a^6*b^6))/((a*b^6 + b^7 - a^2*b
^5 - a^3*b^4)*(b^9 - 3*a^2*b^7 + 3*a^4*b^5 - a^6*b^3)))*(-(a + b)^3*(a - b)
^3)^(1/2))/(b^9 - 3*a^2*b^7 + 3*a^4*b^5 - a^6*b^3))*(2*a^2 - 3*b^2)*(-(a +
b)^3*(a - b)^3)^(1/2)*1i)/(b^9 - 3*a^2*b^7 + 3*a^4*b^5 - a^6*b^3) + (a^2*((
32*tan(c/2 + (d*x)/2)*(8*a^8 - 8*a^7*b + 4*a^2*b^6 - 8*a^3*b^5 + 5*a^4*b^4
+ 16*a^5*b^3 - 16*a^6*b^2))/(a*b^6 + b^7 - a^2*b^5 - a^3*b^4) - (a^2*(2*a^2
 - 3*b^2)*((32*(2*a*b^11 - 3*a^2*b^10 - 3*a^3*b^9 + 5*a^4*b^8 + a^5*b^7 - 2
*a^6*b^6))/(a*b^8 + b^9 - a^2*b^7 - a^3*b^6) + (32*a^2*tan(c/2 + (d*x)/2)*(
2*a^2 - 3*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a*b^11 - 2*a^2*b^10 - 4*a^3*
b^9 + 4*a^4*b^8 + 2*a^5*b^7 - 2*a^6*b^6))/((a*b^6 + b^7 - a^2*b^5 - a^3*b^4
)*(b^9 - 3*a^2*b^7 + 3*a^4*b^5 - a^6*b^3)))*(-(a + b)^3*(a - b)^3)^(1/2))/(
b^9 - 3*a^2*b^7 + 3*a^4*b^5 - a^6*b^3))*(2*a^2 - 3*b^2)*(-(a + b)^3*(a - b)
^3)^(1/2)*1i)/(b^9 - 3*a^2*b^7 + 3*a^4*b^5 - a^6*b^3))/((64*(8*a^8 - 4*a^7*
b + 12*a^4*b^4 + 6*a^5*b^3 - 20*a^6*b^2))/(a*b^8 + b^9 - a^2*b^7 - a^3*b^6)
 - (a^2*((32*tan(c/2 + (d*x)/2)*(8*a^8 - 8*a^7*b + 4*a^2*b^6 - 8*a^3*b^5 +
5*a^4*b^4 + 16*a^5*b^3 - 16*a^6*b^2))/(a*b^6 + b^7 - a^2*b^5 - a^3*b^4) + (
a^2*(2*a^2 - 3*b^2)*((32*(2*a*b^11 - 3*a^2*b^10 - 3*a^3*b^9 + 5*a^4*b^8 + a
^5*b^7 - 2*a^6*b^6))/(a*b^8 + b^9 - a^2*b^7 - a^3*b^6) - (32*a^2*tan(c/2 +
(d*x)/2)*(2*a^2 - 3*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a*b^11 - 2*a^2*b^1
0 - 4*a^3*b^9 + 4*a^4*b^8 + 2*a^5*b^7 - 2*a^6*b^6))/((a*b^6 + b^7 - a^2*b^5
 - a^3*b^4)*(b^9 - 3*a^2*b^7 + 3*a^4*b^5 - a^6*b^3)))*(-(a + b)^3*(a - b)^3
)^(1/2))/(b^9 - 3*a^2*b^7 + 3*a^4*b^5 - a^6*b^3))*(2*a^2 - 3*b^2)*(-(a + b)
^3*(a - b)^3)^(1/2))/(b^9 - 3*a^2*b^7 + 3*a^4*b^5 - a^6*b^3) + (a^2*((32*ta
n(c/2 + (d*x)/2)*(8*a^8 - 8*a^7*b + 4*a^2*b^6 - 8*a^3*b^5 + 5*a^4*b^4 + 16*
a^5*b^3 - 16*a^6*b^2))/(a*b^6 + b^7 - a^2*b^5 - a^3*b^4) - (a^2*(2*a^2 - 3*
b^2)*((32*(2*a*b^11 - 3*a^2*b^10 - 3*a^3*b^9 + 5*a^4*b^8 + a^5*b^7 - 2*a^6*
b^6))/(a*b^8 + b^9 - a^2*b^7 - a^3*b^6) + (32*a^2*tan(c/2 + (d*x)/2)*(2*a^2
 - 3*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a*b^11 - 2*a^2*b^10 - 4*a^3*b^9 +

```
 4*a^4*b^8 + 2*a^5*b^7 - 2*a^6*b^6))/((a*b^6 + b^7 - a^2*b^5 - a^3*b^4)*(b^
9 - 3*a^2*b^7 + 3*a^4*b^5 - a^6*b^3)))*(-(a + b)^3*(a - b)^3)^(1/2))/(b^9 -
 3*a^2*b^7 + 3*a^4*b^5 - a^6*b^3))*(2*a^2 - 3*b^2)*(-(a + b)^3*(a - b)^3)^(
1/2))/(b^9 - 3*a^2*b^7 + 3*a^4*b^5 - a^6*b^3)))*(2*a^2 - 3*b^2)*(-(a + b)^3
*(a - b)^3)^(1/2)*2i)/(d*(b^9 - 3*a^2*b^7 + 3*a^4*b^5 - a^6*b^3))
```

3.462 $\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^2} dx$

Optimal result

Integrand size = 21, antiderivative size = 108

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^2} dx = \frac{x}{b^2} - \frac{2a(a^2-2b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{3/2}b^2(a+b)^{3/2}d} - \frac{a^2\sin(c+dx)}{b(a^2-b^2)\,d(a+b\cos(c+dx))}$$

```
[Out] x/b^2-2*a*(a^2-2*b^2)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/2))/(a
-b)^(3/2)/b^2/(a+b)^(3/2)/d-a^2*sin(d*x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {2869, 2814, 2738, 211}

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^2} dx = -\frac{2a(a^2-2b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{b^2d(a-b)^{3/2}(a+b)^{3/2}} - \frac{a^2\sin(c+dx)}{bd\,(a^2-b^2)\,(a+b\cos(c+dx))} + \frac{x}{b^2}$$

```
[In] Int[Cos[c + d*x]^2/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] x/b^2 - (2*a*(a^2 - 2*b^2)*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b
]])/((a - b)^(3/2)*b^2*(a + b)^(3/2)*d) - (a^2*Sin[c + d*x])/(b*(a^2 - b^2)
*d*(a + b*Cos[c + d*x]))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2869

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^2, x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Cos[e
+ f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*(a^2 - b^2))), x] - Dist[
1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[b*(m + 1)*
(2*b*c*d - a*(c^2 + d^2)) + (a^2*d^2 - 2*a*b*c*d*(m + 2) + b^2*(d^2*(m + 1)
 + c^2*(m + 2)))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &
& NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && LtQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{a^2\sin(c+dx)}{b\left(a^2-b^2\right)d(a+b\cos(c+dx))}+\frac{\int\frac{ab+\left(a^2-b^2\right)\cos(c+dx)}{a+b\cos(c+dx)}\,dx}{b\left(a^2-b^2\right)}\\
&= \frac{x}{b^2}-\frac{a^2\sin(c+dx)}{b\left(a^2-b^2\right)d(a+b\cos(c+dx))}-\frac{\left(a\left(a^2-2b^2\right)\right)\int\frac{1}{a+b\cos(c+dx)}\,dx}{b^2\left(a^2-b^2\right)}\\
&= \frac{x}{b^2}-\frac{a^2\sin(c+dx)}{b\left(a^2-b^2\right)d(a+b\cos(c+dx))}\\
&\quad -\frac{\left(2a\left(a^2-2b^2\right)\right)\operatorname{Subst}\left(\int\frac{1}{a+b+(a-b)x^2}\,dx,x,\tan\left(\frac{1}{2}(c+dx)\right)\right)}{b^2\left(a^2-b^2\right)d}\\
&= \frac{x}{b^2}-\frac{2a\left(a^2-2b^2\right)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{3/2}b^2(a+b)^{3/2}d}-\frac{a^2\sin(c+dx)}{b\left(a^2-b^2\right)d(a+b\cos(c+dx))}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.40 (sec) , antiderivative size = 103, normalized size of antiderivative = 0.95

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \frac{c+dx-\frac{2a(a^2-2b^2)\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{3/2}}-\frac{a^2b\sin(c+dx)}{(a-b)(a+b)(a+b\cos(c+dx))}}{b^2d}$$

```
[In] Integrate[Cos[c + d*x]^2/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (c + d*x - (2*a*(a^2 - 2*b^2)*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2
+ b^2]])/(-a^2 + b^2)^(3/2) - (a^2*b*Sin[c + d*x])/((a - b)*(a + b)*(a + b*
Cos[c + d*x])))/(b^2*d)
```

Maple [A] (verified)

Time = 1.00 (sec) , antiderivative size = 143, normalized size of antiderivative = 1.32

method	result
derivativedivides	$\frac{\frac{2\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{b^2}-\frac{2a\left(\frac{ab\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(a^2-b^2\right)\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)}+\frac{\left(a^2-2b^2\right)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{(a-b)(a+b)\sqrt{(a-b)(a+b)}}\right)}{b^2}}{d}$
default	$\frac{\frac{2\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{b^2}-\frac{2a\left(\frac{ab\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(a^2-b^2\right)\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)}+\frac{\left(a^2-2b^2\right)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{(a-b)(a+b)\sqrt{(a-b)(a+b)}}\right)}{b^2}}{d}$
risch	$\frac{x}{b^2}-\frac{2ia^2\left(a\,\mathrm{e}^{i(dx+c)}+b\right)}{b^2(a^2-b^2)d\left(b\,\mathrm{e}^{2i(dx+c)}+2a\,\mathrm{e}^{i(dx+c)}+b\right)}-\frac{a^3\ln\left(\mathrm{e}^{i(dx+c)}-\frac{ia^2-ib^2-a\sqrt{-a^2+b^2}}{b\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}\,(a+b)(a-b)d\,b^2}+\frac{2a\ln\left(\mathrm{e}^{i(dx+c)}-\frac{ia^2-ib^2}{b\sqrt{}}\right)}{\sqrt{-a^2+b^2}\,(a+b)}$

```
[In] int(cos(d*x+c)^2/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(2/b^2*arctan(tan(1/2*d*x+1/2*c))-2*a/b^2*(a*b/(a^2-b^2)*tan(1/2*d*x+1/
2*c)/(tan(1/2*d*x+1/2*c)^2*a-b*tan(1/2*d*x+1/2*c)^2+a+b)+(a^2-2*b^2)/(a-b)/
(a+b)/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/
2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 199 vs. $2(99) = 198$.

Time = 0.29 (sec) , antiderivative size = 470, normalized size of antiderivative = 4.35

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$
$$= \left[\frac{2\,(a^4b-2\,a^2b^3+b^5)dx\cos{(dx+c)}+2\,(a^5-2\,a^3b^2+ab^4)dx-(a^4-2\,a^2b^2+(a^3b-2\,ab^3)\cos{(dx+c)})\cdots}{2\,((a^4b^3-2\,a^2b^5+b^7)d\cos\cdots}\right.$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c))^2,x, algorithm="fricas")
[Out] [1/2*(2*(a^4*b - 2*a^2*b^3 + b^5)*d*x*cos(d*x + c) + 2*(a^5 - 2*a^3*b^2 + a
*b^4)*d*x - (a^4 - 2*a^2*b^2 + (a^3*b - 2*a*b^3)*cos(d*x + c))*sqrt(-a^2 +
b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x + c)^2 - 2*sqrt(-a^2 +
 b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2)/(b^2*cos(d*x + c)^2
+ 2*a*b*cos(d*x + c) + a^2)) - 2*(a^4*b - a^2*b^3)*sin(d*x + c))/((a^4*b^3
- 2*a^2*b^5 + b^7)*d*cos(d*x + c) + (a^5*b^2 - 2*a^3*b^4 + a*b^6)*d), ((a^4
*b - 2*a^2*b^3 + b^5)*d*x*cos(d*x + c) + (a^5 - 2*a^3*b^2 + a*b^4)*d*x - (a
^4 - 2*a^2*b^2 + (a^3*b - 2*a*b^3)*cos(d*x + c))*sqrt(a^2 - b^2)*arctan(-(a
*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c))) - (a^4*b - a^2*b^3)*sin(
d*x + c))/((a^4*b^3 - 2*a^2*b^5 + b^7)*d*cos(d*x + c) + (a^5*b^2 - 2*a^3*b^
4 + a*b^6)*d)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**2/(a+b*cos(d*x+c))**2,x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 175, normalized size of antiderivative = 1.62

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^2}\,dx =$$

$$-\frac{\frac{2\,a^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{(a^2b-b^3)\left(a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+a+b\right)}-\frac{2\,(a^3-2\,ab^2)\left(\pi\left\lfloor\frac{dx+c}{2\,\pi}+\frac{1}{2}\right\rfloor\mathrm{sgn}(-2\,a+2\,b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-b\tan\left(\frac{1}{2}\,dx\right.}{\sqrt{a^2-b^2}}\right.\right.}{(a^2b^2-b^4)\sqrt{a^2-b^2}}}{d}$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -(2*a^2*tan(1/2*d*x + 1/2*c)/((a^2*b - b^3)*(a*tan(1/2*d*x + 1/2*c)^2 - b*t
an(1/2*d*x + 1/2*c)^2 + a + b)) - 2*(a^3 - 2*a*b^2)*(pi*floor(1/2*(d*x + c)
/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1/2*d*x + 1/2*c) - b*tan(1/2*d*
x + 1/2*c))/sqrt(a^2 - b^2)))/((a^2*b^2 - b^4)*sqrt(a^2 - b^2)) - (d*x + c)
/b^2)/d
```

Mupad [B] (verification not implemented)

Time = 20.89 (sec) , antiderivative size = 2872, normalized size of antiderivative = 26.59

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Too large to display}$$

```
[In] int(cos(c + d*x)^2/(a + b*cos(c + d*x))^2,x)
```

```
[Out] (2*atan((((((32*(2*a*b^8 - b^9 + a^2*b^7 - 3*a^3*b^6 + a^5*b^4))/(a*b^5 + b
^6 - a^2*b^4 - a^3*b^3) - (tan(c/2 + (d*x)/2)*(2*a*b^9 - 2*a^2*b^8 - 4*a^3*
b^7 + 4*a^4*b^6 + 2*a^5*b^5 - 2*a^6*b^4)*32i)/(b^2*(a*b^4 + b^5 - a^2*b^3 -
 a^3*b^2)))*1i)/b^2 + (32*tan(c/2 + (d*x)/2)*(2*a^6 - 2*a^5*b - 2*a*b^5 + b
^6 + 3*a^2*b^4 + 4*a^3*b^3 - 5*a^4*b^2))/(a*b^4 + b^5 - a^2*b^3 - a^3*b^2))
/b^2 - ((((32*(2*a*b^8 - b^9 + a^2*b^7 - 3*a^3*b^6 + a^5*b^4))/(a*b^5 + b^6
 - a^2*b^4 - a^3*b^3) + (tan(c/2 + (d*x)/2)*(2*a*b^9 - 2*a^2*b^8 - 4*a^3*b^
7 + 4*a^4*b^6 + 2*a^5*b^5 - 2*a^6*b^4)*32i)/(b^2*(a*b^4 + b^5 - a^2*b^3 - a
^3*b^2)))*1i)/b^2 - (32*tan(c/2 + (d*x)/2)*(2*a^6 - 2*a^5*b - 2*a*b^5 + b^6
 + 3*a^2*b^4 + 4*a^3*b^3 - 5*a^4*b^2))/(a*b^4 + b^5 - a^2*b^3 - a^3*b^2))/b
^2)/((64*(2*a*b^4 - a^4*b + a^5 + 2*a^2*b^3 - 3*a^3*b^2))/(a*b^5 + b^6 - a^
2*b^4 - a^3*b^3) + (((((32*(2*a*b^8 - b^9 + a^2*b^7 - 3*a^3*b^6 + a^5*b^4))
/(a*b^5 + b^6 - a^2*b^4 - a^3*b^3) - (tan(c/2 + (d*x)/2)*(2*a*b^9 - 2*a^2*b
^8 - 4*a^3*b^7 + 4*a^4*b^6 + 2*a^5*b^5 - 2*a^6*b^4)*32i)/(b^2*(a*b^4 + b^5
- a^2*b^3 - a^3*b^2)))*1i)/b^2 + (32*tan(c/2 + (d*x)/2)*(2*a^6 - 2*a^5*b -
2*a*b^5 + b^6 + 3*a^2*b^4 + 4*a^3*b^3 - 5*a^4*b^2))/(a*b^4 + b^5 - a^2*b^3
```

- a^3*b^2))*1i)/b^2 + (((((32*(2*a*b^8 - b^9 + a^2*b^7 - 3*a^3*b^6 + a^5*b^
4))/(a*b^5 + b^6 - a^2*b^4 - a^3*b^3) + (tan(c/2 + (d*x)/2)*(2*a*b^9 - 2*a^
2*b^8 - 4*a^3*b^7 + 4*a^4*b^6 + 2*a^5*b^5 - 2*a^6*b^4)*32i)/(b^2*(a*b^4 + b
^5 - a^2*b^3 - a^3*b^2)))*1i)/b^2 - (32*tan(c/2 + (d*x)/2)*(2*a^6 - 2*a^5*b
 - 2*a*b^5 + b^6 + 3*a^2*b^4 + 4*a^3*b^3 - 5*a^4*b^2))/(a*b^4 + b^5 - a^2*b
^3 - a^3*b^2))*1i)/b^2)))/(b^2*d) + (a*atan(((a*(a^2 - 2*b^2)*(-(a + b)^3*(
a - b)^3)^(1/2)*((32*tan(c/2 + (d*x)/2)*(2*a^6 - 2*a^5*b - 2*a*b^5 + b^6 +
3*a^2*b^4 + 4*a^3*b^3 - 5*a^4*b^2))/(a*b^4 + b^5 - a^2*b^3 - a^3*b^2) + (a*
(a^2 - 2*b^2)*((32*(2*a*b^8 - b^9 + a^2*b^7 - 3*a^3*b^6 + a^5*b^4))/(a*b^5
+ b^6 - a^2*b^4 - a^3*b^3) - (32*a*tan(c/2 + (d*x)/2)*(a^2 - 2*b^2)*(-(a +
b)^3*(a - b)^3)^(1/2)*(2*a*b^9 - 2*a^2*b^8 - 4*a^3*b^7 + 4*a^4*b^6 + 2*a^5*
b^5 - 2*a^6*b^4))/((a*b^4 + b^5 - a^2*b^3 - a^3*b^2)*(b^8 - 3*a^2*b^6 + 3*a
^4*b^4 - a^6*b^2)))*(-(a + b)^3*(a - b)^3)^(1/2))/(b^8 - 3*a^2*b^6 + 3*a^4*
b^4 - a^6*b^2))*1i)/(b^8 - 3*a^2*b^6 + 3*a^4*b^4 - a^6*b^2) + (a*(a^2 - 2*b
^2)*(-(a + b)^3*(a - b)^3)^(1/2)*((32*tan(c/2 + (d*x)/2)*(2*a^6 - 2*a^5*b -
 2*a*b^5 + b^6 + 3*a^2*b^4 + 4*a^3*b^3 - 5*a^4*b^2))/(a*b^4 + b^5 - a^2*b^3
 - a^3*b^2) - (a*(a^2 - 2*b^2)*((32*(2*a*b^8 - b^9 + a^2*b^7 - 3*a^3*b^6 +
a^5*b^4))/(a*b^5 + b^6 - a^2*b^4 - a^3*b^3) + (32*a*tan(c/2 + (d*x)/2)*(a^2
 - 2*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a*b^9 - 2*a^2*b^8 - 4*a^3*b^7 + 4
*a^4*b^6 + 2*a^5*b^5 - 2*a^6*b^4))/((a*b^4 + b^5 - a^2*b^3 - a^3*b^2)*(b^8
- 3*a^2*b^6 + 3*a^4*b^4 - a^6*b^2)))*(-(a + b)^3*(a - b)^3)^(1/2))/(b^8 - 3
*a^2*b^6 + 3*a^4*b^4 - a^6*b^2))*1i)/(b^8 - 3*a^2*b^6 + 3*a^4*b^4 - a^6*b^2
))/((64*(2*a*b^4 - a^4*b + a^5 + 2*a^2*b^3 - 3*a^3*b^2))/(a*b^5 + b^6 - a^2
*b^4 - a^3*b^3) + (a*(a^2 - 2*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*((32*tan(c/
2 + (d*x)/2)*(2*a^6 - 2*a^5*b - 2*a*b^5 + b^6 + 3*a^2*b^4 + 4*a^3*b^3 - 5*a
^4*b^2))/(a*b^4 + b^5 - a^2*b^3 - a^3*b^2) + (a*(a^2 - 2*b^2)*((32*(2*a*b^8
 - b^9 + a^2*b^7 - 3*a^3*b^6 + a^5*b^4))/(a*b^5 + b^6 - a^2*b^4 - a^3*b^3)
- (32*a*tan(c/2 + (d*x)/2)*(a^2 - 2*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a*
b^9 - 2*a^2*b^8 - 4*a^3*b^7 + 4*a^4*b^6 + 2*a^5*b^5 - 2*a^6*b^4))/((a*b^4 +
 b^5 - a^2*b^3 - a^3*b^2)*(b^8 - 3*a^2*b^6 + 3*a^4*b^4 - a^6*b^2)))*(-(a +
b)^3*(a - b)^3)^(1/2))/(b^8 - 3*a^2*b^6 + 3*a^4*b^4 - a^6*b^2)))/(b^8 - 3*a
^2*b^6 + 3*a^4*b^4 - a^6*b^2) - (a*(a^2 - 2*b^2)*(-(a + b)^3*(a - b)^3)^(1/
2)*((32*tan(c/2 + (d*x)/2)*(2*a^6 - 2*a^5*b - 2*a*b^5 + b^6 + 3*a^2*b^4 + 4
*a^3*b^3 - 5*a^4*b^2))/(a*b^4 + b^5 - a^2*b^3 - a^3*b^2) - (a*(a^2 - 2*b^2)
((32(2*a*b^8 - b^9 + a^2*b^7 - 3*a^3*b^6 + a^5*b^4))/(a*b^5 + b^6 - a^2*b
^4 - a^3*b^3) + (32*a*tan(c/2 + (d*x)/2)*(a^2 - 2*b^2)*(-(a + b)^3*(a - b)^
3)^(1/2)*(2*a*b^9 - 2*a^2*b^8 - 4*a^3*b^7 + 4*a^4*b^6 + 2*a^5*b^5 - 2*a^6*b
^4))/((a*b^4 + b^5 - a^2*b^3 - a^3*b^2)*(b^8 - 3*a^2*b^6 + 3*a^4*b^4 - a^6*
b^2)))*(-(a + b)^3*(a - b)^3)^(1/2))/(b^8 - 3*a^2*b^6 + 3*a^4*b^4 - a^6*b^2
)))/(b^8 - 3*a^2*b^6 + 3*a^4*b^4 - a^6*b^2)))*(a^2 - 2*b^2)*(-(a + b)^3*(a
- b)^3)^(1/2)*2i)/(d*(b^8 - 3*a^2*b^6 + 3*a^4*b^4 - a^6*b^2)) - (2*a^2*tan(
c/2 + (d*x)/2))/(d*(a + b)*(a*b - b^2)*(a + b + tan(c/2 + (d*x)/2)^2*(a - b
)))

3.463 $\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^2} \, dx$

Optimal result

Integrand size = 19, antiderivative size = 85

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^2} \, dx = -\frac{2b\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{3/2}(a+b)^{3/2}d} + \frac{a\sin(c+dx)}{(a^2-b^2)\,d(a+b\cos(c+dx))}$$

```
[Out] -2*b*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/2))/(a-b)^(3/2)/(a+b)^(
3/2)/d+a*sin(d*x+c)/(a^2-b^2)/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2833, 12, 2738, 211}

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^2} \, dx = \frac{a\sin(c+dx)}{d\,(a^2-b^2)\,(a+b\cos(c+dx))} - \frac{2b\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{d(a-b)^{3/2}(a+b)^{3/2}}$$

```
[In] Int[Cos[c + d*x]/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (-2*b*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/((a - b)^(3/2)*(a
 + b)^(3/2)*d) + (a*Sin[c + d*x])/((a^2 - b^2)*d*(a + b*Cos[c + d*x]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2833

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((a + b*Sin[e +
 f*x])^(m + 1)/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(a^2 - b^2)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[(a*c - b*d)*(m + 1) - (b*c - a*d)*(m
 + 2)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 - b^2, 0] && LtQ[m, -1] && IntegerQ[2*m]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{a\sin(c+dx)}{(a^2-b^2)\,d(a+b\cos(c+dx))}+\frac{\int\frac{b}{a+b\cos(c+dx)}\,dx}{-a^2+b^2} \\
&= \frac{a\sin(c+dx)}{(a^2-b^2)\,d(a+b\cos(c+dx))}-\frac{b\int\frac{1}{a+b\cos(c+dx)}\,dx}{a^2-b^2} \\
&= \frac{a\sin(c+dx)}{(a^2-b^2)\,d(a+b\cos(c+dx))}-\frac{(2b)\text{Subst}\left(\int\frac{1}{a+b+(a-b)x^2}\,dx,x,\tan\left(\frac{1}{2}(c+dx)\right)\right)}{(a^2-b^2)\,d} \\
&= -\frac{2b\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{3/2}(a+b)^{3/2}d}+\frac{a\sin(c+dx)}{(a^2-b^2)\,d(a+b\cos(c+dx))}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.98

$$
\int\frac{\cos(c+dx)}{(a+b\cos(c+dx))^2}\,dx=\frac{-\frac{2b\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{3/2}}+\frac{a\sin(c+dx)}{(a-b)(a+b)(a+b\cos(c+dx))}}{d}
$$

```
[In] Integrate[Cos[c + d*x]/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] ((-2*b*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/(-a^2 + b^2)^(
3/2) + (a*Sin[c + d*x])/((a - b)*(a + b)*(a + b*Cos[c + d*x])))/d
```

Maple [A] (verified)

Time = 0.96 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.34

method	result
derivativedivides	$\frac{\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(a^2-b^2\right)\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)}-\frac{2b\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{(a-b)(a+b)\sqrt{(a-b)(a+b)}}}{d}$
default	$\frac{\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(a^2-b^2\right)\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)}-\frac{2b\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{(a-b)(a+b)\sqrt{(a-b)(a+b)}}}{d}$
risch	$-\frac{2ia\left(a\,e^{i(dx+c)}+b\right)}{b(-a^2+b^2)d\left(b\,e^{2i(dx+c)}+2a\,e^{i(dx+c)}+b\right)}-\frac{b\ln\left(e^{i(dx+c)}+\frac{-ia^2+ib^2+a\sqrt{-a^2+b^2}}{\sqrt{-a^2+b^2}\,b}\right)}{\sqrt{-a^2+b^2}\,(a+b)(a-b)d}+\frac{b\ln\left(e^{i(dx+c)}+\frac{ia^2-ib^2+a\sqrt{\ldots}}{b\sqrt{-a^2+\ldots}}\right)}{\sqrt{-a^2+b^2}\,(a+b)(a-\ldots}$

```
[In] int(cos(d*x+c)/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(2*a/(a^2-b^2)*tan(1/2*d*x+1/2*c)/(tan(1/2*d*x+1/2*c)^2*a-b*tan(1/2*d*x
+1/2*c)^2+a+b)-2*b/(a-b)/(a+b)/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x
+1/2*c)/((a-b)*(a+b))^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 321, normalized size of antiderivative = 3.78

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$
$$= \left[\frac{(b^2\cos(dx+c)+ab)\sqrt{-a^2+b^2}\log\left(\frac{2\,ab\cos(dx+c)+(2\,a^2-b^2)\cos(dx+c)^2+2\,\sqrt{-a^2+b^2}(a\cos(dx+c)+b)\sin(dx+c)-a^2+2\,b^2}{b^2\cos(dx+c)^2+2\,ab\cos(dx+c)+a^2}\right) \ldots}{2\left((a^4b-2\,a^2b^3+b^5)d\cos(dx+c)+(a^5-2\,a^3b^2+ab^4)d\right)}\right.$$
$$\left.-\frac{(b^2\cos(dx+c)+ab)\sqrt{a^2-b^2}\arctan\left(-\frac{a\cos(dx+c)+b}{\sqrt{a^2-b^2}\sin(dx+c)}\right)-(a^3-ab^2)\sin(dx+c)}{(a^4b-2\,a^2b^3+b^5)d\cos(dx+c)+(a^5-2\,a^3b^2+ab^4)d}\right]$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] [1/2*((b^2*cos(d*x + c) + a*b)*sqrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (
2*a^2 - b^2)*cos(d*x + c)^2 + 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d
*x + c) - a^2 + 2*b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) + 2
*(a^3 - a*b^2)*sin(d*x + c))/((a^4*b - 2*a^2*b^3 + b^5)*d*cos(d*x + c) + (a
^5 - 2*a^3*b^2 + a*b^4)*d), -((b^2*cos(d*x + c) + a*b)*sqrt(a^2 - b^2)*arct
an(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c))) - (a^3 - a*b^2)*si
n(d*x + c))/((a^4*b - 2*a^2*b^3 + b^5)*d*cos(d*x + c) + (a^5 - 2*a^3*b^2 +
a*b^4)*d)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))**2,x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.59

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \frac{2\left(\frac{\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor \operatorname{sgn}(-2a+2b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{a^2-b^2}}\right)\right)b}{(a^2-b^2)^{\frac{3}{2}}}+\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\left(a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2+a+b\right)(a^2-b^2)}\right)}{d}$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))^2,x, algorithm="giac")
[Out] 2*((pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1/2*d
*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))*b/(a^2 - b^2)^(3/2)
 + a*tan(1/2*d*x + 1/2*c)/((a*tan(1/2*d*x + 1/2*c)^2 - b*tan(1/2*d*x + 1/2*
c)^2 + a + b)*(a^2 - b^2)))/d
```

Mupad [B] (verification not implemented)

Time = 15.17 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.16

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \frac{2\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{d\,\left(a+b\right)\,\left(a-b\right)\,\left(\left(a-b\right)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+a+b\right)} - \frac{2\,b\,\mathrm{atan}\left(\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(2\,a-2\,b\right)}{2\,\sqrt{a+b}\,\sqrt{a-b}}\right)}{d\,{\left(a+b\right)}^{3/2}\,{\left(a-b\right)}^{3/2}}$$

```
[In] int(cos(c + d*x)/(a + b*cos(c + d*x))^2,x)
```

```
[Out] (2*a*tan(c/2 + (d*x)/2))/(d*(a + b)*(a - b)*(a + b + tan(c/2 + (d*x)/2)^2*(
a - b))) - (2*b*atan((tan(c/2 + (d*x)/2)*(2*a - 2*b))/(2*(a + b)^(1/2)*(a -
 b)^(1/2))))/(d*(a + b)^(3/2)*(a - b)^(3/2))
```

3.464 $\int \frac{1}{(a+b\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 86

$$\int \frac{1}{(a+b\cos(c+dx))^2}\,dx = \frac{2a\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{3/2}(a+b)^{3/2}d} - \frac{b\sin(c+dx)}{(a^2-b^2)\,d(a+b\cos(c+dx))}$$

```
[Out] 2*a*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/2))/(a-b)^(3/2)/(a+b)^(3
/2)/d-b*sin(d*x+c)/(a^2-b^2)/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2743, 12, 2738, 211}

$$\int \frac{1}{(a+b\cos(c+dx))^2}\,dx = \frac{2a\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{d(a-b)^{3/2}(a+b)^{3/2}} - \frac{b\sin(c+dx)}{d\,(a^2-b^2)\,(a+b\cos(c+dx))}$$

```
[In] Int[(a + b*Cos[c + d*x])^(-2),x]
```

```
[Out] (2*a*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/((a - b)^(3/2)*(a
+ b)^(3/2)*d) - (b*Sin[c + d*x])/((a^2 - b^2)*d*(a + b*Cos[c + d*x]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2743

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos
[c + d*x]*((a + b*Sin[c + d*x])^(n + 1)/(d*(n + 1)*(a^2 - b^2))), x] + Dist
[1/((n + 1)*(a^2 - b^2)), Int[(a + b*Sin[c + d*x])^(n + 1)*Simp[a*(n + 1) -
 b*(n + 2)*Sin[c + d*x], x], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{b\sin(c+dx)}{(a^2-b^2)\,d(a+b\cos(c+dx))}-\frac{\int\frac{a}{a+b\cos(c+dx)}\,dx}{-a^2+b^2}\\
&= -\frac{b\sin(c+dx)}{(a^2-b^2)\,d(a+b\cos(c+dx))}+\frac{a\int\frac{1}{a+b\cos(c+dx)}\,dx}{a^2-b^2}\\
&= -\frac{b\sin(c+dx)}{(a^2-b^2)\,d(a+b\cos(c+dx))}+\frac{(2a)\text{Subst}\left(\int\frac{1}{a+b+(a-b)x^2}\,dx,x,\tan\left(\frac{1}{2}(c+dx)\right)\right)}{(a^2-b^2)\,d}\\
&= \frac{2a\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{3/2}(a+b)^{3/2}d}-\frac{b\sin(c+dx)}{(a^2-b^2)\,d(a+b\cos(c+dx))}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.98

$$
\int\frac{1}{(a+b\cos(c+dx))^2}\,dx=\frac{\frac{2a\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{3/2}}-\frac{b\sin(c+dx)}{(a-b)(a+b)(a+b\cos(c+dx))}}{d}
$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(-2),x]
[Out] ((2*a*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/(-a^2 + b^2)^(3
/2) - (b*Sin[c + d*x])/((a - b)*(a + b)*(a + b*Cos[c + d*x])))/d
```

Maple [A] (verified)

Time = 0.83 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.33

method	result
derivativedivides	$\frac{-\frac{2b\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(a^2-b^2\right)\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)}+\frac{2a\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{(a-b)(a+b)\sqrt{(a-b)(a+b)}}}{d}$
default	$\frac{-\frac{2b\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(a^2-b^2\right)\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)}+\frac{2a\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{(a-b)(a+b)\sqrt{(a-b)(a+b)}}}{d}$
risch	$\frac{2i\left(a\,e^{i(dx+c)}+b\right)}{d(-a^2+b^2)\left(b\,e^{2i(dx+c)}+2a\,e^{i(dx+c)}+b\right)}-\frac{a\ln\left(e^{i(dx+c)}+\frac{ia^2-ib^2+a\sqrt{-a^2+b^2}}{b\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}\,(a+b)(a-b)d}+\frac{a\ln\left(e^{i(dx+c)}-\frac{ia^2-ib^2-a\sqrt{-a^2+b^2}}{b\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}\,(a+b)(a-b)d}$

[In] int(1/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)

[Out] 1/d*(-2/(a^2-b^2)*b*tan(1/2*d*x+1/2*c)/(tan(1/2*d*x+1/2*c)^2*a-b*tan(1/2*d*x+1/2*c)^2+a+b)+2*a/(a-b)/(a+b)/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2)))

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 320, normalized size of antiderivative = 3.72

$$\int \frac{1}{(a+b\cos(c+dx))^2}\,dx$$
$$= \left[\frac{(ab\cos(dx+c)+a^2)\sqrt{-a^2+b^2}\log\left(\frac{2\,ab\cos(dx+c)+(2\,a^2-b^2)\cos(dx+c)^2-2\sqrt{-a^2+b^2}(a\cos(dx+c)+b)\sin(dx+c)-a^2+2\,b^2}{b^2\cos(dx+c)^2+2\,ab\cos(dx+c)+a^2}\right)}{2\left((a^4b-2\,a^2b^3+b^5)d\cos(dx+c)+(a^5-2\,a^3b^2+ab^4)d\right)}\right.$$

[In] integrate(1/(a+b*cos(d*x+c))^2,x, algorithm="fricas")

[Out] [1/2*((a*b*cos(d*x + c) + a^2)*sqrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x + c)^2 - 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) - 2*(a^2*b - b^3)*sin(d*x + c))/((a^4*b - 2*a^2*b^3 + b^5)*d*cos(d*x + c) + (a^5 - 2*a^3*b^2 + a*b^4)*d), ((a*b*cos(d*x + c) + a^2)*sqrt(a^2 - b^2)*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c))) - (a^2*b - b^3)*sin(d*x + c))/((a^4*b - 2*a^2*b^3 + b^5)*d*cos(d*x + c) + (a^5 - 2*a^3*b^2 + a*b^4)*d)]

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2470 vs. 2(70) = 140.

Time = 34.66 (sec) , antiderivative size = 2470, normalized size of antiderivative = 28.72

$$\int \frac{1}{(a+b\cos(c+dx))^2}\,dx = \text{Too large to display}$$

```
[In] integrate(1/(a+b*cos(d*x+c))**2,x)
```

```
[Out] Piecewise((zoo*x/cos(c)**2, Eq(a, 0) & Eq(b, 0) & Eq(d, 0)), (tan(c/2 + d*x
/2)**3/(6*b**2*d) + tan(c/2 + d*x/2)/(2*b**2*d), Eq(a, b)), (-1/(2*b**2*d*t
an(c/2 + d*x/2)) - 1/(6*b**2*d*tan(c/2 + d*x/2)**3), Eq(a, -b)), (x/(a + b*
cos(c))**2, Eq(d, 0)), (a**2*log(-sqrt(-a/(a - b) - b/(a - b)) + tan(c/2 +
d*x/2))*tan(c/2 + d*x/2)**2/(a**4*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 +
d*x/2)**2 + a**4*d*sqrt(-a/(a - b) - b/(a - b)) - 2*a**3*b*d*sqrt(-a/(a - b
) - b/(a - b))*tan(c/2 + d*x/2)**2 - 2*a**2*b**2*d*sqrt(-a/(a - b) - b/(a -
 b)) + 2*a*b**3*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 - b**4*d
*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 + b**4*d*sqrt(-a/(a - b)
- b/(a - b))) + a**2*log(-sqrt(-a/(a - b) - b/(a - b)) + tan(c/2 + d*x/2))/
(a**4*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 + a**4*d*sqrt(-a/(
a - b) - b/(a - b)) - 2*a**3*b*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x
/2)**2 - 2*a**2*b**2*d*sqrt(-a/(a - b) - b/(a - b)) + 2*a*b**3*d*sqrt(-a/(a
 - b) - b/(a - b))*tan(c/2 + d*x/2)**2 - b**4*d*sqrt(-a/(a - b) - b/(a - b)
)*tan(c/2 + d*x/2)**2 + b**4*d*sqrt(-a/(a - b) - b/(a - b))) - a**2*log(sqr
t(-a/(a - b) - b/(a - b)) + tan(c/2 + d*x/2))*tan(c/2 + d*x/2)**2/(a**4*d*s
qrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 + a**4*d*sqrt(-a/(a - b) -
b/(a - b)) - 2*a**3*b*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 -
2*a**2*b**2*d*sqrt(-a/(a - b) - b/(a - b)) + 2*a*b**3*d*sqrt(-a/(a - b) - b
/(a - b))*tan(c/2 + d*x/2)**2 - b**4*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2
 + d*x/2)**2 + b**4*d*sqrt(-a/(a - b) - b/(a - b))) - a**2*log(sqrt(-a/(a -
 b) - b/(a - b)) + tan(c/2 + d*x/2))/(a**4*d*sqrt(-a/(a - b) - b/(a - b))*t
an(c/2 + d*x/2)**2 + a**4*d*sqrt(-a/(a - b) - b/(a - b)) - 2*a**3*b*d*sqrt(
-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 - 2*a**2*b**2*d*sqrt(-a/(a - b)
 - b/(a - b)) + 2*a*b**3*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2
 - b**4*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 + b**4*d*sqrt(-a
/(a - b) - b/(a - b))) - 2*a*b*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2
)/(a**4*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 + a**4*d*sqrt(-a
/(a - b) - b/(a - b)) - 2*a**3*b*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d
*x/2)**2 - 2*a**2*b**2*d*sqrt(-a/(a - b) - b/(a - b)) + 2*a*b**3*d*sqrt(-a/
(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 - b**4*d*sqrt(-a/(a - b) - b/(a -
b))*tan(c/2 + d*x/2)**2 + b**4*d*sqrt(-a/(a - b) - b/(a - b))) - a*b*log(-s
qrt(-a/(a - b) - b/(a - b)) + tan(c/2 + d*x/2))*tan(c/2 + d*x/2)**2/(a**4*d
*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 + a**4*d*sqrt(-a/(a - b)
- b/(a - b)) - 2*a**3*b*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2
```

```
- 2*a**2*b**2*d*sqrt(-a/(a - b) - b/(a - b)) + 2*a*b**3*d*sqrt(-a/(a - b) -
 b/(a - b))*tan(c/2 + d*x/2)**2 - b**4*d*sqrt(-a/(a - b) - b/(a - b))*tan(c
/2 + d*x/2)**2 + b**4*d*sqrt(-a/(a - b) - b/(a - b))) + a*b*log(-sqrt(-a/(a
 - b) - b/(a - b)) + tan(c/2 + d*x/2))/(a**4*d*sqrt(-a/(a - b) - b/(a - b))
*tan(c/2 + d*x/2)**2 + a**4*d*sqrt(-a/(a - b) - b/(a - b)) - 2*a**3*b*d*sqr
t(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 - 2*a**2*b**2*d*sqrt(-a/(a -
b) - b/(a - b)) + 2*a*b**3*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)*
*2 - b**4*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 + b**4*d*sqrt(
-a/(a - b) - b/(a - b))) + a*b*log(sqrt(-a/(a - b) - b/(a - b)) + tan(c/2 +
 d*x/2))*tan(c/2 + d*x/2)**2/(a**4*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 +
 d*x/2)**2 + a**4*d*sqrt(-a/(a - b) - b/(a - b)) - 2*a**3*b*d*sqrt(-a/(a -
b) - b/(a - b))*tan(c/2 + d*x/2)**2 - 2*a**2*b**2*d*sqrt(-a/(a - b) - b/(a
- b)) + 2*a*b**3*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 - b**4*
d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 + b**4*d*sqrt(-a/(a - b)
 - b/(a - b))) - a*b*log(sqrt(-a/(a - b) - b/(a - b)) + tan(c/2 + d*x/2))/(
a**4*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 + a**4*d*sqrt(-a/(a
 - b) - b/(a - b)) - 2*a**3*b*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/
2)**2 - 2*a**2*b**2*d*sqrt(-a/(a - b) - b/(a - b)) + 2*a*b**3*d*sqrt(-a/(a
- b) - b/(a - b))*tan(c/2 + d*x/2)**2 - b**4*d*sqrt(-a/(a - b) - b/(a - b))
*tan(c/2 + d*x/2)**2 + b**4*d*sqrt(-a/(a - b) - b/(a - b))) + 2*b**2*sqrt(-
a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)/(a**4*d*sqrt(-a/(a - b) - b/(a - b)
)*tan(c/2 + d*x/2)**2 + a**4*d*sqrt(-a/(a - b) - b/(a - b)) - 2*a**3*b*d*sq
rt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 - 2*a**2*b**2*d*sqrt(-a/(a -
 b) - b/(a - b)) + 2*a*b**3*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)
**2 - b**4*d*sqrt(-a/(a - b) - b/(a - b))*tan(c/2 + d*x/2)**2 + b**4*d*sqrt
(-a/(a - b) - b/(a - b))), True))
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\cos(c+dx))^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(1/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.57

$$\int \frac{1}{(a+b\cos(c+dx))^2}\,dx = -\frac{2\left(\frac{\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor\operatorname{sgn}(-2a+2b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{a^2-b^2}}\right)\right)a}{(a^2-b^2)^{\frac{3}{2}}}+\frac{b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\left(a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2+a+b\right)(a^2-b}\right)}{d}$$

```
[In] integrate(1/(a+b*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -2*((pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1/2*
d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))*a/(a^2 - b^2)^(3/2
) + b*tan(1/2*d*x + 1/2*c)/((a*tan(1/2*d*x + 1/2*c)^2 - b*tan(1/2*d*x + 1/2
*c)^2 + a + b)*(a^2 - b^2)))/d
```

Mupad [B] (verification not implemented)

Time = 14.36 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.15

$$\int \frac{1}{(a+b\cos(c+dx))^2}\,dx = \frac{2a\,\mathrm{atan}\left(\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)(2a-2b)}{2\sqrt{a+b}\sqrt{a-b}}\right)}{d\,(a+b)^{3/2}\,(a-b)^{3/2}} - \frac{2\,b\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{d\,(a+b)\,(a-b)\,\left((a-b)\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+a+b\right)}$$

```
[In] int(1/(a + b*cos(c + d*x))^2,x)
```

```
[Out] (2*a*atan((tan(c/2 + (d*x)/2)*(2*a - 2*b))/(2*(a + b)^(1/2)*(a - b)^(1/2)))
)/(d*(a + b)^(3/2)*(a - b)^(3/2)) - (2*b*tan(c/2 + (d*x)/2))/(d*(a + b)*(a
- b)*(a + b + tan(c/2 + (d*x)/2)^2*(a - b)))
```

3.465 $\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 118

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^2}\,dx = -\frac{2b(2a^2-b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^2(a-b)^{3/2}(a+b)^{3/2}d} + \frac{\operatorname{arctanh}(\sin(c+dx))}{a^2d} + \frac{b^2\sin(c+dx)}{a(a^2-b^2)\,d(a+b\cos(c+dx))}$$

```
[Out] -2*b*(2*a^2-b^2)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/2))/a^2/(a-
b)^(3/2)/(a+b)^(3/2)/d+arctanh(sin(d*x+c))/a^2/d+b^2*sin(d*x+c)/a/(a^2-b^2)
/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {2881, 3080, 3855, 2738, 211}

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^2}\,dx = -\frac{2b(2a^2-b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^2d(a-b)^{3/2}(a+b)^{3/2}} + \frac{\operatorname{arctanh}(\sin(c+dx))}{a^2d} + \frac{b^2\sin(c+dx)}{ad\,(a^2-b^2)\,(a+b\cos(c+dx))}$$

```
[In] Int[Sec[c + d*x]/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (-2*b*(2*a^2 - b^2)*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/(a^
2*(a - b)^(3/2)*(a + b)^(3/2)*d) + ArcTanh[Sin[c + d*x]]/(a^2*d) + (b^2*Sin
[c + d*x])/(a*(a^2 - b^2)*d*(a + b*Cos[c + d*x]))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 3080

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[(A*b
- a*B)/(b*c - a*d), Int[1/(a + b*Sin[e + f*x]), x], x] + Dist[(B*c - A*d)/(
b*c - a*d), Int[1/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f,
A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{b^2\sin(c+dx)}{a(a^2-b^2)\,d(a+b\cos(c+dx))}+\frac{\int\frac{(a^2-b^2-ab\cos(c+dx))\sec(c+dx)}{a+b\cos(c+dx)}\,dx}{a(a^2-b^2)}\\ &= \frac{b^2\sin(c+dx)}{a(a^2-b^2)\,d(a+b\cos(c+dx))}+\frac{\int\sec(c+dx)\,dx}{a^2}-\frac{(b(2a^2-b^2))\int\frac{1}{a+b\cos(c+dx)}\,dx}{a^2(a^2-b^2)}\end{aligned}$$

$$= \frac{\operatorname{arctanh}(\sin(c+dx))}{a^2d} + \frac{b^2\sin(c+dx)}{a(a^2-b^2)d(a+b\cos(c+dx))} - \frac{(2b(2a^2-b^2))\operatorname{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{a^2(a^2-b^2)d}$$

$$= -\frac{2b(2a^2-b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^2(a-b)^{3/2}(a+b)^{3/2}d} + \frac{\operatorname{arctanh}(\sin(c+dx))}{a^2d} + \frac{b^2\sin(c+dx)}{a(a^2-b^2)d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 0.40 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.24

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \frac{\frac{2b(-2a^2+b^2)\operatorname{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{3/2}} - \log\left(\cos\left(\frac{1}{2}(c+dx)\right) - \sin\left(\frac{1}{2}(c+dx)\right)\right) + \log\left(\cos\left(\frac{1}{2}(c+dx)\right) + \sin\right.}{a^2d}$$

```
[In] Integrate[Sec[c + d*x]/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] ((2*b*(-2*a^2 + b^2)*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/
(-a^2 + b^2)^(3/2) - Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + Log[Cos[(c
+ d*x)/2] + Sin[(c + d*x)/2]] + (a*b^2*Sin[c + d*x])/((a - b)*(a + b)*(a +
b*Cos[c + d*x])))/(a^2*d)
```

Maple [A] (verified)

Time = 1.49 (sec) , antiderivative size = 164, normalized size of antiderivative = 1.39

method	result
derivativedivides	$\frac{-\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^2}-\frac{2b\left(-\frac{ab\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(a^2-b^2\right)\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)}+\frac{\left(2a^2-b^2\right)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{(a-b)(a+b)\sqrt{(a-b)(a+b)}}\right)}{a^2}+}{d}$
default	$\frac{-\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^2}-\frac{2b\left(-\frac{ab\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(a^2-b^2\right)\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)}+\frac{\left(2a^2-b^2\right)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{(a-b)(a+b)\sqrt{(a-b)(a+b)}}\right)}{a^2}+}{d}$
risch	$-\frac{2ib\left(a\,e^{i(dx+c)}+b\right)}{(-a^2+b^2)da\left(b\,e^{2i(dx+c)}+2a\,e^{i(dx+c)}+b\right)}-\frac{2b\ln\left(e^{i(dx+c)}-\frac{ia^2-ib^2-a\sqrt{-a^2+b^2}}{b\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}\,(a+b)(a-b)d}+\frac{b^3\ln\left(e^{i(dx+c)}-\frac{ia^2-ib^2-a}{b\sqrt{-a^2}}\right)}{\sqrt{-a^2+b^2}\,(a+b)(a-b}$

```
[In] int(sec(d*x+c)/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-1/a^2*ln(tan(1/2*d*x+1/2*c)-1)-2*b/a^2*(-a*b/(a^2-b^2)*tan(1/2*d*x+1/
2*c)/(tan(1/2*d*x+1/2*c)^2*a-b*tan(1/2*d*x+1/2*c)^2+a+b)+(2*a^2-b^2)/(a-b)/
(a+b)/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/
2)))+1/a^2*ln(tan(1/2*d*x+1/2*c)+1))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 262 vs. 2(109) = 218.

Time = 0.47 (sec) , antiderivative size = 592, normalized size of antiderivative = 5.02

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$

$$= \left[-\frac{\left(2\,a^3b-ab^3+\left(2\,a^2b^2-b^4\right)\cos\left(dx+c\right)\right)\sqrt{-a^2+b^2}\log\left(\frac{2\,ab\cos(dx+c)+\left(2\,a^2-b^2\right)\cos(dx+c)^2-2\,\sqrt{-a^2+b^2}(a\cos(dx}{b^2\cos(dx+c)^2+2\,ab\cos(dx+c)+a^2}\right.}{}\right.$$

$$-\frac{2\left(2\,a^3b-ab^3+\left(2\,a^2b^2-b^4\right)\cos\left(dx+c\right)\right)\sqrt{a^2-b^2}\arctan\left(-\frac{a\cos(dx+c)+b}{\sqrt{a^2-b^2}\sin(dx+c)}\right)-\left(a^5-2\,a^3b^2+ab^4+(\right.}{2\,(}$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] [-1/2*((2*a^3*b - a*b^3 + (2*a^2*b^2 - b^4)*cos(d*x + c))*sqrt(-a^2 + b^2)*
log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x + c)^2 - 2*sqrt(-a^2 + b^2)
*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2)/(b^2*cos(d*x + c)^2 + 2*a
*b*cos(d*x + c) + a^2)) - (a^5 - 2*a^3*b^2 + a*b^4 + (a^4*b - 2*a^2*b^3 + b
```

```
^5)*cos(d*x + c))*log(sin(d*x + c) + 1) + (a^5 - 2*a^3*b^2 + a*b^4 + (a^4*b
 - 2*a^2*b^3 + b^5)*cos(d*x + c))*log(-sin(d*x + c) + 1) - 2*(a^3*b^2 - a*b
^4)*sin(d*x + c))/((a^6*b - 2*a^4*b^3 + a^2*b^5)*d*cos(d*x + c) + (a^7 - 2*
a^5*b^2 + a^3*b^4)*d), -1/2*(2*(2*a^3*b - a*b^3 + (2*a^2*b^2 - b^4)*cos(d*x
 + c))*sqrt(a^2 - b^2)*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*
x + c))) - (a^5 - 2*a^3*b^2 + a*b^4 + (a^4*b - 2*a^2*b^3 + b^5)*cos(d*x + c
))*log(sin(d*x + c) + 1) + (a^5 - 2*a^3*b^2 + a*b^4 + (a^4*b - 2*a^2*b^3 +
b^5)*cos(d*x + c))*log(-sin(d*x + c) + 1) - 2*(a^3*b^2 - a*b^4)*sin(d*x + c
))/((a^6*b - 2*a^4*b^3 + a^2*b^5)*d*cos(d*x + c) + (a^7 - 2*a^5*b^2 + a^3*b
^4)*d)]
```

Sympy [F]

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))**2,x)
[Out] Integral(sec(c + d*x)/(a + b*cos(c + d*x))**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 198, normalized size of antiderivative = 1.68

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \frac{\frac{2\,b^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{(a^3-ab^2)\left(a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+a+b\right)}-\frac{2\,(2\,a^2b-b^3)\left(\pi\left\lfloor\frac{dx+c}{2\,\pi}+\frac{1}{2}\right\rfloor\mathrm{sgn}(2\,a-2\,b)+\arctan\left(\frac{a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\sqrt{a^2-b^2}}\right)\right)}{(a^4-a^2b^2)\sqrt{a^2-b^2}}}{d}$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] (2*b^2*tan(1/2*d*x + 1/2*c)/((a^3 - a*b^2)*(a*tan(1/2*d*x + 1/2*c)^2 - b*ta
n(1/2*d*x + 1/2*c)^2 + a + b)) - 2*(2*a^2*b - b^3)*(pi*floor(1/2*(d*x + c)/
pi + 1/2)*sgn(2*a - 2*b) + arctan((a*tan(1/2*d*x + 1/2*c) - b*tan(1/2*d*x +
 1/2*c))/sqrt(a^2 - b^2)))/((a^4 - a^2*b^2)*sqrt(a^2 - b^2)) + log(abs(tan(
1/2*d*x + 1/2*c) + 1))/a^2 - log(abs(tan(1/2*d*x + 1/2*c) - 1))/a^2)/d
```

Mupad [B] (verification not implemented)

Time = 20.08 (sec) , antiderivative size = 2886, normalized size of antiderivative = 24.46

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Too large to display}$$

```
[In] int(1/(cos(c + d*x)*(a + b*cos(c + d*x))^2),x)
```

```
[Out] - (atan(((((((32*(2*a^8*b - a^9 + a^4*b^5 - 3*a^6*b^3 + a^7*b^2))/(a^5*b + a
^6 - a^3*b^3 - a^4*b^2) - (32*tan(c/2 + (d*x)/2)*(2*a^9*b - 2*a^4*b^6 + 2*a
^5*b^5 + 4*a^6*b^4 - 4*a^7*b^3 - 2*a^8*b^2))/(a^2*(a^4*b + a^5 - a^2*b^3 -
a^3*b^2)))/a^2 - (32*tan(c/2 + (d*x)/2)*(a^6 - 2*a^5*b - 2*a*b^5 + 2*b^6 -
5*a^2*b^4 + 4*a^3*b^3 + 3*a^4*b^2))/(a^4*b + a^5 - a^2*b^3 - a^3*b^2))*1i)/
a^2 - ((((32*(2*a^8*b - a^9 + a^4*b^5 - 3*a^6*b^3 + a^7*b^2))/(a^5*b + a^6
- a^3*b^3 - a^4*b^2) + (32*tan(c/2 + (d*x)/2)*(2*a^9*b - 2*a^4*b^6 + 2*a^5*
b^5 + 4*a^6*b^4 - 4*a^7*b^3 - 2*a^8*b^2))/(a^2*(a^4*b + a^5 - a^2*b^3 - a^3
*b^2)))/a^2 + (32*tan(c/2 + (d*x)/2)*(a^6 - 2*a^5*b - 2*a*b^5 + 2*b^6 - 5*a
^2*b^4 + 4*a^3*b^3 + 3*a^4*b^2))/(a^4*b + a^5 - a^2*b^3 - a^3*b^2))*1i)/a^2
)/((((32*(2*a^8*b - a^9 + a^4*b^5 - 3*a^6*b^3 + a^7*b^2))/(a^5*b + a^6 - a^
3*b^3 - a^4*b^2) - (32*tan(c/2 + (d*x)/2)*(2*a^9*b - 2*a^4*b^6 + 2*a^5*b^5
+ 4*a^6*b^4 - 4*a^7*b^3 - 2*a^8*b^2))/(a^2*(a^4*b + a^5 - a^2*b^3 - a^3*b^2
)))/a^2 - (32*tan(c/2 + (d*x)/2)*(a^6 - 2*a^5*b - 2*a*b^5 + 2*b^6 - 5*a^2*b
^4 + 4*a^3*b^3 + 3*a^4*b^2))/(a^4*b + a^5 - a^2*b^3 - a^3*b^2))/a^2 - (64*(
2*a^4*b - a*b^4 + b^5 - 3*a^2*b^3 + 2*a^3*b^2))/(a^5*b + a^6 - a^3*b^3 - a^
4*b^2) + (((32*(2*a^8*b - a^9 + a^4*b^5 - 3*a^6*b^3 + a^7*b^2))/(a^5*b + a^
6 - a^3*b^3 - a^4*b^2) + (32*tan(c/2 + (d*x)/2)*(2*a^9*b - 2*a^4*b^6 + 2*a^
5*b^5 + 4*a^6*b^4 - 4*a^7*b^3 - 2*a^8*b^2))/(a^2*(a^4*b + a^5 - a^2*b^3 - a
^3*b^2)))/a^2 + (32*tan(c/2 + (d*x)/2)*(a^6 - 2*a^5*b - 2*a*b^5 + 2*b^6 - 5
*a^2*b^4 + 4*a^3*b^3 + 3*a^4*b^2))/(a^4*b + a^5 - a^2*b^3 - a^3*b^2))/a^2))
*2i)/(a^2*d) - (b*atan(((b*((32*tan(c/2 + (d*x)/2)*(a^6 - 2*a^5*b - 2*a*b^5
 + 2*b^6 - 5*a^2*b^4 + 4*a^3*b^3 + 3*a^4*b^2))/(a^4*b + a^5 - a^2*b^3 - a^3
*b^2) + (b*(2*a^2 - b^2)*((32*(2*a^8*b - a^9 + a^4*b^5 - 3*a^6*b^3 + a^7*b^
2))/(a^5*b + a^6 - a^3*b^3 - a^4*b^2) + (32*b*tan(c/2 + (d*x)/2)*(2*a^2 - b
^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a^9*b - 2*a^4*b^6 + 2*a^5*b^5 + 4*a^6*b
^4 - 4*a^7*b^3 - 2*a^8*b^2))/((a^4*b + a^5 - a^2*b^3 - a^3*b^2)*(a^8 - a^2*
b^6 + 3*a^4*b^4 - 3*a^6*b^2)))*(-(a + b)^3*(a - b)^3)^(1/2))/(a^8 - a^2*b^6
 + 3*a^4*b^4 - 3*a^6*b^2))*(2*a^2 - b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*1i)/(
```

a^8 - a^2*b^6 + 3*a^4*b^4 - 3*a^6*b^2) + (b*((32*tan(c/2 + (d*x)/2)*(a^6 - 2*a^5*b - 2*a*b^5 + 2*b^6 - 5*a^2*b^4 + 4*a^3*b^3 + 3*a^4*b^2))/(a^4*b + a^5 - a^2*b^3 - a^3*b^2) - (b*(2*a^2 - b^2)*((32*(2*a^8*b - a^9 + a^4*b^5 - 3*a^6*b^3 + a^7*b^2))/(a^5*b + a^6 - a^3*b^3 - a^4*b^2) - (32*b*tan(c/2 + (d*x)/2)*(2*a^2 - b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a^9*b - 2*a^4*b^6 + 2*a^5*b^5 + 4*a^6*b^4 - 4*a^7*b^3 - 2*a^8*b^2))/((a^4*b + a^5 - a^2*b^3 - a^3*b^2)*(a^8 - a^2*b^6 + 3*a^4*b^4 - 3*a^6*b^2)))*(-(a + b)^3*(a - b)^3)^(1/2))/(a^8 - a^2*b^6 + 3*a^4*b^4 - 3*a^6*b^2))*(2*a^2 - b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*1i)/(a^8 - a^2*b^6 + 3*a^4*b^4 - 3*a^6*b^2))/((64*(2*a^4*b - a*b^4 + b^5 - 3*a^2*b^3 + 2*a^3*b^2))/(a^5*b + a^6 - a^3*b^3 - a^4*b^2) - (b*((32*tan(c/2 + (d*x)/2)*(a^6 - 2*a^5*b - 2*a*b^5 + 2*b^6 - 5*a^2*b^4 + 4*a^3*b^3 + 3*a^4*b^2))/(a^4*b + a^5 - a^2*b^3 - a^3*b^2) + (b*(2*a^2 - b^2)*((32*(2*a^8*b - a^9 + a^4*b^5 - 3*a^6*b^3 + a^7*b^2))/(a^5*b + a^6 - a^3*b^3 - a^4*b^2) + (32*b*tan(c/2 + (d*x)/2)*(2*a^2 - b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a^9*b - 2*a^4*b^6 + 2*a^5*b^5 + 4*a^6*b^4 - 4*a^7*b^3 - 2*a^8*b^2))/((a^4*b + a^5 - a^2*b^3 - a^3*b^2)*(a^8 - a^2*b^6 + 3*a^4*b^4 - 3*a^6*b^2)))*(-(a + b)^3*(a - b)^3)^(1/2))/(a^8 - a^2*b^6 + 3*a^4*b^4 - 3*a^6*b^2))*(2*a^2 - b^2)*(-(a + b)^3*(a - b)^3)^(1/2))/(a^8 - a^2*b^6 + 3*a^4*b^4 - 3*a^6*b^2) + (b*((32*tan(c/2 + (d*x)/2)*(a^6 - 2*a^5*b - 2*a*b^5 + 2*b^6 - 5*a^2*b^4 + 4*a^3*b^3 + 3*a^4*b^2))/(a^4*b + a^5 - a^2*b^3 - a^3*b^2) - (b*(2*a^2 - b^2)*((32*(2*a^8*b - a^9 + a^4*b^5 - 3*a^6*b^3 + a^7*b^2))/(a^5*b + a^6 - a^3*b^3 - a^4*b^2) - (32*b*tan(c/2 + (d*x)/2)*(2*a^2 - b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a^9*b - 2*a^4*b^6 + 2*a^5*b^5 + 4*a^6*b^4 - 4*a^7*b^3 - 2*a^8*b^2))/((a^4*b + a^5 - a^2*b^3 - a^3*b^2)*(a^8 - a^2*b^6 + 3*a^4*b^4 - 3*a^6*b^2)))*(-(a + b)^3*(a - b)^3)^(1/2))/(a^8 - a^2*b^6 + 3*a^4*b^4 - 3*a^6*b^2))*(2*a^2 - b^2)*(-(a + b)^3*(a - b)^3)^(1/2))/(a^8 - a^2*b^6 + 3*a^4*b^4 - 3*a^6*b^2)))*(2*a^2 - b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*2i)/(d*(a^8 - a^2*b^6 + 3*a^4*b^4 - 3*a^6*b^2)) - (2*b^2*tan(c/2 + (d*x)/2))/(d*(a + b)*(a*b - a^2)*(a + b + tan(c/2 + (d*x)/2)^2*(a - b)))

3.466 $\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^2} \, dx$

Optimal result

Integrand size = 21, antiderivative size = 155

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^2} \, dx = \frac{2b^2(3a^2-2b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^3(a-b)^{3/2}(a+b)^{3/2}d} - \frac{2b\text{arctanh}(\sin(c+dx))}{a^3d} + \frac{(a^2-2b^2)\tan(c+dx)}{a^2(a^2-b^2)d} + \frac{b^2\tan(c+dx)}{a(a^2-b^2)d(a+b\cos(c+dx))}$$

```
[Out] 2*b^2*(3*a^2-2*b^2)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/2))/a^3/
(a-b)^(3/2)/(a+b)^(3/2)/d-2*b*arctanh(sin(d*x+c))/a^3/d+(a^2-2*b^2)*tan(d*x
+c)/a^2/(a^2-b^2)/d+b^2*tan(d*x+c)/a/(a^2-b^2)/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 155, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2881, 3134, 3080, 3855, 2738, 211}

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^2} \, dx = -\frac{2b\text{arctanh}(\sin(c+dx))}{a^3d} + \frac{(a^2-2b^2)\tan(c+dx)}{a^2d(a^2-b^2)} + \frac{b^2\tan(c+dx)}{ad(a^2-b^2)(a+b\cos(c+dx))} + \frac{2b^2(3a^2-2b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^3d(a-b)^{3/2}(a+b)^{3/2}}$$

```
[In] Int[Sec[c + d*x]^2/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (2*b^2*(3*a^2 - 2*b^2)*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/
(a^3*(a - b)^(3/2)*(a + b)^(3/2)*d) - (2*b*ArcTanh[Sin[c + d*x]])/(a^3*d) +
 ((a^2 - 2*b^2)*Tan[c + d*x])/(a^2*(a^2 - b^2)*d) + (b^2*Tan[c + d*x])/(a*(
a^2 - b^2)*d*(a + b*Cos[c + d*x]))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 3080

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[(A*b
- a*B)/(b*c - a*d), Int[1/(a + b*Sin[e + f*x]), x], x] + Dist[(B*c - A*d)/(
b*c - a*d), Int[1/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f,
A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
```

```
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{b^2\tan(c+dx)}{a\,(a^2-b^2)\,d(a+b\cos(c+dx))}+\frac{\int\frac{(a^2-2b^2-ab\cos(c+dx)+b^2\cos^2(c+dx))\sec^2(c+dx)}{a+b\cos(c+dx)}\,dx}{a\,(a^2-b^2)}\\
&= \frac{(a^2-2b^2)\tan(c+dx)}{a^2\,(a^2-b^2)\,d}+\frac{b^2\tan(c+dx)}{a\,(a^2-b^2)\,d(a+b\cos(c+dx))}\\
&\quad+\frac{\int\frac{(-2b(a^2-b^2)+ab^2\cos(c+dx))\sec(c+dx)}{a+b\cos(c+dx)}\,dx}{a^2\,(a^2-b^2)}\\
&= \frac{(a^2-2b^2)\tan(c+dx)}{a^2\,(a^2-b^2)\,d}+\frac{b^2\tan(c+dx)}{a\,(a^2-b^2)\,d(a+b\cos(c+dx))}\\
&\quad-\frac{(2b)\int\sec(c+dx)\,dx}{a^3}+\frac{(b^2(3a^2-2b^2))\int\frac{1}{a+b\cos(c+dx)}\,dx}{a^3\,(a^2-b^2)}\\
&= -\frac{2b\operatorname{arctanh}(\sin(c+dx))}{a^3d}+\frac{(a^2-2b^2)\tan(c+dx)}{a^2\,(a^2-b^2)\,d}\\
&\quad+\frac{b^2\tan(c+dx)}{a\,(a^2-b^2)\,d(a+b\cos(c+dx))}\\
&\quad+\frac{(2b^2(3a^2-2b^2))\,\text{Subst}\left(\int\frac{1}{a+b+(a-b)x^2}\,dx,x,\tan\left(\frac{1}{2}(c+dx)\right)\right)}{a^3\,(a^2-b^2)\,d}\\
&= \frac{2b^2(3a^2-2b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^3(a-b)^{3/2}(a+b)^{3/2}d}-\frac{2b\operatorname{arctanh}(\sin(c+dx))}{a^3d}\\
&\quad+\frac{(a^2-2b^2)\tan(c+dx)}{a^2\,(a^2-b^2)\,d}+\frac{b^2\tan(c+dx)}{a\,(a^2-b^2)\,d(a+b\cos(c+dx))}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.86 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.05

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$
$$= \frac{-\frac{2b^2(-3a^2+2b^2)\operatorname{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{3/2}} + 2b\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right) - 2b\log\left(\cos\left(\frac{1}{2}(c+dx\right.\right.}{a^3d}$$

[In] Integrate[Sec[c + d*x]^2/(a + b*Cos[c + d*x])^2,x]

[Out] ((-2*b^2*(-3*a^2 + 2*b^2)*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/(-a^2 + b^2)^(3/2) + 2*b*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - 2*b*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] - (a*b^3*Sin[c + d*x])/((a - b)*(a + b)*(a + b*Cos[c + d*x])) + a*Tan[c + d*x])/(a^3*d)

Maple [A] (verified)

Time = 1.73 (sec) , antiderivative size = 205, normalized size of antiderivative = 1.32

method	result
derivativedivides	$\frac{\frac{2b\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^3}-\frac{1}{a^2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}-\frac{1}{a^2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}-\frac{2b\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{a^3}+\frac{2b^2\left(-\frac{ab\tan\left(\frac{dx}{2}\right.}{(a^2-b^2)\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-\right.}\right.}{}}{d}$
default	$\frac{\frac{2b\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^3}-\frac{1}{a^2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}-\frac{1}{a^2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}-\frac{2b\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{a^3}+\frac{2b^2\left(-\frac{ab\tan\left(\frac{dx}{2}\right.}{(a^2-b^2)\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-\right.}\right.}{}}{d}$
risch	$\frac{2i\left(-ab^2e^{3i(dx+c)}+a^2be^{2i(dx+c)}-2b^3e^{2i(dx+c)}+2a^3e^{i(dx+c)}-3ab^2e^{i(dx+c)}+a^2b-2b^3\right)}{(a^2-b^2)da^2\left(be^{2i(dx+c)}+2ae^{i(dx+c)}+b\right)\left(e^{2i(dx+c)}+1\right)}-\frac{3b^2\ln\left(e^{i(dx+c)}+\frac{ia^2-ib^2+a\sqrt{}}{b\sqrt{-a^2}}\right.}{\sqrt{-a^2+b^2}(a+b)(a-b}$

[In] int(sec(d*x+c)^2/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)

[Out] 1/d*(2*b/a^3*ln(tan(1/2*d*x+1/2*c)-1)-1/a^2/(tan(1/2*d*x+1/2*c)-1)-1/a^2/(tan(1/2*d*x+1/2*c)+1)-2*b/a^3*ln(tan(1/2*d*x+1/2*c)+1)+2*b^2/a^3*(-a*b/(a^2-b^2)*tan(1/2*d*x+1/2*c)/(tan(1/2*d*x+1/2*c)^2*a-b*tan(1/2*d*x+1/2*c)^2+a+b)+(3*a^2-2*b^2)/(a-b)/(a+b)/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2))))

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 339 vs. $2(146) = 292$.

Time = 0.47 (sec) , antiderivative size = 750, normalized size of antiderivative = 4.84

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$
$$= \left[-\frac{\left((3\,a^2b^3-2\,b^5)\cos\left(dx+c\right)^2+(3\,a^3b^2-2\,ab^4)\cos\left(dx+c\right)\right)\sqrt{-a^2+b^2}\log\left(\frac{2\,ab\cos(dx+c)+(2\,a^2-b^2)\cos(dx+}{b^2\cos(c}\right.}{}\right.$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] [-1/2*(((3*a^2*b^3 - 2*b^5)*cos(d*x + c)^2 + (3*a^3*b^2 - 2*a*b^4)*cos(d*x
+ c))*sqrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x + c)
^2 + 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2)/(b
^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) + 2*((a^4*b^2 - 2*a^2*b^4 +
b^6)*cos(d*x + c)^2 + (a^5*b - 2*a^3*b^3 + a*b^5)*cos(d*x + c))*log(sin(d*x
 + c) + 1) - 2*((a^4*b^2 - 2*a^2*b^4 + b^6)*cos(d*x + c)^2 + (a^5*b - 2*a^3
*b^3 + a*b^5)*cos(d*x + c))*log(-sin(d*x + c) + 1) - 2*(a^6 - 2*a^4*b^2 + a
^2*b^4 + (a^5*b - 3*a^3*b^3 + 2*a*b^5)*cos(d*x + c))*sin(d*x + c))/((a^7*b
- 2*a^5*b^3 + a^3*b^5)*d*cos(d*x + c)^2 + (a^8 - 2*a^6*b^2 + a^4*b^4)*d*cos
(d*x + c)), (((3*a^2*b^3 - 2*b^5)*cos(d*x + c)^2 + (3*a^3*b^2 - 2*a*b^4)*co
s(d*x + c))*sqrt(a^2 - b^2)*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*s
in(d*x + c))) - ((a^4*b^2 - 2*a^2*b^4 + b^6)*cos(d*x + c)^2 + (a^5*b - 2*a^
3*b^3 + a*b^5)*cos(d*x + c))*log(sin(d*x + c) + 1) + ((a^4*b^2 - 2*a^2*b^4
+ b^6)*cos(d*x + c)^2 + (a^5*b - 2*a^3*b^3 + a*b^5)*cos(d*x + c))*log(-sin(
d*x + c) + 1) + (a^6 - 2*a^4*b^2 + a^2*b^4 + (a^5*b - 3*a^3*b^3 + 2*a*b^5)*
cos(d*x + c))*sin(d*x + c))/((a^7*b - 2*a^5*b^3 + a^3*b^5)*d*cos(d*x + c)^2
 + (a^8 - 2*a^6*b^2 + a^4*b^4)*d*cos(d*x + c))]
```

Sympy [F]

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\sec^2\left(c+dx\right)}{\left(a+b\cos\left(c+dx\right)\right)^2}\,dx$$

```
[In] integrate(sec(d*x+c)**2/(a+b*cos(d*x+c))**2,x)
```

```
[Out] Integral(sec(c + d*x)**2/(a + b*cos(c + d*x))**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 332 vs. $2(146) = 292$.

Time = 0.33 (sec) , antiderivative size = 332, normalized size of antiderivative = 2.14

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^2}\,dx = -\frac{2\left(\frac{(3a^2b^2-2b^4)\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor\operatorname{sgn}(-2a+2b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{a^2-b^2}}\right)\right)}{(a^5-a^3b^2)\sqrt{a^2-b^2}}+\frac{a^3\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-a^2b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-\cdots}{\cdots}\right.}{\cdots}$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -2*((3*a^2*b^2 - 2*b^4)*(pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) +
 arctan(-(a*tan(1/2*d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2))
)/((a^5 - a^3*b^2)*sqrt(a^2 - b^2)) + (a^3*tan(1/2*d*x + 1/2*c)^3 - a^2*b*t
an(1/2*d*x + 1/2*c)^3 - a*b^2*tan(1/2*d*x + 1/2*c)^3 + 2*b^3*tan(1/2*d*x +
1/2*c)^3 + a^3*tan(1/2*d*x + 1/2*c) + a^2*b*tan(1/2*d*x + 1/2*c) - a*b^2*ta
n(1/2*d*x + 1/2*c) - 2*b^3*tan(1/2*d*x + 1/2*c))/((a*tan(1/2*d*x + 1/2*c)^4
 - b*tan(1/2*d*x + 1/2*c)^4 + 2*b*tan(1/2*d*x + 1/2*c)^2 - a - b)*(a^4 - a^
2*b^2)) + b*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^3 - b*log(abs(tan(1/2*d*x
+ 1/2*c) - 1))/a^3)/d
```

Mupad [B] (verification not implemented)

Time = 20.86 (sec) , antiderivative size = 3176, normalized size of antiderivative = 20.49

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Too large to display}$$

```
[In] int(1/(cos(c + d*x)^2*(a + b*cos(c + d*x))^2),x)
```

```
[Out] (b*atan(((b*((32*tan(c/2 + (d*x)/2)*(8*b^8 - 8*a*b^7 - 16*a^2*b^6 + 16*a^3*
b^5 + 5*a^4*b^4 - 8*a^5*b^3 + 4*a^6*b^2))/(a^6*b + a^7 - a^4*b^3 - a^5*b^2)
 - (2*b*((32*(2*a^11*b - 2*a^6*b^6 + a^7*b^5 + 5*a^8*b^4 - 3*a^9*b^3 - 3*a^
10*b^2))/(a^8*b + a^9 - a^6*b^3 - a^7*b^2) - (64*b*tan(c/2 + (d*x)/2)*(2*a^
11*b - 2*a^6*b^6 + 2*a^7*b^5 + 4*a^8*b^4 - 4*a^9*b^3 - 2*a^10*b^2))/(a^3*(a
^6*b + a^7 - a^4*b^3 - a^5*b^2))))/a^3)*2i)/a^3 + (b*((32*tan(c/2 + (d*x)/2
)*(8*b^8 - 8*a*b^7 - 16*a^2*b^6 + 16*a^3*b^5 + 5*a^4*b^4 - 8*a^5*b^3 + 4*a^
6*b^2))/(a^6*b + a^7 - a^4*b^3 - a^5*b^2) + (2*b*((32*(2*a^11*b - 2*a^6*b^6
 + a^7*b^5 + 5*a^8*b^4 - 3*a^9*b^3 - 3*a^10*b^2))/(a^8*b + a^9 - a^6*b^3 -
a^7*b^2) + (64*b*tan(c/2 + (d*x)/2)*(2*a^11*b - 2*a^6*b^6 + 2*a^7*b^5 + 4*a
^8*b^4 - 4*a^9*b^3 - 2*a^10*b^2))/(a^3*(a^6*b + a^7 - a^4*b^3 - a^5*b^2))))
/a^3)*2i)/a^3)/((64*(8*b^8 - 4*a*b^7 - 20*a^2*b^6 + 6*a^3*b^5 + 12*a^4*b^4)
)/(a^8*b + a^9 - a^6*b^3 - a^7*b^2) - (2*b*((32*tan(c/2 + (d*x)/2)*(8*b^8 -
 8*a*b^7 - 16*a^2*b^6 + 16*a^3*b^5 + 5*a^4*b^4 - 8*a^5*b^3 + 4*a^6*b^2))/(a
^6*b + a^7 - a^4*b^3 - a^5*b^2) - (2*b*((32*(2*a^11*b - 2*a^6*b^6 + a^7*b^5
 + 5*a^8*b^4 - 3*a^9*b^3 - 3*a^10*b^2))/(a^8*b + a^9 - a^6*b^3 - a^7*b^2) -
 (64*b*tan(c/2 + (d*x)/2)*(2*a^11*b - 2*a^6*b^6 + 2*a^7*b^5 + 4*a^8*b^4 - 4
*a^9*b^3 - 2*a^10*b^2))/(a^3*(a^6*b + a^7 - a^4*b^3 - a^5*b^2))))/a^3))/a^3
 + (2*b*((32*tan(c/2 + (d*x)/2)*(8*b^8 - 8*a*b^7 - 16*a^2*b^6 + 16*a^3*b^5
+ 5*a^4*b^4 - 8*a^5*b^3 + 4*a^6*b^2))/(a^6*b + a^7 - a^4*b^3 - a^5*b^2) + (
2*b*((32*(2*a^11*b - 2*a^6*b^6 + a^7*b^5 + 5*a^8*b^4 - 3*a^9*b^3 - 3*a^10*b
^2))/(a^8*b + a^9 - a^6*b^3 - a^7*b^2) + (64*b*tan(c/2 + (d*x)/2)*(2*a^11*b
 - 2*a^6*b^6 + 2*a^7*b^5 + 4*a^8*b^4 - 4*a^9*b^3 - 2*a^10*b^2))/(a^3*(a^6*b
 + a^7 - a^4*b^3 - a^5*b^2))))/a^3))/a^3))*4i)/(a^3*d) - ((2*tan(c/2 + (d*x
)/2)^3*(a*b^2 + a^2*b - a^3 - 2*b^3))/(a^2*(a + b)*(a - b)) + (2*tan(c/2 +
(d*x)/2)*(a*b^2 - a^2*b - a^3 + 2*b^3))/(a^2*(a + b)*(a - b)))/(d*(a + b -
tan(c/2 + (d*x)/2)^4*(a - b) - 2*b*tan(c/2 + (d*x)/2)^2)) + (b^2*atan(((b^2
*((32*tan(c/2 + (d*x)/2)*(8*b^8 - 8*a*b^7 - 16*a^2*b^6 + 16*a^3*b^5 + 5*a^4
*b^4 - 8*a^5*b^3 + 4*a^6*b^2))/(a^6*b + a^7 - a^4*b^3 - a^5*b^2) + (b^2*(3*
a^2 - 2*b^2)*((32*(2*a^11*b - 2*a^6*b^6 + a^7*b^5 + 5*a^8*b^4 - 3*a^9*b^3 -
 3*a^10*b^2))/(a^8*b + a^9 - a^6*b^3 - a^7*b^2) + (32*b^2*tan(c/2 + (d*x)/2
)*(3*a^2 - 2*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a^11*b - 2*a^6*b^6 + 2*a^
7*b^5 + 4*a^8*b^4 - 4*a^9*b^3 - 2*a^10*b^2))/((a^6*b + a^7 - a^4*b^3 - a^5*
b^2)*(a^9 - a^3*b^6 + 3*a^5*b^4 - 3*a^7*b^2)))*(-(a + b)^3*(a - b)^3)^(1/2)
)/(a^9 - a^3*b^6 + 3*a^5*b^4 - 3*a^7*b^2))*(3*a^2 - 2*b^2)*(-(a + b)^3*(a -
 b)^3)^(1/2)*1i)/(a^9 - a^3*b^6 + 3*a^5*b^4 - 3*a^7*b^2) + (b^2*((32*tan(c/
```

2 + (d*x)/2)*(8*b^8 - 8*a*b^7 - 16*a^2*b^6 + 16*a^3*b^5 + 5*a^4*b^4 - 8*a^5
*b^3 + 4*a^6*b^2))/(a^6*b + a^7 - a^4*b^3 - a^5*b^2) - (b^2*(3*a^2 - 2*b^2)
((32(2*a^11*b - 2*a^6*b^6 + a^7*b^5 + 5*a^8*b^4 - 3*a^9*b^3 - 3*a^10*b^2)
)/(a^8*b + a^9 - a^6*b^3 - a^7*b^2) - (32*b^2*tan(c/2 + (d*x)/2)*(3*a^2 - 2
b^2)(-(a + b)^3*(a - b)^3)^(1/2)*(2*a^11*b - 2*a^6*b^6 + 2*a^7*b^5 + 4*a^
8*b^4 - 4*a^9*b^3 - 2*a^10*b^2))/((a^6*b + a^7 - a^4*b^3 - a^5*b^2)*(a^9 -
a^3*b^6 + 3*a^5*b^4 - 3*a^7*b^2)))*(-(a + b)^3*(a - b)^3)^(1/2))/(a^9 - a^3
*b^6 + 3*a^5*b^4 - 3*a^7*b^2))*(3*a^2 - 2*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)
*1i)/(a^9 - a^3*b^6 + 3*a^5*b^4 - 3*a^7*b^2))/((64*(8*b^8 - 4*a*b^7 - 20*a^
2*b^6 + 6*a^3*b^5 + 12*a^4*b^4))/(a^8*b + a^9 - a^6*b^3 - a^7*b^2) + (b^2*(
(32*tan(c/2 + (d*x)/2)*(8*b^8 - 8*a*b^7 - 16*a^2*b^6 + 16*a^3*b^5 + 5*a^4*b
^4 - 8*a^5*b^3 + 4*a^6*b^2))/(a^6*b + a^7 - a^4*b^3 - a^5*b^2) + (b^2*(3*a^
2 - 2*b^2)*((32*(2*a^11*b - 2*a^6*b^6 + a^7*b^5 + 5*a^8*b^4 - 3*a^9*b^3 - 3
*a^10*b^2))/(a^8*b + a^9 - a^6*b^3 - a^7*b^2) + (32*b^2*tan(c/2 + (d*x)/2)*
(3*a^2 - 2*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a^11*b - 2*a^6*b^6 + 2*a^7*
b^5 + 4*a^8*b^4 - 4*a^9*b^3 - 2*a^10*b^2))/((a^6*b + a^7 - a^4*b^3 - a^5*b^
2)*(a^9 - a^3*b^6 + 3*a^5*b^4 - 3*a^7*b^2)))*(-(a + b)^3*(a - b)^3)^(1/2))/
(a^9 - a^3*b^6 + 3*a^5*b^4 - 3*a^7*b^2))*(3*a^2 - 2*b^2)*(-(a + b)^3*(a - b
)^3)^(1/2))/(a^9 - a^3*b^6 + 3*a^5*b^4 - 3*a^7*b^2) - (b^2*((32*tan(c/2 + (
d*x)/2)*(8*b^8 - 8*a*b^7 - 16*a^2*b^6 + 16*a^3*b^5 + 5*a^4*b^4 - 8*a^5*b^3
+ 4*a^6*b^2))/(a^6*b + a^7 - a^4*b^3 - a^5*b^2) - (b^2*(3*a^2 - 2*b^2)*((32
*(2*a^11*b - 2*a^6*b^6 + a^7*b^5 + 5*a^8*b^4 - 3*a^9*b^3 - 3*a^10*b^2))/(a^
8*b + a^9 - a^6*b^3 - a^7*b^2) - (32*b^2*tan(c/2 + (d*x)/2)*(3*a^2 - 2*b^2)
(-(a + b)^3(a - b)^3)^(1/2)*(2*a^11*b - 2*a^6*b^6 + 2*a^7*b^5 + 4*a^8*b^4
 - 4*a^9*b^3 - 2*a^10*b^2))/((a^6*b + a^7 - a^4*b^3 - a^5*b^2)*(a^9 - a^3*b
^6 + 3*a^5*b^4 - 3*a^7*b^2)))*(-(a + b)^3*(a - b)^3)^(1/2))/(a^9 - a^3*b^6
+ 3*a^5*b^4 - 3*a^7*b^2))*(3*a^2 - 2*b^2)*(-(a + b)^3*(a - b)^3)^(1/2))/(a^
9 - a^3*b^6 + 3*a^5*b^4 - 3*a^7*b^2)))*(3*a^2 - 2*b^2)*(-(a + b)^3*(a - b)^
3)^(1/2)*2i)/(d*(a^9 - a^3*b^6 + 3*a^5*b^4 - 3*a^7*b^2))

3.467 $\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 217

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^2}\,dx = -\frac{2b^3(4a^2-3b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^4(a-b)^{3/2}(a+b)^{3/2}d} + \frac{(a^2+6b^2)\,\text{arctanh}(\sin(c+dx))}{2a^4d} - \frac{b(2a^2-3b^2)\tan(c+dx)}{a^3(a^2-b^2)\,d} + \frac{(a^2-3b^2)\sec(c+dx)\tan(c+dx)}{2a^2(a^2-b^2)\,d} + \frac{b^2\sec(c+dx)\tan(c+dx)}{a(a^2-b^2)\,d(a+b\cos(c+dx))}$$

```
[Out] -2*b^3*(4*a^2-3*b^2)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/2))/a^4
/(a-b)^(3/2)/(a+b)^(3/2)/d+1/2*(a^2+6*b^2)*arctanh(sin(d*x+c))/a^4/d-b*(2*a
^2-3*b^2)*tan(d*x+c)/a^3/(a^2-b^2)/d+1/2*(a^2-3*b^2)*sec(d*x+c)*tan(d*x+c)/
a^2/(a^2-b^2)/d+b^2*sec(d*x+c)*tan(d*x+c)/a/(a^2-b^2)/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.74 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used

$= \{2881, 3134, 3080, 3855, 2738, 211\}$

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \frac{(a^2-3b^2)\tan(c+dx)\sec(c+dx)}{2a^2d\,(a^2-b^2)} + \frac{b^2\tan(c+dx)\sec(c+dx)}{ad\,(a^2-b^2)\,(a+b\cos(c+dx))} - \frac{2b^3(4a^2-3b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^4d(a-b)^{3/2}(a+b)^{3/2}} + \frac{(a^2+6b^2)\,\text{arctanh}(\sin(c+dx))}{2a^4d} - \frac{b(2a^2-3b^2)\tan(c+dx)}{a^3d\,(a^2-b^2)}$$

```
[In] Int[Sec[c + d*x]^3/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (-2*b^3*(4*a^2 - 3*b^2)*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])
/(a^4*(a - b)^(3/2)*(a + b)^(3/2)*d) + ((a^2 + 6*b^2)*ArcTanh[Sin[c + d*x]]
)/(2*a^4*d) - (b*(2*a^2 - 3*b^2)*Tan[c + d*x])/(a^3*(a^2 - b^2)*d) + ((a^2
- 3*b^2)*Sec[c + d*x]*Tan[c + d*x])/(2*a^2*(a^2 - b^2)*d) + (b^2*Sec[c + d*
x]*Tan[c + d*x])/(a*(a^2 - b^2)*d*(a + b*Cos[c + d*x]))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 3080

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[(A*b
- a*B)/(b*c - a*d), Int[1/(a + b*Sin[e + f*x]), x], x] + Dist[(B*c - A*d)/(
b*c - a*d), Int[1/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f,
A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{b^2\sec(c+dx)\tan(c+dx)}{a\left(a^2-b^2\right)d(a+b\cos(c+dx))}+\frac{\int\frac{\left(a^2-3b^2-ab\cos(c+dx)+2b^2\cos^2(c+dx)\right)\sec^3(c+dx)}{a+b\cos(c+dx)}\,dx}{a\left(a^2-b^2\right)}\\
&= \frac{\left(a^2-3b^2\right)\sec(c+dx)\tan(c+dx)}{2a^2\left(a^2-b^2\right)d}+\frac{b^2\sec(c+dx)\tan(c+dx)}{a\left(a^2-b^2\right)d(a+b\cos(c+dx))}\\
&\quad+\frac{\int\frac{\left(-2b\left(2a^2-3b^2\right)+a\left(a^2+b^2\right)\cos(c+dx)+b\left(a^2-3b^2\right)\cos^2(c+dx)\right)\sec^2(c+dx)}{a+b\cos(c+dx)}\,dx}{2a^2\left(a^2-b^2\right)}\\
&= -\frac{b\left(2a^2-3b^2\right)\tan(c+dx)}{a^3\left(a^2-b^2\right)d}+\frac{\left(a^2-3b^2\right)\sec(c+dx)\tan(c+dx)}{2a^2\left(a^2-b^2\right)d}\\
&\quad+\frac{b^2\sec(c+dx)\tan(c+dx)}{a\left(a^2-b^2\right)d(a+b\cos(c+dx))}+\frac{\int\frac{\left(a^4+5a^2b^2-6b^4+ab\left(a^2-3b^2\right)\cos(c+dx)\right)\sec(c+dx)}{a+b\cos(c+dx)}\,dx}{2a^3\left(a^2-b^2\right)}
\end{aligned}$$

$$
\begin{aligned}
&= -\frac{b(2a^2-3b^2)\tan(c+dx)}{a^3(a^2-b^2)d} + \frac{(a^2-3b^2)\sec(c+dx)\tan(c+dx)}{2a^2(a^2-b^2)d} \\
&\quad + \frac{b^2\sec(c+dx)\tan(c+dx)}{a(a^2-b^2)d(a+b\cos(c+dx))} \\
&\quad - \frac{(b^3(4a^2-3b^2))\int \frac{1}{a+b\cos(c+dx)}\,dx}{a^4(a^2-b^2)} + \frac{(a^2+6b^2)\int \sec(c+dx)\,dx}{2a^4} \\
&= \frac{(a^2+6b^2)\operatorname{arctanh}(\sin(c+dx))}{2a^4d} - \frac{b(2a^2-3b^2)\tan(c+dx)}{a^3(a^2-b^2)d} \\
&\quad + \frac{(a^2-3b^2)\sec(c+dx)\tan(c+dx)}{2a^2(a^2-b^2)d} + \frac{b^2\sec(c+dx)\tan(c+dx)}{a(a^2-b^2)d(a+b\cos(c+dx))} \\
&\quad - \frac{(2b^3(4a^2-3b^2))\,\text{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{a^4(a^2-b^2)d} \\
&= -\frac{2b^3(4a^2-3b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^4(a-b)^{3/2}(a+b)^{3/2}d} \\
&\quad + \frac{(a^2+6b^2)\operatorname{arctanh}(\sin(c+dx))}{2a^4d} - \frac{b(2a^2-3b^2)\tan(c+dx)}{a^3(a^2-b^2)d} \\
&\quad + \frac{(a^2-3b^2)\sec(c+dx)\tan(c+dx)}{2a^2(a^2-b^2)d} + \frac{b^2\sec(c+dx)\tan(c+dx)}{a(a^2-b^2)d(a+b\cos(c+dx))}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 3.81 (sec) , antiderivative size = 285, normalized size of antiderivative = 1.31

$$
\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \frac{\frac{8b^3(-4a^2+3b^2)\operatorname{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{3/2}} - 2a^2\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right) - 12b^2\log\left(\cos\left(\frac{1}{2}(c+a\right.\right.}{}
$$

```
[In] Integrate[Sec[c + d*x]^3/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] ((8*b^3*(-4*a^2 + 3*b^2)*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2
]])/(-a^2 + b^2)^(3/2) - 2*a^2*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - 1
2*b^2*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + 2*a^2*Log[Cos[(c + d*x)/2]
 + Sin[(c + d*x)/2]] + 12*b^2*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] + a^
2/(Cos[(c + d*x)/2] - Sin[(c + d*x)/2])^2 - a^2/(Cos[(c + d*x)/2] + Sin[(c
+ d*x)/2])^2 + (4*a*b^4*Sin[c + d*x])/((a - b)*(a + b)*(a + b*Cos[c + d*x])
) - 8*a*b*Tan[c + d*x])/(4*a^4*d)
```

Maple [A] (verified)

Time = 1.83 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.26

method	result
derivativedivides	$\frac{\frac{1}{2a^2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}-\frac{-a-4b}{2a^3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{\left(-a^2-6b^2\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2a^4}-\frac{2b^3\left(-\frac{ab\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(a^2-b^2\right)\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\right.\right.\right.}}{}}{}$
default	$\frac{\frac{1}{2a^2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}-\frac{-a-4b}{2a^3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{\left(-a^2-6b^2\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2a^4}-\frac{2b^3\left(-\frac{ab\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(a^2-b^2\right)\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\right.\right.\right.}}{}}{}$
risch	$-\frac{i\left(a^3e^{5i(dx+c)}b-3b^3a\,e^{5i(dx+c)}+2a^4e^{4i(dx+c)}+2a^2b^2e^{4i(dx+c)}-6b^4e^{4i(dx+c)}+8b\,a^3e^{3i(dx+c)}-12b^3a\,e^{3i(dx+c)}-2a^4e\right.}{d\,a^3\left(e^{2i(dx+c)}+1\right)^2\left(a^2-b^2\right)\left(b\,e^{2i(dx+c)}+2a\right.}$

```
[In] int(sec(d*x+c)^3/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(1/2/a^2/(tan(1/2*d*x+1/2*c)-1)^2-1/2*(-a-4*b)/a^3/(tan(1/2*d*x+1/2*c)-
1)+1/2/a^4*(-a^2-6*b^2)*ln(tan(1/2*d*x+1/2*c)-1)-2*b^3/a^4*(-a*b/(a^2-b^2)*
tan(1/2*d*x+1/2*c)/(tan(1/2*d*x+1/2*c)^2*a-b*tan(1/2*d*x+1/2*c)^2+a+b)+(4*a
^2-3*b^2)/(a-b)/(a+b)/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/(
(a-b)*(a+b))^(1/2)))-1/2/a^2/(tan(1/2*d*x+1/2*c)+1)^2-1/2*(-a-4*b)/a^3/(tan
(1/2*d*x+1/2*c)+1)+1/2*(a^2+6*b^2)/a^4*ln(tan(1/2*d*x+1/2*c)+1))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 415 vs. 2(204) = 408.

Time = 0.71 (sec) , antiderivative size = 899, normalized size of antiderivative = 4.14

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$
$$=\left[-\frac{2\left(\left(4\,a^2b^4-3\,b^6\right)\cos\left(dx+c\right)^3+\left(4\,a^3b^3-3\,ab^5\right)\cos\left(dx+c\right)^2\right)\sqrt{-a^2+b^2}\log\left(\frac{2\,ab\cos(dx+c)+\left(2\,a^2-b^2\right)\cos(}{b^2\cos}\right.}{}\right.$$
$$-\frac{4\left(\left(4\,a^2b^4-3\,b^6\right)\cos\left(dx+c\right)^3+\left(4\,a^3b^3-3\,ab^5\right)\cos\left(dx+c\right)^2\right)\sqrt{a^2-b^2}\arctan\left(-\frac{a\cos(dx+c)+b}{\sqrt{a^2-b^2}\sin(dx+c)}\right)-\left(\right.}{}$$

```
[In] integrate(sec(d*x+c)^3/(a+b*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] [-1/4*(2*((4*a^2*b^4 - 3*b^6)*cos(d*x + c)^3 + (4*a^3*b^3 - 3*a*b^5)*cos(d*
x + c)^2)*sqrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x
```

```
+ c)^2 - 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2
)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) - ((a^6*b + 4*a^4*b^3 -
11*a^2*b^5 + 6*b^7)*cos(d*x + c)^3 + (a^7 + 4*a^5*b^2 - 11*a^3*b^4 + 6*a*b^
6)*cos(d*x + c)^2)*log(sin(d*x + c) + 1) + ((a^6*b + 4*a^4*b^3 - 11*a^2*b^5
 + 6*b^7)*cos(d*x + c)^3 + (a^7 + 4*a^5*b^2 - 11*a^3*b^4 + 6*a*b^6)*cos(d*x
 + c)^2)*log(-sin(d*x + c) + 1) - 2*(a^7 - 2*a^5*b^2 + a^3*b^4 - 2*(2*a^5*b
^2 - 5*a^3*b^4 + 3*a*b^6)*cos(d*x + c)^2 - 3*(a^6*b - 2*a^4*b^3 + a^2*b^5)*
cos(d*x + c))*sin(d*x + c))/((a^8*b - 2*a^6*b^3 + a^4*b^5)*d*cos(d*x + c)^3
 + (a^9 - 2*a^7*b^2 + a^5*b^4)*d*cos(d*x + c)^2), -1/4*(4*((4*a^2*b^4 - 3*b
^6)*cos(d*x + c)^3 + (4*a^3*b^3 - 3*a*b^5)*cos(d*x + c)^2)*sqrt(a^2 - b^2)*
arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c))) - ((a^6*b + 4*
a^4*b^3 - 11*a^2*b^5 + 6*b^7)*cos(d*x + c)^3 + (a^7 + 4*a^5*b^2 - 11*a^3*b^
4 + 6*a*b^6)*cos(d*x + c)^2)*log(sin(d*x + c) + 1) + ((a^6*b + 4*a^4*b^3 -
11*a^2*b^5 + 6*b^7)*cos(d*x + c)^3 + (a^7 + 4*a^5*b^2 - 11*a^3*b^4 + 6*a*b^
6)*cos(d*x + c)^2)*log(-sin(d*x + c) + 1) - 2*(a^7 - 2*a^5*b^2 + a^3*b^4 -
2*(2*a^5*b^2 - 5*a^3*b^4 + 3*a*b^6)*cos(d*x + c)^2 - 3*(a^6*b - 2*a^4*b^3 +
 a^2*b^5)*cos(d*x + c))*sin(d*x + c))/((a^8*b - 2*a^6*b^3 + a^4*b^5)*d*cos(
d*x + c)^3 + (a^9 - 2*a^7*b^2 + a^5*b^4)*d*cos(d*x + c)^2)]
```

Sympy [F]

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^2}\,dx=\int \frac{\sec^3{(c+dx)}}{(a+b\cos{(c+dx)})^2}\,dx$$

```
[In] integrate(sec(d*x+c)**3/(a+b*cos(d*x+c))**2,x)
```

```
[Out] Integral(sec(c + d*x)**3/(a + b*cos(c + d*x))**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^2}\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate(sec(d*x+c)^3/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 293, normalized size of antiderivative = 1.35

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$

$$= \frac{\frac{4\,b^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{(a^5-a^3b^2)\left(a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+a+b\right)}+\frac{4\,(4\,a^2b^3-3\,b^5)\left(\pi\left\lfloor\frac{dx+c}{2\,\pi}+\frac{1}{2}\right\rfloor\mathrm{sgn}(-2\,a+2\,b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-b\tan\left(\frac{1}{2}\,dx\right.}{\sqrt{a^2-b^2}}\right.\right.}{(a^6-a^4b^2)\sqrt{a^2-b^2}}}{}$$

```
[In] integrate(sec(d*x+c)^3/(a+b*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/2*(4*b^4*tan(1/2*d*x + 1/2*c)/((a^5 - a^3*b^2)*(a*tan(1/2*d*x + 1/2*c)^2
- b*tan(1/2*d*x + 1/2*c)^2 + a + b)) + 4*(4*a^2*b^3 - 3*b^5)*(pi*floor(1/2*
(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1/2*d*x + 1/2*c) - b*t
an(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))/((a^6 - a^4*b^2)*sqrt(a^2 - b^2)) +
(a^2 + 6*b^2)*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^4 - (a^2 + 6*b^2)*log(ab
s(tan(1/2*d*x + 1/2*c) - 1))/a^4 + 2*(a*tan(1/2*d*x + 1/2*c)^3 + 4*b*tan(1/
2*d*x + 1/2*c)^3 + a*tan(1/2*d*x + 1/2*c) - 4*b*tan(1/2*d*x + 1/2*c))/((tan
(1/2*d*x + 1/2*c)^2 - 1)^2*a^3))/d
```

Mupad [B] (verification not implemented)

Time = 21.33 (sec) , antiderivative size = 3699, normalized size of antiderivative = 17.05

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Too large to display}$$

```
[In] int(1/(cos(c + d*x)^3*(a + b*cos(c + d*x))^2),x)
```

```
[Out] - ((tan(c/2 + (d*x)/2)*(3*a*b^3 - 3*a^3*b + a^4 + 6*b^4 - 5*a^2*b^2))/((a^3
*b - a^4)*(a + b)) + (tan(c/2 + (d*x)/2)^5*(3*a^3*b - 3*a*b^3 + a^4 + 6*b^4
 - 5*a^2*b^2))/((a^3*b - a^4)*(a + b)) + (2*tan(c/2 + (d*x)/2)^3*(a^4 - 6*b
^4 + 3*a^2*b^2))/(a*(a^2*b - a^3)*(a + b)))/(d*(a + b - tan(c/2 + (d*x)/2)^
2*(a + 3*b) - tan(c/2 + (d*x)/2)^4*(a - 3*b) + tan(c/2 + (d*x)/2)^6*(a - b)
)) - (atan((((a^2 + 6*b^2)*((8*tan(c/2 + (d*x)/2)*(a^10 - 2*a^9*b - 72*a*b^
9 + 72*b^10 - 120*a^2*b^8 + 120*a^3*b^7 + 17*a^4*b^6 - 26*a^5*b^5 + 23*a^6*
b^4 - 20*a^7*b^3 + 11*a^8*b^2))/(a^8*b + a^9 - a^6*b^3 - a^7*b^2) - ((a^2 +
 6*b^2)*((8*(2*a^15 - 12*a^8*b^7 + 6*a^9*b^6 + 28*a^10*b^5 - 14*a^11*b^4 -
16*a^12*b^3 + 6*a^13*b^2))/(a^11*b + a^12 - a^9*b^3 - a^10*b^2) - (4*tan(c/
2 + (d*x)/2)*(a^2 + 6*b^2)*(8*a^13*b - 8*a^8*b^6 + 8*a^9*b^5 + 16*a^10*b^4
- 16*a^11*b^3 - 8*a^12*b^2))/(a^4*(a^8*b + a^9 - a^6*b^3 - a^7*b^2))))/(2*a
^4))*1i)/(2*a^4) + ((a^2 + 6*b^2)*((8*tan(c/2 + (d*x)/2)*(a^10 - 2*a^9*b -
```

72*a*b^9 + 72*b^10 - 120*a^2*b^8 + 120*a^3*b^7 + 17*a^4*b^6 - 26*a^5*b^5 + 23*a^6*b^4 - 20*a^7*b^3 + 11*a^8*b^2))/(a^8*b + a^9 - a^6*b^3 - a^7*b^2) + ((a^2 + 6*b^2)*((8*(2*a^15 - 12*a^8*b^7 + 6*a^9*b^6 + 28*a^10*b^5 - 14*a^11 *b^4 - 16*a^12*b^3 + 6*a^13*b^2))/(a^11*b + a^12 - a^9*b^3 - a^10*b^2) + (4 *tan(c/2 + (d*x)/2)*(a^2 + 6*b^2)*(8*a^13*b - 8*a^8*b^6 + 8*a^9*b^5 + 16*a^ 10*b^4 - 16*a^11*b^3 - 8*a^12*b^2))/(a^4*(a^8*b + a^9 - a^6*b^3 - a^7*b^2))))/(2*a^4))*1i)/(2*a^4))/((16*(108*b^11 - 54*a*b^10 - 216*a^2*b^9 + 81*a^3* b^8 + 63*a^4*b^7 - 9*a^5*b^6 + 41*a^6*b^5 - 4*a^7*b^4 + 4*a^8*b^3))/(a^11*b + a^12 - a^9*b^3 - a^10*b^2) - ((a^2 + 6*b^2)*((8*tan(c/2 + (d*x)/2)*(a^10 - 2*a^9*b - 72*a*b^9 + 72*b^10 - 120*a^2*b^8 + 120*a^3*b^7 + 17*a^4*b^6 - 26*a^5*b^5 + 23*a^6*b^4 - 20*a^7*b^3 + 11*a^8*b^2))/(a^8*b + a^9 - a^6*b^3 - a^7*b^2) - ((a^2 + 6*b^2)*((8*(2*a^15 - 12*a^8*b^7 + 6*a^9*b^6 + 28*a^10* b^5 - 14*a^11*b^4 - 16*a^12*b^3 + 6*a^13*b^2))/(a^11*b + a^12 - a^9*b^3 - a ^10*b^2) - (4*tan(c/2 + (d*x)/2)*(a^2 + 6*b^2)*(8*a^13*b - 8*a^8*b^6 + 8*a^ 9*b^5 + 16*a^10*b^4 - 16*a^11*b^3 - 8*a^12*b^2))/(a^4*(a^8*b + a^9 - a^6*b^ 3 - a^7*b^2))))/(2*a^4)))/(2*a^4) + ((a^2 + 6*b^2)*((8*tan(c/2 + (d*x)/2)*(a^10 - 2*a^9*b - 72*a*b^9 + 72*b^10 - 120*a^2*b^8 + 120*a^3*b^7 + 17*a^4*b^ 6 - 26*a^5*b^5 + 23*a^6*b^4 - 20*a^7*b^3 + 11*a^8*b^2))/(a^8*b + a^9 - a^6* b^3 - a^7*b^2) + ((a^2 + 6*b^2)*((8*(2*a^15 - 12*a^8*b^7 + 6*a^9*b^6 + 28*a ^10*b^5 - 14*a^11*b^4 - 16*a^12*b^3 + 6*a^13*b^2))/(a^11*b + a^12 - a^9*b^3 - a^10*b^2) + (4*tan(c/2 + (d*x)/2)*(a^2 + 6*b^2)*(8*a^13*b - 8*a^8*b^6 + 8*a^9*b^5 + 16*a^10*b^4 - 16*a^11*b^3 - 8*a^12*b^2))/(a^4*(a^8*b + a^9 - a^ 6*b^3 - a^7*b^2))))/(2*a^4)))/(2*a^4)))*(a^2 + 6*b^2)*1i)/(a^4*d) - (b^3*at an(((b^3*(4*a^2 - 3*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*((8*tan(c/2 + (d*x)/2)*(a^10 - 2*a^9*b - 72*a*b^9 + 72*b^10 - 120*a^2*b^8 + 120*a^3*b^7 + 17*a^4 *b^6 - 26*a^5*b^5 + 23*a^6*b^4 - 20*a^7*b^3 + 11*a^8*b^2))/(a^8*b + a^9 - a ^6*b^3 - a^7*b^2) + (b^3*((8*(2*a^15 - 12*a^8*b^7 + 6*a^9*b^6 + 28*a^10*b^5 - 14*a^11*b^4 - 16*a^12*b^3 + 6*a^13*b^2))/(a^11*b + a^12 - a^9*b^3 - a^10 *b^2) + (8*b^3*tan(c/2 + (d*x)/2)*(4*a^2 - 3*b^2)*(-(a + b)^3*(a - b)^3)^(1 /2)*(8*a^13*b - 8*a^8*b^6 + 8*a^9*b^5 + 16*a^10*b^4 - 16*a^11*b^3 - 8*a^12* b^2))/((a^8*b + a^9 - a^6*b^3 - a^7*b^2)*(a^10 - a^4*b^6 + 3*a^6*b^4 - 3*a^ 8*b^2)))*(4*a^2 - 3*b^2)*(-(a + b)^3*(a - b)^3)^(1/2))/(a^10 - a^4*b^6 + 3* a^6*b^4 - 3*a^8*b^2))*1i)/(a^10 - a^4*b^6 + 3*a^6*b^4 - 3*a^8*b^2) + (b^3*(4*a^2 - 3*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*((8*tan(c/2 + (d*x)/2)*(a^10 - 2*a^9*b - 72*a*b^9 + 72*b^10 - 120*a^2*b^8 + 120*a^3*b^7 + 17*a^4*b^6 - 26* a^5*b^5 + 23*a^6*b^4 - 20*a^7*b^3 + 11*a^8*b^2))/(a^8*b + a^9 - a^6*b^3 - a ^7*b^2) - (b^3*((8*(2*a^15 - 12*a^8*b^7 + 6*a^9*b^6 + 28*a^10*b^5 - 14*a^11 *b^4 - 16*a^12*b^3 + 6*a^13*b^2))/(a^11*b + a^12 - a^9*b^3 - a^10*b^2) - (8 *b^3*tan(c/2 + (d*x)/2)*(4*a^2 - 3*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(8*a^1 3*b - 8*a^8*b^6 + 8*a^9*b^5 + 16*a^10*b^4 - 16*a^11*b^3 - 8*a^12*b^2))/((a^ 8*b + a^9 - a^6*b^3 - a^7*b^2)*(a^10 - a^4*b^6 + 3*a^6*b^4 - 3*a^8*b^2)))*(4*a^2 - 3*b^2)*(-(a + b)^3*(a - b)^3)^(1/2))/(a^10 - a^4*b^6 + 3*a^6*b^4 - 3*a^8*b^2))*1i)/(a^10 - a^4*b^6 + 3*a^6*b^4 - 3*a^8*b^2))/((16*(108*b^11 - 54*a*b^10 - 216*a^2*b^9 + 81*a^3*b^8 + 63*a^4*b^7 - 9*a^5*b^6 + 41*a^6*b^5 - 4*a^7*b^4 + 4*a^8*b^3))/(a^11*b + a^12 - a^9*b^3 - a^10*b^2) + (b^3*(4*a^

2 - 3*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*((8*tan(c/2 + (d*x)/2)*(a^10 - 2*a^9*b - 72*a*b^9 + 72*b^10 - 120*a^2*b^8 + 120*a^3*b^7 + 17*a^4*b^6 - 26*a^5*b^5 + 23*a^6*b^4 - 20*a^7*b^3 + 11*a^8*b^2))/(a^8*b + a^9 - a^6*b^3 - a^7*b^2) + (b^3*((8*(2*a^15 - 12*a^8*b^7 + 6*a^9*b^6 + 28*a^10*b^5 - 14*a^11*b^4 - 16*a^12*b^3 + 6*a^13*b^2))/(a^11*b + a^12 - a^9*b^3 - a^10*b^2) + (8*b^3*tan(c/2 + (d*x)/2)*(4*a^2 - 3*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(8*a^13*b - 8*a^8*b^6 + 8*a^9*b^5 + 16*a^10*b^4 - 16*a^11*b^3 - 8*a^12*b^2))/((a^8*b + a^9 - a^6*b^3 - a^7*b^2)*(a^10 - a^4*b^6 + 3*a^6*b^4 - 3*a^8*b^2)))*(4*a^2 - 3*b^2)*(-(a + b)^3*(a - b)^3)^(1/2))/(a^10 - a^4*b^6 + 3*a^6*b^4 - 3*a^8*b^2)))/(a^10 - a^4*b^6 + 3*a^6*b^4 - 3*a^8*b^2) - (b^3*(4*a^2 - 3*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*((8*tan(c/2 + (d*x)/2)*(a^10 - 2*a^9*b - 72*a*b^9 + 72*b^10 - 120*a^2*b^8 + 120*a^3*b^7 + 17*a^4*b^6 - 26*a^5*b^5 + 23*a^6*b^4 - 20*a^7*b^3 + 11*a^8*b^2))/(a^8*b + a^9 - a^6*b^3 - a^7*b^2) - (b^3*((8*(2*a^15 - 12*a^8*b^7 + 6*a^9*b^6 + 28*a^10*b^5 - 14*a^11*b^4 - 16*a^12*b^3 + 6*a^13*b^2))/(a^11*b + a^12 - a^9*b^3 - a^10*b^2) - (8*b^3*tan(c/2 + (d*x)/2)*(4*a^2 - 3*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(8*a^13*b - 8*a^8*b^6 + 8*a^9*b^5 + 16*a^10*b^4 - 16*a^11*b^3 - 8*a^12*b^2))/((a^8*b + a^9 - a^6*b^3 - a^7*b^2)*(a^10 - a^4*b^6 + 3*a^6*b^4 - 3*a^8*b^2)))*(4*a^2 - 3*b^2)*(-(a + b)^3*(a - b)^3)^(1/2))/(a^10 - a^4*b^6 + 3*a^6*b^4 - 3*a^8*b^2)))/(a^10 - a^4*b^6 + 3*a^6*b^4 - 3*a^8*b^2)))*(4*a^2 - 3*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*2i)/(d*(a^10 - a^4*b^6 + 3*a^6*b^4 - 3*a^8*b^2))

3.468 $\int \frac{\sec^4(c+dx)}{(a+b\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 270

$$\int \frac{\sec^4(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \frac{2b^4(5a^2-4b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^5(a-b)^{3/2}(a+b)^{3/2}d} - \frac{b(a^2+4b^2)\,\text{arctanh}(\sin(c+dx))}{a^5d} + \frac{(2a^4+7a^2b^2-12b^4)\tan(c+dx)}{3a^4(a^2-b^2)\,d} - \frac{b(a^2-2b^2)\sec(c+dx)\tan(c+dx)}{a^3(a^2-b^2)\,d} + \frac{(a^2-4b^2)\sec^2(c+dx)\tan(c+dx)}{3a^2(a^2-b^2)\,d} + \frac{b^2\sec^2(c+dx)\tan(c+dx)}{a(a^2-b^2)\,d(a+b\cos(c+dx))}$$

```
[Out] 2*b^4*(5*a^2-4*b^2)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/2))/a^5/
(a-b)^(3/2)/(a+b)^(3/2)/d-b*(a^2+4*b^2)*arctanh(sin(d*x+c))/a^5/d+1/3*(2*a^
4+7*a^2*b^2-12*b^4)*tan(d*x+c)/a^4/(a^2-b^2)/d-b*(a^2-2*b^2)*sec(d*x+c)*tan
(d*x+c)/a^3/(a^2-b^2)/d+1/3*(a^2-4*b^2)*sec(d*x+c)^2*tan(d*x+c)/a^2/(a^2-b^
2)/d+b^2*sec(d*x+c)^2*tan(d*x+c)/a/(a^2-b^2)/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 1.10 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {2881, 3134, 3080, 3855, 2738, 211}

$$\int \frac{\sec^4(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \frac{(a^2-4b^2)\tan(c+dx)\sec^2(c+dx)}{3a^2d\,(a^2-b^2)} + \frac{b^2\tan(c+dx)\sec^2(c+dx)}{ad\,(a^2-b^2)\,(a+b\cos(c+dx))} + \frac{2b^4(5a^2-4b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^5d(a-b)^{3/2}(a+b)^{3/2}} - \frac{b(a^2+4b^2)\,\text{arctanh}(\sin(c+dx))}{a^5d} + \frac{(2a^4+7a^2b^2-12b^4)\tan(c+dx)}{3a^4d\,(a^2-b^2)} - \frac{b(a^2-2b^2)\tan(c+dx)\sec(c+dx)}{a^3d\,(a^2-b^2)}$$

```
[In] Int[Sec[c + d*x]^4/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (2*b^4*(5*a^2 - 4*b^2)*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/
(a^5*(a - b)^(3/2)*(a + b)^(3/2)*d) - (b*(a^2 + 4*b^2)*ArcTanh[Sin[c + d*x]
])/(a^5*d) + ((2*a^4 + 7*a^2*b^2 - 12*b^4)*Tan[c + d*x])/(3*a^4*(a^2 - b^2)
*d) - (b*(a^2 - 2*b^2)*Sec[c + d*x]*Tan[c + d*x])/(a^3*(a^2 - b^2)*d) + ((a
^2 - 4*b^2)*Sec[c + d*x]^2*Tan[c + d*x])/(3*a^2*(a^2 - b^2)*d) + (b^2*Sec[c
 + d*x]^2*Tan[c + d*x])/(a*(a^2 - b^2)*d*(a + b*Cos[c + d*x]))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
```

```
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 3080

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[(A*b
- a*B)/(b*c - a*d), Int[1/(a + b*Sin[e + f*x]), x], x] + Dist[(B*c - A*d)/(
b*c - a*d), Int[1/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f,
A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{b^2\sec^2(c+dx)\tan(c+dx)}{a(a^2-b^2)\,d(a+b\cos(c+dx))}+\frac{\int\frac{(a^2-4b^2-ab\cos(c+dx)+3b^2\cos^2(c+dx))\sec^4(c+dx)}{a+b\cos(c+dx)}\,dx}{a(a^2-b^2)}\\ &= \frac{(a^2-4b^2)\sec^2(c+dx)\tan(c+dx)}{3a^2(a^2-b^2)\,d}+\frac{b^2\sec^2(c+dx)\tan(c+dx)}{a(a^2-b^2)\,d(a+b\cos(c+dx))}\\ &\quad+\frac{\int\frac{(-6b(a^2-2b^2)+a(2a^2+b^2)\cos(c+dx)+2b(a^2-4b^2)\cos^2(c+dx))\sec^3(c+dx)}{a+b\cos(c+dx)}\,dx}{3a^2(a^2-b^2)}\end{aligned}$$

$$= -\frac{b(a^2-2b^2)\sec(c+dx)\tan(c+dx)}{a^3(a^2-b^2)d} + \frac{(a^2-4b^2)\sec^2(c+dx)\tan(c+dx)}{3a^2(a^2-b^2)d} + \frac{b^2\sec^2(c+dx)\tan(c+dx)}{a(a^2-b^2)d(a+b\cos(c+dx))} + \frac{\int \frac{(2(2a^4+7a^2b^2-12b^4)-2ab(a^2+2b^2)\cos(c+dx)-6b^2(a^2-2b^2)\cos^2(c+dx))\sec^2(c+dx)}{a+b\cos(c+dx)}dx}{6a^3(a^2-b^2)}$$

$$= \frac{(2a^4+7a^2b^2-12b^4)\tan(c+dx)}{3a^4(a^2-b^2)d} - \frac{b(a^2-2b^2)\sec(c+dx)\tan(c+dx)}{a^3(a^2-b^2)d} + \frac{(a^2-4b^2)\sec^2(c+dx)\tan(c+dx)}{3a^2(a^2-b^2)d} + \frac{b^2\sec^2(c+dx)\tan(c+dx)}{a(a^2-b^2)d(a+b\cos(c+dx))} + \frac{\int \frac{(-6b(a^4+3a^2b^2-4b^4)-6ab^2(a^2-2b^2)\cos(c+dx))\sec(c+dx)}{a+b\cos(c+dx)}dx}{6a^4(a^2-b^2)}$$

$$= \frac{(2a^4+7a^2b^2-12b^4)\tan(c+dx)}{3a^4(a^2-b^2)d} - \frac{b(a^2-2b^2)\sec(c+dx)\tan(c+dx)}{a^3(a^2-b^2)d} + \frac{(a^2-4b^2)\sec^2(c+dx)\tan(c+dx)}{3a^2(a^2-b^2)d} + \frac{b^2\sec^2(c+dx)\tan(c+dx)}{a(a^2-b^2)d(a+b\cos(c+dx))} + \frac{(b^4(5a^2-4b^2))\int \frac{1}{a+b\cos(c+dx)}dx}{a^5(a^2-b^2)} - \frac{(b(a^2+4b^2))\int \sec(c+dx)dx}{a^5}$$

$$= -\frac{b(a^2+4b^2)\operatorname{arctanh}(\sin(c+dx))}{a^5d} + \frac{(2a^4+7a^2b^2-12b^4)\tan(c+dx)}{3a^4(a^2-b^2)d} - \frac{b(a^2-2b^2)\sec(c+dx)\tan(c+dx)}{a^3(a^2-b^2)d} + \frac{(a^2-4b^2)\sec^2(c+dx)\tan(c+dx)}{3a^2(a^2-b^2)d} + \frac{b^2\sec^2(c+dx)\tan(c+dx)}{a(a^2-b^2)d(a+b\cos(c+dx))} + \frac{(2b^4(5a^2-4b^2))\operatorname{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{a^5(a^2-b^2)d}$$

$$= \frac{2b^4(5a^2-4b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^5(a-b)^{3/2}(a+b)^{3/2}d} - \frac{b(a^2+4b^2)\operatorname{arctanh}(\sin(c+dx))}{a^5d} + \frac{(2a^4+7a^2b^2-12b^4)\tan(c+dx)}{3a^4(a^2-b^2)d} - \frac{b(a^2-2b^2)\sec(c+dx)\tan(c+dx)}{a^3(a^2-b^2)d} + \frac{(a^2-4b^2)\sec^2(c+dx)\tan(c+dx)}{3a^2(a^2-b^2)d} + \frac{b^2\sec^2(c+dx)\tan(c+dx)}{a(a^2-b^2)d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 6.48 (sec) , antiderivative size = 499, normalized size of antiderivative = 1.85

$$\int \frac{\sec^4(c+dx)}{(a+b\cos(c+dx))^2}\,dx = -\frac{2b^4(5a^2-4b^2)\operatorname{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{a^5\left(a^2-b^2\right)\sqrt{-a^2+b^2}d} + \frac{(a^2b+4b^3)\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)}{a^5d} + \frac{(-a^2b-4b^3)\log\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)}{a^5d} + \frac{a-6b}{12a^3d\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)^2} + \frac{\sin\left(\frac{1}{2}(c+dx)\right)}{6a^2d\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)^3} + \frac{\sin\left(\frac{1}{2}(c+dx)\right)}{6a^2d\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)^3} + \frac{-a+6b}{12a^3d\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)^2} + \frac{2a^2\sin\left(\frac{1}{2}(c+dx)\right)+9b^2\sin\left(\frac{1}{2}(c+dx)\right)}{3a^4d\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)} + \frac{2a^2\sin\left(\frac{1}{2}(c+dx)\right)+9b^2\sin\left(\frac{1}{2}(c+dx)\right)}{3a^4d\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)} - \frac{b^5\sin(c+dx)}{a^4(a-b)(a+b)d(a+b\cos(c+dx))}$$

```
[In] Integrate[Sec[c + d*x]^4/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (-2*b^4*(5*a^2 - 4*b^2)*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]
])/(a^5*(a^2 - b^2)*Sqrt[-a^2 + b^2]*d) + ((a^2*b + 4*b^3)*Log[Cos[(c + d*x
)/2] - Sin[(c + d*x)/2]])/(a^5*d) + ((-(a^2*b) - 4*b^3)*Log[Cos[(c + d*x)/2
] + Sin[(c + d*x)/2]])/(a^5*d) + (a - 6*b)/(12*a^3*d*(Cos[(c + d*x)/2] - Si
n[(c + d*x)/2])^2) + Sin[(c + d*x)/2]/(6*a^2*d*(Cos[(c + d*x)/2] - Sin[(c +
 d*x)/2])^3) + Sin[(c + d*x)/2]/(6*a^2*d*(Cos[(c + d*x)/2] + Sin[(c + d*x)/
2])^3) + (-a + 6*b)/(12*a^3*d*(Cos[(c + d*x)/2] + Sin[(c + d*x)/2])^2) + (2
*a^2*Sin[(c + d*x)/2] + 9*b^2*Sin[(c + d*x)/2])/(3*a^4*d*(Cos[(c + d*x)/2]
- Sin[(c + d*x)/2])) + (2*a^2*Sin[(c + d*x)/2] + 9*b^2*Sin[(c + d*x)/2])/(3
*a^4*d*(Cos[(c + d*x)/2] + Sin[(c + d*x)/2])) - (b^5*Sin[c + d*x])/(a^4*(a
- b)*(a + b)*d*(a + b*Cos[c + d*x]))
```

Maple [A] (verified)

Time = 2.06 (sec) , antiderivative size = 330, normalized size of antiderivative = 1.22

method	result
derivativedivides	$\frac{-\frac{1}{3a^2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^3}-\frac{a+2b}{2a^3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}-\frac{a^2+ab+3b^2}{a^4\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{b\left(a^2+4b^2\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^5}-\frac{1}{3a^2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right.}}{}$
default	$\frac{-\frac{1}{3a^2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^3}-\frac{a+2b}{2a^3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}-\frac{a^2+ab+3b^2}{a^4\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{b\left(a^2+4b^2\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^5}-\frac{1}{3a^2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right.}}{}$
risch	$\frac{2i\left(3a^3b^2e^{7i(dx+c)}-6a\,b^4e^{7i(dx+c)}+6b\,a^4e^{6i(dx+c)}+3a^2b^3e^{6i(dx+c)}-12b^5e^{6i(dx+c)}+21a^3b^2e^{5i(dx+c)}-30a\,b^4e^{5i(dx+c)}+\right.}{}$

```
[In] int(sec(d*x+c)^4/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-1/3/a^2/(tan(1/2*d*x+1/2*c)-1)^3-1/2*(a+2*b)/a^3/(tan(1/2*d*x+1/2*c)-
1)^2-(a^2+a*b+3*b^2)/a^4/(tan(1/2*d*x+1/2*c)-1)+b*(a^2+4*b^2)/a^5*ln(tan(1/
2*d*x+1/2*c)-1)-1/3/a^2/(tan(1/2*d*x+1/2*c)+1)^3-1/2*(-a-2*b)/a^3/(tan(1/2*
d*x+1/2*c)+1)^2-(a^2+a*b+3*b^2)/a^4/(tan(1/2*d*x+1/2*c)+1)-b*(a^2+4*b^2)/a^
5*ln(tan(1/2*d*x+1/2*c)+1)+2*b^4/a^5*(-a*b/(a^2-b^2)*tan(1/2*d*x+1/2*c)/(ta
n(1/2*d*x+1/2*c)^2*a-b*tan(1/2*d*x+1/2*c)^2+a+b)+(5*a^2-4*b^2)/(a-b)/(a+b)/
((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.66 (sec) , antiderivative size = 1001, normalized size of antiderivative = 3.71

$$\int \frac{\sec^4(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Too large to display}$$

```
[In] integrate(sec(d*x+c)^4/(a+b*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] [-1/6*(3*((5*a^2*b^5 - 4*b^7)*cos(d*x + c)^4 + (5*a^3*b^4 - 4*a*b^6)*cos(d*
x + c)^3)*sqrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x
+ c)^2 + 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2
)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) + 3*((a^6*b^2 + 2*a^4*b^
4 - 7*a^2*b^6 + 4*b^8)*cos(d*x + c)^4 + (a^7*b + 2*a^5*b^3 - 7*a^3*b^5 + 4*
a*b^7)*cos(d*x + c)^3)*log(sin(d*x + c) + 1) - 3*((a^6*b^2 + 2*a^4*b^4 - 7*
a^2*b^6 + 4*b^8)*cos(d*x + c)^4 + (a^7*b + 2*a^5*b^3 - 7*a^3*b^5 + 4*a*b^7)
```

```
*cos(d*x + c)^3)*log(-sin(d*x + c) + 1) - 2*(a^8 - 2*a^6*b^2 + a^4*b^4 + (2
*a^7*b + 5*a^5*b^3 - 19*a^3*b^5 + 12*a*b^7)*cos(d*x + c)^3 + 2*(a^8 + a^6*b
^2 - 5*a^4*b^4 + 3*a^2*b^6)*cos(d*x + c)^2 - 2*(a^7*b - 2*a^5*b^3 + a^3*b^5
)*cos(d*x + c))*sin(d*x + c))/((a^9*b - 2*a^7*b^3 + a^5*b^5)*d*cos(d*x + c)
^4 + (a^10 - 2*a^8*b^2 + a^6*b^4)*d*cos(d*x + c)^3), 1/6*(6*((5*a^2*b^5 - 4
*b^7)*cos(d*x + c)^4 + (5*a^3*b^4 - 4*a*b^6)*cos(d*x + c)^3)*sqrt(a^2 - b^2
)*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c))) - 3*((a^6*b^
2 + 2*a^4*b^4 - 7*a^2*b^6 + 4*b^8)*cos(d*x + c)^4 + (a^7*b + 2*a^5*b^3 - 7*
a^3*b^5 + 4*a*b^7)*cos(d*x + c)^3)*log(sin(d*x + c) + 1) + 3*((a^6*b^2 + 2*
a^4*b^4 - 7*a^2*b^6 + 4*b^8)*cos(d*x + c)^4 + (a^7*b + 2*a^5*b^3 - 7*a^3*b^
5 + 4*a*b^7)*cos(d*x + c)^3)*log(-sin(d*x + c) + 1) + 2*(a^8 - 2*a^6*b^2 +
a^4*b^4 + (2*a^7*b + 5*a^5*b^3 - 19*a^3*b^5 + 12*a*b^7)*cos(d*x + c)^3 + 2*
(a^8 + a^6*b^2 - 5*a^4*b^4 + 3*a^2*b^6)*cos(d*x + c)^2 - 2*(a^7*b - 2*a^5*b
^3 + a^3*b^5)*cos(d*x + c))*sin(d*x + c))/((a^9*b - 2*a^7*b^3 + a^5*b^5)*d*
cos(d*x + c)^4 + (a^10 - 2*a^8*b^2 + a^6*b^4)*d*cos(d*x + c)^3)]
```

Sympy [F]

$$\int \frac{\sec^4(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\sec^4(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$

```
[In] integrate(sec(d*x+c)**4/(a+b*cos(d*x+c))**2,x)
[Out] Integral(sec(c + d*x)**4/(a + b*cos(c + d*x))**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sec^4(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(sec(d*x+c)^4/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 368, normalized size of antiderivative = 1.36

$$\int \frac{\sec^4(c+dx)}{(a+b\cos(c+dx))^2}\,dx =$$

$$-\frac{\frac{6\,b^5\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{(a^6-a^4b^2)\left(a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+a+b\right)}+\frac{6\,(5\,a^2b^4-4\,b^6)\left(\pi\left\lfloor\frac{dx+c}{2\,\pi}+\frac{1}{2}\right\rfloor\mathrm{sgn}(-2\,a+2\,b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-b\tan\left(\right.}{\sqrt{a^2-b^2}}\right.\right.}{(a^7-a^5b^2)\sqrt{a^2-b^2}}}{}$$

```
[In] integrate(sec(d*x+c)^4/(a+b*cos(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/3*(6*b^5*tan(1/2*d*x + 1/2*c)/((a^6 - a^4*b^2)*(a*tan(1/2*d*x + 1/2*c)^2
 - b*tan(1/2*d*x + 1/2*c)^2 + a + b)) + 6*(5*a^2*b^4 - 4*b^6)*(pi*floor(1/2
*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1/2*d*x + 1/2*c) - b*
tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))/((a^7 - a^5*b^2)*sqrt(a^2 - b^2)) +
 3*(a^2*b + 4*b^3)*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^5 - 3*(a^2*b + 4*b^
3)*log(abs(tan(1/2*d*x + 1/2*c) - 1))/a^5 + 2*(3*a^2*tan(1/2*d*x + 1/2*c)^5
 + 3*a*b*tan(1/2*d*x + 1/2*c)^5 + 9*b^2*tan(1/2*d*x + 1/2*c)^5 - 2*a^2*tan(
1/2*d*x + 1/2*c)^3 - 18*b^2*tan(1/2*d*x + 1/2*c)^3 + 3*a^2*tan(1/2*d*x + 1/
2*c) - 3*a*b*tan(1/2*d*x + 1/2*c) + 9*b^2*tan(1/2*d*x + 1/2*c))/((tan(1/2*d
*x + 1/2*c)^2 - 1)^3*a^4))/d
```

Mupad [B] (verification not implemented)

Time = 21.28 (sec) , antiderivative size = 3843, normalized size of antiderivative = 14.23

$$\int \frac{\sec^4(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Too large to display}$$

```
[In] int(1/(cos(c + d*x)^4*(a + b*cos(c + d*x))^2),x)
```

```
[Out] ((2*tan(c/2 + (d*x)/2)^7*(a^5 - 2*a*b^4 + 4*b^5 - 3*a^2*b^3 + a^3*b^2))/(a^
4*(a + b)*(a - b)) + (2*tan(c/2 + (d*x)/2)^3*(6*a*b^4 - 8*a^4*b + a^5 + 36*
b^5 - 19*a^2*b^3 - 7*a^3*b^2))/(3*a^4*(a + b)*(a - b)) + (2*tan(c/2 + (d*x)
/2)^5*(6*a*b^4 + 8*a^4*b + a^5 - 36*b^5 + 19*a^2*b^3 - 7*a^3*b^2))/(3*a^4*(
a + b)*(a - b)) + (2*tan(c/2 + (d*x)/2)*(a^5 - 2*a*b^4 - 4*b^5 + 3*a^2*b^3
+ a^3*b^2))/(a^4*(a + b)*(a - b)))/(d*(a + b - tan(c/2 + (d*x)/2)^8*(a - b)
 - tan(c/2 + (d*x)/2)^2*(2*a + 4*b) + tan(c/2 + (d*x)/2)^6*(2*a - 4*b) + 6*
b*tan(c/2 + (d*x)/2)^4)) + (b*atan(((b*(a^2 + 4*b^2)*((32*tan(c/2 + (d*x)/2
)*(32*b^12 - 32*a*b^11 - 48*a^2*b^10 + 48*a^3*b^9 + 2*a^4*b^8 - 2*a^5*b^7 +
 7*a^6*b^6 - 12*a^7*b^5 + 7*a^8*b^4 - 2*a^9*b^3 + a^10*b^2))/(a^10*b + a^11
 - a^8*b^3 - a^9*b^2) + (b*(a^2 + 4*b^2)*((32*(a^17*b - 4*a^10*b^8 + 2*a^11
```

*b^7 + 9*a^12*b^6 - 4*a^13*b^5 - 5*a^14*b^4 + a^15*b^3))/(a^14*b + a^15 - a^12*b^3 - a^13*b^2) + (32*b*tan(c/2 + (d*x)/2)*(a^2 + 4*b^2)*(2*a^15*b - 2*a^10*b^6 + 2*a^11*b^5 + 4*a^12*b^4 - 4*a^13*b^3 - 2*a^14*b^2))/(a^5*(a^10*b + a^11 - a^8*b^3 - a^9*b^2))))/a^5)*1i)/a^5 + (b*(a^2 + 4*b^2)*((32*tan(c/2 + (d*x)/2)*(32*b^12 - 32*a*b^11 - 48*a^2*b^10 + 48*a^3*b^9 + 2*a^4*b^8 - 2*a^5*b^7 + 7*a^6*b^6 - 12*a^7*b^5 + 7*a^8*b^4 - 2*a^9*b^3 + a^10*b^2))/(a^10*b + a^11 - a^8*b^3 - a^9*b^2) - (b*(a^2 + 4*b^2)*((32*(a^17*b - 4*a^10*b^8 + 2*a^11*b^7 + 9*a^12*b^6 - 4*a^13*b^5 - 5*a^14*b^4 + a^15*b^3))/(a^14*b + a^15 - a^12*b^3 - a^13*b^2) - (32*b*tan(c/2 + (d*x)/2)*(a^2 + 4*b^2)*(2*a^15*b - 2*a^10*b^6 + 2*a^11*b^5 + 4*a^12*b^4 - 4*a^13*b^3 - 2*a^14*b^2))/(a^5*(a^10*b + a^11 - a^8*b^3 - a^9*b^2))))/a^5)*1i)/a^5)/((64*(64*b^14 - 32*a*b^13 - 112*a^2*b^12 + 48*a^3*b^11 + 12*a^4*b^10 - 6*a^5*b^9 + 31*a^6*b^8 - 5*a^7*b^7 + 5*a^8*b^6))/(a^14*b + a^15 - a^12*b^3 - a^13*b^2) + (b*(a^2 + 4*b^2)*((32*tan(c/2 + (d*x)/2)*(32*b^12 - 32*a*b^11 - 48*a^2*b^10 + 48*a^3*b^9 + 2*a^4*b^8 - 2*a^5*b^7 + 7*a^6*b^6 - 12*a^7*b^5 + 7*a^8*b^4 - 2*a^9*b^3 + a^10*b^2))/(a^10*b + a^11 - a^8*b^3 - a^9*b^2) + (b*(a^2 + 4*b^2)*((32*(a^17*b - 4*a^10*b^8 + 2*a^11*b^7 + 9*a^12*b^6 - 4*a^13*b^5 - 5*a^14*b^4 + a^15*b^3))/(a^14*b + a^15 - a^12*b^3 - a^13*b^2) + (32*b*tan(c/2 + (d*x)/2)*(a^2 + 4*b^2)*(2*a^15*b - 2*a^10*b^6 + 2*a^11*b^5 + 4*a^12*b^4 - 4*a^13*b^3 - 2*a^14*b^2))/(a^5*(a^10*b + a^11 - a^8*b^3 - a^9*b^2))))/a^5))/a^5 - (b*(a^2 + 4*b^2)*((32*tan(c/2 + (d*x)/2)*(32*b^12 - 32*a*b^11 - 48*a^2*b^10 + 48*a^3*b^9 + 2*a^4*b^8 - 2*a^5*b^7 + 7*a^6*b^6 - 12*a^7*b^5 + 7*a^8*b^4 - 2*a^9*b^3 + a^10*b^2))/(a^10*b + a^11 - a^8*b^3 - a^9*b^2) - (b*(a^2 + 4*b^2)*((32*(a^17*b - 4*a^10*b^8 + 2*a^11*b^7 + 9*a^12*b^6 - 4*a^13*b^5 - 5*a^14*b^4 + a^15*b^3))/(a^14*b + a^15 - a^12*b^3 - a^13*b^2) - (32*b*tan(c/2 + (d*x)/2)*(a^2 + 4*b^2)*(2*a^15*b - 2*a^10*b^6 + 2*a^11*b^5 + 4*a^12*b^4 - 4*a^13*b^3 - 2*a^14*b^2))/(a^5*(a^10*b + a^11 - a^8*b^3 - a^9*b^2))))/a^5))/a^5))*(a^2 + 4*b^2)*2i)/(a^5*d) + (b^4*atan(((b^4*(5*a^2 - 4*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*((32*tan(c/2 + (d*x)/2)*(32*b^12 - 32*a*b^11 - 48*a^2*b^10 + 48*a^3*b^9 + 2*a^4*b^8 - 2*a^5*b^7 + 7*a^6*b^6 - 12*a^7*b^5 + 7*a^8*b^4 - 2*a^9*b^3 + a^10*b^2))/(a^10*b + a^11 - a^8*b^3 - a^9*b^2) + (b^4*((32*(a^17*b - 4*a^10*b^8 + 2*a^11*b^7 + 9*a^12*b^6 - 4*a^13*b^5 - 5*a^14*b^4 + a^15*b^3))/(a^14*b + a^15 - a^12*b^3 - a^13*b^2) + (32*b^4*tan(c/2 + (d*x)/2)*(5*a^2 - 4*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a^15*b - 2*a^10*b^6 + 2*a^11*b^5 + 4*a^12*b^4 - 4*a^13*b^3 - 2*a^14*b^2))/((a^10*b + a^11 - a^8*b^3 - a^9*b^2)*(a^11 - a^5*b^6 + 3*a^7*b^4 - 3*a^9*b^2)))*(5*a^2 - 4*b^2)*(-(a + b)^3*(a - b)^3)^(1/2))/(a^11 - a^5*b^6 + 3*a^7*b^4 - 3*a^9*b^2))*1i)/(a^11 - a^5*b^6 + 3*a^7*b^4 - 3*a^9*b^2) + (b^4*(5*a^2 - 4*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*((32*tan(c/2 + (d*x)/2)*(32*b^12 - 32*a*b^11 - 48*a^2*b^10 + 48*a^3*b^9 + 2*a^4*b^8 - 2*a^5*b^7 + 7*a^6*b^6 - 12*a^7*b^5 + 7*a^8*b^4 - 2*a^9*b^3 + a^10*b^2))/(a^10*b + a^11 - a^8*b^3 - a^9*b^2) - (b^4*((32*(a^17*b - 4*a^10*b^8 + 2*a^11*b^7 + 9*a^12*b^6 - 4*a^13*b^5 - 5*a^14*b^4 + a^15*b^3))/(a^14*b + a^15 - a^12*b^3 - a^13*b^2) - (32*b^4*tan(c/2 + (d*x)/2)*(5*a^2 - 4*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a^15*b - 2*a^10*b^6 + 2*a^11*b^5 + 4*a^12*b^4 - 4*a^13*b^3 - 2*a^14*b^2))/((a^10*b + a^11 - a^8*b^3

- a^9*b^2)*(a^11 - a^5*b^6 + 3*a^7*b^4 - 3*a^9*b^2)))*(5*a^2 - 4*b^2)*(-(a + b)^3*(a - b)^3)^(1/2))/(a^11 - a^5*b^6 + 3*a^7*b^4 - 3*a^9*b^2))*1i)/(a^11 - a^5*b^6 + 3*a^7*b^4 - 3*a^9*b^2))/((64*(64*b^14 - 32*a*b^13 - 112*a^2*b^12 + 48*a^3*b^11 + 12*a^4*b^10 - 6*a^5*b^9 + 31*a^6*b^8 - 5*a^7*b^7 + 5*a^8*b^6))/(a^14*b + a^15 - a^12*b^3 - a^13*b^2) + (b^4*(5*a^2 - 4*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*((32*tan(c/2 + (d*x)/2)*(32*b^12 - 32*a*b^11 - 48*a^2*b^10 + 48*a^3*b^9 + 2*a^4*b^8 - 2*a^5*b^7 + 7*a^6*b^6 - 12*a^7*b^5 + 7*a^8*b^4 - 2*a^9*b^3 + a^10*b^2))/(a^10*b + a^11 - a^8*b^3 - a^9*b^2) + (b^4*((32*(a^17*b - 4*a^10*b^8 + 2*a^11*b^7 + 9*a^12*b^6 - 4*a^13*b^5 - 5*a^14*b^4 + a^15*b^3))/(a^14*b + a^15 - a^12*b^3 - a^13*b^2) + (32*b^4*tan(c/2 + (d*x)/2)*(5*a^2 - 4*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a^15*b - 2*a^10*b^6 + 2*a^11*b^5 + 4*a^12*b^4 - 4*a^13*b^3 - 2*a^14*b^2))/((a^10*b + a^11 - a^8*b^3 - a^9*b^2)*(a^11 - a^5*b^6 + 3*a^7*b^4 - 3*a^9*b^2)))*(5*a^2 - 4*b^2)*(-(a + b)^3*(a - b)^3)^(1/2))/(a^11 - a^5*b^6 + 3*a^7*b^4 - 3*a^9*b^2)))/(a^11 - a^5*b^6 + 3*a^7*b^4 - 3*a^9*b^2) - (b^4*(5*a^2 - 4*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*((32*tan(c/2 + (d*x)/2)*(32*b^12 - 32*a*b^11 - 48*a^2*b^10 + 48*a^3*b^9 + 2*a^4*b^8 - 2*a^5*b^7 + 7*a^6*b^6 - 12*a^7*b^5 + 7*a^8*b^4 - 2*a^9*b^3 + a^10*b^2))/(a^10*b + a^11 - a^8*b^3 - a^9*b^2) - (b^4*((32*(a^17*b - 4*a^10*b^8 + 2*a^11*b^7 + 9*a^12*b^6 - 4*a^13*b^5 - 5*a^14*b^4 + a^15*b^3))/(a^14*b + a^15 - a^12*b^3 - a^13*b^2) - (32*b^4*tan(c/2 + (d*x)/2)*(5*a^2 - 4*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*(2*a^15*b - 2*a^10*b^6 + 2*a^11*b^5 + 4*a^12*b^4 - 4*a^13*b^3 - 2*a^14*b^2))/((a^10*b + a^11 - a^8*b^3 - a^9*b^2)*(a^11 - a^5*b^6 + 3*a^7*b^4 - 3*a^9*b^2)))*(5*a^2 - 4*b^2)*(-(a + b)^3*(a - b)^3)^(1/2))/(a^11 - a^5*b^6 + 3*a^7*b^4 - 3*a^9*b^2)))/(a^11 - a^5*b^6 + 3*a^7*b^4 - 3*a^9*b^2)))*(5*a^2 - 4*b^2)*(-(a + b)^3*(a - b)^3)^(1/2)*2i)/(d*(a^11 - a^5*b^6 + 3*a^7*b^4 - 3*a^9*b^2))

3.469 $\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 300

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \frac{(12a^2+b^2)\,x}{2b^5} - \frac{a^3(12a^4-29a^2b^2+20b^4)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{5/2}b^5(a+b)^{5/2}d} - \frac{3a(4a^4-7a^2b^2+2b^4)\sin(c+dx)}{2b^4\left(a^2-b^2\right)^2 d} + \frac{(6a^4-10a^2b^2+b^4)\cos(c+dx)\sin(c+dx)}{2b^3\left(a^2-b^2\right)^2 d} - \frac{a^2\cos^3(c+dx)\sin(c+dx)}{2b\left(a^2-b^2\right)d(a+b\cos(c+dx))^2} - \frac{a^2(4a^2-7b^2)\cos^2(c+dx)\sin(c+dx)}{2b^2\left(a^2-b^2\right)^2 d(a+b\cos(c+dx))}$$

```
[Out] 1/2*(12*a^2+b^2)*x/b^5-a^3*(12*a^4-29*a^2*b^2+20*b^4)*arctan((a-b)^(1/2)*ta
n(1/2*d*x+1/2*c)/(a+b)^(1/2))/(a-b)^(5/2)/b^5/(a+b)^(5/2)/d-3/2*a*(4*a^4-7*
a^2*b^2+2*b^4)*sin(d*x+c)/b^4/(a^2-b^2)^2/d+1/2*(6*a^4-10*a^2*b^2+b^4)*cos(
d*x+c)*sin(d*x+c)/b^3/(a^2-b^2)^2/d-1/2*a^2*cos(d*x+c)^3*sin(d*x+c)/b/(a^2-
b^2)/d/(a+b*cos(d*x+c))^2-1/2*a^2*(4*a^2-7*b^2)*cos(d*x+c)^2*sin(d*x+c)/b^2
/(a^2-b^2)^2/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.91 (sec) , antiderivative size = 300, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {2871, 3126, 3128, 3102, 2814, 2738, 211}

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^3}\,dx = -\frac{a^2\sin(c+dx)\cos^3(c+dx)}{2bd\,(a^2-b^2)\,(a+b\cos(c+dx))^2} - \frac{a^2(4a^2-7b^2)\sin(c+dx)\cos^2(c+dx)}{2b^2d\,(a^2-b^2)^2\,(a+b\cos(c+dx))} + \frac{x(12a^2+b^2)}{2b^5} - \frac{3a(4a^4-7a^2b^2+2b^4)\sin(c+dx)}{2b^4d\,(a^2-b^2)^2} + \frac{(6a^4-10a^2b^2+b^4)\sin(c+dx)\cos(c+dx)}{2b^3d\,(a^2-b^2)^2} - \frac{a^3(12a^4-29a^2b^2+20b^4)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{b^5d(a-b)^{5/2}(a+b)^{5/2}}$$

```
[In] Int[Cos[c + d*x]^5/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] ((12*a^2 + b^2)*x)/(2*b^5) - (a^3*(12*a^4 - 29*a^2*b^2 + 20*b^4)*ArcTan[(Sq
rt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/((a - b)^(5/2)*b^5*(a + b)^(5/2)*
d) - (3*a*(4*a^4 - 7*a^2*b^2 + 2*b^4)*Sin[c + d*x])/(2*b^4*(a^2 - b^2)^2*d)
 + ((6*a^4 - 10*a^2*b^2 + b^4)*Cos[c + d*x]*Sin[c + d*x])/(2*b^3*(a^2 - b^2
)^2*d) - (a^2*Cos[c + d*x]^3*Sin[c + d*x])/(2*b*(a^2 - b^2)*d*(a + b*Cos[c
+ d*x])^2) - (a^2*(4*a^2 - 7*b^2)*Cos[c + d*x]^2*Sin[c + d*x])/(2*b^2*(a^2
- b^2)^2*d*(a + b*Cos[c + d*x]))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rule 3126

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(c^2*C - B*c*d + A*d^2))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(c^2 -
d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[e + f*x])^(m -
1)*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*d*(b*d*m + a*c*(n + 1)) + (c*C - B*d
)*(b*c*m + a*d*(n + 1)) - (d*(A*(a*d*(n + 2) - b*c*(n + 1)) + B*(b*d*(n + 1
) - a*c*(n + 2))) - C*(b*c*d*(n + 1) - a*(c^2 + d^2*(n + 1))))*Sin[e + f*x]
 + b*(d*(B*c - A*d)*(m + n + 2) - C*(c^2*(m + 1) + d^2*(n + 1)))*Sin[e + f*
x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d,
 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 0] && LtQ[n, -1]
```

Rule 3128

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*sin[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_
.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n + 2))), x] + Dist[1/(d*(m +
n + 2)), Int[(a + b*Sin[e + f*x])^(m - 1)*(c + d*Sin[e + f*x])^n*Simp[a*A*d
*(m + n + 2) + C*(b*c*m + a*d*(n + 1)) + (d*(A*b + a*B)*(m + n + 2) - C*(a*
c - b*d*(m + n + 1)))*Sin[e + f*x] + (C*(a*d*m - b*c*(m + 1)) + b*B*d*(m +
```

```
n + 2))*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n},
 x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m
, 0] &&  !(IGtQ[n, 0] && ( !IntegerQ[m] || (EqQ[a, 0] && NeQ[c, 0])))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a^2\cos^3(c+dx)\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2} - \frac{\int \frac{\cos^2(c+dx)(3a^2-2ab\cos(c+dx)-2(2a^2-b^2)\cos^2(c+dx))}{(a+b\cos(c+dx))^2}\,dx}{2b(a^2-b^2)} \\
&= -\frac{a^2\cos^3(c+dx)\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2} - \frac{a^2(4a^2-7b^2)\cos^2(c+dx)\sin(c+dx)}{2b^2(a^2-b^2)^2d(a+b\cos(c+dx))} \\
&\quad + \frac{\int \frac{\cos(c+dx)(-2a^2(4a^2-7b^2)+ab(a^2-4b^2)\cos(c+dx)+2(6a^4-10a^2b^2+b^4)\cos^2(c+dx))}{a+b\cos(c+dx)}\,dx}{2b^2(a^2-b^2)^2} \\
&= \frac{(6a^4-10a^2b^2+b^4)\cos(c+dx)\sin(c+dx)}{2b^3(a^2-b^2)^2d} \\
&\quad - \frac{a^2\cos^3(c+dx)\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2} - \frac{a^2(4a^2-7b^2)\cos^2(c+dx)\sin(c+dx)}{2b^2(a^2-b^2)^2d(a+b\cos(c+dx))} \\
&\quad + \frac{\int \frac{2a(6a^4-10a^2b^2+b^4)-2b(2a^4-4a^2b^2-b^4)\cos(c+dx)-6a(4a^4-7a^2b^2+2b^4)\cos^2(c+dx)}{a+b\cos(c+dx)}\,dx}{4b^3(a^2-b^2)^2} \\
&= -\frac{3a(4a^4-7a^2b^2+2b^4)\sin(c+dx)}{2b^4(a^2-b^2)^2d} + \frac{(6a^4-10a^2b^2+b^4)\cos(c+dx)\sin(c+dx)}{2b^3(a^2-b^2)^2d} \\
&\quad - \frac{a^2\cos^3(c+dx)\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2} - \frac{a^2(4a^2-7b^2)\cos^2(c+dx)\sin(c+dx)}{2b^2(a^2-b^2)^2d(a+b\cos(c+dx))} \\
&\quad + \frac{\int \frac{2ab(6a^4-10a^2b^2+b^4)+2(a^2-b^2)^2(12a^2+b^2)\cos(c+dx)}{a+b\cos(c+dx)}\,dx}{4b^4(a^2-b^2)^2} \\
&= \frac{(12a^2+b^2)x}{2b^5} - \frac{3a(4a^4-7a^2b^2+2b^4)\sin(c+dx)}{2b^4(a^2-b^2)^2d} \\
&\quad + \frac{(6a^4-10a^2b^2+b^4)\cos(c+dx)\sin(c+dx)}{2b^3(a^2-b^2)^2d} - \frac{a^2\cos^3(c+dx)\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2} \\
&\quad - \frac{a^2(4a^2-7b^2)\cos^2(c+dx)\sin(c+dx)}{2b^2(a^2-b^2)^2d(a+b\cos(c+dx))} - \frac{(a^3(12a^4-29a^2b^2+20b^4))\int \frac{1}{a+b\cos(c+dx)}\,dx}{2b^5(a^2-b^2)^2}
\end{aligned}$$

$$= \frac{(12a^2+b^2)\,x}{2b^5} - \frac{3a(4a^4-7a^2b^2+2b^4)\sin(c+dx)}{2b^4\,(a^2-b^2)^2\,d} + \frac{(6a^4-10a^2b^2+b^4)\cos(c+dx)\sin(c+dx)}{2b^3\,(a^2-b^2)^2\,d} - \frac{a^2\cos^3(c+dx)\sin(c+dx)}{2b\,(a^2-b^2)\,d(a+b\cos(c+dx))^2} - \frac{a^2(4a^2-7b^2)\cos^2(c+dx)\sin(c+dx)}{2b^2\,(a^2-b^2)^2\,d(a+b\cos(c+dx))} - \frac{\left(a^3(12a^4-29a^2b^2+20b^4)\right)\text{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{b^5\,(a^2-b^2)^2\,d}$$

$$= \frac{(12a^2+b^2)\,x}{2b^5} - \frac{a^3(12a^4-29a^2b^2+20b^4)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{5/2}b^5(a+b)^{5/2}d} - \frac{3a(4a^4-7a^2b^2+2b^4)\sin(c+dx)}{2b^4\,(a^2-b^2)^2\,d} + \frac{(6a^4-10a^2b^2+b^4)\cos(c+dx)\sin(c+dx)}{2b^3\,(a^2-b^2)^2\,d} - \frac{a^2\cos^3(c+dx)\sin(c+dx)}{2b\,(a^2-b^2)\,d(a+b\cos(c+dx))^2} - \frac{a^2(4a^2-7b^2)\cos^2(c+dx)\sin(c+dx)}{2b^2\,(a^2-b^2)^2\,d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 1.61 (sec) , antiderivative size = 199, normalized size of antiderivative = 0.66

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^3}\,dx$$

$$= \frac{2(12a^2+b^2)\,(c+dx) + \frac{4a^3(12a^4-29a^2b^2+20b^4)\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{5/2}} - 12ab\sin(c+dx) + \frac{2a^5b\sin(c+dx)}{(a-b)(a+b)(a+b\cos(c}}{4b^5d}$$

```
[In] Integrate[Cos[c + d*x]^5/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (2*(12*a^2 + b^2)*(c + d*x) + (4*a^3*(12*a^4 - 29*a^2*b^2 + 20*b^4)*ArcTanh
[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/(-a^2 + b^2)^(5/2) - 12*a*b*
Sin[c + d*x] + (2*a^5*b*Sin[c + d*x])/((a - b)*(a + b)*(a + b*Cos[c + d*x])
^2) + (2*a^4*b*(-7*a^2 + 10*b^2)*Sin[c + d*x])/((a - b)^2*(a + b)^2*(a + b*
Cos[c + d*x])) + b^2*Sin[2*(c + d*x)])/(4*b^5*d)
```

Maple [A] (verified)

Time = 1.88 (sec) , antiderivative size = 306, normalized size of antiderivative = 1.02

method	result
derivativedivides	$\frac{\frac{2\left(\frac{\left(-3ab-\frac{1}{2}b^2\right)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(-3ab+\frac{1}{2}b^2\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}+\left(12a^2+b^2\right)\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}{b^5}-\frac{2a^3\left(\frac{\frac{\left(6a^2-ab-10b^2\right)ab\left(\tan^3\right.}{2(a-b)\left(a^2+2ab+\right.}}{\left(\left(\tan^2\left(\frac{dx}{2}+\right.\right.\right.}\right.}{d}$
default	$\frac{\frac{2\left(\frac{\left(-3ab-\frac{1}{2}b^2\right)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(-3ab+\frac{1}{2}b^2\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}+\left(12a^2+b^2\right)\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}{b^5}-\frac{2a^3\left(\frac{\frac{\left(6a^2-ab-10b^2\right)ab\left(\tan^3\right.}{2(a-b)\left(a^2+2ab+\right.}}{\left(\left(\tan^2\left(\frac{dx}{2}+\right.\right.\right.}\right.}{d}$
risch	$\frac{6x\,a^2}{b^5}+\frac{x}{2b^3}-\frac{i\mathrm{e}^{2i(dx+c)}}{8b^3d}+\frac{3ia\,\mathrm{e}^{i(dx+c)}}{2b^4d}-\frac{3ia\,\mathrm{e}^{-i(dx+c)}}{2b^4d}+\frac{i\mathrm{e}^{-2i(dx+c)}}{8b^3d}-\frac{ia^4\left(8b\,a^3\mathrm{e}^{3i(dx+c)}-11b^3a\,\mathrm{e}^{3i(dx+c)}\right.}{}$

```
[In] int(cos(d*x+c)^5/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(2/b^5*(((-3*a*b-1/2*b^2)*tan(1/2*d*x+1/2*c)^3+(-3*a*b+1/2*b^2)*tan(1/2
*d*x+1/2*c))/(1+tan(1/2*d*x+1/2*c)^2)^2+1/2*(12*a^2+b^2)*arctan(tan(1/2*d*x
+1/2*c)))-2*a^3/b^5*((1/2*(6*a^2-a*b-10*b^2)*a*b/(a-b)/(a^2+2*a*b+b^2)*tan(
1/2*d*x+1/2*c)^3+1/2*(6*a^2+a*b-10*b^2)*a*b/(a+b)/(a^2-2*a*b+b^2)*tan(1/2*d
*x+1/2*c))/(tan(1/2*d*x+1/2*c)^2*a-b*tan(1/2*d*x+1/2*c)^2+a+b)^2+1/2*(12*a^
4-29*a^2*b^2+20*b^4)/(a^4-2*a^2*b^2+b^4)/((a-b)*(a+b))^(1/2)*arctan((a-b)*t
an(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 1161, normalized size of antiderivative = 3.87

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^5/(a+b*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] [1/4*(2*(12*a^8*b^2 - 35*a^6*b^4 + 33*a^4*b^6 - 9*a^2*b^8 - b^10)*d*x*cos(d
*x + c)^2 + 4*(12*a^9*b - 35*a^7*b^3 + 33*a^5*b^5 - 9*a^3*b^7 - a*b^9)*d*x*
cos(d*x + c) + 2*(12*a^10 - 35*a^8*b^2 + 33*a^6*b^4 - 9*a^4*b^6 - a^2*b^8)*
d*x - (12*a^9 - 29*a^7*b^2 + 20*a^5*b^4 + (12*a^7*b^2 - 29*a^5*b^4 + 20*a^3
*b^6)*cos(d*x + c)^2 + 2*(12*a^8*b - 29*a^6*b^3 + 20*a^4*b^5)*cos(d*x + c))
*sqrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x + c)^2 -
2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2)/(b^2*co
s(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) - 2*(12*a^9*b - 33*a^7*b^3 + 27*a
```

```
^5*b^5 - 6*a^3*b^7 - (a^6*b^4 - 3*a^4*b^6 + 3*a^2*b^8 - b^10)*cos(d*x + c)^
3 + 4*(a^7*b^3 - 3*a^5*b^5 + 3*a^3*b^7 - a*b^9)*cos(d*x + c)^2 + (18*a^8*b^
2 - 50*a^6*b^4 + 43*a^4*b^6 - 11*a^2*b^8)*cos(d*x + c))*sin(d*x + c))/((a^6
*b^7 - 3*a^4*b^9 + 3*a^2*b^11 - b^13)*d*cos(d*x + c)^2 + 2*(a^7*b^6 - 3*a^5
*b^8 + 3*a^3*b^10 - a*b^12)*d*cos(d*x + c) + (a^8*b^5 - 3*a^6*b^7 + 3*a^4*b
^9 - a^2*b^11)*d), 1/2*((12*a^8*b^2 - 35*a^6*b^4 + 33*a^4*b^6 - 9*a^2*b^8 -
 b^10)*d*x*cos(d*x + c)^2 + 2*(12*a^9*b - 35*a^7*b^3 + 33*a^5*b^5 - 9*a^3*b
^7 - a*b^9)*d*x*cos(d*x + c) + (12*a^10 - 35*a^8*b^2 + 33*a^6*b^4 - 9*a^4*b
^6 - a^2*b^8)*d*x - (12*a^9 - 29*a^7*b^2 + 20*a^5*b^4 + (12*a^7*b^2 - 29*a^
5*b^4 + 20*a^3*b^6)*cos(d*x + c)^2 + 2*(12*a^8*b - 29*a^6*b^3 + 20*a^4*b^5)
*cos(d*x + c))*sqrt(a^2 - b^2)*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2
)*sin(d*x + c))) - (12*a^9*b - 33*a^7*b^3 + 27*a^5*b^5 - 6*a^3*b^7 - (a^6*b
^4 - 3*a^4*b^6 + 3*a^2*b^8 - b^10)*cos(d*x + c)^3 + 4*(a^7*b^3 - 3*a^5*b^5
+ 3*a^3*b^7 - a*b^9)*cos(d*x + c)^2 + (18*a^8*b^2 - 50*a^6*b^4 + 43*a^4*b^6
 - 11*a^2*b^8)*cos(d*x + c))*sin(d*x + c))/((a^6*b^7 - 3*a^4*b^9 + 3*a^2*b^
11 - b^13)*d*cos(d*x + c)^2 + 2*(a^7*b^6 - 3*a^5*b^8 + 3*a^3*b^10 - a*b^12)
*d*cos(d*x + c) + (a^8*b^5 - 3*a^6*b^7 + 3*a^4*b^9 - a^2*b^11)*d)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**5/(a+b*cos(d*x+c))**3,x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)^5/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1735 vs. 2(281) = 562.

Time = 0.50 (sec) , antiderivative size = 1735, normalized size of antiderivative = 5.78

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^5/(a+b*cos(d*x+c))^3,x, algorithm="giac")
[Out] -1/2*(((12*a^6 - 6*a^5*b - 23*a^4*b^2 + 10*a^3*b^3 + 10*a^2*b^4 - a*b^5 + b
^6)*sqrt(a^2 - b^2)*abs(a^4*b^5 - 2*a^2*b^7 + b^9)*abs(-a + b) + (24*a^11*b
^4 - 12*a^10*b^5 - 100*a^9*b^6 + 47*a^8*b^7 + 158*a^7*b^8 - 68*a^6*b^9 - 11
1*a^5*b^10 + 42*a^4*b^11 + 28*a^3*b^12 - 8*a^2*b^13 + a*b^14 - b^15)*sqrt(a
^2 - b^2)*abs(-a + b))*(pi*floor(1/2*(d*x + c)/pi + 1/2) + arctan(2*tan(1/2
*d*x + 1/2*c)/sqrt((4*a^5*b^4 - 8*a^3*b^6 + 4*a*b^8 + sqrt(-16*(a^5*b^4 + a
^4*b^5 - 2*a^3*b^6 - 2*a^2*b^7 + a*b^8 + b^9)*(a^5*b^4 - a^4*b^5 - 2*a^3*b^
6 + 2*a^2*b^7 + a*b^8 - b^9) + 16*(a^5*b^4 - 2*a^3*b^6 + a*b^8)^2))/(a^5*b^
4 - a^4*b^5 - 2*a^3*b^6 + 2*a^2*b^7 + a*b^8 - b^9))))/((a^4*b^5 - 2*a^2*b^7
 + b^9)^2*(a^2 - 2*a*b + b^2) + (a^7*b^4 - 2*a^6*b^5 - a^5*b^6 + 4*a^4*b^7
- a^3*b^8 - 2*a^2*b^9 + a*b^10)*abs(a^4*b^5 - 2*a^2*b^7 + b^9)) - (24*a^11*
b^4 - 12*a^10*b^5 - 100*a^9*b^6 + 47*a^8*b^7 + 158*a^7*b^8 - 68*a^6*b^9 - 1
11*a^5*b^10 + 42*a^4*b^11 + 28*a^3*b^12 - 8*a^2*b^13 + a*b^14 - b^15 - 12*a
^6*abs(a^4*b^5 - 2*a^2*b^7 + b^9) + 6*a^5*b*abs(a^4*b^5 - 2*a^2*b^7 + b^9)
+ 23*a^4*b^2*abs(a^4*b^5 - 2*a^2*b^7 + b^9) - 10*a^3*b^3*abs(a^4*b^5 - 2*a^
2*b^7 + b^9) - 10*a^2*b^4*abs(a^4*b^5 - 2*a^2*b^7 + b^9) + a*b^5*abs(a^4*b^
5 - 2*a^2*b^7 + b^9) - b^6*abs(a^4*b^5 - 2*a^2*b^7 + b^9))*(pi*floor(1/2*(d
*x + c)/pi + 1/2) + arctan(2*tan(1/2*d*x + 1/2*c)/sqrt((4*a^5*b^4 - 8*a^3*b
^6 + 4*a*b^8 - sqrt(-16*(a^5*b^4 + a^4*b^5 - 2*a^3*b^6 - 2*a^2*b^7 + a*b^8
+ b^9)*(a^5*b^4 - a^4*b^5 - 2*a^3*b^6 + 2*a^2*b^7 + a*b^8 - b^9) + 16*(a^5*
b^4 - 2*a^3*b^6 + a*b^8)^2))/(a^5*b^4 - a^4*b^5 - 2*a^3*b^6 + 2*a^2*b^7 + a
*b^8 - b^9))))/(a^5*b^4*abs(a^4*b^5 - 2*a^2*b^7 + b^9) - 2*a^3*b^6*abs(a^4*
b^5 - 2*a^2*b^7 + b^9) + a*b^8*abs(a^4*b^5 - 2*a^2*b^7 + b^9) - (a^4*b^5 -
2*a^2*b^7 + b^9)^2) + 2*(12*a^7*tan(1/2*d*x + 1/2*c)^7 - 18*a^6*b*tan(1/2*d
*x + 1/2*c)^7 - 17*a^5*b^2*tan(1/2*d*x + 1/2*c)^7 + 33*a^4*b^3*tan(1/2*d*x
+ 1/2*c)^7 - 2*a^3*b^4*tan(1/2*d*x + 1/2*c)^7 - 13*a^2*b^5*tan(1/2*d*x + 1/
2*c)^7 + 4*a*b^6*tan(1/2*d*x + 1/2*c)^7 + b^7*tan(1/2*d*x + 1/2*c)^7 + 36*a
^7*tan(1/2*d*x + 1/2*c)^5 - 18*a^6*b*tan(1/2*d*x + 1/2*c)^5 - 67*a^5*b^2*ta
n(1/2*d*x + 1/2*c)^5 + 29*a^4*b^3*tan(1/2*d*x + 1/2*c)^5 + 26*a^3*b^4*tan(1
/2*d*x + 1/2*c)^5 - 5*a^2*b^5*tan(1/2*d*x + 1/2*c)^5 - 4*a*b^6*tan(1/2*d*x
+ 1/2*c)^5 - 3*b^7*tan(1/2*d*x + 1/2*c)^5 + 36*a^7*tan(1/2*d*x + 1/2*c)^3 +
 18*a^6*b*tan(1/2*d*x + 1/2*c)^3 - 67*a^5*b^2*tan(1/2*d*x + 1/2*c)^3 - 29*a
^4*b^3*tan(1/2*d*x + 1/2*c)^3 + 26*a^3*b^4*tan(1/2*d*x + 1/2*c)^3 + 5*a^2*b
^5*tan(1/2*d*x + 1/2*c)^3 - 4*a*b^6*tan(1/2*d*x + 1/2*c)^3 + 3*b^7*tan(1/2*
d*x + 1/2*c)^3 + 12*a^7*tan(1/2*d*x + 1/2*c) + 18*a^6*b*tan(1/2*d*x + 1/2*c
```

```
) - 17*a^5*b^2*tan(1/2*d*x + 1/2*c) - 33*a^4*b^3*tan(1/2*d*x + 1/2*c) - 2*a
^3*b^4*tan(1/2*d*x + 1/2*c) + 13*a^2*b^5*tan(1/2*d*x + 1/2*c) + 4*a*b^6*tan
(1/2*d*x + 1/2*c) - b^7*tan(1/2*d*x + 1/2*c))/((a^4*b^4 - 2*a^2*b^6 + b^8)*
(a*tan(1/2*d*x + 1/2*c)^4 - b*tan(1/2*d*x + 1/2*c)^4 + 2*a*tan(1/2*d*x + 1/
2*c)^2 + a + b)^2))/d
```

Mupad [B] (verification not implemented)

Time = 22.97 (sec) , antiderivative size = 5962, normalized size of antiderivative = 19.87

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Too large to display}$$

```
[In] int(cos(c + d*x)^5/(a + b*cos(c + d*x))^3,x)
```

```
[Out] (atan(((((8*tan(c/2 + (d*x)/2)*(288*a^14 - 288*a^13*b - 2*a*b^13 + b^14 + 2
1*a^2*b^12 - 40*a^3*b^11 + 74*a^4*b^10 - 108*a^5*b^9 + 18*a^6*b^8 + 872*a^7
*b^7 - 827*a^8*b^6 - 1538*a^9*b^5 + 1538*a^10*b^4 + 1104*a^11*b^3 - 1104*a^
12*b^2))/(a*b^14 + b^15 - 3*a^2*b^13 - 3*a^3*b^12 + 3*a^4*b^11 + 3*a^5*b^10
 - a^6*b^9 - a^7*b^8) + (((4*(4*b^21 + 28*a^2*b^19 - 80*a^3*b^18 - 120*a^4*
b^17 + 276*a^5*b^16 + 164*a^6*b^15 - 360*a^7*b^14 - 100*a^8*b^13 + 212*a^9*
b^12 + 24*a^10*b^11 - 48*a^11*b^10))/(a*b^18 + b^19 - 3*a^2*b^17 - 3*a^3*b^
16 + 3*a^4*b^15 + 3*a^5*b^14 - a^6*b^13 - a^7*b^12) - (4*tan(c/2 + (d*x)/2)
*(a^2*12i + b^2*1i)*(8*a*b^19 - 8*a^2*b^18 - 32*a^3*b^17 + 32*a^4*b^16 + 48
*a^5*b^15 - 48*a^6*b^14 - 32*a^7*b^13 + 32*a^8*b^12 + 8*a^9*b^11 - 8*a^10*b
^10))/(b^5*(a*b^14 + b^15 - 3*a^2*b^13 - 3*a^3*b^12 + 3*a^4*b^11 + 3*a^5*b^
10 - a^6*b^9 - a^7*b^8)))*(a^2*12i + b^2*1i))/(2*b^5))*(a^2*12i + b^2*1i)*1
i)/(2*b^5) + (((8*tan(c/2 + (d*x)/2)*(288*a^14 - 288*a^13*b - 2*a*b^13 + b^
14 + 21*a^2*b^12 - 40*a^3*b^11 + 74*a^4*b^10 - 108*a^5*b^9 + 18*a^6*b^8 + 8
72*a^7*b^7 - 827*a^8*b^6 - 1538*a^9*b^5 + 1538*a^10*b^4 + 1104*a^11*b^3 - 1
104*a^12*b^2))/(a*b^14 + b^15 - 3*a^2*b^13 - 3*a^3*b^12 + 3*a^4*b^11 + 3*a^
5*b^10 - a^6*b^9 - a^7*b^8) - (((4*(4*b^21 + 28*a^2*b^19 - 80*a^3*b^18 - 12
0*a^4*b^17 + 276*a^5*b^16 + 164*a^6*b^15 - 360*a^7*b^14 - 100*a^8*b^13 + 21
2*a^9*b^12 + 24*a^10*b^11 - 48*a^11*b^10))/(a*b^18 + b^19 - 3*a^2*b^17 - 3*
a^3*b^16 + 3*a^4*b^15 + 3*a^5*b^14 - a^6*b^13 - a^7*b^12) + (4*tan(c/2 + (d
*x)/2)*(a^2*12i + b^2*1i)*(8*a*b^19 - 8*a^2*b^18 - 32*a^3*b^17 + 32*a^4*b^1
6 + 48*a^5*b^15 - 48*a^6*b^14 - 32*a^7*b^13 + 32*a^8*b^12 + 8*a^9*b^11 - 8*
a^10*b^10))/(b^5*(a*b^14 + b^15 - 3*a^2*b^13 - 3*a^3*b^12 + 3*a^4*b^11 + 3*
a^5*b^10 - a^6*b^9 - a^7*b^8)))*(a^2*12i + b^2*1i))/(2*b^5))*(a^2*12i + b^2
*1i)*1i)/(2*b^5))/((8*(1728*a^15 - 864*a^14*b + 20*a^3*b^12 - 20*a^4*b^11 +
 411*a^5*b^10 - 11*a^6*b^9 + 1314*a^7*b^8 + 2326*a^8*b^7 - 7829*a^9*b^6 - 4
770*a^10*b^5 + 11700*a^11*b^4 + 3456*a^12*b^3 - 7344*a^13*b^2))/(a*b^18 + b
^19 - 3*a^2*b^17 - 3*a^3*b^16 + 3*a^4*b^15 + 3*a^5*b^14 - a^6*b^13 - a^7*b^
12) - (((8*tan(c/2 + (d*x)/2)*(288*a^14 - 288*a^13*b - 2*a*b^13 + b^14 + 21
*a^2*b^12 - 40*a^3*b^11 + 74*a^4*b^10 - 108*a^5*b^9 + 18*a^6*b^8 + 872*a^7*
```

b^7 - 827*a^8*b^6 - 1538*a^9*b^5 + 1538*a^10*b^4 + 1104*a^11*b^3 - 1104*a^1
2*b^2))/(a*b^14 + b^15 - 3*a^2*b^13 - 3*a^3*b^12 + 3*a^4*b^11 + 3*a^5*b^10
- a^6*b^9 - a^7*b^8) + (((4*(4*b^21 + 28*a^2*b^19 - 80*a^3*b^18 - 120*a^4*b
^17 + 276*a^5*b^16 + 164*a^6*b^15 - 360*a^7*b^14 - 100*a^8*b^13 + 212*a^9*b
^12 + 24*a^10*b^11 - 48*a^11*b^10))/(a*b^18 + b^19 - 3*a^2*b^17 - 3*a^3*b^1
6 + 3*a^4*b^15 + 3*a^5*b^14 - a^6*b^13 - a^7*b^12) - (4*tan(c/2 + (d*x)/2)*
(a^2*12i + b^2*1i)*(8*a*b^19 - 8*a^2*b^18 - 32*a^3*b^17 + 32*a^4*b^16 + 48*
a^5*b^15 - 48*a^6*b^14 - 32*a^7*b^13 + 32*a^8*b^12 + 8*a^9*b^11 - 8*a^10*b^
10))/(b^5*(a*b^14 + b^15 - 3*a^2*b^13 - 3*a^3*b^12 + 3*a^4*b^11 + 3*a^5*b^1
0 - a^6*b^9 - a^7*b^8)))*(a^2*12i + b^2*1i))/(2*b^5))*(a^2*12i + b^2*1i))/(
2*b^5) + (((8*tan(c/2 + (d*x)/2)*(288*a^14 - 288*a^13*b - 2*a*b^13 + b^14 +
21*a^2*b^12 - 40*a^3*b^11 + 74*a^4*b^10 - 108*a^5*b^9 + 18*a^6*b^8 + 872*a
^7*b^7 - 827*a^8*b^6 - 1538*a^9*b^5 + 1538*a^10*b^4 + 1104*a^11*b^3 - 1104*
a^12*b^2))/(a*b^14 + b^15 - 3*a^2*b^13 - 3*a^3*b^12 + 3*a^4*b^11 + 3*a^5*b^
10 - a^6*b^9 - a^7*b^8) - (((4*(4*b^21 + 28*a^2*b^19 - 80*a^3*b^18 - 120*a^
4*b^17 + 276*a^5*b^16 + 164*a^6*b^15 - 360*a^7*b^14 - 100*a^8*b^13 + 212*a^
9*b^12 + 24*a^10*b^11 - 48*a^11*b^10))/(a*b^18 + b^19 - 3*a^2*b^17 - 3*a^3*
b^16 + 3*a^4*b^15 + 3*a^5*b^14 - a^6*b^13 - a^7*b^12) + (4*tan(c/2 + (d*x)/
2)*(a^2*12i + b^2*1i)*(8*a*b^19 - 8*a^2*b^18 - 32*a^3*b^17 + 32*a^4*b^16 +
48*a^5*b^15 - 48*a^6*b^14 - 32*a^7*b^13 + 32*a^8*b^12 + 8*a^9*b^11 - 8*a^10
b^10))/(b^5(a*b^14 + b^15 - 3*a^2*b^13 - 3*a^3*b^12 + 3*a^4*b^11 + 3*a^5*
b^10 - a^6*b^9 - a^7*b^8)))*(a^2*12i + b^2*1i))/(2*b^5))*(a^2*12i + b^2*1i)
)/(2*b^5)))*(a^2*12i + b^2*1i)*1i)/(b^5*d) - ((tan(c/2 + (d*x)/2)^3*(18*a^6
*b - 4*a*b^6 + 36*a^7 + 3*b^7 + 5*a^2*b^5 + 26*a^3*b^4 - 29*a^4*b^3 - 67*a^
5*b^2))/((a + b)^2*(b^6 - 2*a*b^5 + a^2*b^4)) - (tan(c/2 + (d*x)/2)^5*(4*a*
b^6 + 18*a^6*b - 36*a^7 + 3*b^7 + 5*a^2*b^5 - 26*a^3*b^4 - 29*a^4*b^3 + 67*
a^5*b^2))/((a + b)^2*(b^6 - 2*a*b^5 + a^2*b^4)) - (tan(c/2 + (d*x)/2)^7*(5*
a*b^5 + 6*a^5*b - 12*a^6 + b^6 - 8*a^2*b^4 - 10*a^3*b^3 + 23*a^4*b^2))/((a*
b^4 - b^5)*(a + b)^2) + (tan(c/2 + (d*x)/2)*(5*a*b^5 + 6*a^5*b + 12*a^6 - b
^6 + 8*a^2*b^4 - 10*a^3*b^3 - 23*a^4*b^2))/((a + b)*(b^6 - 2*a*b^5 + a^2*b^
4)))/(d*(2*a*b + tan(c/2 + (d*x)/2)^4*(6*a^2 - 2*b^2) + tan(c/2 + (d*x)/2)^
2*(4*a*b + 4*a^2) - tan(c/2 + (d*x)/2)^6*(4*a*b - 4*a^2) + tan(c/2 + (d*x)/
2)^8*(a^2 - 2*a*b + b^2) + a^2 + b^2)) + (a^3*atan(((a^3*((8*tan(c/2 + (d*x
)/2)*(288*a^14 - 288*a^13*b - 2*a*b^13 + b^14 + 21*a^2*b^12 - 40*a^3*b^11 +
74*a^4*b^10 - 108*a^5*b^9 + 18*a^6*b^8 + 872*a^7*b^7 - 827*a^8*b^6 - 1538*
a^9*b^5 + 1538*a^10*b^4 + 1104*a^11*b^3 - 1104*a^12*b^2))/(a*b^14 + b^15 -
3*a^2*b^13 - 3*a^3*b^12 + 3*a^4*b^11 + 3*a^5*b^10 - a^6*b^9 - a^7*b^8) + (a
^3*(-(a + b)^5*(a - b)^5)^(1/2)*((4*(4*b^21 + 28*a^2*b^19 - 80*a^3*b^18 - 1
20*a^4*b^17 + 276*a^5*b^16 + 164*a^6*b^15 - 360*a^7*b^14 - 100*a^8*b^13 + 2
12*a^9*b^12 + 24*a^10*b^11 - 48*a^11*b^10))/(a*b^18 + b^19 - 3*a^2*b^17 - 3
*a^3*b^16 + 3*a^4*b^15 + 3*a^5*b^14 - a^6*b^13 - a^7*b^12) - (4*a^3*tan(c/2
+ (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(12*a^4 + 20*b^4 - 29*a^2*b^2)*(8*
a*b^19 - 8*a^2*b^18 - 32*a^3*b^17 + 32*a^4*b^16 + 48*a^5*b^15 - 48*a^6*b^14
- 32*a^7*b^13 + 32*a^8*b^12 + 8*a^9*b^11 - 8*a^10*b^10))/((b^15 - 5*a^2*b^
13 + 10*a^4*b^11 - 10*a^6*b^9 + 5*a^8*b^7 - a^10*b^5)*(a*b^14 + b^15 - 3*a^

2*b^13 - 3*a^3*b^12 + 3*a^4*b^11 + 3*a^5*b^10 - a^6*b^9 - a^7*b^8)))*(12*a^4 + 20*b^4 - 29*a^2*b^2))/(2*(b^15 - 5*a^2*b^13 + 10*a^4*b^11 - 10*a^6*b^9 + 5*a^8*b^7 - a^10*b^5)))*(-(a + b)^5*(a - b)^5)^(1/2)*(12*a^4 + 20*b^4 - 29*a^2*b^2)*1i)/(2*(b^15 - 5*a^2*b^13 + 10*a^4*b^11 - 10*a^6*b^9 + 5*a^8*b^7 - a^10*b^5)) + (a^3*((8*tan(c/2 + (d*x)/2)*(288*a^14 - 288*a^13*b - 2*a*b^13 + b^14 + 21*a^2*b^12 - 40*a^3*b^11 + 74*a^4*b^10 - 108*a^5*b^9 + 18*a^6*b^8 + 872*a^7*b^7 - 827*a^8*b^6 - 1538*a^9*b^5 + 1538*a^10*b^4 + 1104*a^11*b^3 - 1104*a^12*b^2))/(a*b^14 + b^15 - 3*a^2*b^13 - 3*a^3*b^12 + 3*a^4*b^11 + 3*a^5*b^10 - a^6*b^9 - a^7*b^8) - (a^3*(-(a + b)^5*(a - b)^5)^(1/2)*((4*(4*b^21 + 28*a^2*b^19 - 80*a^3*b^18 - 120*a^4*b^17 + 276*a^5*b^16 + 164*a^6*b^15 - 360*a^7*b^14 - 100*a^8*b^13 + 212*a^9*b^12 + 24*a^10*b^11 - 48*a^11*b^10))/(a*b^18 + b^19 - 3*a^2*b^17 - 3*a^3*b^16 + 3*a^4*b^15 + 3*a^5*b^14 - a^6*b^13 - a^7*b^12) + (4*a^3*tan(c/2 + (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(12*a^4 + 20*b^4 - 29*a^2*b^2)*(8*a*b^19 - 8*a^2*b^18 - 32*a^3*b^17 + 32*a^4*b^16 + 48*a^5*b^15 - 48*a^6*b^14 - 32*a^7*b^13 + 32*a^8*b^12 + 8*a^9*b^11 - 8*a^10*b^10))/((b^15 - 5*a^2*b^13 + 10*a^4*b^11 - 10*a^6*b^9 + 5*a^8*b^7 - a^10*b^5)*(a*b^14 + b^15 - 3*a^2*b^13 - 3*a^3*b^12 + 3*a^4*b^11 + 3*a^5*b^10 - a^6*b^9 - a^7*b^8)))*(12*a^4 + 20*b^4 - 29*a^2*b^2))/(2*(b^15 - 5*a^2*b^13 + 10*a^4*b^11 - 10*a^6*b^9 + 5*a^8*b^7 - a^10*b^5)))*(-(a + b)^5*(a - b)^5)^(1/2)*(12*a^4 + 20*b^4 - 29*a^2*b^2)*1i)/(2*(b^15 - 5*a^2*b^13 + 10*a^4*b^11 - 10*a^6*b^9 + 5*a^8*b^7 - a^10*b^5)))/((8*(1728*a^15 - 864*a^14*b + 20*a^3*b^12 - 20*a^4*b^11 + 411*a^5*b^10 - 11*a^6*b^9 + 1314*a^7*b^8 + 2326*a^8*b^7 - 7829*a^9*b^6 - 4770*a^10*b^5 + 11700*a^11*b^4 + 3456*a^12*b^3 - 7344*a^13*b^2))/(a*b^18 + b^19 - 3*a^2*b^17 - 3*a^3*b^16 + 3*a^4*b^15 + 3*a^5*b^14 - a^6*b^13 - a^7*b^12) - (a^3*((8*tan(c/2 + (d*x)/2)*(288*a^14 - 288*a^13*b - 2*a*b^13 + b^14 + 21*a^2*b^12 - 40*a^3*b^11 + 74*a^4*b^10 - 108*a^5*b^9 + 18*a^6*b^8 + 872*a^7*b^7 - 827*a^8*b^6 - 1538*a^9*b^5 + 1538*a^10*b^4 + 1104*a^11*b^3 - 1104*a^12*b^2))/(a*b^14 + b^15 - 3*a^2*b^13 - 3*a^3*b^12 + 3*a^4*b^11 + 3*a^5*b^10 - a^6*b^9 - a^7*b^8) + (a^3*(-(a + b)^5*(a - b)^5)^(1/2)*((4*(4*b^21 + 28*a^2*b^19 - 80*a^3*b^18 - 120*a^4*b^17 + 276*a^5*b^16 + 164*a^6*b^15 - 360*a^7*b^14 - 100*a^8*b^13 + 212*a^9*b^12 + 24*a^10*b^11 - 48*a^11*b^10))/(a*b^18 + b^19 - 3*a^2*b^17 - 3*a^3*b^16 + 3*a^4*b^15 + 3*a^5*b^14 - a^6*b^13 - a^7*b^12) - (4*a^3*tan(c/2 + (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(12*a^4 + 20*b^4 - 29*a^2*b^2)*(8*a*b^19 - 8*a^2*b^18 - 32*a^3*b^17 + 32*a^4*b^16 + 48*a^5*b^15 - 48*a^6*b^14 - 32*a^7*b^13 + 32*a^8*b^12 + 8*a^9*b^11 - 8*a^10*b^10))/((b^15 - 5*a^2*b^13 + 10*a^4*b^11 - 10*a^6*b^9 + 5*a^8*b^7 - a^10*b^5)*(a*b^14 + b^15 - 3*a^2*b^13 - 3*a^3*b^12 + 3*a^4*b^11 + 3*a^5*b^10 - a^6*b^9 - a^7*b^8)))*(12*a^4 + 20*b^4 - 29*a^2*b^2))/(2*(b^15 - 5*a^2*b^13 + 10*a^4*b^11 - 10*a^6*b^9 + 5*a^8*b^7 - a^10*b^5)))*(-(a + b)^5*(a - b)^5)^(1/2)*(12*a^4 + 20*b^4 - 29*a^2*b^2))/(2*(b^15 - 5*a^2*b^13 + 10*a^4*b^11 - 10*a^6*b^9 + 5*a^8*b^7 - a^10*b^5)) + (a^3*((8*tan(c/2 + (d*x)/2)*(288*a^14 - 288*a^13*b - 2*a*b^13 + b^14 + 21*a^2*b^12 - 40*a^3*b^11 + 74*a^4*b^10 - 108*a^5*b^9 + 18*a^6*b^8 + 872*a^7*b^7 - 827*a^8*b^6 - 1538*a^9*b^5 + 1538*a^10*b^4 + 1104*a^11*b^3 - 1104*a^12*b^2))/(a*b^14 + b^15 - 3*a^2*b^13 - 3*a^3*b^12 + 3*a^4*b^11 + 3*a^5*b^10

- a^6*b^9 - a^7*b^8) - (a^3*(-(a + b)^5*(a - b)^5)^(1/2)*((4*(4*b^21 + 28*a^2*b^19 - 80*a^3*b^18 - 120*a^4*b^17 + 276*a^5*b^16 + 164*a^6*b^15 - 360*a^7*b^14 - 100*a^8*b^13 + 212*a^9*b^12 + 24*a^10*b^11 - 48*a^11*b^10))/(a*b^18 + b^19 - 3*a^2*b^17 - 3*a^3*b^16 + 3*a^4*b^15 + 3*a^5*b^14 - a^6*b^13 - a^7*b^12) + (4*a^3*tan(c/2 + (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(12*a^4 + 20*b^4 - 29*a^2*b^2)*(8*a*b^19 - 8*a^2*b^18 - 32*a^3*b^17 + 32*a^4*b^16 + 48*a^5*b^15 - 48*a^6*b^14 - 32*a^7*b^13 + 32*a^8*b^12 + 8*a^9*b^11 - 8*a^10*b^10))/((b^15 - 5*a^2*b^13 + 10*a^4*b^11 - 10*a^6*b^9 + 5*a^8*b^7 - a^10*b^5)*(a*b^14 + b^15 - 3*a^2*b^13 - 3*a^3*b^12 + 3*a^4*b^11 + 3*a^5*b^10 - a^6*b^9 - a^7*b^8)))*(12*a^4 + 20*b^4 - 29*a^2*b^2))/(2*(b^15 - 5*a^2*b^13 + 10*a^4*b^11 - 10*a^6*b^9 + 5*a^8*b^7 - a^10*b^5)))*(-(a + b)^5*(a - b)^5)^(1/2)*(12*a^4 + 20*b^4 - 29*a^2*b^2))/(2*(b^15 - 5*a^2*b^13 + 10*a^4*b^11 - 10*a^6*b^9 + 5*a^8*b^7 - a^10*b^5))))*(-(a + b)^5*(a - b)^5)^(1/2)*(12*a^4 + 20*b^4 - 29*a^2*b^2)*1i)/(d*(b^15 - 5*a^2*b^13 + 10*a^4*b^11 - 10*a^6*b^9 + 5*a^8*b^7 - a^10*b^5))

3.470 $\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 221

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^3}\,dx = -\frac{3ax}{b^4}+\frac{3a^2(2a^4-5a^2b^2+4b^4)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{5/2}b^4(a+b)^{5/2}d} + \frac{(3a^2-2b^2)\sin(c+dx)}{2b^3(a^2-b^2)\,d} - \frac{a^2\cos^2(c+dx)\sin(c+dx)}{2b(a^2-b^2)\,d(a+b\cos(c+dx))^2} + \frac{3a^3(a^2-2b^2)\sin(c+dx)}{2b^3(a^2-b^2)^2\,d(a+b\cos(c+dx))}$$

```
[Out] -3*a*x/b^4+3*a^2*(2*a^4-5*a^2*b^2+4*b^4)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2
*c)/(a+b)^(1/2))/(a-b)^(5/2)/b^4/(a+b)^(5/2)/d+1/2*(3*a^2-2*b^2)*sin(d*x+c)
/b^3/(a^2-b^2)/d-1/2*a^2*cos(d*x+c)^2*sin(d*x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x
+c))^2+3/2*a^3*(a^2-2*b^2)*sin(d*x+c)/b^3/(a^2-b^2)^2/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 221, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {2871, 3110, 3102, 2814, 2738, 211}

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^3}\,dx = -\frac{a^2\sin(c+dx)\cos^2(c+dx)}{2bd(a^2-b^2)(a+b\cos(c+dx))^2}+\frac{(3a^2-2b^2)\sin(c+dx)}{2b^3d(a^2-b^2)} + \frac{3a^2(2a^4-5a^2b^2+4b^4)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{b^4d(a-b)^{5/2}(a+b)^{5/2}} + \frac{3a^3(a^2-2b^2)\sin(c+dx)}{2b^3d(a^2-b^2)^2(a+b\cos(c+dx))}-\frac{3ax}{b^4}$$

```
[In] Int[Cos[c + d*x]^4/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (-3*a*x)/b^4 + (3*a^2*(2*a^4 - 5*a^2*b^2 + 4*b^4)*ArcTan[(Sqrt[a - b]*Tan[(
c + d*x)/2])/Sqrt[a + b]])/((a - b)^(5/2)*b^4*(a + b)^(5/2)*d) + ((3*a^2 -
2*b^2)*Sin[c + d*x])/(2*b^3*(a^2 - b^2)*d) - (a^2*Cos[c + d*x]^2*Sin[c + d*
x])/(2*b*(a^2 - b^2)*d*(a + b*Cos[c + d*x])^2) + (3*a^3*(a^2 - 2*b^2)*Sin[c
 + d*x])/(2*b^3*(a^2 - b^2)^2*d*(a + b*Cos[c + d*x]))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
```

```
&& !LtQ[m, -1]
```

Rule 3110

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f
_.)*(x_)]^2), x_Symbol] :> Simp[(-(b*c - a*d))*(A*b^2 - a*b*B + a^2*C)*Cos[
e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b^2*f*(m + 1)*(a^2 - b^2))), x] - D
ist[1/(b^2*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[b*(m
 + 1)*((b*B - a*C)*(b*c - a*d) - A*b*(a*c - b*d)) + (b*B*(a^2*d + b^2*d*(m
+ 1) - a*b*c*(m + 2)) + (b*c - a*d)*(A*b^2*(m + 2) + C*(a^2 + b^2*(m + 1)))
)*Sin[e + f*x] - b*C*d*(m + 1)*(a^2 - b^2)*Sin[e + f*x]^2, x], x], x] /; Fr
eeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2,
0] && LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
&\text{integral}\\
&=-\frac{a^2\cos^2(c+dx)\sin(c+dx)}{2b(a^2-b^2)\,d(a+b\cos(c+dx))^2}-\frac{\int\frac{\cos(c+dx)\left(2a^2-2ab\cos(c+dx)-(3a^2-2b^2)\cos^2(c+dx)\right)}{(a+b\cos(c+dx))^2}\,dx}{2b(a^2-b^2)}\\
&=-\frac{a^2\cos^2(c+dx)\sin(c+dx)}{2b(a^2-b^2)\,d(a+b\cos(c+dx))^2}+\frac{3a^3(a^2-2b^2)\sin(c+dx)}{2b^3(a^2-b^2)^2\,d(a+b\cos(c+dx))}\\
&\quad-\frac{\int\frac{3a^2b(a^2-2b^2)+a(3a^2-4b^2)(a^2-b^2)\cos(c+dx)-b(3a^2-2b^2)(a^2-b^2)\cos^2(c+dx)}{a+b\cos(c+dx)}\,dx}{2b^3(a^2-b^2)^2}\\
&=\frac{(3a^2-2b^2)\sin(c+dx)}{2b^3(a^2-b^2)\,d}-\frac{a^2\cos^2(c+dx)\sin(c+dx)}{2b(a^2-b^2)\,d(a+b\cos(c+dx))^2}\\
&\quad+\frac{3a^3(a^2-2b^2)\sin(c+dx)}{2b^3(a^2-b^2)^2\,d(a+b\cos(c+dx))}-\frac{\int\frac{3a^2b^2(a^2-2b^2)+6ab(a^2-b^2)^2\cos(c+dx)}{a+b\cos(c+dx)}\,dx}{2b^4(a^2-b^2)^2}\\
&=-\frac{3ax}{b^4}+\frac{(3a^2-2b^2)\sin(c+dx)}{2b^3(a^2-b^2)\,d}-\frac{a^2\cos^2(c+dx)\sin(c+dx)}{2b(a^2-b^2)\,d(a+b\cos(c+dx))^2}\\
&\quad+\frac{3a^3(a^2-2b^2)\sin(c+dx)}{2b^3(a^2-b^2)^2\,d(a+b\cos(c+dx))}+\frac{(3a^2(2a^4-5a^2b^2+4b^4))\int\frac{1}{a+b\cos(c+dx)}\,dx}{2b^4(a^2-b^2)^2}\\
&=-\frac{3ax}{b^4}+\frac{(3a^2-2b^2)\sin(c+dx)}{2b^3(a^2-b^2)\,d}-\frac{a^2\cos^2(c+dx)\sin(c+dx)}{2b(a^2-b^2)\,d(a+b\cos(c+dx))^2}\\
&\quad+\frac{3a^3(a^2-2b^2)\sin(c+dx)}{2b^3(a^2-b^2)^2\,d(a+b\cos(c+dx))}\\
&\quad+\frac{(3a^2(2a^4-5a^2b^2+4b^4))\,\text{Subst}\left(\int\frac{1}{a+b+(a-b)x^2}\,dx,x,\tan\left(\frac{1}{2}(c+dx)\right)\right)}{b^4(a^2-b^2)^2\,d}
\end{aligned}$$

$$=-\frac{3ax}{b^4}+\frac{3a^2(2a^4-5a^2b^2+4b^4)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{5/2}b^4(a+b)^{5/2}d}+\frac{(3a^2-2b^2)\sin(c+dx)}{2b^3(a^2-b^2)d}$$
$$-\frac{a^2\cos^2(c+dx)\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2}+\frac{3a^3(a^2-2b^2)\sin(c+dx)}{2b^3(a^2-b^2)^2d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 1.22 (sec) , antiderivative size = 177, normalized size of antiderivative = 0.80

$$\int\frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^3}\,dx$$
$$=\frac{-6a(c+dx)-\frac{6a^2(2a^4-5a^2b^2+4b^4)\operatorname{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{5/2}}+2b\sin(c+dx)-\frac{a^4b\sin(c+dx)}{(a-b)(a+b)(a+b\cos(c+dx))^2}+\frac{a^3}{(a-b}}{2b^4d}$$

```
[In] Integrate[Cos[c + d*x]^4/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (-6*a*(c + d*x) - (6*a^2*(2*a^4 - 5*a^2*b^2 + 4*b^4)*ArcTanh[((a - b)*Tan[(
c + d*x)/2])/Sqrt[-a^2 + b^2]])/(-a^2 + b^2)^(5/2) + 2*b*Sin[c + d*x] - (a^
4*b*Sin[c + d*x])/((a - b)*(a + b)*(a + b*Cos[c + d*x])^2) + (a^3*b*(5*a^2
- 8*b^2)*Sin[c + d*x])/((a - b)^2*(a + b)^2*(a + b*Cos[c + d*x])))/(2*b^4*d
)
```

Maple [A] (verified)

Time = 1.38 (sec) , antiderivative size = 266, normalized size of antiderivative = 1.20

method	result
derivativedivides	$\frac{\frac{2a^2\left(\frac{\frac{\left(4a^2-ab-8b^2\right)ab\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)\left(a^2+2ab+b^2\right)}+\frac{\left(4a^2+ab-8b^2\right)ab\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2(a+b)\left(a^2-2ab+b^2\right)}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^2}+\frac{3\left(2a^4-5a^2b^2+4b^4\right)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{2\left(a^4-2a^2b^2+b^4\right)\sqrt{(a-b)(a+b)}}\right)}{b^4}-}{d}$
default	$\frac{\frac{2a^2\left(\frac{\frac{\left(4a^2-ab-8b^2\right)ab\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)\left(a^2+2ab+b^2\right)}+\frac{\left(4a^2+ab-8b^2\right)ab\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2(a+b)\left(a^2-2ab+b^2\right)}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^2}+\frac{3\left(2a^4-5a^2b^2+4b^4\right)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{2\left(a^4-2a^2b^2+b^4\right)\sqrt{(a-b)(a+b)}}\right)}{b^4}-}{d}$
risch	$-\frac{3ax}{b^4}-\frac{ie^{i(dx+c)}}{2b^3d}+\frac{ie^{-i(dx+c)}}{2b^3d}+\frac{ia^3\left(6b\,a^3e^{3i(dx+c)}-9b^3a\,e^{3i(dx+c)}+10a^4e^{2i(dx+c)}-11b^2a^2e^{2i(dx+c)}-8b^4e^{2i(dx}\right.}{b^4\left(a^2-b^2\right)^2d\left(b\,e^{2i(dx+c)}+2a\,e^{i(dx+}\right.}$

```
[In] int(cos(d*x+c)^4/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(2*a^2/b^4*((1/2*(4*a^2-a*b-8*b^2)*a*b/(a-b)/(a^2+2*a*b+b^2)*tan(1/2*d*
x+1/2*c)^3+1/2*(4*a^2+a*b-8*b^2)*a*b/(a+b)/(a^2-2*a*b+b^2)*tan(1/2*d*x+1/2*
c))/(tan(1/2*d*x+1/2*c)^2*a-b*tan(1/2*d*x+1/2*c)^2+a+b)^2+3/2*(2*a^4-5*a^2*
b^2+4*b^4)/(a^4-2*a^2*b^2+b^4)/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x
+1/2*c)/((a-b)*(a+b))^(1/2)))-2/b^4*(-b*tan(1/2*d*x+1/2*c)/(1+tan(1/2*d*x+1
/2*c)^2)+3*a*arctan(tan(1/2*d*x+1/2*c))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 480 vs. $2(206) = 412$.

Time = 0.34 (sec) , antiderivative size = 1029, normalized size of antiderivative = 4.66

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^3}\,dx$$
$$= \Bigg[-\frac{12\,(a^7b^2-3\,a^5b^4+3\,a^3b^6-ab^8)dx\cos{(dx+c)}^2+24\,(a^8b-3\,a^6b^3+3\,a^4b^5-a^2b^7)dx\cos{(dx+c)}+12}{}$$
$$-\frac{6\,(a^7b^2-3\,a^5b^4+3\,a^3b^6-ab^8)dx\cos{(dx+c)}^2+12\,(a^8b-3\,a^6b^3+3\,a^4b^5-a^2b^7)dx\cos{(dx+c)}+6\,(a}{}$$

```
[In] integrate(cos(d*x+c)^4/(a+b*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] [-1/4*(12*(a^7*b^2 - 3*a^5*b^4 + 3*a^3*b^6 - a*b^8)*d*x*cos(d*x + c)^2 + 24
*(a^8*b - 3*a^6*b^3 + 3*a^4*b^5 - a^2*b^7)*d*x*cos(d*x + c) + 12*(a^9 - 3*a
^7*b^2 + 3*a^5*b^4 - a^3*b^6)*d*x + 3*(2*a^8 - 5*a^6*b^2 + 4*a^4*b^4 + (2*a
^6*b^2 - 5*a^4*b^4 + 4*a^2*b^6)*cos(d*x + c)^2 + 2*(2*a^7*b - 5*a^5*b^3 + 4
*a^3*b^5)*cos(d*x + c))*sqrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 -
 b^2)*cos(d*x + c)^2 + 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c)
 - a^2 + 2*b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) - 2*(6*a^8
*b - 17*a^6*b^3 + 13*a^4*b^5 - 2*a^2*b^7 + 2*(a^6*b^3 - 3*a^4*b^5 + 3*a^2*b
^7 - b^9)*cos(d*x + c)^2 + (9*a^7*b^2 - 25*a^5*b^4 + 20*a^3*b^6 - 4*a*b^8)*
cos(d*x + c))*sin(d*x + c))/((a^6*b^6 - 3*a^4*b^8 + 3*a^2*b^10 - b^12)*d*co
s(d*x + c)^2 + 2*(a^7*b^5 - 3*a^5*b^7 + 3*a^3*b^9 - a*b^11)*d*cos(d*x + c)
+ (a^8*b^4 - 3*a^6*b^6 + 3*a^4*b^8 - a^2*b^10)*d), -1/2*(6*(a^7*b^2 - 3*a^5
*b^4 + 3*a^3*b^6 - a*b^8)*d*x*cos(d*x + c)^2 + 12*(a^8*b - 3*a^6*b^3 + 3*a^
4*b^5 - a^2*b^7)*d*x*cos(d*x + c) + 6*(a^9 - 3*a^7*b^2 + 3*a^5*b^4 - a^3*b^
6)*d*x - 3*(2*a^8 - 5*a^6*b^2 + 4*a^4*b^4 + (2*a^6*b^2 - 5*a^4*b^4 + 4*a^2*
b^6)*cos(d*x + c)^2 + 2*(2*a^7*b - 5*a^5*b^3 + 4*a^3*b^5)*cos(d*x + c))*sqr
t(a^2 - b^2)*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c))) -
 (6*a^8*b - 17*a^6*b^3 + 13*a^4*b^5 - 2*a^2*b^7 + 2*(a^6*b^3 - 3*a^4*b^5 +
3*a^2*b^7 - b^9)*cos(d*x + c)^2 + (9*a^7*b^2 - 25*a^5*b^4 + 20*a^3*b^6 - 4*
a*b^8)*cos(d*x + c))*sin(d*x + c))/((a^6*b^6 - 3*a^4*b^8 + 3*a^2*b^10 - b^1
2)*d*cos(d*x + c)^2 + 2*(a^7*b^5 - 3*a^5*b^7 + 3*a^3*b^9 - a*b^11)*d*cos(d*
x + c) + (a^8*b^4 - 3*a^6*b^6 + 3*a^4*b^8 - a^2*b^10)*d)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**4/(a+b*cos(d*x+c))**3,x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)^4/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 354, normalized size of antiderivative = 1.60

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^3}\,dx = -\frac{\frac{3\,(2\,a^6-5\,a^4b^2+4\,a^2b^4)\left(\pi\left\lfloor\frac{dx+c}{2\,\pi}+\frac{1}{2}\right\rfloor\mathrm{sgn}(-2\,a+2\,b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\sqrt{a^2-b^2}}\right)\right)}{(a^4b^4-2\,a^2b^6+b^8)\sqrt{a^2-b^2}} - \frac{4\,a^6\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-5\,a^5b\tan\left(\frac{1}{2}\,\right.}{}}{}$$

```
[In] integrate(cos(d*x+c)^4/(a+b*cos(d*x+c))^3,x, algorithm="giac")
[Out] -(3*(2*a^6 - 5*a^4*b^2 + 4*a^2*b^4)*(pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-
2*a + 2*b) + arctan(-(a*tan(1/2*d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt
(a^2 - b^2)))/((a^4*b^4 - 2*a^2*b^6 + b^8)*sqrt(a^2 - b^2)) - (4*a^6*tan(1/
2*d*x + 1/2*c)^3 - 5*a^5*b*tan(1/2*d*x + 1/2*c)^3 - 7*a^4*b^2*tan(1/2*d*x +
 1/2*c)^3 + 8*a^3*b^3*tan(1/2*d*x + 1/2*c)^3 + 4*a^6*tan(1/2*d*x + 1/2*c) +
 5*a^5*b*tan(1/2*d*x + 1/2*c) - 7*a^4*b^2*tan(1/2*d*x + 1/2*c) - 8*a^3*b^3*
tan(1/2*d*x + 1/2*c))/((a^4*b^3 - 2*a^2*b^5 + b^7)*(a*tan(1/2*d*x + 1/2*c)^
2 - b*tan(1/2*d*x + 1/2*c)^2 + a + b)^2) + 3*(d*x + c)*a/b^4 - 2*tan(1/2*d*
x + 1/2*c)/((tan(1/2*d*x + 1/2*c)^2 + 1)*b^3))/d
```

Mupad [B] (verification not implemented)

Time = 21.55 (sec) , antiderivative size = 5350, normalized size of antiderivative = 24.21

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Too large to display}$$

[In] int(cos(c + d*x)^4/(a + b*cos(c + d*x))^3,x)

[Out] ((tan(c/2 + (d*x)/2)^5*(2*a*b^4 - 3*a^4*b + 6*a^5 - 2*b^5 + 4*a^2*b^3 - 12*a^3*b^2))/((a*b^3 - b^4)*(a + b)^2) + (tan(c/2 + (d*x)/2)*(2*a*b^4 + 3*a^4*b + 6*a^5 + 2*b^5 - 4*a^2*b^3 - 12*a^3*b^2))/((a + b)*(b^5 - 2*a*b^4 + a^2*b^3)) + (2*tan(c/2 + (d*x)/2)^3*(6*a^6 - 2*b^6 + 6*a^2*b^4 - 13*a^4*b^2))/(b*(a*b^2 - b^3)*(a + b)^2*(a - b)))/(d*(2*a*b + tan(c/2 + (d*x)/2)^2*(2*a*b + 3*a^2 - b^2) + tan(c/2 + (d*x)/2)^6*(a^2 - 2*a*b + b^2) + a^2 + b^2 - tan(c/2 + (d*x)/2)^4*(2*a*b - 3*a^2 + b^2))) - (6*a*atan(((3*a*((8*tan(c/2 + (d*x)/2)*(72*a^12 - 72*a^11*b + 36*a^2*b^10 - 72*a^3*b^9 + 36*a^4*b^8 + 288*a^5*b^7 - 288*a^6*b^6 - 432*a^7*b^5 + 441*a^8*b^4 + 288*a^9*b^3 - 288*a^10*b^2))/(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6) + (a*((24*(4*a*b^17 - 8*a^2*b^16 - 12*a^3*b^15 + 26*a^4*b^14 + 14*a^5*b^13 - 32*a^6*b^12 - 8*a^7*b^11 + 18*a^8*b^10 + 2*a^9*b^9 - 4*a^10*b^8))/(a*b^15 + b^16 - 3*a^2*b^14 - 3*a^3*b^13 + 3*a^4*b^12 + 3*a^5*b^11 - a^6*b^10 - a^7*b^9) - (a*tan(c/2 + (d*x)/2)*(8*a*b^17 - 8*a^2*b^16 - 32*a^3*b^15 + 32*a^4*b^14 + 48*a^5*b^13 - 48*a^6*b^12 - 32*a^7*b^11 + 32*a^8*b^10 + 8*a^9*b^9 - 8*a^10*b^8)*24i)/(b^4*(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6)))*3i)/b^4))/b^4 + (3*a*((8*tan(c/2 + (d*x)/2)*(72*a^12 - 72*a^11*b + 36*a^2*b^10 - 72*a^3*b^9 + 36*a^4*b^8 + 288*a^5*b^7 - 288*a^6*b^6 - 432*a^7*b^5 + 441*a^8*b^4 + 288*a^9*b^3 - 288*a^10*b^2))/(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6) - (a*((24*(4*a*b^17 - 8*a^2*b^16 - 12*a^3*b^15 + 26*a^4*b^14 + 14*a^5*b^13 - 32*a^6*b^12 - 8*a^7*b^11 + 18*a^8*b^10 + 2*a^9*b^9 - 4*a^10*b^8))/(a*b^15 + b^16 - 3*a^2*b^14 - 3*a^3*b^13 + 3*a^4*b^12 + 3*a^5*b^11 - a^6*b^10 - a^7*b^9) + (a*tan(c/2 + (d*x)/2)*(8*a*b^17 - 8*a^2*b^16 - 32*a^3*b^15 + 32*a^4*b^14 + 48*a^5*b^13 - 48*a^6*b^12 - 32*a^7*b^11 + 32*a^8*b^10 + 8*a^9*b^9 - 8*a^10*b^8)*24i)/(b^4*(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6)))*3i)/b^4))/b^4)/((48*(36*a^12 - 18*a^11*b + 72*a^4*b^8 + 72*a^5*b^7 - 234*a^6*b^6 - 126*a^7*b^5 + 288*a^8*b^4 + 81*a^9*b^3 - 162*a^10*b^2))/(a*b^15 + b^16 - 3*a^2*b^14 - 3*a^3*b^13 + 3*a^4*b^12 + 3*a^5*b^11 - a^6*b^10 - a^7*b^9) - (a*((8*tan(c/2 + (d*x)/2)*(72*a^12 - 72*a^11*b + 36*a^2*b^10 - 72*a^3*b^9 + 36*a^4*b^8 + 288*a^5*b^7 - 288*a^6*b^6 - 432*a^7*b^5 + 441*a^8*b^4 + 288*a^9*b^3 - 288*a^10*b^2))/(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6) + (a*((24*(4*a*b^17 - 8*a^2*b^16 - 12*a^3*b^15 + 26*a^4*b^14 + 14*a^5*b^13 - 32*a^6*b^12 - 8*a^7*b^11 + 18*a^8*b^10 + 2*a^9*b^9 - 4*a^10*b^8))/(a*b^15 + b^16 - 3*a^2*b^14 - 3*a^3*b^13 + 3*a^

4*b^12 + 3*a^5*b^11 - a^6*b^10 - a^7*b^9) - (a*tan(c/2 + (d*x)/2)*(8*a*b^17 - 8*a^2*b^16 - 32*a^3*b^15 + 32*a^4*b^14 + 48*a^5*b^13 - 48*a^6*b^12 - 32*a^7*b^11 + 32*a^8*b^10 + 8*a^9*b^9 - 8*a^10*b^8)*24i)/(b^4*(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6)))*3i)/b^4)*3i)/b^4 + (a*((8*tan(c/2 + (d*x)/2)*(72*a^12 - 72*a^11*b + 36*a^2*b^10 - 72*a^3*b^9 + 36*a^4*b^8 + 288*a^5*b^7 - 288*a^6*b^6 - 432*a^7*b^5 + 441*a^8*b^4 + 288*a^9*b^3 - 288*a^10*b^2))/(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6) - (a*((24*(4*a*b^17 - 8*a^2*b^16 - 12*a^3*b^15 + 26*a^4*b^14 + 14*a^5*b^13 - 32*a^6*b^12 - 8*a^7*b^11 + 18*a^8*b^10 + 2*a^9*b^9 - 4*a^10*b^8))/(a*b^15 + b^16 - 3*a^2*b^14 - 3*a^3*b^13 + 3*a^4*b^12 + 3*a^5*b^11 - a^6*b^10 - a^7*b^9) + (a*tan(c/2 + (d*x)/2)*(8*a*b^17 - 8*a^2*b^16 - 32*a^3*b^15 + 32*a^4*b^14 + 48*a^5*b^13 - 48*a^6*b^12 - 32*a^7*b^11 + 32*a^8*b^10 + 8*a^9*b^9 - 8*a^10*b^8)*24i)/(b^4*(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6)))*3i)/b^4)*3i)/b^4)))/(b^4*d) - (a^2*atan(((a^2*(-(a + b)^5*(a - b)^5)^(1/2)*((8*tan(c/2 + (d*x)/2)*(72*a^12 - 72*a^11*b + 36*a^2*b^10 - 72*a^3*b^9 + 36*a^4*b^8 + 288*a^5*b^7 - 288*a^6*b^6 - 432*a^7*b^5 + 441*a^8*b^4 + 288*a^9*b^3 - 288*a^10*b^2))/(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6) + (3*a^2*((24*(4*a*b^17 - 8*a^2*b^16 - 12*a^3*b^15 + 26*a^4*b^14 + 14*a^5*b^13 - 32*a^6*b^12 - 8*a^7*b^11 + 18*a^8*b^10 + 2*a^9*b^9 - 4*a^10*b^8))/(a*b^15 + b^16 - 3*a^2*b^14 - 3*a^3*b^13 + 3*a^4*b^12 + 3*a^5*b^11 - a^6*b^10 - a^7*b^9) - (12*a^2*tan(c/2 + (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(2*a^4 + 4*b^4 - 5*a^2*b^2)*(8*a*b^17 - 8*a^2*b^16 - 32*a^3*b^15 + 32*a^4*b^14 + 48*a^5*b^13 - 48*a^6*b^12 - 32*a^7*b^11 + 32*a^8*b^10 + 8*a^9*b^9 - 8*a^10*b^8))/((b^14 - 5*a^2*b^12 + 10*a^4*b^10 - 10*a^6*b^8 + 5*a^8*b^6 - a^10*b^4)*(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6)))*(-(a + b)^5*(a - b)^5)^(1/2)*(2*a^4 + 4*b^4 - 5*a^2*b^2))/(2*(b^14 - 5*a^2*b^12 + 10*a^4*b^10 - 10*a^6*b^8 + 5*a^8*b^6 - a^10*b^4)))*(2*a^4 + 4*b^4 - 5*a^2*b^2)*3i)/(2*(b^14 - 5*a^2*b^12 + 10*a^4*b^10 - 10*a^6*b^8 + 5*a^8*b^6 - a^10*b^4)) + (a^2*(-(a + b)^5*(a - b)^5)^(1/2)*((8*tan(c/2 + (d*x)/2)*(72*a^12 - 72*a^11*b + 36*a^2*b^10 - 72*a^3*b^9 + 36*a^4*b^8 + 288*a^5*b^7 - 288*a^6*b^6 - 432*a^7*b^5 + 441*a^8*b^4 + 288*a^9*b^3 - 288*a^10*b^2))/(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6) - (3*a^2*((24*(4*a*b^17 - 8*a^2*b^16 - 12*a^3*b^15 + 26*a^4*b^14 + 14*a^5*b^13 - 32*a^6*b^12 - 8*a^7*b^11 + 18*a^8*b^10 + 2*a^9*b^9 - 4*a^10*b^8))/(a*b^15 + b^16 - 3*a^2*b^14 - 3*a^3*b^13 + 3*a^4*b^12 + 3*a^5*b^11 - a^6*b^10 - a^7*b^9) + (12*a^2*tan(c/2 + (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(2*a^4 + 4*b^4 - 5*a^2*b^2)*(8*a*b^17 - 8*a^2*b^16 - 32*a^3*b^15 + 32*a^4*b^14 + 48*a^5*b^13 - 48*a^6*b^12 - 32*a^7*b^11 + 32*a^8*b^10 + 8*a^9*b^9 - 8*a^10*b^8))/((b^14 - 5*a^2*b^12 + 10*a^4*b^10 - 10*a^6*b^8 + 5*a^8*b^6 - a^10*b^4)*(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6)))*(-(a + b)^5*(a - b)^5)^(1/2)*(2*a^4 + 4*b^4 - 5*a^2*b^2))/(2*(b^14 - 5*a^2*b^12 + 10*a^4*b^10 - 10*a^6*b^8 + 5*a^8*b^6 - a^10*b^4)))*(2*a^4 + 4*b^4 - 5*a^2*b^2)*3i)/(2*(b^14 - 5*a^2*b^12 + 10*a^4*b^10 - 10*a^6*b^8 + 5* a^8*b^6 - a^10*b^4)))/((48*(36*a^12 - 18*a^11*b + 72*a^4*b^8 + 72*a^5*b^7 - 234*a^6*b^6 - 126*a^7*b^5 + 288*a^8*b^4 + 81*a^9*b^3 - 162*a^10*b^2))/(a*b^15 + b^16 - 3*a^2*b^14 - 3*a^3*b^13 + 3*a^4*b^12 + 3*a^5*b^11 - a^6*b^10 - a^7*b^9) - (3*a^2*(-(a + b)^5*(a - b)^5)^(1/2)*((8*tan(c/2 + (d*x)/2)*(72*a^12 - 72*a^11*b + 36*a^2*b^10 - 72*a^3*b^9 + 36*a^4*b^8 + 288*a^5*b^7 - 288*a^6*b^6 - 432*a^7*b^5 + 441*a^8*b^4 + 288*a^9*b^3 - 288*a^10*b^2))/(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6) + (3*a^2*((24*(4*a*b^17 - 8*a^2*b^16 - 12*a^3*b^15 + 26*a^4*b^14 + 14*a^5*b^13 - 32*a^6*b^12 - 8*a^7*b^11 + 18*a^8*b^10 + 2*a^9*b^9 - 4*a^10*b^8))/(a*b^15 + b^16 - 3*a^2*b^14 - 3*a^3*b^13 + 3*a^4*b^12 + 3*a^5*b^11 - a^6*b^10 - a^7*b^9) - (12*a^2*tan(c/2 + (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(2*a^4 + 4*b^4 - 5*a^2*b^2)*(8*a*b^17 - 8*a^2*b^16 - 32*a^3*b^15 + 32*a^4*b^14 + 48*a^5*b^13 - 48*a^6*b^12 - 32*a^7*b^11 + 32*a^8*b^10 + 8*a^9*b^9 - 8*a^10*b^8))/((b^14 - 5*a^2*b^12 + 10*a^4*b^10 - 10*a^6*b^8 + 5*a^8*b^6 - a^10*b^4)*(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6)))*(-(a + b)^5*(a - b)^5)^(1/2)*(2*a^4 + 4*b^4 - 5*a^2*b^2))/(2*(b^14 - 5*a^2*b^12 + 10*a^4*b^10 - 10*a^6*b^8 + 5*a^8*b^6 - a^10*b^4)))*(2*a^4 + 4*b^4 - 5*a^2*b^2))/(2*(b^14 - 5*a^2*b^12 + 10*a^4*b^10 - 10*a^6*b^8 + 5*a^8*b^6 - a^10*b^4)) + (3*a^2*(-(a + b)^5*(a - b)^5)^(1/2)*((8*tan(c/2 + (d*x)/2)*(72*a^12 - 72*a^11*b + 36*a^2*b^10 - 72*a^3*b^9 + 36*a^4*b^8 + 288*a^5*b^7 - 288*a^6*b^6 - 432*a^7*b^5 + 441*a^8*b^4 + 288*a^9*b^3 - 288*a^10*b^2))/(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6) - (3*a^2*((24*(4*a*b^17 - 8*a^2*b^16 - 12*a^3*b^15 + 26*a^4*b^14 + 14*a^5*b^13 - 32*a^6*b^12 - 8*a^7*b^11 + 18*a^8*b^10 + 2*a^9*b^9 - 4*a^10*b^8))/(a*b^15 + b^16 - 3*a^2*b^14 - 3*a^3*b^13 + 3*a^4*b^12 + 3*a^5*b^11 - a^6*b^10 - a^7*b^9) + (12*a^2*tan(c/2 + (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(2*a^4 + 4*b^4 - 5*a^2*b^2)*(8*a*b^17 - 8*a^2*b^16 - 32*a^3*b^15 + 32*a^4*b^14 + 48*a^5*b^13 - 48*a^6*b^12 - 32*a^7*b^11 + 32*a^8*b^10 + 8*a^9*b^9 - 8*a^10*b^8))/((b^14 - 5*a^2*b^12 + 10*a^4*b^10 - 10*a^6*b^8 + 5*a^8*b^6 - a^10*b^4)*(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6)))*(-(a + b)^5*(a - b)^5)^(1/2)*(2*a^4 + 4*b^4 - 5*a^2*b^2))/(2*(b^14 - 5*a^2*b^12 + 10*a^4*b^10 - 10*a^6*b^8 + 5*a^8*b^6 - a^10*b^4)))*(2*a^4 + 4*b^4 - 5*a^2*b^2))/(2*(b^14 - 5*a^2*b^12 + 10*a^4*b^10 - 10*a^6*b^8 + 5*a^8*b^6 - a^10*b^4))))*(-(a + b)^5*(a - b)^5)^(1/2)*(2*a^4 + 4*b^4 - 5*a^2*b^2)*3i)/(d*(b^14 - 5*a^2*b^12 + 10*a^4*b^10 - 10*a^6*b^8 + 5*a^8*b^6 - a^10*b^4))

3.471 $\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 179

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \frac{x}{b^3} - \frac{a(2a^4-5a^2b^2+6b^4)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{5/2}b^3(a+b)^{5/2}d} - \frac{a^2\cos(c+dx)\sin(c+dx)}{2b\,(a^2-b^2)\,d(a+b\cos(c+dx))^2} - \frac{a^2(2a^2-5b^2)\sin(c+dx)}{2b^2\,(a^2-b^2)^2\,d(a+b\cos(c+dx))}$$

```
[Out] x/b^3-a*(2*a^4-5*a^2*b^2+6*b^4)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)
^(1/2))/(a-b)^(5/2)/b^3/(a+b)^(5/2)/d-1/2*a^2*cos(d*x+c)*sin(d*x+c)/b/(a^2-
b^2)/d/(a+b*cos(d*x+c))^2-1/2*a^2*(2*a^2-5*b^2)*sin(d*x+c)/b^2/(a^2-b^2)^2/
d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 179, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2871, 3100, 2814, 2738, 211}

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^3}\,dx = -\frac{a^2(2a^2-5b^2)\sin(c+dx)}{2b^2d\,(a^2-b^2)^2\,(a+b\cos(c+dx))} - \frac{a^2\sin(c+dx)\cos(c+dx)}{2bd\,(a^2-b^2)\,(a+b\cos(c+dx))^2} - \frac{a(2a^4-5a^2b^2+6b^4)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{b^3d(a-b)^{5/2}(a+b)^{5/2}} + \frac{x}{b^3}$$

```
[In] Int[Cos[c + d*x]^3/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] x/b^3 - (a*(2*a^4 - 5*a^2*b^2 + 6*b^4)*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2]
)/Sqrt[a + b]])/((a - b)^(5/2)*b^3*(a + b)^(5/2)*d) - (a^2*Cos[c + d*x]*Sin
[c + d*x])/(2*b*(a^2 - b^2)*d*(a + b*Cos[c + d*x])^2) - (a^2*(2*a^2 - 5*b^2
)*Sin[c + d*x])/(2*b^2*(a^2 - b^2)^2*d*(a + b*Cos[c + d*x]))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3100

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
 (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2
 - a*b*B + a^2*C))*Cos[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*
(a^2 - b^2))), x] + Dist[1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*Simp[b*(a*A - b*B + a*C)*(m + 1) - (A*b^2 - a*b*B + a^2*C + b*(A*
b - a*B + b*C)*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B
```

```
, C}, x] && LtQ[m, -1] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = -\frac{a^2\cos(c+dx)\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2} - \frac{\int \frac{a^2-2ab\cos(c+dx)-2(a^2-b^2)\cos^2(c+dx)}{(a+b\cos(c+dx))^2}\,dx}{2b(a^2-b^2)}$$

$$= -\frac{a^2\cos(c+dx)\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2} - \frac{a^2(2a^2-5b^2)\sin(c+dx)}{2b^2(a^2-b^2)^2d(a+b\cos(c+dx))} + \frac{\int \frac{ab(a^2-4b^2)+2(a^2-b^2)^2\cos(c+dx)}{a+b\cos(c+dx)}\,dx}{2b^2(a^2-b^2)^2}$$

$$= \frac{x}{b^3} - \frac{a^2\cos(c+dx)\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2} - \frac{a^2(2a^2-5b^2)\sin(c+dx)}{2b^2(a^2-b^2)^2d(a+b\cos(c+dx))} - \frac{(a(2a^4-5a^2b^2+6b^4))\int \frac{1}{a+b\cos(c+dx)}\,dx}{2b^3(a^2-b^2)^2}$$

$$= \frac{x}{b^3} - \frac{a^2\cos(c+dx)\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2} - \frac{a^2(2a^2-5b^2)\sin(c+dx)}{2b^2(a^2-b^2)^2d(a+b\cos(c+dx))} - \frac{(a(2a^4-5a^2b^2+6b^4))\,\text{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{b^3(a^2-b^2)^2d}$$

$$= \frac{x}{b^3} - \frac{a(2a^4-5a^2b^2+6b^4)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{5/2}b^3(a+b)^{5/2}d} - \frac{a^2\cos(c+dx)\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2} - \frac{a^2(2a^2-5b^2)\sin(c+dx)}{2b^2(a^2-b^2)^2d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 0.94 (sec) , antiderivative size = 149, normalized size of antiderivative = 0.83

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \frac{2(c+dx) + \frac{2a(2a^4-5a^2b^2+6b^4)\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{5/2}} - \frac{a^2b(2a^3-5ab^2+3b(a^2-2b^2)\cos(c+dx))\sin(c+dx)}{(a-b)^2(a+b)^2(a+b\cos(c+dx))^2}}{2b^3d}$$

```
[In] Integrate[Cos[c + d*x]^3/(a + b*Cos[c + d*x])^3,x]
[Out] (2*(c + d*x) + (2*a*(2*a^4 - 5*a^2*b^2 + 6*b^4)*ArcTanh[((a - b)*Tan[(c + d
*x)/2])/Sqrt[-a^2 + b^2]])/(-a^2 + b^2)^(5/2) - (a^2*b*(2*a^3 - 5*a*b^2 + 3
*b*(a^2 - 2*b^2)*Cos[c + d*x])*Sin[c + d*x])/((a - b)^2*(a + b)^2*(a + b*Co
s[c + d*x])^2))/(2*b^3*d)
```

Maple [A] (verified)

Time = 1.44 (sec) , antiderivative size = 233, normalized size of antiderivative = 1.30

method	result
derivativedivides	$$-\frac{\frac{2a\left(\frac{\frac{(2a^2-ab-6b^2)ab\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)(a^2+2ab+b^2)}+\frac{(2a^2+ab-6b^2)ab\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2(a+b)(a^2-2ab+b^2)}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^2}+\frac{(2a^4-5a^2b^2+6b^4)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{2(a^4-2a^2b^2+b^4)\sqrt{(a-b)(a+b)}}\right)}{b^3}+\frac{2\,a}{}}{d}$$
default	$$-\frac{\frac{2a\left(\frac{\frac{(2a^2-ab-6b^2)ab\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)(a^2+2ab+b^2)}+\frac{(2a^2+ab-6b^2)ab\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2(a+b)(a^2-2ab+b^2)}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^2}+\frac{(2a^4-5a^2b^2+6b^4)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{2(a^4-2a^2b^2+b^4)\sqrt{(a-b)(a+b)}}\right)}{b^3}+\frac{2\,a}{}}{d}$$
risch	$$\frac{x}{b^3}-\frac{ia^2\left(4b\,a^3\mathrm{e}^{3i(dx+c)}-7b^3a\,\mathrm{e}^{3i(dx+c)}+6a^4\mathrm{e}^{2i(dx+c)}-9b^2a^2\mathrm{e}^{2i(dx+c)}-6b^4\mathrm{e}^{2i(dx+c)}+8b\,a^3\mathrm{e}^{i(dx+c)}-17\,\mathrm{e}^{i(dx+c)}b^3a+3}{b^3(a^2-b^2)^2d\left(b\,\mathrm{e}^{2i(dx+c)}+2a\,\mathrm{e}^{i(dx+c)}+b\right)^2}$$

[In] int(cos(d*x+c)^3/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)

[Out] 1/d*(-2*a/b^3*((1/2*(2*a^2-a*b-6*b^2)*a*b/(a-b)/(a^2+2*a*b+b^2)*tan(1/2*d*x
+1/2*c)^3+1/2*(2*a^2+a*b-6*b^2)*a*b/(a+b)/(a^2-2*a*b+b^2)*tan(1/2*d*x+1/2*c
))/(tan(1/2*d*x+1/2*c)^2*a-b*tan(1/2*d*x+1/2*c)^2+a+b)^2+1/2*(2*a^4-5*a^2*b
^2+6*b^4)/(a^4-2*a^2*b^2+b^4)/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+
1/2*c)/((a-b)*(a+b))^(1/2)))+2/b^3*arctan(tan(1/2*d*x+1/2*c)))

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 422 vs. 2(166) = 332.

Time = 0.31 (sec) , antiderivative size = 913, normalized size of antiderivative = 5.10

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^3}\,dx$$
$$=\left[\frac{4\,(a^6b^2-3\,a^4b^4+3\,a^2b^6-b^8)dx\cos{(dx+c)}^2+8\,(a^7b-3\,a^5b^3+3\,a^3b^5-ab^7)dx\cos{(dx+c)}+4\,(a^8-3}{}\right.$$

[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c))^3,x, algorithm="fricas")

[Out] [1/4*(4*(a^6*b^2 - 3*a^4*b^4 + 3*a^2*b^6 - b^8)*d*x*cos(d*x + c)^2 + 8*(a^7
*b - 3*a^5*b^3 + 3*a^3*b^5 - a*b^7)*d*x*cos(d*x + c) + 4*(a^8 - 3*a^6*b^2 +
 3*a^4*b^4 - a^2*b^6)*d*x - (2*a^7 - 5*a^5*b^2 + 6*a^3*b^4 + (2*a^5*b^2 - 5
*a^3*b^4 + 6*a*b^6)*cos(d*x + c)^2 + 2*(2*a^6*b - 5*a^4*b^3 + 6*a^2*b^5)*co
s(d*x + c))*sqrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*
x + c)^2 - 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b

```
^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) - 2*(2*a^7*b - 7*a^5*b
^3 + 5*a^3*b^5 + 3*(a^6*b^2 - 3*a^4*b^4 + 2*a^2*b^6)*cos(d*x + c))*sin(d*x
+ c))/((a^6*b^5 - 3*a^4*b^7 + 3*a^2*b^9 - b^11)*d*cos(d*x + c)^2 + 2*(a^7*b
^4 - 3*a^5*b^6 + 3*a^3*b^8 - a*b^10)*d*cos(d*x + c) + (a^8*b^3 - 3*a^6*b^5
+ 3*a^4*b^7 - a^2*b^9)*d), 1/2*(2*(a^6*b^2 - 3*a^4*b^4 + 3*a^2*b^6 - b^8)*d
*x*cos(d*x + c)^2 + 4*(a^7*b - 3*a^5*b^3 + 3*a^3*b^5 - a*b^7)*d*x*cos(d*x +
 c) + 2*(a^8 - 3*a^6*b^2 + 3*a^4*b^4 - a^2*b^6)*d*x - (2*a^7 - 5*a^5*b^2 +
6*a^3*b^4 + (2*a^5*b^2 - 5*a^3*b^4 + 6*a*b^6)*cos(d*x + c)^2 + 2*(2*a^6*b -
 5*a^4*b^3 + 6*a^2*b^5)*cos(d*x + c))*sqrt(a^2 - b^2)*arctan(-(a*cos(d*x +
c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c))) - (2*a^7*b - 7*a^5*b^3 + 5*a^3*b^5
+ 3*(a^6*b^2 - 3*a^4*b^4 + 2*a^2*b^6)*cos(d*x + c))*sin(d*x + c))/((a^6*b^5
 - 3*a^4*b^7 + 3*a^2*b^9 - b^11)*d*cos(d*x + c)^2 + 2*(a^7*b^4 - 3*a^5*b^6
+ 3*a^3*b^8 - a*b^10)*d*cos(d*x + c) + (a^8*b^3 - 3*a^6*b^5 + 3*a^4*b^7 - a
^2*b^9)*d)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3/(a+b*cos(d*x+c))**3,x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 319, normalized size of antiderivative = 1.78

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \frac{\frac{(2a^5-5a^3b^2+6ab^4)\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor\mathrm{sgn}(-2a+2b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{a^2-b^2}}\right)\right)}{(a^4b^3-2a^2b^5+b^7)\sqrt{a^2-b^2}} - \frac{2a^5\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-3a^4b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{}}{}$$

[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c))^3,x, algorithm="giac")

[Out] ((2*a^5 - 5*a^3*b^2 + 6*a*b^4)*(pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1/2*d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))/((a^4*b^3 - 2*a^2*b^5 + b^7)*sqrt(a^2 - b^2)) - (2*a^5*tan(1/2*d*x + 1/2*c)^3 - 3*a^4*b*tan(1/2*d*x + 1/2*c)^3 - 5*a^3*b^2*tan(1/2*d*x + 1/2*c)^3 + 6*a^2*b^3*tan(1/2*d*x + 1/2*c)^3 + 2*a^5*tan(1/2*d*x + 1/2*c) + 3*a^4*b*tan(1/2*d*x + 1/2*c) - 5*a^3*b^2*tan(1/2*d*x + 1/2*c) - 6*a^2*b^3*tan(1/2*d*x + 1/2*c))/((a^4*b^2 - 2*a^2*b^4 + b^6)*(a*tan(1/2*d*x + 1/2*c)^2 - b*tan(1/2*d*x + 1/2*c)^2 + a + b)^2) + (d*x + c)/b^3)/d

Mupad [B] (verification not implemented)

Time = 23.09 (sec) , antiderivative size = 5102, normalized size of antiderivative = 28.50

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Too large to display}$$

[In] int(cos(c + d*x)^3/(a + b*cos(c + d*x))^3,x)

[Out] (2*atan((((((8*(12*a*b^14 - 4*b^15 + 8*a^2*b^13 - 34*a^3*b^12 - 6*a^4*b^11 + 36*a^5*b^10 + 4*a^6*b^9 - 18*a^7*b^8 - 2*a^8*b^7 + 4*a^9*b^6))/(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6) - (tan(c/2 + (d*x)/2)*(8*a*b^15 - 8*a^2*b^14 - 32*a^3*b^13 + 32*a^4*b^12 + 48*a^5*b^11 - 48*a^6*b^10 - 32*a^7*b^9 + 32*a^8*b^8 + 8*a^9*b^7 - 8*a^10*b^6)*8i)/(b^3*(a*b^10 + b^11 - 3*a^2*b^9 - 3*a^3*b^8 + 3*a^4*b^7 + 3*a^5*b^6 - a^6*b^5 - a^7*b^4)))*1i)/b^3 + (8*tan(c/2 + (d*x)/2)*(8*a^10 - 8*a^9*b - 8*a*b^9 + 4*b^10 + 24*a^2*b^8 + 32*a^3*b^7 - 52*a^4*b^6 - 48*a^5*b^5 + 57*a^6*b^4 + 32*a^7*b^3 - 32*a^8*b^2))/(a*b^10 + b^11 - 3*a^2*b^9 - 3*a^3*b^8 + 3*a^4*b^7 + 3*a^5*b^6 - a^6*b^5 - a^7*b^4))/b^3 - ((((8*(12*a*b^14 - 4*b^15 + 8*a^2*b^13 - 34*a^3*b^12 - 6*a^4*b^11 + 36*a^5*b^10 + 4*a^6*b^9 - 18*a^7*b^8 - 2*a^8*b^7 + 4*a^9*b^6))/(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6) + (tan(c/2 + (d*x)/2)*(8*a*b^15

- 8*a^2*b^14 - 32*a^3*b^13 + 32*a^4*b^12 + 48*a^5*b^11 - 48*a^6*b^10 - 32*a^7*b^9 + 32*a^8*b^8 + 8*a^9*b^7 - 8*a^10*b^6)*8i)/(b^3*(a*b^10 + b^11 - 3*a^2*b^9 - 3*a^3*b^8 + 3*a^4*b^7 + 3*a^5*b^6 - a^6*b^5 - a^7*b^4)))*1i)/b^3 - (8*tan(c/2 + (d*x)/2)*(8*a^10 - 8*a^9*b - 8*a*b^9 + 4*b^10 + 24*a^2*b^8 + 32*a^3*b^7 - 52*a^4*b^6 - 48*a^5*b^5 + 57*a^6*b^4 + 32*a^7*b^3 - 32*a^8*b^2))/(a*b^10 + b^11 - 3*a^2*b^9 - 3*a^3*b^8 + 3*a^4*b^7 + 3*a^5*b^6 - a^6*b^5 - a^7*b^4))/b^3)/((((((8*(12*a*b^14 - 4*b^15 + 8*a^2*b^13 - 34*a^3*b^12 - 6*a^4*b^11 + 36*a^5*b^10 + 4*a^6*b^9 - 18*a^7*b^8 - 2*a^8*b^7 + 4*a^9*b^6))/(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6) - (tan(c/2 + (d*x)/2)*(8*a*b^15 - 8*a^2*b^14 - 32*a^3*b^13 + 32*a^4*b^12 + 48*a^5*b^11 - 48*a^6*b^10 - 32*a^7*b^9 + 32*a^8*b^8 + 8*a^9*b^7 - 8*a^10*b^6)*8i)/(b^3*(a*b^10 + b^11 - 3*a^2*b^9 - 3*a^3*b^8 + 3*a^4*b^7 + 3*a^5*b^6 - a^6*b^5 - a^7*b^4)))*1i)/b^3 + (8*tan(c/2 + (d*x)/2)*(8*a^10 - 8*a^9*b - 8*a*b^9 + 4*b^10 + 24*a^2*b^8 + 32*a^3*b^7 - 52*a^4*b^6 - 48*a^5*b^5 + 57*a^6*b^4 + 32*a^7*b^3 - 32*a^8*b^2))/(a*b^10 + b^11 - 3*a^2*b^9 - 3*a^3*b^8 + 3*a^4*b^7 + 3*a^5*b^6 - a^6*b^5 - a^7*b^4))*1i)/b^3 + (((((8*(12*a*b^14 - 4*b^15 + 8*a^2*b^13 - 34*a^3*b^12 - 6*a^4*b^11 + 36*a^5*b^10 + 4*a^6*b^9 - 18*a^7*b^8 - 2*a^8*b^7 + 4*a^9*b^6))/(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6) + (tan(c/2 + (d*x)/2)*(8*a*b^15 - 8*a^2*b^14 - 32*a^3*b^13 + 32*a^4*b^12 + 48*a^5*b^11 - 48*a^6*b^10 - 32*a^7*b^9 + 32*a^8*b^8 + 8*a^9*b^7 - 8*a^10*b^6)*8i)/(b^3*(a*b^10 + b^11 - 3*a^2*b^9 - 3*a^3*b^8 + 3*a^4*b^7 + 3*a^5*b^6 - a^6*b^5 - a^7*b^4)))*1i)/b^3 - (8*tan(c/2 + (d*x)/2)*(8*a^10 - 8*a^9*b - 8*a*b^9 + 4*b^10 + 24*a^2*b^8 + 32*a^3*b^7 - 52*a^4*b^6 - 48*a^5*b^5 + 57*a^6*b^4 + 32*a^7*b^3 - 32*a^8*b^2))/(a*b^10 + b^11 - 3*a^2*b^9 - 3*a^3*b^8 + 3*a^4*b^7 + 3*a^5*b^6 - a^6*b^5 - a^7*b^4))*1i)/b^3 + (16*(12*a*b^8 - 2*a^8*b + 4*a^9 + 24*a^2*b^7 - 34*a^3*b^6 - 26*a^4*b^5 + 36*a^5*b^4 + 13*a^6*b^3 - 18*a^7*b^2))/(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6))))/(b^3*d) + ((tan(c/2 + (d*x)/2)^3*(a^3*b - 2*a^4 + 6*a^2*b^2))/((a*b^2 - b^3)*(a + b)^2) - (tan(c/2 + (d*x)/2)*(a^3*b + 2*a^4 - 6*a^2*b^2))/((a + b)*(b^4 - 2*a*b^3 + a^2*b^2)))/(d*(2*a*b + tan(c/2 + (d*x)/2)^2*(2*a^2 - 2*b^2) + tan(c/2 + (d*x)/2)^4*(a^2 - 2*a*b + b^2) + a^2 + b^2)) + (a*atan(((a*((8*tan(c/2 + (d*x)/2)*(8*a^10 - 8*a^9*b - 8*a*b^9 + 4*b^10 + 24*a^2*b^8 + 32*a^3*b^7 - 52*a^4*b^6 - 48*a^5*b^5 + 57*a^6*b^4 + 32*a^7*b^3 - 32*a^8*b^2))/(a*b^10 + b^11 - 3*a^2*b^9 - 3*a^3*b^8 + 3*a^4*b^7 + 3*a^5*b^6 - a^6*b^5 - a^7*b^4) + (a*((8*(12*a*b^14 - 4*b^15 + 8*a^2*b^13 - 34*a^3*b^12 - 6*a^4*b^11 + 36*a^5*b^10 + 4*a^6*b^9 - 18*a^7*b^8 - 2*a^8*b^7 + 4*a^9*b^6))/(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6) - (4*a*tan(c/2 + (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(2*a^4 + 6*b^4 - 5*a^2*b^2)*(8*a*b^15 - 8*a^2*b^14 - 32*a^3*b^13 + 32*a^4*b^12 + 48*a^5*b^11 - 48*a^6*b^10 - 32*a^7*b^9 + 32*a^8*b^8 + 8*a^9*b^7 - 8*a^10*b^6))/((b^13 - 5*a^2*b^11 + 10*a^4*b^9 - 10*a^6*b^7 + 5*a^8*b^5 - a^10*b^3)*(a*b^10 + b^11 - 3*a^2*b^9 - 3*a^3*b^8 + 3*a^4*b^7 + 3*a^5*b^6 - a^6*b^5 - a^7*b^4)))*(-(a + b)^5*(a - b)^5)^(1/2)*(2*a^4 + 6*b^4 - 5*a^2*b^2))/(2*(b^13 - 5*a^2*b^11 + 10*a^4*b^9 - 10*a^6*b^7 + 5*a^8*b^5 - a^10*b^3)))*(-

(a + b)^5*(a - b)^5)^(1/2)*(2*a^4 + 6*b^4 - 5*a^2*b^2)*1i)/(2*(b^13 - 5*a^2
*b^11 + 10*a^4*b^9 - 10*a^6*b^7 + 5*a^8*b^5 - a^10*b^3)) + (a*((8*tan(c/2 +
 (d*x)/2)*(8*a^10 - 8*a^9*b - 8*a*b^9 + 4*b^10 + 24*a^2*b^8 + 32*a^3*b^7 -
52*a^4*b^6 - 48*a^5*b^5 + 57*a^6*b^4 + 32*a^7*b^3 - 32*a^8*b^2))/(a*b^10 +
b^11 - 3*a^2*b^9 - 3*a^3*b^8 + 3*a^4*b^7 + 3*a^5*b^6 - a^6*b^5 - a^7*b^4) -
 (a*((8*(12*a*b^14 - 4*b^15 + 8*a^2*b^13 - 34*a^3*b^12 - 6*a^4*b^11 + 36*a^
5*b^10 + 4*a^6*b^9 - 18*a^7*b^8 - 2*a^8*b^7 + 4*a^9*b^6))/(a*b^12 + b^13 -
3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6) + (4*a
*tan(c/2 + (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(2*a^4 + 6*b^4 - 5*a^2*b^2
)*(8*a*b^15 - 8*a^2*b^14 - 32*a^3*b^13 + 32*a^4*b^12 + 48*a^5*b^11 - 48*a^6
*b^10 - 32*a^7*b^9 + 32*a^8*b^8 + 8*a^9*b^7 - 8*a^10*b^6))/((b^13 - 5*a^2*b
^11 + 10*a^4*b^9 - 10*a^6*b^7 + 5*a^8*b^5 - a^10*b^3)*(a*b^10 + b^11 - 3*a^
2*b^9 - 3*a^3*b^8 + 3*a^4*b^7 + 3*a^5*b^6 - a^6*b^5 - a^7*b^4)))*(-(a + b)^
5*(a - b)^5)^(1/2)*(2*a^4 + 6*b^4 - 5*a^2*b^2))/(2*(b^13 - 5*a^2*b^11 + 10*
a^4*b^9 - 10*a^6*b^7 + 5*a^8*b^5 - a^10*b^3)))*(-(a + b)^5*(a - b)^5)^(1/2)
*(2*a^4 + 6*b^4 - 5*a^2*b^2)*1i)/(2*(b^13 - 5*a^2*b^11 + 10*a^4*b^9 - 10*a^
6*b^7 + 5*a^8*b^5 - a^10*b^3)))/((16*(12*a*b^8 - 2*a^8*b + 4*a^9 + 24*a^2*b
^7 - 34*a^3*b^6 - 26*a^4*b^5 + 36*a^5*b^4 + 13*a^6*b^3 - 18*a^7*b^2))/(a*b^
12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7
b^6) + (a((8*tan(c/2 + (d*x)/2)*(8*a^10 - 8*a^9*b - 8*a*b^9 + 4*b^10 + 24
*a^2*b^8 + 32*a^3*b^7 - 52*a^4*b^6 - 48*a^5*b^5 + 57*a^6*b^4 + 32*a^7*b^3 -
 32*a^8*b^2))/(a*b^10 + b^11 - 3*a^2*b^9 - 3*a^3*b^8 + 3*a^4*b^7 + 3*a^5*b^
6 - a^6*b^5 - a^7*b^4) + (a*((8*(12*a*b^14 - 4*b^15 + 8*a^2*b^13 - 34*a^3*b
^12 - 6*a^4*b^11 + 36*a^5*b^10 + 4*a^6*b^9 - 18*a^7*b^8 - 2*a^8*b^7 + 4*a^9
*b^6))/(a*b^12 + b^13 - 3*a^2*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a
^6*b^7 - a^7*b^6) - (4*a*tan(c/2 + (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(2
*a^4 + 6*b^4 - 5*a^2*b^2)*(8*a*b^15 - 8*a^2*b^14 - 32*a^3*b^13 + 32*a^4*b^1
2 + 48*a^5*b^11 - 48*a^6*b^10 - 32*a^7*b^9 + 32*a^8*b^8 + 8*a^9*b^7 - 8*a^1
0*b^6))/((b^13 - 5*a^2*b^11 + 10*a^4*b^9 - 10*a^6*b^7 + 5*a^8*b^5 - a^10*b^
3)*(a*b^10 + b^11 - 3*a^2*b^9 - 3*a^3*b^8 + 3*a^4*b^7 + 3*a^5*b^6 - a^6*b^5
 - a^7*b^4)))*(-(a + b)^5*(a - b)^5)^(1/2)*(2*a^4 + 6*b^4 - 5*a^2*b^2))/(2*
(b^13 - 5*a^2*b^11 + 10*a^4*b^9 - 10*a^6*b^7 + 5*a^8*b^5 - a^10*b^3)))*(-(a
 + b)^5*(a - b)^5)^(1/2)*(2*a^4 + 6*b^4 - 5*a^2*b^2))/(2*(b^13 - 5*a^2*b^11
 + 10*a^4*b^9 - 10*a^6*b^7 + 5*a^8*b^5 - a^10*b^3)) - (a*((8*tan(c/2 + (d*x
)/2)*(8*a^10 - 8*a^9*b - 8*a*b^9 + 4*b^10 + 24*a^2*b^8 + 32*a^3*b^7 - 52*a^
4*b^6 - 48*a^5*b^5 + 57*a^6*b^4 + 32*a^7*b^3 - 32*a^8*b^2))/(a*b^10 + b^11
 - 3*a^2*b^9 - 3*a^3*b^8 + 3*a^4*b^7 + 3*a^5*b^6 - a^6*b^5 - a^7*b^4) - (a*(
(8*(12*a*b^14 - 4*b^15 + 8*a^2*b^13 - 34*a^3*b^12 - 6*a^4*b^11 + 36*a^5*b^1
0 + 4*a^6*b^9 - 18*a^7*b^8 - 2*a^8*b^7 + 4*a^9*b^6))/(a*b^12 + b^13 - 3*a^2
*b^11 - 3*a^3*b^10 + 3*a^4*b^9 + 3*a^5*b^8 - a^6*b^7 - a^7*b^6) + (4*a*tan(
c/2 + (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(2*a^4 + 6*b^4 - 5*a^2*b^2)*(8*
a*b^15 - 8*a^2*b^14 - 32*a^3*b^13 + 32*a^4*b^12 + 48*a^5*b^11 - 48*a^6*b^10
 - 32*a^7*b^9 + 32*a^8*b^8 + 8*a^9*b^7 - 8*a^10*b^6))/((b^13 - 5*a^2*b^11 +
 10*a^4*b^9 - 10*a^6*b^7 + 5*a^8*b^5 - a^10*b^3)*(a*b^10 + b^11 - 3*a^2*b^9
 - 3*a^3*b^8 + 3*a^4*b^7 + 3*a^5*b^6 - a^6*b^5 - a^7*b^4)))*(-(a + b)^5*(a

```
- b)^5)^(1/2)*(2*a^4 + 6*b^4 - 5*a^2*b^2))/(2*(b^13 - 5*a^2*b^11 + 10*a^4*b
^9 - 10*a^6*b^7 + 5*a^8*b^5 - a^10*b^3)))*(-(a + b)^5*(a - b)^5)^(1/2)*(2*a
^4 + 6*b^4 - 5*a^2*b^2))/(2*(b^13 - 5*a^2*b^11 + 10*a^4*b^9 - 10*a^6*b^7 +
5*a^8*b^5 - a^10*b^3))))*(-(a + b)^5*(a - b)^5)^(1/2)*(2*a^4 + 6*b^4 - 5*a^
2*b^2)*1i)/(d*(b^13 - 5*a^2*b^11 + 10*a^4*b^9 - 10*a^6*b^7 + 5*a^8*b^5 - a^
10*b^3))
```

3.472 $\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 149

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \frac{(a^2+2b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{5/2}(a+b)^{5/2}d} - \frac{a^2\sin(c+dx)}{2b\,(a^2-b^2)\,d(a+b\cos(c+dx))^2} + \frac{a(a^2-4b^2)\sin(c+dx)}{2b\,(a^2-b^2)^2\,d(a+b\cos(c+dx))}$$

```
[Out] (a^2+2*b^2)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/2))/(a-b)^(5/2)/
(a+b)^(5/2)/d-1/2*a^2*sin(d*x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))^2+1/2*a*(a^
2-4*b^2)*sin(d*x+c)/b/(a^2-b^2)^2/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 149, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2869, 2833, 12, 2738, 211}

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \frac{(a^2+2b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{d(a-b)^{5/2}(a+b)^{5/2}} - \frac{a^2\sin(c+dx)}{2bd\,(a^2-b^2)\,(a+b\cos(c+dx))^2} + \frac{a(a^2-4b^2)\sin(c+dx)}{2bd\,(a^2-b^2)^2\,(a+b\cos(c+dx))}$$

```
[In] Int[Cos[c + d*x]^2/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] ((a^2 + 2*b^2)*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/((a - b)
^(5/2)*(a + b)^(5/2)*d) - (a^2*Sin[c + d*x])/(2*b*(a^2 - b^2)*d*(a + b*Cos[
c + d*x])^2) + (a*(a^2 - 4*b^2)*Sin[c + d*x])/(2*b*(a^2 - b^2)^2*d*(a + b*C
os[c + d*x]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2833

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((a + b*Sin[e +
 f*x])^(m + 1)/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(a^2 - b^2)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[(a*c - b*d)*(m + 1) - (b*c - a*d)*(m
 + 2)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 - b^2, 0] && LtQ[m, -1] && IntegerQ[2*m]
```

Rule 2869

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^2, x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Cos[e
+ f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*(a^2 - b^2))), x] - Dist[
1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[b*(m + 1)*
(2*b*c*d - a*(c^2 + d^2)) + (a^2*d^2 - 2*a*b*c*d*(m + 2) + b^2*(d^2*(m + 1)
 + c^2*(m + 2)))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &
& NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && LtQ[m, -1]
```

Rubi steps

$$\text{integral} = -\frac{a^2\sin(c+dx)}{2b\,(a^2-b^2)\,d(a+b\cos(c+dx))^2}+\frac{\int\frac{2ab+(a^2-2b^2)\cos(c+dx)}{(a+b\cos(c+dx))^2}\,dx}{2b\,(a^2-b^2)}$$

$$=-\frac{a^2\sin(c+dx)}{2b\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{a(a^2-4b^2)\sin(c+dx)}{2b\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}+\frac{\int\frac{b(a^2+2b^2)}{a+b\cos(c+dx)}\,dx}{2b\left(a^2-b^2\right)^2}$$

$$=-\frac{a^2\sin(c+dx)}{2b\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{a(a^2-4b^2)\sin(c+dx)}{2b\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}+\frac{(a^2+2b^2)\int\frac{1}{a+b\cos(c+dx)}\,dx}{2\left(a^2-b^2\right)^2}$$

$$=-\frac{a^2\sin(c+dx)}{2b\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{a(a^2-4b^2)\sin(c+dx)}{2b\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}+\frac{(a^2+2b^2)\,\text{Subst}\left(\int\frac{1}{a+b+(a-b)x^2}\,dx,x,\tan\left(\frac{1}{2}(c+dx)\right)\right)}{\left(a^2-b^2\right)^2d}$$

$$=\frac{(a^2+2b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{5/2}(a+b)^{5/2}d}-\frac{a^2\sin(c+dx)}{2b\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{a(a^2-4b^2)\sin(c+dx)}{2b\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 0.55 (sec) , antiderivative size = 115, normalized size of antiderivative = 0.77

$$\int\frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx=\frac{-\frac{2(a^2+2b^2)\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{5/2}}+\frac{a(-3ab+(a^2-4b^2)\cos(c+dx))\sin(c+dx)}{(a-b)^2(a+b)^2(a+b\cos(c+dx))^2}}{2d}$$

```
[In] Integrate[Cos[c + d*x]^2/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] ((-2*(a^2 + 2*b^2)*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/(-
a^2 + b^2)^(5/2) + (a*(-3*a*b + (a^2 - 4*b^2)*Cos[c + d*x])*Sin[c + d*x])/(
(a - b)^2*(a + b)^2*(a + b*Cos[c + d*x])^2))/(2*d)
```

Maple [A] (verified)

Time = 1.16 (sec) , antiderivative size = 180, normalized size of antiderivative = 1.21

method	result
derivativedivides	$\frac{\frac{-\frac{(a+4b)a\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{(a-b)\left(a^2+2ab+b^2\right)}+\frac{(a-4b)a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{(a+b)\left(a^2-2ab+b^2\right)}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^2}+\frac{\left(a^2+2b^2\right)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{\left(a^4-2a^2b^2+b^4\right)\sqrt{(a-b)(a+b)}}}{d}$
default	$\frac{\frac{-\frac{(a+4b)a\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{(a-b)\left(a^2+2ab+b^2\right)}+\frac{(a-4b)a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{(a+b)\left(a^2-2ab+b^2\right)}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^2}+\frac{\left(a^2+2b^2\right)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{\left(a^4-2a^2b^2+b^4\right)\sqrt{(a-b)(a+b)}}}{d}$
risch	$\frac{ia\left(2b\,a^3 e^{3i(dx+c)}-5b^3 a\, e^{3i(dx+c)}+2a^4 e^{2i(dx+c)}-7b^2a^2 e^{2i(dx+c)}-4b^4 e^{2i(dx+c)}+2b\,a^3 e^{i(dx+c)}-11\, e^{i(dx+c)}b^3a+a^2b^2-\right.}{b^2\left(a^2-b^2\right)^2 d\left(b\, e^{2i(dx+c)}+2a\, e^{i(dx+c)}+b\right)^2}$

```
[In] int(cos(d*x+c)^2/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(2*(-1/2*(a+4*b)*a/(a-b)/(a^2+2*a*b+b^2)*tan(1/2*d*x+1/2*c)^3+1/2*(a-4*
b)*a/(a+b)/(a^2-2*a*b+b^2)*tan(1/2*d*x+1/2*c))/(tan(1/2*d*x+1/2*c)^2*a-b*ta
n(1/2*d*x+1/2*c)^2+a+b)^2+(a^2+2*b^2)/(a^4-2*a^2*b^2+b^4)/((a-b)*(a+b))^(1/
2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 587, normalized size of antiderivative = 3.94

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \left[-\frac{\left(a^4+2\,a^2b^2+\left(a^2b^2+2\,b^4\right)\cos\left(dx+c\right)^2+2\left(a^3b+2\,ab^3\right)\cos\left(dx+c\right)\right)\sqrt{-a^2+b^2}\log\left(\frac{2\,ab\cos(dx+c)+(2}{}\right.}{4\left(\left(a^6b^2-3\,a^4b^4+3\,a^2b^6-b^8\right)d\cos\left(dx+c\right)^2+2\left(a^7b\right.\right.}\right.$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] [-1/4*((a^4 + 2*a^2*b^2 + (a^2*b^2 + 2*b^4)*cos(d*x + c)^2 + 2*(a^3*b + 2*a
*b^3)*cos(d*x + c))*sqrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2
)*cos(d*x + c)^2 + 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a
^2 + 2*b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) + 2*(3*a^4*b -
 3*a^2*b^3 - (a^5 - 5*a^3*b^2 + 4*a*b^4)*cos(d*x + c))*sin(d*x + c))/((a^6*
b^2 - 3*a^4*b^4 + 3*a^2*b^6 - b^8)*d*cos(d*x + c)^2 + 2*(a^7*b - 3*a^5*b^3
+ 3*a^3*b^5 - a*b^7)*d*cos(d*x + c) + (a^8 - 3*a^6*b^2 + 3*a^4*b^4 - a^2*b^
6)*d), 1/2*((a^4 + 2*a^2*b^2 + (a^2*b^2 + 2*b^4)*cos(d*x + c)^2 + 2*(a^3*b
+ 2*a*b^3)*cos(d*x + c))*sqrt(a^2 - b^2)*arctan(-(a*cos(d*x + c) + b)/(sqrt
(a^2 - b^2)*sin(d*x + c))) - (3*a^4*b - 3*a^2*b^3 - (a^5 - 5*a^3*b^2 + 4*a*
```

```
b^4)*cos(d*x + c))*sin(d*x + c))/((a^6*b^2 - 3*a^4*b^4 + 3*a^2*b^6 - b^8)*d
*cos(d*x + c)^2 + 2*(a^7*b - 3*a^5*b^3 + 3*a^3*b^5 - a*b^7)*d*cos(d*x + c)
+ (a^8 - 3*a^6*b^2 + 3*a^4*b^4 - a^2*b^6)*d)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**2/(a+b*cos(d*x+c))**3,x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.68

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx = -\frac{\frac{\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor\operatorname{sgn}(-2a+2b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{a^2-b^2}}\right)\right)(a^2+2b^2)}{(a^4-2a^2b^2+b^4)\sqrt{a^2-b^2}} + \frac{a^3\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3+3a^2b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-4ab^2\,\mathrm{t}}{(a^4-2a^2b^2+b^4)(}}{d}$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -((pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1/2*d*
x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))*(a^2 + 2*b^2)/((a^4
```

```
- 2*a^2*b^2 + b^4)*sqrt(a^2 - b^2)) + (a^3*tan(1/2*d*x + 1/2*c)^3 + 3*a^2*b
*tan(1/2*d*x + 1/2*c)^3 - 4*a*b^2*tan(1/2*d*x + 1/2*c)^3 - a^3*tan(1/2*d*x
+ 1/2*c) + 3*a^2*b*tan(1/2*d*x + 1/2*c) + 4*a*b^2*tan(1/2*d*x + 1/2*c))/((a
^4 - 2*a^2*b^2 + b^4)*(a*tan(1/2*d*x + 1/2*c)^2 - b*tan(1/2*d*x + 1/2*c)^2
+ a + b)^2))/d
```

Mupad [B] (verification not implemented)

Time = 17.06 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.36

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \frac{\mathrm{atan}\left(\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,(2\,a-2\,b)\,\left(a^2-2\,a\,b+b^2\right)}{2\,\sqrt{a+b}\,(a-b)^{5/2}}\right)\,\left(a^2+2\,b^2\right)}{d\,(a+b)^{5/2}\,(a-b)^{5/2}} - \frac{\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3\,\left(a^2+4\,b\,a\right)}{(a+b)^2\,(a-b)}+\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(4\,a\,b-a^2\right)}{(a+b)\,\left(a^2-2\,a\,b+b^2\right)}}{d\,\left(2\,a\,b+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2\,\left(2\,a^2-2\,b^2\right)+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\,\left(a^2-2\,a\,b+b^2\right)+a^2+b^2\right)}$$

```
[In] int(cos(c + d*x)^2/(a + b*cos(c + d*x))^3,x)
```

```
[Out] (atan((tan(c/2 + (d*x)/2)*(2*a - 2*b)*(a^2 - 2*a*b + b^2))/(2*(a + b)^(1/2)
*(a - b)^(5/2)))*(a^2 + 2*b^2))/(d*(a + b)^(5/2)*(a - b)^(5/2)) - ((tan(c/2
 + (d*x)/2)^3*(4*a*b + a^2))/((a + b)^2*(a - b)) + (tan(c/2 + (d*x)/2)*(4*a
*b - a^2))/((a + b)*(a^2 - 2*a*b + b^2)))/(d*(2*a*b + tan(c/2 + (d*x)/2)^2*
(2*a^2 - 2*b^2) + tan(c/2 + (d*x)/2)^4*(a^2 - 2*a*b + b^2) + a^2 + b^2))
```

3.473 $\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 134

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^3}\,dx = -\frac{3ab\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{5/2}(a+b)^{5/2}d} + \frac{a\sin(c+dx)}{2\left(a^2-b^2\right)d(a+b\cos(c+dx))^2} + \frac{\left(a^2+2b^2\right)\sin(c+dx)}{2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}$$

```
[Out] -3*a*b*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/2))/(a-b)^(5/2)/(a+b)
^(5/2)/d+1/2*a*sin(d*x+c)/(a^2-b^2)/d/(a+b*cos(d*x+c))^2+1/2*(a^2+2*b^2)*si
n(d*x+c)/(a^2-b^2)^2/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 134, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {2833, 12, 2738, 211}

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \frac{\left(a^2+2b^2\right)\sin(c+dx)}{2d\left(a^2-b^2\right)^2(a+b\cos(c+dx))} + \frac{a\sin(c+dx)}{2d\left(a^2-b^2\right)(a+b\cos(c+dx))^2} - \frac{3ab\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{d(a-b)^{5/2}(a+b)^{5/2}}$$

```
[In] Int[Cos[c + d*x]/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (-3*a*b*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/((a - b)^(5/2)*
(a + b)^(5/2)*d) + (a*Sin[c + d*x])/(2*(a^2 - b^2)*d*(a + b*Cos[c + d*x])^2
) + ((a^2 + 2*b^2)*Sin[c + d*x])/(2*(a^2 - b^2)^2*d*(a + b*Cos[c + d*x]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2833

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((a + b*Sin[e +
 f*x])^(m + 1)/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(a^2 - b^2)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[(a*c - b*d)*(m + 1) - (b*c - a*d)*(m
 + 2)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 - b^2, 0] && LtQ[m, -1] && IntegerQ[2*m]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{a\sin(c+dx)}{2\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}-\frac{\int\frac{2b-a\cos(c+dx)}{(a+b\cos(c+dx))^2}\,dx}{2\left(a^2-b^2\right)}\\
&= \frac{a\sin(c+dx)}{2\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{\left(a^2+2b^2\right)\sin(c+dx)}{2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}+\frac{\int-\frac{3ab}{a+b\cos(c+dx)}\,dx}{2\left(a^2-b^2\right)^2}\\
&= \frac{a\sin(c+dx)}{2\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{\left(a^2+2b^2\right)\sin(c+dx)}{2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}-\frac{(3ab)\int\frac{1}{a+b\cos(c+dx)}\,dx}{2\left(a^2-b^2\right)^2}\\
&= \frac{a\sin(c+dx)}{2\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{\left(a^2+2b^2\right)\sin(c+dx)}{2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}\\
&\quad-\frac{(3ab)\text{Subst}\left(\int\frac{1}{a+b+(a-b)x^2}\,dx,x,\tan\left(\frac{1}{2}(c+dx)\right)\right)}{\left(a^2-b^2\right)^2d}
\end{aligned}
$$

$$= -\frac{3ab\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{5/2}(a+b)^{5/2}d} + \frac{a\sin(c+dx)}{2\left(a^2-b^2\right)d(a+b\cos(c+dx))^2} + \frac{\left(a^2+2b^2\right)\sin(c+dx)}{2\left(a^2-b^2\right)^2 d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 115, normalized size of antiderivative = 0.86

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \frac{\frac{6ab\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{\sqrt{-a^2+b^2}} + \frac{\left(a\left(2a^2+b^2\right)+b\left(a^2+2b^2\right)\cos(c+dx)\right)\sin(c+dx)}{(a+b\cos(c+dx))^2}}{2(a-b)^2(a+b)^2 d}$$

```
[In] Integrate[Cos[c + d*x]/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] ((6*a*b*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/Sqrt[-a^2 + b
^2] + ((a*(2*a^2 + b^2) + b*(a^2 + 2*b^2)*Cos[c + d*x])*Sin[c + d*x])/(a +
b*Cos[c + d*x])^2)/(2*(a - b)^2*(a + b)^2*d)
```

Maple [A] (verified)

Time = 1.08 (sec) , antiderivative size = 191, normalized size of antiderivative = 1.43

method	result
derivativedivides	$\frac{-\frac{2\left(-\frac{\left(2a^2+ab+2b^2\right)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)\left(a^2+2ab+b^2\right)}-\frac{\left(2a^2-ab+2b^2\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2(a+b)\left(a^2-2ab+b^2\right)}\right)}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^2}-\frac{3ab\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{\left(a^4-2a^2b^2+b^4\right)\sqrt{(a-b)(a+b)}}}{d}$
default	$\frac{-\frac{2\left(-\frac{\left(2a^2+ab+2b^2\right)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)\left(a^2+2ab+b^2\right)}-\frac{\left(2a^2-ab+2b^2\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2(a+b)\left(a^2-2ab+b^2\right)}\right)}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^2}-\frac{3ab\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{\left(a^4-2a^2b^2+b^4\right)\sqrt{(a-b)(a+b)}}}{d}$
risch	$\frac{i\left(3b^3a\,e^{3i(dx+c)}+2a^4e^{2i(dx+c)}+5b^2a^2e^{2i(dx+c)}+2b^4e^{2i(dx+c)}+4b\,a^3e^{i(dx+c)}+5\,e^{i(dx+c)}b^3a+a^2b^2+2b^4\right)}{b\left(a^2-b^2\right)^2 d\left(b\,e^{2i(dx+c)}+2a\,e^{i(dx+c)}+b\right)^2} - \frac{3ab\ln\left(e^{i(d\cdots}\right.}{2\sqrt{-\cdots}}$

```
[In] int(cos(d*x+c)/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-2*(-1/2*(2*a^2+a*b+2*b^2)/(a-b)/(a^2+2*a*b+b^2)*tan(1/2*d*x+1/2*c)^3-
1/2*(2*a^2-a*b+2*b^2)/(a+b)/(a^2-2*a*b+b^2)*tan(1/2*d*x+1/2*c))/(tan(1/2*d*
x+1/2*c)^2*a-b*tan(1/2*d*x+1/2*c)^2+a+b)^2-3*a*b/(a^4-2*a^2*b^2+b^4)/((a-b)
*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 243 vs. $2(121) = 242$.

Time = 0.29 (sec) , antiderivative size = 555, normalized size of antiderivative = 4.14

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \left[-\frac{3\left(ab^3\cos\left(dx+c\right)^2+2\,a^2b^2\cos\left(dx+c\right)+a^3b\right)\sqrt{-a^2+b^2}\log\left(\frac{2\,ab\cos(dx+c)+(2\,a^2-b^2)\cos(dx+c)^2-2\,\sqrt{-a^2+b^2}}{b^2\cos(dx+c)^2+2\,ab\cos(c}\right.}{4\left((a^6b^2-3\,a^4b^4+3\,a^2b^6-b^8)d\cos\left(dx+c\right)^2+2\left(a^7b-3\,a^5b^3+\right.\right.}\right.$$
$$-\frac{3\left(ab^3\cos\left(dx+c\right)^2+2\,a^2b^2\cos\left(dx+c\right)+a^3b\right)\sqrt{a^2-b^2}\arctan\left(-\frac{a\cos(dx+c)+b}{\sqrt{a^2-b^2}\sin(dx+c)}\right)-\left(2\,a^5-a^3b^2-ab\right.}{2\left((a^6b^2-3\,a^4b^4+3\,a^2b^6-b^8)d\cos\left(dx+c\right)^2+2\left(a^7b-3\,a^5b^3+3\,a^3b^5-ab^7\right)d\cos\left(dx+\right.\right.}$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] [-1/4*(3*(a*b^3*cos(d*x + c)^2 + 2*a^2*b^2*cos(d*x + c) + a^3*b)*sqrt(-a^2
+ b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x + c)^2 - 2*sqrt(-a^2
 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2)/(b^2*cos(d*x + c)^
2 + 2*a*b*cos(d*x + c) + a^2)) - 2*(2*a^5 - a^3*b^2 - a*b^4 + (a^4*b + a^2*
b^3 - 2*b^5)*cos(d*x + c))*sin(d*x + c))/((a^6*b^2 - 3*a^4*b^4 + 3*a^2*b^6
- b^8)*d*cos(d*x + c)^2 + 2*(a^7*b - 3*a^5*b^3 + 3*a^3*b^5 - a*b^7)*d*cos(d
*x + c) + (a^8 - 3*a^6*b^2 + 3*a^4*b^4 - a^2*b^6)*d), -1/2*(3*(a*b^3*cos(d*
x + c)^2 + 2*a^2*b^2*cos(d*x + c) + a^3*b)*sqrt(a^2 - b^2)*arctan(-(a*cos(d
*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c))) - (2*a^5 - a^3*b^2 - a*b^4 + (
a^4*b + a^2*b^3 - 2*b^5)*cos(d*x + c))*sin(d*x + c))/((a^6*b^2 - 3*a^4*b^4
+ 3*a^2*b^6 - b^8)*d*cos(d*x + c)^2 + 2*(a^7*b - 3*a^5*b^3 + 3*a^3*b^5 - a*
b^7)*d*cos(d*x + c) + (a^8 - 3*a^6*b^2 + 3*a^4*b^4 - a^2*b^6)*d)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))**3,x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 271 vs. 2(121) = 242.

Time = 0.32 (sec) , antiderivative size = 271, normalized size of antiderivative = 2.02

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \frac{\frac{3\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor\operatorname{sgn}(-2a+2b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{a^2-b^2}}\right)\right)ab}{(a^4-2a^2b^2+b^4)\sqrt{a^2-b^2}} + \frac{2a^3\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-a^2b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3+ab^2\tan\left(\frac{1}{2}dx+\frac{1}{2}\right.}{(a^4-2}}{d}$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] (3*(pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1/2*d
*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))*a*b/((a^4 - 2*a^2*b
^2 + b^4)*sqrt(a^2 - b^2)) + (2*a^3*tan(1/2*d*x + 1/2*c)^3 - a^2*b*tan(1/2*
d*x + 1/2*c)^3 + a*b^2*tan(1/2*d*x + 1/2*c)^3 - 2*b^3*tan(1/2*d*x + 1/2*c)^
3 + 2*a^3*tan(1/2*d*x + 1/2*c) + a^2*b*tan(1/2*d*x + 1/2*c) + a*b^2*tan(1/2
*d*x + 1/2*c) + 2*b^3*tan(1/2*d*x + 1/2*c))/((a^4 - 2*a^2*b^2 + b^4)*(a*tan
(1/2*d*x + 1/2*c)^2 - b*tan(1/2*d*x + 1/2*c)^2 + a + b)^2))/d
```

Mupad [B] (verification not implemented)

Time = 16.76 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.54

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^3}\,dx$$
$$= \frac{\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3\,(2\,a^2+a\,b+2\,b^2)}{(a+b)^2\,(a-b)}+\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,(2\,a^2-a\,b+2\,b^2)}{(a+b)\,(a^2-2\,a\,b+b^2)}}{d\,\left(2\,a\,b+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2\,(2\,a^2-2\,b^2)+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\,(a^2-2\,a\,b+b^2)+a^2+b^2\right)} - \frac{3\,a\,b\,\mathrm{atan}\left(\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,(2\,a-2\,b)\,(a^2-2\,a\,b+b^2)}{2\,\sqrt{a+b}\,(a-b)^{5/2}}\right)}{d\,(a+b)^{5/2}\,(a-b)^{5/2}}$$

```
[In] int(cos(c + d*x)/(a + b*cos(c + d*x))^3,x)
```

```
[Out] ((tan(c/2 + (d*x)/2)^3*(a*b + 2*a^2 + 2*b^2))/((a + b)^2*(a - b)) + (tan(c/
2 + (d*x)/2)*(2*a^2 - a*b + 2*b^2))/((a + b)*(a^2 - 2*a*b + b^2)))/(d*(2*a*
b + tan(c/2 + (d*x)/2)^2*(2*a^2 - 2*b^2) + tan(c/2 + (d*x)/2)^4*(a^2 - 2*a*
b + b^2) + a^2 + b^2)) - (3*a*b*atan((tan(c/2 + (d*x)/2)*(2*a - 2*b)*(a^2 -
 2*a*b + b^2))/(2*(a + b)^(1/2)*(a - b)^(5/2))))/(d*(a + b)^(5/2)*(a - b)^(
5/2))
```

3.474 $\int \frac{1}{(a+b\cos(c+dx))^3} \, dx$

Optimal result

Integrand size = 12, antiderivative size = 133

$$\int \frac{1}{(a+b\cos(c+dx))^3} \, dx = \frac{(2a^2+b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{5/2}(a+b)^{5/2}d} - \frac{b\sin(c+dx)}{2(a^2-b^2)\,d(a+b\cos(c+dx))^2} - \frac{3ab\sin(c+dx)}{2(a^2-b^2)^2\,d(a+b\cos(c+dx))}$$

```
[Out] (2*a^2+b^2)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/2))/(a-b)^(5/2)/
(a+b)^(5/2)/d-1/2*b*sin(d*x+c)/(a^2-b^2)/d/(a+b*cos(d*x+c))^2-3/2*a*b*sin(d
*x+c)/(a^2-b^2)^2/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 133, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.417$, Rules used = {2743, 2833, 12, 2738, 211}

$$\int \frac{1}{(a+b\cos(c+dx))^3} \, dx = \frac{(2a^2+b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{d(a-b)^{5/2}(a+b)^{5/2}} - \frac{3ab\sin(c+dx)}{2d(a^2-b^2)^2(a+b\cos(c+dx))} - \frac{b\sin(c+dx)}{2d(a^2-b^2)(a+b\cos(c+dx))^2}$$

```
[In] Int[(a + b*Cos[c + d*x])^(-3),x]
```

```
[Out] ((2*a^2 + b^2)*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/((a - b)
^(5/2)*(a + b)^(5/2)*d) - (b*Sin[c + d*x])/(2*(a^2 - b^2)*d*(a + b*Cos[c +
d*x])^2) - (3*a*b*Sin[c + d*x])/(2*(a^2 - b^2)^2*d*(a + b*Cos[c + d*x]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2743

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos
[c + d*x]*((a + b*Sin[c + d*x])^(n + 1)/(d*(n + 1)*(a^2 - b^2))), x] + Dist
[1/((n + 1)*(a^2 - b^2)), Int[(a + b*Sin[c + d*x])^(n + 1)*Simp[a*(n + 1) -
 b*(n + 2)*Sin[c + d*x], x], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2833

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((a + b*Sin[e +
 f*x])^(m + 1)/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(a^2 - b^2)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[(a*c - b*d)*(m + 1) - (b*c - a*d)*(m
 + 2)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 - b^2, 0] && LtQ[m, -1] && IntegerQ[2*m]
```

Rubi steps

$$\text{integral} = -\frac{b\sin(c+dx)}{2\left(a^2-b^2\right)d(a+b\cos(c+dx))^2} - \frac{\int \frac{-2a+b\cos(c+dx)}{(a+b\cos(c+dx))^2}\,dx}{2\left(a^2-b^2\right)}$$

$$= -\frac{b\sin(c+dx)}{2\left(a^2-b^2\right)d(a+b\cos(c+dx))^2} - \frac{3ab\sin(c+dx)}{2\left(a^2-b^2\right)^2 d(a+b\cos(c+dx))} + \frac{\int \frac{2a^2+b^2}{a+b\cos(c+dx)}\,dx}{2\left(a^2-b^2\right)^2}$$

$$
\begin{aligned}
&= -\frac{b\sin(c+dx)}{2(a^2-b^2)d(a+b\cos(c+dx))^2} \\
&\quad - \frac{3ab\sin(c+dx)}{2(a^2-b^2)^2 d(a+b\cos(c+dx))} + \frac{(2a^2+b^2)\int \frac{1}{a+b\cos(c+dx)}dx}{2(a^2-b^2)^2} \\
&= -\frac{b\sin(c+dx)}{2(a^2-b^2)d(a+b\cos(c+dx))^2} - \frac{3ab\sin(c+dx)}{2(a^2-b^2)^2 d(a+b\cos(c+dx))} \\
&\quad + \frac{(2a^2+b^2)\operatorname{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{(a^2-b^2)^2 d} \\
&= \frac{(2a^2+b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{5/2}(a+b)^{5/2}d} \\
&\quad - \frac{b\sin(c+dx)}{2(a^2-b^2)d(a+b\cos(c+dx))^2} - \frac{3ab\sin(c+dx)}{2(a^2-b^2)^2 d(a+b\cos(c+dx))}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.31 (sec) , antiderivative size = 113, normalized size of antiderivative = 0.85

$$
\int \frac{1}{(a+b\cos(c+dx))^3}dx = \frac{-\frac{2(2a^2+b^2)\operatorname{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{5/2}} + \frac{b(-4a^2+b^2-3ab\cos(c+dx))\sin(c+dx)}{(a-b)^2(a+b)^2(a+b\cos(c+dx))^2}}{2d}
$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(-3),x]
```

```
[Out] ((-2*(2*a^2 + b^2)*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/(-
a^2 + b^2)^(5/2) + (b*(-4*a^2 + b^2 - 3*a*b*Cos[c + d*x])*Sin[c + d*x])/((a
 - b)^2*(a + b)^2*(a + b*Cos[c + d*x])^2))/(2*d)
```

Maple [A] (verified)

Time = 1.17 (sec) , antiderivative size = 182, normalized size of antiderivative = 1.37

method	result
derivativedivides	$\frac{\frac{-\frac{(4a+b)b\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{(a-b)\left(a^2+2ab+b^2\right)}-\frac{(4a-b)b\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{(a+b)\left(a^2-2ab+b^2\right)}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^2}+\frac{\left(2a^2+b^2\right)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{\left(a^4-2a^2b^2+b^4\right)\sqrt{(a-b)(a+b)}}}{d}$
default	$\frac{\frac{-\frac{(4a+b)b\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{(a-b)\left(a^2+2ab+b^2\right)}-\frac{(4a-b)b\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{(a+b)\left(a^2-2ab+b^2\right)}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^2}+\frac{\left(2a^2+b^2\right)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{\left(a^4-2a^2b^2+b^4\right)\sqrt{(a-b)(a+b)}}}{d}$
risch	$-\frac{i\left(2a^2b\,e^{3i(dx+c)}+b^3e^{3i(dx+c)}+6a^3e^{2i(dx+c)}+3a\,b^2e^{2i(dx+c)}+10a^2b\,e^{i(dx+c)}-b^3e^{i(dx+c)}+3a\,b^2\right)}{(a^2-b^2)^2d\left(b\,e^{2i(dx+c)}+2a\,e^{i(dx+c)}+b\right)^2}-\frac{a^2\ln\left(e^{i(dx+c)}\right.}{\sqrt{-a^2+b}}$

[In] int(1/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)

[Out] 1/d*(2*(-1/2*(4*a+b)*b/(a-b)/(a^2+2*a*b+b^2)*tan(1/2*d*x+1/2*c)^3-1/2*(4*a-b)*b/(a+b)/(a^2-2*a*b+b^2)*tan(1/2*d*x+1/2*c))/(tan(1/2*d*x+1/2*c)^2*a-b*tan(1/2*d*x+1/2*c)^2+a+b)^2+(2*a^2+b^2)/(a^4-2*a^2*b^2+b^4)/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2)))

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 258 vs. $2(120) = 240$.

Time = 0.29 (sec) , antiderivative size = 585, normalized size of antiderivative = 4.40

$$\int \frac{1}{(a+b\cos(c+dx))^3}\,dx$$
$$= \left[-\frac{\left(2\,a^4+a^2b^2+\left(2\,a^2b^2+b^4\right)\cos\left(dx+c\right)^2+2\left(2\,a^3b+ab^3\right)\cos\left(dx+c\right)\right)\sqrt{-a^2+b^2}\log\left(\frac{2\,ab\cos(dx+c)+(2}{}\right.}{4\left(\left(a^6b^2-3\,a^4b^4+3\,a^2b^6-b^8\right)d\cos\left(dx+c\right)^2+2\left(a^7b\right.\right.}\right.$$

[In] integrate(1/(a+b*cos(d*x+c))^3,x, algorithm="fricas")

[Out] [-1/4*((2*a^4 + a^2*b^2 + (2*a^2*b^2 + b^4)*cos(d*x + c)^2 + 2*(2*a^3*b + a*b^3)*cos(d*x + c))*sqrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x + c)^2 + 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) + 2*(4*a^4*b - 5*a^2*b^3 + b^5 + 3*(a^3*b^2 - a*b^4)*cos(d*x + c))*sin(d*x + c))/((a^6*b^2 - 3*a^4*b^4 + 3*a^2*b^6 - b^8)*d*cos(d*x + c)^2 + 2*(a^7*b - 3*a^5*b^3 + 3*a^3*b^5 - a*b^7)*d*cos(d*x + c) + (a^8 - 3*a^6*b^2 + 3*a^4*b^4 - a^2*b^6)*d), 1/2*((2*a^4 + a^2*b^2 + (2*a^2*b^2 + b^4)*cos(d*x + c)^2 + 2*(2*a^3*b + a*b^3)*cos(d*x + c))*sqrt(a^2 - b^2)*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c))) - (4*a^4*b - 5*a^2*b^3 + b^5 + 3*(a^3*b^2 - a*b^4)*cos(d*x + c))*sin(d*x + c))/((a^6*b^2 - 3*a^4*b^4 + 3*a^2*b^6 - b^8)*d*cos(d*x + c)^2 + 2*(a^7*b - 3*a^5*b^3 + 3*a^3*b^5 - a*b^7)*d*cos(d*x + c) + (a^8 - 3*a^6*b^2 + 3*a^4*b^4 - a^2*b^6)*d)]

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+b*cos(d*x+c))**3,x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\cos(c+dx))^3}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(1/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 251 vs. $2(120) = 240$.

Time = 0.30 (sec) , antiderivative size = 251, normalized size of antiderivative = 1.89

$$\int \frac{1}{(a+b\cos(c+dx))^3}\,dx = -\frac{\frac{\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor\mathrm{sgn}(-2a+2b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{a^2-b^2}}\right)\right)(2a^2+b^2)}{(a^4-2a^2b^2+b^4)\sqrt{a^2-b^2}}+\frac{4a^2b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-3ab^2\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-b^3\,\mathrm{t}\cdots}{(a^4-2a^2b^2+b^4)\left(\cdots\right.}}{d}$$

```
[In] integrate(1/(a+b*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -((pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1/2*d*
x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))*(2*a^2 + b^2)/((a^4
- 2*a^2*b^2 + b^4)*sqrt(a^2 - b^2)) + (4*a^2*b*tan(1/2*d*x + 1/2*c)^3 - 3*a
*b^2*tan(1/2*d*x + 1/2*c)^3 - b^3*tan(1/2*d*x + 1/2*c)^3 + 4*a^2*b*tan(1/2*
d*x + 1/2*c) + 3*a*b^2*tan(1/2*d*x + 1/2*c) - b^3*tan(1/2*d*x + 1/2*c))/((a
^4 - 2*a^2*b^2 + b^4)*(a*tan(1/2*d*x + 1/2*c)^2 - b*tan(1/2*d*x + 1/2*c)^2
+ a + b)^2))/d
```

Mupad [B] (verification not implemented)

Time = 16.63 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.53

$$\int \frac{1}{(a+b\cos(c+dx))^3}\,dx$$
$$=\frac{\operatorname{atan}\left(\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)(2a-2b)(a^2-2ab+b^2)}{2\sqrt{a+b}\,(a-b)^{5/2}}\right)(2a^2+b^2)}{d\,(a+b)^{5/2}\,(a-b)^{5/2}}-\frac{\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^3(b^2+4ab)}{(a+b)^2\,(a-b)}+\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)(4ab-b^2)}{(a+b)\,(a^2-2ab+b^2)}}{d\left(2ab+\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2(2a^2-2b^2)+\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^4(a^2-2ab+b^2)+a^2+b^2\right)}$$

```
[In] int(1/(a + b*cos(c + d*x))^3,x)
```

```
[Out] (atan((tan(c/2 + (d*x)/2)*(2*a - 2*b)*(a^2 - 2*a*b + b^2))/(2*(a + b)^(1/2)
*(a - b)^(5/2)))*(2*a^2 + b^2))/(d*(a + b)^(5/2)*(a - b)^(5/2)) - ((tan(c/2
 + (d*x)/2)^3*(4*a*b + b^2))/((a + b)^2*(a - b)) + (tan(c/2 + (d*x)/2)*(4*a
*b - b^2))/((a + b)*(a^2 - 2*a*b + b^2)))/(d*(2*a*b + tan(c/2 + (d*x)/2)^2*
(2*a^2 - 2*b^2) + tan(c/2 + (d*x)/2)^4*(a^2 - 2*a*b + b^2) + a^2 + b^2))
```

3.475 $\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 182

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^3}\,dx = -\frac{b(6a^4-5a^2b^2+2b^4)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^3(a-b)^{5/2}(a+b)^{5/2}d} + \frac{\operatorname{arctanh}(\sin(c+dx))}{a^3d} + \frac{b^2\sin(c+dx)}{2a\,(a^2-b^2)\,d(a+b\cos(c+dx))^2} + \frac{b^2(5a^2-2b^2)\sin(c+dx)}{2a^2\,(a^2-b^2)^2\,d(a+b\cos(c+dx))}$$

```
[Out] -b*(6*a^4-5*a^2*b^2+2*b^4)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/2
))/a^3/(a-b)^(5/2)/(a+b)^(5/2)/d+arctanh(sin(d*x+c))/a^3/d+1/2*b^2*sin(d*x+
c)/a/(a^2-b^2)/d/(a+b*cos(d*x+c))^2+1/2*b^2*(5*a^2-2*b^2)*sin(d*x+c)/a^2/(a
^2-b^2)^2/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.49 (sec) , antiderivative size = 182, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {2881, 3134, 3080, 3855, 2738, 211}

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \frac{\operatorname{arctanh}(\sin(c+dx))}{a^3d} + \frac{b^2(5a^2-2b^2)\sin(c+dx)}{2a^2d\,(a^2-b^2)^2\,(a+b\cos(c+dx))} + \frac{b^2\sin(c+dx)}{2ad\,(a^2-b^2)\,(a+b\cos(c+dx))^2} - \frac{b(6a^4-5a^2b^2+2b^4)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^3d(a-b)^{5/2}(a+b)^{5/2}}$$

```
[In] Int[Sec[c + d*x]/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] -((b*(6*a^4 - 5*a^2*b^2 + 2*b^4)*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt
[a + b]])/(a^3*(a - b)^(5/2)*(a + b)^(5/2)*d)) + ArcTanh[Sin[c + d*x]]/(a^3
*d) + (b^2*Sin[c + d*x])/(2*a*(a^2 - b^2)*d*(a + b*Cos[c + d*x])^2) + (b^2*
(5*a^2 - 2*b^2)*Sin[c + d*x])/(2*a^2*(a^2 - b^2)^2*d*(a + b*Cos[c + d*x]))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 3080

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[(A*b
- a*B)/(b*c - a*d), Int[1/(a + b*Sin[e + f*x]), x], x] + Dist[(B*c - A*d)/(
b*c - a*d), Int[1/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f,
A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
```

```
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{b^2\sin(c+dx)}{2a\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{\int\frac{\left(2\left(a^2-b^2\right)-2ab\cos(c+dx)+b^2\cos^2(c+dx)\right)\sec(c+dx)}{(a+b\cos(c+dx))^2}\,dx}{2a\left(a^2-b^2\right)}\\
&= \frac{b^2\sin(c+dx)}{2a\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{b^2(5a^2-2b^2)\sin(c+dx)}{2a^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}\\
&\quad+\frac{\int\frac{\left(2\left(a^2-b^2\right)^2-ab\left(4a^2-b^2\right)\cos(c+dx)\right)\sec(c+dx)}{a+b\cos(c+dx)}\,dx}{2a^2\left(a^2-b^2\right)^2}\\
&= \frac{b^2\sin(c+dx)}{2a\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{b^2(5a^2-2b^2)\sin(c+dx)}{2a^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}\\
&\quad+\frac{\int\sec(c+dx)\,dx}{a^3}-\frac{\left(b(6a^4-5a^2b^2+2b^4)\right)\int\frac{1}{a+b\cos(c+dx)}\,dx}{2a^3\left(a^2-b^2\right)^2}\\
&= \frac{\operatorname{arctanh}(\sin(c+dx))}{a^3d}+\frac{b^2\sin(c+dx)}{2a\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}\\
&\quad+\frac{b^2(5a^2-2b^2)\sin(c+dx)}{2a^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}\\
&\quad-\frac{\left(b(6a^4-5a^2b^2+2b^4)\right)\operatorname{Subst}\left(\int\frac{1}{a+b+(a-b)x^2}\,dx,x,\tan\left(\frac{1}{2}(c+dx)\right)\right)}{a^3\left(a^2-b^2\right)^2d}\\
&= -\frac{b(6a^4-5a^2b^2+2b^4)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^3(a-b)^{5/2}(a+b)^{5/2}d}+\frac{\operatorname{arctanh}(\sin(c+dx))}{a^3d}\\
&\quad+\frac{b^2\sin(c+dx)}{2a\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{b^2(5a^2-2b^2)\sin(c+dx)}{2a^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.95 (sec) , antiderivative size = 192, normalized size of antiderivative = 1.05

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^3}\,dx$$
$$= \frac{\frac{2b(6a^4-5a^2b^2+2b^4)\operatorname{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{5/2}} - 2\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)+2\log\left(\cos\left(\frac{1}{2}(c+d\right.\right.}{2a^3d}$$

```
[In] Integrate[Sec[c + d*x]/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] ((2*b*(6*a^4 - 5*a^2*b^2 + 2*b^4)*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-
a^2 + b^2]])/(-a^2 + b^2)^(5/2) - 2*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]
] + 2*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] + (a*b^2*(6*a^3 - 3*a*b^2 +
b*(5*a^2 - 2*b^2)*Cos[c + d*x])*Sin[c + d*x])/((a - b)^2*(a + b)^2*(a + b*C
os[c + d*x])^2))/(2*a^3*d)
```

Maple [A] (verified)

Time = 1.67 (sec) , antiderivative size = 251, normalized size of antiderivative = 1.38

method	result
derivativedivides	$\frac{-\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^3}+\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{a^3}-\frac{2b\left(\frac{-\frac{\left(6a^2+ab-2b^2\right)ab\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)\left(a^2+2ab+b^2\right)}-\frac{\left(6a^2-ab-2b^2\right)ab\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2(a+b)\left(a^2-2ab+b^2\right)}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^2}+\frac{(6a^4-5}{}\right.}{a^3}}{d}$
default	$\frac{-\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^3}+\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{a^3}-\frac{2b\left(\frac{-\frac{\left(6a^2+ab-2b^2\right)ab\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)\left(a^2+2ab+b^2\right)}-\frac{\left(6a^2-ab-2b^2\right)ab\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2(a+b)\left(a^2-2ab+b^2\right)}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^2}+\frac{(6a^4-5}{}\right.}{a^3}}{d}$
risch	$\frac{ib\left(4ba^3e^{3i(dx+c)}-b^3a\,e^{3i(dx+c)}+10a^4e^{2i(dx+c)}+b^2a^2e^{2i(dx+c)}-2b^4e^{2i(dx+c)}+16b\,a^3e^{i(dx+c)}-7\,e^{i(dx+c)}b^3a+5a^2b^2-\right.}{a^2d(a^2-b^2)^2\left(b\,e^{2i(dx+c)}+2a\,e^{i(dx+c)}+b\right)^2}$

```
[In] int(sec(d*x+c)/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-1/a^3*ln(tan(1/2*d*x+1/2*c)-1)+1/a^3*ln(tan(1/2*d*x+1/2*c)+1)-2*b/a^3
*((-1/2*(6*a^2+a*b-2*b^2)*a*b/(a-b)/(a^2+2*a*b+b^2)*tan(1/2*d*x+1/2*c)^3-1/
2*(6*a^2-a*b-2*b^2)*a*b/(a+b)/(a^2-2*a*b+b^2)*tan(1/2*d*x+1/2*c))/(tan(1/2*
d*x+1/2*c)^2*a-b*tan(1/2*d*x+1/2*c)^2+a+b)^2+1/2*(6*a^4-5*a^2*b^2+2*b^4)/(a
^4-2*a^2*b^2+b^4)/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b
)*(a+b))^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 536 vs. 2(169) = 338.

Time = 0.80 (sec) , antiderivative size = 1142, normalized size of antiderivative = 6.27

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Too large to display}$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] [-1/4*((6*a^6*b - 5*a^4*b^3 + 2*a^2*b^5 + (6*a^4*b^3 - 5*a^2*b^5 + 2*b^7)*c
os(d*x + c)^2 + 2*(6*a^5*b^2 - 5*a^3*b^4 + 2*a*b^6)*cos(d*x + c))*sqrt(-a^2
 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x + c)^2 - 2*sqrt(-a^
2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2)/(b^2*cos(d*x + c)
^2 + 2*a*b*cos(d*x + c) + a^2)) - 2*(a^8 - 3*a^6*b^2 + 3*a^4*b^4 - a^2*b^6
+ (a^6*b^2 - 3*a^4*b^4 + 3*a^2*b^6 - b^8)*cos(d*x + c)^2 + 2*(a^7*b - 3*a^5
*b^3 + 3*a^3*b^5 - a*b^7)*cos(d*x + c))*log(sin(d*x + c) + 1) + 2*(a^8 - 3*
a^6*b^2 + 3*a^4*b^4 - a^2*b^6 + (a^6*b^2 - 3*a^4*b^4 + 3*a^2*b^6 - b^8)*cos
(d*x + c)^2 + 2*(a^7*b - 3*a^5*b^3 + 3*a^3*b^5 - a*b^7)*cos(d*x + c))*log(-
sin(d*x + c) + 1) - 2*(6*a^6*b^2 - 9*a^4*b^4 + 3*a^2*b^6 + (5*a^5*b^3 - 7*a
^3*b^5 + 2*a*b^7)*cos(d*x + c))*sin(d*x + c))/((a^9*b^2 - 3*a^7*b^4 + 3*a^5
*b^6 - a^3*b^8)*d*cos(d*x + c)^2 + 2*(a^10*b - 3*a^8*b^3 + 3*a^6*b^5 - a^4*
b^7)*d*cos(d*x + c) + (a^11 - 3*a^9*b^2 + 3*a^7*b^4 - a^5*b^6)*d), -1/2*((6
*a^6*b - 5*a^4*b^3 + 2*a^2*b^5 + (6*a^4*b^3 - 5*a^2*b^5 + 2*b^7)*cos(d*x +
c)^2 + 2*(6*a^5*b^2 - 5*a^3*b^4 + 2*a*b^6)*cos(d*x + c))*sqrt(a^2 - b^2)*ar
ctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c))) - (a^8 - 3*a^6*b
^2 + 3*a^4*b^4 - a^2*b^6 + (a^6*b^2 - 3*a^4*b^4 + 3*a^2*b^6 - b^8)*cos(d*x
+ c)^2 + 2*(a^7*b - 3*a^5*b^3 + 3*a^3*b^5 - a*b^7)*cos(d*x + c))*log(sin(d*
x + c) + 1) + (a^8 - 3*a^6*b^2 + 3*a^4*b^4 - a^2*b^6 + (a^6*b^2 - 3*a^4*b^4
 + 3*a^2*b^6 - b^8)*cos(d*x + c)^2 + 2*(a^7*b - 3*a^5*b^3 + 3*a^3*b^5 - a*b
^7)*cos(d*x + c))*log(-sin(d*x + c) + 1) - (6*a^6*b^2 - 9*a^4*b^4 + 3*a^2*b
^6 + (5*a^5*b^3 - 7*a^3*b^5 + 2*a*b^7)*cos(d*x + c))*sin(d*x + c))/((a^9*b^
2 - 3*a^7*b^4 + 3*a^5*b^6 - a^3*b^8)*d*cos(d*x + c)^2 + 2*(a^10*b - 3*a^8*b
^3 + 3*a^6*b^5 - a^4*b^7)*d*cos(d*x + c) + (a^11 - 3*a^9*b^2 + 3*a^7*b^4 -
a^5*b^6)*d)]
```

Sympy [F]

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^3}\,dx$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))**3,x)
```

```
[Out] Integral(sec(c + d*x)/(a + b*cos(c + d*x))**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 344 vs. $2(169) = 338$.

Time = 0.32 (sec) , antiderivative size = 344, normalized size of antiderivative = 1.89

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \frac{\frac{(6a^4b-5a^2b^3+2b^5)\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor\operatorname{sgn}(-2a+2b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{a^2-b^2}}\right)\right)}{(a^7-2a^5b^2+a^3b^4)\sqrt{a^2-b^2}} + \frac{6a^3b^2\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-5a^2b^3\tan\left(\frac{1}{2}dx+\right.}{}}{}$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] ((6*a^4*b - 5*a^2*b^3 + 2*b^5)*(pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a +
 2*b) + arctan(-(a*tan(1/2*d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2
- b^2)))/((a^7 - 2*a^5*b^2 + a^3*b^4)*sqrt(a^2 - b^2)) + (6*a^3*b^2*tan(1/2
*d*x + 1/2*c)^3 - 5*a^2*b^3*tan(1/2*d*x + 1/2*c)^3 - 3*a*b^4*tan(1/2*d*x +
1/2*c)^3 + 2*b^5*tan(1/2*d*x + 1/2*c)^3 + 6*a^3*b^2*tan(1/2*d*x + 1/2*c) +
5*a^2*b^3*tan(1/2*d*x + 1/2*c) - 3*a*b^4*tan(1/2*d*x + 1/2*c) - 2*b^5*tan(1
/2*d*x + 1/2*c))/((a^6 - 2*a^4*b^2 + a^2*b^4)*(a*tan(1/2*d*x + 1/2*c)^2 - b
*tan(1/2*d*x + 1/2*c)^2 + a + b)^2) + log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^
3 - log(abs(tan(1/2*d*x + 1/2*c) - 1))/a^3)/d
```

Mupad [B] (verification not implemented)

Time = 23.98 (sec) , antiderivative size = 5090, normalized size of antiderivative = 27.97

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Too large to display}$$

[In] int(1/(cos(c + d*x)*(a + b*cos(c + d*x))^3),x)

[Out] - (atan((((((8*(12*a^14*b - 4*a^15 + 4*a^6*b^9 - 2*a^7*b^8 - 18*a^8*b^7 + 4*a^9*b^6 + 36*a^10*b^5 - 6*a^11*b^4 - 34*a^12*b^3 + 8*a^13*b^2))/(a^12*b + a^13 - a^6*b^7 - a^7*b^6 + 3*a^8*b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2) - (8*tan(c/2 + (d*x)/2)*(8*a^15*b - 8*a^6*b^10 + 8*a^7*b^9 + 32*a^8*b^8 - 32*a^9*b^7 - 48*a^10*b^6 + 48*a^11*b^5 + 32*a^12*b^4 - 32*a^13*b^3 - 8*a^14*b^2))/(a^3*(a^10*b + a^11 - a^4*b^7 - a^5*b^6 + 3*a^6*b^5 + 3*a^7*b^4 - 3*a^8*b^3 - 3*a^9*b^2)))/a^3 - (8*tan(c/2 + (d*x)/2)*(4*a^10 - 8*a^9*b - 8*a*b^9 + 8*b^10 - 32*a^2*b^8 + 32*a^3*b^7 + 57*a^4*b^6 - 48*a^5*b^5 - 52*a^6*b^4 + 32*a^7*b^3 + 24*a^8*b^2))/(a^10*b + a^11 - a^4*b^7 - a^5*b^6 + 3*a^6*b^5 + 3*a^7*b^4 - 3*a^8*b^3 - 3*a^9*b^2))*1i)/a^3 - ((((8*(12*a^14*b - 4*a^15 + 4*a^6*b^9 - 2*a^7*b^8 - 18*a^8*b^7 + 4*a^9*b^6 + 36*a^10*b^5 - 6*a^11*b^4 - 34*a^12*b^3 + 8*a^13*b^2))/(a^12*b + a^13 - a^6*b^7 - a^7*b^6 + 3*a^8*b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2) + (8*tan(c/2 + (d*x)/2)*(8*a^15*b - 8*a^6*b^10 + 8*a^7*b^9 + 32*a^8*b^8 - 32*a^9*b^7 - 48*a^10*b^6 + 48*a^11*b^5 + 32*a^12*b^4 - 32*a^13*b^3 - 8*a^14*b^2))/(a^3*(a^10*b + a^11 - a^4*b^7 - a^5*b^6 + 3*a^6*b^5 + 3*a^7*b^4 - 3*a^8*b^3 - 3*a^9*b^2)))/a^3 + (8*tan(c/2 + (d*x)/2)*(4*a^10 - 8*a^9*b - 8*a*b^9 + 8*b^10 - 32*a^2*b^8 + 32*a^3*b^7 + 57*a^4*b^6 - 48*a^5*b^5 - 52*a^6*b^4 + 32*a^7*b^3 + 24*a^8*b^2))/(a^10*b + a^11 - a^4*b^7 - a^5*b^6 + 3*a^6*b^5 + 3*a^7*b^4 - 3*a^8*b^3 - 3*a^9*b^2))*1i)/a^3)/((((8*(12*a^14*b - 4*a^15 + 4*a^6*b^9 - 2*a^7*b^8 - 18*a^8*b^7 + 4*a^9*b^6 + 36*a^10*b^5 - 6*a^11*b^4 - 34*a^12*b^3 + 8*a^13*b^2))/(a^12*b + a^13 - a^6*b^7 - a^7*b^6 + 3*a^8*b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2) - (8*tan(c/2 + (d*x)/2)*(8*a^15*b - 8*a^6*b^10 + 8*a^7*b^9 + 32*a^8*b^8 - 32*a^9*b^7 - 48*a^10*b^6 + 48*a^11*b^5 + 32*a^12*b^4 - 32*a^13*b^3 - 8*a^14*b^2))/(a^3*(a^10*b + a^11 - a^4*b^7 - a^5*b^6 + 3*a^6*b^5 + 3*a^7*b^4 - 3*a^8*b^3 - 3*a^9*b^2)))/a^3 - (8*tan(c/2 + (d*x)/2)*(4*a^10 - 8*a^9*b - 8*a*b^9 + 8*b^10 - 32*a^2*b^8 + 32*a^3*b^7 + 57*a^4*b^6 - 48*a^5*b^5 - 52*a^6*b^4 + 32*a^7*b^3 + 24*a^8*b^2))/(a^10*b + a^11 - a^4*b^7 - a^5*b^6 + 3*a^6*b^5 + 3*a^7*b^4 - 3*a^8*b^3 - 3*a^9*b^2))/a^3 + (((8*(12*a^14*b - 4*a^15 + 4*a^6*b^9 - 2*a^7*b^8 - 18*a^8*b^7 + 4*a^9*b^6 + 36*a^10*b^5 - 6*a^11*b^4 - 34*a^12*b^3 + 8*a^13*b^2))/(a^12*b + a^13 - a^6*b^7 - a^7*b^6 + 3*a^8*b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2) + (8*tan(c/2 + (d*x)/2)*(8*a^15*b - 8*a^6*b^10 + 8*a^7*b^9 + 32*a^8*b^8 - 32*a^9*b^7 - 48*a^10*b^6 + 48*a^11*b^5 + 32*a^12*b^4 - 32*a^13*b^3 - 8*a^14*b^2))/(a^3*(a^10*b + a^11 - a^4*b^7 - a^5*b^6 + 3*a^6*b^5 + 3*a^7*b^4 - 3*a^8*b^3 - 3*a^9*b^2)))/a^3 + (8*tan(c/2 + (d*x)/2)*(4*a^10 - 8*a^9*b - 8*a*b^9 + 8*b^10 - 32*a^2*b^8 + 32

*a^3*b^7 + 57*a^4*b^6 - 48*a^5*b^5 - 52*a^6*b^4 + 32*a^7*b^3 + 24*a^8*b^2))
/(a^10*b + a^11 - a^4*b^7 - a^5*b^6 + 3*a^6*b^5 + 3*a^7*b^4 - 3*a^8*b^3 - 3
*a^9*b^2))/a^3 - (16*(12*a^8*b - 2*a*b^8 + 4*b^9 - 18*a^2*b^7 + 13*a^3*b^6
+ 36*a^4*b^5 - 26*a^5*b^4 - 34*a^6*b^3 + 24*a^7*b^2))/(a^12*b + a^13 - a^6*
b^7 - a^7*b^6 + 3*a^8*b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2)))*2i)/(a^3
*d) - ((tan(c/2 + (d*x)/2)^3*(a*b^3 - 2*b^4 + 6*a^2*b^2))/((a^2*b - a^3)*(a
 + b)^2) + (tan(c/2 + (d*x)/2)*(a*b^3 + 2*b^4 - 6*a^2*b^2))/((a + b)*(a^4 -
 2*a^3*b + a^2*b^2)))/(d*(2*a*b + tan(c/2 + (d*x)/2)^2*(2*a^2 - 2*b^2) + ta
n(c/2 + (d*x)/2)^4*(a^2 - 2*a*b + b^2) + a^2 + b^2)) - (b*atan(((b*((8*tan(
c/2 + (d*x)/2)*(4*a^10 - 8*a^9*b - 8*a*b^9 + 8*b^10 - 32*a^2*b^8 + 32*a^3*b
^7 + 57*a^4*b^6 - 48*a^5*b^5 - 52*a^6*b^4 + 32*a^7*b^3 + 24*a^8*b^2))/(a^10
*b + a^11 - a^4*b^7 - a^5*b^6 + 3*a^6*b^5 + 3*a^7*b^4 - 3*a^8*b^3 - 3*a^9*b
^2) - (b*((8*(12*a^14*b - 4*a^15 + 4*a^6*b^9 - 2*a^7*b^8 - 18*a^8*b^7 + 4*a
^9*b^6 + 36*a^10*b^5 - 6*a^11*b^4 - 34*a^12*b^3 + 8*a^13*b^2))/(a^12*b + a^
13 - a^6*b^7 - a^7*b^6 + 3*a^8*b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2) -
 (4*b*tan(c/2 + (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(6*a^4 + 2*b^4 - 5*a^
2*b^2)*(8*a^15*b - 8*a^6*b^10 + 8*a^7*b^9 + 32*a^8*b^8 - 32*a^9*b^7 - 48*a^
10*b^6 + 48*a^11*b^5 + 32*a^12*b^4 - 32*a^13*b^3 - 8*a^14*b^2))/((a^13 - a^
3*b^10 + 5*a^5*b^8 - 10*a^7*b^6 + 10*a^9*b^4 - 5*a^11*b^2)*(a^10*b + a^11 -
 a^4*b^7 - a^5*b^6 + 3*a^6*b^5 + 3*a^7*b^4 - 3*a^8*b^3 - 3*a^9*b^2)))*(-(a
+ b)^5*(a - b)^5)^(1/2)*(6*a^4 + 2*b^4 - 5*a^2*b^2))/(2*(a^13 - a^3*b^10 +
5*a^5*b^8 - 10*a^7*b^6 + 10*a^9*b^4 - 5*a^11*b^2)))*(-(a + b)^5*(a - b)^5)^
(1/2)*(6*a^4 + 2*b^4 - 5*a^2*b^2)*1i)/(2*(a^13 - a^3*b^10 + 5*a^5*b^8 - 10*
a^7*b^6 + 10*a^9*b^4 - 5*a^11*b^2)) + (b*((8*tan(c/2 + (d*x)/2)*(4*a^10 - 8
*a^9*b - 8*a*b^9 + 8*b^10 - 32*a^2*b^8 + 32*a^3*b^7 + 57*a^4*b^6 - 48*a^5*b
^5 - 52*a^6*b^4 + 32*a^7*b^3 + 24*a^8*b^2))/(a^10*b + a^11 - a^4*b^7 - a^5*
b^6 + 3*a^6*b^5 + 3*a^7*b^4 - 3*a^8*b^3 - 3*a^9*b^2) + (b*((8*(12*a^14*b -
4*a^15 + 4*a^6*b^9 - 2*a^7*b^8 - 18*a^8*b^7 + 4*a^9*b^6 + 36*a^10*b^5 - 6*a
^11*b^4 - 34*a^12*b^3 + 8*a^13*b^2))/(a^12*b + a^13 - a^6*b^7 - a^7*b^6 + 3
*a^8*b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2) + (4*b*tan(c/2 + (d*x)/2)*(
-(a + b)^5*(a - b)^5)^(1/2)*(6*a^4 + 2*b^4 - 5*a^2*b^2)*(8*a^15*b - 8*a^6*b
^10 + 8*a^7*b^9 + 32*a^8*b^8 - 32*a^9*b^7 - 48*a^10*b^6 + 48*a^11*b^5 + 32*
a^12*b^4 - 32*a^13*b^3 - 8*a^14*b^2))/((a^13 - a^3*b^10 + 5*a^5*b^8 - 10*a^
7*b^6 + 10*a^9*b^4 - 5*a^11*b^2)*(a^10*b + a^11 - a^4*b^7 - a^5*b^6 + 3*a^6
*b^5 + 3*a^7*b^4 - 3*a^8*b^3 - 3*a^9*b^2)))*(-(a + b)^5*(a - b)^5)^(1/2)*(6
*a^4 + 2*b^4 - 5*a^2*b^2))/(2*(a^13 - a^3*b^10 + 5*a^5*b^8 - 10*a^7*b^6 + 1
0*a^9*b^4 - 5*a^11*b^2)))*(-(a + b)^5*(a - b)^5)^(1/2)*(6*a^4 + 2*b^4 - 5*a
^2*b^2)*1i)/(2*(a^13 - a^3*b^10 + 5*a^5*b^8 - 10*a^7*b^6 + 10*a^9*b^4 - 5*a
^11*b^2)))/((16*(12*a^8*b - 2*a*b^8 + 4*b^9 - 18*a^2*b^7 + 13*a^3*b^6 + 36*
a^4*b^5 - 26*a^5*b^4 - 34*a^6*b^3 + 24*a^7*b^2))/(a^12*b + a^13 - a^6*b^7 -
 a^7*b^6 + 3*a^8*b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2) + (b*((8*tan(c/
2 + (d*x)/2)*(4*a^10 - 8*a^9*b - 8*a*b^9 + 8*b^10 - 32*a^2*b^8 + 32*a^3*b^7
 + 57*a^4*b^6 - 48*a^5*b^5 - 52*a^6*b^4 + 32*a^7*b^3 + 24*a^8*b^2))/(a^10*b
 + a^11 - a^4*b^7 - a^5*b^6 + 3*a^6*b^5 + 3*a^7*b^4 - 3*a^8*b^3 - 3*a^9*b^2
) - (b*((8*(12*a^14*b - 4*a^15 + 4*a^6*b^9 - 2*a^7*b^8 - 18*a^8*b^7 + 4*a^9

```
*b^6 + 36*a^10*b^5 - 6*a^11*b^4 - 34*a^12*b^3 + 8*a^13*b^2))/(a^12*b + a^13
 - a^6*b^7 - a^7*b^6 + 3*a^8*b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2) - (
4*b*tan(c/2 + (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(6*a^4 + 2*b^4 - 5*a^2*
b^2)*(8*a^15*b - 8*a^6*b^10 + 8*a^7*b^9 + 32*a^8*b^8 - 32*a^9*b^7 - 48*a^10
*b^6 + 48*a^11*b^5 + 32*a^12*b^4 - 32*a^13*b^3 - 8*a^14*b^2))/((a^13 - a^3*
b^10 + 5*a^5*b^8 - 10*a^7*b^6 + 10*a^9*b^4 - 5*a^11*b^2)*(a^10*b + a^11 - a
^4*b^7 - a^5*b^6 + 3*a^6*b^5 + 3*a^7*b^4 - 3*a^8*b^3 - 3*a^9*b^2)))*(-(a +
b)^5*(a - b)^5)^(1/2)*(6*a^4 + 2*b^4 - 5*a^2*b^2))/(2*(a^13 - a^3*b^10 + 5*
a^5*b^8 - 10*a^7*b^6 + 10*a^9*b^4 - 5*a^11*b^2)))*(-(a + b)^5*(a - b)^5)^(1
/2)*(6*a^4 + 2*b^4 - 5*a^2*b^2))/(2*(a^13 - a^3*b^10 + 5*a^5*b^8 - 10*a^7*b
^6 + 10*a^9*b^4 - 5*a^11*b^2)) - (b*((8*tan(c/2 + (d*x)/2)*(4*a^10 - 8*a^9*
b - 8*a*b^9 + 8*b^10 - 32*a^2*b^8 + 32*a^3*b^7 + 57*a^4*b^6 - 48*a^5*b^5 -
52*a^6*b^4 + 32*a^7*b^3 + 24*a^8*b^2))/(a^10*b + a^11 - a^4*b^7 - a^5*b^6 +
 3*a^6*b^5 + 3*a^7*b^4 - 3*a^8*b^3 - 3*a^9*b^2) + (b*((8*(12*a^14*b - 4*a^1
5 + 4*a^6*b^9 - 2*a^7*b^8 - 18*a^8*b^7 + 4*a^9*b^6 + 36*a^10*b^5 - 6*a^11*b
^4 - 34*a^12*b^3 + 8*a^13*b^2))/(a^12*b + a^13 - a^6*b^7 - a^7*b^6 + 3*a^8*
b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2) + (4*b*tan(c/2 + (d*x)/2)*(-(a +
 b)^5*(a - b)^5)^(1/2)*(6*a^4 + 2*b^4 - 5*a^2*b^2)*(8*a^15*b - 8*a^6*b^10 +
 8*a^7*b^9 + 32*a^8*b^8 - 32*a^9*b^7 - 48*a^10*b^6 + 48*a^11*b^5 + 32*a^12*
b^4 - 32*a^13*b^3 - 8*a^14*b^2))/((a^13 - a^3*b^10 + 5*a^5*b^8 - 10*a^7*b^6
 + 10*a^9*b^4 - 5*a^11*b^2)*(a^10*b + a^11 - a^4*b^7 - a^5*b^6 + 3*a^6*b^5
+ 3*a^7*b^4 - 3*a^8*b^3 - 3*a^9*b^2)))*(-(a + b)^5*(a - b)^5)^(1/2)*(6*a^4
+ 2*b^4 - 5*a^2*b^2))/(2*(a^13 - a^3*b^10 + 5*a^5*b^8 - 10*a^7*b^6 + 10*a^9
*b^4 - 5*a^11*b^2)))*(-(a + b)^5*(a - b)^5)^(1/2)*(6*a^4 + 2*b^4 - 5*a^2*b^
2))/(2*(a^13 - a^3*b^10 + 5*a^5*b^8 - 10*a^7*b^6 + 10*a^9*b^4 - 5*a^11*b^2)
)))*(-(a + b)^5*(a - b)^5)^(1/2)*(6*a^4 + 2*b^4 - 5*a^2*b^2)*1i)/(d*(a^13 -
 a^3*b^10 + 5*a^5*b^8 - 10*a^7*b^6 + 10*a^9*b^4 - 5*a^11*b^2))
```

3.476 $\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 232

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \frac{3b^2(4a^4-5a^2b^2+2b^4)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^4(a-b)^{5/2}(a+b)^{5/2}d} - \frac{3b\,\mathrm{arctanh}(\sin(c+dx))}{a^4d} + \frac{(2a^4-11a^2b^2+6b^4)\tan(c+dx)}{2a^3(a^2-b^2)^2d} + \frac{b^2\tan(c+dx)}{2a(a^2-b^2)d(a+b\cos(c+dx))^2} + \frac{3b^2(2a^2-b^2)\tan(c+dx)}{2a^2(a^2-b^2)^2d(a+b\cos(c+dx))}$$

```
[Out] 3*b^2*(4*a^4-5*a^2*b^2+2*b^4)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(
1/2))/a^4/(a-b)^(5/2)/(a+b)^(5/2)/d-3*b*arctanh(sin(d*x+c))/a^4/d+1/2*(2*a^
4-11*a^2*b^2+6*b^4)*tan(d*x+c)/a^3/(a^2-b^2)^2/d+1/2*b^2*tan(d*x+c)/a/(a^2-
b^2)/d/(a+b*cos(d*x+c))^2+3/2*b^2*(2*a^2-b^2)*tan(d*x+c)/a^2/(a^2-b^2)^2/d/
(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.89 (sec) , antiderivative size = 232, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used

$= \{2881, 3134, 3080, 3855, 2738, 211\}$

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx = -\frac{3b\text{arctanh}(\sin(c+dx))}{a^4d} + \frac{3b^2(2a^2-b^2)\tan(c+dx)}{2a^2d\,(a^2-b^2)^2\,(a+b\cos(c+dx))} + \frac{b^2\tan(c+dx)}{2ad\,(a^2-b^2)\,(a+b\cos(c+dx))^2} + \frac{3b^2(4a^4-5a^2b^2+2b^4)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^4d(a-b)^{5/2}(a+b)^{5/2}} + \frac{(2a^4-11a^2b^2+6b^4)\tan(c+dx)}{2a^3d\,(a^2-b^2)^2}$$

```
[In] Int[Sec[c + d*x]^2/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (3*b^2*(4*a^4 - 5*a^2*b^2 + 2*b^4)*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sq
rt[a + b]])/(a^4*(a - b)^(5/2)*(a + b)^(5/2)*d) - (3*b*ArcTanh[Sin[c + d*x]
])/(a^4*d) + ((2*a^4 - 11*a^2*b^2 + 6*b^4)*Tan[c + d*x])/(2*a^3*(a^2 - b^2)
^2*d) + (b^2*Tan[c + d*x])/(2*a*(a^2 - b^2)*d*(a + b*Cos[c + d*x])^2) + (3*
b^2*(2*a^2 - b^2)*Tan[c + d*x])/(2*a^2*(a^2 - b^2)^2*d*(a + b*Cos[c + d*x])
)
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 3080

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[(A*b
- a*B)/(b*c - a*d), Int[1/(a + b*Sin[e + f*x]), x], x] + Dist[(B*c - A*d)/(
b*c - a*d), Int[1/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f,
A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{b^2\tan(c+dx)}{2a\,(a^2-b^2)\,d(a+b\cos(c+dx))^2}+\frac{\int\frac{(2a^2-3b^2-2ab\cos(c+dx)+2b^2\cos^2(c+dx))\sec^2(c+dx)}{(a+b\cos(c+dx))^2}\,dx}{2a\,(a^2-b^2)}\\
&= \frac{b^2\tan(c+dx)}{2a\,(a^2-b^2)\,d(a+b\cos(c+dx))^2}+\frac{3b^2(2a^2-b^2)\tan(c+dx)}{2a^2\,(a^2-b^2)^2\,d(a+b\cos(c+dx))}\\
&\quad+\frac{\int\frac{(2a^4-11a^2b^2+6b^4-ab(4a^2-b^2)\cos(c+dx)+3b^2(2a^2-b^2)\cos^2(c+dx))\sec^2(c+dx)}{a+b\cos(c+dx)}\,dx}{2a^2\,(a^2-b^2)^2}\\
&= \frac{(2a^4-11a^2b^2+6b^4)\tan(c+dx)}{2a^3\,(a^2-b^2)^2\,d}+\frac{b^2\tan(c+dx)}{2a\,(a^2-b^2)\,d(a+b\cos(c+dx))^2}\\
&\quad+\frac{3b^2(2a^2-b^2)\tan(c+dx)}{2a^2\,(a^2-b^2)^2\,d(a+b\cos(c+dx))}\\
&\quad+\frac{\int\frac{\left(-6b(a^2-b^2)^2+3ab^2(2a^2-b^2)\cos(c+dx)\right)\sec(c+dx)}{a+b\cos(c+dx)}\,dx}{2a^3\,(a^2-b^2)^2}
\end{aligned}$$

$$= \frac{(2a^4-11a^2b^2+6b^4)\tan(c+dx)}{2a^3(a^2-b^2)^2 d} + \frac{b^2\tan(c+dx)}{2a(a^2-b^2)d(a+b\cos(c+dx))^2} + \frac{3b^2(2a^2-b^2)\tan(c+dx)}{2a^2(a^2-b^2)^2 d(a+b\cos(c+dx))} - \frac{(3b)\int\sec(c+dx)\,dx}{a^4} + \frac{(3b^2(4a^4-5a^2b^2+2b^4))\int\frac{1}{a+b\cos(c+dx)}\,dx}{2a^4(a^2-b^2)^2}$$

$$= -\frac{3b\text{arctanh}(\sin(c+dx))}{a^4d} + \frac{(2a^4-11a^2b^2+6b^4)\tan(c+dx)}{2a^3(a^2-b^2)^2 d} + \frac{b^2\tan(c+dx)}{2a(a^2-b^2)d(a+b\cos(c+dx))^2} + \frac{3b^2(2a^2-b^2)\tan(c+dx)}{2a^2(a^2-b^2)^2 d(a+b\cos(c+dx))} + \frac{(3b^2(4a^4-5a^2b^2+2b^4))\,\text{Subst}\left(\int\frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{a^4(a^2-b^2)^2 d}$$

$$= \frac{3b^2(4a^4-5a^2b^2+2b^4)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^4(a-b)^{5/2}(a+b)^{5/2}d} - \frac{3b\text{arctanh}(\sin(c+dx))}{a^4d} + \frac{(2a^4-11a^2b^2+6b^4)\tan(c+dx)}{2a^3(a^2-b^2)^2 d} + \frac{b^2\tan(c+dx)}{2a(a^2-b^2)d(a+b\cos(c+dx))^2} + \frac{3b^2(2a^2-b^2)\tan(c+dx)}{2a^2(a^2-b^2)^2 d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 3.01 (sec) , antiderivative size = 205, normalized size of antiderivative = 0.88

$$\int\frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx = -\frac{\frac{6b^2(4a^4-5a^2b^2+2b^4)\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{5/2}} - 6b\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right) + 6b\log\left(\cos\left(\frac{1}{2}(c\right.\right.}{2a^4d}$$

```
[In] Integrate[Sec[c + d*x]^2/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] -1/2*((6*b^2*(4*a^4 - 5*a^2*b^2 + 2*b^4)*ArcTanh[((a - b)*Tan[(c + d*x)/2])
/Sqrt[-a^2 + b^2]])/(-a^2 + b^2)^(5/2) - 6*b*Log[Cos[(c + d*x)/2] - Sin[(c
+ d*x)/2]] + 6*b*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] + (a*b^3*(8*a^3 -
 5*a*b^2 + b*(7*a^2 - 4*b^2)*Cos[c + d*x])*Sin[c + d*x])/((a - b)^2*(a + b)
^2*(a + b*Cos[c + d*x])^2) - 2*a*Tan[c + d*x])/(a^4*d)
```

Maple [A] (verified)

Time = 2.04 (sec) , antiderivative size = 292, normalized size of antiderivative = 1.26

method	result
derivativedivides	$\frac{-\frac{1}{a^3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{3b\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^4}-\frac{1}{a^3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}-\frac{3b\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{a^4}+\frac{2b^2\left(-\frac{\frac{\left(8a^2+ab-4b^2\right)ab\left(\tan^3\left(\right.\right.}{2(a-b)\left(a^2+2ab+b\right.}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.}\right.}{}}{d}$
default	$\frac{-\frac{1}{a^3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{3b\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^4}-\frac{1}{a^3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}-\frac{3b\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{a^4}+\frac{2b^2\left(-\frac{\frac{\left(8a^2+ab-4b^2\right)ab\left(\tan^3\left(\right.\right.}{2(a-b)\left(a^2+2ab+b\right.}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.}\right.}{}}{d}$
risch	$\frac{i\left(-6b^3a^3e^{5i(dx+c)}+3b^5e^{5i(dx+c)}a-12a^4b^2e^{4i(dx+c)}-3a^2b^4e^{4i(dx+c)}+6b^6e^{4i(dx+c)}+8b\,a^5e^{3i(dx+c)}-44b^3a^3e^{3i(dx+c)}+\right.}{\left(a^2-b^2\right)^2d\,a}$

```
[In] int(sec(d*x+c)^2/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-1/a^3/(tan(1/2*d*x+1/2*c)-1)+3*b/a^4*ln(tan(1/2*d*x+1/2*c)-1)-1/a^3/(
tan(1/2*d*x+1/2*c)+1)-3*b/a^4*ln(tan(1/2*d*x+1/2*c)+1)+2*b^2/a^4*((-1/2*(8*
a^2+a*b-4*b^2)*a*b/(a-b)/(a^2+2*a*b+b^2)*tan(1/2*d*x+1/2*c)^3-1/2*(8*a^2-a*
b-4*b^2)*a*b/(a+b)/(a^2-2*a*b+b^2)*tan(1/2*d*x+1/2*c))/(tan(1/2*d*x+1/2*c)^
2*a-b*tan(1/2*d*x+1/2*c)^2+a+b)^2+3/2*(4*a^4-5*a^2*b^2+2*b^4)/(a^4-2*a^2*b^
2+b^4)/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1
/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 638 vs. $2(217) = 434$.

Time = 0.80 (sec) , antiderivative size = 1346, normalized size of antiderivative = 5.80

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Too large to display}$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] [-1/4*(3*((4*a^4*b^4 - 5*a^2*b^6 + 2*b^8)*cos(d*x + c)^3 + 2*(4*a^5*b^3 - 5
*a^3*b^5 + 2*a*b^7)*cos(d*x + c)^2 + (4*a^6*b^2 - 5*a^4*b^4 + 2*a^2*b^6)*co
s(d*x + c))*sqrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*
x + c)^2 + 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b
^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) + 6*((a^6*b^3 - 3*a^4*
b^5 + 3*a^2*b^7 - b^9)*cos(d*x + c)^3 + 2*(a^7*b^2 - 3*a^5*b^4 + 3*a^3*b^6
- a*b^8)*cos(d*x + c)^2 + (a^8*b - 3*a^6*b^3 + 3*a^4*b^5 - a^2*b^7)*cos(d*x
```

```
 + c))*log(sin(d*x + c) + 1) - 6*((a^6*b^3 - 3*a^4*b^5 + 3*a^2*b^7 - b^9)*c
os(d*x + c)^3 + 2*(a^7*b^2 - 3*a^5*b^4 + 3*a^3*b^6 - a*b^8)*cos(d*x + c)^2
+ (a^8*b - 3*a^6*b^3 + 3*a^4*b^5 - a^2*b^7)*cos(d*x + c))*log(-sin(d*x + c)
 + 1) - 2*(2*a^9 - 6*a^7*b^2 + 6*a^5*b^4 - 2*a^3*b^6 + (2*a^7*b^2 - 13*a^5*
b^4 + 17*a^3*b^6 - 6*a*b^8)*cos(d*x + c)^2 + (4*a^8*b - 20*a^6*b^3 + 25*a^4
*b^5 - 9*a^2*b^7)*cos(d*x + c))*sin(d*x + c))/((a^10*b^2 - 3*a^8*b^4 + 3*a^
6*b^6 - a^4*b^8)*d*cos(d*x + c)^3 + 2*(a^11*b - 3*a^9*b^3 + 3*a^7*b^5 - a^5
*b^7)*d*cos(d*x + c)^2 + (a^12 - 3*a^10*b^2 + 3*a^8*b^4 - a^6*b^6)*d*cos(d*
x + c)), 1/2*(3*((4*a^4*b^4 - 5*a^2*b^6 + 2*b^8)*cos(d*x + c)^3 + 2*(4*a^5*
b^3 - 5*a^3*b^5 + 2*a*b^7)*cos(d*x + c)^2 + (4*a^6*b^2 - 5*a^4*b^4 + 2*a^2*
b^6)*cos(d*x + c))*sqrt(a^2 - b^2)*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 -
 b^2)*sin(d*x + c))) - 3*((a^6*b^3 - 3*a^4*b^5 + 3*a^2*b^7 - b^9)*cos(d*x +
 c)^3 + 2*(a^7*b^2 - 3*a^5*b^4 + 3*a^3*b^6 - a*b^8)*cos(d*x + c)^2 + (a^8*b
 - 3*a^6*b^3 + 3*a^4*b^5 - a^2*b^7)*cos(d*x + c))*log(sin(d*x + c) + 1) + 3
*((a^6*b^3 - 3*a^4*b^5 + 3*a^2*b^7 - b^9)*cos(d*x + c)^3 + 2*(a^7*b^2 - 3*a
^5*b^4 + 3*a^3*b^6 - a*b^8)*cos(d*x + c)^2 + (a^8*b - 3*a^6*b^3 + 3*a^4*b^5
 - a^2*b^7)*cos(d*x + c))*log(-sin(d*x + c) + 1) + (2*a^9 - 6*a^7*b^2 + 6*a
^5*b^4 - 2*a^3*b^6 + (2*a^7*b^2 - 13*a^5*b^4 + 17*a^3*b^6 - 6*a*b^8)*cos(d*
x + c)^2 + (4*a^8*b - 20*a^6*b^3 + 25*a^4*b^5 - 9*a^2*b^7)*cos(d*x + c))*si
n(d*x + c))/((a^10*b^2 - 3*a^8*b^4 + 3*a^6*b^6 - a^4*b^8)*d*cos(d*x + c)^3
+ 2*(a^11*b - 3*a^9*b^3 + 3*a^7*b^5 - a^5*b^7)*d*cos(d*x + c)^2 + (a^12 - 3
*a^10*b^2 + 3*a^8*b^4 - a^6*b^6)*d*cos(d*x + c))]
```

Sympy [F]

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx$$

```
[In] integrate(sec(d*x+c)**2/(a+b*cos(d*x+c))**3,x)
[Out] Integral(sec(c + d*x)**2/(a + b*cos(c + d*x))**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 380, normalized size of antiderivative = 1.64

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx = -\frac{\frac{3\,(4\,a^4b^2-5\,a^2b^4+2\,b^6)\left(\pi\left\lfloor\frac{dx+c}{2\,\pi}+\frac{1}{2}\right\rfloor\mathrm{sgn}(-2\,a+2\,b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\sqrt{a^2-b^2}}\right)\right)}{(a^8-2\,a^6b^2+a^4b^4)\sqrt{a^2-b^2}}+\frac{8\,a^3b^3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-7\,a^2b^4\tan(}{}}{}$$

[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c))^3,x, algorithm="giac")

```
[Out] -(3*(4*a^4*b^2 - 5*a^2*b^4 + 2*b^6)*(pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-
2*a + 2*b) + arctan(-(a*tan(1/2*d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt
(a^2 - b^2)))/((a^8 - 2*a^6*b^2 + a^4*b^4)*sqrt(a^2 - b^2)) + (8*a^3*b^3*ta
n(1/2*d*x + 1/2*c)^3 - 7*a^2*b^4*tan(1/2*d*x + 1/2*c)^3 - 5*a*b^5*tan(1/2*d
*x + 1/2*c)^3 + 4*b^6*tan(1/2*d*x + 1/2*c)^3 + 8*a^3*b^3*tan(1/2*d*x + 1/2*
c) + 7*a^2*b^4*tan(1/2*d*x + 1/2*c) - 5*a*b^5*tan(1/2*d*x + 1/2*c) - 4*b^6*
tan(1/2*d*x + 1/2*c))/((a^7 - 2*a^5*b^2 + a^3*b^4)*(a*tan(1/2*d*x + 1/2*c)^
2 - b*tan(1/2*d*x + 1/2*c)^2 + a + b)^2) + 3*b*log(abs(tan(1/2*d*x + 1/2*c)
 + 1))/a^4 - 3*b*log(abs(tan(1/2*d*x + 1/2*c) - 1))/a^4 + 2*tan(1/2*d*x + 1
/2*c)/((tan(1/2*d*x + 1/2*c)^2 - 1)*a^3))/d
```

Mupad [B] (verification not implemented)

Time = 22.51 (sec) , antiderivative size = 5347, normalized size of antiderivative = 23.05

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Too large to display}$$

[In] int(1/(cos(c + d*x)^2*(a + b*cos(c + d*x))^3),x)

```
[Out] (b*atan(((b*((8*tan(c/2 + (d*x)/2)*(72*b^12 - 72*a*b^11 - 288*a^2*b^10 + 28
8*a^3*b^9 + 441*a^4*b^8 - 432*a^5*b^7 - 288*a^6*b^6 + 288*a^7*b^5 + 36*a^8*
b^4 - 72*a^9*b^3 + 36*a^10*b^2))/(a^12*b + a^13 - a^6*b^7 - a^7*b^6 + 3*a^8
*b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2) - (3*b*((24*(4*a^17*b - 4*a^8*b
^10 + 2*a^9*b^9 + 18*a^10*b^8 - 8*a^11*b^7 - 32*a^12*b^6 + 14*a^13*b^5 + 26
*a^14*b^4 - 12*a^15*b^3 - 8*a^16*b^2))/(a^15*b + a^16 - a^9*b^7 - a^10*b^6
+ 3*a^11*b^5 + 3*a^12*b^4 - 3*a^13*b^3 - 3*a^14*b^2) - (24*b*tan(c/2 + (d*x
)/2)*(8*a^17*b - 8*a^8*b^10 + 8*a^9*b^9 + 32*a^10*b^8 - 32*a^11*b^7 - 48*a^
12*b^6 + 48*a^13*b^5 + 32*a^14*b^4 - 32*a^15*b^3 - 8*a^16*b^2))/(a^4*(a^12*
b + a^13 - a^6*b^7 - a^7*b^6 + 3*a^8*b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*
b^2))))/a^4)*3i)/a^4 + (b*((8*tan(c/2 + (d*x)/2)*(72*b^12 - 72*a*b^11 - 288
```

*a^2*b^10 + 288*a^3*b^9 + 441*a^4*b^8 - 432*a^5*b^7 - 288*a^6*b^6 + 288*a^7
*b^5 + 36*a^8*b^4 - 72*a^9*b^3 + 36*a^10*b^2))/(a^12*b + a^13 - a^6*b^7 - a
^7*b^6 + 3*a^8*b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2) + (3*b*((24*(4*a^
17*b - 4*a^8*b^10 + 2*a^9*b^9 + 18*a^10*b^8 - 8*a^11*b^7 - 32*a^12*b^6 + 14
*a^13*b^5 + 26*a^14*b^4 - 12*a^15*b^3 - 8*a^16*b^2))/(a^15*b + a^16 - a^9*b
^7 - a^10*b^6 + 3*a^11*b^5 + 3*a^12*b^4 - 3*a^13*b^3 - 3*a^14*b^2) + (24*b*
tan(c/2 + (d*x)/2)*(8*a^17*b - 8*a^8*b^10 + 8*a^9*b^9 + 32*a^10*b^8 - 32*a^
11*b^7 - 48*a^12*b^6 + 48*a^13*b^5 + 32*a^14*b^4 - 32*a^15*b^3 - 8*a^16*b^2
))/(a^4*(a^12*b + a^13 - a^6*b^7 - a^7*b^6 + 3*a^8*b^5 + 3*a^9*b^4 - 3*a^10
*b^3 - 3*a^11*b^2))))/a^4)*3i)/a^4)/((48*(36*b^12 - 18*a*b^11 - 162*a^2*b^1
0 + 81*a^3*b^9 + 288*a^4*b^8 - 126*a^5*b^7 - 234*a^6*b^6 + 72*a^7*b^5 + 72*
a^8*b^4))/(a^15*b + a^16 - a^9*b^7 - a^10*b^6 + 3*a^11*b^5 + 3*a^12*b^4 - 3
*a^13*b^3 - 3*a^14*b^2) - (3*b*((8*tan(c/2 + (d*x)/2)*(72*b^12 - 72*a*b^11
- 288*a^2*b^10 + 288*a^3*b^9 + 441*a^4*b^8 - 432*a^5*b^7 - 288*a^6*b^6 + 28
8*a^7*b^5 + 36*a^8*b^4 - 72*a^9*b^3 + 36*a^10*b^2))/(a^12*b + a^13 - a^6*b^
7 - a^7*b^6 + 3*a^8*b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2) - (3*b*((24*
(4*a^17*b - 4*a^8*b^10 + 2*a^9*b^9 + 18*a^10*b^8 - 8*a^11*b^7 - 32*a^12*b^6
+ 14*a^13*b^5 + 26*a^14*b^4 - 12*a^15*b^3 - 8*a^16*b^2))/(a^15*b + a^16 -
a^9*b^7 - a^10*b^6 + 3*a^11*b^5 + 3*a^12*b^4 - 3*a^13*b^3 - 3*a^14*b^2) - (
24*b*tan(c/2 + (d*x)/2)*(8*a^17*b - 8*a^8*b^10 + 8*a^9*b^9 + 32*a^10*b^8 -
32*a^11*b^7 - 48*a^12*b^6 + 48*a^13*b^5 + 32*a^14*b^4 - 32*a^15*b^3 - 8*a^1
6*b^2))/(a^4*(a^12*b + a^13 - a^6*b^7 - a^7*b^6 + 3*a^8*b^5 + 3*a^9*b^4 - 3
*a^10*b^3 - 3*a^11*b^2))))/a^4))/a^4 + (3*b*((8*tan(c/2 + (d*x)/2)*(72*b^12
- 72*a*b^11 - 288*a^2*b^10 + 288*a^3*b^9 + 441*a^4*b^8 - 432*a^5*b^7 - 288
*a^6*b^6 + 288*a^7*b^5 + 36*a^8*b^4 - 72*a^9*b^3 + 36*a^10*b^2))/(a^12*b +
a^13 - a^6*b^7 - a^7*b^6 + 3*a^8*b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2)
+ (3*b*((24*(4*a^17*b - 4*a^8*b^10 + 2*a^9*b^9 + 18*a^10*b^8 - 8*a^11*b^7
- 32*a^12*b^6 + 14*a^13*b^5 + 26*a^14*b^4 - 12*a^15*b^3 - 8*a^16*b^2))/(a^1
5*b + a^16 - a^9*b^7 - a^10*b^6 + 3*a^11*b^5 + 3*a^12*b^4 - 3*a^13*b^3 - 3*
a^14*b^2) + (24*b*tan(c/2 + (d*x)/2)*(8*a^17*b - 8*a^8*b^10 + 8*a^9*b^9 + 3
2*a^10*b^8 - 32*a^11*b^7 - 48*a^12*b^6 + 48*a^13*b^5 + 32*a^14*b^4 - 32*a^1
5*b^3 - 8*a^16*b^2))/(a^4*(a^12*b + a^13 - a^6*b^7 - a^7*b^6 + 3*a^8*b^5 +
3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2))))/a^4))/a^4))*6i)/(a^4*d) - ((tan(c/2
+ (d*x)/2)^5*(3*a*b^4 - 2*a^4*b + 2*a^5 - 6*b^5 + 12*a^2*b^3 - 4*a^3*b^2))
/((a^3*b - a^4)*(a + b)^2) - (tan(c/2 + (d*x)/2)*(3*a*b^4 + 2*a^4*b + 2*a^5
+ 6*b^5 - 12*a^2*b^3 - 4*a^3*b^2))/((a + b)*(a^5 - 2*a^4*b + a^3*b^2)) + (
2*tan(c/2 + (d*x)/2)^3*(2*a^6 - 6*b^6 + 13*a^2*b^4 - 6*a^4*b^2))/(a*(a^2*b
- a^3)*(a + b)^2*(a - b)))/(d*(2*a*b - tan(c/2 + (d*x)/2)^2*(2*a*b - a^2 +
3*b^2) - tan(c/2 + (d*x)/2)^6*(a^2 - 2*a*b + b^2) + a^2 + b^2 - tan(c/2 + (
d*x)/2)^4*(2*a*b + a^2 - 3*b^2))) + (b^2*atan(((b^2*(-(a + b)^5*(a - b)^5)^
(1/2)*((8*tan(c/2 + (d*x)/2)*(72*b^12 - 72*a*b^11 - 288*a^2*b^10 + 288*a^3*
b^9 + 441*a^4*b^8 - 432*a^5*b^7 - 288*a^6*b^6 + 288*a^7*b^5 + 36*a^8*b^4 -
72*a^9*b^3 + 36*a^10*b^2))/(a^12*b + a^13 - a^6*b^7 - a^7*b^6 + 3*a^8*b^5 +
3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2) - (3*b^2*((24*(4*a^17*b - 4*a^8*b^10
+ 2*a^9*b^9 + 18*a^10*b^8 - 8*a^11*b^7 - 32*a^12*b^6 + 14*a^13*b^5 + 26*a^1

4*b^4 - 12*a^15*b^3 - 8*a^16*b^2))/(a^15*b + a^16 - a^9*b^7 - a^10*b^6 + 3*
a^11*b^5 + 3*a^12*b^4 - 3*a^13*b^3 - 3*a^14*b^2) - (12*b^2*tan(c/2 + (d*x)/
2)*(-(a + b)^5*(a - b)^5)^(1/2)*(4*a^4 + 2*b^4 - 5*a^2*b^2)*(8*a^17*b - 8*a
^8*b^10 + 8*a^9*b^9 + 32*a^10*b^8 - 32*a^11*b^7 - 48*a^12*b^6 + 48*a^13*b^5
 + 32*a^14*b^4 - 32*a^15*b^3 - 8*a^16*b^2))/((a^14 - a^4*b^10 + 5*a^6*b^8 -
 10*a^8*b^6 + 10*a^10*b^4 - 5*a^12*b^2)*(a^12*b + a^13 - a^6*b^7 - a^7*b^6
+ 3*a^8*b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2)))*(-(a + b)^5*(a - b)^5)
^(1/2)*(4*a^4 + 2*b^4 - 5*a^2*b^2))/(2*(a^14 - a^4*b^10 + 5*a^6*b^8 - 10*a^
8*b^6 + 10*a^10*b^4 - 5*a^12*b^2)))*(4*a^4 + 2*b^4 - 5*a^2*b^2)*3i)/(2*(a^1
4 - a^4*b^10 + 5*a^6*b^8 - 10*a^8*b^6 + 10*a^10*b^4 - 5*a^12*b^2)) + (b^2*(
-(a + b)^5*(a - b)^5)^(1/2)*((8*tan(c/2 + (d*x)/2)*(72*b^12 - 72*a*b^11 - 2
88*a^2*b^10 + 288*a^3*b^9 + 441*a^4*b^8 - 432*a^5*b^7 - 288*a^6*b^6 + 288*a
^7*b^5 + 36*a^8*b^4 - 72*a^9*b^3 + 36*a^10*b^2))/(a^12*b + a^13 - a^6*b^7 -
 a^7*b^6 + 3*a^8*b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2) + (3*b^2*((24*(
4*a^17*b - 4*a^8*b^10 + 2*a^9*b^9 + 18*a^10*b^8 - 8*a^11*b^7 - 32*a^12*b^6
+ 14*a^13*b^5 + 26*a^14*b^4 - 12*a^15*b^3 - 8*a^16*b^2))/(a^15*b + a^16 - a
^9*b^7 - a^10*b^6 + 3*a^11*b^5 + 3*a^12*b^4 - 3*a^13*b^3 - 3*a^14*b^2) + (1
2*b^2*tan(c/2 + (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(4*a^4 + 2*b^4 - 5*a^
2*b^2)*(8*a^17*b - 8*a^8*b^10 + 8*a^9*b^9 + 32*a^10*b^8 - 32*a^11*b^7 - 48*
a^12*b^6 + 48*a^13*b^5 + 32*a^14*b^4 - 32*a^15*b^3 - 8*a^16*b^2))/((a^14 -
a^4*b^10 + 5*a^6*b^8 - 10*a^8*b^6 + 10*a^10*b^4 - 5*a^12*b^2)*(a^12*b + a^1
3 - a^6*b^7 - a^7*b^6 + 3*a^8*b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2)))*
(-(a + b)^5*(a - b)^5)^(1/2)*(4*a^4 + 2*b^4 - 5*a^2*b^2))/(2*(a^14 - a^4*b^
10 + 5*a^6*b^8 - 10*a^8*b^6 + 10*a^10*b^4 - 5*a^12*b^2)))*(4*a^4 + 2*b^4 -
5*a^2*b^2)*3i)/(2*(a^14 - a^4*b^10 + 5*a^6*b^8 - 10*a^8*b^6 + 10*a^10*b^4 -
 5*a^12*b^2)))/((48*(36*b^12 - 18*a*b^11 - 162*a^2*b^10 + 81*a^3*b^9 + 288*
a^4*b^8 - 126*a^5*b^7 - 234*a^6*b^6 + 72*a^7*b^5 + 72*a^8*b^4))/(a^15*b + a
^16 - a^9*b^7 - a^10*b^6 + 3*a^11*b^5 + 3*a^12*b^4 - 3*a^13*b^3 - 3*a^14*b^
2) - (3*b^2*(-(a + b)^5*(a - b)^5)^(1/2)*((8*tan(c/2 + (d*x)/2)*(72*b^12 -
72*a*b^11 - 288*a^2*b^10 + 288*a^3*b^9 + 441*a^4*b^8 - 432*a^5*b^7 - 288*a^
6*b^6 + 288*a^7*b^5 + 36*a^8*b^4 - 72*a^9*b^3 + 36*a^10*b^2))/(a^12*b + a^1
3 - a^6*b^7 - a^7*b^6 + 3*a^8*b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3*a^11*b^2) -
(3*b^2*((24*(4*a^17*b - 4*a^8*b^10 + 2*a^9*b^9 + 18*a^10*b^8 - 8*a^11*b^7 -
 32*a^12*b^6 + 14*a^13*b^5 + 26*a^14*b^4 - 12*a^15*b^3 - 8*a^16*b^2))/(a^15
*b + a^16 - a^9*b^7 - a^10*b^6 + 3*a^11*b^5 + 3*a^12*b^4 - 3*a^13*b^3 - 3*a
^14*b^2) - (12*b^2*tan(c/2 + (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(4*a^4 +
 2*b^4 - 5*a^2*b^2)*(8*a^17*b - 8*a^8*b^10 + 8*a^9*b^9 + 32*a^10*b^8 - 32*a
^11*b^7 - 48*a^12*b^6 + 48*a^13*b^5 + 32*a^14*b^4 - 32*a^15*b^3 - 8*a^16*b^
2))/((a^14 - a^4*b^10 + 5*a^6*b^8 - 10*a^8*b^6 + 10*a^10*b^4 - 5*a^12*b^2)*
(a^12*b + a^13 - a^6*b^7 - a^7*b^6 + 3*a^8*b^5 + 3*a^9*b^4 - 3*a^10*b^3 - 3
*a^11*b^2)))*(-(a + b)^5*(a - b)^5)^(1/2)*(4*a^4 + 2*b^4 - 5*a^2*b^2))/(2*(
a^14 - a^4*b^10 + 5*a^6*b^8 - 10*a^8*b^6 + 10*a^10*b^4 - 5*a^12*b^2)))*(4*a
^4 + 2*b^4 - 5*a^2*b^2))/(2*(a^14 - a^4*b^10 + 5*a^6*b^8 - 10*a^8*b^6 + 10*
a^10*b^4 - 5*a^12*b^2)) + (3*b^2*(-(a + b)^5*(a - b)^5)^(1/2)*((8*tan(c/2 +
 (d*x)/2)*(72*b^12 - 72*a*b^11 - 288*a^2*b^10 + 288*a^3*b^9 + 441*a^4*b^8 -

432*a^5*b^7 - 288*a^6*b^6 + 288*a^7*b^5 + 36*a^8*b^4 - 72*a^9*b^3 + 36*a^1
0*b^2))/(a^12*b + a^13 - a^6*b^7 - a^7*b^6 + 3*a^8*b^5 + 3*a^9*b^4 - 3*a^10
*b^3 - 3*a^11*b^2) + (3*b^2*((24*(4*a^17*b - 4*a^8*b^10 + 2*a^9*b^9 + 18*a^
10*b^8 - 8*a^11*b^7 - 32*a^12*b^6 + 14*a^13*b^5 + 26*a^14*b^4 - 12*a^15*b^3
 - 8*a^16*b^2))/(a^15*b + a^16 - a^9*b^7 - a^10*b^6 + 3*a^11*b^5 + 3*a^12*b
^4 - 3*a^13*b^3 - 3*a^14*b^2) + (12*b^2*tan(c/2 + (d*x)/2)*(-(a + b)^5*(a -
 b)^5)^(1/2)*(4*a^4 + 2*b^4 - 5*a^2*b^2)*(8*a^17*b - 8*a^8*b^10 + 8*a^9*b^9
 + 32*a^10*b^8 - 32*a^11*b^7 - 48*a^12*b^6 + 48*a^13*b^5 + 32*a^14*b^4 - 32
*a^15*b^3 - 8*a^16*b^2))/((a^14 - a^4*b^10 + 5*a^6*b^8 - 10*a^8*b^6 + 10*a^
10*b^4 - 5*a^12*b^2)*(a^12*b + a^13 - a^6*b^7 - a^7*b^6 + 3*a^8*b^5 + 3*a^9
*b^4 - 3*a^10*b^3 - 3*a^11*b^2)))*(-(a + b)^5*(a - b)^5)^(1/2)*(4*a^4 + 2*b
^4 - 5*a^2*b^2))/(2*(a^14 - a^4*b^10 + 5*a^6*b^8 - 10*a^8*b^6 + 10*a^10*b^4
 - 5*a^12*b^2)))*(4*a^4 + 2*b^4 - 5*a^2*b^2))/(2*(a^14 - a^4*b^10 + 5*a^6*b
^8 - 10*a^8*b^6 + 10*a^10*b^4 - 5*a^12*b^2))))*(-(a + b)^5*(a - b)^5)^(1/2)
*(4*a^4 + 2*b^4 - 5*a^2*b^2)*3i)/(d*(a^14 - a^4*b^10 + 5*a^6*b^8 - 10*a^8*b
^6 + 10*a^10*b^4 - 5*a^12*b^2))

3.477 $\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 305

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^3}\,dx = -\frac{b^3(20a^4-29a^2b^2+12b^4)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^5(a-b)^{5/2}(a+b)^{5/2}d} + \frac{(a^2+12b^2)\,\text{arctanh}(\sin(c+dx))}{2a^5d} - \frac{3b(2a^4-7a^2b^2+4b^4)\tan(c+dx)}{2a^4(a^2-b^2)^2d} + \frac{(a^4-10a^2b^2+6b^4)\sec(c+dx)\tan(c+dx)}{2a^3(a^2-b^2)^2d} + \frac{b^2\sec(c+dx)\tan(c+dx)}{2a(a^2-b^2)d(a+b\cos(c+dx))^2} + \frac{b^2(7a^2-4b^2)\sec(c+dx)\tan(c+dx)}{2a^2(a^2-b^2)^2d(a+b\cos(c+dx))}$$

```
[Out] -b^3*(20*a^4-29*a^2*b^2+12*b^4)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)
^(1/2))/a^5/(a-b)^(5/2)/(a+b)^(5/2)/d+1/2*(a^2+12*b^2)*arctanh(sin(d*x+c))/
a^5/d-3/2*b*(2*a^4-7*a^2*b^2+4*b^4)*tan(d*x+c)/a^4/(a^2-b^2)^2/d+1/2*(a^4-1
0*a^2*b^2+6*b^4)*sec(d*x+c)*tan(d*x+c)/a^3/(a^2-b^2)^2/d+1/2*b^2*sec(d*x+c)
*tan(d*x+c)/a/(a^2-b^2)/d/(a+b*cos(d*x+c))^2+1/2*b^2*(7*a^2-4*b^2)*sec(d*x+
c)*tan(d*x+c)/a^2/(a^2-b^2)^2/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 1.20 (sec) , antiderivative size = 305, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2881, 3134, 3080, 3855, 2738, 211}

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \frac{b^2(7a^2-4b^2)\tan(c+dx)\sec(c+dx)}{2a^2d\,(a^2-b^2)^2\,(a+b\cos(c+dx))} + \frac{b^2\tan(c+dx)\sec(c+dx)}{2ad\,(a^2-b^2)\,(a+b\cos(c+dx))^2} + \frac{(a^2+12b^2)\,\text{arctanh}(\sin(c+dx))}{2a^5d} - \frac{3b(2a^4-7a^2b^2+4b^4)\tan(c+dx)}{2a^4d\,(a^2-b^2)^2} - \frac{b^3(20a^4-29a^2b^2+12b^4)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^5d(a-b)^{5/2}(a+b)^{5/2}} + \frac{(a^4-10a^2b^2+6b^4)\tan(c+dx)\sec(c+dx)}{2a^3d\,(a^2-b^2)^2}$$

```
[In] Int[Sec[c + d*x]^3/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] -((b^3*(20*a^4 - 29*a^2*b^2 + 12*b^4)*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])
/Sqrt[a + b]])/(a^5*(a - b)^(5/2)*(a + b)^(5/2)*d)) + ((a^2 + 12*b^2)*ArcTa
nh[Sin[c + d*x]])/(2*a^5*d) - (3*b*(2*a^4 - 7*a^2*b^2 + 4*b^4)*Tan[c + d*x]
)/(2*a^4*(a^2 - b^2)^2*d) + ((a^4 - 10*a^2*b^2 + 6*b^4)*Sec[c + d*x]*Tan[c
+ d*x])/(2*a^3*(a^2 - b^2)^2*d) + (b^2*Sec[c + d*x]*Tan[c + d*x])/(2*a*(a^2
 - b^2)*d*(a + b*Cos[c + d*x])^2) + (b^2*(7*a^2 - 4*b^2)*Sec[c + d*x]*Tan[c
 + d*x])/(2*a^2*(a^2 - b^2)^2*d*(a + b*Cos[c + d*x]))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
```

```
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] && !IntegerQ[n]) || !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] && !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 3080

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[(A*b
- a*B)/(b*c - a*d), Int[1/(a + b*Sin[e + f*x]), x], x] + Dist[(B*c - A*d)/(
b*c - a*d), Int[1/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f,
A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] && !IntegerQ[
n]) || !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] && !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

integral

$$= \frac{b^2 \sec(c+dx)\tan(c+dx)}{2a\,(a^2-b^2)\,d(a+b\cos(c+dx))^2} + \frac{\int \frac{(2(a^2-2b^2)-2ab\cos(c+dx)+3b^2\cos^2(c+dx))\sec^3(c+dx)}{(a+b\cos(c+dx))^2}\,dx}{2a\,(a^2-b^2)}$$

$$=\frac{b^2\sec(c+dx)\tan(c+dx)}{2a\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{b^2(7a^2-4b^2)\sec(c+dx)\tan(c+dx)}{2a^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}+\frac{\int\frac{\left(2\left(a^4-10a^2b^2+6b^4\right)-ab\left(4a^2-b^2\right)\cos(c+dx)+2b^2\left(7a^2-4b^2\right)\cos^2(c+dx)\right)\sec^3(c+dx)}{a+b\cos(c+dx)}dx}{2a^2\left(a^2-b^2\right)^2}$$

$$=\frac{(a^4-10a^2b^2+6b^4)\sec(c+dx)\tan(c+dx)}{2a^3\left(a^2-b^2\right)^2d}+\frac{b^2\sec(c+dx)\tan(c+dx)}{2a\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{b^2(7a^2-4b^2)\sec(c+dx)\tan(c+dx)}{2a^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}+\frac{\int\frac{\left(-6b\left(2a^4-7a^2b^2+4b^4\right)+2a\left(a^4+4a^2b^2-2b^4\right)\cos(c+dx)+2b\left(a^4-10a^2b^2+6b^4\right)\cos^2(c+dx)\right)\sec^2(c+dx)}{a+b\cos(c+dx)}dx}{4a^3\left(a^2-b^2\right)^2}$$

$$=-\frac{3b(2a^4-7a^2b^2+4b^4)\tan(c+dx)}{2a^4\left(a^2-b^2\right)^2d}+\frac{(a^4-10a^2b^2+6b^4)\sec(c+dx)\tan(c+dx)}{2a^3\left(a^2-b^2\right)^2d}+\frac{b^2\sec(c+dx)\tan(c+dx)}{2a\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{b^2(7a^2-4b^2)\sec(c+dx)\tan(c+dx)}{2a^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}+\frac{\int\frac{\left(2\left(a^2-b^2\right)^2\left(a^2+12b^2\right)+2ab\left(a^4-10a^2b^2+6b^4\right)\cos(c+dx)\right)\sec(c+dx)}{a+b\cos(c+dx)}dx}{4a^4\left(a^2-b^2\right)^2}$$

$$=-\frac{3b(2a^4-7a^2b^2+4b^4)\tan(c+dx)}{2a^4\left(a^2-b^2\right)^2d}+\frac{(a^4-10a^2b^2+6b^4)\sec(c+dx)\tan(c+dx)}{2a^3\left(a^2-b^2\right)^2d}+\frac{b^2\sec(c+dx)\tan(c+dx)}{2a\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{b^2(7a^2-4b^2)\sec(c+dx)\tan(c+dx)}{2a^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}+\frac{\left(a^2+12b^2\right)\int\sec(c+dx)dx}{2a^5}-\frac{\left(b^3(20a^4-29a^2b^2+12b^4)\right)\int\frac{1}{a+b\cos(c+dx)}dx}{2a^5\left(a^2-b^2\right)^2}$$

$$=\frac{\left(a^2+12b^2\right)\operatorname{arctanh}(\sin(c+dx))}{2a^5d}-\frac{3b(2a^4-7a^2b^2+4b^4)\tan(c+dx)}{2a^4\left(a^2-b^2\right)^2d}+\frac{(a^4-10a^2b^2+6b^4)\sec(c+dx)\tan(c+dx)}{2a^3\left(a^2-b^2\right)^2d}+\frac{b^2\sec(c+dx)\tan(c+dx)}{2a\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{b^2(7a^2-4b^2)\sec(c+dx)\tan(c+dx)}{2a^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}-\frac{\left(b^3(20a^4-29a^2b^2+12b^4)\right)\operatorname{Subst}\left(\int\frac{1}{a+b+(a-b)x^2}dx,x,\tan\left(\frac{1}{2}(c+dx)\right)\right)}{a^5\left(a^2-b^2\right)^2d}$$

$$= -\frac{b^3(20a^4-29a^2b^2+12b^4)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^5(a-b)^{5/2}(a+b)^{5/2}d}+\frac{(a^2+12b^2)\,\text{arctanh}(\sin(c+dx))}{2a^5d}-\frac{3b(2a^4-7a^2b^2+4b^4)\tan(c+dx)}{2a^4\left(a^2-b^2\right)^2d}+\frac{(a^4-10a^2b^2+6b^4)\sec(c+dx)\tan(c+dx)}{2a^3\left(a^2-b^2\right)^2d}+\frac{b^2\sec(c+dx)\tan(c+dx)}{2a\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{b^2(7a^2-4b^2)\sec(c+dx)\tan(c+dx)}{2a^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 6.52 (sec) , antiderivative size = 427, normalized size of antiderivative = 1.40

$$\int\frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^3}\,dx=\frac{b^3(20a^4-29a^2b^2+12b^4)\,\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{a^5\left(a^2-b^2\right)^2\sqrt{-a^2+b^2}d}+\frac{(-a^2-12b^2)\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)}{2a^5d}+\frac{(a^2+12b^2)\log\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)}{2a^5d}+\frac{1}{4a^3d\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)^2}-\frac{3b\sin\left(\frac{1}{2}(c+dx)\right)}{a^4d\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)}-\frac{1}{4a^3d\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)^2}-\frac{3b\sin\left(\frac{1}{2}(c+dx)\right)}{a^4d\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)}+\frac{b^4\sin(c+dx)}{2a^3(a-b)(a+b)d(a+b\cos(c+dx))^2}+\frac{3(3a^2b^4\sin(c+dx)-2b^6\sin(c+dx))}{2a^4(a-b)^2(a+b)^2d(a+b\cos(c+dx))}$$

```
[In] Integrate[Sec[c + d*x]^3/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (b^3*(20*a^4 - 29*a^2*b^2 + 12*b^4)*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt
[-a^2 + b^2]])/(a^5*(a^2 - b^2)^2*Sqrt[-a^2 + b^2]*d) + ((-a^2 - 12*b^2)*Lo
g[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]])/(2*a^5*d) + ((a^2 + 12*b^2)*Log[Cos
[(c + d*x)/2] + Sin[(c + d*x)/2]])/(2*a^5*d) + 1/(4*a^3*d*(Cos[(c + d*x)/2]
 - Sin[(c + d*x)/2])^2) - (3*b*Sin[(c + d*x)/2])/(a^4*d*(Cos[(c + d*x)/2] -
 Sin[(c + d*x)/2])) - 1/(4*a^3*d*(Cos[(c + d*x)/2] + Sin[(c + d*x)/2])^2) -
 (3*b*Sin[(c + d*x)/2])/(a^4*d*(Cos[(c + d*x)/2] + Sin[(c + d*x)/2])) + (b^
4*Sin[c + d*x])/(2*a^3*(a - b)*(a + b)*d*(a + b*Cos[c + d*x])^2) + (3*(3*a^
2*b^4*Sin[c + d*x] - 2*b^6*Sin[c + d*x]))/(2*a^4*(a - b)^2*(a + b)^2*d*(a +
 b*Cos[c + d*x]))
```

Maple [A] (verified)

Time = 2.44 (sec) , antiderivative size = 360, normalized size of antiderivative = 1.18

method	result
derivativedivides	$\frac{1}{2a^3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}-\frac{-a-6b}{2a^4\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{\left(-a^2-12b^2\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2a^5}-\frac{2b^3\left(\frac{-\frac{\left(10a^2+ab-6b^2\right)ab\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)\left(a^2+2ab+b^2\right)}-\left(\right.}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\right.\right.\right.}}{}$
default	$\frac{1}{2a^3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}-\frac{-a-6b}{2a^4\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{\left(-a^2-12b^2\right)\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2a^5}-\frac{2b^3\left(\frac{-\frac{\left(10a^2+ab-6b^2\right)ab\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)\left(a^2+2ab+b^2\right)}-\left(\right.}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\right.\right.\right.}}{}$
risch	Expression too large to display

```
[In] int(sec(d*x+c)^3/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(1/2/a^3/(tan(1/2*d*x+1/2*c)-1)^2-1/2*(-a-6*b)/a^4/(tan(1/2*d*x+1/2*c)-
1)+1/2/a^5*(-a^2-12*b^2)*ln(tan(1/2*d*x+1/2*c)-1)-2*b^3/a^5*((-1/2*(10*a^2+
a*b-6*b^2)*a*b/(a-b)/(a^2+2*a*b+b^2)*tan(1/2*d*x+1/2*c)^3-1/2*(10*a^2-a*b-6
*b^2)*a*b/(a+b)/(a^2-2*a*b+b^2)*tan(1/2*d*x+1/2*c))/(tan(1/2*d*x+1/2*c)^2*a
-b*tan(1/2*d*x+1/2*c)^2+a+b)^2+1/2*(20*a^4-29*a^2*b^2+12*b^4)/(a^4-2*a^2*b^
2+b^4)/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1
/2)))-1/2/a^3/(tan(1/2*d*x+1/2*c)+1)^2-1/2*(-a-6*b)/a^4/(tan(1/2*d*x+1/2*c)
+1)+1/2*(a^2+12*b^2)/a^5*ln(tan(1/2*d*x+1/2*c)+1))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 728 vs. 2(286) = 572.

Time = 1.47 (sec) , antiderivative size = 1524, normalized size of antiderivative = 5.00

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Too large to display}$$

```
[In] integrate(sec(d*x+c)^3/(a+b*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] [-1/4*(((20*a^4*b^5 - 29*a^2*b^7 + 12*b^9)*cos(d*x + c)^4 + 2*(20*a^5*b^4 -
 29*a^3*b^6 + 12*a*b^8)*cos(d*x + c)^3 + (20*a^6*b^3 - 29*a^4*b^5 + 12*a^2*
b^7)*cos(d*x + c)^2)*sqrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^
2)*cos(d*x + c)^2 - 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) -
a^2 + 2*b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) - ((a^8*b^2 +
 9*a^6*b^4 - 33*a^4*b^6 + 35*a^2*b^8 - 12*b^10)*cos(d*x + c)^4 + 2*(a^9*b +
 9*a^7*b^3 - 33*a^5*b^5 + 35*a^3*b^7 - 12*a*b^9)*cos(d*x + c)^3 + (a^10 + 9
```

```
*a^8*b^2 - 33*a^6*b^4 + 35*a^4*b^6 - 12*a^2*b^8)*cos(d*x + c)^2)*log(sin(d*
x + c) + 1) + ((a^8*b^2 + 9*a^6*b^4 - 33*a^4*b^6 + 35*a^2*b^8 - 12*b^10)*co
s(d*x + c)^4 + 2*(a^9*b + 9*a^7*b^3 - 33*a^5*b^5 + 35*a^3*b^7 - 12*a*b^9)*c
os(d*x + c)^3 + (a^10 + 9*a^8*b^2 - 33*a^6*b^4 + 35*a^4*b^6 - 12*a^2*b^8)*c
os(d*x + c)^2)*log(-sin(d*x + c) + 1) - 2*(a^10 - 3*a^8*b^2 + 3*a^6*b^4 - a
^4*b^6 - 3*(2*a^7*b^3 - 9*a^5*b^5 + 11*a^3*b^7 - 4*a*b^9)*cos(d*x + c)^3 -
(11*a^8*b^2 - 43*a^6*b^4 + 50*a^4*b^6 - 18*a^2*b^8)*cos(d*x + c)^2 - 4*(a^9
*b - 3*a^7*b^3 + 3*a^5*b^5 - a^3*b^7)*cos(d*x + c))*sin(d*x + c))/((a^11*b^
2 - 3*a^9*b^4 + 3*a^7*b^6 - a^5*b^8)*d*cos(d*x + c)^4 + 2*(a^12*b - 3*a^10*
b^3 + 3*a^8*b^5 - a^6*b^7)*d*cos(d*x + c)^3 + (a^13 - 3*a^11*b^2 + 3*a^9*b^
4 - a^7*b^6)*d*cos(d*x + c)^2), -1/4*(2*((20*a^4*b^5 - 29*a^2*b^7 + 12*b^9)
*cos(d*x + c)^4 + 2*(20*a^5*b^4 - 29*a^3*b^6 + 12*a*b^8)*cos(d*x + c)^3 + (
20*a^6*b^3 - 29*a^4*b^5 + 12*a^2*b^7)*cos(d*x + c)^2)*sqrt(a^2 - b^2)*arcta
n(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c))) - ((a^8*b^2 + 9*a^6
*b^4 - 33*a^4*b^6 + 35*a^2*b^8 - 12*b^10)*cos(d*x + c)^4 + 2*(a^9*b + 9*a^7
*b^3 - 33*a^5*b^5 + 35*a^3*b^7 - 12*a*b^9)*cos(d*x + c)^3 + (a^10 + 9*a^8*b
^2 - 33*a^6*b^4 + 35*a^4*b^6 - 12*a^2*b^8)*cos(d*x + c)^2)*log(sin(d*x + c)
 + 1) + ((a^8*b^2 + 9*a^6*b^4 - 33*a^4*b^6 + 35*a^2*b^8 - 12*b^10)*cos(d*x
+ c)^4 + 2*(a^9*b + 9*a^7*b^3 - 33*a^5*b^5 + 35*a^3*b^7 - 12*a*b^9)*cos(d*x
 + c)^3 + (a^10 + 9*a^8*b^2 - 33*a^6*b^4 + 35*a^4*b^6 - 12*a^2*b^8)*cos(d*x
 + c)^2)*log(-sin(d*x + c) + 1) - 2*(a^10 - 3*a^8*b^2 + 3*a^6*b^4 - a^4*b^6
 - 3*(2*a^7*b^3 - 9*a^5*b^5 + 11*a^3*b^7 - 4*a*b^9)*cos(d*x + c)^3 - (11*a^
8*b^2 - 43*a^6*b^4 + 50*a^4*b^6 - 18*a^2*b^8)*cos(d*x + c)^2 - 4*(a^9*b - 3
*a^7*b^3 + 3*a^5*b^5 - a^3*b^7)*cos(d*x + c))*sin(d*x + c))/((a^11*b^2 - 3*
a^9*b^4 + 3*a^7*b^6 - a^5*b^8)*d*cos(d*x + c)^4 + 2*(a^12*b - 3*a^10*b^3 +
3*a^8*b^5 - a^6*b^7)*d*cos(d*x + c)^3 + (a^13 - 3*a^11*b^2 + 3*a^9*b^4 - a^
7*b^6)*d*cos(d*x + c)^2)]
```

Sympy [F]

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^3}\,dx$$

```
[In] integrate(sec(d*x+c)**3/(a+b*cos(d*x+c))**3,x)
```

```
[Out] Integral(sec(c + d*x)**3/(a + b*cos(c + d*x))**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(sec(d*x+c)^3/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 801 vs. $2(286) = 572$.

Time = 0.35 (sec) , antiderivative size = 801, normalized size of antiderivative = 2.63

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Too large to display}$$

```
[In] integrate(sec(d*x+c)^3/(a+b*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/2*(2*(20*a^4*b^3 - 29*a^2*b^5 + 12*b^7)*(pi*floor(1/2*(d*x + c)/pi + 1/2)
*sgn(-2*a + 2*b) + arctan(-(a*tan(1/2*d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c)
)/sqrt(a^2 - b^2)))/((a^9 - 2*a^7*b^2 + a^5*b^4)*sqrt(a^2 - b^2)) + 2*(a^7*
tan(1/2*d*x + 1/2*c)^7 + 4*a^6*b*tan(1/2*d*x + 1/2*c)^7 - 13*a^5*b^2*tan(1/
2*d*x + 1/2*c)^7 - 2*a^4*b^3*tan(1/2*d*x + 1/2*c)^7 + 33*a^3*b^4*tan(1/2*d*
x + 1/2*c)^7 - 17*a^2*b^5*tan(1/2*d*x + 1/2*c)^7 - 18*a*b^6*tan(1/2*d*x + 1
/2*c)^7 + 12*b^7*tan(1/2*d*x + 1/2*c)^7 + 3*a^7*tan(1/2*d*x + 1/2*c)^5 + 4*
a^6*b*tan(1/2*d*x + 1/2*c)^5 + 5*a^5*b^2*tan(1/2*d*x + 1/2*c)^5 - 26*a^4*b^
3*tan(1/2*d*x + 1/2*c)^5 - 29*a^3*b^4*tan(1/2*d*x + 1/2*c)^5 + 67*a^2*b^5*t
an(1/2*d*x + 1/2*c)^5 + 18*a*b^6*tan(1/2*d*x + 1/2*c)^5 - 36*b^7*tan(1/2*d*
x + 1/2*c)^5 + 3*a^7*tan(1/2*d*x + 1/2*c)^3 - 4*a^6*b*tan(1/2*d*x + 1/2*c)^
3 + 5*a^5*b^2*tan(1/2*d*x + 1/2*c)^3 + 26*a^4*b^3*tan(1/2*d*x + 1/2*c)^3 -
29*a^3*b^4*tan(1/2*d*x + 1/2*c)^3 - 67*a^2*b^5*tan(1/2*d*x + 1/2*c)^3 + 18*
a*b^6*tan(1/2*d*x + 1/2*c)^3 + 36*b^7*tan(1/2*d*x + 1/2*c)^3 + a^7*tan(1/2*
d*x + 1/2*c) - 4*a^6*b*tan(1/2*d*x + 1/2*c) - 13*a^5*b^2*tan(1/2*d*x + 1/2*
c) + 2*a^4*b^3*tan(1/2*d*x + 1/2*c) + 33*a^3*b^4*tan(1/2*d*x + 1/2*c) + 17*
a^2*b^5*tan(1/2*d*x + 1/2*c) - 18*a*b^6*tan(1/2*d*x + 1/2*c) - 12*b^7*tan(1
/2*d*x + 1/2*c))/((a^8 - 2*a^6*b^2 + a^4*b^4)*(a*tan(1/2*d*x + 1/2*c)^4 - b
*tan(1/2*d*x + 1/2*c)^4 + 2*b*tan(1/2*d*x + 1/2*c)^2 - a - b)^2) + (a^2 + 1
2*b^2)*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^5 - (a^2 + 12*b^2)*log(abs(tan(
1/2*d*x + 1/2*c) - 1))/a^5)/d
```

Mupad [B] (verification not implemented)

Time = 23.25 (sec) , antiderivative size = 5910, normalized size of antiderivative = 19.38

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Too large to display}$$

```
[In] int(1/(cos(c + d*x)^3*(a + b*cos(c + d*x))^3),x)
```

```
[Out] ((tan(c/2 + (d*x)/2)^3*(18*a*b^6 - 4*a^6*b + 3*a^7 + 36*b^7 - 67*a^2*b^5 -
29*a^3*b^4 + 26*a^4*b^3 + 5*a^5*b^2))/((a + b)^2*(a^6 - 2*a^5*b + a^4*b^2))
 + (tan(c/2 + (d*x)/2)^5*(18*a*b^6 + 4*a^6*b + 3*a^7 - 36*b^7 + 67*a^2*b^5
- 29*a^3*b^4 - 26*a^4*b^3 + 5*a^5*b^2))/((a + b)^2*(a^6 - 2*a^5*b + a^4*b^2
)) - (tan(c/2 + (d*x)/2)^7*(6*a*b^5 + 5*a^5*b + a^6 - 12*b^6 + 23*a^2*b^4 -
 10*a^3*b^3 - 8*a^4*b^2))/((a^4*b - a^5)*(a + b)^2) - (tan(c/2 + (d*x)/2)*(
6*a*b^5 + 5*a^5*b - a^6 + 12*b^6 - 23*a^2*b^4 - 10*a^3*b^3 + 8*a^4*b^2))/((
a + b)*(a^6 - 2*a^5*b + a^4*b^2)))/(d*(2*a*b - tan(c/2 + (d*x)/2)^4*(2*a^2
- 6*b^2) - tan(c/2 + (d*x)/2)^2*(4*a*b + 4*b^2) + tan(c/2 + (d*x)/2)^6*(4*a
*b - 4*b^2) + tan(c/2 + (d*x)/2)^8*(a^2 - 2*a*b + b^2) + a^2 + b^2)) - (ata
n((((a^2 + 12*b^2)*((8*tan(c/2 + (d*x)/2)*(a^14 - 2*a^13*b - 288*a*b^13 + 2
88*b^14 - 1104*a^2*b^12 + 1104*a^3*b^11 + 1538*a^4*b^10 - 1538*a^5*b^9 - 82
7*a^6*b^8 + 872*a^7*b^7 + 18*a^8*b^6 - 108*a^9*b^5 + 74*a^10*b^4 - 40*a^11*
b^3 + 21*a^12*b^2))/(a^14*b + a^15 - a^8*b^7 - a^9*b^6 + 3*a^10*b^5 + 3*a^1
1*b^4 - 3*a^12*b^3 - 3*a^13*b^2) - ((a^2 + 12*b^2)*((4*(4*a^21 - 48*a^10*b^
11 + 24*a^11*b^10 + 212*a^12*b^9 - 100*a^13*b^8 - 360*a^14*b^7 + 164*a^15*b
^6 + 276*a^16*b^5 - 120*a^17*b^4 - 80*a^18*b^3 + 28*a^19*b^2))/(a^18*b + a^
19 - a^12*b^7 - a^13*b^6 + 3*a^14*b^5 + 3*a^15*b^4 - 3*a^16*b^3 - 3*a^17*b^
2) - (4*tan(c/2 + (d*x)/2)*(a^2 + 12*b^2)*(8*a^19*b - 8*a^10*b^10 + 8*a^11*
b^9 + 32*a^12*b^8 - 32*a^13*b^7 - 48*a^14*b^6 + 48*a^15*b^5 + 32*a^16*b^4 -
 32*a^17*b^3 - 8*a^18*b^2))/(a^5*(a^14*b + a^15 - a^8*b^7 - a^9*b^6 + 3*a^1
0*b^5 + 3*a^11*b^4 - 3*a^12*b^3 - 3*a^13*b^2))))/(2*a^5))*1i)/(2*a^5) + ((a
^2 + 12*b^2)*((8*tan(c/2 + (d*x)/2)*(a^14 - 2*a^13*b - 288*a*b^13 + 288*b^1
4 - 1104*a^2*b^12 + 1104*a^3*b^11 + 1538*a^4*b^10 - 1538*a^5*b^9 - 827*a^6*
b^8 + 872*a^7*b^7 + 18*a^8*b^6 - 108*a^9*b^5 + 74*a^10*b^4 - 40*a^11*b^3 +
21*a^12*b^2))/(a^14*b + a^15 - a^8*b^7 - a^9*b^6 + 3*a^10*b^5 + 3*a^11*b^4
- 3*a^12*b^3 - 3*a^13*b^2) + ((a^2 + 12*b^2)*((4*(4*a^21 - 48*a^10*b^11 + 2
4*a^11*b^10 + 212*a^12*b^9 - 100*a^13*b^8 - 360*a^14*b^7 + 164*a^15*b^6 + 2
76*a^16*b^5 - 120*a^17*b^4 - 80*a^18*b^3 + 28*a^19*b^2))/(a^18*b + a^19 - a
^12*b^7 - a^13*b^6 + 3*a^14*b^5 + 3*a^15*b^4 - 3*a^16*b^3 - 3*a^17*b^2) + (
4*tan(c/2 + (d*x)/2)*(a^2 + 12*b^2)*(8*a^19*b - 8*a^10*b^10 + 8*a^11*b^9 +
32*a^12*b^8 - 32*a^13*b^7 - 48*a^14*b^6 + 48*a^15*b^5 + 32*a^16*b^4 - 32*a^
17*b^3 - 8*a^18*b^2))/(a^5*(a^14*b + a^15 - a^8*b^7 - a^9*b^6 + 3*a^10*b^5
+ 3*a^11*b^4 - 3*a^12*b^3 - 3*a^13*b^2))))/(2*a^5))*1i)/(2*a^5))/((8*(1728*
b^15 - 864*a*b^14 - 7344*a^2*b^13 + 3456*a^3*b^12 + 11700*a^4*b^11 - 4770*a
^5*b^10 - 7829*a^6*b^9 + 2326*a^7*b^8 + 1314*a^8*b^7 - 11*a^9*b^6 + 411*a^1
```

0*b^5 - 20*a^11*b^4 + 20*a^12*b^3))/(a^18*b + a^19 - a^12*b^7 - a^13*b^6 + 3*a^14*b^5 + 3*a^15*b^4 - 3*a^16*b^3 - 3*a^17*b^2) - ((a^2 + 12*b^2)*((8*tan(c/2 + (d*x)/2)*(a^14 - 2*a^13*b - 288*a*b^13 + 288*b^14 - 1104*a^2*b^12 + 1104*a^3*b^11 + 1538*a^4*b^10 - 1538*a^5*b^9 - 827*a^6*b^8 + 872*a^7*b^7 + 18*a^8*b^6 - 108*a^9*b^5 + 74*a^10*b^4 - 40*a^11*b^3 + 21*a^12*b^2))/(a^14*b + a^15 - a^8*b^7 - a^9*b^6 + 3*a^10*b^5 + 3*a^11*b^4 - 3*a^12*b^3 - 3*a^13*b^2) - ((a^2 + 12*b^2)*((4*(4*a^21 - 48*a^10*b^11 + 24*a^11*b^10 + 212*a^12*b^9 - 100*a^13*b^8 - 360*a^14*b^7 + 164*a^15*b^6 + 276*a^16*b^5 - 120*a^17*b^4 - 80*a^18*b^3 + 28*a^19*b^2))/(a^18*b + a^19 - a^12*b^7 - a^13*b^6 + 3*a^14*b^5 + 3*a^15*b^4 - 3*a^16*b^3 - 3*a^17*b^2) - (4*tan(c/2 + (d*x)/2)*(a^2 + 12*b^2)*(8*a^19*b - 8*a^10*b^10 + 8*a^11*b^9 + 32*a^12*b^8 - 32*a^13*b^7 - 48*a^14*b^6 + 48*a^15*b^5 + 32*a^16*b^4 - 32*a^17*b^3 - 8*a^18*b^2))/(a^5*(a^14*b + a^15 - a^8*b^7 - a^9*b^6 + 3*a^10*b^5 + 3*a^11*b^4 - 3*a^12*b^3 - 3*a^13*b^2))))/(2*a^5)))/(2*a^5) + ((a^2 + 12*b^2)*((8*tan(c/2 + (d*x)/2)*(a^14 - 2*a^13*b - 288*a*b^13 + 288*b^14 - 1104*a^2*b^12 + 1104*a^3*b^11 + 1538*a^4*b^10 - 1538*a^5*b^9 - 827*a^6*b^8 + 872*a^7*b^7 + 18*a^8*b^6 - 108*a^9*b^5 + 74*a^10*b^4 - 40*a^11*b^3 + 21*a^12*b^2))/(a^14*b + a^15 - a^8*b^7 - a^9*b^6 + 3*a^10*b^5 + 3*a^11*b^4 - 3*a^12*b^3 - 3*a^13*b^2) + ((a^2 + 12*b^2)*((4*(4*a^21 - 48*a^10*b^11 + 24*a^11*b^10 + 212*a^12*b^9 - 100*a^13*b^8 - 360*a^14*b^7 + 164*a^15*b^6 + 276*a^16*b^5 - 120*a^17*b^4 - 80*a^18*b^3 + 28*a^19*b^2))/(a^18*b + a^19 - a^12*b^7 - a^13*b^6 + 3*a^14*b^5 + 3*a^15*b^4 - 3*a^16*b^3 - 3*a^17*b^2) + (4*tan(c/2 + (d*x)/2)*(a^2 + 12*b^2)*(8*a^19*b - 8*a^10*b^10 + 8*a^11*b^9 + 32*a^12*b^8 - 32*a^13*b^7 - 48*a^14*b^6 + 48*a^15*b^5 + 32*a^16*b^4 - 32*a^17*b^3 - 8*a^18*b^2))/(a^5*(a^14*b + a^15 - a^8*b^7 - a^9*b^6 + 3*a^10*b^5 + 3*a^11*b^4 - 3*a^12*b^3 - 3*a^13*b^2))))/(2*a^5)))/(2*a^5))*(a^2 + 12*b^2)*1i)/(a^5*d) - (b^3*atan(((b^3*((8*tan(c/2 + (d*x)/2)*(a^14 - 2*a^13*b - 288*a*b^13 + 288*b^14 - 1104*a^2*b^12 + 1104*a^3*b^11 + 1538*a^4*b^10 - 1538*a^5*b^9 - 827*a^6*b^8 + 872*a^7*b^7 + 18*a^8*b^6 - 108*a^9*b^5 + 74*a^10*b^4 - 40*a^11*b^3 + 21*a^12*b^2))/(a^14*b + a^15 - a^8*b^7 - a^9*b^6 + 3*a^10*b^5 + 3*a^11*b^4 - 3*a^12*b^3 - 3*a^13*b^2) - (b^3*(-(a + b)^5*(a - b)^5)^(1/2)*((4*(4*a^21 - 48*a^10*b^11 + 24*a^11*b^10 + 212*a^12*b^9 - 100*a^13*b^8 - 360*a^14*b^7 + 164*a^15*b^6 + 276*a^16*b^5 - 120*a^17*b^4 - 80*a^18*b^3 + 28*a^19*b^2))/(a^18*b + a^19 - a^12*b^7 - a^13*b^6 + 3*a^14*b^5 + 3*a^15*b^4 - 3*a^16*b^3 - 3*a^17*b^2) - (4*b^3*tan(c/2 + (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(20*a^4 + 12*b^4 - 29*a^2*b^2)*(8*a^19*b - 8*a^10*b^10 + 8*a^11*b^9 + 32*a^12*b^8 - 32*a^13*b^7 - 48*a^14*b^6 + 48*a^15*b^5 + 32*a^16*b^4 - 32*a^17*b^3 - 8*a^18*b^2))/((a^15 - a^5*b^10 + 5*a^7*b^8 - 10*a^9*b^6 + 10*a^11*b^4 - 5*a^13*b^2)*(a^14*b + a^15 - a^8*b^7 - a^9*b^6 + 3*a^10*b^5 + 3*a^11*b^4 - 3*a^12*b^3 - 3*a^13*b^2)))*(20*a^4 + 12*b^4 - 29*a^2*b^2))/(2*(a^15 - a^5*b^10 + 5*a^7*b^8 - 10*a^9*b^6 + 10*a^11*b^4 - 5*a^13*b^2)))*(-(a + b)^5*(a - b)^5)^(1/2)*(20*a^4 + 12*b^4 - 29*a^2*b^2)*1i)/(2*(a^15 - a^5*b^10 + 5*a^7*b^8 - 10*a^9*b^6 + 10*a^11*b^4 - 5*a^13*b^2)) + (b^3*((8*tan(c/2 + (d*x)/2)*(a^14 - 2*a^13*b - 288*a*b^13 + 288*b^14 - 1104*a^2*b^12 + 1104*a^3*b^11 + 1538*a^4*b^10 - 1538*a^5*b^9 - 827*a^6*b^8 + 872*a^7*b^7 + 18*a^8*b^6 - 108*a^9*b^5

+ 74*a^10*b^4 - 40*a^11*b^3 + 21*a^12*b^2))/(a^14*b + a^15 - a^8*b^7 - a^9*b^6 + 3*a^10*b^5 + 3*a^11*b^4 - 3*a^12*b^3 - 3*a^13*b^2) + (b^3*(-(a + b)^5*(a - b)^5)^(1/2)*((4*(4*a^21 - 48*a^10*b^11 + 24*a^11*b^10 + 212*a^12*b^9 - 100*a^13*b^8 - 360*a^14*b^7 + 164*a^15*b^6 + 276*a^16*b^5 - 120*a^17*b^4 - 80*a^18*b^3 + 28*a^19*b^2))/(a^18*b + a^19 - a^12*b^7 - a^13*b^6 + 3*a^14*b^5 + 3*a^15*b^4 - 3*a^16*b^3 - 3*a^17*b^2) + (4*b^3*tan(c/2 + (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(20*a^4 + 12*b^4 - 29*a^2*b^2)*(8*a^19*b - 8*a^10*b^10 + 8*a^11*b^9 + 32*a^12*b^8 - 32*a^13*b^7 - 48*a^14*b^6 + 48*a^15*b^5 + 32*a^16*b^4 - 32*a^17*b^3 - 8*a^18*b^2))/((a^15 - a^5*b^10 + 5*a^7*b^8 - 10*a^9*b^6 + 10*a^11*b^4 - 5*a^13*b^2)*(a^14*b + a^15 - a^8*b^7 - a^9*b^6 + 3*a^10*b^5 + 3*a^11*b^4 - 3*a^12*b^3 - 3*a^13*b^2)))*(20*a^4 + 12*b^4 - 29*a^2*b^2))/(2*(a^15 - a^5*b^10 + 5*a^7*b^8 - 10*a^9*b^6 + 10*a^11*b^4 - 5*a^13*b^2)))*(-(a + b)^5*(a - b)^5)^(1/2)*(20*a^4 + 12*b^4 - 29*a^2*b^2)*1i)/(2*(a^15 - a^5*b^10 + 5*a^7*b^8 - 10*a^9*b^6 + 10*a^11*b^4 - 5*a^13*b^2)))/((8*(1728*b^15 - 864*a*b^14 - 7344*a^2*b^13 + 3456*a^3*b^12 + 11700*a^4*b^11 - 4770*a^5*b^10 - 7829*a^6*b^9 + 2326*a^7*b^8 + 1314*a^8*b^7 - 11*a^9*b^6 + 411*a^10*b^5 - 20*a^11*b^4 + 20*a^12*b^3))/(a^18*b + a^19 - a^12*b^7 - a^13*b^6 + 3*a^14*b^5 + 3*a^15*b^4 - 3*a^16*b^3 - 3*a^17*b^2) - (b^3*((8*tan(c/2 + (d*x)/2)*(a^14 - 2*a^13*b - 288*a*b^13 + 288*b^14 - 1104*a^2*b^12 + 1104*a^3*b^11 + 1538*a^4*b^10 - 1538*a^5*b^9 - 827*a^6*b^8 + 872*a^7*b^7 + 18*a^8*b^6 - 108*a^9*b^5 + 74*a^10*b^4 - 40*a^11*b^3 + 21*a^12*b^2))/(a^14*b + a^15 - a^8*b^7 - a^9*b^6 + 3*a^10*b^5 + 3*a^11*b^4 - 3*a^12*b^3 - 3*a^13*b^2) - (b^3*(-(a + b)^5*(a - b)^5)^(1/2)*((4*(4*a^21 - 48*a^10*b^11 + 24*a^11*b^10 + 212*a^12*b^9 - 100*a^13*b^8 - 360*a^14*b^7 + 164*a^15*b^6 + 276*a^16*b^5 - 120*a^17*b^4 - 80*a^18*b^3 + 28*a^19*b^2))/(a^18*b + a^19 - a^12*b^7 - a^13*b^6 + 3*a^14*b^5 + 3*a^15*b^4 - 3*a^16*b^3 - 3*a^17*b^2) - (4*b^3*tan(c/2 + (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(20*a^4 + 12*b^4 - 29*a^2*b^2)*(8*a^19*b - 8*a^10*b^10 + 8*a^11*b^9 + 32*a^12*b^8 - 32*a^13*b^7 - 48*a^14*b^6 + 48*a^15*b^5 + 32*a^16*b^4 - 32*a^17*b^3 - 8*a^18*b^2))/((a^15 - a^5*b^10 + 5*a^7*b^8 - 10*a^9*b^6 + 10*a^11*b^4 - 5*a^13*b^2)*(a^14*b + a^15 - a^8*b^7 - a^9*b^6 + 3*a^10*b^5 + 3*a^11*b^4 - 3*a^12*b^3 - 3*a^13*b^2)))*(20*a^4 + 12*b^4 - 29*a^2*b^2))/(2*(a^15 - a^5*b^10 + 5*a^7*b^8 - 10*a^9*b^6 + 10*a^11*b^4 - 5*a^13*b^2)))*(-(a + b)^5*(a - b)^5)^(1/2)*(20*a^4 + 12*b^4 - 29*a^2*b^2))/(2*(a^15 - a^5*b^10 + 5*a^7*b^8 - 10*a^9*b^6 + 10*a^11*b^4 - 5*a^13*b^2)) + (b^3*((8*tan(c/2 + (d*x)/2)*(a^14 - 2*a^13*b - 288*a*b^13 + 288*b^14 - 1104*a^2*b^12 + 1104*a^3*b^11 + 1538*a^4*b^10 - 1538*a^5*b^9 - 827*a^6*b^8 + 872*a^7*b^7 + 18*a^8*b^6 - 108*a^9*b^5 + 74*a^10*b^4 - 40*a^11*b^3 + 21*a^12*b^2))/(a^14*b + a^15 - a^8*b^7 - a^9*b^6 + 3*a^10*b^5 + 3*a^11*b^4 - 3*a^12*b^3 - 3*a^13*b^2) + (b^3*(-(a + b)^5*(a - b)^5)^(1/2)*((4*(4*a^21 - 48*a^10*b^11 + 24*a^11*b^10 + 212*a^12*b^9 - 100*a^13*b^8 - 360*a^14*b^7 + 164*a^15*b^6 + 276*a^16*b^5 - 120*a^17*b^4 - 80*a^18*b^3 + 28*a^19*b^2))/(a^18*b + a^19 - a^12*b^7 - a^13*b^6 + 3*a^14*b^5 + 3*a^15*b^4 - 3*a^16*b^3 - 3*a^17*b^2) + (4*b^3*tan(c/2 + (d*x)/2)*(-(a + b)^5*(a - b)^5)^(1/2)*(20*a^4 + 12*b^4 - 29*a^2*b^2)*(8*a^19*b - 8*a^10*b^10 + 8*a^11*b^9 + 32*a^12*b^8 - 32*a^13*b^7 - 48*a^14*b^6 + 48*a^15*b^5 + 32*a^16*b

```
^4 - 32*a^17*b^3 - 8*a^18*b^2))/((a^15 - a^5*b^10 + 5*a^7*b^8 - 10*a^9*b^6
+ 10*a^11*b^4 - 5*a^13*b^2)*(a^14*b + a^15 - a^8*b^7 - a^9*b^6 + 3*a^10*b^5
 + 3*a^11*b^4 - 3*a^12*b^3 - 3*a^13*b^2)))*(20*a^4 + 12*b^4 - 29*a^2*b^2))/
(2*(a^15 - a^5*b^10 + 5*a^7*b^8 - 10*a^9*b^6 + 10*a^11*b^4 - 5*a^13*b^2)))*
(-(a + b)^5*(a - b)^5)^(1/2)*(20*a^4 + 12*b^4 - 29*a^2*b^2))/(2*(a^15 - a^5
*b^10 + 5*a^7*b^8 - 10*a^9*b^6 + 10*a^11*b^4 - 5*a^13*b^2))))*(-(a + b)^5*(
a - b)^5)^(1/2)*(20*a^4 + 12*b^4 - 29*a^2*b^2)*1i)/(d*(a^15 - a^5*b^10 + 5*
a^7*b^8 - 10*a^9*b^6 + 10*a^11*b^4 - 5*a^13*b^2))
```

3.478 $\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^4}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 307

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^4}\,dx = -\frac{4ax}{b^5} + \frac{a^2(8a^6-28a^4b^2+35a^2b^4-20b^6)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{7/2}b^5(a+b)^{7/2}d} + \frac{(12a^4-23a^2b^2+6b^4)\sin(c+dx)}{6b^4(a^2-b^2)^2 d} - \frac{a^2\cos^3(c+dx)\sin(c+dx)}{3b(a^2-b^2)\,d(a+b\cos(c+dx))^3} - \frac{a^2(4a^2-9b^2)\cos^2(c+dx)\sin(c+dx)}{6b^2(a^2-b^2)^2 d(a+b\cos(c+dx))^2} + \frac{a^3(4a^4-11a^2b^2+12b^4)\sin(c+dx)}{2b^4(a^2-b^2)^3 d(a+b\cos(c+dx))}$$

```
[Out] -4*a*x/b^5+a^2*(8*a^6-28*a^4*b^2+35*a^2*b^4-20*b^6)*arctan((a-b)^(1/2)*tan(
1/2*d*x+1/2*c)/(a+b)^(1/2))/(a-b)^(7/2)/b^5/(a+b)^(7/2)/d+1/6*(12*a^4-23*a^
2*b^2+6*b^4)*sin(d*x+c)/b^4/(a^2-b^2)^2/d-1/3*a^2*cos(d*x+c)^3*sin(d*x+c)/b
/(a^2-b^2)/d/(a+b*cos(d*x+c))^3-1/6*a^2*(4*a^2-9*b^2)*cos(d*x+c)^2*sin(d*x+
c)/b^2/(a^2-b^2)^2/d/(a+b*cos(d*x+c))^2+1/2*a^3*(4*a^4-11*a^2*b^2+12*b^4)*s
in(d*x+c)/b^4/(a^2-b^2)^3/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 1.01 (sec) , antiderivative size = 307, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {2871, 3126, 3110, 3102, 2814, 2738, 211}

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^4}\,dx = -\frac{a^2\sin(c+dx)\cos^3(c+dx)}{3bd(a^2-b^2)(a+b\cos(c+dx))^3} - \frac{a^2(4a^2-9b^2)\sin(c+dx)\cos^2(c+dx)}{6b^2d(a^2-b^2)^2(a+b\cos(c+dx))^2} + \frac{(12a^4-23a^2b^2+6b^4)\sin(c+dx)}{6b^4d(a^2-b^2)^2} + \frac{a^2(8a^6-28a^4b^2+35a^2b^4-20b^6)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{b^5d(a-b)^{7/2}(a+b)^{7/2}} + \frac{a^3(4a^4-11a^2b^2+12b^4)\sin(c+dx)}{2b^4d(a^2-b^2)^3(a+b\cos(c+dx))} - \frac{4ax}{b^5}$$

```
[In] Int[Cos[c + d*x]^5/(a + b*Cos[c + d*x])^4,x]
```

```
[Out] (-4*a*x)/b^5 + (a^2*(8*a^6 - 28*a^4*b^2 + 35*a^2*b^4 - 20*b^6)*ArcTan[(Sqrt
[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/((a - b)^(7/2)*b^5*(a + b)^(7/2)*d)
 + ((12*a^4 - 23*a^2*b^2 + 6*b^4)*Sin[c + d*x])/(6*b^4*(a^2 - b^2)^2*d) - (
a^2*Cos[c + d*x]^3*Sin[c + d*x])/(3*b*(a^2 - b^2)*d*(a + b*Cos[c + d*x])^3)
 - (a^2*(4*a^2 - 9*b^2)*Cos[c + d*x]^2*Sin[c + d*x])/(6*b^2*(a^2 - b^2)^2*d
*(a + b*Cos[c + d*x])^2) + (a^3*(4*a^4 - 11*a^2*b^2 + 12*b^4)*Sin[c + d*x])
/(2*b^4*(a^2 - b^2)^3*d*(a + b*Cos[c + d*x]))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rule 3110

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f
_.)*(x_)]^2), x_Symbol] :> Simp[(-(b*c - a*d))*(A*b^2 - a*b*B + a^2*C)*Cos[
e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b^2*f*(m + 1)*(a^2 - b^2))), x] - D
ist[1/(b^2*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[b*(m
 + 1)*((b*B - a*C)*(b*c - a*d) - A*b*(a*c - b*d)) + (b*B*(a^2*d + b^2*d*(m
+ 1) - a*b*c*(m + 2)) + (b*c - a*d)*(A*b^2*(m + 2) + C*(a^2 + b^2*(m + 1)))
)*Sin[e + f*x] - b*C*d*(m + 1)*(a^2 - b^2)*Sin[e + f*x]^2, x], x], x] /; Fr
eeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2,
0] && LtQ[m, -1]
```

Rule 3126

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(c^2*C - B*c*d + A*d^2))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(c^2 -
d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[e + f*x])^(m -
1)*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*d*(b*d*m + a*c*(n + 1)) + (c*C - B*d
)*(b*c*m + a*d*(n + 1)) - (d*(A*(a*d*(n + 2) - b*c*(n + 1)) + B*(b*d*(n + 1
) - a*c*(n + 2))) - C*(b*c*d*(n + 1) - a*(c^2 + d^2*(n + 1))))*Sin[e + f*x]
```

```
 + b*(d*(B*c - A*d)*(m + n + 2) - C*(c^2*(m + 1) + d^2*(n + 1)))*Sin[e + f*
x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d,
 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 0] && LtQ[n, -1]
```

Rubi steps

integral

$$= -\frac{a^2\cos^3(c+dx)\sin(c+dx)}{3b(a^2-b^2)d(a+b\cos(c+dx))^3} - \frac{\int \frac{\cos^2(c+dx)(3a^2-3ab\cos(c+dx)-(4a^2-3b^2)\cos^2(c+dx))}{(a+b\cos(c+dx))^3}\,dx}{3b(a^2-b^2)}$$

$$= -\frac{a^2\cos^3(c+dx)\sin(c+dx)}{3b(a^2-b^2)d(a+b\cos(c+dx))^3} - \frac{a^2(4a^2-9b^2)\cos^2(c+dx)\sin(c+dx)}{6b^2(a^2-b^2)^2d(a+b\cos(c+dx))^2} + \frac{\int \frac{\cos(c+dx)(-2a^2(4a^2-9b^2)+2ab(a^2-6b^2)\cos(c+dx)+(12a^4-23a^2b^2+6b^4)\cos^2(c+dx))}{(a+b\cos(c+dx))^2}\,dx}{6b^2(a^2-b^2)^2}$$

$$= -\frac{a^2\cos^3(c+dx)\sin(c+dx)}{3b(a^2-b^2)d(a+b\cos(c+dx))^3} - \frac{a^2(4a^2-9b^2)\cos^2(c+dx)\sin(c+dx)}{6b^2(a^2-b^2)^2d(a+b\cos(c+dx))^2} + \frac{a^3(4a^4-11a^2b^2+12b^4)\sin(c+dx)}{2b^4(a^2-b^2)^3d(a+b\cos(c+dx))} + \frac{\int \frac{-3a^2b(4a^4-11a^2b^2+12b^4)-a(12a^6-37a^4b^2+43a^2b^4-18b^6)\cos(c+dx)+b(a^2-b^2)(12a^4-23a^2b^2+6b^4)\cos^2(c+dx)}{a+b\cos(c+dx)}\,dx}{6b^4(a^2-b^2)^3}$$

$$= \frac{(12a^4-23a^2b^2+6b^4)\sin(c+dx)}{6b^4(a^2-b^2)^2d} - \frac{a^2\cos^3(c+dx)\sin(c+dx)}{3b(a^2-b^2)d(a+b\cos(c+dx))^3} - \frac{a^2(4a^2-9b^2)\cos^2(c+dx)\sin(c+dx)}{6b^2(a^2-b^2)^2d(a+b\cos(c+dx))^2} + \frac{a^3(4a^4-11a^2b^2+12b^4)\sin(c+dx)}{2b^4(a^2-b^2)^3d(a+b\cos(c+dx))} + \frac{\int \frac{-3a^2b^2(4a^4-11a^2b^2+12b^4)-24ab(a^2-b^2)^3\cos(c+dx)}{a+b\cos(c+dx)}\,dx}{6b^5(a^2-b^2)^3}$$

$$= -\frac{4ax}{b^5} + \frac{(12a^4-23a^2b^2+6b^4)\sin(c+dx)}{6b^4(a^2-b^2)^2d} - \frac{a^2\cos^3(c+dx)\sin(c+dx)}{3b(a^2-b^2)d(a+b\cos(c+dx))^3} - \frac{a^2(4a^2-9b^2)\cos^2(c+dx)\sin(c+dx)}{6b^2(a^2-b^2)^2d(a+b\cos(c+dx))^2} + \frac{a^3(4a^4-11a^2b^2+12b^4)\sin(c+dx)}{2b^4(a^2-b^2)^3d(a+b\cos(c+dx))} + \frac{(a^2(8a^6-28a^4b^2+35a^2b^4-20b^6))\int \frac{1}{a+b\cos(c+dx)}\,dx}{2b^5(a^2-b^2)^3}$$

$$= -\frac{4ax}{b^5} + \frac{(12a^4-23a^2b^2+6b^4)\sin(c+dx)}{6b^4(a^2-b^2)^2d} - \frac{a^2\cos^3(c+dx)\sin(c+dx)}{3b(a^2-b^2)d(a+b\cos(c+dx))^3} - \frac{a^2(4a^2-9b^2)\cos^2(c+dx)\sin(c+dx)}{6b^2(a^2-b^2)^2d(a+b\cos(c+dx))^2} + \frac{a^3(4a^4-11a^2b^2+12b^4)\sin(c+dx)}{2b^4(a^2-b^2)^3d(a+b\cos(c+dx))} + \frac{(a^2(8a^6-28a^4b^2+35a^2b^4-20b^6))\,\text{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{b^5(a^2-b^2)^3d}$$

$$= -\frac{4ax}{b^5} + \frac{a^2(8a^6 - 28a^4b^2 + 35a^2b^4 - 20b^6)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{7/2}b^5(a+b)^{7/2}d}$$
$$+ \frac{(12a^4 - 23a^2b^2 + 6b^4)\sin(c+dx)}{6b^4(a^2-b^2)^2 d} - \frac{a^2\cos^3(c+dx)\sin(c+dx)}{3b(a^2-b^2)d(a+b\cos(c+dx))^3}$$
$$- \frac{a^2(4a^2-9b^2)\cos^2(c+dx)\sin(c+dx)}{6b^2(a^2-b^2)^2 d(a+b\cos(c+dx))^2} + \frac{a^3(4a^4 - 11a^2b^2 + 12b^4)\sin(c+dx)}{2b^4(a^2-b^2)^3 d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 4.08 (sec) , antiderivative size = 240, normalized size of antiderivative = 0.78

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^4}\,dx$$
$$= \frac{-24a(c+dx) + \frac{6a^2(8a^6-28a^4b^2+35a^2b^4-20b^6)\operatorname{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{7/2}} + 6b\sin(c+dx) + \frac{2a^5b\sin(c+dx)}{(a-b)(a+b)(a+b\cos(c+dx}\cdots}{6b^5d}$$

```
[In] Integrate[Cos[c + d*x]^5/(a + b*Cos[c + d*x])^4,x]
```

```
[Out] (-24*a*(c + d*x) + (6*a^2*(8*a^6 - 28*a^4*b^2 + 35*a^2*b^4 - 20*b^6)*ArcTan
h[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/(-a^2 + b^2)^(7/2) + 6*b*Si
n[c + d*x] + (2*a^5*b*Sin[c + d*x])/((a - b)*(a + b)*(a + b*Cos[c + d*x])^3
) + (5*a^4*b*(-2*a^2 + 3*b^2)*Sin[c + d*x])/((a - b)^2*(a + b)^2*(a + b*Cos
[c + d*x])^2) + (a^3*b*(26*a^4 - 71*a^2*b^2 + 60*b^4)*Sin[c + d*x])/((a - b
)^3*(a + b)^3*(a + b*Cos[c + d*x])))/(6*b^5*d)
```

Maple [A] (verified)

Time = 2.25 (sec) , antiderivative size = 395, normalized size of antiderivative = 1.29

method	result
derivativedivides	$\frac{2a^2\left(\frac{\frac{\left(6a^4-2a^3b-18a^2b^2+5a\,b^3+20b^4\right)ab\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)\left(a^3+3a^2b+3a\,b^2+b^3\right)}+\frac{2\left(9a^4-29a^2b^2+30b^4\right)ab\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3\left(a^2-2ab+b^2\right)\left(a^2+2ab+b^2\right)}+\frac{\left(6a^4+2a^3b-18a^2b^2-5a\,b^3 \cdots}{2(a+b)\left(a^3-3a^2 \cdots}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^3} \cdots\right.}{b^5}$
default	$\frac{2a^2\left(\frac{\frac{\left(6a^4-2a^3b-18a^2b^2+5a\,b^3+20b^4\right)ab\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)\left(a^3+3a^2b+3a\,b^2+b^3\right)}+\frac{2\left(9a^4-29a^2b^2+30b^4\right)ab\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3\left(a^2-2ab+b^2\right)\left(a^2+2ab+b^2\right)}+\frac{\left(6a^4+2a^3b-18a^2b^2-5a\,b^3 \cdots}{2(a+b)\left(a^3-3a^2 \cdots}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^3} \cdots\right.}{b^5}$
risch	Expression too large to display

```
[In] int(cos(d*x+c)^5/(a+cos(d*x+c)*b)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(2*a^2/b^5*((1/2*(6*a^4-2*a^3*b-18*a^2*b^2+5*a*b^3+20*b^4)*a*b/(a-b)/(a
^3+3*a^2*b+3*a*b^2+b^3)*tan(1/2*d*x+1/2*c)^5+2/3*(9*a^4-29*a^2*b^2+30*b^4)*
a*b/(a^2-2*a*b+b^2)/(a^2+2*a*b+b^2)*tan(1/2*d*x+1/2*c)^3+1/2*(6*a^4+2*a^3*b
-18*a^2*b^2-5*a*b^3+20*b^4)*a*b/(a+b)/(a^3-3*a^2*b+3*a*b^2-b^3)*tan(1/2*d*x
+1/2*c))/(tan(1/2*d*x+1/2*c)^2*a-b*tan(1/2*d*x+1/2*c)^2+a+b)^3+1/2*(8*a^6-2
8*a^4*b^2+35*a^2*b^4-20*b^6)/(a^6-3*a^4*b^2+3*a^2*b^4-b^6)/((a-b)*(a+b))^(1
/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2)))-2/b^5*(-b*tan(1/2
*d*x+1/2*c)/(1+tan(1/2*d*x+1/2*c)^2)+4*a*arctan(tan(1/2*d*x+1/2*c))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 762 vs. $2(290) = 580$.

Time = 0.37 (sec) , antiderivative size = 1593, normalized size of antiderivative = 5.19

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^5/(a+b*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] [-1/12*(48*(a^9*b^3 - 4*a^7*b^5 + 6*a^5*b^7 - 4*a^3*b^9 + a*b^11)*d*x*cos(d
*x + c)^3 + 144*(a^10*b^2 - 4*a^8*b^4 + 6*a^6*b^6 - 4*a^4*b^8 + a^2*b^10)*d
*x*cos(d*x + c)^2 + 144*(a^11*b - 4*a^9*b^3 + 6*a^7*b^5 - 4*a^5*b^7 + a^3*b
^9)*d*x*cos(d*x + c) + 48*(a^12 - 4*a^10*b^2 + 6*a^8*b^4 - 4*a^6*b^6 + a^4*
b^8)*d*x + 3*(8*a^11 - 28*a^9*b^2 + 35*a^7*b^4 - 20*a^5*b^6 + (8*a^8*b^3 -
28*a^6*b^5 + 35*a^4*b^7 - 20*a^2*b^9)*cos(d*x + c)^3 + 3*(8*a^9*b^2 - 28*a^
7*b^4 + 35*a^5*b^6 - 20*a^3*b^8)*cos(d*x + c)^2 + 3*(8*a^10*b - 28*a^8*b^3
+ 35*a^6*b^5 - 20*a^4*b^7)*cos(d*x + c))*sqrt(-a^2 + b^2)*log((2*a*b*cos(d*
x + c) + (2*a^2 - b^2)*cos(d*x + c)^2 + 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c)
+ b)*sin(d*x + c) - a^2 + 2*b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) +
 a^2)) - 2*(24*a^11*b - 92*a^9*b^3 + 133*a^7*b^5 - 71*a^5*b^7 + 6*a^3*b^9 +
 6*(a^8*b^4 - 4*a^6*b^6 + 6*a^4*b^8 - 4*a^2*b^10 + b^12)*cos(d*x + c)^3 + (
44*a^9*b^3 - 169*a^7*b^5 + 239*a^5*b^7 - 132*a^3*b^9 + 18*a*b^11)*cos(d*x +
 c)^2 + 3*(20*a^10*b^2 - 77*a^8*b^4 + 110*a^6*b^6 - 59*a^4*b^8 + 6*a^2*b^10
)*cos(d*x + c))*sin(d*x + c))/((a^8*b^8 - 4*a^6*b^10 + 6*a^4*b^12 - 4*a^2*b
^14 + b^16)*d*cos(d*x + c)^3 + 3*(a^9*b^7 - 4*a^7*b^9 + 6*a^5*b^11 - 4*a^3*
b^13 + a*b^15)*d*cos(d*x + c)^2 + 3*(a^10*b^6 - 4*a^8*b^8 + 6*a^6*b^10 - 4*
a^4*b^12 + a^2*b^14)*d*cos(d*x + c) + (a^11*b^5 - 4*a^9*b^7 + 6*a^7*b^9 - 4
*a^5*b^11 + a^3*b^13)*d), -1/6*(24*(a^9*b^3 - 4*a^7*b^5 + 6*a^5*b^7 - 4*a^3
*b^9 + a*b^11)*d*x*cos(d*x + c)^3 + 72*(a^10*b^2 - 4*a^8*b^4 + 6*a^6*b^6 -
4*a^4*b^8 + a^2*b^10)*d*x*cos(d*x + c)^2 + 72*(a^11*b - 4*a^9*b^3 + 6*a^7*b
^5 - 4*a^5*b^7 + a^3*b^9)*d*x*cos(d*x + c) + 24*(a^12 - 4*a^10*b^2 + 6*a^8*
b^4 - 4*a^6*b^6 + a^4*b^8)*d*x - 3*(8*a^11 - 28*a^9*b^2 + 35*a^7*b^4 - 20*a
^5*b^6 + (8*a^8*b^3 - 28*a^6*b^5 + 35*a^4*b^7 - 20*a^2*b^9)*cos(d*x + c)^3
+ 3*(8*a^9*b^2 - 28*a^7*b^4 + 35*a^5*b^6 - 20*a^3*b^8)*cos(d*x + c)^2 + 3*(
8*a^10*b - 28*a^8*b^3 + 35*a^6*b^5 - 20*a^4*b^7)*cos(d*x + c))*sqrt(a^2 - b
```

```
^2)*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c))) - (24*a^11
*b - 92*a^9*b^3 + 133*a^7*b^5 - 71*a^5*b^7 + 6*a^3*b^9 + 6*(a^8*b^4 - 4*a^6
*b^6 + 6*a^4*b^8 - 4*a^2*b^10 + b^12)*cos(d*x + c)^3 + (44*a^9*b^3 - 169*a^
7*b^5 + 239*a^5*b^7 - 132*a^3*b^9 + 18*a*b^11)*cos(d*x + c)^2 + 3*(20*a^10*
b^2 - 77*a^8*b^4 + 110*a^6*b^6 - 59*a^4*b^8 + 6*a^2*b^10)*cos(d*x + c))*sin
(d*x + c))/((a^8*b^8 - 4*a^6*b^10 + 6*a^4*b^12 - 4*a^2*b^14 + b^16)*d*cos(d
*x + c)^3 + 3*(a^9*b^7 - 4*a^7*b^9 + 6*a^5*b^11 - 4*a^3*b^13 + a*b^15)*d*co
s(d*x + c)^2 + 3*(a^10*b^6 - 4*a^8*b^8 + 6*a^6*b^10 - 4*a^4*b^12 + a^2*b^14
)*d*cos(d*x + c) + (a^11*b^5 - 4*a^9*b^7 + 6*a^7*b^9 - 4*a^5*b^11 + a^3*b^1
3)*d)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**5/(a+b*cos(d*x+c))**4,x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)^5/(a+b*cos(d*x+c))^4,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [A] (verification not implemented)

none

Time = 0.38 (sec) , antiderivative size = 563, normalized size of antiderivative = 1.83

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^4}\,dx = -\frac{\frac{3\,(8\,a^8-28\,a^6b^2+35\,a^4b^4-20\,a^2b^6)\left(\pi\left\lfloor\frac{dx+c}{2\,\pi}+\frac{1}{2}\right\rfloor\mathrm{sgn}(-2\,a+2\,b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\sqrt{a^2-b^2}}\right)\right)}{(a^6b^5-3\,a^4b^7+3\,a^2b^9-b^{11})\sqrt{a^2-b^2}} - \frac{18\,a^9\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-}{}}{}$$

```
[In] integrate(cos(d*x+c)^5/(a+b*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] -1/3*(3*(8*a^8 - 28*a^6*b^2 + 35*a^4*b^4 - 20*a^2*b^6)*(pi*floor(1/2*(d*x +
 c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1/2*d*x + 1/2*c) - b*tan(1/2
*d*x + 1/2*c))/sqrt(a^2 - b^2)))/((a^6*b^5 - 3*a^4*b^7 + 3*a^2*b^9 - b^11)*
sqrt(a^2 - b^2)) - (18*a^9*tan(1/2*d*x + 1/2*c)^5 - 42*a^8*b*tan(1/2*d*x +
1/2*c)^5 - 24*a^7*b^2*tan(1/2*d*x + 1/2*c)^5 + 117*a^6*b^3*tan(1/2*d*x + 1/
2*c)^5 - 24*a^5*b^4*tan(1/2*d*x + 1/2*c)^5 - 105*a^4*b^5*tan(1/2*d*x + 1/2*
c)^5 + 60*a^3*b^6*tan(1/2*d*x + 1/2*c)^5 + 36*a^9*tan(1/2*d*x + 1/2*c)^3 -
152*a^7*b^2*tan(1/2*d*x + 1/2*c)^3 + 236*a^5*b^4*tan(1/2*d*x + 1/2*c)^3 - 1
20*a^3*b^6*tan(1/2*d*x + 1/2*c)^3 + 18*a^9*tan(1/2*d*x + 1/2*c) + 42*a^8*b*
tan(1/2*d*x + 1/2*c) - 24*a^7*b^2*tan(1/2*d*x + 1/2*c) - 117*a^6*b^3*tan(1/
2*d*x + 1/2*c) - 24*a^5*b^4*tan(1/2*d*x + 1/2*c) + 105*a^4*b^5*tan(1/2*d*x
+ 1/2*c) + 60*a^3*b^6*tan(1/2*d*x + 1/2*c))/((a^6*b^4 - 3*a^4*b^6 + 3*a^2*b
^8 - b^10)*(a*tan(1/2*d*x + 1/2*c)^2 - b*tan(1/2*d*x + 1/2*c)^2 + a + b)^3)
 + 12*(d*x + c)*a/b^5 - 6*tan(1/2*d*x + 1/2*c)/((tan(1/2*d*x + 1/2*c)^2 + 1
)*b^4))/d
```

Mupad [B] (verification not implemented)

Time = 24.95 (sec) , antiderivative size = 7494, normalized size of antiderivative = 24.41

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \text{Too large to display}$$

```
[In] int(cos(c + d*x)^5/(a + b*cos(c + d*x))^4,x)
```

```
[Out] - ((tan(c/2 + (d*x)/2)^3*(12*a^7*b - 72*a^8 - 18*b^8 + 72*a^2*b^6 + 60*a^3*
b^5 - 273*a^4*b^4 - 47*a^5*b^3 + 236*a^6*b^2))/(3*b^4*(a + b)^2*(a - b)^3)
- (tan(c/2 + (d*x)/2)^5*(12*a^7*b + 72*a^8 + 18*b^8 - 72*a^2*b^6 + 60*a^3*b
^5 + 273*a^4*b^4 - 47*a^5*b^3 - 236*a^6*b^2))/(3*b^4*(a + b)^3*(a - b)^2) +
 (tan(c/2 + (d*x)/2)*(2*a*b^6 - 4*a^6*b - 8*a^7 + 2*b^7 - 6*a^2*b^5 - 26*a^
3*b^4 + 11*a^4*b^3 + 24*a^5*b^2))/(b^4*(a + b)*(a - b)^3) + (tan(c/2 + (d*x
)/2)^7*(2*a*b^6 + 4*a^6*b - 8*a^7 - 2*b^7 + 6*a^2*b^5 - 26*a^3*b^4 - 11*a^4
*b^3 + 24*a^5*b^2))/(b^4*(a + b)^3*(a - b)))/(d*(3*a*b^2 + 3*a^2*b - tan(c/
2 + (d*x)/2)^4*(6*a*b^2 - 6*a^3) + tan(c/2 + (d*x)/2)^2*(6*a^2*b + 4*a^3 -
2*b^3) + tan(c/2 + (d*x)/2)^6*(4*a^3 - 6*a^2*b + 2*b^3) + a^3 + b^3 + tan(c
/2 + (d*x)/2)^8*(3*a*b^2 - 3*a^2*b + a^3 - b^3))) - (8*a*atan(((4*a*((8*tan
(c/2 + (d*x)/2)*(128*a^16 - 128*a^15*b + 64*a^2*b^14 - 128*a^3*b^13 + 80*a^
4*b^12 + 768*a^5*b^11 - 824*a^6*b^10 - 1920*a^7*b^9 + 2025*a^8*b^8 + 2560*a
^9*b^7 - 2600*a^10*b^6 - 1920*a^11*b^5 + 1920*a^12*b^4 + 768*a^13*b^3 - 768
*a^14*b^2))/(a*b^18 + b^19 - 5*a^2*b^17 - 5*a^3*b^16 + 10*a^4*b^15 + 10*a^5
*b^14 - 10*a^6*b^13 - 10*a^7*b^12 + 5*a^8*b^11 + 5*a^9*b^10 - a^10*b^9 - a^
11*b^8) + (a*((16*(8*a*b^23 - 20*a^2*b^22 - 36*a^3*b^21 + 95*a^4*b^20 + 73*
a^5*b^19 - 193*a^6*b^18 - 87*a^7*b^17 + 217*a^8*b^16 + 63*a^9*b^15 - 143*a^
10*b^14 - 25*a^11*b^13 + 52*a^12*b^12 + 4*a^13*b^11 - 8*a^14*b^10))/(a*b^22
```

+ b^23 - 5*a^2*b^21 - 5*a^3*b^20 + 10*a^4*b^19 + 10*a^5*b^18 - 10*a^6*b^17
- 10*a^7*b^16 + 5*a^8*b^15 + 5*a^9*b^14 - a^10*b^13 - a^11*b^12) - (a*tan(
c/2 + (d*x)/2)*(8*a*b^23 - 8*a^2*b^22 - 48*a^3*b^21 + 48*a^4*b^20 + 120*a^5
*b^19 - 120*a^6*b^18 - 160*a^7*b^17 + 160*a^8*b^16 + 120*a^9*b^15 - 120*a^1
0*b^14 - 48*a^11*b^13 + 48*a^12*b^12 + 8*a^13*b^11 - 8*a^14*b^10)*32i)/(b^5
*(a*b^18 + b^19 - 5*a^2*b^17 - 5*a^3*b^16 + 10*a^4*b^15 + 10*a^5*b^14 - 10*
a^6*b^13 - 10*a^7*b^12 + 5*a^8*b^11 + 5*a^9*b^10 - a^10*b^9 - a^11*b^8)))*4
i)/b^5))/b^5 + (4*a*((8*tan(c/2 + (d*x)/2)*(128*a^16 - 128*a^15*b + 64*a^2*
b^14 - 128*a^3*b^13 + 80*a^4*b^12 + 768*a^5*b^11 - 824*a^6*b^10 - 1920*a^7*
b^9 + 2025*a^8*b^8 + 2560*a^9*b^7 - 2600*a^10*b^6 - 1920*a^11*b^5 + 1920*a^
12*b^4 + 768*a^13*b^3 - 768*a^14*b^2))/(a*b^18 + b^19 - 5*a^2*b^17 - 5*a^3*
b^16 + 10*a^4*b^15 + 10*a^5*b^14 - 10*a^6*b^13 - 10*a^7*b^12 + 5*a^8*b^11 +
5*a^9*b^10 - a^10*b^9 - a^11*b^8) - (a*((16*(8*a*b^23 - 20*a^2*b^22 - 36*a
^3*b^21 + 95*a^4*b^20 + 73*a^5*b^19 - 193*a^6*b^18 - 87*a^7*b^17 + 217*a^8*
b^16 + 63*a^9*b^15 - 143*a^10*b^14 - 25*a^11*b^13 + 52*a^12*b^12 + 4*a^13*b
^11 - 8*a^14*b^10))/(a*b^22 + b^23 - 5*a^2*b^21 - 5*a^3*b^20 + 10*a^4*b^19
+ 10*a^5*b^18 - 10*a^6*b^17 - 10*a^7*b^16 + 5*a^8*b^15 + 5*a^9*b^14 - a^10*
b^13 - a^11*b^12) + (a*tan(c/2 + (d*x)/2)*(8*a*b^23 - 8*a^2*b^22 - 48*a^3*b
^21 + 48*a^4*b^20 + 120*a^5*b^19 - 120*a^6*b^18 - 160*a^7*b^17 + 160*a^8*b^
16 + 120*a^9*b^15 - 120*a^10*b^14 - 48*a^11*b^13 + 48*a^12*b^12 + 8*a^13*b^
11 - 8*a^14*b^10)*32i)/(b^5*(a*b^18 + b^19 - 5*a^2*b^17 - 5*a^3*b^16 + 10*a
^4*b^15 + 10*a^5*b^14 - 10*a^6*b^13 - 10*a^7*b^12 + 5*a^8*b^11 + 5*a^9*b^10
- a^10*b^9 - a^11*b^8)))*4i)/b^5))/b^5)/((32*(128*a^16 - 64*a^15*b + 320*a
^4*b^12 + 480*a^5*b^11 - 1520*a^6*b^10 - 1280*a^7*b^9 + 3088*a^8*b^8 + 1602
*a^9*b^7 - 3472*a^10*b^6 - 1088*a^11*b^5 + 2288*a^12*b^4 + 400*a^13*b^3 - 8
32*a^14*b^2))/(a*b^22 + b^23 - 5*a^2*b^21 - 5*a^3*b^20 + 10*a^4*b^19 + 10*a
^5*b^18 - 10*a^6*b^17 - 10*a^7*b^16 + 5*a^8*b^15 + 5*a^9*b^14 - a^10*b^13 -
a^11*b^12) - (a*((8*tan(c/2 + (d*x)/2)*(128*a^16 - 128*a^15*b + 64*a^2*b^1
4 - 128*a^3*b^13 + 80*a^4*b^12 + 768*a^5*b^11 - 824*a^6*b^10 - 1920*a^7*b^9
+ 2025*a^8*b^8 + 2560*a^9*b^7 - 2600*a^10*b^6 - 1920*a^11*b^5 + 1920*a^12*
b^4 + 768*a^13*b^3 - 768*a^14*b^2))/(a*b^18 + b^19 - 5*a^2*b^17 - 5*a^3*b^1
6 + 10*a^4*b^15 + 10*a^5*b^14 - 10*a^6*b^13 - 10*a^7*b^12 + 5*a^8*b^11 + 5*
a^9*b^10 - a^10*b^9 - a^11*b^8) + (a*((16*(8*a*b^23 - 20*a^2*b^22 - 36*a^3*
b^21 + 95*a^4*b^20 + 73*a^5*b^19 - 193*a^6*b^18 - 87*a^7*b^17 + 217*a^8*b^1
6 + 63*a^9*b^15 - 143*a^10*b^14 - 25*a^11*b^13 + 52*a^12*b^12 + 4*a^13*b^11
- 8*a^14*b^10))/(a*b^22 + b^23 - 5*a^2*b^21 - 5*a^3*b^20 + 10*a^4*b^19 + 1
0*a^5*b^18 - 10*a^6*b^17 - 10*a^7*b^16 + 5*a^8*b^15 + 5*a^9*b^14 - a^10*b^1
3 - a^11*b^12) - (a*tan(c/2 + (d*x)/2)*(8*a*b^23 - 8*a^2*b^22 - 48*a^3*b^21
+ 48*a^4*b^20 + 120*a^5*b^19 - 120*a^6*b^18 - 160*a^7*b^17 + 160*a^8*b^16
+ 120*a^9*b^15 - 120*a^10*b^14 - 48*a^11*b^13 + 48*a^12*b^12 + 8*a^13*b^11
- 8*a^14*b^10)*32i)/(b^5*(a*b^18 + b^19 - 5*a^2*b^17 - 5*a^3*b^16 + 10*a^4*
b^15 + 10*a^5*b^14 - 10*a^6*b^13 - 10*a^7*b^12 + 5*a^8*b^11 + 5*a^9*b^10 -
a^10*b^9 - a^11*b^8)))*4i)/b^5)*4i)/b^5 + (a*((8*tan(c/2 + (d*x)/2)*(128*a^
16 - 128*a^15*b + 64*a^2*b^14 - 128*a^3*b^13 + 80*a^4*b^12 + 768*a^5*b^11 -
824*a^6*b^10 - 1920*a^7*b^9 + 2025*a^8*b^8 + 2560*a^9*b^7 - 2600*a^10*b^6

- 1920*a^11*b^5 + 1920*a^12*b^4 + 768*a^13*b^3 - 768*a^14*b^2))/(a*b^18 + b^19 - 5*a^2*b^17 - 5*a^3*b^16 + 10*a^4*b^15 + 10*a^5*b^14 - 10*a^6*b^13 - 10*a^7*b^12 + 5*a^8*b^11 + 5*a^9*b^10 - a^10*b^9 - a^11*b^8) - (a*((16*(8*a*b^23 - 20*a^2*b^22 - 36*a^3*b^21 + 95*a^4*b^20 + 73*a^5*b^19 - 193*a^6*b^18 - 87*a^7*b^17 + 217*a^8*b^16 + 63*a^9*b^15 - 143*a^10*b^14 - 25*a^11*b^13 + 52*a^12*b^12 + 4*a^13*b^11 - 8*a^14*b^10))/(a*b^22 + b^23 - 5*a^2*b^21 - 5*a^3*b^20 + 10*a^4*b^19 + 10*a^5*b^18 - 10*a^6*b^17 - 10*a^7*b^16 + 5*a^8*b^15 + 5*a^9*b^14 - a^10*b^13 - a^11*b^12) + (a*tan(c/2 + (d*x)/2)*(8*a*b^23 - 8*a^2*b^22 - 48*a^3*b^21 + 48*a^4*b^20 + 120*a^5*b^19 - 120*a^6*b^18 - 160*a^7*b^17 + 160*a^8*b^16 + 120*a^9*b^15 - 120*a^10*b^14 - 48*a^11*b^13 + 48*a^12*b^12 + 8*a^13*b^11 - 8*a^14*b^10)*32i)/(b^5*(a*b^18 + b^19 - 5*a^2*b^17 - 5*a^3*b^16 + 10*a^4*b^15 + 10*a^5*b^14 - 10*a^6*b^13 - 10*a^7*b^12 + 5*a^8*b^11 + 5*a^9*b^10 - a^10*b^9 - a^11*b^8)))*4i)/b^5)*4i)/b^5)))/(b^5*d) - (a^2*atan(((a^2*((8*tan(c/2 + (d*x)/2)*(128*a^16 - 128*a^15*b + 64*a^2*b^14 - 128*a^3*b^13 + 80*a^4*b^12 + 768*a^5*b^11 - 824*a^6*b^10 - 1920*a^7*b^9 + 2025*a^8*b^8 + 2560*a^9*b^7 - 2600*a^10*b^6 - 1920*a^11*b^5 + 1920*a^12*b^4 + 768*a^13*b^3 - 768*a^14*b^2))/(a*b^18 + b^19 - 5*a^2*b^17 - 5*a^3*b^16 + 10*a^4*b^15 + 10*a^5*b^14 - 10*a^6*b^13 - 10*a^7*b^12 + 5*a^8*b^11 + 5*a^9*b^10 - a^10*b^9 - a^11*b^8) + (a^2*((16*(8*a*b^23 - 20*a^2*b^22 - 36*a^3*b^21 + 95*a^4*b^20 + 73*a^5*b^19 - 193*a^6*b^18 - 87*a^7*b^17 + 217*a^8*b^16 + 63*a^9*b^15 - 143*a^10*b^14 - 25*a^11*b^13 + 52*a^12*b^12 + 4*a^13*b^11 - 8*a^14*b^10))/(a*b^22 + b^23 - 5*a^2*b^21 - 5*a^3*b^20 + 10*a^4*b^19 + 10*a^5*b^18 - 10*a^6*b^17 - 10*a^7*b^16 + 5*a^8*b^15 + 5*a^9*b^14 - a^10*b^13 - a^11*b^12) - (4*a^2*tan(c/2 + (d*x)/2)*(-(a + b)^7*(a - b)^7)^(1/2)*(8*a^6 - 20*b^6 + 35*a^2*b^4 - 28*a^4*b^2)*(8*a*b^23 - 8*a^2*b^22 - 48*a^3*b^21 + 48*a^4*b^20 + 120*a^5*b^19 - 120*a^6*b^18 - 160*a^7*b^17 + 160*a^8*b^16 + 120*a^9*b^15 - 120*a^10*b^14 - 48*a^11*b^13 + 48*a^12*b^12 + 8*a^13*b^11 - 8*a^14*b^10))/((b^19 - 7*a^2*b^17 + 21*a^4*b^15 - 35*a^6*b^13 + 35*a^8*b^11 - 21*a^10*b^9 + 7*a^12*b^7 - a^14*b^5)*(a*b^18 + b^19 - 5*a^2*b^17 - 5*a^3*b^16 + 10*a^4*b^15 + 10*a^5*b^14 - 10*a^6*b^13 - 10*a^7*b^12 + 5*a^8*b^11 + 5*a^9*b^10 - a^10*b^9 - a^11*b^8)))*(-(a + b)^7*(a - b)^7)^(1/2)*(8*a^6 - 20*b^6 + 35*a^2*b^4 - 28*a^4*b^2))/(2*(b^19 - 7*a^2*b^17 + 21*a^4*b^15 - 35*a^6*b^13 + 35*a^8*b^11 - 21*a^10*b^9 + 7*a^12*b^7 - a^14*b^5)))*(-(a + b)^7*(a - b)^7)^(1/2)*(8*a^6 - 20*b^6 + 35*a^2*b^4 - 28*a^4*b^2)*1i)/(2*(b^19 - 7*a^2*b^17 + 21*a^4*b^15 - 35*a^6*b^13 + 35*a^8*b^11 - 21*a^10*b^9 + 7*a^12*b^7 - a^14*b^5)) + (a^2*((8*tan(c/2 + (d*x)/2)*(128*a^16 - 128*a^15*b + 64*a^2*b^14 - 128*a^3*b^13 + 80*a^4*b^12 + 768*a^5*b^11 - 824*a^6*b^10 - 1920*a^7*b^9 + 2025*a^8*b^8 + 2560*a^9*b^7 - 2600*a^10*b^6 - 1920*a^11*b^5 + 1920*a^12*b^4 + 768*a^13*b^3 - 768*a^14*b^2))/(a*b^18 + b^19 - 5*a^2*b^17 - 5*a^3*b^16 + 10*a^4*b^15 + 10*a^5*b^14 - 10*a^6*b^13 - 10*a^7*b^12 + 5*a^8*b^11 + 5*a^9*b^10 - a^10*b^9 - a^11*b^8) - (a^2*((16*(8*a*b^23 - 20*a^2*b^22 - 36*a^3*b^21 + 95*a^4*b^20 + 73*a^5*b^19 - 193*a^6*b^18 - 87*a^7*b^17 + 217*a^8*b^16 + 63*a^9*b^15 - 143*a^10*b^14 - 25*a^11*b^13 + 52*a^12*b^12 + 4*a^13*b^11 - 8*a^14*b^10))/(a*b^22 + b^23 - 5*a^2*b^21 - 5*a^3*b^20 + 10*a^4*b^19 + 10*a^5*b^18 - 10*a^6*b^17 - 10*a^7*b^16 + 5*a^8*b^15

+ 5*a^9*b^14 - a^10*b^13 - a^11*b^12) + (4*a^2*tan(c/2 + (d*x)/2)*(-(a + b)
^7*(a - b)^7)^(1/2)*(8*a^6 - 20*b^6 + 35*a^2*b^4 - 28*a^4*b^2)*(8*a*b^23 -
8*a^2*b^22 - 48*a^3*b^21 + 48*a^4*b^20 + 120*a^5*b^19 - 120*a^6*b^18 - 160*
a^7*b^17 + 160*a^8*b^16 + 120*a^9*b^15 - 120*a^10*b^14 - 48*a^11*b^13 + 48*
a^12*b^12 + 8*a^13*b^11 - 8*a^14*b^10))/((b^19 - 7*a^2*b^17 + 21*a^4*b^15 -
35*a^6*b^13 + 35*a^8*b^11 - 21*a^10*b^9 + 7*a^12*b^7 - a^14*b^5)*(a*b^18 +
b^19 - 5*a^2*b^17 - 5*a^3*b^16 + 10*a^4*b^15 + 10*a^5*b^14 - 10*a^6*b^13 -
10*a^7*b^12 + 5*a^8*b^11 + 5*a^9*b^10 - a^10*b^9 - a^11*b^8)))*(-(a + b)^7
(a - b)^7)^(1/2)(8*a^6 - 20*b^6 + 35*a^2*b^4 - 28*a^4*b^2))/(2*(b^19 - 7*
a^2*b^17 + 21*a^4*b^15 - 35*a^6*b^13 + 35*a^8*b^11 - 21*a^10*b^9 + 7*a^12*b
^7 - a^14*b^5)))*(-(a + b)^7*(a - b)^7)^(1/2)*(8*a^6 - 20*b^6 + 35*a^2*b^4
- 28*a^4*b^2)*1i)/(2*(b^19 - 7*a^2*b^17 + 21*a^4*b^15 - 35*a^6*b^13 + 35*a^
8*b^11 - 21*a^10*b^9 + 7*a^12*b^7 - a^14*b^5)))/((32*(128*a^16 - 64*a^15*b
+ 320*a^4*b^12 + 480*a^5*b^11 - 1520*a^6*b^10 - 1280*a^7*b^9 + 3088*a^8*b^8
+ 1602*a^9*b^7 - 3472*a^10*b^6 - 1088*a^11*b^5 + 2288*a^12*b^4 + 400*a^13*
b^3 - 832*a^14*b^2))/(a*b^22 + b^23 - 5*a^2*b^21 - 5*a^3*b^20 + 10*a^4*b^19
+ 10*a^5*b^18 - 10*a^6*b^17 - 10*a^7*b^16 + 5*a^8*b^15 + 5*a^9*b^14 - a^10
*b^13 - a^11*b^12) - (a^2*((8*tan(c/2 + (d*x)/2)*(128*a^16 - 128*a^15*b + 6
4*a^2*b^14 - 128*a^3*b^13 + 80*a^4*b^12 + 768*a^5*b^11 - 824*a^6*b^10 - 192
0*a^7*b^9 + 2025*a^8*b^8 + 2560*a^9*b^7 - 2600*a^10*b^6 - 1920*a^11*b^5 + 1
920*a^12*b^4 + 768*a^13*b^3 - 768*a^14*b^2))/(a*b^18 + b^19 - 5*a^2*b^17 -
5*a^3*b^16 + 10*a^4*b^15 + 10*a^5*b^14 - 10*a^6*b^13 - 10*a^7*b^12 + 5*a^8*
b^11 + 5*a^9*b^10 - a^10*b^9 - a^11*b^8) + (a^2*((16*(8*a*b^23 - 20*a^2*b^2
2 - 36*a^3*b^21 + 95*a^4*b^20 + 73*a^5*b^19 - 193*a^6*b^18 - 87*a^7*b^17 +
217*a^8*b^16 + 63*a^9*b^15 - 143*a^10*b^14 - 25*a^11*b^13 + 52*a^12*b^12 +
4*a^13*b^11 - 8*a^14*b^10))/(a*b^22 + b^23 - 5*a^2*b^21 - 5*a^3*b^20 + 10*a
^4*b^19 + 10*a^5*b^18 - 10*a^6*b^17 - 10*a^7*b^16 + 5*a^8*b^15 + 5*a^9*b^14
- a^10*b^13 - a^11*b^12) - (4*a^2*tan(c/2 + (d*x)/2)*(-(a + b)^7*(a - b)^7
)^(1/2)*(8*a^6 - 20*b^6 + 35*a^2*b^4 - 28*a^4*b^2)*(8*a*b^23 - 8*a^2*b^22 -
48*a^3*b^21 + 48*a^4*b^20 + 120*a^5*b^19 - 120*a^6*b^18 - 160*a^7*b^17 + 1
60*a^8*b^16 + 120*a^9*b^15 - 120*a^10*b^14 - 48*a^11*b^13 + 48*a^12*b^12 +
8*a^13*b^11 - 8*a^14*b^10))/((b^19 - 7*a^2*b^17 + 21*a^4*b^15 - 35*a^6*b^13
+ 35*a^8*b^11 - 21*a^10*b^9 + 7*a^12*b^7 - a^14*b^5)*(a*b^18 + b^19 - 5*a^
2*b^17 - 5*a^3*b^16 + 10*a^4*b^15 + 10*a^5*b^14 - 10*a^6*b^13 - 10*a^7*b^12
+ 5*a^8*b^11 + 5*a^9*b^10 - a^10*b^9 - a^11*b^8)))*(-(a + b)^7*(a - b)^7)^
(1/2)*(8*a^6 - 20*b^6 + 35*a^2*b^4 - 28*a^4*b^2))/(2*(b^19 - 7*a^2*b^17 + 2
1*a^4*b^15 - 35*a^6*b^13 + 35*a^8*b^11 - 21*a^10*b^9 + 7*a^12*b^7 - a^14*b^
5)))*(-(a + b)^7*(a - b)^7)^(1/2)*(8*a^6 - 20*b^6 + 35*a^2*b^4 - 28*a^4*b^2
))/(2*(b^19 - 7*a^2*b^17 + 21*a^4*b^15 - 35*a^6*b^13 + 35*a^8*b^11 - 21*a^1
0*b^9 + 7*a^12*b^7 - a^14*b^5)) + (a^2*((8*tan(c/2 + (d*x)/2)*(128*a^16 - 1
28*a^15*b + 64*a^2*b^14 - 128*a^3*b^13 + 80*a^4*b^12 + 768*a^5*b^11 - 824*a
^6*b^10 - 1920*a^7*b^9 + 2025*a^8*b^8 + 2560*a^9*b^7 - 2600*a^10*b^6 - 1920
*a^11*b^5 + 1920*a^12*b^4 + 768*a^13*b^3 - 768*a^14*b^2))/(a*b^18 + b^19 -
5*a^2*b^17 - 5*a^3*b^16 + 10*a^4*b^15 + 10*a^5*b^14 - 10*a^6*b^13 - 10*a^7*
b^12 + 5*a^8*b^11 + 5*a^9*b^10 - a^10*b^9 - a^11*b^8) - (a^2*((16*(8*a*b^23

- 20*a^2*b^22 - 36*a^3*b^21 + 95*a^4*b^20 + 73*a^5*b^19 - 193*a^6*b^18 - 8
7*a^7*b^17 + 217*a^8*b^16 + 63*a^9*b^15 - 143*a^10*b^14 - 25*a^11*b^13 + 52
*a^12*b^12 + 4*a^13*b^11 - 8*a^14*b^10))/(a*b^22 + b^23 - 5*a^2*b^21 - 5*a^
3*b^20 + 10*a^4*b^19 + 10*a^5*b^18 - 10*a^6*b^17 - 10*a^7*b^16 + 5*a^8*b^15
 + 5*a^9*b^14 - a^10*b^13 - a^11*b^12) + (4*a^2*tan(c/2 + (d*x)/2)*(-(a + b
)^7*(a - b)^7)^(1/2)*(8*a^6 - 20*b^6 + 35*a^2*b^4 - 28*a^4*b^2)*(8*a*b^23 -
 8*a^2*b^22 - 48*a^3*b^21 + 48*a^4*b^20 + 120*a^5*b^19 - 120*a^6*b^18 - 160
*a^7*b^17 + 160*a^8*b^16 + 120*a^9*b^15 - 120*a^10*b^14 - 48*a^11*b^13 + 48
*a^12*b^12 + 8*a^13*b^11 - 8*a^14*b^10))/((b^19 - 7*a^2*b^17 + 21*a^4*b^15
- 35*a^6*b^13 + 35*a^8*b^11 - 21*a^10*b^9 + 7*a^12*b^7 - a^14*b^5)*(a*b^18
+ b^19 - 5*a^2*b^17 - 5*a^3*b^16 + 10*a^4*b^15 + 10*a^5*b^14 - 10*a^6*b^13
- 10*a^7*b^12 + 5*a^8*b^11 + 5*a^9*b^10 - a^10*b^9 - a^11*b^8)))*(-(a + b)^
7*(a - b)^7)^(1/2)*(8*a^6 - 20*b^6 + 35*a^2*b^4 - 28*a^4*b^2))/(2*(b^19 - 7
*a^2*b^17 + 21*a^4*b^15 - 35*a^6*b^13 + 35*a^8*b^11 - 21*a^10*b^9 + 7*a^12*
b^7 - a^14*b^5)))*(-(a + b)^7*(a - b)^7)^(1/2)*(8*a^6 - 20*b^6 + 35*a^2*b^4
 - 28*a^4*b^2))/(2*(b^19 - 7*a^2*b^17 + 21*a^4*b^15 - 35*a^6*b^13 + 35*a^8*
b^11 - 21*a^10*b^9 + 7*a^12*b^7 - a^14*b^5))))*(-(a + b)^7*(a - b)^7)^(1/2)
*(8*a^6 - 20*b^6 + 35*a^2*b^4 - 28*a^4*b^2)*1i)/(d*(b^19 - 7*a^2*b^17 + 21*
a^4*b^15 - 35*a^6*b^13 + 35*a^8*b^11 - 21*a^10*b^9 + 7*a^12*b^7 - a^14*b^5)
)

3.479 $\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^4}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 250

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \frac{x}{b^4} - \frac{a(2a^6-7a^4b^2+8a^2b^4-8b^6)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{7/2}b^4(a+b)^{7/2}d} - \frac{a^2\cos^2(c+dx)\sin(c+dx)}{3b(a^2-b^2)\,d(a+b\cos(c+dx))^3} + \frac{a^3(3a^2-8b^2)\sin(c+dx)}{6b^3(a^2-b^2)^2\,d(a+b\cos(c+dx))^2} - \frac{a^2(9a^4-28a^2b^2+34b^4)\sin(c+dx)}{6b^3(a^2-b^2)^3\,d(a+b\cos(c+dx))}$$

```
[Out] x/b^4-a*(2*a^6-7*a^4*b^2+8*a^2*b^4-8*b^6)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/
2*c)/(a+b)^(1/2))/(a-b)^(7/2)/b^4/(a+b)^(7/2)/d-1/3*a^2*cos(d*x+c)^2*sin(d*
x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))^3+1/6*a^3*(3*a^2-8*b^2)*sin(d*x+c)/b^3/
(a^2-b^2)^2/d/(a+b*cos(d*x+c))^2-1/6*a^2*(9*a^4-28*a^2*b^2+34*b^4)*sin(d*x+
c)/b^3/(a^2-b^2)^3/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.65 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used

$= \{2871, 3110, 3100, 2814, 2738, 211\}$

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^4}\,dx = -\frac{a^2\sin(c+dx)\cos^2(c+dx)}{3bd\,(a^2-b^2)\,(a+b\cos(c+dx))^3} - \frac{a^2(9a^4-28a^2b^2+34b^4)\sin(c+dx)}{6b^3d\,(a^2-b^2)^3\,(a+b\cos(c+dx))} + \frac{a^3(3a^2-8b^2)\sin(c+dx)}{6b^3d\,(a^2-b^2)^2\,(a+b\cos(c+dx))^2} - \frac{a(2a^6-7a^4b^2+8a^2b^4-8b^6)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{b^4d(a-b)^{7/2}(a+b)^{7/2}} + \frac{x}{b^4}$$

```
[In] Int[Cos[c + d*x]^4/(a + b*Cos[c + d*x])^4,x]
```

```
[Out] x/b^4 - (a*(2*a^6 - 7*a^4*b^2 + 8*a^2*b^4 - 8*b^6)*ArcTan[(Sqrt[a - b]*Tan[
(c + d*x)/2])/Sqrt[a + b]])/((a - b)^(7/2)*b^4*(a + b)^(7/2)*d) - (a^2*Cos[
c + d*x]^2*Sin[c + d*x])/(3*b*(a^2 - b^2)*d*(a + b*Cos[c + d*x])^3) + (a^3*
(3*a^2 - 8*b^2)*Sin[c + d*x])/(6*b^3*(a^2 - b^2)^2*d*(a + b*Cos[c + d*x])^2
) - (a^2*(9*a^4 - 28*a^2*b^2 + 34*b^4)*Sin[c + d*x])/(6*b^3*(a^2 - b^2)^3*d
*(a + b*Cos[c + d*x]))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
```

```
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3100

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
 (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2
 - a*b*B + a^2*C))*Cos[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*
(a^2 - b^2))), x] + Dist[1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*Simp[b*(a*A - b*B + a*C)*(m + 1) - (A*b^2 - a*b*B + a^2*C + b*(A*
b - a*B + b*C)*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B
, C}, x] && LtQ[m, -1] && NeQ[a^2 - b^2, 0]
```

Rule 3110

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f
_.)*(x_)]^2), x_Symbol] :> Simp[(-(b*c - a*d))*(A*b^2 - a*b*B + a^2*C)*Cos[
e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b^2*f*(m + 1)*(a^2 - b^2))), x] - D
ist[1/(b^2*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[b*(m
 + 1)*((b*B - a*C)*(b*c - a*d) - A*b*(a*c - b*d)) + (b*B*(a^2*d + b^2*d*(m
+ 1) - a*b*c*(m + 2)) + (b*c - a*d)*(A*b^2*(m + 2) + C*(a^2 + b^2*(m + 1)))
)*Sin[e + f*x] - b*C*d*(m + 1)*(a^2 - b^2)*Sin[e + f*x]^2, x], x], x] /; Fr
eeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2,
0] && LtQ[m, -1]
```

Rubi steps

integral

$$= -\frac{a^2\cos^2(c+dx)\sin(c+dx)}{3b\left(a^2-b^2\right)d(a+b\cos(c+dx))^3} - \frac{\int \frac{\cos(c+dx)\left(2a^2-3ab\cos(c+dx)-3\left(a^2-b^2\right)\cos^2(c+dx)\right)}{(a+b\cos(c+dx))^3}\,dx}{3b\left(a^2-b^2\right)}$$

$$= -\frac{a^2\cos^2(c+dx)\sin(c+dx)}{3b\left(a^2-b^2\right)d(a+b\cos(c+dx))^3} + \frac{a^3\left(3a^2-8b^2\right)\sin(c+dx)}{6b^3\left(a^2-b^2\right)^2 d(a+b\cos(c+dx))^2} - \frac{\int \frac{2a^2b\left(3a^2-8b^2\right)+a\left(3a^4-10a^2b^2+12b^4\right)\cos(c+dx)-6b\left(a^2-b^2\right)^2\cos^2(c+dx)}{(a+b\cos(c+dx))^2}\,dx}{6b^3\left(a^2-b^2\right)^2}$$

$$= -\frac{a^2\cos^2(c+dx)\sin(c+dx)}{3b\left(a^2-b^2\right)d(a+b\cos(c+dx))^3} + \frac{a^3\left(3a^2-8b^2\right)\sin(c+dx)}{6b^3\left(a^2-b^2\right)^2 d(a+b\cos(c+dx))^2} - \frac{a^2\left(9a^4-28a^2b^2+34b^4\right)\sin(c+dx)}{6b^3\left(a^2-b^2\right)^3 d(a+b\cos(c+dx))} + \frac{\int \frac{3ab^2\left(a^4-2a^2b^2+6b^4\right)+6b\left(a^2-b^2\right)^3\cos(c+dx)}{a+b\cos(c+dx)}\,dx}{6b^4\left(a^2-b^2\right)^3}$$

$$= \frac{x}{b^4} - \frac{a^2\cos^2(c+dx)\sin(c+dx)}{3b(a^2-b^2)\,d(a+b\cos(c+dx))^3} + \frac{a^3(3a^2-8b^2)\sin(c+dx)}{6b^3(a^2-b^2)^2\,d(a+b\cos(c+dx))^2} - \frac{a^2(9a^4-28a^2b^2+34b^4)\sin(c+dx)}{6b^3(a^2-b^2)^3\,d(a+b\cos(c+dx))} - \frac{(a(2a^6-7a^4b^2+8a^2b^4-8b^6))\int\frac{1}{a+b\cos(c+dx)}\,dx}{2b^4(a^2-b^2)^3}$$

$$= \frac{x}{b^4} - \frac{a^2\cos^2(c+dx)\sin(c+dx)}{3b(a^2-b^2)\,d(a+b\cos(c+dx))^3} + \frac{a^3(3a^2-8b^2)\sin(c+dx)}{6b^3(a^2-b^2)^2\,d(a+b\cos(c+dx))^2} - \frac{a^2(9a^4-28a^2b^2+34b^4)\sin(c+dx)}{6b^3(a^2-b^2)^3\,d(a+b\cos(c+dx))} - \frac{(a(2a^6-7a^4b^2+8a^2b^4-8b^6))\,\text{Subst}\left(\int\frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{b^4(a^2-b^2)^3\,d}$$

$$= \frac{x}{b^4} - \frac{a(2a^6-7a^4b^2+8a^2b^4-8b^6)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{7/2}b^4(a+b)^{7/2}d} - \frac{a^2\cos^2(c+dx)\sin(c+dx)}{3b(a^2-b^2)\,d(a+b\cos(c+dx))^3} + \frac{a^3(3a^2-8b^2)\sin(c+dx)}{6b^3(a^2-b^2)^2\,d(a+b\cos(c+dx))^2} - \frac{a^2(9a^4-28a^2b^2+34b^4)\sin(c+dx)}{6b^3(a^2-b^2)^3\,d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 2.03 (sec) , antiderivative size = 227, normalized size of antiderivative = 0.91

$$\int\frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^4}\,dx$$

$$= \frac{6(c+dx) - \frac{6a(2a^6-7a^4b^2+8a^2b^4-8b^6)\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{7/2}} - \frac{2a^4b\sin(c+dx)}{(a-b)(a+b)(a+b\cos(c+dx))^3} + \frac{a^3b(7a^2-12b^2)\sin(c+dx}{(a-b)^2(a+b)^2(a+b\cos(c+d}}{6b^4d}$$

```
[In] Integrate[Cos[c + d*x]^4/(a + b*Cos[c + d*x])^4,x]
```

```
[Out] (6*(c + d*x) - (6*a*(2*a^6 - 7*a^4*b^2 + 8*a^2*b^4 - 8*b^6)*ArcTanh[((a - b
)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/(-a^2 + b^2)^(7/2) - (2*a^4*b*Sin[c
+ d*x])/((a - b)*(a + b)*(a + b*Cos[c + d*x])^3) + (a^3*b*(7*a^2 - 12*b^2)*
Sin[c + d*x])/((a - b)^2*(a + b)^2*(a + b*Cos[c + d*x])^2) + (a^2*b*(-11*a^
4 + 32*a^2*b^2 - 36*b^4)*Sin[c + d*x])/((a - b)^3*(a + b)^3*(a + b*Cos[c +
d*x])))/(6*b^4*d)
```

Maple [A] (verified)

Time = 1.75 (sec) , antiderivative size = 361, normalized size of antiderivative = 1.44

method	result
derivativedivides	$\frac{\frac{2\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{b^4}-\frac{2a\left(\frac{\left(2a^4-a^3b-6a^2b^2+4a\,b^3+12b^4\right)ab\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)\left(a^3+3a^2b+3a\,b^2+b^3\right)}+\frac{2\left(3a^4-11a^2b^2+18b^4\right)ab\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3\left(a^2-2ab+b^2\right)\left(a^2+2ab+b^2\right)}+\frac{(2a}{}\right.}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^3 \quad b}}{d}$
default	$\frac{\frac{2\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{b^4}-\frac{2a\left(\frac{\left(2a^4-a^3b-6a^2b^2+4a\,b^3+12b^4\right)ab\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)\left(a^3+3a^2b+3a\,b^2+b^3\right)}+\frac{2\left(3a^4-11a^2b^2+18b^4\right)ab\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3\left(a^2-2ab+b^2\right)\left(a^2+2ab+b^2\right)}+\frac{(2a}{}\right.}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^3 \quad b}}{d}$
risch	Expression too large to display

```
[In] int(cos(d*x+c)^4/(a+cos(d*x+c)*b)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(2/b^4*arctan(tan(1/2*d*x+1/2*c))-2*a/b^4*((1/2*(2*a^4-a^3*b-6*a^2*b^2+
4*a*b^3+12*b^4)*a*b/(a-b)/(a^3+3*a^2*b+3*a*b^2+b^3)*tan(1/2*d*x+1/2*c)^5+2/
3*(3*a^4-11*a^2*b^2+18*b^4)*a*b/(a^2-2*a*b+b^2)/(a^2+2*a*b+b^2)*tan(1/2*d*x
+1/2*c)^3+1/2*(2*a^4+a^3*b-6*a^2*b^2-4*a*b^3+12*b^4)*a*b/(a+b)/(a^3-3*a^2*b
+3*a*b^2-b^3)*tan(1/2*d*x+1/2*c))/(tan(1/2*d*x+1/2*c)^2*a-b*tan(1/2*d*x+1/2
*c)^2+a+b)^3+1/2*(2*a^6-7*a^4*b^2+8*a^2*b^4-8*b^6)/(a^6-3*a^4*b^2+3*a^2*b^4
-b^6)/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/
2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 688 vs. $2(235) = 470$.

Time = 0.36 (sec) , antiderivative size = 1445, normalized size of antiderivative = 5.78

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^4/(a+b*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] [1/12*(12*(a^8*b^3 - 4*a^6*b^5 + 6*a^4*b^7 - 4*a^2*b^9 + b^11)*d*x*cos(d*x
+ c)^3 + 36*(a^9*b^2 - 4*a^7*b^4 + 6*a^5*b^6 - 4*a^3*b^8 + a*b^10)*d*x*cos(
d*x + c)^2 + 36*(a^10*b - 4*a^8*b^3 + 6*a^6*b^5 - 4*a^4*b^7 + a^2*b^9)*d*x*
cos(d*x + c) + 12*(a^11 - 4*a^9*b^2 + 6*a^7*b^4 - 4*a^5*b^6 + a^3*b^8)*d*x
- 3*(2*a^10 - 7*a^8*b^2 + 8*a^6*b^4 - 8*a^4*b^6 + (2*a^7*b^3 - 7*a^5*b^5 +
8*a^3*b^7 - 8*a*b^9)*cos(d*x + c)^3 + 3*(2*a^8*b^2 - 7*a^6*b^4 + 8*a^4*b^6
- 8*a^2*b^8)*cos(d*x + c)^2 + 3*(2*a^9*b - 7*a^7*b^3 + 8*a^5*b^5 - 8*a^3*b^
7)*cos(d*x + c))*sqrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*c
```

```
os(d*x + c)^2 - 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2
+ 2*b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) - 2*(6*a^10*b - 2
3*a^8*b^3 + 43*a^6*b^5 - 26*a^4*b^7 + (11*a^8*b^3 - 43*a^6*b^5 + 68*a^4*b^7
 - 36*a^2*b^9)*cos(d*x + c)^2 + 15*(a^9*b^2 - 4*a^7*b^4 + 7*a^5*b^6 - 4*a^3
*b^8)*cos(d*x + c))*sin(d*x + c))/((a^8*b^7 - 4*a^6*b^9 + 6*a^4*b^11 - 4*a^
2*b^13 + b^15)*d*cos(d*x + c)^3 + 3*(a^9*b^6 - 4*a^7*b^8 + 6*a^5*b^10 - 4*a
^3*b^12 + a*b^14)*d*cos(d*x + c)^2 + 3*(a^10*b^5 - 4*a^8*b^7 + 6*a^6*b^9 -
4*a^4*b^11 + a^2*b^13)*d*cos(d*x + c) + (a^11*b^4 - 4*a^9*b^6 + 6*a^7*b^8 -
 4*a^5*b^10 + a^3*b^12)*d), 1/6*(6*(a^8*b^3 - 4*a^6*b^5 + 6*a^4*b^7 - 4*a^2
*b^9 + b^11)*d*x*cos(d*x + c)^3 + 18*(a^9*b^2 - 4*a^7*b^4 + 6*a^5*b^6 - 4*a
^3*b^8 + a*b^10)*d*x*cos(d*x + c)^2 + 18*(a^10*b - 4*a^8*b^3 + 6*a^6*b^5 -
4*a^4*b^7 + a^2*b^9)*d*x*cos(d*x + c) + 6*(a^11 - 4*a^9*b^2 + 6*a^7*b^4 - 4
*a^5*b^6 + a^3*b^8)*d*x - 3*(2*a^10 - 7*a^8*b^2 + 8*a^6*b^4 - 8*a^4*b^6 + (
2*a^7*b^3 - 7*a^5*b^5 + 8*a^3*b^7 - 8*a*b^9)*cos(d*x + c)^3 + 3*(2*a^8*b^2
- 7*a^6*b^4 + 8*a^4*b^6 - 8*a^2*b^8)*cos(d*x + c)^2 + 3*(2*a^9*b - 7*a^7*b^
3 + 8*a^5*b^5 - 8*a^3*b^7)*cos(d*x + c))*sqrt(a^2 - b^2)*arctan(-(a*cos(d*x
 + c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c))) - (6*a^10*b - 23*a^8*b^3 + 43*a^
6*b^5 - 26*a^4*b^7 + (11*a^8*b^3 - 43*a^6*b^5 + 68*a^4*b^7 - 36*a^2*b^9)*co
s(d*x + c)^2 + 15*(a^9*b^2 - 4*a^7*b^4 + 7*a^5*b^6 - 4*a^3*b^8)*cos(d*x + c
))*sin(d*x + c))/((a^8*b^7 - 4*a^6*b^9 + 6*a^4*b^11 - 4*a^2*b^13 + b^15)*d*
cos(d*x + c)^3 + 3*(a^9*b^6 - 4*a^7*b^8 + 6*a^5*b^10 - 4*a^3*b^12 + a*b^14)
*d*cos(d*x + c)^2 + 3*(a^10*b^5 - 4*a^8*b^7 + 6*a^6*b^9 - 4*a^4*b^11 + a^2*
b^13)*d*cos(d*x + c) + (a^11*b^4 - 4*a^9*b^6 + 6*a^7*b^8 - 4*a^5*b^10 + a^3
*b^12)*d)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**4/(a+b*cos(d*x+c))**4,x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)^4/(a+b*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
```

```
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see 'assume?' for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 531 vs. $2(235) = 470$.

Time = 0.35 (sec) , antiderivative size = 531, normalized size of antiderivative = 2.12

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \frac{\frac{3\,(2\,a^7-7\,a^5b^2+8\,a^3b^4-8\,ab^6)\left(\pi\left\lfloor\frac{dx+c}{2\,\pi}+\frac{1}{2}\right\rfloor\mathrm{sgn}(-2\,a+2\,b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\sqrt{a^2-b^2}}\right)\right)}{(a^6b^4-3\,a^4b^6+3\,a^2b^8-b^{10})\sqrt{a^2-b^2}} - \frac{6\,a^8\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-15\,a^7b\tan}{}}{}$$

```
[In] integrate(cos(d*x+c)^4/(a+b*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/3*(3*(2*a^7 - 7*a^5*b^2 + 8*a^3*b^4 - 8*a*b^6)*(pi*floor(1/2*(d*x + c)/pi
 + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1/2*d*x + 1/2*c) - b*tan(1/2*d*x +
 1/2*c))/sqrt(a^2 - b^2)))/((a^6*b^4 - 3*a^4*b^6 + 3*a^2*b^8 - b^10)*sqrt(a
^2 - b^2)) - (6*a^8*tan(1/2*d*x + 1/2*c)^5 - 15*a^7*b*tan(1/2*d*x + 1/2*c)^
5 - 6*a^6*b^2*tan(1/2*d*x + 1/2*c)^5 + 45*a^5*b^3*tan(1/2*d*x + 1/2*c)^5 -
6*a^4*b^4*tan(1/2*d*x + 1/2*c)^5 - 60*a^3*b^5*tan(1/2*d*x + 1/2*c)^5 + 36*a
^2*b^6*tan(1/2*d*x + 1/2*c)^5 + 12*a^8*tan(1/2*d*x + 1/2*c)^3 - 56*a^6*b^2*
tan(1/2*d*x + 1/2*c)^3 + 116*a^4*b^4*tan(1/2*d*x + 1/2*c)^3 - 72*a^2*b^6*ta
n(1/2*d*x + 1/2*c)^3 + 6*a^8*tan(1/2*d*x + 1/2*c) + 15*a^7*b*tan(1/2*d*x +
1/2*c) - 6*a^6*b^2*tan(1/2*d*x + 1/2*c) - 45*a^5*b^3*tan(1/2*d*x + 1/2*c) -
 6*a^4*b^4*tan(1/2*d*x + 1/2*c) + 60*a^3*b^5*tan(1/2*d*x + 1/2*c) + 36*a^2*
b^6*tan(1/2*d*x + 1/2*c))/((a^6*b^3 - 3*a^4*b^5 + 3*a^2*b^7 - b^9)*(a*tan(1
/2*d*x + 1/2*c)^2 - b*tan(1/2*d*x + 1/2*c)^2 + a + b)^3) + 3*(d*x + c)/b^4)
/d
```

Mupad [B] (verification not implemented)

Time = 27.41 (sec) , antiderivative size = 7247, normalized size of antiderivative = 28.99

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \text{Too large to display}$$

```
[In] int(cos(c + d*x)^4/(a + b*cos(c + d*x))^4,x)
```

```
[Out] (2*atan((((((8*(16*a*b^20 - 4*b^21 + 12*a^2*b^19 - 64*a^3*b^18 - 20*a^4*b^1
7 + 110*a^5*b^16 + 30*a^6*b^15 - 110*a^7*b^14 - 30*a^8*b^13 + 70*a^9*b^12 +
 14*a^10*b^11 - 26*a^11*b^10 - 2*a^12*b^9 + 4*a^13*b^8))/(a*b^19 + b^20 - 5
```

*a^2*b^18 - 5*a^3*b^17 + 10*a^4*b^16 + 10*a^5*b^15 - 10*a^6*b^14 - 10*a^7*b
^13 + 5*a^8*b^12 + 5*a^9*b^11 - a^10*b^10 - a^11*b^9) - (tan(c/2 + (d*x)/2)
*(8*a*b^21 - 8*a^2*b^20 - 48*a^3*b^19 + 48*a^4*b^18 + 120*a^5*b^17 - 120*a^
6*b^16 - 160*a^7*b^15 + 160*a^8*b^14 + 120*a^9*b^13 - 120*a^10*b^12 - 48*a^
11*b^11 + 48*a^12*b^10 + 8*a^13*b^9 - 8*a^14*b^8)*8i)/(b^4*(a*b^16 + b^17 -
 5*a^2*b^15 - 5*a^3*b^14 + 10*a^4*b^13 + 10*a^5*b^12 - 10*a^6*b^11 - 10*a^7
*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - a^10*b^7 - a^11*b^6)))*1i)/b^4 + (8*tan(c/2
 + (d*x)/2)*(8*a^14 - 8*a^13*b - 8*a*b^13 + 4*b^14 + 44*a^2*b^12 + 48*a^3*b
^11 - 92*a^4*b^10 - 120*a^5*b^9 + 156*a^6*b^8 + 160*a^7*b^7 - 164*a^8*b^6 -
 120*a^9*b^5 + 117*a^10*b^4 + 48*a^11*b^3 - 48*a^12*b^2))/(a*b^16 + b^17 -
5*a^2*b^15 - 5*a^3*b^14 + 10*a^4*b^13 + 10*a^5*b^12 - 10*a^6*b^11 - 10*a^7*
b^10 + 5*a^8*b^9 + 5*a^9*b^8 - a^10*b^7 - a^11*b^6))/b^4 - ((((8*(16*a*b^20
 - 4*b^21 + 12*a^2*b^19 - 64*a^3*b^18 - 20*a^4*b^17 + 110*a^5*b^16 + 30*a^6
*b^15 - 110*a^7*b^14 - 30*a^8*b^13 + 70*a^9*b^12 + 14*a^10*b^11 - 26*a^11*b
^10 - 2*a^12*b^9 + 4*a^13*b^8))/(a*b^19 + b^20 - 5*a^2*b^18 - 5*a^3*b^17 +
10*a^4*b^16 + 10*a^5*b^15 - 10*a^6*b^14 - 10*a^7*b^13 + 5*a^8*b^12 + 5*a^9*
b^11 - a^10*b^10 - a^11*b^9) + (tan(c/2 + (d*x)/2)*(8*a*b^21 - 8*a^2*b^20 -
 48*a^3*b^19 + 48*a^4*b^18 + 120*a^5*b^17 - 120*a^6*b^16 - 160*a^7*b^15 + 1
60*a^8*b^14 + 120*a^9*b^13 - 120*a^10*b^12 - 48*a^11*b^11 + 48*a^12*b^10 +
8*a^13*b^9 - 8*a^14*b^8)*8i)/(b^4*(a*b^16 + b^17 - 5*a^2*b^15 - 5*a^3*b^14
+ 10*a^4*b^13 + 10*a^5*b^12 - 10*a^6*b^11 - 10*a^7*b^10 + 5*a^8*b^9 + 5*a^9
*b^8 - a^10*b^7 - a^11*b^6)))*1i)/b^4 - (8*tan(c/2 + (d*x)/2)*(8*a^14 - 8*a
^13*b - 8*a*b^13 + 4*b^14 + 44*a^2*b^12 + 48*a^3*b^11 - 92*a^4*b^10 - 120*a
^5*b^9 + 156*a^6*b^8 + 160*a^7*b^7 - 164*a^8*b^6 - 120*a^9*b^5 + 117*a^10*b
^4 + 48*a^11*b^3 - 48*a^12*b^2))/(a*b^16 + b^17 - 5*a^2*b^15 - 5*a^3*b^14 +
 10*a^4*b^13 + 10*a^5*b^12 - 10*a^6*b^11 - 10*a^7*b^10 + 5*a^8*b^9 + 5*a^9*
b^8 - a^10*b^7 - a^11*b^6))/b^4)/((((((8*(16*a*b^20 - 4*b^21 + 12*a^2*b^19
- 64*a^3*b^18 - 20*a^4*b^17 + 110*a^5*b^16 + 30*a^6*b^15 - 110*a^7*b^14 - 3
0*a^8*b^13 + 70*a^9*b^12 + 14*a^10*b^11 - 26*a^11*b^10 - 2*a^12*b^9 + 4*a^1
3*b^8))/(a*b^19 + b^20 - 5*a^2*b^18 - 5*a^3*b^17 + 10*a^4*b^16 + 10*a^5*b^1
5 - 10*a^6*b^14 - 10*a^7*b^13 + 5*a^8*b^12 + 5*a^9*b^11 - a^10*b^10 - a^11*
b^9) - (tan(c/2 + (d*x)/2)*(8*a*b^21 - 8*a^2*b^20 - 48*a^3*b^19 + 48*a^4*b^
18 + 120*a^5*b^17 - 120*a^6*b^16 - 160*a^7*b^15 + 160*a^8*b^14 + 120*a^9*b^
13 - 120*a^10*b^12 - 48*a^11*b^11 + 48*a^12*b^10 + 8*a^13*b^9 - 8*a^14*b^8)
8i)/(b^4(a*b^16 + b^17 - 5*a^2*b^15 - 5*a^3*b^14 + 10*a^4*b^13 + 10*a^5*b
^12 - 10*a^6*b^11 - 10*a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - a^10*b^7 - a^11*b
^6)))*1i)/b^4 + (8*tan(c/2 + (d*x)/2)*(8*a^14 - 8*a^13*b - 8*a*b^13 + 4*b^1
4 + 44*a^2*b^12 + 48*a^3*b^11 - 92*a^4*b^10 - 120*a^5*b^9 + 156*a^6*b^8 + 1
60*a^7*b^7 - 164*a^8*b^6 - 120*a^9*b^5 + 117*a^10*b^4 + 48*a^11*b^3 - 48*a^
12*b^2))/(a*b^16 + b^17 - 5*a^2*b^15 - 5*a^3*b^14 + 10*a^4*b^13 + 10*a^5*b^
12 - 10*a^6*b^11 - 10*a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - a^10*b^7 - a^11*b^
6))*1i)/b^4 + (((((8*(16*a*b^20 - 4*b^21 + 12*a^2*b^19 - 64*a^3*b^18 - 20*a
^4*b^17 + 110*a^5*b^16 + 30*a^6*b^15 - 110*a^7*b^14 - 30*a^8*b^13 + 70*a^9*
b^12 + 14*a^10*b^11 - 26*a^11*b^10 - 2*a^12*b^9 + 4*a^13*b^8))/(a*b^19 + b^
20 - 5*a^2*b^18 - 5*a^3*b^17 + 10*a^4*b^16 + 10*a^5*b^15 - 10*a^6*b^14 - 10

*a^7*b^13 + 5*a^8*b^12 + 5*a^9*b^11 - a^10*b^10 - a^11*b^9) + (tan(c/2 + (d
x)/2)(8*a*b^21 - 8*a^2*b^20 - 48*a^3*b^19 + 48*a^4*b^18 + 120*a^5*b^17 -
120*a^6*b^16 - 160*a^7*b^15 + 160*a^8*b^14 + 120*a^9*b^13 - 120*a^10*b^12 -
48*a^11*b^11 + 48*a^12*b^10 + 8*a^13*b^9 - 8*a^14*b^8)*8i)/(b^4*(a*b^16 +
b^17 - 5*a^2*b^15 - 5*a^3*b^14 + 10*a^4*b^13 + 10*a^5*b^12 - 10*a^6*b^11 -
10*a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - a^10*b^7 - a^11*b^6)))*1i)/b^4 - (8*t
an(c/2 + (d*x)/2)*(8*a^14 - 8*a^13*b - 8*a*b^13 + 4*b^14 + 44*a^2*b^12 + 48
*a^3*b^11 - 92*a^4*b^10 - 120*a^5*b^9 + 156*a^6*b^8 + 160*a^7*b^7 - 164*a^8
*b^6 - 120*a^9*b^5 + 117*a^10*b^4 + 48*a^11*b^3 - 48*a^12*b^2))/(a*b^16 + b
^17 - 5*a^2*b^15 - 5*a^3*b^14 + 10*a^4*b^13 + 10*a^5*b^12 - 10*a^6*b^11 - 1
0*a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - a^10*b^7 - a^11*b^6))*1i)/b^4 + (16*(1
6*a*b^12 - 2*a^12*b + 4*a^13 + 48*a^2*b^11 - 64*a^3*b^10 - 64*a^4*b^9 + 110
*a^5*b^8 + 66*a^6*b^7 - 110*a^7*b^6 - 34*a^8*b^5 + 70*a^9*b^4 + 11*a^10*b^3
 - 26*a^11*b^2))/(a*b^19 + b^20 - 5*a^2*b^18 - 5*a^3*b^17 + 10*a^4*b^16 + 1
0*a^5*b^15 - 10*a^6*b^14 - 10*a^7*b^13 + 5*a^8*b^12 + 5*a^9*b^11 - a^10*b^1
0 - a^11*b^9)))))/(b^4*d) - ((tan(c/2 + (d*x)/2)^5*(2*a^6 - a^5*b + 12*a^2*b
^4 + 4*a^3*b^3 - 6*a^4*b^2))/((a*b^3 - b^4)*(a + b)^3) + (4*tan(c/2 + (d*x)
/2)^3*(3*a^6 + 18*a^2*b^4 - 11*a^4*b^2))/(3*(a + b)^2*(b^5 - 2*a*b^4 + a^2*
b^3)) + (tan(c/2 + (d*x)/2)*(a^5*b + 2*a^6 + 12*a^2*b^4 - 4*a^3*b^3 - 6*a^4
b^2))/((a + b)(3*a*b^5 - b^6 - 3*a^2*b^4 + a^3*b^3)))/(d*(3*a*b^2 - tan(c
/2 + (d*x)/2)^4*(3*a*b^2 + 3*a^2*b - 3*a^3 - 3*b^3) - tan(c/2 + (d*x)/2)^2*
(3*a*b^2 - 3*a^2*b - 3*a^3 + 3*b^3) + 3*a^2*b + a^3 + b^3 + tan(c/2 + (d*x)
/2)^6*(3*a*b^2 - 3*a^2*b + a^3 - b^3))) + (a*atan(((a*((8*tan(c/2 + (d*x)/2
)*(8*a^14 - 8*a^13*b - 8*a*b^13 + 4*b^14 + 44*a^2*b^12 + 48*a^3*b^11 - 92*a
^4*b^10 - 120*a^5*b^9 + 156*a^6*b^8 + 160*a^7*b^7 - 164*a^8*b^6 - 120*a^9*b
^5 + 117*a^10*b^4 + 48*a^11*b^3 - 48*a^12*b^2))/(a*b^16 + b^17 - 5*a^2*b^15
 - 5*a^3*b^14 + 10*a^4*b^13 + 10*a^5*b^12 - 10*a^6*b^11 - 10*a^7*b^10 + 5*a
^8*b^9 + 5*a^9*b^8 - a^10*b^7 - a^11*b^6) + (a*((8*(16*a*b^20 - 4*b^21 + 12
*a^2*b^19 - 64*a^3*b^18 - 20*a^4*b^17 + 110*a^5*b^16 + 30*a^6*b^15 - 110*a^
7*b^14 - 30*a^8*b^13 + 70*a^9*b^12 + 14*a^10*b^11 - 26*a^11*b^10 - 2*a^12*b
^9 + 4*a^13*b^8))/(a*b^19 + b^20 - 5*a^2*b^18 - 5*a^3*b^17 + 10*a^4*b^16 +
10*a^5*b^15 - 10*a^6*b^14 - 10*a^7*b^13 + 5*a^8*b^12 + 5*a^9*b^11 - a^10*b^
10 - a^11*b^9) - (4*a*tan(c/2 + (d*x)/2)*(-(a + b)^7*(a - b)^7)^(1/2)*(2*a^
6 - 8*b^6 + 8*a^2*b^4 - 7*a^4*b^2)*(8*a*b^21 - 8*a^2*b^20 - 48*a^3*b^19 + 4
8*a^4*b^18 + 120*a^5*b^17 - 120*a^6*b^16 - 160*a^7*b^15 + 160*a^8*b^14 + 12
0*a^9*b^13 - 120*a^10*b^12 - 48*a^11*b^11 + 48*a^12*b^10 + 8*a^13*b^9 - 8*a
^14*b^8))/((b^18 - 7*a^2*b^16 + 21*a^4*b^14 - 35*a^6*b^12 + 35*a^8*b^10 - 2
1*a^10*b^8 + 7*a^12*b^6 - a^14*b^4)*(a*b^16 + b^17 - 5*a^2*b^15 - 5*a^3*b^1
4 + 10*a^4*b^13 + 10*a^5*b^12 - 10*a^6*b^11 - 10*a^7*b^10 + 5*a^8*b^9 + 5*a
^9*b^8 - a^10*b^7 - a^11*b^6)))*(-(a + b)^7*(a - b)^7)^(1/2)*(2*a^6 - 8*b^6
 + 8*a^2*b^4 - 7*a^4*b^2))/(2*(b^18 - 7*a^2*b^16 + 21*a^4*b^14 - 35*a^6*b^1
2 + 35*a^8*b^10 - 21*a^10*b^8 + 7*a^12*b^6 - a^14*b^4)))*(-(a + b)^7*(a - b
)^7)^(1/2)*(2*a^6 - 8*b^6 + 8*a^2*b^4 - 7*a^4*b^2)*1i)/(2*(b^18 - 7*a^2*b^1
6 + 21*a^4*b^14 - 35*a^6*b^12 + 35*a^8*b^10 - 21*a^10*b^8 + 7*a^12*b^6 - a^
14*b^4)) + (a*((8*tan(c/2 + (d*x)/2)*(8*a^14 - 8*a^13*b - 8*a*b^13 + 4*b^14

+ 44*a^2*b^12 + 48*a^3*b^11 - 92*a^4*b^10 - 120*a^5*b^9 + 156*a^6*b^8 + 16
0*a^7*b^7 - 164*a^8*b^6 - 120*a^9*b^5 + 117*a^10*b^4 + 48*a^11*b^3 - 48*a^1
2*b^2))/(a*b^16 + b^17 - 5*a^2*b^15 - 5*a^3*b^14 + 10*a^4*b^13 + 10*a^5*b^1
2 - 10*a^6*b^11 - 10*a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - a^10*b^7 - a^11*b^6
) - (a*((8*(16*a*b^20 - 4*b^21 + 12*a^2*b^19 - 64*a^3*b^18 - 20*a^4*b^17 +
110*a^5*b^16 + 30*a^6*b^15 - 110*a^7*b^14 - 30*a^8*b^13 + 70*a^9*b^12 + 14*
a^10*b^11 - 26*a^11*b^10 - 2*a^12*b^9 + 4*a^13*b^8))/(a*b^19 + b^20 - 5*a^2
*b^18 - 5*a^3*b^17 + 10*a^4*b^16 + 10*a^5*b^15 - 10*a^6*b^14 - 10*a^7*b^13
+ 5*a^8*b^12 + 5*a^9*b^11 - a^10*b^10 - a^11*b^9) + (4*a*tan(c/2 + (d*x)/2)
(-(a + b)^7(a - b)^7)^(1/2)*(2*a^6 - 8*b^6 + 8*a^2*b^4 - 7*a^4*b^2)*(8*a*
b^21 - 8*a^2*b^20 - 48*a^3*b^19 + 48*a^4*b^18 + 120*a^5*b^17 - 120*a^6*b^16
 - 160*a^7*b^15 + 160*a^8*b^14 + 120*a^9*b^13 - 120*a^10*b^12 - 48*a^11*b^1
1 + 48*a^12*b^10 + 8*a^13*b^9 - 8*a^14*b^8))/((b^18 - 7*a^2*b^16 + 21*a^4*b
^14 - 35*a^6*b^12 + 35*a^8*b^10 - 21*a^10*b^8 + 7*a^12*b^6 - a^14*b^4)*(a*b
^16 + b^17 - 5*a^2*b^15 - 5*a^3*b^14 + 10*a^4*b^13 + 10*a^5*b^12 - 10*a^6*b
^11 - 10*a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - a^10*b^7 - a^11*b^6)))*(-(a + b
)^7*(a - b)^7)^(1/2)*(2*a^6 - 8*b^6 + 8*a^2*b^4 - 7*a^4*b^2))/(2*(b^18 - 7*
a^2*b^16 + 21*a^4*b^14 - 35*a^6*b^12 + 35*a^8*b^10 - 21*a^10*b^8 + 7*a^12*b
^6 - a^14*b^4)))*(-(a + b)^7*(a - b)^7)^(1/2)*(2*a^6 - 8*b^6 + 8*a^2*b^4 -
7*a^4*b^2)*1i)/(2*(b^18 - 7*a^2*b^16 + 21*a^4*b^14 - 35*a^6*b^12 + 35*a^8*b
^10 - 21*a^10*b^8 + 7*a^12*b^6 - a^14*b^4)))/((16*(16*a*b^12 - 2*a^12*b + 4
*a^13 + 48*a^2*b^11 - 64*a^3*b^10 - 64*a^4*b^9 + 110*a^5*b^8 + 66*a^6*b^7 -
 110*a^7*b^6 - 34*a^8*b^5 + 70*a^9*b^4 + 11*a^10*b^3 - 26*a^11*b^2))/(a*b^1
9 + b^20 - 5*a^2*b^18 - 5*a^3*b^17 + 10*a^4*b^16 + 10*a^5*b^15 - 10*a^6*b^1
4 - 10*a^7*b^13 + 5*a^8*b^12 + 5*a^9*b^11 - a^10*b^10 - a^11*b^9) + (a*((8*
tan(c/2 + (d*x)/2)*(8*a^14 - 8*a^13*b - 8*a*b^13 + 4*b^14 + 44*a^2*b^12 + 4
8*a^3*b^11 - 92*a^4*b^10 - 120*a^5*b^9 + 156*a^6*b^8 + 160*a^7*b^7 - 164*a^
8*b^6 - 120*a^9*b^5 + 117*a^10*b^4 + 48*a^11*b^3 - 48*a^12*b^2))/(a*b^16 +
b^17 - 5*a^2*b^15 - 5*a^3*b^14 + 10*a^4*b^13 + 10*a^5*b^12 - 10*a^6*b^11 -
10*a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - a^10*b^7 - a^11*b^6) + (a*((8*(16*a*b
^20 - 4*b^21 + 12*a^2*b^19 - 64*a^3*b^18 - 20*a^4*b^17 + 110*a^5*b^16 + 30*
a^6*b^15 - 110*a^7*b^14 - 30*a^8*b^13 + 70*a^9*b^12 + 14*a^10*b^11 - 26*a^1
1*b^10 - 2*a^12*b^9 + 4*a^13*b^8))/(a*b^19 + b^20 - 5*a^2*b^18 - 5*a^3*b^17
 + 10*a^4*b^16 + 10*a^5*b^15 - 10*a^6*b^14 - 10*a^7*b^13 + 5*a^8*b^12 + 5*a
^9*b^11 - a^10*b^10 - a^11*b^9) - (4*a*tan(c/2 + (d*x)/2)*(-(a + b)^7*(a -
b)^7)^(1/2)*(2*a^6 - 8*b^6 + 8*a^2*b^4 - 7*a^4*b^2)*(8*a*b^21 - 8*a^2*b^20
- 48*a^3*b^19 + 48*a^4*b^18 + 120*a^5*b^17 - 120*a^6*b^16 - 160*a^7*b^15 +
160*a^8*b^14 + 120*a^9*b^13 - 120*a^10*b^12 - 48*a^11*b^11 + 48*a^12*b^10 +
 8*a^13*b^9 - 8*a^14*b^8))/((b^18 - 7*a^2*b^16 + 21*a^4*b^14 - 35*a^6*b^12
+ 35*a^8*b^10 - 21*a^10*b^8 + 7*a^12*b^6 - a^14*b^4)*(a*b^16 + b^17 - 5*a^2
*b^15 - 5*a^3*b^14 + 10*a^4*b^13 + 10*a^5*b^12 - 10*a^6*b^11 - 10*a^7*b^10
+ 5*a^8*b^9 + 5*a^9*b^8 - a^10*b^7 - a^11*b^6)))*(-(a + b)^7*(a - b)^7)^(1/
2)*(2*a^6 - 8*b^6 + 8*a^2*b^4 - 7*a^4*b^2))/(2*(b^18 - 7*a^2*b^16 + 21*a^4*
b^14 - 35*a^6*b^12 + 35*a^8*b^10 - 21*a^10*b^8 + 7*a^12*b^6 - a^14*b^4)))*(
-(a + b)^7*(a - b)^7)^(1/2)*(2*a^6 - 8*b^6 + 8*a^2*b^4 - 7*a^4*b^2))/(2*(b^

18 - 7*a^2*b^16 + 21*a^4*b^14 - 35*a^6*b^12 + 35*a^8*b^10 - 21*a^10*b^8 + 7*a^12*b^6 - a^14*b^4)) - (a*((8*tan(c/2 + (d*x)/2)*(8*a^14 - 8*a^13*b - 8*a*b^13 + 4*b^14 + 44*a^2*b^12 + 48*a^3*b^11 - 92*a^4*b^10 - 120*a^5*b^9 + 156*a^6*b^8 + 160*a^7*b^7 - 164*a^8*b^6 - 120*a^9*b^5 + 117*a^10*b^4 + 48*a^11*b^3 - 48*a^12*b^2))/(a*b^16 + b^17 - 5*a^2*b^15 - 5*a^3*b^14 + 10*a^4*b^13 + 10*a^5*b^12 - 10*a^6*b^11 - 10*a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - a^10*b^7 - a^11*b^6) - (a*((8*(16*a*b^20 - 4*b^21 + 12*a^2*b^19 - 64*a^3*b^18 - 20*a^4*b^17 + 110*a^5*b^16 + 30*a^6*b^15 - 110*a^7*b^14 - 30*a^8*b^13 + 70*a^9*b^12 + 14*a^10*b^11 - 26*a^11*b^10 - 2*a^12*b^9 + 4*a^13*b^8))/(a*b^19 + b^20 - 5*a^2*b^18 - 5*a^3*b^17 + 10*a^4*b^16 + 10*a^5*b^15 - 10*a^6*b^14 - 10*a^7*b^13 + 5*a^8*b^12 + 5*a^9*b^11 - a^10*b^10 - a^11*b^9) + (4*a*tan(c/2 + (d*x)/2)*(-(a + b)^7*(a - b)^7)^(1/2)*(2*a^6 - 8*b^6 + 8*a^2*b^4 - 7*a^4*b^2)*(8*a*b^21 - 8*a^2*b^20 - 48*a^3*b^19 + 48*a^4*b^18 + 120*a^5*b^17 - 120*a^6*b^16 - 160*a^7*b^15 + 160*a^8*b^14 + 120*a^9*b^13 - 120*a^10*b^12 - 48*a^11*b^11 + 48*a^12*b^10 + 8*a^13*b^9 - 8*a^14*b^8))/((b^18 - 7*a^2*b^16 + 21*a^4*b^14 - 35*a^6*b^12 + 35*a^8*b^10 - 21*a^10*b^8 + 7*a^12*b^6 - a^14*b^4)*(a*b^16 + b^17 - 5*a^2*b^15 - 5*a^3*b^14 + 10*a^4*b^13 + 10*a^5*b^12 - 10*a^6*b^11 - 10*a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - a^10*b^7 - a^11*b^6)))*(-(a + b)^7*(a - b)^7)^(1/2)*(2*a^6 - 8*b^6 + 8*a^2*b^4 - 7*a^4*b^2))/(2*(b^18 - 7*a^2*b^16 + 21*a^4*b^14 - 35*a^6*b^12 + 35*a^8*b^10 - 21*a^10*b^8 + 7*a^12*b^6 - a^14*b^4)))*(-(a + b)^7*(a - b)^7)^(1/2)*(2*a^6 - 8*b^6 + 8*a^2*b^4 - 7*a^4*b^2))/(2*(b^18 - 7*a^2*b^16 + 21*a^4*b^14 - 35*a^6*b^12 + 35*a^8*b^10 - 21*a^10*b^8 + 7*a^12*b^6 - a^14*b^4))))*(-(a + b)^7*(a - b)^7)^(1/2)*(2*a^6 - 8*b^6 + 8*a^2*b^4 - 7*a^4*b^2)*1i)/(d*(b^18 - 7*a^2*b^16 + 21*a^4*b^14 - 35*a^6*b^12 + 35*a^8*b^10 - 21*a^10*b^8 + 7*a^12*b^6 - a^14*b^4))

3.480 $\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^4}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 222

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^4}\,dx = -\frac{b(3a^2+2b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{7/2}(a+b)^{7/2}d} - \frac{a^2\cos(c+dx)\sin(c+dx)}{3b\,(a^2-b^2)\,d(a+b\cos(c+dx))^3} - \frac{a^2(2a^2-7b^2)\sin(c+dx)}{6b^2\,(a^2-b^2)^2\,d(a+b\cos(c+dx))^2} + \frac{a(2a^4-5a^2b^2+18b^4)\sin(c+dx)}{6b^2\,(a^2-b^2)^3\,d(a+b\cos(c+dx))}$$

```
[Out] -b*(3*a^2+2*b^2)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/2))/(a-b)^(
7/2)/(a+b)^(7/2)/d-1/3*a^2*cos(d*x+c)*sin(d*x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x
+c))^3-1/6*a^2*(2*a^2-7*b^2)*sin(d*x+c)/b^2/(a^2-b^2)^2/d/(a+b*cos(d*x+c))^
2+1/6*a*(2*a^4-5*a^2*b^2+18*b^4)*sin(d*x+c)/b^2/(a^2-b^2)^3/d/(a+b*cos(d*x+
c))
```

Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 222, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used

$= \{2871, 3100, 2833, 12, 2738, 211\}$

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^4}\,dx = -\frac{b(3a^2+2b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{d(a-b)^{7/2}(a+b)^{7/2}} - \frac{a^2(2a^2-7b^2)\sin(c+dx)}{6b^2d\left(a^2-b^2\right)^2(a+b\cos(c+dx))^2} - \frac{a^2\sin(c+dx)\cos(c+dx)}{3bd\left(a^2-b^2\right)(a+b\cos(c+dx))^3} + \frac{a(2a^4-5a^2b^2+18b^4)\sin(c+dx)}{6b^2d\left(a^2-b^2\right)^3(a+b\cos(c+dx))}$$

```
[In] Int[Cos[c + d*x]^3/(a + b*Cos[c + d*x])^4,x]
```

```
[Out] -((b*(3*a^2 + 2*b^2)*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/((
a - b)^(7/2)*(a + b)^(7/2)*d)) - (a^2*Cos[c + d*x]*Sin[c + d*x])/(3*b*(a^2
- b^2)*d*(a + b*Cos[c + d*x])^3) - (a^2*(2*a^2 - 7*b^2)*Sin[c + d*x])/(6*b^
2*(a^2 - b^2)^2*d*(a + b*Cos[c + d*x])^2) + (a*(2*a^4 - 5*a^2*b^2 + 18*b^4)
*Sin[c + d*x])/(6*b^2*(a^2 - b^2)^3*d*(a + b*Cos[c + d*x]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2833

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((a + b*Sin[e +
 f*x])^(m + 1)/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(a^2 - b^2)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[(a*c - b*d)*(m + 1) - (b*c - a*d)*(m
 + 2)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 - b^2, 0] && LtQ[m, -1] && IntegerQ[2*m]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3100

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
 (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2
 - a*b*B + a^2*C))*Cos[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*
(a^2 - b^2))), x] + Dist[1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*Simp[b*(a*A - b*B + a*C)*(m + 1) - (A*b^2 - a*b*B + a^2*C + b*(A*
b - a*B + b*C)*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B
, C}, x] && LtQ[m, -1] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a^2\cos(c+dx)\sin(c+dx)}{3b\left(a^2-b^2\right)d(a+b\cos(c+dx))^3}-\frac{\int\frac{a^2-3ab\cos(c+dx)-\left(2a^2-3b^2\right)\cos^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx}{3b\left(a^2-b^2\right)}\\
&= -\frac{a^2\cos(c+dx)\sin(c+dx)}{3b\left(a^2-b^2\right)d(a+b\cos(c+dx))^3}-\frac{a^2(2a^2-7b^2)\sin(c+dx)}{6b^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))^2}\\
&\quad+\frac{\int\frac{2ab\left(a^2-6b^2\right)+\left(2a^4-3a^2b^2+6b^4\right)\cos(c+dx)}{(a+b\cos(c+dx))^2}\,dx}{6b^2\left(a^2-b^2\right)^2}\\
&= -\frac{a^2\cos(c+dx)\sin(c+dx)}{3b\left(a^2-b^2\right)d(a+b\cos(c+dx))^3}-\frac{a^2(2a^2-7b^2)\sin(c+dx)}{6b^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))^2}\\
&\quad+\frac{a(2a^4-5a^2b^2+18b^4)\sin(c+dx)}{6b^2\left(a^2-b^2\right)^3d(a+b\cos(c+dx))}-\frac{\int\frac{3b^3\left(3a^2+2b^2\right)}{a+b\cos(c+dx)}\,dx}{6b^2\left(a^2-b^2\right)^3}\\
&= -\frac{a^2\cos(c+dx)\sin(c+dx)}{3b\left(a^2-b^2\right)d(a+b\cos(c+dx))^3}-\frac{a^2(2a^2-7b^2)\sin(c+dx)}{6b^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))^2}\\
&\quad+\frac{a(2a^4-5a^2b^2+18b^4)\sin(c+dx)}{6b^2\left(a^2-b^2\right)^3d(a+b\cos(c+dx))}-\frac{\left(b(3a^2+2b^2)\right)\int\frac{1}{a+b\cos(c+dx)}\,dx}{2\left(a^2-b^2\right)^3}
\end{aligned}$$

$$= -\frac{a^2\cos(c+dx)\sin(c+dx)}{3b\,(a^2-b^2)\,d(a+b\cos(c+dx))^3} - \frac{a^2(2a^2-7b^2)\sin(c+dx)}{6b^2\,(a^2-b^2)^2\,d(a+b\cos(c+dx))^2} + \frac{a(2a^4-5a^2b^2+18b^4)\sin(c+dx)}{6b^2\,(a^2-b^2)^3\,d(a+b\cos(c+dx))} - \frac{(b(3a^2+2b^2))\,\mathrm{Subst}\left(\int\frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{(a^2-b^2)^3\,d}$$

$$= -\frac{b(3a^2+2b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{7/2}(a+b)^{7/2}d} - \frac{a^2\cos(c+dx)\sin(c+dx)}{3b\,(a^2-b^2)\,d(a+b\cos(c+dx))^3} - \frac{a^2(2a^2-7b^2)\sin(c+dx)}{6b^2\,(a^2-b^2)^2\,d(a+b\cos(c+dx))^2} + \frac{a(2a^4-5a^2b^2+18b^4)\sin(c+dx)}{6b^2\,(a^2-b^2)^3\,d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 1.11 (sec) , antiderivative size = 158, normalized size of antiderivative = 0.71

$$\int\frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \frac{-\frac{6b(3a^2+2b^2)\operatorname{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{7/2}} + \frac{a(4a^4+11a^2b^2+3ab(a^2+9b^2)\cos(c+dx)+(2a^4-5a^2b^2+18b^4)\cos^2(c+dx))\sin(c+dx)}{(a-b)^3(a+b)^3(a+b\cos(c+dx))^3}}{6d}$$

```
[In] Integrate[Cos[c + d*x]^3/(a + b*Cos[c + d*x])^4,x]
[Out] ((-6*b*(3*a^2 + 2*b^2)*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]]
)/(-a^2 + b^2)^(7/2) + (a*(4*a^4 + 11*a^2*b^2 + 3*a*b*(a^2 + 9*b^2)*Cos[c +
 d*x] + (2*a^4 - 5*a^2*b^2 + 18*b^4)*Cos[c + d*x]^2)*Sin[c + d*x])/((a - b)
^3*(a + b)^3*(a + b*Cos[c + d*x])^3))/(6*d)
```

Maple [A] (verified)

Time = 1.37 (sec) , antiderivative size = 281, normalized size of antiderivative = 1.27

method	result
derivativedivides	$-\frac{\frac{2\left(-\frac{\left(2a^2+3ab+6b^2\right)a\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)\left(a^3+3a^2b+3a\,b^2+b^3\right)}-\frac{2\left(a^2+9b^2\right)a\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3\left(a^2-2ab+b^2\right)\left(a^2+2ab+b^2\right)}-\frac{\left(2a^2-3ab+6b^2\right)a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2(a+b)\left(a^3-3a^2b+3a\,b^2-b^3\right)}\right)}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^3}-\frac{b\left(3a^2+2b^2\right)\arctan\left(\cdots\right.}{\left(a^6-3a^4b^2+3a^2b^4-\cdots\right.}}{d}$
default	$-\frac{\frac{2\left(-\frac{\left(2a^2+3ab+6b^2\right)a\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)\left(a^3+3a^2b+3a\,b^2+b^3\right)}-\frac{2\left(a^2+9b^2\right)a\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3\left(a^2-2ab+b^2\right)\left(a^2+2ab+b^2\right)}-\frac{\left(2a^2-3ab+6b^2\right)a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2(a+b)\left(a^3-3a^2b+3a\,b^2-b^3\right)}\right)}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^3}-\frac{b\left(3a^2+2b^2\right)\arctan\left(\cdots\right.}{\left(a^6-3a^4b^2+3a^2b^4-\cdots\right.}}{d}$
risch	$\frac{ia\left(6a^5e^{5i(dx+c)}b^2-18a^3b^4e^{5i(dx+c)}+27a\,b^6e^{5i(dx+c)}+12a^6b\,e^{4i(dx+c)}-36a^4b^3e^{4i(dx+c)}+81a^2b^5e^{4i(dx+c)}+18b^7e^{4i(dx+c)}\cdots\right.}{\cdots}$

[In] int(cos(d*x+c)^3/(a+cos(d*x+c)*b)^4,x,method=_RETURNVERBOSE)

```
[Out] 1/d*(-2*(-1/2*(2*a^2+3*a*b+6*b^2)*a/(a-b)/(a^3+3*a^2*b+3*a*b^2+b^3)*tan(1/2
*d*x+1/2*c)^5-2/3*(a^2+9*b^2)*a/(a^2-2*a*b+b^2)/(a^2+2*a*b+b^2)*tan(1/2*d*x
+1/2*c)^3-1/2*(2*a^2-3*a*b+6*b^2)*a/(a+b)/(a^3-3*a^2*b+3*a*b^2-b^3)*tan(1/2
*d*x+1/2*c))/(tan(1/2*d*x+1/2*c)^2*a-b*tan(1/2*d*x+1/2*c)^2+a+b)^3-b*(3*a^2
+2*b^2)/(a^6-3*a^4*b^2+3*a^2*b^4-b^6)/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(
1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 893, normalized size of antiderivative = 4.02

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \left[\frac{3\left(3a^5b+2a^3b^3+\left(3a^2b^4+2b^6\right)\cos(dx+c)^3+3\left(3a^3b^3+2ab^5\right)\cos(dx+c)^2+3\left(3a^4b^2+2a^2b^4\right)\cos(\cdots\right.}{12\left(\left(a^8b^3-4a^6b^5+6a^4b^7-4a^2b^9+b^{11}\right)d\cos(d\cdots\right.} - \frac{3\left(3a^5b+2a^3b^3+\left(3a^2b^4+2b^6\right)\cos(dx+c)^3+3\left(3a^3b^3+2ab^5\right)\cos(dx+c)^2+3\left(3a^4b^2+2a^2b^4\right)\cos\cdots\right.}{6\left(\left(a^8b^3-4a^6b^5+6a^4b^7-4a^2b^9+b^{11}\right)d\cos(dx+c)^3+3\left(a^9b^2-4a^7b\cdots\right.}\right.$$

[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c))^4,x, algorithm="fricas")

```
[Out] [1/12*(3*(3*a^5*b + 2*a^3*b^3 + (3*a^2*b^4 + 2*b^6)*cos(d*x + c)^3 + 3*(3*a
^3*b^3 + 2*a*b^5)*cos(d*x + c)^2 + 3*(3*a^4*b^2 + 2*a^2*b^4)*cos(d*x + c))*
sqrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x + c)^2 + 2
*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2)/(b^2*cos
(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) + 2*(4*a^7 + 7*a^5*b^2 - 11*a^3*b^
4 + (2*a^7 - 7*a^5*b^2 + 23*a^3*b^4 - 18*a*b^6)*cos(d*x + c)^2 + 3*(a^6*b +
 8*a^4*b^3 - 9*a^2*b^5)*cos(d*x + c))*sin(d*x + c))/((a^8*b^3 - 4*a^6*b^5 +
```

```
 6*a^4*b^7 - 4*a^2*b^9 + b^11)*d*cos(d*x + c)^3 + 3*(a^9*b^2 - 4*a^7*b^4 +
6*a^5*b^6 - 4*a^3*b^8 + a*b^10)*d*cos(d*x + c)^2 + 3*(a^10*b - 4*a^8*b^3 +
6*a^6*b^5 - 4*a^4*b^7 + a^2*b^9)*d*cos(d*x + c) + (a^11 - 4*a^9*b^2 + 6*a^7
*b^4 - 4*a^5*b^6 + a^3*b^8)*d), -1/6*(3*(3*a^5*b + 2*a^3*b^3 + (3*a^2*b^4 +
 2*b^6)*cos(d*x + c)^3 + 3*(3*a^3*b^3 + 2*a*b^5)*cos(d*x + c)^2 + 3*(3*a^4*
b^2 + 2*a^2*b^4)*cos(d*x + c))*sqrt(a^2 - b^2)*arctan(-(a*cos(d*x + c) + b)
/(sqrt(a^2 - b^2)*sin(d*x + c))) - (4*a^7 + 7*a^5*b^2 - 11*a^3*b^4 + (2*a^7
 - 7*a^5*b^2 + 23*a^3*b^4 - 18*a*b^6)*cos(d*x + c)^2 + 3*(a^6*b + 8*a^4*b^3
 - 9*a^2*b^5)*cos(d*x + c))*sin(d*x + c))/((a^8*b^3 - 4*a^6*b^5 + 6*a^4*b^7
 - 4*a^2*b^9 + b^11)*d*cos(d*x + c)^3 + 3*(a^9*b^2 - 4*a^7*b^4 + 6*a^5*b^6
- 4*a^3*b^8 + a*b^10)*d*cos(d*x + c)^2 + 3*(a^10*b - 4*a^8*b^3 + 6*a^6*b^5
- 4*a^4*b^7 + a^2*b^9)*d*cos(d*x + c) + (a^11 - 4*a^9*b^2 + 6*a^7*b^4 - 4*a
^5*b^6 + a^3*b^8)*d)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^3(c + dx)}{(a + b\cos(c + dx))^4} \, dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3/(a+b*cos(d*x+c))**4,x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos^3(c + dx)}{(a + b\cos(c + dx))^4} \, dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 399, normalized size of antiderivative = 1.80

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^4}\,dx$$
$$= \frac{\frac{3\,(3\,a^2b+2\,b^3)\left(\pi\left\lfloor\frac{dx+c}{2\,\pi}+\frac{1}{2}\right\rfloor\mathrm{sgn}(-2\,a+2\,b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\sqrt{a^2-b^2}}\right)\right)}{(a^6-3\,a^4b^2+3\,a^2b^4-b^6)\sqrt{a^2-b^2}} + \frac{6\,a^5\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-3\,a^4b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5+6\,a^3}{}}{}$$

```
[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/3*(3*(3*a^2*b + 2*b^3)*(pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b)
+ arctan(-(a*tan(1/2*d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)
))/((a^6 - 3*a^4*b^2 + 3*a^2*b^4 - b^6)*sqrt(a^2 - b^2)) + (6*a^5*tan(1/2*d
*x + 1/2*c)^5 - 3*a^4*b*tan(1/2*d*x + 1/2*c)^5 + 6*a^3*b^2*tan(1/2*d*x + 1/
2*c)^5 - 27*a^2*b^3*tan(1/2*d*x + 1/2*c)^5 + 18*a*b^4*tan(1/2*d*x + 1/2*c)^
5 + 4*a^5*tan(1/2*d*x + 1/2*c)^3 + 32*a^3*b^2*tan(1/2*d*x + 1/2*c)^3 - 36*a
*b^4*tan(1/2*d*x + 1/2*c)^3 + 6*a^5*tan(1/2*d*x + 1/2*c) + 3*a^4*b*tan(1/2*
d*x + 1/2*c) + 6*a^3*b^2*tan(1/2*d*x + 1/2*c) + 27*a^2*b^3*tan(1/2*d*x + 1/
2*c) + 18*a*b^4*tan(1/2*d*x + 1/2*c))/((a^6 - 3*a^4*b^2 + 3*a^2*b^4 - b^6)*
(a*tan(1/2*d*x + 1/2*c)^2 - b*tan(1/2*d*x + 1/2*c)^2 + a + b)^3))/d
```

Mupad [B] (verification not implemented)

Time = 18.10 (sec) , antiderivative size = 378, normalized size of antiderivative = 1.70

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^4}\,dx$$
$$= \frac{\frac{4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3\,(a^3+9\,a\,b^2)}{3\,(a+b)^2\,(a^2-2\,a\,b+b^2)} + \frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5\,(2\,a^3+3\,a^2\,b+6\,a\,b^2)}{(a+b)^3\,(a-b)} + \frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{(a+b)\,(a^3-}}{d\,\left(3\,a\,b^2-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\,(-3\,a^3+3\,a^2\,b+3\,a\,b^2-3\,b^3)-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2\,(-3\,a^3-3\,a^2\,b+3\,a\,b^2+3\,b^3)+\right.}$$
$$- \frac{b\,\mathrm{atan}\left(\frac{b\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,(3\,a^2+2\,b^2)\,(2\,a-2\,b)\,(a^3-3\,a^2\,b+3\,a\,b^2-b^3)}{2\,(3\,a^2\,b+2\,b^3)\,\sqrt{a+b}\,(a-b)^{7/2}}\right)\,(3\,a^2+2\,b^2)}{d\,(a+b)^{7/2}\,(a-b)^{7/2}}$$

```
[In] int(cos(c + d*x)^3/(a + b*cos(c + d*x))^4,x)
```

```
[Out] ((4*tan(c/2 + (d*x)/2)^3*(9*a*b^2 + a^3))/(3*(a + b)^2*(a^2 - 2*a*b + b^2))
 + (tan(c/2 + (d*x)/2)^5*(6*a*b^2 + 3*a^2*b + 2*a^3))/((a + b)^3*(a - b)) +
 (tan(c/2 + (d*x)/2)*(6*a*b^2 - 3*a^2*b + 2*a^3))/((a + b)*(3*a*b^2 - 3*a^2
*b + a^3 - b^3)))/(d*(3*a*b^2 - tan(c/2 + (d*x)/2)^4*(3*a*b^2 + 3*a^2*b - 3
```

```
*a^3 - 3*b^3) - tan(c/2 + (d*x)/2)^2*(3*a*b^2 - 3*a^2*b - 3*a^3 + 3*b^3) +
3*a^2*b + a^3 + b^3 + tan(c/2 + (d*x)/2)^6*(3*a*b^2 - 3*a^2*b + a^3 - b^3))
) - (b*atan((b*tan(c/2 + (d*x)/2)*(3*a^2 + 2*b^2)*(2*a - 2*b)*(3*a*b^2 - 3*
a^2*b + a^3 - b^3))/(2*(3*a^2*b + 2*b^3)*(a + b)^(1/2)*(a - b)^(7/2)))*(3*a
^2 + 2*b^2))/(d*(a + b)^(7/2)*(a - b)^(7/2))
```

3.481 $\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^4} dx$

Optimal result

Integrand size = 21, antiderivative size = 206

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^4} dx = \frac{a(a^2+4b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{7/2}(a+b)^{7/2}d} - \frac{a^2\sin(c+dx)}{3b(a^2-b^2)\,d(a+b\cos(c+dx))^3} + \frac{a(a^2-6b^2)\sin(c+dx)}{6b(a^2-b^2)^2\,d(a+b\cos(c+dx))^2} + \frac{(a^4-10a^2b^2-6b^4)\sin(c+dx)}{6b(a^2-b^2)^3\,d(a+b\cos(c+dx))}$$

```
[Out] a*(a^2+4*b^2)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/2))/(a-b)^(7/2
)/(a+b)^(7/2)/d-1/3*a^2*sin(d*x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))^3+1/6*a*(
a^2-6*b^2)*sin(d*x+c)/b/(a^2-b^2)^2/d/(a+b*cos(d*x+c))^2+1/6*(a^4-10*a^2*b^
2-6*b^4)*sin(d*x+c)/b/(a^2-b^2)^3/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used

$= \{2869, 2833, 12, 2738, 211\}$

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \frac{a(a^2+4b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{d(a-b)^{7/2}(a+b)^{7/2}} - \frac{a^2\sin(c+dx)}{3bd\,(a^2-b^2)\,(a+b\cos(c+dx))^3} + \frac{a(a^2-6b^2)\sin(c+dx)}{6bd\,(a^2-b^2)^2\,(a+b\cos(c+dx))^2} + \frac{(a^4-10a^2b^2-6b^4)\sin(c+dx)}{6bd\,(a^2-b^2)^3\,(a+b\cos(c+dx))}$$

```
[In] Int[Cos[c + d*x]^2/(a + b*Cos[c + d*x])^4,x]
```

```
[Out] (a*(a^2 + 4*b^2)*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/((a -
b)^(7/2)*(a + b)^(7/2)*d) - (a^2*Sin[c + d*x])/(3*b*(a^2 - b^2)*d*(a + b*Co
s[c + d*x])^3) + (a*(a^2 - 6*b^2)*Sin[c + d*x])/(6*b*(a^2 - b^2)^2*d*(a + b
*Cos[c + d*x])^2) + ((a^4 - 10*a^2*b^2 - 6*b^4)*Sin[c + d*x])/(6*b*(a^2 - b
^2)^3*d*(a + b*Cos[c + d*x]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2833

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((a + b*Sin[e +
 f*x])^(m + 1)/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(a^2 - b^2)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[(a*c - b*d)*(m + 1) - (b*c - a*d)*(m
 + 2)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 - b^2, 0] && LtQ[m, -1] && IntegerQ[2*m]
```

Rule 2869

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^2, x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Cos[e
+ f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*(a^2 - b^2))), x] - Dist[
1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[b*(m + 1)*
(2*b*c*d - a*(c^2 + d^2)) + (a^2*d^2 - 2*a*b*c*d*(m + 2) + b^2*(d^2*(m + 1)
 + c^2*(m + 2)))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &
& NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a^2\sin(c+dx)}{3b\,(a^2-b^2)\,d(a+b\cos(c+dx))^3}+\frac{\int\frac{3ab+(a^2-3b^2)\cos(c+dx)}{(a+b\cos(c+dx))^3}\,dx}{3b\,(a^2-b^2)}\\
&= -\frac{a^2\sin(c+dx)}{3b\,(a^2-b^2)\,d(a+b\cos(c+dx))^3}+\frac{a(a^2-6b^2)\sin(c+dx)}{6b\,(a^2-b^2)^2\,d(a+b\cos(c+dx))^2}\\
&\quad-\frac{\int\frac{-2b(2a^2+3b^2)-a(a^2-6b^2)\cos(c+dx)}{(a+b\cos(c+dx))^2}\,dx}{6b\,(a^2-b^2)^2}\\
&= -\frac{a^2\sin(c+dx)}{3b\,(a^2-b^2)\,d(a+b\cos(c+dx))^3}+\frac{a(a^2-6b^2)\sin(c+dx)}{6b\,(a^2-b^2)^2\,d(a+b\cos(c+dx))^2}\\
&\quad+\frac{(a^4-10a^2b^2-6b^4)\sin(c+dx)}{6b\,(a^2-b^2)^3\,d(a+b\cos(c+dx))}+\frac{\int\frac{3ab(a^2+4b^2)}{a+b\cos(c+dx)}\,dx}{6b\,(a^2-b^2)^3}\\
&= -\frac{a^2\sin(c+dx)}{3b\,(a^2-b^2)\,d(a+b\cos(c+dx))^3}+\frac{a(a^2-6b^2)\sin(c+dx)}{6b\,(a^2-b^2)^2\,d(a+b\cos(c+dx))^2}\\
&\quad+\frac{(a^4-10a^2b^2-6b^4)\sin(c+dx)}{6b\,(a^2-b^2)^3\,d(a+b\cos(c+dx))}+\frac{(a(a^2+4b^2))\int\frac{1}{a+b\cos(c+dx)}\,dx}{2\,(a^2-b^2)^3}\\
&= -\frac{a^2\sin(c+dx)}{3b\,(a^2-b^2)\,d(a+b\cos(c+dx))^3}+\frac{a(a^2-6b^2)\sin(c+dx)}{6b\,(a^2-b^2)^2\,d(a+b\cos(c+dx))^2}\\
&\quad+\frac{(a^4-10a^2b^2-6b^4)\sin(c+dx)}{6b\,(a^2-b^2)^3\,d(a+b\cos(c+dx))}\\
&\quad+\frac{(a(a^2+4b^2))\,\text{Subst}\left(\int\frac{1}{a+b+(a-b)x^2}\,dx,x,\tan\left(\frac{1}{2}(c+dx)\right)\right)}{(a^2-b^2)^3\,d}\\
&= \frac{a(a^2+4b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{7/2}(a+b)^{7/2}d}-\frac{a^2\sin(c+dx)}{3b\,(a^2-b^2)\,d(a+b\cos(c+dx))^3}\\
&\quad+\frac{a(a^2-6b^2)\sin(c+dx)}{6b\,(a^2-b^2)^2\,d(a+b\cos(c+dx))^2}+\frac{(a^4-10a^2b^2-6b^4)\sin(c+dx)}{6b\,(a^2-b^2)^3\,d(a+b\cos(c+dx))}
\end{aligned}$$

Mathematica [A] (verified)

Time = 1.02 (sec) , antiderivative size = 162, normalized size of antiderivative = 0.79

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^4}\,dx$$
$$= \frac{\frac{6a(a^2+4b^2)\operatorname{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{7/2}}+\frac{(-13a^4b-2a^2b^3+3a(a^4-9a^2b^2-2b^4)\cos(c+dx)+b(a^4-10a^2b^2-6b^4)\cos^2(c+dx))\sin(c+dx)}{(a-b)^3(a+b)^3(a+b\cos(c+dx))^3}}{6d}$$

```
[In] Integrate[Cos[c + d*x]^2/(a + b*Cos[c + d*x])^4,x]
```

```
[Out] ((6*a*(a^2 + 4*b^2)*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/(
-a^2 + b^2)^(7/2) + ((-13*a^4*b - 2*a^2*b^3 + 3*a*(a^4 - 9*a^2*b^2 - 2*b^4)
*Cos[c + d*x] + b*(a^4 - 10*a^2*b^2 - 6*b^4)*Cos[c + d*x]^2)*Sin[c + d*x])/
((a - b)^3*(a + b)^3*(a + b*Cos[c + d*x])^3))/(6*d)
```

Maple [A] (verified)

Time = 1.38 (sec) , antiderivative size = 290, normalized size of antiderivative = 1.41

method	result
derivativedivides	$\frac{\frac{-\frac{(a^3+6a^2b+2ab^2+2b^3)\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{(a-b)\left(a^3+3a^2b+3ab^2+b^3\right)}-\frac{4(7a^2+3b^2)b\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3(a^2-2ab+b^2)(a^2+2ab+b^2)}+\frac{(a^3-6a^2b+2ab^2-2b^3)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{(a+b)\left(a^3-3a^2b+3ab^2-b^3\right)}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^3}+\frac{a(a^2+4b^2)\operatorname{arc}}{(a^6-3a^4b^2+}}{d}$
default	$\frac{\frac{-\frac{(a^3+6a^2b+2ab^2+2b^3)\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{(a-b)\left(a^3+3a^2b+3ab^2+b^3\right)}-\frac{4(7a^2+3b^2)b\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3(a^2-2ab+b^2)(a^2+2ab+b^2)}+\frac{(a^3-6a^2b+2ab^2-2b^3)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{(a+b)\left(a^3-3a^2b+3ab^2-b^3\right)}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^3}+\frac{a(a^2+4b^2)\operatorname{arc}}{(a^6-3a^4b^2+}}{d}$
risch	$i(-3a^3b^4e^{5i(dx+c)}-12ab^6e^{5i(dx+c)}+6a^6be^{4i(dx+c)}-33a^4b^3e^{4i(dx+c)}-42a^2b^5e^{4i(dx+c)}-6b^7e^{4i(dx+c)}+4a^7e^{3i(dx+c)}-$

```
[In] int(cos(d*x+c)^2/(a+cos(d*x+c)*b)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(2*(-1/2*(a^3+6*a^2*b+2*a*b^2+2*b^3)/(a-b)/(a^3+3*a^2*b+3*a*b^2+b^3)*ta
n(1/2*d*x+1/2*c)^5-2/3*(7*a^2+3*b^2)*b/(a^2-2*a*b+b^2)/(a^2+2*a*b+b^2)*tan(
1/2*d*x+1/2*c)^3+1/2*(a^3-6*a^2*b+2*a*b^2-2*b^3)/(a+b)/(a^3-3*a^2*b+3*a*b^2
-b^3)*tan(1/2*d*x+1/2*c))/(tan(1/2*d*x+1/2*c)^2*a-b*tan(1/2*d*x+1/2*c)^2+a+
b)^3+a*(a^2+4*b^2)/(a^6-3*a^4*b^2+3*a^2*b^4-b^6)/((a-b)*(a+b))^(1/2)*arctan
((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 412 vs. $2(191) = 382$.

Time = 0.31 (sec) , antiderivative size = 893, normalized size of antiderivative = 4.33

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^4}\,dx$$
$$= \left[\frac{3\left(a^6+4a^4b^2+(a^3b^3+4ab^5)\cos(dx+c)^3+3(a^4b^2+4a^2b^4)\cos(dx+c)^2+3(a^5b+4a^3b^3)\cos(dx+c\right.}{12\left((a^8b^3-4a^6b^5+6a^4b^7-4a^2b^9+b^{11})d\cos(d\right.}\right.$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] [1/12*(3*(a^6 + 4*a^4*b^2 + (a^3*b^3 + 4*a*b^5)*cos(d*x + c)^3 + 3*(a^4*b^2
 + 4*a^2*b^4)*cos(d*x + c)^2 + 3*(a^5*b + 4*a^3*b^3)*cos(d*x + c))*sqrt(-a^
2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x + c)^2 - 2*sqrt(-a
^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2)/(b^2*cos(d*x + c
)^2 + 2*a*b*cos(d*x + c) + a^2)) - 2*(13*a^6*b - 11*a^4*b^3 - 2*a^2*b^5 - (
a^6*b - 11*a^4*b^3 + 4*a^2*b^5 + 6*b^7)*cos(d*x + c)^2 - 3*(a^7 - 10*a^5*b^
2 + 7*a^3*b^4 + 2*a*b^6)*cos(d*x + c))*sin(d*x + c))/((a^8*b^3 - 4*a^6*b^5
+ 6*a^4*b^7 - 4*a^2*b^9 + b^11)*d*cos(d*x + c)^3 + 3*(a^9*b^2 - 4*a^7*b^4 +
 6*a^5*b^6 - 4*a^3*b^8 + a*b^10)*d*cos(d*x + c)^2 + 3*(a^10*b - 4*a^8*b^3 +
 6*a^6*b^5 - 4*a^4*b^7 + a^2*b^9)*d*cos(d*x + c) + (a^11 - 4*a^9*b^2 + 6*a^
7*b^4 - 4*a^5*b^6 + a^3*b^8)*d), 1/6*(3*(a^6 + 4*a^4*b^2 + (a^3*b^3 + 4*a*b
^5)*cos(d*x + c)^3 + 3*(a^4*b^2 + 4*a^2*b^4)*cos(d*x + c)^2 + 3*(a^5*b + 4*
a^3*b^3)*cos(d*x + c))*sqrt(a^2 - b^2)*arctan(-(a*cos(d*x + c) + b)/(sqrt(a
^2 - b^2)*sin(d*x + c))) - (13*a^6*b - 11*a^4*b^3 - 2*a^2*b^5 - (a^6*b - 11
*a^4*b^3 + 4*a^2*b^5 + 6*b^7)*cos(d*x + c)^2 - 3*(a^7 - 10*a^5*b^2 + 7*a^3*
b^4 + 2*a*b^6)*cos(d*x + c))*sin(d*x + c))/((a^8*b^3 - 4*a^6*b^5 + 6*a^4*b^
7 - 4*a^2*b^9 + b^11)*d*cos(d*x + c)^3 + 3*(a^9*b^2 - 4*a^7*b^4 + 6*a^5*b^6
 - 4*a^3*b^8 + a*b^10)*d*cos(d*x + c)^2 + 3*(a^10*b - 4*a^8*b^3 + 6*a^6*b^5
 - 4*a^4*b^7 + a^2*b^9)*d*cos(d*x + c) + (a^11 - 4*a^9*b^2 + 6*a^7*b^4 - 4*
a^5*b^6 + a^3*b^8)*d)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**2/(a+b*cos(d*x+c))**4,x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 427 vs. $2(191) = 382$.

Time = 0.33 (sec) , antiderivative size = 427, normalized size of antiderivative = 2.07

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^4}\,dx = -\frac{\frac{3\,(a^3+4\,ab^2)\left(\pi\left\lfloor\frac{dx+c}{2\,\pi}+\frac{1}{2}\right\rfloor\operatorname{sgn}(-2\,a+2\,b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\sqrt{a^2-b^2}}\right)\right)}{(a^6-3\,a^4b^2+3\,a^2b^4-b^6)\sqrt{a^2-b^2}}+\frac{3\,a^5\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5+12\,a^4b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5\cdots}{\cdots}}{\cdots}$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] -1/3*(3*(a^3 + 4*a*b^2)*(pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) +
 arctan(-(a*tan(1/2*d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2))
)/((a^6 - 3*a^4*b^2 + 3*a^2*b^4 - b^6)*sqrt(a^2 - b^2)) + (3*a^5*tan(1/2*d*
x + 1/2*c)^5 + 12*a^4*b*tan(1/2*d*x + 1/2*c)^5 - 27*a^3*b^2*tan(1/2*d*x + 1
/2*c)^5 + 12*a^2*b^3*tan(1/2*d*x + 1/2*c)^5 - 6*a*b^4*tan(1/2*d*x + 1/2*c)^
5 + 6*b^5*tan(1/2*d*x + 1/2*c)^5 + 28*a^4*b*tan(1/2*d*x + 1/2*c)^3 - 16*a^2
*b^3*tan(1/2*d*x + 1/2*c)^3 - 12*b^5*tan(1/2*d*x + 1/2*c)^3 - 3*a^5*tan(1/2
*d*x + 1/2*c) + 12*a^4*b*tan(1/2*d*x + 1/2*c) + 27*a^3*b^2*tan(1/2*d*x + 1/
2*c) + 12*a^2*b^3*tan(1/2*d*x + 1/2*c) + 6*a*b^4*tan(1/2*d*x + 1/2*c) + 6*b
^5*tan(1/2*d*x + 1/2*c))/((a^6 - 3*a^4*b^2 + 3*a^2*b^4 - b^6)*(a*tan(1/2*d*
x + 1/2*c)^2 - b*tan(1/2*d*x + 1/2*c)^2 + a + b)^3))/d
```

Mupad [B] (verification not implemented)

Time = 18.37 (sec) , antiderivative size = 381, normalized size of antiderivative = 1.85

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \frac{a\,\mathrm{atan}\left(\frac{a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(a^2+4\,b^2\right)\,\left(2\,a-2\,b\right)\,\left(a^3-3\,a^2\,b+3\,a\,b^2-b^3\right)}{2\,\sqrt{a+b}\,{\left(a-b\right)}^{7/2}\,\left(a^3+4\,a\,b^2\right)}\right)\,\left(a^2+4\,b^2\right)}{d\,{\left(a+b\right)}^{7/2}\,{\left(a-b\right)}^{7/2}} - \frac{\frac{{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^5\,\left(a^3+6\,a^2\,b+2\,a\,b^2+2\,b^3\right)}{{\left(a+b\right)}^3\,\left(a-b\right)}+\frac{4\,{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^3\,\left(7\,a^2\,b+3\,b^3\right)}{3\,{\left(a+b\right)}^2\,\left(a^2-2\,a\,b+b^2\right)}-\frac{\tan\left(\frac{c}{2}+\cdots\right)}{(a+\cdots}}{d\,\left(3\,a\,b^2-{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^4\,\left(-3\,a^3+3\,a^2\,b+3\,a\,b^2-3\,b^3\right)-{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^2\,\left(-3\,a^3-3\,a^2\,b+3\,a\,b^2+3\,b^3\right)\cdots\right.}$$

```
[In] int(cos(c + d*x)^2/(a + b*cos(c + d*x))^4,x)
```

```
[Out] (a*atan((a*tan(c/2 + (d*x)/2)*(a^2 + 4*b^2)*(2*a - 2*b)*(3*a*b^2 - 3*a^2*b
+ a^3 - b^3))/(2*(a + b)^(1/2)*(a - b)^(7/2)*(4*a*b^2 + a^3)))*(a^2 + 4*b^2
))/(d*(a + b)^(7/2)*(a - b)^(7/2)) - ((tan(c/2 + (d*x)/2)^5*(2*a*b^2 + 6*a^
2*b + a^3 + 2*b^3))/((a + b)^3*(a - b)) + (4*tan(c/2 + (d*x)/2)^3*(7*a^2*b
+ 3*b^3))/(3*(a + b)^2*(a^2 - 2*a*b + b^2)) - (tan(c/2 + (d*x)/2)*(2*a*b^2
- 6*a^2*b + a^3 - 2*b^3))/((a + b)*(3*a*b^2 - 3*a^2*b + a^3 - b^3)))/(d*(3*
a*b^2 - tan(c/2 + (d*x)/2)^4*(3*a*b^2 + 3*a^2*b - 3*a^3 - 3*b^3) - tan(c/2
+ (d*x)/2)^2*(3*a*b^2 - 3*a^2*b - 3*a^3 + 3*b^3) + 3*a^2*b + a^3 + b^3 + ta
n(c/2 + (d*x)/2)^6*(3*a*b^2 - 3*a^2*b + a^3 - b^3)))
```

3.482 $\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^4}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 192

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^4}\,dx = -\frac{b(4a^2+b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{7/2}(a+b)^{7/2}d} + \frac{a\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^3} + \frac{(2a^2+3b^2)\sin(c+dx)}{6(a^2-b^2)^2\,d(a+b\cos(c+dx))^2} + \frac{a(2a^2+13b^2)\sin(c+dx)}{6(a^2-b^2)^3\,d(a+b\cos(c+dx))}$$

```
[Out] -b*(4*a^2+b^2)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/2))/(a-b)^(7/
2)/(a+b)^(7/2)/d+1/3*a*sin(d*x+c)/(a^2-b^2)/d/(a+b*cos(d*x+c))^3+1/6*(2*a^2
+3*b^2)*sin(d*x+c)/(a^2-b^2)^2/d/(a+b*cos(d*x+c))^2+1/6*a*(2*a^2+13*b^2)*si
n(d*x+c)/(a^2-b^2)^3/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 192, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.211$, Rules used

$= \{2833, 12, 2738, 211\}$

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^4}\,dx = -\frac{b(4a^2+b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{d(a-b)^{7/2}(a+b)^{7/2}} + \frac{a(2a^2+13b^2)\sin(c+dx)}{6d\left(a^2-b^2\right)^3(a+b\cos(c+dx))} + \frac{(2a^2+3b^2)\sin(c+dx)}{6d\left(a^2-b^2\right)^2(a+b\cos(c+dx))^2} + \frac{a\sin(c+dx)}{3d\left(a^2-b^2\right)(a+b\cos(c+dx))^3}$$

```
[In] Int[Cos[c + d*x]/(a + b*Cos[c + d*x])^4,x]
```

```
[Out] -((b*(4*a^2 + b^2)*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/((a
- b)^(7/2)*(a + b)^(7/2)*d)) + (a*Sin[c + d*x])/(3*(a^2 - b^2)*d*(a + b*Cos
[c + d*x])^3) + ((2*a^2 + 3*b^2)*Sin[c + d*x])/(6*(a^2 - b^2)^2*d*(a + b*Co
s[c + d*x])^2) + (a*(2*a^2 + 13*b^2)*Sin[c + d*x])/(6*(a^2 - b^2)^3*d*(a +
b*Cos[c + d*x]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2833

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((a + b*Sin[e +
 f*x])^(m + 1)/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(a^2 - b^2)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[(a*c - b*d)*(m + 1) - (b*c - a*d)*(m
 + 2)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 - b^2, 0] && LtQ[m, -1] && IntegerQ[2*m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{a\sin(c+dx)}{3\left(a^2-b^2\right)d(a+b\cos(c+dx))^3}-\frac{\int\frac{3b-2a\cos(c+dx)}{(a+b\cos(c+dx))^3}\,dx}{3\left(a^2-b^2\right)}\\
&= \frac{a\sin(c+dx)}{3\left(a^2-b^2\right)d(a+b\cos(c+dx))^3}\\
&\quad+\frac{\left(2a^2+3b^2\right)\sin(c+dx)}{6\left(a^2-b^2\right)^2d(a+b\cos(c+dx))^2}+\frac{\int\frac{-10ab+\left(2a^2+3b^2\right)\cos(c+dx)}{(a+b\cos(c+dx))^2}\,dx}{6\left(a^2-b^2\right)^2}\\
&= \frac{a\sin(c+dx)}{3\left(a^2-b^2\right)d(a+b\cos(c+dx))^3}+\frac{\left(2a^2+3b^2\right)\sin(c+dx)}{6\left(a^2-b^2\right)^2d(a+b\cos(c+dx))^2}\\
&\quad+\frac{a\left(2a^2+13b^2\right)\sin(c+dx)}{6\left(a^2-b^2\right)^3d(a+b\cos(c+dx))}-\frac{\int\frac{3b\left(4a^2+b^2\right)}{a+b\cos(c+dx)}\,dx}{6\left(a^2-b^2\right)^3}\\
&= \frac{a\sin(c+dx)}{3\left(a^2-b^2\right)d(a+b\cos(c+dx))^3}+\frac{\left(2a^2+3b^2\right)\sin(c+dx)}{6\left(a^2-b^2\right)^2d(a+b\cos(c+dx))^2}\\
&\quad+\frac{a\left(2a^2+13b^2\right)\sin(c+dx)}{6\left(a^2-b^2\right)^3d(a+b\cos(c+dx))}-\frac{\left(b\left(4a^2+b^2\right)\right)\int\frac{1}{a+b\cos(c+dx)}\,dx}{2\left(a^2-b^2\right)^3}\\
&= \frac{a\sin(c+dx)}{3\left(a^2-b^2\right)d(a+b\cos(c+dx))^3}+\frac{\left(2a^2+3b^2\right)\sin(c+dx)}{6\left(a^2-b^2\right)^2d(a+b\cos(c+dx))^2}\\
&\quad+\frac{a\left(2a^2+13b^2\right)\sin(c+dx)}{6\left(a^2-b^2\right)^3d(a+b\cos(c+dx))}\\
&\quad-\frac{\left(b\left(4a^2+b^2\right)\right)\operatorname{Subst}\left(\int\frac{1}{a+b+(a-b)x^2}\,dx,x,\tan\left(\frac{1}{2}(c+dx)\right)\right)}{\left(a^2-b^2\right)^3d}\\
&= -\frac{b\left(4a^2+b^2\right)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{7/2}(a+b)^{7/2}d}+\frac{a\sin(c+dx)}{3\left(a^2-b^2\right)d(a+b\cos(c+dx))^3}\\
&\quad+\frac{\left(2a^2+3b^2\right)\sin(c+dx)}{6\left(a^2-b^2\right)^2d(a+b\cos(c+dx))^2}+\frac{a\left(2a^2+13b^2\right)\sin(c+dx)}{6\left(a^2-b^2\right)^3d(a+b\cos(c+dx))}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.83 (sec) , antiderivative size = 164, normalized size of antiderivative = 0.85

$$\int\frac{\cos(c+dx)}{(a+b\cos(c+dx))^4}\,dx$$

$$=\frac{-\frac{6b\left(4a^2+b^2\right)\operatorname{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{\left(-a^2+b^2\right)^{7/2}}+\frac{\left(6a^5+10a^3b^2-ab^4-3b\left(-2a^4-9a^2b^2+b^4\right)\cos(c+dx)+ab^2\left(2a^2+13b^2\right)\cos^2(c+dx)\right)\sin(c+d}{(a-b)^3(a+b)^3(a+b\cos(c+dx))^3}}{6d}$$

```
[In] Integrate[Cos[c + d*x]/(a + b*Cos[c + d*x])^4,x]
```

```
[Out] ((-6*b*(4*a^2 + b^2)*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/
(-a^2 + b^2)^(7/2) + ((6*a^5 + 10*a^3*b^2 - a*b^4 - 3*b*(-2*a^4 - 9*a^2*b^2
 + b^4)*Cos[c + d*x] + a*b^2*(2*a^2 + 13*b^2)*Cos[c + d*x]^2)*Sin[c + d*x])
/((a - b)^3*(a + b)^3*(a + b*Cos[c + d*x])^3))/(6*d)
```

Maple [A] (verified)

Time = 1.33 (sec) , antiderivative size = 293, normalized size of antiderivative = 1.53

method	result
derivativedivides	$\frac{-\frac{2\left(-\frac{(2a^3+2a^2b+6ab^2+b^3)\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)(a^3+3a^2b+3ab^2+b^3)}-\frac{2(3a^2+7b^2)a\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3(a^2-2ab+b^2)(a^2+2ab+b^2)}-\frac{(2a^3-2a^2b+6ab^2-b^3)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2(a+b)(a^3-3a^2b+3ab^2-b^3)}\right)}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^3}-\frac{b(4a^2+b^2}{(a^6-3a^4}}{d}$
default	$\frac{-\frac{2\left(-\frac{(2a^3+2a^2b+6ab^2+b^3)\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)(a^3+3a^2b+3ab^2+b^3)}-\frac{2(3a^2+7b^2)a\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3(a^2-2ab+b^2)(a^2+2ab+b^2)}-\frac{(2a^3-2a^2b+6ab^2-b^3)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2(a+b)(a^3-3a^2b+3ab^2-b^3)}\right)}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^3}-\frac{b(4a^2+b^2}{(a^6-3a^4}}{d}$
risch	$\frac{i(12a^2b^4e^{5i(dx+c)}+3b^6e^{5i(dx+c)}+60a^3b^3e^{4i(dx+c)}+15ab^5e^{4i(dx+c)}+8a^6e^{3i(dx+c)}+64a^4b^2e^{3i(dx+c)}+78a^2b^4e^{3i(dx+c)}+2}{3b(a^2-b^2)^3d(be^{2i(dx+c)}}$

```
[In] int(cos(d*x+c)/(a+cos(d*x+c)*b)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-2*(-1/2*(2*a^3+2*a^2*b+6*a*b^2+b^3)/(a-b)/(a^3+3*a^2*b+3*a*b^2+b^3)*t
an(1/2*d*x+1/2*c)^5-2/3*(3*a^2+7*b^2)*a/(a^2-2*a*b+b^2)/(a^2+2*a*b+b^2)*tan
(1/2*d*x+1/2*c)^3-1/2*(2*a^3-2*a^2*b+6*a*b^2-b^3)/(a+b)/(a^3-3*a^2*b+3*a*b^
2-b^3)*tan(1/2*d*x+1/2*c))/(tan(1/2*d*x+1/2*c)^2*a-b*tan(1/2*d*x+1/2*c)^2+a
+b)^3-b*(4*a^2+b^2)/(a^6-3*a^4*b^2+3*a^2*b^4-b^6)/((a-b)*(a+b))^(1/2)*arcta
n((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 411 vs. 2(177) = 354.

Time = 0.31 (sec) , antiderivative size = 891, normalized size of antiderivative = 4.64

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^4}\,dx$$

$$= \left[\frac{3\left(4a^5b+a^3b^3+(4a^2b^4+b^6)\cos(dx+c)^3+3(4a^3b^3+ab^5)\cos(dx+c)^2+3(4a^4b^2+a^2b^4)\cos(dx+c\right.}{12\left((a^8b^3-4a^6b^5+6a^4b^7-4a^2b^9+b^{11})d\cos(d\right.}\right.$$

$$-\frac{3\left(4a^5b+a^3b^3+(4a^2b^4+b^6)\cos(dx+c)^3+3(4a^3b^3+ab^5)\cos(dx+c)^2+3(4a^4b^2+a^2b^4)\cos(dx+\right.}{6\left((a^8b^3-4a^6b^5+6a^4b^7-4a^2b^9+b^{11})d\cos(dx+c)^3+3(a^9b^2-4a^7b\right.}$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] [1/12*(3*(4*a^5*b + a^3*b^3 + (4*a^2*b^4 + b^6)*cos(d*x + c)^3 + 3*(4*a^3*b
^3 + a*b^5)*cos(d*x + c)^2 + 3*(4*a^4*b^2 + a^2*b^4)*cos(d*x + c))*sqrt(-a^
2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x + c)^2 + 2*sqrt(-a
^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2)/(b^2*cos(d*x + c
)^2 + 2*a*b*cos(d*x + c) + a^2)) + 2*(6*a^7 + 4*a^5*b^2 - 11*a^3*b^4 + a*b^
6 + (2*a^5*b^2 + 11*a^3*b^4 - 13*a*b^6)*cos(d*x + c)^2 + 3*(2*a^6*b + 7*a^4
*b^3 - 10*a^2*b^5 + b^7)*cos(d*x + c))*sin(d*x + c))/((a^8*b^3 - 4*a^6*b^5
+ 6*a^4*b^7 - 4*a^2*b^9 + b^11)*d*cos(d*x + c)^3 + 3*(a^9*b^2 - 4*a^7*b^4 +
 6*a^5*b^6 - 4*a^3*b^8 + a*b^10)*d*cos(d*x + c)^2 + 3*(a^10*b - 4*a^8*b^3 +
 6*a^6*b^5 - 4*a^4*b^7 + a^2*b^9)*d*cos(d*x + c) + (a^11 - 4*a^9*b^2 + 6*a^
7*b^4 - 4*a^5*b^6 + a^3*b^8)*d), -1/6*(3*(4*a^5*b + a^3*b^3 + (4*a^2*b^4 +
b^6)*cos(d*x + c)^3 + 3*(4*a^3*b^3 + a*b^5)*cos(d*x + c)^2 + 3*(4*a^4*b^2 +
 a^2*b^4)*cos(d*x + c))*sqrt(a^2 - b^2)*arctan(-(a*cos(d*x + c) + b)/(sqrt(
a^2 - b^2)*sin(d*x + c))) - (6*a^7 + 4*a^5*b^2 - 11*a^3*b^4 + a*b^6 + (2*a^
5*b^2 + 11*a^3*b^4 - 13*a*b^6)*cos(d*x + c)^2 + 3*(2*a^6*b + 7*a^4*b^3 - 10
*a^2*b^5 + b^7)*cos(d*x + c))*sin(d*x + c))/((a^8*b^3 - 4*a^6*b^5 + 6*a^4*b
^7 - 4*a^2*b^9 + b^11)*d*cos(d*x + c)^3 + 3*(a^9*b^2 - 4*a^7*b^4 + 6*a^5*b^
6 - 4*a^3*b^8 + a*b^10)*d*cos(d*x + c)^2 + 3*(a^10*b - 4*a^8*b^3 + 6*a^6*b^
5 - 4*a^4*b^7 + a^2*b^9)*d*cos(d*x + c) + (a^11 - 4*a^9*b^2 + 6*a^7*b^4 - 4
*a^5*b^6 + a^3*b^8)*d)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))**4,x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 427 vs. 2(177) = 354.

Time = 0.34 (sec) , antiderivative size = 427, normalized size of antiderivative = 2.22

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \frac{\frac{3\,(4\,a^2b+b^3)\left(\pi\left\lfloor\frac{dx+c}{2\,\pi}+\frac{1}{2}\right\rfloor\mathrm{sgn}(-2\,a+2\,b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\sqrt{a^2-b^2}}\right)\right)}{(a^6-3\,a^4b^2+3\,a^2b^4-b^6)\sqrt{a^2-b^2}}+\frac{6\,a^5\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-6\,a^4b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5+12\,a^3\cdots}{\cdots}}{\cdots}$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/3*(3*(4*a^2*b + b^3)*(pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b) +
arctan(-(a*tan(1/2*d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2)))
/((a^6 - 3*a^4*b^2 + 3*a^2*b^4 - b^6)*sqrt(a^2 - b^2)) + (6*a^5*tan(1/2*d*x
 + 1/2*c)^5 - 6*a^4*b*tan(1/2*d*x + 1/2*c)^5 + 12*a^3*b^2*tan(1/2*d*x + 1/2
*c)^5 - 27*a^2*b^3*tan(1/2*d*x + 1/2*c)^5 + 12*a*b^4*tan(1/2*d*x + 1/2*c)^5
 + 3*b^5*tan(1/2*d*x + 1/2*c)^5 + 12*a^5*tan(1/2*d*x + 1/2*c)^3 + 16*a^3*b^
2*tan(1/2*d*x + 1/2*c)^3 - 28*a*b^4*tan(1/2*d*x + 1/2*c)^3 + 6*a^5*tan(1/2*
d*x + 1/2*c) + 6*a^4*b*tan(1/2*d*x + 1/2*c) + 12*a^3*b^2*tan(1/2*d*x + 1/2*
c) + 27*a^2*b^3*tan(1/2*d*x + 1/2*c) + 12*a*b^4*tan(1/2*d*x + 1/2*c) - 3*b^
5*tan(1/2*d*x + 1/2*c))/((a^6 - 3*a^4*b^2 + 3*a^2*b^4 - b^6)*(a*tan(1/2*d*x
 + 1/2*c)^2 - b*tan(1/2*d*x + 1/2*c)^2 + a + b)^3))/d
```

Mupad [B] (verification not implemented)

Time = 17.62 (sec) , antiderivative size = 382, normalized size of antiderivative = 1.99

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \frac{\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5\,(2\,a^3+2\,a^2\,b+6\,a\,b^2+b^3)}{(a+b)^3\,(a-b)}+\frac{4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3\,(3\,a^3+7\,a\,b^2)}{3\,(a+b)^2\,(a^2-2\,a\,b+b^2)}+\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\cdots}{(a+b)\,(\cdots}}{d\left(3\,a\,b^2-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\,(-3\,a^3+3\,a^2\,b+3\,a\,b^2-3\,b^3)-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2\,(-3\,a^3-3\,a^2\,b+3\,a\,b^2+3\,b^3)+\cdots\right.} - \frac{b\,\mathrm{atan}\left(\frac{b\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,(4\,a^2+b^2)\,(2\,a-2\,b)\,(a^3-3\,a^2\,b+3\,a\,b^2-b^3)}{2\,\sqrt{a+b}\,(a-b)^{7/2}\,(4\,a^2\,b+b^3)}\right)\,(4\,a^2+b^2)}{d\,(a+b)^{7/2}\,(a-b)^{7/2}}$$

```
[In] int(cos(c + d*x)/(a + b*cos(c + d*x))^4,x)
```

```
[Out] ((tan(c/2 + (d*x)/2)^5*(6*a*b^2 + 2*a^2*b + 2*a^3 + b^3))/((a + b)^3*(a - b
)) + (4*tan(c/2 + (d*x)/2)^3*(7*a*b^2 + 3*a^3))/(3*(a + b)^2*(a^2 - 2*a*b +
 b^2)) + (tan(c/2 + (d*x)/2)*(6*a*b^2 - 2*a^2*b + 2*a^3 - b^3))/((a + b)*(3
```

```
*a*b^2 - 3*a^2*b + a^3 - b^3)))/(d*(3*a*b^2 - tan(c/2 + (d*x)/2)^4*(3*a*b^2
 + 3*a^2*b - 3*a^3 - 3*b^3) - tan(c/2 + (d*x)/2)^2*(3*a*b^2 - 3*a^2*b - 3*a
^3 + 3*b^3) + 3*a^2*b + a^3 + b^3 + tan(c/2 + (d*x)/2)^6*(3*a*b^2 - 3*a^2*b
 + a^3 - b^3))) - (b*atan((b*tan(c/2 + (d*x)/2)*(4*a^2 + b^2)*(2*a - 2*b)*(
3*a*b^2 - 3*a^2*b + a^3 - b^3))/(2*(a + b)^(1/2)*(a - b)^(7/2)*(4*a^2*b + b
^3)))*(4*a^2 + b^2))/(d*(a + b)^(7/2)*(a - b)^(7/2))
```

3.483 $\int \frac{1}{(a+b\cos(c+dx))^4}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 184

$$\int \frac{1}{(a+b\cos(c+dx))^4}\,dx = \frac{a(2a^2+3b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{7/2}(a+b)^{7/2}d} - \frac{b\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^3} - \frac{5ab\sin(c+dx)}{6(a^2-b^2)^2\,d(a+b\cos(c+dx))^2} - \frac{b(11a^2+4b^2)\sin(c+dx)}{6(a^2-b^2)^3\,d(a+b\cos(c+dx))}$$

```
[Out] a*(2*a^2+3*b^2)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/2))/(a-b)^(7
/2)/(a+b)^(7/2)/d-1/3*b*sin(d*x+c)/(a^2-b^2)/d/(a+b*cos(d*x+c))^3-5/6*a*b*s
in(d*x+c)/(a^2-b^2)^2/d/(a+b*cos(d*x+c))^2-1/6*b*(11*a^2+4*b^2)*sin(d*x+c)/
(a^2-b^2)^3/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 184, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used

$= \{2743, 2833, 12, 2738, 211\}$

$$\int \frac{1}{(a+b\cos(c+dx))^4}\,dx = \frac{a(2a^2+3b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{d(a-b)^{7/2}(a+b)^{7/2}} - \frac{b(11a^2+4b^2)\sin(c+dx)}{6d\left(a^2-b^2\right)^3(a+b\cos(c+dx))} - \frac{5ab\sin(c+dx)}{6d\left(a^2-b^2\right)^2(a+b\cos(c+dx))^2} - \frac{b\sin(c+dx)}{3d\left(a^2-b^2\right)(a+b\cos(c+dx))^3}$$

```
[In] Int[(a + b*Cos[c + d*x])^(-4),x]
```

```
[Out] (a*(2*a^2 + 3*b^2)*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2])/Sqrt[a + b]])/((a
- b)^(7/2)*(a + b)^(7/2)*d) - (b*Sin[c + d*x])/(3*(a^2 - b^2)*d*(a + b*Cos[
c + d*x])^3) - (5*a*b*Sin[c + d*x])/(6*(a^2 - b^2)^2*d*(a + b*Cos[c + d*x])
^2) - (b*(11*a^2 + 4*b^2)*Sin[c + d*x])/(6*(a^2 - b^2)^3*d*(a + b*Cos[c + d
*x]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2743

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos
[c + d*x]*((a + b*Sin[c + d*x])^(n + 1)/(d*(n + 1)*(a^2 - b^2))), x] + Dist
[1/((n + 1)*(a^2 - b^2)), Int[(a + b*Sin[c + d*x])^(n + 1)*Simp[a*(n + 1) -
 b*(n + 2)*Sin[c + d*x], x], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2833

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((a + b*Sin[e +
 f*x])^(m + 1)/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(a^2 - b^2)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[(a*c - b*d)*(m + 1) - (b*c - a*d)*(m
 + 2)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 - b^2, 0] && LtQ[m, -1] && IntegerQ[2*m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{b\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^3}-\frac{\int\frac{-3a+2b\cos(c+dx)}{(a+b\cos(c+dx))^3}\,dx}{3(a^2-b^2)}\\
&= -\frac{b\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^3}\\
&\quad-\frac{5ab\sin(c+dx)}{6(a^2-b^2)^2\,d(a+b\cos(c+dx))^2}+\frac{\int\frac{2(3a^2+2b^2)-5ab\cos(c+dx)}{(a+b\cos(c+dx))^2}\,dx}{6(a^2-b^2)^2}\\
&= -\frac{b\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^3}-\frac{5ab\sin(c+dx)}{6(a^2-b^2)^2\,d(a+b\cos(c+dx))^2}\\
&\quad-\frac{b(11a^2+4b^2)\sin(c+dx)}{6(a^2-b^2)^3\,d(a+b\cos(c+dx))}-\frac{\int-\frac{3a(2a^2+3b^2)}{a+b\cos(c+dx)}\,dx}{6(a^2-b^2)^3}\\
&= -\frac{b\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^3}-\frac{5ab\sin(c+dx)}{6(a^2-b^2)^2\,d(a+b\cos(c+dx))^2}\\
&\quad-\frac{b(11a^2+4b^2)\sin(c+dx)}{6(a^2-b^2)^3\,d(a+b\cos(c+dx))}+\frac{(a(2a^2+3b^2))\int\frac{1}{a+b\cos(c+dx)}\,dx}{2(a^2-b^2)^3}\\
&= -\frac{b\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^3}-\frac{5ab\sin(c+dx)}{6(a^2-b^2)^2\,d(a+b\cos(c+dx))^2}\\
&\quad-\frac{b(11a^2+4b^2)\sin(c+dx)}{6(a^2-b^2)^3\,d(a+b\cos(c+dx))}\\
&\quad+\frac{(a(2a^2+3b^2))\,\text{Subst}\left(\int\frac{1}{a+b+(a-b)x^2}\,dx,x,\tan\left(\frac{1}{2}(c+dx)\right)\right)}{(a^2-b^2)^3\,d}\\
&= \frac{a(2a^2+3b^2)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{(a-b)^{7/2}(a+b)^{7/2}d}-\frac{b\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^3}\\
&\quad-\frac{5ab\sin(c+dx)}{6(a^2-b^2)^2\,d(a+b\cos(c+dx))^2}-\frac{b(11a^2+4b^2)\sin(c+dx)}{6(a^2-b^2)^3\,d(a+b\cos(c+dx))}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.67 (sec) , antiderivative size = 159, normalized size of antiderivative = 0.86

$$\int \frac{1}{(a+b\cos(c+dx))^4}\,dx$$
$$=\frac{\frac{6a(2a^2+3b^2)\operatorname{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{7/2}}-\frac{b(18a^4-5a^2b^2+2b^4+3ab(9a^2+b^2)\cos(c+dx)+b^2(11a^2+4b^2)\cos^2(c+dx))\sin(c+dx)}{(a-b)^3(a+b)^3(a+b\cos(c+dx))^3}}{6d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(-4),x]
```

```
[Out] ((6*a*(2*a^2 + 3*b^2)*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])
/(-a^2 + b^2)^(7/2) - (b*(18*a^4 - 5*a^2*b^2 + 2*b^4 + 3*a*b*(9*a^2 + b^2)*
Cos[c + d*x] + b^2*(11*a^2 + 4*b^2)*Cos[c + d*x]^2)*Sin[c + d*x])/((a - b)^
3*(a + b)^3*(a + b*Cos[c + d*x])^3))/(6*d)
```

Maple [A] (verified)

Time = 1.23 (sec) , antiderivative size = 280, normalized size of antiderivative = 1.52

method	result
derivativedivides	$\frac{\frac{-\frac{(6a^2+3ab+2b^2)b\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{(a-b)\left(a^3+3a^2b+3a\,b^2+b^3\right)}-\frac{4(9a^2+b^2)b\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3\left(a^2-2ab+b^2\right)\left(a^2+2ab+b^2\right)}-\frac{(6a^2-3ab+2b^2)b\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{(a+b)\left(a^3-3a^2b+3a\,b^2-b^3\right)}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^3}+\frac{a\left(2a^2+3b^2\right)\arctan\left(\frac{(a-b)\ldots}{\sqrt{(\ldots}}\right.}{\left(a^6-3a^4b^2+3a^2b^4-b^6\right)\ldots}}{d}$
default	$\frac{\frac{-\frac{(6a^2+3ab+2b^2)b\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{(a-b)\left(a^3+3a^2b+3a\,b^2+b^3\right)}-\frac{4(9a^2+b^2)b\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3\left(a^2-2ab+b^2\right)\left(a^2+2ab+b^2\right)}-\frac{(6a^2-3ab+2b^2)b\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{(a+b)\left(a^3-3a^2b+3a\,b^2-b^3\right)}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^3}+\frac{a\left(2a^2+3b^2\right)\arctan\left(\frac{(a-b)\ldots}{\sqrt{(\ldots}}\right.}{\left(a^6-3a^4b^2+3a^2b^4-b^6\right)\ldots}}{d}$
risch	$-\frac{i(6a^3b^2e^{5i(dx+c)}+9a\,b^4e^{5i(dx+c)}+30a^4b\,e^{4i(dx+c)}+45a^2b^3e^{4i(dx+c)}+44a^5e^{3i(dx+c)}+82a^3b^2e^{3i(dx+c)}+24a\,b^4e^{3i(dx\ldots}}{3(a^2-b^2)^3d\left(b\,e^{2i(dx+c)}+2a\ldots\right.}$

```
[In] int(1/(a+cos(d*x+c)*b)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(2*(-1/2*(6*a^2+3*a*b+2*b^2)*b/(a-b)/(a^3+3*a^2*b+3*a*b^2+b^3)*tan(1/2*
d*x+1/2*c)^5-2/3*(9*a^2+b^2)*b/(a^2-2*a*b+b^2)/(a^2+2*a*b+b^2)*tan(1/2*d*x+
1/2*c)^3-1/2*(6*a^2-3*a*b+2*b^2)*b/(a+b)/(a^3-3*a^2*b+3*a*b^2-b^3)*tan(1/2*
d*x+1/2*c))/(tan(1/2*d*x+1/2*c)^2*a-b*tan(1/2*d*x+1/2*c)^2+a+b)^3+a*(2*a^2+
3*b^2)/(a^6-3*a^4*b^2+3*a^2*b^4-b^6)/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1
/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 413 vs. 2(169) = 338.

Time = 0.31 (sec) , antiderivative size = 895, normalized size of antiderivative = 4.86

$$\int \frac{1}{(a+b\cos(c+dx))^4}\,dx$$
$$= \left[\frac{3\left(2a^6+3a^4b^2+(2a^3b^3+3ab^5)\cos(dx+c)^3+3(2a^4b^2+3a^2b^4)\cos(dx+c)^2+3(2a^5b+3a^3b^3)\cos(\right.}{12\left((a^8b^3-4a^6b^5+6a^4b^7-4a^2b^9+b^{11})d\cos(d\right.}\right.$$

```
[In] integrate(1/(a+b*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] [1/12*(3*(2*a^6 + 3*a^4*b^2 + (2*a^3*b^3 + 3*a*b^5)*cos(d*x + c)^3 + 3*(2*a
^4*b^2 + 3*a^2*b^4)*cos(d*x + c)^2 + 3*(2*a^5*b + 3*a^3*b^3)*cos(d*x + c))*
sqrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x + c)^2 - 2
*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2)/(b^2*cos
(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) - 2*(18*a^6*b - 23*a^4*b^3 + 7*a^2
*b^5 - 2*b^7 + (11*a^4*b^3 - 7*a^2*b^5 - 4*b^7)*cos(d*x + c)^2 + 3*(9*a^5*b
^2 - 8*a^3*b^4 - a*b^6)*cos(d*x + c))*sin(d*x + c))/((a^8*b^3 - 4*a^6*b^5 +
 6*a^4*b^7 - 4*a^2*b^9 + b^11)*d*cos(d*x + c)^3 + 3*(a^9*b^2 - 4*a^7*b^4 +
6*a^5*b^6 - 4*a^3*b^8 + a*b^10)*d*cos(d*x + c)^2 + 3*(a^10*b - 4*a^8*b^3 +
6*a^6*b^5 - 4*a^4*b^7 + a^2*b^9)*d*cos(d*x + c) + (a^11 - 4*a^9*b^2 + 6*a^7
*b^4 - 4*a^5*b^6 + a^3*b^8)*d), 1/6*(3*(2*a^6 + 3*a^4*b^2 + (2*a^3*b^3 + 3*
a*b^5)*cos(d*x + c)^3 + 3*(2*a^4*b^2 + 3*a^2*b^4)*cos(d*x + c)^2 + 3*(2*a^5
*b + 3*a^3*b^3)*cos(d*x + c))*sqrt(a^2 - b^2)*arctan(-(a*cos(d*x + c) + b)/
(sqrt(a^2 - b^2)*sin(d*x + c))) - (18*a^6*b - 23*a^4*b^3 + 7*a^2*b^5 - 2*b^
7 + (11*a^4*b^3 - 7*a^2*b^5 - 4*b^7)*cos(d*x + c)^2 + 3*(9*a^5*b^2 - 8*a^3*
b^4 - a*b^6)*cos(d*x + c))*sin(d*x + c))/((a^8*b^3 - 4*a^6*b^5 + 6*a^4*b^7
- 4*a^2*b^9 + b^11)*d*cos(d*x + c)^3 + 3*(a^9*b^2 - 4*a^7*b^4 + 6*a^5*b^6 -
 4*a^3*b^8 + a*b^10)*d*cos(d*x + c)^2 + 3*(a^10*b - 4*a^8*b^3 + 6*a^6*b^5 -
 4*a^4*b^7 + a^2*b^9)*d*cos(d*x + c) + (a^11 - 4*a^9*b^2 + 6*a^7*b^4 - 4*a^
5*b^6 + a^3*b^8)*d)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^4}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+b*cos(d*x+c))**4,x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\cos(c+dx))^4}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(1/(a+b*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 399 vs. $2(169) = 338$.

Time = 0.31 (sec) , antiderivative size = 399, normalized size of antiderivative = 2.17

$$\int \frac{1}{(a+b\cos(c+dx))^4}\,dx = -\frac{\frac{3\,(2\,a^3+3\,ab^2)\left(\pi\left\lfloor\frac{dx+c}{2\,\pi}+\frac{1}{2}\right\rfloor\operatorname{sgn}(-2\,a+2\,b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\sqrt{a^2-b^2}}\right)\right)}{(a^6-3\,a^4b^2+3\,a^2b^4-b^6)\sqrt{a^2-b^2}}+\frac{18\,a^4b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-27\,a^3b^2\tan\left(\frac{1}{2}\,dx+\right.}{}}{}$$

```
[In] integrate(1/(a+b*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] -1/3*(3*(2*a^3 + 3*a*b^2)*(pi*floor(1/2*(d*x + c)/pi + 1/2)*sgn(-2*a + 2*b)
 + arctan(-(a*tan(1/2*d*x + 1/2*c) - b*tan(1/2*d*x + 1/2*c))/sqrt(a^2 - b^2
)))/((a^6 - 3*a^4*b^2 + 3*a^2*b^4 - b^6)*sqrt(a^2 - b^2)) + (18*a^4*b*tan(1
/2*d*x + 1/2*c)^5 - 27*a^3*b^2*tan(1/2*d*x + 1/2*c)^5 + 6*a^2*b^3*tan(1/2*d
*x + 1/2*c)^5 - 3*a*b^4*tan(1/2*d*x + 1/2*c)^5 + 6*b^5*tan(1/2*d*x + 1/2*c)
^5 + 36*a^4*b*tan(1/2*d*x + 1/2*c)^3 - 32*a^2*b^3*tan(1/2*d*x + 1/2*c)^3 -
4*b^5*tan(1/2*d*x + 1/2*c)^3 + 18*a^4*b*tan(1/2*d*x + 1/2*c) + 27*a^3*b^2*t
an(1/2*d*x + 1/2*c) + 6*a^2*b^3*tan(1/2*d*x + 1/2*c) + 3*a*b^4*tan(1/2*d*x
+ 1/2*c) + 6*b^5*tan(1/2*d*x + 1/2*c))/((a^6 - 3*a^4*b^2 + 3*a^2*b^4 - b^6)
*(a*tan(1/2*d*x + 1/2*c)^2 - b*tan(1/2*d*x + 1/2*c)^2 + a + b)^3))/d
```

Mupad [B] (verification not implemented)

Time = 18.19 (sec) , antiderivative size = 378, normalized size of antiderivative = 2.05

$$\int \frac{1}{(a+b\cos(c+dx))^4}\,dx$$
$$= \frac{a\,\mathrm{atan}\left(\frac{a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(2\,a^2+3\,b^2\right)\,\left(2\,a-2\,b\right)\,\left(a^3-3\,a^2\,b+3\,a\,b^2-b^3\right)}{2\,\left(2\,a^3+3\,a\,b^2\right)\,\sqrt{a+b}\,{\left(a-b\right)}^{7/2}}\right)\,\left(2\,a^2+3\,b^2\right)}{d\,{\left(a+b\right)}^{7/2}\,{\left(a-b\right)}^{7/2}}$$
$$- \frac{\frac{4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3\,\left(9\,a^2\,b+b^3\right)}{3\,{\left(a+b\right)}^2\,\left(a^2-2\,a\,b+b^2\right)}+\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5\,\left(6\,a^2\,b+3\,a\,b^2+2\,b^3\right)}{{\left(a+b\right)}^3\,\left(a-b\right)}+\frac{\tan\left(\frac{c}{2}+\frac{d}{\ldots}\right.}{(a+b)\,(\ldots}}{d\,\left(3\,a\,b^2-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\,\left(-3\,a^3+3\,a^2\,b+3\,a\,b^2-3\,b^3\right)-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2\,\left(-3\,a^3-3\,a^2\,b+3\,a\,b^2+3\,b^3\right)\ldots\right.}$$

```
[In] int(1/(a + b*cos(c + d*x))^4,x)
```

```
[Out] (a*atan((a*tan(c/2 + (d*x)/2)*(2*a^2 + 3*b^2)*(2*a - 2*b)*(3*a*b^2 - 3*a^2*
b + a^3 - b^3))/(2*(3*a*b^2 + 2*a^3)*(a + b)^(1/2)*(a - b)^(7/2)))*(2*a^2 +
 3*b^2))/(d*(a + b)^(7/2)*(a - b)^(7/2)) - ((4*tan(c/2 + (d*x)/2)^3*(9*a^2*
b + b^3))/(3*(a + b)^2*(a^2 - 2*a*b + b^2)) + (tan(c/2 + (d*x)/2)^5*(3*a*b^
2 + 6*a^2*b + 2*b^3))/((a + b)^3*(a - b)) + (tan(c/2 + (d*x)/2)*(6*a^2*b -
3*a*b^2 + 2*b^3))/((a + b)*(3*a*b^2 - 3*a^2*b + a^3 - b^3)))/(d*(3*a*b^2 -
tan(c/2 + (d*x)/2)^4*(3*a*b^2 + 3*a^2*b - 3*a^3 - 3*b^3) - tan(c/2 + (d*x)/
2)^2*(3*a*b^2 - 3*a^2*b - 3*a^3 + 3*b^3) + 3*a^2*b + a^3 + b^3 + tan(c/2 +
(d*x)/2)^6*(3*a*b^2 - 3*a^2*b + a^3 - b^3)))
```

3.484 $\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^4}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 251

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^4}\,dx = -\frac{b(8a^6-8a^4b^2+7a^2b^4-2b^6)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^4(a-b)^{7/2}(a+b)^{7/2}d} + \frac{\operatorname{arctanh}(\sin(c+dx))}{a^4d} + \frac{b^2\sin(c+dx)}{3a(a^2-b^2)\,d(a+b\cos(c+dx))^3} + \frac{b^2(8a^2-3b^2)\sin(c+dx)}{6a^2(a^2-b^2)^2\,d(a+b\cos(c+dx))^2} + \frac{b^2(26a^4-17a^2b^2+6b^4)\sin(c+dx)}{6a^3(a^2-b^2)^3\,d(a+b\cos(c+dx))}$$

```
[Out] -b*(8*a^6-8*a^4*b^2+7*a^2*b^4-2*b^6)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/
(a+b)^(1/2))/a^4/(a-b)^(7/2)/(a+b)^(7/2)/d+arctanh(sin(d*x+c))/a^4/d+1/3*b^
2*sin(d*x+c)/a/(a^2-b^2)/d/(a+b*cos(d*x+c))^3+1/6*b^2*(8*a^2-3*b^2)*sin(d*x
+c)/a^2/(a^2-b^2)^2/d/(a+b*cos(d*x+c))^2+1/6*b^2*(26*a^4-17*a^2*b^2+6*b^4)*
sin(d*x+c)/a^3/(a^2-b^2)^3/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.85 (sec) , antiderivative size = 251, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used

$= \{2881, 3134, 3080, 3855, 2738, 211\}$

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \frac{\operatorname{arctanh}(\sin(c+dx))}{a^4d} + \frac{b^2(8a^2-3b^2)\sin(c+dx)}{6a^2d\,(a^2-b^2)^2\,(a+b\cos(c+dx))^2} + \frac{b^2\sin(c+dx)}{3ad\,(a^2-b^2)\,(a+b\cos(c+dx))^3} - \frac{b(8a^6-8a^4b^2+7a^2b^4-2b^6)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^4d(a-b)^{7/2}(a+b)^{7/2}} + \frac{b^2(26a^4-17a^2b^2+6b^4)\sin(c+dx)}{6a^3d\,(a^2-b^2)^3\,(a+b\cos(c+dx))}$$

```
[In] Int[Sec[c + d*x]/(a + b*Cos[c + d*x])^4,x]
```

```
[Out] -((b*(8*a^6 - 8*a^4*b^2 + 7*a^2*b^4 - 2*b^6)*ArcTan[(Sqrt[a - b]*Tan[(c + d
*x)/2])/Sqrt[a + b]])/(a^4*(a - b)^(7/2)*(a + b)^(7/2)*d)) + ArcTanh[Sin[c
+ d*x]]/(a^4*d) + (b^2*Sin[c + d*x])/(3*a*(a^2 - b^2)*d*(a + b*Cos[c + d*x]
)^3) + (b^2*(8*a^2 - 3*b^2)*Sin[c + d*x])/(6*a^2*(a^2 - b^2)^2*d*(a + b*Cos
[c + d*x])^2) + (b^2*(26*a^4 - 17*a^2*b^2 + 6*b^4)*Sin[c + d*x])/(6*a^3*(a^
2 - b^2)^3*d*(a + b*Cos[c + d*x]))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 3080

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[(A*b
- a*B)/(b*c - a*d), Int[1/(a + b*Sin[e + f*x]), x], x] + Dist[(B*c - A*d)/(
b*c - a*d), Int[1/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f,
A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = \frac{b^2\sin(c+dx)}{3a\,(a^2-b^2)\,d(a+b\cos(c+dx))^3}+\frac{\int\frac{\left(3\left(a^2-b^2\right)-3ab\cos(c+dx)+2b^2\cos^2(c+dx)\right)\sec(c+dx)}{(a+b\cos(c+dx))^3}\,dx}{3a\,(a^2-b^2)}$$

$$=\frac{b^2\sin(c+dx)}{3a\,(a^2-b^2)\,d(a+b\cos(c+dx))^3}+\frac{b^2(8a^2-3b^2)\sin(c+dx)}{6a^2\,(a^2-b^2)^2\,d(a+b\cos(c+dx))^2}+\frac{\int\frac{\left(6\left(a^2-b^2\right)^2-2ab\left(6a^2-b^2\right)\cos(c+dx)+b^2\left(8a^2-3b^2\right)\cos^2(c+dx)\right)\sec(c+dx)}{(a+b\cos(c+dx))^2}\,dx}{6a^2\,(a^2-b^2)^2}$$

$$= \frac{b^2\sin(c+dx)}{3a\left(a^2-b^2\right)d(a+b\cos(c+dx))^3} + \frac{b^2(8a^2-3b^2)\sin(c+dx)}{6a^2\left(a^2-b^2\right)^2 d(a+b\cos(c+dx))^2} + \frac{b^2(26a^4-17a^2b^2+6b^4)\sin(c+dx)}{6a^3\left(a^2-b^2\right)^3 d(a+b\cos(c+dx))} + \frac{\int \frac{\left(6\left(a^2-b^2\right)^3-3ab(6a^4-2a^2b^2+b^4)\cos(c+dx)\right)\sec(c+dx)}{a+b\cos(c+dx)}dx}{6a^3\left(a^2-b^2\right)^3}$$

$$= \frac{b^2\sin(c+dx)}{3a\left(a^2-b^2\right)d(a+b\cos(c+dx))^3} + \frac{b^2(8a^2-3b^2)\sin(c+dx)}{6a^2\left(a^2-b^2\right)^2 d(a+b\cos(c+dx))^2} + \frac{b^2(26a^4-17a^2b^2+6b^4)\sin(c+dx)}{6a^3\left(a^2-b^2\right)^3 d(a+b\cos(c+dx))} + \frac{\int \sec(c+dx)\,dx}{a^4} - \frac{(b(8a^6-8a^4b^2+7a^2b^4-2b^6))\int \frac{1}{a+b\cos(c+dx)}dx}{2a^4\left(a^2-b^2\right)^3}$$

$$= \frac{\operatorname{arctanh}(\sin(c+dx))}{a^4d} + \frac{b^2\sin(c+dx)}{3a\left(a^2-b^2\right)d(a+b\cos(c+dx))^3} + \frac{b^2(8a^2-3b^2)\sin(c+dx)}{6a^2\left(a^2-b^2\right)^2 d(a+b\cos(c+dx))^2} + \frac{b^2(26a^4-17a^2b^2+6b^4)\sin(c+dx)}{6a^3\left(a^2-b^2\right)^3 d(a+b\cos(c+dx))} - \frac{(b(8a^6-8a^4b^2+7a^2b^4-2b^6))\operatorname{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{a^4\left(a^2-b^2\right)^3 d}$$

$$= -\frac{b(8a^6-8a^4b^2+7a^2b^4-2b^6)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^4(a-b)^{7/2}(a+b)^{7/2}d} + \frac{\operatorname{arctanh}(\sin(c+dx))}{a^4d} + \frac{b^2\sin(c+dx)}{3a\left(a^2-b^2\right)d(a+b\cos(c+dx))^3} + \frac{b^2(8a^2-3b^2)\sin(c+dx)}{6a^2\left(a^2-b^2\right)^2 d(a+b\cos(c+dx))^2} + \frac{b^2(26a^4-17a^2b^2+6b^4)\sin(c+dx)}{6a^3\left(a^2-b^2\right)^3 d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 2.11 (sec) , antiderivative size = 274, normalized size of antiderivative = 1.09

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^4}dx = \frac{\frac{6b(-8a^6+8a^4b^2-7a^2b^4+2b^6)\operatorname{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{(-a^2+b^2)^{7/2}} - 6\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right) + 6\log\left(\cos\left(\frac{1}{2}(\right.\right.}{6}$$

```
[In] Integrate[Sec[c + d*x]/(a + b*Cos[c + d*x])^4,x]
```

[Out] ((6*b*(-8*a^6 + 8*a^4*b^2 - 7*a^2*b^4 + 2*b^6)*ArcTanh[((a - b)*Tan[(c + d*x)/2])/Sqrt[-a^2 + b^2]])/(-a^2 + b^2)^(7/2) - 6*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + 6*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] + (2*a^3*b^2*Sin[c + d*x])/((a - b)*(a + b)*(a + b*Cos[c + d*x])^3) + (a^2*b^2*(8*a^2 - 3*b^2)*Sin[c + d*x])/((a - b)^2*(a + b)^2*(a + b*Cos[c + d*x])^2) + (a*b^2*(26*a^4 - 17*a^2*b^2 + 6*b^4)*Sin[c + d*x])/((a - b)^3*(a + b)^3*(a + b*Cos[c + d*x]))))/(6*a^4*d)

Maple [A] (verified)

Time = 2.32 (sec) , antiderivative size = 379, normalized size of antiderivative = 1.51

method	result
derivativedivides	$\frac{\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{a^4}-\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^4}-\frac{2b\left(\frac{-\frac{\left(12a^4+4a^3b-6a^2b^2-a\,b^3+2b^4\right)ab\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)\left(a^3+3a^2b+3a\,b^2+b^3\right)}-\frac{2\left(18a^4-11a^2b^2+3b^4\right)ab(\cdots}{3\left(a^2-2ab+b^2\right)\left(a^2+\cdots\right.}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}\cdots\right.\right.}\cdots\right.}{\cdots}}{d}$
default	$\frac{\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{a^4}-\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^4}-\frac{2b\left(\frac{-\frac{\left(12a^4+4a^3b-6a^2b^2-a\,b^3+2b^4\right)ab\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)\left(a^3+3a^2b+3a\,b^2+b^3\right)}-\frac{2\left(18a^4-11a^2b^2+3b^4\right)ab(\cdots}{3\left(a^2-2ab+b^2\right)\left(a^2+\cdots\right.}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}\cdots\right.\right.}\cdots\right.}{\cdots}}{d}$
risch	Expression too large to display

[In] int(sec(d*x+c)/(a+cos(d*x+c)*b)^4,x,method=_RETURNVERBOSE)

[Out] 1/d*(1/a^4*ln(tan(1/2*d*x+1/2*c)+1)-1/a^4*ln(tan(1/2*d*x+1/2*c)-1)-2*b/a^4*((-1/2*(12*a^4+4*a^3*b-6*a^2*b^2-a*b^3+2*b^4)*a*b/(a-b)/(a^3+3*a^2*b+3*a*b^2+b^3)*tan(1/2*d*x+1/2*c)^5-2/3*(18*a^4-11*a^2*b^2+3*b^4)*a*b/(a^2-2*a*b+b^2)/(a^2+2*a*b+b^2)*tan(1/2*d*x+1/2*c)^3-1/2*(12*a^4-4*a^3*b-6*a^2*b^2+a*b^3+2*b^4)*a*b/(a+b)/(a^3-3*a^2*b+3*a*b^2-b^3)*tan(1/2*d*x+1/2*c))/(tan(1/2*d*x+1/2*c)^2*a-b*tan(1/2*d*x+1/2*c)^2+a+b)^3+1/2*(8*a^6-8*a^4*b^2+7*a^2*b^4-2*b^6)/(a^6-3*a^4*b^2+3*a^2*b^4-b^6)/((a-b)*(a+b))^(1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2))))

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 873 vs. 2(236) = 472.

Time = 1.73 (sec) , antiderivative size = 1815, normalized size of antiderivative = 7.23

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \text{Too large to display}$$

[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))^4,x, algorithm="fricas")

[Out] [-1/12*(3*(8*a^9*b - 8*a^7*b^3 + 7*a^5*b^5 - 2*a^3*b^7 + (8*a^6*b^4 - 8*a^4*b^6 + 7*a^2*b^8 - 2*b^10)*cos(d*x + c)^3 + 3*(8*a^7*b^3 - 8*a^5*b^5 + 7*a^3*b^7 - 2*a*b^9)*cos(d*x + c)^2 + 3*(8*a^8*b^2 - 8*a^6*b^4 + 7*a^4*b^6 - 2*a^2*b^8)*cos(d*x + c))*sqrt(-a^2 + b^2)*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x + c)^2 - 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)) - 6*(a^11 - 4*a^9*b^2 + 6*a^7*b^4 - 4*a^5*b^6 + a^3*b^8 + (a^8*b^3 - 4*a^6*b^5 + 6*a^4*b^7 - 4*a^2*b^9 + b^11)*cos(d*x + c)^3 + 3*(a^9*b^2 - 4*a^7*b^4 + 6*a^5*b^6 - 4*a^3*b^8 + a*b^10)*cos(d*x + c)^2 + 3*(a^10*b - 4*a^8*b^3 + 6*a^6*b^5 - 4*a^4*b^7 + a^2*b^9)*cos(d*x + c))*log(sin(d*x + c) + 1) + 6*(a^11 - 4*a^9*b^2 + 6*a^7*b^4 - 4*a^5*b^6 + a^3*b^8 + (a^8*b^3 - 4*a^6*b^5 + 6*a^4*b^7 - 4*a^2*b^9 + b^11)*cos(d*x + c)^3 + 3*(a^9*b^2 - 4*a^7*b^4 + 6*a^5*b^6 - 4*a^3*b^8 + a*b^10)*cos(d*x + c)^2 + 3*(a^10*b - 4*a^8*b^3 + 6*a^6*b^5 - 4*a^4*b^7 + a^2*b^9)*cos(d*x + c))*log(-sin(d*x + c) + 1) - 2*(36*a^9*b^2 - 68*a^7*b^4 + 43*a^5*b^6 - 11*a^3*b^8 + (26*a^7*b^4 - 43*a^5*b^6 + 23*a^3*b^8 - 6*a*b^10)*cos(d*x + c)^2 + 15*(4*a^8*b^3 - 7*a^6*b^5 + 4*a^4*b^7 - a^2*b^9)*cos(d*x + c))*sin(d*x + c))/((a^12*b^3 - 4*a^10*b^5 + 6*a^8*b^7 - 4*a^6*b^9 + a^4*b^11)*d*cos(d*x + c)^3 + 3*(a^13*b^2 - 4*a^11*b^4 + 6*a^9*b^6 - 4*a^7*b^8 + a^5*b^10)*d*cos(d*x + c)^2 + 3*(a^14*b - 4*a^12*b^3 + 6*a^10*b^5 - 4*a^8*b^7 + a^6*b^9)*d*cos(d*x + c) + (a^15 - 4*a^13*b^2 + 6*a^11*b^4 - 4*a^9*b^6 + a^7*b^8)*d), -1/6*(3*(8*a^9*b - 8*a^7*b^3 + 7*a^5*b^5 - 2*a^3*b^7 + (8*a^6*b^4 - 8*a^4*b^6 + 7*a^2*b^8 - 2*b^10)*cos(d*x + c)^3 + 3*(8*a^7*b^3 - 8*a^5*b^5 + 7*a^3*b^7 - 2*a*b^9)*cos(d*x + c)^2 + 3*(8*a^8*b^2 - 8*a^6*b^4 + 7*a^4*b^6 - 2*a^2*b^8)*cos(d*x + c))*sqrt(a^2 - b^2)*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c))) - 3*(a^11 - 4*a^9*b^2 + 6*a^7*b^4 - 4*a^5*b^6 + a^3*b^8 + (a^8*b^3 - 4*a^6*b^5 + 6*a^4*b^7 - 4*a^2*b^9 + b^11)*cos(d*x + c)^3 + 3*(a^9*b^2 - 4*a^7*b^4 + 6*a^5*b^6 - 4*a^3*b^8 + a*b^10)*cos(d*x + c)^2 + 3*(a^10*b - 4*a^8*b^3 + 6*a^6*b^5 - 4*a^4*b^7 + a^2*b^9)*cos(d*x + c))*log(sin(d*x + c) + 1) + 3*(a^11 - 4*a^9*b^2 + 6*a^7*b^4 - 4*a^5*b^6 + a^3*b^8 + (a^8*b^3 - 4*a^6*b^5 + 6*a^4*b^7 - 4*a^2*b^9 + b^11)*cos(d*x + c)^3 + 3*(a^9*b^2 - 4*a^7*b^4 + 6*a^5*b^6 - 4*a^3*b^8 + a*b^10)*cos(d*x + c)^2 + 3*(a^10*b - 4*a^8*b^3 + 6*a^6*b^5 - 4*a^4*b^7 + a^2*b^9)*cos(d*x + c))*log(-sin(d*x + c) + 1) - (36*a^9*b^2 - 68*a^7*b^4 + 43*a^5*b^6 - 11*a^3*b^8 + (26*a^7*b^4 - 43*a^5*b^6 + 23*a^3*b^8 - 6*a*b^10)*cos(d*x + c)^2 + 15*(4*a^8*b^3 - 7*a^6*b^5 + 4*a^4*b^7 - a^2*b^9)*cos(d*x + c))*sin(d*x + c))/((a^12*b^3 - 4*a^10*b^5 + 6*a^8*b^7 - 4*a^6*b^9 + a^4*b^11)*d*cos(d*x + c)^3 + 3*(a^13*b^2 - 4*a^11*b^4 + 6*a^9*b^6 - 4*a^7*b^8 + a^5*b^10)*d*cos(d*x + c)^2 + 3*(a^14*b - 4*a^12*b^3 + 6*a^10*b^5 - 4*a^8*b^7 + a^6*b^9)*d*cos(d*x + c) + (a^15 - 4*a^13*b^2 + 6*a^11*b^4 - 4*a^9*b^6 + a^7*b^8)*d)]

Sympy [F]

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^4}\,dx$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))**4,x)
```

```
[Out] Integral(sec(c + d*x)/(a + b*cos(c + d*x))**4, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 554 vs. $2(236) = 472$.

Time = 0.35 (sec) , antiderivative size = 554, normalized size of antiderivative = 2.21

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \frac{\frac{3\left(8a^6b-8a^4b^3+7a^2b^5-2b^7\right)\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor\mathrm{sgn}(-2a+2b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{a^2-b^2}}\right)\right)}{\left(a^{10}-3a^8b^2+3a^6b^4-a^4b^6\right)\sqrt{a^2-b^2}} + \frac{36a^6b^2\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5-60a^5b}{}}{}$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/3*(3*(8*a^6*b - 8*a^4*b^3 + 7*a^2*b^5 - 2*b^7)*(pi*floor(1/2*(d*x + c)/pi
 + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1/2*d*x + 1/2*c) - b*tan(1/2*d*x +
 1/2*c))/sqrt(a^2 - b^2)))/((a^10 - 3*a^8*b^2 + 3*a^6*b^4 - a^4*b^6)*sqrt(a
^2 - b^2)) + (36*a^6*b^2*tan(1/2*d*x + 1/2*c)^5 - 60*a^5*b^3*tan(1/2*d*x +
1/2*c)^5 - 6*a^4*b^4*tan(1/2*d*x + 1/2*c)^5 + 45*a^3*b^5*tan(1/2*d*x + 1/2*
c)^5 - 6*a^2*b^6*tan(1/2*d*x + 1/2*c)^5 - 15*a*b^7*tan(1/2*d*x + 1/2*c)^5 +
 6*b^8*tan(1/2*d*x + 1/2*c)^5 + 72*a^6*b^2*tan(1/2*d*x + 1/2*c)^3 - 116*a^4
```

```
*b^4*tan(1/2*d*x + 1/2*c)^3 + 56*a^2*b^6*tan(1/2*d*x + 1/2*c)^3 - 12*b^8*ta
n(1/2*d*x + 1/2*c)^3 + 36*a^6*b^2*tan(1/2*d*x + 1/2*c) + 60*a^5*b^3*tan(1/2
*d*x + 1/2*c) - 6*a^4*b^4*tan(1/2*d*x + 1/2*c) - 45*a^3*b^5*tan(1/2*d*x + 1
/2*c) - 6*a^2*b^6*tan(1/2*d*x + 1/2*c) + 15*a*b^7*tan(1/2*d*x + 1/2*c) + 6*
b^8*tan(1/2*d*x + 1/2*c))/((a^9 - 3*a^7*b^2 + 3*a^5*b^4 - a^3*b^6)*(a*tan(1
/2*d*x + 1/2*c)^2 - b*tan(1/2*d*x + 1/2*c)^2 + a + b)^3) + 3*log(abs(tan(1/
2*d*x + 1/2*c) + 1))/a^4 - 3*log(abs(tan(1/2*d*x + 1/2*c) - 1))/a^4)/d
```

Mupad [B] (verification not implemented)

Time = 27.37 (sec) , antiderivative size = 7235, normalized size of antiderivative = 28.82

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \text{Too large to display}$$

```
[In] int(1/(cos(c + d*x)*(a + b*cos(c + d*x))^4),x)
```

```
[Out] - (atan((((((8*(16*a^20*b - 4*a^21 + 4*a^8*b^13 - 2*a^9*b^12 - 26*a^10*b^11
 + 14*a^11*b^10 + 70*a^12*b^9 - 30*a^13*b^8 - 110*a^14*b^7 + 30*a^15*b^6 +
110*a^16*b^5 - 20*a^17*b^4 - 64*a^18*b^3 + 12*a^19*b^2))/(a^19*b + a^20 - a
^9*b^11 - a^10*b^10 + 5*a^11*b^9 + 5*a^12*b^8 - 10*a^13*b^7 - 10*a^14*b^6 +
 10*a^15*b^5 + 10*a^16*b^4 - 5*a^17*b^3 - 5*a^18*b^2) - (8*tan(c/2 + (d*x)/
2)*(8*a^21*b - 8*a^8*b^14 + 8*a^9*b^13 + 48*a^10*b^12 - 48*a^11*b^11 - 120*
a^12*b^10 + 120*a^13*b^9 + 160*a^14*b^8 - 160*a^15*b^7 - 120*a^16*b^6 + 120
*a^17*b^5 + 48*a^18*b^4 - 48*a^19*b^3 - 8*a^20*b^2))/(a^4*(a^16*b + a^17 -
a^6*b^11 - a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - 10*a^10*b^7 - 10*a^11*b^6 + 1
0*a^12*b^5 + 10*a^13*b^4 - 5*a^14*b^3 - 5*a^15*b^2)))/a^4 - (8*tan(c/2 + (d
*x)/2)*(4*a^14 - 8*a^13*b - 8*a*b^13 + 8*b^14 - 48*a^2*b^12 + 48*a^3*b^11 +
 117*a^4*b^10 - 120*a^5*b^9 - 164*a^6*b^8 + 160*a^7*b^7 + 156*a^8*b^6 - 120
*a^9*b^5 - 92*a^10*b^4 + 48*a^11*b^3 + 44*a^12*b^2))/(a^16*b + a^17 - a^6*b
^11 - a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - 10*a^10*b^7 - 10*a^11*b^6 + 10*a^1
2*b^5 + 10*a^13*b^4 - 5*a^14*b^3 - 5*a^15*b^2))*1i)/a^4 - ((((8*(16*a^20*b
- 4*a^21 + 4*a^8*b^13 - 2*a^9*b^12 - 26*a^10*b^11 + 14*a^11*b^10 + 70*a^12*
b^9 - 30*a^13*b^8 - 110*a^14*b^7 + 30*a^15*b^6 + 110*a^16*b^5 - 20*a^17*b^4
 - 64*a^18*b^3 + 12*a^19*b^2))/(a^19*b + a^20 - a^9*b^11 - a^10*b^10 + 5*a^
11*b^9 + 5*a^12*b^8 - 10*a^13*b^7 - 10*a^14*b^6 + 10*a^15*b^5 + 10*a^16*b^4
 - 5*a^17*b^3 - 5*a^18*b^2) + (8*tan(c/2 + (d*x)/2)*(8*a^21*b - 8*a^8*b^14
+ 8*a^9*b^13 + 48*a^10*b^12 - 48*a^11*b^11 - 120*a^12*b^10 + 120*a^13*b^9 +
 160*a^14*b^8 - 160*a^15*b^7 - 120*a^16*b^6 + 120*a^17*b^5 + 48*a^18*b^4 -
48*a^19*b^3 - 8*a^20*b^2))/(a^4*(a^16*b + a^17 - a^6*b^11 - a^7*b^10 + 5*a^
8*b^9 + 5*a^9*b^8 - 10*a^10*b^7 - 10*a^11*b^6 + 10*a^12*b^5 + 10*a^13*b^4 -
 5*a^14*b^3 - 5*a^15*b^2)))/a^4 + (8*tan(c/2 + (d*x)/2)*(4*a^14 - 8*a^13*b
- 8*a*b^13 + 8*b^14 - 48*a^2*b^12 + 48*a^3*b^11 + 117*a^4*b^10 - 120*a^5*b^
9 - 164*a^6*b^8 + 160*a^7*b^7 + 156*a^8*b^6 - 120*a^9*b^5 - 92*a^10*b^4 + 4
8*a^11*b^3 + 44*a^12*b^2))/(a^16*b + a^17 - a^6*b^11 - a^7*b^10 + 5*a^8*b^9
```

+ 5*a^9*b^8 - 10*a^10*b^7 - 10*a^11*b^6 + 10*a^12*b^5 + 10*a^13*b^4 - 5*a^14*b^3 - 5*a^15*b^2))*1i)/a^4)/((((8*(16*a^20*b - 4*a^21 + 4*a^8*b^13 - 2*a^9*b^12 - 26*a^10*b^11 + 14*a^11*b^10 + 70*a^12*b^9 - 30*a^13*b^8 - 110*a^14*b^7 + 30*a^15*b^6 + 110*a^16*b^5 - 20*a^17*b^4 - 64*a^18*b^3 + 12*a^19*b^2))/(a^19*b + a^20 - a^9*b^11 - a^10*b^10 + 5*a^11*b^9 + 5*a^12*b^8 - 10*a^13*b^7 - 10*a^14*b^6 + 10*a^15*b^5 + 10*a^16*b^4 - 5*a^17*b^3 - 5*a^18*b^2) - (8*tan(c/2 + (d*x)/2)*(8*a^21*b - 8*a^8*b^14 + 8*a^9*b^13 + 48*a^10*b^12 - 48*a^11*b^11 - 120*a^12*b^10 + 120*a^13*b^9 + 160*a^14*b^8 - 160*a^15*b^7 - 120*a^16*b^6 + 120*a^17*b^5 + 48*a^18*b^4 - 48*a^19*b^3 - 8*a^20*b^2))/(a^4*(a^16*b + a^17 - a^6*b^11 - a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - 10*a^10*b^7 - 10*a^11*b^6 + 10*a^12*b^5 + 10*a^13*b^4 - 5*a^14*b^3 - 5*a^15*b^2)))/a^4 - (8*tan(c/2 + (d*x)/2)*(4*a^14 - 8*a^13*b - 8*a*b^13 + 8*b^14 - 48*a^2*b^12 + 48*a^3*b^11 + 117*a^4*b^10 - 120*a^5*b^9 - 164*a^6*b^8 + 160*a^7*b^7 + 156*a^8*b^6 - 120*a^9*b^5 - 92*a^10*b^4 + 48*a^11*b^3 + 44*a^12*b^2))/(a^16*b + a^17 - a^6*b^11 - a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - 10*a^10*b^7 - 10*a^11*b^6 + 10*a^12*b^5 + 10*a^13*b^4 - 5*a^14*b^3 - 5*a^15*b^2))/a^4 + (((8*(16*a^20*b - 4*a^21 + 4*a^8*b^13 - 2*a^9*b^12 - 26*a^10*b^11 + 14*a^11*b^10 + 70*a^12*b^9 - 30*a^13*b^8 - 110*a^14*b^7 + 30*a^15*b^6 + 110*a^16*b^5 - 20*a^17*b^4 - 64*a^18*b^3 + 12*a^19*b^2))/(a^19*b + a^20 - a^9*b^11 - a^10*b^10 + 5*a^11*b^9 + 5*a^12*b^8 - 10*a^13*b^7 - 10*a^14*b^6 + 10*a^15*b^5 + 10*a^16*b^4 - 5*a^17*b^3 - 5*a^18*b^2) + (8*tan(c/2 + (d*x)/2)*(8*a^21*b - 8*a^8*b^14 + 8*a^9*b^13 + 48*a^10*b^12 - 48*a^11*b^11 - 120*a^12*b^10 + 120*a^13*b^9 + 160*a^14*b^8 - 160*a^15*b^7 - 120*a^16*b^6 + 120*a^17*b^5 + 48*a^18*b^4 - 48*a^19*b^3 - 8*a^20*b^2))/(a^4*(a^16*b + a^17 - a^6*b^11 - a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - 10*a^10*b^7 - 10*a^11*b^6 + 10*a^12*b^5 + 10*a^13*b^4 - 5*a^14*b^3 - 5*a^15*b^2)))/a^4 + (8*tan(c/2 + (d*x)/2)*(4*a^14 - 8*a^13*b - 8*a*b^13 + 8*b^14 - 48*a^2*b^12 + 48*a^3*b^11 + 117*a^4*b^10 - 120*a^5*b^9 - 164*a^6*b^8 + 160*a^7*b^7 + 156*a^8*b^6 - 120*a^9*b^5 - 92*a^10*b^4 + 48*a^11*b^3 + 44*a^12*b^2))/(a^16*b + a^17 - a^6*b^11 - a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - 10*a^10*b^7 - 10*a^11*b^6 + 10*a^12*b^5 + 10*a^13*b^4 - 5*a^14*b^3 - 5*a^15*b^2))/a^4 - (16*(16*a^12*b - 2*a*b^12 + 4*b^13 - 26*a^2*b^11 + 11*a^3*b^10 + 70*a^4*b^9 - 34*a^5*b^8 - 110*a^6*b^7 + 66*a^7*b^6 + 110*a^8*b^5 - 64*a^9*b^4 - 64*a^10*b^3 + 48*a^11*b^2))/(a^19*b + a^20 - a^9*b^11 - a^10*b^10 + 5*a^11*b^9 + 5*a^12*b^8 - 10*a^13*b^7 - 10*a^14*b^6 + 10*a^15*b^5 + 10*a^16*b^4 - 5*a^17*b^3 - 5*a^18*b^2)))*2i)/(a^4*d) - ((tan(c/2 + (d*x)/2)^5*(2*b^6 - a*b^5 - 6*a^2*b^4 + 4*a^3*b^3 + 12*a^4*b^2))/((a^3*b - a^4)*(a + b)^3) - (4*tan(c/2 + (d*x)/2)^3*(3*b^6 - 11*a^2*b^4 + 18*a^4*b^2))/(3*(a + b)^2*(a^5 - 2*a^4*b + a^3*b^2)) + (tan(c/2 + (d*x)/2)*(a*b^5 + 2*b^6 - 6*a^2*b^4 - 4*a^3*b^3 + 12*a^4*b^2))/((a + b)*(3*a^5*b - a^6 + a^3*b^3 - 3*a^4*b^2)))/(d*(3*a*b^2 - tan(c/2 + (d*x)/2)^4*(3*a*b^2 + 3*a^2*b - 3*a^3 - 3*b^3) - tan(c/2 + (d*x)/2)^2*(3*a*b^2 - 3*a^2*b - 3*a^3 + 3*b^3) + 3*a^2*b + a^3 + b^3 + tan(c/2 + (d*x)/2)^6*(3*a*b^2 - 3*a^2*b + a^3 - b^3))) - (b*atan(((b*((8*tan(c/2 + (d*x)/2)*(4*a^14 - 8*a^13*b - 8*a*b^13 + 8*b^14 - 48*a^2*b^12 + 48*a^3*b^11 + 117*a^4*b^10 - 120*a^5*b^9 - 164*a^6*b^8 + 160*a^7*b^7 + 156*a^8*b^6 - 120*a^9*b^5 - 92*a^10*b^4 + 4

8*a^11*b^3 + 44*a^12*b^2))/(a^16*b + a^17 - a^6*b^11 - a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - 10*a^10*b^7 - 10*a^11*b^6 + 10*a^12*b^5 + 10*a^13*b^4 - 5*a^14*b^3 - 5*a^15*b^2) - (b*(-(a + b)^7*(a - b)^7)^(1/2)*((8*(16*a^20*b - 4*a^21 + 4*a^8*b^13 - 2*a^9*b^12 - 26*a^10*b^11 + 14*a^11*b^10 + 70*a^12*b^9 - 30*a^13*b^8 - 110*a^14*b^7 + 30*a^15*b^6 + 110*a^16*b^5 - 20*a^17*b^4 - 64*a^18*b^3 + 12*a^19*b^2))/(a^19*b + a^20 - a^9*b^11 - a^10*b^10 + 5*a^11*b^9 + 5*a^12*b^8 - 10*a^13*b^7 - 10*a^14*b^6 + 10*a^15*b^5 + 10*a^16*b^4 - 5*a^17*b^3 - 5*a^18*b^2) - (4*b*tan(c/2 + (d*x)/2)*(-(a + b)^7*(a - b)^7)^(1/2)*(8*a^6 - 2*b^6 + 7*a^2*b^4 - 8*a^4*b^2)*(8*a^21*b - 8*a^8*b^14 + 8*a^9*b^13 + 48*a^10*b^12 - 48*a^11*b^11 - 120*a^12*b^10 + 120*a^13*b^9 + 160*a^14*b^8 - 160*a^15*b^7 - 120*a^16*b^6 + 120*a^17*b^5 + 48*a^18*b^4 - 48*a^19*b^3 - 8*a^20*b^2))/((a^18 - a^4*b^14 + 7*a^6*b^12 - 21*a^8*b^10 + 35*a^10*b^8 - 35*a^12*b^6 + 21*a^14*b^4 - 7*a^16*b^2)*(a^16*b + a^17 - a^6*b^11 - a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - 10*a^10*b^7 - 10*a^11*b^6 + 10*a^12*b^5 + 10*a^13*b^4 - 5*a^14*b^3 - 5*a^15*b^2)))*(8*a^6 - 2*b^6 + 7*a^2*b^4 - 8*a^4*b^2))/(2*(a^18 - a^4*b^14 + 7*a^6*b^12 - 21*a^8*b^10 + 35*a^10*b^8 - 35*a^12*b^6 + 21*a^14*b^4 - 7*a^16*b^2)))*(-(a + b)^7*(a - b)^7)^(1/2)*(8*a^6 - 2*b^6 + 7*a^2*b^4 - 8*a^4*b^2)*1i)/(2*(a^18 - a^4*b^14 + 7*a^6*b^12 - 21*a^8*b^10 + 35*a^10*b^8 - 35*a^12*b^6 + 21*a^14*b^4 - 7*a^16*b^2)) + (b*((8*tan(c/2 + (d*x)/2)*(4*a^14 - 8*a^13*b - 8*a*b^13 + 8*b^14 - 48*a^2*b^12 + 48*a^3*b^11 + 117*a^4*b^10 - 120*a^5*b^9 - 164*a^6*b^8 + 160*a^7*b^7 + 156*a^8*b^6 - 120*a^9*b^5 - 92*a^10*b^4 + 48*a^11*b^3 + 44*a^12*b^2))/(a^16*b + a^17 - a^6*b^11 - a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - 10*a^10*b^7 - 10*a^11*b^6 + 10*a^12*b^5 + 10*a^13*b^4 - 5*a^14*b^3 - 5*a^15*b^2) + (b*(-(a + b)^7*(a - b)^7)^(1/2)*((8*(16*a^20*b - 4*a^21 + 4*a^8*b^13 - 2*a^9*b^12 - 26*a^10*b^11 + 14*a^11*b^10 + 70*a^12*b^9 - 30*a^13*b^8 - 110*a^14*b^7 + 30*a^15*b^6 + 110*a^16*b^5 - 20*a^17*b^4 - 64*a^18*b^3 + 12*a^19*b^2))/(a^19*b + a^20 - a^9*b^11 - a^10*b^10 + 5*a^11*b^9 + 5*a^12*b^8 - 10*a^13*b^7 - 10*a^14*b^6 + 10*a^15*b^5 + 10*a^16*b^4 - 5*a^17*b^3 - 5*a^18*b^2) + (4*b*tan(c/2 + (d*x)/2)*(-(a + b)^7*(a - b)^7)^(1/2)*(8*a^6 - 2*b^6 + 7*a^2*b^4 - 8*a^4*b^2)*(8*a^21*b - 8*a^8*b^14 + 8*a^9*b^13 + 48*a^10*b^12 - 48*a^11*b^11 - 120*a^12*b^10 + 120*a^13*b^9 + 160*a^14*b^8 - 160*a^15*b^7 - 120*a^16*b^6 + 120*a^17*b^5 + 48*a^18*b^4 - 48*a^19*b^3 - 8*a^20*b^2))/((a^18 - a^4*b^14 + 7*a^6*b^12 - 21*a^8*b^10 + 35*a^10*b^8 - 35*a^12*b^6 + 21*a^14*b^4 - 7*a^16*b^2)*(a^16*b + a^17 - a^6*b^11 - a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - 10*a^10*b^7 - 10*a^11*b^6 + 10*a^12*b^5 + 10*a^13*b^4 - 5*a^14*b^3 - 5*a^15*b^2)))*(8*a^6 - 2*b^6 + 7*a^2*b^4 - 8*a^4*b^2))/(2*(a^18 - a^4*b^14 + 7*a^6*b^12 - 21*a^8*b^10 + 35*a^10*b^8 - 35*a^12*b^6 + 21*a^14*b^4 - 7*a^16*b^2)))*(-(a + b)^7*(a - b)^7)^(1/2)*(8*a^6 - 2*b^6 + 7*a^2*b^4 - 8*a^4*b^2)*1i)/(2*(a^18 - a^4*b^14 + 7*a^6*b^12 - 21*a^8*b^10 + 35*a^10*b^8 - 35*a^12*b^6 + 21*a^14*b^4 - 7*a^16*b^2)))/((16*(16*a^12*b - 2*a*b^12 + 4*b^13 - 26*a^2*b^11 + 11*a^3*b^10 + 70*a^4*b^9 - 34*a^5*b^8 - 110*a^6*b^7 + 66*a^7*b^6 + 110*a^8*b^5 - 64*a^9*b^4 - 64*a^10*b^3 + 48*a^11*b^2))/(a^19*b + a^20 - a^9*b^11 - a^10*b^10 + 5*a^11*b^9 + 5*a^12*b^8 - 10*a^13*b^7 - 10*a^14*b^6 + 10*a^15*b^5 + 10*a^16*b^4 - 5*a^17*b^3 - 5*a^18*b^2) + (b*((8*tan(c/2 + (d*x)/2)*(4 *a^14 - 8*a^13*b - 8*a*b^13 + 8*b^14 - 48*a^2*b^12 + 48*a^3*b^11 + 117*a^4*b^10 - 120*a^5*b^9 - 164*a^6*b^8 + 160*a^7*b^7 + 156*a^8*b^6 - 120*a^9*b^5 - 92*a^10*b^4 + 48*a^11*b^3 + 44*a^12*b^2))/(a^16*b + a^17 - a^6*b^11 - a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - 10*a^10*b^7 - 10*a^11*b^6 + 10*a^12*b^5 + 10*a^13*b^4 - 5*a^14*b^3 - 5*a^15*b^2) - (b*(-(a + b)^7*(a - b)^7)^(1/2)*((8*(16*a^20*b - 4*a^21 + 4*a^8*b^13 - 2*a^9*b^12 - 26*a^10*b^11 + 14*a^11*b^10 + 70*a^12*b^9 - 30*a^13*b^8 - 110*a^14*b^7 + 30*a^15*b^6 + 110*a^16*b^5 - 20*a^17*b^4 - 64*a^18*b^3 + 12*a^19*b^2))/(a^19*b + a^20 - a^9*b^11 - a^10*b^10 + 5*a^11*b^9 + 5*a^12*b^8 - 10*a^13*b^7 - 10*a^14*b^6 + 10*a^15*b^5 + 10*a^16*b^4 - 5*a^17*b^3 - 5*a^18*b^2) - (4*b*tan(c/2 + (d*x)/2)*(-(a + b)^7*(a - b)^7)^(1/2)*(8*a^6 - 2*b^6 + 7*a^2*b^4 - 8*a^4*b^2)*(8*a^21*b - 8*a^8*b^14 + 8*a^9*b^13 + 48*a^10*b^12 - 48*a^11*b^11 - 120*a^12*b^10 + 120*a^13*b^9 + 160*a^14*b^8 - 160*a^15*b^7 - 120*a^16*b^6 + 120*a^17*b^5 + 48*a^18*b^4 - 48*a^19*b^3 - 8*a^20*b^2))/((a^18 - a^4*b^14 + 7*a^6*b^12 - 21*a^8*b^10 + 35*a^10*b^8 - 35*a^12*b^6 + 21*a^14*b^4 - 7*a^16*b^2)*(a^16*b + a^17 - a^6*b^11 - a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - 10*a^10*b^7 - 10*a^11*b^6 + 10*a^12*b^5 + 10*a^13*b^4 - 5*a^14*b^3 - 5*a^15*b^2)))*(8*a^6 - 2*b^6 + 7*a^2*b^4 - 8*a^4*b^2))/(2*(a^18 - a^4*b^14 + 7*a^6*b^12 - 21*a^8*b^10 + 35*a^10*b^8 - 35*a^12*b^6 + 21*a^14*b^4 - 7*a^16*b^2)))*(-(a + b)^7*(a - b)^7)^(1/2)*(8*a^6 - 2*b^6 + 7*a^2*b^4 - 8*a^4*b^2))/(2*(a^18 - a^4*b^14 + 7*a^6*b^12 - 21*a^8*b^10 + 35*a^10*b^8 - 35*a^12*b^6 + 21*a^14*b^4 - 7*a^16*b^2)) - (b*((8*tan(c/2 + (d*x)/2)*(4*a^14 - 8*a^13*b - 8*a*b^13 + 8*b^14 - 48*a^2*b^12 + 48*a^3*b^11 + 117*a^4*b^10 - 120*a^5*b^9 - 164*a^6*b^8 + 160*a^7*b^7 + 156*a^8*b^6 - 120*a^9*b^5 - 92*a^10*b^4 + 48*a^11*b^3 + 44*a^12*b^2))/(a^16*b + a^17 - a^6*b^11 - a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - 10*a^10*b^7 - 10*a^11*b^6 + 10*a^12*b^5 + 10*a^13*b^4 - 5*a^14*b^3 - 5*a^15*b^2) + (b*(-(a + b)^7*(a - b)^7)^(1/2)*((8*(16*a^20*b - 4*a^21 + 4*a^8*b^13 - 2*a^9*b^12 - 26*a^10*b^11 + 14*a^11*b^10 + 70*a^12*b^9 - 30*a^13*b^8 - 110*a^14*b^7 + 30*a^15*b^6 + 110*a^16*b^5 - 20*a^17*b^4 - 64*a^18*b^3 + 12*a^19*b^2))/(a^19*b + a^20 - a^9*b^11 - a^10*b^10 + 5*a^11*b^9 + 5*a^12*b^8 - 10*a^13*b^7 - 10*a^14*b^6 + 10*a^15*b^5 + 10*a^16*b^4 - 5*a^17*b^3 - 5*a^18*b^2) + (4*b*tan(c/2 + (d*x)/2)*(-(a + b)^7*(a - b)^7)^(1/2)*(8*a^6 - 2*b^6 + 7*a^2*b^4 - 8*a^4*b^2)*(8*a^21*b - 8*a^8*b^14 + 8*a^9*b^13 + 48*a^10*b^12 - 48*a^11*b^11 - 120*a^12*b^10 + 120*a^13*b^9 + 160*a^14*b^8 - 160*a^15*b^7 - 120*a^16*b^6 + 120*a^17*b^5 + 48*a^18*b^4 - 48*a^19*b^3 - 8*a^20*b^2))/((a^18 - a^4*b^14 + 7*a^6*b^12 - 21*a^8*b^10 + 35*a^10*b^8 - 35*a^12*b^6 + 21*a^14*b^4 - 7*a^16*b^2)*(a^16*b + a^17 - a^6*b^11 - a^7*b^10 + 5*a^8*b^9 + 5*a^9*b^8 - 10*a^10*b^7 - 10*a^11*b^6 + 10*a^12*b^5 + 10*a^13*b^4 - 5*a^14*b^3 - 5*a^15*b^2)))*(8*a^6 - 2*b^6 + 7*a^2*b^4 - 8*a^4*b^2))/(2*(a^18 - a^4*b^14 + 7*a^6*b^12 - 21*a^8*b^10 + 35*a^10*b^8 - 35*a^12*b^6 + 21*a^14*b^4 - 7*a^16*b^2)))*(-(a + b)^7*(a - b)^7)^(1/2)*(8*a^6 - 2*b^6 + 7*a^2*b^4 - 8*a^4*b^2))/(2*(a^18 - a^4*b^14 + 7*a^6*b^12 - 21*a^8*b^10 + 35*a^10*b^8 - 35*a^12*b^6 + 21*a^14*b^4 - 7*a^16*b^2))))*(-(a + b)^7*(a - b)^7)^(1/2)*(8*a^6 - 2*b^6 + 7*a^2*b^4 - 8*a^4*b^2)*1i)/(d*(a^18 - a^4*b^14 + 7*a^6*b^12 - 21*a^8*b^10 + 35*a^10*b^8 - 35*a^12*b^6 + 21*a^14*b^4 - 7*a^16*b^2))

3.485 $\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^4}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 308

$$\begin{aligned}\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^4}\,dx &= \frac{b^2(20a^6-35a^4b^2+28a^2b^4-8b^6)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^5(a-b)^{7/2}(a+b)^{7/2}d}\\ &\quad-\frac{4b\text{arctanh}(\sin(c+dx))}{a^5d}\\ &\quad+\frac{(6a^6-65a^4b^2+68a^2b^4-24b^6)\tan(c+dx)}{6a^4(a^2-b^2)^3d}\\ &\quad+\frac{b^2\tan(c+dx)}{3a(a^2-b^2)d(a+b\cos(c+dx))^3}\\ &\quad+\frac{b^2(9a^2-4b^2)\tan(c+dx)}{6a^2(a^2-b^2)^2d(a+b\cos(c+dx))^2}\\ &\quad+\frac{b^2(12a^4-11a^2b^2+4b^4)\tan(c+dx)}{2a^3(a^2-b^2)^3d(a+b\cos(c+dx))}\end{aligned}$$

```
[Out] b^2*(20*a^6-35*a^4*b^2+28*a^2*b^4-8*b^6)*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2
*c)/(a+b)^(1/2))/a^5/(a-b)^(7/2)/(a+b)^(7/2)/d-4*b*arctanh(sin(d*x+c))/a^5/
d+1/6*(6*a^6-65*a^4*b^2+68*a^2*b^4-24*b^6)*tan(d*x+c)/a^4/(a^2-b^2)^3/d+1/3
*b^2*tan(d*x+c)/a/(a^2-b^2)/d/(a+b*cos(d*x+c))^3+1/6*b^2*(9*a^2-4*b^2)*tan(
d*x+c)/a^2/(a^2-b^2)^2/d/(a+b*cos(d*x+c))^2+1/2*b^2*(12*a^4-11*a^2*b^2+4*b^
4)*tan(d*x+c)/a^3/(a^2-b^2)^3/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 1.39 (sec) , antiderivative size = 308, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2881, 3134, 3080, 3855, 2738, 211}

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^4}\,dx = -\frac{4b\text{arctanh}(\sin(c+dx))}{a^5d} + \frac{b^2(9a^2-4b^2)\tan(c+dx)}{6a^2d(a^2-b^2)^2(a+b\cos(c+dx))^2} + \frac{b^2\tan(c+dx)}{3ad(a^2-b^2)(a+b\cos(c+dx))^3} + \frac{(6a^6-65a^4b^2+68a^2b^4-24b^6)\tan(c+dx)}{6a^4d(a^2-b^2)^3} + \frac{b^2(12a^4-11a^2b^2+4b^4)\tan(c+dx)}{2a^3d(a^2-b^2)^3(a+b\cos(c+dx))} + \frac{b^2(20a^6-35a^4b^2+28a^2b^4-8b^6)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^5d(a-b)^{7/2}(a+b)^{7/2}}$$

```
[In] Int[Sec[c + d*x]^2/(a + b*Cos[c + d*x])^4,x]
```

```
[Out] (b^2*(20*a^6 - 35*a^4*b^2 + 28*a^2*b^4 - 8*b^6)*ArcTan[(Sqrt[a - b]*Tan[(c
+ d*x)/2])/Sqrt[a + b]])/(a^5*(a - b)^(7/2)*(a + b)^(7/2)*d) - (4*b*ArcTanh
[Sin[c + d*x]])/(a^5*d) + ((6*a^6 - 65*a^4*b^2 + 68*a^2*b^4 - 24*b^6)*Tan[c
 + d*x])/(6*a^4*(a^2 - b^2)^3*d) + (b^2*Tan[c + d*x])/(3*a*(a^2 - b^2)*d*(a
 + b*Cos[c + d*x])^3) + (b^2*(9*a^2 - 4*b^2)*Tan[c + d*x])/(6*a^2*(a^2 - b^
2)^2*d*(a + b*Cos[c + d*x])^2) + (b^2*(12*a^4 - 11*a^2*b^2 + 4*b^4)*Tan[c +
 d*x])/(2*a^3*(a^2 - b^2)^3*d*(a + b*Cos[c + d*x]))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
```

```
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] && !IntegerQ[n]) || !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] && !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 3080

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[(A*b
- a*B)/(b*c - a*d), Int[1/(a + b*Sin[e + f*x]), x], x] + Dist[(B*c - A*d)/(
b*c - a*d), Int[1/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f,
A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] && !IntegerQ[
n]) || !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] && !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{b^2\tan(c+dx)}{3a\,(a^2-b^2)\,d(a+b\cos(c+dx))^3}+\frac{\int \frac{(3a^2-4b^2-3ab\cos(c+dx)+3b^2\cos^2(c+dx))\sec^2(c+dx)}{(a+b\cos(c+dx))^3}\,dx}{3a\,(a^2-b^2)} \\
&= \frac{b^2\tan(c+dx)}{3a\,(a^2-b^2)\,d(a+b\cos(c+dx))^3}+\frac{b^2(9a^2-4b^2)\tan(c+dx)}{6a^2\,(a^2-b^2)^2\,d(a+b\cos(c+dx))^2} \\
&\quad+\frac{\int \frac{(6a^4-23a^2b^2+12b^4-2ab(6a^2-b^2)\cos(c+dx)+2b^2(9a^2-4b^2)\cos^2(c+dx))\sec^2(c+dx)}{(a+b\cos(c+dx))^2}\,dx}{6a^2\,(a^2-b^2)^2}
\end{aligned}$$

$$=\frac{b^2\tan(c+dx)}{3a(a^2-b^2)d(a+b\cos(c+dx))^3}+\frac{b^2(9a^2-4b^2)\tan(c+dx)}{6a^2(a^2-b^2)^2d(a+b\cos(c+dx))^2}+\frac{b^2(12a^4-11a^2b^2+4b^4)\tan(c+dx)}{2a^3(a^2-b^2)^3d(a+b\cos(c+dx))}+\frac{\int\frac{(6a^6-65a^4b^2+68a^2b^4-24b^6-ab(18a^4-7a^2b^2+4b^4)\cos(c+dx)+3b^2(12a^4-11a^2b^2+4b^4)\cos^2(c+dx))\sec^2(c+dx)}{a+b\cos(c+dx)}dx}{6a^3(a^2-b^2)^3}$$

$$=\frac{(6a^6-65a^4b^2+68a^2b^4-24b^6)\tan(c+dx)}{6a^4(a^2-b^2)^3d}+\frac{b^2\tan(c+dx)}{3a(a^2-b^2)d(a+b\cos(c+dx))^3}+\frac{b^2(9a^2-4b^2)\tan(c+dx)}{6a^2(a^2-b^2)^2d(a+b\cos(c+dx))^2}+\frac{b^2(12a^4-11a^2b^2+4b^4)\tan(c+dx)}{2a^3(a^2-b^2)^3d(a+b\cos(c+dx))}+\frac{\int\frac{\left(-24b(a^2-b^2)^3+3ab^2(12a^4-11a^2b^2+4b^4)\cos(c+dx)\right)\sec(c+dx)}{a+b\cos(c+dx)}dx}{6a^4(a^2-b^2)^3}$$

$$=\frac{(6a^6-65a^4b^2+68a^2b^4-24b^6)\tan(c+dx)}{6a^4(a^2-b^2)^3d}+\frac{b^2\tan(c+dx)}{3a(a^2-b^2)d(a+b\cos(c+dx))^3}+\frac{b^2(9a^2-4b^2)\tan(c+dx)}{6a^2(a^2-b^2)^2d(a+b\cos(c+dx))^2}+\frac{b^2(12a^4-11a^2b^2+4b^4)\tan(c+dx)}{2a^3(a^2-b^2)^3d(a+b\cos(c+dx))}-\frac{(4b)\int\sec(c+dx)\,dx}{a^5}+\frac{(b^2(20a^6-35a^4b^2+28a^2b^4-8b^6))\int\frac{1}{a+b\cos(c+dx)}dx}{2a^5(a^2-b^2)^3}$$

$$=-\frac{4b\text{arctanh}(\sin(c+dx))}{a^5d}+\frac{(6a^6-65a^4b^2+68a^2b^4-24b^6)\tan(c+dx)}{6a^4(a^2-b^2)^3d}+\frac{b^2\tan(c+dx)}{3a(a^2-b^2)d(a+b\cos(c+dx))^3}+\frac{b^2(9a^2-4b^2)\tan(c+dx)}{6a^2(a^2-b^2)^2d(a+b\cos(c+dx))^2}+\frac{b^2(12a^4-11a^2b^2+4b^4)\tan(c+dx)}{2a^3(a^2-b^2)^3d(a+b\cos(c+dx))}+\frac{(b^2(20a^6-35a^4b^2+28a^2b^4-8b^6))\text{Subst}\left(\int\frac{1}{a+b+(a-b)x^2}dx,x,\tan\left(\frac{1}{2}(c+dx)\right)\right)}{a^5(a^2-b^2)^3d}$$

$$=\frac{b^2(20a^6-35a^4b^2+28a^2b^4-8b^6)\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{a^5(a-b)^{7/2}(a+b)^{7/2}d}-\frac{4b\text{arctanh}(\sin(c+dx))}{a^5d}+\frac{(6a^6-65a^4b^2+68a^2b^4-24b^6)\tan(c+dx)}{6a^4(a^2-b^2)^3d}+\frac{b^2\tan(c+dx)}{3a(a^2-b^2)d(a+b\cos(c+dx))^3}+\frac{b^2(9a^2-4b^2)\tan(c+dx)}{6a^2(a^2-b^2)^2d(a+b\cos(c+dx))^2}+\frac{b^2(12a^4-11a^2b^2+4b^4)\tan(c+dx)}{2a^3(a^2-b^2)^3d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 6.58 (sec) , antiderivative size = 416, normalized size of antiderivative = 1.35

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^4}\,dx = -\frac{b^2(20a^6-35a^4b^2+28a^2b^4-8b^6)\,\text{arctanh}\left(\frac{(a-b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)}{a^5\left(a^2-b^2\right)^3\sqrt{-a^2+b^2}d} + \frac{4b\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)}{a^5d} - \frac{4b\log\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)}{a^5d} + \frac{\sin\left(\frac{1}{2}(c+dx)\right)}{a^4d\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)} + \frac{\sin\left(\frac{1}{2}(c+dx)\right)}{a^4d\left(\cos\left(\frac{1}{2}(c+dx)\right)+\sin\left(\frac{1}{2}(c+dx)\right)\right)} - \frac{b^3\sin(c+dx)}{3a^2(a-b)(a+b)d(a+b\cos(c+dx))^3} + \frac{-11a^2b^3\sin(c+dx)+6b^5\sin(c+dx)}{6a^3(a-b)^2(a+b)^2d(a+b\cos(c+dx))^2} + \frac{-47a^4b^3\sin(c+dx)+50a^2b^5\sin(c+dx)-18b^7\sin(c+dx)}{6a^4(a-b)^3(a+b)^3d(a+b\cos(c+dx))}$$

```
[In] Integrate[Sec[c + d*x]^2/(a + b*Cos[c + d*x])^4,x]
```

```
[Out] -((b^2*(20*a^6 - 35*a^4*b^2 + 28*a^2*b^4 - 8*b^6)*ArcTanh[((a - b)*Tan[(c +
 d*x)/2])/Sqrt[-a^2 + b^2]])/(a^5*(a^2 - b^2)^3*Sqrt[-a^2 + b^2]*d)) + (4*b
*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]])/(a^5*d) - (4*b*Log[Cos[(c + d*x)
/2] + Sin[(c + d*x)/2]])/(a^5*d) + Sin[(c + d*x)/2]/(a^4*d*(Cos[(c + d*x)/2
] - Sin[(c + d*x)/2])) + Sin[(c + d*x)/2]/(a^4*d*(Cos[(c + d*x)/2] + Sin[(c
 + d*x)/2])) - (b^3*Sin[c + d*x])/(3*a^2*(a - b)*(a + b)*d*(a + b*Cos[c + d
*x])^3) + (-11*a^2*b^3*Sin[c + d*x] + 6*b^5*Sin[c + d*x])/(6*a^3*(a - b)^2*
(a + b)^2*d*(a + b*Cos[c + d*x])^2) + (-47*a^4*b^3*Sin[c + d*x] + 50*a^2*b^
5*Sin[c + d*x] - 18*b^7*Sin[c + d*x])/(6*a^4*(a - b)^3*(a + b)^3*d*(a + b*C
os[c + d*x]))
```

Maple [A] (verified)

Time = 2.62 (sec) , antiderivative size = 421, normalized size of antiderivative = 1.37

method	result
derivativedivides	$\frac{2b^2\left(\frac{-\frac{(20a^4+5a^3b-18a^2b^2-2a\,b^3+6b^4)ab\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)(a^3+3a^2b+3a\,b^2+b^3)}-\frac{2(30a^4-29a^2b^2+9b^4)ab\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3(a^2-2ab+b^2)(a^2+2ab+b^2)}-\frac{(20a^4-5a^3b-18a^2b^2+2}{2(a+b)(a^3-3a}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^3}\right.}{a^5}$
default	$\frac{2b^2\left(\frac{-\frac{(20a^4+5a^3b-18a^2b^2-2a\,b^3+6b^4)ab\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a-b)(a^3+3a^2b+3a\,b^2+b^3)}-\frac{2(30a^4-29a^2b^2+9b^4)ab\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3(a^2-2ab+b^2)(a^2+2ab+b^2)}-\frac{(20a^4-5a^3b-18a^2b^2+2}{2(a+b)(a^3-3a}}{\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b\right)^3}\right.}{a^5}$
risch	Expression too large to display

```
[In] int(sec(d*x+c)^2/(a+cos(d*x+c)*b)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(2*b^2/a^5*((-1/2*(20*a^4+5*a^3*b-18*a^2*b^2-2*a*b^3+6*b^4)*a*b/(a-b)/(
a^3+3*a^2*b+3*a*b^2+b^3)*tan(1/2*d*x+1/2*c)^5-2/3*(30*a^4-29*a^2*b^2+9*b^4)
*a*b/(a^2-2*a*b+b^2)/(a^2+2*a*b+b^2)*tan(1/2*d*x+1/2*c)^3-1/2*(20*a^4-5*a^3
*b-18*a^2*b^2+2*a*b^3+6*b^4)*a*b/(a+b)/(a^3-3*a^2*b+3*a*b^2-b^3)*tan(1/2*d*
x+1/2*c))/(tan(1/2*d*x+1/2*c)^2*a-b*tan(1/2*d*x+1/2*c)^2+a+b)^3+1/2*(20*a^6
-35*a^4*b^2+28*a^2*b^4-8*b^6)/(a^6-3*a^4*b^2+3*a^2*b^4-b^6)/((a-b)*(a+b))^(
1/2)*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2)))-1/a^4/(tan(1/2*d
*x+1/2*c)+1)-4*b/a^5*ln(tan(1/2*d*x+1/2*c)+1)-1/a^4/(tan(1/2*d*x+1/2*c)-1)+
4*b/a^5*ln(tan(1/2*d*x+1/2*c)-1))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 989 vs. $2(291) = 582$.

Time = 1.69 (sec) , antiderivative size = 2048, normalized size of antiderivative = 6.65

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \text{Too large to display}$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] [-1/12*(3*((20*a^6*b^5 - 35*a^4*b^7 + 28*a^2*b^9 - 8*b^11)*cos(d*x + c)^4 +
 3*(20*a^7*b^4 - 35*a^5*b^6 + 28*a^3*b^8 - 8*a*b^10)*cos(d*x + c)^3 + 3*(20
*a^8*b^3 - 35*a^6*b^5 + 28*a^4*b^7 - 8*a^2*b^9)*cos(d*x + c)^2 + (20*a^9*b^
2 - 35*a^7*b^4 + 28*a^5*b^6 - 8*a^3*b^8)*cos(d*x + c))*sqrt(-a^2 + b^2)*log
((2*a*b*cos(d*x + c) + (2*a^2 - b^2)*cos(d*x + c)^2 + 2*sqrt(-a^2 + b^2)*(a
*cos(d*x + c) + b)*sin(d*x + c) - a^2 + 2*b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*
```

cos(d*x + c) + a^2)) + 24*((a^8*b^4 - 4*a^6*b^6 + 6*a^4*b^8 - 4*a^2*b^10 + b^12)*cos(d*x + c)^4 + 3*(a^9*b^3 - 4*a^7*b^5 + 6*a^5*b^7 - 4*a^3*b^9 + a*b ^11)*cos(d*x + c)^3 + 3*(a^10*b^2 - 4*a^8*b^4 + 6*a^6*b^6 - 4*a^4*b^8 + a^2 *b^10)*cos(d*x + c)^2 + (a^11*b - 4*a^9*b^3 + 6*a^7*b^5 - 4*a^5*b^7 + a^3*b ^9)*cos(d*x + c))*log(sin(d*x + c) + 1) - 24*((a^8*b^4 - 4*a^6*b^6 + 6*a^4* b^8 - 4*a^2*b^10 + b^12)*cos(d*x + c)^4 + 3*(a^9*b^3 - 4*a^7*b^5 + 6*a^5*b^ 7 - 4*a^3*b^9 + a*b^11)*cos(d*x + c)^3 + 3*(a^10*b^2 - 4*a^8*b^4 + 6*a^6*b^ 6 - 4*a^4*b^8 + a^2*b^10)*cos(d*x + c)^2 + (a^11*b - 4*a^9*b^3 + 6*a^7*b^5 - 4*a^5*b^7 + a^3*b^9)*cos(d*x + c))*log(-sin(d*x + c) + 1) - 2*(6*a^12 - 2 4*a^10*b^2 + 36*a^8*b^4 - 24*a^6*b^6 + 6*a^4*b^8 + (6*a^9*b^3 - 71*a^7*b^5 + 133*a^5*b^7 - 92*a^3*b^9 + 24*a*b^11)*cos(d*x + c)^3 + 3*(6*a^10*b^2 - 59 *a^8*b^4 + 110*a^6*b^6 - 77*a^4*b^8 + 20*a^2*b^10)*cos(d*x + c)^2 + (18*a^1 1*b - 132*a^9*b^3 + 239*a^7*b^5 - 169*a^5*b^7 + 44*a^3*b^9)*cos(d*x + c))*s in(d*x + c))/((a^13*b^3 - 4*a^11*b^5 + 6*a^9*b^7 - 4*a^7*b^9 + a^5*b^11)*d* cos(d*x + c)^4 + 3*(a^14*b^2 - 4*a^12*b^4 + 6*a^10*b^6 - 4*a^8*b^8 + a^6*b^ 10)*d*cos(d*x + c)^3 + 3*(a^15*b - 4*a^13*b^3 + 6*a^11*b^5 - 4*a^9*b^7 + a^ 7*b^9)*d*cos(d*x + c)^2 + (a^16 - 4*a^14*b^2 + 6*a^12*b^4 - 4*a^10*b^6 + a^ 8*b^8)*d*cos(d*x + c)), 1/6*(3*((20*a^6*b^5 - 35*a^4*b^7 + 28*a^2*b^9 - 8*b ^11)*cos(d*x + c)^4 + 3*(20*a^7*b^4 - 35*a^5*b^6 + 28*a^3*b^8 - 8*a*b^10)*c os(d*x + c)^3 + 3*(20*a^8*b^3 - 35*a^6*b^5 + 28*a^4*b^7 - 8*a^2*b^9)*cos(d* x + c)^2 + (20*a^9*b^2 - 35*a^7*b^4 + 28*a^5*b^6 - 8*a^3*b^8)*cos(d*x + c)) *sqrt(a^2 - b^2)*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(d*x + c))) - 12*((a^8*b^4 - 4*a^6*b^6 + 6*a^4*b^8 - 4*a^2*b^10 + b^12)*cos(d*x + c) ^4 + 3*(a^9*b^3 - 4*a^7*b^5 + 6*a^5*b^7 - 4*a^3*b^9 + a*b^11)*cos(d*x + c)^ 3 + 3*(a^10*b^2 - 4*a^8*b^4 + 6*a^6*b^6 - 4*a^4*b^8 + a^2*b^10)*cos(d*x + c)^2 + (a^11*b - 4*a^9*b^3 + 6*a^7*b^5 - 4*a^5*b^7 + a^3*b^9)*cos(d*x + c))* log(sin(d*x + c) + 1) + 12*((a^8*b^4 - 4*a^6*b^6 + 6*a^4*b^8 - 4*a^2*b^10 + b^12)*cos(d*x + c)^4 + 3*(a^9*b^3 - 4*a^7*b^5 + 6*a^5*b^7 - 4*a^3*b^9 + a* b^11)*cos(d*x + c)^3 + 3*(a^10*b^2 - 4*a^8*b^4 + 6*a^6*b^6 - 4*a^4*b^8 + a^ 2*b^10)*cos(d*x + c)^2 + (a^11*b - 4*a^9*b^3 + 6*a^7*b^5 - 4*a^5*b^7 + a^3* b^9)*cos(d*x + c))*log(-sin(d*x + c) + 1) + (6*a^12 - 24*a^10*b^2 + 36*a^8* b^4 - 24*a^6*b^6 + 6*a^4*b^8 + (6*a^9*b^3 - 71*a^7*b^5 + 133*a^5*b^7 - 92*a ^3*b^9 + 24*a*b^11)*cos(d*x + c)^3 + 3*(6*a^10*b^2 - 59*a^8*b^4 + 110*a^6*b ^6 - 77*a^4*b^8 + 20*a^2*b^10)*cos(d*x + c)^2 + (18*a^11*b - 132*a^9*b^3 + 239*a^7*b^5 - 169*a^5*b^7 + 44*a^3*b^9)*cos(d*x + c))*sin(d*x + c))/((a^13* b^3 - 4*a^11*b^5 + 6*a^9*b^7 - 4*a^7*b^9 + a^5*b^11)*d*cos(d*x + c)^4 + 3*(a^14*b^2 - 4*a^12*b^4 + 6*a^10*b^6 - 4*a^8*b^8 + a^6*b^10)*d*cos(d*x + c)^3 + 3*(a^15*b - 4*a^13*b^3 + 6*a^11*b^5 - 4*a^9*b^7 + a^7*b^9)*d*cos(d*x + c)^2 + (a^16 - 4*a^14*b^2 + 6*a^12*b^4 - 4*a^10*b^6 + a^8*b^8)*d*cos(d*x + c))]

Sympy [F]

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \int \frac{\sec^2{(c+dx)}}{(a+b\cos{(c+dx)})^4}\,dx$$

```
[In] integrate(sec(d*x+c)**2/(a+b*cos(d*x+c))**4,x)
```

```
[Out] Integral(sec(c + d*x)**2/(a + b*cos(c + d*x))**4, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 587 vs. $2(291) = 582$.

Time = 0.38 (sec) , antiderivative size = 587, normalized size of antiderivative = 1.91

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^4}\,dx = -\frac{\frac{3\,(20\,a^6b^2-35\,a^4b^4+28\,a^2b^6-8\,b^8)\left(\pi\left\lfloor\frac{dx+c}{2\,\pi}+\frac{1}{2}\right\rfloor\mathrm{sgn}(-2\,a+2\,b)+\arctan\left(-\frac{a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\sqrt{a^2-b^2}}\right)\right)}{(a^{11}-3\,a^9b^2+3\,a^7b^4-a^5b^6)\sqrt{a^2-b^2}}+\frac{60\,a^6b^3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5}{}}{}$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c))^4,x, algorithm="giac")
```

```
[Out] -1/3*(3*(20*a^6*b^2 - 35*a^4*b^4 + 28*a^2*b^6 - 8*b^8)*(pi*floor(1/2*(d*x +
 c)/pi + 1/2)*sgn(-2*a + 2*b) + arctan(-(a*tan(1/2*d*x + 1/2*c) - b*tan(1/2
*d*x + 1/2*c))/sqrt(a^2 - b^2)))/((a^11 - 3*a^9*b^2 + 3*a^7*b^4 - a^5*b^6)*
sqrt(a^2 - b^2)) + (60*a^6*b^3*tan(1/2*d*x + 1/2*c)^5 - 105*a^5*b^4*tan(1/2
*d*x + 1/2*c)^5 - 24*a^4*b^5*tan(1/2*d*x + 1/2*c)^5 + 117*a^3*b^6*tan(1/2*d
*x + 1/2*c)^5 - 24*a^2*b^7*tan(1/2*d*x + 1/2*c)^5 - 42*a*b^8*tan(1/2*d*x +
1/2*c)^5 + 18*b^9*tan(1/2*d*x + 1/2*c)^5 + 120*a^6*b^3*tan(1/2*d*x + 1/2*c)
```

```
^3 - 236*a^4*b^5*tan(1/2*d*x + 1/2*c)^3 + 152*a^2*b^7*tan(1/2*d*x + 1/2*c)^
3 - 36*b^9*tan(1/2*d*x + 1/2*c)^3 + 60*a^6*b^3*tan(1/2*d*x + 1/2*c) + 105*a
^5*b^4*tan(1/2*d*x + 1/2*c) - 24*a^4*b^5*tan(1/2*d*x + 1/2*c) - 117*a^3*b^6
*tan(1/2*d*x + 1/2*c) - 24*a^2*b^7*tan(1/2*d*x + 1/2*c) + 42*a*b^8*tan(1/2*
d*x + 1/2*c) + 18*b^9*tan(1/2*d*x + 1/2*c))/((a^10 - 3*a^8*b^2 + 3*a^6*b^4
- a^4*b^6)*(a*tan(1/2*d*x + 1/2*c)^2 - b*tan(1/2*d*x + 1/2*c)^2 + a + b)^3)
 + 12*b*log(abs(tan(1/2*d*x + 1/2*c) + 1))/a^5 - 12*b*log(abs(tan(1/2*d*x +
 1/2*c) - 1))/a^5 + 6*tan(1/2*d*x + 1/2*c)/((tan(1/2*d*x + 1/2*c)^2 - 1)*a^
4))/d
```

Mupad [B] (verification not implemented)

Time = 23.52 (sec) , antiderivative size = 7490, normalized size of antiderivative = 24.32

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^4}\,dx = \text{Too large to display}$$

```
[In] int(1/(cos(c + d*x)^2*(a + b*cos(c + d*x))^4),x)
```

```
[Out] (b*atan(((b*((8*tan(c/2 + (d*x)/2)*(128*b^16 - 128*a*b^15 - 768*a^2*b^14 +
768*a^3*b^13 + 1920*a^4*b^12 - 1920*a^5*b^11 - 2600*a^6*b^10 + 2560*a^7*b^9
 + 2025*a^8*b^8 - 1920*a^9*b^7 - 824*a^10*b^6 + 768*a^11*b^5 + 80*a^12*b^4
- 128*a^13*b^3 + 64*a^14*b^2))/(a^18*b + a^19 - a^8*b^11 - a^9*b^10 + 5*a^1
0*b^9 + 5*a^11*b^8 - 10*a^12*b^7 - 10*a^13*b^6 + 10*a^14*b^5 + 10*a^15*b^4
- 5*a^16*b^3 - 5*a^17*b^2) - (4*b*((16*(8*a^23*b - 8*a^10*b^14 + 4*a^11*b^1
3 + 52*a^12*b^12 - 25*a^13*b^11 - 143*a^14*b^10 + 63*a^15*b^9 + 217*a^16*b^
8 - 87*a^17*b^7 - 193*a^18*b^6 + 73*a^19*b^5 + 95*a^20*b^4 - 36*a^21*b^3 -
20*a^22*b^2))/(a^22*b + a^23 - a^12*b^11 - a^13*b^10 + 5*a^14*b^9 + 5*a^15*
b^8 - 10*a^16*b^7 - 10*a^17*b^6 + 10*a^18*b^5 + 10*a^19*b^4 - 5*a^20*b^3 -
5*a^21*b^2) - (32*b*tan(c/2 + (d*x)/2)*(8*a^23*b - 8*a^10*b^14 + 8*a^11*b^1
3 + 48*a^12*b^12 - 48*a^13*b^11 - 120*a^14*b^10 + 120*a^15*b^9 + 160*a^16*b
^8 - 160*a^17*b^7 - 120*a^18*b^6 + 120*a^19*b^5 + 48*a^20*b^4 - 48*a^21*b^3
 - 8*a^22*b^2))/(a^5*(a^18*b + a^19 - a^8*b^11 - a^9*b^10 + 5*a^10*b^9 + 5*
a^11*b^8 - 10*a^12*b^7 - 10*a^13*b^6 + 10*a^14*b^5 + 10*a^15*b^4 - 5*a^16*b
^3 - 5*a^17*b^2))))/a^5)*4i)/a^5 + (b*((8*tan(c/2 + (d*x)/2)*(128*b^16 - 12
8*a*b^15 - 768*a^2*b^14 + 768*a^3*b^13 + 1920*a^4*b^12 - 1920*a^5*b^11 - 26
00*a^6*b^10 + 2560*a^7*b^9 + 2025*a^8*b^8 - 1920*a^9*b^7 - 824*a^10*b^6 + 7
68*a^11*b^5 + 80*a^12*b^4 - 128*a^13*b^3 + 64*a^14*b^2))/(a^18*b + a^19 - a
^8*b^11 - a^9*b^10 + 5*a^10*b^9 + 5*a^11*b^8 - 10*a^12*b^7 - 10*a^13*b^6 +
10*a^14*b^5 + 10*a^15*b^4 - 5*a^16*b^3 - 5*a^17*b^2) + (4*b*((16*(8*a^23*b
- 8*a^10*b^14 + 4*a^11*b^13 + 52*a^12*b^12 - 25*a^13*b^11 - 143*a^14*b^10 +
 63*a^15*b^9 + 217*a^16*b^8 - 87*a^17*b^7 - 193*a^18*b^6 + 73*a^19*b^5 + 95
*a^20*b^4 - 36*a^21*b^3 - 20*a^22*b^2))/(a^22*b + a^23 - a^12*b^11 - a^13*b
^10 + 5*a^14*b^9 + 5*a^15*b^8 - 10*a^16*b^7 - 10*a^17*b^6 + 10*a^18*b^5 + 1
0*a^19*b^4 - 5*a^20*b^3 - 5*a^21*b^2) + (32*b*tan(c/2 + (d*x)/2)*(8*a^23*b
```

- 8*a^10*b^14 + 8*a^11*b^13 + 48*a^12*b^12 - 48*a^13*b^11 - 120*a^14*b^10 +
120*a^15*b^9 + 160*a^16*b^8 - 160*a^17*b^7 - 120*a^18*b^6 + 120*a^19*b^5 +
48*a^20*b^4 - 48*a^21*b^3 - 8*a^22*b^2))/(a^5*(a^18*b + a^19 - a^8*b^11 -
a^9*b^10 + 5*a^10*b^9 + 5*a^11*b^8 - 10*a^12*b^7 - 10*a^13*b^6 + 10*a^14*b^
5 + 10*a^15*b^4 - 5*a^16*b^3 - 5*a^17*b^2))))/a^5)*4i)/a^5)/((32*(128*b^16
- 64*a*b^15 - 832*a^2*b^14 + 400*a^3*b^13 + 2288*a^4*b^12 - 1088*a^5*b^11 -
3472*a^6*b^10 + 1602*a^7*b^9 + 3088*a^8*b^8 - 1280*a^9*b^7 - 1520*a^10*b^6
+ 480*a^11*b^5 + 320*a^12*b^4))/(a^22*b + a^23 - a^12*b^11 - a^13*b^10 + 5
*a^14*b^9 + 5*a^15*b^8 - 10*a^16*b^7 - 10*a^17*b^6 + 10*a^18*b^5 + 10*a^19*
b^4 - 5*a^20*b^3 - 5*a^21*b^2) - (4*b*((8*tan(c/2 + (d*x)/2)*(128*b^16 - 12
8*a*b^15 - 768*a^2*b^14 + 768*a^3*b^13 + 1920*a^4*b^12 - 1920*a^5*b^11 - 26
00*a^6*b^10 + 2560*a^7*b^9 + 2025*a^8*b^8 - 1920*a^9*b^7 - 824*a^10*b^6 + 7
68*a^11*b^5 + 80*a^12*b^4 - 128*a^13*b^3 + 64*a^14*b^2))/(a^18*b + a^19 - a
^8*b^11 - a^9*b^10 + 5*a^10*b^9 + 5*a^11*b^8 - 10*a^12*b^7 - 10*a^13*b^6 +
10*a^14*b^5 + 10*a^15*b^4 - 5*a^16*b^3 - 5*a^17*b^2) - (4*b*((16*(8*a^23*b
- 8*a^10*b^14 + 4*a^11*b^13 + 52*a^12*b^12 - 25*a^13*b^11 - 143*a^14*b^10 +
63*a^15*b^9 + 217*a^16*b^8 - 87*a^17*b^7 - 193*a^18*b^6 + 73*a^19*b^5 + 95
*a^20*b^4 - 36*a^21*b^3 - 20*a^22*b^2))/(a^22*b + a^23 - a^12*b^11 - a^13*b
^10 + 5*a^14*b^9 + 5*a^15*b^8 - 10*a^16*b^7 - 10*a^17*b^6 + 10*a^18*b^5 + 1
0*a^19*b^4 - 5*a^20*b^3 - 5*a^21*b^2) - (32*b*tan(c/2 + (d*x)/2)*(8*a^23*b
- 8*a^10*b^14 + 8*a^11*b^13 + 48*a^12*b^12 - 48*a^13*b^11 - 120*a^14*b^10 +
120*a^15*b^9 + 160*a^16*b^8 - 160*a^17*b^7 - 120*a^18*b^6 + 120*a^19*b^5 +
48*a^20*b^4 - 48*a^21*b^3 - 8*a^22*b^2))/(a^5*(a^18*b + a^19 - a^8*b^11 -
a^9*b^10 + 5*a^10*b^9 + 5*a^11*b^8 - 10*a^12*b^7 - 10*a^13*b^6 + 10*a^14*b^
5 + 10*a^15*b^4 - 5*a^16*b^3 - 5*a^17*b^2))))/a^5))/a^5 + (4*b*((8*tan(c/2
+ (d*x)/2)*(128*b^16 - 128*a*b^15 - 768*a^2*b^14 + 768*a^3*b^13 + 1920*a^4*
b^12 - 1920*a^5*b^11 - 2600*a^6*b^10 + 2560*a^7*b^9 + 2025*a^8*b^8 - 1920*a
^9*b^7 - 824*a^10*b^6 + 768*a^11*b^5 + 80*a^12*b^4 - 128*a^13*b^3 + 64*a^14
*b^2))/(a^18*b + a^19 - a^8*b^11 - a^9*b^10 + 5*a^10*b^9 + 5*a^11*b^8 - 10*
a^12*b^7 - 10*a^13*b^6 + 10*a^14*b^5 + 10*a^15*b^4 - 5*a^16*b^3 - 5*a^17*b^
2) + (4*b*((16*(8*a^23*b - 8*a^10*b^14 + 4*a^11*b^13 + 52*a^12*b^12 - 25*a^
13*b^11 - 143*a^14*b^10 + 63*a^15*b^9 + 217*a^16*b^8 - 87*a^17*b^7 - 193*a^
18*b^6 + 73*a^19*b^5 + 95*a^20*b^4 - 36*a^21*b^3 - 20*a^22*b^2))/(a^22*b +
a^23 - a^12*b^11 - a^13*b^10 + 5*a^14*b^9 + 5*a^15*b^8 - 10*a^16*b^7 - 10*a
^17*b^6 + 10*a^18*b^5 + 10*a^19*b^4 - 5*a^20*b^3 - 5*a^21*b^2) + (32*b*tan(
c/2 + (d*x)/2)*(8*a^23*b - 8*a^10*b^14 + 8*a^11*b^13 + 48*a^12*b^12 - 48*a^
13*b^11 - 120*a^14*b^10 + 120*a^15*b^9 + 160*a^16*b^8 - 160*a^17*b^7 - 120*
a^18*b^6 + 120*a^19*b^5 + 48*a^20*b^4 - 48*a^21*b^3 - 8*a^22*b^2))/(a^5*(a^
18*b + a^19 - a^8*b^11 - a^9*b^10 + 5*a^10*b^9 + 5*a^11*b^8 - 10*a^12*b^7 -
10*a^13*b^6 + 10*a^14*b^5 + 10*a^15*b^4 - 5*a^16*b^3 - 5*a^17*b^2))))/a^5)
)/a^5))*8i)/(a^5*d) - ((tan(c/2 + (d*x)/2)^3*(12*a*b^7 - 18*a^8 - 72*b^8 +
236*a^2*b^6 - 47*a^3*b^5 - 273*a^4*b^4 + 60*a^5*b^3 + 72*a^6*b^2))/(3*a^4*(
a + b)^2*(a - b)^3) - (tan(c/2 + (d*x)/2)^5*(12*a*b^7 + 18*a^8 + 72*b^8 - 2
36*a^2*b^6 - 47*a^3*b^5 + 273*a^4*b^4 + 60*a^5*b^3 - 72*a^6*b^2))/(3*a^4*(a
+ b)^3*(a - b)^2) + (tan(c/2 + (d*x)/2)*(4*a*b^6 - 2*a^6*b - 2*a^7 + 8*b^7

- 24*a^2*b^5 - 11*a^3*b^4 + 26*a^4*b^3 + 6*a^5*b^2))/(a^4*(a + b)*(a - b)^
3) + (tan(c/2 + (d*x)/2)^7*(4*a*b^6 + 2*a^6*b - 2*a^7 - 8*b^7 + 24*a^2*b^5
- 11*a^3*b^4 - 26*a^4*b^3 + 6*a^5*b^2))/(a^4*(a + b)^3*(a - b)))/(d*(3*a*b^
2 + 3*a^2*b - tan(c/2 + (d*x)/2)^4*(6*a^2*b - 6*b^3) - tan(c/2 + (d*x)/2)^2
*(6*a*b^2 - 2*a^3 + 4*b^3) - tan(c/2 + (d*x)/2)^6*(2*a^3 - 6*a*b^2 + 4*b^3)
+ a^3 + b^3 - tan(c/2 + (d*x)/2)^8*(3*a*b^2 - 3*a^2*b + a^3 - b^3))) + (b^
2*atan(((b^2*((8*tan(c/2 + (d*x)/2)*(128*b^16 - 128*a*b^15 - 768*a^2*b^14 +
768*a^3*b^13 + 1920*a^4*b^12 - 1920*a^5*b^11 - 2600*a^6*b^10 + 2560*a^7*b^
9 + 2025*a^8*b^8 - 1920*a^9*b^7 - 824*a^10*b^6 + 768*a^11*b^5 + 80*a^12*b^4
- 128*a^13*b^3 + 64*a^14*b^2))/(a^18*b + a^19 - a^8*b^11 - a^9*b^10 + 5*a^
10*b^9 + 5*a^11*b^8 - 10*a^12*b^7 - 10*a^13*b^6 + 10*a^14*b^5 + 10*a^15*b^4
- 5*a^16*b^3 - 5*a^17*b^2) - (b^2*((16*(8*a^23*b - 8*a^10*b^14 + 4*a^11*b^
13 + 52*a^12*b^12 - 25*a^13*b^11 - 143*a^14*b^10 + 63*a^15*b^9 + 217*a^16*b
^8 - 87*a^17*b^7 - 193*a^18*b^6 + 73*a^19*b^5 + 95*a^20*b^4 - 36*a^21*b^3 -
20*a^22*b^2))/(a^22*b + a^23 - a^12*b^11 - a^13*b^10 + 5*a^14*b^9 + 5*a^15
*b^8 - 10*a^16*b^7 - 10*a^17*b^6 + 10*a^18*b^5 + 10*a^19*b^4 - 5*a^20*b^3 -
5*a^21*b^2) - (4*b^2*tan(c/2 + (d*x)/2)*(-(a + b)^7*(a - b)^7)^(1/2)*(20*a
^6 - 8*b^6 + 28*a^2*b^4 - 35*a^4*b^2)*(8*a^23*b - 8*a^10*b^14 + 8*a^11*b^13
+ 48*a^12*b^12 - 48*a^13*b^11 - 120*a^14*b^10 + 120*a^15*b^9 + 160*a^16*b^
8 - 160*a^17*b^7 - 120*a^18*b^6 + 120*a^19*b^5 + 48*a^20*b^4 - 48*a^21*b^3
- 8*a^22*b^2))/((a^19 - a^5*b^14 + 7*a^7*b^12 - 21*a^9*b^10 + 35*a^11*b^8 -
35*a^13*b^6 + 21*a^15*b^4 - 7*a^17*b^2)*(a^18*b + a^19 - a^8*b^11 - a^9*b^
10 + 5*a^10*b^9 + 5*a^11*b^8 - 10*a^12*b^7 - 10*a^13*b^6 + 10*a^14*b^5 + 10
*a^15*b^4 - 5*a^16*b^3 - 5*a^17*b^2)))*(-(a + b)^7*(a - b)^7)^(1/2)*(20*a^6
- 8*b^6 + 28*a^2*b^4 - 35*a^4*b^2))/(2*(a^19 - a^5*b^14 + 7*a^7*b^12 - 21*
a^9*b^10 + 35*a^11*b^8 - 35*a^13*b^6 + 21*a^15*b^4 - 7*a^17*b^2)))*(-(a + b
)^7*(a - b)^7)^(1/2)*(20*a^6 - 8*b^6 + 28*a^2*b^4 - 35*a^4*b^2)*1i)/(2*(a^1
9 - a^5*b^14 + 7*a^7*b^12 - 21*a^9*b^10 + 35*a^11*b^8 - 35*a^13*b^6 + 21*a^
15*b^4 - 7*a^17*b^2)) + (b^2*((8*tan(c/2 + (d*x)/2)*(128*b^16 - 128*a*b^15
- 768*a^2*b^14 + 768*a^3*b^13 + 1920*a^4*b^12 - 1920*a^5*b^11 - 2600*a^6*b^
10 + 2560*a^7*b^9 + 2025*a^8*b^8 - 1920*a^9*b^7 - 824*a^10*b^6 + 768*a^11*b
^5 + 80*a^12*b^4 - 128*a^13*b^3 + 64*a^14*b^2))/(a^18*b + a^19 - a^8*b^11 -
a^9*b^10 + 5*a^10*b^9 + 5*a^11*b^8 - 10*a^12*b^7 - 10*a^13*b^6 + 10*a^14*b
^5 + 10*a^15*b^4 - 5*a^16*b^3 - 5*a^17*b^2) + (b^2*((16*(8*a^23*b - 8*a^10*
b^14 + 4*a^11*b^13 + 52*a^12*b^12 - 25*a^13*b^11 - 143*a^14*b^10 + 63*a^15*
b^9 + 217*a^16*b^8 - 87*a^17*b^7 - 193*a^18*b^6 + 73*a^19*b^5 + 95*a^20*b^4
- 36*a^21*b^3 - 20*a^22*b^2))/(a^22*b + a^23 - a^12*b^11 - a^13*b^10 + 5*a
^14*b^9 + 5*a^15*b^8 - 10*a^16*b^7 - 10*a^17*b^6 + 10*a^18*b^5 + 10*a^19*b^
4 - 5*a^20*b^3 - 5*a^21*b^2) + (4*b^2*tan(c/2 + (d*x)/2)*(-(a + b)^7*(a - b
)^7)^(1/2)*(20*a^6 - 8*b^6 + 28*a^2*b^4 - 35*a^4*b^2)*(8*a^23*b - 8*a^10*b^
14 + 8*a^11*b^13 + 48*a^12*b^12 - 48*a^13*b^11 - 120*a^14*b^10 + 120*a^15*b
^9 + 160*a^16*b^8 - 160*a^17*b^7 - 120*a^18*b^6 + 120*a^19*b^5 + 48*a^20*b^
4 - 48*a^21*b^3 - 8*a^22*b^2))/((a^19 - a^5*b^14 + 7*a^7*b^12 - 21*a^9*b^10
+ 35*a^11*b^8 - 35*a^13*b^6 + 21*a^15*b^4 - 7*a^17*b^2)*(a^18*b + a^19 - a
^8*b^11 - a^9*b^10 + 5*a^10*b^9 + 5*a^11*b^8 - 10*a^12*b^7 - 10*a^13*b^6 +

10*a^14*b^5 + 10*a^15*b^4 - 5*a^16*b^3 - 5*a^17*b^2)))*(-(a + b)^7*(a - b)^
7)^(1/2)*(20*a^6 - 8*b^6 + 28*a^2*b^4 - 35*a^4*b^2))/(2*(a^19 - a^5*b^14 +
7*a^7*b^12 - 21*a^9*b^10 + 35*a^11*b^8 - 35*a^13*b^6 + 21*a^15*b^4 - 7*a^17
b^2)))(-(a + b)^7*(a - b)^7)^(1/2)*(20*a^6 - 8*b^6 + 28*a^2*b^4 - 35*a^4*
b^2)*1i)/(2*(a^19 - a^5*b^14 + 7*a^7*b^12 - 21*a^9*b^10 + 35*a^11*b^8 - 35*
a^13*b^6 + 21*a^15*b^4 - 7*a^17*b^2)))/((32*(128*b^16 - 64*a*b^15 - 832*a^2
*b^14 + 400*a^3*b^13 + 2288*a^4*b^12 - 1088*a^5*b^11 - 3472*a^6*b^10 + 1602
*a^7*b^9 + 3088*a^8*b^8 - 1280*a^9*b^7 - 1520*a^10*b^6 + 480*a^11*b^5 + 320
*a^12*b^4))/(a^22*b + a^23 - a^12*b^11 - a^13*b^10 + 5*a^14*b^9 + 5*a^15*b^
8 - 10*a^16*b^7 - 10*a^17*b^6 + 10*a^18*b^5 + 10*a^19*b^4 - 5*a^20*b^3 - 5*
a^21*b^2) - (b^2*((8*tan(c/2 + (d*x)/2)*(128*b^16 - 128*a*b^15 - 768*a^2*b^
14 + 768*a^3*b^13 + 1920*a^4*b^12 - 1920*a^5*b^11 - 2600*a^6*b^10 + 2560*a^
7*b^9 + 2025*a^8*b^8 - 1920*a^9*b^7 - 824*a^10*b^6 + 768*a^11*b^5 + 80*a^12
*b^4 - 128*a^13*b^3 + 64*a^14*b^2))/(a^18*b + a^19 - a^8*b^11 - a^9*b^10 +
5*a^10*b^9 + 5*a^11*b^8 - 10*a^12*b^7 - 10*a^13*b^6 + 10*a^14*b^5 + 10*a^15
*b^4 - 5*a^16*b^3 - 5*a^17*b^2) - (b^2*((16*(8*a^23*b - 8*a^10*b^14 + 4*a^1
1*b^13 + 52*a^12*b^12 - 25*a^13*b^11 - 143*a^14*b^10 + 63*a^15*b^9 + 217*a^
16*b^8 - 87*a^17*b^7 - 193*a^18*b^6 + 73*a^19*b^5 + 95*a^20*b^4 - 36*a^21*b
^3 - 20*a^22*b^2))/(a^22*b + a^23 - a^12*b^11 - a^13*b^10 + 5*a^14*b^9 + 5*
a^15*b^8 - 10*a^16*b^7 - 10*a^17*b^6 + 10*a^18*b^5 + 10*a^19*b^4 - 5*a^20*b
^3 - 5*a^21*b^2) - (4*b^2*tan(c/2 + (d*x)/2)*(-(a + b)^7*(a - b)^7)^(1/2)*(
20*a^6 - 8*b^6 + 28*a^2*b^4 - 35*a^4*b^2)*(8*a^23*b - 8*a^10*b^14 + 8*a^11*
b^13 + 48*a^12*b^12 - 48*a^13*b^11 - 120*a^14*b^10 + 120*a^15*b^9 + 160*a^1
6*b^8 - 160*a^17*b^7 - 120*a^18*b^6 + 120*a^19*b^5 + 48*a^20*b^4 - 48*a^21*
b^3 - 8*a^22*b^2))/((a^19 - a^5*b^14 + 7*a^7*b^12 - 21*a^9*b^10 + 35*a^11*b
^8 - 35*a^13*b^6 + 21*a^15*b^4 - 7*a^17*b^2)*(a^18*b + a^19 - a^8*b^11 - a^
9*b^10 + 5*a^10*b^9 + 5*a^11*b^8 - 10*a^12*b^7 - 10*a^13*b^6 + 10*a^14*b^5
+ 10*a^15*b^4 - 5*a^16*b^3 - 5*a^17*b^2)))*(-(a + b)^7*(a - b)^7)^(1/2)*(20
*a^6 - 8*b^6 + 28*a^2*b^4 - 35*a^4*b^2))/(2*(a^19 - a^5*b^14 + 7*a^7*b^12 -
21*a^9*b^10 + 35*a^11*b^8 - 35*a^13*b^6 + 21*a^15*b^4 - 7*a^17*b^2)))*(-(a
+ b)^7*(a - b)^7)^(1/2)*(20*a^6 - 8*b^6 + 28*a^2*b^4 - 35*a^4*b^2))/(2*(a^
19 - a^5*b^14 + 7*a^7*b^12 - 21*a^9*b^10 + 35*a^11*b^8 - 35*a^13*b^6 + 21*a
^15*b^4 - 7*a^17*b^2)) + (b^2*((8*tan(c/2 + (d*x)/2)*(128*b^16 - 128*a*b^15
- 768*a^2*b^14 + 768*a^3*b^13 + 1920*a^4*b^12 - 1920*a^5*b^11 - 2600*a^6*b
^10 + 2560*a^7*b^9 + 2025*a^8*b^8 - 1920*a^9*b^7 - 824*a^10*b^6 + 768*a^11*
b^5 + 80*a^12*b^4 - 128*a^13*b^3 + 64*a^14*b^2))/(a^18*b + a^19 - a^8*b^11
- a^9*b^10 + 5*a^10*b^9 + 5*a^11*b^8 - 10*a^12*b^7 - 10*a^13*b^6 + 10*a^14*
b^5 + 10*a^15*b^4 - 5*a^16*b^3 - 5*a^17*b^2) + (b^2*((16*(8*a^23*b - 8*a^10
*b^14 + 4*a^11*b^13 + 52*a^12*b^12 - 25*a^13*b^11 - 143*a^14*b^10 + 63*a^15
*b^9 + 217*a^16*b^8 - 87*a^17*b^7 - 193*a^18*b^6 + 73*a^19*b^5 + 95*a^20*b^
4 - 36*a^21*b^3 - 20*a^22*b^2))/(a^22*b + a^23 - a^12*b^11 - a^13*b^10 + 5*
a^14*b^9 + 5*a^15*b^8 - 10*a^16*b^7 - 10*a^17*b^6 + 10*a^18*b^5 + 10*a^19*b
^4 - 5*a^20*b^3 - 5*a^21*b^2) + (4*b^2*tan(c/2 + (d*x)/2)*(-(a + b)^7*(a -
b)^7)^(1/2)*(20*a^6 - 8*b^6 + 28*a^2*b^4 - 35*a^4*b^2)*(8*a^23*b - 8*a^10*b
^14 + 8*a^11*b^13 + 48*a^12*b^12 - 48*a^13*b^11 - 120*a^14*b^10 + 120*a^15*

b^9 + 160*a^16*b^8 - 160*a^17*b^7 - 120*a^18*b^6 + 120*a^19*b^5 + 48*a^20*b
^4 - 48*a^21*b^3 - 8*a^22*b^2))/((a^19 - a^5*b^14 + 7*a^7*b^12 - 21*a^9*b^1
0 + 35*a^11*b^8 - 35*a^13*b^6 + 21*a^15*b^4 - 7*a^17*b^2)*(a^18*b + a^19 -
a^8*b^11 - a^9*b^10 + 5*a^10*b^9 + 5*a^11*b^8 - 10*a^12*b^7 - 10*a^13*b^6 +
 10*a^14*b^5 + 10*a^15*b^4 - 5*a^16*b^3 - 5*a^17*b^2)))*(-(a + b)^7*(a - b)
^7)^(1/2)*(20*a^6 - 8*b^6 + 28*a^2*b^4 - 35*a^4*b^2))/(2*(a^19 - a^5*b^14 +
 7*a^7*b^12 - 21*a^9*b^10 + 35*a^11*b^8 - 35*a^13*b^6 + 21*a^15*b^4 - 7*a^1
7*b^2)))*(-(a + b)^7*(a - b)^7)^(1/2)*(20*a^6 - 8*b^6 + 28*a^2*b^4 - 35*a^4
b^2))/(2(a^19 - a^5*b^14 + 7*a^7*b^12 - 21*a^9*b^10 + 35*a^11*b^8 - 35*a^
13*b^6 + 21*a^15*b^4 - 7*a^17*b^2))))*(-(a + b)^7*(a - b)^7)^(1/2)*(20*a^6
- 8*b^6 + 28*a^2*b^4 - 35*a^4*b^2)*1i)/(d*(a^19 - a^5*b^14 + 7*a^7*b^12 - 2
1*a^9*b^10 + 35*a^11*b^8 - 35*a^13*b^6 + 21*a^15*b^4 - 7*a^17*b^2))

3.486 $\int \cos^3(c+dx)\sqrt{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 264

$$\begin{aligned}\int \cos^3(c+dx)\sqrt{a+b\cos(c+dx)}\,dx &= \frac{2a(8a^2+19b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{105b^3d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\ &\quad -\frac{2(8a^4+17a^2b^2-25b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{105b^3d\sqrt{a+b\cos(c+dx)}} \\ &\quad +\frac{2(8a^2+25b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105b^2d}-\frac{8a(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{35b^2d} \\ &\quad +\frac{2\cos(c+dx)(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{7bd}\end{aligned}$$

```
[Out] -8/35*a*(a+b*cos(d*x+c))^(3/2)*sin(d*x+c)/b^2/d+2/7*cos(d*x+c)*(a+b*cos(d*x
+c))^(3/2)*sin(d*x+c)/b/d+2/105*(8*a^2+25*b^2)*sin(d*x+c)*(a+b*cos(d*x+c))^
(1/2)/b^2/d+2/105*a*(8*a^2+19*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x
+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+
c))^(1/2)/b^3/d/((a+b*cos(d*x+c))/(a+b))^(1/2)-2/105*(8*a^4+17*a^2*b^2-25*b
^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1
/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/b^3/d/(a+b*co
s(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 264, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2872, 3102, 2832, 2831, 2742, 2740, 2734, 2732}

$$\begin{aligned}
&\int \cos^3(c+dx)\sqrt{a+b\cos(c+dx)}\,dx \\
&=\frac{2(8a^2+25b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{105b^2d} \\
&\quad+\frac{2a(8a^2+19b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{105b^3d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\
&\quad-\frac{2(8a^4+17a^2b^2-25b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{105b^3d\sqrt{a+b\cos(c+dx)}} \\
&\quad-\frac{8a\sin(c+dx)(a+b\cos(c+dx))^{3/2}}{35b^2d}+\frac{2\sin(c+dx)\cos(c+dx)(a+b\cos(c+dx))^{3/2}}{7bd}
\end{aligned}$$

```
[In] Int[Cos[c + d*x]^3*Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (2*a*(8*a^2 + 19*b^2)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)
/(a + b)])/(105*b^3*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) - (2*(8*a^4 + 17*
a^2*b^2 - 25*b^4)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2,
 (2*b)/(a + b)])/(105*b^3*d*Sqrt[a + b*Cos[c + d*x]]) + (2*(8*a^2 + 25*b^2)
*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(105*b^2*d) - (8*a*(a + b*Cos[c + d
*x])^(3/2)*Sin[c + d*x])/(35*b^2*d) + (2*Cos[c + d*x]*(a + b*Cos[c + d*x])^
(3/2)*Sin[c + d*x])/(7*b*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
```

```
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
```

```
&&  !LtQ[m, -1]
```

Rubi steps

$$\text{integral} = \frac{2\cos(c+dx)(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{7bd} + \frac{2\int\sqrt{a+b\cos(c+dx)}\left(a+\frac{5}{2}b\cos(c+dx)-2a\cos^2(c+dx)\right)\,dx}{7b}$$

$$= -\frac{8a(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{35b^2d} + \frac{2\cos(c+dx)(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{7bd} + \frac{4\int\sqrt{a+b\cos(c+dx)}\left(-\frac{ab}{2}+\frac{1}{4}(8a^2+25b^2)\cos(c+dx)\right)\,dx}{35b^2}$$

$$= \frac{2(8a^2+25b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105b^2d} - \frac{8a(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{35b^2d} + \frac{2\cos(c+dx)(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{7bd} + \frac{8\int\frac{\frac{1}{8}b(2a^2+25b^2)+\frac{1}{8}a(8a^2+19b^2)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{105b^2}$$

$$= \frac{2(8a^2+25b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105b^2d} - \frac{8a(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{35b^2d} + \frac{2\cos(c+dx)(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{7bd} + \frac{(a(8a^2+19b^2))\int\sqrt{a+b\cos(c+dx)}\,dx}{105b^3} - \frac{(8a^4+17a^2b^2-25b^4)\int\frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{105b^3}$$

$$= \frac{2(8a^2+25b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105b^2d} - \frac{8a(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{35b^2d} + \frac{2\cos(c+dx)(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{7bd} + \frac{\left(a(8a^2+19b^2)\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{105b^3\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{\left((8a^4+17a^2b^2-25b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{105b^3\sqrt{a+b\cos(c+dx)}}$$

$$= \frac{2a(8a^2+19b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{105b^3d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2(8a^4+17a^2b^2-25b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{105b^3d\sqrt{a+b\cos(c+dx)}} + \frac{2(8a^2+25b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105b^2d} - \frac{8a(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{35b^2d} + \frac{2\cos(c+dx)(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{7bd}$$

Mathematica [A] (verified)

Time = 0.90 (sec) , antiderivative size = 214, normalized size of antiderivative = 0.81

$$\int \cos^3(c+dx)\sqrt{a+b\cos(c+dx)}\,dx = \frac{4a(8a^3+8a^2b+19ab^2+19b^3)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right) - 4(8a^4+17a^2b^2-25b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\text{El}}{}$$

```
[In] Integrate[Cos[c + d*x]^3*Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (4*a*(8*a^3 + 8*a^2*b + 19*a*b^2 + 19*b^3)*Sqrt[(a + b*Cos[c + d*x])/(a + b
)]*EllipticE[(c + d*x)/2, (2*b)/(a + b)] - 4*(8*a^4 + 17*a^2*b^2 - 25*b^4)*
Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)] +
b*(-16*a^3 + 136*a*b^2 + (-4*a^2*b + 145*b^3)*Cos[c + d*x] + 36*a*b^2*Cos[2
*(c + d*x)] + 15*b^3*Cos[3*(c + d*x)])*Sin[c + d*x])/(210*b^3*d*Sqrt[a + b*
Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 826 vs. 2(298) = 596.

Time = 7.53 (sec) , antiderivative size = 827, normalized size of antiderivative = 3.13

method	result	size
default	Expression too large to display	827

```
[In] int(cos(d*x+c)^3*(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/105*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(240*cos
(1/2*d*x+1/2*c)^9*b^4+144*cos(1/2*d*x+1/2*c)^7*a*b^3-600*cos(1/2*d*x+1/2*c)
^7*b^4-4*cos(1/2*d*x+1/2*c)^5*a^2*b^2-288*cos(1/2*d*x+1/2*c)^5*a*b^3+640*co
```

```
s(1/2*d*x+1/2*c)^5*b^4-8*cos(1/2*d*x+1/2*c)^3*a^3*b+6*cos(1/2*d*x+1/2*c)^3*
a^2*b^2+230*cos(1/2*d*x+1/2*c)^3*a*b^3-360*cos(1/2*d*x+1/2*c)^3*b^4-8*(sin(
1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*Ellipt
icF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^4-17*(sin(1/2*d*x+1/2*c)^2)^(1
/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*
c),(-2*b/(a-b))^(1/2))*a^2*b^2+25*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/
2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^
(1/2))*b^4+8*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(
a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^4-8*(sin(1/2
*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE
(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^3*b+19*(sin(1/2*d*x+1/2*c)^2)^(1/
2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c
),(-2*b/(a-b))^(1/2))*a^2*b^2-19*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2
*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(
1/2))*a*b^3+8*cos(1/2*d*x+1/2*c)*a^3*b-2*cos(1/2*d*x+1/2*c)*a^2*b^2-86*cos(
1/2*d*x+1/2*c)*a*b^3+80*cos(1/2*d*x+1/2*c)*b^4)/b^3/(-2*sin(1/2*d*x+1/2*c)^
4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+
1/2*c)^2+a+b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 474, normalized size of antiderivative = 1.80

$$\int \cos^3(c+dx)\sqrt{a+b\cos(c+dx)}\,dx$$
$$= \frac{\sqrt{2}(16i\,a^4+32i\,a^2b^2-75i\,b^4)\sqrt{b}\,\text{weierstrassPInverse}\left(\frac{4\,(4\,a^2-3\,b^2)}{3\,b^2},-\frac{8\,(8\,a^3-9\,ab^2)}{27\,b^3},\frac{3\,b\cos(dx+c)+3i\,b\sin(dx+c)+2\,a}{3\,b}\right)}{}$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/315*(sqrt(2)*(16*I*a^4 + 32*I*a^2*b^2 - 75*I*b^4)*sqrt(b)*weierstrassPInv
erse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x
 + c) + 3*I*b*sin(d*x + c) + 2*a)/b) + sqrt(2)*(-16*I*a^4 - 32*I*a^2*b^2 +
75*I*b^4)*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3
 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b) - 3*s
qrt(2)*(-8*I*a^3*b - 19*I*a*b^3)*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2
)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)
/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x +
c) + 2*a)/b)) - 3*sqrt(2)*(8*I*a^3*b + 19*I*a*b^3)*sqrt(b)*weierstrassZeta(
4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4
/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c)
- 3*I*b*sin(d*x + c) + 2*a)/b)) + 6*(15*b^4*cos(d*x + c)^2 + 3*a*b^3*cos(d*
x + c) - 4*a^2*b^2 + 25*b^4)*sqrt(b*cos(d*x + c) + a)*sin(d*x + c))/(b^4*d)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^3(c+dx)\sqrt{a+b\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3*(a+b*cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \cos^3(c+dx)\sqrt{a+b\cos(c+dx)}\,dx = \int \sqrt{b\cos(dx+c)+a}\cos(dx+c)^3\,dx$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^3, x)
```

Giac [F]

$$\int \cos^3(c+dx)\sqrt{a+b\cos(c+dx)}\,dx = \int \sqrt{b\cos(dx+c)+a}\cos(dx+c)^3\,dx$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^3(c+dx)\sqrt{a+b\cos(c+dx)}\,dx = \int \cos(c+d\,x)^3\,\sqrt{a+b\,\cos(c+d\,x)}\,dx$$

```
[In] int(cos(c + d*x)^3*(a + b*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^3*(a + b*cos(c + d*x))^(1/2), x)
```

3.487 $\int \cos^2(c+dx)\sqrt{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 207

$$\int \cos^2(c+dx)\sqrt{a+b\cos(c+dx)}\,dx = -\frac{2(2a^2-9b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{15b^2d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{4a(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{15b^2d\sqrt{a+b\cos(c+dx)}} - \frac{4a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15bd} + \frac{2(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{5bd}$$

```
[Out] 2/5*(a+b*cos(d*x+c))^(3/2)*sin(d*x+c)/b/d-4/15*a*sin(d*x+c)*(a+b*cos(d*x+c)
)^(1/2)/b/d-2/15*(2*a^2-9*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2
*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^
(1/2)/b^2/d/((a+b*cos(d*x+c))/(a+b))^(1/2)+4/15*a*(a^2-b^2)*(cos(1/2*d*x+1/
2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a
+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/b^2/d/(a+b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used

$= \{2870, 2832, 2831, 2742, 2740, 2734, 2732\}$

$$\int \cos^2(c+dx)\sqrt{a+b\cos(c+dx)}\,dx = \frac{4a(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{15b^2d\sqrt{a+b\cos(c+dx)}} - \frac{2(2a^2-9b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{15b^2d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2\sin(c+dx)(a+b\cos(c+dx))^{3/2}}{5bd} - \frac{4a\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{15bd}$$

```
[In] Int[Cos[c + d*x]^2*Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (-2*(2*a^2 - 9*b^2)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(
a + b)])/(15*b^2*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) + (4*a*(a^2 - b^2)*S
qrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(1
5*b^2*d*Sqrt[a + b*Cos[c + d*x]]) - (4*a*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d
*x])/(15*b*d) + (2*(a + b*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(5*b*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rule 2870

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^2, x_Symbol] :> Simp[(-d^2)*Cos[e + f*x]*((a + b*Sin[e + f*x])
^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m + 2)), Int[(a + b*Sin[e + f*x])^
m*Simp[b*(d^2*(m + 1) + c^2*(m + 2)) - d*(a*d - 2*b*c*(m + 2))*Sin[e + f*x]
, x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] && NeQ
[a^2 - b^2, 0] &&  !LtQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
&\text{integral}\\
&= \frac{2(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{5bd} + \frac{2\int\left(\frac{3b}{2}-a\cos(c+dx)\right)\sqrt{a+b\cos(c+dx)}\,dx}{5b}\\
&= -\frac{4a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15bd}\\
&\quad + \frac{2(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{5bd} + \frac{4\int\frac{\frac{7ab}{4}-\frac{1}{4}(2a^2-9b^2)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{15b}\\
&= -\frac{4a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15bd} + \frac{2(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{5bd}\\
&\quad + \frac{1}{15}\left(9-\frac{2a^2}{b^2}\right)\int\sqrt{a+b\cos(c+dx)}\,dx + \frac{(2a(a^2-b^2))\int\frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{15b^2}
\end{aligned}
$$

$$= -\frac{4a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15bd} + \frac{2(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{5bd} + \frac{\left(\left(9-\frac{2a^2}{b^2}\right)\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{15\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{\left(2a(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{15b^2\sqrt{a+b\cos(c+dx)}}$$

$$= \frac{2\left(9-\frac{2a^2}{b^2}\right)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{15d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{4a(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{15b^2d\sqrt{a+b\cos(c+dx)}} - \frac{4a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15bd} + \frac{2(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{5bd}$$

Mathematica [A] (verified)

Time = 0.67 (sec) , antiderivative size = 180, normalized size of antiderivative = 0.87

$$\int\cos^2(c+dx)\sqrt{a+b\cos(c+dx)}\,dx$$

$$= \frac{-2(2a^3+2a^2b-9ab^2-9b^3)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)+4a(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+\ldots\right.}{15b^2d\sqrt{a+b\cos(c+dx)}}$$

```
[In] Integrate[Cos[c + d*x]^2*Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (-2*(2*a^3 + 2*a^2*b - 9*a*b^2 - 9*b^3)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*
EllipticE[(c + d*x)/2, (2*b)/(a + b)] + 4*a*(a^2 - b^2)*Sqrt[(a + b*Cos[c +
 d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)] + b*(2*a^2 + 3*b^2 +
8*a*b*Cos[c + d*x] + 3*b^2*Cos[2*(c + d*x)])*Sin[c + d*x])/(15*b^2*d*Sqrt[a
 + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 664 vs. 2(245) = 490.

Time = 6.69 (sec) , antiderivative size = 665, normalized size of antiderivative = 3.21

method	result
default	$-\frac{2\sqrt{\left(2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(24\left(\cos^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3+16\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a\,b^2-48\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3+2\left(\cos^3\left(\frac{dx}{2}+\right.\right.\right.}{}$

```
[In] int(cos(d*x+c)^2*(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/15*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(24*cos(1
/2*d*x+1/2*c)^7*b^3+16*cos(1/2*d*x+1/2*c)^5*a*b^2-48*cos(1/2*d*x+1/2*c)^5*b
^3+2*cos(1/2*d*x+1/2*c)^3*a^2*b-24*cos(1/2*d*x+1/2*c)^3*a*b^2+30*cos(1/2*d*
x+1/2*c)^3*b^3+2*a^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^
2+a-b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-2*a*b^
2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)
*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-2*(sin(1/2*d*x+1/2*c)^2)^
(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/
2*c),(-2*b/(a-b))^(1/2))*a^3+2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d
*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/
2))*a^2*b+9*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a
-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^2-9*(sin(1/
2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*Elliptic
E(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*b^3-2*cos(1/2*d*x+1/2*c)*a^2*b+8*c
os(1/2*d*x+1/2*c)*a*b^2-6*cos(1/2*d*x+1/2*c)*b^3)/b^2/(-2*sin(1/2*d*x+1/2*c
)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*
x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 436, normalized size of antiderivative = 2.11

$$\int \cos^2(c+dx)\sqrt{a+b\cos(c+dx)}\,dx = \frac{\sqrt{2}(-4i\,a^3-3i\,ab^2)\sqrt{b}\text{weierstrassPInverse}\left(\frac{4\,(4\,a^2-3\,b^2)}{3\,b^2},-\frac{8\,(8\,a^3-9\,ab^2)}{27\,b^3},\frac{3\,b\cos(dx+c)+3i\,b\sin(dx+c)+2\,a}{3\,b}\right)+\sqrt{2}(4i\,a}{}$$

```
[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/45*(sqrt(2)*(-4*I*a^3 - 3*I*a*b^2)*sqrt(b)*weierstrassPInverse(4/3*(4*a^2
 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*s
```

```
in(d*x + c) + 2*a)/b) + sqrt(2)*(4*I*a^3 + 3*I*a*b^2)*sqrt(b)*weierstrassPI
nverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d
*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b) - 3*sqrt(2)*(2*I*a^2*b - 9*I*b^3)*sq
rt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3,
 weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3,
1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b)) - 3*sqrt(2)*(-2*I*a^2
*b + 9*I*b^3)*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3
 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3
- 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b)) + 6*(
3*b^3*cos(d*x + c) + a*b^2)*sqrt(b*cos(d*x + c) + a)*sin(d*x + c))/(b^3*d)
```

Sympy [F]

$$\int \cos^2(c+dx)\sqrt{a+b\cos(c+dx)}\,dx=\int\sqrt{a+b\cos{(c+dx)}}\cos^2{(c+dx)}\,dx$$

[In] integrate(cos(d*x+c)**2*(a+b*cos(d*x+c))**(1/2),x)

[Out] Integral(sqrt(a + b*cos(c + d*x))*cos(c + d*x)**2, x)

Maxima [F]

$$\int \cos^2(c+dx)\sqrt{a+b\cos(c+dx)}\,dx=\int\sqrt{b\cos{(dx+c)}+a}\cos{(dx+c)}^2\,dx$$

[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^2, x)

Giac [F]

$$\int \cos^2(c+dx)\sqrt{a+b\cos(c+dx)}\,dx=\int\sqrt{b\cos{(dx+c)}+a}\cos{(dx+c)}^2\,dx$$

[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")

[Out] integrate(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^2, x)

Mupad [F(-1)]

Timed out.

$$\int \cos^2(c+dx)\sqrt{a+b\cos(c+dx)}\,dx = \int \cos\left(c+d\,x\right)^2\,\sqrt{a+b\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(cos(c + d*x)^2*(a + b*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^2*(a + b*cos(c + d*x))^(1/2), x)
```

3.488 $\int \cos(c+dx)\sqrt{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 162

$$\int \cos(c+dx)\sqrt{a+b\cos(c+dx)}\,dx = \frac{2a\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3bd\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3bd\sqrt{a+b\cos(c+dx)}} + \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d}$$

```
[Out] 2/3*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+2/3*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/
cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a
+b*cos(d*x+c))^(1/2)/b/d/((a+b*cos(d*x+c))/(a+b))^(1/2)-2/3*(a^2-b^2)*(cos(
1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(
1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/b/d/(a+b*cos(d*x+c))^(
1/2)
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used

$= \{2832, 2831, 2742, 2740, 2734, 2732\}$

$$\int \cos(c+dx)\sqrt{a+b\cos(c+dx)}\,dx = -\frac{2(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3bd\sqrt{a+b\cos(c+dx)}} + \frac{2\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{3d} + \frac{2a\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{3bd\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[In] Int[Cos[c + d*x]*Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (2*a*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(3*b*d
*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) - (2*(a^2 - b^2)*Sqrt[(a + b*Cos[c + d
*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(3*b*d*Sqrt[a + b*Cos[
c + d*x]]) + (2*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(3*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
```

```
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rubi steps

$$\text{integral} = \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2}{3}\int \frac{\frac{b}{2}+\frac{1}{2}a\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{a\int\sqrt{a+b\cos(c+dx)}\,dx}{3b} - \frac{(a^2-b^2)\int\frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{3b}$$

$$= \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{\left(a\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{3b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{\left((a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{3b\sqrt{a+b\cos(c+dx)}}$$

$$= \frac{2a\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{3bd\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3bd\sqrt{a+b\cos(c+dx)}} + \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d}$$

Mathematica [A] (verified)

Time = 0.45 (sec) , antiderivative size = 137, normalized size of antiderivative = 0.85

$$\int \cos(c+dx)\sqrt{a+b\cos(c+dx)}\,dx$$
$$= \frac{2a(a+b)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)-2(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)+2b(a+b\cos$$
$$3bd\sqrt{a+b\cos(c+dx)}$$

```
[In] Integrate[Cos[c + d*x]*Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (2*a*(a + b)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticE[(c + d*x)/2, (2*b
)/(a + b)] - 2*(a^2 - b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c
+ d*x)/2, (2*b)/(a + b)] + 2*b*(a + b*Cos[c + d*x])*Sin[c + d*x])/(3*b*d*Sq
rt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 451 vs. 2(204) = 408.

Time = 5.45 (sec) , antiderivative size = 452, normalized size of antiderivative = 2.79

method	result
default	$-\frac{2\sqrt{\left(2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^2+2\left(\cos^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)ab-6\left(\cos^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^2-a^2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\right.}{}$

```
[In] int(cos(d*x+c)*(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(4*cos(1/2
*d*x+1/2*c)^5*b^2+2*cos(1/2*d*x+1/2*c)^3*a*b-6*cos(1/2*d*x+1/2*c)^3*b^2-a^2
*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*
EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))+b^2*(sin(1/2*d*x+1/2*c)^2)
^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1
/2*c),(-2*b/(a-b))^(1/2))+(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/
2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a
^2-(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2
)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b-2*cos(1/2*d*x+1/2*c)
*a*b+2*cos(1/2*d*x+1/2*c)*b^2)/b/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d
*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)
/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 398, normalized size of antiderivative = 2.46

$$\int \cos(c+dx)\sqrt{a+b\cos(c+dx)}\,dx$$
$$= \frac{3i\sqrt{2}ab^{\frac{3}{2}}\text{weierstrassZeta}\left(\frac{4(4a^2-3b^2)}{3b^2}, -\frac{8(8a^3-9ab^2)}{27b^3}, \text{weierstrassPInverse}\left(\frac{4(4a^2-3b^2)}{3b^2}, -\frac{8(8a^3-9ab^2)}{27b^3}, \frac{3b\cos(dx}{}\right.\right.}{}$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/9*(3*I*sqrt(2)*a*b^(3/2)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(
8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8
*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b))
- 3*I*sqrt(2)*a*b^(3/2)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a
^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^
3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b)) + 6
*sqrt(b*cos(d*x + c) + a)*b^2*sin(d*x + c) + sqrt(2)*(2*I*a^2 - 3*I*b^2)*sq
rt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/
b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b) + sqrt(2)*(-2*I*a
^2 + 3*I*b^2)*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8
*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b))/
(b^2*d)
```

Sympy [F]

$$\int \cos(c+dx)\sqrt{a+b\cos(c+dx)}\,dx = \int \sqrt{a+b\cos{(c+dx)}}\cos{(c+dx)}\,dx$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*cos(c + d*x))*cos(c + d*x), x)
```

Maxima [F]

$$\int \cos(c+dx)\sqrt{a+b\cos(c+dx)}\,dx = \int \sqrt{b\cos{(dx+c)}+a}\cos{(dx+c)}\,dx$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*cos(d*x + c) + a)*cos(d*x + c), x)
```

Giac [F]

$$\int \cos(c+dx)\sqrt{a+b\cos(c+dx)}\,dx = \int \sqrt{b\cos(dx+c)+a}\cos(dx+c)\,dx$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(b*cos(d*x + c) + a)*cos(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos(c+dx)\sqrt{a+b\cos(c+dx)}\,dx = \int \cos(c+d\,x)\,\sqrt{a+b\,\cos(c+d\,x)}\,dx$$

```
[In] int(cos(c + d*x)*(a + b*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)*(a + b*cos(c + d*x))^(1/2), x)
```

3.489 $\int \sqrt{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 57

$$\int \sqrt{a+b\cos(c+dx)}\,dx = \frac{2\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[Out] 2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2
*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/d/((a+b*cos(d*x+c))/(a+
b))^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2734, 2732}

$$\int \sqrt{a+b\cos(c+dx)}\,dx = \frac{2\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[In] Int[Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (2*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(d*Sqrt[
(a + b*Cos[c + d*x])/(a + b)])
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{a+b\cos(c+dx)}\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

$$= \frac{2\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.00

$$\int\sqrt{a+b\cos(c+dx)}\,dx = \frac{2\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[In] Integrate[Sqrt[a + b*Cos[c + d*x]],x]
[Out] (2*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(d*Sqrt[
(a + b*Cos[c + d*x])/(a + b)])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 169 vs. 2(82) = 164.

Time = 3.00 (sec) , antiderivative size = 170, normalized size of antiderivative = 2.98

method	result	size
default	$-\frac{2\sqrt{\left(2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{\frac{2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b}{a-b}}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{-\frac{2b}{a-b}}\right)(a-b)}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+(a+b)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b}\,d}$	170
risch	Expression too large to display	1046

```
[In] int((a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
[Out] -2*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos
```

```
(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*(a-b)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*
sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a
+b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 355, normalized size of antiderivative = 6.23

$$\int \sqrt{a+b\cos(c+dx)}\,dx = \frac{-i\sqrt{2}a\sqrt{b}\text{weierstrassPInverse}\left(\frac{4\,(4\,a^2-3\,b^2)}{3\,b^2},-\frac{8\,(8\,a^3-9\,ab^2)}{27\,b^3},\frac{3\,b\cos(dx+c)+3i\,b\sin(dx+c)+2\,a}{3\,b}\right)+i\sqrt{2}a\sqrt{b}\text{weierstras}}{}$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/3*(-I*sqrt(2)*a*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/2
7*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/
b) + I*sqrt(2)*a*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27
*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b
) + 3*I*sqrt(2)*b^(3/2)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a
^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^
3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b)) - 3
*I*sqrt(2)*b^(3/2)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 -
9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9
*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b)))/(b*d)
```

Sympy [F]

$$\int \sqrt{a+b\cos(c+dx)}\,dx = \int \sqrt{a+b\cos{(c+dx)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*cos(c + d*x)), x)
```

Maxima [F]

$$\int \sqrt{a+b\cos(c+dx)}\,dx=\int \sqrt{b\cos\left(dx+c\right)+a}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \sqrt{a+b\cos(c+dx)}\,dx=\int \sqrt{b\cos\left(dx+c\right)+a}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(b*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+b\cos(c+dx)}\,dx=\int \sqrt{a+b\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(1/2),x)
[Out] int((a + b*cos(c + d*x))^(1/2), x)
```

3.490 $\int \sqrt{a+b\cos(c+dx)}\sec(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 118

$$\int \sqrt{a+b\cos(c+dx)}\sec(c+dx)\,dx=\frac{2b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}+\frac{2a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] 2*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1
/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/d/(a+b*cos(d*
x+c))^(1/2)+2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(
sin(1/2*d*x+1/2*c),2,2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2
)/d/(a+b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2882, 2742, 2740, 2886, 2884}

$$\int \sqrt{a+b\cos(c+dx)}\sec(c+dx)\,dx=\frac{2b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}+\frac{2a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}$$

```
[In] Int[Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x],x]
```

```
[Out] (2*b*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b
)])/(d*Sqrt[a + b*Cos[c + d*x]]) + (2*a*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*
EllipticPi[2, (c + d*x)/2, (2*b)/(a + b)])/(d*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2882

```
Int[Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]/((a_.) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[d/b, Int[1/Sqrt[c + d*Sin[e + f*x]], x], x]
 + Dist[(b*c - a*d)/b, Int[1/((a + b*Sin[e + f*x])*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 -
 b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 2886

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(c + d*Sin[e + f*x])/(c + d)]/Sqrt
[c + d*Sin[e + f*x]], Int[1/((a + b*Sin[e + f*x])*Sqrt[c/(c + d) + (d/(c +
d))*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] &&  !GtQ[c + d, 0]
```

Rubi steps

$$\text{integral} = a\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx + b\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{\left(a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{\sec(c+dx)}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}dx}{\sqrt{a+b\cos(c+dx)}} + \frac{\left(b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}dx}{\sqrt{a+b\cos(c+dx)}}$$

$$= \frac{2b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} + \frac{2a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 13.94 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.69

$$\int \sqrt{a+b\cos(c+dx)}\sec(c+dx)\,dx$$
$$= \frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\left(b\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)+a\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)\right)}{d\sqrt{a+b\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x],x]
```

```
[Out] (2*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*(b*EllipticF[(c + d*x)/2, (2*b)/(a +
b)] + a*EllipticPi[2, (c + d*x)/2, (2*b)/(a + b)]))/(d*Sqrt[a + b*Cos[c + d
*x]])
```

Maple [A] (verified)

Time = 3.47 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.64

method	result
default	$-\frac{2\sqrt{\left(2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{\frac{2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b}{a-b}}\left(F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{-\frac{2b}{a-b}}\right)b-\Pi\left(\cos\left(\frac{dx}{2}\right.\right.\right.}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+(a+b)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b}\,d}$

```
[In] int(sec(d*x+c)*(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*(EllipticF(co
s(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*b-EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*
b/(a-b))^(1/2))*a)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(
1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \sqrt{a+b\cos(c+dx)}\sec(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)*(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \sqrt{a+b\cos(c+dx)}\sec(c+dx)\,dx = \int \sqrt{a+b\cos{(c+dx)}}\sec{(c+dx)}\,dx$$

```
[In] integrate(sec(d*x+c)*(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(a + b*cos(c + d*x))*sec(c + d*x), x)
```

Maxima [F]

$$\int \sqrt{a+b\cos(c+dx)}\sec(c+dx)\,dx = \int \sqrt{b\cos{(dx+c)}+a}\sec{(dx+c)}\,dx$$

```
[In] integrate(sec(d*x+c)*(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(b*cos(d*x + c) + a)*sec(d*x + c), x)
```

Giac [F]

$$\int \sqrt{a+b\cos(c+dx)}\sec(c+dx)\,dx = \int \sqrt{b\cos{(dx+c)}+a}\sec{(dx+c)}\,dx$$

```
[In] integrate(sec(d*x+c)*(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(b*cos(d*x + c) + a)*sec(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+b\cos(c+dx)}\sec(c+dx)\,dx=\int \frac{\sqrt{a+b\,\cos\left(c+d\,x\right)}}{\cos\left(c+d\,x\right)}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(1/2)/cos(c + d*x),x)
[Out] int((a + b*cos(c + d*x))^(1/2)/cos(c + d*x), x)
```

3.491 $\int \sqrt{a+b\cos(c+dx)}\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 197

$$\int \sqrt{a+b\cos(c+dx)}\sec^2(c+dx)\,dx = -\frac{\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} + \frac{b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} + \frac{\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{d}$$

```
[Out] -(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*
c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/d/((a+b*cos(d*x+c))/(a+b
))^(1/2)+a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/
2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/d/(a+b
*cos(d*x+c))^(1/2)+b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icPi(sin(1/2*d*x+1/2*c),2,2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))
^(1/2)/d/(a+b*cos(d*x+c))^(1/2)+(a+b*cos(d*x+c))^(1/2)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.59 (sec) , antiderivative size = 197, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.391$, Rules used = {2875, 3139, 2734, 2732, 3081, 2742, 2740, 2886, 2884}

$$\int \sqrt{a+b\cos(c+dx)}\sec^2(c+dx)\,dx = \frac{\tan(c+dx)\sqrt{a+b\cos(c+dx)}}{d} + \frac{a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} - \frac{\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}$$

```
[In] Int[Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^2,x]
```

```
[Out] -((Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(d*Sqrt[
(a + b*Cos[c + d*x])/(a + b)])) + (a*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*Ell
ipticF[(c + d*x)/2, (2*b)/(a + b)])/(d*Sqrt[a + b*Cos[c + d*x]]) + (b*Sqrt[
(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(a + b)])/(d
*Sqrt[a + b*Cos[c + d*x]]) + (Sqrt[a + b*Cos[c + d*x]]*Tan[c + d*x])/d
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2875

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m + 1)*((c + d*Sin[e + f*x])^n/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m
 + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(
n - 1)*Simp[a*c*(m + 1) + b*d*n + (a*d*(m + 1) - b*c*(m + 2))*Sin[e + f*x]
- b*d*(m + n + 2)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x
] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m,
-1] && LtQ[0, n, 1] && IntegersQ[2*m, 2*n]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 2886

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(c + d*Sin[e + f*x])/(c + d)]/Sqrt
[c + d*Sin[e + f*x]], Int[1/((a + b*Sin[e + f*x])*Sqrt[c/(c + d) + (d/(c +
d))*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] &&  !GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3139

```
Int[((A_.) + (C_.)*sin[(e_.) + (f_.)*(x_)]^2)/(Sqrt[(a_.) + (b_.)*sin[(e_.)
 + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist
[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x], x] - Dist[1/(b*d), Int[Simp[a*c
*C - A*b*d + (b*c*C + a*C*d)*Sin[e + f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c
```

```
+ d*Sin[e + f*x])), x], x] /; FreeQ[{a, b, c, d, e, f, A, C}, x] && NeQ[b*c
 - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{d}+\int\frac{\left(\frac{b}{2}-\frac{1}{2}b\cos^2(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx\\
&= \frac{\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{d}-\frac{1}{2}\int\sqrt{a+b\cos(c+dx)}\,dx\\
&\quad-\frac{\int\frac{\left(-\frac{b^2}{2}-\frac{1}{2}ab\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{b}\\
&= \frac{\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{d}+\frac{1}{2}a\int\frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx\\
&\quad+\frac{1}{2}b\int\frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx-\frac{\sqrt{a+b\cos(c+dx)}\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\\
&= -\frac{\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}+\frac{\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{d}\\
&\quad+\frac{\left(a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{2\sqrt{a+b\cos(c+dx)}}+\frac{\left(b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{\sec(c+dx)}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{2\sqrt{a+b\cos(c+dx)}}\\
&= -\frac{\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}+\frac{a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}\\
&\quad+\frac{b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}+\frac{\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{d}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 14.87 (sec) , antiderivative size = 307, normalized size of antiderivative = 1.56

$$\int\sqrt{a+b\cos(c+dx)}\sec^2(c+dx)\,dx$$

$$=\frac{\frac{2b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}}-\frac{2i\sqrt{-\frac{b(-1+\cos(c+dx))}{a+b}}\sqrt{\frac{b(1+\cos(c+dx))}{-a+b}}\csc(c+dx)\left(-2a(a-b)E\left(i\,\text{arcsinh}\left(\sqrt{-\frac{1}{a+b}}\sqrt{a+b\cdots\right.\right.\right.}{\cdots}}{\cdots}$$

```
[In] Integrate[Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^2,x]
```

```
[Out] ((2*b*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(
a + b)])/Sqrt[a + b*Cos[c + d*x]] - ((2*I)*Sqrt[-((b*(-1 + Cos[c + d*x]))/(
a + b))]*Sqrt[(b*(1 + Cos[c + d*x]))/(-a + b)]*Csc[c + d*x]*(-2*a*(a - b)*E
llipticE[I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(
a - b)] + b*(-2*a*EllipticF[I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c
+ d*x]]], (a + b)/(a - b)] + b*EllipticPi[(a + b)/a, I*ArcSinh[Sqrt[-(a + b
)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)])))/(a*b*Sqrt[-(a + b)^(
-1)]) + 4*Sqrt[a + b*Cos[c + d*x]]*Tan[c + d*x])/(4*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 621 vs. $2(270) = 540$.

Time = 4.96 (sec) , antiderivative size = 622, normalized size of antiderivative = 3.16

method	result
default	$-\frac{\sqrt{\left(2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\left(4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+(-2a-2b)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\sqrt{-\frac{2b(\text{s}}{}}\right.}{}$

```
[In] int(sec(d*x+c)^2*(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(4*cos(1/2*d*x
+1/2*c)*sin(1/2*d*x+1/2*c)^4*b+(-2*a-2*b)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+
1/2*c)-2*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2*d*x+1
/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a-Elliptic
E(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a+EllipticE(cos(1/2*d*x+1/2*c),(-2
*b/(a-b))^(1/2))*b-EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))*b)*s
in(1/2*d*x+1/2*c)^2+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/
2*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*
a-EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*(-2*b/(a-b)*sin(1/2*d*x+
1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*a+EllipticE(cos(1/
2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-
b))^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*b-b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticPi(cos(1/2*d*x+1/2
*c),2,(-2*b/(a-b))^(1/2)))/(2*cos(1/2*d*x+1/2*c)^2-1)/(-2*sin(1/2*d*x+1/2*c
)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*
x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \sqrt{a+b\cos(c+dx)}\sec^2(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^2*(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \sqrt{a+b\cos(c+dx)}\sec^2(c+dx)\,dx = \int \sqrt{a+b\cos(c+dx)}\sec^2(c+dx)\,dx$$

```
[In] integrate(sec(d*x+c)**2*(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(a + b*cos(c + d*x))*sec(c + d*x)**2, x)
```

Maxima [F]

$$\int \sqrt{a+b\cos(c+dx)}\sec^2(c+dx)\,dx = \int \sqrt{b\cos(dx+c)+a}\sec(dx+c)^2\,dx$$

```
[In] integrate(sec(d*x+c)^2*(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^2, x)
```

Giac [F]

$$\int \sqrt{a+b\cos(c+dx)}\sec^2(c+dx)\,dx = \int \sqrt{b\cos(dx+c)+a}\sec(dx+c)^2\,dx$$

```
[In] integrate(sec(d*x+c)^2*(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+b\cos(c+dx)}\sec^2(c+dx)\,dx=\int \frac{\sqrt{a+b\,\cos\left(c+d\,x\right)}}{\cos\left(c+d\,x\right)^2}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(1/2)/cos(c + d*x)^2,x)
[Out] int((a + b*cos(c + d*x))^(1/2)/cos(c + d*x)^2, x)
```

3.492 $\int \sqrt{a+b\cos(c+dx)}\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 262

$$\begin{aligned}\int \sqrt{a+b\cos(c+dx)}\sec^3(c+dx)\,dx &= -\frac{b\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{4ad\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}+\frac{3b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4d\sqrt{a+b\cos(c+dx)}}\\&\quad+\frac{(4a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4ad\sqrt{a+b\cos(c+dx)}}\\&\quad+\frac{b\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4ad}+\frac{\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d}\end{aligned}$$

```
[Out] -1/4*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*
x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/a/d/((a+b*cos(d*x+
c))/(a+b))^(1/2)+3/4*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elli
pticF(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^
(1/2)/d/(a+b*cos(d*x+c))^(1/2)+1/4*(4*a^2-b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)
/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2,2^(1/2)*(b/(a+b))^(1/2)
)*((a+b*cos(d*x+c))/(a+b))^(1/2)/a/d/(a+b*cos(d*x+c))^(1/2)+1/4*b*(a+b*cos(
d*x+c))^(1/2)*tan(d*x+c)/a/d+1/2*sec(d*x+c)*(a+b*cos(d*x+c))^(1/2)*tan(d*x+
c)/d
```

Rubi [A] (verified)

Time = 0.86 (sec) , antiderivative size = 262, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {2875, 3134, 3138, 2734, 2732, 3081, 2742, 2740, 2886, 2884}

$$\int \sqrt{a+b\cos(c+dx)}\sec^3(c+dx)\,dx$$
$$=\frac{(4a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4ad\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{b\tan(c+dx)\sqrt{a+b\cos(c+dx)}}{4ad}+\frac{3b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4d\sqrt{a+b\cos(c+dx)}}$$
$$-\frac{b\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{4ad\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}+\frac{\tan(c+dx)\sec(c+dx)\sqrt{a+b\cos(c+dx)}}{2d}$$

```
[In] Int[Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^3,x]
```

```
[Out] -1/4*(b*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(a*
d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) + (3*b*Sqrt[(a + b*Cos[c + d*x])/(a +
 b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(4*d*Sqrt[a + b*Cos[c + d*x]])
+ ((4*a^2 - b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c + d*x)
/2, (2*b)/(a + b)])/(4*a*d*Sqrt[a + b*Cos[c + d*x]]) + (b*Sqrt[a + b*Cos[c
+ d*x]]*Tan[c + d*x])/(4*a*d) + (Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]*Tan[
c + d*x])/(2*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2875

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m + 1)*((c + d*Sin[e + f*x])^n/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m
 + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(
n - 1)*Simp[a*c*(m + 1) + b*d*n + (a*d*(m + 1) - b*c*(m + 2))*Sin[e + f*x]
- b*d*(m + n + 2)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x
] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m,
-1] && LtQ[0, n, 1] && IntegersQ[2*m, 2*n]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 2886

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(c + d*Sin[e + f*x])/(c + d)]/Sqrt
[c + d*Sin[e + f*x]], Int[1/((a + b*Sin[e + f*x])*Sqrt[c/(c + d) + (d/(c +
d))*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] &&  !GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
```

```
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} \\
&\quad+\frac{1}{2}\int\frac{\left(\frac{b}{2}+a\cos(c+dx)+\frac{1}{2}b\cos^2(c+dx)\right)\sec^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx \\
&= \frac{b\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4ad}+\frac{\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} \\
&\quad+\frac{\int\frac{\left(\frac{1}{4}(4a^2-b^2)+\frac{1}{2}ab\cos(c+dx)-\frac{1}{4}b^2\cos^2(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{2a} \\
&= \frac{b\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4ad}+\frac{\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} \\
&\quad-\frac{\int\frac{\left(-\frac{1}{4}b(4a^2-b^2)-\frac{3}{4}ab^2\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{2ab}-\frac{b\int\sqrt{a+b\cos(c+dx)}\,dx}{8a}
\end{aligned}
$$

$$= \frac{b\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4ad} + \frac{\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} + \frac{1}{8}(3b)\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx + \frac{(4a^2-b^2)\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{8a} - \frac{\left(b\sqrt{a+b\cos(c+dx)}\right)\int \sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{8a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

$$= -\frac{b\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{4ad\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{b\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4ad} + \frac{\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} + \frac{\left(3b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{8\sqrt{a+b\cos(c+dx)}} + \frac{\left((4a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{\sec(c+dx)}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{8a\sqrt{a+b\cos(c+dx)}}$$

$$= -\frac{b\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{4ad\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{3b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4d\sqrt{a+b\cos(c+dx)}} + \frac{(4a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4ad\sqrt{a+b\cos(c+dx)}} + \frac{b\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4ad} + \frac{\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 5.68 (sec) , antiderivative size = 393, normalized size of antiderivative = 1.50

$$\int \sqrt{a+b\cos(c+dx)}\sec^3(c+dx)\,dx$$

$$= \frac{\frac{8b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}} + \frac{2(8a^2-3b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{a\sqrt{a+b\cos(c+dx)}} - \frac{2i\sqrt{-\frac{b(-1+\cos(c+dx))}{a+b}}\sqrt{\frac{b(1+\cos(c}{-a+}}}{}}{}$$

```
[In] Integrate[Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^3,x]
```

```
[Out] ((8*b*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a +
b)])/Sqrt[a + b*Cos[c + d*x]] + (2*(8*a^2 - 3*b^2)*Sqrt[(a + b*Cos[c + d*x]
)/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(a + b)])/(a*Sqrt[a + b*Cos[c +
 d*x]]) - ((2*I)*Sqrt[-((b*(-1 + Cos[c + d*x]))/(a + b))]*Sqrt[(b*(1 + Cos[
c + d*x]))/(-a + b)]*Csc[c + d*x]*(-2*a*(a - b)*EllipticE[I*ArcSinh[Sqrt[-(
a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)] + b*(-2*a*Elliptic
F[I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)]
 + b*EllipticPi[(a + b)/a, I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c +
 d*x]]], (a + b)/(a - b)])))/(a^2*Sqrt[-(a + b)^(-1)]) + (4*Sqrt[a + b*Cos[
c + d*x]]*(2*a + b*Cos[c + d*x])*Sec[c + d*x]*Tan[c + d*x])/a)/(16*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 976 vs. $2(323) = 646$.

Time = 5.46 (sec) , antiderivative size = 977, normalized size of antiderivative = 3.73

method	result	size
default	Expression too large to display	977

```
[In] int(sec(d*x+c)^3*(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-8*cos(1/
2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6*b^2+(12*a*b+8*b^2)*sin(1/2*d*x+1/2*c)^4*c
os(1/2*d*x+1/2*c)+(-4*a^2-6*a*b-2*b^2)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2
*c)+4*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2*d*x+1/2*
c)^2)^(1/2)*(3*b*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a-b*Ellip
ticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a+b^2*EllipticE(cos(1/2*d*x+1/2
*c),(-2*b/(a-b))^(1/2))-4*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2
))*a^2+EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))*b^2)*sin(1/2*d*x
+1/2*c)^4-4*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(3*b*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a-b
*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a+b^2*EllipticE(cos(1/2*d
*x+1/2*c),(-2*b/(a-b))^(1/2))-4*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b)
)^(1/2))*a^2+EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))*b^2)*sin(1
/2*d*x+1/2*c)^2+3*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/
2*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*
a-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b)
)^(1/2)*b*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a+b^2*(sin(1/2*d
*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*Elli
pticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-4*(sin(1/2*d*x+1/2*c)^2)^(1/2)
*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticPi(cos(1/2*d*x
+1/2*c),2,(-2*b/(a-b))^(1/2))*a^2+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*
sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2
```

```
*b/(a-b))^(1/2))*b^2)/a/(2*cos(1/2*d*x+1/2*c)^2-1)^2/(-2*sin(1/2*d*x+1/2*c)
^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x
+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \sqrt{a+b\cos(c+dx)}\sec^3(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^3*(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \sqrt{a+b\cos(c+dx)}\sec^3(c+dx)\,dx = \int \sqrt{a+b\cos(c+dx)}\sec^3(c+dx)\,dx$$

```
[In] integrate(sec(d*x+c)**3*(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(a + b*cos(c + d*x))*sec(c + d*x)**3, x)
```

Maxima [F]

$$\int \sqrt{a+b\cos(c+dx)}\sec^3(c+dx)\,dx = \int \sqrt{b\cos(dx+c)+a}\sec(dx+c)^3\,dx$$

```
[In] integrate(sec(d*x+c)^3*(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^3, x)
```

Giac [F]

$$\int \sqrt{a+b\cos(c+dx)}\sec^3(c+dx)\,dx = \int \sqrt{b\cos(dx+c)+a}\sec(dx+c)^3\,dx$$

```
[In] integrate(sec(d*x+c)^3*(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+b\cos(c+dx)}\sec^3(c+dx)\,dx=\int \frac{\sqrt{a+b\,\cos\left(c+d\,x\right)}}{{\cos\left(c+d\,x\right)}^3}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(1/2)/cos(c + d*x)^3,x)
[Out] int((a + b*cos(c + d*x))^(1/2)/cos(c + d*x)^3, x)
```

3.493 $\int \cos^3(c+dx)(a+b\cos(c+dx))^{3/2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 314

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \frac{2(8a^4+33a^2b^2+147b^4)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{315b^3d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2a(8a^4+31a^2b^2-39b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{315b^3d\sqrt{a+b\cos(c+dx)}} + \frac{2a(8a^2+39b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315b^2d} + \frac{2(8a^2+49b^2)(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{315b^2d} - \frac{8a(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{63b^2d} + \frac{2\cos(c+dx)(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{9bd}$$

```
[Out] 2/315*(8*a^2+49*b^2)*(a+b*cos(d*x+c))^(3/2)*sin(d*x+c)/b^2/d-8/63*a*(a+b*co
s(d*x+c))^(5/2)*sin(d*x+c)/b^2/d+2/9*cos(d*x+c)*(a+b*cos(d*x+c))^(5/2)*sin(
d*x+c)/b/d+2/315*a*(8*a^2+39*b^2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/b^2/d+2
/315*(8*a^4+33*a^2*b^2+147*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/
2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))
^(1/2)/b^3/d/((a+b*cos(d*x+c))/(a+b))^(1/2)-2/315*a*(8*a^4+31*a^2*b^2-39*b^
4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/
2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/b^3/d/(a+b*cos
(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.83 (sec) , antiderivative size = 314, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.348$, Rules used = {2872, 3102, 2832, 2831, 2742, 2740, 2734, 2732}

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \frac{2(8a^2+49b^2)\sin(c+dx)(a+b\cos(c+dx))^{3/2}}{315b^2d} + \frac{2a(8a^2+39b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{315b^2d} - \frac{2a(8a^4+31a^2b^2-39b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{315b^3d\sqrt{a+b\cos(c+dx)}} + \frac{2(8a^4+33a^2b^2+147b^4)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{315b^3d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{8a\sin(c+dx)(a+b\cos(c+dx))^{5/2}}{63b^2d} + \frac{2\sin(c+dx)\cos(c+dx)(a+b\cos(c+dx))^{5/2}}{9bd}$$

```
[In] Int[Cos[c + d*x]^3*(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*(8*a^4 + 33*a^2*b^2 + 147*b^4)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d
*x)/2, (2*b)/(a + b)])/(315*b^3*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) - (2*
a*(8*a^4 + 31*a^2*b^2 - 39*b^4)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*Elliptic
F[(c + d*x)/2, (2*b)/(a + b)])/(315*b^3*d*Sqrt[a + b*Cos[c + d*x]]) + (2*a*
(8*a^2 + 39*b^2)*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(315*b^2*d) + (2*(8
*a^2 + 49*b^2)*(a + b*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(315*b^2*d) - (8*a*
(a + b*Cos[c + d*x])^(5/2)*Sin[c + d*x])/(63*b^2*d) + (2*Cos[c + d*x]*(a +
b*Cos[c + d*x])^(5/2)*Sin[c + d*x])/(9*b*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
```

```
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2\cos(c+dx)(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{9bd} \\
&\quad+ \frac{2\int (a+b\cos(c+dx))^{3/2}\left(a+\frac{7}{2}b\cos(c+dx)-2a\cos^2(c+dx)\right)\,dx}{9b} \\
&= -\frac{8a(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{63b^2d} \\
&\quad+ \frac{2\cos(c+dx)(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{9bd} \\
&\quad+ \frac{4\int (a+b\cos(c+dx))^{3/2}\left(-\frac{3ab}{2}+\frac{1}{4}(8a^2+49b^2)\cos(c+dx)\right)\,dx}{63b^2} \\
&= \frac{2(8a^2+49b^2)(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{315b^2d} \\
&\quad- \frac{8a(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{63b^2d} \\
&\quad+ \frac{2\cos(c+dx)(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{9bd} \\
&\quad+ \frac{8\int \sqrt{a+b\cos(c+dx)}\left(-\frac{3}{8}b(2a^2-49b^2)+\frac{3}{8}a(8a^2+39b^2)\cos(c+dx)\right)\,dx}{315b^2} \\
&= \frac{2a(8a^2+39b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315b^2d} \\
&\quad+ \frac{2(8a^2+49b^2)(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{315b^2d} \\
&\quad- \frac{8a(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{63b^2d} \\
&\quad+ \frac{2\cos(c+dx)(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{9bd} \\
&\quad+ \frac{16\int \frac{\frac{3}{8}ab(a^2+93b^2)+\frac{3}{16}(8a^4+33a^2b^2+147b^4)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{945b^2}
\end{aligned}$$

$$
\begin{aligned}
&= \frac{2a(8a^2+39b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315b^2d} \\
&+ \frac{2(8a^2+49b^2)(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{315b^2d} \\
&- \frac{8a(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{63b^2d} \\
&+ \frac{2\cos(c+dx)(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{9bd} \\
&- \frac{(a(8a^4+31a^2b^2-39b^4))\int\frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{315b^3} \\
&+ \frac{(8a^4+33a^2b^2+147b^4)\int\sqrt{a+b\cos(c+dx)}\,dx}{315b^3}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{2a(8a^2+39b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315b^2d} \\
&+ \frac{2(8a^2+49b^2)(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{315b^2d} \\
&- \frac{8a(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{63b^2d} \\
&+ \frac{2\cos(c+dx)(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{9bd} \\
&+ \frac{\left((8a^4+33a^2b^2+147b^4)\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{315b^3\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\
&- \frac{\left(a(8a^4+31a^2b^2-39b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{315b^3\sqrt{a+b\cos(c+dx)}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{2(8a^4+33a^2b^2+147b^4)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{315b^3d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\
&- \frac{2a(8a^4+31a^2b^2-39b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{315b^3d\sqrt{a+b\cos(c+dx)}} \\
&+ \frac{2a(8a^2+39b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315b^2d} \\
&+ \frac{2(8a^2+49b^2)(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{315b^2d} \\
&- \frac{8a(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{63b^2d} \\
&+ \frac{2\cos(c+dx)(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{9bd}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.06 (sec) , antiderivative size = 262, normalized size of antiderivative = 0.83

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \frac{8(8a^5+8a^4b+33a^3b^2+33a^2b^3+147ab^4+147b^5)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)-8a(8a^4+}{}$$

[In] Integrate[Cos[c + d*x]^3*(a + b*Cos[c + d*x])^(3/2),x]

[Out] (8*(8*a^5 + 8*a^4*b + 33*a^3*b^2 + 33*a^2*b^3 + 147*a*b^4 + 147*b^5)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticE[(c + d*x)/2, (2*b)/(a + b)] - 8*a*(8*a^4 + 31*a^2*b^2 - 39*b^4)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)] + b*(-32*a^4 + 916*a^2*b^2 + 301*b^4 + (-8*a^3*b + 1606*a*b^3)*Cos[c + d*x] + 4*(53*a^2*b^2 + 84*b^4)*Cos[2*(c + d*x)] + 170*a*b^3*Cos[3*(c + d*x)] + 35*b^4*Cos[4*(c + d*x)])*Sin[c + d*x])/(1260*b^3*d*Sqrt[a + b*Cos[c + d*x]])

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 994 vs. 2(344) = 688.

Time = 8.67 (sec) , antiderivative size = 995, normalized size of antiderivative = 3.17

method	result	size
default	Expression too large to display	995

[In] int(cos(d*x+c)^3*(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)

[Out] -2/315*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-1120*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^10*b^5+(1360*a*b^4+2240*b^5)*sin(1/2*d*x+1/2*c)^8*cos(1/2*d*x+1/2*c)+(-424*a^2*b^3-2040*a*b^4-2072*b^5)*sin(1/2*d*x+1/2*c)^6*cos(1/2*d*x+1/2*c)+(-4*a^3*b^2+424*a^2*b^3+1568*a*b^4+952*b^5)*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+(8*a^4*b+2*a^3*b^2-282*a^2*b^3-444*a*b^4-168*b^5)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-8*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^5-31*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^3*b^2+39*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^4+8*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^5-8*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^4*b+33*(s

```
in(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1
/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^3*b^2-33*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*Ellip
ticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2*b^3+147*(sin(1/2*d*x+1/2*c)
^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos
(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^4-147*(sin(1/2*d*x+1/2*c)^2)^(1/2)*
(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1
/2*c),(-2*b/(a-b))^(1/2))*b^5)/b^3/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2
*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/
2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.15 (sec) , antiderivative size = 516, normalized size of antiderivative = 1.64

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^{3/2}\,dx =$$

$$-\frac{4\sqrt{2}(-4i\,a^5-15i\,a^3b^2+66i\,ab^4)\sqrt{b}\text{weierstrassPInverse}\left(\frac{4\,(4\,a^2-3\,b^2)}{3\,b^2},-\frac{8\,(8\,a^3-9\,ab^2)}{27\,b^3},\frac{3\,b\cos(dx+c)+3i\,b\sin(dx+c)+}{3\,b}\right.}{}$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] -1/945*(4*sqrt(2)*(-4*I*a^5 - 15*I*a^3*b^2 + 66*I*a*b^4)*sqrt(b)*weierstras
sPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*co
s(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b) + 4*sqrt(2)*(4*I*a^5 + 15*I*a^3*b
^2 - 66*I*a*b^4)*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27
*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b
) + 3*sqrt(2)*(-8*I*a^4*b - 33*I*a^2*b^3 - 147*I*b^5)*sqrt(b)*weierstrassZe
ta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInvers
e(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x +
c) + 3*I*b*sin(d*x + c) + 2*a)/b)) + 3*sqrt(2)*(8*I*a^4*b + 33*I*a^2*b^3 +
147*I*b^5)*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 -
9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9
*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b)) - 6*(35*
b^5*cos(d*x + c)^3 + 50*a*b^4*cos(d*x + c)^2 - 4*a^3*b^2 + 88*a*b^4 + (3*a^
2*b^3 + 49*b^5)*cos(d*x + c))*sqrt(b*cos(d*x + c) + a)*sin(d*x + c))/(b^4*d
)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3*(a+b*cos(d*x+c))**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^3\,dx$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*cos(d*x + c)^3, x)
```

Giac [F]

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^3\,dx$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*cos(d*x + c)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \int \cos(c+d\,x)^3\,(a+b\,\cos(c+d\,x))^{3/2}\,dx$$

```
[In] int(cos(c + d*x)^3*(a + b*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)^3*(a + b*cos(c + d*x))^(3/2), x)
```

3.494 $\int \cos^2(c+dx)(a+b\cos(c+dx))^{3/2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 258

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = -\frac{4a(3a^2-41b^2)\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{105b^2d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2(6a^4-31a^2b^2+25b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{105b^2d\sqrt{a+b\cos(c+dx)}} - \frac{2(6a^2-25b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105bd} - \frac{4a(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{35bd} + \frac{2(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7bd}$$

```
[Out] -4/35*a*(a+b*cos(d*x+c))^(3/2)*sin(d*x+c)/b/d+2/7*(a+b*cos(d*x+c))^(5/2)*si
n(d*x+c)/b/d-2/105*(6*a^2-25*b^2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/b/d-4/1
05*a*(3*a^2-41*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipti
cE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/b^2/d
/((a+b*cos(d*x+c))/(a+b))^(1/2)+2/105*(6*a^4-31*a^2*b^2+25*b^4)*(cos(1/2*d*
x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2)*(
b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/b^2/d/(a+b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 258, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {2870, 2832, 2831, 2742, 2740, 2734, 2732}

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = -\frac{2(6a^2-25b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{105bd} - \frac{4a(3a^2-41b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{105b^2d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2(6a^4-31a^2b^2+25b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{105b^2d\sqrt{a+b\cos(c+dx)}} + \frac{2\sin(c+dx)(a+b\cos(c+dx))^{5/2}}{7bd} - \frac{4a\sin(c+dx)(a+b\cos(c+dx))^{3/2}}{35bd}$$

```
[In] Int[Cos[c + d*x]^2*(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-4*a*(3*a^2 - 41*b^2)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b
)/(a + b)])/(105*b^2*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) + (2*(6*a^4 - 31
*a^2*b^2 + 25*b^4)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2
, (2*b)/(a + b)])/(105*b^2*d*Sqrt[a + b*Cos[c + d*x]]) - (2*(6*a^2 - 25*b^2
)*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(105*b*d) - (4*a*(a + b*Cos[c + d*
x])^(3/2)*Sin[c + d*x])/(35*b*d) + (2*(a + b*Cos[c + d*x])^(5/2)*Sin[c + d*
x])/(7*b*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
```

```
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rule 2870

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^2, x_Symbol] :> Simp[(-d^2)*Cos[e + f*x]*((a + b*Sin[e + f*x])
^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m + 2)), Int[(a + b*Sin[e + f*x])^
m*Simp[b*(d^2*(m + 1) + c^2*(m + 2)) - d*(a*d - 2*b*c*(m + 2))*Sin[e + f*x]
, x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] && NeQ
[a^2 - b^2, 0] &&  !LtQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{2(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7bd} \\
&\quad+\frac{2\int\left(\frac{5b}{2}-a\cos(c+dx)\right)(a+b\cos(c+dx))^{3/2}\,dx}{7b} \\
&= -\frac{4a(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{35bd}+\frac{2(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7bd} \\
&\quad+\frac{4\int\sqrt{a+b\cos(c+dx)}\left(\frac{19ab}{4}-\frac{1}{4}(6a^2-25b^2)\cos(c+dx)\right)\,dx}{35b}
\end{aligned}
$$

$$=-\frac{2(6a^2-25b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105bd}-\frac{4a(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{35bd}+\frac{2(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7bd}+\frac{8\int\frac{\frac{1}{8}b(51a^2+25b^2)-\frac{1}{4}a(3a^2-41b^2)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}dx}{105b}$$

$$=-\frac{2(6a^2-25b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105bd}-\frac{4a(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{35bd}+\frac{2(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7bd}+\frac{1}{105}\left(2a\left(41-\frac{3a^2}{b^2}\right)\right)\int\sqrt{a+b\cos(c+dx)}dx+\frac{(6a^4-31a^2b^2+25b^4)\int\frac{1}{\sqrt{a+b\cos(c+dx)}}dx}{105b^2}$$

$$=-\frac{2(6a^2-25b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105bd}-\frac{4a(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{35bd}+\frac{2(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7bd}+\frac{\left(2a\left(41-\frac{3a^2}{b^2}\right)\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}dx}{105\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}+\frac{\left((6a^4-31a^2b^2+25b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}dx}{105b^2\sqrt{a+b\cos(c+dx)}}$$

$$=\frac{4a\left(41-\frac{3a^2}{b^2}\right)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{105d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}+\frac{2(6a^4-31a^2b^2+25b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{105b^2d\sqrt{a+b\cos(c+dx)}}-\frac{2(6a^2-25b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105bd}-\frac{4a(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{35bd}+\frac{2(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7bd}$$

Mathematica [A] (verified)

Time = 0.88 (sec) , antiderivative size = 214, normalized size of antiderivative = 0.83

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \frac{-8a(3a^3+3a^2b-41ab^2-41b^3)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)+4(6a^4-31a^2b^2+25b^4)\sqrt{}}{}$$

```
[In] Integrate[Cos[c + d*x]^2*(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-8*a*(3*a^3 + 3*a^2*b - 41*a*b^2 - 41*b^3)*Sqrt[(a + b*Cos[c + d*x])/(a +
b)]*EllipticE[(c + d*x)/2, (2*b)/(a + b)] + 4*(6*a^4 - 31*a^2*b^2 + 25*b^4)
*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)] +
 b*(12*a^3 + 178*a*b^2 + b*(108*a^2 + 145*b^2)*Cos[c + d*x] + 78*a*b^2*Cos[
2*(c + d*x)] + 15*b^3*Cos[3*(c + d*x)])*Sin[c + d*x])/(210*b^2*d*Sqrt[a + b
*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 826 vs. 2(292) = 584.

Time = 7.81 (sec) , antiderivative size = 827, normalized size of antiderivative = 3.21

method	result	size
default	Expression too large to display	827

```
[In] int(cos(d*x+c)^2*(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/105*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(240*cos
(1/2*d*x+1/2*c)^9*b^4+312*cos(1/2*d*x+1/2*c)^7*a*b^3-600*cos(1/2*d*x+1/2*c)
^7*b^4+108*cos(1/2*d*x+1/2*c)^5*a^2*b^2-624*cos(1/2*d*x+1/2*c)^5*a*b^3+640*
cos(1/2*d*x+1/2*c)^5*b^4+6*cos(1/2*d*x+1/2*c)^3*a^3*b-162*cos(1/2*d*x+1/2*c
)^3*a^2*b^2+440*cos(1/2*d*x+1/2*c)^3*a*b^3-360*cos(1/2*d*x+1/2*c)^3*b^4+6*(
sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*El
lipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^4-31*(sin(1/2*d*x+1/2*c)^2
)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+
1/2*c),(-2*b/(a-b))^(1/2))*a^2*b^2+25*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*co
s(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-
b))^(1/2))*b^4-6*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-
b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^4+6*(sin
(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*Ellip
ticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^3*b+82*(sin(1/2*d*x+1/2*c)^2)
^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1
/2*c),(-2*b/(a-b))^(1/2))*a^2*b^2-82*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos
```

```
(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b
))^(1/2))*a*b^3-6*cos(1/2*d*x+1/2*c)*a^3*b+54*cos(1/2*d*x+1/2*c)*a^2*b^2-12
8*cos(1/2*d*x+1/2*c)*a*b^3+80*cos(1/2*d*x+1/2*c)*b^4)/b^2/(-2*sin(1/2*d*x+1
/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/
2*d*x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.14 (sec) , antiderivative size = 474, normalized size of antiderivative = 1.84

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \frac{\sqrt{2}(-12i\,a^4+11i\,a^2b^2-75i\,b^4)\sqrt{b}\,\text{weierstrassPInverse}\left(\frac{4\,(4\,a^2-3\,b^2)}{3\,b^2},-\frac{8\,(8\,a^3-9\,ab^2)}{27\,b^3},\frac{3\,b\cos(dx+c)+3i\,b}{3\,b}\right.}{}$$

```
[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/315*(sqrt(2)*(-12*I*a^4 + 11*I*a^2*b^2 - 75*I*b^4)*sqrt(b)*weierstrassPIn
verse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*
x + c) + 3*I*b*sin(d*x + c) + 2*a)/b) + sqrt(2)*(12*I*a^4 - 11*I*a^2*b^2 +
75*I*b^4)*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3
 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b) - 6*s
qrt(2)*(3*I*a^3*b - 41*I*a*b^3)*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)
/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/
b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c
) + 2*a)/b)) - 6*sqrt(2)*(-3*I*a^3*b + 41*I*a*b^3)*sqrt(b)*weierstrassZeta(
4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4
/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c)
- 3*I*b*sin(d*x + c) + 2*a)/b)) + 6*(15*b^4*cos(d*x + c)^2 + 24*a*b^3*cos(d
*x + c) + 3*a^2*b^2 + 25*b^4)*sqrt(b*cos(d*x + c) + a)*sin(d*x + c))/(b^3*d
)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**2*(a+b*cos(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^2\,dx$$

```
[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*cos(d*x + c)^2, x)
```

Giac [F]

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^2\,dx$$

```
[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*cos(d*x + c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \int \cos(c+d\,x)^2\,(a+b\,\cos(c+d\,x))^{3/2}\,dx$$

```
[In] int(cos(c + d*x)^2*(a + b*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)^2*(a + b*cos(c + d*x))^(3/2), x)
```

3.495 $\int \cos(c+dx)(a+b\cos(c+dx))^{3/2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 199

$$\int \cos(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \frac{2(a^2+3b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{5bd\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2a(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{5bd\sqrt{a+b\cos(c+dx)}} + \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d} + \frac{2(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{5d}$$

```
[Out] 2/5*(a+b*cos(d*x+c))^(3/2)*sin(d*x+c)/d+2/5*a*sin(d*x+c)*(a+b*cos(d*x+c))^(
1/2)/d+2/5*(a^2+3*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elli
pticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/b/
d/((a+b*cos(d*x+c))/(a+b))^(1/2)-2/5*a*(a^2-b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/
2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))
*((a+b*cos(d*x+c))/(a+b))^(1/2)/b/d/(a+b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 199, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used

$= \{2832, 2831, 2742, 2740, 2734, 2732\}$

$$\int \cos(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = -\frac{2a(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{5bd\sqrt{a+b\cos(c+dx)}} + \frac{2(a^2+3b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{5bd\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2\sin(c+dx)(a+b\cos(c+dx))^{3/2}}{5d} + \frac{2a\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{5d}$$

```
[In] Int[Cos[c + d*x]*(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*(a^2 + 3*b^2)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a +
 b)])/(5*b*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) - (2*a*(a^2 - b^2)*Sqrt[(a
 + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(5*b*d*S
qrt[a + b*Cos[c + d*x]]) + (2*a*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(5*d
) + (2*(a + b*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(5*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{2(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{5d} \\
&\quad + \frac{2}{5}\int\left(\frac{3b}{2}+\frac{3}{2}a\cos(c+dx)\right)\sqrt{a+b\cos(c+dx)}\,dx \\
&= \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d} + \frac{2(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{5d} \\
&\quad + \frac{4}{15}\int\frac{3ab+\frac{3}{4}(a^2+3b^2)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx \\
&= \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d} + \frac{2(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{5d} \\
&\quad - \frac{(a(a^2-b^2))\int\frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{5b} + \frac{(a^2+3b^2)\int\sqrt{a+b\cos(c+dx)}\,dx}{5b} \\
&= \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d} + \frac{2(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{5d} \\
&\quad + \frac{\left((a^2+3b^2)\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{5b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\
&\quad - \frac{\left(a(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{5b\sqrt{a+b\cos(c+dx)}}
\end{aligned}
$$

$$= \frac{2(a^2+3b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{5bd\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2a(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{5bd\sqrt{a+b\cos(c+dx)}} + \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d} + \frac{2(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{5d}$$

Mathematica [A] (verified)

Time = 0.61 (sec) , antiderivative size = 174, normalized size of antiderivative = 0.87

$$\int \cos(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \frac{2(a^3+a^2b+3ab^2+3b^3)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right) - 2a(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{Elliptic}}{5bd\sqrt{a+b\cos(c}$$

```
[In] Integrate[Cos[c + d*x]*(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*(a^3 + a^2*b + 3*a*b^2 + 3*b^3)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*Ellip
ticE[(c + d*x)/2, (2*b)/(a + b)] - 2*a*(a^2 - b^2)*Sqrt[(a + b*Cos[c + d*x]
)/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)] + b*(4*a^2 + b^2 + 6*a*b*C
os[c + d*x] + b^2*Cos[2*(c + d*x)])*Sin[c + d*x])/(5*b*d*Sqrt[a + b*Cos[c +
 d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 662 vs. 2(237) = 474.

Time = 6.56 (sec) , antiderivative size = 663, normalized size of antiderivative = 3.33

method	result
default	$-\frac{2\sqrt{\left(2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(8\left(\cos^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3+12\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a\,b^2-16\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3+4\left(\cos^3\left(\frac{dx}{2}\right.\right.\right.}{}$

```
[In] int(cos(d*x+c)*(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/5*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(8*cos(1/2
*d*x+1/2*c)^7*b^3+12*cos(1/2*d*x+1/2*c)^5*a*b^2-16*cos(1/2*d*x+1/2*c)^5*b^3
+4*cos(1/2*d*x+1/2*c)^3*a^2*b-18*cos(1/2*d*x+1/2*c)^3*a*b^2+10*cos(1/2*d*x+
1/2*c)^3*b^3-a^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-
b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))+a*b^2*(sin
```

(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))+(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^3-(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2*b+3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^2-3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*b^3-4*cos(1/2*d*x+1/2*c)*a^2*b+6*cos(1/2*d*x+1/2*c)*a*b^2-2*cos(1/2*d*x+1/2*c)*b^3)/b/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.13 (sec) , antiderivative size = 438, normalized size of antiderivative = 2.20

$$\int \cos(c+dx)(a+b\cos(c+dx))^{3/2}\,dx =$$
$$-\frac{2\sqrt{2}(-i\,a^3+3i\,ab^2)\sqrt{b}\text{weierstrassPInverse}\left(\frac{4\,(4\,a^2-3\,b^2)}{3\,b^2},-\frac{8\,(8\,a^3-9\,ab^2)}{27\,b^3},\frac{3\,b\cos(dx+c)+3i\,b\sin(dx+c)+2\,a}{3\,b}\right)+2\sqrt{2}(i\,a}{}$$

[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")

[Out] -1/15*(2*sqrt(2)*(-I*a^3 + 3*I*a*b^2)*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b) + 2*sqrt(2)*(I*a^3 - 3*I*a*b^2)*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b) + 3*sqrt(2)*(-I*a^2*b - 3*I*b^3)*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b)) + 3*sqrt(2)*(I*a^2*b + 3*I*b^3)*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b)) - 6*(b^3*cos(d*x + c) + 2*a*b^2)*sqrt(b*cos(d*x + c) + a)*sin(d*x + c))/(b^2*d)

Sympy [F]

$$\int \cos(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \int (a+b\cos(c+dx))^{\frac{3}{2}}\cos(c+dx)\,dx$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))**(3/2),x)
[Out] Integral((a + b*cos(c + d*x))**(3/2)*cos(c + d*x), x)
```

Maxima [F]

$$\int \cos(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)\,dx$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*cos(d*x + c), x)
```

Giac [F]

$$\int \cos(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)\,dx$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*cos(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \int \cos(c+d\,x)\,\left(a+b\,\cos(c+d\,x)\right)^{3/2}\,dx$$

```
[In] int(cos(c + d*x)*(a + b*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)*(a + b*cos(c + d*x))^(3/2), x)
```

3.496 $\int (a+b\cos(c+dx))^{3/2}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 157

$$\int (a+b\cos(c+dx))^{3/2}\,dx=\frac{8a\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}-\frac{2(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3d\sqrt{a+b\cos(c+dx)}}+\frac{2b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d}$$

```
[Out] 2/3*b*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+8/3*a*(cos(1/2*d*x+1/2*c)^2)^(1/2
)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*
(a+b*cos(d*x+c))^(1/2)/d/((a+b*cos(d*x+c))/(a+b))^(1/2)-2/3*(a^2-b^2)*(cos(
1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(
1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/d/(a+b*cos(d*x+c))^(1/
2)
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {2735, 2831, 2742, 2740, 2734, 2732}

$$\int (a+b\cos(c+dx))^{3/2}\,dx=-\frac{2(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3d\sqrt{a+b\cos(c+dx)}}+\frac{2b\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{3d}+\frac{8a\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[In] Int[(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (8*a*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(3*d*S
qrt[(a + b*Cos[c + d*x])/(a + b)]) - (2*(a^2 - b^2)*Sqrt[(a + b*Cos[c + d*x
])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(3*d*Sqrt[a + b*Cos[c +
d*x]]) + (2*b*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(3*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2735

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos
[c + d*x]*((a + b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[1/n, Int[(a + b*S
in[c + d*x])^(n - 2)*Simp[a^2*n + b^2*(n - 1) + a*b*(2*n - 1)*Sin[c + d*x],
 x], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d}+\frac{2}{3}\int\frac{\frac{1}{2}(3a^2+b^2)+2ab\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx\\
&= \frac{2b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d}+\frac{1}{3}(4a)\int\sqrt{a+b\cos(c+dx)}\,dx\\
&\quad+\frac{1}{3}\left(-a^2+b^2\right)\int\frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx\\
&= \frac{2b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d}\\
&\quad+\frac{\left(4a\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{3\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\\
&\quad+\frac{\left(\left(-a^2+b^2\right)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{3\sqrt{a+b\cos(c+dx)}}\\
&= \frac{8a\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{3d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\\
&\quad-\frac{2(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3d\sqrt{a+b\cos(c+dx)}}\\
&\quad+\frac{2b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.36 (sec) , antiderivative size = 134, normalized size of antiderivative = 0.85

$$\int(a+b\cos(c+dx))^{3/2}\,dx=\frac{8a(a+b)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)-2(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3d\sqrt{a+b\cos(c+dx)}}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(3/2),x]
[Out] (8*a*(a + b)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticE[(c + d*x)/2, (2*b
)/(a + b)] - 2*(a^2 - b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c
+ d*x)/2, (2*b)/(a + b)] + 2*b*(a + b*Cos[c + d*x])*Sin[c + d*x])/(3*d*Sqrt
[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 449 vs. $2(199) = 398$.

Time = 4.68 (sec) , antiderivative size = 450, normalized size of antiderivative = 2.87

method	result
default	$-\frac{2\sqrt{\left(2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^2+2\left(\cos^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)ab-6\left(\cos^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^2-a^2\sqrt{\frac{1}{2}-\frac{\cos(dx+}{2}}}{}$

```
[In] int((a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(4*cos(1/2
*d*x+1/2*c)^5*b^2+2*cos(1/2*d*x+1/2*c)^3*a*b-6*cos(1/2*d*x+1/2*c)^3*b^2-a^2
*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*
EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))+b^2*(sin(1/2*d*x+1/2*c)^2)
^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1
/2*c),(-2*b/(a-b))^(1/2))+4*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+
1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))
*a^2-4*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^
(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b-2*cos(1/2*d*x+1/
2*c)*a*b+2*cos(1/2*d*x+1/2*c)*b^2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2
*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/
2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 398, normalized size of antiderivative = 2.54

$$\int (a+b\cos(c+dx))^{3/2}\,dx = \frac{12i\sqrt{2}ab^{\frac{3}{2}}\text{weierstrassZeta}\left(\frac{4\,(4\,a^2-3\,b^2)}{3\,b^2},-\frac{8\,(8\,a^3-9\,ab^2)}{27\,b^3},\text{weierstrassPInverse}\left(\frac{4\,(4\,a^2-3\,b^2)}{3\,b^2},-\frac{8\,(8\,a^3-}{27\,b}\right.\right.}{}$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/9*(12*I*sqrt(2)*a*b^(3/2)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*
(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(
8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b))
 - 12*I*sqrt(2)*a*b^(3/2)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8
*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*
a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b)) +
 6*sqrt(b*cos(d*x + c) + a)*b^2*sin(d*x + c) + sqrt(2)*(-I*a^2 - 3*I*b^2)*s
```

```
qrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)
/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b) + sqrt(2)*(I*a^2
 + 3*I*b^2)*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a
^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b))/(b
*d)
```

Sympy [F]

$$\int (a+b\cos(c+dx))^{3/2}\,dx = \int (a+b\cos{(c+dx)})^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**(3/2),x)
[Out] Integral((a + b*cos(c + d*x))**(3/2), x)
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{3/2}\,dx = \int (b\cos{(dx+c)}+a)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{3/2}\,dx = \int (b\cos{(dx+c)}+a)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{3/2}\,dx = \int {\left(a+b\,\cos\left(c+d\,x\right)\right)}^{3/2}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(3/2),x)
[Out] int((a + b*cos(c + d*x))^(3/2), x)
```

3.497 $\int (a+b\cos(c+dx))^{3/2}\sec(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 179

$$\int (a+b\cos(c+dx))^{3/2}\sec(c+dx)\,dx = \frac{2b\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2ab\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} + \frac{2a^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] 2*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1
/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/d/((a+b*cos(d*x+c))/(
a+b))^(1/2)+2*a*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF
(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)
/d/(a+b*cos(d*x+c))^(1/2)+2*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/
2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2,2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x
+c))/(a+b))^(1/2)/d/(a+b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 179, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.381$, Rules used

$= \{2883, 2734, 2732, 2882, 2742, 2740, 2886, 2884\}$

$$\int (a+b\cos(c+dx))^{3/2}\sec(c+dx)\,dx = \frac{2a^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} + \frac{2ab\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} + \frac{2b\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[In] Int[(a + b*Cos[c + d*x])^(3/2)*Sec[c + d*x],x]
```

```
[Out] (2*b*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(d*Sqr
t[(a + b*Cos[c + d*x])/(a + b)]) + (2*a*b*Sqrt[(a + b*Cos[c + d*x])/(a + b)
]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(d*Sqrt[a + b*Cos[c + d*x]]) + (2*
a^2*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(a
+ b)])/(d*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2882

```
Int[Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]/((a_.) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[d/b, Int[1/Sqrt[c + d*Sin[e + f*x]], x], x]
```

```
 + Dist[(b*c - a*d)/b, Int[1/((a + b*Sin[e + f*x])*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 -
 b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2883

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)/((c_.) + (d_.)*sin[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[b/d, Int[Sqrt[a + b*Sin[e + f*x]], x], x]
 - Dist[(b*c - a*d)/d, Int[Sqrt[a + b*Sin[e + f*x]]/(c + d*Sin[e + f*x]), x
], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2
, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 2886

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(c + d*Sin[e + f*x])/(c + d)]/Sqrt
[c + d*Sin[e + f*x]], Int[1/((a + b*Sin[e + f*x])*Sqrt[c/(c + d) + (d/(c +
d))*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] &&  !GtQ[c + d, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= a\int \sqrt{a+b\cos(c+dx)}\sec(c+dx)\,dx+b\int \sqrt{a+b\cos(c+dx)}\,dx\\
&= a^2\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx+(ab)\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx\\
&\quad+\frac{\left(b\sqrt{a+b\cos(c+dx)}\right)\int \sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\\
&= \frac{2b\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}+\frac{\left(a^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{\sec(c+dx)}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{\sqrt{a+b\cos(c+dx)}}\\
&\quad+\frac{\left(ab\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{\sqrt{a+b\cos(c+dx)}}
\end{aligned}$$

$$= \frac{2b\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2ab\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} + \frac{2a^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 26.93 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.60

$$\int (a+b\cos(c+dx))^{3/2}\sec(c+dx)\,dx = \frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\left(b(a+b)E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)+a\left(b\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)+a\,\text{EllipticPi}\left(2,\frac{1}{2}(c+\right.\right.\right.}{d\sqrt{a+b\cos(c+dx)}}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(3/2)*Sec[c + d*x],x]
[Out] (2*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*(b*(a + b)*EllipticE[(c + d*x)/2, (2*
b)/(a + b)] + a*(b*EllipticF[(c + d*x)/2, (2*b)/(a + b)] + a*EllipticPi[2,
(c + d*x)/2, (2*b)/(a + b)])))/(d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 4.43 (sec) , antiderivative size = 249, normalized size of antiderivative = 1.39

method	result
default	$-\frac{2\sqrt{\left(2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{\frac{2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b}{a-b}}\left(bF\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{-\frac{2b}{a-b}}\right)a+bE\left(\cos\left(\frac{dx}{2}\right.\right.\right.}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+(a+b)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2b\left(\sin\right.}}$

```
[In] int((a+cos(d*x+c)*b)^(3/2)*sec(d*x+c),x,method=_RETURNVERBOSE)
[Out] -2*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*(b*EllipticF(
cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a+b*EllipticE(cos(1/2*d*x+1/2*c),(-2
*b/(a-b))^(1/2))*a-b^2*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-Ell
ipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))*a^2)/(-2*sin(1/2*d*x+1/2*c
)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*
x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)\;dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c),x, algorithm="fricas")
[Out] integral((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c), x)
```

Sympy [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec(c+dx)\,dx=\int (a+b\cos(c+dx))^{\frac{3}{2}}\sec(c+dx)\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**(3/2)*sec(d*x+c),x)
[Out] Integral((a + b*cos(c + d*x))**(3/2)*sec(c + d*x), x)
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)\;dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)\;dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{3/2}\sec(c+dx)\,dx=\int \frac{(a+b\,\cos{(c+d\,x)})^{3/2}}{\cos{(c+d\,x)}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(3/2)/cos(c + d*x),x)
[Out] int((a + b*cos(c + d*x))^(3/2)/cos(c + d*x), x)
```

3.498 $\int (a+b\cos(c+dx))^{3/2}\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 209

$$\int (a+b\cos(c+dx))^{3/2}\sec^2(c+dx)\,dx = -\frac{a\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{(a^2+2b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} + \frac{3ab\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} + \frac{a\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{d}$$

```
[Out] -a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/
2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/d/((a+b*cos(d*x+c))/(a
+b))^(1/2)+(a^2+2*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elli
pticF(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^
(1/2)/d/(a+b*cos(d*x+c))^(1/2)+3*a*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d
*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2,2^(1/2)*(b/(a+b))^(1/2))*((a+b*co
s(d*x+c))/(a+b))^(1/2)/d/(a+b*cos(d*x+c))^(1/2)+a*(a+b*cos(d*x+c))^(1/2)*ta
n(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.67 (sec) , antiderivative size = 209, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.391$, Rules used = {2878, 3138, 2734, 2732, 3081, 2742, 2740, 2886, 2884}

$$\int (a+b\cos(c+dx))^{3/2}\sec^2(c+dx)\,dx=\frac{(a^2+2b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}+\frac{a\tan(c+dx)\sqrt{a+b\cos(c+dx)}}{d}-\frac{a\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}+\frac{3ab\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}$$

```
[In] Int[(a + b*Cos[c + d*x])^(3/2)*Sec[c + d*x]^2,x]
```

```
[Out] -((a*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(d*Sqr
t[(a + b*Cos[c + d*x])/(a + b)])) + ((a^2 + 2*b^2)*Sqrt[(a + b*Cos[c + d*x]
)/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(d*Sqrt[a + b*Cos[c + d*x
]]) + (3*a*b*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c + d*x)/2,
(2*b)/(a + b)])/(d*Sqrt[a + b*Cos[c + d*x]]) + (a*Sqrt[a + b*Cos[c + d*x]]*
Tan[c + d*x])/d
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2878

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*(a + b*Si
n[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n - 1)/(f*(m + 1)*(a^2 - b^2))),
 x] + Dist[1/((m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d
*Sin[e + f*x])^(n - 2)*Simp[c*(a*c - b*d)*(m + 1) + d*(b*c - a*d)*(n - 1) +
 (d*(a*c - b*d)*(m + 1) - c*(b*c - a*d)*(m + 2))*Sin[e + f*x] - d*(b*c - a*
d)*(m + n + 1)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &
& NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1]
 && LtQ[1, n, 2] && IntegersQ[2*m, 2*n]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 2886

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(c + d*Sin[e + f*x])/(c + d)]/Sqrt
[c + d*Sin[e + f*x]], Int[1/((a + b*Sin[e + f*x])*Sqrt[c/(c + d) + (d/(c +
d))*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] &&  !GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
```

```
x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{a\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{d} \\
&\quad + \int \frac{\left(\frac{3ab}{2}+b^2\cos(c+dx)-\frac{1}{2}ab\cos^2(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx \\
&= \frac{a\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{d}-\frac{1}{2}a\int\sqrt{a+b\cos(c+dx)}\,dx \\
&\quad - \frac{\int \frac{\left(-\frac{3ab^2}{2}-\frac{1}{2}b\left(a^2+2b^2\right)\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{b} \\
&= \frac{a\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{d}+\frac{1}{2}(3ab)\int\frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx \\
&\quad - \frac{1}{2}\left(-a^2-2b^2\right)\int\frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx \\
&\quad - \frac{\left(a\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\
&= -\frac{a\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}+\frac{a\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{d} \\
&\quad + \frac{\left(3ab\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{\sec(c+dx)}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{2\sqrt{a+b\cos(c+dx)}} \\
&\quad - \frac{\left(\left(-a^2-2b^2\right)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{2\sqrt{a+b\cos(c+dx)}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{a\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\
&\quad + \frac{(a^2+2b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} \\
&\quad + \frac{3ab\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} \\
&\quad + \frac{a\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{d}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 16.28 (sec) , antiderivative size = 363, normalized size of antiderivative = 1.74

$$
\int (a+b\cos(c+dx))^{3/2}\sec^2(c+dx)\,dx = \frac{b\left(\frac{8b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}} + \frac{10a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}} - \frac{2i\sqrt{-\frac{b(-1+\cos(c+dx))}{a+b}}\sqrt{\frac{b(}{}}}{}\right.}{}
$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(3/2)*Sec[c + d*x]^2,x]
```

```
[Out] (b*((8*b*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a
 + b)])/Sqrt[a + b*Cos[c + d*x]] + (10*a*Sqrt[(a + b*Cos[c + d*x])/(a + b)]
*EllipticPi[2, (c + d*x)/2, (2*b)/(a + b)])/Sqrt[a + b*Cos[c + d*x]] - ((2*
I)*Sqrt[-((b*(-1 + Cos[c + d*x]))/(a + b))]*Sqrt[(b*(1 + Cos[c + d*x]))/(-a
 + b)]*Csc[c + d*x]*(-2*a*(a - b)*EllipticE[I*ArcSinh[Sqrt[-(a + b)^(-1)]*S
qrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)] + b*(-2*a*EllipticF[I*ArcSinh[Sq
rt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)] + b*EllipticP
i[(a + b)/a, I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a +
b)/(a - b)])))/(b^2*Sqrt[-(a + b)^(-1)])) + 4*a*Sqrt[a + b*Cos[c + d*x]]*Ta
n[c + d*x])/(4*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 739 vs. 2(282) = 564.

Time = 5.12 (sec) , antiderivative size = 740, normalized size of antiderivative = 3.54

method	result
default	$-\frac{\sqrt{\left(2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)ab+\left(-2a^2-2ab\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\sqrt{-}\right.}{}$

```
[In] int((a+cos(d*x+c)*b)^(3/2)*sec(d*x+c)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(4*cos(1/2*d*x
+1/2*c)*sin(1/2*d*x+1/2*c)^4*a*b+(-2*a^2-2*a*b)*sin(1/2*d*x+1/2*c)^2*cos(1/
2*d*x+1/2*c)-2*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2
*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2+
2*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*b^2-EllipticE(cos(1/2*d*
x+1/2*c),(-2*b/(a-b))^(1/2))*a^2+b*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b)
)^(1/2))*a-3*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))*a*b)*sin(1
/2*d*x+1/2*c)^2+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)
^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2+
2*b^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(
a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-(sin(1/2*d*x+1
/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*Elliptic
E(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(
-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*b*EllipticE(cos(1/2*d*x+
1/2*c),(-2*b/(a-b))^(1/2))*a-3*a*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)
*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,(-
2*b/(a-b))^(1/2)))/(2*cos(1/2*d*x+1/2*c)^2-1)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a
+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)
^2+a+b)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{3/2}\sec^2(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{3/2}\sec^2(c+dx)\,dx=\text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(3/2)*sec(d*x+c)**2,x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec^2(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^2\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^2,x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^2, x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec^2(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^2\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^2,x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{3/2}\sec^2(c+dx)\,dx=\int \frac{(a+b\,\cos(c+d\,x))^{3/2}}{\cos(c+d\,x)^2}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(3/2)/cos(c + d*x)^2,x)
[Out] int((a + b*cos(c + d*x))^(3/2)/cos(c + d*x)^2, x)
```

3.499 $\int (a+b\cos(c+dx))^{3/2}\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 255

$$\int (a+b\cos(c+dx))^{3/2}\sec^3(c+dx)\,dx = -\frac{5b\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{4d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$
$$+\frac{7ab\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4d\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{(4a^2+3b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4d\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{5b\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4d}+\frac{a\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d}$$

```
[Out] -5/4*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*
x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/d/((a+b*cos(d*x+c)
)/(a+b))^(1/2)+7/4*a*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elli
pticF(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^
(1/2)/d/(a+b*cos(d*x+c))^(1/2)+1/4*(4*a^2+3*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/
2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2,2^(1/2)*(b/(a+b))^(1/
2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/d/(a+b*cos(d*x+c))^(1/2)+5/4*b*(a+b*cos(
d*x+c))^(1/2)*tan(d*x+c)/d+1/2*a*sec(d*x+c)*(a+b*cos(d*x+c))^(1/2)*tan(d*x+
c)/d
```

Rubi [A] (verified)

Time = 0.93 (sec) , antiderivative size = 255, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {2878, 3134, 3138, 2734, 2732, 3081, 2742, 2740, 2886, 2884}

$$\int (a+b\cos(c+dx))^{3/2}\sec^3(c+dx)\,dx = \frac{(4a^2+3b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4d\sqrt{a+b\cos(c+dx)}} + \frac{5b\tan(c+dx)\sqrt{a+b\cos(c+dx)}}{4d} + \frac{7ab\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4d\sqrt{a+b\cos(c+dx)}} - \frac{5b\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{4d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{a\tan(c+dx)\sec(c+dx)\sqrt{a+b\cos(c+dx)}}{2d}$$

```
[In] Int[(a + b*Cos[c + d*x])^(3/2)*Sec[c + d*x]^3,x]
```

```
[Out] (-5*b*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(4*d*
Sqrt[(a + b*Cos[c + d*x])/(a + b)]) + (7*a*b*Sqrt[(a + b*Cos[c + d*x])/(a +
 b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(4*d*Sqrt[a + b*Cos[c + d*x]])
+ ((4*a^2 + 3*b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c + d*
x)/2, (2*b)/(a + b)])/(4*d*Sqrt[a + b*Cos[c + d*x]]) + (5*b*Sqrt[a + b*Cos[
c + d*x]]*Tan[c + d*x])/(4*d) + (a*Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]*Ta
n[c + d*x])/(2*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
```

```
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2878

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*(a + b*Si
n[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n - 1)/(f*(m + 1)*(a^2 - b^2))),
 x] + Dist[1/((m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d
*Sin[e + f*x])^(n - 2)*Simp[c*(a*c - b*d)*(m + 1) + d*(b*c - a*d)*(n - 1) +
 (d*(a*c - b*d)*(m + 1) - c*(b*c - a*d)*(m + 2))*Sin[e + f*x] - d*(b*c - a*
d)*(m + n + 1)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &
& NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1]
 && LtQ[1, n, 2] && IntegersQ[2*m, 2*n]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 2886

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(c + d*Sin[e + f*x])/(c + d)]/Sqrt
[c + d*Sin[e + f*x]], Int[1/((a + b*Sin[e + f*x])*Sqrt[c/(c + d) + (d/(c +
d))*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] &&  !GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{a\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} \\
&\quad +\frac{1}{2}\int \frac{\left(\frac{5ab}{2}+(a^2+2b^2)\cos(c+dx)+\frac{1}{2}ab\cos^2(c+dx)\right)\sec^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx \\
&= \frac{5b\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4d}+\frac{a\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} \\
&\quad +\frac{\int \frac{\left(\frac{1}{4}a(4a^2+3b^2)+\frac{1}{2}a^2b\cos(c+dx)-\frac{5}{4}ab^2\cos^2(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{2a} \\
&= \frac{5b\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4d}+\frac{a\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} \\
&\quad -\frac{\int \frac{\left(-\frac{1}{4}ab(4a^2+3b^2)-\frac{7}{4}a^2b^2\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{2ab}-\frac{1}{8}(5b)\int \sqrt{a+b\cos(c+dx)}\,dx
\end{aligned}
$$

$$= \frac{5b\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4d} + \frac{a\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} + \frac{1}{8}(7ab)\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx - \frac{1}{8}\left(-4a^2-3b^2\right)\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx - \frac{\left(5b\sqrt{a+b\cos(c+dx)}\right)\int \sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{8\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

$$= -\frac{5b\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{4d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{5b\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4d} + \frac{a\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} + \frac{\left(7ab\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{8\sqrt{a+b\cos(c+dx)}} - \frac{\left(\left(-4a^2-3b^2\right)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{\sec(c+dx)}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{8\sqrt{a+b\cos(c+dx)}}$$

$$= -\frac{5b\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{4d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{7ab\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4d\sqrt{a+b\cos(c+dx)}} + \frac{\left(4a^2+3b^2\right)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4d\sqrt{a+b\cos(c+dx)}} + \frac{5b\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4d} + \frac{a\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 5.85 (sec) , antiderivative size = 386, normalized size of antiderivative = 1.51

$$\int (a+b\cos(c+dx))^{3/2}\sec^3(c+dx)\,dx = \frac{\frac{4ab\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}}+\frac{(8a^2+b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}}-\frac{5i\sqrt{-\frac{b(-1+\cos(c+dx))}{a+b}}\sqrt{\cdots}}{\cdots}}{\cdots}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(3/2)*Sec[c + d*x]^3,x]
```

```
[Out] ((4*a*b*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a
+ b)])/Sqrt[a + b*Cos[c + d*x]] + ((8*a^2 + b^2)*Sqrt[(a + b*Cos[c + d*x])/
(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(a + b)])/Sqrt[a + b*Cos[c + d*x]
] - ((5*I)*Sqrt[-((b*(-1 + Cos[c + d*x]))/(a + b))]*Sqrt[(b*(1 + Cos[c + d*
x]))/(-a + b)]*Csc[c + d*x]*(-2*a*(a - b)*EllipticE[I*ArcSinh[Sqrt[-(a + b)
^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)] + b*(-2*a*EllipticF[I*Ar
cSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)] + b*E
llipticPi[(a + b)/a, I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]
], (a + b)/(a - b)])))/(a*Sqrt[-(a + b)^(-1)]) + 2*Sqrt[a + b*Cos[c + d*x]]
*(2*a + 5*b*Cos[c + d*x])*Sec[c + d*x]*Tan[c + d*x])/(8*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 979 vs. 2(316) = 632.

Time = 6.47 (sec) , antiderivative size = 980, normalized size of antiderivative = 3.84

method	result	size
default	Expression too large to display	980

```
[In] int((a+cos(d*x+c)*b)^(3/2)*sec(d*x+c)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-40*cos(1
/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6*b^2+(28*a*b+40*b^2)*sin(1/2*d*x+1/2*c)^4
*cos(1/2*d*x+1/2*c)+(-4*a^2-14*a*b-10*b^2)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x
+1/2*c)-4*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+
b)/(a-b))^(1/2)*(4*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))*a^2+
3*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))*b^2-7*b*EllipticF(cos
(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a+5*b*EllipticE(cos(1/2*d*x+1/2*c),(-2*
b/(a-b))^(1/2))*a-5*b^2*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2)))*s
in(1/2*d*x+1/2*c)^4+4*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+
1/2*c)^2+(a+b)/(a-b))^(1/2)*(4*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))
```

```
^(1/2))*a^2+3*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))*b^2-7*b*E
llipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a+5*b*EllipticE(cos(1/2*d*x
+1/2*c),(-2*b/(a-b))^(1/2))*a-5*b^2*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b
))^(1/2)))*sin(1/2*d*x+1/2*c)^2-4*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*
sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2
*b/(a-b))^(1/2))*a^2-3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x
+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(
1/2))*b^2+7*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2
+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a-5*(s
in(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1
/2)*b*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a+5*b^2*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*Ellipt
icE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2)))/(2*cos(1/2*d*x+1/2*c)^2-1)^2/(-
2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*
c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{3/2}\sec^3(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^3,x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{3/2}\sec^3(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(3/2)*sec(d*x+c)**3,x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec^3(c+dx)\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^3\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^3,x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^3, x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec^3(c+dx)\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^3\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^3,x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{3/2}\sec^3(c+dx)\,dx = \int \frac{(a+b\cos(c+dx))^{3/2}}{\cos(c+dx)^3}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(3/2)/cos(c + d*x)^3,x)
[Out] int((a + b*cos(c + d*x))^(3/2)/cos(c + d*x)^3, x)
```

3.500 $\int \cos^3(c+dx)(a+b\cos(c+dx))^{5/2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 371

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^{5/2}\,dx = \frac{2a(8a^4+51a^2b^2+741b^4)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{693b^3d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2(8a^6+49a^4b^2+78a^2b^4-135b^6)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{693b^3d\sqrt{a+b\cos(c+dx)}} + \frac{2(8a^4+57a^2b^2+135b^4)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{693b^2d} + \frac{2a(8a^2+67b^2)(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{693b^2d} + \frac{2(8a^2+81b^2)(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{693b^2d} - \frac{8a(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{99b^2d} + \frac{2\cos(c+dx)(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{11bd}$$

```
[Out] 2/693*a*(8*a^2+67*b^2)*(a+b*cos(d*x+c))^(3/2)*sin(d*x+c)/b^2/d+2/693*(8*a^2
+81*b^2)*(a+b*cos(d*x+c))^(5/2)*sin(d*x+c)/b^2/d-8/99*a*(a+b*cos(d*x+c))^(7
/2)*sin(d*x+c)/b^2/d+2/11*cos(d*x+c)*(a+b*cos(d*x+c))^(7/2)*sin(d*x+c)/b/d+
2/693*(8*a^4+57*a^2*b^2+135*b^4)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/b^2/d+2/
693*a*(8*a^4+51*a^2*b^2+741*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1
/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c)
)^(1/2)/b^3/d/((a+b*cos(d*x+c))/(a+b))^(1/2)-2/693*(8*a^6+49*a^4*b^2+78*a^2
*b^4-135*b^6)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin
```

```
(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/b^3
/d/(a+b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.74 (sec) , antiderivative size = 371, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.348$, Rules used = {2872, 3102, 2832, 2831, 2742, 2740, 2734, 2732}

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^{5/2}\,dx = \frac{2(8a^2+81b^2)\sin(c+dx)(a+b\cos(c+dx))^{5/2}}{693b^2d} + \frac{2a(8a^2+67b^2)\sin(c+dx)(a+b\cos(c+dx))^{3/2}}{693b^2d} + \frac{2(8a^4+57a^2b^2+135b^4)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{693b^2d} + \frac{2a(8a^4+51a^2b^2+741b^4)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{693b^3d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2(8a^6+49a^4b^2+78a^2b^4-135b^6)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{693b^3d\sqrt{a+b\cos(c+dx)}} - \frac{8a\sin(c+dx)(a+b\cos(c+dx))^{7/2}}{99b^2d} + \frac{2\sin(c+dx)\cos(c+dx)(a+b\cos(c+dx))^{7/2}}{11bd}$$

```
[In] Int[Cos[c + d*x]^3*(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*a*(8*a^4 + 51*a^2*b^2 + 741*b^4)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c +
 d*x)/2, (2*b)/(a + b)])/(693*b^3*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) - (
2*(8*a^6 + 49*a^4*b^2 + 78*a^2*b^4 - 135*b^6)*Sqrt[(a + b*Cos[c + d*x])/(a
+ b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(693*b^3*d*Sqrt[a + b*Cos[c +
d*x]]) + (2*(8*a^4 + 57*a^2*b^2 + 135*b^4)*Sqrt[a + b*Cos[c + d*x]]*Sin[c +
 d*x])/(693*b^2*d) + (2*a*(8*a^2 + 67*b^2)*(a + b*Cos[c + d*x])^(3/2)*Sin[c
 + d*x])/(693*b^2*d) + (2*(8*a^2 + 81*b^2)*(a + b*Cos[c + d*x])^(5/2)*Sin[c
 + d*x])/(693*b^2*d) - (8*a*(a + b*Cos[c + d*x])^(7/2)*Sin[c + d*x])/(99*b^
2*d) + (2*Cos[c + d*x]*(a + b*Cos[c + d*x])^(7/2)*Sin[c + d*x])/(11*b*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
```

```
|| IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2\cos(c+dx)(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{11bd} \\
&\quad + \frac{2\int (a+b\cos(c+dx))^{5/2}\left(a+\frac{9}{2}b\cos(c+dx)-2a\cos^2(c+dx)\right)\,dx}{11b} \\
&= -\frac{8a(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{99b^2d} \\
&\quad + \frac{2\cos(c+dx)(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{11bd} \\
&\quad + \frac{4\int (a+b\cos(c+dx))^{5/2}\left(-\frac{5ab}{2}+\frac{1}{4}(8a^2+81b^2)\cos(c+dx)\right)\,dx}{99b^2} \\
&= \frac{2(8a^2+81b^2)(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{693b^2d} \\
&\quad - \frac{8a(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{99b^2d} \\
&\quad + \frac{2\cos(c+dx)(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{11bd} \\
&\quad + \frac{8\int (a+b\cos(c+dx))^{3/2}\left(-\frac{15}{8}b(2a^2-27b^2)+\frac{5}{8}a(8a^2+67b^2)\cos(c+dx)\right)\,dx}{693b^2} \\
&= \frac{2a(8a^2+67b^2)(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{693b^2d} \\
&\quad + \frac{2(8a^2+81b^2)(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{693b^2d} \\
&\quad - \frac{8a(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{99b^2d} \\
&\quad + \frac{2\cos(c+dx)(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{11bd} \\
&\quad + \frac{16\int \sqrt{a+b\cos(c+dx)}\left(-\frac{15}{8}ab(a^2-101b^2)+\frac{15}{16}(8a^4+57a^2b^2+135b^4)\cos(c+dx)\right)\,dx}{3465b^2}
\end{aligned}$$

$$= \frac{2(8a^4 + 57a^2b^2 + 135b^4)\sqrt{a + b\cos(c + dx)}\sin(c + dx)}{693b^2d} + \frac{2a(8a^2 + 67b^2)(a + b\cos(c + dx))^{3/2}\sin(c + dx)}{693b^2d} + \frac{2(8a^2 + 81b^2)(a + b\cos(c + dx))^{5/2}\sin(c + dx)}{693b^2d} - \frac{8a(a + b\cos(c + dx))^{7/2}\sin(c + dx)}{99b^2d} + \frac{2\cos(c + dx)(a + b\cos(c + dx))^{7/2}\sin(c + dx)}{11bd} + \frac{32\int \frac{\frac{15}{32}b(2a^4+663a^2b^2+135b^4)+\frac{15}{32}a(8a^4+51a^2b^2+741b^4)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}dx}{10395b^2}$$

$$= \frac{2(8a^4 + 57a^2b^2 + 135b^4)\sqrt{a + b\cos(c + dx)}\sin(c + dx)}{693b^2d} + \frac{2a(8a^2 + 67b^2)(a + b\cos(c + dx))^{3/2}\sin(c + dx)}{693b^2d} + \frac{2(8a^2 + 81b^2)(a + b\cos(c + dx))^{5/2}\sin(c + dx)}{693b^2d} - \frac{8a(a + b\cos(c + dx))^{7/2}\sin(c + dx)}{99b^2d} + \frac{2\cos(c + dx)(a + b\cos(c + dx))^{7/2}\sin(c + dx)}{11bd} + \frac{(a(8a^4 + 51a^2b^2 + 741b^4))\int\sqrt{a + b\cos(c + dx)}\,dx}{693b^3} - \frac{(8a^6 + 49a^4b^2 + 78a^2b^4 - 135b^6)\int\frac{1}{\sqrt{a+b\cos(c+dx)}}dx}{693b^3}$$

$$
\begin{aligned}
&= \frac{2(8a^4+57a^2b^2+135b^4)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{693b^2d} \\
&+ \frac{2a(8a^2+67b^2)(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{693b^2d} \\
&+ \frac{2(8a^2+81b^2)(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{693b^2d} \\
&- \frac{8a(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{99b^2d} \\
&+ \frac{2\cos(c+dx)(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{11bd} \\
&+ \frac{\left(a(8a^4+51a^2b^2+741b^4)\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{693b^3\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\
&- \frac{\left((8a^6+49a^4b^2+78a^2b^4-135b^6)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{693b^3\sqrt{a+b\cos(c+dx)}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{2a(8a^4+51a^2b^2+741b^4)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{693b^3d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\
&- \frac{2(8a^6+49a^4b^2+78a^2b^4-135b^6)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{693b^3d\sqrt{a+b\cos(c+dx)}} \\
&+ \frac{2(8a^4+57a^2b^2+135b^4)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{693b^2d} \\
&+ \frac{2a(8a^2+67b^2)(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{693b^2d} \\
&+ \frac{2(8a^2+81b^2)(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{693b^2d} \\
&- \frac{8a(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{99b^2d} \\
&+ \frac{2\cos(c+dx)(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{11bd}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.99 (sec) , antiderivative size = 268, normalized size of antiderivative = 0.72

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^{5/2}\,dx = \frac{16\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\left(b(2a^4b+663a^2b^3+135b^5)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)+a(8a^4+51a^2b^2+741b\cdots\right.}{\cdots}$$

```
[In] Integrate[Cos[c + d*x]^3*(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (16*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*(b*(2*a^4*b + 663*a^2*b^3 + 135*b^5)
*EllipticF[(c + d*x)/2, (2*b)/(a + b)] + a*(8*a^4 + 51*a^2*b^2 + 741*b^4)*(
(a + b)*EllipticE[(c + d*x)/2, (2*b)/(a + b)] - a*EllipticF[(c + d*x)/2, (2
*b)/(a + b)])) - b*(a + b*Cos[c + d*x])*((64*a^4 - 3732*a^2*b^2 - 2610*b^4)
*Sin[c + d*x] - b*(4*(6*a^3 + 619*a*b^2)*Sin[2*(c + d*x)] + b*((452*a^2 + 5
13*b^2)*Sin[3*(c + d*x)] + 7*b*(46*a*Sin[4*(c + d*x)] + 9*b*Sin[5*(c + d*x)
])))))/(5544*b^3*d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1139 vs. 2(397) = 794.

Time = 14.84 (sec) , antiderivative size = 1140, normalized size of antiderivative = 3.07

method	result	size
default	Expression too large to display	1140

```
[In] int(cos(d*x+c)^3*(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/693*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(4032*co
s(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^12*b^6+(-7168*a*b^5-10080*b^6)*sin(1/2*
d*x+1/2*c)^10*cos(1/2*d*x+1/2*c)+(4384*a^2*b^4+14336*a*b^5+11376*b^6)*sin(1
/2*d*x+1/2*c)^8*cos(1/2*d*x+1/2*c)+(-928*a^3*b^3-6576*a^2*b^4-13232*a*b^5-6
984*b^6)*sin(1/2*d*x+1/2*c)^6*cos(1/2*d*x+1/2*c)+(-4*a^4*b^2+928*a^3*b^3+50
24*a^2*b^4+6064*a*b^5+2772*b^6)*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+(8*
a^5*b+2*a^4*b^2-642*a^3*b^3-1416*a^2*b^4-1338*a*b^5-558*b^6)*sin(1/2*d*x+1/
2*c)^2*cos(1/2*d*x+1/2*c)-8*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/
2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))
^(1/2))*a^6-49*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^
2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^4*b
^2-78*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(
a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2*b^4+135*(s
in(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1
/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*b^6+8*(sin(1/2*d*x+1/2
```

```
*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(
cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^6-8*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(
-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/
2*c),(-2*b/(a-b))^(1/2))*a^5*b+51*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*
sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/
(a-b))^(1/2))*a^4*b^2-51*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d
*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1
/2))*a^3*b^3+741*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c
)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2
*b^4-741*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b
)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^5)/b^3/
(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/
2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.18 (sec) , antiderivative size = 561, normalized size of antiderivative = 1.51

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^{5/2}\,dx = \frac{\sqrt{2}(16i\,a^6+96i\,a^4b^2-507i\,a^2b^4-405i\,b^6)\sqrt{b}\text{weierstrassPInverse}\left(\frac{4\,(4\,a^2-3\,b^2)}{3\,b^2},-\frac{8\,(8\,a^3-9\,ab^2)}{27\,b^3},\right.}{}$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/2079*(sqrt(2)*(16*I*a^6 + 96*I*a^4*b^2 - 507*I*a^2*b^4 - 405*I*b^6)*sqrt(
b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3
, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b) + sqrt(2)*(-16*I*a^6
 - 96*I*a^4*b^2 + 507*I*a^2*b^4 + 405*I*b^6)*sqrt(b)*weierstrassPInverse(4/
3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) -
 3*I*b*sin(d*x + c) + 2*a)/b) - 3*sqrt(2)*(-8*I*a^5*b - 51*I*a^3*b^3 - 741*
I*a*b^5)*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*
a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a
*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b)) - 3*sqrt(2
)*(8*I*a^5*b + 51*I*a^3*b^3 + 741*I*a*b^5)*sqrt(b)*weierstrassZeta(4/3*(4*a
^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^
2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*
sin(d*x + c) + 2*a)/b)) + 6*(63*b^6*cos(d*x + c)^4 + 161*a*b^5*cos(d*x + c)
^3 - 4*a^4*b^2 + 205*a^2*b^4 + 135*b^6 + (113*a^2*b^4 + 81*b^6)*cos(d*x + c
)^2 + (3*a^3*b^3 + 229*a*b^5)*cos(d*x + c))*sqrt(b*cos(d*x + c) + a)*sin(d*
x + c))/(b^4*d)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^{5/2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3*(a+b*cos(d*x+c))**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^{5/2}\,dx = \int (b\cos(dx+c)+a)^{\frac{5}{2}}\cos(dx+c)^3\,dx$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*cos(d*x + c)^3, x)
```

Giac [F]

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^{5/2}\,dx = \int (b\cos(dx+c)+a)^{\frac{5}{2}}\cos(dx+c)^3\,dx$$

```
[In] integrate(cos(d*x+c)^3*(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*cos(d*x + c)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^3(c+dx)(a+b\cos(c+dx))^{5/2}\,dx = \int \cos(c+d\,x)^3\,(a+b\,\cos(c+d\,x))^{5/2}\,dx$$

```
[In] int(cos(c + d*x)^3*(a + b*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)^3*(a + b*cos(c + d*x))^(5/2), x)
```

3.501 $\int \cos^2(c+dx)(a+b\cos(c+dx))^{5/2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 308

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^{5/2}\,dx = -\frac{2(10a^4-279a^2b^2-147b^4)\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{315b^2d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{4a(5a^4-62a^2b^2+57b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{315b^2d\sqrt{a+b\cos(c+dx)}} - \frac{4a(5a^2-57b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315bd} - \frac{2(10a^2-49b^2)(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{315bd} - \frac{4a(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{63bd} + \frac{2(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{9bd}$$

```
[Out] -2/315*(10*a^2-49*b^2)*(a+b*cos(d*x+c))^(3/2)*sin(d*x+c)/b/d-4/63*a*(a+b*co
s(d*x+c))^(5/2)*sin(d*x+c)/b/d+2/9*(a+b*cos(d*x+c))^(7/2)*sin(d*x+c)/b/d-4/
315*a*(5*a^2-57*b^2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/b/d-2/315*(10*a^4-27
9*a^2*b^2-147*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elliptic
E(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/b^2/d/
((a+b*cos(d*x+c))/(a+b))^(1/2)+4/315*a*(5*a^4-62*a^2*b^2+57*b^4)*(cos(1/2*d
*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2)*
(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/b^2/d/(a+b*cos(d*x+c))^(1/2
)
```

Rubi [A] (verified)

Time = 0.58 (sec) , antiderivative size = 308, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {2870, 2832, 2831, 2742, 2740, 2734, 2732}

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^{5/2}\,dx = -\frac{2(10a^2-49b^2)\sin(c+dx)(a+b\cos(c+dx))^{3/2}}{315bd} - \frac{4a(5a^2-57b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{315bd} + \frac{4a(5a^4-62a^2b^2+57b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{315b^2d\sqrt{a+b\cos(c+dx)}} - \frac{2(10a^4-279a^2b^2-147b^4)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{315b^2d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2\sin(c+dx)(a+b\cos(c+dx))^{7/2}}{9bd} - \frac{4a\sin(c+dx)(a+b\cos(c+dx))^{5/2}}{63bd}$$

```
[In] Int[Cos[c + d*x]^2*(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (-2*(10*a^4 - 279*a^2*b^2 - 147*b^4)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c
+ d*x)/2, (2*b)/(a + b)])/(315*b^2*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) +
(4*a*(5*a^4 - 62*a^2*b^2 + 57*b^4)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*Ellip
ticF[(c + d*x)/2, (2*b)/(a + b)])/(315*b^2*d*Sqrt[a + b*Cos[c + d*x]]) - (4
*a*(5*a^2 - 57*b^2)*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(315*b*d) - (2*(
10*a^2 - 49*b^2)*(a + b*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(315*b*d) - (4*a*
(a + b*Cos[c + d*x])^(5/2)*Sin[c + d*x])/(63*b*d) + (2*(a + b*Cos[c + d*x])
^(7/2)*Sin[c + d*x])/(9*b*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rule 2870

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^2, x_Symbol] :> Simp[(-d^2)*Cos[e + f*x]*((a + b*Sin[e + f*x])
^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m + 2)), Int[(a + b*Sin[e + f*x])^
m*Simp[b*(d^2*(m + 1) + c^2*(m + 2)) - d*(a*d - 2*b*c*(m + 2))*Sin[e + f*x]
, x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] && NeQ
[a^2 - b^2, 0] &&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{2(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{9bd} \\ &\quad + \frac{2\int\left(\frac{7b}{2}-a\cos(c+dx)\right)(a+b\cos(c+dx))^{5/2}\,dx}{9b} \\ &= -\frac{4a(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{63bd}+\frac{2(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{9bd} \\ &\quad + \frac{4\int(a+b\cos(c+dx))^{3/2}\left(\frac{39ab}{4}-\frac{1}{4}(10a^2-49b^2)\cos(c+dx)\right)\,dx}{63b}\end{aligned}$$

$$= -\frac{2(10a^2-49b^2)\,(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{315bd} - \frac{4a(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{63bd} + \frac{2(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{9bd} + \frac{8\int\sqrt{a+b\cos(c+dx)}\left(\frac{3}{8}b(55a^2+49b^2)-\frac{3}{4}a(5a^2-57b^2)\cos(c+dx)\right)\,dx}{315b}$$

$$= -\frac{4a(5a^2-57b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315bd} - \frac{2(10a^2-49b^2)\,(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{315bd} - \frac{4a(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{63bd} + \frac{2(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{9bd} + \frac{16\int\frac{\frac{3}{16}ab(155a^2+261b^2)-\frac{3}{16}(10a^4-279a^2b^2-147b^4)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{945b}$$

$$= -\frac{4a(5a^2-57b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315bd} - \frac{2(10a^2-49b^2)\,(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{315bd} - \frac{4a(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{63bd} + \frac{2(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{9bd} - \frac{(10a^4-279a^2b^2-147b^4)\int\sqrt{a+b\cos(c+dx)}\,dx}{315b^2} + \frac{(2a(5a^4-62a^2b^2+57b^4))\int\frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{315b^2}$$

$$= -\frac{4a(5a^2-57b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315bd} - \frac{2(10a^2-49b^2)\,(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{315bd} - \frac{4a(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{63bd} + \frac{2(a+b\cos(c+dx))^{7/2}\sin(c+dx)}{9bd} - \frac{\left((10a^4-279a^2b^2-147b^4)\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{315b^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{\left(2a(5a^4-62a^2b^2+57b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{315b^2\sqrt{a+b\cos(c+dx)}}$$

$$= -\frac{2(10a^4 - 279a^2b^2 - 147b^4)\sqrt{a + b\cos(c + dx)}E\left(\frac{1}{2}(c + dx)|\frac{2b}{a+b}\right)}{315b^2d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$
$$+ \frac{4a(5a^4 - 62a^2b^2 + 57b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\text{EllipticF}\left(\frac{1}{2}(c + dx), \frac{2b}{a+b}\right)}{315b^2d\sqrt{a + b\cos(c + dx)}}$$
$$- \frac{4a(5a^2 - 57b^2)\sqrt{a + b\cos(c + dx)}\sin(c + dx)}{315bd}$$
$$- \frac{2(10a^2 - 49b^2)(a + b\cos(c + dx))^{3/2}\sin(c + dx)}{315bd}$$
$$- \frac{4a(a + b\cos(c + dx))^{5/2}\sin(c + dx)}{63bd} + \frac{2(a + b\cos(c + dx))^{7/2}\sin(c + dx)}{9bd}$$

Mathematica [A] (verified)

Time = 1.03 (sec) , antiderivative size = 263, normalized size of antiderivative = 0.85

$$\int \cos^2(c + dx)(a + b\cos(c + dx))^{5/2}\,dx = \frac{-8(10a^5 + 10a^4b - 279a^3b^2 - 279a^2b^3 - 147ab^4 - 147b^5)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}E\left(\frac{1}{2}(c + dx)|\frac{2b}{a+b}\right) + 1}{}$$

```
[In] Integrate[Cos[c + d*x]^2*(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (-8*(10*a^5 + 10*a^4*b - 279*a^3*b^2 - 279*a^2*b^3 - 147*a*b^4 - 147*b^5)*S
qrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticE[(c + d*x)/2, (2*b)/(a + b)] + 1
6*a*(5*a^4 - 62*a^2*b^2 + 57*b^4)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*Ellipt
icF[(c + d*x)/2, (2*b)/(a + b)] + b*(40*a^4 + 1984*a^2*b^2 + 301*b^4 + 4*a*
b*(160*a^2 + 619*b^2)*Cos[c + d*x] + 8*(85*a^2*b^2 + 42*b^4)*Cos[2*(c + d*x
)] + 260*a*b^3*Cos[3*(c + d*x)] + 35*b^4*Cos[4*(c + d*x)])*Sin[c + d*x])/(1
260*b^2*d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 994 vs. $2(338) = 676$.

Time = 10.02 (sec) , antiderivative size = 995, normalized size of antiderivative = 3.23

method	result	size
default	Expression too large to display	995

```
[In] int(cos(d*x+c)^2*(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/315*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-1120*c
os(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^10*b^5+(2080*a*b^4+2240*b^5)*sin(1/2*d
```

```
*x+1/2*c)^8*cos(1/2*d*x+1/2*c)+(-1360*a^2*b^3-3120*a*b^4-2072*b^5)*sin(1/2*
d*x+1/2*c)^6*cos(1/2*d*x+1/2*c)+(320*a^3*b^2+1360*a^2*b^3+2408*a*b^4+952*b^
5)*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+(-10*a^4*b-160*a^3*b^2-666*a^2*b
^3-684*a*b^4-168*b^5)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+10*(sin(1/2*d
*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*Elli
pticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^5-124*(sin(1/2*d*x+1/2*c)^2)
^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/
2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^3*b^2+114*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(
-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/
2*c),(-2*b/(a-b))^(1/2))*a*b^4-10*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*
sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/
(a-b))^(1/2))*a^5+10*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1
/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))
*a^4*b+279*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a
+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^3*b^2-2
79*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b
))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2*b^3+147*(sin(
1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)
*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^4-147*(sin(1/2*d*x+1/
2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE
(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*b^5)/b^2/(-2*sin(1/2*d*x+1/2*c)^4*b
+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2
*c)^2+a+b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.19 (sec) , antiderivative size = 514, normalized size of antiderivative = 1.67

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^{5/2}\,dx = \frac{\sqrt{2}(-20i\,a^5+93i\,a^3b^2-489i\,ab^4)\sqrt{b}\,\text{weierstrassPInverse}\left(\frac{4\,(4\,a^2-3\,b^2)}{3\,b^2},-\frac{8\,(8\,a^3-9\,ab^2)}{27\,b^3},\frac{3\,b\cos(dx+c)+\cdots}{\cdots}\right)\cdots}{\cdots}$$

```
[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/945*(sqrt(2)*(-20*I*a^5 + 93*I*a^3*b^2 - 489*I*a*b^4)*sqrt(b)*weierstrass
PInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos
(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b) + sqrt(2)*(20*I*a^5 - 93*I*a^3*b^2
 + 489*I*a*b^4)*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*
(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b)
 - 3*sqrt(2)*(10*I*a^4*b - 279*I*a^2*b^3 - 147*I*b^5)*sqrt(b)*weierstrassZe
ta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInvers
e(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x +
```

```
c) + 3*I*b*sin(d*x + c) + 2*a)/b)) - 3*sqrt(2)*(-10*I*a^4*b + 279*I*a^2*b^3
 + 147*I*b^5)*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3
 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3
- 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b)) + 6*(
35*b^5*cos(d*x + c)^3 + 95*a*b^4*cos(d*x + c)^2 + 5*a^3*b^2 + 163*a*b^4 + (
75*a^2*b^3 + 49*b^5)*cos(d*x + c))*sqrt(b*cos(d*x + c) + a)*sin(d*x + c))/(
b^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^{5/2}\,dx=\text{Timed out}$$

```
[In] integrate(cos(d*x+c)**2*(a+b*cos(d*x+c))**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^{5/2}\,dx=\int (b\cos(dx+c)+a)^{\frac{5}{2}}\cos(dx+c)^2\,dx$$

```
[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*cos(d*x + c)^2, x)
```

Giac [F]

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^{5/2}\,dx=\int (b\cos(dx+c)+a)^{\frac{5}{2}}\cos(dx+c)^2\,dx$$

```
[In] integrate(cos(d*x+c)^2*(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*cos(d*x + c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^2(c+dx)(a+b\cos(c+dx))^{5/2}\,dx=\int \cos\left(c+d\,x\right)^2\,\left(a+b\,\cos\left(c+d\,x\right)\right)^{5/2}\,dx$$

```
[In] int(cos(c + d*x)^2*(a + b*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)^2*(a + b*cos(c + d*x))^(5/2), x)
```

3.502 $\int \cos(c+dx)(a+b\cos(c+dx))^{5/2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 249

$$\int \cos(c+dx)(a+b\cos(c+dx))^{5/2}\,dx = \frac{2a(3a^2+29b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{21bd\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2(3a^4+2a^2b^2-5b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{21bd\sqrt{a+b\cos(c+dx)}} + \frac{2(3a^2+5b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{21d} + \frac{2a(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{7d} + \frac{2(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7d}$$

```
[Out] 2/7*a*(a+b*cos(d*x+c))^(3/2)*sin(d*x+c)/d+2/7*(a+b*cos(d*x+c))^(5/2)*sin(d*
x+c)/d+2/21*(3*a^2+5*b^2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+2/21*a*(3*a^2
+29*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*
d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/b/d/((a+b*cos(d*
x+c))/(a+b))^(1/2)-2/21*(3*a^4+2*a^2*b^2-5*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2
)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*
((a+b*cos(d*x+c))/(a+b))^(1/2)/b/d/(a+b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.42 (sec) , antiderivative size = 249, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2832, 2831, 2742, 2740, 2734, 2732}

$$\int \cos(c+dx)(a+b\cos(c+dx))^{5/2}\,dx = \frac{2(3a^2+5b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{21d} + \frac{2a(3a^2+29b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{21bd\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2(3a^4+2a^2b^2-5b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{21bd\sqrt{a+b\cos(c+dx)}} + \frac{2\sin(c+dx)(a+b\cos(c+dx))^{5/2}}{7d} + \frac{2a\sin(c+dx)(a+b\cos(c+dx))^{3/2}}{7d}$$

```
[In] Int[Cos[c + d*x]*(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*a*(3*a^2 + 29*b^2)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)
/(a + b)])/(21*b*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) - (2*(3*a^4 + 2*a^2*
b^2 - 5*b^4)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b
)/(a + b)])/(21*b*d*Sqrt[a + b*Cos[c + d*x]]) + (2*(3*a^2 + 5*b^2)*Sqrt[a +
 b*Cos[c + d*x]]*Sin[c + d*x])/(21*d) + (2*a*(a + b*Cos[c + d*x])^(3/2)*Sin
[c + d*x])/(7*d) + (2*(a + b*Cos[c + d*x])^(5/2)*Sin[c + d*x])/(7*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{2(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7d} \\
&\quad+\frac{2}{7}\int\left(\frac{5b}{2}+\frac{5}{2}a\cos(c+dx)\right)(a+b\cos(c+dx))^{3/2}\,dx \\
&= \frac{2a(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{7d}+\frac{2(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7d} \\
&\quad+\frac{4}{35}\int\sqrt{a+b\cos(c+dx)}\left(10ab+\frac{5}{4}(3a^2+5b^2)\cos(c+dx)\right)\,dx \\
&= \frac{2(3a^2+5b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{21d} \\
&\quad+\frac{2a(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{7d}+\frac{2(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7d} \\
&\quad+\frac{8}{105}\int\frac{\frac{5}{8}b(27a^2+5b^2)+\frac{5}{8}a(3a^2+29b^2)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx \\
&= \frac{2(3a^2+5b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{21d}+\frac{2a(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{7d} \\
&\quad+\frac{2(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7d}+\frac{(a(3a^2+29b^2))\int\sqrt{a+b\cos(c+dx)}\,dx}{21b} \\
&\quad-\frac{(3a^4+2a^2b^2-5b^4)\int\frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{21b}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{2(3a^2+5b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{21d} \\
&+ \frac{2a(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{7d} + \frac{2(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7d} \\
&+ \frac{\left(a(3a^2+29b^2)\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{21b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\
&- \frac{\left((3a^4+2a^2b^2-5b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{21b\sqrt{a+b\cos(c+dx)}} \\
&= \frac{2a(3a^2+29b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{21bd\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\
&- \frac{2(3a^4+2a^2b^2-5b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{21bd\sqrt{a+b\cos(c+dx)}} \\
&+ \frac{2(3a^2+5b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{21d} \\
&+ \frac{2a(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{7d} + \frac{2(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.67 (sec) , antiderivative size = 214, normalized size of antiderivative = 0.86

$$
\int \cos(c+dx)(a+b\cos(c+dx))^{5/2}\,dx = \frac{4a(3a^3+3a^2b+29ab^2+29b^3)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)-4(3a^4+2a^2b^2-5b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}
$$

```
[In] Integrate[Cos[c + d*x]*(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (4*a*(3*a^3 + 3*a^2*b + 29*a*b^2 + 29*b^3)*Sqrt[(a + b*Cos[c + d*x])/(a + b
)]*EllipticE[(c + d*x)/2, (2*b)/(a + b)] - 4*(3*a^4 + 2*a^2*b^2 - 5*b^4)*Sq
rt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)] + b*
(36*a^3 + 44*a*b^2 + b*(72*a^2 + 29*b^2)*Cos[c + d*x] + 24*a*b^2*Cos[2*(c +
 d*x)] + 3*b^3*Cos[3*(c + d*x)])*Sin[c + d*x])/(42*b*d*Sqrt[a + b*Cos[c + d
*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 826 vs. 2(283) = 566.

Time = 7.88 (sec) , antiderivative size = 827, normalized size of antiderivative = 3.32

method	result	size
default	Expression too large to display	827

```
[In] int(cos(d*x+c)*(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/21*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(48*cos(1
/2*d*x+1/2*c)^9*b^4+96*cos(1/2*d*x+1/2*c)^7*a*b^3-120*cos(1/2*d*x+1/2*c)^7*
b^4+72*cos(1/2*d*x+1/2*c)^5*a^2*b^2-192*cos(1/2*d*x+1/2*c)^5*a*b^3+128*cos(
1/2*d*x+1/2*c)^5*b^4+18*cos(1/2*d*x+1/2*c)^3*a^3*b-108*cos(1/2*d*x+1/2*c)^3
*a^2*b^2+130*cos(1/2*d*x+1/2*c)^3*a*b^3-72*cos(1/2*d*x+1/2*c)^3*b^4-3*(sin(
1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*Ellipt
icF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^4-2*(sin(1/2*d*x+1/2*c)^2)^(1/
2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c
),(-2*b/(a-b))^(1/2))*a^2*b^2+5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*
d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1
/2))*b^4+3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-
b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^4-3*(sin(1/2*d
*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(c
os(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^3*b+29*(sin(1/2*d*x+1/2*c)^2)^(1/2)
*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),
(-2*b/(a-b))^(1/2))*a^2*b^2-29*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d
*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/
2))*a*b^3-18*cos(1/2*d*x+1/2*c)*a^3*b+36*cos(1/2*d*x+1/2*c)*a^2*b^2-34*cos(
1/2*d*x+1/2*c)*a*b^3+16*cos(1/2*d*x+1/2*c)*b^4)/b/(-2*sin(1/2*d*x+1/2*c)^4*
b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/
2*c)^2+a+b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 474, normalized size of antiderivative = 1.90

$$\int \cos(c+dx)(a+b\cos(c+dx))^{5/2}\,dx = \frac{\sqrt{2}(6i\,a^4-23i\,a^2b^2-15i\,b^4)\sqrt{b}\,\text{weierstrassPInverse}\left(\frac{4\,(4\,a^2-3\,b^2)}{3\,b^2},-\frac{8\,(8\,a^3-9\,ab^2)}{27\,b^3},\frac{3\,b\cos(dx+c)+3i\,b\sin}{3\,b}\right.}{}$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/63*(sqrt(2)*(6*I*a^4 - 23*I*a^2*b^2 - 15*I*b^4)*sqrt(b)*weierstrassPInver
se(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x +
 c) + 3*I*b*sin(d*x + c) + 2*a)/b) + sqrt(2)*(-6*I*a^4 + 23*I*a^2*b^2 + 15*
I*b^4)*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 -
9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b) - 3*sqrt
(2)*(-3*I*a^3*b - 29*I*a*b^3)*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b
^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^
2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c)
+ 2*a)/b)) - 3*sqrt(2)*(3*I*a^3*b + 29*I*a*b^3)*sqrt(b)*weierstrassZeta(4/3
*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*
(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3
*I*b*sin(d*x + c) + 2*a)/b)) + 6*(3*b^4*cos(d*x + c)^2 + 9*a*b^3*cos(d*x +
c) + 9*a^2*b^2 + 5*b^4)*sqrt(b*cos(d*x + c) + a)*sin(d*x + c))/(b^2*d)
```

Sympy [F(-1)]

Timed out.

$$\int \cos(c+dx)(a+b\cos(c+dx))^{5/2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \cos(c+dx)(a+b\cos(c+dx))^{5/2}\,dx = \int (b\cos(dx+c)+a)^{\frac{5}{2}}\cos(dx+c)\,dx$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*cos(d*x + c), x)
```

Giac [F]

$$\int \cos(c+dx)(a+b\cos(c+dx))^{5/2}\,dx = \int (b\cos(dx+c)+a)^{\frac{5}{2}}\cos(dx+c)\,dx$$

```
[In] integrate(cos(d*x+c)*(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*cos(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos(c+dx)(a+b\cos(c+dx))^{5/2}\,dx = \int \cos\left(c+d\,x\right)\,\left(a+b\,\cos\left(c+d\,x\right)\right)^{5/2}\,dx$$

```
[In] int(cos(c + d*x)*(a + b*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)*(a + b*cos(c + d*x))^(5/2), x)
```

3.503 $\int (a+b\cos(c+dx))^{5/2}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 197

$$\int (a+b\cos(c+dx))^{5/2}\,dx=\frac{2(23a^2+9b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{15d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}-\frac{16a(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{15d\sqrt{a+b\cos(c+dx)}}+\frac{16ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15d}+\frac{2b(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{5d}$$

```
[Out] 2/5*b*(a+b*cos(d*x+c))^(3/2)*sin(d*x+c)/d+16/15*a*b*sin(d*x+c)*(a+b*cos(d*x
+c))^(1/2)/d+2/15*(23*a^2+9*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1
/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c)
)^(1/2)/d/((a+b*cos(d*x+c))/(a+b))^(1/2)-16/15*a*(a^2-b^2)*(cos(1/2*d*x+1/2
*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+
b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/d/(a+b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 197, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used

$= \{2735, 2832, 2831, 2742, 2740, 2734, 2732\}$

$$\int (a+b\cos(c+dx))^{5/2}\,dx = -\frac{16a(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{15d\sqrt{a+b\cos(c+dx)}} + \frac{2(23a^2+9b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{15d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2b\sin(c+dx)(a+b\cos(c+dx))^{3/2}}{5d} + \frac{16ab\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{15d}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*(23*a^2 + 9*b^2)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(
a + b)])/(15*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) - (16*a*(a^2 - b^2)*Sqrt
[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(15*d
*Sqrt[a + b*Cos[c + d*x]]) + (16*a*b*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])
/(15*d) + (2*b*(a + b*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(5*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2735

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos
[c + d*x]*((a + b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[1/n, Int[(a + b*S
in[c + d*x])^(n - 2)*Simp[a^2*n + b^2*(n - 1) + a*b*(2*n - 1)*Sin[c + d*x],
 x], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{2b(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{5d} \\
&\quad +\frac{2}{5}\int \sqrt{a+b\cos(c+dx)}\left(\frac{1}{2}(5a^2+3b^2)+4ab\cos(c+dx)\right)\,dx \\
&= \frac{16ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15d}+\frac{2b(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{5d} \\
&\quad +\frac{4}{15}\int \frac{\frac{1}{4}a(15a^2+17b^2)+\frac{1}{4}b(23a^2+9b^2)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx \\
&= \frac{16ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15d}+\frac{2b(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{5d} \\
&\quad -\frac{1}{15}\left(8a\left(a^2-b^2\right)\right)\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx+\frac{1}{15}\left(23a^2\right. \\
&\qquad \left.+9b^2\right)\int \sqrt{a+b\cos(c+dx)}\,dx
\end{aligned}
$$

$$= \frac{16ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15d} + \frac{2b(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{5d} + \frac{\left((23a^2+9b^2)\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}dx}{15\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{\left(8a(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}dx}{15\sqrt{a+b\cos(c+dx)}}$$

$$= \frac{2(23a^2+9b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{15d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{16a(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{15d\sqrt{a+b\cos(c+dx)}} + \frac{16ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15d} + \frac{2b(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{5d}$$

Mathematica [A] (verified)

Time = 0.50 (sec) , antiderivative size = 177, normalized size of antiderivative = 0.90

$$\int(a+b\cos(c+dx))^{5/2}\,dx = \frac{2(23a^3+23a^2b+9ab^2+9b^3)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)-16a(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\text{El}}{15d\sqrt{a+b\text{c}}}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*(23*a^3 + 23*a^2*b + 9*a*b^2 + 9*b^3)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]
*EllipticE[(c + d*x)/2, (2*b)/(a + b)] - 16*a*(a^2 - b^2)*Sqrt[(a + b*Cos[c
 + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)] + b*(22*a^2 + 3*b^2
 + 28*a*b*Cos[c + d*x] + 3*b^2*Cos[2*(c + d*x)])*Sin[c + d*x])/(15*d*Sqrt[a
 + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 661 vs. $2(235) = 470$.

Time = 6.55 (sec) , antiderivative size = 662, normalized size of antiderivative = 3.36

method	result
default	$-\frac{2\sqrt{\left(2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(24\left(\cos^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3+56\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a\,b^2-48\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3+22\left(\cos^3\left(\frac{dx}{2}\right.\right.\right.}{}$

```
[In] int((a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/15*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(24*cos(1
/2*d*x+1/2*c)^7*b^3+56*cos(1/2*d*x+1/2*c)^5*a*b^2-48*cos(1/2*d*x+1/2*c)^5*b
^3+22*cos(1/2*d*x+1/2*c)^3*a^2*b-84*cos(1/2*d*x+1/2*c)^3*a*b^2+30*cos(1/2*d
*x+1/2*c)^3*b^3-8*a^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)
^2+a-b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))+8*a*b
^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2
)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))+23*(sin(1/2*d*x+1/2*c)^2
)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+
1/2*c),(-2*b/(a-b))^(1/2))*a^3-23*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/
2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^
(1/2))*a^2*b+9*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)
/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^2-9*(sin
(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*Ellip
ticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*b^3-22*cos(1/2*d*x+1/2*c)*a^2*b
+28*cos(1/2*d*x+1/2*c)*a*b^2-6*cos(1/2*d*x+1/2*c)*b^3)/(-2*sin(1/2*d*x+1/2*
c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d
*x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.13 (sec) , antiderivative size = 437, normalized size of antiderivative = 2.22

$$\int (a+b\cos(c+dx))^{5/2}\,dx = \frac{\sqrt{2}(i\,a^3-33i\,ab^2)\sqrt{b}\text{weierstrassPInverse}\left(\frac{4\,(4\,a^2-3\,b^2)}{3\,b^2},-\frac{8\,(8\,a^3-9\,ab^2)}{27\,b^3},\frac{3\,b\cos(dx+c)+3i\,b\sin(dx+c)+2\,a}{3\,b}\right)}{}$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/45*(sqrt(2)*(I*a^3 - 33*I*a*b^2)*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 -
 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin
```

```
(d*x + c) + 2*a)/b) + sqrt(2)*(-I*a^3 + 33*I*a*b^2)*sqrt(b)*weierstrassPInv
erse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x
 + c) - 3*I*b*sin(d*x + c) + 2*a)/b) - 3*sqrt(2)*(-23*I*a^2*b - 9*I*b^3)*sq
rt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3,
 weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3,
1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b)) - 3*sqrt(2)*(23*I*a^2
*b + 9*I*b^3)*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3
 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3
- 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b)) + 6*(
3*b^3*cos(d*x + c) + 11*a*b^2)*sqrt(b*cos(d*x + c) + a)*sin(d*x + c))/(b*d)
```

Sympy [F]

$$\int (a+b\cos(c+dx))^{5/2}\,dx=\int (a+b\cos{(c+dx)})^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**(5/2),x)
[Out] Integral((a + b*cos(c + d*x))**(5/2), x)
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{5/2}\,dx=\int (b\cos{(dx+c)}+a)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{5/2}\,dx=\int (b\cos{(dx+c)}+a)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\,dx=\int {\left(a+b\,\cos\left(c+d\,x\right)\right)}^{5/2}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(5/2),x)
[Out] int((a + b*cos(c + d*x))^(5/2), x)
```

3.504 $\int (a+b\cos(c+dx))^{5/2}\sec(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 222

$$\int (a+b\cos(c+dx))^{5/2}\sec(c+dx)\,dx = \frac{14ab\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2b(2a^2+b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3d\sqrt{a+b\cos(c+dx)}} + \frac{2a^3\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} + \frac{2b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d}$$

```
[Out] 2/3*b^2*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+14/3*a*b*(cos(1/2*d*x+1/2*c)^2)
^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1
/2))*(a+b*cos(d*x+c))^(1/2)/d/((a+b*cos(d*x+c))/(a+b))^(1/2)+2/3*b*(2*a^2+b
^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1
/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/d/(a+b*cos(d*
x+c))^(1/2)+2*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticP
i(sin(1/2*d*x+1/2*c),2,2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1
/2)/d/(a+b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.66 (sec) , antiderivative size = 222, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.429$, Rules used = {2872, 3138, 2734, 2732, 3081, 2742, 2740, 2886, 2884}

$$\int (a+b\cos(c+dx))^{5/2}\sec(c+dx)\,dx = \frac{2a^3\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} + \frac{2b(2a^2+b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3d\sqrt{a+b\cos(c+dx)}} + \frac{2b^2\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{3d} + \frac{14ab\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x],x]
```

```
[Out] (14*a*b*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(3*
d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) + (2*b*(2*a^2 + b^2)*Sqrt[(a + b*Cos[
c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(3*d*Sqrt[a + b*C
os[c + d*x]]) + (2*a^3*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c
+ d*x)/2, (2*b)/(a + b)])/(d*Sqrt[a + b*Cos[c + d*x]]) + (2*b^2*Sqrt[a + b*
Cos[c + d*x]]*Sin[c + d*x])/(3*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
```

+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && !GtQ[a + b, 0]

Rule 2872

Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) - 3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m] || IntegersQ[2*m, 2*n]) && !(IGtQ[n, 2] && (!IntegerQ[m] || (EqQ[a, 0] && NeQ[c, 0])))

Rule 2884

Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[c + d, 0]

Rule 2886

Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(c + d*Sin[e + f*x])/(c + d)]/Sqrt[c + d*Sin[e + f*x]], Int[1/((a + b*Sin[e + f*x])*Sqrt[c/(c + d) + (d/(c + d))*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && !GtQ[c + d, 0]

Rule 3081

Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Sin[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]

Rule 3138

Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x], x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e

```
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{2b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2}{3}\int \frac{\left(\frac{3a^3}{2}+\frac{1}{2}b(9a^2+b^2)\cos(c+dx)+\frac{7}{2}ab^2\cos^2(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d} - \frac{2\int \frac{\left(-\frac{3a^3b}{2}-\frac{1}{2}b^2(2a^2+b^2)\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{3b} + \frac{1}{3}(7ab)\int \sqrt{a+b\cos(c+dx)}\,dx$$

$$= \frac{2b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d} + a^3\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx + \frac{1}{3}\left(b\left(2a^2+b^2\right)\right)\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx + \frac{\left(7ab\sqrt{a+b\cos(c+dx)}\right)\int \sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{3\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

$$= \frac{14ab\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{3d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{\left(a^3\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{\sec(c+dx)}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{\sqrt{a+b\cos(c+dx)}} + \frac{\left(b(2a^2+b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{3\sqrt{a+b\cos(c+dx)}}$$

$$= \frac{14ab\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$
$$+ \frac{2b(2a^2+b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3d\sqrt{a+b\cos(c+dx)}}$$
$$+ \frac{2a^3\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}$$
$$+ \frac{2b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.09 (sec) , antiderivative size = 379, normalized size of antiderivative = 1.71

$$\int (a+b\cos(c+dx))^{5/2}\sec(c+dx)\,dx = \frac{\frac{4b(9a^2+b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}} + \frac{2a(6a^2+7b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}} + 14i\sqrt{-\frac{b(-1}{}}}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x],x]
```

```
[Out] ((4*b*(9*a^2 + b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/
2, (2*b)/(a + b)])/Sqrt[a + b*Cos[c + d*x]] + (2*a*(6*a^2 + 7*b^2)*Sqrt[(a
+ b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(a + b)])/Sqrt[
a + b*Cos[c + d*x]] + ((14*I)*Sqrt[-((b*(-1 + Cos[c + d*x]))/(a + b))]*Sqrt
[(b*(1 + Cos[c + d*x]))/(-a + b)]*Csc[c + d*x]*(-2*a*(a - b)*EllipticE[I*Ar
cSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)] + b*(
-2*a*EllipticF[I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a
+ b)/(a - b)] + b*EllipticPi[(a + b)/a, I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[
a + b*Cos[c + d*x]]], (a + b)/(a - b)])))/Sqrt[-(a + b)^(-1)] + 4*b^2*Sqrt[
a + b*Cos[c + d*x]]*Sin[c + d*x])/(6*d)
```

Maple [A] (verified)

Time = 6.06 (sec) , antiderivative size = 528, normalized size of antiderivative = 2.38

method	result
default	$-\frac{2\sqrt{\left(2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3+2\left(\cos^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a\,b^2-6\left(\cos^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3+2a^2b\sqrt{\frac{1}{2}-\frac{\cos(dx}{2}}}{}$

[In] int((a+cos(d*x+c)*b)^(5/2)*sec(d*x+c),x,method=_RETURNVERBOSE)

[Out] -2/3*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(4*cos(1/2*d*x+1/2*c)^5*b^3+2*cos(1/2*d*x+1/2*c)^3*a*b^2-6*cos(1/2*d*x+1/2*c)^3*b^3+2*a^2*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))+b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))+7*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2*b-7*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^2-3*a^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))-2*cos(1/2*d*x+1/2*c)*a*b^2+2*cos(1/2*d*x+1/2*c)*b^3)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d

Fricas [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec(c+dx)\,dx = \text{Timed out}$$

[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c),x, algorithm="fricas")

[Out] Timed out

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec(c+dx)\,dx = \text{Timed out}$$

[In] integrate((a+b*cos(d*x+c))**(5/2)*sec(d*x+c),x)

[Out] Timed out

Maxima [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec(c+dx)\,dx = \int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec(c+dx)\,dx = \int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec(c+dx)\,dx = \int \frac{(a+b\cos(c+d\,x))^{5/2}}{\cos(c+d\,x)}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x),x)
[Out] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x), x)
```

3.505 $\int (a+b\cos(c+dx))^{5/2}\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 222

$$\int (a+b\cos(c+dx))^{5/2}\sec^2(c+dx)\,dx = -\frac{(a^2-2b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{a(a^2+4b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} + \frac{5a^2b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} + \frac{a^2\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{d}$$

```
[Out] -(a^2-2*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(
1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/d/((a+b*cos(
d*x+c))/(a+b))^(1/2)+a*(a^2+4*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x
+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x
+c))/(a+b))^(1/2)/d/(a+b*cos(d*x+c))^(1/2)+5*a^2*b*(cos(1/2*d*x+1/2*c)^2)^(
1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2,2^(1/2)*(b/(a+b))^(
1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/d/(a+b*cos(d*x+c))^(1/2)+a^2*(a+b*cos(
d*x+c))^(1/2)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.72 (sec) , antiderivative size = 222, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.391$, Rules used = {2871, 3138, 2734, 2732, 3081, 2742, 2740, 2886, 2884}

$$\int (a+b\cos(c+dx))^{5/2}\sec^2(c+dx)\,dx=\frac{a(a^2+4b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}-\frac{(a^2-2b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}+\frac{a^2\tan(c+dx)\sqrt{a+b\cos(c+dx)}}{d}+\frac{5a^2b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^2,x]
```

```
[Out] -(((a^2 - 2*b^2)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a +
 b)])/(d*Sqrt[(a + b*Cos[c + d*x])/(a + b)])) + (a*(a^2 + 4*b^2)*Sqrt[(a +
b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(d*Sqrt[a +
 b*Cos[c + d*x]]) + (5*a^2*b*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[
2, (c + d*x)/2, (2*b)/(a + b)])/(d*Sqrt[a + b*Cos[c + d*x]]) + (a^2*Sqrt[a
+ b*Cos[c + d*x]]*Tan[c + d*x])/d
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 2886

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(c + d*Sin[e + f*x])/(c + d)]/Sqrt
[c + d*Sin[e + f*x]], Int[1/((a + b*Sin[e + f*x])*Sqrt[c/(c + d) + (d/(c +
d))*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] &&  !GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
```

```
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{a^2\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{d} \\
&\quad+\int \frac{\left(\frac{5a^2b}{2}+3ab^2\cos(c+dx)-\frac{1}{2}b(a^2-2b^2)\cos^2(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx \\
&= \frac{a^2\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{d}-\frac{\int \frac{\left(-\frac{5}{2}a^2b^2-\frac{1}{2}ab(a^2+4b^2)\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{b} \\
&\quad+\frac{1}{2}(-a^2+2b^2)\int \sqrt{a+b\cos(c+dx)}\,dx \\
&= \frac{a^2\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{d}+\frac{1}{2}(5a^2b)\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx \\
&\quad+\frac{1}{2}\left(a(a^2+4b^2)\right)\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx \\
&\quad+\frac{\left((-a^2+2b^2)\sqrt{a+b\cos(c+dx)}\right)\int \sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\
&= -\frac{(a^2-2b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\
&\quad+\frac{a^2\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{d}+\frac{\left(5a^2b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{\sec(c+dx)}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{2\sqrt{a+b\cos(c+dx)}} \\
&\quad+\frac{\left(a(a^2+4b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{2\sqrt{a+b\cos(c+dx)}}
\end{aligned}
$$

$$= -\frac{(a^2-2b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{a(a^2+4b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} + \frac{5a^2b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} + \frac{a^2\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.46 (sec) , antiderivative size = 390, normalized size of antiderivative = 1.76

$$\int(a+b\cos(c+dx))^{5/2}\sec^2(c+dx)\,dx = \frac{\frac{24ab^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}} + \frac{2b(9a^2+2b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}} + \frac{2i(a^2-2b^2)\sqrt{-\frac{b(-1}{}}}{}}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^2,x]
```

```
[Out] ((24*a*b^2*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/
(a + b)])/Sqrt[a + b*Cos[c + d*x]] + (2*b*(9*a^2 + 2*b^2)*Sqrt[(a + b*Cos[c
 + d*x])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(a + b)])/Sqrt[a + b*Cos
[c + d*x]] + ((2*I)*(a^2 - 2*b^2)*Sqrt[-((b*(-1 + Cos[c + d*x]))/(a + b))]*
Sqrt[-((b*(1 + Cos[c + d*x]))/(a - b))]*Csc[c + d*x]*(2*a*(a - b)*EllipticE
[I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)]
+ b*(2*a*EllipticF[I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]],
 (a + b)/(a - b)] - b*EllipticPi[(a + b)/a, I*ArcSinh[Sqrt[-(a + b)^(-1)]*S
qrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)])))/(a*b*Sqrt[-(a + b)^(-1)]) + 4
*a^2*Sqrt[a + b*Cos[c + d*x]]*Tan[c + d*x])/(4*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 959 vs. $2(295) = 590$.

Time = 10.75 (sec) , antiderivative size = 960, normalized size of antiderivative = 4.32

method	result	size
default	Expression too large to display	960

```
[In] int((a+cos(d*x+c)*b)^(5/2)*sec(d*x+c)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(4*cos(1/2*d*x
+1/2*c)*sin(1/2*d*x+1/2*c)^4*a^2*b+(-2*a^3-2*a^2*b)*sin(1/2*d*x+1/2*c)^2*co
s(1/2*d*x+1/2*c)-2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2
*c)^2+(a+b)/(a-b))^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*
a^3+4*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^2-EllipticE(cos(
1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^3+EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(
a-b))^(1/2))*a^2*b+2*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^2
-2*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*b^3-5*EllipticPi(cos(1/
2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))*a^2*b)*sin(1/2*d*x+1/2*c)^2+(sin(1/2*d*x
+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*Ellipt
icF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^3+4*a*b^2*(sin(1/2*d*x+1/2*c)^
2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(
1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)
*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b
/(a-b))^(1/2))*a^3+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2
*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a
^2*b+2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/
(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^2-2*(sin(
1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)
*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*b^3-5*a^2*b*(sin(1/2*d*x+
1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*Ellipti
cPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2)))/(2*cos(1/2*d*x+1/2*c)^2-1)/(-
2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*
c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec^2(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec^2(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(5/2)*sec(d*x+c)**2,x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^2(c+dx)\,dx = \int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^2\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^2,x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^2, x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^2(c+dx)\,dx = \int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^2\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^2,x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec^2(c+dx)\,dx = \int \frac{(a+b\cos(c+d\,x))^{5/2}}{\cos(c+d\,x)^2}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^2,x)
[Out] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^2, x)
```

3.506 $\int (a+b\cos(c+dx))^{5/2}\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 270

$$\int (a+b\cos(c+dx))^{5/2}\sec^3(c+dx)\,dx = -\frac{9ab\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{4d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{b(11a^2+8b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4d\sqrt{a+b\cos(c+dx)}} + \frac{a(4a^2+15b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4d\sqrt{a+b\cos(c+dx)}} + \frac{9ab\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4d} + \frac{a^2\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d}$$

```
[Out] -9/4*a*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*
d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/d/((a+b*cos(d*x+
c))/(a+b))^(1/2)+1/4*b*(11*a^2+8*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*
d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(
d*x+c))/(a+b))^(1/2)/d/(a+b*cos(d*x+c))^(1/2)+1/4*a*(4*a^2+15*b^2)*(cos(1/2
*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2,2^(
1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/d/(a+b*cos(d*x+c))^(1/
2)+9/4*a*b*(a+b*cos(d*x+c))^(1/2)*tan(d*x+c)/d+1/2*a^2*sec(d*x+c)*(a+b*cos(
d*x+c))^(1/2)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 1.03 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.435$, Rules used = {2871, 3134, 3138, 2734, 2732, 3081, 2742, 2740, 2886, 2884}

$$\int (a+b\cos(c+dx))^{5/2}\sec^3(c+dx)\,dx = \frac{b(11a^2+8b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4d\sqrt{a+b\cos(c+dx)}} + \frac{a(4a^2+15b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4d\sqrt{a+b\cos(c+dx)}} + \frac{a^2\tan(c+dx)\sec(c+dx)\sqrt{a+b\cos(c+dx)}}{2d} + \frac{9ab\tan(c+dx)\sqrt{a+b\cos(c+dx)}}{4d} - \frac{9ab\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{4d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^3,x]
```

```
[Out] (-9*a*b*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(4*
d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) + (b*(11*a^2 + 8*b^2)*Sqrt[(a + b*Cos
[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(4*d*Sqrt[a + b*
Cos[c + d*x]]) + (a*(4*a^2 + 15*b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*Ell
ipticPi[2, (c + d*x)/2, (2*b)/(a + b)])/(4*d*Sqrt[a + b*Cos[c + d*x]]) + (9
*a*b*Sqrt[a + b*Cos[c + d*x]]*Tan[c + d*x])/(4*d) + (a^2*Sqrt[a + b*Cos[c +
 d*x]]*Sec[c + d*x]*Tan[c + d*x])/(2*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
```

```
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 2886

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(c + d*Sin[e + f*x])/(c + d)]/Sqrt
[c + d*Sin[e + f*x]], Int[1/((a + b*Sin[e + f*x])*Sqrt[c/(c + d) + (d/(c +
d))*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] &&  !GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
```

```
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

integral

$$= \frac{a^2\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} + \frac{1}{2}\int \frac{\left(\frac{9a^2b}{2}+a(a^2+6b^2)\cos(c+dx)+\frac{1}{2}b(a^2+4b^2)\cos^2(c+dx)\right)\sec^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{9ab\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4d} + \frac{a^2\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} + \frac{\int \frac{\left(\frac{1}{4}a^2(4a^2+15b^2)+\frac{1}{2}ab(a^2+4b^2)\cos(c+dx)-\frac{9}{4}a^2b^2\cos^2(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{2a}$$

$$= \frac{9ab\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4d} + \frac{a^2\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} - \frac{\int \frac{\left(-\frac{1}{4}a^2b(4a^2+15b^2)-\frac{1}{4}ab^2(11a^2+8b^2)\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{2ab} - \frac{1}{8}(9ab)\int\sqrt{a+b\cos(c+dx)}\,dx$$

$$= \frac{9ab\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4d} + \frac{a^2\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} + \frac{1}{8}\left(b\left(11a^2+8b^2\right)\right)\int \frac{1}{\sqrt{a+b\cos(c+dx)}}dx + \frac{1}{8}\left(a\left(4a^2+15b^2\right)\right)\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}dx - \frac{\left(9ab\sqrt{a+b\cos(c+dx)}\right)\int \sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}dx}{8\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

$$= -\frac{9ab\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{4d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{9ab\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4d} + \frac{a^2\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} + \frac{\left(b(11a^2+8b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}dx}{8\sqrt{a+b\cos(c+dx)}} + \frac{\left(a(4a^2+15b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{\sec(c+dx)}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}dx}{8\sqrt{a+b\cos(c+dx)}}$$

$$= -\frac{9ab\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{4d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{b(11a^2+8b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4d\sqrt{a+b\cos(c+dx)}} + \frac{a(4a^2+15b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4d\sqrt{a+b\cos(c+dx)}} + \frac{9ab\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4d} + \frac{a^2\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.84 (sec) , antiderivative size = 395, normalized size of antiderivative = 1.46

$$\int (a+b\cos(c+dx))^{5/2}\sec^3(c+dx)\,dx = \frac{\frac{4b(a^2+4b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}} + \frac{a(8a^2+21b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}} - 9i\sqrt{-\frac{b(-1+\cdots}{\cdots}}\cdots}{\cdots}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^3,x]
```

```
[Out] ((4*b*(a^2 + 4*b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/
2, (2*b)/(a + b)])/Sqrt[a + b*Cos[c + d*x]] + (a*(8*a^2 + 21*b^2)*Sqrt[(a +
 b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(a + b)])/Sqrt[a
 + b*Cos[c + d*x]] - ((9*I)*Sqrt[-((b*(-1 + Cos[c + d*x]))/(a + b))]*Sqrt[(
b*(1 + Cos[c + d*x]))/(-a + b)]*Csc[c + d*x]*(-2*a*(a - b)*EllipticE[I*ArcS
inh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)] + b*(-2
*a*EllipticF[I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a +
b)/(a - b)] + b*EllipticPi[(a + b)/a, I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a
+ b*Cos[c + d*x]]], (a + b)/(a - b)])))/Sqrt[-(a + b)^(-1)] + 2*a*Sqrt[a +
b*Cos[c + d*x]]*(2*a + 9*b*Cos[c + d*x])*Sec[c + d*x]*Tan[c + d*x])/(8*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1133 vs. $2(331) = 662$.

Time = 33.46 (sec) , antiderivative size = 1134, normalized size of antiderivative = 4.20

method	result	size
default	Expression too large to display	1134

```
[In] int((a+cos(d*x+c)*b)^(5/2)*sec(d*x+c)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-72*cos(1
/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6*a*b^2+(44*a^2*b+72*a*b^2)*sin(1/2*d*x+1/
2*c)^4*cos(1/2*d*x+1/2*c)+(-4*a^3-22*a^2*b-18*a*b^2)*sin(1/2*d*x+1/2*c)^2*c
os(1/2*d*x+1/2*c)+4*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(si
n(1/2*d*x+1/2*c)^2)^(1/2)*(11*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/
2))*a^2*b+8*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*b^3-9*Elliptic
E(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2*b+9*EllipticE(cos(1/2*d*x+1/2*
c),(-2*b/(a-b))^(1/2))*a*b^2-4*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))
^(1/2))*a^3-15*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))*a*b^2)*s
in(1/2*d*x+1/2*c)^4-4*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(
sin(1/2*d*x+1/2*c)^2)^(1/2)*(11*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(
1/2))*a^2*b+8*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*b^3-9*Ellipt
icE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2*b+9*EllipticE(cos(1/2*d*x+1/
2*c),(-2*b/(a-b))^(1/2))*a*b^2-4*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b
))^(1/2))*a^3-15*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))*a*b^2)
*sin(1/2*d*x+1/2*c)^2+11*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d
*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1
/2))*a^2*b+8*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c
)^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-9*(
sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(
1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2*b+9*(sin(1/2*d*x+
1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*Ellipti
cE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^2-4*(sin(1/2*d*x+1/2*c)^2)^(1
/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticPi(cos(1/2*
```

```
d*x+1/2*c),2,(-2*b/(a-b))^(1/2))*a^3-15*a*b^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*
(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticPi(cos(1/2*d*x+
1/2*c),2,(-2*b/(a-b))^(1/2)))/(2*cos(1/2*d*x+1/2*c)^2-1)^2/(-2*sin(1/2*d*x+
1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1
/2*d*x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec^3(c+dx)\,dx=\text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^3,x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec^3(c+dx)\,dx=\text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(5/2)*sec(d*x+c)**3,x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^3(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^3\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^3,x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^3, x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^3(c+dx)\,dx = \int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^3\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^3,x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec^3(c+dx)\,dx = \int \frac{(a+b\cos(c+d\,x))^{5/2}}{\cos(c+d\,x)^3}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^3,x)
[Out] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^3, x)
```

3.507 $\int (a+b\cos(c+dx))^{5/2}\sec^4(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 323

$$\begin{aligned}\int (a+b\cos(c+dx))^{5/2}\sec^4(c+dx)\,dx &= -\frac{(16a^2+33b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{24d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\\
&+\frac{a(16a^2+59b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{24d\sqrt{a+b\cos(c+dx)}}\\
&+\frac{5b(4a^2+b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{8d\sqrt{a+b\cos(c+dx)}}\\
&+\frac{(16a^2+33b^2)\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{24d}\\
&+\frac{13ab\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{12d}\\
&+\frac{a^2\sqrt{a+b\cos(c+dx)}\sec^2(c+dx)\tan(c+dx)}{3d}\end{aligned}$$

```
[Out] -1/24*(16*a^2+33*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellip
ticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/d/(
(a+b*cos(d*x+c))/(a+b))^(1/2)+1/24*a*(16*a^2+59*b^2)*(cos(1/2*d*x+1/2*c)^2)
^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1
/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/d/(a+b*cos(d*x+c))^(1/2)+5/8*b*(4*a^2+b
^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+
1/2*c),2,2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/d/(a+b*cos
(d*x+c))^(1/2)+1/24*(16*a^2+33*b^2)*(a+b*cos(d*x+c))^(1/2)*tan(d*x+c)/d+13/
12*a*b*sec(d*x+c)*(a+b*cos(d*x+c))^(1/2)*tan(d*x+c)/d+1/3*a^2*sec(d*x+c)^2*
(a+b*cos(d*x+c))^(1/2)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 1.35 (sec) , antiderivative size = 323, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {2871, 3134, 3138, 2734, 2732, 3081, 2742, 2740, 2886, 2884}

$$\int (a+b\cos(c+dx))^{5/2}\sec^4(c+dx)\,dx=\frac{(16a^2+33b^2)\tan(c+dx)\sqrt{a+b\cos(c+dx)}}{24d}+\frac{a(16a^2+59b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{24d\sqrt{a+b\cos(c+dx)}}-\frac{(16a^2+33b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{24d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}+\frac{5b(4a^2+b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{8d\sqrt{a+b\cos(c+dx)}}+\frac{a^2\tan(c+dx)\sec^2(c+dx)\sqrt{a+b\cos(c+dx)}}{3d}+\frac{13ab\tan(c+dx)\sec(c+dx)\sqrt{a+b\cos(c+dx)}}{12d}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^4,x]
```

```
[Out] -1/24*((16*a^2 + 33*b^2)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2
*b)/(a + b)])/(d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) + (a*(16*a^2 + 59*b^2)
*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/
(24*d*Sqrt[a + b*Cos[c + d*x]]) + (5*b*(4*a^2 + b^2)*Sqrt[(a + b*Cos[c + d*
x])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(a + b)])/(8*d*Sqrt[a + b*Cos
[c + d*x]]) + ((16*a^2 + 33*b^2)*Sqrt[a + b*Cos[c + d*x]]*Tan[c + d*x])/(24
*d) + (13*a*b*Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]*Tan[c + d*x])/(12*d) +
(a^2*Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^2*Tan[c + d*x])/(3*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
```

```
0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 2886

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(c + d*Sin[e + f*x])/(c + d)]/Sqrt
[c + d*Sin[e + f*x]], Int[1/((a + b*Sin[e + f*x])*Sqrt[c/(c + d) + (d/(c +
d))*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] &&  !GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}&\text{integral}\\&=\frac{a^2\sqrt{a+b\cos(c+dx)}\sec^2(c+dx)\tan(c+dx)}{3d}\\&\quad+\frac{1}{3}\int\frac{\left(\frac{13a^2b}{2}+a(2a^2+9b^2)\cos(c+dx)+\frac{3}{2}b(a^2+2b^2)\cos^2(c+dx)\right)\sec^3(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx\end{aligned}$$

$$= \frac{13ab\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{12d} + \frac{a^2\sqrt{a+b\cos(c+dx)}\sec^2(c+dx)\tan(c+dx)}{3d} + \frac{\int \frac{\left(\frac{1}{4}a^2(16a^2+33b^2)+\frac{1}{2}ab(19a^2+12b^2)\cos(c+dx)+\frac{13}{4}a^2b^2\cos^2(c+dx)\right)\sec^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}dx}{6a}$$

$$= \frac{(16a^2+33b^2)\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{24d} + \frac{13ab\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{12d} + \frac{a^2\sqrt{a+b\cos(c+dx)}\sec^2(c+dx)\tan(c+dx)}{3d} + \frac{\int \frac{\left(\frac{15}{8}a^2b(4a^2+b^2)+\frac{13}{4}a^3b^2\cos(c+dx)-\frac{1}{8}a^2b(16a^2+33b^2)\cos^2(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}dx}{6a^2}$$

$$= \frac{(16a^2+33b^2)\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{24d} + \frac{13ab\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{12d} + \frac{a^2\sqrt{a+b\cos(c+dx)}\sec^2(c+dx)\tan(c+dx)}{3d} - \frac{\int \frac{\left(-\frac{15}{8}a^2b^2(4a^2+b^2)-\frac{1}{8}a^3b(16a^2+59b^2)\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}dx}{6a^2b} + \frac{1}{48}\left(-16a^2-33b^2\right)\int \sqrt{a+b\cos(c+dx)}\,dx$$

$$= \frac{(16a^2+33b^2)\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{24d} + \frac{13ab\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{12d} + \frac{a^2\sqrt{a+b\cos(c+dx)}\sec^2(c+dx)\tan(c+dx)}{3d} + \frac{1}{16}\left(5b(4a^2+b^2)\right)\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}dx + \frac{1}{48}\left(a(16a^2+59b^2)\right)\int \frac{1}{\sqrt{a+b\cos(c+dx)}}dx + \frac{\left((-16a^2-33b^2)\sqrt{a+b\cos(c+dx)}\right)\int \sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}dx}{48\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

$$= -\frac{(16a^2+33b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{24d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{(16a^2+33b^2)\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{24d} + \frac{13ab\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{12d} + \frac{a^2\sqrt{a+b\cos(c+dx)}\sec^2(c+dx)\tan(c+dx)}{3d} + \frac{\left(5b(4a^2+b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{\sec(c+dx)}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}dx}{16\sqrt{a+b\cos(c+dx)}} + \frac{\left(a(16a^2+59b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}dx}{48\sqrt{a+b\cos(c+dx)}}$$

$$= -\frac{(16a^2+33b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{24d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{a(16a^2+59b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{24d\sqrt{a+b\cos(c+dx)}} + \frac{5b(4a^2+b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{8d\sqrt{a+b\cos(c+dx)}} + \frac{(16a^2+33b^2)\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{24d} + \frac{13ab\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{12d} + \frac{a^2\sqrt{a+b\cos(c+dx)}\sec^2(c+dx)\tan(c+dx)}{3d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.67 (sec) , antiderivative size = 434, normalized size of antiderivative = 1.34

$$\int(a+b\cos(c+dx))^{5/2}\sec^4(c+dx)\,dx = \frac{\frac{104ab^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}} + \frac{2b(104a^2-3b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}} - \frac{2i(16a^2+33b^2)\sqrt{\ldots}}{\ldots}}{\ldots}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^4,x]
```

```
[Out] ((104*a*b^2*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)
/(a + b)])/Sqrt[a + b*Cos[c + d*x]] + (2*b*(104*a^2 - 3*b^2)*Sqrt[(a + b*Co
s[c + d*x])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(a + b)])/Sqrt[a + b*
Cos[c + d*x]] - ((2*I)*(16*a^2 + 33*b^2)*Sqrt[-((b*(-1 + Cos[c + d*x]))/(a
+ b))]*Sqrt[-((b*(1 + Cos[c + d*x]))/(a - b))]*Csc[c + d*x]*(-2*a*(a - b)*E
llipticE[I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(
a - b)] + b*(-2*a*EllipticF[I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c
+ d*x]]], (a + b)/(a - b)] + b*EllipticPi[(a + b)/a, I*ArcSinh[Sqrt[-(a + b
)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)])))/(a*b*Sqrt[-(a + b)^(
-1)]) + 4*Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^2*(26*a*b*Sin[c + d*x] + (8
*a^2 + (33*b^2)/2)*Sin[2*(c + d*x)] + 8*a^2*Tan[c + d*x]))/(96*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1741 vs. $2(380) = 760$.

Time = 103.95 (sec) , antiderivative size = 1742, normalized size of antiderivative = 5.39

method	result	size
default	Expression too large to display	1742

```
[In] int((a+cos(d*x+c)*b)^(5/2)*sec(d*x+c)^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/24*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*((256*a^2
*b+528*b^3)*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8+(-128*a^3-384*a^2*b-472
*a*b^2-792*b^3)*sin(1/2*d*x+1/2*c)^6*cos(1/2*d*x+1/2*c)+(128*a^3+328*a^2*b+
472*a*b^2+396*b^3)*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+(-48*a^3-100*a^2
*b-118*a*b^2-66*b^3)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+8*(-2*b/(a-b)*
sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(60*El
lipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))*a^2*b+15*b^3*EllipticPi(c
os(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))-16*EllipticF(cos(1/2*d*x+1/2*c),(-2
*b/(a-b))^(1/2))*a^3-59*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*
b^2+16*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^3-16*EllipticE(co
s(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2*b+33*EllipticE(cos(1/2*d*x+1/2*c),
(-2*b/(a-b))^(1/2))*a*b^2-33*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2
))*b^3)*sin(1/2*d*x+1/2*c)^6-12*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b
))^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(60*EllipticPi(cos(1/2*d*x+1/2*c),2,(
-2*b/(a-b))^(1/2))*a^2*b+15*b^3*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b)
)^(1/2))-16*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^3-59*Ellipti
cF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^2+16*EllipticE(cos(1/2*d*x+1/
2*c),(-2*b/(a-b))^(1/2))*a^3-16*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(
1/2))*a^2*b+33*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^2-33*El
lipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*b^3)*sin(1/2*d*x+1/2*c)^4+6*
(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2*d*x+1/2*c)^2)^
```

```
(1/2)*(60*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))*a^2*b+15*b^3*
EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))-16*EllipticF(cos(1/2*d*
x+1/2*c),(-2*b/(a-b))^(1/2))*a^3-59*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b
))^(1/2))*a*b^2+16*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^3-16*
EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2*b+33*EllipticE(cos(1/2
*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^2-33*EllipticE(cos(1/2*d*x+1/2*c),(-2*b
/(a-b))^(1/2))*b^3)*sin(1/2*d*x+1/2*c)^2-60*a^2*b*(sin(1/2*d*x+1/2*c)^2)^(1
/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticPi(cos(1/2*
d*x+1/2*c),2,(-2*b/(a-b))^(1/2))-15*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/
(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c)
,2,(-2*b/(a-b))^(1/2))+16*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*
d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(
1/2))*a^3+59*a*b^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2
*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-1
6*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b)
)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^3+16*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*Ellip
ticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2*b-33*(sin(1/2*d*x+1/2*c)^2)
^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/
2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^2+33*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*
b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c
),(-2*b/(a-b))^(1/2))*b^3)/(2*cos(1/2*d*x+1/2*c)^2-1)^3/(-2*sin(1/2*d*x+1/2
*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*
d*x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec^4(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec^4(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(5/2)*sec(d*x+c)**4,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^4(c+dx)\,dx = \int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^4\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^4,x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^4, x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^4(c+dx)\,dx = \int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^4\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^4,x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^4, x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec^4(c+dx)\,dx = \int \frac{(a+b\cos(c+d\,x))^{5/2}}{\cos(c+d\,x)^4}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^4,x)
[Out] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^4, x)
```

3.508 $\int (a+b\cos(c+dx))^{7/2}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 246

$$\int (a+b\cos(c+dx))^{7/2}\,dx = \frac{32a(11a^2+13b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{105d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2(71a^4-46a^2b^2-25b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{105d\sqrt{a+b\cos(c+dx)}} + \frac{2b(71a^2+25b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105d} + \frac{24ab(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{35d} + \frac{2b(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7d}$$

```
[Out] 24/35*a*b*(a+b*cos(d*x+c))^(3/2)*sin(d*x+c)/d+2/7*b*(a+b*cos(d*x+c))^(5/2)*
sin(d*x+c)/d+2/105*b*(71*a^2+25*b^2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+32
/105*a*(11*a^2+13*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elli
pticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/d/
((a+b*cos(d*x+c))/(a+b))^(1/2)-2/105*(71*a^4-46*a^2*b^2-25*b^4)*(cos(1/2*d*
x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2)*(
b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/d/(a+b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.54 (sec) , antiderivative size = 246, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {2735, 2832, 2831, 2742, 2740, 2734, 2732}

$$\begin{aligned}\int (a+b\cos(c+dx))^{7/2}\,dx =&\ \frac{2b(71a^2+25b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{105d}\\&+\frac{32a(11a^2+13b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{105d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\\&-\frac{2(71a^4-46a^2b^2-25b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{105d\sqrt{a+b\cos(c+dx)}}\\&+\frac{2b\sin(c+dx)(a+b\cos(c+dx))^{5/2}}{7d}+\frac{24ab\sin(c+dx)(a+b\cos(c+dx))^{3/2}}{35d}\end{aligned}$$

```
[In] Int[(a + b*Cos[c + d*x])^(7/2),x]
```

```
[Out] (32*a*(11*a^2 + 13*b^2)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*
b)/(a + b)])/(105*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) - (2*(71*a^4 - 46*a
^2*b^2 - 25*b^4)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2,
(2*b)/(a + b)])/(105*d*Sqrt[a + b*Cos[c + d*x]]) + (2*b*(71*a^2 + 25*b^2)*S
qrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(105*d) + (24*a*b*(a + b*Cos[c + d*x]
)^(3/2)*Sin[c + d*x])/(35*d) + (2*b*(a + b*Cos[c + d*x])^(5/2)*Sin[c + d*x]
)/(7*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2735

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos
[c + d*x]*((a + b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[1/n, Int[(a + b*S
in[c + d*x])^(n - 2)*Simp[a^2*n + b^2*(n - 1) + a*b*(2*n - 1)*Sin[c + d*x],
 x], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[n, 1] &&
```

```
IntegerQ[2*n]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2b(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7d} \\
&\quad + \frac{2}{7}\int (a+b\cos(c+dx))^{3/2}\left(\frac{1}{2}(7a^2+5b^2)+6ab\cos(c+dx)\right)\,dx \\
&= \frac{24ab(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{35d}+\frac{2b(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7d} \\
&\quad + \frac{4}{35}\int \sqrt{a+b\cos(c+dx)}\left(\frac{1}{4}a(35a^2+61b^2)+\frac{1}{4}b(71a^2+25b^2)\cos(c+dx)\right)\,dx
\end{aligned}$$

$$
\begin{aligned}
&= \frac{2b(71a^2+25b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105d} \\
&\quad + \frac{24ab(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{35d} + \frac{2b(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7d} \\
&\quad + \frac{8}{105}\int \frac{\frac{1}{8}(105a^4+254a^2b^2+25b^4)+2ab(11a^2+13b^2)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx \\
&= \frac{2b(71a^2+25b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105d} \\
&\quad + \frac{24ab(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{35d} + \frac{2b(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7d} \\
&\quad + \frac{1}{105}\left(16a\left(11a^2+13b^2\right)\right)\int \sqrt{a+b\cos(c+dx)}\,dx \\
&\quad + \frac{1}{105}\left(-71a^4+46a^2b^2+25b^4\right)\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx \\
&= \frac{2b(71a^2+25b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105d} \\
&\quad + \frac{24ab(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{35d} + \frac{2b(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7d} \\
&\quad + \frac{\left(16a(11a^2+13b^2)\sqrt{a+b\cos(c+dx)}\right)\int \sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{105\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\
&\quad + \frac{\left((-71a^4+46a^2b^2+25b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{105\sqrt{a+b\cos(c+dx)}} \\
&= \frac{32a(11a^2+13b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{105d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\
&\quad - \frac{2(71a^4-46a^2b^2-25b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{105d\sqrt{a+b\cos(c+dx)}} \\
&\quad + \frac{2b(71a^2+25b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105d} \\
&\quad + \frac{24ab(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{35d} + \frac{2b(a+b\cos(c+dx))^{5/2}\sin(c+dx)}{7d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.79 (sec) , antiderivative size = 211, normalized size of antiderivative = 0.86

$$\int (a+b\cos(c+dx))^{7/2}\,dx = \frac{64a(11a^3+11a^2b+13ab^2+13b^3)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)-4(71a^4-46a^2b^2-25b^4)\sqrt{\cdots}}{\cdots}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(7/2),x]
```

```
[Out] (64*a*(11*a^3 + 11*a^2*b + 13*a*b^2 + 13*b^3)*Sqrt[(a + b*Cos[c + d*x])/(a
+ b)]*EllipticE[(c + d*x)/2, (2*b)/(a + b)] - 4*(71*a^4 - 46*a^2*b^2 - 25*b
^4)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)
] + b*(488*a^3 + 262*a*b^2 + b*(752*a^2 + 145*b^2)*Cos[c + d*x] + 162*a*b^2
*Cos[2*(c + d*x)] + 15*b^3*Cos[3*(c + d*x)])*Sin[c + d*x])/(210*d*Sqrt[a +
b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 823 vs. 2(280) = 560.

Time = 7.40 (sec) , antiderivative size = 824, normalized size of antiderivative = 3.35

method	result	size
default	Expression too large to display	824

```
[In] int((a+cos(d*x+c)*b)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/105*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(240*cos
(1/2*d*x+1/2*c)^9*b^4+648*cos(1/2*d*x+1/2*c)^7*a*b^3-600*cos(1/2*d*x+1/2*c)
^7*b^4+752*cos(1/2*d*x+1/2*c)^5*a^2*b^2-1296*cos(1/2*d*x+1/2*c)^5*a*b^3+640
*cos(1/2*d*x+1/2*c)^5*b^4+244*cos(1/2*d*x+1/2*c)^3*a^3*b-1128*cos(1/2*d*x+1
/2*c)^3*a^2*b^2+860*cos(1/2*d*x+1/2*c)^3*a*b^3-360*cos(1/2*d*x+1/2*c)^3*b^4
-71*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/
2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^4+46*(sin(1/2*d*x+1/2
*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticF(cos(1/2
*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2*b^2+25*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2
*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*
b/(a-b))^(1/2))*b^4+176*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*
c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^4
-176*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1
/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^3*b+208*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos
(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2*b^2-208*(sin(1/2*d*x+1/2*c)^2)^(1/2
```

```
)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c)
,(-2*b/(a-b))^(1/2))*a*b^3-244*cos(1/2*d*x+1/2*c)*a^3*b+376*cos(1/2*d*x+1/2
*c)*a^2*b^2-212*cos(1/2*d*x+1/2*c)*a*b^3+80*cos(1/2*d*x+1/2*c)*b^4)/(-2*sin
(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-
2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.13 (sec) , antiderivative size = 474, normalized size of antiderivative = 1.93

$$\int (a+b\cos(c+dx))^{7/2}\,dx = \frac{\sqrt{2}(37i\,a^4-346i\,a^2b^2-75i\,b^4)\sqrt{b}\,\mathrm{weierstrassPInverse}\left(\frac{4\,(4\,a^2-3\,b^2)}{3\,b^2},-\frac{8\,(8\,a^3-9\,ab^2)}{27\,b^3},\frac{3\,b\cos(dx+c)+3i}{3}\right.}{}$$

```
[In] integrate((a+b*cos(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/315*(sqrt(2)*(37*I*a^4 - 346*I*a^2*b^2 - 75*I*b^4)*sqrt(b)*weierstrassPIn
verse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*
x + c) + 3*I*b*sin(d*x + c) + 2*a)/b) + sqrt(2)*(-37*I*a^4 + 346*I*a^2*b^2
+ 75*I*b^4)*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a
^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b) - 4
8*sqrt(2)*(-11*I*a^3*b - 13*I*a*b^3)*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3
*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*
b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*
x + c) + 2*a)/b)) - 48*sqrt(2)*(11*I*a^3*b + 13*I*a*b^3)*sqrt(b)*weierstras
sZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInv
erse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x
 + c) - 3*I*b*sin(d*x + c) + 2*a)/b)) + 6*(15*b^4*cos(d*x + c)^2 + 66*a*b^3
*cos(d*x + c) + 122*a^2*b^2 + 25*b^4)*sqrt(b*cos(d*x + c) + a)*sin(d*x + c)
)/(b*d)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{7/2}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{7/2}\,dx = \int (b\cos(dx+c)+a)^{\frac{7}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(7/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(7/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{7/2}\,dx = \int (b\cos(dx+c)+a)^{\frac{7}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(7/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{7/2}\,dx = \int (a+b\,\cos(c+d\,x))^{7/2}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(7/2),x)
[Out] int((a + b*cos(c + d*x))^(7/2), x)
```

3.509 $\int \cos^3(c+dx)\sqrt{3+4\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 138

$$\int \cos^3(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \frac{47E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{20\sqrt{7}d}+\frac{59\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{60\sqrt{7}d}+\frac{59\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{105d}-\frac{3(3+4\cos(c+dx))^{3/2}\sin(c+dx)}{70d}+\frac{\cos(c+dx)(3+4\cos(c+dx))^{3/2}\sin(c+dx)}{14d}$$

```
[Out] -3/70*(3+4*cos(d*x+c))^(3/2)*sin(d*x+c)/d+1/14*cos(d*x+c)*(3+4*cos(d*x+c))^
(3/2)*sin(d*x+c)/d+47/140*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*E
llipticE(sin(1/2*d*x+1/2*c),2/7*14^(1/2))/d*7^(1/2)+59/420*(cos(1/2*d*x+1/2
*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2/7*14^(1/2))/
d*7^(1/2)+59/105*sin(d*x+c)*(3+4*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used

= {2872, 3102, 2832, 2831, 2740, 2732}

$$\int \cos^3(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \frac{59\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{60\sqrt{7}d} + \frac{47E\left(\frac{1}{2}(c+dx)\middle|\frac{8}{7}\right)}{20\sqrt{7}d} + \frac{\sin(c+dx)\cos(c+dx)(4\cos(c+dx)+3)^{3/2}}{14d} - \frac{3\sin(c+dx)(4\cos(c+dx)+3)^{3/2}}{70d} + \frac{59\sin(c+dx)\sqrt{4\cos(c+dx)+3}}{105d}$$

```
[In] Int[Cos[c + d*x]^3*Sqrt[3 + 4*Cos[c + d*x]],x]
```

```
[Out] (47*EllipticE[(c + d*x)/2, 8/7])/(20*Sqrt[7]*d) + (59*EllipticF[(c + d*x)/2
, 8/7])/(60*Sqrt[7]*d) + (59*Sqrt[3 + 4*Cos[c + d*x]]*Sin[c + d*x])/(105*d)
 - (3*(3 + 4*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(70*d) + (Cos[c + d*x]*(3 +
4*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(14*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\cos(c+dx)(3+4\cos(c+dx))^{3/2}\sin(c+dx)}{14d} \\
&\quad + \frac{1}{14}\int \sqrt{3+4\cos(c+dx)}\left(3+10\cos(c+dx)-6\cos^2(c+dx)\right)\,dx \\
&= -\frac{3(3+4\cos(c+dx))^{3/2}\sin(c+dx)}{70d} \\
&\quad + \frac{\cos(c+dx)(3+4\cos(c+dx))^{3/2}\sin(c+dx)}{14d} \\
&\quad + \frac{1}{140}\int \sqrt{3+4\cos(c+dx)}(-6+118\cos(c+dx))\,dx \\
&= \frac{59\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{105d} - \frac{3(3+4\cos(c+dx))^{3/2}\sin(c+dx)}{70d} \\
&\quad + \frac{\cos(c+dx)(3+4\cos(c+dx))^{3/2}\sin(c+dx)}{14d} + \frac{1}{210}\int \frac{209+141\cos(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx \\
&= \frac{59\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{105d} - \frac{3(3+4\cos(c+dx))^{3/2}\sin(c+dx)}{70d} \\
&\quad + \frac{\cos(c+dx)(3+4\cos(c+dx))^{3/2}\sin(c+dx)}{14d} \\
&\quad + \frac{47}{280}\int \sqrt{3+4\cos(c+dx)}\,dx + \frac{59}{120}\int \frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx
\end{aligned}
$$

$$= \frac{47E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{20\sqrt{7}d} + \frac{59\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{60\sqrt{7}d} + \frac{59\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{105d} - \frac{3(3+4\cos(c+dx))^{3/2}\sin(c+dx)}{70d} + \frac{\cos(c+dx)(3+4\cos(c+dx))^{3/2}\sin(c+dx)}{14d}$$

Mathematica [A] (verified)

Time = 0.28 (sec) , antiderivative size = 92, normalized size of antiderivative = 0.67

$$\int \cos^3(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \frac{141\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right) + 59\sqrt{7}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right) + \sqrt{3+4\cos(c+dx)}(212\sin(c+dx) + 9\sin(2(c-$$
$$420d$$

```
[In] Integrate[Cos[c + d*x]^3*Sqrt[3 + 4*Cos[c + d*x]],x]
```

```
[Out] (141*Sqrt[7]*EllipticE[(c + d*x)/2, 8/7] + 59*Sqrt[7]*EllipticF[(c + d*x)/2
, 8/7] + Sqrt[3 + 4*Cos[c + d*x]]*(212*Sin[c + d*x] + 9*Sin[2*(c + d*x)] +
30*Sin[3*(c + d*x)]))/(420*d)
```

Maple [A] (verified)

Time = 6.00 (sec) , antiderivative size = 275, normalized size of antiderivative = 1.99

method	result
default	$-\frac{\sqrt{\left(8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(7680\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-14976\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+12344\left(\sin^4\left(\frac{dx}{2}\right.\right.\right.}{420\sqrt{-8\left(\text{si}\right.}}$

```
[In] int(cos(d*x+c)^3*(3+4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/420*((8*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(7680*cos(1/
2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8-14976*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*
c)^6+12344*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-4480*sin(1/2*d*x+1/2*c)^
2*cos(1/2*d*x+1/2*c)+413*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(8*sin(1/2*d*x+1/2*c)
^2-7)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2*2^(1/2))-141*(sin(1/2*d*x+1/2*c)
^2)^(1/2)*(8*sin(1/2*d*x+1/2*c)^2-7)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2*2
^(1/2)))/(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x
+1/2*c)/(8*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.07

$$\int \cos^3(c+dx)\sqrt{3+4\cos(c+dx)}\,dx$$
$$= \frac{4\left(60\cos\left(dx+c\right)^2+9\cos\left(dx+c\right)+91\right)\sqrt{4\cos\left(dx+c\right)+3}\sin\left(dx+c\right)-277i\sqrt{2}\text{weierstrassPInverse}}{}$$

```
[In] integrate(cos(d*x+c)^3*(3+4*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] 1/840*(4*(60*cos(d*x + c)^2 + 9*cos(d*x + c) + 91)*sqrt(4*cos(d*x + c) + 3)
*sin(d*x + c) - 277*I*sqrt(2)*weierstrassPInverse(-1, 1, cos(d*x + c) + I*s
in(d*x + c) + 1/2) + 277*I*sqrt(2)*weierstrassPInverse(-1, 1, cos(d*x + c)
- I*sin(d*x + c) + 1/2) + 282*I*sqrt(2)*weierstrassZeta(-1, 1, weierstrassP
Inverse(-1, 1, cos(d*x + c) + I*sin(d*x + c) + 1/2)) - 282*I*sqrt(2)*weiers
trassZeta(-1, 1, weierstrassPInverse(-1, 1, cos(d*x + c) - I*sin(d*x + c) +
 1/2)))/d
```

Sympy [F(-1)]

Timed out.

$$\int \cos^3(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3*(3+4*cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \cos^3(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \int \sqrt{4\cos\left(dx+c\right)+3}\cos\left(dx+c\right)^3\,dx$$

```
[In] integrate(cos(d*x+c)^3*(3+4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(4*cos(d*x + c) + 3)*cos(d*x + c)^3, x)
```

Giac [F]

$$\int \cos^3(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \int \sqrt{4\cos(dx+c)+3}\cos(dx+c)^3\,dx$$

```
[In] integrate(cos(d*x+c)^3*(3+4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(4*cos(d*x + c) + 3)*cos(d*x + c)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^3(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \int \cos(c+d\,x)^3\sqrt{4\cos(c+d\,x)+3}\,dx$$

```
[In] int(cos(c + d*x)^3*(4*cos(c + d*x) + 3)^(1/2),x)
[Out] int(cos(c + d*x)^3*(4*cos(c + d*x) + 3)^(1/2), x)
```

3.510 $\int \cos^2(c+dx)\sqrt{3+4\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 105

$$\int \cos^2(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \frac{21\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{20d} - \frac{\sqrt{7}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{20d} - \frac{\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{5d} + \frac{(3+4\cos(c+dx))^{3/2}\sin(c+dx)}{10d}$$

```
[Out] 1/10*(3+4*cos(d*x+c))^(3/2)*sin(d*x+c)/d+21/20*(cos(1/2*d*x+1/2*c)^2)^(1/2)
/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2/7*14^(1/2))/d*7^(1/2)-1/
20*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/
2*c),2/7*14^(1/2))/d*7^(1/2)-1/5*sin(d*x+c)*(3+4*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2870, 2832, 2831, 2740, 2732}

$$\int \cos^2(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = -\frac{\sqrt{7}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{20d} + \frac{21\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{20d} + \frac{\sin(c+dx)(4\cos(c+dx)+3)^{3/2}}{10d} - \frac{\sin(c+dx)\sqrt{4\cos(c+dx)+3}}{5d}$$

[In] Int[Cos[c + d*x]^2*Sqrt[3 + 4*Cos[c + d*x]],x]

[Out] (21*Sqrt[7]*EllipticE[(c + d*x)/2, 8/7])/(20*d) - (Sqrt[7]*EllipticF[(c + d*x)/2, 8/7])/(20*d) - (Sqrt[3 + 4*Cos[c + d*x]]*Sin[c + d*x])/(5*d) + ((3 + 4*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(10*d)

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rule 2870

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^2, x_Symbol] :> Simp[(-d^2)*Cos[e + f*x]*((a + b*Sin[e + f*x])
^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m + 2)), Int[(a + b*Sin[e + f*x])^
m*Simp[b*(d^2*(m + 1) + c^2*(m + 2)) - d*(a*d - 2*b*c*(m + 2))*Sin[e + f*x]
, x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] && NeQ
[a^2 - b^2, 0] &&  !LtQ[m, -1]
```

Rubi steps

$$\text{integral} = \frac{(3+4\cos(c+dx))^{3/2}\sin(c+dx)}{10d} + \frac{1}{10}\int (6-3\cos(c+dx))\sqrt{3+4\cos(c+dx)}\,dx$$

$$= -\frac{\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{5d} + \frac{(3+4\cos(c+dx))^{3/2}\sin(c+dx)}{10d} + \frac{1}{15}\int \frac{21+\frac{63}{2}\cos(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx$$

$$= -\frac{\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{5d} + \frac{(3+4\cos(c+dx))^{3/2}\sin(c+dx)}{10d} - \frac{7}{40}\int \frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx + \frac{21}{40}\int \sqrt{3+4\cos(c+dx)}\,dx$$

$$= \frac{21\sqrt{7}E\left(\frac{1}{2}(c+dx)\middle|\frac{8}{7}\right)}{20d} - \frac{\sqrt{7}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{20d} - \frac{\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{5d} + \frac{(3+4\cos(c+dx))^{3/2}\sin(c+dx)}{10d}$$

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.77

$$\int \cos^2(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \frac{21\sqrt{7}E\left(\frac{1}{2}(c+dx)\middle|\frac{8}{7}\right) - \sqrt{7}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right) + 2\sqrt{3+4\cos(c+dx)}(\sin(c+dx)+2\sin(2(c+dx)}{20d}$$

```
[In] Integrate[Cos[c + d*x]^2*Sqrt[3 + 4*Cos[c + d*x]],x]
```

```
[Out] (21*Sqrt[7]*EllipticE[(c + d*x)/2, 8/7] - Sqrt[7]*EllipticF[(c + d*x)/2, 8/
7] + 2*Sqrt[3 + 4*Cos[c + d*x]]*(Sin[c + d*x] + 2*Sin[2*(c + d*x)]))/(20*d)
```

Maple [A] (verified)

Time = 3.36 (sec) , antiderivative size = 253, normalized size of antiderivative = 2.41

method	result
default	$-\frac{\sqrt{\left(8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-256\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+384\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-140\left(\sin^2\left(\frac{dx}{2}+\right.\right.\right.}{20\sqrt{-8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7\left(\sin\right.}}$

```
[In] int(cos(d*x+c)^2*(3+4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/20*((8*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-256*cos(1/2
*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+384*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c
)-140*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-7*(sin(1/2*d*x+1/2*c)^2)^(1/2
)*(8*sin(1/2*d*x+1/2*c)^2-7)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2*2^(1/2))-
21*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(8*sin(1/2*d*x+1/2*c)^2-7)^(1/2)*EllipticE(
```

```
cos(1/2*d*x+1/2*c),2*2^(1/2)))/(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*d*x+1/2*c
)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(8*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.31

$$\int \cos^2(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \frac{4\sqrt{4\cos(dx+c)+3}(4\cos(dx+c)+1)\sin(dx+c) - 7i\sqrt{2}\text{weierstrassPInverse}(-1,1,\cos(dx+c)+i\,\text{s}}{}$$

```
[In] integrate(cos(d*x+c)^2*(3+4*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/40*(4*sqrt(4*cos(d*x + c) + 3)*(4*cos(d*x + c) + 1)*sin(d*x + c) - 7*I*sq
rt(2)*weierstrassPInverse(-1, 1, cos(d*x + c) + I*sin(d*x + c) + 1/2) + 7*I
*sqrt(2)*weierstrassPInverse(-1, 1, cos(d*x + c) - I*sin(d*x + c) + 1/2) +
42*I*sqrt(2)*weierstrassZeta(-1, 1, weierstrassPInverse(-1, 1, cos(d*x + c)
 + I*sin(d*x + c) + 1/2)) - 42*I*sqrt(2)*weierstrassZeta(-1, 1, weierstrass
PInverse(-1, 1, cos(d*x + c) - I*sin(d*x + c) + 1/2)))/d
```

Sympy [F]

$$\int \cos^2(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \int \sqrt{4\cos(c+dx)+3}\cos^2(c+dx)\,dx$$

```
[In] integrate(cos(d*x+c)**2*(3+4*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(4*cos(c + d*x) + 3)*cos(c + d*x)**2, x)
```

Maxima [F]

$$\int \cos^2(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \int \sqrt{4\cos(dx+c)+3}\cos(dx+c)^2\,dx$$

```
[In] integrate(cos(d*x+c)^2*(3+4*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(4*cos(d*x + c) + 3)*cos(d*x + c)^2, x)
```

Giac [F]

$$\int \cos^2(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \int \sqrt{4\cos(dx+c)+3}\cos(dx+c)^2\,dx$$

```
[In] integrate(cos(d*x+c)^2*(3+4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(4*cos(d*x + c) + 3)*cos(d*x + c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^2(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \int \cos(c+d\,x)^2\,\sqrt{4\cos(c+d\,x)+3}\,dx$$

```
[In] int(cos(c + d*x)^2*(4*cos(c + d*x) + 3)^(1/2),x)
[Out] int(cos(c + d*x)^2*(4*cos(c + d*x) + 3)^(1/2), x)
```

3.511 $\int \cos(c+dx)\sqrt{3+4\cos(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 78

$$\int \cos(c+dx)\sqrt{3+4\cos(c+dx)}\,dx=\frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{2d}+\frac{\sqrt{7}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{6d}+\frac{2\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{3d}$$

```
[Out] 1/2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1
/2*c),2/7*14^(1/2))/d*7^(1/2)+1/6*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+
1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2/7*14^(1/2))/d*7^(1/2)+2/3*sin(d*x+c)*
(3+4*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 78, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2832, 2831, 2740, 2732}

$$\int \cos(c+dx)\sqrt{3+4\cos(c+dx)}\,dx=\frac{\sqrt{7}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{6d}+\frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{2d}+\frac{2\sin(c+dx)\sqrt{4\cos(c+dx)+3}}{3d}$$

```
[In] Int[Cos[c + d*x]*Sqrt[3 + 4*Cos[c + d*x]],x]
```

```
[Out] (Sqrt[7]*EllipticE[(c + d*x)/2, 8/7])/(2*d) + (Sqrt[7]*EllipticF[(c + d*x)/
2, 8/7])/(6*d) + (2*Sqrt[3 + 4*Cos[c + d*x]]*Sin[c + d*x])/(3*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{2\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{3d}+\frac{2}{3}\int\frac{2+\frac{3}{2}\cos(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx\\
&= \frac{2\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{3d}\\
&\quad+\frac{1}{4}\int\sqrt{3+4\cos(c+dx)}\,dx+\frac{7}{12}\int\frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx\\
&= \frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)\middle|\frac{8}{7}\right)}{2d}+\frac{\sqrt{7}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{6d}+\frac{2\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{3d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 69, normalized size of antiderivative = 0.88

$$\int \cos(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \frac{3\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)+\sqrt{7}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)+4\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{6d}$$

```
[In] Integrate[Cos[c + d*x]*Sqrt[3 + 4*Cos[c + d*x]],x]
```

```
[Out] (3*Sqrt[7]*EllipticE[(c + d*x)/2, 8/7] + Sqrt[7]*EllipticF[(c + d*x)/2, 8/7
] + 4*Sqrt[3 + 4*Cos[c + d*x]]*Sin[c + d*x])/(6*d)
```

Maple [A] (verified)

Time = 2.73 (sec) , antiderivative size = 231, normalized size of antiderivative = 2.96

method	result
default	$-\frac{\sqrt{\left(8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(64\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-56\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+7\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{8(}\right.}{6\sqrt{-8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sin\left(\frac{dx}{2}+\right.}$

```
[In] int(cos(d*x+c)*(3+4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/6*((8*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(64*sin(1/2*d*
x+1/2*c)^4*cos(1/2*d*x+1/2*c)-56*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+7*
(sin(1/2*d*x+1/2*c)^2)^(1/2)*(8*sin(1/2*d*x+1/2*c)^2-7)^(1/2)*EllipticF(cos
(1/2*d*x+1/2*c),2*2^(1/2))-3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(8*sin(1/2*d*x+1/
2*c)^2-7)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2*2^(1/2)))/(-8*sin(1/2*d*x+1/
2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(8*cos(1/2*d*x+1/2*
c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.64

$$\int \cos(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \frac{8\sqrt{4\cos(dx+c)+3}\sin(dx+c)-5i\sqrt{2}\text{weierstrassPInverse}\left(-1,1,\cos(dx+c)+i\sin(dx+c)+\frac{1}{2}\right)+}{}$$

```
[In] integrate(cos(d*x+c)*(3+4*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/12*(8*sqrt(4*cos(d*x + c) + 3)*sin(d*x + c) - 5*I*sqrt(2)*weierstrassPInv
erse(-1, 1, cos(d*x + c) + I*sin(d*x + c) + 1/2) + 5*I*sqrt(2)*weierstrassP
Inverse(-1, 1, cos(d*x + c) - I*sin(d*x + c) + 1/2) + 6*I*sqrt(2)*weierstra
ssZeta(-1, 1, weierstrassPInverse(-1, 1, cos(d*x + c) + I*sin(d*x + c) + 1/
2)) - 6*I*sqrt(2)*weierstrassZeta(-1, 1, weierstrassPInverse(-1, 1, cos(d*x
 + c) - I*sin(d*x + c) + 1/2)))/d
```

Sympy [F]

$$\int \cos(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \int \sqrt{4\cos(c+dx)+3}\cos(c+dx)\,dx$$

```
[In] integrate(cos(d*x+c)*(3+4*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(4*cos(c + d*x) + 3)*cos(c + d*x), x)
```

Maxima [F]

$$\int \cos(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \int \sqrt{4\cos(dx+c)+3}\cos(dx+c)\,dx$$

```
[In] integrate(cos(d*x+c)*(3+4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(4*cos(d*x + c) + 3)*cos(d*x + c), x)
```

Giac [F]

$$\int \cos(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \int \sqrt{4\cos(dx+c)+3}\cos(dx+c)\,dx$$

```
[In] integrate(cos(d*x+c)*(3+4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(4*cos(d*x + c) + 3)*cos(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos(c+dx)\sqrt{3+4\cos(c+dx)}\,dx = \int \cos\left(c+d\,x\right)\,\sqrt{4\,\cos\left(c+d\,x\right)+3}\,dx$$

```
[In] int(cos(c + d*x)*(4*cos(c + d*x) + 3)^(1/2),x)
[Out] int(cos(c + d*x)*(4*cos(c + d*x) + 3)^(1/2), x)
```

3.512 $\int \sqrt{3+4\cos(c+dx)}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 23

$$\int \sqrt{3+4\cos(c+dx)}\,dx=\frac{2\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{d}$$

```
[Out] 2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2
*c),2/7*14^(1/2))/d*7^(1/2)
```

Rubi [A] (verified)

Time = 0.01 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.071, Rules used = {2732}

$$\int \sqrt{3+4\cos(c+dx)}\,dx=\frac{2\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{d}$$

```
[In] Int[Sqrt[3 + 4*Cos[c + d*x]],x]
[Out] (2*Sqrt[7]*EllipticE[(c + d*x)/2, 8/7])/d
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rubi steps

$$\text{integral}=\frac{2\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{d}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00

$$\int \sqrt{3+4\cos(c+dx)}\,dx = \frac{2\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{d}$$

```
[In] Integrate[Sqrt[3 + 4*Cos[c + d*x]],x]
[Out] (2*Sqrt[7]*EllipticE[(c + d*x)/2, 8/7])/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 136 vs. 2(47) = 94.

Time = 3.66 (sec) , antiderivative size = 137, normalized size of antiderivative = 5.96

method	result
default	$\frac{2\sqrt{\left(8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{1-8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),2\sqrt{2}\right)}{\sqrt{-8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$
risch	$-\frac{2i\sqrt{\left(2\,e^{2i(dx+c)}+3\,e^{i(dx+c)}+2\right)e^{-i(dx+c)}}}{d} - \frac{i\left(\frac{6\left(\frac{3}{4}+\frac{i\sqrt{7}}{4}\right)\sqrt{\frac{e^{i(dx+c)}+\frac{3}{4}+\frac{i\sqrt{7}}{4}}{\frac{3}{4}+\frac{i\sqrt{7}}{4}}}\,\sqrt{14}\,\sqrt{i\left(e^{i(dx+c)}+\frac{3}{4}-\frac{i\sqrt{7}}{4}\right)\sqrt{7}}\,\sqrt{\frac{e^{i(dx+c)}}{-\frac{3}{4}-\frac{i\sqrt{7}}{4}}}\,F\left(\sqrt{\frac{e^{i(d}}{}}\right.}{7\sqrt{2\,e^{3i(dx+c)}+3\,e^{2i(dx+c)}+2\,e^{i(dx+c)}}}\right.}{}$

```
[In] int((3+4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
[Out] 2*((8*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2*
c)^2)^(1/2)*(1-8*cos(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2
*2^(1/2))/(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*
x+1/2*c)/(8*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 108, normalized size of antiderivative = 4.70

$$\int \sqrt{3+4\cos(c+dx)}\,dx$$
$$= \frac{-i\sqrt{2}\text{weierstrassPInverse}\left(-1,1,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right)+\frac{1}{2}\right)+i\sqrt{2}\text{weierstrassPInverse}\left(-1,1,\cos\right.}{}$$

```
[In] integrate((3+4*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/2*(-I*sqrt(2)*weierstrassPInverse(-1, 1, cos(d*x + c) + I*sin(d*x + c) +
1/2) + I*sqrt(2)*weierstrassPInverse(-1, 1, cos(d*x + c) - I*sin(d*x + c) +
 1/2) + 4*I*sqrt(2)*weierstrassZeta(-1, 1, weierstrassPInverse(-1, 1, cos(d
*x + c) + I*sin(d*x + c) + 1/2)) - 4*I*sqrt(2)*weierstrassZeta(-1, 1, weier
strassPInverse(-1, 1, cos(d*x + c) - I*sin(d*x + c) + 1/2)))/d
```

Sympy [F]

$$\int \sqrt{3+4\cos(c+dx)}\,dx = \int \sqrt{4\cos\left(c+dx\right)+3}\,dx$$

```
[In] integrate((3+4*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(4*cos(c + d*x) + 3), x)
```

Maxima [F]

$$\int \sqrt{3+4\cos(c+dx)}\,dx = \int \sqrt{4\,\cos\left(dx+c\right)+3}\,dx$$

```
[In] integrate((3+4*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(4*cos(d*x + c) + 3), x)
```

Giac [F]

$$\int \sqrt{3+4\cos(c+dx)}\,dx=\int \sqrt{4\,\cos\left(dx+c\right)+3}\,dx$$

```
[In] integrate((3+4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(4*cos(d*x + c) + 3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{3+4\cos(c+dx)}\,dx=\int \sqrt{4\,\cos\left(c+d\,x\right)+3}\,dx$$

```
[In] int((4*cos(c + d*x) + 3)^(1/2),x)
[Out] int((4*cos(c + d*x) + 3)^(1/2), x)
```

3.513 $\int \sqrt{3+4\cos(c+dx)}\sec(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 48

$$\int \sqrt{3+4\cos(c+dx)}\sec(c+dx)\,dx = \frac{8\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d} + \frac{6\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}$$

```
[Out] 8/7*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1
/2*c),2/7*14^(1/2))/d*7^(1/2)+6/7*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+
1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2,2/7*14^(1/2))/d*7^(1/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {2882, 2740, 2884}

$$\int \sqrt{3+4\cos(c+dx)}\sec(c+dx)\,dx = \frac{8\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d} + \frac{6\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}$$

```
[In] Int[Sqrt[3 + 4*Cos[c + d*x]]*Sec[c + d*x],x]
```

```
[Out] (8*EllipticF[(c + d*x)/2, 8/7])/(Sqrt[7]*d) + (6*EllipticPi[2, (c + d*x)/2,
 8/7])/(Sqrt[7]*d)
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2882

```
Int[Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]/((a_.) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[d/b, Int[1/Sqrt[c + d*Sin[e + f*x]], x], x]
 + Dist[(b*c - a*d)/b, Int[1/((a + b*Sin[e + f*x])*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 -
 b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= 3\int \frac{\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx + 4\int \frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx\\ &= \frac{8\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d} + \frac{6\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 41, normalized size of antiderivative = 0.85

$$\begin{aligned}&\int \sqrt{3+4\cos(c+dx)}\sec(c+dx)\,dx\\ &= \frac{8\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)+6\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}\end{aligned}$$

```
[In] Integrate[Sqrt[3 + 4*Cos[c + d*x]]*Sec[c + d*x],x]
[Out] (8*EllipticF[(c + d*x)/2, 8/7] + 6*EllipticPi[2, (c + d*x)/2, 8/7])/(Sqrt[7
]*d)
```

Maple [A] (verified)

Time = 2.31 (sec) , antiderivative size = 158, normalized size of antiderivative = 3.29

method	result
default	$-\frac{2\sqrt{\left(8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{1-8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\left(4F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),2\sqrt{2}\right)-3\Pi\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),2,2\right.\right.}{\sqrt{-8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int(sec(d*x+c)*(3+4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2*((8*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2
*c)^2)^(1/2)*(1-8*cos(1/2*d*x+1/2*c)^2)^(1/2)*(4*EllipticF(cos(1/2*d*x+1/2*
c),2*2^(1/2))-3*EllipticPi(cos(1/2*d*x+1/2*c),2,2*2^(1/2)))/(-8*sin(1/2*d*x
+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(8*cos(1/2*d*x+1
/2*c)^2-1)^(1/2)/d
```

Fricas [F]

$$\int \sqrt{3+4\cos(c+dx)}\sec(c+dx)\,dx=\int \sqrt{4\,\cos\left(dx+c\right)+3}\sec\left(dx+c\right)\,dx$$

```
[In] integrate(sec(d*x+c)*(3+4*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(4*cos(d*x + c) + 3)*sec(d*x + c), x)
```

Sympy [F]

$$\int \sqrt{3+4\cos(c+dx)}\sec(c+dx)\,dx=\int \sqrt{4\cos\left(c+dx\right)+3}\sec\left(c+dx\right)dx$$

```
[In] integrate(sec(d*x+c)*(3+4*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(4*cos(c + d*x) + 3)*sec(c + d*x), x)
```

Maxima [F]

$$\int \sqrt{3+4\cos(c+dx)}\sec(c+dx)\,dx = \int \sqrt{4\,\cos\left(dx+c\right)+3}\sec\left(dx+c\right)\,dx$$

```
[In] integrate(sec(d*x+c)*(3+4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(4*cos(d*x + c) + 3)*sec(d*x + c), x)
```

Giac [F]

$$\int \sqrt{3+4\cos(c+dx)}\sec(c+dx)\,dx = \int \sqrt{4\,\cos\left(dx+c\right)+3}\sec\left(dx+c\right)\,dx$$

```
[In] integrate(sec(d*x+c)*(3+4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(4*cos(d*x + c) + 3)*sec(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{3+4\cos(c+dx)}\sec(c+dx)\,dx = \int \frac{\sqrt{4\,\cos\left(c+d\,x\right)+3}}{\cos\left(c+d\,x\right)}\,dx$$

```
[In] int((4*cos(c + d*x) + 3)^(1/2)/cos(c + d*x),x)
[Out] int((4*cos(c + d*x) + 3)^(1/2)/cos(c + d*x), x)
```

3.514 $\int \sqrt{3+4\cos(c+dx)}\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 95

$$\int \sqrt{3+4\cos(c+dx)}\sec^2(c+dx)\,dx = -\frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)\middle|\frac{8}{7}\right)}{d}+\frac{3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}+\frac{4\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}+\frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{d}$$

```
[Out] 3/7*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1
/2*c),2/7*14^(1/2))/d*7^(1/2)+4/7*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+
1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2,2/7*14^(1/2))/d*7^(1/2)-(cos(1/2*d*x
+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2/7*14^(1/
2))/d*7^(1/2)+(3+4*cos(d*x+c))^(1/2)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {2875, 3139, 2732, 3081, 2740, 2884}

$$\int \sqrt{3+4\cos(c+dx)}\sec^2(c+dx)\,dx = \frac{3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}-\frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)\middle|\frac{8}{7}\right)}{d}+\frac{4\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}+\frac{\sqrt{4\cos(c+dx)+3}\tan(c+dx)}{d}$$

```
[In] Int[Sqrt[3 + 4*Cos[c + d*x]]*Sec[c + d*x]^2,x]
```

```
[Out] -((Sqrt[7]*EllipticE[(c + d*x)/2, 8/7])/d) + (3*EllipticF[(c + d*x)/2, 8/7]
)/(Sqrt[7]*d) + (4*EllipticPi[2, (c + d*x)/2, 8/7])/(Sqrt[7]*d) + (Sqrt[3 +
 4*Cos[c + d*x]]*Tan[c + d*x])/d
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2875

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m + 1)*((c + d*Sin[e + f*x])^n/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m
 + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(
n - 1)*Simp[a*c*(m + 1) + b*d*n + (a*d*(m + 1) - b*c*(m + 2))*Sin[e + f*x]
- b*d*(m + n + 2)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x
] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m,
-1] && LtQ[0, n, 1] && IntegersQ[2*m, 2*n]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3139

```
Int[((A_.) + (C_.)*sin[(e_.) + (f_.)*(x_)]^2)/(Sqrt[(a_.) + (b_.)*sin[(e_.)
 + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist
[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x], x] - Dist[1/(b*d), Int[Simp[a*c
*C - A*b*d + (b*c*C + a*C*d)*Sin[e + f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c
+ d*Sin[e + f*x])), x], x] /; FreeQ[{a, b, c, d, e, f, A, C}, x] && NeQ[b*c
 - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{d}+\int\frac{(2-2\cos^2(c+dx))\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx\\ &= \frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{d}\\ &\quad-\frac{1}{4}\int\frac{(-8-6\cos(c+dx))\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx-\frac{1}{2}\int\sqrt{3+4\cos(c+dx)}\,dx\\ &= -\frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{d}+\frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{d}\\ &\quad+\frac{3}{2}\int\frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx+2\int\frac{\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx\\ &= -\frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{d}+\frac{3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}\\ &\quad+\frac{4\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}+\frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{d}\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 10.87 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.65

$$\int\sqrt{3+4\cos(c+dx)}\sec^2(c+dx)\,dx$$

$$=\frac{6\sqrt{7}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)+\frac{i\sqrt{7}\left(21E\left(i\,\text{arcsinh}\left(\sqrt{3+4\cos(c+dx)}\right)|-\frac{1}{7}\right)-12\,\text{EllipticF}\left(i\,\text{arcsinh}\left(\sqrt{3+4\cos(c+dx)}\right),-\frac{1}{7}\right.\right.}{\sqrt{\sin^2(c+dx)}}}{21d}$$

```
[In] Integrate[Sqrt[3 + 4*Cos[c + d*x]]*Sec[c + d*x]^2,x]
```

```
[Out] (6*Sqrt[7]*EllipticPi[2, (c + d*x)/2, 8/7] + (I*Sqrt[7]*(21*EllipticE[I*Arc
Sinh[Sqrt[3 + 4*Cos[c + d*x]]], -1/7] - 12*EllipticF[I*ArcSinh[Sqrt[3 + 4*C
os[c + d*x]]], -1/7] - 8*EllipticPi[-1/3, I*ArcSinh[Sqrt[3 + 4*Cos[c + d*x]
]], -1/7])*Sin[c + d*x])/Sqrt[Sin[c + d*x]^2] + 21*Sqrt[3 + 4*Cos[c + d*x]]
*Tan[c + d*x])/(21*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 349 vs. $2(165) = 330$.

Time = 3.78 (sec) , antiderivative size = 350, normalized size of antiderivative = 3.68

method	result
default	$-\frac{\sqrt{-\left(1-8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-\frac{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}}{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}+\frac{3\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{1-8\left(\cos^2\left(\frac{dx}{2}+\cdots\right.\right.}}{\sqrt{-8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7\left(\cdots\right.}}\right.}{\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\cdots}$

[In] int(sec(d*x+c)^2*(3+4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)

[Out] -(-(1-8*cos(1/2*d*x+1/2*c)^2)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)*(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^2-1)+3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(1-8*cos(1/2*d*x+1/2*c)^2)^(1/2)/(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2*2^(1/2))+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(1-8*cos(1/2*d*x+1/2*c)^2)^(1/2)/(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2*2^(1/2))-4*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(1-8*cos(1/2*d*x+1/2*c)^2)^(1/2)/(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,2*2^(1/2)))/sin(1/2*d*x+1/2*c)/(8*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [F]

$$\int \sqrt{3+4\cos(c+dx)}\sec^2(c+dx)\,dx = \int \sqrt{4\cos\left(dx+c\right)+3}\sec\left(dx+c\right)^2\,dx$$

[In] integrate(sec(d*x+c)^2*(3+4*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(4*cos(d*x + c) + 3)*sec(d*x + c)^2, x)

Sympy [F]

$$\int \sqrt{3+4\cos(c+dx)}\sec^2(c+dx)\,dx = \int \sqrt{4\cos\left(c+dx\right)+3}\sec^2\left(c+dx\right)dx$$

[In] integrate(sec(d*x+c)**2*(3+4*cos(d*x+c))**(1/2),x)

[Out] Integral(sqrt(4*cos(c + d*x) + 3)*sec(c + d*x)**2, x)

Maxima [F]

$$\int \sqrt{3+4\cos(c+dx)}\sec^2(c+dx)\,dx = \int \sqrt{4\,\cos\left(dx+c\right)+3}\sec\left(dx+c\right)^2\,dx$$

```
[In] integrate(sec(d*x+c)^2*(3+4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(4*cos(d*x + c) + 3)*sec(d*x + c)^2, x)
```

Giac [F]

$$\int \sqrt{3+4\cos(c+dx)}\sec^2(c+dx)\,dx = \int \sqrt{4\,\cos\left(dx+c\right)+3}\sec\left(dx+c\right)^2\,dx$$

```
[In] integrate(sec(d*x+c)^2*(3+4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(4*cos(d*x + c) + 3)*sec(d*x + c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{3+4\cos(c+dx)}\sec^2(c+dx)\,dx = \int \frac{\sqrt{4\,\cos\left(c+d\,x\right)+3}}{\cos\left(c+d\,x\right)^2}\,dx$$

```
[In] int((4*cos(c + d*x) + 3)^(1/2)/cos(c + d*x)^2,x)
[Out] int((4*cos(c + d*x) + 3)^(1/2)/cos(c + d*x)^2, x)
```

3.515 $\int \sqrt{3+4\cos(c+dx)}\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 135

$$\int \sqrt{3+4\cos(c+dx)}\sec^3(c+dx)\,dx = -\frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{3d}+\frac{3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}+\frac{5\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{3\sqrt{7}d}+\frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{3d}+\frac{\sqrt{3+4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d}$$

```
[Out] 3/7*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1
/2*c),2/7*14^(1/2))/d*7^(1/2)+5/21*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x
+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2,2/7*14^(1/2))/d*7^(1/2)-1/3*(cos(1/
2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2/7*1
4^(1/2))/d*7^(1/2)+1/3*(3+4*cos(d*x+c))^(1/2)*tan(d*x+c)/d+1/2*sec(d*x+c)*(
3+4*cos(d*x+c))^(1/2)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.42 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used

= {2875, 3134, 3138, 2732, 3081, 2740, 2884}

$$\int \sqrt{3+4\cos(c+dx)}\sec^3(c+dx)\,dx = \frac{3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d} - \frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{3d} + \frac{5\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{3\sqrt{7}d} + \frac{\sqrt{4\cos(c+dx)+3}\tan(c+dx)}{3d} + \frac{\sqrt{4\cos(c+dx)+3}\tan(c+dx)\sec(c+dx)}{2d}$$

```
[In] Int[Sqrt[3 + 4*Cos[c + d*x]]*Sec[c + d*x]^3,x]
```

```
[Out] -1/3*(Sqrt[7]*EllipticE[(c + d*x)/2, 8/7])/d + (3*EllipticF[(c + d*x)/2, 8/
7])/(Sqrt[7]*d) + (5*EllipticPi[2, (c + d*x)/2, 8/7])/(3*Sqrt[7]*d) + (Sqrt
[3 + 4*Cos[c + d*x]]*Tan[c + d*x])/(3*d) + (Sqrt[3 + 4*Cos[c + d*x]]*Sec[c
+ d*x]*Tan[c + d*x])/(2*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2875

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m + 1)*((c + d*Sin[e + f*x])^n/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m
 + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(
n - 1)*Simp[a*c*(m + 1) + b*d*n + (a*d*(m + 1) - b*c*(m + 2))*Sin[e + f*x]
- b*d*(m + n + 2)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x
] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m,
-1] && LtQ[0, n, 1] && IntegersQ[2*m, 2*n]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
```

```
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sqrt{3+4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} \\ &\quad+\frac{1}{2}\int\frac{(2+3\cos(c+dx)+2\cos^2(c+dx))\sec^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx\end{aligned}$$

$$= \frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{3d} + \frac{\sqrt{3+4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} + \frac{1}{6}\int \frac{(5+6\cos(c+dx)-4\cos^2(c+dx))\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx$$

$$= \frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{3d} + \frac{\sqrt{3+4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} - \frac{1}{24}\int \frac{(-20-36\cos(c+dx))\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx - \frac{1}{6}\int \sqrt{3+4\cos(c+dx)}\,dx$$

$$= -\frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{3d} + \frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{3d} + \frac{\sqrt{3+4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} + \frac{5}{6}\int \frac{\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx + \frac{3}{2}\int \frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx$$

$$= -\frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{3d} + \frac{3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d} + \frac{5\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{3\sqrt{7}d} + \frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{3d} + \frac{\sqrt{3+4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.90 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.44

$$\int \sqrt{3+4\cos(c+dx)}\sec^3(c+dx)\,dx$$

$$= \frac{\frac{12\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}} + \frac{6\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}} + \frac{2i\left(21E\left(i\text{arcsinh}\left(\sqrt{3+4\cos(c+dx)}\right)|-\frac{1}{7}\right)-12\,\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{3+4\cos}\right.\right.\right.}{3\sqrt{7}\sqrt{\sin^2}}}{}$$

```
[In] Integrate[Sqrt[3 + 4*Cos[c + d*x]]*Sec[c + d*x]^3,x]
```

```
[Out] ((12*EllipticF[(c + d*x)/2, 8/7])/Sqrt[7] + (6*EllipticPi[2, (c + d*x)/2, 8
/7])/Sqrt[7] + (((2*I)/3)*(21*EllipticE[I*ArcSinh[Sqrt[3 + 4*Cos[c + d*x]]]
, -1/7] - 12*EllipticF[I*ArcSinh[Sqrt[3 + 4*Cos[c + d*x]]], -1/7] - 8*Ellip
ticPi[-1/3, I*ArcSinh[Sqrt[3 + 4*Cos[c + d*x]]], -1/7])*Sin[c + d*x])/(Sqrt
[7]*Sqrt[Sin[c + d*x]^2]) + (3 + 2*Cos[c + d*x])*Sqrt[3 + 4*Cos[c + d*x]]*S
ec[c + d*x]*Tan[c + d*x])/(6*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 407 vs. 2(195) = 390.

Time = 4.08 (sec) , antiderivative size = 408, normalized size of antiderivative = 3.02

method	result
default	$-\frac{\sqrt{-\left(1-8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}}{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)^2}-\frac{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7}}{3\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right.}\right.}{}$

[In] int(sec(d*x+c)^3*(3+4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)

[Out] -(-(1-8*cos(1/2*d*x+1/2*c)^2)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-cos(1/2*d*x+1/2*c)*(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^2-1)^2-2/3*cos(1/2*d*x+1/2*c)*(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^2-1)+3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(1-8*cos(1/2*d*x+1/2*c)^2)^(1/2)/(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2*2^(1/2))+1/3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(1-8*cos(1/2*d*x+1/2*c)^2)^(1/2)/(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2*2^(1/2))-5/3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(1-8*cos(1/2*d*x+1/2*c)^2)^(1/2)/(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,2*2^(1/2)))/sin(1/2*d*x+1/2*c)/(8*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [F]

$$\int \sqrt{3+4\cos(c+dx)}\sec^3(c+dx)\,dx=\int \sqrt{4\,\cos\left(dx+c\right)+3}\sec\left(dx+c\right)^3\,dx$$

[In] integrate(sec(d*x+c)^3*(3+4*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(4*cos(d*x + c) + 3)*sec(d*x + c)^3, x)

Sympy [F]

$$\int \sqrt{3+4\cos(c+dx)}\sec^3(c+dx)\,dx=\int \sqrt{4\cos\left(c+dx\right)+3}\sec^3\left(c+dx\right)dx$$

[In] integrate(sec(d*x+c)**3*(3+4*cos(d*x+c))**(1/2),x)

[Out] Integral(sqrt(4*cos(c + d*x) + 3)*sec(c + d*x)**3, x)

Maxima [F]

$$\int \sqrt{3+4\cos(c+dx)}\sec^3(c+dx)\,dx = \int \sqrt{4\cos(dx+c)+3}\sec(dx+c)^3\,dx$$

```
[In] integrate(sec(d*x+c)^3*(3+4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(4*cos(d*x + c) + 3)*sec(d*x + c)^3, x)
```

Giac [F]

$$\int \sqrt{3+4\cos(c+dx)}\sec^3(c+dx)\,dx = \int \sqrt{4\cos(dx+c)+3}\sec(dx+c)^3\,dx$$

```
[In] integrate(sec(d*x+c)^3*(3+4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(4*cos(d*x + c) + 3)*sec(d*x + c)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{3+4\cos(c+dx)}\sec^3(c+dx)\,dx = \int \frac{\sqrt{4\cos(c+d\,x)+3}}{\cos(c+d\,x)^3}\,dx$$

```
[In] int((4*cos(c + d*x) + 3)^(1/2)/cos(c + d*x)^3,x)
[Out] int((4*cos(c + d*x) + 3)^(1/2)/cos(c + d*x)^3, x)
```

3.516 $\int \sqrt{3-4\cos(c+dx)}\cos^3(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 140

$$\int \sqrt{3-4\cos(c+dx)}\cos^3(c+dx)\,dx = -\frac{47E\left(\frac{1}{2}(c+\pi+dx)\middle|\frac{8}{7}\right)}{20\sqrt{7}d} - \frac{59\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{60\sqrt{7}d} + \frac{59\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{105d} - \frac{3(3-4\cos(c+dx))^{3/2}\sin(c+dx)}{70d} - \frac{(3-4\cos(c+dx))^{3/2}\cos(c+dx)\sin(c+dx)}{14d}$$

```
[Out] -3/70*(3-4*cos(d*x+c))^(3/2)*sin(d*x+c)/d-1/14*(3-4*cos(d*x+c))^(3/2)*cos(d
*x+c)*sin(d*x+c)/d+47/140*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)*E
llipticE(cos(1/2*d*x+1/2*c),2/7*14^(1/2))/d*7^(1/2)+59/420*(sin(1/2*d*x+1/2
*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)*EllipticF(cos(1/2*d*x+1/2*c),2/7*14^(1/2))/
d*7^(1/2)+59/105*sin(d*x+c)*(3-4*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used

$= \{2872, 3102, 2832, 2831, 2741, 2733\}$

$$\int \sqrt{3-4\cos(c+dx)}\cos^3(c+dx)\,dx = -\frac{59\,\text{EllipticF}\left(\frac{1}{2}(c+dx+\pi),\frac{8}{7}\right)}{60\sqrt{7}d} - \frac{47E\left(\frac{1}{2}(c+dx+\pi)\middle|\frac{8}{7}\right)}{20\sqrt{7}d} - \frac{\sin(c+dx)\cos(c+dx)(3-4\cos(c+dx))^{3/2}}{14d} - \frac{3\sin(c+dx)(3-4\cos(c+dx))^{3/2}}{70d} + \frac{59\sin(c+dx)\sqrt{3-4\cos(c+dx)}}{105d}$$

```
[In] Int[Sqrt[3 - 4*Cos[c + d*x]]*Cos[c + d*x]^3,x]
```

```
[Out] (-47*EllipticE[(c + Pi + d*x)/2, 8/7])/(20*Sqrt[7]*d) - (59*EllipticF[(c +
Pi + d*x)/2, 8/7])/(60*Sqrt[7]*d) + (59*Sqrt[3 - 4*Cos[c + d*x]]*Sin[c + d*
x])/(105*d) - (3*(3 - 4*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(70*d) - ((3 - 4*
Cos[c + d*x])^(3/2)*Cos[c + d*x]*Sin[c + d*x])/(14*d)
```

Rule 2733

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 - b]/d)*EllipticE[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ[{a,
 b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2741

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a - b]))*EllipticF[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ
[{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
```

```
0] && IntegerQ[2*m]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(3-4\cos(c+dx))^{3/2}\cos(c+dx)\sin(c+dx)}{14d} \\
&\quad -\frac{1}{14}\int \sqrt{3-4\cos(c+dx)}\left(3-10\cos(c+dx)-6\cos^2(c+dx)\right)\,dx \\
&= -\frac{3(3-4\cos(c+dx))^{3/2}\sin(c+dx)}{70d} \\
&\quad -\frac{(3-4\cos(c+dx))^{3/2}\cos(c+dx)\sin(c+dx)}{14d} \\
&\quad +\frac{1}{140}\int \sqrt{3-4\cos(c+dx)}(6+118\cos(c+dx))\,dx \\
&= \frac{59\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{105d}-\frac{3(3-4\cos(c+dx))^{3/2}\sin(c+dx)}{70d} \\
&\quad -\frac{(3-4\cos(c+dx))^{3/2}\cos(c+dx)\sin(c+dx)}{14d} \\
&\quad +\frac{1}{210}\int \frac{-209+141\cos(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx
\end{aligned}$$

$$= \frac{59\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{105d} - \frac{3(3-4\cos(c+dx))^{3/2}\sin(c+dx)}{70d} - \frac{(3-4\cos(c+dx))^{3/2}\cos(c+dx)\sin(c+dx)}{14d} - \frac{47}{280}\int\sqrt{3-4\cos(c+dx)}\,dx - \frac{59}{120}\int\frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx$$

$$= -\frac{47E\left(\frac{1}{2}(c+\pi+dx)\middle|\frac{8}{7}\right)}{20\sqrt{7}d} - \frac{59\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{60\sqrt{7}d} + \frac{59\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{105d} - \frac{3(3-4\cos(c+dx))^{3/2}\sin(c+dx)}{70d} - \frac{(3-4\cos(c+dx))^{3/2}\cos(c+dx)\sin(c+dx)}{14d}$$

Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 114, normalized size of antiderivative = 0.81

$$\int\sqrt{3-4\cos(c+dx)}\cos^3(c+dx)\,dx = \frac{141\sqrt{-3+4\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|8\right) - 413\sqrt{-3+4\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),8\right) + 654\sin(c}{420d\sqrt{3-4\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[3 - 4*Cos[c + d*x]]*Cos[c + d*x]^3,x]
```

```
[Out] (141*Sqrt[-3 + 4*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 8] - 413*Sqrt[-3 + 4*
Cos[c + d*x]]*EllipticF[(c + d*x)/2, 8] + 654*Sin[c + d*x] - 511*Sin[2*(c +
 d*x)] + 108*Sin[3*(c + d*x)] - 60*Sin[4*(c + d*x)])/(420*d*Sqrt[3 - 4*Cos[
c + d*x]])
```

Maple [A] (verified)

Time = 7.31 (sec) , antiderivative size = 276, normalized size of antiderivative = 1.97

method	result
default	$\frac{\sqrt{-\left(8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-7\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(7680\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-8064\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+5432\left(\sin^4\left(\frac{dx}{2}+\right.\right.\right.}{420\sqrt{8\left(\sin\right.}}$

```
[In] int(cos(d*x+c)^3*(3-4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/420*(-(8*cos(1/2*d*x+1/2*c)^2-7)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(7680*cos(1/
2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8-8064*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c
)^6+5432*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-568*sin(1/2*d*x+1/2*c)^2*c
```

```
os(1/2*d*x+1/2*c)+59*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(56*sin(1/2*d*x+1/2*c)^2-
7)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2/7*14^(1/2))+141*(sin(1/2*d*x+1/2*c)
^2)^(1/2)*(56*sin(1/2*d*x+1/2*c)^2-7)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2/
7*14^(1/2)))/(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*
x+1/2*c)/(-8*cos(1/2*d*x+1/2*c)^2+7)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.06

$$\int \sqrt{3-4\cos(c+dx)}\cos^3(c+dx)\,dx = \frac{4\left(60\,\cos\left(dx+c\right)^2-9\,\cos\left(dx+c\right)+91\right)\sqrt{-4\,\cos\left(dx+c\right)+3}\sin\left(dx+c\right)+277\,\sqrt{2}\text{weierstrassPInverse}$$

```
[In] integrate(cos(d*x+c)^3*(3-4*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/840*(4*(60*cos(d*x + c)^2 - 9*cos(d*x + c) + 91)*sqrt(-4*cos(d*x + c) + 3
)*sin(d*x + c) + 277*sqrt(2)*weierstrassPInverse(-1, -1, cos(d*x + c) + I*s
in(d*x + c) - 1/2) + 277*sqrt(2)*weierstrassPInverse(-1, -1, cos(d*x + c) -
 I*sin(d*x + c) - 1/2) + 282*sqrt(2)*weierstrassZeta(-1, -1, weierstrassPIn
verse(-1, -1, cos(d*x + c) + I*sin(d*x + c) - 1/2)) + 282*sqrt(2)*weierstra
ssZeta(-1, -1, weierstrassPInverse(-1, -1, cos(d*x + c) - I*sin(d*x + c) -
1/2)))/d
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{3-4\cos(c+dx)}\cos^3(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3*(3-4*cos(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \sqrt{3-4\cos(c+dx)}\cos^3(c+dx)\,dx = \int \sqrt{-4\,\cos\left(dx+c\right)+3}\cos\left(dx+c\right)^3\,dx$$

```
[In] integrate(cos(d*x+c)^3*(3-4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(-4*cos(d*x + c) + 3)*cos(d*x + c)^3, x)
```

Giac [F]

$$\int \sqrt{3-4\cos(c+dx)}\cos^3(c+dx)\,dx = \int \sqrt{-4\,\cos\left(dx+c\right)+3}\cos\left(dx+c\right)^3\,dx$$

```
[In] integrate(cos(d*x+c)^3*(3-4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(-4*cos(d*x + c) + 3)*cos(d*x + c)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{3-4\cos(c+dx)}\cos^3(c+dx)\,dx = \int \cos\left(c+d\,x\right)^3\,\sqrt{3-4\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(cos(c + d*x)^3*(3 - 4*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^3*(3 - 4*cos(c + d*x))^(1/2), x)
```

3.517 $\int \sqrt{3-4\cos(c+dx)}\cos^2(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 107

$$\int \sqrt{3-4\cos(c+dx)}\cos^2(c+dx)\,dx = \frac{21\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)|\frac{8}{7}\right)}{20d} - \frac{\sqrt{7}\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{20d} + \frac{\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{5d} - \frac{(3-4\cos(c+dx))^{3/2}\sin(c+dx)}{10d}$$

```
[Out] -1/10*(3-4*cos(d*x+c))^(3/2)*sin(d*x+c)/d-21/20*(sin(1/2*d*x+1/2*c)^2)^(1/2
)/sin(1/2*d*x+1/2*c)*EllipticE(cos(1/2*d*x+1/2*c),2/7*14^(1/2))/d*7^(1/2)+1
/20*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)*EllipticF(cos(1/2*d*x+1
/2*c),2/7*14^(1/2))/d*7^(1/2)+1/5*sin(d*x+c)*(3-4*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2870, 2832, 2831, 2741, 2733}

$$\int \sqrt{3-4\cos(c+dx)}\cos^2(c+dx)\,dx = -\frac{\sqrt{7}\,\text{EllipticF}\left(\frac{1}{2}(c+dx+\pi),\frac{8}{7}\right)}{20d} + \frac{21\sqrt{7}E\left(\frac{1}{2}(c+dx+\pi)|\frac{8}{7}\right)}{20d} - \frac{\sin(c+dx)(3-4\cos(c+dx))^{3/2}}{10d} + \frac{\sin(c+dx)\sqrt{3-4\cos(c+dx)}}{5d}$$

```
[In] Int[Sqrt[3 - 4*Cos[c + d*x]]*Cos[c + d*x]^2,x]
```

```
[Out] (21*Sqrt[7]*EllipticE[(c + Pi + d*x)/2, 8/7])/(20*d) - (Sqrt[7]*EllipticF[(
c + Pi + d*x)/2, 8/7])/(20*d) + (Sqrt[3 - 4*Cos[c + d*x]]*Sin[c + d*x])/(5*
d) - ((3 - 4*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(10*d)
```

Rule 2733

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 - b]/d)*EllipticE[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ[{a,
 b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2741

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a - b]))*EllipticF[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ
[{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rule 2870

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^2, x_Symbol] :> Simp[(-d^2)*Cos[e + f*x]*((a + b*Sin[e + f*x])
^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m + 2)), Int[(a + b*Sin[e + f*x])^
m*Simp[b*(d^2*(m + 1) + c^2*(m + 2)) - d*(a*d - 2*b*c*(m + 2))*Sin[e + f*x]
, x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] && NeQ
[a^2 - b^2, 0] &&  !LtQ[m, -1]
```

Rubi steps

$$\text{integral} = -\frac{(3-4\cos(c+dx))^{3/2}\sin(c+dx)}{10d} - \frac{1}{10}\int \sqrt{3-4\cos(c+dx)}(-6-3\cos(c+dx))\,dx$$

$$
\begin{aligned}
&= \frac{\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{5d} - \frac{(3-4\cos(c+dx))^{3/2}\sin(c+dx)}{10d} \\
&\quad - \frac{1}{15}\int \frac{-21+\frac{63}{2}\cos(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx \\
&= \frac{\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{5d} - \frac{(3-4\cos(c+dx))^{3/2}\sin(c+dx)}{10d} \\
&\quad - \frac{7}{40}\int \frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx + \frac{21}{40}\int \sqrt{3-4\cos(c+dx)}\,dx \\
&= \frac{21\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)\middle|\frac{8}{7}\right)}{20d} - \frac{\sqrt{7}\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{20d} \\
&\quad + \frac{\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{5d} - \frac{(3-4\cos(c+dx))^{3/2}\sin(c+dx)}{10d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.23 (sec) , antiderivative size = 104, normalized size of antiderivative = 0.97

$$
\int \sqrt{3-4\cos(c+dx)}\cos^2(c+dx)\,dx = -\frac{21\sqrt{-3+4\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|8\right)+7\sqrt{-3+4\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),8\right)+14\sin(c+d}{20d\sqrt{3-4\cos(c+dx)}}
$$

```
[In] Integrate[Sqrt[3 - 4*Cos[c + d*x]]*Cos[c + d*x]^2,x]
```

```
[Out] -1/20*(21*Sqrt[-3 + 4*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 8] + 7*Sqrt[-3 +
 4*Cos[c + d*x]]*EllipticF[(c + d*x)/2, 8] + 14*Sin[c + d*x] - 16*Sin[2*(c
+ d*x)] + 8*Sin[3*(c + d*x)])/(d*Sqrt[3 - 4*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.15 (sec) , antiderivative size = 253, normalized size of antiderivative = 2.36

method	result
default	$\frac{\sqrt{-\left(8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-7\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-256\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+128\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-12\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right.}{20\sqrt{8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{d}{2}\right.\right.}}$

```
[In] int(cos(d*x+c)^2*(3-4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/20*(-(8*cos(1/2*d*x+1/2*c)^2-7)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-256*cos(1/2
*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+128*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c
)-12*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(
56*sin(1/2*d*x+1/2*c)^2-7)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2/7*14^(1/2))
```

```
-21*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(56*sin(1/2*d*x+1/2*c)^2-7)^(1/2)*Elliptic
E(cos(1/2*d*x+1/2*c),2/7*14^(1/2)))/(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2
*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-8*cos(1/2*d*x+1/2*c)^2+7)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.29

$$\int \sqrt{3-4\cos(c+dx)}\cos^2(c+dx)\,dx$$
$$= \frac{4\,(4\,\cos{(dx+c)}-1)\sqrt{-4\,\cos{(dx+c)}+3}\,\sin{(dx+c)} - 7\,\sqrt{2}\text{weierstrassPInverse}\left(-1,-1,\cos{(dx+c)}\right.}{}$$

```
[In] integrate(cos(d*x+c)^2*(3-4*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/40*(4*(4*cos(d*x + c) - 1)*sqrt(-4*cos(d*x + c) + 3)*sin(d*x + c) - 7*sqr
t(2)*weierstrassPInverse(-1, -1, cos(d*x + c) + I*sin(d*x + c) - 1/2) - 7*s
qrt(2)*weierstrassPInverse(-1, -1, cos(d*x + c) - I*sin(d*x + c) - 1/2) - 4
2*sqrt(2)*weierstrassZeta(-1, -1, weierstrassPInverse(-1, -1, cos(d*x + c)
+ I*sin(d*x + c) - 1/2)) - 42*sqrt(2)*weierstrassZeta(-1, -1, weierstrassPI
nverse(-1, -1, cos(d*x + c) - I*sin(d*x + c) - 1/2)))/d
```

Sympy [F]

$$\int \sqrt{3-4\cos(c+dx)}\cos^2(c+dx)\,dx = \int \sqrt{3-4\cos{(c+dx)}}\cos^2{(c+dx)}\,dx$$

```
[In] integrate(cos(d*x+c)**2*(3-4*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(3 - 4*cos(c + d*x))*cos(c + d*x)**2, x)
```

Maxima [F]

$$\int \sqrt{3-4\cos(c+dx)}\cos^2(c+dx)\,dx = \int \sqrt{-4\,\cos{(dx+c)}+3}\cos{(dx+c)}^2\,dx$$

```
[In] integrate(cos(d*x+c)^2*(3-4*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-4*cos(d*x + c) + 3)*cos(d*x + c)^2, x)
```

Giac [F]

$$\int \sqrt{3-4\cos(c+dx)}\cos^2(c+dx)\,dx = \int \sqrt{-4\cos(dx+c)+3}\cos(dx+c)^2\,dx$$

```
[In] integrate(cos(d*x+c)^2*(3-4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(-4*cos(d*x + c) + 3)*cos(d*x + c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{3-4\cos(c+dx)}\cos^2(c+dx)\,dx = \int \cos(c+d\,x)^2\,\sqrt{3-4\cos(c+d\,x)}\,dx$$

```
[In] int(cos(c + d*x)^2*(3 - 4*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^2*(3 - 4*cos(c + d*x))^(1/2), x)
```

3.518 $\int \sqrt{3-4\cos(c+dx)}\cos(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 80

$$\int \sqrt{3-4\cos(c+dx)}\cos(c+dx)\,dx = -\frac{\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)|\frac{8}{7}\right)}{2d} - \frac{\sqrt{7}\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{6d} + \frac{2\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{3d}$$

```
[Out] 1/2*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)*EllipticE(cos(1/2*d*x+1
/2*c),2/7*14^(1/2))/d*7^(1/2)+1/6*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+
1/2*c)*EllipticF(cos(1/2*d*x+1/2*c),2/7*14^(1/2))/d*7^(1/2)+2/3*sin(d*x+c)*
(3-4*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2832, 2831, 2741, 2733}

$$\int \sqrt{3-4\cos(c+dx)}\cos(c+dx)\,dx = -\frac{\sqrt{7}\,\text{EllipticF}\left(\frac{1}{2}(c+dx+\pi),\frac{8}{7}\right)}{6d} - \frac{\sqrt{7}E\left(\frac{1}{2}(c+dx+\pi)|\frac{8}{7}\right)}{2d} + \frac{2\sin(c+dx)\sqrt{3-4\cos(c+dx)}}{3d}$$

```
[In] Int[Sqrt[3 - 4*Cos[c + d*x]]*Cos[c + d*x],x]
```

```
[Out] -1/2*(Sqrt[7]*EllipticE[(c + Pi + d*x)/2, 8/7])/d - (Sqrt[7]*EllipticF[(c +
 Pi + d*x)/2, 8/7])/(6*d) + (2*Sqrt[3 - 4*Cos[c + d*x]]*Sin[c + d*x])/(3*d)
```

Rule 2733

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 - b]/d)*EllipticE[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ[{a,
 b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2741

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a - b]))*EllipticF[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ
[{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2832

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[1/(m + 1), Int[(a + b*Sin[e + f*x])^(m - 1)*Simp[b*d
*m + a*c*(m + 1) + (a*d*m + b*c*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[
{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && GtQ[m,
0] && IntegerQ[2*m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{3d}+\frac{2}{3}\int\frac{-2+\frac{3}{2}\cos(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx \\
&= \frac{2\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{3d} \\
&\quad -\frac{1}{4}\int\sqrt{3-4\cos(c+dx)}\,dx-\frac{7}{12}\int\frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx \\
&= -\frac{\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)|\frac{8}{7}\right)}{2d}-\frac{\sqrt{7}\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{6d} \\
&\quad +\frac{2\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{3d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 94, normalized size of antiderivative = 1.18

$$\int \sqrt{3-4\cos(c+dx)}\cos(c+dx)\,dx$$
$$=\frac{3\sqrt{-3+4\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|8\right)-7\sqrt{-3+4\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),8\right)+12\sin(c+dx)}{6d\sqrt{3-4\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[3 - 4*Cos[c + d*x]]*Cos[c + d*x],x]
[Out] (3*Sqrt[-3 + 4*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 8] - 7*Sqrt[-3 + 4*Cos[
c + d*x]]*EllipticF[(c + d*x)/2, 8] + 12*Sin[c + d*x] - 8*Sin[2*(c + d*x)])
/(6*d*Sqrt[3 - 4*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 3.55 (sec) , antiderivative size = 231, normalized size of antiderivative = 2.89

method	result
default	$\frac{\sqrt{-\left(8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-7\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(64\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-8\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{56(}\right.}{6\sqrt{8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right.}$

```
[In] int(cos(d*x+c)*(3-4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/6*(-(8*cos(1/2*d*x+1/2*c)^2-7)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(64*sin(1/2*d*
x+1/2*c)^4*cos(1/2*d*x+1/2*c)-8*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+(si
n(1/2*d*x+1/2*c)^2)^(1/2)*(56*sin(1/2*d*x+1/2*c)^2-7)^(1/2)*EllipticF(cos(1
/2*d*x+1/2*c),2/7*14^(1/2))+3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(56*sin(1/2*d*x+
1/2*c)^2-7)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2/7*14^(1/2)))/(8*sin(1/2*d*
x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-8*cos(1/2*d*x+1
/2*c)^2+7)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.60

$$\int \sqrt{3-4\cos(c+dx)}\cos(c+dx)\,dx$$
$$=\frac{8\sqrt{-4\cos(dx+c)+3}\sin(dx+c)+5\sqrt{2}\text{weierstrassPInverse}\left(-1,-1,\cos(dx+c)+i\sin(dx+c)-\frac{1}{2}\right.}{}$$

[In] integrate(cos(d*x+c)*(3-4*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] 1/12*(8*sqrt(-4*cos(d*x + c) + 3)*sin(d*x + c) + 5*sqrt(2)*weierstrassPInverse(-1, -1, cos(d*x + c) + I*sin(d*x + c) - 1/2) + 5*sqrt(2)*weierstrassPInverse(-1, -1, cos(d*x + c) - I*sin(d*x + c) - 1/2) + 6*sqrt(2)*weierstrassZeta(-1, -1, weierstrassPInverse(-1, -1, cos(d*x + c) + I*sin(d*x + c) - 1/2)) + 6*sqrt(2)*weierstrassZeta(-1, -1, weierstrassPInverse(-1, -1, cos(d*x + c) - I*sin(d*x + c) - 1/2)))/d

Sympy [F]

$$\int \sqrt{3-4\cos(c+dx)}\cos(c+dx)\,dx = \int \sqrt{3-4\cos\left(c+dx\right)}\cos\left(c+dx\right)dx$$

[In] integrate(cos(d*x+c)*(3-4*cos(d*x+c))**(1/2),x)

[Out] Integral(sqrt(3 - 4*cos(c + d*x))*cos(c + d*x), x)

Maxima [F]

$$\int \sqrt{3-4\cos(c+dx)}\cos(c+dx)\,dx = \int \sqrt{-4\cos\left(dx+c\right)+3}\cos\left(dx+c\right)\,dx$$

[In] integrate(cos(d*x+c)*(3-4*cos(d*x+c))^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(-4*cos(d*x + c) + 3)*cos(d*x + c), x)

Giac [F]

$$\int \sqrt{3-4\cos(c+dx)}\cos(c+dx)\,dx = \int \sqrt{-4\cos\left(dx+c\right)+3}\cos\left(dx+c\right)\,dx$$

[In] integrate(cos(d*x+c)*(3-4*cos(d*x+c))^(1/2),x, algorithm="giac")

[Out] integrate(sqrt(-4*cos(d*x + c) + 3)*cos(d*x + c), x)

Mupad [F(-1)]

Timed out.

$$\int \sqrt{3-4\cos(c+dx)}\cos(c+dx)\,dx = \int \cos\left(c+d\,x\right)\,\sqrt{3-4\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(cos(c + d*x)*(3 - 4*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)*(3 - 4*cos(c + d*x))^(1/2), x)
```

3.519 $\int \sqrt{3-4\cos(c+dx)}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 24

$$\int \sqrt{3-4\cos(c+dx)}\,dx=\frac{2\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)|\frac{8}{7}\right)}{d}$$

```
[Out] -2*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)*EllipticE(cos(1/2*d*x+1/
2*c),2/7*14^(1/2))/d*7^(1/2)
```

Rubi [A] (verified)

Time = 0.01 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.071, Rules used = {2733}

$$\int \sqrt{3-4\cos(c+dx)}\,dx=\frac{2\sqrt{7}E\left(\frac{1}{2}(c+dx+\pi)|\frac{8}{7}\right)}{d}$$

```
[In] Int[Sqrt[3 - 4*Cos[c + d*x]],x]
```

```
[Out] (2*Sqrt[7]*EllipticE[(c + Pi + d*x)/2, 8/7])/d
```

Rule 2733

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 - b]/d)*EllipticE[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ[{a,
 b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rubi steps

$$\text{integral}=\frac{2\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)|\frac{8}{7}\right)}{d}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.83

$$\int \sqrt{3-4\cos(c+dx)}\,dx=-\frac{2\sqrt{-3+4\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|8\right)}{d\sqrt{3-4\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[3 - 4*Cos[c + d*x]],x]
```

```
[Out] (-2*Sqrt[-3 + 4*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 8])/(d*Sqrt[3 - 4*Cos[
c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 137 vs. 2(47) = 94.

Time = 3.81 (sec) , antiderivative size = 138, normalized size of antiderivative = 5.75

method	result
default	$-\frac{2\sqrt{-\left(8\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-7\right)\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{56\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-7}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\frac{2\sqrt{14}}{7}\right)}{\sqrt{8\left(\sin^{4}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-8\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7}\,d}$
risch	$-\frac{2i\sqrt{-\left(2\,e^{2i(dx+c)}-3\,e^{i(dx+c)}+2\right)e^{-i(dx+c)}}}{d}+\frac{i\left(\frac{6\left(-\frac{3}{4}+\frac{i\sqrt{7}}{4}\right)\sqrt{\frac{e^{i(dx+c)}-\frac{3}{4}+\frac{i\sqrt{7}}{4}}{-\frac{3}{4}+\frac{i\sqrt{7}}{4}}}\,\sqrt{14}\,\sqrt{i\left(e^{i(dx+c)}-\frac{3}{4}-\frac{i\sqrt{7}}{4}\right)\sqrt{7}}\,\sqrt{\frac{e^{i(dx+c)}}{\frac{3}{4}-\frac{i\sqrt{7}}{4}}}\,F\left(\sqrt{\right.\right.}{7\sqrt{-2\,e^{3i(dx+c)}+3\,e^{2i(dx+c)}-2\,e^{i(dx+c)}}}\right.}{}$

```
[In] int((3-4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2*(-(8*cos(1/2*d*x+1/2*c)^2-7)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/
2*c)^2)^(1/2)*(56*sin(1/2*d*x+1/2*c)^2-7)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c
),2/7*14^(1/2))/(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2
*d*x+1/2*c)/(-8*cos(1/2*d*x+1/2*c)^2+7)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 106, normalized size of antiderivative = 4.42

$$\int \sqrt{3-4\cos(c+dx)}\,dx =$$

$$-\frac{\sqrt{2}\text{weierstrassPInverse}\left(-1,-1,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right)-\frac{1}{2}\right)+\sqrt{2}\text{weierstrassPInverse}\left(-1,-1,\cos\right.}{}$$

```
[In] integrate((3-4*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] -1/2*(sqrt(2)*weierstrassPInverse(-1, -1, cos(d*x + c) + I*sin(d*x + c) - 1
/2) + sqrt(2)*weierstrassPInverse(-1, -1, cos(d*x + c) - I*sin(d*x + c) - 1
/2) + 4*sqrt(2)*weierstrassZeta(-1, -1, weierstrassPInverse(-1, -1, cos(d*x
 + c) + I*sin(d*x + c) - 1/2)) + 4*sqrt(2)*weierstrassZeta(-1, -1, weierstr
assPInverse(-1, -1, cos(d*x + c) - I*sin(d*x + c) - 1/2)))/d
```

Sympy [F]

$$\int \sqrt{3-4\cos(c+dx)}\,dx = \int \sqrt{3-4\cos\left(c+dx\right)}\,dx$$

```
[In] integrate((3-4*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(3 - 4*cos(c + d*x)), x)
```

Maxima [F]

$$\int \sqrt{3-4\cos(c+dx)}\,dx = \int \sqrt{-4\,\cos\left(dx+c\right)+3}\,dx$$

```
[In] integrate((3-4*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-4*cos(d*x + c) + 3), x)
```

Giac [F]

$$\int \sqrt{3-4\cos(c+dx)}\,dx = \int \sqrt{-4\,\cos\left(dx+c\right)+3}\,dx$$

```
[In] integrate((3-4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(-4*cos(d*x + c) + 3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{3-4\cos(c+dx)}\,dx = \int \sqrt{3-4\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int((3 - 4*cos(c + d*x))^(1/2),x)
[Out] int((3 - 4*cos(c + d*x))^(1/2), x)
```

3.520 $\int \sqrt{3-4\cos(c+dx)}\sec(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 50

$$\int \sqrt{3-4\cos(c+dx)}\sec(c+dx)\,dx = -\frac{8\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{\sqrt{7}d} - \frac{6\,\text{EllipticPi}\left(2,\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{\sqrt{7}d}$$

```
[Out] 8/7*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)*EllipticF(cos(1/2*d*x+1
/2*c),2/7*14^(1/2))/d*7^(1/2)+6/7*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+
1/2*c)*EllipticPi(cos(1/2*d*x+1/2*c),2,2/7*14^(1/2))/d*7^(1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2882, 2741, 2885}

$$\int \sqrt{3-4\cos(c+dx)}\sec(c+dx)\,dx = -\frac{8\,\text{EllipticF}\left(\frac{1}{2}(c+dx+\pi),\frac{8}{7}\right)}{\sqrt{7}d} - \frac{6\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx+\pi),\frac{8}{7}\right)}{\sqrt{7}d}$$

```
[In] Int[Sqrt[3 - 4*Cos[c + d*x]]*Sec[c + d*x],x]
```

```
[Out] (-8*EllipticF[(c + Pi + d*x)/2, 8/7])/(Sqrt[7]*d) - (6*EllipticPi[2, (c + P
i + d*x)/2, 8/7])/(Sqrt[7]*d)
```

Rule 2741

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a - b]))*EllipticF[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ
[{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2882

```
Int[Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]/((a_.) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[d/b, Int[1/Sqrt[c + d*Sin[e + f*x]], x], x]
 + Dist[(b*c - a*d)/b, Int[1/((a + b*Sin[e + f*x])*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 -
 b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2885

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a - b)*Sqrt[c - d]))*EllipticPi[
-2*(b/(a - b)), (1/2)*(e + Pi/2 + f*x), -2*(d/(c - d))], x] /; FreeQ[{a, b,
 c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2
, 0] && GtQ[c - d, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= 3\int \frac{\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx - 4\int \frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx\\ &= -\frac{8\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{\sqrt{7}d} - \frac{6\,\text{EllipticPi}\left(2,\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{\sqrt{7}d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.22

$$\int \sqrt{3-4\cos(c+dx)}\sec(c+dx)\,dx = \frac{2\sqrt{-3+4\cos(c+dx)}\left(-4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),8\right)+3\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),8\right)\right)}{d\sqrt{3-4\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[3 - 4*Cos[c + d*x]]*Sec[c + d*x],x]
[Out] (2*Sqrt[-3 + 4*Cos[c + d*x]]*(-4*EllipticF[(c + d*x)/2, 8] + 3*EllipticPi[2
, (c + d*x)/2, 8]))/(d*Sqrt[3 - 4*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 3.01 (sec) , antiderivative size = 159, normalized size of antiderivative = 3.18

method	result
default	$\frac{2\sqrt{-\left(8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-7\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{56\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-7}\,\left(4F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\frac{2\sqrt{14}}{7}\right)+3\Pi\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),2,\frac{2\sqrt{14}}{7}\right)\right)}{7\sqrt{8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7}\,d}$

```
[In] int(sec(d*x+c)*(3-4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/7*(-(8*cos(1/2*d*x+1/2*c)^2-7)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1
/2*c)^2)^(1/2)*(56*sin(1/2*d*x+1/2*c)^2-7)^(1/2)*(4*EllipticF(cos(1/2*d*x+1
/2*c),2/7*14^(1/2))+3*EllipticPi(cos(1/2*d*x+1/2*c),2,2/7*14^(1/2)))/(8*sin
(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-8*cos(1/
2*d*x+1/2*c)^2+7)^(1/2)/d
```

Fricas [F]

$$\int \sqrt{3-4\cos(c+dx)}\sec(c+dx)\,dx = \int \sqrt{-4\,\cos\left(dx+c\right)+3}\sec\left(dx+c\right)\,dx$$

```
[In] integrate(sec(d*x+c)*(3-4*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-4*cos(d*x + c) + 3)*sec(d*x + c), x)
```

Sympy [F]

$$\int \sqrt{3-4\cos(c+dx)}\sec(c+dx)\,dx = \int \sqrt{3-4\cos\left(c+dx\right)}\sec\left(c+dx\right)dx$$

```
[In] integrate(sec(d*x+c)*(3-4*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(3 - 4*cos(c + d*x))*sec(c + d*x), x)
```

Maxima [F]

$$\int \sqrt{3-4\cos(c+dx)}\sec(c+dx)\,dx = \int \sqrt{-4\,\cos\left(dx+c\right)+3}\sec\left(dx+c\right)\,dx$$

```
[In] integrate(sec(d*x+c)*(3-4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(-4*cos(d*x + c) + 3)*sec(d*x + c), x)
```

Giac [F]

$$\int \sqrt{3-4\cos(c+dx)}\sec(c+dx)\,dx = \int \sqrt{-4\,\cos\left(dx+c\right)+3}\sec\left(dx+c\right)\,dx$$

```
[In] integrate(sec(d*x+c)*(3-4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(-4*cos(d*x + c) + 3)*sec(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{3-4\cos(c+dx)}\sec(c+dx)\,dx = \int \frac{\sqrt{3-4\,\cos\left(c+d\,x\right)}}{\cos\left(c+d\,x\right)}\,dx$$

```
[In] int((3 - 4*cos(c + d*x))^(1/2)/cos(c + d*x),x)
[Out] int((3 - 4*cos(c + d*x))^(1/2)/cos(c + d*x), x)
```

3.521 $\int \sqrt{3-4\cos(c+dx)}\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 98

$$\int \sqrt{3-4\cos(c+dx)}\sec^2(c+dx)\,dx = -\frac{\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)|\frac{8}{7}\right)}{d} + \frac{3\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{\sqrt{7}d} + \frac{4\,\text{EllipticPi}\left(2,\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{\sqrt{7}d} + \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{d}$$

```
[Out] -3/7*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)*EllipticF(cos(1/2*d*x+
1/2*c),2/7*14^(1/2))/d*7^(1/2)-4/7*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x
+1/2*c)*EllipticPi(cos(1/2*d*x+1/2*c),2,2/7*14^(1/2))/d*7^(1/2)+(sin(1/2*d*
x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)*EllipticE(cos(1/2*d*x+1/2*c),2/7*14^(1
/2))/d*7^(1/2)+(3-4*cos(d*x+c))^(1/2)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {2875, 3139, 2733, 3081, 2741, 2885}

$$\int \sqrt{3-4\cos(c+dx)}\sec^2(c+dx)\,dx = \frac{3\,\text{EllipticF}\left(\frac{1}{2}(c+dx+\pi),\frac{8}{7}\right)}{\sqrt{7}d} - \frac{\sqrt{7}E\left(\frac{1}{2}(c+dx+\pi)|\frac{8}{7}\right)}{d} + \frac{4\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx+\pi),\frac{8}{7}\right)}{\sqrt{7}d} + \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{d}$$

```
[In] Int[Sqrt[3 - 4*Cos[c + d*x]]*Sec[c + d*x]^2,x]
```

```
[Out] -((Sqrt[7]*EllipticE[(c + Pi + d*x)/2, 8/7])/d) + (3*EllipticF[(c + Pi + d*
x)/2, 8/7])/(Sqrt[7]*d) + (4*EllipticPi[2, (c + Pi + d*x)/2, 8/7])/(Sqrt[7]
*d) + (Sqrt[3 - 4*Cos[c + d*x]]*Tan[c + d*x])/d
```

Rule 2733

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 - b]/d)*EllipticE[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ[{a,
 b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2741

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a - b]))*EllipticF[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ
[{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2875

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m + 1)*((c + d*Sin[e + f*x])^n/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m
 + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(
n - 1)*Simp[a*c*(m + 1) + b*d*n + (a*d*(m + 1) - b*c*(m + 2))*Sin[e + f*x]
- b*d*(m + n + 2)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x
] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m,
-1] && LtQ[0, n, 1] && IntegersQ[2*m, 2*n]
```

Rule 2885

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a - b)*Sqrt[c - d]))*EllipticPi[
-2*(b/(a - b)), (1/2)*(e + Pi/2 + f*x), -2*(d/(c - d))], x] /; FreeQ[{a, b,
 c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2
```

```
, 0] && GtQ[c - d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3139

```
Int[((A_.) + (C_.)*sin[(e_.) + (f_.)*(x_)]^2)/(Sqrt[(a_.) + (b_.)*sin[(e_.)
 + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist
[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x], x] - Dist[1/(b*d), Int[Simp[a*c
*C - A*b*d + (b*c*C + a*C*d)*Sin[e + f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c
+ d*Sin[e + f*x])), x], x] /; FreeQ[{a, b, c, d, e, f, A, C}, x] && NeQ[b*c
 - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{d} + \int \frac{(-2+2\cos^2(c+dx))\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx \\
&= \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{d} \\
&\quad + \frac{1}{4}\int \frac{(-8+6\cos(c+dx))\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx - \frac{1}{2}\int \sqrt{3-4\cos(c+dx)}\,dx \\
&= -\frac{\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)\middle|\frac{8}{7}\right)}{d} + \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{d} \\
&\quad + \frac{3}{2}\int \frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx - 2\int \frac{\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx \\
&= -\frac{\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)\middle|\frac{8}{7}\right)}{d} + \frac{3\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{\sqrt{7}d} \\
&\quad + \frac{4\,\text{EllipticPi}\left(2,\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{\sqrt{7}d} + \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{d}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.97 (sec) , antiderivative size = 178, normalized size of antiderivative = 1.82

$$\int \sqrt{3-4\cos(c+dx)}\sec^2(c+dx)\,dx = \frac{-\frac{42\sqrt{-3+4\cos(c+dx)}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),8\right)}{\sqrt{3-4\cos(c+dx)}} - \frac{i\sqrt{7}\left(21E\left(i\text{arcsinh}\left(\sqrt{3-4\cos(c+dx)}\right)|-\frac{1}{7}\right)-12\,\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{3-4\cos(c+dx}\right.\right.\right.}{\sqrt{\sin^2(c+dx)}}}{21d}$$

```
[In] Integrate[Sqrt[3 - 4*Cos[c + d*x]]*Sec[c + d*x]^2,x]
```

```
[Out] ((-42*Sqrt[-3 + 4*Cos[c + d*x]]*EllipticPi[2, (c + d*x)/2, 8])/Sqrt[3 - 4*C
os[c + d*x]] - (I*Sqrt[7]*(21*EllipticE[I*ArcSinh[Sqrt[3 - 4*Cos[c + d*x]]]
, -1/7] - 12*EllipticF[I*ArcSinh[Sqrt[3 - 4*Cos[c + d*x]]], -1/7] - 8*Ellip
ticPi[-1/3, I*ArcSinh[Sqrt[3 - 4*Cos[c + d*x]]], -1/7])*Sin[c + d*x])/Sqrt[
Sin[c + d*x]^2] + 21*Sqrt[3 - 4*Cos[c + d*x]]*Tan[c + d*x])/(21*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 350 vs. 2(164) = 328.

Time = 4.61 (sec) , antiderivative size = 351, normalized size of antiderivative = 3.58

method	result
default	$-\frac{\sqrt{-\left(8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-7\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-\frac{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}}{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}+\frac{3\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{56\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right.\right.}}{7\sqrt{8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\right.}}\right.}{\sin\left(\frac{dx}{2}\right.}$

```
[In] int(sec(d*x+c)^2*(3-4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(8*cos(1/2*d*x+1/2*c)^2-7)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1
/2*c)*(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/
2*c)^2-1)+3/7*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(56*sin(1/2*d*x+1/2*c)^2-7)^(1/2
)/(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x
+1/2*c),2/7*14^(1/2))-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(56*sin(1/2*d*x+1/2*c)^2
-7)^(1/2)/(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos
(1/2*d*x+1/2*c),2/7*14^(1/2))+4/7*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(56*sin(1/2*
d*x+1/2*c)^2-7)^(1/2)/(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)^(1/2)*E
llipticPi(cos(1/2*d*x+1/2*c),2,2/7*14^(1/2)))/sin(1/2*d*x+1/2*c)/(-8*cos(1/
2*d*x+1/2*c)^2+7)^(1/2)/d
```

Fricas [F]

$$\int \sqrt{3-4\cos(c+dx)}\sec^2(c+dx)\,dx = \int \sqrt{-4\cos(dx+c)+3}\sec(dx+c)^2\,dx$$

```
[In] integrate(sec(d*x+c)^2*(3-4*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(-4*cos(d*x + c) + 3)*sec(d*x + c)^2, x)
```

Sympy [F]

$$\int \sqrt{3-4\cos(c+dx)}\sec^2(c+dx)\,dx = \int \sqrt{3-4\cos(c+dx)}\sec^2(c+dx)\,dx$$

```
[In] integrate(sec(d*x+c)**2*(3-4*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(3 - 4*cos(c + d*x))*sec(c + d*x)**2, x)
```

Maxima [F]

$$\int \sqrt{3-4\cos(c+dx)}\sec^2(c+dx)\,dx = \int \sqrt{-4\cos(dx+c)+3}\sec(dx+c)^2\,dx$$

```
[In] integrate(sec(d*x+c)^2*(3-4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(-4*cos(d*x + c) + 3)*sec(d*x + c)^2, x)
```

Giac [F]

$$\int \sqrt{3-4\cos(c+dx)}\sec^2(c+dx)\,dx = \int \sqrt{-4\cos(dx+c)+3}\sec(dx+c)^2\,dx$$

```
[In] integrate(sec(d*x+c)^2*(3-4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(-4*cos(d*x + c) + 3)*sec(d*x + c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{3-4\cos(c+dx)}\sec^2(c+dx)\,dx = \int \frac{\sqrt{3-4\,\cos\left(c+d\,x\right)}}{{\cos\left(c+d\,x\right)}^2}\,dx$$

```
[In] int((3 - 4*cos(c + d*x))^(1/2)/cos(c + d*x)^2,x)
[Out] int((3 - 4*cos(c + d*x))^(1/2)/cos(c + d*x)^2, x)
```

3.522 $\int \sqrt{3-4\cos(c+dx)}\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 138

$$\int \sqrt{3-4\cos(c+dx)}\sec^3(c+dx)\,dx = \frac{\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)\middle|\frac{8}{7}\right)}{3d} - \frac{3\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{\sqrt{7}d} - \frac{5\,\text{EllipticPi}\left(2,\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{3\sqrt{7}d} - \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{3d} + \frac{\sqrt{3-4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d}$$

```
[Out] 3/7*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)*EllipticF(cos(1/2*d*x+1
/2*c),2/7*14^(1/2))/d*7^(1/2)+5/21*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x
+1/2*c)*EllipticPi(cos(1/2*d*x+1/2*c),2,2/7*14^(1/2))/d*7^(1/2)-1/3*(sin(1/
2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)*EllipticE(cos(1/2*d*x+1/2*c),2/7*1
4^(1/2))/d*7^(1/2)-1/3*(3-4*cos(d*x+c))^(1/2)*tan(d*x+c)/d+1/2*sec(d*x+c)*(
3-4*cos(d*x+c))^(1/2)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {2875, 3134, 3138, 2733, 3081, 2741, 2885}

$$\int \sqrt{3-4\cos(c+dx)}\sec^3(c+dx)\,dx = -\frac{3\,\text{EllipticF}\left(\frac{1}{2}(c+dx+\pi),\frac{8}{7}\right)}{\sqrt{7}d} + \frac{\sqrt{7}E\left(\frac{1}{2}(c+dx+\pi)|\frac{8}{7}\right)}{3d} - \frac{5\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx+\pi),\frac{8}{7}\right)}{3\sqrt{7}d} - \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{3d} + \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)\sec(c+dx)}{2d}$$

```
[In] Int[Sqrt[3 - 4*Cos[c + d*x]]*Sec[c + d*x]^3,x]
```

```
[Out] (Sqrt[7]*EllipticE[(c + Pi + d*x)/2, 8/7])/(3*d) - (3*EllipticF[(c + Pi + d
*x)/2, 8/7])/(Sqrt[7]*d) - (5*EllipticPi[2, (c + Pi + d*x)/2, 8/7])/(3*Sqrt
[7]*d) - (Sqrt[3 - 4*Cos[c + d*x]]*Tan[c + d*x])/(3*d) + (Sqrt[3 - 4*Cos[c
+ d*x]]*Sec[c + d*x]*Tan[c + d*x])/(2*d)
```

Rule 2733

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 - b]/d)*EllipticE[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ[{a,
 b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2741

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a - b]))*EllipticF[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ
[{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2875

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m + 1)*((c + d*Sin[e + f*x])^n/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m
 + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(
n - 1)*Simp[a*c*(m + 1) + b*d*n + (a*d*(m + 1) - b*c*(m + 2))*Sin[e + f*x]
- b*d*(m + n + 2)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x
] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m,
-1] && LtQ[0, n, 1] && IntegersQ[2*m, 2*n]
```

Rule 2885

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a - b)*Sqrt[c - d]))*EllipticPi[
-2*(b/(a - b)), (1/2)*(e + Pi/2 + f*x), -2*(d/(c - d))], x] /; FreeQ[{a, b,
 c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2
, 0] && GtQ[c - d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{3-4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} + \frac{1}{2}\int \frac{(-2+3\cos(c+dx)-2\cos^2(c+dx))\sec^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx$$

$$= -\frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{3d} + \frac{\sqrt{3-4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} + \frac{1}{6}\int \frac{(5-6\cos(c+dx)-4\cos^2(c+dx))\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx$$

$$= -\frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{3d} + \frac{\sqrt{3-4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} + \frac{1}{24}\int \frac{(20-36\cos(c+dx))\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx + \frac{1}{6}\int \sqrt{3-4\cos(c+dx)}\,dx$$

$$= \frac{\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)\middle|\frac{8}{7}\right)}{3d} - \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{3d} + \frac{\sqrt{3-4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d} + \frac{5}{6}\int \frac{\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx - \frac{3}{2}\int \frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx$$

$$= \frac{\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)\middle|\frac{8}{7}\right)}{3d} - \frac{3\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{\sqrt{7}d} - \frac{5\,\text{EllipticPi}\left(2,\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{3\sqrt{7}d} - \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{3d} + \frac{\sqrt{3-4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.42 (sec) , antiderivative size = 237, normalized size of antiderivative = 1.72

$$\int \sqrt{3-4\cos(c+dx)}\sec^3(c+dx)\,dx$$

$$= \frac{-\frac{12\sqrt{-3+4\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),8\right)}{\sqrt{3-4\cos(c+dx)}} + \frac{6\sqrt{-3+4\cos(c+dx)}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),8\right)}{\sqrt{3-4\cos(c+dx)}} + \frac{2i\left(21E\left(i\text{arcsinh}\left(\sqrt{3-4\cos(c+dx)}\right)\middle|-\frac{1}{7}\right.\right.}{}}{}$$

```
[In] Integrate[Sqrt[3 - 4*Cos[c + d*x]]*Sec[c + d*x]^3,x]
```

```
[Out] ((-12*Sqrt[-3 + 4*Cos[c + d*x]]*EllipticF[(c + d*x)/2, 8])/Sqrt[3 - 4*Cos[c
 + d*x]] + (6*Sqrt[-3 + 4*Cos[c + d*x]]*EllipticPi[2, (c + d*x)/2, 8])/Sqrt
[3 - 4*Cos[c + d*x]] + (((2*I)/3)*(21*EllipticE[I*ArcSinh[Sqrt[3 - 4*Cos[c
```

```
+ d*x]]], -1/7] - 12*EllipticF[I*ArcSinh[Sqrt[3 - 4*Cos[c + d*x]]], -1/7] -
 8*EllipticPi[-1/3, I*ArcSinh[Sqrt[3 - 4*Cos[c + d*x]]], -1/7])*Sin[c + d*x
])/(Sqrt[7]*Sqrt[Sin[c + d*x]^2]) - Sqrt[3 - 4*Cos[c + d*x]]*(-3 + 2*Cos[c
+ d*x])*Sec[c + d*x]*Tan[c + d*x])/(6*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 407 vs. $2(195) = 390$.

Time = 5.86 (sec) , antiderivative size = 408, normalized size of antiderivative = 2.96

method	result
default	$-\frac{\sqrt{-\left(8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-7\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}}{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)^2}+\frac{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\right.}}{3\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)}\right.}{}$

```
[In] int(sec(d*x+c)^3*(3-4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)

[Out] -(-(8*cos(1/2*d*x+1/2*c)^2-7)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-cos(1/2*d*x+1/2
*c)*(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*
c)^2-1)^2+2/3*cos(1/2*d*x+1/2*c)*(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)
^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^2-1)-3/7*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(56*s
in(1/2*d*x+1/2*c)^2-7)^(1/2)/(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)^
(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2/7*14^(1/2))+1/3*(sin(1/2*d*x+1/2*c)^2)
^(1/2)*(56*sin(1/2*d*x+1/2*c)^2-7)^(1/2)/(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*
x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2/7*14^(1/2))-5/21*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(56*sin(1/2*d*x+1/2*c)^2-7)^(1/2)/(8*sin(1/2*d*x+1/2*c)
^4-sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,2/7*14^(1/2)
))/sin(1/2*d*x+1/2*c)/(-8*cos(1/2*d*x+1/2*c)^2+7)^(1/2)/d
```

Fricas [F]

$$\int \sqrt{3-4\cos(c+dx)}\sec^3(c+dx)\,dx = \int \sqrt{-4\,\cos\left(dx+c\right)+3}\sec\left(dx+c\right)^3\,dx$$

```
[In] integrate(sec(d*x+c)^3*(3-4*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(-4*cos(d*x + c) + 3)*sec(d*x + c)^3, x)
```

Sympy [F]

$$\int \sqrt{3-4\cos(c+dx)}\sec^3(c+dx)\,dx = \int \sqrt{3-4\cos\left(c+dx\right)}\sec^3\left(c+dx\right)dx$$

```
[In] integrate(sec(d*x+c)**3*(3-4*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(3 - 4*cos(c + d*x))*sec(c + d*x)**3, x)
```

Maxima [F]

$$\int \sqrt{3-4\cos(c+dx)}\sec^3(c+dx)\,dx = \int \sqrt{-4\cos\left(dx+c\right)+3}\sec\left(dx+c\right)^3\,dx$$

```
[In] integrate(sec(d*x+c)^3*(3-4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(-4*cos(d*x + c) + 3)*sec(d*x + c)^3, x)
```

Giac [F]

$$\int \sqrt{3-4\cos(c+dx)}\sec^3(c+dx)\,dx = \int \sqrt{-4\cos\left(dx+c\right)+3}\sec\left(dx+c\right)^3\,dx$$

```
[In] integrate(sec(d*x+c)^3*(3-4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(-4*cos(d*x + c) + 3)*sec(d*x + c)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{3-4\cos(c+dx)}\sec^3(c+dx)\,dx = \int \frac{\sqrt{3-4\cos\left(c+d\,x\right)}}{\cos\left(c+d\,x\right)^3}\,dx$$

```
[In] int((3 - 4*cos(c + d*x))^(1/2)/cos(c + d*x)^3,x)
[Out] int((3 - 4*cos(c + d*x))^(1/2)/cos(c + d*x)^3, x)
```

3.523 $\int \frac{\cos^3(c+dx)}{\sqrt{a+b\cos(c+dx)}} dx$

Optimal result

Integrand size = 23, antiderivative size = 215

$$\int \frac{\cos^3(c+dx)}{\sqrt{a+b\cos(c+dx)}} dx = \frac{2(8a^2+9b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{15b^3d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2a(8a^2+7b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{15b^3d\sqrt{a+b\cos(c+dx)}} - \frac{8a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15b^2d} + \frac{2\cos(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5bd}$$

```
[Out] -8/15*a*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/b^2/d+2/5*cos(d*x+c)*sin(d*x+c)*(
a+b*cos(d*x+c))^(1/2)/b/d+2/15*(8*a^2+9*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/c
os(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+
b*cos(d*x+c))^(1/2)/b^3/d/((a+b*cos(d*x+c))/(a+b))^(1/2)-2/15*a*(8*a^2+7*b^
2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/
2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/b^3/d/(a+b*cos
(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 215, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {2872, 3102, 2831, 2742, 2740, 2734, 2732}

$$\int \frac{\cos^3(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = -\frac{2a(8a^2+7b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{15b^3d\sqrt{a+b\cos(c+dx)}} + \frac{2(8a^2+9b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{15b^3d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{8a\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{15b^2d} + \frac{2\sin(c+dx)\cos(c+dx)\sqrt{a+b\cos(c+dx)}}{5bd}$$

```
[In] Int[Cos[c + d*x]^3/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (2*(8*a^2 + 9*b^2)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a
 + b)])/(15*b^3*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) - (2*a*(8*a^2 + 7*b^2
)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])
/(15*b^3*d*Sqrt[a + b*Cos[c + d*x]]) - (8*a*Sqrt[a + b*Cos[c + d*x]]*Sin[c
+ d*x])/(15*b^2*d) + (2*Cos[c + d*x]*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])
/(5*b*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\text{integral} = \frac{2\cos(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5bd} + \frac{2\int \frac{a+\frac{3}{2}b\cos(c+dx)-2a\cos^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{5b}$$

$$= -\frac{8a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15b^2d} + \frac{2\cos(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5bd} + \frac{4\int \frac{\frac{ab}{2}+\frac{1}{4}(8a^2+9b^2)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{15b^2}$$

$$= -\frac{8a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15b^2d} + \frac{2\cos(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5bd} - \frac{(a(8a^2+7b^2))\int\frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{15b^3} + \frac{(8a^2+9b^2)\int\sqrt{a+b\cos(c+dx)}\,dx}{15b^3}$$

$$= -\frac{8a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15b^2d} + \frac{2\cos(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5bd} + \frac{\left((8a^2+9b^2)\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{15b^3\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{\left(a(8a^2+7b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{15b^3\sqrt{a+b\cos(c+dx)}}$$

$$= \frac{2(8a^2+9b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{15b^3d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2a(8a^2+7b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{15b^3d\sqrt{a+b\cos(c+dx)}} - \frac{8a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15b^2d} + \frac{2\cos(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5bd}$$

Mathematica [A] (verified)

Time = 0.75 (sec) , antiderivative size = 182, normalized size of antiderivative = 0.85

$$\int\frac{\cos^3(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2(8a^3+8a^2b+9ab^2+9b^3)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right) - 2a(8a^2+7b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c\right.}{15b^3d\sqrt{a+b\cos(c+dx)}}$$

```
[In] Integrate[Cos[c + d*x]^3/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (2*(8*a^3 + 8*a^2*b + 9*a*b^2 + 9*b^3)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*E
llipticE[(c + d*x)/2, (2*b)/(a + b)] - 2*a*(8*a^2 + 7*b^2)*Sqrt[(a + b*Cos[
c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)] + b*(-8*a^2 + 3*b^
2 - 2*a*b*Cos[c + d*x] + 3*b^2*Cos[2*(c + d*x)])*Sin[c + d*x])/(15*b^3*d*Sq
rt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 664 vs. 2(253) = 506.

Time = 5.59 (sec) , antiderivative size = 665, normalized size of antiderivative = 3.09

method	result
default	$-\frac{2\sqrt{\left(2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(24\left(\cos^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3-4\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a\,b^2-48\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3-8\left(\cos^3\left(\frac{dx}{2}+\right.\right.\right.}{}$

[In] int(cos(d*x+c)^3/(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)

[Out] -2/15*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(24*cos(1/2*d*x+1/2*c)^7*b^3-4*cos(1/2*d*x+1/2*c)^5*a*b^2-48*cos(1/2*d*x+1/2*c)^5*b^3-8*cos(1/2*d*x+1/2*c)^3*a^2*b+6*cos(1/2*d*x+1/2*c)^3*a*b^2+30*cos(1/2*d*x+1/2*c)^3*b^3-8*a^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-7*a*b^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))+8*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^3-8*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2*b+9*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^2-9*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*b^3+8*cos(1/2*d*x+1/2*c)*a^2*b-2*cos(1/2*d*x+1/2*c)*a*b^2-6*cos(1/2*d*x+1/2*c)*b^3)/b^3/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 439, normalized size of antiderivative = 2.04

$$\int \frac{\cos^3(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = -\frac{4\sqrt{2}(-4i\,a^3-3i\,ab^2)\sqrt{b}\,\text{weierstrassPInverse}\left(\frac{4\,(4\,a^2-3\,b^2)}{3\,b^2},-\frac{8\,(8\,a^3-9\,ab^2)}{27\,b^3},\frac{3\,b\cos(dx+c)+3i\,b\sin(dx+c)+2\,a}{3\,b}\right)+4\sqrt{}}{}$$

[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] -1/45*(4*sqrt(2)*(-4*I*a^3 - 3*I*a*b^2)*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*

```
b*sin(d*x + c) + 2*a)/b) + 4*sqrt(2)*(4*I*a^3 + 3*I*a*b^2)*sqrt(b)*weierstr
assPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*
cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b) + 3*sqrt(2)*(-8*I*a^2*b - 9*I*b
^3)*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2
)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)
/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b)) + 3*sqrt(2)*(8*
I*a^2*b + 9*I*b^3)*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(
8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8
*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b))
- 6*(3*b^3*cos(d*x + c) - 4*a*b^2)*sqrt(b*cos(d*x + c) + a)*sin(d*x + c))/(
b^4*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3/(a+b*cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^3(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos(dx+c)^3}{\sqrt{b\cos(dx+c)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^3/sqrt(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\cos^3(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos(dx+c)^3}{\sqrt{b\cos(dx+c)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^3/sqrt(b*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos\left(c+d\,x\right)^3}{\sqrt{a+b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(cos(c + d*x)^3/(a + b*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^3/(a + b*cos(c + d*x))^(1/2), x)
```

3.524 $\int \frac{\cos^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 165

$$\int \frac{\cos^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = -\frac{4a\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{3b^2d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2(2a^2+b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3b^2d\sqrt{a+b\cos(c+dx)}} + \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3bd}$$

```
[Out] 2/3*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/b/d-4/3*a*(cos(1/2*d*x+1/2*c)^2)^(1/2
)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*
(a+b*cos(d*x+c))^(1/2)/b^2/d/((a+b*cos(d*x+c))/(a+b))^(1/2)+2/3*(2*a^2+b^2)
*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*
c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/b^2/d/(a+b*cos(d
*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 165, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used

$= \{2870, 2831, 2742, 2740, 2734, 2732\}$

$$\int \frac{\cos^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2(2a^2+b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx), \frac{2b}{a+b}\right)}{3b^2d\sqrt{a+b\cos(c+dx)}} - \frac{4a\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3b^2d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{3bd}$$

```
[In] Int[Cos[c + d*x]^2/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (-4*a*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(3*b^
2*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) + (2*(2*a^2 + b^2)*Sqrt[(a + b*Cos[
c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(3*b^2*d*Sqrt[a +
 b*Cos[c + d*x]]) + (2*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(3*b*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]]
```

```
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2870

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^2, x_Symbol] :> Simp[(-d^2)*Cos[e + f*x]*((a + b*Sin[e + f*x])
^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m + 2)), Int[(a + b*Sin[e + f*x])^
m*Simp[b*(d^2*(m + 1) + c^2*(m + 2)) - d*(a*d - 2*b*c*(m + 2))*Sin[e + f*x]
, x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] && NeQ
[a^2 - b^2, 0] &&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3bd}+\frac{2\int\frac{\frac{b}{2}-a\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{3b}\\
&= \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3bd}\\
&\quad+\frac{1}{3}\left(1+\frac{2a^2}{b^2}\right)\int\frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx-\frac{(2a)\int\sqrt{a+b\cos(c+dx)}\,dx}{3b^2}\\
&= \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3bd}-\frac{\left(2a\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{3b^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\\
&\quad+\frac{\left(\left(1+\frac{2a^2}{b^2}\right)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{3\sqrt{a+b\cos(c+dx)}}\\
&= -\frac{4a\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3b^2d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\\
&\quad+\frac{2\left(1+\frac{2a^2}{b^2}\right)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3d\sqrt{a+b\cos(c+dx)}}\\
&\quad+\frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3bd}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.54 (sec) , antiderivative size = 137, normalized size of antiderivative = 0.83

$$\int \frac{\cos^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$
$$= \frac{-4a(a+b)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)+2(2a^2+b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)+2b(a+}{3b^2d\sqrt{a+b\cos(c+dx)}}$$

```
[In] Integrate[Cos[c + d*x]^2/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (-4*a*(a + b)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticE[(c + d*x)/2, (2*
b)/(a + b)] + 2*(2*a^2 + b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[
(c + d*x)/2, (2*b)/(a + b)] + 2*b*(a + b*Cos[c + d*x])*Sin[c + d*x])/(3*b^2
*d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 452 vs. 2(207) = 414.

Time = 4.11 (sec) , antiderivative size = 453, normalized size of antiderivative = 2.75

method	result
default	$-\frac{2\sqrt{\left(2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^2+2\left(\cos^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)ab-6\left(\cos^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^2+2a^2\sqrt{\frac{1}{2}-\frac{\cos(dx+c}{2}}\right.}{}$

```
[In] int(cos(d*x+c)^2/(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(4*cos(1/2
*d*x+1/2*c)^5*b^2+2*cos(1/2*d*x+1/2*c)^3*a*b-6*cos(1/2*d*x+1/2*c)^3*b^2+2*a
^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2
)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))+b^2*(sin(1/2*d*x+1/2*c)^
2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x
+1/2*c),(-2*b/(a-b))^(1/2))-2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*
x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2
))*a^2+2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b)
)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b-2*cos(1/2*d*x+
1/2*c)*a*b+2*cos(1/2*d*x+1/2*c)*b^2)/b^2/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*s
in(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+
b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 398, normalized size of antiderivative = 2.41

$$\int \frac{\cos^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{-6i\sqrt{2}ab^{\frac{3}{2}}\text{weierstrassZeta}\left(\frac{4\,(4\,a^2-3\,b^2)}{3\,b^2}, -\frac{8\,(8\,a^3-9\,ab^2)}{27\,b^3}, \text{weierstrassPInverse}\left(\frac{4\,(4\,a^2-3\,b^2)}{3\,b^2}, -\frac{8\,(8\,a^3-9\,ab^2)}{27\,b^3}, \frac{3\,b\cos(\right.\right.}{}$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/9*(-6*I*sqrt(2)*a*b^(3/2)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*
(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(
8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b))
 + 6*I*sqrt(2)*a*b^(3/2)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*
a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a
^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b)) +
6*sqrt(b*cos(d*x + c) + a)*b^2*sin(d*x + c) + sqrt(2)*(-4*I*a^2 - 3*I*b^2)*
sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2
)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b) + sqrt(2)*(4*I*
a^2 + 3*I*b^2)*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(
8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b))
/(b^3*d)
```

Sympy [F]

$$\int \frac{\cos^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos^2\left(c+dx\right)}{\sqrt{a+b\cos\left(c+dx\right)}}\,dx$$

```
[In] integrate(cos(d*x+c)**2/(a+b*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(cos(c + d*x)**2/sqrt(a + b*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{\cos^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)^2}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(cos(d*x + c)^2/sqrt(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\cos^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)^2}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^2/sqrt(b*cos(d*x + c) + a), x)
```

Mupad [B] (verification not implemented)

Time = 14.34 (sec) , antiderivative size = 116, normalized size of antiderivative = 0.70

$$\begin{aligned}\int \frac{\cos^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx &= \frac{2\,\sin\left(c+d\,x\right)\,\sqrt{a+b\,\cos\left(c+d\,x\right)}}{3\,b\,d} \\ &+ \frac{2\,\sqrt{\frac{a+b\,\cos\left(c+d\,x\right)}{a+b}}\,\left(\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|\frac{2\,b}{a+b}\right)\,\left(2\,a^2+b^2\right)-2\,a\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|\frac{2\,b}{a+b}\right)\,\left(a+b\right)\right)}{3\,b^2\,d\,\sqrt{a+b\,\cos\left(c+d\,x\right)}}\end{aligned}$$

```
[In] int(cos(c + d*x)^2/(a + b*cos(c + d*x))^(1/2),x)
[Out] (2*sin(c + d*x)*(a + b*cos(c + d*x))^(1/2))/(3*b*d) + (2*((a + b*cos(c + d*
x))/(a + b))^(1/2)*(ellipticF(c/2 + (d*x)/2, (2*b)/(a + b))*(2*a^2 + b^2) -
 2*a*ellipticE(c/2 + (d*x)/2, (2*b)/(a + b))*(a + b)))/(3*b^2*d*(a + b*cos(
c + d*x))^(1/2))
```

3.525 $\int \frac{\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}} \, dx$

Optimal result

Integrand size = 21, antiderivative size = 122

$$\int \frac{\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}} \, dx = \frac{2\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{bd\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{bd\sqrt{a+b\cos(c+dx)}}$$

```
[Out] 2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2
*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/b/d/((a+b*cos(d*x+c))/(
a+b))^(1/2)-2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(s
in(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/b
/d/(a+b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2831, 2742, 2740, 2734, 2732}

$$\int \frac{\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}} \, dx = \frac{2\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{bd\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{bd\sqrt{a+b\cos(c+dx)}}$$

```
[In] Int[Cos[c + d*x]/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (2*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(b*d*Sqr
t[(a + b*Cos[c + d*x])/(a + b)]) - (2*a*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*
EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(b*d*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \frac{\int \sqrt{a+b\cos(c+dx)}\,dx}{b} - \frac{a\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{b}$$

$$= \frac{\sqrt{a+b\cos(c+dx)}\int \sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{\left(a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{b\sqrt{a+b\cos(c+dx)}}$$

$$=\frac{2\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{bd\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}-\frac{2a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{bd\sqrt{a+b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 2.30 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.70

$$\int\frac{\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$
$$=\frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\left((a+b)E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)-a\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)\right)}{bd\sqrt{a+b\cos(c+dx)}}$$

```
[In] Integrate[Cos[c + d*x]/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (2*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*((a + b)*EllipticE[(c + d*x)/2, (2*b)
/(a + b)] - a*EllipticF[(c + d*x)/2, (2*b)/(a + b)]))/(b*d*Sqrt[a + b*Cos[c
 + d*x]])
```

Maple [A] (verified)

Time = 3.40 (sec) , antiderivative size = 220, normalized size of antiderivative = 1.80

method	result
default	$\frac{2\sqrt{\left(2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{\frac{2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b}{a-b}}\left(F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{-\frac{2b}{a-b}}\right)a-E\left(\cos\left(\frac{dx}{2}+\right.\right.\right.}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+(a+b)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b}}$
risch	$-\frac{i\left(b\,e^{2i(dx+c)}+2a\,e^{i(dx+c)}+b\right)\sqrt{2}\,e^{-i(dx+c)}}{bd\sqrt{\left(b\,e^{2i(dx+c)}+2a\,e^{i(dx+c)}+b\right)e^{-i(dx+c)}}}-\frac{i\left(-\frac{2\left(b\,e^{2i(dx+c)}+2a\,e^{i(dx+c)}+b\right)}{b\sqrt{\left(b\,e^{2i(dx+c)}+2a\,e^{i(dx+c)}+b\right)e^{i(dx+c)}}}+\frac{2\left(\sqrt{a^2-b^2}+a\right)\sqrt{\frac{\left(e^{i(dx+c)}+\frac{\sqrt{a^2-b^2}}{b}\right.}{\sqrt{a^2-b^2}+a}}}{}\right.}{}$

```
[In] int(cos(d*x+c)/(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+
1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*(EllipticF(cos
(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a-EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a
```

```
-b))^(1/2))*a+EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*b)/(-2*sin(1
/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/b/sin(1/2*d*x+1/2*c)/(-
2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 355, normalized size of antiderivative = 2.91

$$\int \frac{\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2i\sqrt{2}a\sqrt{b}\text{weierstrassPInverse}\left(\frac{4\,(4\,a^2-3\,b^2)}{3\,b^2},-\frac{8\,(8\,a^3-9\,ab^2)}{27\,b^3},\frac{3\,b\cos(dx+c)+3i\,b\sin(dx+c)+2\,a}{3\,b}\right)-2i\sqrt{2}a\sqrt{b}\text{weierstrass}}{}$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/3*(2*I*sqrt(2)*a*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/
27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)
/b) - 2*I*sqrt(2)*a*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8
/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a
)/b) + 3*I*sqrt(2)*b^(3/2)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(
8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8
*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b))
- 3*I*sqrt(2)*b^(3/2)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3
 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3
- 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b)))/(b^2
*d)
```

Sympy [F]

$$\int \frac{\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(cos(c + d*x)/sqrt(a + b*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)/sqrt(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)/sqrt(b*cos(d*x + c) + a), x)
```

Mupad [B] (verification not implemented)

Time = 14.60 (sec) , antiderivative size = 80, normalized size of antiderivative = 0.66

$$\int \frac{\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2\left(\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|\frac{2\,b}{a+b}\right)\,\left(a+b\right)-a\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|\frac{2\,b}{a+b}\right)\right)\,\sqrt{\frac{a+b\,\cos\left(c+d\,x\right)}{a+b}}}{b\,d\,\sqrt{a+b\,\cos\left(c+d\,x\right)}}$$

```
[In] int(cos(c + d*x)/(a + b*cos(c + d*x))^(1/2),x)
[Out] (2*(ellipticE(c/2 + (d*x)/2, (2*b)/(a + b))*(a + b) - a*ellipticF(c/2 + (d*
x)/2, (2*b)/(a + b)))*((a + b*cos(c + d*x))/(a + b))^(1/2))/(b*d*(a + b*cos
(c + d*x))^(1/2))
```

3.526 $\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 57

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] 2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2
*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/d/(a+b*cos(d*x+
c))^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2742, 2740}

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}$$

```
[In] Int[1/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (2*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)]
)/(d*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\int \frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{\sqrt{a+b\cos(c+dx)}}\\ &= \frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}$$

```
[In] Integrate[1/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (2*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)]
)/(d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [C] (verified)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.92 (sec) , antiderivative size = 78, normalized size of antiderivative = 1.37

method	result	size
default	$\frac{2\sqrt{-\frac{2b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-a-b}{a+b}}\,\operatorname{am}^{-1}\left(\frac{dx}{2}+\frac{c}{2}\,\middle|\,\frac{\sqrt{2}\,\sqrt{b}}{\sqrt{a+b}}\right)}{d\sqrt{2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b}}$	78

```
[In] int(1/(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)^(1/2)*(-(2*b*sin(1/2*d*x+1/2*c)^2-a-b)/(
a+b))^(1/2)*InverseJacobiAM(1/2*d*x+1/2*c,2^(1/2)/(a+b)^(1/2)*b^(1/2))
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 146, normalized size of antiderivative = 2.56

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{-i\sqrt{2}\sqrt{b}\text{weierstrassPInverse}\left(\frac{4\,(4\,a^2-3\,b^2)}{3\,b^2},-\frac{8\,(8\,a^3-9\,ab^2)}{27\,b^3},\frac{3\,b\cos(dx+c)+3i\,b\sin(dx+c)+2\,a}{3\,b}\right)+i\sqrt{2}\sqrt{b}\text{weierstrassPI}}{bd}$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] (-I*sqrt(2)*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a
^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b) + I
*sqrt(2)*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3
- 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b))/(b*d)
```

Sympy [F]

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{a+b\cos{(c+dx)}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(1/sqrt(a + b*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos{(dx+c)}+a}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(1/sqrt(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos(dx+c)+a}}\,dx$$

[In] integrate(1/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")

[Out] integrate(1/sqrt(b*cos(d*x + c) + a), x)

Mupad [B] (verification not implemented)

Time = 14.56 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.91

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\,\middle|\,\frac{2\,b}{a+b}\right)\,\sqrt{\frac{a+b\,\cos(c+d\,x)}{a+b}}}{d\,\sqrt{a+b\,\cos\left(c+d\,x\right)}}$$

[In] int(1/(a + b*cos(c + d*x))^(1/2),x)

[Out] (2*ellipticF(c/2 + (d*x)/2, (2*b)/(a + b))*((a + b*cos(c + d*x))/(a + b))^(1/2))/(d*(a + b*cos(c + d*x))^(1/2))

3.527 $\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 58

$$\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx=\frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] 2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/
2*c),2,2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/d/(a+b*cos(d
*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2886, 2884}

$$\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx=\frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}$$

```
[In] Int[Sec[c + d*x]/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (2*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(a +
 b)])/(d*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
```

```
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 2886

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(c + d*Sin[e + f*x])/(c + d)]/Sqrt
[c + d*Sin[e + f*x]], Int[1/((a + b*Sin[e + f*x])*Sqrt[c/(c + d) + (d/(c +
d))*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] &&  !GtQ[c + d, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\int \frac{\sec(c+dx)}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{\sqrt{a+b\cos(c+dx)}}\\ &= \frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 58, normalized size of antiderivative = 1.00

$$\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}$$

```
[In] Integrate[Sec[c + d*x]/Sqrt[a + b*Cos[c + d*x]],x]
[Out] (2*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(a +
 b)])/(d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 2.07 (sec) , antiderivative size = 166, normalized size of antiderivative = 2.86

method	result	size
default	$\frac{2\sqrt{\left(2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{\frac{2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b}{a-b}}\,\Pi\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),2,\sqrt{-\frac{2b}{a-b}}\right)}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+(a+b)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b}\,d}$	166

```
[In] int(sec(d*x+c)/(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

[Out] 2*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d

Fricas [F(-1)]

Timed out.

$$\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \text{Timed out}$$

[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] Timed out

Sympy [F]

$$\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))**(1/2),x)

[Out] Integral(sec(c + d*x)/sqrt(a + b*cos(c + d*x)), x)

Maxima [F]

$$\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sec(dx+c)}{\sqrt{b\cos(dx+c)+a}}\,dx$$

[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")

[Out] integrate(sec(d*x + c)/sqrt(b*cos(d*x + c) + a), x)

Giac [F]

$$\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sec(dx+c)}{\sqrt{b\cos(dx+c)+a}}\,dx$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)/sqrt(b*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\cos(c+d\,x)\,\sqrt{a+b\,\cos(c+d\,x)}}\,dx$$

```
[In] int(1/(cos(c + d*x)*(a + b*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)*(a + b*cos(c + d*x))^(1/2)), x)
```

3.528 $\int \frac{\sec^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 206

$$\int \frac{\sec^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = -\frac{\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{ad\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} - \frac{b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{ad\sqrt{a+b\cos(c+dx)}} + \frac{\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{ad}$$

```
[Out] -(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*
c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/a/d/((a+b*cos(d*x+c))/(a
+b))^(1/2)+(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/
2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/d/(a+b
*cos(d*x+c))^(1/2)-b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icPi(sin(1/2*d*x+1/2*c),2,2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))
^(1/2)/a/d/(a+b*cos(d*x+c))^(1/2)+(a+b*cos(d*x+c))^(1/2)*tan(d*x+c)/a/d
```

Rubi [A] (verified)

Time = 0.63 (sec) , antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.391$, Rules used = {2881, 3139, 2734, 2732, 3081, 2742, 2740, 2886, 2884}

$$\int \frac{\sec^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{\tan(c+dx)\sqrt{a+b\cos(c+dx)}}{ad} + \frac{\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}} - \frac{\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{ad\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{ad\sqrt{a+b\cos(c+dx)}}$$

```
[In] Int[Sec[c + d*x]^2/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] -((Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(a*d*Sqr
t[(a + b*Cos[c + d*x])/(a + b)])) + (Sqrt[(a + b*Cos[c + d*x])/(a + b)]*Ell
ipticF[(c + d*x)/2, (2*b)/(a + b)])/(d*Sqrt[a + b*Cos[c + d*x]]) - (b*Sqrt[
(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(a + b)])/(a
*d*Sqrt[a + b*Cos[c + d*x]]) + (Sqrt[a + b*Cos[c + d*x]]*Tan[c + d*x])/(a*d
)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 2886

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(c + d*Sin[e + f*x])/(c + d)]/Sqrt
[c + d*Sin[e + f*x]], Int[1/((a + b*Sin[e + f*x])*Sqrt[c/(c + d) + (d/(c +
d))*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] &&  !GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3139

```
Int[((A_.) + (C_.)*sin[(e_.) + (f_.)*(x_)]^2)/(Sqrt[(a_.) + (b_.)*sin[(e_.)
 + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist
[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x], x] - Dist[1/(b*d), Int[Simp[a*c
*C - A*b*d + (b*c*C + a*C*d)*Sin[e + f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c
+ d*Sin[e + f*x])), x], x] /; FreeQ[{a, b, c, d, e, f, A, C}, x] && NeQ[b*c
 - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{ad}+\frac{\int \frac{\left(-\frac{b}{2}-\frac{1}{2}b\cos^2(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{a}\\
&= \frac{\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{ad}-\frac{\int \sqrt{a+b\cos(c+dx)}\,dx}{2a}-\frac{\int \frac{\left(\frac{b^2}{2}-\frac{1}{2}ab\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{ab}\\
&= \frac{\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{ad}+\frac{1}{2}\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx\\
&\quad -\frac{b\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{2a}-\frac{\sqrt{a+b\cos(c+dx)}\int \sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{2a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\\
&= -\frac{\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{ad\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}+\frac{\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{ad}\\
&\quad +\frac{\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\int \frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{2\sqrt{a+b\cos(c+dx)}}-\frac{\left(b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{\sec(c+dx)}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{2a\sqrt{a+b\cos(c+dx)}}\\
&= -\frac{\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{ad\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}+\frac{\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{d\sqrt{a+b\cos(c+dx)}}\\
&\quad -\frac{b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{ad\sqrt{a+b\cos(c+dx)}}+\frac{\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{ad}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 15.20 (sec) , antiderivative size = 310, normalized size of antiderivative = 1.50

$$\int \frac{\sec^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$
$$= \frac{-\frac{6b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}} - \frac{2i\sqrt{-\frac{b(-1+\cos(c+dx))}{a+b}}\sqrt{\frac{b(1+\cos(c+dx))}{-a+b}}\csc(c+dx)\left(-2a(a-b)E\left(i\text{arcsinh}\left(\sqrt{-\frac{1}{a+b}}\sqrt{a+b}\right.\right.\right.}{}}{}$$

```
[In] Integrate[Sec[c + d*x]^2/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] ((-6*b*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/
(a + b)])/Sqrt[a + b*Cos[c + d*x]] - ((2*I)*Sqrt[-((b*(-1 + Cos[c + d*x]))/
(a + b))]*Sqrt[(b*(1 + Cos[c + d*x]))/(-a + b)]*Csc[c + d*x]*(-2*a*(a - b)*
EllipticE[I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/
(a - b)] + b*(-2*a*EllipticF[I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c
 + d*x]]], (a + b)/(a - b)] + b*EllipticPi[(a + b)/a, I*ArcSinh[Sqrt[-(a +
b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)])))/(a*b*Sqrt[-(a + b)^
(-1)]) + 4*Sqrt[a + b*Cos[c + d*x]]*Tan[c + d*x])/(4*a*d)
```

Maple [A] (verified)

Time = 3.06 (sec) , antiderivative size = 532, normalized size of antiderivative = 2.58

method	result
default	$-\frac{\sqrt{-\left(-2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-a+b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-\frac{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+(a+b)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}}{a\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)}+\frac{\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{\frac{2b(c}{}}}{\sqrt{-2(\sin^4(}}\right.}{}$

```
[In] int(sec(d*x+c)^2/(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*
d*x+1/2*c)/a*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/(
2*cos(1/2*d*x+1/2*c)^2-1)+(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/
2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c
)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-(sin(1/2*d*x+1/
2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+
1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(
-2*b/(a-b))^(1/2))+1/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c
)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2
)^(1/2)*b*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))+1/a*b*(sin(1/2*d
```

```
*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2
*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/
2*c),2,(-2*b/(a-b))^(1/2)))/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a
+b)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\sec^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \frac{\sec^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sec^2{(c+dx)}}{\sqrt{a+b\cos{(c+dx)}}}\,dx$$

```
[In] integrate(sec(d*x+c)**2/(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(sec(c + d*x)**2/sqrt(a + b*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{\sec^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sec{(dx+c)}^2}{\sqrt{b\cos{(dx+c)}+a}}\,dx$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^2/sqrt(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\sec^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)^2}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^2/sqrt(b*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^2\,\sqrt{a+b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^2*(a + b*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^2*(a + b*cos(c + d*x))^(1/2)), x)
```

3.529 $\int \frac{\sec^3(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 268

$$\int \frac{\sec^3(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{3b\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{4a^2d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4ad\sqrt{a+b\cos(c+dx)}} + \frac{(4a^2+3b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4a^2d\sqrt{a+b\cos(c+dx)}} - \frac{3b\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4a^2d} + \frac{\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2ad}$$

```
[Out] 3/4*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x
+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/a^2/d/((a+b*cos(d*x
+c))/(a+b))^(1/2)-1/4*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ell
ipticF(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))
^(1/2)/a/d/(a+b*cos(d*x+c))^(1/2)+1/4*(4*a^2+3*b^2)*(cos(1/2*d*x+1/2*c)^2)^
(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2,2^(1/2)*(b/(a+b))^
(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/a^2/d/(a+b*cos(d*x+c))^(1/2)-3/4*b*(a
+b*cos(d*x+c))^(1/2)*tan(d*x+c)/a^2/d+1/2*sec(d*x+c)*(a+b*cos(d*x+c))^(1/2)
*tan(d*x+c)/a/d
```

Rubi [A] (verified)

Time = 0.90 (sec) , antiderivative size = 268, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.435$, Rules used = {2881, 3134, 3138, 2734, 2732, 3081, 2742, 2740, 2886, 2884}

$$\int \frac{\sec^3(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{(4a^2+3b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4a^2d\sqrt{a+b\cos(c+dx)}} - \frac{3b\tan(c+dx)\sqrt{a+b\cos(c+dx)}}{4a^2d} + \frac{3b\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{4a^2d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4ad\sqrt{a+b\cos(c+dx)}} + \frac{\tan(c+dx)\sec(c+dx)\sqrt{a+b\cos(c+dx)}}{2ad}$$

```
[In] Int[Sec[c + d*x]^3/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (3*b*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(4*a^2
*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) - (b*Sqrt[(a + b*Cos[c + d*x])/(a +
b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(4*a*d*Sqrt[a + b*Cos[c + d*x]])
 + ((4*a^2 + 3*b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c + d
*x)/2, (2*b)/(a + b)])/(4*a^2*d*Sqrt[a + b*Cos[c + d*x]]) - (3*b*Sqrt[a + b
*Cos[c + d*x]]*Tan[c + d*x])/(4*a^2*d) + (Sqrt[a + b*Cos[c + d*x]]*Sec[c +
d*x]*Tan[c + d*x])/(2*a*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
```

```
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 2886

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(c + d*Sin[e + f*x])/(c + d)]/Sqrt
[c + d*Sin[e + f*x]], Int[1/((a + b*Sin[e + f*x])*Sqrt[c/(c + d) + (d/(c +
d))*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] &&  !GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2ad} \\
&\quad + \frac{\int \frac{\left(-\frac{3b}{2}+a\cos(c+dx)+\frac{1}{2}b\cos^2(c+dx)\right)\sec^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{2a} \\
&= -\frac{3b\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4a^2d} + \frac{\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2ad} \\
&\quad + \frac{\int \frac{\left(\frac{1}{4}\left(4a^2+3b^2\right)+\frac{1}{2}ab\cos(c+dx)+\frac{3}{4}b^2\cos^2(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{2a^2} \\
&= -\frac{3b\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4a^2d} + \frac{\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2ad} \\
&\quad - \frac{\int \frac{\left(-\frac{1}{4}b\left(4a^2+3b^2\right)+\frac{1}{4}ab^2\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{2a^2b} + \frac{(3b)\int\sqrt{a+b\cos(c+dx)}\,dx}{8a^2}
\end{aligned}
$$

$$= -\frac{3b\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4a^2d} + \frac{\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2ad}$$
$$-\frac{b\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{8a} + \frac{1}{8}\left(4+\frac{3b^2}{a^2}\right)\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$
$$+\frac{\left(3b\sqrt{a+b\cos(c+dx)}\right)\int \sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{8a^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

$$= \frac{3b\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{4a^2d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{3b\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4a^2d}$$
$$+\frac{\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2ad}$$
$$-\frac{\left(b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{8a\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{\left(\left(4+\frac{3b^2}{a^2}\right)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{\sec(c+dx)}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{8\sqrt{a+b\cos(c+dx)}}$$

$$= \frac{3b\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{4a^2d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4ad\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{\left(4+\frac{3b^2}{a^2}\right)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4d\sqrt{a+b\cos(c+dx)}}$$
$$-\frac{3b\sqrt{a+b\cos(c+dx)}\tan(c+dx)}{4a^2d} + \frac{\sqrt{a+b\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{2ad}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.37 (sec) , antiderivative size = 518, normalized size of antiderivative = 1.93

$$\int \frac{\sec^3(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$
$$= \frac{\frac{8ab\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}} + \frac{2(8a^2+9b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}} - \frac{6ib^2\sqrt{\frac{b-b\cos(c+dx)}{a+b}}\sqrt{-\frac{b+b\cos(c}{a-b}}}{}}{}$$
$$+\frac{\sqrt{a+b\cos(c+dx)}\left(-\frac{3b\tan(c+dx)}{4a^2}+\frac{\sec(c+dx)\tan(c+dx)}{2a}\right)}{d}$$

[In] Integrate[Sec[c + d*x]^3/Sqrt[a + b*Cos[c + d*x]],x]

[Out] ((8*a*b*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/Sqrt[a + b*Cos[c + d*x]] + (2*(8*a^2 + 9*b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(a + b)])/Sqrt[a + b*Cos[c + d*x]] - ((6*I)*b^2*Sqrt[(b - b*Cos[c + d*x])/(a + b)]*Sqrt[-((b + b*Cos[c + d*x])/(a - b))]*Cos[2*(c + d*x)]*(2*a*(a - b)*EllipticE[I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)] + b*(2*a*EllipticF[I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)] - b*EllipticPi[(a + b)/a, I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)]))*Sin[c + d*x])/(a*Sqrt[-(a + b)^(-1)]*Sqrt[1 - Cos[c + d*x]^2]*Sqrt[-((a^2 - b^2 - 2*a*(a + b*Cos[c + d*x]) + (a + b*Cos[c + d*x])^2)/b^2)]*(2*a^2 - b^2 - 4*a*(a + b*Cos[c + d*x]) + 2*(a + b*Cos[c + d*x])^2)))/(16*a^2*d) + (Sqrt[a + b*Cos[c + d*x]]*((-3*b*Tan[c + d*x])/(4*a^2) + (Sec[c + d*x]*Tan[c + d*x])/(2*a)))/d

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 709 vs. $2(329) = 658$.

Time = 3.67 (sec) , antiderivative size = 710, normalized size of antiderivative = 2.65

method	result
default	$-\frac{\sqrt{-\left(-2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-a+b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+(a+b)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}}{a\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)^2}+\frac{3b\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\right.}}{2a^2\left(2\left(c\right.\right.}\right.}{}$

[In] int(sec(d*x+c)^3/(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)

[Out] -(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-cos(1/2*d*x+1/2*c)/a*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^2-1)^2+3/2*b/a^2*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^2-1)-1/4*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))+3/4/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*b*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-3/4*b^2/a^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))-3/4/a^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/

```
2)*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))*b^2)/sin(1/2*d*x+1/2
*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\sec^3(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^3/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \frac{\sec^3(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sec^3{(c+dx)}}{\sqrt{a+b\cos{(c+dx)}}}\,dx$$

```
[In] integrate(sec(d*x+c)**3/(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(sec(c + d*x)**3/sqrt(a + b*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{\sec^3(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sec(dx+c)^3}{\sqrt{b\cos(dx+c)+a}}\,dx$$

```
[In] integrate(sec(d*x+c)^3/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^3/sqrt(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\sec^3(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sec(dx+c)^3}{\sqrt{b\cos(dx+c)+a}}\,dx$$

```
[In] integrate(sec(d*x+c)^3/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^3/sqrt(b*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^3(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\cos(c+d\,x)^3\,\sqrt{a+b\,\cos(c+d\,x)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^3*(a + b*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^3*(a + b*cos(c + d*x))^(1/2)), x)
```

3.530 $\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 326

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2(16a^4-8a^2b^2-3b^4)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{5b^4(a^2-b^2)\,d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$
$$-\frac{8a(4a^2+b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{5b^4d\sqrt{a+b\cos(c+dx)}}$$
$$-\frac{2a^2\cos^2(c+dx)\sin(c+dx)}{b(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}-\frac{2a(8a^2-3b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5b^3(a^2-b^2)\,d}$$
$$+\frac{2(6a^2-b^2)\cos(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5b^2(a^2-b^2)\,d}$$

```
[Out] -2*a^2*cos(d*x+c)^2*sin(d*x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))^(1/2)-2/5*a*(
8*a^2-3*b^2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/b^3/(a^2-b^2)/d+2/5*(6*a^2-b
^2)*cos(d*x+c)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/b^2/(a^2-b^2)/d+2/5*(16*a^
4-8*a^2*b^2-3*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elliptic
E(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/b^4/(a
^2-b^2)/d/((a+b*cos(d*x+c))/(a+b))^(1/2)-8/5*a*(4*a^2+b^2)*(cos(1/2*d*x+1/2
*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+
b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/b^4/d/(a+b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.60 (sec) , antiderivative size = 326, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2871, 3128, 3102, 2831, 2742, 2740, 2734, 2732}

$$\begin{aligned}\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = &-\frac{2a^2\sin(c+dx)\cos^2(c+dx)}{bd\,(a^2-b^2)\sqrt{a+b\cos(c+dx)}}\\&+\frac{2(6a^2-b^2)\sin(c+dx)\cos(c+dx)\sqrt{a+b\cos(c+dx)}}{5b^2d\,(a^2-b^2)}\\&-\frac{8a(4a^2+b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{5b^4d\sqrt{a+b\cos(c+dx)}}\\&-\frac{2a(8a^2-3b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{5b^3d\,(a^2-b^2)}\\&+\frac{2(16a^4-8a^2b^2-3b^4)\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{5b^4d\,(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\end{aligned}$$

```
[In] Int[Cos[c + d*x]^4/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*(16*a^4 - 8*a^2*b^2 - 3*b^4)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x
)/2, (2*b)/(a + b)])/(5*b^4*(a^2 - b^2)*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)
]) - (8*a*(4*a^2 + b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d
*x)/2, (2*b)/(a + b)])/(5*b^4*d*Sqrt[a + b*Cos[c + d*x]]) - (2*a^2*Cos[c +
d*x]^2*Sin[c + d*x])/(b*(a^2 - b^2)*d*Sqrt[a + b*Cos[c + d*x]]) - (2*a*(8*a
^2 - 3*b^2)*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(5*b^3*(a^2 - b^2)*d) +
(2*(6*a^2 - b^2)*Cos[c + d*x]*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(5*b^2
*(a^2 - b^2)*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
```

```
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rule 3128

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*sin[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_
.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n + 2))), x] + Dist[1/(d*(m +
n + 2)), Int[(a + b*Sin[e + f*x])^(m - 1)*(c + d*Sin[e + f*x])^n*Simp[a*A*d
```

```
*(m + n + 2) + C*(b*c*m + a*d*(n + 1)) + (d*(A*b + a*B)*(m + n + 2) - C*(a*
c - b*d*(m + n + 1)))*Sin[e + f*x] + (C*(a*d*m - b*c*(m + 1)) + b*B*d*(m +
n + 2))*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n},
 x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m
, 0] &&  !(IGtQ[n, 0] && ( !IntegerQ[m] || (EqQ[a, 0] && NeQ[c, 0])))
```

Rubi steps

integral

$$= -\frac{2a^2\cos^2(c+dx)\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} - \frac{2\int \frac{\cos(c+dx)\left(2a^2-\frac{1}{2}ab\cos(c+dx)-\frac{1}{2}(6a^2-b^2)\cos^2(c+dx)\right)}{\sqrt{a+b\cos(c+dx)}}\,dx}{b(a^2-b^2)}$$

$$= -\frac{2a^2\cos^2(c+dx)\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} + \frac{2(6a^2-b^2)\cos(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5b^2(a^2-b^2)d} - \frac{4\int \frac{-\frac{1}{2}a(6a^2-b^2)+\frac{1}{4}b(2a^2+3b^2)\cos(c+dx)+\frac{3}{4}a(8a^2-3b^2)\cos^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{5b^2(a^2-b^2)}$$

$$= -\frac{2a^2\cos^2(c+dx)\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} - \frac{2a(8a^2-3b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5b^3(a^2-b^2)d} + \frac{2(6a^2-b^2)\cos(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5b^2(a^2-b^2)d} - \frac{8\int \frac{-\frac{3}{8}ab(4a^2+b^2)-\frac{3}{8}(16a^4-8a^2b^2-3b^4)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{15b^3(a^2-b^2)}$$

$$= -\frac{2a^2\cos^2(c+dx)\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} - \frac{2a(8a^2-3b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5b^3(a^2-b^2)d} + \frac{2(6a^2-b^2)\cos(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5b^2(a^2-b^2)d} - \frac{(4a(4a^2+b^2))\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{5b^4} + \frac{(16a^4-8a^2b^2-3b^4)\int \sqrt{a+b\cos(c+dx)}\,dx}{5b^4(a^2-b^2)}$$

$$= -\frac{2a^2\cos^2(c+dx)\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} - \frac{2a(8a^2-3b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5b^3(a^2-b^2)d} + \frac{2(6a^2-b^2)\cos(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5b^2(a^2-b^2)d} + \frac{\left((16a^4-8a^2b^2-3b^4)\sqrt{a+b\cos(c+dx)}\right)\int \sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{5b^4(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{\left(4a(4a^2+b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{5b^4\sqrt{a+b\cos(c+dx)}}$$

$$= \frac{2(16a^4 - 8a^2b^2 - 3b^4)\sqrt{a + b\cos(c + dx)}E\left(\frac{1}{2}(c + dx)|\frac{2b}{a+b}\right)}{5b^4(a^2 - b^2)d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$
$$- \frac{8a(4a^2 + b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\text{EllipticF}\left(\frac{1}{2}(c + dx), \frac{2b}{a+b}\right)}{5b^4d\sqrt{a + b\cos(c + dx)}}$$
$$- \frac{2a^2\cos^2(c + dx)\sin(c + dx)}{b(a^2 - b^2)d\sqrt{a + b\cos(c + dx)}} - \frac{2a(8a^2 - 3b^2)\sqrt{a + b\cos(c + dx)}\sin(c + dx)}{5b^3(a^2 - b^2)d}$$
$$+ \frac{2(6a^2 - b^2)\cos(c + dx)\sqrt{a + b\cos(c + dx)}\sin(c + dx)}{5b^2(a^2 - b^2)d}$$

Mathematica [A] (verified)

Time = 1.03 (sec) , antiderivative size = 242, normalized size of antiderivative = 0.74

$$\int \frac{\cos^4(c + dx)}{(a + b\cos(c + dx))^{3/2}}\,dx = \frac{2(16a^5 + 16a^4b - 8a^3b^2 - 8a^2b^3 - 3ab^4 - 3b^5)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}E\left(\frac{1}{2}(c + dx)|\frac{2b}{a+b}\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^4/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*(16*a^5 + 16*a^4*b - 8*a^3*b^2 - 8*a^2*b^3 - 3*a*b^4 - 3*b^5)*Sqrt[(a +
b*Cos[c + d*x])/(a + b)]*EllipticE[(c + d*x)/2, (2*b)/(a + b)] - 8*a*(4*a^4
 - 3*a^2*b^2 - b^4)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/
2, (2*b)/(a + b)] - b*(16*a^4 - 7*a^2*b^2 + b^4 + 4*a*b*(a^2 - b^2)*Cos[c +
 d*x] + (-(a^2*b^2) + b^4)*Cos[2*(c + d*x)])*Sin[c + d*x])/(5*(a - b)*b^4*(
a + b)*d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1284 vs. 2(362) = 724.

Time = 6.16 (sec) , antiderivative size = 1285, normalized size of antiderivative = 3.94

method	result	size
default	Expression too large to display	1285

```
[In] int(cos(d*x+c)^4/(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/5*(-8*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*b^3*(
a^2-b^2)*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6-8*(-2*sin(1/2*d*x+1/2*c)^4
*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*b^2*(a^3-a^2*b-a*b^2+b^3)*sin(1/2*d*x+
1/2*c)^4*cos(1/2*d*x+1/2*c)+2*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+
1/2*c)^2)^(1/2)*b*(8*a^4+2*a^3*b-4*a^2*b^2-2*a*b^3+b^4)*sin(1/2*d*x+1/2*c)^
2*cos(1/2*d*x+1/2*c)-16*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)
```

```
^2)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+
b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^5+12*(-2
*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2*
c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(c
os(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^3*b^2+4*(-2*sin(1/2*d*x+1/2*c)^4*b+
(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*
sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/
(a-b))^(1/2))*a*b^4+16*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^
2)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b
)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^5-16*(-2*
sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2*c
)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(co
s(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^4*b-8*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+
b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin
(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-
b))^(1/2))*a^3*b^2+8*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)
^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/
(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2*b^3-3*(-2
*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2*
c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(c
os(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^4+3*(-2*sin(1/2*d*x+1/2*c)^4*b+(a
+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*si
n(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a
-b))^(1/2))*b^5)/b^4/(a-b)/(a+b)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d
*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)
/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.16 (sec) , antiderivative size = 687, normalized size of antiderivative = 2.11

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = -\frac{6\left(8\,a^4b^2-3\,a^2b^4-(a^2b^4-b^6)\cos{(dx+c)}^2+2\,(a^3b^3-ab^5)\cos{(dx+c)}\right)\sqrt{b\cos{(dx+c)}+a}\sin{(dx+c)}}{}$$

```
[In] integrate(cos(d*x+c)^4/(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] -1/15*(6*(8*a^4*b^2 - 3*a^2*b^4 - (a^2*b^4 - b^6)*cos(d*x + c)^2 + 2*(a^3*b
^3 - a*b^5)*cos(d*x + c))*sqrt(b*cos(d*x + c) + a)*sin(d*x + c) + (sqrt(2)*
(-32*I*a^5*b + 28*I*a^3*b^3 + 9*I*a*b^5)*cos(d*x + c) + sqrt(2)*(-32*I*a^6
+ 28*I*a^4*b^2 + 9*I*a^2*b^4))*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b
^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x
```

```
+ c) + 2*a)/b) + (sqrt(2)*(32*I*a^5*b - 28*I*a^3*b^3 - 9*I*a*b^5)*cos(d*x
+ c) + sqrt(2)*(32*I*a^6 - 28*I*a^4*b^2 - 9*I*a^2*b^4))*sqrt(b)*weierstrass
PInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos
(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b) - 3*(sqrt(2)*(16*I*a^4*b^2 - 8*I*a
^2*b^4 - 3*I*b^6)*cos(d*x + c) + sqrt(2)*(16*I*a^5*b - 8*I*a^3*b^3 - 3*I*a*
b^5))*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b
^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^
2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b)) - 3*(sqrt(2)*
(-16*I*a^4*b^2 + 8*I*a^2*b^4 + 3*I*b^6)*cos(d*x + c) + sqrt(2)*(-16*I*a^5*b
 + 8*I*a^3*b^3 + 3*I*a*b^5))*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^
2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2
, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) +
 2*a)/b)))/((a^2*b^6 - b^8)*d*cos(d*x + c) + (a^3*b^5 - a*b^7)*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**4/(a+b*cos(d*x+c))**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos\left(dx+c\right)^4}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^4/(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^4/(b*cos(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos\left(dx+c\right)^4}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^4/(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^4/(b*cos(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)^4}{\left(a+b\,\cos\left(c+d\,x\right)\right)^{3/2}}\,dx$$

```
[In] int(cos(c + d*x)^4/(a + b*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)^4/(a + b*cos(c + d*x))^(3/2), x)
```

3.531 $\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 257

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = -\frac{2a(8a^2-5b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3b^3(a^2-b^2)\,d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2(8a^2+b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3b^3d\sqrt{a+b\cos(c+dx)}} - \frac{2a^2\cos(c+dx)\sin(c+dx)}{b(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}} + \frac{2(4a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3b^2(a^2-b^2)\,d}$$

```
[Out] -2*a^2*cos(d*x+c)*sin(d*x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))^(1/2)+2/3*(4*a^
2-b^2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/b^2/(a^2-b^2)/d-2/3*a*(8*a^2-5*b^2
)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2
*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/b^3/(a^2-b^2)/d/((a+b*c
os(d*x+c))/(a+b))^(1/2)+2/3*(8*a^2+b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/
2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*co
s(d*x+c))/(a+b))^(1/2)/b^3/d/(a+b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 257, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used

$= \{2871, 3102, 2831, 2742, 2740, 2734, 2732\}$

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = -\frac{2a^2\sin(c+dx)\cos(c+dx)}{bd\,(a^2-b^2)\,\sqrt{a+b\cos(c+dx)}} + \frac{2(4a^2-b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{3b^2d\,(a^2-b^2)} + \frac{2(8a^2+b^2)\,\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3b^3d\sqrt{a+b\cos(c+dx)}} - \frac{2a(8a^2-5b^2)\,\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3b^3d\,(a^2-b^2)\,\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[In] Int[Cos[c + d*x]^3/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-2*a*(8*a^2 - 5*b^2)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)
/(a + b)])/(3*b^3*(a^2 - b^2)*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) + (2*(8
*a^2 + b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)
/(a + b)])/(3*b^3*d*Sqrt[a + b*Cos[c + d*x]]) - (2*a^2*Cos[c + d*x]*Sin[c +
 d*x])/(b*(a^2 - b^2)*d*Sqrt[a + b*Cos[c + d*x]]) + (2*(4*a^2 - b^2)*Sqrt[a
 + b*Cos[c + d*x]]*Sin[c + d*x])/(3*b^2*(a^2 - b^2)*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
```

```
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{2a^2\cos(c+dx)\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}}-\frac{2\int\frac{a^2-\frac{1}{2}ab\cos(c+dx)-\frac{1}{2}(4a^2-b^2)\cos^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{b(a^2-b^2)} \\
&= -\frac{2a^2\cos(c+dx)\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}}+\frac{2(4a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3b^2(a^2-b^2)d} \\
&\quad -\frac{4\int\frac{\frac{1}{4}b(2a^2+b^2)+\frac{1}{4}a(8a^2-5b^2)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{3b^2(a^2-b^2)}
\end{aligned}$$

$$= -\frac{2a^2\cos(c+dx)\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} + \frac{2(4a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3b^2(a^2-b^2)d} - \frac{(a(8a^2-5b^2))\int\sqrt{a+b\cos(c+dx)}\,dx}{3b^3(a^2-b^2)} + \frac{(8a^2+b^2)\int\frac{1}{\sqrt{a+b\cos(c+dx)}}dx}{3b^3}$$

$$= -\frac{2a^2\cos(c+dx)\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} + \frac{2(4a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3b^2(a^2-b^2)d} - \frac{\left(a(8a^2-5b^2)\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}dx}{3b^3(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{\left((8a^2+b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}dx}{3b^3\sqrt{a+b\cos(c+dx)}}$$

$$= -\frac{2a(8a^2-5b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{3b^3(a^2-b^2)d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2(8a^2+b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3b^3d\sqrt{a+b\cos(c+dx)}} - \frac{2a^2\cos(c+dx)\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} + \frac{2(4a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3b^2(a^2-b^2)d}$$

Mathematica [A] (verified)

Time = 0.74 (sec) , antiderivative size = 197, normalized size of antiderivative = 0.77

$$\int\frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^{3/2}}dx = \frac{-2a(8a^3+8a^2b-5ab^2-5b^3)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)+2(8a^4-7a^2b^2\cdots}{3(a-\cdots}$$

```
[In] Integrate[Cos[c + d*x]^3/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-2*a*(8*a^3 + 8*a^2*b - 5*a*b^2 - 5*b^3)*Sqrt[(a + b*Cos[c + d*x])/(a + b)
]*EllipticE[(c + d*x)/2, (2*b)/(a + b)] + 2*(8*a^4 - 7*a^2*b^2 - b^4)*Sqrt[
(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)] - 2*b*(
-4*a^3 + a*b^2 + (-(a^2*b) + b^3)*Cos[c + d*x])*Sin[c + d*x])/(3*(a - b)*b^
3*(a + b)*d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 742 vs. $2(297) = 594$.

Time = 5.74 (sec) , antiderivative size = 743, normalized size of antiderivative = 2.89

method	result
default	$-\frac{2\left(4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a^2b^2-4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^4-8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a^3b-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\right.\right.}{}$

```
[In] int(cos(d*x+c)^3/(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*(4*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4*a^2*b^2-4*cos(1/2*d*x+1/2*c
)*sin(1/2*d*x+1/2*c)^4*b^4-8*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*a^3*b-
2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*a^2*b^2+2*cos(1/2*d*x+1/2*c)*sin(
1/2*d*x+1/2*c)^2*a*b^3+2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*b^4+8*(sin
(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2
)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^4-7*(sin(1/2*d*x+1/2*c
)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(co
s(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2*b^2-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(
-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/
2*c),(-2*b/(a-b))^(1/2))*b^4-8*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin
(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-
b))^(1/2))*a^4+8*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c
)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^3
*b+5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a
-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2*b^2-5*(sin(
1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)
*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^3)/b^3/(a-b)/(a+b)/si
n(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.15 (sec) , antiderivative size = 630, normalized size of antiderivative = 2.45

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{6\left(4a^3b^2-ab^4+(a^2b^3-b^5)\cos(dx+c)\right)\sqrt{b\cos(dx+c)+a}\sin(dx+c)-(}{}$$

```
[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/9*(6*(4*a^3*b^2 - a*b^4 + (a^2*b^3 - b^5)*cos(d*x + c))*sqrt(b*cos(d*x +
c) + a)*sin(d*x + c) - (sqrt(2)*(16*I*a^4*b - 16*I*a^2*b^3 - 3*I*b^5)*cos(d
*x + c) + sqrt(2)*(16*I*a^5 - 16*I*a^3*b^2 - 3*I*a*b^4))*sqrt(b)*weierstras
```

```
sPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*co
s(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b) - (sqrt(2)*(-16*I*a^4*b + 16*I*a^
2*b^3 + 3*I*b^5)*cos(d*x + c) + sqrt(2)*(-16*I*a^5 + 16*I*a^3*b^2 + 3*I*a*b
^4))*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*
a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b) + 3*(sqrt(
2)*(-8*I*a^3*b^2 + 5*I*a*b^4)*cos(d*x + c) + sqrt(2)*(-8*I*a^4*b + 5*I*a^2*
b^3))*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b
^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^
2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b)) + 3*(sqrt(2)*
(8*I*a^3*b^2 - 5*I*a*b^4)*cos(d*x + c) + sqrt(2)*(8*I*a^4*b - 5*I*a^2*b^3))
*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b
^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^
3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b)))/((a^2*b^5 - b^7)*
d*cos(d*x + c) + (a^3*b^4 - a*b^6)*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3/(a+b*cos(d*x+c))**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos\left(dx+c\right)^3}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^3/(b*cos(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos\left(dx+c\right)^3}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^3/(b*cos(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)^3}{\left(a+b\,\cos\left(c+d\,x\right)\right)^{3/2}}\,dx$$

```
[In] int(cos(c + d*x)^3/(a + b*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)^3/(a + b*cos(c + d*x))^(3/2), x)
```

3.532 $\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 186

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2(2a^2-b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{b^2(a^2-b^2)\,d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{4a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{b^2d\sqrt{a+b\cos(c+dx)}} - \frac{2a^2\sin(c+dx)}{b(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] -2*a^2*sin(d*x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))^(1/2)+2*(2*a^2-b^2)*(cos(1
/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1
/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/b^2/(a^2-b^2)/d/((a+b*cos(d*x+c
))/(a+b))^(1/2)-4*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipti
cF(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/
2)/b^2/d/(a+b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 186, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2869, 2831, 2742, 2740, 2734, 2732}

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = -\frac{2a^2\sin(c+dx)}{bd(a^2-b^2)\sqrt{a+b\cos(c+dx)}} + \frac{2(2a^2-b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{b^2d(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{4a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{b^2d\sqrt{a+b\cos(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^2/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*(2*a^2 - b^2)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a +
 b)])/(b^2*(a^2 - b^2)*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) - (4*a*Sqrt[(a
 + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(b^2*d*S
qrt[a + b*Cos[c + d*x]]) - (2*a^2*Sin[c + d*x])/(b*(a^2 - b^2)*d*Sqrt[a + b
*Cos[c + d*x]])
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2869

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^2, x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Cos[e
+ f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*(a^2 - b^2))), x] - Dist[
1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[b*(m + 1)*
(2*b*c*d - a*(c^2 + d^2)) + (a^2*d^2 - 2*a*b*c*d*(m + 2) + b^2*(d^2*(m + 1)
```

```
 + c^2*(m + 2)))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &
& NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{2a^2\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}}+\frac{2\int\frac{\frac{ab}{2}+\frac{1}{2}(2a^2-b^2)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{b(a^2-b^2)}\\
&= -\frac{2a^2\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}}-\frac{(2a)\int\frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{b^2}\\
&\quad+\frac{(2a^2-b^2)\int\sqrt{a+b\cos(c+dx)}\,dx}{b^2(a^2-b^2)}\\
&= -\frac{2a^2\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}}\\
&\quad+\frac{\left((2a^2-b^2)\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{b^2(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\\
&\quad-\frac{\left(2a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{b^2\sqrt{a+b\cos(c+dx)}}\\
&= \frac{2(2a^2-b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{b^2(a^2-b^2)d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\\
&\quad-\frac{4a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{b^2d\sqrt{a+b\cos(c+dx)}}-\frac{2a^2\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.59 (sec) , antiderivative size = 159, normalized size of antiderivative = 0.85

$$\int\frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx=\frac{2(2a^3+2a^2b-ab^2-b^3)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)-2a\left(2(a^2-b^2)\sqrt{\frac{a-}{}}\right.}{(a-b)b^2(a+b)d\sqrt{a+b\cos(c}}$$

```
[In] Integrate[Cos[c + d*x]^2/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*(2*a^3 + 2*a^2*b - a*b^2 - b^3)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*Ellip
ticE[(c + d*x)/2, (2*b)/(a + b)] - 2*a*(2*(a^2 - b^2)*Sqrt[(a + b*Cos[c + d
*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)] + a*b*Sin[c + d*x]))/((
a - b)*b^2*(a + b)*d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 529 vs. $2(234) = 468$.

Time = 5.25 (sec) , antiderivative size = 530, normalized size of antiderivative = 2.85

method	result
default	$-\frac{2\left(2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a^2b-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-\frac{2b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{a-b}+\frac{a+b}{a-b}}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{-\frac{2b}{a-b}}\right)a^3+2a\,b^2\sqrt{\frac{1}{2}-\frac{\cos(d}{2}}\right.}{}$

[In] int(cos(d*x+c)^2/(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)

[Out] -2*(2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*a^2*b-2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1 /2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^3+2*a*b^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)* (-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1 /2*c),(-2*b/(a-b))^(1/2))+2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/ 2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b)) ^(1/2))*a^3-2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2 +(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2*b- (sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^ (1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a*b^2+(sin(1/2*d*x+1 /2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*Elliptic E(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*b^3)/b^2/(a-b)/(a+b)/sin(1/2*d*x+1 /2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.13 (sec) , antiderivative size = 567, normalized size of antiderivative = 3.05

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx =$$
$$-\frac{6\sqrt{b\cos(dx+c)+a}a^2b^2\sin(dx+c)+\left(\sqrt{2}(-4i\,a^3b+5i\,ab^3)\cos(dx+c)+\sqrt{2}(-4i\,a^4+5i\,a^2b^2)\right)\sqrt{b}\mathrm{we}}{}$$

[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")

[Out] -1/3*(6*sqrt(b*cos(d*x + c) + a)*a^2*b^2*sin(d*x + c) + (sqrt(2)*(-4*I*a^3* b + 5*I*a*b^3)*cos(d*x + c) + sqrt(2)*(-4*I*a^4 + 5*I*a^2*b^2))*sqrt(b)*wei erstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3* (3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b) + (sqrt(2)*(4*I*a^3*b - 5* I*a*b^3)*cos(d*x + c) + sqrt(2)*(4*I*a^4 - 5*I*a^2*b^2))*sqrt(b)*weierstras

```
sPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*co
s(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b) - 3*(sqrt(2)*(2*I*a^2*b^2 - I*b^4
)*cos(d*x + c) + sqrt(2)*(2*I*a^3*b - I*a*b^3))*sqrt(b)*weierstrassZeta(4/3
*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*
(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3
*I*b*sin(d*x + c) + 2*a)/b)) - 3*(sqrt(2)*(-2*I*a^2*b^2 + I*b^4)*cos(d*x +
c) + sqrt(2)*(-2*I*a^3*b + I*a*b^3))*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3
*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*
b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*
x + c) + 2*a)/b)))/((a^2*b^4 - b^6)*d*cos(d*x + c) + (a^3*b^3 - a*b^5)*d)
```

Sympy [F]

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos^2{(c+dx)}}{(a+b\cos{(c+dx)})^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)**2/(a+b*cos(d*x+c))**(3/2),x)
[Out] Integral(cos(c + d*x)**2/(a + b*cos(c + d*x))**(3/2), x)
```

Maxima [F]

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos(dx+c)^2}{(b\cos(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^2/(b*cos(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos(dx+c)^2}{(b\cos(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^2/(b*cos(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)^2}{\left(a+b\,\cos\left(c+d\,x\right)\right)^{3/2}}\,dx$$

```
[In] int(cos(c + d*x)^2/(a + b*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)^2/(a + b*cos(c + d*x))^(3/2), x)
```

3.533 $\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 170

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = -\frac{2a\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{b(a^2-b^2)\,d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{bd\sqrt{a+b\cos(c+dx)}} + \frac{2a\sin(c+dx)}{(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] 2*a*sin(d*x+c)/(a^2-b^2)/d/(a+b*cos(d*x+c))^(1/2)-2*a*(cos(1/2*d*x+1/2*c)^2
)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(
1/2))*(a+b*cos(d*x+c))^(1/2)/b/(a^2-b^2)/d/((a+b*cos(d*x+c))/(a+b))^(1/2)+2
*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*
c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/b/d/(a+b*cos(d*x
+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2833, 2831, 2742, 2740, 2734, 2732}

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2a\sin(c+dx)}{d(a^2-b^2)\sqrt{a+b\cos(c+dx)}} - \frac{2a\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{bd(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{bd\sqrt{a+b\cos(c+dx)}}$$

```
[In] Int[Cos[c + d*x]/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-2*a*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(b*(a
^2 - b^2)*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) + (2*Sqrt[(a + b*Cos[c + d*
x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(b*d*Sqrt[a + b*Cos[c +
 d*x]]) + (2*a*Sin[c + d*x])/((a^2 - b^2)*d*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2833

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((a + b*Sin[e +
 f*x])^(m + 1)/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(a^2 - b^2)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[(a*c - b*d)*(m + 1) - (b*c - a*d)*(m
 + 2)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c -
```

```
a*d, 0] && NeQ[a^2 - b^2, 0] && LtQ[m, -1] && IntegerQ[2*m]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{2a\sin(c+dx)}{(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}-\frac{2\int\frac{\frac{b}{2}+\frac{1}{2}a\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{a^2-b^2}\\
&= \frac{2a\sin(c+dx)}{(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}+\frac{\int\frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{b}-\frac{a\int\sqrt{a+b\cos(c+dx)}\,dx}{b\,(a^2-b^2)}\\
&= \frac{2a\sin(c+dx)}{(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}-\frac{\left(a\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{b\,(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\\
&\quad+\frac{\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{b\sqrt{a+b\cos(c+dx)}}\\
&= -\frac{2a\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{b\,(a^2-b^2)\,d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\\
&\quad+\frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{bd\sqrt{a+b\cos(c+dx)}}+\frac{2a\sin(c+dx)}{(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.42 (sec) , antiderivative size = 137, normalized size of antiderivative = 0.81

$$
\int\frac{\cos(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx=\frac{-2a(a+b)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)+2(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{Elliptic}}{(a-b)b(a+b)d\sqrt{a+b\cos(c+dx)}}
$$

```
[In] Integrate[Cos[c + d*x]/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-2*a*(a + b)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticE[(c + d*x)/2, (2*
b)/(a + b)] + 2*(a^2 - b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c
 + d*x)/2, (2*b)/(a + b)] + 2*a*b*Sin[c + d*x])/((a - b)*b*(a + b)*d*Sqrt[a
 + b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 3.54 (sec) , antiderivative size = 373, normalized size of antiderivative = 2.19

method	result
default	$\frac{4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)ab-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-\frac{2b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{a-b}+\frac{a+b}{a-b}}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{-\frac{2b}{a-b}}\right)a^2+2b^2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-}}{}$

[In] int(cos(d*x+c)/(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)

[Out] 2*(2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*a*b-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2+b^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a^2-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*b*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a)/b/(a-b)/(a+b)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 527, normalized size of antiderivative = 3.10

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{6\sqrt{b\cos(dx+c)+a}\,ab^2\sin(dx+c)-\left(\sqrt{2}(2i\,a^2b-3i\,b^3)\cos(dx+c)+\sqrt{2}\right.}{}$$

[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")

[Out] 1/3*(6*sqrt(b*cos(d*x + c) + a)*a*b^2*sin(d*x + c) - (sqrt(2)*(2*I*a^2*b - 3*I*b^3)*cos(d*x + c) + sqrt(2)*(2*I*a^3 - 3*I*a*b^2))*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b) - (sqrt(2)*(-2*I*a^2*b + 3*I*b^3)*cos(d*x + c) + sqrt(2)*(-2*I*a^3 + 3*I*a*b^2))*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b) + 3*(-I*sqrt(2)*a*b^2*cos(d*x + c) - I*sqrt(2)*a^2*b)*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b)) + 3*(I*sqrt(2)*a*b^2*cos(d*x + c) + I*sqrt(2)*a^2*b)*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b)))/((a^2*b^3 - b^5)*d*cos(d*x + c) + (a^3*b^2 - a*b^4)*d)

Sympy [F]

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))**(3/2),x)
[Out] Integral(cos(c + d*x)/(a + b*cos(c + d*x))**(3/2), x)
```

Maxima [F]

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos(dx+c)}{(b\cos(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)/(b*cos(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos(dx+c)}{(b\cos(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)/(b*cos(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos(c+d\,x)}{(a+b\,\cos(c+d\,x))^{3/2}}\,dx$$

```
[In] int(cos(c + d*x)/(a + b*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)/(a + b*cos(c + d*x))^(3/2), x)
```

3.534 $\int \frac{1}{(a+b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 106

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{(a^2-b^2)\,d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2b\sin(c+dx)}{(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] -2*b*sin(d*x+c)/(a^2-b^2)/d/(a+b*cos(d*x+c))^(1/2)+2*(cos(1/2*d*x+1/2*c)^2)
^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1
/2))*(a+b*cos(d*x+c))^(1/2)/(a^2-b^2)/d/((a+b*cos(d*x+c))/(a+b))^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2743, 21, 2734, 2732}

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\,(a^2-b^2)\,\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2b\sin(c+dx)}{d\,(a^2-b^2)\,\sqrt{a+b\cos(c+dx)}}$$

```
[In] Int[(a + b*Cos[c + d*x])^(-3/2),x]
```

```
[Out] (2*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/((a^2 -
b^2)*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) - (2*b*Sin[c + d*x])/((a^2 - b^2
)*d*Sqrt[a + b*Cos[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2743

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos
[c + d*x]*((a + b*Sin[c + d*x])^(n + 1)/(d*(n + 1)*(a^2 - b^2))), x] + Dist
[1/((n + 1)*(a^2 - b^2)), Int[(a + b*Sin[c + d*x])^(n + 1)*Simp[a*(n + 1) -
 b*(n + 2)*Sin[c + d*x], x], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{2b\sin(c+dx)}{(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}-\frac{2\int\frac{-\frac{a}{2}-\frac{1}{2}b\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{a^2-b^2}\\
&= -\frac{2b\sin(c+dx)}{(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}+\frac{\int\sqrt{a+b\cos(c+dx)}\,dx}{a^2-b^2}\\
&= -\frac{2b\sin(c+dx)}{(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}+\frac{\sqrt{a+b\cos(c+dx)}\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\\
&= \frac{2\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{(a^2-b^2)\,d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}-\frac{2b\sin(c+dx)}{(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.78

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2(a+b)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)-2b\sin(c+dx)}{(a-b)(a+b)d\sqrt{a+b\cos(c+dx)}}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(-3/2),x]
```

```
[Out] (2*(a + b)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticE[(c + d*x)/2, (2*b)/
(a + b)] - 2*b*Sin[c + d*x])/((a - b)*(a + b)*d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 3.01 (sec) , antiderivative size = 217, normalized size of antiderivative = 2.05

method	result
default	$-\frac{2\left(2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{-\frac{2b}{a-b}}\right)\sqrt{-\frac{2b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{a-b}+\frac{a+b}{a-b}}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,a-E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{-\right.\right.}{(a-b)(a+b)\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b}\,d}$

```
[In] int(1/(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2*(2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*b+EllipticE(cos(1/2*d*x+1/2*c
),(-2*b/(a-b))^(1/2))*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(
sin(1/2*d*x+1/2*c)^2)^(1/2)*a-EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/
2))*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2*d*x+1/2*c)
^2)^(1/2)*b)/(a-b)/(a+b)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)
^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 482, normalized size of antiderivative = 4.55

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}}\,dx =$$

$$-\frac{6\sqrt{b\cos(dx+c)+a}\,b^2\sin(dx+c)+\left(i\sqrt{2}ab\cos(dx+c)+i\sqrt{2}a^2\right)\sqrt{b}\,\text{weierstrassPInverse}\left(\frac{4\left(4a^2-3b^2\right)}{3b^2},\right.}{}$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] -1/3*(6*sqrt(b*cos(d*x + c) + a)*b^2*sin(d*x + c) + (I*sqrt(2)*a*b*cos(d*x
+ c) + I*sqrt(2)*a^2)*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2,
-8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2
*a)/b) + (-I*sqrt(2)*a*b*cos(d*x + c) - I*sqrt(2)*a^2)*sqrt(b)*weierstrassP
Inverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(
d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b) - 3*(I*sqrt(2)*b^2*cos(d*x + c) + I
*sqrt(2)*a*b)*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3
 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3
- 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b)) - 3*(
-I*sqrt(2)*b^2*cos(d*x + c) - I*sqrt(2)*a*b)*sqrt(b)*weierstrassZeta(4/3*(4
*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*
a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*
b*sin(d*x + c) + 2*a)/b)))/((a^2*b^2 - b^4)*d*cos(d*x + c) + (a^3*b - a*b^3
)*d)
```

Sympy [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(a+b\cos{(c+dx)})^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))**(3/2),x)
[Out] Integral((a + b*cos(c + d*x))**(-3/2), x)
```

Maxima [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\cos{(dx+c)}+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(-3/2), x)
```

Giac [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\cos{(dx+c)}+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(-3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{{\left(a+b\,\cos\left(c+d\,x\right)\right)}^{3/2}} \,d x$$

```
[In] int(1/(a + b*cos(c + d*x))^(3/2),x)
[Out] int(1/(a + b*cos(c + d*x))^(3/2), x)
```

3.535 $\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 176

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = -\frac{2b\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{a(a^2-b^2)\,d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{ad\sqrt{a+b\cos(c+dx)}} + \frac{2b^2\sin(c+dx)}{a(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] 2*b^2*sin(d*x+c)/a/(a^2-b^2)/d/(a+b*cos(d*x+c))^(1/2)-2*b*(cos(1/2*d*x+1/2*
c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b
))^(1/2))*(a+b*cos(d*x+c))^(1/2)/a/(a^2-b^2)/d/((a+b*cos(d*x+c))/(a+b))^(1/
2)+2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x
+1/2*c),2,2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/a/d/(a+b*
cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2881, 3138, 2734, 2732, 12, 2886, 2884}

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2b^2\sin(c+dx)}{ad(a^2-b^2)\sqrt{a+b\cos(c+dx)}} - \frac{2b\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{ad(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{ad\sqrt{a+b\cos(c+dx)}}$$

```
[In] Int[Sec[c + d*x]/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-2*b*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(a*(a
^2 - b^2)*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) + (2*Sqrt[(a + b*Cos[c + d*
x])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(a + b)])/(a*d*Sqrt[a + b*Cos
[c + d*x]]) + (2*b^2*Sin[c + d*x])/(a*(a^2 - b^2)*d*Sqrt[a + b*Cos[c + d*x]
])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 2886

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(c + d*Sin[e + f*x])/(c + d)]/Sqrt
[c + d*Sin[e + f*x]], Int[1/((a + b*Sin[e + f*x])*Sqrt[c/(c + d) + (d/(c +
d))*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] &&  !GtQ[c + d, 0]
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2b^2\sin(c+dx)}{a(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}+\frac{2\int\frac{\left(\frac{1}{2}(a^2-b^2)-\frac{1}{2}ab\cos(c+dx)-\frac{1}{2}b^2\cos^2(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{a(a^2-b^2)}\\
&= \frac{2b^2\sin(c+dx)}{a(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}-\frac{2\int-\frac{b(a^2-b^2)\sec(c+dx)}{2\sqrt{a+b\cos(c+dx)}}\,dx}{ab(a^2-b^2)}-\frac{b\int\sqrt{a+b\cos(c+dx)}\,dx}{a(a^2-b^2)}\\
&= \frac{2b^2\sin(c+dx)}{a(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}+\frac{\int\frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{a}\\
&\quad-\frac{\left(b\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{a(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\\
&= -\frac{2b\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{a(a^2-b^2)\,d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\\
&\quad+\frac{2b^2\sin(c+dx)}{a(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}+\frac{\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\int\frac{\sec(c+dx)}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{a\sqrt{a+b\cos(c+dx)}}\\
&= -\frac{2b\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{a(a^2-b^2)\,d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\\
&\quad+\frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{ad\sqrt{a+b\cos(c+dx)}}+\frac{2b^2\sin(c+dx)}{a(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 3.77 (sec) , antiderivative size = 402, normalized size of antiderivative = 2.28

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{-\frac{-\frac{4ab\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}}+\frac{2\left(2a^2-3b^2\right)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}}-\frac{2\cdots}{\cdots}}{\cdots}}{\cdots}$$

[In] Integrate[Sec[c + d*x]/(a + b*Cos[c + d*x])^(3/2),x]

[Out] (-(((-4*a*b*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/Sqrt[a + b*Cos[c + d*x]] + (2*(2*a^2 - 3*b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(a + b)])/Sqrt[a + b*Cos[c + d*x]] - ((2*I)*Sqrt[-((b*(-1 + Cos[c + d*x]))/(a + b))]*Sqrt[(b*(1 + Cos[c + d*x]))/(-a + b)]*Csc[c + d*x]*(-2*a*(a - b)*EllipticE[I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)] + b*(-2*a*EllipticF[I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)] + b*EllipticPi[(a + b)/a, I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)])))/(a*Sqrt[-(a + b)^(-1)]))/((-a + b)*(a + b))) + (4*b^2*Sin[c + d*x])/((a^2 - b^2)*Sqrt[a + b*Cos[c + d*x]]))/(2*a*d)

Maple [A] (verified)

Time = 4.45 (sec) , antiderivative size = 376, normalized size of antiderivative = 2.14

method	result
default	$\frac{4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^2+2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-\frac{2b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{a-b}+\frac{a+b}{a-b}}\,\Pi\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),2,\sqrt{-\frac{2b}{a-b}}\right)a^2-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-\cdots}}{\cdots}$

[In] int(sec(d*x+c)/(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)

[Out] 2*(2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*b^2+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))*a^2-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))*b^2+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*b*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a-b^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2)))/a/(a-b)/(a+b)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d

Fricas [F(-1)]

Timed out.

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))**(3/2),x)
[Out] Integral(sec(c + d*x)/(a + b*cos(c + d*x))**(3/2), x)
```

Maxima [F]

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec(dx+c)}{(b\cos(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)/(b*cos(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec(dx+c)}{(b\cos(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)/(b*cos(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)\,\left(a+b\,\cos\left(c+d\,x\right)\right)^{3/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)*(a + b*cos(c + d*x))^(3/2)),x)
[Out] int(1/(cos(c + d*x)*(a + b*cos(c + d*x))^(3/2)), x)
```

3.536 $\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 277

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = -\frac{(a^2-3b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{a^2(a^2-b^2)\,d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$
$$+\frac{\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{ad\sqrt{a+b\cos(c+dx)}}$$
$$-\frac{3b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{a^2d\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{b(a^2-3b^2)\sin(c+dx)}{a^2(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}+\frac{\tan(c+dx)}{ad\sqrt{a+b\cos(c+dx)}}$$

```
[Out] b*(a^2-3*b^2)*sin(d*x+c)/a^2/(a^2-b^2)/d/(a+b*cos(d*x+c))^(1/2)-(a^2-3*b^2)
*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*
c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/a^2/(a^2-b^2)/d/((a+b*co
s(d*x+c))/(a+b))^(1/2)+(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elli
pticF(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^
(1/2)/a/d/(a+b*cos(d*x+c))^(1/2)-3*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d
*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2,2^(1/2)*(b/(a+b))^(1/2))*((a+b*co
s(d*x+c))/(a+b))^(1/2)/a^2/d/(a+b*cos(d*x+c))^(1/2)+tan(d*x+c)/a/d/(a+b*cos
(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 1.22 (sec) , antiderivative size = 277, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {2881, 3135, 3138, 2734, 2732, 3081, 2742, 2740, 2886, 2884}

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{b(a^2-3b^2)\sin(c+dx)}{a^2d\,(a^2-b^2)\sqrt{a+b\cos(c+dx)}} - \frac{(a^2-3b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{a^2d\,(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{3b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{a^2d\sqrt{a+b\cos(c+dx)}} + \frac{\tan(c+dx)}{ad\sqrt{a+b\cos(c+dx)}} + \frac{\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{ad\sqrt{a+b\cos(c+dx)}}$$

```
[In] Int[Sec[c + d*x]^2/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] -(((a^2 - 3*b^2)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a +
 b)])/(a^2*(a^2 - b^2)*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)])) + (Sqrt[(a +
b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(a*d*Sqrt[a
 + b*Cos[c + d*x]]) - (3*b*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[2,
 (c + d*x)/2, (2*b)/(a + b)])/(a^2*d*Sqrt[a + b*Cos[c + d*x]]) + (b*(a^2 -
3*b^2)*Sin[c + d*x])/(a^2*(a^2 - b^2)*d*Sqrt[a + b*Cos[c + d*x]]) + Tan[c +
 d*x]/(a*d*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 2886

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(c + d*Sin[e + f*x])/(c + d)]/Sqrt
[c + d*Sin[e + f*x]], Int[1/((a + b*Sin[e + f*x])*Sqrt[c/(c + d) + (d/(c +
d))*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] &&  !GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3135

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
Simp[(-(A*b^2 + a^2*C))*Cos[e + f*x]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*S
in[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2))), x] + Dist[1/((m
+ 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[
e + f*x])^n*Simp[a*(m + 1)*(b*c - a*d)*(A + C) + d*(A*b^2 + a^2*C)*(m + n +
 2) - (c*(A*b^2 + a^2*C) + b*(m + 1)*(b*c - a*d)*(A + C))*Sin[e + f*x] - d*
(A*b^2 + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d
, e, f, A, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 -
 d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||
!(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a,
0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{\tan(c+dx)}{ad\sqrt{a+b\cos(c+dx)}} + \frac{\int \frac{\left(-\frac{3b}{2}+\frac{1}{2}b\cos^2(c+dx)\right)\sec(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx}{a}$$

$$= \frac{b(a^2-3b^2)\sin(c+dx)}{a^2(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}} + \frac{\tan(c+dx)}{ad\sqrt{a+b\cos(c+dx)}} + \frac{2\int \frac{\left(-\frac{3}{4}b(a^2-b^2)+\frac{1}{2}ab^2\cos(c+dx)-\frac{1}{4}b(a^2-3b^2)\cos^2(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{a^2(a^2-b^2)}$$

$$= \frac{b(a^2-3b^2)\sin(c+dx)}{a^2(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}} + \frac{\tan(c+dx)}{ad\sqrt{a+b\cos(c+dx)}} - \frac{2\int \frac{\left(\frac{3}{4}b^2(a^2-b^2)-\frac{1}{4}ab(a^2-b^2)\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{a^2b(a^2-b^2)} - \frac{(a^2-3b^2)\int\sqrt{a+b\cos(c+dx)}\,dx}{2a^2(a^2-b^2)}$$

$$= \frac{b(a^2-3b^2)\sin(c+dx)}{a^2(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} + \frac{\tan(c+dx)}{ad\sqrt{a+b\cos(c+dx)}} + \frac{\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{2a} - \frac{(3b)\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{2a^2} - \frac{\left((a^2-3b^2)\sqrt{a+b\cos(c+dx)}\right)\int \sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{2a^2(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

$$= -\frac{(a^2-3b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{a^2(a^2-b^2)d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{b(a^2-3b^2)\sin(c+dx)}{a^2(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} + \frac{\tan(c+dx)}{ad\sqrt{a+b\cos(c+dx)}} + \frac{\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\int \frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{2a\sqrt{a+b\cos(c+dx)}} - \frac{\left(3b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{\sec(c+dx)}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{2a^2\sqrt{a+b\cos(c+dx)}}$$

$$= -\frac{(a^2-3b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{a^2(a^2-b^2)d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{ad\sqrt{a+b\cos(c+dx)}} - \frac{3b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{a^2d\sqrt{a+b\cos(c+dx)}} + \frac{b(a^2-3b^2)\sin(c+dx)}{a^2(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} + \frac{\tan(c+dx)}{ad\sqrt{a+b\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.70 (sec) , antiderivative size = 441, normalized size of antiderivative = 1.59

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = -\frac{b\left(-\frac{8ab\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}} + \frac{2(7a^2-9b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}} - \cdots\right.}{\cdots}$$

```
[In] Integrate[Sec[c + d*x]^2/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-((b*((-8*a*b*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2
*b)/(a + b)])/Sqrt[a + b*Cos[c + d*x]] + (2*(7*a^2 - 9*b^2)*Sqrt[(a + b*Cos
[c + d*x])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(a + b)])/Sqrt[a + b*C
os[c + d*x]] - ((2*I)*(a^2 - 3*b^2)*Sqrt[-((b*(-1 + Cos[c + d*x]))/(a + b))
```

```
]*Sqrt[-((b*(1 + Cos[c + d*x]))/(a - b))]*Csc[c + d*x]*(2*a*(a - b)*Ellipti
cE[I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)
] + b*(2*a*EllipticF[I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]
], (a + b)/(a - b)] - b*EllipticPi[(a + b)/a, I*ArcSinh[Sqrt[-(a + b)^(-1)]
*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)])))/(a*b^2*Sqrt[-(a + b)^(-1)])
))/((a - b)*(a + b))) + (4*(a^3 - a*b^2 + b*(a^2 - 3*b^2)*Cos[c + d*x])*Tan
[c + d*x])/((a^2 - b^2)*Sqrt[a + b*Cos[c + d*x]]))/(4*a^2*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 897 vs. $2(348) = 696$.

Time = 6.44 (sec) , antiderivative size = 898, normalized size of antiderivative = 3.24

method	result	size
default	Expression too large to display	898

```
[In] int(sec(d*x+c)^2/(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/a*(-cos(1
/2*d*x+1/2*c)/a*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2
)/(2*cos(1/2*d*x+1/2*c)^2-1)+1/2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2
*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*
x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-1/2*(sin
(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*s
in(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d
*x+1/2*c),(-2*b/(a-b))^(1/2))+1/2/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(
1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2
*d*x+1/2*c)^2)^(1/2)*b*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))+1/2
/a*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1
/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi
(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2)))+2/a^2*b*(sin(1/2*d*x+1/2*c)^2)^(
1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*
b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(
a-b))^(1/2))-2*b^2/a^2/sin(1/2*d*x+1/2*c)^2/(2*b*sin(1/2*d*x+1/2*c)^2-a-b)/
(a^2-b^2)*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*c
os(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*b+EllipticE(cos(1/2*d*x+1/2*c),(-2*b
/(a-b))^(1/2))*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2
*d*x+1/2*c)^2)^(1/2)*a-EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*(-2
*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/
2)*b))/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)**2/(a+b*cos(d*x+c))**(3/2),x)
[Out] Integral(sec(c + d*x)**2/(a + b*cos(c + d*x))**(3/2), x)
```

Maxima [F]

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec(dx+c)^2}{(b\cos(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^2/(b*cos(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec(dx+c)^2}{(b\cos(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^2/(b*cos(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^2\,\left(a+b\,\cos\left(c+d\,x\right)\right)^{3/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^2*(a + b*cos(c + d*x))^(3/2)),x)
[Out] int(1/(cos(c + d*x)^2*(a + b*cos(c + d*x))^(3/2)), x)
```

3.537 $\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 345

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{b(7a^2-15b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{4a^3(a^2-b^2)\,d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{5b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4a^2d\sqrt{a+b\cos(c+dx)}} + \frac{(4a^2+15b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4a^3d\sqrt{a+b\cos(c+dx)}} - \frac{b^2(7a^2-15b^2)\sin(c+dx)}{4a^3(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}} - \frac{5b\tan(c+dx)}{4a^2d\sqrt{a+b\cos(c+dx)}} + \frac{\sec(c+dx)\tan(c+dx)}{2ad\sqrt{a+b\cos(c+dx)}}$$

```
[Out] -1/4*b^2*(7*a^2-15*b^2)*sin(d*x+c)/a^3/(a^2-b^2)/d/(a+b*cos(d*x+c))^(1/2)+1
/4*b*(7*a^2-15*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipti
cE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/a^3/(
a^2-b^2)/d/((a+b*cos(d*x+c))/(a+b))^(1/2)-5/4*b*(cos(1/2*d*x+1/2*c)^2)^(1/2
)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*
((a+b*cos(d*x+c))/(a+b))^(1/2)/a^2/d/(a+b*cos(d*x+c))^(1/2)+1/4*(4*a^2+15*b
^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+
1/2*c),2,2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/a^3/d/(a+b
*cos(d*x+c))^(1/2)-5/4*b*tan(d*x+c)/a^2/d/(a+b*cos(d*x+c))^(1/2)+1/2*sec(d*
x+c)*tan(d*x+c)/a/d/(a+b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 1.27 (sec) , antiderivative size = 345, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {2881, 3134, 3138, 2734, 2732, 3081, 2742, 2740, 2886, 2884}

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = -\frac{5b\tan(c+dx)}{4a^2d\sqrt{a+b\cos(c+dx)}} - \frac{5b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4a^2d\sqrt{a+b\cos(c+dx)}} - \frac{b^2(7a^2-15b^2)\sin(c+dx)}{4a^3d\,(a^2-b^2)\sqrt{a+b\cos(c+dx)}} + \frac{b(7a^2-15b^2)\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{4a^3d\,(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{(4a^2+15b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4a^3d\sqrt{a+b\cos(c+dx)}} + \frac{\tan(c+dx)\sec(c+dx)}{2ad\sqrt{a+b\cos(c+dx)}}$$

```
[In] Int[Sec[c + d*x]^3/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (b*(7*a^2 - 15*b^2)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(
a + b)])/(4*a^3*(a^2 - b^2)*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) - (5*b*Sq
rt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(4*
a^2*d*Sqrt[a + b*Cos[c + d*x]]) + ((4*a^2 + 15*b^2)*Sqrt[(a + b*Cos[c + d*x
])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(a + b)])/(4*a^3*d*Sqrt[a + b*
Cos[c + d*x]]) - (b^2*(7*a^2 - 15*b^2)*Sin[c + d*x])/(4*a^3*(a^2 - b^2)*d*S
qrt[a + b*Cos[c + d*x]]) - (5*b*Tan[c + d*x])/(4*a^2*d*Sqrt[a + b*Cos[c + d
*x]]) + (Sec[c + d*x]*Tan[c + d*x])/(2*a*d*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
```

```
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 2886

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(c + d*Sin[e + f*x])/(c + d)]/Sqrt
[c + d*Sin[e + f*x]], Int[1/((a + b*Sin[e + f*x])*Sqrt[c/(c + d) + (d/(c +
d))*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] &&  !GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{\sec(c+dx)\tan(c+dx)}{2ad\sqrt{a+b\cos(c+dx)}} + \frac{\int \frac{\left(-\frac{5b}{2}+a\cos(c+dx)+\frac{3}{2}b\cos^2(c+dx)\right)\sec^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx}{2a}$$

$$= -\frac{5b\tan(c+dx)}{4a^2d\sqrt{a+b\cos(c+dx)}} + \frac{\sec(c+dx)\tan(c+dx)}{2ad\sqrt{a+b\cos(c+dx)}} + \frac{\int \frac{\left(\frac{1}{4}(4a^2+15b^2)+\frac{3}{2}ab\cos(c+dx)-\frac{5}{4}b^2\cos^2(c+dx)\right)\sec(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx}{2a^2}$$

$$= -\frac{b^2(7a^2-15b^2)\sin(c+dx)}{4a^3(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}} - \frac{5b\tan(c+dx)}{4a^2d\sqrt{a+b\cos(c+dx)}} + \frac{\sec(c+dx)\tan(c+dx)}{2ad\sqrt{a+b\cos(c+dx)}} + \frac{\int \frac{\left(\frac{1}{8}(4a^4+11a^2b^2-15b^4)+\frac{1}{4}ab(a^2-5b^2)\cos(c+dx)+\frac{1}{8}b^2(7a^2-15b^2)\cos^2(c+dx)\right)\sec(c+dx}{\sqrt{a+b\cos(c+dx)}}}{a^3(a^2-b^2)}$$

$$= -\frac{b^2(7a^2-15b^2)\sin(c+dx)}{4a^3(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} - \frac{5b\tan(c+dx)}{4a^2d\sqrt{a+b\cos(c+dx)}} + \frac{\sec(c+dx)\tan(c+dx)}{2ad\sqrt{a+b\cos(c+dx)}} - \frac{\int \frac{\left(-\frac{1}{8}b(4a^4+11a^2b^2-15b^4)+\frac{5}{8}ab^2(a^2-b^2)\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}dx}{a^3b(a^2-b^2)} + \frac{(b(7a^2-15b^2))\int\sqrt{a+b\cos(c+dx)}dx}{8a^3(a^2-b^2)}$$

$$= -\frac{b^2(7a^2-15b^2)\sin(c+dx)}{4a^3(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} - \frac{5b\tan(c+dx)}{4a^2d\sqrt{a+b\cos(c+dx)}} + \frac{\sec(c+dx)\tan(c+dx)}{2ad\sqrt{a+b\cos(c+dx)}} - \frac{(5b)\int\frac{1}{\sqrt{a+b\cos(c+dx)}}dx}{8a^2} + \frac{(4a^2+15b^2)\int\frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}dx}{8a^3} + \frac{\left(b(7a^2-15b^2)\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}dx}{8a^3(a^2-b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

$$= \frac{b(7a^2-15b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{4a^3(a^2-b^2)d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{b^2(7a^2-15b^2)\sin(c+dx)}{4a^3(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} - \frac{5b\tan(c+dx)}{4a^2d\sqrt{a+b\cos(c+dx)}} + \frac{\sec(c+dx)\tan(c+dx)}{2ad\sqrt{a+b\cos(c+dx)}} - \frac{\left(5b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}dx}{8a^2\sqrt{a+b\cos(c+dx)}} + \frac{\left((4a^2+15b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{\sec(c+dx)}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}dx}{8a^3\sqrt{a+b\cos(c+dx)}}$$

$$= \frac{b(7a^2-15b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{4a^3(a^2-b^2)d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{5b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4a^2d\sqrt{a+b\cos(c+dx)}} + \frac{(4a^2+15b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{4a^3d\sqrt{a+b\cos(c+dx)}} - \frac{b^2(7a^2-15b^2)\sin(c+dx)}{4a^3(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} - \frac{5b\tan(c+dx)}{4a^2d\sqrt{a+b\cos(c+dx)}} + \frac{\sec(c+dx)\tan(c+dx)}{2ad\sqrt{a+b\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 4.58 (sec) , antiderivative size = 466, normalized size of antiderivative = 1.35

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{-\frac{\frac{8ab\left(a^2-5b^2\right)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}}+\frac{2\left(8a^4+29a^2b^2-45b^4\right)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}\right.}{\sqrt{a+b\cos(c+dx)}}}{}}{}$$

```
[In] Integrate[Sec[c + d*x]^3/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-(((8*a*b*(a^2 - 5*b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c +
d*x)/2, (2*b)/(a + b)])/Sqrt[a + b*Cos[c + d*x]] + (2*(8*a^4 + 29*a^2*b^2 -
 45*b^4)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b
)/(a + b)])/Sqrt[a + b*Cos[c + d*x]] - ((2*I)*(-7*a^2 + 15*b^2)*Sqrt[-((b*(
-1 + Cos[c + d*x]))/(a + b))]*Sqrt[-((b*(1 + Cos[c + d*x]))/(a - b))]*Csc[c
 + d*x]*(-2*a*(a - b)*EllipticE[I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Co
s[c + d*x]]], (a + b)/(a - b)] + b*(-2*a*EllipticF[I*ArcSinh[Sqrt[-(a + b)^
(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)] + b*EllipticPi[(a + b)/a,
 I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)])
))/(a*Sqrt[-(a + b)^(-1)]))/((-a + b)*(a + b))) + 4*Sqrt[a + b*Cos[c + d*x]
]*((8*b^4*Sin[c + d*x])/((a^2 - b^2)*(a + b*Cos[c + d*x])) + (-7*b + 2*a*Se
c[c + d*x])*Tan[c + d*x]))/(16*a^3*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1545 vs. $2(402) = 804$.

Time = 8.82 (sec) , antiderivative size = 1546, normalized size of antiderivative = 4.48

method	result	size
default	Expression too large to display	1546

```
[In] int(sec(d*x+c)^3/(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/a*(-1/2*c
os(1/2*d*x+1/2*c)/a*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^
(1/2)/(2*cos(1/2*d*x+1/2*c)^2-1)^2+3/4*b/a^2*cos(1/2*d*x+1/2*c)*(-2*sin(1/2
*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^2-1
)-1/8*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b
))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellip
ticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))+3/8/a*(sin(1/2*d*x+1/2*c)^2)^(1
/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b
+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*b*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-
```

```
b))^(1/2))-3/8*b^2/a^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c
)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2
)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-1/2*(sin(1/2*d*x+1
/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x
+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c)
,2,(-2*b/(a-b))^(1/2))-3/8/a^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d
*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+
1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))*b^2)-2*
b^2/a^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))
^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellipti
cPi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2))-2/a^2*b*(-cos(1/2*d*x+1/2*c)/a
*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*
x+1/2*c)^2-1)+1/2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a
-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/
2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-1/2*(sin(1/2*d*x+1/2*c)
^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*
c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),(-2*b
/(a-b))^(1/2))+1/2/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^
2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^
(1/2)*b*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))+1/2/a*b*(sin(1/2*d
*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2
*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/
2*c),2,(-2*b/(a-b))^(1/2)))+2/a^3*b^3/sin(1/2*d*x+1/2*c)^2/(2*b*sin(1/2*d*x
+1/2*c)^2-a-b)/(a^2-b^2)*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c
)^2)^(1/2)*(2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*b+EllipticE(cos(1/2*d
*x+1/2*c),(-2*b/(a-b))^(1/2))*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))
^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*a-EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a
-b))^(1/2))*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*b))/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1
/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^3/(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec^3{(c+dx)}}{(a+b\cos{(c+dx)})^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)**3/(a+b*cos(d*x+c))**(3/2),x)
[Out] Integral(sec(c + d*x)**3/(a + b*cos(c + d*x))**(3/2), x)
```

Maxima [F]

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec{(dx+c)}^3}{(b\cos{(dx+c)}+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^3/(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^3/(b*cos(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec{(dx+c)}^3}{(b\cos{(dx+c)}+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^3/(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^3/(b*cos(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^3(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{\cos{(c+d\,x)}^3\,(a+b\,\cos{(c+d\,x)})^{3/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^3*(a + b*cos(c + d*x))^(3/2)),x)
[Out] int(1/(cos(c + d*x)^3*(a + b*cos(c + d*x))^(3/2)), x)
```

3.538 $\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 436

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{2(128a^6-212a^4b^2+55a^2b^4+9b^6)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{15b^5(a^2-b^2)^2 d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$
$$-\frac{2a(128a^4-116a^2b^2-17b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{15b^5(a^2-b^2)d\sqrt{a+b\cos(c+dx)}}$$
$$-\frac{2a^2\cos^3(c+dx)\sin(c+dx)}{3b(a^2-b^2)d(a+b\cos(c+dx))^{3/2}}-\frac{8a^2(2a^2-3b^2)\cos^2(c+dx)\sin(c+dx)}{3b^2(a^2-b^2)^2 d\sqrt{a+b\cos(c+dx)}}$$
$$-\frac{4a(32a^4-49a^2b^2+7b^4)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15b^4(a^2-b^2)^2 d}$$
$$+\frac{2(48a^4-71a^2b^2+3b^4)\cos(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15b^3(a^2-b^2)^2 d}$$

```
[Out] -2/3*a^2*cos(d*x+c)^3*sin(d*x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))^(3/2)-8/3*a
^2*(2*a^2-3*b^2)*cos(d*x+c)^2*sin(d*x+c)/b^2/(a^2-b^2)^2/d/(a+b*cos(d*x+c))
^(1/2)-4/15*a*(32*a^4-49*a^2*b^2+7*b^4)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/b
^4/(a^2-b^2)^2/d+2/15*(48*a^4-71*a^2*b^2+3*b^4)*cos(d*x+c)*sin(d*x+c)*(a+b*
cos(d*x+c))^(1/2)/b^3/(a^2-b^2)^2/d+2/15*(128*a^6-212*a^4*b^2+55*a^2*b^4+9*
b^6)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+
1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/b^5/(a^2-b^2)^2/d/((
a+b*cos(d*x+c))/(a+b))^(1/2)-2/15*a*(128*a^4-116*a^2*b^2-17*b^4)*(cos(1/2*d
*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2)*
(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/b^5/(a^2-b^2)/d/(a+b*cos(d*
x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.97 (sec) , antiderivative size = 436, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {2871, 3126, 3128, 3102, 2831, 2742, 2740, 2734, 2732}

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = -\frac{2a^2\sin(c+dx)\cos^3(c+dx)}{3bd(a^2-b^2)(a+b\cos(c+dx))^{3/2}} - \frac{8a^2(2a^2-3b^2)\sin(c+dx)\cos^2(c+dx)}{3b^2d(a^2-b^2)^2\sqrt{a+b\cos(c+dx)}} - \frac{4a(32a^4-49a^2b^2+7b^4)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{15b^4d(a^2-b^2)^2} - \frac{2a(128a^4-116a^2b^2-17b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{15b^5d(a^2-b^2)\sqrt{a+b\cos(c+dx)}} + \frac{2(48a^4-71a^2b^2+3b^4)\sin(c+dx)\cos(c+dx)\sqrt{a+b\cos(c+dx)}}{15b^3d(a^2-b^2)^2} + \frac{2(128a^6-212a^4b^2+55a^2b^4+9b^6)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{15b^5d(a^2-b^2)^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[In] Int[Cos[c + d*x]^5/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*(128*a^6 - 212*a^4*b^2 + 55*a^2*b^4 + 9*b^6)*Sqrt[a + b*Cos[c + d*x]]*El
lipticE[(c + d*x)/2, (2*b)/(a + b)])/(15*b^5*(a^2 - b^2)^2*d*Sqrt[(a + b*Co
s[c + d*x])/(a + b)]) - (2*a*(128*a^4 - 116*a^2*b^2 - 17*b^4)*Sqrt[(a + b*C
os[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(15*b^5*(a^2 -
 b^2)*d*Sqrt[a + b*Cos[c + d*x]]) - (2*a^2*Cos[c + d*x]^3*Sin[c + d*x])/(3*
b*(a^2 - b^2)*d*(a + b*Cos[c + d*x])^(3/2)) - (8*a^2*(2*a^2 - 3*b^2)*Cos[c
+ d*x]^2*Sin[c + d*x])/(3*b^2*(a^2 - b^2)^2*d*Sqrt[a + b*Cos[c + d*x]]) - (
4*a*(32*a^4 - 49*a^2*b^2 + 7*b^4)*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(1
5*b^4*(a^2 - b^2)^2*d) + (2*(48*a^4 - 71*a^2*b^2 + 3*b^4)*Cos[c + d*x]*Sqrt
[a + b*Cos[c + d*x]]*Sin[c + d*x])/(15*b^3*(a^2 - b^2)^2*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
```

```
0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rule 3126

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(c^2*C - B*c*d + A*d^2))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(c^2 -
d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[e + f*x])^(m -
1)*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*d*(b*d*m + a*c*(n + 1)) + (c*C - B*d
)*(b*c*m + a*d*(n + 1)) - (d*(A*(a*d*(n + 2) - b*c*(n + 1)) + B*(b*d*(n + 1
) - a*c*(n + 2))) - C*(b*c*d*(n + 1) - a*(c^2 + d^2*(n + 1))))*Sin[e + f*x]
 + b*(d*(B*c - A*d)*(m + n + 2) - C*(c^2*(m + 1) + d^2*(n + 1)))*Sin[e + f*
x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d,
 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 0] && LtQ[n, -1]
```

Rule 3128

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*sin[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_
.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n + 2))), x] + Dist[1/(d*(m +
n + 2)), Int[(a + b*Sin[e + f*x])^(m - 1)*(c + d*Sin[e + f*x])^n*Simp[a*A*d
*(m + n + 2) + C*(b*c*m + a*d*(n + 1)) + (d*(A*b + a*B)*(m + n + 2) - C*(a*
c - b*d*(m + n + 1)))*Sin[e + f*x] + (C*(a*d*m - b*c*(m + 1)) + b*B*d*(m +
n + 2))*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n},
 x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m
, 0] && !(IGtQ[n, 0] && ( !IntegerQ[m] || (EqQ[a, 0] && NeQ[c, 0])))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{2a^2\cos^3(c+dx)\sin(c+dx)}{3b(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} \\
&\quad -\frac{2\int \frac{\cos^2(c+dx)\left(3a^2-\frac{3}{2}ab\cos(c+dx)-\frac{1}{2}(8a^2-3b^2)\cos^2(c+dx)\right)}{(a+b\cos(c+dx))^{3/2}}\,dx}{3b(a^2-b^2)} \\
&= -\frac{2a^2\cos^3(c+dx)\sin(c+dx)}{3b(a^2-b^2)d(a+b\cos(c+dx))^{3/2}}-\frac{8a^2(2a^2-3b^2)\cos^2(c+dx)\sin(c+dx)}{3b^2(a^2-b^2)^2d\sqrt{a+b\cos(c+dx)}} \\
&\quad +\frac{4\int \frac{\cos(c+dx)\left(-4a^2(2a^2-3b^2)+\frac{1}{2}ab(a^2-3b^2)\cos(c+dx)+\frac{1}{4}(48a^4-71a^2b^2+3b^4)\cos^2(c+dx)\right)}{\sqrt{a+b\cos(c+dx)}}\,dx}{3b^2(a^2-b^2)^2} \\
&= -\frac{2a^2\cos^3(c+dx)\sin(c+dx)}{3b(a^2-b^2)d(a+b\cos(c+dx))^{3/2}}-\frac{8a^2(2a^2-3b^2)\cos^2(c+dx)\sin(c+dx)}{3b^2(a^2-b^2)^2d\sqrt{a+b\cos(c+dx)}} \\
&\quad +\frac{2(48a^4-71a^2b^2+3b^4)\cos(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15b^3(a^2-b^2)^2d} \\
&\quad +\frac{8\int \frac{\frac{1}{4}a(48a^4-71a^2b^2+3b^4)-\frac{1}{8}b(16a^4-27a^2b^2-9b^4)\cos(c+dx)-\frac{3}{4}a(32a^4-49a^2b^2+7b^4)\cos^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{15b^3(a^2-b^2)^2}
\end{aligned}$$

$$= -\frac{2a^2\cos^3(c+dx)\sin(c+dx)}{3b(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} - \frac{8a^2(2a^2-3b^2)\cos^2(c+dx)\sin(c+dx)}{3b^2(a^2-b^2)^2 d\sqrt{a+b\cos(c+dx)}} - \frac{4a(32a^4-49a^2b^2+7b^4)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15b^4(a^2-b^2)^2 d} + \frac{2(48a^4-71a^2b^2+3b^4)\cos(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15b^3(a^2-b^2)^2 d} + \frac{16\int \frac{\frac{3}{4}ab(8a^4-11a^2b^2-2b^4)+\frac{3}{16}(128a^6-212a^4b^2+55a^2b^4+9b^6)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}dx}{45b^4(a^2-b^2)^2}$$

$$= -\frac{2a^2\cos^3(c+dx)\sin(c+dx)}{3b(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} - \frac{8a^2(2a^2-3b^2)\cos^2(c+dx)\sin(c+dx)}{3b^2(a^2-b^2)^2 d\sqrt{a+b\cos(c+dx)}} - \frac{4a(32a^4-49a^2b^2+7b^4)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15b^4(a^2-b^2)^2 d} + \frac{2(48a^4-71a^2b^2+3b^4)\cos(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15b^3(a^2-b^2)^2 d} - \frac{(a(128a^4-116a^2b^2-17b^4))\int \frac{1}{\sqrt{a+b\cos(c+dx)}}dx}{15b^5(a^2-b^2)} + \frac{(128a^6-212a^4b^2+55a^2b^4+9b^6)\int \sqrt{a+b\cos(c+dx)}dx}{15b^5(a^2-b^2)^2}$$

$$= -\frac{2a^2\cos^3(c+dx)\sin(c+dx)}{3b(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} - \frac{8a^2(2a^2-3b^2)\cos^2(c+dx)\sin(c+dx)}{3b^2(a^2-b^2)^2 d\sqrt{a+b\cos(c+dx)}} - \frac{4a(32a^4-49a^2b^2+7b^4)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15b^4(a^2-b^2)^2 d} + \frac{2(48a^4-71a^2b^2+3b^4)\cos(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15b^3(a^2-b^2)^2 d} + \frac{\left((128a^6-212a^4b^2+55a^2b^4+9b^6)\sqrt{a+b\cos(c+dx)}\right)\int \sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}dx}{15b^5(a^2-b^2)^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{\left(a(128a^4-116a^2b^2-17b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}dx}{15b^5(a^2-b^2)\sqrt{a+b\cos(c+dx)}}$$

$$
= \frac{2(128a^6 - 212a^4b^2 + 55a^2b^4 + 9b^6)\sqrt{a + b\cos(c + dx)}E\left(\frac{1}{2}(c + dx)|\frac{2b}{a+b}\right)}{15b^5(a^2 - b^2)^2 d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}
- \frac{2a(128a^4 - 116a^2b^2 - 17b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c + dx), \frac{2b}{a+b}\right)}{15b^5(a^2 - b^2)d\sqrt{a + b\cos(c + dx)}}
- \frac{2a^2\cos^3(c + dx)\sin(c + dx)}{3b(a^2 - b^2)d(a + b\cos(c + dx))^{3/2}} - \frac{8a^2(2a^2 - 3b^2)\cos^2(c + dx)\sin(c + dx)}{3b^2(a^2 - b^2)^2 d\sqrt{a + b\cos(c + dx)}}
- \frac{4a(32a^4 - 49a^2b^2 + 7b^4)\sqrt{a + b\cos(c + dx)}\sin(c + dx)}{15b^4(a^2 - b^2)^2 d}
+ \frac{2(48a^4 - 71a^2b^2 + 3b^4)\cos(c + dx)\sqrt{a + b\cos(c + dx)}\sin(c + dx)}{15b^3(a^2 - b^2)^2 d}
$$

Mathematica [A] (verified)

Time = 1.52 (sec) , antiderivative size = 272, normalized size of antiderivative = 0.62

$$
\int \frac{\cos^5(c + dx)}{(a + b\cos(c + dx))^{5/2}}\,dx = \frac{\frac{2\left(\frac{a+b\cos(c+dx)}{a+b}\right)^{3/2}\left((128a^6 - 212a^4b^2 + 55a^2b^4 + 9b^6)E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right) + a(-128a^5 + 128a^4b + 116a^3b^2 - \cdots}{(a-b)^2}}{\cdots}
$$

```
[In] Integrate[Cos[c + d*x]^5/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] ((2*((a + b*Cos[c + d*x])/(a + b))^(3/2)*((128*a^6 - 212*a^4*b^2 + 55*a^2*b
^4 + 9*b^6)*EllipticE[(c + d*x)/2, (2*b)/(a + b)] + a*(-128*a^5 + 128*a^4*b
 + 116*a^3*b^2 - 116*a^2*b^3 + 17*a*b^4 - 17*b^5)*EllipticF[(c + d*x)/2, (2
*b)/(a + b)]))/(a - b)^2 + b*((10*a^5*Sin[c + d*x])/(a^2 - b^2) - (10*a^4*(
11*a^2 - 15*b^2)*(a + b*Cos[c + d*x])*Sin[c + d*x])/(a^2 - b^2)^2 - 28*a*(a
 + b*Cos[c + d*x])^2*Sin[c + d*x] + 3*b*(a + b*Cos[c + d*x])^2*Sin[2*(c + d
*x)]))/(15*b^5*d*(a + b*Cos[c + d*x])^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1687 vs. 2(466) = 932.

Time = 12.06 (sec) , antiderivative size = 1688, normalized size of antiderivative = 3.87

method	result	size
default	Expression too large to display	1688

```
[In] int(cos(d*x+c)^5/(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(16/b^2*(-1/
10/b*cos(1/2*d*x+1/2*c)^3*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*
```

c)^2)^(1/2)-1/60/b^2*(-4*a+12*b)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)+1/60/b^2*(-4*a+12*b)*(a-b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-1/60*(4*a^2-15*a*b+27*b^2)/b^3*(a-b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))))-8/b^3*(2*a+3*b)*(-1/6/b*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)+1/6*(a-b)/b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-1/12/b^2*(-2*a+6*b)*(a-b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))))-10/b^5*a^4/sin(1/2*d*x+1/2*c)^2/(2*b*sin(1/2*d*x+1/2*c)^2-a-b)/(a^2-b^2)*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*b+EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*a-EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*b)-2/b^5*a^5*(1/6/b/(a-b)/(a+b)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2+1/2*(a-b)/b)^2+8/3*sin(1/2*d*x+1/2*c)^2*b/(a-b)^2/(a+b)^2*cos(1/2*d*x+1/2*c)*a/(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)+(3*a-b)/(3*a^3+3*a^2*b-3*a*b^2-3*b^3)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-4/3*a/(a-b)/(a+b)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))))-2/b^5*(3*a^2+4*a*b+3*b^2)*(a-b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2)))-2*(4*a^3+3*a^2*b+2*a*b^2+b^3)/b^5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2)))/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.21 (sec) , antiderivative size = 1040, normalized size of antiderivative = 2.39

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^5/(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] -1/45*(6*(64*a^7*b^2 - 98*a^5*b^4 + 14*a^3*b^6 - 3*(a^4*b^5 - 2*a^2*b^7 + b
^9)*cos(d*x + c)^3 + 8*(a^5*b^4 - 2*a^3*b^6 + a*b^8)*cos(d*x + c)^2 + 5*(16
*a^6*b^3 - 25*a^4*b^5 + 5*a^2*b^7)*cos(d*x + c))*sqrt(b*cos(d*x + c) + a)*s
in(d*x + c) + 2*(sqrt(2)*(-128*I*a^7*b^2 + 260*I*a^5*b^4 - 121*I*a^3*b^6 -
21*I*a*b^8)*cos(d*x + c)^2 + 2*sqrt(2)*(-128*I*a^8*b + 260*I*a^6*b^3 - 121*
I*a^4*b^5 - 21*I*a^2*b^7)*cos(d*x + c) + sqrt(2)*(-128*I*a^9 + 260*I*a^7*b^
2 - 121*I*a^5*b^4 - 21*I*a^3*b^6))*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 -
 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin
(d*x + c) + 2*a)/b) + 2*(sqrt(2)*(128*I*a^7*b^2 - 260*I*a^5*b^4 + 121*I*a^3
*b^6 + 21*I*a*b^8)*cos(d*x + c)^2 + 2*sqrt(2)*(128*I*a^8*b - 260*I*a^6*b^3
+ 121*I*a^4*b^5 + 21*I*a^2*b^7)*cos(d*x + c) + sqrt(2)*(128*I*a^9 - 260*I*a
^7*b^2 + 121*I*a^5*b^4 + 21*I*a^3*b^6))*sqrt(b)*weierstrassPInverse(4/3*(4*
a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*
b*sin(d*x + c) + 2*a)/b) + 3*(sqrt(2)*(-128*I*a^6*b^3 + 212*I*a^4*b^5 - 55*
I*a^2*b^7 - 9*I*b^9)*cos(d*x + c)^2 + 2*sqrt(2)*(-128*I*a^7*b^2 + 212*I*a^5
*b^4 - 55*I*a^3*b^6 - 9*I*a*b^8)*cos(d*x + c) + sqrt(2)*(-128*I*a^8*b + 212
*I*a^6*b^3 - 55*I*a^4*b^5 - 9*I*a^2*b^7))*sqrt(b)*weierstrassZeta(4/3*(4*a^
2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2
 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*s
in(d*x + c) + 2*a)/b)) + 3*(sqrt(2)*(128*I*a^6*b^3 - 212*I*a^4*b^5 + 55*I*a
^2*b^7 + 9*I*b^9)*cos(d*x + c)^2 + 2*sqrt(2)*(128*I*a^7*b^2 - 212*I*a^5*b^4
 + 55*I*a^3*b^6 + 9*I*a*b^8)*cos(d*x + c) + sqrt(2)*(128*I*a^8*b - 212*I*a^
6*b^3 + 55*I*a^4*b^5 + 9*I*a^2*b^7))*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3
*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*
b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*
x + c) + 2*a)/b)))/((a^4*b^8 - 2*a^2*b^10 + b^12)*d*cos(d*x + c)^2 + 2*(a^5
*b^7 - 2*a^3*b^9 + a*b^11)*d*cos(d*x + c) + (a^6*b^6 - 2*a^4*b^8 + a^2*b^10
)*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**5/(a+b*cos(d*x+c))**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos\left(dx+c\right)^5}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^5/(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^5/(b*cos(d*x + c) + a)^(5/2), x)
```

Giac [F]

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos\left(dx+c\right)^5}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^5/(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^5/(b*cos(d*x + c) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^5(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)^5}{\left(a+b\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int(cos(c + d*x)^5/(a + b*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)^5/(a + b*cos(c + d*x))^(5/2), x)
```

3.539 $\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 345

$$\begin{aligned}\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = & -\frac{8a(4a^4-7a^2b^2+2b^4)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3b^4(a^2-b^2)^2d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\ & +\frac{2(16a^4-16a^2b^2-b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3b^4(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} \\ & -\frac{2a^2\cos^2(c+dx)\sin(c+dx)}{3b(a^2-b^2)d(a+b\cos(c+dx))^{3/2}}+\frac{4a^3(3a^2-5b^2)\sin(c+dx)}{3b^3(a^2-b^2)^2d\sqrt{a+b\cos(c+dx)}} \\ & +\frac{2(2a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3b^3(a^2-b^2)d}\end{aligned}$$

```
[Out] -2/3*a^2*cos(d*x+c)^2*sin(d*x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))^(3/2)+4/3*a
^3*(3*a^2-5*b^2)*sin(d*x+c)/b^3/(a^2-b^2)^2/d/(a+b*cos(d*x+c))^(1/2)+2/3*(2
*a^2-b^2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/b^3/(a^2-b^2)/d-8/3*a*(4*a^4-7*
a^2*b^2+2*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(si
n(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/b^4/(a^2-b
^2)^2/d/((a+b*cos(d*x+c))/(a+b))^(1/2)+2/3*(16*a^4-16*a^2*b^2-b^4)*(cos(1/2
*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2
)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/b^4/(a^2-b^2)/d/(a+b*cos(
d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.66 (sec) , antiderivative size = 345, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.348$, Rules used = {2871, 3110, 3102, 2831, 2742, 2740, 2734, 2732}

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = -\frac{2a^2\sin(c+dx)\cos^2(c+dx)}{3bd\,(a^2-b^2)\,(a+b\cos(c+dx))^{3/2}} + \frac{2(2a^2-b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{3b^3d\,(a^2-b^2)} + \frac{2(16a^4-16a^2b^2-b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3b^4d\,(a^2-b^2)\sqrt{a+b\cos(c+dx)}} - \frac{8a(4a^4-7a^2b^2+2b^4)\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{3b^4d\,(a^2-b^2)^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{4a^3(3a^2-5b^2)\sin(c+dx)}{3b^3d\,(a^2-b^2)^2\sqrt{a+b\cos(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^4/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (-8*a*(4*a^4 - 7*a^2*b^2 + 2*b^4)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d
*x)/2, (2*b)/(a + b)])/(3*b^4*(a^2 - b^2)^2*d*Sqrt[(a + b*Cos[c + d*x])/(a
+ b)]) + (2*(16*a^4 - 16*a^2*b^2 - b^4)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*
EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(3*b^4*(a^2 - b^2)*d*Sqrt[a + b*Cos[
c + d*x]]) - (2*a^2*Cos[c + d*x]^2*Sin[c + d*x])/(3*b*(a^2 - b^2)*d*(a + b*
Cos[c + d*x])^(3/2)) + (4*a^3*(3*a^2 - 5*b^2)*Sin[c + d*x])/(3*b^3*(a^2 - b
^2)^2*d*Sqrt[a + b*Cos[c + d*x]]) + (2*(2*a^2 - b^2)*Sqrt[a + b*Cos[c + d*x
]]*Sin[c + d*x])/(3*b^3*(a^2 - b^2)*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
```

```
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rule 3110

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f
_.)*(x_)]^2), x_Symbol] :> Simp[(-(b*c - a*d))*(A*b^2 - a*b*B + a^2*C)*Cos[
e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b^2*f*(m + 1)*(a^2 - b^2))), x] - D
ist[1/(b^2*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[b*(m
```

```
 + 1)*((b*B - a*C)*(b*c - a*d) - A*b*(a*c - b*d)) + (b*B*(a^2*d + b^2*d*(m
+ 1) - a*b*c*(m + 2)) + (b*c - a*d)*(A*b^2*(m + 2) + C*(a^2 + b^2*(m + 1)))
)*Sin[e + f*x] - b*C*d*(m + 1)*(a^2 - b^2)*Sin[e + f*x]^2, x], x], x] /; Fr
eeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2,
0] && LtQ[m, -1]
```

Rubi steps

$$\text{integral} = -\frac{2a^2\cos^2(c+dx)\sin(c+dx)}{3b(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} - \frac{2\int\frac{\cos(c+dx)\left(2a^2-\frac{3}{2}ab\cos(c+dx)-\frac{3}{2}(2a^2-b^2)\cos^2(c+dx)\right)}{(a+b\cos(c+dx))^{3/2}}\,dx}{3b(a^2-b^2)}$$

$$= -\frac{2a^2\cos^2(c+dx)\sin(c+dx)}{3b(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{4a^3(3a^2-5b^2)\sin(c+dx)}{3b^3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}} - \frac{4\int\frac{\frac{1}{2}a^2b(3a^2-5b^2)+\frac{1}{2}a(6a^4-11a^2b^2+3b^4)\cos(c+dx)-\frac{3}{4}b(a^2-b^2)(2a^2-b^2)\cos^2(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{3b^3(a^2-b^2)^2}$$

$$= -\frac{2a^2\cos^2(c+dx)\sin(c+dx)}{3b(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{4a^3(3a^2-5b^2)\sin(c+dx)}{3b^3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}} + \frac{2(2a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3b^3(a^2-b^2)\,d} - \frac{8\int\frac{\frac{3}{8}b^2(4a^4-7a^2b^2-b^4)+\frac{3}{2}ab(4a^4-7a^2b^2+2b^4)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{9b^4(a^2-b^2)^2}$$

$$= -\frac{2a^2\cos^2(c+dx)\sin(c+dx)}{3b(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{4a^3(3a^2-5b^2)\sin(c+dx)}{3b^3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}} + \frac{2(2a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3b^3(a^2-b^2)\,d} + \frac{(16a^4-16a^2b^2-b^4)\int\frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{3b^4(a^2-b^2)} - \frac{(4a(4a^4-7a^2b^2+2b^4))\int\sqrt{a+b\cos(c+dx)}\,dx}{3b^4(a^2-b^2)^2}$$

$$= -\frac{2a^2\cos^2(c+dx)\sin(c+dx)}{3b(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{4a^3(3a^2-5b^2)\sin(c+dx)}{3b^3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}}$$
$$+ \frac{2(2a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3b^3(a^2-b^2)\,d}$$
$$- \frac{\left(4a(4a^4-7a^2b^2+2b^4)\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{3b^4(a^2-b^2)^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$
$$+ \frac{\left((16a^4-16a^2b^2-b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{3b^4(a^2-b^2)\sqrt{a+b\cos(c+dx)}}$$

$$= -\frac{8a(4a^4-7a^2b^2+2b^4)\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{3b^4(a^2-b^2)^2\,d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$
$$+ \frac{2(16a^4-16a^2b^2-b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3b^4(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}$$
$$- \frac{2a^2\cos^2(c+dx)\sin(c+dx)}{3b(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{4a^3(3a^2-5b^2)\sin(c+dx)}{3b^3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}}$$
$$+ \frac{2(2a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3b^3(a^2-b^2)\,d}$$

Mathematica [A] (verified)

Time = 1.25 (sec) , antiderivative size = 237, normalized size of antiderivative = 0.69

$$\int\frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{2\left(\frac{\left(\frac{a+b\cos(c+dx)}{a+b}\right)^{3/2}\left(-4(4a^5-7a^3b^2+2ab^4)E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)+(16a^5-16a^4b-16a^3b^2+16a^2b^3-ab^4+\right.}{(a-b)^2}\right.}{3b^4}$$

```
[In] Integrate[Cos[c + d*x]^4/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*((((a + b*Cos[c + d*x])/(a + b))^(3/2)*(-4*(4*a^5 - 7*a^3*b^2 + 2*a*b^4)
*EllipticE[(c + d*x)/2, (2*b)/(a + b)] + (16*a^5 - 16*a^4*b - 16*a^3*b^2 +
16*a^2*b^3 - a*b^4 + b^5)*EllipticF[(c + d*x)/2, (2*b)/(a + b)]))/(a - b)^2
 + (b*(16*a^6 - 25*a^4*b^2 + b^6 + 4*a*b*(5*a^4 - 8*a^2*b^2 + b^4)*Cos[c +
d*x] + (-(a^2*b) + b^3)^2*Cos[2*(c + d*x)])*Sin[c + d*x])/(2*(a^2 - b^2)^2)
))/(3*b^4*d*(a + b*Cos[c + d*x])^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1294 vs. 2(379) = 758.

Time = 10.29 (sec) , antiderivative size = 1295, normalized size of antiderivative = 3.75

method	result	size
default	Expression too large to display	1295

```
[In] int(cos(d*x+c)^4/(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(8/b^2*(-1/6
/b*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2
)^(1/2)+1/6*(a-b)/b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2
+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(
1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-1/12/b^2*(-2*a+6*b)*(
a-b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1
/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF
(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),(-2*b/
(a-b))^(1/2))))+4*(a+b)/b^4*(a-b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/
2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d
*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-Ellipt
icE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2)))+2/b^4*a^4*(1/6/b/(a-b)/(a+b)*co
s(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/
2)/(cos(1/2*d*x+1/2*c)^2+1/2*(a-b)/b)^2+8/3*sin(1/2*d*x+1/2*c)^2*b/(a-b)^2/
(a+b)^2*cos(1/2*d*x+1/2*c)*a/(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*sin(1/2*d*x+
1/2*c)^2)^(1/2)+(3*a-b)/(3*a^3+3*a^2*b-3*a*b^2-3*b^3)*(sin(1/2*d*x+1/2*c)^2
)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)
^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(
a-b))^(1/2))-4/3*a/(a-b)/(a+b)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2
*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*
x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-Ellipti
cE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))))+2*(3*a^2+2*a*b+b^2)/b^4*(sin(1/
2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(
1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+
1/2*c),(-2*b/(a-b))^(1/2))+8*a^3/b^4/sin(1/2*d*x+1/2*c)^2/(2*b*sin(1/2*d*x+
1/2*c)^2-a-b)/(a^2-b^2)*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)
^2)^(1/2)*(2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*b+EllipticE(cos(1/2*d*
x+1/2*c),(-2*b/(a-b))^(1/2))*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^
(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*a-EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-
b))^(1/2))*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*b))/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/
2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.18 (sec) , antiderivative size = 954, normalized size of antiderivative = 2.77

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^4/(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/9*(6*(8*a^6*b^2 - 13*a^4*b^4 + a^2*b^6 + (a^4*b^4 - 2*a^2*b^6 + b^8)*cos(
d*x + c)^2 + 2*(5*a^5*b^3 - 8*a^3*b^5 + a*b^7)*cos(d*x + c))*sqrt(b*cos(d*x
 + c) + a)*sin(d*x + c) + (sqrt(2)*(-32*I*a^6*b^2 + 68*I*a^4*b^4 - 37*I*a^2
*b^6 - 3*I*b^8)*cos(d*x + c)^2 - 2*sqrt(2)*(32*I*a^7*b - 68*I*a^5*b^3 + 37*
I*a^3*b^5 + 3*I*a*b^7)*cos(d*x + c) + sqrt(2)*(-32*I*a^8 + 68*I*a^6*b^2 - 3
7*I*a^4*b^4 - 3*I*a^2*b^6))*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)
/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x +
c) + 2*a)/b) + (sqrt(2)*(32*I*a^6*b^2 - 68*I*a^4*b^4 + 37*I*a^2*b^6 + 3*I*b
^8)*cos(d*x + c)^2 - 2*sqrt(2)*(-32*I*a^7*b + 68*I*a^5*b^3 - 37*I*a^3*b^5 -
 3*I*a*b^7)*cos(d*x + c) + sqrt(2)*(32*I*a^8 - 68*I*a^6*b^2 + 37*I*a^4*b^4
+ 3*I*a^2*b^6))*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*
(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b)
 - 12*(sqrt(2)*(4*I*a^5*b^3 - 7*I*a^3*b^5 + 2*I*a*b^7)*cos(d*x + c)^2 + 2*s
qrt(2)*(4*I*a^6*b^2 - 7*I*a^4*b^4 + 2*I*a^2*b^6)*cos(d*x + c) + sqrt(2)*(4*
I*a^7*b - 7*I*a^5*b^3 + 2*I*a^3*b^5))*sqrt(b)*weierstrassZeta(4/3*(4*a^2 -
3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3
*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d
*x + c) + 2*a)/b)) - 12*(sqrt(2)*(-4*I*a^5*b^3 + 7*I*a^3*b^5 - 2*I*a*b^7)*c
os(d*x + c)^2 + 2*sqrt(2)*(-4*I*a^6*b^2 + 7*I*a^4*b^4 - 2*I*a^2*b^6)*cos(d*
x + c) + sqrt(2)*(-4*I*a^7*b + 7*I*a^5*b^3 - 2*I*a^3*b^5))*sqrt(b)*weierstr
assZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPI
nverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d
*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b)))/((a^4*b^7 - 2*a^2*b^9 + b^11)*d*co
s(d*x + c)^2 + 2*(a^5*b^6 - 2*a^3*b^8 + a*b^10)*d*cos(d*x + c) + (a^6*b^5 -
 2*a^4*b^7 + a^2*b^9)*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**4/(a+b*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(dx+c)^4}{(b\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^4/(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^4/(b*cos(d*x + c) + a)^(5/2), x)
```

Giac [F]

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(dx+c)^4}{(b\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^4/(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^4/(b*cos(d*x + c) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(c+d\,x)^4}{(a+b\,\cos(c+d\,x))^{5/2}}\,dx$$

```
[In] int(cos(c + d*x)^4/(a + b*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)^4/(a + b*cos(c + d*x))^(5/2), x)
```

3.540 $\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 281

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{2(8a^4-15a^2b^2+3b^4)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3b^3(a^2-b^2)^2 d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2a(8a^2-9b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3b^3(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} - \frac{2a^2\cos(c+dx)\sin(c+dx)}{3b(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} - \frac{8a^2(a^2-2b^2)\sin(c+dx)}{3b^2(a^2-b^2)^2 d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] -2/3*a^2*cos(d*x+c)*sin(d*x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))^(3/2)-8/3*a^2
*(a^2-2*b^2)*sin(d*x+c)/b^2/(a^2-b^2)^2/d/(a+b*cos(d*x+c))^(1/2)+2/3*(8*a^4
-15*a^2*b^2+3*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elliptic
E(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/b^3/(a
^2-b^2)^2/d/((a+b*cos(d*x+c))/(a+b))^(1/2)-2/3*a*(8*a^2-9*b^2)*(cos(1/2*d*x
+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2)*(b
/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/b^3/(a^2-b^2)/d/(a+b*cos(d*x+
c))^(1/2)
```

Rubi [A] (verified)

Time = 0.64 (sec) , antiderivative size = 281, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {2871, 3100, 2831, 2742, 2740, 2734, 2732}

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = -\frac{8a^2(a^2-2b^2)\sin(c+dx)}{3b^2d\,(a^2-b^2)^2\sqrt{a+b\cos(c+dx)}} - \frac{2a^2\sin(c+dx)\cos(c+dx)}{3bd\,(a^2-b^2)\,(a+b\cos(c+dx))^{3/2}} - \frac{2a(8a^2-9b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3b^3d\,(a^2-b^2)\sqrt{a+b\cos(c+dx)}} + \frac{2(8a^4-15a^2b^2+3b^4)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3b^3d\,(a^2-b^2)^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[In] Int[Cos[c + d*x]^3/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*(8*a^4 - 15*a^2*b^2 + 3*b^4)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x
)/2, (2*b)/(a + b)])/(3*b^3*(a^2 - b^2)^2*d*Sqrt[(a + b*Cos[c + d*x])/(a +
b)]) - (2*a*(8*a^2 - 9*b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c
 + d*x)/2, (2*b)/(a + b)])/(3*b^3*(a^2 - b^2)*d*Sqrt[a + b*Cos[c + d*x]]) -
 (2*a^2*Cos[c + d*x]*Sin[c + d*x])/(3*b*(a^2 - b^2)*d*(a + b*Cos[c + d*x])^
(3/2)) - (8*a^2*(a^2 - 2*b^2)*Sin[c + d*x])/(3*b^2*(a^2 - b^2)^2*d*Sqrt[a +
 b*Cos[c + d*x]])
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3100

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
 (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2
 - a*b*B + a^2*C))*Cos[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*
(a^2 - b^2))), x] + Dist[1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*Simp[b*(a*A - b*B + a*C)*(m + 1) - (A*b^2 - a*b*B + a^2*C + b*(A*
b - a*B + b*C)*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B
, C}, x] && LtQ[m, -1] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = -\frac{2a^2\cos(c+dx)\sin(c+dx)}{3b\,(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} - \frac{2\int \frac{a^2-\frac{3}{2}ab\cos(c+dx)-\frac{1}{2}\left(4a^2-3b^2\right)\cos^2(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx}{3b\,(a^2-b^2)}$$

$$= -\frac{2a^2\cos(c+dx)\sin(c+dx)}{3b\,(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} - \frac{8a^2(a^2-2b^2)\sin(c+dx)}{3b^2\,(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}} + \frac{4\int \frac{\frac{1}{2}ab(a^2-3b^2)+\frac{1}{4}(8a^4-15a^2b^2+3b^4)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}dx}{3b^2\,(a^2-b^2)^2}$$

$$= -\frac{2a^2\cos(c+dx)\sin(c+dx)}{3b\,(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} - \frac{8a^2(a^2-2b^2)\sin(c+dx)}{3b^2\,(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}} - \frac{(a(8a^2-9b^2))\int \frac{1}{\sqrt{a+b\cos(c+dx)}}dx}{3b^3\,(a^2-b^2)} + \frac{(8a^4-15a^2b^2+3b^4)\int \sqrt{a+b\cos(c+dx)}\,dx}{3b^3\,(a^2-b^2)^2}$$

$$= -\frac{2a^2\cos(c+dx)\sin(c+dx)}{3b\,(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} - \frac{8a^2(a^2-2b^2)\sin(c+dx)}{3b^2\,(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}} + \frac{\left((8a^4-15a^2b^2+3b^4)\sqrt{a+b\cos(c+dx)}\right)\int \sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{3b^3\,(a^2-b^2)^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{\left(a(8a^2-9b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int \frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}dx}{3b^3\,(a^2-b^2)\sqrt{a+b\cos(c+dx)}}$$

$$= \frac{2(8a^4-15a^2b^2+3b^4)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3b^3\,(a^2-b^2)^2\,d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2a(8a^2-9b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3b^3\,(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}} - \frac{2a^2\cos(c+dx)\sin(c+dx)}{3b\,(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} - \frac{8a^2(a^2-2b^2)\sin(c+dx)}{3b^2\,(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 1.00 (sec) , antiderivative size = 188, normalized size of antiderivative = 0.67

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{2\left(\frac{\left(\frac{a+b\cos(c+dx)}{a+b}\right)^{3/2}\left((8a^4-15a^2b^2+3b^4)E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)+a(-8a^3+8a^2b+9ab^2-9b^3)\,\text{EllipticF}\left(\frac{1}{2}(c+\right.\right.}{(a-b)^2}\right.}{3b^3d(a+b\cos(c+dx))^{3/2}}$$

```
[In] Integrate[Cos[c + d*x]^3/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*((((a + b*Cos[c + d*x])/(a + b))^(3/2)*((8*a^4 - 15*a^2*b^2 + 3*b^4)*Ell
ipticE[(c + d*x)/2, (2*b)/(a + b)] + a*(-8*a^3 + 8*a^2*b + 9*a*b^2 - 9*b^3)
*EllipticF[(c + d*x)/2, (2*b)/(a + b)]))/(a - b)^2 + (a^2*b*(-4*a^3 + 8*a*b
^2 + (-5*a^2*b + 9*b^3)*Cos[c + d*x])*Sin[c + d*x])/(a^2 - b^2)^2))/(3*b^3*
d*(a + b*Cos[c + d*x])^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 910 vs. $2(319) = 638$.

Time = 9.85 (sec) , antiderivative size = 911, normalized size of antiderivative = 3.24

method	result	size
default	Expression too large to display	911

```
[In] int(cos(d*x+c)^3/(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2/b^3/(-2*
sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*b/(a-b)*sin(1/
2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(3*EllipticF
(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*a-EllipticE(cos(1/2*d*x+1/2*c),(-2*
b/(a-b))^(1/2))*a+EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*b)-6/b^3
*a^2/sin(1/2*d*x+1/2*c)^2/(2*b*sin(1/2*d*x+1/2*c)^2-a-b)/(a^2-b^2)*(-2*sin(
1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*cos(1/2*d*x+1/2*c)*
sin(1/2*d*x+1/2*c)^2*b+EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*(-2
*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/
2)*a-EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*(-2*b/(a-b)*sin(1/2*d
*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*b)-2/b^3*a^3*(1
/6/b/(a-b)/(a+b)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/
2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2+1/2*(a-b)/b)^2+8/3*sin(1/2*d*x+
1/2*c)^2*b/(a-b)^2/(a+b)^2*cos(1/2*d*x+1/2*c)*a/(-(-2*b*cos(1/2*d*x+1/2*c)^
2-a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)+(3*a-b)/(3*a^3+3*a^2*b-3*a*b^2-3*b^3)*(s
in(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2
*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2
*d*x+1/2*c),(-2*b/(a-b))^(1/2))-4/3*a/(a-b)/(a+b)^2*(sin(1/2*d*x+1/2*c)^2)^
(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4
*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a
-b))^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2)))))/sin(1/2*d*x
+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.16 (sec) , antiderivative size = 867, normalized size of antiderivative = 3.09

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] -1/9*(6*(4*a^5*b^2 - 8*a^3*b^4 + (5*a^4*b^3 - 9*a^2*b^5)*cos(d*x + c))*sqrt
(b*cos(d*x + c) + a)*sin(d*x + c) + 4*(sqrt(2)*(-4*I*a^5*b^2 + 9*I*a^3*b^4
```

```
- 6*I*a*b^6)*cos(d*x + c)^2 + 2*sqrt(2)*(-4*I*a^6*b + 9*I*a^4*b^3 - 6*I*a^2
*b^5)*cos(d*x + c) + sqrt(2)*(-4*I*a^7 + 9*I*a^5*b^2 - 6*I*a^3*b^4))*sqrt(b
)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3,
 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b) + 4*(sqrt(2)*(4*I*a^5
*b^2 - 9*I*a^3*b^4 + 6*I*a*b^6)*cos(d*x + c)^2 + 2*sqrt(2)*(4*I*a^6*b - 9*I
*a^4*b^3 + 6*I*a^2*b^5)*cos(d*x + c) + sqrt(2)*(4*I*a^7 - 9*I*a^5*b^2 + 6*I
*a^3*b^4))*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^
3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b) + 3*
(sqrt(2)*(-8*I*a^4*b^3 + 15*I*a^2*b^5 - 3*I*b^7)*cos(d*x + c)^2 + 2*sqrt(2)
*(-8*I*a^5*b^2 + 15*I*a^3*b^4 - 3*I*a*b^6)*cos(d*x + c) + sqrt(2)*(-8*I*a^6
*b + 15*I*a^4*b^3 - 3*I*a^2*b^5))*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^
2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2
)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x +
 c) + 2*a)/b)) + 3*(sqrt(2)*(8*I*a^4*b^3 - 15*I*a^2*b^5 + 3*I*b^7)*cos(d*x
+ c)^2 + 2*sqrt(2)*(8*I*a^5*b^2 - 15*I*a^3*b^4 + 3*I*a*b^6)*cos(d*x + c) +
sqrt(2)*(8*I*a^6*b - 15*I*a^4*b^3 + 3*I*a^2*b^5))*sqrt(b)*weierstrassZeta(4
/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/
3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) -
 3*I*b*sin(d*x + c) + 2*a)/b)))/((a^4*b^6 - 2*a^2*b^8 + b^10)*d*cos(d*x + c
)^2 + 2*(a^5*b^5 - 2*a^3*b^7 + a*b^9)*d*cos(d*x + c) + (a^6*b^4 - 2*a^4*b^6
 + a^2*b^8)*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3/(a+b*cos(d*x+c))**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos\left(dx+c\right)^3}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^3/(b*cos(d*x + c) + a)^(5/2), x)
```

Giac [F]

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(dx+c)^3}{(b\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^3/(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^3/(b*cos(d*x + c) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(c+d\,x)^3}{(a+b\,\cos(c+d\,x))^{5/2}}\,dx$$

```
[In] int(cos(c + d*x)^3/(a + b*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)^3/(a + b*cos(c + d*x))^(5/2), x)
```

3.541 $\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 263

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = -\frac{4a(a^2-3b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3b^2(a^2-b^2)^2 d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2(2a^2-3b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3b^2(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} - \frac{2a^2\sin(c+dx)}{3b(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} + \frac{4a(a^2-3b^2)\sin(c+dx)}{3b(a^2-b^2)^2 d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] -2/3*a^2*sin(d*x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))^(3/2)+4/3*a*(a^2-3*b^2)*
sin(d*x+c)/b/(a^2-b^2)^2/d/(a+b*cos(d*x+c))^(1/2)-4/3*a*(a^2-3*b^2)*(cos(1/
2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/
2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/b^2/(a^2-b^2)^2/d/((a+b*cos(d*x+
c))/(a+b))^(1/2)+2/3*(2*a^2-3*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x
+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x
+c))/(a+b))^(1/2)/b^2/(a^2-b^2)/d/(a+b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.54 (sec) , antiderivative size = 263, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used

$= \{2869, 2833, 2831, 2742, 2740, 2734, 2732\}$

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = -\frac{2a^2\sin(c+dx)}{3bd\,(a^2-b^2)\,(a+b\cos(c+dx))^{3/2}} + \frac{4a(a^2-3b^2)\sin(c+dx)}{3bd\,(a^2-b^2)^2\sqrt{a+b\cos(c+dx)}} + \frac{2(2a^2-3b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3b^2d\,(a^2-b^2)\sqrt{a+b\cos(c+dx)}} - \frac{4a(a^2-3b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3b^2d\,(a^2-b^2)^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[In] Int[Cos[c + d*x]^2/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (-4*a*(a^2 - 3*b^2)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(
a + b)])/(3*b^2*(a^2 - b^2)^2*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) + (2*(2
*a^2 - 3*b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*
b)/(a + b)])/(3*b^2*(a^2 - b^2)*d*Sqrt[a + b*Cos[c + d*x]]) - (2*a^2*Sin[c
+ d*x])/(3*b*(a^2 - b^2)*d*(a + b*Cos[c + d*x])^(3/2)) + (4*a*(a^2 - 3*b^2)
*Sin[c + d*x])/(3*b*(a^2 - b^2)^2*d*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
```

```
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2833

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((a + b*Sin[e +
 f*x])^(m + 1)/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(a^2 - b^2)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[(a*c - b*d)*(m + 1) - (b*c - a*d)*(m
 + 2)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 - b^2, 0] && LtQ[m, -1] && IntegerQ[2*m]
```

Rule 2869

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^2, x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Cos[e
+ f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*(a^2 - b^2))), x] - Dist[
1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[b*(m + 1)*
(2*b*c*d - a*(c^2 + d^2)) + (a^2*d^2 - 2*a*b*c*d*(m + 2) + b^2*(d^2*(m + 1)
 + c^2*(m + 2)))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &
& NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{2a^2\sin(c+dx)}{3b\,(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}}+\frac{2\int\frac{\frac{3ab}{2}+\frac{1}{2}(2a^2-3b^2)\cos(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx}{3b\,(a^2-b^2)}\\
&= -\frac{2a^2\sin(c+dx)}{3b\,(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}}+\frac{4a(a^2-3b^2)\sin(c+dx)}{3b\,(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}}\\
&\quad-\frac{4\int\frac{-\frac{1}{4}b(a^2+3b^2)+\frac{1}{2}a(a^2-3b^2)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{3b\,(a^2-b^2)^2}\\
&= -\frac{2a^2\sin(c+dx)}{3b\,(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}}+\frac{4a(a^2-3b^2)\sin(c+dx)}{3b\,(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}}\\
&\quad-\frac{(2a(a^2-3b^2))\int\sqrt{a+b\cos(c+dx)}\,dx}{3b^2\,(a^2-b^2)^2}+\frac{(2a^2-3b^2)\int\frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{3b^2\,(a^2-b^2)}
\end{aligned}$$

$$= -\frac{2a^2\sin(c+dx)}{3b(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{4a(a^2-3b^2)\sin(c+dx)}{3b(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}}$$
$$- \frac{\left(2a(a^2-3b^2)\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{3b^2(a^2-b^2)^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$
$$+ \frac{\left((2a^2-3b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{3b^2(a^2-b^2)\sqrt{a+b\cos(c+dx)}}$$
$$= -\frac{4a(a^2-3b^2)\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3b^2(a^2-b^2)^2\,d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$
$$+ \frac{2(2a^2-3b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3b^2(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}$$
$$- \frac{2a^2\sin(c+dx)}{3b(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{4a(a^2-3b^2)\sin(c+dx)}{3b(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.92 (sec) , antiderivative size = 175, normalized size of antiderivative = 0.67

$$\int\frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{2\left(-\frac{\left(\frac{a+b\cos(c+dx)}{a+b}\right)^{3/2}\left(2(a^3-3ab^2)E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)+(-2a^3+2a^2b+3ab^2-3b^3)\,\text{EllipticF}\left(\frac{1}{2}(c+dx)\right.\right.}{(a-b)^2}\right.}{3b^2d(a+b\cos(c+dx))^{3/2}}$$

```
[In] Integrate[Cos[c + d*x]^2/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*(-((((a + b*Cos[c + d*x])/(a + b))^(3/2)*(2*(a^3 - 3*a*b^2)*EllipticE[(c
 + d*x)/2, (2*b)/(a + b)] + (-2*a^3 + 2*a^2*b + 3*a*b^2 - 3*b^3)*EllipticF[
(c + d*x)/2, (2*b)/(a + b)]))/(a - b)^2) + (a*b*(a^3 - 5*a*b^2 + 2*b*(a^2 -
 3*b^2)*Cos[c + d*x])*Sin[c + d*x])/(a^2 - b^2)^2))/(3*b^2*d*(a + b*Cos[c +
 d*x])^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 849 vs. 2(301) = 602.

Time = 8.48 (sec) , antiderivative size = 850, normalized size of antiderivative = 3.23

method	result	size
default	Expression too large to display	850

```
[In] int(cos(d*x+c)^2/(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/b^2*(sin(
1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*si
n(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*
x+1/2*c),(-2*b/(a-b))^(1/2))+2*a^2/b^2*(1/6/b/(a-b)/(a+b)*cos(1/2*d*x+1/2*c
)*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x
+1/2*c)^2+1/2*(a-b)/b)^2+8/3*sin(1/2*d*x+1/2*c)^2*b/(a-b)^2/(a+b)^2*cos(1/2
*d*x+1/2*c)*a/(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)
+(3*a-b)/(3*a^3+3*a^2*b-3*a*b^2-3*b^3)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*c
os(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(
1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-4/
3*a/(a-b)/(a+b)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a
-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/
2)*(EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-EllipticE(cos(1/2*d*x+
1/2*c),(-2*b/(a-b))^(1/2))))+4*a/b^2/sin(1/2*d*x+1/2*c)^2/(2*b*sin(1/2*d*x+
1/2*c)^2-a-b)/(a^2-b^2)*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)
^2)^(1/2)*(2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*b+EllipticE(cos(1/2*d*
x+1/2*c),(-2*b/(a-b))^(1/2))*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^
(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*a-EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-
b))^(1/2))*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*b))/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/
2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 814, normalized size of antiderivative = 3.10

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \text{Too large to display}$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/9*(6*(a^4*b^2 - 5*a^2*b^4 + 2*(a^3*b^3 - 3*a*b^5)*cos(d*x + c))*sqrt(b*co
s(d*x + c) + a)*sin(d*x + c) + (sqrt(2)*(-4*I*a^4*b^2 + 9*I*a^2*b^4 - 9*I*b
^6)*cos(d*x + c)^2 - 2*sqrt(2)*(4*I*a^5*b - 9*I*a^3*b^3 + 9*I*a*b^5)*cos(d*
x + c) + sqrt(2)*(-4*I*a^6 + 9*I*a^4*b^2 - 9*I*a^2*b^4))*sqrt(b)*weierstras
sPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*co
s(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b) + (sqrt(2)*(4*I*a^4*b^2 - 9*I*a^2
*b^4 + 9*I*b^6)*cos(d*x + c)^2 - 2*sqrt(2)*(-4*I*a^5*b + 9*I*a^3*b^3 - 9*I*
a*b^5)*cos(d*x + c) + sqrt(2)*(4*I*a^6 - 9*I*a^4*b^2 + 9*I*a^2*b^4))*sqrt(b
)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3,
 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b) - 6*(sqrt(2)*(I*a^3*b
^3 - 3*I*a*b^5)*cos(d*x + c)^2 + 2*sqrt(2)*(I*a^4*b^2 - 3*I*a^2*b^4)*cos(d*
```

```
x + c) + sqrt(2)*(I*a^5*b - 3*I*a^3*b^3))*sqrt(b)*weierstrassZeta(4/3*(4*a^
2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2
 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*s
in(d*x + c) + 2*a)/b)) - 6*(sqrt(2)*(-I*a^3*b^3 + 3*I*a*b^5)*cos(d*x + c)^2
 + 2*sqrt(2)*(-I*a^4*b^2 + 3*I*a^2*b^4)*cos(d*x + c) + sqrt(2)*(-I*a^5*b +
3*I*a^3*b^3))*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3
 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3
- 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b)))/((a^
4*b^5 - 2*a^2*b^7 + b^9)*d*cos(d*x + c)^2 + 2*(a^5*b^4 - 2*a^3*b^6 + a*b^8)
*d*cos(d*x + c) + (a^6*b^3 - 2*a^4*b^5 + a^2*b^7)*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**2/(a+b*cos(d*x+c))**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(dx+c)^2}{(b\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^2/(b*cos(d*x + c) + a)^(5/2), x)
```

Giac [F]

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(dx+c)^2}{(b\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^2/(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^2/(b*cos(d*x + c) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)^2}{\left(a+b\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int(cos(c + d*x)^2/(a + b*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)^2/(a + b*cos(c + d*x))^(5/2), x)
```

3.542 $\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 243

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = -\frac{2(a^2+3b^2)\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{3b(a^2-b^2)^2 d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} + \frac{2a\sin(c+dx)}{3(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} + \frac{2(a^2+3b^2)\sin(c+dx)}{3(a^2-b^2)^2 d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] 2/3*a*sin(d*x+c)/(a^2-b^2)/d/(a+b*cos(d*x+c))^(3/2)+2/3*(a^2+3*b^2)*sin(d*x
+c)/(a^2-b^2)^2/d/(a+b*cos(d*x+c))^(1/2)-2/3*(a^2+3*b^2)*(cos(1/2*d*x+1/2*c
)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b)
)^(1/2))*(a+b*cos(d*x+c))^(1/2)/b/(a^2-b^2)^2/d/((a+b*cos(d*x+c))/(a+b))^(1
/2)+2/3*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2
*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/b/(a^2-
b^2)/d/(a+b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.32 (sec) , antiderivative size = 243, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used

$= \{2833, 2831, 2742, 2740, 2734, 2732\}$

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{2(a^2+3b^2)\sin(c+dx)}{3d\,(a^2-b^2)^2\sqrt{a+b\cos(c+dx)}} + \frac{2a\sin(c+dx)}{3d\,(a^2-b^2)\,(a+b\cos(c+dx))^{3/2}} + \frac{2a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3bd\,(a^2-b^2)\sqrt{a+b\cos(c+dx)}} - \frac{2(a^2+3b^2)\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3bd\,(a^2-b^2)^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[In] Int[Cos[c + d*x]/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (-2*(a^2 + 3*b^2)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a
+ b)])/(3*b*(a^2 - b^2)^2*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) + (2*a*Sqrt
[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(3*b*
(a^2 - b^2)*d*Sqrt[a + b*Cos[c + d*x]]) + (2*a*Sin[c + d*x])/(3*(a^2 - b^2)
*d*(a + b*Cos[c + d*x])^(3/2)) + (2*(a^2 + 3*b^2)*Sin[c + d*x])/(3*(a^2 - b
^2)^2*d*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2833

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((a + b*Sin[e +
 f*x])^(m + 1)/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(a^2 - b^2)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[(a*c - b*d)*(m + 1) - (b*c - a*d)*(m
 + 2)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 - b^2, 0] && LtQ[m, -1] && IntegerQ[2*m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2a\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}}-\frac{2\int\frac{\frac{3b}{2}-\frac{1}{2}a\cos(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx}{3(a^2-b^2)}\\
&= \frac{2a\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}}\\
&\quad+\frac{2(a^2+3b^2)\sin(c+dx)}{3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}}+\frac{4\int\frac{-ab-\frac{1}{4}(a^2+3b^2)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{3(a^2-b^2)^2}\\
&= \frac{2a\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}}+\frac{2(a^2+3b^2)\sin(c+dx)}{3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}}\\
&\quad+\frac{a\int\frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{3b(a^2-b^2)}-\frac{(a^2+3b^2)\int\sqrt{a+b\cos(c+dx)}\,dx}{3b(a^2-b^2)^2}\\
&= \frac{2a\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}}+\frac{2(a^2+3b^2)\sin(c+dx)}{3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}}\\
&\quad-\frac{\left((a^2+3b^2)\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{3b(a^2-b^2)^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\\
&\quad+\frac{\left(a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{3b(a^2-b^2)\sqrt{a+b\cos(c+dx)}}
\end{aligned}$$

$$= -\frac{2(a^2+3b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3b(a^2-b^2)^2 d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} + \frac{2a\sin(c+dx)}{3(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} + \frac{2(a^2+3b^2)\sin(c+dx)}{3(a^2-b^2)^2 d\sqrt{a+b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.77 (sec) , antiderivative size = 154, normalized size of antiderivative = 0.63

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{2\left(-\frac{\left(\frac{a+b\cos(c+dx)}{a+b}\right)^{3/2}\left((a^2+3b^2)E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)+a(-a+b)\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)\right)}{(a-b)^2 b} + \frac{(2a(a^2+}{}\right.}{3d(a+b\cos(c+dx))^{3/2}}$$

```
[In] Integrate[Cos[c + d*x]/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*(-((((a + b*Cos[c + d*x])/(a + b))^(3/2)*((a^2 + 3*b^2)*EllipticE[(c + d
*x)/2, (2*b)/(a + b)] + a*(-a + b)*EllipticF[(c + d*x)/2, (2*b)/(a + b)]))/
((a - b)^2*b)) + ((2*a*(a^2 + b^2) + b*(a^2 + 3*b^2)*Cos[c + d*x])*Sin[c +
d*x])/(a^2 - b^2)^2))/(3*d*(a + b*Cos[c + d*x])^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 745 vs. 2(281) = 562.

Time = 7.80 (sec) , antiderivative size = 746, normalized size of antiderivative = 3.07

method	result
default	$-\frac{\sqrt{-\left(-2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-a+b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-\frac{2\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+(a+b)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+E\left(c\right.\right.}{}\right.}{}$

```
[In] int(cos(d*x+c)/(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2/b/sin(1/
2*d*x+1/2*c)^2/(2*b*sin(1/2*d*x+1/2*c)^2-a-b)/(a^2-b^2)*(-2*sin(1/2*d*x+1/2
*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x
```

```
+1/2*c)^2*b+EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*(-2*b/(a-b)*si
n(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*a-Ellipt
icE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2
+(a+b)/(a-b))^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*b)-2/b*a*(1/6/b/(a-b)/(a+b
)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)
^(1/2)/(cos(1/2*d*x+1/2*c)^2+1/2*(a-b)/b)^2+8/3*sin(1/2*d*x+1/2*c)^2*b/(a-b
)^2/(a+b)^2*cos(1/2*d*x+1/2*c)*a/(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*sin(1/2*
d*x+1/2*c)^2)^(1/2)+(3*a-b)/(3*a^3+3*a^2*b-3*a*b^2-3*b^3)*(sin(1/2*d*x+1/2*
c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/
2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2
*b/(a-b))^(1/2))-4/3*a/(a-b)/(a+b)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos
(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/
2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-Ell
ipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2)))))/sin(1/2*d*x+1/2*c)/(-2*b*s
in(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 765, normalized size of antiderivative = 3.15

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{6\left(2\,a^3b^2+2\,ab^4+\left(a^2b^3+3\,b^5\right)\cos\left(dx+c\right)\right)\sqrt{b\cos\left(dx+c\right)+a}\sin\left(dx+c\right)}{}$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/9*(6*(2*a^3*b^2 + 2*a*b^4 + (a^2*b^3 + 3*b^5)*cos(d*x + c))*sqrt(b*cos(d*
x + c) + a)*sin(d*x + c) - 2*(sqrt(2)*(I*a^3*b^2 - 3*I*a*b^4)*cos(d*x + c)^
2 + 2*sqrt(2)*(I*a^4*b - 3*I*a^2*b^3)*cos(d*x + c) + sqrt(2)*(I*a^5 - 3*I*a
^3*b^2))*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3
- 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b) - 2*(s
qrt(2)*(-I*a^3*b^2 + 3*I*a*b^4)*cos(d*x + c)^2 + 2*sqrt(2)*(-I*a^4*b + 3*I*
a^2*b^3)*cos(d*x + c) + sqrt(2)*(-I*a^5 + 3*I*a^3*b^2))*sqrt(b)*weierstrass
PInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos
(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b) - 3*(sqrt(2)*(I*a^2*b^3 + 3*I*b^5)
*cos(d*x + c)^2 + 2*sqrt(2)*(I*a^3*b^2 + 3*I*a*b^4)*cos(d*x + c) + sqrt(2)*
(I*a^4*b + 3*I*a^2*b^3))*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -
8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8
/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a
)/b)) - 3*(sqrt(2)*(-I*a^2*b^3 - 3*I*b^5)*cos(d*x + c)^2 + 2*sqrt(2)*(-I*a^
3*b^2 - 3*I*a*b^4)*cos(d*x + c) + sqrt(2)*(-I*a^4*b - 3*I*a^2*b^3))*sqrt(b)
*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weie
rstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(
3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b)))/((a^4*b^4 - 2*a^2*b^6 + b
```

```
^8)*d*cos(d*x + c)^2 + 2*(a^5*b^3 - 2*a^3*b^5 + a*b^7)*d*cos(d*x + c) + (a^
6*b^2 - 2*a^4*b^4 + a^2*b^6)*d)
```

Sympy [F]

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))**(5/2),x)
[Out] Integral(cos(c + d*x)/(a + b*cos(c + d*x))**(5/2), x)
```

Maxima [F]

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(dx+c)}{(b\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)/(b*cos(d*x + c) + a)^(5/2), x)
```

Giac [F]

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(dx+c)}{(b\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)/(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)/(b*cos(d*x + c) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(c+d\,x)}{(a+b\,\cos(c+d\,x))^{5/2}}\,dx$$

```
[In] int(cos(c + d*x)/(a + b*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)/(a + b*cos(c + d*x))^(5/2), x)
```

3.543 $\int \frac{1}{(a+b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 221

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{8a\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3(a^2-b^2)^2 d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} - \frac{2b\sin(c+dx)}{3(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} - \frac{8ab\sin(c+dx)}{3(a^2-b^2)^2 d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] -2/3*b*sin(d*x+c)/(a^2-b^2)/d/(a+b*cos(d*x+c))^(3/2)-8/3*a*b*sin(d*x+c)/(a^
2-b^2)^2/d/(a+b*cos(d*x+c))^(1/2)+8/3*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/
2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos
(d*x+c))^(1/2)/(a^2-b^2)^2/d/((a+b*cos(d*x+c))/(a+b))^(1/2)-2/3*(cos(1/2*d*
x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2)*(
b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/(a^2-b^2)/d/(a+b*cos(d*x+c))
^(1/2)
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 221, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used

$= \{2743, 2833, 2831, 2742, 2740, 2734, 2732\}$

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}}\,dx = -\frac{8ab\sin(c+dx)}{3d\,(a^2-b^2)^2\,\sqrt{a+b\cos(c+dx)}} - \frac{2b\sin(c+dx)}{3d\,(a^2-b^2)\,(a+b\cos(c+dx))^{3/2}} - \frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3d\,(a^2-b^2)\,\sqrt{a+b\cos(c+dx)}} + \frac{8a\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3d\,(a^2-b^2)^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[In] Int[(a + b*Cos[c + d*x])^(-5/2),x]
```

```
[Out] (8*a*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(3*(a^
2 - b^2)^2*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) - (2*Sqrt[(a + b*Cos[c + d
*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(3*(a^2 - b^2)*d*Sqrt[
a + b*Cos[c + d*x]]) - (2*b*Sin[c + d*x])/(3*(a^2 - b^2)*d*(a + b*Cos[c + d
*x])^(3/2)) - (8*a*b*Sin[c + d*x])/(3*(a^2 - b^2)^2*d*Sqrt[a + b*Cos[c + d*
x]])
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2743

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos
[c + d*x]*((a + b*Sin[c + d*x])^(n + 1)/(d*(n + 1)*(a^2 - b^2))), x] + Dist
[1/((n + 1)*(a^2 - b^2)), Int[(a + b*Sin[c + d*x])^(n + 1)*Simp[a*(n + 1) -
 b*(n + 2)*Sin[c + d*x], x], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2833

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((a + b*Sin[e +
 f*x])^(m + 1)/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(a^2 - b^2)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[(a*c - b*d)*(m + 1) - (b*c - a*d)*(m
 + 2)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 - b^2, 0] && LtQ[m, -1] && IntegerQ[2*m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{2b\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} - \frac{2\int \frac{-\frac{3a}{2}+\frac{1}{2}b\cos(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx}{3(a^2-b^2)} \\
&= -\frac{2b\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} \\
&\quad - \frac{8ab\sin(c+dx)}{3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}} + \frac{4\int \frac{\frac{1}{4}(3a^2+b^2)+ab\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{3(a^2-b^2)^2} \\
&= -\frac{2b\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} - \frac{8ab\sin(c+dx)}{3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}} \\
&\quad + \frac{(4a)\int \sqrt{a+b\cos(c+dx)}\,dx}{3(a^2-b^2)^2} - \frac{\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{3(a^2-b^2)}
\end{aligned}$$

$$
\begin{aligned}
&= -\frac{2b\sin(c+dx)}{3\left(a^2-b^2\right)d(a+b\cos(c+dx))^{3/2}} - \frac{8ab\sin(c+dx)}{3\left(a^2-b^2\right)^2 d\sqrt{a+b\cos(c+dx)}} \\
&\quad + \frac{\left(4a\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{3\left(a^2-b^2\right)^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\
&\quad - \frac{\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{3\left(a^2-b^2\right)\sqrt{a+b\cos(c+dx)}} \\
&= \frac{8a\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3\left(a^2-b^2\right)^2 d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3\left(a^2-b^2\right)d\sqrt{a+b\cos(c+dx)}} \\
&\quad - \frac{2b\sin(c+dx)}{3\left(a^2-b^2\right)d(a+b\cos(c+dx))^{3/2}} - \frac{8ab\sin(c+dx)}{3\left(a^2-b^2\right)^2 d\sqrt{a+b\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.61 (sec) , antiderivative size = 158, normalized size of antiderivative = 0.71

$$
\int\frac{1}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{8a(a+b)^2\left(\frac{a+b\cos(c+dx)}{a+b}\right)^{3/2}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)-2(a-b)(a+b)^2\left(\frac{a+b\cos(c+dx)}{a+b}\right.}{3(a-b)^2(a+b)^2d(a}
$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(-5/2),x]
```

```
[Out] (8*a*(a + b)^2*((a + b*Cos[c + d*x])/(a + b))^(3/2)*EllipticE[(c + d*x)/2,
(2*b)/(a + b)] - 2*(a - b)*(a + b)^2*((a + b*Cos[c + d*x])/(a + b))^(3/2)*E
llipticF[(c + d*x)/2, (2*b)/(a + b)] + 2*b*(-5*a^2 + b^2 - 4*a*b*Cos[c + d*
x])*Sin[c + d*x])/(3*(a - b)^2*(a + b)^2*d*(a + b*Cos[c + d*x])^(3/2))
```

Maple [A] (verified)

Time = 5.96 (sec) , antiderivative size = 489, normalized size of antiderivative = 2.21

method	result
default	$-\frac{\sqrt{-\left(-2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-a+b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+(a+b)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}}{3b(a-b)(a+b)\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{a-b}{2b}\right)^2}+\frac{16\left(\sin^2\left(\frac{dx}{2}\right.\right.}{3(a-b)^2(a+b)^2\sqrt{-\left(-2b\left(\mathrm{co}\right.\right.}}\right.}{}$

```
[In] int(1/(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(1/3/b/(a-b)
/(a+b)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*
c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2+1/2*(a-b)/b)^2+16/3*sin(1/2*d*x+1/2*c)^2*
b/(a-b)^2/(a+b)^2*cos(1/2*d*x+1/2*c)*a/(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*si
n(1/2*d*x+1/2*c)^2)^(1/2)+2*(3*a-b)/(3*a^3+3*a^2*b-3*a*b^2-3*b^3)*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/
2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/
2*c),(-2*b/(a-b))^(1/2))-8/3*a/(a-b)/(a+b)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(
(2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b
)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1
/2))-EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))))/sin(1/2*d*x+1/2*c)/
(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 692, normalized size of antiderivative = 3.13

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}}\,dx = -\frac{6\,(4\,ab^3\cos{(dx+c)} + 5\,a^2b^2 - b^4)\sqrt{b\cos{(dx+c)}+a}\sin{(dx+c)} - \left(\sqrt{2}(-i\,a^2b^2 - 3i\,b^4)\cos{(dx+c)}^2 - \right.}{}$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] -1/9*(6*(4*a*b^3*cos(d*x + c) + 5*a^2*b^2 - b^4)*sqrt(b*cos(d*x + c) + a)*s
in(d*x + c) - (sqrt(2)*(-I*a^2*b^2 - 3*I*b^4)*cos(d*x + c)^2 - 2*sqrt(2)*(I
*a^3*b + 3*I*a*b^3)*cos(d*x + c) + sqrt(2)*(-I*a^4 - 3*I*a^2*b^2))*sqrt(b)*
weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1
/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b) - (sqrt(2)*(I*a^2*b^2 +
 3*I*b^4)*cos(d*x + c)^2 - 2*sqrt(2)*(-I*a^3*b - 3*I*a*b^3)*cos(d*x + c) +
sqrt(2)*(I*a^4 + 3*I*a^2*b^2))*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b
^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x
 + c) + 2*a)/b) + 12*(-I*sqrt(2)*a*b^3*cos(d*x + c)^2 - 2*I*sqrt(2)*a^2*b^2
*cos(d*x + c) - I*sqrt(2)*a^3*b)*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2
)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)
/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x +
c) + 2*a)/b)) + 12*(I*sqrt(2)*a*b^3*cos(d*x + c)^2 + 2*I*sqrt(2)*a^2*b^2*co
s(d*x + c) + I*sqrt(2)*a^3*b)*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b
^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^
2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c)
+ 2*a)/b)))/((a^4*b^3 - 2*a^2*b^5 + b^7)*d*cos(d*x + c)^2 + 2*(a^5*b^2 - 2*
a^3*b^4 + a*b^6)*d*cos(d*x + c) + (a^6*b - 2*a^4*b^3 + a^2*b^5)*d)
```

Sympy [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}}\,dx=\int \frac{1}{(a+b\cos{(c+dx)})^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))**(5/2),x)
[Out] Integral((a + b*cos(c + d*x))**(-5/2), x)
```

Maxima [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}}\,dx=\int \frac{1}{(b\cos{(dx+c)}+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(-5/2), x)
```

Giac [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}}\,dx=\int \frac{1}{(b\cos{(dx+c)}+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(-5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}}\,dx=\int \frac{1}{{\left(a+b\,\cos\left(c+d\,x\right)\right)}^{5/2}}\,dx$$

```
[In] int(1/(a + b*cos(c + d*x))^(5/2),x)
[Out] int(1/(a + b*cos(c + d*x))^(5/2), x)
```

3.544 $\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 320

$$\begin{aligned}\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx =& -\frac{2b(7a^2-3b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3a^2(a^2-b^2)^2 d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\ &+ \frac{2b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3a(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}} \\ &+ \frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{a^2 d\sqrt{a+b\cos(c+dx)}} \\ &+ \frac{2b^2\sin(c+dx)}{3a(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{2b^2(7a^2-3b^2)\sin(c+dx)}{3a^2(a^2-b^2)^2 d\sqrt{a+b\cos(c+dx)}}\end{aligned}$$

```
[Out] 2/3*b^2*sin(d*x+c)/a/(a^2-b^2)/d/(a+b*cos(d*x+c))^(3/2)+2/3*b^2*(7*a^2-3*b^
2)*sin(d*x+c)/a^2/(a^2-b^2)^2/d/(a+b*cos(d*x+c))^(1/2)-2/3*b*(7*a^2-3*b^2)*
(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c
),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/a^2/(a^2-b^2)^2/d/((a+b*c
os(d*x+c))/(a+b))^(1/2)+2/3*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*
c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/
(a+b))^(1/2)/a/(a^2-b^2)/d/(a+b*cos(d*x+c))^(1/2)+2*(cos(1/2*d*x+1/2*c)^2)^
(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2,2^(1/2)*(b/(a+b))^
(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/a^2/d/(a+b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.99 (sec) , antiderivative size = 320, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.476$, Rules used = {2881, 3134, 3138, 2734, 2732, 3081, 2742, 2740, 2886, 2884}

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{2b^2(7a^2-3b^2)\sin(c+dx)}{3a^2d\,(a^2-b^2)^2\,\sqrt{a+b\cos(c+dx)}} + \frac{2b^2\sin(c+dx)}{3ad\,(a^2-b^2)\,(a+b\cos(c+dx))^{3/2}} + \frac{2b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3ad\,(a^2-b^2)\,\sqrt{a+b\cos(c+dx)}} - \frac{2b(7a^2-3b^2)\,\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3a^2d\,(a^2-b^2)^2\,\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{a^2d\sqrt{a+b\cos(c+dx)}}$$

```
[In] Int[Sec[c + d*x]/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (-2*b*(7*a^2 - 3*b^2)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)
/(a + b)])/(3*a^2*(a^2 - b^2)^2*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) + (2*
b*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])
/(3*a*(a^2 - b^2)*d*Sqrt[a + b*Cos[c + d*x]]) + (2*Sqrt[(a + b*Cos[c + d*x]
)/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(a + b)])/(a^2*d*Sqrt[a + b*Cos
[c + d*x]]) + (2*b^2*Sin[c + d*x])/(3*a*(a^2 - b^2)*d*(a + b*Cos[c + d*x])^
(3/2)) + (2*b^2*(7*a^2 - 3*b^2)*Sin[c + d*x])/(3*a^2*(a^2 - b^2)^2*d*Sqrt[a
 + b*Cos[c + d*x]])
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
```

```
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 2886

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(c + d*Sin[e + f*x])/(c + d)]/Sqrt
[c + d*Sin[e + f*x]], Int[1/((a + b*Sin[e + f*x])*Sqrt[c/(c + d) + (d/(c +
d))*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] &&  !GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{2b^2\sin(c+dx)}{3a\,(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{2\int \frac{\left(\frac{3}{2}(a^2-b^2)-\frac{3}{2}ab\cos(c+dx)+\frac{1}{2}b^2\cos^2(c+dx)\right)\sec(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx}{3a\,(a^2-b^2)}$$

$$= \frac{2b^2\sin(c+dx)}{3a\,(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{2b^2(7a^2-3b^2)\sin(c+dx)}{3a^2\,(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}} + \frac{4\int \frac{\left(\frac{3}{4}(a^2-b^2)^2-\frac{1}{2}ab(3a^2-b^2)\cos(c+dx)-\frac{1}{4}b^2(7a^2-3b^2)\cos^2(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{3a^2\,(a^2-b^2)^2}$$

$$=\frac{2b^2\sin(c+dx)}{3a\left(a^2-b^2\right)d(a+b\cos(c+dx))^{3/2}}+\frac{2b^2(7a^2-3b^2)\sin(c+dx)}{3a^2\left(a^2-b^2\right)^2d\sqrt{a+b\cos(c+dx)}}-\frac{4\int\frac{\left(-\frac{3}{4}b\left(a^2-b^2\right)^2-\frac{1}{4}ab^2\left(a^2-b^2\right)\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}dx}{3a^2b\left(a^2-b^2\right)^2}-\frac{(b(7a^2-3b^2))\int\sqrt{a+b\cos(c+dx)}dx}{3a^2\left(a^2-b^2\right)^2}$$

$$=\frac{2b^2\sin(c+dx)}{3a\left(a^2-b^2\right)d(a+b\cos(c+dx))^{3/2}}+\frac{2b^2(7a^2-3b^2)\sin(c+dx)}{3a^2\left(a^2-b^2\right)^2d\sqrt{a+b\cos(c+dx)}}+\frac{\int\frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}dx}{a^2}+\frac{b\int\frac{1}{\sqrt{a+b\cos(c+dx)}}dx}{3a\left(a^2-b^2\right)}-\frac{\left(b(7a^2-3b^2)\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}dx}{3a^2\left(a^2-b^2\right)^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

$$=-\frac{2b(7a^2-3b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3a^2\left(a^2-b^2\right)^2d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}+\frac{2b^2\sin(c+dx)}{3a\left(a^2-b^2\right)d(a+b\cos(c+dx))^{3/2}}+\frac{2b^2(7a^2-3b^2)\sin(c+dx)}{3a^2\left(a^2-b^2\right)^2d\sqrt{a+b\cos(c+dx)}}+\frac{\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\int\frac{\sec(c+dx)}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}dx}{a^2\sqrt{a+b\cos(c+dx)}}+\frac{\left(b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}dx}{3a\left(a^2-b^2\right)\sqrt{a+b\cos(c+dx)}}$$

$$=-\frac{2b(7a^2-3b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3a^2\left(a^2-b^2\right)^2d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}+\frac{2b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3a\left(a^2-b^2\right)d\sqrt{a+b\cos(c+dx)}}+\frac{2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{a^2d\sqrt{a+b\cos(c+dx)}}+\frac{2b^2\sin(c+dx)}{3a\left(a^2-b^2\right)d(a+b\cos(c+dx))^{3/2}}+\frac{2b^2(7a^2-3b^2)\sin(c+dx)}{3a^2\left(a^2-b^2\right)^2d\sqrt{a+b\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 3.23 (sec) , antiderivative size = 464, normalized size of antiderivative = 1.45

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{\frac{-\frac{8ab\left(3a^2-b^2\right)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}}+\frac{2\left(6a^4-19a^2b^2+9b^4\right)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+\cdots\right.}{\cdots}}{\cdots}$$

```
[In] Integrate[Sec[c + d*x]/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (((-8*a*b*(3*a^2 - b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d
*x)/2, (2*b)/(a + b)])/Sqrt[a + b*Cos[c + d*x]] + (2*(6*a^4 - 19*a^2*b^2 +
9*b^4)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/
(a + b)])/Sqrt[a + b*Cos[c + d*x]] + ((2*I)*(-7*a^2 + 3*b^2)*Sqrt[-((b*(-1
+ Cos[c + d*x]))/(a + b))]*Sqrt[-((b*(1 + Cos[c + d*x]))/(a - b))]*Csc[c +
d*x]*(-2*a*(a - b)*EllipticE[I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c
 + d*x]]], (a + b)/(a - b)] + b*(-2*a*EllipticF[I*ArcSinh[Sqrt[-(a + b)^(-1
)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)] + b*EllipticPi[(a + b)/a, I*
ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)])))/
(a*Sqrt[-(a + b)^(-1)]))/(a^2*(a - b)^2*(a + b)^2) + (4*b^2*(8*a^3 - 4*a*b^
2 + b*(7*a^2 - 3*b^2)*Cos[c + d*x])*Sin[c + d*x])/((a^3 - a*b^2)^2*(a + b*C
os[c + d*x])^(3/2)))/(6*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 848 vs. 2(383) = 766.

Time = 9.02 (sec) , antiderivative size = 849, normalized size of antiderivative = 2.65

method	result	size
default	Expression too large to display	849

```
[In] int(sec(d*x+c)/(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2/a^2*(sin
(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*s
in(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*
d*x+1/2*c),2,(-2*b/(a-b))^(1/2))+2/a^2*b/sin(1/2*d*x+1/2*c)^2/(2*b*sin(1/2*
d*x+1/2*c)^2-a-b)/(a^2-b^2)*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/
2*c)^2)^(1/2)*(2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*b+EllipticE(cos(1/
2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-
b))^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*a-EllipticE(cos(1/2*d*x+1/2*c),(-2*b
/(a-b))^(1/2))*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2
```

```
*d*x+1/2*c)^2)^(1/2)*b)-2/a*b*(1/6/b/(a-b)/(a+b)*cos(1/2*d*x+1/2*c)*(-2*sin
(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2
+1/2*(a-b)/b)^2+8/3*sin(1/2*d*x+1/2*c)^2*b/(a-b)^2/(a+b)^2*cos(1/2*d*x+1/2*
c)*a/(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)+(3*a-b)/
(3*a^3+3*a^2*b-3*a*b^2-3*b^3)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*
x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1
/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-4/3*a/(a-b)
/(a+b)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b)
)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(Ellip
ticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),(-
2*b/(a-b))^(1/2)))))/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/
2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))**(5/2),x)
[Out] Integral(sec(c + d*x)/(a + b*cos(c + d*x))**(5/2), x)
```

Maxima [F]

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\sec(dx+c)}{(b\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)/(b*cos(d*x + c) + a)^(5/2), x)
```

Giac [F]

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx=\int \frac{\sec(dx+c)}{(b\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)/(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)/(b*cos(d*x + c) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx=\int \frac{1}{\cos(c+d\,x)\,\left(a+b\,\cos(c+d\,x)\right)^{5/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)*(a + b*cos(c + d*x))^(5/2)),x)
[Out] int(1/(cos(c + d*x)*(a + b*cos(c + d*x))^(5/2)), x)
```

3.545 $\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 380

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = -\frac{(3a^4-26a^2b^2+15b^4)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{3a^3(a^2-b^2)^2 d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{(3a^2-5b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3a^2(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}} - \frac{5b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{a^3d\sqrt{a+b\cos(c+dx)}} + \frac{b(3a^2-5b^2)\sin(c+dx)}{3a^2(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{b(3a^4-26a^2b^2+15b^4)\sin(c+dx)}{3a^3(a^2-b^2)^2 d\sqrt{a+b\cos(c+dx)}} + \frac{\tan(c+dx)}{ad(a+b\cos(c+dx))^{3/2}}$$

```
[Out] 1/3*b*(3*a^2-5*b^2)*sin(d*x+c)/a^2/(a^2-b^2)/d/(a+b*cos(d*x+c))^(3/2)+1/3*b
*(3*a^4-26*a^2*b^2+15*b^4)*sin(d*x+c)/a^3/(a^2-b^2)^2/d/(a+b*cos(d*x+c))^(1
/2)-1/3*(3*a^4-26*a^2*b^2+15*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+
1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c
))^(1/2)/a^3/(a^2-b^2)^2/d/((a+b*cos(d*x+c))/(a+b))^(1/2)+1/3*(3*a^2-5*b^2)
*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*
c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/a^2/(a^2-b^2)/d/
(a+b*cos(d*x+c))^(1/2)-5*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*
EllipticPi(sin(1/2*d*x+1/2*c),2,2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/
(a+b))^(1/2)/a^3/d/(a+b*cos(d*x+c))^(1/2)+tan(d*x+c)/a/d/(a+b*cos(d*x+c))^(
3/2)
```

Rubi [A] (verified)

Time = 1.29 (sec) , antiderivative size = 380, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {2881, 3135, 3134, 3138, 2734, 2732, 3081, 2742, 2740, 2886, 2884}

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = -\frac{5b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{a^3d\sqrt{a+b\cos(c+dx)}} + \frac{b(3a^2-5b^2)\sin(c+dx)}{3a^2d\left(a^2-b^2\right)(a+b\cos(c+dx))^{3/2}} + \frac{(3a^2-5b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3a^2d\left(a^2-b^2\right)\sqrt{a+b\cos(c+dx)}} + \frac{b(3a^4-26a^2b^2+15b^4)\sin(c+dx)}{3a^3d\left(a^2-b^2\right)^2\sqrt{a+b\cos(c+dx)}} - \frac{(3a^4-26a^2b^2+15b^4)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{3a^3d\left(a^2-b^2\right)^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{\tan(c+dx)}{ad(a+b\cos(c+dx))^{3/2}}$$

```
[In] Int[Sec[c + d*x]^2/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] -1/3*((3*a^4 - 26*a^2*b^2 + 15*b^4)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c +
 d*x)/2, (2*b)/(a + b)])/(a^3*(a^2 - b^2)^2*d*Sqrt[(a + b*Cos[c + d*x])/(a
+ b)]) + ((3*a^2 - 5*b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c +
 d*x)/2, (2*b)/(a + b)])/(3*a^2*(a^2 - b^2)*d*Sqrt[a + b*Cos[c + d*x]]) - (
5*b*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c + d*x)/2, (2*b)/(a
+ b)])/(a^3*d*Sqrt[a + b*Cos[c + d*x]]) + (b*(3*a^2 - 5*b^2)*Sin[c + d*x])/
(3*a^2*(a^2 - b^2)*d*(a + b*Cos[c + d*x])^(3/2)) + (b*(3*a^4 - 26*a^2*b^2 +
 15*b^4)*Sin[c + d*x])/(3*a^3*(a^2 - b^2)^2*d*Sqrt[a + b*Cos[c + d*x]]) + T
an[c + d*x]/(a*d*(a + b*Cos[c + d*x])^(3/2))
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 2886

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(c + d*Sin[e + f*x])/(c + d)]/Sqrt
[c + d*Sin[e + f*x]], Int[1/((a + b*Sin[e + f*x])*Sqrt[c/(c + d) + (d/(c +
d))*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] &&  !GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
```

```
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3135

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
Simp[(-(A*b^2 + a^2*C))*Cos[e + f*x]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*S
in[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2))), x] + Dist[1/((m
+ 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[
e + f*x])^n*Simp[a*(m + 1)*(b*c - a*d)*(A + C) + d*(A*b^2 + a^2*C)*(m + n +
 2) - (c*(A*b^2 + a^2*C) + b*(m + 1)*(b*c - a*d)*(A + C))*Sin[e + f*x] - d*
(A*b^2 + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d
, e, f, A, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 -
 d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||
!(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a,
0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{\tan(c+dx)}{ad(a+b\cos(c+dx))^{3/2}} + \frac{\int \frac{\left(-\frac{5b}{2}+\frac{3}{2}b\cos^2(c+dx)\right)\sec(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx}{a}$$

$$= \frac{b(3a^2-5b^2)\sin(c+dx)}{3a^2(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{\tan(c+dx)}{ad(a+b\cos(c+dx))^{3/2}} + \frac{2\int \frac{\left(-\frac{15}{4}b(a^2-b^2)+\frac{3}{2}ab^2\cos(c+dx)+\frac{1}{4}b(3a^2-5b^2)\cos^2(c+dx)\right)\sec(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx}{3a^2(a^2-b^2)}$$

$$= \frac{b(3a^2-5b^2)\sin(c+dx)}{3a^2(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{b(3a^4-26a^2b^2+15b^4)\sin(c+dx)}{3a^3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}} + \frac{\tan(c+dx)}{ad(a+b\cos(c+dx))^{3/2}} + \frac{4\int \frac{\left(-\frac{15}{8}b(a^2-b^2)^2+\frac{1}{4}ab^2(9a^2-5b^2)\cos(c+dx)-\frac{1}{8}b(3a^4-26a^2b^2+15b^4)\cos^2(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{3a^3(a^2-b^2)^2}$$

$$= \frac{b(3a^2-5b^2)\sin(c+dx)}{3a^2(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{b(3a^4-26a^2b^2+15b^4)\sin(c+dx)}{3a^3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}} + \frac{\tan(c+dx)}{ad(a+b\cos(c+dx))^{3/2}} - \frac{4\int \frac{\left(\frac{15}{8}b^2(a^2-b^2)^2-\frac{1}{8}ab(3a^4-8a^2b^2+5b^4)\cos(c+dx)\right)\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{3a^3b(a^2-b^2)^2} - \frac{(3a^4-26a^2b^2+15b^4)\int \sqrt{a+b\cos(c+dx)}\,dx}{6a^3(a^2-b^2)^2}$$

$$= \frac{b(3a^2-5b^2)\sin(c+dx)}{3a^2(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{b(3a^4-26a^2b^2+15b^4)\sin(c+dx)}{3a^3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}} + \frac{\tan(c+dx)}{ad(a+b\cos(c+dx))^{3/2}} - \frac{(5b)\int \frac{\sec(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{2a^3} + \frac{(3a^2-5b^2)\int \frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{6a^2(a^2-b^2)} - \frac{\left((3a^4-26a^2b^2+15b^4)\sqrt{a+b\cos(c+dx)}\right)\int \sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{6a^3(a^2-b^2)^2\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

$$= -\frac{(3a^4-26a^2b^2+15b^4)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{3a^3(a^2-b^2)^2 d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{b(3a^2-5b^2)\sin(c+dx)}{3a^2(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} + \frac{b(3a^4-26a^2b^2+15b^4)\sin(c+dx)}{3a^3(a^2-b^2)^2 d\sqrt{a+b\cos(c+dx)}} + \frac{\tan(c+dx)}{ad(a+b\cos(c+dx))^{3/2}} - \frac{\left(5b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{\sec(c+dx)}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}dx}{2a^3\sqrt{a+b\cos(c+dx)}} + \frac{\left((3a^2-5b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}dx}{6a^2(a^2-b^2)\sqrt{a+b\cos(c+dx)}}$$

$$= -\frac{(3a^4-26a^2b^2+15b^4)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{3a^3(a^2-b^2)^2 d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{(3a^2-5b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{3a^2(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} - \frac{5b\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{a^3d\sqrt{a+b\cos(c+dx)}} + \frac{b(3a^2-5b^2)\sin(c+dx)}{3a^2(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} + \frac{b(3a^4-26a^2b^2+15b^4)\sin(c+dx)}{3a^3(a^2-b^2)^2 d\sqrt{a+b\cos(c+dx)}} + \frac{\tan(c+dx)}{ad(a+b\cos(c+dx))^{3/2}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 5.22 (sec) , antiderivative size = 517, normalized size of antiderivative = 1.36

$$\int\frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^{5/2}}dx = -\frac{b\left(-\frac{8ab(9a^2-5b^2)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{\sqrt{a+b\cos(c+dx)}}+\frac{2(33a^4-86a^2b^2+45b^4)\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\operatorname{EllipticP}}{\sqrt{a+b\cos(c+dx)}}\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^2/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (-((b*((-8*a*b*(9*a^2 - 5*b^2)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF
[(c + d*x)/2, (2*b)/(a + b)])/Sqrt[a + b*Cos[c + d*x]] + (2*(33*a^4 - 86*a^
2*b^2 + 45*b^4)*Sqrt[(a + b*Cos[c + d*x])/(a + b)]*EllipticPi[2, (c + d*x)/
2, (2*b)/(a + b)])/Sqrt[a + b*Cos[c + d*x]] + ((2*I)*(3*a^4 - 26*a^2*b^2 +
15*b^4)*Sqrt[-((b*(-1 + Cos[c + d*x]))/(a + b))]*Sqrt[-((b*(1 + Cos[c + d*x
```

```
]))/(a - b))]*Csc[c + d*x]*(-2*a*(a - b)*EllipticE[I*ArcSinh[Sqrt[-(a + b)^
(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)] + b*(-2*a*EllipticF[I*Arc
Sinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]], (a + b)/(a - b)] + b*El
lipticPi[(a + b)/a, I*ArcSinh[Sqrt[-(a + b)^(-1)]*Sqrt[a + b*Cos[c + d*x]]]
, (a + b)/(a - b)])))/(a*b^2*Sqrt[-(a + b)^(-1)])))/((a - b)^2*(a + b)^2))
+ (2*(4*a*b*(3*a^4 - 17*a^2*b^2 + 10*b^4)*Sin[c + d*x] + (3*a^4*b^2 - 26*a^
2*b^4 + 15*b^6)*Sin[2*(c + d*x)] + 6*(a^3 - a*b^2)^2*Tan[c + d*x]))/((a^2 -
 b^2)^2*(a + b*Cos[c + d*x])^(3/2)))/(12*a^3*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1323 vs. $2(441) = 882$.

Time = 12.07 (sec) , antiderivative size = 1324, normalized size of antiderivative = 3.48

method	result	size
default	Expression too large to display	1324

```
[In] int(sec(d*x+c)^2/(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/a^2*(-cos
(1/2*d*x+1/2*c)/a*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1
/2)/(2*cos(1/2*d*x+1/2*c)^2-1)+1/2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1
/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*
d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-1/2*(s
in(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2
*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2
*d*x+1/2*c),(-2*b/(a-b))^(1/2))+1/2/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*co
s(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1
/2*d*x+1/2*c)^2)^(1/2)*b*EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))+1
/2/a*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^
(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*Elliptic
Pi(cos(1/2*d*x+1/2*c),2,(-2*b/(a-b))^(1/2)))+4/a^3*b*(sin(1/2*d*x+1/2*c)^2)
^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^
4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,(-2*b
/(a-b))^(1/2))+2*b^2/a^2*(1/6/b/(a-b)/(a+b)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*
d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2+1/2*
(a-b)/b)^2+8/3*sin(1/2*d*x+1/2*c)^2*b/(a-b)^2/(a+b)^2*cos(1/2*d*x+1/2*c)*a/
(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)+(3*a-b)/(3*a^
3+3*a^2*b-3*a*b^2-3*b^3)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2
*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)
^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-4/3*a/(a-b)/(a+b
)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/
2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(EllipticF(
cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(
a-b))^(1/2))))-4*b^2/a^3/sin(1/2*d*x+1/2*c)^2/(2*b*sin(1/2*d*x+1/2*c)^2-a-b
```

```
)/(a^2-b^2)*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2
*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*b+EllipticE(cos(1/2*d*x+1/2*c),(-2
*b/(a-b))^(1/2))*(-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1
/2*d*x+1/2*c)^2)^(1/2)*a-EllipticE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*(
-2*b/(a-b)*sin(1/2*d*x+1/2*c)^2+(a+b)/(a-b))^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(
1/2)*b))/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\sec^2{(c+dx)}}{(a+b\cos{(c+dx)})^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)**2/(a+b*cos(d*x+c))**(5/2),x)
[Out] Integral(sec(c + d*x)**2/(a + b*cos(c + d*x))**(5/2), x)
```

Maxima [F]

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\sec{(dx+c)}^2}{(b\cos{(dx+c)}+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^2/(b*cos(d*x + c) + a)^(5/2), x)
```

Giac [F]

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\sec\left(dx+c\right)^2}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^2/(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^2/(b*cos(d*x + c) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^2(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^2\,{\left(a+b\,\cos\left(c+d\,x\right)\right)}^{5/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^2*(a + b*cos(c + d*x))^(5/2)),x)
[Out] int(1/(cos(c + d*x)^2*(a + b*cos(c + d*x))^(5/2)), x)
```

3.546 $\int \frac{1}{(a+b\cos(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 282

$$\int \frac{1}{(a+b\cos(c+dx))^{7/2}}\,dx = \frac{2(23a^2+9b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{15(a^2-b^2)^3 d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} - \frac{16a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{15(a^2-b^2)^2 d\sqrt{a+b\cos(c+dx)}} - \frac{2b\sin(c+dx)}{5(a^2-b^2)d(a+b\cos(c+dx))^{5/2}} - \frac{16ab\sin(c+dx)}{15(a^2-b^2)^2 d(a+b\cos(c+dx))^{3/2}} - \frac{2b(23a^2+9b^2)\sin(c+dx)}{15(a^2-b^2)^3 d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] -2/5*b*sin(d*x+c)/(a^2-b^2)/d/(a+b*cos(d*x+c))^(5/2)-16/15*a*b*sin(d*x+c)/(
a^2-b^2)^2/d/(a+b*cos(d*x+c))^(3/2)-2/15*b*(23*a^2+9*b^2)*sin(d*x+c)/(a^2-b
^2)^3/d/(a+b*cos(d*x+c))^(1/2)+2/15*(23*a^2+9*b^2)*(cos(1/2*d*x+1/2*c)^2)^(
1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2)*(b/(a+b))^(1/2
))*(a+b*cos(d*x+c))^(1/2)/(a^2-b^2)^3/d/((a+b*cos(d*x+c))/(a+b))^(1/2)-16/1
5*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1
/2*c),2^(1/2)*(b/(a+b))^(1/2))*((a+b*cos(d*x+c))/(a+b))^(1/2)/(a^2-b^2)^2/d
/(a+b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 282, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {2743, 2833, 2831, 2742, 2740, 2734, 2732}

$$\int \frac{1}{(a+b\cos(c+dx))^{7/2}}\,dx = -\frac{2b(23a^2+9b^2)\sin(c+dx)}{15d\,(a^2-b^2)^3\sqrt{a+b\cos(c+dx)}} - \frac{16ab\sin(c+dx)}{15d\,(a^2-b^2)^2\,(a+b\cos(c+dx))^{3/2}} - \frac{2b\sin(c+dx)}{5d\,(a^2-b^2)\,(a+b\cos(c+dx))^{5/2}} - \frac{16a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{15d\,(a^2-b^2)^2\sqrt{a+b\cos(c+dx)}} + \frac{2(23a^2+9b^2)\sqrt{a+b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{15d\,(a^2-b^2)^3\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[In] Int[(a + b*Cos[c + d*x])^(-7/2),x]
```

```
[Out] (2*(23*a^2 + 9*b^2)*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(
a + b)])/(15*(a^2 - b^2)^3*d*Sqrt[(a + b*Cos[c + d*x])/(a + b)]) - (16*a*Sq
rt[(a + b*Cos[c + d*x])/(a + b)]*EllipticF[(c + d*x)/2, (2*b)/(a + b)])/(15
*(a^2 - b^2)^2*d*Sqrt[a + b*Cos[c + d*x]]) - (2*b*Sin[c + d*x])/(5*(a^2 - b
^2)*d*(a + b*Cos[c + d*x])^(5/2)) - (16*a*b*Sin[c + d*x])/(15*(a^2 - b^2)^2
*d*(a + b*Cos[c + d*x])^(3/2)) - (2*b*(23*a^2 + 9*b^2)*Sin[c + d*x])/(15*(a
^2 - b^2)^3*d*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2742

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[(a
 + b*Sin[c + d*x])/(a + b)]/Sqrt[a + b*Sin[c + d*x]], Int[1/Sqrt[a/(a + b)
+ (b/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] &&  !GtQ[a + b, 0]
```

Rule 2743

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos
[c + d*x]*((a + b*Sin[c + d*x])^(n + 1)/(d*(n + 1)*(a^2 - b^2))), x] + Dist
[1/((n + 1)*(a^2 - b^2)), Int[(a + b*Sin[c + d*x])^(n + 1)*Simp[a*(n + 1) -
 b*(n + 2)*Sin[c + d*x], x], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 -
b^2, 0] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2833

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((a + b*Sin[e +
 f*x])^(m + 1)/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(a^2 - b^2)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[(a*c - b*d)*(m + 1) - (b*c - a*d)*(m
 + 2)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 - b^2, 0] && LtQ[m, -1] && IntegerQ[2*m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{2b\sin(c+dx)}{5(a^2-b^2)\,d(a+b\cos(c+dx))^{5/2}}-\frac{2\int\frac{-\frac{5a}{2}+\frac{3}{2}b\cos(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx}{5(a^2-b^2)}\\
&= -\frac{2b\sin(c+dx)}{5(a^2-b^2)\,d(a+b\cos(c+dx))^{5/2}}\\
&\quad-\frac{16ab\sin(c+dx)}{15(a^2-b^2)^2\,d(a+b\cos(c+dx))^{3/2}}+\frac{4\int\frac{\frac{3}{4}(5a^2+3b^2)-2ab\cos(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx}{15(a^2-b^2)^2}\\
&= -\frac{2b\sin(c+dx)}{5(a^2-b^2)\,d(a+b\cos(c+dx))^{5/2}}-\frac{16ab\sin(c+dx)}{15(a^2-b^2)^2\,d(a+b\cos(c+dx))^{3/2}}\\
&\quad-\frac{2b(23a^2+9b^2)\sin(c+dx)}{15(a^2-b^2)^3\,d\sqrt{a+b\cos(c+dx)}}-\frac{8\int\frac{-\frac{1}{8}a(15a^2+17b^2)-\frac{1}{8}b(23a^2+9b^2)\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx}{15(a^2-b^2)^3}
\end{aligned}$$

$$
\begin{aligned}
&= -\frac{2b\sin(c+dx)}{5\left(a^2-b^2\right)d(a+b\cos(c+dx))^{5/2}} - \frac{16ab\sin(c+dx)}{15\left(a^2-b^2\right)^2 d(a+b\cos(c+dx))^{3/2}} \\
&\quad - \frac{2b(23a^2+9b^2)\sin(c+dx)}{15\left(a^2-b^2\right)^3 d\sqrt{a+b\cos(c+dx)}} - \frac{(8a)\int\frac{1}{\sqrt{a+b\cos(c+dx)}}\,dx}{15\left(a^2-b^2\right)^2} \\
&\quad + \frac{(23a^2+9b^2)\int\sqrt{a+b\cos(c+dx)}\,dx}{15\left(a^2-b^2\right)^3}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{2b\sin(c+dx)}{5\left(a^2-b^2\right)d(a+b\cos(c+dx))^{5/2}} - \frac{16ab\sin(c+dx)}{15\left(a^2-b^2\right)^2 d(a+b\cos(c+dx))^{3/2}} \\
&\quad - \frac{2b(23a^2+9b^2)\sin(c+dx)}{15\left(a^2-b^2\right)^3 d\sqrt{a+b\cos(c+dx)}} \\
&\quad + \frac{\left((23a^2+9b^2)\sqrt{a+b\cos(c+dx)}\right)\int\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{15\left(a^2-b^2\right)^3\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\
&\quad - \frac{\left(8a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\right)\int\frac{1}{\sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}}\,dx}{15\left(a^2-b^2\right)^2\sqrt{a+b\cos(c+dx)}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{2(23a^2+9b^2)\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)}{15\left(a^2-b^2\right)^3 d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}} \\
&\quad - \frac{16a\sqrt{\frac{a+b\cos(c+dx)}{a+b}}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)}{15\left(a^2-b^2\right)^2 d\sqrt{a+b\cos(c+dx)}} - \frac{2b\sin(c+dx)}{5\left(a^2-b^2\right)d(a+b\cos(c+dx))^{5/2}} \\
&\quad - \frac{16ab\sin(c+dx)}{15\left(a^2-b^2\right)^2 d(a+b\cos(c+dx))^{3/2}} - \frac{2b(23a^2+9b^2)\sin(c+dx)}{15\left(a^2-b^2\right)^3 d\sqrt{a+b\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.92 (sec) , antiderivative size = 189, normalized size of antiderivative = 0.67

$$
\int\frac{1}{(a+b\cos(c+dx))^{7/2}}\,dx = \frac{2\left(\frac{\left(\frac{a+b\cos(c+dx)}{a+b}\right)^{5/2}\left((23a^2+9b^2)E\left(\frac{1}{2}(c+dx)\middle|\frac{2b}{a+b}\right)+8a(-a+b)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{2b}{a+b}\right)\right)}{(a-b)^3} + \frac{b(34a}{} \right.}{15d(a+b\cos(c+dx}
$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(-7/2),x]
```

```
[Out] (2*((((a + b*Cos[c + d*x])/(a + b))^(5/2)*((23*a^2 + 9*b^2)*EllipticE[(c +
d*x)/2, (2*b)/(a + b)] + 8*a*(-a + b)*EllipticF[(c + d*x)/2, (2*b)/(a + b)]
))/(a - b)^3 + (b*(34*a^4 - 5*a^2*b^2 + 3*b^4 + 2*a*b*(27*a^2 + 5*b^2)*Cos[
c + d*x] + b^2*(23*a^2 + 9*b^2)*Cos[c + d*x]^2)*Sin[c + d*x])/(-a^2 + b^2)^
3))/(15*d*(a + b*Cos[c + d*x])^(5/2))
```

Maple [A] (verified)

Time = 7.51 (sec) , antiderivative size = 616, normalized size of antiderivative = 2.18

method	result
default	$-\frac{\sqrt{-\left(-2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-a+b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+(a+b)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}}{10b^2(a-b)(a+b)\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)+\frac{a-b}{2b}\right)^3}+\frac{8a\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\right.\right.}}{15b(a-b)^2(a+b)^2}\right.}{}$

```
[In] int(1/(a+cos(d*x+c)*b)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*b*cos(1/2*d*x+1/2*c)^2-a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(1/10/b^2/(a
-b)/(a+b)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1
/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2+1/2*(a-b)/b)^3+8/15*a/b/(a-b)^2/(a+b)^
2*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*x+1/2*c)^2)
^(1/2)/(cos(1/2*d*x+1/2*c)^2+1/2*(a-b)/b)^2+4/15*sin(1/2*d*x+1/2*c)^2*b/(a-
b)^3/(a+b)^3*cos(1/2*d*x+1/2*c)*(23*a^2+9*b^2)/(-(-2*b*cos(1/2*d*x+1/2*c)^2
-a+b)*sin(1/2*d*x+1/2*c)^2)^(1/2)+2*(15*a^2-8*a*b+9*b^2)/(15*a^5+15*a^4*b-3
0*a^3*b^2-30*a^2*b^3+15*a*b^4+15*b^5)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*co
s(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1
/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-2/1
5*(23*a^2+9*b^2)/(a-b)^2/(a+b)^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2
*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b)*sin(1/2*d*
x+1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))-Ellipti
cE(cos(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))))/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/
2*d*x+1/2*c)^2+a+b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.17 (sec) , antiderivative size = 985, normalized size of antiderivative = 3.49

$$\int \frac{1}{(a+b\cos(c+dx))^{7/2}}\,dx = \text{Too large to display}$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] -1/45*(6*(34*a^4*b^2 - 5*a^2*b^4 + 3*b^6 + (23*a^2*b^4 + 9*b^6)*cos(d*x + c
)^2 + 2*(27*a^3*b^3 + 5*a*b^5)*cos(d*x + c))*sqrt(b*cos(d*x + c) + a)*sin(d
*x + c) + (sqrt(2)*(-I*a^3*b^3 + 33*I*a*b^5)*cos(d*x + c)^3 - 3*sqrt(2)*(I*
a^4*b^2 - 33*I*a^2*b^4)*cos(d*x + c)^2 - 3*sqrt(2)*(I*a^5*b - 33*I*a^3*b^3)
*cos(d*x + c) + sqrt(2)*(-I*a^6 + 33*I*a^4*b^2))*sqrt(b)*weierstrassPInvers
e(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x +
c) + 3*I*b*sin(d*x + c) + 2*a)/b) + (sqrt(2)*(I*a^3*b^3 - 33*I*a*b^5)*cos(d
```

```
*x + c)^3 - 3*sqrt(2)*(-I*a^4*b^2 + 33*I*a^2*b^4)*cos(d*x + c)^2 - 3*sqrt(2
)*(-I*a^5*b + 33*I*a^3*b^3)*cos(d*x + c) + sqrt(2)*(I*a^6 - 33*I*a^4*b^2))*
sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2
)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b) - 3*(sqrt(2)*(2
3*I*a^2*b^4 + 9*I*b^6)*cos(d*x + c)^3 + 3*sqrt(2)*(23*I*a^3*b^3 + 9*I*a*b^5
)*cos(d*x + c)^2 + 3*sqrt(2)*(23*I*a^4*b^2 + 9*I*a^2*b^4)*cos(d*x + c) + sq
rt(2)*(23*I*a^5*b + 9*I*a^3*b^3))*sqrt(b)*weierstrassZeta(4/3*(4*a^2 - 3*b^
2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2
)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x +
 c) + 2*a)/b)) - 3*(sqrt(2)*(-23*I*a^2*b^4 - 9*I*b^6)*cos(d*x + c)^3 + 3*sq
rt(2)*(-23*I*a^3*b^3 - 9*I*a*b^5)*cos(d*x + c)^2 + 3*sqrt(2)*(-23*I*a^4*b^2
 - 9*I*a^2*b^4)*cos(d*x + c) + sqrt(2)*(-23*I*a^5*b - 9*I*a^3*b^3))*sqrt(b)
*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, weie
rstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(
3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b)))/((a^6*b^4 - 3*a^4*b^6 + 3
*a^2*b^8 - b^10)*d*cos(d*x + c)^3 + 3*(a^7*b^3 - 3*a^5*b^5 + 3*a^3*b^7 - a*
b^9)*d*cos(d*x + c)^2 + 3*(a^8*b^2 - 3*a^6*b^4 + 3*a^4*b^6 - a^2*b^8)*d*cos
(d*x + c) + (a^9*b - 3*a^7*b^3 + 3*a^5*b^5 - a^3*b^7)*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^{7/2}}\,dx=\text{Timed out}$$

```
[In] integrate(1/(a+b*cos(d*x+c))**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{7/2}}\,dx=\int \frac{1}{(b\cos(dx+c)+a)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(7/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(-7/2), x)
```

Giac [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{7/2}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(7/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(-7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^{7/2}}\,dx = \int \frac{1}{(a+b\,\cos(c+d\,x))^{7/2}}\,dx$$

```
[In] int(1/(a + b*cos(c + d*x))^(7/2),x)
[Out] int(1/(a + b*cos(c + d*x))^(7/2), x)
```

3.547 $\int \frac{\cos^3(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 111

$$\int \frac{\cos^3(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{9\sqrt{7}E\left(\frac{1}{2}(c+dx)\middle|\frac{8}{7}\right)}{20d} - \frac{23\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{20\sqrt{7}d} - \frac{\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{10d} + \frac{\cos(c+dx)\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{10d}$$

```
[Out] -23/140*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d
*x+1/2*c),2/7*14^(1/2))/d*7^(1/2)+9/20*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2
*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2/7*14^(1/2))/d*7^(1/2)-1/10*sin(d
*x+c)*(3+4*cos(d*x+c))^(1/2)/d+1/10*cos(d*x+c)*sin(d*x+c)*(3+4*cos(d*x+c))^
(1/2)/d
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2872, 3102, 2831, 2740, 2732}

$$\int \frac{\cos^3(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = -\frac{23\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{20\sqrt{7}d} + \frac{9\sqrt{7}E\left(\frac{1}{2}(c+dx)\middle|\frac{8}{7}\right)}{20d} + \frac{\sin(c+dx)\cos(c+dx)\sqrt{4\cos(c+dx)+3}}{10d} - \frac{\sin(c+dx)\sqrt{4\cos(c+dx)+3}}{10d}$$

```
[In] Int[Cos[c + d*x]^3/Sqrt[3 + 4*Cos[c + d*x]],x]
```

```
[Out] (9*Sqrt[7]*EllipticE[(c + d*x)/2, 8/7])/(20*d) - (23*EllipticF[(c + d*x)/2,
 8/7])/(20*Sqrt[7]*d) - (Sqrt[3 + 4*Cos[c + d*x]]*Sin[c + d*x])/(10*d) + (C
os[c + d*x]*Sqrt[3 + 4*Cos[c + d*x]]*Sin[c + d*x])/(10*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\cos(c+dx)\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{10d} \\
&\quad + \frac{1}{10}\int \frac{3+6\cos(c+dx)-6\cos^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx \\
&= -\frac{\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{10d} \\
&\quad + \frac{\cos(c+dx)\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{10d} + \frac{1}{60}\int \frac{6+54\cos(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx \\
&= -\frac{\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{10d} + \frac{\cos(c+dx)\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{10d} \\
&\quad + \frac{9}{40}\int \sqrt{3+4\cos(c+dx)}\,dx - \frac{23}{40}\int \frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx \\
&= \frac{9\sqrt{7}E\left(\frac{1}{2}(c+dx)\middle|\frac{8}{7}\right)}{20d} - \frac{23\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{20\sqrt{7}d} \\
&\quad - \frac{\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{10d} + \frac{\cos(c+dx)\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{10d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.25 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.73

$$\int \frac{\cos^3(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{63\sqrt{7}E\left(\frac{1}{2}(c+dx)\middle|\frac{8}{7}\right) - 23\sqrt{7}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right) + 7\sqrt{3+4\cos(c+dx)}(-2\sin(c+dx)+\sin(2(c+}{140d}$$

```
[In] Integrate[Cos[c + d*x]^3/Sqrt[3 + 4*Cos[c + d*x]],x]
[Out] (63*Sqrt[7]*EllipticE[(c + d*x)/2, 8/7] - 23*Sqrt[7]*EllipticF[(c + d*x)/2,
 8/7] + 7*Sqrt[3 + 4*Cos[c + d*x]]*(-2*Sin[c + d*x] + Sin[2*(c + d*x)]))/(1
40*d)
```

Maple [A] (verified)

Time = 3.84 (sec) , antiderivative size = 231, normalized size of antiderivative = 2.08

method	result
default	$-\frac{\sqrt{\left(8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-64\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+56\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-23\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\right.}{20\sqrt{-8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sin\left(\frac{dx}{2}\right.}$

```
[In] int(cos(d*x+c)^3/(3+4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/20*((8*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-64*cos(1/2*
d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+56*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-
23*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(8*sin(1/2*d*x+1/2*c)^2-7)^(1/2)*EllipticF(
cos(1/2*d*x+1/2*c),2*2^(1/2))-9*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(8*sin(1/2*d*x
+1/2*c)^2-7)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2*2^(1/2)))/(-8*sin(1/2*d*x
+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(8*cos(1/2*d*x+1
/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.23

$$\int \frac{\cos^3(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{4\sqrt{4\cos(dx+c)+3}(\cos(dx+c)-1)\sin(dx+c)+7i\sqrt{2}\text{weierstrassPInverse}\left(-1,1,\cos(dx+c)+i\sin\right.}{}$$

```
[In] integrate(cos(d*x+c)^3/(3+4*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/40*(4*sqrt(4*cos(d*x + c) + 3)*(cos(d*x + c) - 1)*sin(d*x + c) + 7*I*sqrt
(2)*weierstrassPInverse(-1, 1, cos(d*x + c) + I*sin(d*x + c) + 1/2) - 7*I*s
qrt(2)*weierstrassPInverse(-1, 1, cos(d*x + c) - I*sin(d*x + c) + 1/2) + 18
*I*sqrt(2)*weierstrassZeta(-1, 1, weierstrassPInverse(-1, 1, cos(d*x + c) +
 I*sin(d*x + c) + 1/2)) - 18*I*sqrt(2)*weierstrassZeta(-1, 1, weierstrassPI
nverse(-1, 1, cos(d*x + c) - I*sin(d*x + c) + 1/2)))/d
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3/(3+4*cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^3(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{\cos(dx+c)^3}{\sqrt{4\cos(dx+c)+3}}\,dx$$

```
[In] integrate(cos(d*x+c)^3/(3+4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^3/sqrt(4*cos(d*x + c) + 3), x)
```

Giac [F]

$$\int \frac{\cos^3(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{\cos(dx+c)^3}{\sqrt{4\cos(dx+c)+3}}\,dx$$

```
[In] integrate(cos(d*x+c)^3/(3+4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^3/sqrt(4*cos(d*x + c) + 3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{\cos(c+d\,x)^3}{\sqrt{4\cos(c+d\,x)+3}}\,dx$$

```
[In] int(cos(c + d*x)^3/(4*cos(c + d*x) + 3)^(1/2),x)
[Out] int(cos(c + d*x)^3/(4*cos(c + d*x) + 3)^(1/2), x)
```

3.548 $\int \frac{\cos^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 78

$$\int \frac{\cos^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = -\frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{4d}+\frac{17\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{12\sqrt{7}d}+\frac{\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{6d}$$

```
[Out] 17/84*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x
+1/2*c),2/7*14^(1/2))/d*7^(1/2)-1/4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*
x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2/7*14^(1/2))/d*7^(1/2)+1/6*sin(d*x+c
)*(3+4*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 78, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2870, 2831, 2740, 2732}

$$\int \frac{\cos^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{17\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{12\sqrt{7}d}-\frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{4d}+\frac{\sin(c+dx)\sqrt{4\cos(c+dx)+3}}{6d}$$

```
[In] Int[Cos[c + d*x]^2/Sqrt[3 + 4*Cos[c + d*x]],x]
```

```
[Out] -1/4*(Sqrt[7]*EllipticE[(c + d*x)/2, 8/7])/d + (17*EllipticF[(c + d*x)/2, 8
/7])/(12*Sqrt[7]*d) + (Sqrt[3 + 4*Cos[c + d*x]]*Sin[c + d*x])/(6*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2870

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^2, x_Symbol] :> Simp[(-d^2)*Cos[e + f*x]*((a + b*Sin[e + f*x])
^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m + 2)), Int[(a + b*Sin[e + f*x])^
m*Simp[b*(d^2*(m + 1) + c^2*(m + 2)) - d*(a*d - 2*b*c*(m + 2))*Sin[e + f*x]
, x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] && NeQ
[a^2 - b^2, 0] &&  !LtQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{6d}+\frac{1}{6}\int \frac{2-3\cos(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx \\
&= \frac{\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{6d}-\frac{1}{8}\int \sqrt{3+4\cos(c+dx)}\,dx+\frac{17}{24}\int \frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx \\
&= -\frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{4d}+\frac{17\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{12\sqrt{7}d}+\frac{\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{6d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 70, normalized size of antiderivative = 0.90

$$\int \frac{\cos^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{-21\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)+17\sqrt{7}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)+14\sqrt{3+4\cos(c+dx)}\sin(c+dx)}{84d}$$

```
[In] Integrate[Cos[c + d*x]^2/Sqrt[3 + 4*Cos[c + d*x]],x]
[Out] (-21*Sqrt[7]*EllipticE[(c + d*x)/2, 8/7] + 17*Sqrt[7]*EllipticF[(c + d*x)/2
, 8/7] + 14*Sqrt[3 + 4*Cos[c + d*x]]*Sin[c + d*x])/(84*d)
```

Maple [A] (verified)

Time = 2.60 (sec) , antiderivative size = 231, normalized size of antiderivative = 2.96

method	result
default	$-\frac{\sqrt{\left(8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(32\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-28\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+17\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{8\right.}{12\sqrt{-8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sin\left(\frac{dx}{2}+\right.}$

```
[In] int(cos(d*x+c)^2/(3+4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/12*((8*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(32*sin(1/2*d
*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-28*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+1
7*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(8*sin(1/2*d*x+1/2*c)^2-7)^(1/2)*EllipticF(c
os(1/2*d*x+1/2*c),2*2^(1/2))+3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(8*sin(1/2*d*x+
1/2*c)^2-7)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2*2^(1/2)))/(-8*sin(1/2*d*x+
1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(8*cos(1/2*d*x+1/
2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.64

$$\int \frac{\cos^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{4\sqrt{4\cos(dx+c)+3}\sin(dx+c)-7i\sqrt{2}\text{weierstrassPInverse}\left(-1,1,\cos(dx+c)+i\sin(dx+c)+\frac{1}{2}\right)+}{}$$

```
[In] integrate(cos(d*x+c)^2/(3+4*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/24*(4*sqrt(4*cos(d*x + c) + 3)*sin(d*x + c) - 7*I*sqrt(2)*weierstrassPInv
erse(-1, 1, cos(d*x + c) + I*sin(d*x + c) + 1/2) + 7*I*sqrt(2)*weierstrassP
Inverse(-1, 1, cos(d*x + c) - I*sin(d*x + c) + 1/2) - 6*I*sqrt(2)*weierstra
ssZeta(-1, 1, weierstrassPInverse(-1, 1, cos(d*x + c) + I*sin(d*x + c) + 1/
2)) + 6*I*sqrt(2)*weierstrassZeta(-1, 1, weierstrassPInverse(-1, 1, cos(d*x
 + c) - I*sin(d*x + c) + 1/2)))/d
```

Sympy [F]

$$\int \frac{\cos^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{\cos^2\left(c+dx\right)}{\sqrt{4\cos\left(c+dx\right)+3}}\,dx$$

```
[In] integrate(cos(d*x+c)**2/(3+4*cos(d*x+c))**(1/2),x)
[Out] Integral(cos(c + d*x)**2/sqrt(4*cos(c + d*x) + 3), x)
```

Maxima [F]

$$\int \frac{\cos^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)^2}{\sqrt{4\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(cos(d*x+c)^2/(3+4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^2/sqrt(4*cos(d*x + c) + 3), x)
```

Giac [F]

$$\int \frac{\cos^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)^2}{\sqrt{4\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(cos(d*x+c)^2/(3+4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^2/sqrt(4*cos(d*x + c) + 3), x)
```

Mupad [B] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 78, normalized size of antiderivative = 1.00

$$\int \frac{\cos^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{\sin(c+d\,x)\,\sqrt{4\,\cos(c+d\,x)+3}}{6\,d} - \frac{\sqrt{\frac{4\,\cos(c+d\,x)}{7}+\frac{3}{7}}\,\left(42\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|\frac{8}{7}\right)-34\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|\frac{8}{7}\right)\right)}{24\,d\,\sqrt{4\,\cos(c+d\,x)+3}}$$

```
[In] int(cos(c + d*x)^2/(4*cos(c + d*x) + 3)^(1/2),x)
```

```
[Out] (sin(c + d*x)*(4*cos(c + d*x) + 3)^(1/2))/(6*d) - (((4*cos(c + d*x))/7 + 3/
7)^(1/2)*(42*ellipticE(c/2 + (d*x)/2, 8/7) - 34*ellipticF(c/2 + (d*x)/2, 8/
7)))/(24*d*(4*cos(c + d*x) + 3)^(1/2))
```

3.549 $\int \frac{\cos(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 51

$$\int \frac{\cos(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)\middle|\frac{8}{7}\right)}{2d} - \frac{3\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{2\sqrt{7}d}$$

```
[Out] -3/14*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x
+1/2*c),2/7*14^(1/2))/d*7^(1/2)+1/2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*
x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2/7*14^(1/2))/d*7^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 51, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {2831, 2740, 2732}

$$\int \frac{\cos(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)\middle|\frac{8}{7}\right)}{2d} - \frac{3\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{2\sqrt{7}d}$$

```
[In] Int[Cos[c + d*x]/Sqrt[3 + 4*Cos[c + d*x]],x]
```

```
[Out] (Sqrt[7]*EllipticE[(c + d*x)/2, 8/7])/(2*d) - (3*EllipticF[(c + d*x)/2, 8/7
])/(2*Sqrt[7]*d)
```

<u>Rule 2732</u>

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{1}{4}\int \sqrt{3+4\cos(c+dx)}\,dx - \frac{3}{4}\int \frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx \\ &= \frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)\middle|\frac{8}{7}\right)}{2d} - \frac{3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{2\sqrt{7}d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 43, normalized size of antiderivative = 0.84

$$\int \frac{\cos(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{7E\left(\frac{1}{2}(c+dx)\middle|\frac{8}{7}\right) - 3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{2\sqrt{7}d}$$

```
[In] Integrate[Cos[c + d*x]/Sqrt[3 + 4*Cos[c + d*x]],x]
[Out] (7*EllipticE[(c + d*x)/2, 8/7] - 3*EllipticF[(c + d*x)/2, 8/7])/(2*Sqrt[7]*
d)
```

Maple [A] (verified)

Time = 2.29 (sec) , antiderivative size = 155, normalized size of antiderivative = 3.04

method	result
default	$\frac{\sqrt{\left(8\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{1-8\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\left(3F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),2\sqrt{2}\right)+E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),2\sqrt{2}\right)\right)}{2\sqrt{-8\left(\sin^{4}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{8\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$
risch	$-\frac{i\left(2\,e^{2i(dx+c)}+3\,e^{i(dx+c)}+2\right)e^{-i(dx+c)}}{2d\sqrt{\left(2\,e^{2i(dx+c)}+3\,e^{i(dx+c)}+2\right)e^{-i(dx+c)}}}-\frac{i\left(-\frac{2\,e^{2i(dx+c)}+3\,e^{i(dx+c)}+2}{\sqrt{\left(2\,e^{2i(dx+c)}+3\,e^{i(dx+c)}+2\right)e^{i(dx+c)}}}+\frac{2\left(\frac{3}{4}+\frac{i\sqrt{7}}{4}\right)\sqrt{\frac{e^{i(dx+c)}+\frac{3}{4}+\frac{i\sqrt{7}}{4}}{\frac{3}{4}+\frac{i\sqrt{7}}{4}}}\,\sqrt{14}\,\sqrt{i(\cdots}}{\cdots}\right.}{\cdots}$

[In] int(cos(d*x+c)/(3+4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)

[Out] 1/2*((8*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(1-8*cos(1/2*d*x+1/2*c)^2)^(1/2)*(3*EllipticF(cos(1/2*d*x+1/2*c),2*2^(1/2))+EllipticE(cos(1/2*d*x+1/2*c),2*2^(1/2)))/(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(8*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 108, normalized size of antiderivative = 2.12

$$\int \frac{\cos(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{i\sqrt{2}\text{weierstrassPInverse}\left(-1,1,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right)+\frac{1}{2}\right)-i\sqrt{2}\text{weierstrassPInverse}\left(-1,1,\cos\left(\cdots\right.\right.}{\cdots}$$

[In] integrate(cos(d*x+c)/(3+4*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] 1/4*(I*sqrt(2)*weierstrassPInverse(-1, 1, cos(d*x + c) + I*sin(d*x + c) + 1/2) - I*sqrt(2)*weierstrassPInverse(-1, 1, cos(d*x + c) - I*sin(d*x + c) + 1/2) + 2*I*sqrt(2)*weierstrassZeta(-1, 1, weierstrassPInverse(-1, 1, cos(d*x + c) + I*sin(d*x + c) + 1/2)) - 2*I*sqrt(2)*weierstrassZeta(-1, 1, weierstrassPInverse(-1, 1, cos(d*x + c) - I*sin(d*x + c) + 1/2)))/d

Sympy [F]

$$\int \frac{\cos(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{\cos{\left(c+dx \right)}}{\sqrt{4\cos{\left(c+dx \right)}+3}}\,dx$$

```
[In] integrate(cos(d*x+c)/(3+4*cos(d*x+c))**(1/2),x)
[Out] Integral(cos(c + d*x)/sqrt(4*cos(c + d*x) + 3), x)
```

Maxima [F]

$$\int \frac{\cos(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)}{\sqrt{4\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(cos(d*x+c)/(3+4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)/sqrt(4*cos(d*x + c) + 3), x)
```

Giac [F]

$$\int \frac{\cos(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)}{\sqrt{4\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(cos(d*x+c)/(3+4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)/sqrt(4*cos(d*x + c) + 3), x)
```

Mupad [B] (verification not implemented)

Time = 14.50 (sec) , antiderivative size = 54, normalized size of antiderivative = 1.06

$$\int \frac{\cos(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{\sqrt{\frac{4\,\cos(c+d\,x)}{7}+\frac{3}{7}}\,\left(7\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|\frac{8}{7}\right)-3\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|\frac{8}{7}\right)\right)}{2\,d\,\sqrt{4\,\cos\left(c+d\,x\right)+3}}$$

```
[In] int(cos(c + d*x)/(4*cos(c + d*x) + 3)^(1/2),x)
[Out] (((4*cos(c + d*x))/7 + 3/7)^(1/2)*(7*ellipticE(c/2 + (d*x)/2, 8/7) - 3*elli
pticF(c/2 + (d*x)/2, 8/7)))/(2*d*(4*cos(c + d*x) + 3)^(1/2))
```

3.550 $\int \frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 23

$$\int \frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}$$

```
[Out] 2/7*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1
/2*c),2/7*14^(1/2))/d*7^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.071$, Rules used = {2740}

$$\int \frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}$$

```
[In] Int[1/Sqrt[3 + 4*Cos[c + d*x]],x]
```

```
[Out] (2*EllipticF[(c + d*x)/2, 8/7])/(Sqrt[7]*d)
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rubi steps

$$\text{integral} = \frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}$$

```
[In] Integrate[1/Sqrt[3 + 4*Cos[c + d*x]],x]
[Out] (2*EllipticF[(c + d*x)/2, 8/7])/(Sqrt[7]*d)
```

Maple [C] (verified)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.44 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00

method	result	size
default	$\frac{2\sqrt{7}\,\operatorname{am}^{-1}\left(\frac{dx}{2}+\frac{c}{2}\middle\vert\frac{2\sqrt{14}}{7}\right)}{7d}$	23

```
[In] int(1/(3+4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
[Out] 2/7/d*7^(1/2)*InverseJacobiAM(1/2*d*x+1/2*c,2/7*14^(1/2))
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 54, normalized size of antiderivative = 2.35

$$\int \frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{-i\sqrt{2}\text{weierstrassPInverse}\left(-1,1,\cos(dx+c)+i\sin(dx+c)+\frac{1}{2}\right)+i\sqrt{2}\text{weierstrassPInverse}\left(-1,1,\cos(\right.}{2\,d}$$

```
[In] integrate(1/(3+4*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] 1/2*(-I*sqrt(2)*weierstrassPInverse(-1, 1, cos(d*x + c) + I*sin(d*x + c) +
1/2) + I*sqrt(2)*weierstrassPInverse(-1, 1, cos(d*x + c) - I*sin(d*x + c) +
 1/2))/d
```

Sympy [F]

$$\int \frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{4\cos(c+dx)+3}}\,dx$$

```
[In] integrate(1/(3+4*cos(d*x+c))**(1/2),x)
[Out] Integral(1/sqrt(4*cos(c + d*x) + 3), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{4\cos(dx+c)+3}}\,dx$$

```
[In] integrate(1/(3+4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(1/sqrt(4*cos(d*x + c) + 3), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{4\cos(dx+c)+3}}\,dx$$

```
[In] integrate(1/(3+4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/sqrt(4*cos(d*x + c) + 3), x)
```

Mupad [B] (verification not implemented)

Time = 14.82 (sec) , antiderivative size = 39, normalized size of antiderivative = 1.70

$$\int \frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{2\sqrt{\frac{4\cos(c+dx)}{7}+\frac{3}{7}}\,\mathrm{F}\left(\frac{c}{2}+\frac{dx}{2}\middle|\frac{8}{7}\right)}{d\sqrt{4\cos(c+dx)+3}}$$

```
[In] int(1/(4*cos(c + d*x) + 3)^(1/2),x)
[Out] (2*((4*cos(c + d*x))/7 + 3/7)^(1/2)*ellipticF(c/2 + (d*x)/2, 8/7))/(d*(4*co
s(c + d*x) + 3)^(1/2))
```

3.551 $\int \frac{\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 24

$$\int \frac{\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{2\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}$$

```
[Out] 2/7*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+
1/2*c),2,2/7*14^(1/2))/d*7^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2884}

$$\int \frac{\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{2\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}$$

```
[In] Int[Sec[c + d*x]/Sqrt[3 + 4*Cos[c + d*x]],x]
```

```
[Out] (2*EllipticPi[2, (c + d*x)/2, 8/7])/(Sqrt[7]*d)
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rubi steps

$$\text{integral} = \frac{2\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{2\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}$$

```
[In] Integrate[Sec[c + d*x]/Sqrt[3 + 4*Cos[c + d*x]],x]
[Out] (2*EllipticPi[2, (c + d*x)/2, 8/7])/(Sqrt[7]*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 137 vs. 2(48) = 96.

Time = 1.84 (sec) , antiderivative size = 138, normalized size of antiderivative = 5.75

method	result	size
default	$\frac{2\sqrt{\left(8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{1-8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\Pi\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),2,2\sqrt{2}\right)}{\sqrt{-8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$	138

```
[In] int(sec(d*x+c)/(3+4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
[Out] 2*((8*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2*
c)^2)^(1/2)*(1-8*cos(1/2*d*x+1/2*c)^2)^(1/2)/(-8*sin(1/2*d*x+1/2*c)^4+7*sin
(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,2*2^(1/2))/sin(1/2
*d*x+1/2*c)/(8*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F]

$$\int \frac{\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)}{\sqrt{4\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(sec(d*x+c)/(3+4*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sec(d*x + c)/sqrt(4*cos(d*x + c) + 3), x)
```

Sympy [F]

$$\int \frac{\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx=\int \frac{\sec\left(c+dx\right)}{\sqrt{4\cos\left(c+dx\right)+3}}\,dx$$

```
[In] integrate(sec(d*x+c)/(3+4*cos(d*x+c))**(1/2),x)
[Out] Integral(sec(c + d*x)/sqrt(4*cos(c + d*x) + 3), x)
```

Maxima [F]

$$\int \frac{\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx=\int \frac{\sec\left(dx+c\right)}{\sqrt{4\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(sec(d*x+c)/(3+4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)/sqrt(4*cos(d*x + c) + 3), x)
```

Giac [F]

$$\int \frac{\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx=\int \frac{\sec\left(dx+c\right)}{\sqrt{4\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(sec(d*x+c)/(3+4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)/sqrt(4*cos(d*x + c) + 3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx=\int \frac{1}{\cos\left(c+d\,x\right)\,\sqrt{4\cos\left(c+d\,x\right)+3}}\,dx$$

```
[In] int(1/(cos(c + d*x)*(4*cos(c + d*x) + 3)^(1/2)),x)
[Out] int(1/(cos(c + d*x)*(4*cos(c + d*x) + 3)^(1/2)), x)
```

3.552 $\int \frac{\sec^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 101

$$\int \frac{\sec^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = -\frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{3d} + \frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d} - \frac{4\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{3\sqrt{7}d} + \frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{3d}$$

```
[Out] 1/7*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1
/2*c),2/7*14^(1/2))/d*7^(1/2)-4/21*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x
+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2,2/7*14^(1/2))/d*7^(1/2)-1/3*(cos(1/
2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2/7*1
4^(1/2))/d*7^(1/2)+1/3*(3+4*cos(d*x+c))^(1/2)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2881, 3139, 2732, 3081, 2740, 2884}

$$\int \frac{\sec^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d} - \frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{3d} - \frac{4\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{3\sqrt{7}d} + \frac{\sqrt{4\cos(c+dx)+3}\tan(c+dx)}{3d}$$

```
[In] Int[Sec[c + d*x]^2/Sqrt[3 + 4*Cos[c + d*x]],x]
```

```
[Out] -1/3*(Sqrt[7]*EllipticE[(c + d*x)/2, 8/7])/d + EllipticF[(c + d*x)/2, 8/7]/
(Sqrt[7]*d) - (4*EllipticPi[2, (c + d*x)/2, 8/7])/(3*Sqrt[7]*d) + (Sqrt[3 +
 4*Cos[c + d*x]]*Tan[c + d*x])/(3*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3139

```
Int[((A_.) + (C_.)*sin[(e_.) + (f_.)*(x_)]^2)/(Sqrt[(a_.) + (b_.)*sin[(e_.)
 + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist
[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x], x] - Dist[1/(b*d), Int[Simp[a*c
*C - A*b*d + (b*c*C + a*C*d)*Sin[e + f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c
+ d*Sin[e + f*x])), x], x] /; FreeQ[{a, b, c, d, e, f, A, C}, x] && NeQ[b*c
 - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{3d}+\frac{1}{3}\int\frac{(-2-2\cos^2(c+dx))\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx\\
&= \frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{3d}\\
&\quad-\frac{1}{12}\int\frac{(8-6\cos(c+dx))\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx-\frac{1}{6}\int\sqrt{3+4\cos(c+dx)}\,dx\\
&= -\frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)\middle|\frac{8}{7}\right)}{3d}+\frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{3d}\\
&\quad+\frac{1}{2}\int\frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx-\frac{2}{3}\int\frac{\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx\\
&= -\frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)\middle|\frac{8}{7}\right)}{3d}+\frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}d}\\
&\quad-\frac{4\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{3\sqrt{7}d}+\frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{3d}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.79 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.56

$$\int\frac{\sec^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx$$

$$=\frac{-\frac{6\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}}+\frac{i\left(21E\left(i\text{arcsinh}\left(\sqrt{3+4\cos(c+dx)}\right)\middle|-\frac{1}{7}\right)-12\,\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{3+4\cos(c+dx)}\right),-\frac{1}{7}\right)-8\,\text{EllipticPi}\left(\right.}{3\sqrt{7}\sqrt{\sin^2(c+dx)}}}{3d}$$

```
[In] Integrate[Sec[c + d*x]^2/Sqrt[3 + 4*Cos[c + d*x]],x]
[Out] ((-6*EllipticPi[2, (c + d*x)/2, 8/7])/Sqrt[7] + ((I/3)*(21*EllipticE[I*ArcS
inh[Sqrt[3 + 4*Cos[c + d*x]]], -1/7] - 12*EllipticF[I*ArcSinh[Sqrt[3 + 4*Co
s[c + d*x]]], -1/7] - 8*EllipticPi[-1/3, I*ArcSinh[Sqrt[3 + 4*Cos[c + d*x]]
], -1/7])*Sin[c + d*x])/(Sqrt[7]*Sqrt[Sin[c + d*x]^2]) + Sqrt[3 + 4*Cos[c +
 d*x]]*Tan[c + d*x])/(3*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 349 vs. $2(166) = 332$.

Time = 2.53 (sec) , antiderivative size = 350, normalized size of antiderivative = 3.47

method	result
default	$-\frac{\sqrt{-\left(1-8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-\frac{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}}{3\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)}+\frac{\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{1-8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right.\right.}}{\sqrt{-8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7\left(\right.}}\right.}{\sin\left(\frac{dx}{2}+\frac{c}{2}\right)}$

[In] int(sec(d*x+c)^2/(3+4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)

[Out] -(-(1-8*cos(1/2*d*x+1/2*c)^2)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2/3*cos(1/2*d*x+1/2*c)*(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^2-1)+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(1-8*cos(1/2*d*x+1/2*c)^2)^(1/2)/(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2*2^(1/2))+1/3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(1-8*cos(1/2*d*x+1/2*c)^2)^(1/2)/(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2*2^(1/2))+4/3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(1-8*cos(1/2*d*x+1/2*c)^2)^(1/2)/(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,2*2^(1/2)))/sin(1/2*d*x+1/2*c)/(8*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [F]

$$\int \frac{\sec^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)^2}{\sqrt{4\,\cos\left(dx+c\right)+3}}\,dx$$

[In] integrate(sec(d*x+c)^2/(3+4*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] integral(sec(d*x + c)^2/sqrt(4*cos(d*x + c) + 3), x)

Sympy [F]

$$\int \frac{\sec^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{\sec^2\left(c+dx\right)}{\sqrt{4\cos\left(c+dx\right)+3}}\,dx$$

[In] integrate(sec(d*x+c)**2/(3+4*cos(d*x+c))**(1/2),x)

[Out] Integral(sec(c + d*x)**2/sqrt(4*cos(c + d*x) + 3), x)

Maxima [F]

$$\int \frac{\sec^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)^2}{\sqrt{4\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(sec(d*x+c)^2/(3+4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^2/sqrt(4*cos(d*x + c) + 3), x)
```

Giac [F]

$$\int \frac{\sec^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)^2}{\sqrt{4\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(sec(d*x+c)^2/(3+4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^2/sqrt(4*cos(d*x + c) + 3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{1}{{\cos\left(c+d\,x\right)}^2\,\sqrt{4\,\cos\left(c+d\,x\right)+3}}\,dx$$

```
[In] int(1/(cos(c + d*x)^2*(4*cos(c + d*x) + 3)^(1/2)),x)
[Out] int(1/(cos(c + d*x)^2*(4*cos(c + d*x) + 3)^(1/2)), x)
```

3.553 $\int \frac{\sec^3(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 137

$$\int \frac{\sec^3(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{3d} - \frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{3\sqrt{7}d} + \frac{\sqrt{7}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{3d} - \frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{3d} + \frac{\sqrt{3+4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{6d}$$

```
[Out] -1/21*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x
+1/2*c),2/7*14^(1/2))/d*7^(1/2)+1/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*
x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2/7*14^(1/2))/d*7^(1/2)+1/3*(cos(1/2*
d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2,2/7*
14^(1/2))/d*7^(1/2)-1/3*(3+4*cos(d*x+c))^(1/2)*tan(d*x+c)/d+1/6*sec(d*x+c)*
(3+4*cos(d*x+c))^(1/2)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used

$= \{2881, 3134, 3138, 2732, 3081, 2740, 2884\}$

$$\int \frac{\sec^3(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = -\frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{3\sqrt{7}d} + \frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)\middle|\frac{8}{7}\right)}{3d} + \frac{\sqrt{7}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{3d} - \frac{\sqrt{4\cos(c+dx)+3}\tan(c+dx)}{3d} + \frac{\sqrt{4\cos(c+dx)+3}\tan(c+dx)\sec(c+dx)}{6d}$$

```
[In] Int[Sec[c + d*x]^3/Sqrt[3 + 4*Cos[c + d*x]],x]
```

```
[Out] (Sqrt[7]*EllipticE[(c + d*x)/2, 8/7])/(3*d) - EllipticF[(c + d*x)/2, 8/7]/(
3*Sqrt[7]*d) + (Sqrt[7]*EllipticPi[2, (c + d*x)/2, 8/7])/(3*d) - (Sqrt[3 +
4*Cos[c + d*x]]*Tan[c + d*x])/(3*d) + (Sqrt[3 + 4*Cos[c + d*x]]*Sec[c + d*x
]*Tan[c + d*x])/(6*d)
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2740

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a + b]))*EllipticF[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[
{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
```

```
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sqrt{3+4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{6d}\\&\quad+\frac{1}{6}\int\frac{(-6+3\cos(c+dx)+2\cos^2(c+dx))\sec^2(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx\end{aligned}$$

$$= -\frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{3d} + \frac{\sqrt{3+4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{6d} + \frac{1}{18}\int \frac{(21+6\cos(c+dx)+12\cos^2(c+dx))\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx$$

$$= -\frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{3d} + \frac{\sqrt{3+4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{6d} - \frac{1}{72}\int \frac{(-84+12\cos(c+dx))\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx + \frac{1}{6}\int \sqrt{3+4\cos(c+dx)}\,dx$$

$$= \frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{3d} - \frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{3d} + \frac{\sqrt{3+4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{6d} - \frac{1}{6}\int \frac{1}{\sqrt{3+4\cos(c+dx)}}\,dx + \frac{7}{6}\int \frac{\sec(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx$$

$$= \frac{\sqrt{7}E\left(\frac{1}{2}(c+dx)|\frac{8}{7}\right)}{3d} - \frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{3\sqrt{7}d} + \frac{\sqrt{7}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{3d} - \frac{\sqrt{3+4\cos(c+dx)}\tan(c+dx)}{3d} + \frac{\sqrt{3+4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{6d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.89 (sec) , antiderivative size = 195, normalized size of antiderivative = 1.42

$$\int \frac{\sec^3(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \frac{\frac{4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}} + \frac{18\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),\frac{8}{7}\right)}{\sqrt{7}} - \frac{2i\left(21E\left(i\,\text{arcsinh}\left(\sqrt{3+4\cos(c+dx)}\right)|-\frac{1}{7}\right)-12\,\text{EllipticF}\left(i\,\text{arcsinh}\left(\sqrt{3+4\cos\ldots}\right.\right.\right.}{3\sqrt{7}\sqrt{\sin^{\ldots}}}}{\ldots}$$

```
[In] Integrate[Sec[c + d*x]^3/Sqrt[3 + 4*Cos[c + d*x]],x]
```

```
[Out] ((4*EllipticF[(c + d*x)/2, 8/7])/Sqrt[7] + (18*EllipticPi[2, (c + d*x)/2, 8
/7])/Sqrt[7] - (((2*I)/3)*(21*EllipticE[I*ArcSinh[Sqrt[3 + 4*Cos[c + d*x]]]
, -1/7] - 12*EllipticF[I*ArcSinh[Sqrt[3 + 4*Cos[c + d*x]]], -1/7] - 8*Ellip
ticPi[-1/3, I*ArcSinh[Sqrt[3 + 4*Cos[c + d*x]]], -1/7])*Sin[c + d*x])/(Sqrt
[7]*Sqrt[Sin[c + d*x]^2]) - (-1 + 2*Cos[c + d*x])*Sqrt[3 + 4*Cos[c + d*x]]*
Sec[c + d*x]*Tan[c + d*x])/(6*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 407 vs. 2(195) = 390.

Time = 3.09 (sec) , antiderivative size = 408, normalized size of antiderivative = 2.98

method	result
default	$-\frac{\sqrt{-\left(1-8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}}{3\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)^2}+\frac{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7}}{3\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\right.}{}$

```
[In] int(sec(d*x+c)^3/(3+4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
[Out] -(-(1-8*cos(1/2*d*x+1/2*c)^2)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-1/3*cos(1/2*d*x
+1/2*c)*(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d
*x+1/2*c)^2-1)^2+2/3*cos(1/2*d*x+1/2*c)*(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*
d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^2-1)-1/3*(sin(1/2*d*x+1/2*c)^2)^(
1/2)*(1-8*cos(1/2*d*x+1/2*c)^2)^(1/2)/(-8*sin(1/2*d*x+1/2*c)^4+7*sin(1/2*d*
x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2*2^(1/2))-1/3*(sin(1/2*d*x+
1/2*c)^2)^(1/2)*(1-8*cos(1/2*d*x+1/2*c)^2)^(1/2)/(-8*sin(1/2*d*x+1/2*c)^4+7
*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2*2^(1/2))-7/3*(s
in(1/2*d*x+1/2*c)^2)^(1/2)*(1-8*cos(1/2*d*x+1/2*c)^2)^(1/2)/(-8*sin(1/2*d*x
+1/2*c)^4+7*sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,2*2
^(1/2)))/sin(1/2*d*x+1/2*c)/(8*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F]

$$\int \frac{\sec^3(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)^3}{\sqrt{4\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(sec(d*x+c)^3/(3+4*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sec(d*x + c)^3/sqrt(4*cos(d*x + c) + 3), x)
```

Sympy [F]

$$\int \frac{\sec^3(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{\sec^3\left(c+dx\right)}{\sqrt{4\cos\left(c+dx\right)+3}}\,dx$$

```
[In] integrate(sec(d*x+c)**3/(3+4*cos(d*x+c))**(1/2),x)
[Out] Integral(sec(c + d*x)**3/sqrt(4*cos(c + d*x) + 3), x)
```

Maxima [F]

$$\int \frac{\sec^3(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)^3}{\sqrt{4\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(sec(d*x+c)^3/(3+4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^3/sqrt(4*cos(d*x + c) + 3), x)
```

Giac [F]

$$\int \frac{\sec^3(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)^3}{\sqrt{4\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(sec(d*x+c)^3/(3+4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^3/sqrt(4*cos(d*x + c) + 3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^3(c+dx)}{\sqrt{3+4\cos(c+dx)}}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^3\,\sqrt{4\,\cos\left(c+d\,x\right)+3}}\,dx$$

```
[In] int(1/(cos(c + d*x)^3*(4*cos(c + d*x) + 3)^(1/2)),x)
[Out] int(1/(cos(c + d*x)^3*(4*cos(c + d*x) + 3)^(1/2)), x)
```

3.554 $\int \frac{\cos^3(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 113

$$\int \frac{\cos^3(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = -\frac{9\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)|\frac{8}{7}\right)}{20d}+\frac{23\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{20\sqrt{7}d}-\frac{\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{10d}-\frac{\sqrt{3-4\cos(c+dx)}\cos(c+dx)\sin(c+dx)}{10d}$$

```
[Out] -23/140*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)*EllipticF(cos(1/2*d
*x+1/2*c),2/7*14^(1/2))/d*7^(1/2)+9/20*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2
*d*x+1/2*c)*EllipticE(cos(1/2*d*x+1/2*c),2/7*14^(1/2))/d*7^(1/2)-1/10*sin(d
*x+c)*(3-4*cos(d*x+c))^(1/2)/d-1/10*cos(d*x+c)*sin(d*x+c)*(3-4*cos(d*x+c))^
(1/2)/d
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 113, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2872, 3102, 2831, 2741, 2733}

$$\int \frac{\cos^3(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \frac{23\,\text{EllipticF}\left(\frac{1}{2}(c+dx+\pi),\frac{8}{7}\right)}{20\sqrt{7}d}-\frac{9\sqrt{7}E\left(\frac{1}{2}(c+dx+\pi)|\frac{8}{7}\right)}{20d}-\frac{\sin(c+dx)\sqrt{3-4\cos(c+dx)}\cos(c+dx)}{10d}-\frac{\sin(c+dx)\sqrt{3-4\cos(c+dx)}}{10d}$$

```
[In] Int[Cos[c + d*x]^3/Sqrt[3 - 4*Cos[c + d*x]],x]
```

```
[Out] (-9*Sqrt[7]*EllipticE[(c + Pi + d*x)/2, 8/7])/(20*d) + (23*EllipticF[(c + P
i + d*x)/2, 8/7])/(20*Sqrt[7]*d) - (Sqrt[3 - 4*Cos[c + d*x]]*Sin[c + d*x])/
(10*d) - (Sqrt[3 - 4*Cos[c + d*x]]*Cos[c + d*x]*Sin[c + d*x])/(10*d)
```

Rule 2733

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 - b]/d)*EllipticE[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ[{a,
 b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2741

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a - b]))*EllipticF[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ
[{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\sqrt{3-4\cos(c+dx)}\cos(c+dx)\sin(c+dx)}{10d} \\
&\quad -\frac{1}{10}\int \frac{3-6\cos(c+dx)-6\cos^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx \\
&= -\frac{\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{10d} \\
&\quad -\frac{\sqrt{3-4\cos(c+dx)}\cos(c+dx)\sin(c+dx)}{10d}+\frac{1}{60}\int \frac{-6+54\cos(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx \\
&= -\frac{\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{10d}-\frac{\sqrt{3-4\cos(c+dx)}\cos(c+dx)\sin(c+dx)}{10d} \\
&\quad -\frac{9}{40}\int \sqrt{3-4\cos(c+dx)}\,dx+\frac{23}{40}\int \frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx \\
&= -\frac{9\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)\middle|\frac{8}{7}\right)}{20d}+\frac{23\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{20\sqrt{7}d} \\
&\quad -\frac{\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{10d}-\frac{\sqrt{3-4\cos(c+dx)}\cos(c+dx)\sin(c+dx)}{10d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.25 (sec) , antiderivative size = 102, normalized size of antiderivative = 0.90

$$
\int \frac{\cos^3(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx
$$

$$
= \frac{9\sqrt{-3+4\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|8\right)+23\sqrt{-3+4\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),8\right)-4\sin(c+dx)\cdots}{20d\sqrt{3-4\cos(c+dx)}}
$$

```
[In] Integrate[Cos[c + d*x]^3/Sqrt[3 - 4*Cos[c + d*x]],x]
```

```
[Out] (9*Sqrt[-3 + 4*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 8] + 23*Sqrt[-3 + 4*Cos
[c + d*x]]*EllipticF[(c + d*x)/2, 8] - 4*Sin[c + d*x] + Sin[2*(c + d*x)] +
2*Sin[3*(c + d*x)])/(20*d*Sqrt[3 - 4*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 4.36 (sec) , antiderivative size = 254, normalized size of antiderivative = 2.25

method	result
default	$-\frac{\sqrt{-\left(8\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-7\right)\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\left(-448\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^{6}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+504\left(\sin^{4}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-56\left(\sin^{2}\left(\frac{dx}{2}+\right.\right.\right.}{140\sqrt{8\left(\sin^{4}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\mathrm{si}\right.}}$

```
[In] int(cos(d*x+c)^3/(3-4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/140*(-(8*cos(1/2*d*x+1/2*c)^2-7)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-448*cos(1
/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+504*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2
*c)-56*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+23*(sin(1/2*d*x+1/2*c)^2)^(1
/2)*(56*sin(1/2*d*x+1/2*c)^2-7)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2/7*14^(
1/2))-63*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(56*sin(1/2*d*x+1/2*c)^2-7)^(1/2)*Ell
ipticE(cos(1/2*d*x+1/2*c),2/7*14^(1/2)))/(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*
x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-8*cos(1/2*d*x+1/2*c)^2+7)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.20

$$\int \frac{\cos^{3}(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = -\frac{4\left(\cos\left(dx+c\right)+1\right)\sqrt{-4\,\cos\left(dx+c\right)+3}\sin\left(dx+c\right)+7\,\sqrt{2}\mathrm{weierstrassPInverse}\left(-1,-1,\cos\left(dx+c\right)\right.}{}$$

```
[In] integrate(cos(d*x+c)^3/(3-4*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] -1/40*(4*(cos(d*x + c) + 1)*sqrt(-4*cos(d*x + c) + 3)*sin(d*x + c) + 7*sqrt
(2)*weierstrassPInverse(-1, -1, cos(d*x + c) + I*sin(d*x + c) - 1/2) + 7*sq
rt(2)*weierstrassPInverse(-1, -1, cos(d*x + c) - I*sin(d*x + c) - 1/2) - 18
*sqrt(2)*weierstrassZeta(-1, -1, weierstrassPInverse(-1, -1, cos(d*x + c) +
 I*sin(d*x + c) - 1/2)) - 18*sqrt(2)*weierstrassZeta(-1, -1, weierstrassPIn
verse(-1, -1, cos(d*x + c) - I*sin(d*x + c) - 1/2)))/d
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3/(3-4*cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^3(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{\cos(dx+c)^3}{\sqrt{-4\cos(dx+c)+3}}\,dx$$

```
[In] integrate(cos(d*x+c)^3/(3-4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^3/sqrt(-4*cos(d*x + c) + 3), x)
```

Giac [F]

$$\int \frac{\cos^3(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{\cos(dx+c)^3}{\sqrt{-4\cos(dx+c)+3}}\,dx$$

```
[In] integrate(cos(d*x+c)^3/(3-4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^3/sqrt(-4*cos(d*x + c) + 3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{\cos(c+d\,x)^3}{\sqrt{3-4\cos(c+d\,x)}}\,dx$$

```
[In] int(cos(c + d*x)^3/(3 - 4*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^3/(3 - 4*cos(c + d*x))^(1/2), x)
```

3.555 $\int \frac{\cos^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 80

$$\int \frac{\cos^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = -\frac{\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)\middle|\frac{8}{7}\right)}{4d} + \frac{17\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{12\sqrt{7}d} - \frac{\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{6d}$$

```
[Out] -17/84*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)*EllipticF(cos(1/2*d*
x+1/2*c),2/7*14^(1/2))/d*7^(1/2)+1/4*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d
*x+1/2*c)*EllipticE(cos(1/2*d*x+1/2*c),2/7*14^(1/2))/d*7^(1/2)-1/6*sin(d*x+
c)*(3-4*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2870, 2831, 2741, 2733}

$$\int \frac{\cos^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \frac{17\,\text{EllipticF}\left(\frac{1}{2}(c+dx+\pi),\frac{8}{7}\right)}{12\sqrt{7}d} - \frac{\sqrt{7}E\left(\frac{1}{2}(c+dx+\pi)\middle|\frac{8}{7}\right)}{4d} - \frac{\sin(c+dx)\sqrt{3-4\cos(c+dx)}}{6d}$$

```
[In] Int[Cos[c + d*x]^2/Sqrt[3 - 4*Cos[c + d*x]],x]
```

```
[Out] -1/4*(Sqrt[7]*EllipticE[(c + Pi + d*x)/2, 8/7])/d + (17*EllipticF[(c + Pi +
 d*x)/2, 8/7])/(12*Sqrt[7]*d) - (Sqrt[3 - 4*Cos[c + d*x]]*Sin[c + d*x])/(6*
d)
```

Rule 2733

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 - b]/d)*EllipticE[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ[{a,
 b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2741

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a - b]))*EllipticF[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ
[{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rule 2870

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])^2, x_Symbol] :> Simp[(-d^2)*Cos[e + f*x]*((a + b*Sin[e + f*x])
^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m + 2)), Int[(a + b*Sin[e + f*x])^
m*Simp[b*(d^2*(m + 1) + c^2*(m + 2)) - d*(a*d - 2*b*c*(m + 2))*Sin[e + f*x]
, x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] && NeQ
[a^2 - b^2, 0] &&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{6d}-\frac{1}{6}\int\frac{-2-3\cos(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx\\
&= -\frac{\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{6d}\\
&\quad -\frac{1}{8}\int\sqrt{3-4\cos(c+dx)}\,dx+\frac{17}{24}\int\frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx\\
&= -\frac{\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)\middle|\frac{8}{7}\right)}{4d}+\frac{17\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{12\sqrt{7}d}-\frac{\sqrt{3-4\cos(c+dx)}\sin(c+dx)}{6d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 94, normalized size of antiderivative = 1.18

$$\int \frac{\cos^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \frac{3\sqrt{-3+4\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|8\right)+17\sqrt{-3+4\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),8\right)-6\sin(c+dx)}{12d\sqrt{3-4\cos(c+dx)}}$$

```
[In] Integrate[Cos[c + d*x]^2/Sqrt[3 - 4*Cos[c + d*x]],x]
```

```
[Out] (3*Sqrt[-3 + 4*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 8] + 17*Sqrt[-3 + 4*Cos
[c + d*x]]*EllipticF[(c + d*x)/2, 8] - 6*Sin[c + d*x] + 4*Sin[2*(c + d*x)])
/(12*d*Sqrt[3 - 4*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 2.93 (sec) , antiderivative size = 232, normalized size of antiderivative = 2.90

method	result
default	$-\frac{\sqrt{-\left(8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-7\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(224\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-28\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+17\sqrt{\frac{1}{2}-\frac{\cos(dx+c}{2}}}{84\sqrt{8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sin(}$

```
[In] int(cos(d*x+c)^2/(3-4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/84*(-(8*cos(1/2*d*x+1/2*c)^2-7)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(224*sin(1/2
*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-28*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)
+17*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(56*sin(1/2*d*x+1/2*c)^2-7)^(1/2)*Elliptic
F(cos(1/2*d*x+1/2*c),2/7*14^(1/2))-21*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(56*sin(
1/2*d*x+1/2*c)^2-7)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2/7*14^(1/2)))/(8*si
n(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-8*cos(1
/2*d*x+1/2*c)^2+7)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.60

$$\int \frac{\cos^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = -\frac{4\sqrt{-4\cos(dx+c)+3}\sin(dx+c)+7\sqrt{2}\text{weierstrassPInverse}\left(-1,-1,\cos(dx+c)+i\sin(dx+c)-\right.}{}$$

```
[In] integrate(cos(d*x+c)^2/(3-4*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] -1/24*(4*sqrt(-4*cos(d*x + c) + 3)*sin(d*x + c) + 7*sqrt(2)*weierstrassPInv
erse(-1, -1, cos(d*x + c) + I*sin(d*x + c) - 1/2) + 7*sqrt(2)*weierstrassPI
nverse(-1, -1, cos(d*x + c) - I*sin(d*x + c) - 1/2) - 6*sqrt(2)*weierstrass
Zeta(-1, -1, weierstrassPInverse(-1, -1, cos(d*x + c) + I*sin(d*x + c) - 1/
2)) - 6*sqrt(2)*weierstrassZeta(-1, -1, weierstrassPInverse(-1, -1, cos(d*x
 + c) - I*sin(d*x + c) - 1/2)))/d
```

Sympy [F]

$$\int \frac{\cos^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{\cos^2{(c+dx)}}{\sqrt{3-4\cos{(c+dx)}}}\,dx$$

```
[In] integrate(cos(d*x+c)**2/(3-4*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(cos(c + d*x)**2/sqrt(3 - 4*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{\cos^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{\cos{(dx+c)}^2}{\sqrt{-4\,\cos{(dx+c)}+3}}\,dx$$

```
[In] integrate(cos(d*x+c)^2/(3-4*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(cos(d*x + c)^2/sqrt(-4*cos(d*x + c) + 3), x)
```

Giac [F]

$$\int \frac{\cos^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{\cos{(dx+c)}^2}{\sqrt{-4\,\cos{(dx+c)}+3}}\,dx$$

```
[In] integrate(cos(d*x+c)^2/(3-4*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(cos(d*x + c)^2/sqrt(-4*cos(d*x + c) + 3), x)
```

Mupad [B] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 78, normalized size of antiderivative = 0.98

$$\int \frac{\cos^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \frac{\sqrt{4\cos(c+d\,x)-3}\,\left(6\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|8\right)+34\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|8\right)\right)}{24\,d\,\sqrt{3-4\cos(c+d\,x)}} - \frac{\sin(c+d\,x)\,\sqrt{3-4\cos(c+d\,x)}}{6\,d}$$

```
[In] int(cos(c + d*x)^2/(3 - 4*cos(c + d*x))^(1/2),x)
```

```
[Out] ((4*cos(c + d*x) - 3)^(1/2)*(6*ellipticE(c/2 + (d*x)/2, 8) + 34*ellipticF(c
/2 + (d*x)/2, 8)))/(24*d*(3 - 4*cos(c + d*x))^(1/2)) - (sin(c + d*x)*(3 - 4
*cos(c + d*x))^(1/2))/(6*d)
```

3.556 $\int \frac{\cos(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 53

$$\int \frac{\cos(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = -\frac{\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)\middle|\frac{8}{7}\right)}{2d} + \frac{3\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{2\sqrt{7}d}$$

```
[Out] -3/14*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)*EllipticF(cos(1/2*d*x
+1/2*c),2/7*14^(1/2))/d*7^(1/2)+1/2*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*
x+1/2*c)*EllipticE(cos(1/2*d*x+1/2*c),2/7*14^(1/2))/d*7^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {2831, 2741, 2733}

$$\int \frac{\cos(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \frac{3\,\text{EllipticF}\left(\frac{1}{2}(c+dx+\pi),\frac{8}{7}\right)}{2\sqrt{7}d} - \frac{\sqrt{7}E\left(\frac{1}{2}(c+dx+\pi)\middle|\frac{8}{7}\right)}{2d}$$

```
[In] Int[Cos[c + d*x]/Sqrt[3 - 4*Cos[c + d*x]],x]
```

```
[Out] -1/2*(Sqrt[7]*EllipticE[(c + Pi + d*x)/2, 8/7])/d + (3*EllipticF[(c + Pi +
d*x)/2, 8/7])/(2*Sqrt[7]*d)
```

Rule 2733

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 - b]/d)*EllipticE[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ[{a,
 b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2741

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a - b]))*EllipticF[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ
[{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2831

```
Int[((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*sin[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(b*c - a*d)/b, Int[1/Sqrt[a + b*Sin[e + f*x]
], x], x] + Dist[d/b, Int[Sqrt[a + b*Sin[e + f*x]], x], x] /; FreeQ[{a, b,
c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\left(\frac{1}{4}\int \sqrt{3-4\cos(c+dx)}\,dx\right)+\frac{3}{4}\int \frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx\\ &= -\frac{\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)\middle|\frac{8}{7}\right)}{2d}+\frac{3\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{2\sqrt{7}d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 60, normalized size of antiderivative = 1.13

$$\int \frac{\cos(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx=\frac{\sqrt{-3+4\cos(c+dx)}\left(E\left(\frac{1}{2}(c+dx)\middle|8\right)+3\,\text{EllipticF}\left(\frac{1}{2}(c+dx),8\right)\right)}{2d\sqrt{3-4\cos(c+dx)}}$$

```
[In] Integrate[Cos[c + d*x]/Sqrt[3 - 4*Cos[c + d*x]],x]
[Out] (Sqrt[-3 + 4*Cos[c + d*x]]*(EllipticE[(c + d*x)/2, 8] + 3*EllipticF[(c + d*
x)/2, 8]))/(2*d*Sqrt[3 - 4*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 2.28 (sec) , antiderivative size = 158, normalized size of antiderivative = 2.98

method	result
default	$-\frac{\sqrt{-\left(8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-7\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{56\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-7}\,\left(3F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\frac{2\sqrt{14}}{7}\right)-7E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\frac{2\sqrt{}}{}\right.\right.}{14\sqrt{8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7}\,d}$
risch	$-\frac{i\left(2\,e^{2i(dx+c)}-3\,e^{i(dx+c)}+2\right)e^{-i(dx+c)}}{2d\sqrt{-\left(2\,e^{2i(dx+c)}-3\,e^{i(dx+c)}+2\right)e^{-i(dx+c)}}}-\frac{i\left(\frac{-2\,e^{2i(dx+c)}+3\,e^{i(dx+c)}-2}{\sqrt{\left(-2\,e^{2i(dx+c)}+3\,e^{i(dx+c)}-2\right)e^{i(dx+c)}}}+\frac{2\left(-\frac{3}{4}+\frac{i\sqrt{7}}{4}\right)\sqrt{\frac{e^{i(dx+c)}-\frac{3}{4}+\frac{i\sqrt{7}}{4}}{-\frac{3}{4}+\frac{i\sqrt{7}}{4}}}\,\sqrt{14}\,\sqrt{}}{}\right.}{}$

[In] int(cos(d*x+c)/(3-4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)

[Out] -1/14*(-(8*cos(1/2*d*x+1/2*c)^2-7)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(56*sin(1/2*d*x+1/2*c)^2-7)^(1/2)*(3*EllipticF(cos(1/2*d*x+1/2*c),2/7*14^(1/2))-7*EllipticE(cos(1/2*d*x+1/2*c),2/7*14^(1/2)))/(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-8*cos(1/2*d*x+1/2*c)^2+7)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 106, normalized size of antiderivative = 2.00

$$\int \frac{\cos(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\text{weierstrassPInverse}\left(-1,-1,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right)-\frac{1}{2}\right)+\sqrt{2}\text{weierstrassPInverse}\left(-1,-1,\cos\right.}{}$$

[In] integrate(cos(d*x+c)/(3-4*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] -1/4*(sqrt(2)*weierstrassPInverse(-1, -1, cos(d*x + c) + I*sin(d*x + c) - 1/2) + sqrt(2)*weierstrassPInverse(-1, -1, cos(d*x + c) - I*sin(d*x + c) - 1/2) - 2*sqrt(2)*weierstrassZeta(-1, -1, weierstrassPInverse(-1, -1, cos(d*x + c) + I*sin(d*x + c) - 1/2)) - 2*sqrt(2)*weierstrassZeta(-1, -1, weierstrassPInverse(-1, -1, cos(d*x + c) - I*sin(d*x + c) - 1/2)))/d

Sympy [F]

$$\int \frac{\cos(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{\cos(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx$$

```
[In] integrate(cos(d*x+c)/(3-4*cos(d*x+c))**(1/2),x)
[Out] Integral(cos(c + d*x)/sqrt(3 - 4*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{\cos(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{\cos(dx+c)}{\sqrt{-4\cos(dx+c)+3}}\,dx$$

```
[In] integrate(cos(d*x+c)/(3-4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)/sqrt(-4*cos(d*x + c) + 3), x)
```

Giac [F]

$$\int \frac{\cos(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{\cos(dx+c)}{\sqrt{-4\cos(dx+c)+3}}\,dx$$

```
[In] integrate(cos(d*x+c)/(3-4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)/sqrt(-4*cos(d*x + c) + 3), x)
```

Mupad [B] (verification not implemented)

Time = 15.08 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.98

$$\int \frac{\cos(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \frac{\sqrt{4\cos(c+d\,x)-3}\,\left(\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|8\right)+3\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|8\right)\right)}{2\,d\,\sqrt{3-4\cos(c+d\,x)}}$$

```
[In] int(cos(c + d*x)/(3 - 4*cos(c + d*x))^(1/2),x)
[Out] ((4*cos(c + d*x) - 3)^(1/2)*(ellipticE(c/2 + (d*x)/2, 8) + 3*ellipticF(c/2
+ (d*x)/2, 8)))/(2*d*(3 - 4*cos(c + d*x))^(1/2))
```

3.557 $\int \frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 24

$$\int \frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx = \frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{\sqrt{7}d}$$

```
[Out] -2/7*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)*EllipticF(cos(1/2*d*x+
1/2*c),2/7*14^(1/2))/d*7^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.071, Rules used = {2741}

$$\int \frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx = \frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+dx+\pi),\frac{8}{7}\right)}{\sqrt{7}d}$$

```
[In] Int[1/Sqrt[3 - 4*Cos[c + d*x]],x]
[Out] (2*EllipticF[(c + Pi + d*x)/2, 8/7])/(Sqrt[7]*d)
```

Rule 2741

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a - b]))*EllipticF[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ
[{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rubi steps

$$\text{integral} = \frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{\sqrt{7}d}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.83

$$\int \frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx = \frac{2\sqrt{-3+4\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),8\right)}{d\sqrt{3-4\cos(c+dx)}}$$

```
[In] Integrate[1/Sqrt[3 - 4*Cos[c + d*x]],x]
[Out] (2*Sqrt[-3 + 4*Cos[c + d*x]]*EllipticF[(c + d*x)/2, 8])/(d*Sqrt[3 - 4*Cos[c
 + d*x]])
```

Maple [C] (verified)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.52 (sec) , antiderivative size = 54, normalized size of antiderivative = 2.25

method	result	size
default	$\frac{2\sqrt{8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-7}\,\operatorname{am}^{-1}\left(\frac{dx}{2}+\frac{c}{2}\middle|2\sqrt{2}\right)}{d\sqrt{-8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7}}$	54

```
[In] int(1/(3-4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
[Out] 2/d/(-8*cos(1/2*d*x+1/2*c)^2+7)^(1/2)*(8*cos(1/2*d*x+1/2*c)^2-7)^(1/2)*Inve
rseJacobiAM(1/2*d*x+1/2*c,2*2^(1/2))
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 52, normalized size of antiderivative = 2.17

$$\int \frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx = -\frac{\sqrt{2}\text{weierstrassPInverse}\left(-1,-1,\cos(dx+c)+i\sin(dx+c)-\frac{1}{2}\right)+\sqrt{2}\text{weierstrassPInverse}\left(-1,-1,\text{c}\right.}{2\,d}$$

```
[In] integrate(1/(3-4*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] -1/2*(sqrt(2)*weierstrassPInverse(-1, -1, cos(d*x + c) + I*sin(d*x + c) - 1
/2) + sqrt(2)*weierstrassPInverse(-1, -1, cos(d*x + c) - I*sin(d*x + c) - 1
/2))/d
```

Sympy [F]

$$\int \frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{3-4\cos{(c+dx)}}}\,dx$$

```
[In] integrate(1/(3-4*cos(d*x+c))**(1/2),x)
[Out] Integral(1/sqrt(3 - 4*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-4\cos{(dx+c)}+3}}\,dx$$

```
[In] integrate(1/(3-4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(1/sqrt(-4*cos(d*x + c) + 3), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-4\cos{(dx+c)}+3}}\,dx$$

```
[In] integrate(1/(3-4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/sqrt(-4*cos(d*x + c) + 3), x)
```

Mupad [B] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 39, normalized size of antiderivative = 1.62

$$\int \frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx = \frac{2\sqrt{4\cos{(c+d\,x)}-3}\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|8\right)}{d\sqrt{3-4\cos{(c+d\,x)}}}$$

```
[In] int(1/(3 - 4*cos(c + d*x))^(1/2),x)
[Out] (2*(4*cos(c + d*x) - 3)^(1/2)*ellipticF(c/2 + (d*x)/2, 8))/(d*(3 - 4*cos(c
+ d*x))^(1/2))
```

3.558 $\int \frac{\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 25

$$\int \frac{\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = -\frac{2\,\text{EllipticPi}\left(2,\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{\sqrt{7}d}$$

```
[Out] 2/7*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)*EllipticPi(cos(1/2*d*x+
1/2*c),2,2/7*14^(1/2))/d*7^(1/2)
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2885}

$$\int \frac{\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = -\frac{2\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx+\pi),\frac{8}{7}\right)}{\sqrt{7}d}$$

```
[In] Int[Sec[c + d*x]/Sqrt[3 - 4*Cos[c + d*x]],x]
[Out] (-2*EllipticPi[2, (c + Pi + d*x)/2, 8/7])/(Sqrt[7]*d)
```

Rule 2885

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a - b)*Sqrt[c - d]))*EllipticPi[
-2*(b/(a - b)), (1/2)*(e + Pi/2 + f*x), -2*(d/(c - d))], x] /; FreeQ[{a, b,
 c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2
, 0] && GtQ[c - d, 0]
```

Rubi steps

$$\text{integral} = -\frac{2\,\text{EllipticPi}\left(2,\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{\sqrt{7}d}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.80

$$\int \frac{\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \frac{2\sqrt{-3+4\cos(c+dx)}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),8\right)}{d\sqrt{3-4\cos(c+dx)}}$$

```
[In] Integrate[Sec[c + d*x]/Sqrt[3 - 4*Cos[c + d*x]],x]
[Out] (2*Sqrt[-3 + 4*Cos[c + d*x]]*EllipticPi[2, (c + d*x)/2, 8])/(d*Sqrt[3 - 4*C
os[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 138 vs. $2(48) = 96$.

Time = 1.74 (sec) , antiderivative size = 139, normalized size of antiderivative = 5.56

method	result	size
default	$\frac{2\sqrt{-\left(8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-7\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{56\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-7}\,\Pi\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),2,\frac{2\sqrt{14}}{7}\right)}{7\sqrt{8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+7}\,d}$	139

```
[In] int(sec(d*x+c)/(3-4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
[Out] 2/7*(-(8*cos(1/2*d*x+1/2*c)^2-7)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1
/2*c)^2)^(1/2)*(56*sin(1/2*d*x+1/2*c)^2-7)^(1/2)/(8*sin(1/2*d*x+1/2*c)^4-si
n(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,2/7*14^(1/2))/sin
(1/2*d*x+1/2*c)/(-8*cos(1/2*d*x+1/2*c)^2+7)^(1/2)/d
```

Fricas [F]

$$\int \frac{\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)}{\sqrt{-4\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(sec(d*x+c)/(3-4*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-4*cos(d*x + c) + 3)*sec(d*x + c)/(4*cos(d*x + c) - 3), x)
```

Sympy [F]

$$\int \frac{\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx$$

```
[In] integrate(sec(d*x+c)/(3-4*cos(d*x+c))**(1/2),x)
[Out] Integral(sec(c + d*x)/sqrt(3 - 4*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{\sec(dx+c)}{\sqrt{-4\cos(dx+c)+3}}\,dx$$

```
[In] integrate(sec(d*x+c)/(3-4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)/sqrt(-4*cos(d*x + c) + 3), x)
```

Giac [F]

$$\int \frac{\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{\sec(dx+c)}{\sqrt{-4\cos(dx+c)+3}}\,dx$$

```
[In] integrate(sec(d*x+c)/(3-4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)/sqrt(-4*cos(d*x + c) + 3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{1}{\cos(c+d\,x)\,\sqrt{3-4\cos(c+d\,x)}}\,dx$$

```
[In] int(1/(cos(c + d*x)*(3 - 4*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)*(3 - 4*cos(c + d*x))^(1/2)), x)
```

3.559 $\int \frac{\sec^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 104

$$\int \frac{\sec^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = -\frac{\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)\middle|\frac{8}{7}\right)}{3d}+\frac{\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{\sqrt{7}d} - \frac{4\,\text{EllipticPi}\left(2,\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{3\sqrt{7}d} + \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{3d}$$

```
[Out] -1/7*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)*EllipticF(cos(1/2*d*x+
1/2*c),2/7*14^(1/2))/d*7^(1/2)+4/21*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*
x+1/2*c)*EllipticPi(cos(1/2*d*x+1/2*c),2,2/7*14^(1/2))/d*7^(1/2)+1/3*(sin(1
/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)*EllipticE(cos(1/2*d*x+1/2*c),2/7*
14^(1/2))/d*7^(1/2)+1/3*(3-4*cos(d*x+c))^(1/2)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 104, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2881, 3139, 2733, 3081, 2741, 2885}

$$\int \frac{\sec^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \frac{\text{EllipticF}\left(\frac{1}{2}(c+dx+\pi),\frac{8}{7}\right)}{\sqrt{7}d}-\frac{\sqrt{7}E\left(\frac{1}{2}(c+dx+\pi)\middle|\frac{8}{7}\right)}{3d} - \frac{4\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx+\pi),\frac{8}{7}\right)}{3\sqrt{7}d} + \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{3d}$$

```
[In] Int[Sec[c + d*x]^2/Sqrt[3 - 4*Cos[c + d*x]],x]
```

```
[Out] -1/3*(Sqrt[7]*EllipticE[(c + Pi + d*x)/2, 8/7])/d + EllipticF[(c + Pi + d*x
)/2, 8/7]/(Sqrt[7]*d) - (4*EllipticPi[2, (c + Pi + d*x)/2, 8/7])/(3*Sqrt[7]
*d) + (Sqrt[3 - 4*Cos[c + d*x]]*Tan[c + d*x])/(3*d)
```

Rule 2733

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 - b]/d)*EllipticE[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ[{a,
 b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2741

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a - b]))*EllipticF[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ
[{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2885

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a - b)*Sqrt[c - d]))*EllipticPi[
-2*(b/(a - b)), (1/2)*(e + Pi/2 + f*x), -2*(d/(c - d))], x] /; FreeQ[{a, b,
 c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2
, 0] && GtQ[c - d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3139

```
Int[((A_.) + (C_.)*sin[(e_.) + (f_.)*(x_)]^2)/(Sqrt[(a_.) + (b_.)*sin[(e_.)
 + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])), x_Symbol] :> Dist
[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x], x] - Dist[1/(b*d), Int[Simp[a*c
*C - A*b*d + (b*c*C + a*C*d)*Sin[e + f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c
+ d*Sin[e + f*x])), x], x] /; FreeQ[{a, b, c, d, e, f, A, C}, x] && NeQ[b*c
 - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{3d} + \frac{1}{3}\int \frac{(2+2\cos^2(c+dx))\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx \\
&= \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{3d} \\
&\quad + \frac{1}{12}\int \frac{(8+6\cos(c+dx))\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx - \frac{1}{6}\int \sqrt{3-4\cos(c+dx)}\,dx \\
&= -\frac{\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)\middle|\frac{8}{7}\right)}{3d} + \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{3d} \\
&\quad + \frac{1}{2}\int \frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx + \frac{2}{3}\int \frac{\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx \\
&= -\frac{\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)\middle|\frac{8}{7}\right)}{3d} + \frac{\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{\sqrt{7}d} \\
&\quad - \frac{4\,\text{EllipticPi}\left(2,\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{3\sqrt{7}d} + \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{3d}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.03 (sec) , antiderivative size = 179, normalized size of antiderivative = 1.72

$$\int \frac{\sec^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \frac{\frac{6\sqrt{-3+4\cos(c+dx)}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),8\right)}{\sqrt{3-4\cos(c+dx)}} - \frac{i\left(21E\left(i\text{arcsinh}\left(\sqrt{3-4\cos(c+dx)}\right)\middle|-\frac{1}{7}\right)-12\,\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{3-4\cos(c+dx)}\right),-\frac{1}{7}\right)\cdots}{3\sqrt{7}\sqrt{\sin^2(c+dx)}}}{3d}$$

```
[In] Integrate[Sec[c + d*x]^2/Sqrt[3 - 4*Cos[c + d*x]],x]
[Out] ((6*Sqrt[-3 + 4*Cos[c + d*x]]*EllipticPi[2, (c + d*x)/2, 8])/Sqrt[3 - 4*Cos
[c + d*x]] - ((I/3)*(21*EllipticE[I*ArcSinh[Sqrt[3 - 4*Cos[c + d*x]]], -1/7
] - 12*EllipticF[I*ArcSinh[Sqrt[3 - 4*Cos[c + d*x]]], -1/7] - 8*EllipticPi[
-1/3, I*ArcSinh[Sqrt[3 - 4*Cos[c + d*x]]], -1/7])*Sin[c + d*x])/(Sqrt[7]*Sq
rt[Sin[c + d*x]^2]) + Sqrt[3 - 4*Cos[c + d*x]]*Tan[c + d*x])/(3*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 350 vs. $2(166) = 332$.

Time = 2.89 (sec) , antiderivative size = 351, normalized size of antiderivative = 3.38

method	result
default	$-\frac{\sqrt{-\left(8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-7\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-\frac{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}}{3\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)}+\frac{\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{56\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right.}}{7\sqrt{8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\right.}}\right.}{\sin\left(\frac{dx}{2}+\right.}$

```
[In] int(sec(d*x+c)^2/(3-4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(8*cos(1/2*d*x+1/2*c)^2-7)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2/3*cos(1/2*d*x
+1/2*c)*(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+
1/2*c)^2-1)+1/7*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(56*sin(1/2*d*x+1/2*c)^2-7)^(1
/2)/(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d
*x+1/2*c),2/7*14^(1/2))-1/3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(56*sin(1/2*d*x+1/
2*c)^2-7)^(1/2)/(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellipti
cE(cos(1/2*d*x+1/2*c),2/7*14^(1/2))-4/21*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(56*s
in(1/2*d*x+1/2*c)^2-7)^(1/2)/(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)^
(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,2/7*14^(1/2)))/sin(1/2*d*x+1/2*c)/(-8
*cos(1/2*d*x+1/2*c)^2+7)^(1/2)/d
```

Fricas [F]

$$\int \frac{\sec^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx=\int \frac{\sec\left(dx+c\right)^2}{\sqrt{-4\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(sec(d*x+c)^2/(3-4*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-4*cos(d*x + c) + 3)*sec(d*x + c)^2/(4*cos(d*x + c) - 3), x)
```

Sympy [F]

$$\int \frac{\sec^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx=\int \frac{\sec^2\left(c+dx\right)}{\sqrt{3-4\cos\left(c+dx\right)}}\,dx$$

```
[In] integrate(sec(d*x+c)**2/(3-4*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sec(c + d*x)**2/sqrt(3 - 4*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{\sec^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)^2}{\sqrt{-4\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(sec(d*x+c)^2/(3-4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^2/sqrt(-4*cos(d*x + c) + 3), x)
```

Giac [F]

$$\int \frac{\sec^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)^2}{\sqrt{-4\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(sec(d*x+c)^2/(3-4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^2/sqrt(-4*cos(d*x + c) + 3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^2\,\sqrt{3-4\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^2*(3 - 4*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^2*(3 - 4*cos(c + d*x))^(1/2)), x)
```

3.560 $\int \frac{\sec^3(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 140

$$\int \frac{\sec^3(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = -\frac{\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)|\frac{8}{7}\right)}{3d}+\frac{\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{3\sqrt{7}d}-\frac{\sqrt{7}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{3d}+\frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{3d}+\frac{\sqrt{3-4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{6d}$$

```
[Out] -1/21*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)*EllipticF(cos(1/2*d*x
+1/2*c),2/7*14^(1/2))/d*7^(1/2)+1/3*(sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*
x+1/2*c)*EllipticE(cos(1/2*d*x+1/2*c),2/7*14^(1/2))/d*7^(1/2)+1/3*(sin(1/2*
d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)*EllipticPi(cos(1/2*d*x+1/2*c),2,2/7*
14^(1/2))/d*7^(1/2)+1/3*(3-4*cos(d*x+c))^(1/2)*tan(d*x+c)/d+1/6*sec(d*x+c)*
(3-4*cos(d*x+c))^(1/2)*tan(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.48 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used

$= \{2881, 3134, 3138, 2733, 3081, 2741, 2885\}$

$$\int \frac{\sec^3(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \frac{\text{EllipticF}\left(\frac{1}{2}(c+dx+\pi),\frac{8}{7}\right)}{3\sqrt{7}d} - \frac{\sqrt{7}E\left(\frac{1}{2}(c+dx+\pi)\middle|\frac{8}{7}\right)}{3d} - \frac{\sqrt{7}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx+\pi),\frac{8}{7}\right)}{3d} + \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{3d} + \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)\sec(c+dx)}{6d}$$

```
[In] Int[Sec[c + d*x]^3/Sqrt[3 - 4*Cos[c + d*x]],x]
```

```
[Out] -1/3*(Sqrt[7]*EllipticE[(c + Pi + d*x)/2, 8/7])/d + EllipticF[(c + Pi + d*x
)/2, 8/7]/(3*Sqrt[7]*d) - (Sqrt[7]*EllipticPi[2, (c + Pi + d*x)/2, 8/7])/(3
*d) + (Sqrt[3 - 4*Cos[c + d*x]]*Tan[c + d*x])/(3*d) + (Sqrt[3 - 4*Cos[c + d
*x]]*Sec[c + d*x]*Tan[c + d*x])/(6*d)
```

Rule 2733

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 - b]/d)*EllipticE[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ[{a,
 b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2741

```
Int[1/Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/(d*S
qrt[a - b]))*EllipticF[(1/2)*(c + Pi/2 + d*x), -2*(b/(a - b))], x] /; FreeQ
[{a, b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a - b, 0]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2885

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a - b)*Sqrt[c - d]))*EllipticPi[
```

```
-2*(b/(a - b)), (1/2)*(e + Pi/2 + f*x), -2*(d/(c - d))], x] /; FreeQ[{a, b,
 c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2
, 0] && GtQ[c - d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{3-4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{6d} + \frac{1}{6}\int \frac{(6+3\cos(c+dx)-2\cos^2(c+dx))\sec^2(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx$$

$$
\begin{aligned}
&= \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{3d} + \frac{\sqrt{3-4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{6d} \\
&\quad + \frac{1}{18}\int \frac{(21-6\cos(c+dx)+12\cos^2(c+dx))\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx \\
&= \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{3d} + \frac{\sqrt{3-4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{6d} \\
&\quad + \frac{1}{72}\int \frac{(84+12\cos(c+dx))\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx - \frac{1}{6}\int \sqrt{3-4\cos(c+dx)}\,dx \\
&= -\frac{\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)|\frac{8}{7}\right)}{3d} + \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{3d} \\
&\quad + \frac{\sqrt{3-4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{6d} \\
&\quad + \frac{1}{6}\int \frac{1}{\sqrt{3-4\cos(c+dx)}}\,dx + \frac{7}{6}\int \frac{\sec(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx \\
&= -\frac{\sqrt{7}E\left(\frac{1}{2}(c+\pi+dx)|\frac{8}{7}\right)}{3d} + \frac{\text{EllipticF}\left(\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{3\sqrt{7}d} \\
&\quad - \frac{\sqrt{7}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+\pi+dx),\frac{8}{7}\right)}{3d} + \frac{\sqrt{3-4\cos(c+dx)}\tan(c+dx)}{3d} \\
&\quad + \frac{\sqrt{3-4\cos(c+dx)}\sec(c+dx)\tan(c+dx)}{6d}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.30 (sec) , antiderivative size = 236, normalized size of antiderivative = 1.69

$$
\int \frac{\sec^3(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \frac{-\frac{4\sqrt{-3+4\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),8\right)}{\sqrt{3-4\cos(c+dx)}} + \frac{18\sqrt{-3+4\cos(c+dx)}\,\text{EllipticPi}\left(2,\frac{1}{2}(c+dx),8\right)}{\sqrt{3-4\cos(c+dx)}} - \frac{2i\left(21E\left(i\text{arcsinh}\left(\sqrt{3-4\cos(c+dx)}\right)|-\frac{1}{7}\right)\right.}{}}{}
$$

```
[In] Integrate[Sec[c + d*x]^3/Sqrt[3 - 4*Cos[c + d*x]],x]
```

```
[Out] ((-4*Sqrt[-3 + 4*Cos[c + d*x]]*EllipticF[(c + d*x)/2, 8])/Sqrt[3 - 4*Cos[c
+ d*x]] + (18*Sqrt[-3 + 4*Cos[c + d*x]]*EllipticPi[2, (c + d*x)/2, 8])/Sqrt
[3 - 4*Cos[c + d*x]] - (((2*I)/3)*(21*EllipticE[I*ArcSinh[Sqrt[3 - 4*Cos[c
+ d*x]]], -1/7] - 12*EllipticF[I*ArcSinh[Sqrt[3 - 4*Cos[c + d*x]]], -1/7] -
 8*EllipticPi[-1/3, I*ArcSinh[Sqrt[3 - 4*Cos[c + d*x]]], -1/7])*Sin[c + d*x
])/(Sqrt[7]*Sqrt[Sin[c + d*x]^2]) + Sqrt[3 - 4*Cos[c + d*x]]*(1 + 2*Cos[c +
 d*x])*Sec[c + d*x]*Tan[c + d*x])/(6*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 407 vs. $2(195) = 390$.

Time = 3.45 (sec) , antiderivative size = 408, normalized size of antiderivative = 2.91

method	result
default	$-\frac{\sqrt{-\left(8\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-7\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}}{3\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)^2}-\frac{2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin\ldots\right.}}{3\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)}\ldots\right.}{}$

```
[In] int(sec(d*x+c)^3/(3-4*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(8*cos(1/2*d*x+1/2*c)^2-7)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-1/3*cos(1/2*d*x
+1/2*c)*(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+
1/2*c)^2-1)^2-2/3*cos(1/2*d*x+1/2*c)*(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/
2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^2-1)+1/21*(sin(1/2*d*x+1/2*c)^2)^(1/2)*
(56*sin(1/2*d*x+1/2*c)^2-7)^(1/2)/(8*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c
)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2/7*14^(1/2))-1/3*(sin(1/2*d*x+1/2*
c)^2)^(1/2)*(56*sin(1/2*d*x+1/2*c)^2-7)^(1/2)/(8*sin(1/2*d*x+1/2*c)^4-sin(1
/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2/7*14^(1/2))-1/3*(sin(
1/2*d*x+1/2*c)^2)^(1/2)*(56*sin(1/2*d*x+1/2*c)^2-7)^(1/2)/(8*sin(1/2*d*x+1/
2*c)^4-sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),2,2/7*14^(
1/2)))/sin(1/2*d*x+1/2*c)/(-8*cos(1/2*d*x+1/2*c)^2+7)^(1/2)/d
```

Fricas [F]

$$\int \frac{\sec^3(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)^3}{\sqrt{-4\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(sec(d*x+c)^3/(3-4*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-4*cos(d*x + c) + 3)*sec(d*x + c)^3/(4*cos(d*x + c) - 3), x)
```

Sympy [F]

$$\int \frac{\sec^3(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{\sec^3\left(c+dx\right)}{\sqrt{3-4\cos\left(c+dx\right)}}\,dx$$

```
[In] integrate(sec(d*x+c)**3/(3-4*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sec(c + d*x)**3/sqrt(3 - 4*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{\sec^3(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)^3}{\sqrt{-4\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(sec(d*x+c)^3/(3-4*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^3/sqrt(-4*cos(d*x + c) + 3), x)
```

Giac [F]

$$\int \frac{\sec^3(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)^3}{\sqrt{-4\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(sec(d*x+c)^3/(3-4*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^3/sqrt(-4*cos(d*x + c) + 3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^3(c+dx)}{\sqrt{3-4\cos(c+dx)}}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^3\,\sqrt{3-4\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^3*(3 - 4*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^3*(3 - 4*cos(c + d*x))^(1/2)), x)
```

3.561 $\int \cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 111

$$\int \cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))\,dx = \frac{6AE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{10B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d}+\frac{10B\sqrt{\cos(c+dx)}\sin(c+dx)}{21d}+\frac{2A\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{2B\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}$$

```
[Out] 6/5*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x
+1/2*c),2^(1/2))/d+10/21*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*
EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/5*A*cos(d*x+c)^(3/2)*sin(d*x+c)/d
+2/7*B*cos(d*x+c)^(5/2)*sin(d*x+c)/d+10/21*B*sin(d*x+c)*cos(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used

$= \{2827, 2715, 2719, 2720\}$

$$\int \cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))\,dx = \frac{6AE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{2A\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{5d} + \frac{10B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{2B\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{7d} + \frac{10B\sin(c+dx)\sqrt{\cos(c+dx)}}{21d}$$

```
[In] Int[Cos[c + d*x]^(5/2)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (6*A*EllipticE[(c + d*x)/2, 2])/(5*d) + (10*B*EllipticF[(c + d*x)/2, 2])/(2
1*d) + (10*B*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(21*d) + (2*A*Cos[c + d*x]^(3
/2)*Sin[c + d*x])/(5*d) + (2*B*Cos[c + d*x]^(5/2)*Sin[c + d*x])/(7*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = A\int \cos^{\frac{5}{2}}(c+dx)\,dx + B\int \cos^{\frac{7}{2}}(c+dx)\,dx$$

$$= \frac{2A\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2B\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{1}{5}(3A)\int \sqrt{\cos(c+dx)}\,dx + \frac{1}{7}(5B)\int \cos^{\frac{3}{2}}(c+dx)\,dx$$

$$= \frac{6AE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{10B\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} + \frac{2A\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2B\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{1}{21}(5B)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{6AE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{10B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{10B\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} + \frac{2A\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2B\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}$$

Mathematica [A] (verified)

Time = 0.40 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.69

$$\int \cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))\,dx = \frac{126AE\left(\frac{1}{2}(c+dx)\middle|2\right)+50B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\sqrt{\cos(c+dx)}(65B+42A\cos(c+dx)+15B\cos(}{105d}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (126*A*EllipticE[(c + d*x)/2, 2] + 50*B*EllipticF[(c + d*x)/2, 2] + Sqrt[Co
s[c + d*x]]*(65*B + 42*A*Cos[c + d*x] + 15*B*Cos[2*(c + d*x)])*Sin[c + d*x]
)/(105*d)
```

Maple [A] (verified)

Time = 9.74 (sec) , antiderivative size = 290, normalized size of antiderivative = 2.61

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(240B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(-168A-360B)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+(}{}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}\right.\right.}}$

```
[In] int(cos(d*x+c)^(5/2)*(A+B*cos(d*x+c)),x,method=_RETURNVERBOSE)
```

```
[Out] -2/105*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(240*B*cos(1
/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8+(-168*A-360*B)*sin(1/2*d*x+1/2*c)^6*cos(
1/2*d*x+1/2*c)+(168*A+280*B)*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+(-42*A
-80*B)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-63*A*(sin(1/2*d*x+1/2*c)^2)^
(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)
```

```
)+25*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Ellipt
icF(cos(1/2*d*x+1/2*c),2^(1/2)))/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c
)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.33

$$\int \cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))\,dx = \frac{2\left(15\,B\cos\left(dx+c\right)^{2}+21\,A\cos\left(dx+c\right)+25\,B\right)\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-25i\,\sqrt{2}B\text{weierstrassPInverse}$$

```
[In] integrate(cos(d*x+c)^(5/2)*(A+B*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/105*(2*(15*B*cos(d*x + c)^2 + 21*A*cos(d*x + c) + 25*B)*sqrt(cos(d*x + c)
)*sin(d*x + c) - 25*I*sqrt(2)*B*weierstrassPInverse(-4, 0, cos(d*x + c) + I
*sin(d*x + c)) + 25*I*sqrt(2)*B*weierstrassPInverse(-4, 0, cos(d*x + c) - I
*sin(d*x + c)) + 63*I*sqrt(2)*A*weierstrassZeta(-4, 0, weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 63*I*sqrt(2)*A*weierstrassZeta(-4,
 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/d
```

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)*(A+B*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))\,dx = \int \left(B\cos\left(dx+c\right)+A\right)\cos\left(dx+c\right)^{\frac{5}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)*(A+B*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^(5/2), x)
```

Giac [F]

$$\int \cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)\cos(dx+c)^{\frac{5}{2}}\,dx$$

[In] integrate(cos(d*x+c)^(5/2)*(A+B*cos(d*x+c)),x, algorithm="giac")

[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^(5/2), x)

Mupad [B] (verification not implemented)

Time = 15.23 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.78

$$\int \cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))\,dx$$
$$= -\frac{2A\cos(c+dx)^{7/2}\sin(c+dx)\,{}_2F_1\left(\frac{1}{2},\frac{7}{4};\ \frac{11}{4};\ \cos(c+dx)^2\right)}{7d\sqrt{\sin(c+dx)^2}} - \frac{2B\cos(c+dx)^{9/2}\sin(c+dx)\,{}_2F_1\left(\frac{1}{2},\frac{9}{4};\ \frac{13}{4};\ \cos(c+dx)^2\right)}{9d\sqrt{\sin(c+dx)^2}}$$

[In] int(cos(c + d*x)^(5/2)*(A + B*cos(c + d*x)),x)

[Out] - (2*A*cos(c + d*x)^(7/2)*sin(c + d*x)*hypergeom([1/2, 7/4], 11/4, cos(c + d*x)^2))/(7*d*(sin(c + d*x)^2)^(1/2)) - (2*B*cos(c + d*x)^(9/2)*sin(c + d*x)*hypergeom([1/2, 9/4], 13/4, cos(c + d*x)^2))/(9*d*(sin(c + d*x)^2)^(1/2))

3.562 $\int \cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 87

$$\int \cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))\,dx=\frac{6BE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2A\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}+\frac{2B\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}$$

```
[Out] 6/5*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x
+1/2*c),2^(1/2))/d+2/3*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*El
lipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/5*B*cos(d*x+c)^(3/2)*sin(d*x+c)/d+2
/3*A*sin(d*x+c)*cos(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2827, 2715, 2720, 2719}

$$\int \cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))\,dx=\frac{2A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2A\sin(c+dx)\sqrt{\cos(c+dx)}}{3d}+\frac{6BE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2B\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{5d}$$

```
[In] Int[Cos[c + d*x]^(3/2)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (6*B*EllipticE[(c + d*x)/2, 2])/(5*d) + (2*A*EllipticF[(c + d*x)/2, 2])/(3*
d) + (2*A*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(3*d) + (2*B*Cos[c + d*x]^(3/2)*
Sin[c + d*x])/(5*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= A\int \cos^{\frac{3}{2}}(c+dx)\,dx + B\int \cos^{\frac{5}{2}}(c+dx)\,dx\\
&= \frac{2A\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2B\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}\\
&\quad + \frac{1}{3}A\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx + \frac{1}{5}(3B)\int \sqrt{\cos(c+dx)}\,dx\\
&= \frac{6BE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{2A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}\\
&\quad + \frac{2A\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2B\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.76

$$\int \cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))\,dx = \frac{2\left(9BE\left(\frac{1}{2}(c+dx)\middle|2\right)+5A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\sqrt{\cos(c+dx)}(5A+3B\cos(c+dx))\sin(c+dx)\right)}{15d}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (2*(9*B*EllipticE[(c + d*x)/2, 2] + 5*A*EllipticF[(c + d*x)/2, 2] + Sqrt[Co
s[c + d*x]]*(5*A + 3*B*Cos[c + d*x])*Sin[c + d*x]))/(15*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 261 vs. 2(127) = 254.

Time = 7.90 (sec) , antiderivative size = 262, normalized size of antiderivative = 3.01

method	result
default	$-\frac{2\sqrt{(2(\cos^2(\frac{dx}{2}+\frac{c}{2}))-1)(\sin^2(\frac{dx}{2}+\frac{c}{2}))}\,(-24B\cos(\frac{dx}{2}+\frac{c}{2})(\sin^6(\frac{dx}{2}+\frac{c}{2}))+(20A+24B)(\sin^4(\frac{dx}{2}+\frac{c}{2}))\cos(\frac{dx}{2}+\frac{c}{2})+(-10A}{15\sqrt{-2(\sin^4(\frac{dx}{2}+\frac{c}{2}}}$
parts	$-\frac{2A\sqrt{(2(\cos^2(\frac{dx}{2}+\frac{c}{2}))-1)(\sin^2(\frac{dx}{2}+\frac{c}{2}))}\,(4(\sin^4(\frac{dx}{2}+\frac{c}{2}))\cos(\frac{dx}{2}+\frac{c}{2})-2(\sin^2(\frac{dx}{2}+\frac{c}{2}))\cos(\frac{dx}{2}+\frac{c}{2})+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2(}}{3\sqrt{-2(\sin^4(\frac{dx}{2}+\frac{c}{2}))+\sin^2(\frac{dx}{2}+\frac{c}{2})}\,\sin(\frac{dx}{2}+\frac{c}{2})\sqrt{2(\cos^2(\frac{dx}{2}+\frac{c}{2}))-1}\,d}$

```
[In] int(cos(d*x+c)^(3/2)*(A+B*cos(d*x+c)),x,method=_RETURNVERBOSE)
```

```
[Out] -2/15*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-24*B*cos(1/
2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+(20*A+24*B)*sin(1/2*d*x+1/2*c)^4*cos(1/2*
d*x+1/2*c)+(-10*A-6*B)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+5*A*(sin(1/2
*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x
+1/2*c),2^(1/2))-9*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1
)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-2*sin(1/2*d*x+1/2*c)^4+sin
(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2
)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.57

$$\int \cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))\,dx$$
$$= \frac{2\left(3\,B\cos\left(dx+c\right)+5\,A\right)\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-5i\,\sqrt{2}A\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i$$

```
[In] integrate(cos(d*x+c)^(3/2)*(A+B*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/15*(2*(3*B*cos(d*x + c) + 5*A)*sqrt(cos(d*x + c))*sin(d*x + c) - 5*I*sqrt
(2)*A*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 5*I*sqrt(
2)*A*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 9*I*sqrt(2
)*B*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(
d*x + c))) - 9*I*sqrt(2)*B*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0
, cos(d*x + c) - I*sin(d*x + c))))/d
```

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(3/2)*(A+B*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))\,dx = \int \left(B\cos\left(dx+c\right)+A\right)\cos\left(dx+c\right)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(A+B*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(A+B*cos(d*x+c)),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^(3/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.10 (sec) , antiderivative size = 80, normalized size of antiderivative = 0.92

$$\int \cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))\,dx = \frac{2\,A\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{3\,d} + \frac{2\,A\,\sqrt{\cos(c+d\,x)}\,\sin(c+d\,x)}{3\,d} - \frac{2\,B\cos(c+d\,x)^{7/2}\,\sin(c+d\,x)\;{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{7}{4};\ \frac{11}{4};\ \cos(c+d\,x)^2\right)}{7\,d\,\sqrt{\sin(c+d\,x)^2}}$$

```
[In] int(cos(c + d*x)^(3/2)*(A + B*cos(c + d*x)),x)
[Out] (2*A*ellipticF(c/2 + (d*x)/2, 2))/(3*d) + (2*A*cos(c + d*x)^(1/2)*sin(c + d
*x))/(3*d) - (2*B*cos(c + d*x)^(7/2)*sin(c + d*x)*hypergeom([1/2, 7/4], 11/
4, cos(c + d*x)^2))/(7*d*(sin(c + d*x)^2)^(1/2))
```

3.563 $\int \sqrt{\cos(c+dx)}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 61

$$\int \sqrt{\cos(c+dx)}(A+B\cos(c+dx))\,dx=\frac{2AE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2B\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}$$

```
[Out] 2*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1
/2*c),2^(1/2))/d+2/3*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elli
pticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/3*B*sin(d*x+c)*cos(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2827, 2719, 2715, 2720}

$$\int \sqrt{\cos(c+dx)}(A+B\cos(c+dx))\,dx=\frac{2AE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2B\sin(c+dx)\sqrt{\cos(c+dx)}}{3d}$$

```
[In] Int[Sqrt[Cos[c + d*x]]*(A + B*Cos[c + d*x]),x]
```

```
[Out] (2*A*EllipticE[(c + d*x)/2, 2])/d + (2*B*EllipticF[(c + d*x)/2, 2])/(3*d) +
 (2*B*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(3*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
```

```
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= A\int \sqrt{\cos(c+dx)}\,dx + B\int \cos^{\frac{3}{2}}(c+dx)\,dx\\ &= \frac{2AE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2B\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{1}{3}B\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\\ &= \frac{2AE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2B\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.87

$$\int \sqrt{\cos(c+dx)}(A+B\cos(c+dx))\,dx = \frac{2\left(3AE\left(\frac{1}{2}(c+dx)\middle|2\right)+B\left(\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\sqrt{\cos(c+dx)}\sin(c+dx)\right)\right)}{3d}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]*(A + B*Cos[c + d*x]),x]
[Out] (2*(3*A*EllipticE[(c + d*x)/2, 2] + B*(EllipticF[(c + d*x)/2, 2] + Sqrt[Cos
[c + d*x]]*Sin[c + d*x])))/(3*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 228 vs. $2(107) = 214$.

Time = 6.60 (sec) , antiderivative size = 229, normalized size of antiderivative = 3.75

method	result
default	$\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-4B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+3A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E\left(\cos\left(\right.\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\right.}$
parts	$\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d} - \frac{2B\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\right.\right.\right.}}{}$

```
[In] int((A+B*cos(d*x+c))*cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-4*B*cos(1/2*d
*x+1/2*c)*sin(1/2*d*x+1/2*c)^4+3*A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*
d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+2*B*cos(1/2*d*x
+1/2*c)*sin(1/2*d*x+1/2*c)^2-B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+
1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))/(-2*sin(1/2*d*x+1/
2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)
^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 125, normalized size of antiderivative = 2.05

$$\int \sqrt{\cos(c+dx)}(A+B\cos(c+dx))\,dx = \frac{2\,B\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-i\,\sqrt{2}B\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))+i\,\sqrt{2}B\text{v}}{}$$

```
[In] integrate((A+B*cos(d*x+c))*cos(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/3*(2*B*sqrt(cos(d*x + c))*sin(d*x + c) - I*sqrt(2)*B*weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c)) + I*sqrt(2)*B*weierstrassPInverse(-4,
 0, cos(d*x + c) - I*sin(d*x + c)) + 3*I*sqrt(2)*A*weierstrassZeta(-4, 0, w
eierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*I*sqrt(2)*A*w
eierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x +
 c))))/d
```

Sympy [F]

$$\int \sqrt{\cos(c+dx)}(A+B\cos(c+dx))\,dx = \int (A+B\cos{(c+dx)})\sqrt{\cos{(c+dx)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*cos(d*x+c)**(1/2),x)
[Out] Integral((A + B*cos(c + d*x))*sqrt(cos(c + d*x)), x)
```

Maxima [F]

$$\int \sqrt{\cos(c+dx)}(A+B\cos(c+dx))\,dx = \int (B\cos{(dx+c)}+A)\sqrt{\cos{(dx+c)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*cos(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)*sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \sqrt{\cos(c+dx)}(A+B\cos(c+dx))\,dx = \int (B\cos{(dx+c)}+A)\sqrt{\cos{(dx+c)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*cos(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)*sqrt(cos(d*x + c)), x)
```

Mupad [B] (verification not implemented)

Time = 0.18 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.87

$$\int \sqrt{\cos(c+dx)}(A+B\cos(c+dx))\,dx = \frac{2\,A\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d}+\frac{2\,B\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{3\,d} + \frac{2\,B\,\sqrt{\cos{(c+d\,x)}}\,\sin{(c+d\,x)}}{3\,d}$$

```
[In] int(cos(c + d*x)^(1/2)*(A + B*cos(c + d*x)),x)
[Out] (2*A*ellipticE(c/2 + (d*x)/2, 2))/d + (2*B*ellipticF(c/2 + (d*x)/2, 2))/(3*
d) + (2*B*cos(c + d*x)^(1/2)*sin(c + d*x))/(3*d)
```

3.564 $\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 35

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx = \frac{2BE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}$$

```
[Out] 2*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1
/2*c),2^(1/2))/d+2*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icF(sin(1/2*d*x+1/2*c),2^(1/2))/d
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2827, 2720, 2719}

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx = \frac{2A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}+\frac{2BE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}$$

```
[In] Int[(A + B*Cos[c + d*x])/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (2*B*EllipticE[(c + d*x)/2, 2])/d + (2*A*EllipticF[(c + d*x)/2, 2])/d
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= A\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx + B\int \sqrt{\cos(c+dx)}\,dx \\
&= \frac{2BE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00

$$
\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx = \frac{2BE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}
$$

```
[In] Integrate[(A + B*Cos[c + d*x])/Sqrt[Cos[c + d*x]],x]
[Out] (2*B*EllipticE[(c + d*x)/2, 2])/d + (2*A*EllipticF[(c + d*x)/2, 2])/d
```

Maple [A] (verified)

Time = 3.37 (sec) , antiderivative size = 152, normalized size of antiderivative = 4.34

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,\left(AF\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-BE\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right.\right.}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$
parts	$\frac{2A\ \text{am}^{-1}\left(\frac{dx}{2}+\frac{c}{2}\middle|\sqrt{2}\right)}{d}+\frac{2B\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$
risch	$-\frac{iB\left(e^{2i(dx+c)}+1\right)\sqrt{2}\,e^{-i(dx+c)}}{d\sqrt{\left(e^{2i(dx+c)}+1\right)e^{-i(dx+c)}}}-\frac{i\left(\frac{iA\sqrt{-i\left(e^{i(dx+c)}+i\right)}\,\sqrt{2}\,\sqrt{i\left(e^{i(dx+c)}-i\right)}\,\sqrt{ie^{i(dx+c)}}\,F\left(\sqrt{-i\left(e^{i(dx+c)}+i\right)},\frac{\sqrt{2}}{2}\right)}{\sqrt{e^{3i(dx+c)}+e^{i(dx+c)}}}+B\left(-\frac{2\left(e^{2i(\cdots}{\sqrt{\left(e^{2i(dx+\cdots}}\right.\right.}{\cdots}$

```
[In] int((A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2
*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*(A*EllipticF(cos(1/2*d*x+1/2
*c),2^(1/2))-B*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-2*sin(1/2*d*x+1/2*c
)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-
1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 107, normalized size of antiderivative = 3.06

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx = \frac{-i\sqrt{2}A\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+i\sqrt{2}A\text{weierstrassPInverse}(-4,0,\cos(\ldots$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] (-I*sqrt(2)*A*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + I
*sqrt(2)*A*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + I*sq
rt(2)*B*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c))) - I*sqrt(2)*B*weierstrassZeta(-4, 0, weierstrassPInverse(-4,
 0, cos(d*x + c) - I*sin(d*x + c))))/d
```

Sympy [F]

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{A+B\cos{(c+dx)}}{\sqrt{\cos{(c+dx)}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)**(1/2),x)
```

```
[Out] Integral((A + B*cos(c + d*x))/sqrt(cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{B\cos{(dx+c)}+A}{\sqrt{\cos{(dx+c)}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)/sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx=\int \frac{B\cos\left(dx+c\right)+A}{\sqrt{\cos\left(dx+c\right)}}\,dx$$

[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x, algorithm="giac")

[Out] integrate((B*cos(d*x + c) + A)/sqrt(cos(d*x + c)), x)

Mupad [B] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 33, normalized size of antiderivative = 0.94

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx=\frac{2\,A\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d}+\frac{2\,B\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d}$$

[In] int((A + B*cos(c + d*x))/cos(c + d*x)^(1/2),x)

[Out] (2*A*ellipticF(c/2 + (d*x)/2, 2))/d + (2*B*ellipticE(c/2 + (d*x)/2, 2))/d

3.565 $\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 57

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx = -\frac{2AE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{2A\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[Out] -2*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+
1/2*c),2^(1/2))/d+2*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellip
ticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2*A*sin(d*x+c)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2827, 2716, 2719, 2720}

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx = -\frac{2AE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2A\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{2B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}$$

```
[In] Int[(A + B*Cos[c + d*x])/Cos[c + d*x]^(3/2),x]
```

```
[Out] (-2*A*EllipticE[(c + d*x)/2, 2])/d + (2*B*EllipticF[(c + d*x)/2, 2])/d + (2
*A*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]])
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= A\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx + B\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{2B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{2A\sin(c+dx)}{d\sqrt{\cos(c+dx)}} - A\int \sqrt{\cos(c+dx)}\,dx \\
&= -\frac{2AE\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{d} + \frac{2B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{2A\sin(c+dx)}{d\sqrt{\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 51, normalized size of antiderivative = 0.89

$$
\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\left(-AE\left(\frac{1}{2}(c+dx)\middle|\,2\right) + B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right) + \frac{A\sin(c+dx)}{\sqrt{\cos(c+dx)}}\right)}{d}
$$

```
[In] Integrate[(A + B*Cos[c + d*x])/Cos[c + d*x]^(3/2),x]
```

```
[Out] (2*(-(A*EllipticE[(c + d*x)/2, 2]) + B*EllipticF[(c + d*x)/2, 2] + (A*Sin[c
 + d*x])/Sqrt[Cos[c + d*x]]))/d
```

Maple [A] (verified)

Time = 4.35 (sec) , antiderivative size = 150, normalized size of antiderivative = 2.63

method	result
default	$\frac{4A\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-2B\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\cdots\right.\right.}}{\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$
parts	$-\frac{2A\left(-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{-2\left(\sin^4\left(\frac{dx}{2}\cdots\right.\right.}\right.}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int((A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2*(2*A*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2-A*(sin(1/2*d*x+1/2*c)^2)^(1/
2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-B
*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(co
s(1/2*d*x+1/2*c),2^(1/2)))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1
/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 156, normalized size of antiderivative = 2.74

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$
$$= \frac{-i\sqrt{2}B\cos(dx+c)\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\,\sin(dx+c))+i\sqrt{2}B\cos(dx+c)\,\text{weiers}\cdots}{}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] (-I*sqrt(2)*B*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(
d*x + c)) + I*sqrt(2)*B*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c
) - I*sin(d*x + c)) - I*sqrt(2)*A*cos(d*x + c)*weierstrassZeta(-4, 0, weier
strassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + I*sqrt(2)*A*cos(d*x
 + c)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*si
n(d*x + c))) + 2*A*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c))
```

Sympy [F]

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{A+B\cos{(c+dx)}}{\cos^{\frac{3}{2}}{(c+dx)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)**(3/2),x)
[Out] Integral((A + B*cos(c + d*x))/cos(c + d*x)**(3/2), x)
```

Maxima [F]

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{B\cos{(dx+c)}+A}{\cos{(dx+c)}^{\frac{3}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)/cos(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{B\cos{(dx+c)}+A}{\cos{(dx+c)}^{\frac{3}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)/cos(d*x + c)^(3/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.48 (sec) , antiderivative size = 60, normalized size of antiderivative = 1.05

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\frac{2\,B\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d}+\frac{2\,A\,\sin{(c+d\,x)}\;{}_2\mathrm{F}_1\left(-\frac{1}{4},\frac{1}{2};\;\frac{3}{4};\;\cos{(c+d\,x)}^2\right)}{d\,\sqrt{\cos{(c+d\,x)}}\,\sqrt{\sin{(c+d\,x)}^2}}$$

```
[In] int((A + B*cos(c + d*x))/cos(c + d*x)^(3/2),x)
[Out] (2*B*ellipticF(c/2 + (d*x)/2, 2))/d + (2*A*sin(c + d*x)*hypergeom([-1/4, 1/
2], 3/4, cos(c + d*x)^2))/(d*cos(c + d*x)^(1/2)*(sin(c + d*x)^2)^(1/2))
```

3.566 $\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 83

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx = -\frac{2BE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2A\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{2B\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[Out] -2*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+
1/2*c),2^(1/2))/d+2/3*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ell
ipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/3*A*sin(d*x+c)/d/cos(d*x+c)^(3/2)+2*
B*sin(d*x+c)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec), antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2827, 2716, 2720, 2719}

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2A\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}-\frac{2BE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2B\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(A + B*Cos[c + d*x])/Cos[c + d*x]^(5/2),x]
```

```
[Out] (-2*B*EllipticE[(c + d*x)/2, 2])/d + (2*A*EllipticF[(c + d*x)/2, 2])/(3*d)
+ (2*A*Sin[c + d*x])/(3*d*Cos[c + d*x]^(3/2)) + (2*B*Sin[c + d*x])/(d*Sqrt[
Cos[c + d*x]])
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= A\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)}\,dx + B\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx\\ &= \frac{2A\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{2B\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{1}{3}A\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx - B\int \sqrt{\cos(c+dx)}\,dx\\ &= -\frac{2BE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2A\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{2B\sin(c+dx)}{d\sqrt{\cos(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.31 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.78

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{-6BE\left(\frac{1}{2}(c+dx)\middle|2\right) + 2A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right) + \frac{2(A+3B\cos(c+dx))\sin(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}}{3d}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/Cos[c + d*x]^(5/2),x]
[Out] (-6*B*EllipticE[(c + d*x)/2, 2] + 2*A*EllipticF[(c + d*x)/2, 2] + (2*(A + 3
*B*Cos[c + d*x])*Sin[c + d*x])/Cos[c + d*x]^(3/2))/(3*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 396 vs. $2(127) = 254$.

Time = 6.82 (sec) , antiderivative size = 397, normalized size of antiderivative = 4.78

method	result
default	$\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(2A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12}{}$
parts	$-\frac{2A\left(-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx}{2}}}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right.}$

```
[In] int((A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)/(4*sin(1/2*d*
x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)/sin(1/2*d*x+1/2*c)^3*(2*A*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*(2*sin(1/2*d*x+1/2*c
)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2-12*B*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c
)^4+6*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*
(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2+2*A*cos(1/2*d*x+1/2*c
)*sin(1/2*d*x+1/2*c)^2-A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)
^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+6*B*cos(1/2*d*x+1/2*c)*si
n(1/2*d*x+1/2*c)^2-3*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2
-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c)^4+s
in(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 175, normalized size of antiderivative = 2.11

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{-i\sqrt{2}A\cos(dx+c)^2\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\,\sin(dx+c))+i\sqrt{2}A\cos(dx+c)^2\,\text{weie}}{}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/3*(-I*sqrt(2)*A*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x + c) +
I*sin(d*x + c)) + I*sqrt(2)*A*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos
(d*x + c) - I*sin(d*x + c)) - 3*I*sqrt(2)*B*cos(d*x + c)^2*weierstrassZeta(
-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 3*I*sqr
t(2)*B*cos(d*x + c)^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos
```

```
(d*x + c) - I*sin(d*x + c))) + 2*(3*B*cos(d*x + c) + A)*sqrt(cos(d*x + c))*
sin(d*x + c))/(d*cos(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A + B\cos(c + dx)}{\cos^{\frac{5}{2}}(c + dx)}\,dx = \text{Timed out}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{A + B\cos(c + dx)}{\cos^{\frac{5}{2}}(c + dx)}\,dx = \int \frac{B\cos\left(dx + c\right) + A}{\cos\left(dx + c\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)/cos(d*x + c)^(5/2), x)
```

Giac [F]

$$\int \frac{A + B\cos(c + dx)}{\cos^{\frac{5}{2}}(c + dx)}\,dx = \int \frac{B\cos\left(dx + c\right) + A}{\cos\left(dx + c\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)/cos(d*x + c)^(5/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.62 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.05

$$\int \frac{A + B\cos(c + dx)}{\cos^{\frac{5}{2}}(c + dx)}\,dx = \frac{2\,A\,\sin\left(c + d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{3}{4}, \frac{1}{2};\ \frac{1}{4};\ \cos\left(c + d\,x\right)^2\right)}{3\,d\cos\left(c + d\,x\right)^{3/2}\,\sqrt{\sin\left(c + d\,x\right)^2}} + \frac{2\,B\,\sin\left(c + d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{1}{4}, \frac{1}{2};\ \frac{3}{4};\ \cos\left(c + d\,x\right)^2\right)}{d\,\sqrt{\cos\left(c + d\,x\right)}\,\sqrt{\sin\left(c + d\,x\right)^2}}$$

```
[In] int((A + B*cos(c + d*x))/cos(c + d*x)^(5/2),x)
[Out] (2*A*sin(c + d*x)*hypergeom([-3/4, 1/2], 1/4, cos(c + d*x)^2))/(3*d*cos(c +
 d*x)^(3/2)*(sin(c + d*x)^2)^(1/2)) + (2*B*sin(c + d*x)*hypergeom([-1/4, 1/
2], 3/4, cos(c + d*x)^2))/(d*cos(c + d*x)^(1/2)*(sin(c + d*x)^2)^(1/2))
```

3.567 $\int \frac{A+B\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 111

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)}\,dx = -\frac{6AE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2A\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{2B\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{6A\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

```
[Out] -6/5*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*
x+1/2*c),2^(1/2))/d+2/3*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*E
llipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/5*A*sin(d*x+c)/d/cos(d*x+c)^(5/2)+
2/3*B*sin(d*x+c)/d/cos(d*x+c)^(3/2)+6/5*A*sin(d*x+c)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2827, 2716, 2719, 2720}

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)}\,dx = -\frac{6AE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2A\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{6A\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}+\frac{2B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2B\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Int[(A + B*Cos[c + d*x])/Cos[c + d*x]^(7/2),x]
```

```
[Out] (-6*A*EllipticE[(c + d*x)/2, 2])/(5*d) + (2*B*EllipticF[(c + d*x)/2, 2])/(3
*d) + (2*A*Sin[c + d*x])/(5*d*Cos[c + d*x]^(5/2)) + (2*B*Sin[c + d*x])/(3*d
*Cos[c + d*x]^(3/2)) + (6*A*Sin[c + d*x])/(5*d*Sqrt[Cos[c + d*x]])
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= A\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)}\,dx + B\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{2A\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{2B\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{1}{5}(3A)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx + \frac{1}{3}B\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{2B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2A\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{2B\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} \\
&\quad + \frac{6A\sin(c+dx)}{5d\sqrt{\cos(c+dx)}} - \frac{1}{5}(3A)\int \sqrt{\cos(c+dx)}\,dx \\
&= -\frac{6AE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{2B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} \\
&\quad + \frac{2A\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{2B\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{6A\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.25 (sec) , antiderivative size = 95, normalized size of antiderivative = 0.86

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)}\,dx$$
$$= \frac{-18A\cos^{\frac{3}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|\,2\right)+10B\cos^{\frac{3}{2}}(c+dx)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+10B\sin(c+dx)+9A}{15d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/Cos[c + d*x]^(7/2),x]
```

```
[Out] (-18*A*Cos[c + d*x]^(3/2)*EllipticE[(c + d*x)/2, 2] + 10*B*Cos[c + d*x]^(3/
2)*EllipticF[(c + d*x)/2, 2] + 10*B*Sin[c + d*x] + 9*A*Sin[2*(c + d*x)] + 6
*A*Tan[c + d*x])/(15*d*Cos[c + d*x]^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 501 vs. 2(147) = 294.

Time = 9.33 (sec) , antiderivative size = 502, normalized size of antiderivative = 4.52

method	result
default	$-\frac{\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(2B\left(-\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}{6\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{1}{2}\right)^2}+\frac{\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}\right.\right.}}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right.\right.}}\right.\right.}{}$
parts	$-\frac{2A\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(24\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}E\left(c\right.\right.}{}$

```
[In] int((A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*B*(-1/6*cos(1
/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2
*d*x+1/2*c)^2-1/2)^2+1/3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c
)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF
(cos(1/2*d*x+1/2*c),2^(1/2)))+2/5*A/(8*sin(1/2*d*x+1/2*c)^6-12*sin(1/2*d*x+
1/2*c)^4+6*sin(1/2*d*x+1/2*c)^2-1)/sin(1/2*d*x+1/2*c)^2*(24*cos(1/2*d*x+1/2
*c)*sin(1/2*d*x+1/2*c)^6-12*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1
/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^4-2
4*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+12*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/
2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1
/2*d*x+1/2*c)^2+8*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-3*(sin(1/2*d*x+1/
2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c)
```

```
,2^(1/2)))*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2))/sin(1/2*d*
x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 188, normalized size of antiderivative = 1.69

$$\int \frac{A + B\cos(c + dx)}{\cos^{\frac{7}{2}}(c + dx)}\,dx$$
$$= \frac{-5i\sqrt{2}B\cos(dx + c)^3 \text{weierstrassPInverse}(-4, 0, \cos(dx + c) + i\sin(dx + c)) + 5i\sqrt{2}B\cos(dx + c)^3 \text{wei}}{}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] 1/15*(-5*I*sqrt(2)*B*cos(d*x + c)^3*weierstrassPInverse(-4, 0, cos(d*x + c)
 + I*sin(d*x + c)) + 5*I*sqrt(2)*B*cos(d*x + c)^3*weierstrassPInverse(-4, 0
, cos(d*x + c) - I*sin(d*x + c)) - 9*I*sqrt(2)*A*cos(d*x + c)^3*weierstrass
Zeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 9*
I*sqrt(2)*A*cos(d*x + c)^3*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0
, cos(d*x + c) - I*sin(d*x + c))) + 2*(9*A*cos(d*x + c)^2 + 5*B*cos(d*x + c
) + 3*A)*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^3)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A + B\cos(c + dx)}{\cos^{\frac{7}{2}}(c + dx)}\,dx = \text{Timed out}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)**(7/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{A + B\cos(c + dx)}{\cos^{\frac{7}{2}}(c + dx)}\,dx = \int \frac{B\cos(dx + c) + A}{\cos(dx + c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x, algorithm="maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)/cos(d*x + c)^(7/2), x)
```

Giac [F]

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{B\cos(dx+c)+A}{\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x, algorithm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)/cos(d*x + c)^(7/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.76 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.78

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2\,A\,\sin(c+d\,x)\;{}_2\mathrm{F}_1\left(-\frac{5}{4},\frac{1}{2};\;-\frac{1}{4};\;\cos(c+d\,x)^2\right)}{5\,d\cos(c+d\,x)^{5/2}\,\sqrt{\sin(c+d\,x)^2}} + \frac{2\,B\,\sin(c+d\,x)\;{}_2\mathrm{F}_1\left(-\frac{3}{4},\frac{1}{2};\;\frac{1}{4};\;\cos(c+d\,x)^2\right)}{3\,d\cos(c+d\,x)^{3/2}\,\sqrt{\sin(c+d\,x)^2}}$$

```
[In] int((A + B*cos(c + d*x))/cos(c + d*x)^(7/2),x)
```

```
[Out] (2*A*sin(c + d*x)*hypergeom([-5/4, 1/2], -1/4, cos(c + d*x)^2))/(5*d*cos(c
+ d*x)^(5/2)*(sin(c + d*x)^2)^(1/2)) + (2*B*sin(c + d*x)*hypergeom([-3/4, 1
/2], 1/4, cos(c + d*x)^2))/(3*d*cos(c + d*x)^(3/2)*(sin(c + d*x)^2)^(1/2))
```

3.568 $\int \cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^2\,dx$

Optimal result

Integrand size = 23, antiderivative size = 160

$$\int \cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{2(9a^2+7b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{15d} + \frac{20ab\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{20ab\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} + \frac{2(9a^2+7b^2)\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{45d} + \frac{4ab\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{2b^2\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d}$$

```
[Out] 2/15*(9*a^2+7*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elliptic
E(sin(1/2*d*x+1/2*c),2^(1/2))/d+20/21*a*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(
1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/45*(9*a^2+7*b^2)*c
os(d*x+c)^(3/2)*sin(d*x+c)/d+4/7*a*b*cos(d*x+c)^(5/2)*sin(d*x+c)/d+2/9*b^2*
cos(d*x+c)^(7/2)*sin(d*x+c)/d+20/21*a*b*sin(d*x+c)*cos(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 160, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2868, 2715, 2720, 3093, 2719}

$$\int \cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{2(9a^2+7b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15d} + \frac{2(9a^2+7b^2)\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{45d} + \frac{20ab\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{4ab\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{7d} + \frac{20ab\sin(c+dx)\sqrt{\cos(c+dx)}}{21d} + \frac{2b^2\sin(c+dx)\cos^{\frac{7}{2}}(c+dx)}{9d}$$

```
[In] Int[Cos[c + d*x]^(5/2)*(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (2*(9*a^2 + 7*b^2)*EllipticE[(c + d*x)/2, 2])/(15*d) + (20*a*b*EllipticF[(c
 + d*x)/2, 2])/(21*d) + (20*a*b*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(21*d) + (
2*(9*a^2 + 7*b^2)*Cos[c + d*x]^(3/2)*Sin[c + d*x])/(45*d) + (4*a*b*Cos[c +
d*x]^(5/2)*Sin[c + d*x])/(7*d) + (2*b^2*Cos[c + d*x]^(7/2)*Sin[c + d*x])/(9
*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2868

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)])^2, x_Symbol] :> Dist[2*c*(d/b), Int[(b*Sin[e + f*x])^(m + 1), x], x] +
 Int[(b*Sin[e + f*x])^m*(c^2 + d^2*Sin[e + f*x]^2), x] /; FreeQ[{b, c, d, e
, f, m}, x]
```

Rule 3093

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_) + (C_.)*sin[(e_.) + (f_.)*(
x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*((b*Sin[e + f*x])^(m + 1)/(b*f
*(m + 2))), x] + Dist[(A*(m + 2) + C*(m + 1))/(m + 2), Int[(b*Sin[e + f*x])
^m, x], x] /; FreeQ[{b, e, f, A, C, m}, x] &&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= (2ab)\int \cos^{\frac{7}{2}}(c+dx)\,dx + \int \cos^{\frac{5}{2}}(c+dx)\left(a^2+b^2\cos^2(c+dx)\right)\,dx \\
&= \frac{4ab\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{2b^2\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d} \\
&\quad + \frac{1}{7}(10ab)\int \cos^{\frac{3}{2}}(c+dx)\,dx + \frac{1}{9}\left(9a^2+7b^2\right)\int \cos^{\frac{5}{2}}(c+dx)\,dx \\
&= \frac{20ab\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} + \frac{2(9a^2+7b^2)\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{45d} \\
&\quad + \frac{4ab\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{2b^2\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d} \\
&\quad + \frac{1}{21}(10ab)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx + \frac{1}{15}\left(9a^2+7b^2\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= \frac{2(9a^2+7b^2)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15d} + \frac{20ab\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} \\
&\quad + \frac{20ab\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} + \frac{2(9a^2+7b^2)\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{45d} \\
&\quad + \frac{4ab\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{2b^2\cos^{\frac{7}{2}}(c+dx)\sin(c+dx)}{9d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.80 (sec) , antiderivative size = 113, normalized size of antiderivative = 0.71

$$\int \cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^2\,dx$$
$$=\frac{84(9a^2+7b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)+600ab\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\sqrt{\cos(c+dx)}(7(36a^2+43b^2)\cos(c+d}{630d}$$

[In] Integrate[Cos[c + d*x]^(5/2)*(a + b*Cos[c + d*x])^2,x]

[Out] (84*(9*a^2 + 7*b^2)*EllipticE[(c + d*x)/2, 2] + 600*a*b*EllipticF[(c + d*x)/2, 2] + Sqrt[Cos[c + d*x]]*(7*(36*a^2 + 43*b^2)*Cos[c + d*x] + 5*b*(156*a + 36*a*Cos[2*(c + d*x)] + 7*b*Cos[3*(c + d*x)]))*Sin[c + d*x])/(630*d)

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 397 vs. $2(192) = 384$.

Time = 17.91 (sec) , antiderivative size = 398, normalized size of antiderivative = 2.49

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-1120\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^2+(1440ab+2240b^2)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\right.\right.}{}$
parts	$-\frac{2a^2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right.\right.}{5\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{d}{2}\right.\right.}}$

[In] int(cos(d*x+c)^(5/2)*(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)

[Out] -2/315*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-1120*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^10*b^2+(1440*a*b+2240*b^2)*sin(1/2*d*x+1/2*c)^8*cos(1/2*d*x+1/2*c)+(-504*a^2-2160*a*b-2072*b^2)*sin(1/2*d*x+1/2*c)^6*cos(1/2*d*x+1/2*c)+(504*a^2+1680*a*b+952*b^2)*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+(-126*a^2-480*a*b-168*b^2)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+150*a*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-189*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*a^2-147*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*b^2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 195, normalized size of antiderivative = 1.22

$$\int \cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^2\,dx$$
$$= \frac{-150i\sqrt{2}ab\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+150i\sqrt{2}ab\text{weierstrassPInverse}(-4,0}{}$$

[In] integrate(cos(d*x+c)^(5/2)*(a+b*cos(d*x+c))^2,x, algorithm="fricas")

[Out] 1/315*(-150*I*sqrt(2)*a*b*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d *x + c)) + 150*I*sqrt(2)*a*b*weierstrassPInverse(-4, 0, cos(d*x + c) - I*si n(d*x + c)) + 2*(35*b^2*cos(d*x + c)^3 + 90*a*b*cos(d*x + c)^2 + 150*a*b + 7*(9*a^2 + 7*b^2)*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c) - 21*sqrt(2)*(-9*I*a^2 - 7*I*b^2)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, co s(d*x + c) + I*sin(d*x + c))) - 21*sqrt(2)*(9*I*a^2 + 7*I*b^2)*weierstrassZ eta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/d

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^2\,dx = \text{Timed out}$$

[In] integrate(cos(d*x+c)**(5/2)*(a+b*cos(d*x+c))**2,x)

[Out] Timed out

Maxima [F]

$$\int \cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^2\,dx = \int (b\cos(dx+c)+a)^2\cos(dx+c)^{\frac{5}{2}}\,dx$$

[In] integrate(cos(d*x+c)^(5/2)*(a+b*cos(d*x+c))^2,x, algorithm="maxima")

[Out] integrate((b*cos(d*x + c) + a)^2*cos(d*x + c)^(5/2), x)

Giac [F]

$$\int \cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^2\,dx = \int (b\cos(dx+c)+a)^2\cos(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)*(a+b*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^2*cos(d*x + c)^(5/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.23 (sec) , antiderivative size = 135, normalized size of antiderivative = 0.84

$$\begin{aligned}&\int \cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^2\,dx\\&= -\frac{2a^2\cos(c+dx)^{7/2}\sin(c+dx)\,{}_2F_1\left(\frac{1}{2},\frac{7}{4};\ \frac{11}{4};\ \cos(c+dx)^2\right)}{7d\sqrt{\sin(c+dx)^2}}\\&\quad-\frac{2b^2\cos(c+dx)^{11/2}\sin(c+dx)\,{}_2F_1\left(\frac{1}{2},\frac{11}{4};\ \frac{15}{4};\ \cos(c+dx)^2\right)}{11d\sqrt{\sin(c+dx)^2}}\\&\quad-\frac{4ab\cos(c+dx)^{9/2}\sin(c+dx)\,{}_2F_1\left(\frac{1}{2},\frac{9}{4};\ \frac{13}{4};\ \cos(c+dx)^2\right)}{9d\sqrt{\sin(c+dx)^2}}\end{aligned}$$

```
[In] int(cos(c + d*x)^(5/2)*(a + b*cos(c + d*x))^2,x)
[Out] - (2*a^2*cos(c + d*x)^(7/2)*sin(c + d*x)*hypergeom([1/2, 7/4], 11/4, cos(c
+ d*x)^2))/(7*d*(sin(c + d*x)^2)^(1/2)) - (2*b^2*cos(c + d*x)^(11/2)*sin(c
+ d*x)*hypergeom([1/2, 11/4], 15/4, cos(c + d*x)^2))/(11*d*(sin(c + d*x)^2)
^(1/2)) - (4*a*b*cos(c + d*x)^(9/2)*sin(c + d*x)*hypergeom([1/2, 9/4], 13/4
, cos(c + d*x)^2))/(9*d*(sin(c + d*x)^2)^(1/2))
```

3.569 $\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2\,dx$

Optimal result

Integrand size = 23, antiderivative size = 135

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2\,dx=\frac{12abE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2(7a^2+5b^2)\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d}+\frac{2(7a^2+5b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{21d}+\frac{4ab\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{2b^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}$$

```
[Out] 12/5*a*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*
d*x+1/2*c),2^(1/2))/d+2/21*(7*a^2+5*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1
/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+4/5*a*b*cos(d*x+c)^(3
/2)*sin(d*x+c)/d+2/7*b^2*cos(d*x+c)^(5/2)*sin(d*x+c)/d+2/21*(7*a^2+5*b^2)*s
in(d*x+c)*cos(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used

$= \{2868, 2715, 2719, 3093, 2720\}$

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{2(7a^2+5b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{2(7a^2+5b^2)\sin(c+dx)\sqrt{\cos(c+dx)}}{21d} + \frac{12abE\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{5d} + \frac{4ab\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{5d} + \frac{2b^2\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{7d}$$

```
[In] Int[Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (12*a*b*EllipticE[(c + d*x)/2, 2])/(5*d) + (2*(7*a^2 + 5*b^2)*EllipticF[(c
+ d*x)/2, 2])/(21*d) + (2*(7*a^2 + 5*b^2)*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/
(21*d) + (4*a*b*Cos[c + d*x]^(3/2)*Sin[c + d*x])/(5*d) + (2*b^2*Cos[c + d*x
]^(5/2)*Sin[c + d*x])/(7*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2868

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)])^2, x_Symbol] :> Dist[2*c*(d/b), Int[(b*Sin[e + f*x])^(m + 1), x], x] +
 Int[(b*Sin[e + f*x])^m*(c^2 + d^2*Sin[e + f*x]^2), x] /; FreeQ[{b, c, d, e
, f, m}, x]
```

Rule 3093

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_) + (C_.)*sin[(e_.) + (f_.)*(
x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*((b*Sin[e + f*x])^(m + 1)/(b*f
*(m + 2))), x] + Dist[(A*(m + 2) + C*(m + 1))/(m + 2), Int[(b*Sin[e + f*x])
^m, x], x] /; FreeQ[{b, e, f, A, C, m}, x] &&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= (2ab)\int \cos^{\frac{5}{2}}(c+dx)\,dx+\int \cos^{\frac{3}{2}}(c+dx)\left(a^2+b^2\cos^2(c+dx)\right)\,dx\\
&= \frac{4ab\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{2b^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}\\
&\quad+\frac{1}{5}(6ab)\int \sqrt{\cos(c+dx)}\,dx+\frac{1}{7}\left(7a^2+5b^2\right)\int \cos^{\frac{3}{2}}(c+dx)\,dx\\
&= \frac{12abE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2(7a^2+5b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{21d}\\
&\quad+\frac{4ab\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{2b^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}\\
&\quad+\frac{1}{21}\left(7a^2+5b^2\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\\
&= \frac{12abE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2(7a^2+5b^2)\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d}\\
&\quad+\frac{2(7a^2+5b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{21d}\\
&\quad+\frac{4ab\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{2b^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.64 (sec) , antiderivative size = 98, normalized size of antiderivative = 0.73

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2\,dx$$
$$=\frac{252abE\left(\frac{1}{2}(c+dx)\middle|2\right)+10(7a^2+5b^2)\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\sqrt{\cos(c+dx)}(70a^2+65b^2+84ab\cos(c-}{105d}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (252*a*b*EllipticE[(c + d*x)/2, 2] + 10*(7*a^2 + 5*b^2)*EllipticF[(c + d*x)
/2, 2] + Sqrt[Cos[c + d*x]]*(70*a^2 + 65*b^2 + 84*a*b*Cos[c + d*x] + 15*b^2
*Cos[2*(c + d*x)])*Sin[c + d*x])/(105*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 361 vs. $2(171) = 342$.

Time = 10.99 (sec) , antiderivative size = 362, normalized size of antiderivative = 2.68

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(240\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^2+\left(-336ab-360b^2\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\cdots}{\cdots}$
parts	$-\frac{2a^2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{\cdots}}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int(cos(d*x+c)^(3/2)*(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -2/105*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(240*cos(1/2
*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8*b^2+(-336*a*b-360*b^2)*sin(1/2*d*x+1/2*c)^
6*cos(1/2*d*x+1/2*c)+(140*a^2+336*a*b+280*b^2)*sin(1/2*d*x+1/2*c)^4*cos(1/2
*d*x+1/2*c)+(-70*a^2-84*a*b-80*b^2)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)
+35*a^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Ellip
ticF(cos(1/2*d*x+1/2*c),2^(1/2))+25*b^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin
(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-126*(sin(1
/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d
*x+1/2*c),2^(1/2))*a*b)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2
)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 180, normalized size of antiderivative = 1.33

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{126i\sqrt{2}ab\text{weierstrassZeta}(-4,0,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c)))-126i\sqrt{2}ab\text{w}\cdots}{\cdots}$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+b*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/105*(126*I*sqrt(2)*a*b*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0,
cos(d*x + c) + I*sin(d*x + c))) - 126*I*sqrt(2)*a*b*weierstrassZeta(-4, 0,
weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(15*b^2*cos(
d*x + c)^2 + 42*a*b*cos(d*x + c) + 35*a^2 + 25*b^2)*sqrt(cos(d*x + c))*sin(
d*x + c) - 5*sqrt(2)*(7*I*a^2 + 5*I*b^2)*weierstrassPInverse(-4, 0, cos(d*x
 + c) + I*sin(d*x + c)) - 5*sqrt(2)*(-7*I*a^2 - 5*I*b^2)*weierstrassPInvers
e(-4, 0, cos(d*x + c) - I*sin(d*x + c)))/d
```

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(3/2)*(a+b*cos(d*x+c))**2,x)
[Out] Timed out
```

Maxima [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2\,dx = \int (b\cos(dx+c)+a)^2\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+b*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^2*cos(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2\,dx = \int (b\cos(dx+c)+a)^2\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+b*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^2*cos(d*x + c)^(3/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.16 (sec) , antiderivative size = 128, normalized size of antiderivative = 0.95

$$\begin{aligned}&\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2\,dx\\&=\frac{2\left(a^2\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)+a^2\,\sqrt{\cos\left(c+d\,x\right)}\,\sin\left(c+d\,x\right)\right)}{3\,d}\\&\quad-\frac{2\,b^2\cos\left(c+d\,x\right)^{9/2}\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{9}{4};\ \frac{13}{4};\ \cos\left(c+d\,x\right)^2\right)}{9\,d\,\sqrt{\sin\left(c+d\,x\right)^2}}\\&\quad-\frac{4\,a\,b\cos\left(c+d\,x\right)^{7/2}\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{7}{4};\ \frac{11}{4};\ \cos\left(c+d\,x\right)^2\right)}{7\,d\,\sqrt{\sin\left(c+d\,x\right)^2}}\end{aligned}$$

```
[In] int(cos(c + d*x)^(3/2)*(a + b*cos(c + d*x))^2,x)
```

```
[Out] (2*(a^2*ellipticF(c/2 + (d*x)/2, 2) + a^2*cos(c + d*x)^(1/2)*sin(c + d*x)))
/(3*d) - (2*b^2*cos(c + d*x)^(9/2)*sin(c + d*x)*hypergeom([1/2, 9/4], 13/4,
 cos(c + d*x)^2))/(9*d*(sin(c + d*x)^2)^(1/2)) - (4*a*b*cos(c + d*x)^(7/2)*
sin(c + d*x)*hypergeom([1/2, 7/4], 11/4, cos(c + d*x)^2))/(7*d*(sin(c + d*x
)^2)^(1/2))
```

3.570 $\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2\,dx$

Optimal result

Integrand size = 23, antiderivative size = 101

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2\,dx = \frac{2(5a^2+3b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{5d} + \frac{4ab\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{4ab\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2b^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}$$

```
[Out] 2/5*(5*a^2+3*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE
(sin(1/2*d*x+1/2*c),2^(1/2))/d+4/3*a*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2
*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/5*b^2*cos(d*x+c)^(3/2
)*sin(d*x+c)/d+4/3*a*b*sin(d*x+c)*cos(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$, Rules used = {2868, 2715, 2720, 3093, 2719}

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2\,dx = \frac{2(5a^2+3b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{5d} + \frac{4ab\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{4ab\sin(c+dx)\sqrt{\cos(c+dx)}}{3d} + \frac{2b^2\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{5d}$$

```
[In] Int[Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (2*(5*a^2 + 3*b^2)*EllipticE[(c + d*x)/2, 2])/(5*d) + (4*a*b*EllipticF[(c +
 d*x)/2, 2])/(3*d) + (4*a*b*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(3*d) + (2*b^2
*Cos[c + d*x]^(3/2)*Sin[c + d*x])/(5*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2868

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)])^2, x_Symbol] :> Dist[2*c*(d/b), Int[(b*Sin[e + f*x])^(m + 1), x], x] +
 Int[(b*Sin[e + f*x])^m*(c^2 + d^2*Sin[e + f*x]^2), x] /; FreeQ[{b, c, d, e
, f, m}, x]
```

Rule 3093

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_) + (C_.)*sin[(e_.) + (f_.)*(
x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*((b*Sin[e + f*x])^(m + 1)/(b*f
*(m + 2))), x] + Dist[(A*(m + 2) + C*(m + 1))/(m + 2), Int[(b*Sin[e + f*x])
^m, x], x] /; FreeQ[{b, e, f, A, C, m}, x] &&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= (2ab)\int \cos^{\frac{3}{2}}(c+dx)\,dx + \int \sqrt{\cos(c+dx)}\left(a^2+b^2\cos^2(c+dx)\right)\,dx \\
&= \frac{4ab\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2b^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} \\
&\quad + \frac{1}{3}(2ab)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx + \frac{1}{5}\left(5a^2+3b^2\right)\int \sqrt{\cos(c+dx)}\,dx
\end{aligned}$$

$$= \frac{2(5a^2+3b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{5d} + \frac{4ab\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{4ab\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2b^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}$$

Mathematica [A] (verified)

Time = 0.40 (sec) , antiderivative size = 79, normalized size of antiderivative = 0.78

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2\,dx$$
$$= \frac{6(5a^2+3b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)+20ab\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+2b\sqrt{\cos(c+dx)}(10a+3b\cos(c+dx))\sin(\cdots}{15d}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (6*(5*a^2 + 3*b^2)*EllipticE[(c + d*x)/2, 2] + 20*a*b*EllipticF[(c + d*x)/2
, 2] + 2*b*Sqrt[Cos[c + d*x]]*(10*a + 3*b*Cos[c + d*x])*Sin[c + d*x])/(15*d
)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 356 vs. 2(141) = 282.

Time = 9.50 (sec) , antiderivative size = 357, normalized size of antiderivative = 3.53

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-24\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^2+40\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)ab+24\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\cdots\right.}{\cdots}$
parts	$\frac{2a^2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}-\frac{2b^2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\cdots\right.\right.\right.}}{\cdots}$

```
[In] int(cos(d*x+c)^(1/2)*(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -2/15*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-24*cos(1/2*
d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6*b^2+40*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c
)^4*a*b+24*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4*b^2-20*cos(1/2*d*x+1/2*c
)*sin(1/2*d*x+1/2*c)^2*a*b-6*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*b^2+10
*a*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Elliptic
F(cos(1/2*d*x+1/2*c),2^(1/2))-15*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*
x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*a^2-9*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/
```

```
2*c),2^(1/2))*b^2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin
(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.60

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2\,dx$$
$$= \frac{-10i\sqrt{2}ab\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\sin{(dx+c)})+10i\sqrt{2}ab\text{weierstrassPInverse}(-4,0}{}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+b*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/15*(-10*I*sqrt(2)*a*b*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x
 + c)) + 10*I*sqrt(2)*a*b*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d
*x + c)) + 2*(3*b^2*cos(d*x + c) + 10*a*b)*sqrt(cos(d*x + c))*sin(d*x + c)
- 3*sqrt(2)*(-5*I*a^2 - 3*I*b^2)*weierstrassZeta(-4, 0, weierstrassPInverse
(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*sqrt(2)*(5*I*a^2 + 3*I*b^2)*wei
erstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c
))))/d
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(1/2)*(a+b*cos(d*x+c))**2,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2\,dx = \int (b\cos{(dx+c)}+a)^2\sqrt{\cos{(dx+c)}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+b*cos(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] integrate((b*cos(d*x + c) + a)^2*sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2\,dx = \int (b\cos(dx+c)+a)^2\sqrt{\cos(dx+c)}\,dx$$

[In] integrate(cos(d*x+c)^(1/2)*(a+b*cos(d*x+c))^2,x, algorithm="giac")

[Out] integrate((b*cos(d*x + c) + a)^2*sqrt(cos(d*x + c)), x)

Mupad [B] (verification not implemented)

Time = 15.36 (sec) , antiderivative size = 102, normalized size of antiderivative = 1.01

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2\,dx = \frac{2a^2\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d}+\frac{4\,a\,b\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{3\,d}+\frac{4\,a\,b\,\sqrt{\cos\left(c+d\,x\right)}\,\sin\left(c+d\,x\right)}{3\,d}-\frac{2\,b^2\cos\left(c+d\,x\right)^{7/2}\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{7}{4};\ \frac{11}{4};\ \cos\left(c+d\,x\right)^2\right)}{7\,d\,\sqrt{\sin\left(c+d\,x\right)^2}}$$

[In] int(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))^2,x)

[Out] (2*a^2*ellipticE(c/2 + (d*x)/2, 2))/d + (4*a*b*ellipticF(c/2 + (d*x)/2, 2))/(3*d) + (4*a*b*cos(c + d*x)^(1/2)*sin(c + d*x))/(3*d) - (2*b^2*cos(c + d*x)^(7/2)*sin(c + d*x)*hypergeom([1/2, 7/4], 11/4, cos(c + d*x)^2))/(7*d*(sin(c + d*x)^2)^(1/2))

3.571 $\int \frac{(a+b\cos(c+dx))^2}{\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 72

$$\int \frac{(a+b\cos(c+dx))^2}{\sqrt{\cos(c+dx)}}\,dx = \frac{4abE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2(3a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}$$

```
[Out] 4*a*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x
+1/2*c),2^(1/2))/d+2/3*(3*a^2+b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x
+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/3*b^2*sin(d*x+c)*cos(d*x+
c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2868, 2719, 3093, 2720}

$$\int \frac{(a+b\cos(c+dx))^2}{\sqrt{\cos(c+dx)}}\,dx = \frac{2(3a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{4abE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2b^2\sin(c+dx)\sqrt{\cos(c+dx)}}{3d}$$

```
[In] Int[(a + b*Cos[c + d*x])^2/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (4*a*b*EllipticE[(c + d*x)/2, 2])/d + (2*(3*a^2 + b^2)*EllipticF[(c + d*x)/
2, 2])/(3*d) + (2*b^2*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(3*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2868

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)])^2, x_Symbol] :> Dist[2*c*(d/b), Int[(b*Sin[e + f*x])^(m + 1), x], x] +
 Int[(b*Sin[e + f*x])^m*(c^2 + d^2*Sin[e + f*x]^2), x] /; FreeQ[{b, c, d, e
, f, m}, x]
```

Rule 3093

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_) + (C_.)*sin[(e_.) + (f_.)*(
x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*((b*Sin[e + f*x])^(m + 1)/(b*f
*(m + 2))), x] + Dist[(A*(m + 2) + C*(m + 1))/(m + 2), Int[(b*Sin[e + f*x])
^m, x], x] /; FreeQ[{b, e, f, A, C, m}, x] &&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= (2ab)\int \sqrt{\cos(c+dx)}\,dx + \int \frac{a^2+b^2\cos^2(c+dx)}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{4abE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{1}{3}\left(3a^2+b^2\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{4abE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2(3a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.58 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.89

$$\int \frac{(a+b\cos(c+dx))^2}{\sqrt{\cos(c+dx)}}\,dx = \frac{2\left(6abE\left(\frac{1}{2}(c+dx)\middle|2\right) + (3a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right) + b^2\sqrt{\cos(c+dx)}\sin(c+dx)\right)}{3d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2/Sqrt[Cos[c + d*x]],x]
[Out] (2*(6*a*b*EllipticE[(c + d*x)/2, 2] + (3*a^2 + b^2)*EllipticF[(c + d*x)/2,
2] + b^2*Sqrt[Cos[c + d*x]]*Sin[c + d*x]))/(3*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 282 vs. $2(118) = 236$.

Time = 7.04 (sec) , antiderivative size = 283, normalized size of antiderivative = 3.93

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^2-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^2+3a^2\sqrt{\frac{1}{2}-\frac{\cos(dx-}{2}}}{3\sqrt{-2\left(\sin^4\left(\right.\right.}}$
parts	$\frac{2a^2\operatorname{am}^{-1}\left(\frac{dx}{2}+\frac{c}{2}\middle\|\sqrt{2}\right)}{d}-\frac{2b^2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}\right.\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\right.}}$

```
[In] int((a+cos(d*x+c)*b)^2/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(4*cos(1/2*d*x
+1/2*c)*sin(1/2*d*x+1/2*c)^4*b^2-2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*
b^2+3*a^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Ell
ipticF(cos(1/2*d*x+1/2*c),2^(1/2))+b^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(
1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-6*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+
1/2*c),2^(1/2))*a*b)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/s
in(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 147, normalized size of antiderivative = 2.04

$$\int \frac{(a+b\cos(c+dx))^2}{\sqrt{\cos(c+dx)}}\,dx = \frac{2\,b^2\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)+6i\,\sqrt{2}ab\text{weierstrassZeta}(-4,0,\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+}{}$$

```
[In] integrate((a+b*cos(d*x+c))^2/cos(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/3*(2*b^2*sqrt(cos(d*x + c))*sin(d*x + c) + 6*I*sqrt(2)*a*b*weierstrassZet
a(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 6*I*s
qrt(2)*a*b*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) -
 I*sin(d*x + c))) + sqrt(2)*(-3*I*a^2 - I*b^2)*weierstrassPInverse(-4, 0, c
os(d*x + c) + I*sin(d*x + c)) + sqrt(2)*(3*I*a^2 + I*b^2)*weierstrassPInver
se(-4, 0, cos(d*x + c) - I*sin(d*x + c)))/d
```

Sympy [F]

$$\int \frac{(a+b\cos(c+dx))^2}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(a+b\cos{(c+dx)})^2}{\sqrt{\cos{(c+dx)}}}\,dx$$

[In] integrate((a+b*cos(d*x+c))**2/cos(d*x+c)**(1/2),x)

[Out] Integral((a + b*cos(c + d*x))**2/sqrt(cos(c + d*x)), x)

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^2}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(b\cos{(dx+c)}+a)^2}{\sqrt{\cos{(dx+c)}}}\,dx$$

[In] integrate((a+b*cos(d*x+c))^2/cos(d*x+c)^(1/2),x, algorithm="maxima")

[Out] integrate((b*cos(d*x + c) + a)^2/sqrt(cos(d*x + c)), x)

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^2}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(b\cos{(dx+c)}+a)^2}{\sqrt{\cos{(dx+c)}}}\,dx$$

[In] integrate((a+b*cos(d*x+c))^2/cos(d*x+c)^(1/2),x, algorithm="giac")

[Out] integrate((b*cos(d*x + c) + a)^2/sqrt(cos(d*x + c)), x)

Mupad [B] (verification not implemented)

Time = 14.72 (sec) , antiderivative size = 76, normalized size of antiderivative = 1.06

$$\int \frac{(a+b\cos(c+dx))^2}{\sqrt{\cos(c+dx)}}\,dx = \frac{2\,a^2\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d}+\frac{2\,b^2\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{3\,d} + \frac{2\,b^2\,\sqrt{\cos{(c+d\,x)}}\,\sin{(c+d\,x)}}{3\,d}+\frac{4\,a\,b\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d}$$

[In] int((a + b*cos(c + d*x))^2/cos(c + d*x)^(1/2),x)

[Out] (2*a^2*ellipticF(c/2 + (d*x)/2, 2))/d + (2*b^2*ellipticF(c/2 + (d*x)/2, 2))/(3*d) + (2*b^2*cos(c + d*x)^(1/2)*sin(c + d*x))/(3*d) + (4*a*b*ellipticE(c/2 + (d*x)/2, 2))/d

3.572 $\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 68

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{3}{2}}(c+dx)}\,dx = -\frac{2(a^2-b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{4ab\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{2a^2\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[Out] -2*(a^2-b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(
1/2*d*x+1/2*c),2^(1/2))/d+4*a*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/
2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2*a^2*sin(d*x+c)/d/cos(d*x+c)^
(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {2868, 2720, 3091, 2719}

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{3}{2}}(c+dx)}\,dx = -\frac{2(a^2-b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2a^2\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{4ab\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}$$

```
[In] Int[(a + b*Cos[c + d*x])^2/Cos[c + d*x]^(3/2),x]
```

```
[Out] (-2*(a^2 - b^2)*EllipticE[(c + d*x)/2, 2])/d + (4*a*b*EllipticF[(c + d*x)/2
, 2])/d + (2*a^2*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2868

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)])^2, x_Symbol] :> Dist[2*c*(d/b), Int[(b*Sin[e + f*x])^(m + 1), x], x] +
 Int[(b*Sin[e + f*x])^m*(c^2 + d^2*Sin[e + f*x]^2), x] /; FreeQ[{b, c, d, e
, f, m}, x]
```

Rule 3091

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_) + (C_.)*sin[(e_.) + (f_.)*(x
_)]^2), x_Symbol] :> Simp[A*Cos[e + f*x]*((b*Sin[e + f*x])^(m + 1)/(b*f*(m
+ 1))), x] + Dist[(A*(m + 2) + C*(m + 1))/(b^2*(m + 1)), Int[(b*Sin[e + f*x
])^(m + 2), x], x] /; FreeQ[{b, e, f, A, C}, x] && LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= (2ab)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx + \int \frac{a^2+b^2\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{4ab\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{2a^2\sin(c+dx)}{d\sqrt{\cos(c+dx)}} - \left(a^2-b^2\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= -\frac{2(a^2-b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{4ab\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{2a^2\sin(c+dx)}{d\sqrt{\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.44 (sec) , antiderivative size = 62, normalized size of antiderivative = 0.91

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\left((-a^2+b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)+a\left(2b\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\frac{a\sin(c+dx)}{\sqrt{\cos(c+dx)}}\right)\right)}{d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2/Cos[c + d*x]^(3/2),x]
[Out] (2*((-a^2 + b^2)*EllipticE[(c + d*x)/2, 2] + a*(2*b*EllipticF[(c + d*x)/2,
2] + (a*Sin[c + d*x])/Sqrt[Cos[c + d*x]])))/d
```

Maple [A] (verified)

Time = 6.91 (sec) , antiderivative size = 202, normalized size of antiderivative = 2.97

method	result
default	$\frac{4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a^2-4ab\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\right.\right.}}{\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$
parts	$-\frac{2a^2\left(-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{-2\left(\sin^4\left(\frac{dx}{2}\right.\right.}}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int((a+cos(d*x+c)*b)^2/cos(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2*(2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*a^2-2*a*b*(sin(1/2*d*x+1/2*c)^
2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1
/2))-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Elliptic
E(cos(1/2*d*x+1/2*c),2^(1/2))*a^2+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d
*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*b^2)/sin(1/2*d*x
+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 178, normalized size of antiderivative = 2.62

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{-2i\sqrt{2}ab\cos(dx+c)\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\,\sin(dx+c))+2i\sqrt{2}ab\cos(dx+c)\,\text{wei}}{}$$

```
[In] integrate((a+b*cos(d*x+c))^2/cos(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] (-2*I*sqrt(2)*a*b*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c)) + 2*I*sqrt(2)*a*b*cos(d*x + c)*weierstrassPInverse(-4, 0, cos
(d*x + c) - I*sin(d*x + c)) + 2*a^2*sqrt(cos(d*x + c))*sin(d*x + c) + sqrt(
2)*(-I*a^2 + I*b^2)*cos(d*x + c)*weierstrassZeta(-4, 0, weierstrassPInverse
(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + sqrt(2)*(I*a^2 - I*b^2)*cos(d*x +
 c)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(
d*x + c))))/(d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**2/cos(d*x+c)**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^2}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2/cos(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^2/cos(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^2}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2/cos(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^2/cos(d*x + c)^(3/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.29 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.19

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2b^2\,\mathrm{E}\left(\frac{c}{2}+\frac{dx}{2}\middle|2\right)}{d} + \frac{4ab\,\mathrm{F}\left(\frac{c}{2}+\frac{dx}{2}\middle|2\right)}{d} + \frac{2a^2\sin(c+dx)\,{}_2\mathrm{F}_1\left(-\frac{1}{4},\frac{1}{2};\ \frac{3}{4};\ \cos(c+dx)^2\right)}{d\sqrt{\cos(c+dx)}\sqrt{\sin(c+dx)^2}}$$

```
[In] int((a + b*cos(c + d*x))^2/cos(c + d*x)^(3/2),x)
[Out] (2*b^2*ellipticE(c/2 + (d*x)/2, 2))/d + (4*a*b*ellipticF(c/2 + (d*x)/2, 2))
/d + (2*a^2*sin(c + d*x)*hypergeom([-1/4, 1/2], 3/4, cos(c + d*x)^2))/(d*co
s(c + d*x)^(1/2)*(sin(c + d*x)^2)^(1/2))
```

3.573 $\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 95

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{5}{2}}(c+dx)}\,dx = -\frac{4abE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2(a^2+3b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2a^2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{4ab\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[Out] -4*a*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*
x+1/2*c),2^(1/2))/d+2/3*(a^2+3*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*
x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/3*a^2*sin(d*x+c)/d/cos(d
*x+c)^(3/2)+4*a*b*sin(d*x+c)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$, Rules used = {2868, 2716, 2719, 3091, 2720}

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2(a^2+3b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}+\frac{2a^2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}-\frac{4abE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{4ab\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + b*Cos[c + d*x])^2/Cos[c + d*x]^(5/2),x]
```

```
[Out] (-4*a*b*EllipticE[(c + d*x)/2, 2])/d + (2*(a^2 + 3*b^2)*EllipticF[(c + d*x)
/2, 2])/(3*d) + (2*a^2*Sin[c + d*x])/(3*d*Cos[c + d*x]^(3/2)) + (4*a*b*Sin[
c + d*x])/(d*Sqrt[Cos[c + d*x]])
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2868

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)])^2, x_Symbol] :> Dist[2*c*(d/b), Int[(b*Sin[e + f*x])^(m + 1), x], x] +
 Int[(b*Sin[e + f*x])^m*(c^2 + d^2*Sin[e + f*x]^2), x] /; FreeQ[{b, c, d, e
, f, m}, x]
```

Rule 3091

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_) + (C_.)*sin[(e_.) + (f_.)*(x
_)]^2), x_Symbol] :> Simp[A*Cos[e + f*x]*((b*Sin[e + f*x])^(m + 1)/(b*f*(m
+ 1))), x] + Dist[(A*(m + 2) + C*(m + 1))/(b^2*(m + 1)), Int[(b*Sin[e + f*x
])^(m + 2), x], x] /; FreeQ[{b, e, f, A, C}, x] && LtQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= (2ab)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx + \int \frac{a^2+b^2\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{2a^2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{4ab\sin(c+dx)}{d\sqrt{\cos(c+dx)}} - (2ab)\int \sqrt{\cos(c+dx)}\,dx \\
&\quad - \frac{1}{3}\left(-a^2-3b^2\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= -\frac{4abE\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{d} + \frac{2(a^2+3b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} \\
&\quad + \frac{2a^2\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{4ab\sin(c+dx)}{d\sqrt{\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.66 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.77

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{5}{2}}(c+dx)}\,dx$$
$$=\frac{2\left(-6abE\left(\frac{1}{2}(c+dx)\middle|2\right)+(a^2+3b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\frac{a(a+6b\cos(c+dx))\sin(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\right)}{3d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2/Cos[c + d*x]^(5/2),x]
```

```
[Out] (2*(-6*a*b*EllipticE[(c + d*x)/2, 2] + (a^2 + 3*b^2)*EllipticF[(c + d*x)/2,
 2] + (a*(a + 6*b*Cos[c + d*x])*Sin[c + d*x])/Cos[c + d*x]^(3/2)))/(3*d)
```

Maple [C] (verified)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 8.41 (sec) , antiderivative size = 420, normalized size of antiderivative = 4.42

method	result
parts	$-\frac{2a^2\left(-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx}{2}}\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right.}$
default	$-\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\left(24\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)ab-2F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\right.}{}$

```
[In] int((a+cos(d*x+c)*b)^2/cos(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*a^2*(-2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*
EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2-2*sin(1/2*d*x+1/
2*c)^2*cos(1/2*d*x+1/2*c)+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c
)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))*((2*cos(1/2*d*x+1/2*c)^
2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c
)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^2-1)^(3/2)/sin(1/2*d*x+1/2*c)/d+2*b^2/d*In
verseJacobiAM(1/2*d*x+1/2*c,2^(1/2))-4*a*b*(-2*cos(1/2*d*x+1/2*c)*(-2*sin(1
/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)^2+(sin(1/2*d
*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(-2*sin(1/2*d*x+1/2*c)^
4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-2*si
n(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/
2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 198, normalized size of antiderivative = 2.08

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{-6i\sqrt{2}ab\cos(dx+c)^2 \operatorname{weierstrassZeta}(-4,0,\operatorname{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))) + }{}$$

[In] integrate((a+b*cos(d*x+c))^2/cos(d*x+c)^(5/2),x, algorithm="fricas")

[Out] 1/3*(-6*I*sqrt(2)*a*b*cos(d*x + c)^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 6*I*sqrt(2)*a*b*cos(d*x + c)^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + sqrt(2)*(-I*a^2 - 3*I*b^2)*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + sqrt(2)*(I*a^2 + 3*I*b^2)*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 2*(6*a*b*cos(d*x + c) + a^2)*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^2)

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

[In] integrate((a+b*cos(d*x+c))**2/cos(d*x+c)**(5/2),x)

[Out] Timed out

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^2}{\cos(dx+c)^{\frac{5}{2}}}\,dx$$

[In] integrate((a+b*cos(d*x+c))^2/cos(d*x+c)^(5/2),x, algorithm="maxima")

[Out] integrate((b*cos(d*x + c) + a)^2/cos(d*x + c)^(5/2), x)

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^2}{\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2/cos(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^2/cos(d*x + c)^(5/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.58 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.14

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2b^2\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d} + \frac{2a^2\sin(c+d\,x)\;{}_2\mathrm{F}_1\left(-\frac{3}{4},\frac{1}{2};\ \frac{1}{4};\ \cos(c+d\,x)^2\right)}{3\,d\cos(c+d\,x)^{3/2}\sqrt{\sin(c+d\,x)^2}} + \frac{4\,a\,b\sin(c+d\,x)\;{}_2\mathrm{F}_1\left(-\frac{1}{4},\frac{1}{2};\ \frac{3}{4};\ \cos(c+d\,x)^2\right)}{d\sqrt{\cos(c+d\,x)}\sqrt{\sin(c+d\,x)^2}}$$

```
[In] int((a + b*cos(c + d*x))^2/cos(c + d*x)^(5/2),x)
[Out] (2*b^2*ellipticF(c/2 + (d*x)/2, 2))/d + (2*a^2*sin(c + d*x)*hypergeom([-3/4
, 1/2], 1/4, cos(c + d*x)^2))/(3*d*cos(c + d*x)^(3/2)*(sin(c + d*x)^2)^(1/2
)) + (4*a*b*sin(c + d*x)*hypergeom([-1/4, 1/2], 3/4, cos(c + d*x)^2))/(d*co
s(c + d*x)^(1/2)*(sin(c + d*x)^2)^(1/2))
```

3.574 $\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 135

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{7}{2}}(c+dx)}\,dx = -\frac{2(3a^2+5b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{4ab\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2a^2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{4ab\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{2(3a^2+5b^2)\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

```
[Out] -2/5*(3*a^2+5*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elliptic
E(sin(1/2*d*x+1/2*c),2^(1/2))/d+4/3*a*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/
2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/5*a^2*sin(d*x+c)/d/c
os(d*x+c)^(5/2)+4/3*a*b*sin(d*x+c)/d/cos(d*x+c)^(3/2)+2/5*(3*a^2+5*b^2)*sin
(d*x+c)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2868, 2716, 2720, 3091, 2719}

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{7}{2}}(c+dx)}\,dx = -\frac{2(3a^2+5b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{2(3a^2+5b^2)\sin(c+dx)}{5d\sqrt{\cos(c+dx)}} + \frac{2a^2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{4ab\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{4ab\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Int[(a + b*Cos[c + d*x])^2/Cos[c + d*x]^(7/2),x]
```

```
[Out] (-2*(3*a^2 + 5*b^2)*EllipticE[(c + d*x)/2, 2])/(5*d) + (4*a*b*EllipticF[(c
+ d*x)/2, 2])/(3*d) + (2*a^2*Sin[c + d*x])/(5*d*Cos[c + d*x]^(5/2)) + (4*a*
b*Sin[c + d*x])/(3*d*Cos[c + d*x]^(3/2)) + (2*(3*a^2 + 5*b^2)*Sin[c + d*x])
/(5*d*Sqrt[Cos[c + d*x]])
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2868

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)])^2, x_Symbol] :> Dist[2*c*(d/b), Int[(b*Sin[e + f*x])^(m + 1), x], x] +
 Int[(b*Sin[e + f*x])^m*(c^2 + d^2*Sin[e + f*x]^2), x] /; FreeQ[{b, c, d, e
, f, m}, x]
```

Rule 3091

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_) + (C_.)*sin[(e_.) + (f_.)*(x
_)]^2), x_Symbol] :> Simp[A*Cos[e + f*x]*((b*Sin[e + f*x])^(m + 1)/(b*f*(m
+ 1))), x] + Dist[(A*(m + 2) + C*(m + 1))/(b^2*(m + 1)), Int[(b*Sin[e + f*x
])^(m + 2), x], x] /; FreeQ[{b, e, f, A, C}, x] && LtQ[m, -1]
```

Rule 3091

Rubi steps

$$\begin{aligned}\text{integral} &= (2ab)\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)}\,dx + \int \frac{a^2+b^2\cos^2(c+dx)}{\cos^{\frac{7}{2}}(c+dx)}\,dx\\ &= \frac{2a^2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{4ab\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{1}{3}(2ab)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\\ &\quad - \frac{1}{5}\left(-3a^2-5b^2\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx\end{aligned}$$

$$= \frac{4ab\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2a^2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{4ab\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{2(3a^2+5b^2)\sin(c+dx)}{5d\sqrt{\cos(c+dx)}} - \frac{1}{5}(3a^2+5b^2)\int\sqrt{\cos(c+dx)}\,dx$$

$$= -\frac{2(3a^2+5b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{4ab\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2a^2\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{4ab\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{2(3a^2+5b^2)\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.50 (sec) , antiderivative size = 124, normalized size of antiderivative = 0.92

$$\int\frac{(a+b\cos(c+dx))^2}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{-6(3a^2+5b^2)\cos^{\frac{3}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right) + 20ab\cos^{\frac{3}{2}}(c+dx)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right) + 20ab\sin(c+dx}{15d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2/Cos[c + d*x]^(7/2),x]
```

```
[Out] (-6*(3*a^2 + 5*b^2)*Cos[c + d*x]^(3/2)*EllipticE[(c + d*x)/2, 2] + 20*a*b*C
os[c + d*x]^(3/2)*EllipticF[(c + d*x)/2, 2] + 20*a*b*Sin[c + d*x] + 9*a^2*S
in[2*(c + d*x)] + 15*b^2*Sin[2*(c + d*x)] + 6*a^2*Tan[c + d*x])/(15*d*Cos[c
 + d*x]^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 632 vs. 2(171) = 342.

Time = 11.75 (sec) , antiderivative size = 633, normalized size of antiderivative = 4.69

method	result
default	$-\frac{\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\frac{2a^2\left(24\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,E\left(\cos\left(\frac{dx}{2}+\right.\right.\right.}{}\right.}{}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*b)^2/cos(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/5*a^2/(8*sin(
1/2*d*x+1/2*c)^6-12*sin(1/2*d*x+1/2*c)^4+6*sin(1/2*d*x+1/2*c)^2-1)/sin(1/2*
d*x+1/2*c)^2*(24*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6-12*(2*sin(1/2*d*x+
```

```
1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c)
,2^(1/2))*sin(1/2*d*x+1/2*c)^4-24*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+1
2*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(c
os(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2+8*sin(1/2*d*x+1/2*c)^2*cos(
1/2*d*x+1/2*c)-3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1
/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2
*d*x+1/2*c)^2)^(1/2)+2*b^2/sin(1/2*d*x+1/2*c)^2/(2*sin(1/2*d*x+1/2*c)^2-1)*
(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^
2*cos(1/2*d*x+1/2*c)-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1
)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))+4*a*b*(-1/6*cos(1/2*d*x+1/2*
c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)
^2-1/2)^2+1/3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2
)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*
x+1/2*c),2^(1/2))))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 223, normalized size of antiderivative = 1.65

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{-10i\sqrt{2}ab\cos(dx+c)^3\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\,\sin(dx+c))+10i\sqrt{2}ab\cos(dx+c)}{}$$

```
[In] integrate((a+b*cos(d*x+c))^2/cos(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] 1/15*(-10*I*sqrt(2)*a*b*cos(d*x + c)^3*weierstrassPInverse(-4, 0, cos(d*x +
 c) + I*sin(d*x + c)) + 10*I*sqrt(2)*a*b*cos(d*x + c)^3*weierstrassPInverse
(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 3*sqrt(2)*(3*I*a^2 + 5*I*b^2)*cos(
d*x + c)^3*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) +
 I*sin(d*x + c))) - 3*sqrt(2)*(-3*I*a^2 - 5*I*b^2)*cos(d*x + c)^3*weierstra
ssZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) +
2*(10*a*b*cos(d*x + c) + 3*(3*a^2 + 5*b^2)*cos(d*x + c)^2 + 3*a^2)*sqrt(cos
(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^3)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**2/cos(d*x+c)**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^2}{\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2/cos(d*x+c)^(7/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^2/cos(d*x + c)^(7/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^2}{\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2/cos(d*x+c)^(7/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^2/cos(d*x + c)^(7/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.46 (sec) , antiderivative size = 113, normalized size of antiderivative = 0.84

$$\int \frac{(a+b\cos(c+dx))^2}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{6\,a^2\,\sin(c+d\,x)\;{}_2\mathrm{F}_1\left(-\frac{5}{4},\frac{1}{2};\;-\frac{1}{4};\;\cos(c+d\,x)^2\right)+30\,b^2\cos(c+d\,x)^2\,\sin(c+d\,x)\;{}_2\mathrm{F}_1\left(-\frac{1}{4},\frac{1}{2};\;\frac{3}{4};\;\cos(c+\right.}{15\,d\cos(c+d\,x)^{5/2}\,\sqrt{1-\cos(c+d\,x}}$$

```
[In] int((a + b*cos(c + d*x))^2/cos(c + d*x)^(7/2),x)
[Out] (6*a^2*sin(c + d*x)*hypergeom([-5/4, 1/2], -1/4, cos(c + d*x)^2) + 30*b^2*c
os(c + d*x)^2*sin(c + d*x)*hypergeom([-1/4, 1/2], 3/4, cos(c + d*x)^2) + 20
*a*b*cos(c + d*x)*sin(c + d*x)*hypergeom([-3/4, 1/2], 1/4, cos(c + d*x)^2))
/(15*d*cos(c + d*x)^(5/2)*(1 - cos(c + d*x)^2)^(1/2))
```

3.575 $\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^3\,dx$

Optimal result

Integrand size = 23, antiderivative size = 194

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^3\,dx = \frac{2b(27a^2+7b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15d} + \frac{2a(7a^2+15b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{2a(7a^2+15b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} + \frac{2b(27a^2+7b^2)\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{45d} + \frac{40ab^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{63d} + \frac{2b^2\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{9d}$$

```
[Out] 2/15*b*(27*a^2+7*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellip
ticE(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/21*a*(7*a^2+15*b^2)*(cos(1/2*d*x+1/2*c
)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/45*
b*(27*a^2+7*b^2)*cos(d*x+c)^(3/2)*sin(d*x+c)/d+40/63*a*b^2*cos(d*x+c)^(5/2)
*sin(d*x+c)/d+2/9*b^2*cos(d*x+c)^(5/2)*(a+b*cos(d*x+c))*sin(d*x+c)/d+2/21*a
*(7*a^2+15*b^2)*sin(d*x+c)*cos(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2872, 3102, 2827, 2715, 2720, 2719}

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^3\,dx = \frac{2a(7a^2+15b^2)\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{2b(27a^2+7b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15d} + \frac{2b(27a^2+7b^2)\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{45d} + \frac{2a(7a^2+15b^2)\sin(c+dx)\sqrt{\cos(c+dx)}}{21d} + \frac{2b^2\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))}{9d} + \frac{40ab^2\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{63d}$$

```
[In] Int[Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (2*b*(27*a^2 + 7*b^2)*EllipticE[(c + d*x)/2, 2])/(15*d) + (2*a*(7*a^2 + 15*
b^2)*EllipticF[(c + d*x)/2, 2])/(21*d) + (2*a*(7*a^2 + 15*b^2)*Sqrt[Cos[c +
 d*x]]*Sin[c + d*x])/(21*d) + (2*b*(27*a^2 + 7*b^2)*Cos[c + d*x]^(3/2)*Sin[
c + d*x])/(45*d) + (40*a*b^2*Cos[c + d*x]^(5/2)*Sin[c + d*x])/(63*d) + (2*b
^2*Cos[c + d*x]^(5/2)*(a + b*Cos[c + d*x])*Sin[c + d*x])/(9*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2b^2\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{9d} + \frac{2}{9}\int \cos^{\frac{3}{2}}(c+dx)\left(\frac{1}{2}a(9a^2+5b^2) + \frac{1}{2}b(27a^2+7b^2)\cos(c+dx) + 10ab^2\cos^2(c+dx)\right)dx \\
&= \frac{40ab^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{63d} + \frac{2b^2\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{9d} + \frac{4}{63}\int \cos^{\frac{3}{2}}(c+dx)\left(\frac{9}{4}a(7a^2+15b^2) + \frac{7}{4}b(27a^2+7b^2)\cos(c+dx)\right)dx \\
&= \frac{40ab^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{63d} + \frac{2b^2\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{9d} + \frac{1}{9}\left(b(27a^2+7b^2)\right)\int \cos^{\frac{5}{2}}(c+dx)\,dx + \frac{1}{7}\left(a(7a^2+15b^2)\right)\int \cos^{\frac{3}{2}}(c+dx)\,dx
\end{aligned}$$

$$= \frac{2a(7a^2+15b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} + \frac{2b(27a^2+7b^2)\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{45d} + \frac{40ab^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{63d} + \frac{2b^2\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{9d} + \frac{1}{15}\left(b(27a^2+7b^2)\right)\int\sqrt{\cos(c+dx)}\,dx + \frac{1}{21}\left(a(7a^2+15b^2)\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{2b(27a^2+7b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{15d} + \frac{2a(7a^2+15b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{2a(7a^2+15b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} + \frac{2b(27a^2+7b^2)\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{45d} + \frac{40ab^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{63d} + \frac{2b^2\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{9d}$$

Mathematica [A] (verified)

Time = 1.00 (sec) , antiderivative size = 137, normalized size of antiderivative = 0.71

$$\int\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^3\,dx$$
$$= \frac{84(27a^2b+7b^3)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)+60(7a^3+15ab^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\sqrt{\cos(c+dx)}(7b(108a^2+4\dots}{630d}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (84*(27*a^2*b + 7*b^3)*EllipticE[(c + d*x)/2, 2] + 60*(7*a^3 + 15*a*b^2)*El
lipticF[(c + d*x)/2, 2] + Sqrt[Cos[c + d*x]]*(7*b*(108*a^2 + 43*b^2)*Cos[c
+ d*x] + 5*(84*a^3 + 234*a*b^2 + 54*a*b^2*Cos[2*(c + d*x)] + 7*b^3*Cos[3*(c
 + d*x)]))*Sin[c + d*x])/(630*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 469 vs. $2(226) = 452$.

Time = 13.53 (sec) , antiderivative size = 470, normalized size of antiderivative = 2.42

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-1120\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3+\left(2160a\,b^2+2240b^3\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\dots\right.}{\dots}$
parts	Expression too large to display

```
[In] int(cos(d*x+c)^(3/2)*(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -2/315*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-1120*cos(1
/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^10*b^3+(2160*a*b^2+2240*b^3)*sin(1/2*d*x+1
/2*c)^8*cos(1/2*d*x+1/2*c)+(-1512*a^2*b-3240*a*b^2-2072*b^3)*sin(1/2*d*x+1/
2*c)^6*cos(1/2*d*x+1/2*c)+(420*a^3+1512*a^2*b+2520*a*b^2+952*b^3)*sin(1/2*d
*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+(-210*a^3-378*a^2*b-720*a*b^2-168*b^3)*sin(1
/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+105*a^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*
sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+225*a*b
^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(
cos(1/2*d*x+1/2*c),2^(1/2))-567*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x
+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*a^2*b-147*(sin(1/2
*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x
+1/2*c),2^(1/2))*b^3)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/
sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 227, normalized size of antiderivative = 1.17

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^3\,dx$$
$$= \frac{2\left(35\,b^3\cos\left(dx+c\right)^3+135\,ab^2\cos\left(dx+c\right)^2+105\,a^3+225\,ab^2+7\left(27\,a^2b+7\,b^3\right)\cos\left(dx+c\right)\right)\sqrt{\cos\left(dx\right.}}{}$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+b*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/315*(2*(35*b^3*cos(d*x + c)^3 + 135*a*b^2*cos(d*x + c)^2 + 105*a^3 + 225*
a*b^2 + 7*(27*a^2*b + 7*b^3)*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c)
- 15*sqrt(2)*(7*I*a^3 + 15*I*a*b^2)*weierstrassPInverse(-4, 0, cos(d*x + c)
 + I*sin(d*x + c)) - 15*sqrt(2)*(-7*I*a^3 - 15*I*a*b^2)*weierstrassPInverse
(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 21*sqrt(2)*(-27*I*a^2*b - 7*I*b^3)
*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x
 + c))) - 21*sqrt(2)*(27*I*a^2*b + 7*I*b^3)*weierstrassZeta(-4, 0, weierstr
assPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/d
```

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^3\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(3/2)*(a+b*cos(d*x+c))**3,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^3\,dx = \int (b\cos(dx+c)+a)^3\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+b*cos(d*x+c))^3,x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^3*cos(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^3\,dx = \int (b\cos(dx+c)+a)^3\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+b*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^3*cos(d*x + c)^(3/2), x)
```

Mupad [B] (verification not implemented)

Time = 14.77 (sec) , antiderivative size = 178, normalized size of antiderivative = 0.92

$$\begin{aligned}\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^3\,dx &= \frac{2\,a^3\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{3\,d}+\frac{2\,a^3\,\sqrt{\cos\left(c+d\,x\right)}\,\sin\left(c+d\,x\right)}{3\,d}\\&\quad-\frac{2\,b^3\cos\left(c+d\,x\right)^{11/2}\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{11}{4};\ \frac{15}{4};\ \cos\left(c+d\,x\right)^2\right)}{11\,d\,\sqrt{\sin\left(c+d\,x\right)^2}}\\&\quad-\frac{6\,a^2\,b\cos\left(c+d\,x\right)^{7/2}\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{7}{4};\ \frac{11}{4};\ \cos\left(c+d\,x\right)^2\right)}{7\,d\,\sqrt{\sin\left(c+d\,x\right)^2}}\\&\quad-\frac{2\,a\,b^2\cos\left(c+d\,x\right)^{9/2}\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{9}{4};\ \frac{13}{4};\ \cos\left(c+d\,x\right)^2\right)}{3\,d\,\sqrt{\sin\left(c+d\,x\right)^2}}\end{aligned}$$

```
[In] int(cos(c + d*x)^(3/2)*(a + b*cos(c + d*x))^3,x)
[Out] (2*a^3*ellipticF(c/2 + (d*x)/2, 2))/(3*d) + (2*a^3*cos(c + d*x)^(1/2)*sin(c
 + d*x))/(3*d) - (2*b^3*cos(c + d*x)^(11/2)*sin(c + d*x)*hypergeom([1/2, 11
/4], 15/4, cos(c + d*x)^2))/(11*d*(sin(c + d*x)^2)^(1/2)) - (6*a^2*b*cos(c
+ d*x)^(7/2)*sin(c + d*x)*hypergeom([1/2, 7/4], 11/4, cos(c + d*x)^2))/(7*d
*(sin(c + d*x)^2)^(1/2)) - (2*a*b^2*cos(c + d*x)^(9/2)*sin(c + d*x)*hyperge
om([1/2, 9/4], 13/4, cos(c + d*x)^2))/(3*d*(sin(c + d*x)^2)^(1/2))
```

3.576 $\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^3\,dx$

Optimal result

Integrand size = 23, antiderivative size = 159

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^3\,dx = \frac{2a(5a^2+9b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{5d} + \frac{2b(21a^2+5b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{2b(21a^2+5b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} + \frac{32ab^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{35d} + \frac{2b^2\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{7d}$$

```
[Out] 2/5*a*(5*a^2+9*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipti
cE(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/21*b*(21*a^2+5*b^2)*(cos(1/2*d*x+1/2*c)^
2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+32/35*a
*b^2*cos(d*x+c)^(3/2)*sin(d*x+c)/d+2/7*b^2*cos(d*x+c)^(3/2)*(a+b*cos(d*x+c)
)*sin(d*x+c)/d+2/21*b*(21*a^2+5*b^2)*sin(d*x+c)*cos(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 159, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used

$= \{2872, 3102, 2827, 2719, 2715, 2720\}$

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^3\,dx = \frac{2b(21a^2+5b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{2a(5a^2+9b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{5d} + \frac{2b(21a^2+5b^2)\sin(c+dx)\sqrt{\cos(c+dx)}}{21d} + \frac{32ab^2\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{35d} + \frac{2b^2\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}{7d}$$

```
[In] Int[Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (2*a*(5*a^2 + 9*b^2)*EllipticE[(c + d*x)/2, 2])/(5*d) + (2*b*(21*a^2 + 5*b^
2)*EllipticF[(c + d*x)/2, 2])/(21*d) + (2*b*(21*a^2 + 5*b^2)*Sqrt[Cos[c + d
*x]]*Sin[c + d*x])/(21*d) + (32*a*b^2*Cos[c + d*x]^(3/2)*Sin[c + d*x])/(35*
d) + (2*b^2*Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*x])*Sin[c + d*x])/(7*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
```

```
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2b^2\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{7d} \\
&\quad + \frac{2}{7}\int \sqrt{\cos(c+dx)}\left(\frac{1}{2}a\left(7a^2+3b^2\right)+\frac{1}{2}b\left(21a^2+5b^2\right)\cos(c+dx)\right. \\
&\qquad \left. + 8ab^2\cos^2(c+dx)\right)\,dx \\
&= \frac{32ab^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{35d}+\frac{2b^2\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{7d} \\
&\quad + \frac{4}{35}\int \sqrt{\cos(c+dx)}\left(\frac{7}{4}a\left(5a^2+9b^2\right)+\frac{5}{4}b\left(21a^2+5b^2\right)\cos(c+dx)\right)\,dx \\
&= \frac{32ab^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{35d}+\frac{2b^2\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{7d} \\
&\quad + \frac{1}{7}\left(b\left(21a^2+5b^2\right)\right)\int \cos^{\frac{3}{2}}(c+dx)\,dx+\frac{1}{5}\left(a\left(5a^2+9b^2\right)\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= \frac{2a(5a^2+9b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2b(21a^2+5b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} \\
&\quad + \frac{32ab^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{35d}+\frac{2b^2\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{7d} \\
&\quad + \frac{1}{21}\left(b\left(21a^2+5b^2\right)\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx
\end{aligned}$$

$$= \frac{2a(5a^2+9b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{5d} + \frac{2b(21a^2+5b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{2b(21a^2+5b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{21d} + \frac{32ab^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{35d} + \frac{2b^2\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{7d}$$

Mathematica [A] (verified)

Time = 0.78 (sec) , antiderivative size = 110, normalized size of antiderivative = 0.69

$$\int\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^3\,dx$$
$$= \frac{42(5a^3+9ab^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)+10(21a^2b+5b^3)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+b\sqrt{\cos(c+dx)}(210a^2+65b^2}{105d}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (42*(5*a^3 + 9*a*b^2)*EllipticE[(c + d*x)/2, 2] + 10*(21*a^2*b + 5*b^3)*Ell
ipticF[(c + d*x)/2, 2] + b*Sqrt[Cos[c + d*x]]*(210*a^2 + 65*b^2 + 126*a*b*C
os[c + d*x] + 15*b^2*Cos[2*(c + d*x)])*Sin[c + d*x])/(105*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 420 vs. 2(195) = 390.

Time = 12.03 (sec) , antiderivative size = 421, normalized size of antiderivative = 2.65

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(240\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3+\left(-504a\,b^2-360b^3\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\right.}{}$
parts	Expression too large to display

```
[In] int(cos(d*x+c)^(1/2)*(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -2/105*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(240*cos(1/2
*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8*b^3+(-504*a*b^2-360*b^3)*sin(1/2*d*x+1/2*c
)^6*cos(1/2*d*x+1/2*c)+(420*a^2*b+504*a*b^2+280*b^3)*sin(1/2*d*x+1/2*c)^4*c
os(1/2*d*x+1/2*c)+(-210*a^2*b-126*a*b^2-80*b^3)*sin(1/2*d*x+1/2*c)^2*cos(1/
2*d*x+1/2*c)+105*a^2*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2
-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+25*b^3*(sin(1/2*d*x+1/2*c)^
2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1
/2))-105*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Elli
pticE(cos(1/2*d*x+1/2*c),2^(1/2))*a^3-189*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*s
```

```
in(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*a*b^2)/(
-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*c
os(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 205, normalized size of antiderivative = 1.29

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^3\,dx$$
$$= \frac{2\left(15\,b^3\cos\left(dx+c\right)^2+63\,ab^2\cos\left(dx+c\right)+105\,a^2b+25\,b^3\right)\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-5\,\sqrt{2}(21i\,a^2b+}{}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+b*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/105*(2*(15*b^3*cos(d*x + c)^2 + 63*a*b^2*cos(d*x + c) + 105*a^2*b + 25*b^
3)*sqrt(cos(d*x + c))*sin(d*x + c) - 5*sqrt(2)*(21*I*a^2*b + 5*I*b^3)*weier
strassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) - 5*sqrt(2)*(-21*I*a^2
*b - 5*I*b^3)*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 2
1*sqrt(2)*(-5*I*a^3 - 9*I*a*b^2)*weierstrassZeta(-4, 0, weierstrassPInverse
(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 21*sqrt(2)*(5*I*a^3 + 9*I*a*b^2)*
weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x
+ c))))/d
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^3\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(1/2)*(a+b*cos(d*x+c))**3,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^3\,dx = \int \left(b\cos\left(dx+c\right)+a\right)^3\sqrt{\cos\left(dx+c\right)}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+b*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] integrate((b*cos(d*x + c) + a)^3*sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^3\,dx = \int (b\cos(dx+c)+a)^3\sqrt{\cos(dx+c)}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+b*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((b*cos(d*x + c) + a)^3*sqrt(cos(d*x + c)), x)
```

Mupad [B] (verification not implemented)

Time = 14.57 (sec) , antiderivative size = 146, normalized size of antiderivative = 0.92

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^3\,dx = \frac{2\left(a^3\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)+a^2\,b\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)+a^2\,b\,\sqrt{\cos\left(c+d\,x\right)}\,\sin\left(c+d\,x\right)\right)}{d} - \frac{2\,b^3\cos\left(c+d\,x\right)^{9/2}\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{9}{4};\ \frac{13}{4};\ \cos\left(c+d\,x\right)^2\right)}{9\,d\,\sqrt{\sin\left(c+d\,x\right)^2}} - \frac{6\,a\,b^2\cos\left(c+d\,x\right)^{7/2}\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{7}{4};\ \frac{11}{4};\ \cos\left(c+d\,x\right)^2\right)}{7\,d\,\sqrt{\sin\left(c+d\,x\right)^2}}$$

```
[In] int(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))^3,x)
```

```
[Out] (2*(a^3*ellipticE(c/2 + (d*x)/2, 2) + a^2*b*ellipticF(c/2 + (d*x)/2, 2) + a
^2*b*cos(c + d*x)^(1/2)*sin(c + d*x)))/d - (2*b^3*cos(c + d*x)^(9/2)*sin(c
+ d*x)*hypergeom([1/2, 9/4], 13/4, cos(c + d*x)^2))/(9*d*(sin(c + d*x)^2)^(
1/2)) - (6*a*b^2*cos(c + d*x)^(7/2)*sin(c + d*x)*hypergeom([1/2, 7/4], 11/4
, cos(c + d*x)^2))/(7*d*(sin(c + d*x)^2)^(1/2))
```

3.577 $\int \frac{(a+b\cos(c+dx))^3}{\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 116

$$\int \frac{(a+b\cos(c+dx))^3}{\sqrt{\cos(c+dx)}}\,dx = \frac{6b(5a^2+b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{2a(a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{8ab^2\sqrt{\cos(c+dx)}\sin(c+dx)}{5d} + \frac{2b^2\sqrt{\cos(c+dx)}(a+b\cos(c+dx))\sin(c+dx)}{5d}$$

```
[Out] 6/5*b*(5*a^2+b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE
(sin(1/2*d*x+1/2*c),2^(1/2))/d+2*a*(a^2+b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/c
os(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+8/5*a*b^2*sin(d*x
+c)*cos(d*x+c)^(1/2)/d+2/5*b^2*(a+b*cos(d*x+c))*sin(d*x+c)*cos(d*x+c)^(1/2)
/d
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$, Rules used

$= \{2872, 3102, 2827, 2720, 2719\}$

$$\int \frac{(a+b\cos(c+dx))^3}{\sqrt{\cos(c+dx)}}\,dx = \frac{2a(a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{6b(5a^2+b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{5d} + \frac{2b^2\sin(c+dx)\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}{5d} + \frac{8ab^2\sin(c+dx)\sqrt{\cos(c+dx)}}{5d}$$

```
[In] Int[(a + b*Cos[c + d*x])^3/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (6*b*(5*a^2 + b^2)*EllipticE[(c + d*x)/2, 2])/(5*d) + (2*a*(a^2 + b^2)*Elli
pticF[(c + d*x)/2, 2])/d + (8*a*b^2*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(5*d)
+ (2*b^2*Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])*Sin[c + d*x])/(5*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2b^2\sqrt{\cos(c+dx)}(a+b\cos(c+dx))\sin(c+dx)}{5d} \\
&\quad + \frac{2}{5}\int \frac{\frac{1}{2}a(5a^2+b^2)+\frac{3}{2}b(5a^2+b^2)\cos(c+dx)+6ab^2\cos^2(c+dx)}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{8ab^2\sqrt{\cos(c+dx)}\sin(c+dx)}{5d} + \frac{2b^2\sqrt{\cos(c+dx)}(a+b\cos(c+dx))\sin(c+dx)}{5d} \\
&\quad + \frac{4}{15}\int \frac{\frac{15}{4}a(a^2+b^2)+\frac{9}{4}b(5a^2+b^2)\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{8ab^2\sqrt{\cos(c+dx)}\sin(c+dx)}{5d} + \frac{2b^2\sqrt{\cos(c+dx)}(a+b\cos(c+dx))\sin(c+dx)}{5d} \\
&\quad + \left(a\left(a^2+b^2\right)\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx + \frac{1}{5}\left(3b\left(5a^2+b^2\right)\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= \frac{6b(5a^2+b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{5d} + \frac{2a(a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} \\
&\quad + \frac{8ab^2\sqrt{\cos(c+dx)}\sin(c+dx)}{5d} + \frac{2b^2\sqrt{\cos(c+dx)}(a+b\cos(c+dx))\sin(c+dx)}{5d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.57 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.72

$$\int \frac{(a+b\cos(c+dx))^3}{\sqrt{\cos(c+dx)}}\,dx$$
$$= \frac{2\left(3(5a^2b+b^3)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)+5a(a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+b^2\sqrt{\cos(c+dx)}(5a+b\cos(c+d}{5d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^3/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (2*(3*(5*a^2*b + b^3)*EllipticE[(c + d*x)/2, 2] + 5*a*(a^2 + b^2)*EllipticF
[(c + d*x)/2, 2] + b^2*Sqrt[Cos[c + d*x]]*(5*a + b*Cos[c + d*x])*Sin[c + d*
x]))/(5*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 411 vs. 2(158) = 316.

Time = 9.48 (sec) , antiderivative size = 412, normalized size of antiderivative = 3.55

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3+20\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a\,b^2+8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\right.}{}$
parts	$\frac{2a^3\,\mathrm{am}^{-1}\left(\frac{dx}{2}+\frac{c}{2}\vert\sqrt{2}\right)}{d}-\frac{2b^3\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}\right.\right.}{5\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\mathrm{si}}$

```
[In] int((a+cos(d*x+c)*b)^3/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/5*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-8*cos(1/2*d*
x+1/2*c)*sin(1/2*d*x+1/2*c)^6*b^3+20*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^
4*a*b^2+8*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4*b^3-10*cos(1/2*d*x+1/2*c)
*sin(1/2*d*x+1/2*c)^2*a*b^2-2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*b^3+5
*a^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Elliptic
F(cos(1/2*d*x+1/2*c),2^(1/2))+5*a*b^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1
/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-15*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+
1/2*c),2^(1/2))*a^2*b-3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^
2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*b^3)/(-2*sin(1/2*d*x+1/2*c
)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-
1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 185, normalized size of antiderivative = 1.59

$$\int \frac{(a+b\cos(c+dx))^3}{\sqrt{\cos(c+dx)}}\,dx$$
$$=\frac{2\left(b^3\cos\left(dx+c\right)+5\,ab^2\right)\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-5\sqrt{2}(i\,a^3+i\,ab^2)\mathrm{weierstrassPInverse}(-4,0,\cos\left(dx\right.}{}$$

```
[In] integrate((a+b*cos(d*x+c))^3/cos(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/5*(2*(b^3*cos(d*x + c) + 5*a*b^2)*sqrt(cos(d*x + c))*sin(d*x + c) - 5*sqr
t(2)*(I*a^3 + I*a*b^2)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x
+ c)) - 5*sqrt(2)*(-I*a^3 - I*a*b^2)*weierstrassPInverse(-4, 0, cos(d*x + c
) - I*sin(d*x + c)) - 3*sqrt(2)*(-5*I*a^2*b - I*b^3)*weierstrassZeta(-4, 0,
```

```
weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*sqrt(2)*(5*
I*a^2*b + I*b^3)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x
+ c) - I*sin(d*x + c))))/d
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^3}{\sqrt{\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**3/cos(d*x+c)**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^3}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(b\cos(dx+c)+a)^3}{\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3/cos(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^3/sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^3}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(b\cos(dx+c)+a)^3}{\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3/cos(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^3/sqrt(cos(d*x + c)), x)
```

Mupad [B] (verification not implemented)

Time = 14.75 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\cos(c+dx))^3}{\sqrt{\cos(c+dx)}}\,dx = \frac{2a^3\,\mathrm{F}\left(\frac{c}{2}+\frac{dx}{2}\middle|2\right)}{d} + \frac{6a^2b\,\mathrm{E}\left(\frac{c}{2}+\frac{dx}{2}\middle|2\right)}{d} + \frac{2ab^2\,\mathrm{F}\left(\frac{c}{2}+\frac{dx}{2}\middle|2\right)}{d} + \frac{2ab^2\sqrt{\cos(c+dx)}\,\sin(c+dx)}{d} - \frac{2b^3\cos(c+dx)^{7/2}\sin(c+dx)\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{7}{4};\ \frac{11}{4};\ \cos(c+dx)^2\right)}{7d\sqrt{\sin(c+dx)^2}}$$

```
[In] int((a + b*cos(c + d*x))^3/cos(c + d*x)^(1/2),x)
```

```
[Out] (2*a^3*ellipticF(c/2 + (d*x)/2, 2))/d + (6*a^2*b*ellipticE(c/2 + (d*x)/2, 2
))/d + (2*a*b^2*ellipticF(c/2 + (d*x)/2, 2))/d + (2*a*b^2*cos(c + d*x)^(1/2
)*sin(c + d*x))/d - (2*b^3*cos(c + d*x)^(7/2)*sin(c + d*x)*hypergeom([1/2,
7/4], 11/4, cos(c + d*x)^2))/(7*d*(sin(c + d*x)^2)^(1/2))
```

3.578 $\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 124

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{3}{2}}(c+dx)}\,dx = -\frac{2a(a^2-3b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{d} + \frac{2b(9a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} - \frac{2b(3a^2-b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[Out] -2*a*(a^2-3*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(
sin(1/2*d*x+1/2*c),2^(1/2))/d+2/3*b*(9*a^2+b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2
)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2*a^2*(a+b*cos
(d*x+c))*sin(d*x+c)/d/cos(d*x+c)^(1/2)-2/3*b*(3*a^2-b^2)*sin(d*x+c)*cos(d*x
+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$, Rules used

$= \{2871, 3102, 2827, 2720, 2719\}$

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2b(9a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} - \frac{2a(a^2-3b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{d} - \frac{2b(3a^2-b^2)\sin(c+dx)\sqrt{\cos(c+dx)}}{3d} + \frac{2a^2\sin(c+dx)(a+b\cos(c+dx))}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + b*Cos[c + d*x])^3/Cos[c + d*x]^(3/2),x]
```

```
[Out] (-2*a*(a^2 - 3*b^2)*EllipticE[(c + d*x)/2, 2])/d + (2*b*(9*a^2 + b^2)*Ellip
ticF[(c + d*x)/2, 2])/(3*d) - (2*b*(3*a^2 - b^2)*Sqrt[Cos[c + d*x]]*Sin[c +
 d*x])/(3*d) + (2*a^2*(a + b*Cos[c + d*x])*Sin[c + d*x])/(d*Sqrt[Cos[c + d*
x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
```

```
ntegersQ[2*m, 2*n])
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{d\sqrt{\cos(c+dx)}} \\
&\quad + 2\int \frac{2a^2b - \frac{1}{2}a(a^2-3b^2)\cos(c+dx) - \frac{1}{2}b(3a^2-b^2)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}}\,dx \\
&= -\frac{2b(3a^2-b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{d\sqrt{\cos(c+dx)}} \\
&\quad + \frac{4}{3}\int \frac{\frac{1}{4}b(9a^2+b^2) - \frac{3}{4}a(a^2-3b^2)\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx \\
&= -\frac{2b(3a^2-b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{d\sqrt{\cos(c+dx)}} \\
&\quad - \left(a\left(a^2-3b^2\right)\right)\int \sqrt{\cos(c+dx)}\,dx + \frac{1}{3}\left(b\left(9a^2+b^2\right)\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= -\frac{2a(a^2-3b^2)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2b(9a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} \\
&\quad - \frac{2b(3a^2-b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{d\sqrt{\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.60 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.69

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\left(-3(a^3-3ab^2)E\left(\frac{1}{2}(c+dx)\middle|2\right) + (9a^2b+b^3)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right) + \frac{(3a^3+b^3\cos(c+dx))\sin(c+dx)}{\sqrt{\cos(c+dx)}}\right)}{3d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^3/Cos[c + d*x]^(3/2),x]
```

```
[Out] (2*(-3*(a^3 - 3*a*b^2)*EllipticE[(c + d*x)/2, 2] + (9*a^2*b + b^3)*Elliptic
F[(c + d*x)/2, 2] + ((3*a^3 + b^3*Cos[c + d*x])*Sin[c + d*x])/Sqrt[Cos[c +
d*x]]))/(3*d)
```

Maple [A] (verified)

Time = 8.83 (sec) , antiderivative size = 303, normalized size of antiderivative = 2.44

method	result
default	$-\frac{2\left(4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3-6\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a^3-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3+9a^2b\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2(\mathrm{s}}}{}$
parts	$-\frac{2a^3\left(-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\right.\right.}}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int((a+cos(d*x+c)*b)^3/cos(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*(4*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4*b^3-6*cos(1/2*d*x+1/2*c)*si
n(1/2*d*x+1/2*c)^2*a^3-2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*b^3+9*a^2*
b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(c
os(1/2*d*x+1/2*c),2^(1/2))+b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+
1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+3*(sin(1/2*d*x+1/2*
c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2
^(1/2))*a^3-9*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)
*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*a*b^2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2
*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 214, normalized size of antiderivative = 1.73

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$
$$=\frac{\sqrt{2}(-9i\,a^2b-i\,b^3)\cos{(dx+c)}\,\mathrm{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin{(dx+c)})+\sqrt{2}(9i\,a^2b+i\,b^3)}{}$$

```
[In] integrate((a+b*cos(d*x+c))^3/cos(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/3*(sqrt(2)*(-9*I*a^2*b - I*b^3)*cos(d*x + c)*weierstrassPInverse(-4, 0, c
os(d*x + c) + I*sin(d*x + c)) + sqrt(2)*(9*I*a^2*b + I*b^3)*cos(d*x + c)*we
ierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 3*sqrt(2)*(I*a^3
- 3*I*a*b^2)*cos(d*x + c)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0,
```

```
cos(d*x + c) + I*sin(d*x + c))) - 3*sqrt(2)*(-I*a^3 + 3*I*a*b^2)*cos(d*x +
c)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(
d*x + c))) + 2*(b^3*cos(d*x + c) + 3*a^3)*sqrt(cos(d*x + c))*sin(d*x + c))/
(d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**3/cos(d*x+c)**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^3}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3/cos(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^3/cos(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^3}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3/cos(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^3/cos(d*x + c)^(3/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.14 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\,b^3\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{3\,d}+\frac{6\,a\,b^2\,\mathrm{E}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d}+\frac{6\,a^2\,b\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d}+\frac{2\,b^3\,\sqrt{\cos\left(c+d\,x\right)}\,\sin\left(c+d\,x\right)}{3\,d}+\frac{2\,a^3\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{1}{4},\frac{1}{2};\ \frac{3}{4};\ \cos\left(c+d\,x\right)^2\right)}{d\,\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{\sin\left(c+d\,x\right)^2}}$$

```
[In] int((a + b*cos(c + d*x))^3/cos(c + d*x)^(3/2),x)
```

```
[Out] (2*b^3*ellipticF(c/2 + (d*x)/2, 2))/(3*d) + (6*a*b^2*ellipticE(c/2 + (d*x)/
2, 2))/d + (6*a^2*b*ellipticF(c/2 + (d*x)/2, 2))/d + (2*b^3*cos(c + d*x)^(1
/2)*sin(c + d*x))/(3*d) + (2*a^3*sin(c + d*x)*hypergeom([-1/4, 1/2], 3/4, c
os(c + d*x)^2))/(d*cos(c + d*x)^(1/2)*(sin(c + d*x)^2)^(1/2))
```

3.579 $\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 120

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{5}{2}}(c+dx)}\,dx = -\frac{2b(3a^2-b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2a(a^2+9b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{16a^2b\sin(c+dx)}{3d\sqrt{\cos(c+dx)}} + \frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] -2*b*(3*a^2-b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(
sin(1/2*d*x+1/2*c),2^(1/2))/d+2/3*a*(a^2+9*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2
)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/3*a^2*(a+b*c
os(d*x+c))*sin(d*x+c)/d/cos(d*x+c)^(3/2)+16/3*a^2*b*sin(d*x+c)/d/cos(d*x+c)
^(1/2)
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 120, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$, Rules used = {2871, 3100, 2827, 2720, 2719}

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2a(a^2+9b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} - \frac{2b(3a^2-b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2a^2\sin(c+dx)(a+b\cos(c+dx))}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{16a^2b\sin(c+dx)}{3d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + b*Cos[c + d*x])^3/Cos[c + d*x]^(5/2),x]
```

```
[Out] (-2*b*(3*a^2 - b^2)*EllipticE[(c + d*x)/2, 2])/d + (2*a*(a^2 + 9*b^2)*Ellip
ticF[(c + d*x)/2, 2])/(3*d) + (16*a^2*b*Sin[c + d*x])/(3*d*Sqrt[Cos[c + d*x
]]) + (2*a^2*(a + b*Cos[c + d*x])*Sin[c + d*x])/(3*d*Cos[c + d*x]^(3/2))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3100

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
 (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2
 - a*b*B + a^2*C))*Cos[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*
(a^2 - b^2))), x] + Dist[1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*Simp[b*(a*A - b*B + a*C)*(m + 1) - (A*b^2 - a*b*B + a^2*C + b*(A*
b - a*B + b*C)*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B
, C}, x] && LtQ[m, -1] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} \\
&\quad+\frac{2}{3}\int\frac{4a^2b+\frac{1}{2}a(a^2+9b^2)\cos(c+dx)-\frac{1}{2}b(a^2-3b^2)\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{16a^2b\sin(c+dx)}{3d\sqrt{\cos(c+dx)}}+\frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} \\
&\quad+\frac{4}{3}\int\frac{\frac{1}{4}a(a^2+9b^2)-\frac{3}{4}b(3a^2-b^2)\cos(c+dx)}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{16a^2b\sin(c+dx)}{3d\sqrt{\cos(c+dx)}}+\frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} \\
&\quad-\left(b\left(3a^2-b^2\right)\right)\int\sqrt{\cos(c+dx)}\,dx+\frac{1}{3}\left(a\left(a^2+9b^2\right)\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= -\frac{2b(3a^2-b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2a(a^2+9b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} \\
&\quad+\frac{16a^2b\sin(c+dx)}{3d\sqrt{\cos(c+dx)}}+\frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.09 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.71

$$
\int\frac{(a+b\cos(c+dx))^3}{\cos^{\frac{5}{2}}(c+dx)}\,dx
=\frac{2\left((-9a^2b+3b^3)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)+a\left((a^2+9b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\frac{a(a+9b\cos(c+dx))\sin(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\right)\right)}{3d}
$$

```
[In] Integrate[(a + b*Cos[c + d*x])^3/Cos[c + d*x]^(5/2),x]
```

```
[Out] (2*((-9*a^2*b + 3*b^3)*EllipticE[(c + d*x)/2, 2] + a*((a^2 + 9*b^2)*Ellipti
cF[(c + d*x)/2, 2] + (a*(a + 9*b*Cos[c + d*x])*Sin[c + d*x])/Cos[c + d*x]^(
3/2))))/(3*d)
```

Maple [C] (verified)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 9.73 (sec) , antiderivative size = 558, normalized size of antiderivative = 4.65

method	result
parts	$-\frac{2a^3\left(-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+}{2}}\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\right.}$
default	$-\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\left(36\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a^2b-2F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\right.}{}$

```
[In] int((a+cos(d*x+c)*b)^3/cos(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*a^3*(-2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*
EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2-2*sin(1/2*d*x+1/
2*c)^2*cos(1/2*d*x+1/2*c)+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c
)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))*((2*cos(1/2*d*x+1/2*c)^
2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c
)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^2-1)^(3/2)/sin(1/2*d*x+1/2*c)/d+2*b^3*((2*
cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^
(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2
))/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/
(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d+6*a*b^2/d*InverseJacobiAM(1/2*d*x+1/2*c,
2^(1/2))-6*a^2*b*(-2*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*
x+1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)^2+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(
1/2*d*x+1/2*c)^2-1)^(1/2)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1
/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2
*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 222, normalized size of antiderivative = 1.85

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{\sqrt{2}(-i\,a^3-9i\,ab^2)\cos\left(dx+c\right)^2\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))+\sqrt{2}(i\,a^3+9i\,ab}{}$$

```
[In] integrate((a+b*cos(d*x+c))^3/cos(d*x+c)^(5/2),x, algorithm="fricas")
```

[Out] 1/3*(sqrt(2)*(-I*a^3 - 9*I*a*b^2)*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + sqrt(2)*(I*a^3 + 9*I*a*b^2)*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 3*sqrt(2)*(3*I*a^2*b - I*b^3)*cos(d*x + c)^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*sqrt(2)*(-3*I*a^2*b + I*b^3)*cos(d*x + c)^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(9*a^2*b*cos(d*x + c) + a^3)*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^2)

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

[In] integrate((a+b*cos(d*x+c))**3/cos(d*x+c)**(5/2),x)

[Out] Timed out

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^3}{\cos(dx+c)^{\frac{5}{2}}}\,dx$$

[In] integrate((a+b*cos(d*x+c))^3/cos(d*x+c)^(5/2),x, algorithm="maxima")

[Out] integrate((b*cos(d*x + c) + a)^3/cos(d*x + c)^(5/2), x)

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^3}{\cos(dx+c)^{\frac{5}{2}}}\,dx$$

[In] integrate((a+b*cos(d*x+c))^3/cos(d*x+c)^(5/2),x, algorithm="giac")

[Out] integrate((b*cos(d*x + c) + a)^3/cos(d*x + c)^(5/2), x)

Mupad [B] (verification not implemented)

Time = 15.47 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.07

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2\left(\mathrm{E}\left(\frac{c}{2}+\frac{dx}{2}\middle|2\right)\,b^3+3\,a\,\mathrm{F}\left(\frac{c}{2}+\frac{dx}{2}\middle|2\right)\,b^2\right)}{d} + \frac{2\,a^3\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{3}{4},\frac{1}{2};\ \frac{1}{4};\ \cos\left(c+d\,x\right)^2\right)}{3\,d\cos\left(c+d\,x\right)^{3/2}\,\sqrt{\sin\left(c+d\,x\right)^2}} + \frac{6\,a^2\,b\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{1}{4},\frac{1}{2};\ \frac{3}{4};\ \cos\left(c+d\,x\right)^2\right)}{d\,\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{\sin\left(c+d\,x\right)^2}}$$

```
[In] int((a + b*cos(c + d*x))^3/cos(c + d*x)^(5/2),x)
```

```
[Out] (2*(b^3*ellipticE(c/2 + (d*x)/2, 2) + 3*a*b^2*ellipticF(c/2 + (d*x)/2, 2)))
/d + (2*a^3*sin(c + d*x)*hypergeom([-3/4, 1/2], 1/4, cos(c + d*x)^2))/(3*d*
cos(c + d*x)^(3/2)*(sin(c + d*x)^2)^(1/2)) + (6*a^2*b*sin(c + d*x)*hypergeo
m([-1/4, 1/2], 3/4, cos(c + d*x)^2))/(d*cos(c + d*x)^(1/2)*(sin(c + d*x)^2)
^(1/2))
```

3.580 $\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 149

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{7}{2}}(c+dx)}\,dx = -\frac{6a(a^2+5b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{2b(a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{8a^2b\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)} + \frac{6a(a^2+5b^2)\sin(c+dx)}{5d\sqrt{\cos(c+dx)}} + \frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}$$

```
[Out] -6/5*a*(a^2+5*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elliptic
E(sin(1/2*d*x+1/2*c),2^(1/2))/d+2*b*(a^2+b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/
cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+8/5*a^2*b*sin(d*
x+c)/d/cos(d*x+c)^(3/2)+2/5*a^2*(a+b*cos(d*x+c))*sin(d*x+c)/d/cos(d*x+c)^(5
/2)+6/5*a*(a^2+5*b^2)*sin(d*x+c)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 149, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2871, 3100, 2827, 2716, 2719, 2720}

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2b(a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} - \frac{6a(a^2+5b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{6a(a^2+5b^2)\sin(c+dx)}{5d\sqrt{\cos(c+dx)}} + \frac{2a^2\sin(c+dx)(a+b\cos(c+dx))}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{8a^2b\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Int[(a + b*Cos[c + d*x])^3/Cos[c + d*x]^(7/2),x]
```

```
[Out] (-6*a*(a^2 + 5*b^2)*EllipticE[(c + d*x)/2, 2])/(5*d) + (2*b*(a^2 + b^2)*Ell
ipticF[(c + d*x)/2, 2])/d + (8*a^2*b*Sin[c + d*x])/(5*d*Cos[c + d*x]^(3/2))
 + (6*a*(a^2 + 5*b^2)*Sin[c + d*x])/(5*d*Sqrt[Cos[c + d*x]]) + (2*a^2*(a +
b*Cos[c + d*x])*Sin[c + d*x])/(5*d*Cos[c + d*x]^(5/2))
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3100

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
 (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2
```

```
 - a*b*B + a^2*C))*Cos[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*
(a^2 - b^2))), x] + Dist[1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*Simp[b*(a*A - b*B + a*C)*(m + 1) - (A*b^2 - a*b*B + a^2*C + b*(A*
b - a*B + b*C)*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B
, C}, x] && LtQ[m, -1] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} \\
&\quad + \frac{2}{5}\int \frac{6a^2b+\frac{3}{2}a(a^2+5b^2)\cos(c+dx)+\frac{1}{2}b(a^2+5b^2)\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{8a^2b\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)}+\frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} \\
&\quad + \frac{4}{15}\int \frac{\frac{9}{4}a(a^2+5b^2)+\frac{15}{4}b(a^2+b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{8a^2b\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)}+\frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} \\
&\quad + \left(b\left(a^2+b^2\right)\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx+\frac{1}{5}\left(3a\left(a^2+5b^2\right)\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{2b(a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}+\frac{8a^2b\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)}+\frac{6a(a^2+5b^2)\sin(c+dx)}{5d\sqrt{\cos(c+dx)}} \\
&\quad + \frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}-\frac{1}{5}\left(3a\left(a^2+5b^2\right)\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= -\frac{6a(a^2+5b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2b(a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} \\
&\quad + \frac{8a^2b\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)}+\frac{6a(a^2+5b^2)\sin(c+dx)}{5d\sqrt{\cos(c+dx)}}+\frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.94 (sec) , antiderivative size = 125, normalized size of antiderivative = 0.84

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{7}{2}}(c+dx)}\,dx$$
$$= \frac{-6a(a^2+5b^2)\cos^{\frac{3}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)+10b(a^2+b^2)\cos^{\frac{3}{2}}(c+dx)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+10a^2b}{5d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^3/Cos[c + d*x]^(7/2),x]
```

```
[Out] (-6*a*(a^2 + 5*b^2)*Cos[c + d*x]^(3/2)*EllipticE[(c + d*x)/2, 2] + 10*b*(a^
2 + b^2)*Cos[c + d*x]^(3/2)*EllipticF[(c + d*x)/2, 2] + 10*a^2*b*Sin[c + d*
x] + 3*(a^3 + 5*a*b^2)*Sin[2*(c + d*x)] + 2*a^3*Tan[c + d*x])/(5*d*Cos[c +
d*x]^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 710 vs. 2(187) = 374.

Time = 12.05 (sec) , antiderivative size = 711, normalized size of antiderivative = 4.77

method	result	size
default	Expression too large to display	711
parts	Expression too large to display	783

```
[In] int((a+cos(d*x+c)*b)^3/cos(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*b^3*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c
)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+2/5*a
^3/(8*sin(1/2*d*x+1/2*c)^6-12*sin(1/2*d*x+1/2*c)^4+6*sin(1/2*d*x+1/2*c)^2-1
)/sin(1/2*d*x+1/2*c)^2*(24*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6-12*(2*si
n(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*
d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^4-24*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*
x+1/2*c)+12*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*E
llipticE(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2+8*sin(1/2*d*x+1/2
*c)^2*cos(1/2*d*x+1/2*c)-3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*
c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c)
^4+sin(1/2*d*x+1/2*c)^2)^(1/2)+6*a^2*b*(-1/6*cos(1/2*d*x+1/2*c)*(-2*sin(1/2
*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^2+1/3*
(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*
d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/
2)))+6*a*b^2/sin(1/2*d*x+1/2*c)^2/(2*sin(1/2*d*x+1/2*c)^2-1)*(-2*sin(1/2*d*
x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+
1/2*c)-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Ellipt
icE(cos(1/2*d*x+1/2*c),2^(1/2))))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^
2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 244, normalized size of antiderivative = 1.64

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{7}{2}}(c+dx)}\,dx = -\frac{5\sqrt{2}(i\,a^2b+i\,b^3)\cos{(dx+c)}^3\,\mathrm{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin{(dx+c)})+5\sqrt{2}(-i\,a^2b}{}$$

```
[In] integrate((a+b*cos(d*x+c))^3/cos(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] -1/5*(5*sqrt(2)*(I*a^2*b + I*b^3)*cos(d*x + c)^3*weierstrassPInverse(-4, 0,
 cos(d*x + c) + I*sin(d*x + c)) + 5*sqrt(2)*(-I*a^2*b - I*b^3)*cos(d*x + c)
^3*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 3*sqrt(2)*(I
*a^3 + 5*I*a*b^2)*cos(d*x + c)^3*weierstrassZeta(-4, 0, weierstrassPInverse
(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 3*sqrt(2)*(-I*a^3 - 5*I*a*b^2)*co
s(d*x + c)^3*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c)
 - I*sin(d*x + c))) - 2*(5*a^2*b*cos(d*x + c) + a^3 + 3*(a^3 + 5*a*b^2)*cos
(d*x + c)^2)*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^3)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**3/cos(d*x+c)**(7/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(b\cos{(dx+c)}+a)^3}{\cos{(dx+c)}^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3/cos(d*x+c)^(7/2),x, algorithm="maxima")
```

```
[Out] integrate((b*cos(d*x + c) + a)^3/cos(d*x + c)^(7/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^3}{\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3/cos(d*x+c)^(7/2),x, algorithm="giac")
```

```
[Out] integrate((b*cos(d*x + c) + a)^3/cos(d*x + c)^(7/2), x)
```

Mupad [B] (verification not implemented)

Time = 15.55 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.05

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2\,b^3\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d} + \frac{2\,a^3\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{5}{4},\frac{1}{2};\ -\frac{1}{4};\ \cos\left(c+d\,x\right)^2\right)}{5\,d\cos\left(c+d\,x\right)^{5/2}\,\sqrt{\sin\left(c+d\,x\right)^2}} + \frac{6\,a\,b^2\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{1}{4},\frac{1}{2};\ \frac{3}{4};\ \cos\left(c+d\,x\right)^2\right)}{d\,\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{\sin\left(c+d\,x\right)^2}} + \frac{2\,a^2\,b\,\sin\left(c+d\,x\right)\,{}_2\mathrm{F}_1\left(-\frac{3}{4},\frac{1}{2};\ \frac{1}{4};\ \cos\left(c+d\,x\right)^2\right)}{d\cos\left(c+d\,x\right)^{3/2}\,\sqrt{\sin\left(c+d\,x\right)^2}}$$

```
[In] int((a + b*cos(c + d*x))^3/cos(c + d*x)^(7/2),x)
```

```
[Out] (2*b^3*ellipticF(c/2 + (d*x)/2, 2))/d + (2*a^3*sin(c + d*x)*hypergeom([-5/4
, 1/2], -1/4, cos(c + d*x)^2))/(5*d*cos(c + d*x)^(5/2)*(sin(c + d*x)^2)^(1/
2)) + (6*a*b^2*sin(c + d*x)*hypergeom([-1/4, 1/2], 3/4, cos(c + d*x)^2))/(d
*cos(c + d*x)^(1/2)*(sin(c + d*x)^2)^(1/2)) + (2*a^2*b*sin(c + d*x)*hyperge
om([-3/4, 1/2], 1/4, cos(c + d*x)^2))/(d*cos(c + d*x)^(3/2)*(sin(c + d*x)^2
)^(1/2))
```

3.581 $\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{9}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 194

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{9}{2}}(c+dx)}\,dx = -\frac{2b(9a^2+5b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{2a(5a^2+21b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{32a^2b\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)} + \frac{2a(5a^2+21b^2)\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)} + \frac{2b(9a^2+5b^2)\sin(c+dx)}{5d\sqrt{\cos(c+dx)}} + \frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)}$$

```
[Out] -2/5*b*(9*a^2+5*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icE(sin(1/2*d*x+1/2*c),2^(1/2))/d+2/21*a*(5*a^2+21*b^2)*(cos(1/2*d*x+1/2*c)
^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d+32/35*
a^2*b*sin(d*x+c)/d/cos(d*x+c)^(5/2)+2/21*a*(5*a^2+21*b^2)*sin(d*x+c)/d/cos(
d*x+c)^(3/2)+2/7*a^2*(a+b*cos(d*x+c))*sin(d*x+c)/d/cos(d*x+c)^(7/2)+2/5*b*(
9*a^2+5*b^2)*sin(d*x+c)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2871, 3100, 2827, 2716, 2720, 2719}

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{2a(5a^2+21b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} - \frac{2b(9a^2+5b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{2a(5a^2+21b^2)\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)} + \frac{2b(9a^2+5b^2)\sin(c+dx)}{5d\sqrt{\cos(c+dx)}} + \frac{2a^2\sin(c+dx)(a+b\cos(c+dx))}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{32a^2b\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Int[(a + b*Cos[c + d*x])^3/Cos[c + d*x]^(9/2),x]
```

```
[Out] (-2*b*(9*a^2 + 5*b^2)*EllipticE[(c + d*x)/2, 2])/(5*d) + (2*a*(5*a^2 + 21*b
^2)*EllipticF[(c + d*x)/2, 2])/(21*d) + (32*a^2*b*Sin[c + d*x])/(35*d*Cos[c
 + d*x]^(5/2)) + (2*a*(5*a^2 + 21*b^2)*Sin[c + d*x])/(21*d*Cos[c + d*x]^(3/
2)) + (2*b*(9*a^2 + 5*b^2)*Sin[c + d*x])/(5*d*Sqrt[Cos[c + d*x]]) + (2*a^2*
(a + b*Cos[c + d*x])*Sin[c + d*x])/(7*d*Cos[c + d*x]^(7/2))
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 3100

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.) +
 (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2
 - a*b*B + a^2*C))*Cos[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 1)*
(a^2 - b^2))), x] + Dist[1/(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*Simp[b*(a*A - b*B + a*C)*(m + 1) - (A*b^2 - a*b*B + a^2*C + b*(A*
b - a*B + b*C)*(m + 1))*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B
, C}, x] && LtQ[m, -1] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} \\
&\quad + \frac{2}{7}\int \frac{8a^2b+\frac{1}{2}a(5a^2+21b^2)\cos(c+dx)+\frac{1}{2}b(3a^2+7b^2)\cos^2(c+dx)}{\cos^{\frac{7}{2}}(c+dx)}\,dx \\
&= \frac{32a^2b\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)}+\frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} \\
&\quad + \frac{4}{35}\int \frac{\frac{5}{4}a(5a^2+21b^2)+\frac{7}{4}b(9a^2+5b^2)\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{32a^2b\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)}+\frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} \\
&\quad + \frac{1}{5}\left(b\left(9a^2+5b^2\right)\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)}\,dx+\frac{1}{7}\left(a\left(5a^2+21b^2\right)\right)\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)}\,dx
\end{aligned}
$$

$$= \frac{32a^2b\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)} + \frac{2a(5a^2+21b^2)\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)} + \frac{2b(9a^2+5b^2)\sin(c+dx)}{5d\sqrt{\cos(c+dx)}} + \frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} - \frac{1}{5}\left(b(9a^2+5b^2)\right)\int\sqrt{\cos(c+dx)}\,dx + \frac{1}{21}\left(a(5a^2+21b^2)\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= -\frac{2b(9a^2+5b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{5d} + \frac{2a(5a^2+21b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{32a^2b\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)} + \frac{2a(5a^2+21b^2)\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)} + \frac{2b(9a^2+5b^2)\sin(c+dx)}{5d\sqrt{\cos(c+dx)}} + \frac{2a^2(a+b\cos(c+dx))\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)}$$

Mathematica [A] (verified)

Time = 0.91 (sec) , antiderivative size = 177, normalized size of antiderivative = 0.91

$$\int\frac{(a+b\cos(c+dx))^3}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{-42b(9a^2+5b^2)\cos^{\frac{5}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|\,2\right) + 10a(5a^2+21b^2)\cos^{\frac{5}{2}}(c+dx)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right) + 1\ldots}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^3/Cos[c + d*x]^(9/2),x]
```

```
[Out] (-42*b*(9*a^2 + 5*b^2)*Cos[c + d*x]^(5/2)*EllipticE[(c + d*x)/2, 2] + 10*a*
(5*a^2 + 21*b^2)*Cos[c + d*x]^(5/2)*EllipticF[(c + d*x)/2, 2] + 126*a^2*b*S
in[c + d*x] + 378*a^2*b*Cos[c + d*x]^2*Sin[c + d*x] + 210*b^3*Cos[c + d*x]^
2*Sin[c + d*x] + 25*a^3*Sin[2*(c + d*x)] + 105*a*b^2*Sin[2*(c + d*x)] + 30*
a^3*Tan[c + d*x])/(105*d*Cos[c + d*x]^(5/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 819 vs. 2(226) = 452.

Time = 14.69 (sec) , antiderivative size = 820, normalized size of antiderivative = 4.23

method	result	size
default	Expression too large to display	820
parts	Expression too large to display	1008

```
[In] int((a+cos(d*x+c)*b)^3/cos(d*x+c)^(9/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*a^3*(-1/56*co
s(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(
1/2*d*x+1/2*c)^2-1/2)^4-5/42*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+si
n(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^2+5/21*(sin(1/2*d*x+1/
2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+si
n(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))+2*b^3/sin(
1/2*d*x+1/2*c)^2/(2*sin(1/2*d*x+1/2*c)^2-1)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/
2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-(sin(1/2*d
*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1
/2*c),2^(1/2)))+6/5*a^2*b/sin(1/2*d*x+1/2*c)^2/(8*sin(1/2*d*x+1/2*c)^6-12*s
in(1/2*d*x+1/2*c)^4+6*sin(1/2*d*x+1/2*c)^2-1)*(24*cos(1/2*d*x+1/2*c)*sin(1/
2*d*x+1/2*c)^6-12*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(
1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^4-24*sin(1/2*
d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+12*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/
2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2
*c)^2+8*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-3*(sin(1/2*d*x+1/2*c)^2)^(1
/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))
*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)+6*a*b^2*(-1/6*cos(1/2
*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d
*x+1/2*c)^2-1/2)^2+1/3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^
2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(c
os(1/2*d*x+1/2*c),2^(1/2))))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^
(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.39

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{9}{2}}(c+dx)}\,dx = -\frac{5\sqrt{2}(5i\,a^3+21i\,ab^2)\cos{(dx+c)}^4\,\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin{(dx+c)})+5\sqrt{2}(-5}{}$$

```
[In] integrate((a+b*cos(d*x+c))^3/cos(d*x+c)^(9/2),x, algorithm="fricas")
```

```
[Out] -1/105*(5*sqrt(2)*(5*I*a^3 + 21*I*a*b^2)*cos(d*x + c)^4*weierstrassPInverse
(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 5*sqrt(2)*(-5*I*a^3 - 21*I*a*b^2)*
cos(d*x + c)^4*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) +
21*sqrt(2)*(9*I*a^2*b + 5*I*b^3)*cos(d*x + c)^4*weierstrassZeta(-4, 0, weie
rstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 21*sqrt(2)*(-9*I*a
^2*b - 5*I*b^3)*cos(d*x + c)^4*weierstrassZeta(-4, 0, weierstrassPInverse(-
4, 0, cos(d*x + c) - I*sin(d*x + c))) - 2*(63*a^2*b*cos(d*x + c) + 21*(9*a^
2*b + 5*b^3)*cos(d*x + c)^3 + 15*a^3 + 5*(5*a^3 + 21*a*b^2)*cos(d*x + c)^2)
*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^4)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**3/cos(d*x+c)**(9/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^3}{\cos(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3/cos(d*x+c)^(9/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^3/cos(d*x + c)^(9/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^3}{\cos(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3/cos(d*x+c)^(9/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^3/cos(d*x + c)^(9/2), x)
```

Mupad [B] (verification not implemented)

Time = 16.46 (sec) , antiderivative size = 147, normalized size of antiderivative = 0.76

$$\int \frac{(a+b\cos(c+dx))^3}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{\frac{2a^3\sin(c+dx)\,{}_2F_1\left(-\frac{7}{4},\frac{1}{2};\ -\frac{3}{4};\ \cos(c+dx)^2\right)}{7}+2b^3\cos(c+dx)^3\sin(c+dx)\,{}_2F_1\left(-\frac{1}{4},\frac{1}{2};\ \frac{3}{4};\ \cos(c+dx)^2\right)+\frac{6a^2b\,c}{}}{d\cos(c+dx)^{7/2}\sqrt{1}}$$

```
[In] int((a + b*cos(c + d*x))^3/cos(c + d*x)^(9/2),x)
[Out] ((2*a^3*sin(c + d*x)*hypergeom([-7/4, 1/2], -3/4, cos(c + d*x)^2))/7 + 2*b^
3*cos(c + d*x)^3*sin(c + d*x)*hypergeom([-1/4, 1/2], 3/4, cos(c + d*x)^2) +
 (6*a^2*b*cos(c + d*x)*sin(c + d*x)*hypergeom([-5/4, 1/2], -1/4, cos(c + d*
x)^2))/5 + 2*a*b^2*cos(c + d*x)^2*sin(c + d*x)*hypergeom([-3/4, 1/2], 1/4,
cos(c + d*x)^2))/(d*cos(c + d*x)^(7/2)*(1 - cos(c + d*x)^2)^(1/2))
```

3.582 $\int \frac{\cos^{\frac{5}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 112

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = -\frac{2aE\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{b^2d} + \frac{2(3a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^3d} - \frac{2a^3\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{b^3(a+b)d} + \frac{2\sqrt{\cos(c+dx)}\sin(c+dx)}{3bd}$$

```
[Out] -2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+
1/2*c),2^(1/2))/b^2/d+2/3*(3*a^2+b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*
d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/b^3/d-2*a^3*(cos(1/2*d*x+1
/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2
^(1/2))/b^3/(a+b)/d+2/3*sin(d*x+c)*cos(d*x+c)^(1/2)/b/d
```

Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2872, 3138, 2719, 3081, 2720, 2884}

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = -\frac{2a^3\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{b^3d(a+b)} + \frac{2(3a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^3d} - \frac{2aE\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{b^2d} + \frac{2\sin(c+dx)\sqrt{\cos(c+dx)}}{3bd}$$

```
[In] Int[Cos[c + d*x]^(5/2)/(a + b*Cos[c + d*x]),x]
```

```
[Out] (-2*a*EllipticE[(c + d*x)/2, 2])/(b^2*d) + (2*(3*a^2 + b^2)*EllipticF[(c +
d*x)/2, 2])/(3*b^3*d) - (2*a^3*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(
b^3*(a + b)*d) + (2*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(3*b*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
```

```
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{2\sqrt{\cos(c+dx)}\sin(c+dx)}{3bd} + \frac{2\int \frac{\frac{a}{2}+\frac{1}{2}b\cos(c+dx)-\frac{3}{2}a\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{3b}$$

$$= \frac{2\sqrt{\cos(c+dx)}\sin(c+dx)}{3bd} - \frac{2\int \frac{-\frac{ab}{2}-\frac{1}{2}(3a^2+b^2)\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{3b^2} - \frac{a\int \sqrt{\cos(c+dx)}\,dx}{b^2}$$

$$= -\frac{2aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^2d} + \frac{2\sqrt{\cos(c+dx)}\sin(c+dx)}{3bd} - \frac{a^3\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{b^3} + \frac{(3a^2+b^2)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3b^3}$$

$$= -\frac{2aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^2d} + \frac{2(3a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^3d} - \frac{2a^3\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{b^3(a+b)d} + \frac{2\sqrt{\cos(c+dx)}\sin(c+dx)}{3bd}$$

Mathematica [A] (verified)

Time = 11.38 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.41

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx$$

$$= \frac{4\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right) - \frac{6a\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b} + 4\sqrt{\cos(c+dx)}\sin(c+dx) - \frac{6\left(-2abE\left(\arcsin\left(\sqrt{\cos(c+d}\right.\right.\right.}{}}{6bd}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)/(a + b*Cos[c + d*x]),x]
```

```
[Out] (4*EllipticF[(c + d*x)/2, 2] - (6*a*EllipticPi[(2*b)/(a + b), (c + d*x)/2,
2])/(a + b) + 4*Sqrt[Cos[c + d*x]]*Sin[c + d*x] - (6*(-2*a*b*EllipticE[ArcS
in[Sqrt[Cos[c + d*x]]], -1] + 2*a*(a + b)*EllipticF[ArcSin[Sqrt[Cos[c + d*x
]]], -1] + (-2*a^2 + b^2)*EllipticPi[-(b/a), ArcSin[Sqrt[Cos[c + d*x]]], -1
])*Sin[c + d*x])/(b^2*Sqrt[Sin[c + d*x]^2]))/(6*b*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 551 vs. $2(184) = 368$.

Time = 5.14 (sec) , antiderivative size = 552, normalized size of antiderivative = 4.93

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\left(4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^{4}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a\,b^{2}-4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^{4}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^{3}-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\mathrm{si}\right.\right.}{}$

```
[In] int(cos(d*x+c)^(5/2)/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(4*cos(1/2*d*x
+1/2*c)*sin(1/2*d*x+1/2*c)^4*a*b^2-4*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^
4*b^3-2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*a*b^2+2*cos(1/2*d*x+1/2*c)*
sin(1/2*d*x+1/2*c)^2*b^3+3*a^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+
1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-3*a^2*b*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/
2*c),2^(1/2))+a*b^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)
^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-b^3*(sin(1/2*d*x+1/2*c)^2)^(1/
2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+3
*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(co
s(1/2*d*x+1/2*c),2^(1/2))*a^2*b-3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d
*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*a*b^2-3*a^3*(sin
(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticPi(cos(1/
2*d*x+1/2*c),-2*b/(a-b),2^(1/2)))/b^3/(a-b)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/
2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+b*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)/(a+b*cos(d*x+c)),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{b\cos\left(dx+c\right)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+b*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(5/2)/(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{b\cos\left(dx+c\right)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+b*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(5/2)/(b*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\cos\left(c+d\,x\right)^{5/2}}{a+b\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(cos(c + d*x)^(5/2)/(a + b*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^(5/2)/(a + b*cos(c + d*x)), x)
```

3.583 $\int \frac{\cos^{\frac{3}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 75

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx=\frac{2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{bd}-\frac{2a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b^2d}+\frac{2a^2\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{b^2(a+b)d}$$

```
[Out] 2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2
*c),2^(1/2))/b/d-2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icF(sin(1/2*d*x+1/2*c),2^(1/2))/b^2/d+2*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/co
s(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))/b^2/(a+b)
/d
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2883, 2719, 2882, 2720, 2884}

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx=\frac{2a^2\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{b^2d(a+b)}-\frac{2a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b^2d}+\frac{2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{bd}$$

```
[In] Int[Cos[c + d*x]^(3/2)/(a + b*Cos[c + d*x]),x]
```

```
[Out] (2*EllipticE[(c + d*x)/2, 2])/(b*d) - (2*a*EllipticF[(c + d*x)/2, 2])/(b^2*
d) + (2*a^2*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(b^2*(a + b)*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2882

```
Int[Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]/((a_.) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[d/b, Int[1/Sqrt[c + d*Sin[e + f*x]], x], x]
 + Dist[(b*c - a*d)/b, Int[1/((a + b*Sin[e + f*x])*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 -
 b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2883

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)/((c_.) + (d_.)*sin[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[b/d, Int[Sqrt[a + b*Sin[e + f*x]], x], x]
 - Dist[(b*c - a*d)/d, Int[Sqrt[a + b*Sin[e + f*x]]/(c + d*Sin[e + f*x]), x
], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2
, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\int \sqrt{\cos(c+dx)}\,dx}{b} - \frac{a\int \frac{\sqrt{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx}{b} \\
&= \frac{2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{bd} - \frac{a\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{b^2} + \frac{a^2\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{b^2} \\
&= \frac{2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{bd} - \frac{2a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b^2d} + \frac{2a^2\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{b^2(a+b)d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 10.40 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.08

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = -\frac{2\left(bE\left(\arcsin\left(\sqrt{\cos(c+dx)}\right)\middle|-1\right)-(a+b)\,\text{EllipticF}\left(\arcsin\left(\sqrt{\cos(c+dx)}\right),-1\right)+a\,\text{EllipticPi}\left(-\right.\right.}{b^2d\sqrt{\sin^2(c+dx)}}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)/(a + b*Cos[c + d*x]),x]
```

```
[Out] (-2*(b*EllipticE[ArcSin[Sqrt[Cos[c + d*x]]], -1] - (a + b)*EllipticF[ArcSin
[Sqrt[Cos[c + d*x]]], -1] + a*EllipticPi[-(b/a), ArcSin[Sqrt[Cos[c + d*x]]]
, -1])*Sin[c + d*x])/(b^2*d*Sqrt[Sin[c + d*x]^2])
```

Maple [A] (verified)

Time = 4.18 (sec) , antiderivative size = 227, normalized size of antiderivative = 3.03

method	result
default	$\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\left(F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)a^2-F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)ab\right.}{b^2(a-b)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\right.}}$

```
[In] int(cos(d*x+c)^(3/2)/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
```

```
[Out] 2*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2*
c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c)
,2^(1/2))*a^2-EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*a*b+EllipticE(cos(1/2*d
*x+1/2*c),2^(1/2))*a*b-EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*b^2-a^2*Ellipt
icPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2)))/b^2/(a-b)/(-2*sin(1/2*d*x+1/2*
c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2
-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+b*cos(d*x+c)),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(3/2)/(a+b*cos(d*x+c)),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{3}{2}}}{b\cos\left(dx+c\right)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+b*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(3/2)/(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{3}{2}}}{b\cos\left(dx+c\right)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+b*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(3/2)/(b*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\cos\left(c+d\,x\right)^{3/2}}{a+b\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)/(a + b*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^(3/2)/(a + b*cos(c + d*x)), x)
```

3.584 $\int \frac{\sqrt{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 53

$$\int \frac{\sqrt{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx=\frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{bd}-\frac{2a\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{b(a+b)d}$$

```
[Out] 2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2
*c),2^(1/2))/b/d-2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))/b/(a+b)/d
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2882, 2720, 2884}

$$\int \frac{\sqrt{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx=\frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{bd}-\frac{2a\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{bd(a+b)}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/(a + b*Cos[c + d*x]),x]
```

```
[Out] (2*EllipticF[(c + d*x)/2, 2])/(b*d) - (2*a*EllipticPi[(2*b)/(a + b), (c + d
*x)/2, 2])/(b*(a + b)*d)
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2882

```
Int[Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]/((a_.) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[d/b, Int[1/Sqrt[c + d*Sin[e + f*x]], x], x]
 + Dist[(b*c - a*d)/b, Int[1/((a + b*Sin[e + f*x])*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 -
 b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{b} - \frac{a\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{b}\\ &= \frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{bd} - \frac{2a\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{b(a+b)d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 48, normalized size of antiderivative = 0.91

$$\int \frac{\sqrt{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx = \frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right) - \frac{2a\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b}}{bd}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/(a + b*Cos[c + d*x]),x]
[Out] (2*EllipticF[(c + d*x)/2, 2] - (2*a*EllipticPi[(2*b)/(a + b), (c + d*x)/2,
2])/(a + b))/(b*d)
```

Maple [A] (verified)

Time = 2.92 (sec) , antiderivative size = 188, normalized size of antiderivative = 3.55

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,\left(F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)a-F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)b}{(a-b)b\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int(cos(d*x+c)^(1/2)/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
```

```
[Out] -2*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2
*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c
),2^(1/2))*a-EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*b-a*EllipticPi(cos(1/2*d
*x+1/2*c),-2*b/(a-b),2^(1/2)))/(a-b)/b/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x
+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+b*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(1/2)/(a+b*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx = \int \frac{\sqrt{\cos(dx+c)}}{b\cos(dx+c)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+b*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(cos(d*x + c))/(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx = \int \frac{\sqrt{\cos(dx+c)}}{b\cos(dx+c)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+b*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(sqrt(cos(d*x + c))/(b*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx = \int \frac{\sqrt{\cos(c+d\,x)}}{a+b\,\cos(c+d\,x)}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(a + b*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^(1/2)/(a + b*cos(c + d*x)), x)
```

3.585 $\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 29

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx = \frac{2\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{(a+b)d}$$

```
[Out] 2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/
2*c),2*b/(a+b),2^(1/2))/(a+b)/d
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.043, Rules used = {2884}

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx = \frac{2\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{d(a+b)}$$

```
[In] Int[1/(Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])),x]
[Out] (2*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/((a + b)*d)
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rubi steps

$$\text{integral} = \frac{2\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{(a+b)d}$$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx=\frac{2\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{(a+b)d}$$

```
[In] Integrate[1/(Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])),x]
[Out] (2*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/((a + b)*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 149 vs. 2(55) = 110.

Time = 2.17 (sec) , antiderivative size = 150, normalized size of antiderivative = 5.17

method	result	size
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,\Pi\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),-\frac{2b}{a-b},\sqrt{2}\right)}{(a-b)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$	150

```
[In] int(1/cos(d*x+c)^(1/2)/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
[Out] -2*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2
*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c
),-2*b/(a-b),2^(1/2))/(a-b)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^
(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx=\text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c)),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(1/2)/(a+b*cos(d*x+c)),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx = \int \frac{1}{(b\cos(dx+c)+a)\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)*sqrt(cos(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx = \int \frac{1}{(b\cos(dx+c)+a)\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)*sqrt(cos(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx = \int \frac{1}{\sqrt{\cos(c+d\,x)}\,\left(a+b\,\cos(c+d\,x)\right)}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))), x)
```

3.586 $\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 77

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}\,dx = -\frac{2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad} - \frac{2b\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a(a+b)d} + \frac{2\sin(c+dx)}{ad\sqrt{\cos(c+dx)}}$$

```
[Out] -2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/
2*c),2^(1/2))/a/d-2*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellip
ticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))/a/(a+b)/d+2*sin(d*x+c)/a/d/cos(
d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2881, 3138, 2719, 12, 2884}

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}\,dx = -\frac{2b\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{ad(a+b)} - \frac{2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad} + \frac{2\sin(c+dx)}{ad\sqrt{\cos(c+dx)}}$$

```
[In] Int[1/(Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*x])),x]
```

```
[Out] (-2*EllipticE[(c + d*x)/2, 2])/(a*d) - (2*b*EllipticPi[(2*b)/(a + b), (c +
d*x)/2, 2])/(a*(a + b)*d) + (2*Sin[c + d*x])/(a*d*Sqrt[Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{2\sin(c+dx)}{ad\sqrt{\cos(c+dx)}} + \frac{2\int \frac{-\frac{b}{2}-\frac{1}{2}a\cos(c+dx)-\frac{1}{2}b\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{a}$$
$$= \frac{2\sin(c+dx)}{ad\sqrt{\cos(c+dx)}} - \frac{\int \sqrt{\cos(c+dx)}\,dx}{a} - \frac{2\int \frac{b^2}{2\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{ab}$$
$$= -\frac{2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad} + \frac{2\sin(c+dx)}{ad\sqrt{\cos(c+dx)}} - \frac{b\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{a}$$
$$= -\frac{2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad} - \frac{2b\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a(a+b)d} + \frac{2\sin(c+dx)}{ad\sqrt{\cos(c+dx)}}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 195 vs. $2(77) = 154$.

Time = 1.96 (sec) , antiderivative size = 195, normalized size of antiderivative = 2.53

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}\,dx = -\frac{\frac{6b\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b} + \frac{2a\left(2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)-\frac{2a\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b}\right)}{b} - \frac{4\sin(c+dx)}{\sqrt{\cos(c+dx)}} + \frac{2\left(-2abE\left(\arcsin\left(\sqrt{\cos(\right.\right.\right.}{}}{2ad}$$

```
[In] Integrate[1/(Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*x])),x]
```

```
[Out] -1/2*((6*b*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(a + b) + (2*a*(2*Ell
ipticF[(c + d*x)/2, 2] - (2*a*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(a
 + b)))/b - (4*Sin[c + d*x])/Sqrt[Cos[c + d*x]] + (2*(-2*a*b*EllipticE[ArcS
in[Sqrt[Cos[c + d*x]]], -1] + 2*a*(a + b)*EllipticF[ArcSin[Sqrt[Cos[c + d*x
]]], -1] + (-2*a^2 + b^2)*EllipticPi[-(b/a), ArcSin[Sqrt[Cos[c + d*x]]], -1
])*Sin[c + d*x])/(a*b*Sqrt[Sin[c + d*x]^2]))/(a*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 353 vs. $2(127) = 254$.

Time = 3.90 (sec) , antiderivative size = 354, normalized size of antiderivative = 4.60

method	result
default	$-\frac{2\left(-2\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,(a-b)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+}{2}}}{}$

```
[In] int(1/cos(d*x+c)^(3/2)/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
[Out] -2*(-2*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(a-b)*cos(1/2*d
*x+1/2*c)*sin(1/2*d*x+1/2*c)^2+(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Elli
pticE(cos(1/2*d*x+1/2*c),2^(1/2))*a-(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/
2*c)^2)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)
*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*b-b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*
sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1
/2))*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2))/a/(-2*sin(1/2*d*
x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(a-b)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*
d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c)),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(3/2)/(a+b*cos(d*x+c)),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}\,dx = \int \frac{1}{(b\cos(dx+c)+a)\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)*cos(d*x + c)^(3/2)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}\,dx = \int \frac{1}{(b\cos(dx+c)+a)\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)*cos(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}\,dx = \int \frac{1}{\cos(c+d\,x)^{3/2}\,(a+b\,\cos(c+d\,x))}\,dx$$

```
[In] int(1/(cos(c + d*x)^(3/2)*(a + b*cos(c + d*x))),x)
[Out] int(1/(cos(c + d*x)^(3/2)*(a + b*cos(c + d*x))), x)
```

3.587 $\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 128

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))}\,dx = \frac{2bE\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d}+\frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3ad}+\frac{2b^2\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a^2(a+b)d}+\frac{2\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)}-\frac{2b\sin(c+dx)}{a^2d\sqrt{\cos(c+dx)}}$$

```
[Out] 2*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1
/2*c),2^(1/2))/a^2/d+2/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*El
lipticF(sin(1/2*d*x+1/2*c),2^(1/2))/a/d+2*b^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/
cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))/a^2/(a+
b)/d+2/3*sin(d*x+c)/a/d/cos(d*x+c)^(3/2)-2*b*sin(d*x+c)/a^2/d/cos(d*x+c)^(1
/2)
```

Rubi [A] (verified)

Time = 0.59 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {2881, 3134, 3138, 2719, 3081, 2720, 2884}

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))}\,dx = \frac{2b^2\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a^2d(a+b)}+\frac{2bE\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d}-\frac{2b\sin(c+dx)}{a^2d\sqrt{\cos(c+dx)}}+\frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3ad}+\frac{2\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Int[1/(Cos[c + d*x]^(5/2)*(a + b*Cos[c + d*x])),x]
```

```
[Out] (2*b*EllipticE[(c + d*x)/2, 2])/(a^2*d) + (2*EllipticF[(c + d*x)/2, 2])/(3*
a*d) + (2*b^2*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(a^2*(a + b)*d) +
(2*Sin[c + d*x])/(3*a*d*Cos[c + d*x]^(3/2)) - (2*b*Sin[c + d*x])/(a^2*d*Sqr
t[Cos[c + d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)} + \frac{2\int \frac{-\frac{3b}{2}+\frac{1}{2}a\cos(c+dx)+\frac{1}{2}b\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}\,dx}{3a} \\
&= \frac{2\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)} - \frac{2b\sin(c+dx)}{a^2d\sqrt{\cos(c+dx)}} + \frac{4\int \frac{\frac{1}{4}(a^2+3b^2)+ab\cos(c+dx)+\frac{3}{4}b^2\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{3a^2} \\
&= \frac{2\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)} - \frac{2b\sin(c+dx)}{a^2d\sqrt{\cos(c+dx)}} \\
&\quad - \frac{4\int \frac{-\frac{1}{4}b(a^2+3b^2)-\frac{1}{4}ab^2\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{3a^2b} + \frac{b\int \sqrt{\cos(c+dx)}\,dx}{a^2} \\
&= \frac{2bE\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} + \frac{2\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)} - \frac{2b\sin(c+dx)}{a^2d\sqrt{\cos(c+dx)}} \\
&\quad + \frac{\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3a} + \frac{b^2\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{a^2}
\end{aligned}$$

$$= \frac{2bE\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{a^2d} + \frac{2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3ad} + \frac{2b^2\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a^2(a+b)d} + \frac{2\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)} - \frac{2b\sin(c+dx)}{a^2d\sqrt{\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 2.82 (sec) , antiderivative size = 210, normalized size of antiderivative = 1.64

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))}\,dx$$

$$= \frac{\frac{2(2a^2+9b^2)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b} + 8a\left(2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right) - \frac{2a\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b}\right) + \frac{4(a-3b\cos(c+dx)}{\cos^{\frac{3}{2}}(c+d}}{}$$

[In] Integrate[1/(Cos[c + d*x]^(5/2)*(a + b*Cos[c + d*x])),x]

[Out] ((2*(2*a^2 + 9*b^2)*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(a + b) + 8*a*(2*EllipticF[(c + d*x)/2, 2] - (2*a*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(a + b)) + (4*(a - 3*b*Cos[c + d*x])*Sin[c + d*x])/Cos[c + d*x]^(3/2) + (6*(-2*a*b*EllipticE[ArcSin[Sqrt[Cos[c + d*x]]], -1] + 2*a*(a + b)*EllipticF[ArcSin[Sqrt[Cos[c + d*x]]], -1] + (-2*a^2 + b^2)*EllipticPi[-(b/a), ArcSin[Sqrt[Cos[c + d*x]]], -1])*Sin[c + d*x])/(a*Sqrt[Sin[c + d*x]^2]))/(6*a^2*d)

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 424 vs. 2(198) = 396.

Time = 5.97 (sec) , antiderivative size = 425, normalized size of antiderivative = 3.32

method	result
default	$-\frac{\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\frac{-\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}{3\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{1}{2}\right)^2}+\frac{2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin}}}{a}\right.}{}$

[In] int(1/cos(d*x+c)^(5/2)/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)

[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/a*(-1/6*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^2+1/3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF

```
(cos(1/2*d*x+1/2*c),2^(1/2)))-2/a^2*b/sin(1/2*d*x+1/2*c)^2/(2*sin(1/2*d*x+1
/2*c)^2-1)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*
d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x
+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))-4*b^3/a^2/(-2*a*b
+2*b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*
sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2
*c),-2*b/(a-b),2^(1/2)))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2
)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+b*cos(d*x+c)),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(5/2)/(a+b*cos(d*x+c)),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))}\,dx = \int \frac{1}{(b\cos(dx+c)+a)\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+b*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)*cos(d*x + c)^(5/2)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))}\,dx = \int \frac{1}{(b\cos(dx+c)+a)\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+b*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)*cos(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))}\,dx = \int \frac{1}{\cos(c+d\,x)^{5/2}\,(a+b\,\cos(c+d\,x))}\,dx$$

```
[In] int(1/(cos(c + d*x)^(5/2)*(a + b*cos(c + d*x))),x)
[Out] int(1/(cos(c + d*x)^(5/2)*(a + b*cos(c + d*x))), x)
```

3.588 $\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 245

$$
\begin{aligned}
\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = & -\frac{a(5a^2-4b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{b^3\,(a^2-b^2)\,d} \\
& + \frac{(15a^4-16a^2b^2-2b^4)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^4\,(a^2-b^2)\,d} \\
& - \frac{a^3(5a^2-7b^2)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{(a-b)b^4(a+b)^2d} \\
& + \frac{(5a^2-2b^2)\,\sqrt{\cos(c+dx)}\sin(c+dx)}{3b^2\,(a^2-b^2)\,d} \\
& - \frac{a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{b\,(a^2-b^2)\,d(a+b\cos(c+dx))}
\end{aligned}
$$

```
[Out] -a*(5*a^2-4*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(
sin(1/2*d*x+1/2*c),2^(1/2))/b^3/(a^2-b^2)/d+1/3*(15*a^4-16*a^2*b^2-2*b^4)*(
cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c)
,2^(1/2))/b^4/(a^2-b^2)/d-a^3*(5*a^2-7*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/co
s(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))/(a-b)/b^4
/(a+b)^2/d-a^2*cos(d*x+c)^(3/2)*sin(d*x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))+1
/3*(5*a^2-2*b^2)*sin(d*x+c)*cos(d*x+c)^(1/2)/b^2/(a^2-b^2)/d
```

Rubi [A] (verified)

Time = 0.78 (sec) , antiderivative size = 245, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {2871, 3128, 3138, 2719, 3081, 2720, 2884}

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = -\frac{a^2\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{bd\,(a^2-b^2)\,(a+b\cos(c+dx))} + \frac{(5a^2-2b^2)\sin(c+dx)\sqrt{\cos(c+dx)}}{3b^2d\,(a^2-b^2)} - \frac{a(5a^2-4b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{b^3d\,(a^2-b^2)} + \frac{(15a^4-16a^2b^2-2b^4)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^4d\,(a^2-b^2)} - \frac{a^3(5a^2-7b^2)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{b^4d(a-b)(a+b)^2}$$

```
[In] Int[Cos[c + d*x]^(7/2)/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] -((a*(5*a^2 - 4*b^2)*EllipticE[(c + d*x)/2, 2])/(b^3*(a^2 - b^2)*d)) + ((15
*a^4 - 16*a^2*b^2 - 2*b^4)*EllipticF[(c + d*x)/2, 2])/(3*b^4*(a^2 - b^2)*d)
 - (a^3*(5*a^2 - 7*b^2)*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/((a - b)
*b^4*(a + b)^2*d) + ((5*a^2 - 2*b^2)*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(3*b^
2*(a^2 - b^2)*d) - (a^2*Cos[c + d*x]^(3/2)*Sin[c + d*x])/(b*(a^2 - b^2)*d*(
a + b*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
```

```
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3128

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*sin[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_
.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n + 2))), x] + Dist[1/(d*(m +
n + 2)), Int[(a + b*Sin[e + f*x])^(m - 1)*(c + d*Sin[e + f*x])^n*Simp[a*A*d
*(m + n + 2) + C*(b*c*m + a*d*(n + 1)) + (d*(A*b + a*B)*(m + n + 2) - C*(a*
c - b*d*(m + n + 1)))*Sin[e + f*x] + (C*(a*d*m - b*c*(m + 1)) + b*B*d*(m +
n + 2))*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n},
 x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m
, 0] &&  !(IGtQ[n, 0] && ( !IntegerQ[m] || (EqQ[a, 0] && NeQ[c, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

integral

$$= -\frac{a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{b(a^2-b^2)\,d(a+b\cos(c+dx))} - \frac{\int \frac{\sqrt{\cos(c+dx)}\left(\frac{3a^2}{2}-ab\cos(c+dx)-\frac{1}{2}(5a^2-2b^2)\cos^2(c+dx)\right)}{a+b\cos(c+dx)}\,dx}{b(a^2-b^2)}$$

$$= \frac{(5a^2-2b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{3b^2(a^2-b^2)\,d} - \frac{a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{b(a^2-b^2)\,d(a+b\cos(c+dx))} - \frac{2\int \frac{-\frac{1}{4}a(5a^2-2b^2)+\frac{1}{2}b(2a^2+b^2)\cos(c+dx)+\frac{3}{4}a(5a^2-4b^2)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{3b^2(a^2-b^2)}$$

$$= \frac{(5a^2-2b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{3b^2(a^2-b^2)\,d} - \frac{a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{b(a^2-b^2)\,d(a+b\cos(c+dx))} + \frac{2\int \frac{\frac{1}{4}ab(5a^2-2b^2)+\frac{1}{4}(15a^4-16a^2b^2-2b^4)\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{3b^3(a^2-b^2)} - \frac{(a(5a^2-4b^2))\int\sqrt{\cos(c+dx)}\,dx}{2b^3(a^2-b^2)}$$

$$= -\frac{a(5a^2-4b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^3(a^2-b^2)\,d} + \frac{(5a^2-2b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{3b^2(a^2-b^2)\,d} - \frac{a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{b(a^2-b^2)\,d(a+b\cos(c+dx))} - \frac{(a^3(5a^2-7b^2))\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{2b^4(a^2-b^2)} + \frac{(15a^4-16a^2b^2-2b^4)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{6b^4(a^2-b^2)}$$

$$= -\frac{a(5a^2-4b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^3(a^2-b^2)\,d} + \frac{(15a^4-16a^2b^2-2b^4)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^4(a^2-b^2)\,d} - \frac{a^3(5a^2-7b^2)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{(a-b)b^4(a+b)^2d} + \frac{(5a^2-2b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{3b^2(a^2-b^2)\,d} - \frac{a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{b(a^2-b^2)\,d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 1.25 (sec) , antiderivative size = 266, normalized size of antiderivative = 1.09

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$

$$= \frac{4\sqrt{\cos(c+dx)}\left(2+\frac{3a^3}{(a^2-b^2)(a+b\cos(c+dx))}\right)\sin(c+dx) - \frac{\frac{2(5a^3-8ab^2)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b} + 8(2a^2+b^2)\left((a+b)\,\text{EllipticF}\left(\frac{1}{2}(c\right.\right.}{}}{}$$

```
[In] Integrate[Cos[c + d*x]^(7/2)/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (4*Sqrt[Cos[c + d*x]]*(2 + (3*a^3)/((a^2 - b^2)*(a + b*Cos[c + d*x])))*Sin[
c + d*x] - ((2*(5*a^3 - 8*a*b^2)*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])
/(a + b) + (8*(2*a^2 + b^2)*((a + b)*EllipticF[(c + d*x)/2, 2] - a*Elliptic
Pi[(2*b)/(a + b), (c + d*x)/2, 2]))/(a + b) + (6*(5*a^2 - 4*b^2)*(-2*a*b*El
lipticE[ArcSin[Sqrt[Cos[c + d*x]]], -1] + 2*a*(a + b)*EllipticF[ArcSin[Sqrt
[Cos[c + d*x]]], -1] + (-2*a^2 + b^2)*EllipticPi[-(b/a), ArcSin[Sqrt[Cos[c
+ d*x]]], -1])*Sin[c + d*x])/(b^2*Sqrt[Sin[c + d*x]^2]))/((a - b)*(a + b)))
/(12*b^2*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1069 vs. $2(315) = 630$.

Time = 17.42 (sec) , antiderivative size = 1070, normalized size of antiderivative = 4.37

method	result	size
default	Expression too large to display	1070

```
[In] int(cos(d*x+c)^(7/2)/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(4/3/b^2*(2*sin(
1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)
+2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(
cos(1/2*d*x+1/2*c),2^(1/2))-3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1
/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-2*sin(1/2*d*x+1/2
*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)-4*(a+b)/b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*
(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*
c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-EllipticE(cos(1/2*d*x+1/
2*c),2^(1/2)))+2/b^4*a^4*(-1/a*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2
*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/
2/a/(a+b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-
2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/
2*c),2^(1/2))-1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*
x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*El
lipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2
)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*
d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2
*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2
)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d
*x+1/2*c),-2*b/(a-b),2^(1/2))+1/a/(a^2-b^2)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4
+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/
2)))+2*(3*a^2+2*a*b+b^2)/b^4*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1
/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellip
ticF(cos(1/2*d*x+1/2*c),2^(1/2))+16*a^3/b^3/(-2*a*b+2*b^2)*(sin(1/2*d*x+1/2
*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin
```

```
(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2)))
/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+b*cos(d*x+c))^2,x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(7/2)/(a+b*cos(d*x+c))**2,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{7}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(7/2)/(b*cos(d*x + c) + a)^2, x)
```

Giac [F]

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{7}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+b*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(7/2)/(b*cos(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\cos\left(c+d\,x\right)^{7/2}}{\left(a+b\,\cos\left(c+d\,x\right)\right)^2}\,dx$$

```
[In] int(cos(c + d*x)^(7/2)/(a + b*cos(c + d*x))^2,x)
[Out] int(cos(c + d*x)^(7/2)/(a + b*cos(c + d*x))^2, x)
```

3.589 $\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 185

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \frac{(3a^2-2b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^2\,(a^2-b^2)\,d} - \frac{a(3a^2-4b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b^3\,(a^2-b^2)\,d} + \frac{a^2(3a^2-5b^2)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{(a-b)b^3(a+b)^2d} - \frac{a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{b\,(a^2-b^2)\,d(a+b\cos(c+dx))}$$

```
[Out] (3*a^2-2*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin
(1/2*d*x+1/2*c),2^(1/2))/b^2/(a^2-b^2)/d-a*(3*a^2-4*b^2)*(cos(1/2*d*x+1/2*c
)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/b^3/(a^
2-b^2)/d+a^2*(3*a^2-5*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*
EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))/(a-b)/b^3/(a+b)^2/d-a^2*si
n(d*x+c)*cos(d*x+c)^(1/2)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 185, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used

= {2871, 3138, 2719, 3081, 2720, 2884}

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \frac{(3a^2-2b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^2d\,(a^2-b^2)} - \frac{a^2\sin(c+dx)\sqrt{\cos(c+dx)}}{bd\,(a^2-b^2)\,(a+b\cos(c+dx))} - \frac{a(3a^2-4b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b^3d\,(a^2-b^2)} + \frac{a^2(3a^2-5b^2)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{b^3d(a-b)(a+b)^2}$$

```
[In] Int[Cos[c + d*x]^(5/2)/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] ((3*a^2 - 2*b^2)*EllipticE[(c + d*x)/2, 2])/(b^2*(a^2 - b^2)*d) - (a*(3*a^2
 - 4*b^2)*EllipticF[(c + d*x)/2, 2])/(b^3*(a^2 - b^2)*d) + (a^2*(3*a^2 - 5*
b^2)*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/((a - b)*b^3*(a + b)^2*d) -
 (a^2*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(b*(a^2 - b^2)*d*(a + b*Cos[c + d*x]
))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
```

```
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))} - \frac{\int \frac{\frac{a^2}{2}-ab\cos(c+dx)-\frac{1}{2}(3a^2-2b^2)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{b(a^2-b^2)} \\
&= -\frac{a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))} + \frac{\int \frac{-\frac{a^2b}{2}-\frac{1}{2}a(3a^2-4b^2)\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{b^2(a^2-b^2)} \\
&\quad + \frac{(3a^2-2b^2)\int\sqrt{\cos(c+dx)}\,dx}{2b^2(a^2-b^2)} \\
&= \frac{(3a^2-2b^2)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^2(a^2-b^2)d} - \frac{a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))} \\
&\quad + \frac{(a^2(3a^2-5b^2))\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{2b^3(a^2-b^2)} - \frac{(a(3a^2-4b^2))\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{2b^3(a^2-b^2)} \\
&= \frac{(3a^2-2b^2)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^2(a^2-b^2)d} - \frac{a(3a^2-4b^2)\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b^3(a^2-b^2)d} \\
&\quad + \frac{a^2(3a^2-5b^2)\operatorname{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{(a-b)b^3(a+b)^2d} - \frac{a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{b(a^2-b^2)d(a+b\cos(c+dx))}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.24 (sec) , antiderivative size = 251, normalized size of antiderivative = 1.36

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$
$$= \frac{\frac{4a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{(-a^2+b^2)(a+b\cos(c+dx))} + \frac{\frac{2(a^2-2b^2)\operatorname{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b} + 4a\left(2\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right) - \frac{2a\operatorname{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b}\right) + \frac{2(3a^2-2b^2)(}{}}{}}{4bd}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] ((4*a^2*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/((-a^2 + b^2)*(a + b*Cos[c + d*x])
) + ((2*(a^2 - 2*b^2)*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(a + b) +
4*a*(2*EllipticF[(c + d*x)/2, 2] - (2*a*EllipticPi[(2*b)/(a + b), (c + d*x)
/2, 2])/(a + b)) + (2*(3*a^2 - 2*b^2)*(-2*a*b*EllipticE[ArcSin[Sqrt[Cos[c +
 d*x]]], -1] + 2*a*(a + b)*EllipticF[ArcSin[Sqrt[Cos[c + d*x]]], -1] + (-2*
a^2 + b^2)*EllipticPi[-(b/a), ArcSin[Sqrt[Cos[c + d*x]]], -1])*Sin[c + d*x]
)/(a*b^2*Sqrt[Sin[c + d*x]^2]))/((a - b)*(a + b)))/(4*b*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 814 vs. $2(261) = 522$.

Time = 17.08 (sec) , antiderivative size = 815, normalized size of antiderivative = 4.41

method	result	size
default	Expression too large to display	815

```
[In] int(cos(d*x+c)^(5/2)/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2/b^3/(-2*sin(
1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/
2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*a+
b*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))-12/b^2*a^2/(-2*a*b+2*b^2)*(sin(1/2
*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*
c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2
^(1/2))-2/b^3*a^3*(-1/a*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/
2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+
b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1
/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^
(1/2))-1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c
)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF
(cos(1/2*d*x+1/2*c),2^(1/2))+1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)
*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2
```

```
*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*
b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*s
in(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*
c),-2*b/(a-b),2^(1/2))+1/a/(a^2-b^2)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)
^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/
2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))))/s
in(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx=\text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^2,x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx=\text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)/(a+b*cos(d*x+c))**2,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx=\int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(5/2)/(b*cos(d*x + c) + a)^2, x)
```

Giac [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(5/2)/(b*cos(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\cos\left(c+d\,x\right)^{5/2}}{\left(a+b\,\cos\left(c+d\,x\right)\right)^2}\,dx$$

```
[In] int(cos(c + d*x)^(5/2)/(a + b*cos(c + d*x))^2,x)
[Out] int(cos(c + d*x)^(5/2)/(a + b*cos(c + d*x))^2, x)
```

3.590 $\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^2} dx$

Optimal result

Integrand size = 23, antiderivative size = 163

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^2} dx = -\frac{aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{b(a^2-b^2)d} + \frac{(a^2-2b^2)\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b^2(a^2-b^2)d} - \frac{a(a^2-3b^2)\operatorname{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{(a-b)b^2(a+b)^2d} + \frac{a\sqrt{\cos(c+dx)}\sin(c+dx)}{(a^2-b^2)d(a+b\cos(c+dx))}$$

```
[Out] -a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/
2*c),2^(1/2))/b/(a^2-b^2)/d+(a^2-2*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/
2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/b^2/(a^2-b^2)/d-a*(a^2-3
*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*
x+1/2*c),2*b/(a+b),2^(1/2))/(a-b)/b^2/(a+b)^2/d+a*sin(d*x+c)*cos(d*x+c)^(1/
2)/(a^2-b^2)/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2878, 3138, 2719, 3081, 2720, 2884}

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^2} dx = \frac{(a^2-2b^2)\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b^2d(a^2-b^2)} - \frac{aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{bd(a^2-b^2)} - \frac{a(a^2-3b^2)\operatorname{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{b^2d(a-b)(a+b)^2} + \frac{a\sin(c+dx)\sqrt{\cos(c+dx)}}{d(a^2-b^2)(a+b\cos(c+dx))}$$

```
[In] Int[Cos[c + d*x]^(3/2)/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] -((a*EllipticE[(c + d*x)/2, 2])/(b*(a^2 - b^2)*d)) + ((a^2 - 2*b^2)*Ellipti
cF[(c + d*x)/2, 2])/(b^2*(a^2 - b^2)*d) - (a*(a^2 - 3*b^2)*EllipticPi[(2*b)
/(a + b), (c + d*x)/2, 2])/((a - b)*b^2*(a + b)^2*d) + (a*Sqrt[Cos[c + d*x]
]*Sin[c + d*x])/((a^2 - b^2)*d*(a + b*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2878

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*(a + b*Si
n[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n - 1)/(f*(m + 1)*(a^2 - b^2))),
 x] + Dist[1/((m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d
*Sin[e + f*x])^(n - 2)*Simp[c*(a*c - b*d)*(m + 1) + d*(b*c - a*d)*(n - 1) +
 (d*(a*c - b*d)*(m + 1) - c*(b*c - a*d)*(m + 2))*Sin[e + f*x] - d*(b*c - a*
d)*(m + n + 1)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &
& NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1]
 && LtQ[1, n, 2] && IntegersQ[2*m, 2*n]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{a\sqrt{\cos(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(a+b\cos(c+dx))} + \frac{\int \frac{-\frac{a}{2}+b\cos(c+dx)+\frac{1}{2}a\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{-a^2+b^2}$$

$$= \frac{a\sqrt{\cos(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(a+b\cos(c+dx))} + \frac{\int \frac{\frac{ab}{2}+\frac{1}{2}(a^2-2b^2)\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{b\,(a^2-b^2)} - \frac{a\int \sqrt{\cos(c+dx)}\,dx}{2b\,(a^2-b^2)}$$

$$= -\frac{aE\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{b\,(a^2-b^2)\,d} + \frac{a\sqrt{\cos(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(a+b\cos(c+dx))} - \frac{(a(a^2-3b^2))\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{2b^2\,(a^2-b^2)} + \frac{(a^2-2b^2)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{2b^2\,(a^2-b^2)}$$

$$= -\frac{aE\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{b\,(a^2-b^2)\,d} + \frac{(a^2-2b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b^2\,(a^2-b^2)\,d} - \frac{a(a^2-3b^2)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{(a-b)b^2(a+b)^2d} + \frac{a\sqrt{\cos(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 2.21 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.19

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$

$$= \frac{\frac{4a\sqrt{\cos(c+dx)}\sin(c+dx)}{(a^2-b^2)(a+b\cos(c+dx))} - \frac{8\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right) - \frac{10a\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b} + \frac{2\left(-2abE\left(\arcsin\left(\sqrt{\cos(c+dx)}\right)\middle|-1\right)+2a(a+b)\,\text{EllipticF}\left(\arcsin\left(\sqrt{\right.\right.}{}}{}}{(a-b)(a+b)}}{4d}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] ((4*a*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/((a^2 - b^2)*(a + b*Cos[c + d*x])) -
 (8*EllipticF[(c + d*x)/2, 2] - (10*a*EllipticPi[(2*b)/(a + b), (c + d*x)/2
, 2])/(a + b) + (2*(-2*a*b*EllipticE[ArcSin[Sqrt[Cos[c + d*x]]], -1] + 2*a*
(a + b)*EllipticF[ArcSin[Sqrt[Cos[c + d*x]]], -1] + (-2*a^2 + b^2)*Elliptic
Pi[-(b/a), ArcSin[Sqrt[Cos[c + d*x]]], -1])*Sin[c + d*x])/(b^2*Sqrt[Sin[c +
 d*x]^2]))/((a - b)*(a + b)))/(4*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 793 vs. $2(239) = 478$.

Time = 5.82 (sec) , antiderivative size = 794, normalized size of antiderivative = 4.87

method	result	size
default	Expression too large to display	794

```
[In] int(cos(d*x+c)^(3/2)/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/b^2*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c
)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+2*a^2
/b^2*(-1/a*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/
2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d
*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)
^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a
^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/
(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+
1/2*c),2^(1/2))+1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*
d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*
EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1
/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/
2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b)
,2^(1/2))+1/a/(a^2-b^2)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2)))+8*a/b/(-2*a*b+2
*b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*si
n(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c
),-2*b/(a-b),2^(1/2)))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/
d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(3/2)/(a+b*cos(d*x+c))**2,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{3}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(3/2)/(b*cos(d*x + c) + a)^2, x)
```

Giac [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{3}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(3/2)/(b*cos(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\cos\left(c+d\,x\right)^{3/2}}{\left(a+b\,\cos\left(c+d\,x\right)\right)^2}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)/(a + b*cos(c + d*x))^2,x)
[Out] int(cos(c + d*x)^(3/2)/(a + b*cos(c + d*x))^2, x)
```

3.591 $\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 148

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^2}\,dx = \frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{(a^2-b^2)\,d} + \frac{a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b\,(a^2-b^2)\,d} - \frac{(a^2+b^2)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{(a-b)b(a+b)^2d} - \frac{b\sqrt{\cos(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(a+b\cos(c+dx))}$$

```
[Out] (cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c
),2^(1/2))/(a^2-b^2)/d+a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*El
lipticF(sin(1/2*d*x+1/2*c),2^(1/2))/b/(a^2-b^2)/d-(a^2+b^2)*(cos(1/2*d*x+1/
2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^
(1/2))/(a-b)/b/(a+b)^2/d-b*sin(d*x+c)*cos(d*x+c)^(1/2)/(a^2-b^2)/d/(a+b*cos
(d*x+c))
```

Rubi [A] (verified)

Time = 0.42 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2875, 3138, 2719, 3081, 2720, 2884}

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^2}\,dx = \frac{a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{bd\,(a^2-b^2)} + \frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\,(a^2-b^2)} - \frac{(a^2+b^2)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{bd(a-b)(a+b)^2} - \frac{b\sin(c+dx)\sqrt{\cos(c+dx)}}{d\,(a^2-b^2)\,(a+b\cos(c+dx))}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] EllipticE[(c + d*x)/2, 2]/((a^2 - b^2)*d) + (a*EllipticF[(c + d*x)/2, 2])/(
b*(a^2 - b^2)*d) - ((a^2 + b^2)*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/
((a - b)*b*(a + b)^2*d) - (b*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/((a^2 - b^2)*
d*(a + b*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2875

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m + 1)*((c + d*Sin[e + f*x])^n/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m
 + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(
n - 1)*Simp[a*c*(m + 1) + b*d*n + (a*d*(m + 1) - b*c*(m + 2))*Sin[e + f*x]
- b*d*(m + n + 2)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x
] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m,
-1] && LtQ[0, n, 1] && IntegersQ[2*m, 2*n]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
```

```
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{b\sqrt{\cos(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(a+b\cos(c+dx))}+\frac{\int\frac{\frac{b}{2}-a\cos(c+dx)-\frac{1}{2}b\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{-a^2+b^2}\\
&= -\frac{b\sqrt{\cos(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(a+b\cos(c+dx))}+\frac{\int\sqrt{\cos(c+dx)}\,dx}{2\,(a^2-b^2)}+\frac{\int\frac{-\frac{b^2}{2}+\frac{1}{2}ab\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{b\,(a^2-b^2)}\\
&= \frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{(a^2-b^2)\,d}-\frac{b\sqrt{\cos(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(a+b\cos(c+dx))}\\
&\quad+\frac{a\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{2b\,(a^2-b^2)}-\frac{(a^2+b^2)\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{2b\,(a^2-b^2)}\\
&= \frac{E\left(\frac{1}{2}(c+dx)\middle|2\right)}{(a^2-b^2)\,d}+\frac{a\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b\,(a^2-b^2)\,d}\\
&\quad-\frac{(a^2+b^2)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{(a-b)b(a+b)^2d}-\frac{b\sqrt{\cos(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(a+b\cos(c+dx))}
\end{aligned}$$

Mathematica [A] (verified)

Time = 2.61 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.55

$$\int\frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^2}\,dx = \frac{\frac{4b\sqrt{\cos(c+dx)}\sin(c+dx)}{(-a^2+b^2)(a+b\cos(c+dx))}-\frac{2\left(-\frac{b^2\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b}+2a\left(2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)-\frac{2a\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b}\right)+\frac{\left(-2abE\left(\arcsin\left(\cdots\right.\right.\right.}{\cdots}\right)}{b(-\cdots}}{4d}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] ((4*b*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/((-a^2 + b^2)*(a + b*Cos[c + d*x]))
- (2*(-((b^2*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(a + b)) + 2*a*(2*E
llipticF[(c + d*x)/2, 2] - (2*a*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/
(a + b)) + ((-2*a*b*EllipticE[ArcSin[Sqrt[Cos[c + d*x]]], -1] + 2*a*(a + b)
*EllipticF[ArcSin[Sqrt[Cos[c + d*x]]], -1] + (-2*a^2 + b^2)*EllipticPi[-(b/
a), ArcSin[Sqrt[Cos[c + d*x]]], -1])*Sin[c + d*x])/(a*Sqrt[Sin[c + d*x]^2])
))/(b*(-a + b)*(a + b)))/(4*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 712 vs. $2(224) = 448$.

Time = 5.60 (sec) , antiderivative size = 713, normalized size of antiderivative = 4.82

method	result
default	$-\frac{\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-\frac{4\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,\Pi\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),-\frac{2b}{a-b},\sqrt{2}\right)}{\left(-2ab+2b^2\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}-\frac{2a\left(-\frac{b^2\cos\left(\frac{dx}{2}+\right.}{a\left(a\right.}\right.}{}\right.}{}$

[In] int(cos(d*x+c)^(1/2)/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)

[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-4/(-2*a*b+2*b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))-2/b*a*(-1/a*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+1/a/(a^2-b^2)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

[In] integrate(cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^2,x, algorithm="fricas")

[Out] Timed out

Sympy [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(1/2)/(a+b*cos(d*x+c))**2,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\sqrt{\cos(dx+c)}}{(b\cos(dx+c)+a)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(sqrt(cos(d*x + c))/(b*cos(d*x + c) + a)^2, x)
```

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\sqrt{\cos(dx+c)}}{(b\cos(dx+c)+a)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(sqrt(cos(d*x + c))/(b*cos(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\sqrt{\cos(c+d\,x)}}{(a+b\,\cos(c+d\,x))^2}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(a + b*cos(c + d*x))^2,x)
[Out] int(cos(c + d*x)^(1/2)/(a + b*cos(c + d*x))^2, x)
```

3.592 $\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 157

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2}\,dx = -\frac{bE\left(\frac{1}{2}(c+dx)\middle|2\right)}{a(a^2-b^2)d} - \frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{(a^2-b^2)d} + \frac{(3a^2-b^2)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a(a-b)(a+b)^2d} + \frac{b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{a(a^2-b^2)d(a+b\cos(c+dx))}$$

```
[Out] -b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/
2*c),2^(1/2))/a/(a^2-b^2)/d-(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)
*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/(a^2-b^2)/d+(3*a^2-b^2)*(cos(1/2*d*x
+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b)
,2^(1/2))/a/(a-b)/(a+b)^2/d+b^2*sin(d*x+c)*cos(d*x+c)^(1/2)/a/(a^2-b^2)/d/(
a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2881, 3138, 2719, 3081, 2720, 2884}

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2}\,dx = -\frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d(a^2-b^2)} - \frac{bE\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad(a^2-b^2)} + \frac{(3a^2-b^2)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{ad(a-b)(a+b)^2} + \frac{b^2\sin(c+dx)\sqrt{\cos(c+dx)}}{ad(a^2-b^2)(a+b\cos(c+dx))}$$

```
[In] Int[1/(Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])^2),x]
```

```
[Out] -((b*EllipticE[(c + d*x)/2, 2])/(a*(a^2 - b^2)*d)) - EllipticF[(c + d*x)/2,
 2]/((a^2 - b^2)*d) + ((3*a^2 - b^2)*EllipticPi[(2*b)/(a + b), (c + d*x)/2,
 2])/(a*(a - b)*(a + b)^2*d) + (b^2*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(a*(a^
2 - b^2)*d*(a + b*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{a(a^2-b^2)d(a+b\cos(c+dx))}+\frac{\int \frac{\frac{1}{2}(2a^2-b^2)-ab\cos(c+dx)-\frac{1}{2}b^2\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{a(a^2-b^2)}$$

$$=\frac{b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{a(a^2-b^2)d(a+b\cos(c+dx))}-\frac{\int \frac{-\frac{1}{2}b(2a^2-b^2)+\frac{1}{2}ab^2\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{ab(a^2-b^2)}-\frac{b\int \sqrt{\cos(c+dx)}\,dx}{2a(a^2-b^2)}$$

$$=-\frac{bE\left(\frac{1}{2}(c+dx)\middle|2\right)}{a(a^2-b^2)d}+\frac{b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{a(a^2-b^2)d(a+b\cos(c+dx))} - \frac{\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{2(a^2-b^2)}+\frac{(3a^2-b^2)\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{2a(a^2-b^2)}$$

$$=-\frac{bE\left(\frac{1}{2}(c+dx)\middle|2\right)}{a(a^2-b^2)d}-\frac{\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{(a^2-b^2)d} + \frac{(3a^2-b^2)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a(a-b)(a+b)^2d}+\frac{b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{a(a^2-b^2)d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 2.33 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.52

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2}\,dx$$

$$=\frac{\frac{4b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{(a^2-b^2)(a+b\cos(c+dx))}+\frac{\frac{2(4a^2-3b^2)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b}+8a\left(-\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\frac{a\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b}\right)-\frac{2\left(-2abE\left(\text{arcsi}\right.\right.}{}}{(a-}}{4ad}$$

```
[In] Integrate[1/(Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])^2),x]
[Out] ((4*b^2*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/((a^2 - b^2)*(a + b*Cos[c + d*x]))
 + ((2*(4*a^2 - 3*b^2)*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(a + b) +
 8*a*(-EllipticF[(c + d*x)/2, 2] + (a*EllipticPi[(2*b)/(a + b), (c + d*x)/2
, 2])/(a + b)) - (2*(-2*a*b*EllipticE[ArcSin[Sqrt[Cos[c + d*x]]], -1] + 2*a
*(a + b)*EllipticF[ArcSin[Sqrt[Cos[c + d*x]]], -1] + (-2*a^2 + b^2)*Ellipti
cPi[-(b/a), ArcSin[Sqrt[Cos[c + d*x]]], -1])*Sin[c + d*x])/(a*Sqrt[Sin[c +
d*x]^2]))/((a - b)*(a + b)))/(4*a*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 611 vs. $2(233) = 466$.

Time = 4.75 (sec) , antiderivative size = 612, normalized size of antiderivative = 3.90

method	result
default	$-\frac{\sqrt{-\left(-2\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\left(-\frac{2b^{2}\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^{4}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)}}{a\left(a^{2}-b^{2}\right)\left(2b\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b\right)}-\frac{\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^{2}\left(\frac{dx}{2}+\right.\right.}}{a(a+b)\sqrt{-2\left(\sin^{4}\left(\frac{dx}{2}+\right.\right.}}\right.}{}$

```
[In] int(1/cos(d*x+c)^(1/2)/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2/a*b^2/(a^2-b
^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)
/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/a/(a+b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*
cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2
)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/(a^2-b^2)*b/a*(sin(1/2*d*x+
1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+
sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/(a^2-b^
2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*s
in(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c
),2^(1/2))-6*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*
cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2
)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+2/a/(a^2-b^2)/(-2
*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1
/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2
*d*x+1/2*c),-2*b/(a-b),2^(1/2)))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2
-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(1/2)/(a+b*cos(d*x+c))**2,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^2\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^2*sqrt(cos(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^2\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^2*sqrt(cos(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2}\,dx = \int \frac{1}{\sqrt{\cos(c+d\,x)}\,(a+b\,\cos(c+d\,x))^2}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))^2),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))^2), x)
```

3.593 $\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 217

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2}\,dx = -\frac{(2a^2-3b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{a^2(a^2-b^2)\,d} + \frac{b\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{a(a^2-b^2)\,d} - \frac{b(5a^2-3b^2)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a^2(a-b)(a+b)^2d} + \frac{(2a^2-3b^2)\sin(c+dx)}{a^2(a^2-b^2)\,d\sqrt{\cos(c+dx)}} + \frac{b^2\sin(c+dx)}{a(a^2-b^2)\,d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}$$

```
[Out] -(2*a^2-3*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(si
n(1/2*d*x+1/2*c),2^(1/2))/a^2/(a^2-b^2)/d+b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/co
s(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/a/(a^2-b^2)/d-b*(5*a
^2-3*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/
2*d*x+1/2*c),2*b/(a+b),2^(1/2))/a^2/(a-b)/(a+b)^2/d+(2*a^2-3*b^2)*sin(d*x+c
)/a^2/(a^2-b^2)/d/cos(d*x+c)^(1/2)+b^2*sin(d*x+c)/a/(a^2-b^2)/d/(a+b*cos(d*
x+c))/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.76 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {2881, 3134, 3138, 2719, 3081, 2720, 2884}

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2}\,dx = \frac{b\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{ad\,(a^2-b^2)} - \frac{(2a^2-3b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{a^2d\,(a^2-b^2)} - \frac{b(5a^2-3b^2)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a^2d(a-b)(a+b)^2} + \frac{b^2\sin(c+dx)}{ad\,(a^2-b^2)\sqrt{\cos(c+dx)}(a+b\cos(c+dx))} + \frac{(2a^2-3b^2)\sin(c+dx)}{a^2d\,(a^2-b^2)\sqrt{\cos(c+dx)}}$$

```
[In] Int[1/(Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*x])^2),x]
```

```
[Out] -(((2*a^2 - 3*b^2)*EllipticE[(c + d*x)/2, 2])/(a^2*(a^2 - b^2)*d)) + (b*Ell
ipticF[(c + d*x)/2, 2])/(a*(a^2 - b^2)*d) - (b*(5*a^2 - 3*b^2)*EllipticPi[(
2*b)/(a + b), (c + d*x)/2, 2])/(a^2*(a - b)*(a + b)^2*d) + ((2*a^2 - 3*b^2)
*Sin[c + d*x])/(a^2*(a^2 - b^2)*d*Sqrt[Cos[c + d*x]]) + (b^2*Sin[c + d*x])/
(a*(a^2 - b^2)*d*Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
```

```
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{b^2\sin(c+dx)}{a\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))} + \frac{\int \frac{\frac{1}{2}\left(2a^2-3b^2\right)-ab\cos(c+dx)+\frac{1}{2}b^2\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}\,dx}{a\left(a^2-b^2\right)}$$

$$= \frac{\left(2a^2-3b^2\right)\sin(c+dx)}{a^2\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}} + \frac{b^2\sin(c+dx)}{a\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))} + \frac{2\int \frac{-\frac{1}{4}b\left(4a^2-3b^2\right)-\frac{1}{2}a\left(a^2-2b^2\right)\cos(c+dx)-\frac{1}{4}b\left(2a^2-3b^2\right)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{a^2\left(a^2-b^2\right)}$$

$$= \frac{\left(2a^2-3b^2\right)\sin(c+dx)}{a^2\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}} + \frac{b^2\sin(c+dx)}{a\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))} - \frac{2\int \frac{\frac{1}{4}b^2\left(4a^2-3b^2\right)-\frac{1}{4}ab^3\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{a^2b\left(a^2-b^2\right)} - \frac{\left(2a^2-3b^2\right)\int\sqrt{\cos(c+dx)}\,dx}{2a^2\left(a^2-b^2\right)}$$

$$= -\frac{\left(2a^2-3b^2\right)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2\left(a^2-b^2\right)d} + \frac{\left(2a^2-3b^2\right)\sin(c+dx)}{a^2\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}} + \frac{b^2\sin(c+dx)}{a\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))} + \frac{b\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{2a\left(a^2-b^2\right)} - \frac{\left(b\left(5a^2-3b^2\right)\right)\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{2a^2\left(a^2-b^2\right)}$$

$$= -\frac{\left(2a^2-3b^2\right)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2\left(a^2-b^2\right)d} + \frac{b\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{a\left(a^2-b^2\right)d} - \frac{b\left(5a^2-3b^2\right)\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a^2(a-b)(a+b)^2d} + \frac{\left(2a^2-3b^2\right)\sin(c+dx)}{a^2\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}} + \frac{b^2\sin(c+dx)}{a\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 1.78 (sec) , antiderivative size = 278, normalized size of antiderivative = 1.28

$$\int\frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2}\,dx$$

$$= \frac{-\frac{\frac{2\left(-10a^2b+9b^3\right)\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b}+\frac{\left(-4a^3+8ab^2\right)\left(2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)-\frac{2a\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b}\right)}{b}-\frac{2\left(2a^2-3b^2\right)\left(-2abE\left(\arcsin\left(\sqrt{\cos\right.\right.\right.}{}}{(-a+b)(a+b)}}{}$$

```
[In] Integrate[1/(Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*x])^2),x]
```

```
[Out] (-(((2*(-10*a^2*b + 9*b^3)*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(a +
b) + ((-4*a^3 + 8*a*b^2)*(2*EllipticF[(c + d*x)/2, 2] - (2*a*EllipticPi[(2*
b)/(a + b), (c + d*x)/2, 2])/(a + b)))/b - (2*(2*a^2 - 3*b^2)*(-2*a*b*Ellip
ticE[ArcSin[Sqrt[Cos[c + d*x]]], -1] + 2*a*(a + b)*EllipticF[ArcSin[Sqrt[Co
s[c + d*x]]], -1] + (-2*a^2 + b^2)*EllipticPi[-(b/a), ArcSin[Sqrt[Cos[c + d
*x]]], -1])*Sin[c + d*x])/(a*b*Sqrt[Sin[c + d*x]^2]))/((-a + b)*(a + b))) +
 4*Sqrt[Cos[c + d*x]]*((b^3*Sin[c + d*x])/((-a^2 + b^2)*(a + b*Cos[c + d*x]
)) + 2*Tan[c + d*x]))/(4*a^2*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 846 vs. 2(291) = 582.

Time = 6.61 (sec) , antiderivative size = 847, normalized size of antiderivative = 3.90

method	result	size
default	Expression too large to display	847

```
[In] int(1/cos(d*x+c)^(3/2)/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/a^2/sin(1/2*d
*x+1/2*c)^2/(2*sin(1/2*d*x+1/2*c)^2-1)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x
+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-(sin(1/2*d*x+1/
2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c)
,2^(1/2)))+4*b^2/a^2/(-2*a*b+2*b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/
2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2
)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))-2/a*b*(-1/a*b^2/(a^2-b^
2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/
(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a^2-b^2)*b/a*(sin(1/2*d
*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)
^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/2/(a
^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/
(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+
1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)
*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2
*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+1/a/(a^2-b^2
)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+
1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(co
s(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/
2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^2,x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(3/2)/(a+b*cos(d*x+c))**2,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^2\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^2*cos(d*x + c)^(3/2)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^2\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^2*cos(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2}\,dx = \int \frac{1}{\cos(c+d\,x)^{3/2}\,(a+b\,\cos(c+d\,x))^2}\,dx$$

```
[In] int(1/(cos(c + d*x)^(3/2)*(a + b*cos(c + d*x))^2),x)
[Out] int(1/(cos(c + d*x)^(3/2)*(a + b*cos(c + d*x))^2), x)
```

3.594 $\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^2} dx$

Optimal result

Integrand size = 23, antiderivative size = 281

$$\begin{aligned}\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^2}\,dx &= \frac{b(4a^2-5b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{a^3\,(a^2-b^2)\,d} \\ &+ \frac{(2a^2-5b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2\,(a^2-b^2)\,d} \\ &+ \frac{b^2(7a^2-5b^2)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a^3(a-b)(a+b)^2d} \\ &+ \frac{(2a^2-5b^2)\sin(c+dx)}{3a^2\,(a^2-b^2)\,d\cos^{\frac{3}{2}}(c+dx)} \\ &- \frac{b(4a^2-5b^2)\sin(c+dx)}{a^3\,(a^2-b^2)\,d\sqrt{\cos(c+dx)}} \\ &+ \frac{b^2\sin(c+dx)}{a\,(a^2-b^2)\,d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}\end{aligned}$$

```
[Out] b*(4*a^2-5*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(s
in(1/2*d*x+1/2*c),2^(1/2))/a^3/(a^2-b^2)/d+1/3*(2*a^2-5*b^2)*(cos(1/2*d*x+1
/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^2
/(a^2-b^2)/d+b^2*(7*a^2-5*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2
*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))/a^3/(a-b)/(a+b)^2/d+1/
3*(2*a^2-5*b^2)*sin(d*x+c)/a^2/(a^2-b^2)/d/cos(d*x+c)^(3/2)+b^2*sin(d*x+c)/
a/(a^2-b^2)/d/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))-b*(4*a^2-5*b^2)*sin(d*x+c)/
a^3/(a^2-b^2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 1.06 (sec) , antiderivative size = 281, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {2881, 3134, 3138, 2719, 3081, 2720, 2884}

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^2}\,dx = \frac{(2a^2-5b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d\,(a^2-b^2)} + \frac{b^2\sin(c+dx)}{ad\,(a^2-b^2)\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))} + \frac{(2a^2-5b^2)\sin(c+dx)}{3a^2d\,(a^2-b^2)\cos^{\frac{3}{2}}(c+dx)} + \frac{b(4a^2-5b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{a^3d\,(a^2-b^2)} + \frac{b^2(7a^2-5b^2)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a^3d(a-b)(a+b)^2} - \frac{b(4a^2-5b^2)\sin(c+dx)}{a^3d\,(a^2-b^2)\sqrt{\cos(c+dx)}}$$

```
[In] Int[1/(Cos[c + d*x]^(5/2)*(a + b*Cos[c + d*x])^2),x]
```

```
[Out] (b*(4*a^2 - 5*b^2)*EllipticE[(c + d*x)/2, 2])/(a^3*(a^2 - b^2)*d) + ((2*a^2
 - 5*b^2)*EllipticF[(c + d*x)/2, 2])/(3*a^2*(a^2 - b^2)*d) + (b^2*(7*a^2 -
5*b^2)*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(a^3*(a - b)*(a + b)^2*d)
 + ((2*a^2 - 5*b^2)*Sin[c + d*x])/(3*a^2*(a^2 - b^2)*d*Cos[c + d*x]^(3/2))
- (b*(4*a^2 - 5*b^2)*Sin[c + d*x])/(a^3*(a^2 - b^2)*d*Sqrt[Cos[c + d*x]]) +
 (b^2*Sin[c + d*x])/(a*(a^2 - b^2)*d*Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*x]
))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
```

```
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
```

```
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

integral

$$= \frac{b^2 \sin(c+dx)}{a\left(a^2-b^2\right) d \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))} + \frac{\int \frac{\frac{1}{2}\left(2a^2-5b^2\right)-ab\cos(c+dx)+\frac{3}{2}b^2\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))}\,dx}{a\left(a^2-b^2\right)}$$

$$= \frac{\left(2a^2-5b^2\right)\sin(c+dx)}{3a^2\left(a^2-b^2\right) d\cos^{\frac{3}{2}}(c+dx)} + \frac{b^2\sin(c+dx)}{a\left(a^2-b^2\right) d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))} + \frac{2\int \frac{-\frac{3}{4}b\left(4a^2-5b^2\right)+\frac{1}{2}a\left(a^2+2b^2\right)\cos(c+dx)+\frac{1}{4}b\left(2a^2-5b^2\right)\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}\,dx}{3a^2\left(a^2-b^2\right)}$$

$$= \frac{\left(2a^2-5b^2\right)\sin(c+dx)}{3a^2\left(a^2-b^2\right) d\cos^{\frac{3}{2}}(c+dx)} - \frac{b\left(4a^2-5b^2\right)\sin(c+dx)}{a^3\left(a^2-b^2\right) d\sqrt{\cos(c+dx)}} + \frac{b^2\sin(c+dx)}{a\left(a^2-b^2\right) d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))} + \frac{4\int \frac{\frac{1}{8}\left(2a^4+16a^2b^2-15b^4\right)+\frac{1}{4}ab\left(7a^2-10b^2\right)\cos(c+dx)+\frac{3}{8}b^2\left(4a^2-5b^2\right)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{3a^3\left(a^2-b^2\right)}$$

$$= \frac{\left(2a^2-5b^2\right)\sin(c+dx)}{3a^2\left(a^2-b^2\right) d\cos^{\frac{3}{2}}(c+dx)} - \frac{b\left(4a^2-5b^2\right)\sin(c+dx)}{a^3\left(a^2-b^2\right) d\sqrt{\cos(c+dx)}} + \frac{b^2\sin(c+dx)}{a\left(a^2-b^2\right) d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))} - \frac{4\int \frac{-\frac{1}{8}b\left(2a^4+16a^2b^2-15b^4\right)-\frac{1}{8}ab^2\left(2a^2-5b^2\right)\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{3a^3b\left(a^2-b^2\right)} + \frac{\left(b\left(4a^2-5b^2\right)\right)\int\sqrt{\cos(c+dx)}\,dx}{2a^3\left(a^2-b^2\right)}$$

$$= \frac{b\left(4a^2-5b^2\right)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^3\left(a^2-b^2\right) d} + \frac{\left(2a^2-5b^2\right)\sin(c+dx)}{3a^2\left(a^2-b^2\right) d\cos^{\frac{3}{2}}(c+dx)} - \frac{b\left(4a^2-5b^2\right)\sin(c+dx)}{a^3\left(a^2-b^2\right) d\sqrt{\cos(c+dx)}} + \frac{b^2\sin(c+dx)}{a\left(a^2-b^2\right) d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))} + \frac{\left(2a^2-5b^2\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{6a^2\left(a^2-b^2\right)} + \frac{\left(b^2\left(7a^2-5b^2\right)\right)\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{2a^3\left(a^2-b^2\right)}$$

$$= \frac{b\left(4a^2-5b^2\right)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^3\left(a^2-b^2\right) d} + \frac{\left(2a^2-5b^2\right)\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2\left(a^2-b^2\right) d} + \frac{b^2\left(7a^2-5b^2\right)\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a^3(a-b)(a+b)^2 d} + \frac{\left(2a^2-5b^2\right)\sin(c+dx)}{3a^2\left(a^2-b^2\right) d\cos^{\frac{3}{2}}(c+dx)} - \frac{b\left(4a^2-5b^2\right)\sin(c+dx)}{a^3\left(a^2-b^2\right) d\sqrt{\cos(c+dx)}} + \frac{b^2\sin(c+dx)}{a\left(a^2-b^2\right) d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 2.27 (sec) , antiderivative size = 294, normalized size of antiderivative = 1.05

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^2}\,dx = \frac{\frac{\frac{2(4a^4+44a^2b^2-45b^4)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b}+\frac{8(7a^3-10ab^2)\left((a+b)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)-a\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\right)}{a+b}+\frac{6(4a^2-5b^2)\left(-2abE\left(\arcsin\right.\right.}{}}{(a-b)(a+b)}}{}$$

```
[In] Integrate[1/(Cos[c + d*x]^(5/2)*(a + b*Cos[c + d*x])^2),x]
```

```
[Out] (((2*(4*a^4 + 44*a^2*b^2 - 45*b^4)*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2
])/(a + b) + (8*(7*a^3 - 10*a*b^2)*((a + b)*EllipticF[(c + d*x)/2, 2] - a*E
llipticPi[(2*b)/(a + b), (c + d*x)/2, 2]))/(a + b) + (6*(4*a^2 - 5*b^2)*(-2
*a*b*EllipticE[ArcSin[Sqrt[Cos[c + d*x]]], -1] + 2*a*(a + b)*EllipticF[ArcS
in[Sqrt[Cos[c + d*x]]], -1] + (-2*a^2 + b^2)*EllipticPi[-(b/a), ArcSin[Sqrt
[Cos[c + d*x]]], -1])*Sin[c + d*x])/(a*Sqrt[Sin[c + d*x]^2]))/((a - b)*(a +
 b)) + 4*Sqrt[Cos[c + d*x]]*((3*b^4*Sin[c + d*x])/((a^2 - b^2)*(a + b*Cos[c
 + d*x])) + 2*(-6*b + a*Sec[c + d*x])*Tan[c + d*x]))/(12*a^3*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 980 vs. 2(349) = 698.

Time = 9.05 (sec) , antiderivative size = 981, normalized size of antiderivative = 3.49

method	result	size
default	Expression too large to display	981

```
[In] int(1/cos(d*x+c)^(5/2)/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/a^2*(-1/6*cos
(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1
/2*d*x+1/2*c)^2-1/2)^2+1/3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2
*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellipti
cF(cos(1/2*d*x+1/2*c),2^(1/2)))-4/a^3*b/sin(1/2*d*x+1/2*c)^2/(2*sin(1/2*d*x
+1/2*c)^2-1)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/
2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d
*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))+2*b^2/a^2*(-1/a
*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*
c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d*x+1/2*c)^
2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2
*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a^2-b^2)*b/
a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/
```

```
2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(
1/2))+1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)
^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(
cos(1/2*d*x+1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2
*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin
(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+
1/a/(a^2-b^2)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d
*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*E
llipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2)))-8*b^3/a^3/(-2*a*b+2*b^2)*
(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*
d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b
/(a-b),2^(1/2)))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^2,x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(5/2)/(a+b*cos(d*x+c))**2,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^2}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^2\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^2*cos(d*x + c)^(5/2)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^2}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^2\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^2*cos(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^2}\,dx = \int \frac{1}{\cos(c+d\,x)^{5/2}\,(a+b\,\cos(c+d\,x))^2}\,dx$$

```
[In] int(1/(cos(c + d*x)^(5/2)*(a + b*cos(c + d*x))^2),x)
[Out] int(1/(cos(c + d*x)^(5/2)*(a + b*cos(c + d*x))^2), x)
```

3.595 $\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 346

$$
\begin{aligned}
\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = &-\frac{a(35a^4-65a^2b^2+24b^4)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4b^4(a^2-b^2)^2 d} \\
&+\frac{(105a^6-223a^4b^2+128a^2b^4+8b^6)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{12b^5(a^2-b^2)^2 d} \\
&-\frac{a^3(35a^4-86a^2b^2+63b^4)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4(a-b)^2b^5(a+b)^3d} \\
&+\frac{(35a^4-61a^2b^2+8b^4)\sqrt{\cos(c+dx)}\sin(c+dx)}{12b^3(a^2-b^2)^2 d} \\
&-\frac{a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2} \\
&-\frac{a^2(7a^2-13b^2)\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4b^2(a^2-b^2)^2 d(a+b\cos(c+dx))}
\end{aligned}
$$

```
[Out] -1/4*a*(35*a^4-65*a^2*b^2+24*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+
1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/b^4/(a^2-b^2)^2/d+1/12*(105*a^
6-223*a^4*b^2+128*a^2*b^4+8*b^6)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1
/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/b^5/(a^2-b^2)^2/d-1/4*a^3*(35*a
^4-86*a^2*b^2+63*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellip
ticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))/(a-b)^2/b^5/(a+b)^3/d-1/2*a^2*c
os(d*x+c)^(5/2)*sin(d*x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))^2-1/4*a^2*(7*a^2-
13*b^2)*cos(d*x+c)^(3/2)*sin(d*x+c)/b^2/(a^2-b^2)^2/d/(a+b*cos(d*x+c))+1/12
*(35*a^4-61*a^2*b^2+8*b^4)*sin(d*x+c)*cos(d*x+c)^(1/2)/b^3/(a^2-b^2)^2/d
```

Rubi [A] (verified)

Time = 1.09 (sec) , antiderivative size = 346, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2871, 3126, 3128, 3138, 2719, 3081, 2720, 2884}

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = -\frac{a^2(7a^2-13b^2)\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{4b^2d\,(a^2-b^2)^2\,(a+b\cos(c+dx))} - \frac{a^2\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)}{2bd\,(a^2-b^2)\,(a+b\cos(c+dx))^2} - \frac{a(35a^4-65a^2b^2+24b^4)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4b^4d\,(a^2-b^2)^2} + \frac{(35a^4-61a^2b^2+8b^4)\sin(c+dx)\sqrt{\cos(c+dx)}}{12b^3d\,(a^2-b^2)^2} + \frac{(105a^6-223a^4b^2+128a^2b^4+8b^6)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{12b^5d\,(a^2-b^2)^2} - \frac{a^3(35a^4-86a^2b^2+63b^4)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4b^5d(a-b)^2(a+b)^3}$$

```
[In] Int[Cos[c + d*x]^(9/2)/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] -1/4*(a*(35*a^4 - 65*a^2*b^2 + 24*b^4)*EllipticE[(c + d*x)/2, 2])/(b^4*(a^2
 - b^2)^2*d) + ((105*a^6 - 223*a^4*b^2 + 128*a^2*b^4 + 8*b^6)*EllipticF[(c
+ d*x)/2, 2])/(12*b^5*(a^2 - b^2)^2*d) - (a^3*(35*a^4 - 86*a^2*b^2 + 63*b^4
)*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(4*(a - b)^2*b^5*(a + b)^3*d)
+ ((35*a^4 - 61*a^2*b^2 + 8*b^4)*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(12*b^3*(
a^2 - b^2)^2*d) - (a^2*Cos[c + d*x]^(5/2)*Sin[c + d*x])/(2*b*(a^2 - b^2)*d*
(a + b*Cos[c + d*x])^2) - (a^2*(7*a^2 - 13*b^2)*Cos[c + d*x]^(3/2)*Sin[c +
d*x])/(4*b^2*(a^2 - b^2)^2*d*(a + b*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
```

```
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3126

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(c^2*C - B*c*d + A*d^2))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(c^2 -
d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[e + f*x])^(m -
1)*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*d*(b*d*m + a*c*(n + 1)) + (c*C - B*d
)*(b*c*m + a*d*(n + 1)) - (d*(A*(a*d*(n + 2) - b*c*(n + 1)) + B*(b*d*(n + 1
) - a*c*(n + 2))) - C*(b*c*d*(n + 1) - a*(c^2 + d^2*(n + 1))))*Sin[e + f*x]
 + b*(d*(B*c - A*d)*(m + n + 2) - C*(c^2*(m + 1) + d^2*(n + 1)))*Sin[e + f*
x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d,
 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 0] && LtQ[n, -1]
```

Rule 3128

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*sin[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_
.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n + 2))), x] + Dist[1/(d*(m +
n + 2)), Int[(a + b*Sin[e + f*x])^(m - 1)*(c + d*Sin[e + f*x])^n*Simp[a*A*d
```

```
*(m + n + 2) + C*(b*c*m + a*d*(n + 1)) + (d*(A*b + a*B)*(m + n + 2) - C*(a*
c - b*d*(m + n + 1)))*Sin[e + f*x] + (C*(a*d*m - b*c*(m + 1)) + b*B*d*(m +
n + 2))*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n},
 x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m
, 0] &&  !(IGtQ[n, 0] && ( !IntegerQ[m] || (EqQ[a, 0] && NeQ[c, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{2b\left(a^2-b^2\right)d(a+b\cos(c+dx))^2} \\
&\quad -\frac{\int\frac{\cos^{\frac{3}{2}}(c+dx)\left(\frac{5a^2}{2}-2ab\cos(c+dx)-\frac{1}{2}\left(7a^2-4b^2\right)\cos^2(c+dx)\right)}{(a+b\cos(c+dx))^2}\,dx}{2b\left(a^2-b^2\right)} \\
&= -\frac{a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{2b\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}-\frac{a^2\left(7a^2-13b^2\right)\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4b^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))} \\
&\quad +\frac{\int\frac{\sqrt{\cos(c+dx)}\left(-\frac{3}{4}a^2\left(7a^2-13b^2\right)+ab\left(a^2-4b^2\right)\cos(c+dx)+\frac{1}{4}\left(35a^4-61a^2b^2+8b^4\right)\cos^2(c+dx)\right)}{a+b\cos(c+dx)}\,dx}{2b^2\left(a^2-b^2\right)^2} \\
&= \frac{\left(35a^4-61a^2b^2+8b^4\right)\sqrt{\cos(c+dx)}\sin(c+dx)}{12b^3\left(a^2-b^2\right)^2d} \\
&\quad -\frac{a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{2b\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}-\frac{a^2\left(7a^2-13b^2\right)\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4b^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))} \\
&\quad +\frac{\int\frac{\frac{1}{8}a\left(35a^4-61a^2b^2+8b^4\right)-\frac{1}{2}b\left(7a^4-14a^2b^2-2b^4\right)\cos(c+dx)-\frac{3}{8}a\left(35a^4-65a^2b^2+24b^4\right)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{3b^3\left(a^2-b^2\right)^2}
\end{aligned}$$

$$= \frac{(35a^4 - 61a^2b^2 + 8b^4)\sqrt{\cos(c+dx)}\sin(c+dx)}{12b^3(a^2-b^2)^2 d} - \frac{a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2} - \frac{a^2(7a^2-13b^2)\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4b^2(a^2-b^2)^2 d(a+b\cos(c+dx))} - \frac{\int \frac{-\frac{1}{8}ab(35a^4-61a^2b^2+8b^4)-\frac{1}{8}(105a^6-223a^4b^2+128a^2b^4+8b^6)\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}dx}{3b^4(a^2-b^2)^2} - \frac{(a(35a^4-65a^2b^2+24b^4))\int\sqrt{\cos(c+dx)}dx}{8b^4(a^2-b^2)^2}$$

$$= -\frac{a(35a^4-65a^2b^2+24b^4)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4b^4(a^2-b^2)^2 d} + \frac{(35a^4 - 61a^2b^2 + 8b^4)\sqrt{\cos(c+dx)}\sin(c+dx)}{12b^3(a^2-b^2)^2 d} - \frac{a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2} - \frac{a^2(7a^2-13b^2)\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4b^2(a^2-b^2)^2 d(a+b\cos(c+dx))} - \frac{(a^3(35a^4-86a^2b^2+63b^4))\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}dx}{8b^5(a^2-b^2)^2} + \frac{(105a^6-223a^4b^2+128a^2b^4+8b^6)\int\frac{1}{\sqrt{\cos(c+dx)}}dx}{24b^5(a^2-b^2)^2}$$

$$= -\frac{a(35a^4-65a^2b^2+24b^4)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4b^4(a^2-b^2)^2 d} + \frac{(105a^6-223a^4b^2+128a^2b^4+8b^6)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{12b^5(a^2-b^2)^2 d} - \frac{a^3(35a^4-86a^2b^2+63b^4)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4(a-b)^2b^5(a+b)^3 d} + \frac{(35a^4 - 61a^2b^2 + 8b^4)\sqrt{\cos(c+dx)}\sin(c+dx)}{12b^3(a^2-b^2)^2 d} - \frac{a^2\cos^{\frac{5}{2}}(c+dx)\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2} - \frac{a^2(7a^2-13b^2)\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4b^2(a^2-b^2)^2 d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 2.16 (sec) , antiderivative size = 354, normalized size of antiderivative = 1.02

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx$$

$$= \frac{\frac{4\sqrt{\cos(c+dx)}\left(35a^6-57a^4b^2+4b^6+ab(49a^4-83a^2b^2+16b^4)\cos(c+dx)+4\left(-a^2b+b^3\right)^2\cos(2(c+dx))\right)\sin(c+dx)}{(a^2-b^2)^2(a+b\cos(c+dx))^2} - \frac{\frac{2\left(35a^5-73a^3b^2+56ab^4\right)\text{Elliptic}}{a+b}}{}}{}$$

```
[In] Integrate[Cos[c + d*x]^(9/2)/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] ((4*Sqrt[Cos[c + d*x]]*(35*a^6 - 57*a^4*b^2 + 4*b^6 + a*b*(49*a^4 - 83*a^2*
b^2 + 16*b^4)*Cos[c + d*x] + 4*(-(a^2*b) + b^3)^2*Cos[2*(c + d*x)])*Sin[c +
 d*x])/((a^2 - b^2)^2*(a + b*Cos[c + d*x])^2) - ((2*(35*a^5 - 73*a^3*b^2 +
56*a*b^4)*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(a + b) + (16*(7*a^4 -
 14*a^2*b^2 - 2*b^4)*((a + b)*EllipticF[(c + d*x)/2, 2] - a*EllipticPi[(2*b
)/(a + b), (c + d*x)/2, 2]))/(a + b) + (6*(35*a^4 - 65*a^2*b^2 + 24*b^4)*(-
2*a*b*EllipticE[ArcSin[Sqrt[Cos[c + d*x]]], -1] + 2*a*(a + b)*EllipticF[Arc
Sin[Sqrt[Cos[c + d*x]]], -1] + (-2*a^2 + b^2)*EllipticPi[-(b/a), ArcSin[Sqr
t[Cos[c + d*x]]], -1])*Sin[c + d*x])/(b^2*Sqrt[Sin[c + d*x]^2]))/((a - b)^2
*(a + b)^2))/(48*b^3*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2193 vs. 2(406) = 812.

Time = 87.67 (sec) , antiderivative size = 2194, normalized size of antiderivative = 6.34

method	result	size
default	Expression too large to display	2194

```
[In] int(cos(d*x+c)^(9/2)/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(4/3/b^3*(2*sin(
1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)
+2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(
cos(1/2*d*x+1/2*c),2^(1/2))-3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1
/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-2*sin(1/2*d*x+1/2
*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)-2/b^4*(3*a+2*b)*(sin(1/2*d*x+1/2*c)^2)^(1
/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+
1/2*c)^2)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-EllipticE(cos(1/2*d*
x+1/2*c),2^(1/2)))+2*(6*a^2+3*a*b+b^2)/b^5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-2/b^5*a^5*(-1/2/a*b^2/(a^2-b
```

^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)
/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)^2-3/4*b^2*(3*a^2-b^2)/a^2/(a^2-b^2)^2*cos(1
/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos
(1/2*d*x+1/2*c)^2+a-b)-7/8/(a+b)/(a^2-b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/4/(a+b)/(a^2-b^2)/a*(sin(1
/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/
2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*b+
3/8/(a+b)/(a^2-b^2)/a^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)
^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(
cos(1/2*d*x+1/2*c),2^(1/2))*b^2-9/8*b/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1
/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+
1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+3/8*b^3/a^2/(a^2-b^2)
^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1
/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^
(1/2))+9/8*b/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c
)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE
(cos(1/2*d*x+1/2*c),2^(1/2))-3/8*b^3/a^2/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)
^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d
*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-15/4*a^2/(a^2-b^2)
^2/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1
)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos
(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+3/2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b^3*(sin
(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+
1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-
b),2^(1/2))-3/4/a^2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b^5*(sin(1/2*d*x+1/2*c)^2)^(
1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x
+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2)))+10/b^5*
a^4*(-1/a*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2
*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^
4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a^
2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(
-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1
/2*c),2^(1/2))+1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d
*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*E
llipticE(cos(1/2*d*x+1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1/
2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2
*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),
2^(1/2))+1/a/(a^2-b^2)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*
cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2
)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2)))+40/b^4*a^3/(-2*a
*b+2*b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-
2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1
/2*c),-2*b/(a-b),2^(1/2)))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1

```
/2)/d
```

Fricas [F]

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\cos(dx+c)^{\frac{9}{2}}}{(b\cos(dx+c)+a)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(9/2)/(a+b*cos(d*x+c))^3,x, algorithm="fricas")
[Out] integral(cos(d*x + c)^(9/2)/(b^3*cos(d*x + c)^3 + 3*a*b^2*cos(d*x + c)^2 +
3*a^2*b*cos(d*x + c) + a^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(9/2)/(a+b*cos(d*x+c))**3,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\cos(dx+c)^{\frac{9}{2}}}{(b\cos(dx+c)+a)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(9/2)/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(9/2)/(b*cos(d*x + c) + a)^3, x)
```

Giac [F]

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\cos(dx+c)^{\frac{9}{2}}}{(b\cos(dx+c)+a)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(9/2)/(a+b*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(9/2)/(b*cos(d*x + c) + a)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\cos\left(c+d\,x\right)^{9/2}}{\left(a+b\,\cos\left(c+d\,x\right)\right)^3}\,dx$$

```
[In] int(cos(c + d*x)^(9/2)/(a + b*cos(c + d*x))^3,x)
[Out] int(cos(c + d*x)^(9/2)/(a + b*cos(c + d*x))^3, x)
```

3.596 $\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 282

$$\begin{aligned}\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx &= \frac{(15a^4-29a^2b^2+8b^4)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4b^3\left(a^2-b^2\right)^2d} \\ &\quad - \frac{3a(5a^4-11a^2b^2+8b^4)\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4b^4\left(a^2-b^2\right)^2d} \\ &\quad + \frac{a^2(15a^4-38a^2b^2+35b^4)\operatorname{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4(a-b)^2b^4(a+b)^3d} \\ &\quad - \frac{a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2b\left(a^2-b^2\right)d(a+b\cos(c+dx))^2} \\ &\quad - \frac{a^2(5a^2-11b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4b^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}\end{aligned}$$

```
[Out] 1/4*(15*a^4-29*a^2*b^2+8*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*
c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/b^3/(a^2-b^2)^2/d-3/4*a*(5*a^4-11*
a^2*b^2+8*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(si
n(1/2*d*x+1/2*c),2^(1/2))/b^4/(a^2-b^2)^2/d+1/4*a^2*(15*a^4-38*a^2*b^2+35*b
^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+
1/2*c),2*b/(a+b),2^(1/2))/(a-b)^2/b^4/(a+b)^3/d-1/2*a^2*cos(d*x+c)^(3/2)*si
n(d*x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))^2-1/4*a^2*(5*a^2-11*b^2)*sin(d*x+c)
*cos(d*x+c)^(1/2)/b^2/(a^2-b^2)^2/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 1.10 (sec) , antiderivative size = 282, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {2871, 3126, 3138, 2719, 3081, 2720, 2884}

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = -\frac{a^2\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{2bd(a^2-b^2)(a+b\cos(c+dx))^2} - \frac{a^2(5a^2-11b^2)\sin(c+dx)\sqrt{\cos(c+dx)}}{4b^2d(a^2-b^2)^2(a+b\cos(c+dx))} - \frac{3a(5a^4-11a^2b^2+8b^4)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4b^4d(a^2-b^2)^2} + \frac{a^2(15a^4-38a^2b^2+35b^4)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4b^4d(a-b)^2(a+b)^3} + \frac{(15a^4-29a^2b^2+8b^4)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4b^3d(a^2-b^2)^2}$$

```
[In] Int[Cos[c + d*x]^(7/2)/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] ((15*a^4 - 29*a^2*b^2 + 8*b^4)*EllipticE[(c + d*x)/2, 2])/(4*b^3*(a^2 - b^2
)^2*d) - (3*a*(5*a^4 - 11*a^2*b^2 + 8*b^4)*EllipticF[(c + d*x)/2, 2])/(4*b^
4*(a^2 - b^2)^2*d) + (a^2*(15*a^4 - 38*a^2*b^2 + 35*b^4)*EllipticPi[(2*b)/(
a + b), (c + d*x)/2, 2])/(4*(a - b)^2*b^4*(a + b)^3*d) - (a^2*Cos[c + d*x]^
(3/2)*Sin[c + d*x])/(2*b*(a^2 - b^2)*d*(a + b*Cos[c + d*x])^2) - (a^2*(5*a^
2 - 11*b^2)*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(4*b^2*(a^2 - b^2)^2*d*(a + b*
Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
```

```
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3126

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(c^2*C - B*c*d + A*d^2))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(c^2 -
d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[e + f*x])^(m -
1)*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*d*(b*d*m + a*c*(n + 1)) + (c*C - B*d
)*(b*c*m + a*d*(n + 1)) - (d*(A*(a*d*(n + 2) - b*c*(n + 1)) + B*(b*d*(n + 1
) - a*c*(n + 2))) - C*(b*c*d*(n + 1) - a*(c^2 + d^2*(n + 1))))*Sin[e + f*x]
 + b*(d*(B*c - A*d)*(m + n + 2) - C*(c^2*(m + 1) + d^2*(n + 1)))*Sin[e + f*
x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d,
 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 0] && LtQ[n, -1]
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = -\frac{a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2b(a^2-b^2)\,d(a+b\cos(c+dx))^2} - \frac{\int\frac{\sqrt{\cos(c+dx)}\left(\frac{3a^2}{2}-2ab\cos(c+dx)-\frac{1}{2}(5a^2-4b^2)\cos^2(c+dx)\right)}{(a+b\cos(c+dx))^2}dx}{2b(a^2-b^2)}$$

$$= -\frac{a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2b(a^2-b^2)\,d(a+b\cos(c+dx))^2} - \frac{a^2(5a^2-11b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4b^2(a^2-b^2)^2\,d(a+b\cos(c+dx))} + \frac{\int\frac{-\frac{1}{4}a^2(5a^2-11b^2)+ab(a^2-4b^2)\cos(c+dx)+\frac{1}{4}(15a^4-29a^2b^2+8b^4)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}dx}{2b^2(a^2-b^2)^2}$$

$$= -\frac{a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2b(a^2-b^2)\,d(a+b\cos(c+dx))^2} - \frac{a^2(5a^2-11b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4b^2(a^2-b^2)^2\,d(a+b\cos(c+dx))} - \frac{\int\frac{\frac{1}{4}a^2b(5a^2-11b^2)+\frac{3}{4}a(5a^4-11a^2b^2+8b^4)\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}dx}{2b^3(a^2-b^2)^2} + \frac{(15a^4-29a^2b^2+8b^4)\int\sqrt{\cos(c+dx)}\,dx}{8b^3(a^2-b^2)^2}$$

$$= \frac{(15a^4-29a^2b^2+8b^4)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{4b^3(a^2-b^2)^2\,d} - \frac{a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2b(a^2-b^2)\,d(a+b\cos(c+dx))^2} - \frac{a^2(5a^2-11b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4b^2(a^2-b^2)^2\,d(a+b\cos(c+dx))} - \frac{(3a(5a^4-11a^2b^2+8b^4))\int\frac{1}{\sqrt{\cos(c+dx)}}dx}{8b^4(a^2-b^2)^2} + \frac{(a^2(15a^4-38a^2b^2+35b^4))\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}dx}{8b^4(a^2-b^2)^2}$$

$$= \frac{(15a^4-29a^2b^2+8b^4)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{4b^3(a^2-b^2)^2\,d} - \frac{3a(5a^4-11a^2b^2+8b^4)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4b^4(a^2-b^2)^2\,d} + \frac{a^2(15a^4-38a^2b^2+35b^4)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4(a-b)^2b^4(a+b)^3d} - \frac{a^2\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2b(a^2-b^2)\,d(a+b\cos(c+dx))^2} - \frac{a^2(5a^2-11b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4b^2(a^2-b^2)^2\,d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 1.92 (sec) , antiderivative size = 309, normalized size of antiderivative = 1.10

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx$$
$$= \frac{-\frac{2a^2\sqrt{\cos(c+dx)}\left(5a^3-11ab^2+b\left(7a^2-13b^2\right)\cos(c+dx)\right)\sin(c+dx)}{(a^2-b^2)^2(a+b\cos(c+dx))^2} + \frac{\frac{\left(5a^4-7a^2b^2+8b^4\right)\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b} + \frac{8\left(a^3-4ab^2\right)\left((a+b)\,\text{EllipticF}\left(\right.\right.}{}}{}$$

```
[In] Integrate[Cos[c + d*x]^(7/2)/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] ((-2*a^2*Sqrt[Cos[c + d*x]]*(5*a^3 - 11*a*b^2 + b*(7*a^2 - 13*b^2)*Cos[c +
d*x])*Sin[c + d*x])/((a^2 - b^2)^2*(a + b*Cos[c + d*x])^2) + (((5*a^4 - 7*a
^2*b^2 + 8*b^4)*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(a + b) + (8*(a^
3 - 4*a*b^2)*((a + b)*EllipticF[(c + d*x)/2, 2] - a*EllipticPi[(2*b)/(a + b
), (c + d*x)/2, 2]))/(a + b) + ((15*a^4 - 29*a^2*b^2 + 8*b^4)*(-2*a*b*Ellip
ticE[ArcSin[Sqrt[Cos[c + d*x]]], -1] + 2*a*(a + b)*EllipticF[ArcSin[Sqrt[Co
s[c + d*x]]], -1] + (-2*a^2 + b^2)*EllipticPi[-(b/a), ArcSin[Sqrt[Cos[c + d
*x]]], -1])*Sin[c + d*x])/(a*b^2*Sqrt[Sin[c + d*x]^2]))/((a - b)^2*(a + b)^
2))/(8*b^2*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1934 vs. 2(346) = 692.

Time = 88.06 (sec) , antiderivative size = 1935, normalized size of antiderivative = 6.86

method	result	size
default	Expression too large to display	1935

```
[In] int(cos(d*x+c)^(7/2)/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2/b^4/(-2*sin(
1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(
2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(3*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*a+
b*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))+2/b^4*a^4*(-1/2/a*b^2/(a^2-b^2)*co
s(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*
cos(1/2*d*x+1/2*c)^2+a-b)^2-3/4*b^2*(3*a^2-b^2)/a^2/(a^2-b^2)^2*cos(1/2*d*x
+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d
*x+1/2*c)^2+a-b)-7/8/(a+b)/(a^2-b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1
/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/
2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/4/(a+b)/(a^2-b^2)/a*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4
+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*b+3/8/(a
```

+b)/(a^2-b^2)/a^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*b^2-9/8*b/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+3/8*b^3/a^2/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+9/8*b/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-3/8*b^3/a^2/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-15/4*a^2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+3/2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))-3/4/a^2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b^5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2)))-24*a^2/b^3/(-2*a*b+2*b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))-8*a^3/b^4*(-1/a*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+1/a/(a^2-b^2)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [F]

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{7}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+b*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] integral(cos(d*x + c)^(7/2)/(b^3*cos(d*x + c)^3 + 3*a*b^2*cos(d*x + c)^2 +
3*a^2*b*cos(d*x + c) + a^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(7/2)/(a+b*cos(d*x+c))**3,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{7}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] integrate(cos(d*x + c)^(7/2)/(b*cos(d*x + c) + a)^3, x)
```

Giac [F]

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{7}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(7/2)/(a+b*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate(cos(d*x + c)^(7/2)/(b*cos(d*x + c) + a)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\cos(c+d\,x)^{7/2}}{(a+b\,\cos(c+d\,x))^3}\,dx$$

```
[In] int(cos(c + d*x)^(7/2)/(a + b*cos(c + d*x))^3,x)
[Out] int(cos(c + d*x)^(7/2)/(a + b*cos(c + d*x))^3, x)
```

3.597 $\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 264

$$\begin{aligned}\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx =& -\frac{3a(a^2-3b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4b^2(a^2-b^2)^2 d} \\ &+ \frac{(3a^4-5a^2b^2+8b^4)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4b^3(a^2-b^2)^2 d} \\ &- \frac{3a(a^4-2a^2b^2+5b^4)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4(a-b)^2b^3(a+b)^3 d} \\ &- \frac{a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{2b(a^2-b^2)\,d(a+b\cos(c+dx))^2} \\ &+ \frac{3a(a^2-3b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4b(a^2-b^2)^2 d(a+b\cos(c+dx))}\end{aligned}$$

```
[Out] -3/4*a*(a^2-3*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elliptic
E(sin(1/2*d*x+1/2*c),2^(1/2))/b^2/(a^2-b^2)^2/d+1/4*(3*a^4-5*a^2*b^2+8*b^4)
*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*
c),2^(1/2))/b^3/(a^2-b^2)^2/d-3/4*a*(a^4-2*a^2*b^2+5*b^4)*(cos(1/2*d*x+1/2*
c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1
/2))/(a-b)^2/b^3/(a+b)^3/d-1/2*a^2*sin(d*x+c)*cos(d*x+c)^(1/2)/b/(a^2-b^2)/
d/(a+b*cos(d*x+c))^2+3/4*a*(a^2-3*b^2)*sin(d*x+c)*cos(d*x+c)^(1/2)/b/(a^2-b
^2)^2/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.85 (sec) , antiderivative size = 264, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {2871, 3134, 3138, 2719, 3081, 2720, 2884}

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = -\frac{3a(a^2-3b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4b^2d\,(a^2-b^2)^2} - \frac{a^2\sin(c+dx)\sqrt{\cos(c+dx)}}{2bd\,(a^2-b^2)\,(a+b\cos(c+dx))^2} + \frac{3a(a^2-3b^2)\sin(c+dx)\sqrt{\cos(c+dx)}}{4bd\,(a^2-b^2)^2\,(a+b\cos(c+dx))} + \frac{(3a^4-5a^2b^2+8b^4)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4b^3d\,(a^2-b^2)^2} - \frac{3a(a^4-2a^2b^2+5b^4)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4b^3d(a-b)^2(a+b)^3}$$

```
[In] Int[Cos[c + d*x]^(5/2)/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (-3*a*(a^2 - 3*b^2)*EllipticE[(c + d*x)/2, 2])/(4*b^2*(a^2 - b^2)^2*d) + ((
3*a^4 - 5*a^2*b^2 + 8*b^4)*EllipticF[(c + d*x)/2, 2])/(4*b^3*(a^2 - b^2)^2*
d) - (3*a*(a^4 - 2*a^2*b^2 + 5*b^4)*EllipticPi[(2*b)/(a + b), (c + d*x)/2,
2])/(4*(a - b)^2*b^3*(a + b)^3*d) - (a^2*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(
2*b*(a^2 - b^2)*d*(a + b*Cos[c + d*x])^2) + (3*a*(a^2 - 3*b^2)*Sqrt[Cos[c +
 d*x]]*Sin[c + d*x])/(4*b*(a^2 - b^2)^2*d*(a + b*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
```

```
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

```
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = -\frac{a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2} - \frac{\int \frac{\frac{a^2}{2}-2ab\cos(c+dx)-\frac{1}{2}(3a^2-4b^2)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2}\,dx}{2b(a^2-b^2)}$$

$$= -\frac{a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2} + \frac{3a(a^2-3b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4b(a^2-b^2)^2d(a+b\cos(c+dx))} - \frac{\int \frac{-\frac{1}{4}a^2(a^2-7b^2)-ab(a^2+2b^2)\cos(c+dx)+\frac{3}{4}a^2(a^2-3b^2)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{2ab(a^2-b^2)^2}$$

$$= -\frac{a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2} + \frac{3a(a^2-3b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4b(a^2-b^2)^2d(a+b\cos(c+dx))} + \frac{\int \frac{\frac{1}{4}a^2b(a^2-7b^2)+\frac{1}{4}a(3a^4-5a^2b^2+8b^4)\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{2ab^2(a^2-b^2)^2} - \frac{(3a(a^2-3b^2))\int \sqrt{\cos(c+dx)}\,dx}{8b^2(a^2-b^2)^2}$$

$$= -\frac{3a(a^2-3b^2)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4b^2(a^2-b^2)^2d} - \frac{a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2} + \frac{3a(a^2-3b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4b(a^2-b^2)^2d(a+b\cos(c+dx))} - \frac{(3a(a^4-2a^2b^2+5b^4))\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{8b^3(a^2-b^2)^2} + \frac{(3a^4-5a^2b^2+8b^4)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{8b^3(a^2-b^2)^2}$$

$$= -\frac{3a(a^2-3b^2)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4b^2(a^2-b^2)^2d} + \frac{(3a^4-5a^2b^2+8b^4)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4b^3(a^2-b^2)^2d} - \frac{3a(a^4-2a^2b^2+5b^4)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4(a-b)^2b^3(a+b)^3d} - \frac{a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{2b(a^2-b^2)d(a+b\cos(c+dx))^2} + \frac{3a(a^2-3b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4b(a^2-b^2)^2d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 1.44 (sec) , antiderivative size = 284, normalized size of antiderivative = 1.08

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx$$

$$= \frac{\frac{4a\sqrt{\cos(c+dx)}\left(a^3-7ab^2+3b\left(a^2-3b^2\right)\cos(c+dx)\right)\sin(c+dx)}{\left(a^2-b^2\right)^2(a+b\cos(c+dx))^2} - \frac{\frac{2\left(a^3+5ab^2\right)\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b} - \frac{16\left(a^2+2b^2\right)\left((a+b)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)-a\right.}{a+b}}{}}{}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] ((4*a*Sqrt[Cos[c + d*x]]*(a^3 - 7*a*b^2 + 3*b*(a^2 - 3*b^2)*Cos[c + d*x])*S
in[c + d*x])/((a^2 - b^2)^2*(a + b*Cos[c + d*x])^2) - ((2*(a^3 + 5*a*b^2)*E
llipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(a + b) - (16*(a^2 + 2*b^2)*((a +
 b)*EllipticF[(c + d*x)/2, 2] - a*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2]
))/(a + b) + (6*(a^2 - 3*b^2)*(-2*a*b*EllipticE[ArcSin[Sqrt[Cos[c + d*x]]],
 -1] + 2*a*(a + b)*EllipticF[ArcSin[Sqrt[Cos[c + d*x]]], -1] + (-2*a^2 + b^
2)*EllipticPi[-(b/a), ArcSin[Sqrt[Cos[c + d*x]]], -1])*Sin[c + d*x])/(b^2*S
qrt[Sin[c + d*x]^2]))/((a - b)^2*(a + b)^2))/(16*b*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1913 vs. 2(328) = 656.

Time = 86.51 (sec) , antiderivative size = 1914, normalized size of antiderivative = 7.25

method	result	size
default	Expression too large to display	1914

```
[In] int(cos(d*x+c)^(5/2)/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/b^3*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c
)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-2/b^3
*a^3*(-1/2/a*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(
1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)^2-3/4*b^2*(3*a^2-b^2
)/a^2/(a^2-b^2)^2*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1
/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-7/8/(a+b)/(a^2-b^2)*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c
)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/4/(
a+b)/(a^2-b^2)/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(
1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2
*d*x+1/2*c),2^(1/2))*b+3/8/(a+b)/(a^2-b^2)/a^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)
*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2
```

*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*b^2-9/8*b/(a^2-b^2)^2*(s
in(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*
x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)
)+3/8*b^3/a^2/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*
c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Elliptic
F(cos(1/2*d*x+1/2*c),2^(1/2))+9/8*b/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2
)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/
2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-3/8*b^3/a^2/(a^2-b^2)^2
*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2
*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1
/2))-15/4*a^2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+3/2/(a^2-b^2)^2/
(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)
^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(
1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))-3/4/a^2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b^5*(
sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d
*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/
(a-b),2^(1/2)))+12/b^2*a/(-2*a*b+2*b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*co
s(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^
(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+6/b^3*a^2*(-1/a*b^2
/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2
)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d*x+1/2*c)^2)^(
1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x
+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a^2-b^2)*b/a*(s
in(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*
x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)
)+1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1
)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(
1/2*d*x+1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^
2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2
*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+1/a/
(a^2-b^2)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1
/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellip
ticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))))/sin(1/2*d*x+1/2*c)/(2*cos(1/
2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx=\text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^3,x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx=\text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)/(a+b*cos(d*x+c))**3,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx=\int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(5/2)/(b*cos(d*x + c) + a)^3, x)
```

Giac [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx=\int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(5/2)/(b*cos(d*x + c) + a)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\cos\left(c+d\,x\right)^{5/2}}{\left(a+b\,\cos\left(c+d\,x\right)\right)^3}\,dx$$

```
[In] int(cos(c + d*x)^(5/2)/(a + b*cos(c + d*x))^3,x)
[Out] int(cos(c + d*x)^(5/2)/(a + b*cos(c + d*x))^3, x)
```

3.598 $\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 244

$$\begin{aligned}\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = &-\frac{(a^2+5b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{4b\,(a^2-b^2)^2\,d} \\ &+\frac{a(a^2-7b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4b^2\,(a^2-b^2)^2\,d} \\ &-\frac{(a^4-10a^2b^2-3b^4)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4(a-b)^2b^2(a+b)^3d} \\ &+\frac{a\sqrt{\cos(c+dx)}\sin(c+dx)}{2\,(a^2-b^2)\,d(a+b\cos(c+dx))^2} \\ &+\frac{(a^2+5b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4\,(a^2-b^2)^2\,d(a+b\cos(c+dx))}\end{aligned}$$

```
[Out] -1/4*(a^2+5*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(
sin(1/2*d*x+1/2*c),2^(1/2))/b/(a^2-b^2)^2/d+1/4*a*(a^2-7*b^2)*(cos(1/2*d*x+
1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/b^
2/(a^2-b^2)^2/d-1/4*(a^4-10*a^2*b^2-3*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos
(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))/(a-b)^2/b^
2/(a+b)^3/d+1/2*a*sin(d*x+c)*cos(d*x+c)^(1/2)/(a^2-b^2)/d/(a+b*cos(d*x+c))^
2+1/4*(a^2+5*b^2)*sin(d*x+c)*cos(d*x+c)^(1/2)/(a^2-b^2)^2/d/(a+b*cos(d*x+c)
)
```

Rubi [A] (verified)

Time = 0.75 (sec) , antiderivative size = 244, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {2878, 3134, 3138, 2719, 3081, 2720, 2884}

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \frac{a(a^2-7b^2)\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4b^2d\left(a^2-b^2\right)^2} - \frac{(a^2+5b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4bd\left(a^2-b^2\right)^2} + \frac{(a^2+5b^2)\sin(c+dx)\sqrt{\cos(c+dx)}}{4d\left(a^2-b^2\right)^2(a+b\cos(c+dx))} + \frac{a\sin(c+dx)\sqrt{\cos(c+dx)}}{2d\left(a^2-b^2\right)(a+b\cos(c+dx))^2} - \frac{(a^4-10a^2b^2-3b^4)\operatorname{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4b^2d(a-b)^2(a+b)^3}$$

```
[In] Int[Cos[c + d*x]^(3/2)/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] -1/4*((a^2 + 5*b^2)*EllipticE[(c + d*x)/2, 2])/(b*(a^2 - b^2)^2*d) + (a*(a^
2 - 7*b^2)*EllipticF[(c + d*x)/2, 2])/(4*b^2*(a^2 - b^2)^2*d) - ((a^4 - 10*
a^2*b^2 - 3*b^4)*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(4*(a - b)^2*b^
2*(a + b)^3*d) + (a*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(2*(a^2 - b^2)*d*(a +
b*Cos[c + d*x])^2) + ((a^2 + 5*b^2)*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(4*(a^
2 - b^2)^2*d*(a + b*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2878

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*(a + b*Si
n[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n - 1)/(f*(m + 1)*(a^2 - b^2))),
 x] + Dist[1/((m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d
*Sin[e + f*x])^(n - 2)*Simp[c*(a*c - b*d)*(m + 1) + d*(b*c - a*d)*(n - 1) +
 (d*(a*c - b*d)*(m + 1) - c*(b*c - a*d)*(m + 2))*Sin[e + f*x] - d*(b*c - a*
d)*(m + n + 1)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &
```

```
& NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1]
 && LtQ[1, n, 2] && IntegersQ[2*m, 2*n]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{a\sqrt{\cos(c+dx)}\sin(c+dx)}{2\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}-\frac{\int\frac{-\frac{a}{2}+2b\cos(c+dx)-\frac{1}{2}a\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2}\,dx}{2\left(a^2-b^2\right)}\\
&= \frac{a\sqrt{\cos(c+dx)}\sin(c+dx)}{2\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{\left(a^2+5b^2\right)\sqrt{\cos(c+dx)}\sin(c+dx)}{4\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}\\
&\quad-\frac{\int\frac{-\frac{3}{4}a\left(a^2+b^2\right)+3a^2b\cos(c+dx)+\frac{1}{4}a\left(a^2+5b^2\right)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{2a\left(a^2-b^2\right)^2}\\
&= \frac{a\sqrt{\cos(c+dx)}\sin(c+dx)}{2\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{\left(a^2+5b^2\right)\sqrt{\cos(c+dx)}\sin(c+dx)}{4\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}\\
&\quad+\frac{\int\frac{\frac{3}{4}ab\left(a^2+b^2\right)+\frac{1}{4}a^2\left(a^2-7b^2\right)\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{2ab\left(a^2-b^2\right)^2}-\frac{\left(a^2+5b^2\right)\int\sqrt{\cos(c+dx)}\,dx}{8b\left(a^2-b^2\right)^2}\\
&= -\frac{\left(a^2+5b^2\right)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4b\left(a^2-b^2\right)^2d}+\frac{a\sqrt{\cos(c+dx)}\sin(c+dx)}{2\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}\\
&\quad+\frac{\left(a^2+5b^2\right)\sqrt{\cos(c+dx)}\sin(c+dx)}{4\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}+\frac{\left(a\left(a^2-7b^2\right)\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{8b^2\left(a^2-b^2\right)^2}\\
&\quad-\frac{\left(a^4-10a^2b^2-3b^4\right)\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{8b^2\left(a^2-b^2\right)^2}\\
&= -\frac{\left(a^2+5b^2\right)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4b\left(a^2-b^2\right)^2d}+\frac{a\left(a^2-7b^2\right)\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4b^2\left(a^2-b^2\right)^2d}\\
&\quad-\frac{\left(a^4-10a^2b^2-3b^4\right)\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4(a-b)^2b^2(a+b)^3d}\\
&\quad+\frac{a\sqrt{\cos(c+dx)}\sin(c+dx)}{2\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{\left(a^2+5b^2\right)\sqrt{\cos(c+dx)}\sin(c+dx)}{4\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.35 (sec) , antiderivative size = 272, normalized size of antiderivative = 1.11

$$
\int\frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx
$$

$$
=\frac{\frac{4\sqrt{\cos(c+dx)}\left(3a\left(a^2+b^2\right)+b\left(a^2+5b^2\right)\cos(c+dx)\right)\sin(c+dx)}{\left(a^2-b^2\right)^2(a+b\cos(c+dx))^2}-\frac{-\frac{2\left(5a^2+b^2\right)\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b}+24a\left(2\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)-\frac{2a\,\text{Ellipt}}{}\right.}{}}{}
$$

```
[In] Integrate[Cos[c + d*x]^(3/2)/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] ((4*Sqrt[Cos[c + d*x]]*(3*a*(a^2 + b^2) + b*(a^2 + 5*b^2)*Cos[c + d*x])*Sin
[c + d*x])/((a^2 - b^2)^2*(a + b*Cos[c + d*x])^2) - ((-2*(5*a^2 + b^2)*Elli
pticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(a + b) + 24*a*(2*EllipticF[(c + d*x
)/2, 2] - (2*a*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(a + b)) + (2*(a^
2 + 5*b^2)*(-2*a*b*EllipticE[ArcSin[Sqrt[Cos[c + d*x]]], -1] + 2*a*(a + b)*
EllipticF[ArcSin[Sqrt[Cos[c + d*x]]], -1] + (-2*a^2 + b^2)*EllipticPi[-(b/a
), ArcSin[Sqrt[Cos[c + d*x]]], -1])*Sin[c + d*x])/(a*b^2*Sqrt[Sin[c + d*x]^
2]))/((a - b)^2*(a + b)^2))/(16*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1835 vs. $2(308) = 616$.

Time = 9.60 (sec) , antiderivative size = 1836, normalized size of antiderivative = 7.52

method	result	size
default	Expression too large to display	1836

```
[In] int(cos(d*x+c)^(3/2)/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-4/b/(-2*a*b+2*
b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin
(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c)
,-2*b/(a-b),2^(1/2))+2*a^2/b^2*(-1/2/a*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2
*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2
+a-b)^2-3/4*b^2*(3*a^2-b^2)/a^2/(a^2-b^2)^2*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*
d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-7/8
/(a+b)/(a^2-b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(
1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2
*d*x+1/2*c),2^(1/2))+1/4/(a+b)/(a^2-b^2)/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*b+3/8/(a+b)/(a^2-b^2)/a^2*(s
in(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*
x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)
)*b^2-9/8*b/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)
^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(
cos(1/2*d*x+1/2*c),2^(1/2))+3/8*b^3/a^2/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^
(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*
x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+9/8*b/(a^2-b^2)^2*(
sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d
*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2
))-3/8*b^3/a^2/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2
*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellipti
cE(cos(1/2*d*x+1/2*c),2^(1/2))-15/4*a^2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b*(sin(1
/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/
2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b)
```

```
,2^(1/2))+3/2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(
-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c
)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))-3/4/a^2/(a^2-b
^2)^2/(-2*a*b+2*b^2)*b^5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c
)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticP
i(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2)))-4*a/b^2*(-1/a*b^2/(a^2-b^2)*cos(1
/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos
(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2
*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)
*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c
)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1
/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/2/(a^2-b^2)*
b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(
1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2
^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos
(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(
1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+1/a/(a^2-b^2)/(-2*a*
b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)
/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*
x+1/2*c),-2*b/(a-b),2^(1/2))))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1
)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^3,x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(3/2)/(a+b*cos(d*x+c))**3,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{3}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(3/2)/(b*cos(d*x + c) + a)^3, x)
```

Giac [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{3}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(3/2)/(b*cos(d*x + c) + a)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\cos\left(c+d\,x\right)^{3/2}}{\left(a+b\,\cos\left(c+d\,x\right)\right)^3}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)/(a + b*cos(c + d*x))^3,x)
[Out] int(cos(c + d*x)^(3/2)/(a + b*cos(c + d*x))^3, x)
```

3.599 $\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 250

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^3}\,dx = \frac{(5a^2+b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{4a\,(a^2-b^2)^2\,d}+\frac{3(a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4b\,(a^2-b^2)^2\,d} - \frac{(3a^4+10a^2b^2-b^4)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4a(a-b)^2b(a+b)^3d} - \frac{b\sqrt{\cos(c+dx)}\sin(c+dx)}{2\,(a^2-b^2)\,d(a+b\cos(c+dx))^2} - \frac{b(5a^2+b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4a\,(a^2-b^2)^2\,d(a+b\cos(c+dx))}$$

```
[Out] 1/4*(5*a^2+b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(s
in(1/2*d*x+1/2*c),2^(1/2))/a/(a^2-b^2)^2/d+3/4*(a^2+b^2)*(cos(1/2*d*x+1/2*c
)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/b/(a^2-
b^2)^2/d-1/4*(3*a^4+10*a^2*b^2-b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*
x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))/a/(a-b)^2/b/(a+b)
^3/d-1/2*b*sin(d*x+c)*cos(d*x+c)^(1/2)/(a^2-b^2)/d/(a+b*cos(d*x+c))^2-1/4*b
*(5*a^2+b^2)*sin(d*x+c)*cos(d*x+c)^(1/2)/a/(a^2-b^2)^2/d/(a+b*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.77 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {2875, 3134, 3138, 2719, 3081, 2720, 2884}

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^3}\,dx = \frac{3(a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4bd\,(a^2-b^2)^2}+\frac{(5a^2+b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4ad\,(a^2-b^2)^2} - \frac{b(5a^2+b^2)\sin(c+dx)\sqrt{\cos(c+dx)}}{4ad\,(a^2-b^2)^2\,(a+b\cos(c+dx))} - \frac{b\sin(c+dx)\sqrt{\cos(c+dx)}}{2d\,(a^2-b^2)\,(a+b\cos(c+dx))^2} - \frac{(3a^4+10a^2b^2-b^4)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4abd(a-b)^2(a+b)^3}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] ((5*a^2 + b^2)*EllipticE[(c + d*x)/2, 2])/(4*a*(a^2 - b^2)^2*d) + (3*(a^2 +
 b^2)*EllipticF[(c + d*x)/2, 2])/(4*b*(a^2 - b^2)^2*d) - ((3*a^4 + 10*a^2*b
^2 - b^4)*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(4*a*(a - b)^2*b*(a +
b)^3*d) - (b*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(2*(a^2 - b^2)*d*(a + b*Cos[c
 + d*x])^2) - (b*(5*a^2 + b^2)*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(4*a*(a^2 -
 b^2)^2*d*(a + b*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2875

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m + 1)*((c + d*Sin[e + f*x])^n/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m
 + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(
n - 1)*Simp[a*c*(m + 1) + b*d*n + (a*d*(m + 1) - b*c*(m + 2))*Sin[e + f*x]
- b*d*(m + n + 2)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x
] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m,
-1] && LtQ[0, n, 1] && IntegersQ[2*m, 2*n]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = -\frac{b\sqrt{\cos(c+dx)}\sin(c+dx)}{2\left(a^2-b^2\right)d(a+b\cos(c+dx))^2} - \frac{\int \frac{\frac{b}{2}-2a\cos(c+dx)+\frac{1}{2}b\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2}\,dx}{2\left(a^2-b^2\right)}$$

$$= -\frac{b\sqrt{\cos(c+dx)}\sin(c+dx)}{2(a^2-b^2)d(a+b\cos(c+dx))^2} - \frac{b(5a^2+b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4a(a^2-b^2)^2 d(a+b\cos(c+dx))} - \frac{\int \frac{\frac{1}{4}b(7a^2-b^2)-a(2a^2+b^2)\cos(c+dx)-\frac{1}{4}b(5a^2+b^2)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}dx}{2a(a^2-b^2)^2}$$

$$= -\frac{b\sqrt{\cos(c+dx)}\sin(c+dx)}{2(a^2-b^2)d(a+b\cos(c+dx))^2} - \frac{b(5a^2+b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4a(a^2-b^2)^2 d(a+b\cos(c+dx))} + \frac{\int \frac{-\frac{1}{4}b^2(7a^2-b^2)+\frac{3}{4}ab(a^2+b^2)\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}dx}{2ab(a^2-b^2)^2} + \frac{(5a^2+b^2)\int\sqrt{\cos(c+dx)}dx}{8a(a^2-b^2)^2}$$

$$= \frac{(5a^2+b^2)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4a(a^2-b^2)^2 d} - \frac{b\sqrt{\cos(c+dx)}\sin(c+dx)}{2(a^2-b^2)d(a+b\cos(c+dx))^2} - \frac{b(5a^2+b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4a(a^2-b^2)^2 d(a+b\cos(c+dx))} + \frac{(3(a^2+b^2))\int\frac{1}{\sqrt{\cos(c+dx)}}dx}{8b(a^2-b^2)^2} - \frac{(3a^4+10a^2b^2-b^4)\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}dx}{8ab(a^2-b^2)^2}$$

$$= \frac{(5a^2+b^2)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4a(a^2-b^2)^2 d} + \frac{3(a^2+b^2)\,\mathrm{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4b(a^2-b^2)^2 d} - \frac{(3a^4+10a^2b^2-b^4)\,\mathrm{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4a(a-b)^2b(a+b)^3d} - \frac{b\sqrt{\cos(c+dx)}\sin(c+dx)}{2(a^2-b^2)d(a+b\cos(c+dx))^2} - \frac{b(5a^2+b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4a(a^2-b^2)^2 d(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 1.88 (sec) , antiderivative size = 291, normalized size of antiderivative = 1.16

$$\int\frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^3}\,dx$$

$$= \frac{-\frac{4b\sqrt{\cos(c+dx)}(7a^3-ab^2+b(5a^2+b^2)\cos(c+dx))\sin(c+dx)}{(a^2-b^2)^2(a+b\cos(c+dx))^2} + \frac{\frac{2(-9a^2b+3b^3)\,\mathrm{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b} + \frac{8a(2a^2+b^2)\left(2\,\mathrm{EllipticF}\left(\frac{1}{2}(c+dx),2\right)-\frac{2}{}\right.}{b}}{}}{}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] ((-4*b*Sqrt[Cos[c + d*x]]*(7*a^3 - a*b^2 + b*(5*a^2 + b^2)*Cos[c + d*x])*Si
n[c + d*x])/((a^2 - b^2)^2*(a + b*Cos[c + d*x])^2) + ((2*(-9*a^2*b + 3*b^3)
*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(a + b) + (8*a*(2*a^2 + b^2)*(2
*EllipticF[(c + d*x)/2, 2] - (2*a*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2]
```

```
)/(a + b)))/b + (2*(5*a^2 + b^2)*(-2*a*b*EllipticE[ArcSin[Sqrt[Cos[c + d*x]
]], -1] + 2*a*(a + b)*EllipticF[ArcSin[Sqrt[Cos[c + d*x]]], -1] + (-2*a^2 +
 b^2)*EllipticPi[-(b/a), ArcSin[Sqrt[Cos[c + d*x]]], -1])*Sin[c + d*x])/(a*
b*Sqrt[Sin[c + d*x]^2]))/((a - b)^2*(a + b)^2))/(16*a*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1735 vs. 2(314) = 628.

Time = 8.23 (sec) , antiderivative size = 1736, normalized size of antiderivative = 6.94

method	result	size
default	Expression too large to display	1736

```
[In] int(cos(d*x+c)^(1/2)/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/b*(-1/a*b^2/(
a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^
(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d*x+1/2*c)^2)^(1/
2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1
/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a^2-b^2)*b/a*(sin
(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+
1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+
1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^
(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/
2*d*x+1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)
^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d
*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+1/a/(a
^2-b^2)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2
*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellipti
cPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2)))-2/b*a*(-1/2/a*b^2/(a^2-b^2)*cos
(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*c
os(1/2*d*x+1/2*c)^2+a-b)^2-3/4*b^2*(3*a^2-b^2)/a^2/(a^2-b^2)^2*cos(1/2*d*x+
1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*
x+1/2*c)^2+a-b)-7/8/(a+b)/(a^2-b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/
2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2
)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/4/(a+b)/(a^2-b^2)/a*(sin(1/2*d*x+
1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+
sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*b+3/8/(a+
b)/(a^2-b^2)/a^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(
1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2
*d*x+1/2*c),2^(1/2))*b^2-9/8*b/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+3/8*b^3/a^2/(a^2-b^2)^2*(sin
(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+
1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+
```

```
9/8*b/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^
(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/
2*d*x+1/2*c),2^(1/2))-3/8*b^3/a^2/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*
(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*
c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-15/4*a^2/(a^2-b^2)^2/(-2*
a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)
/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*
x+1/2*c),-2*b/(a-b),2^(1/2))+3/2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^
4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1
/2))-3/4/a^2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b^5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-
2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)
^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))))/sin(1/2*d*x+1
/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^3,x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(1/2)/(a+b*cos(d*x+c))**3,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\sqrt{\cos(dx+c)}}{(b\cos(dx+c)+a)^3}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
[Out] integrate(sqrt(cos(d*x + c))/(b*cos(d*x + c) + a)^3, x)
```

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\left(b\cos\left(dx+c\right)+a\right)^3}\,dx$$

[In] integrate(cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^3,x, algorithm="giac")

[Out] integrate(sqrt(cos(d*x + c))/(b*cos(d*x + c) + a)^3, x)

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\sqrt{\cos\left(c+d\,x\right)}}{\left(a+b\,\cos\left(c+d\,x\right)\right)^3}\,dx$$

[In] int(cos(c + d*x)^(1/2)/(a + b*cos(c + d*x))^3,x)

[Out] int(cos(c + d*x)^(1/2)/(a + b*cos(c + d*x))^3, x)

3.600 $\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 261

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^3}\,dx = -\frac{3b(3a^2-b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{4a^2\,(a^2-b^2)^2\,d} - \frac{(7a^2-b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4a\,(a^2-b^2)^2\,d} + \frac{3(5a^4-2a^2b^2+b^4)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4a^2(a-b)^2(a+b)^3d} + \frac{b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{2a\,(a^2-b^2)\,d(a+b\cos(c+dx))^2} + \frac{3b^2(3a^2-b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4a^2\,(a^2-b^2)^2\,d(a+b\cos(c+dx))}$$

```
[Out] -3/4*b*(3*a^2-b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elliptic
E(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/(a^2-b^2)^2/d-1/4*(7*a^2-b^2)*(cos(1/2*d*
x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/
a/(a^2-b^2)^2/d+3/4*(5*a^4-2*a^2*b^2+b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(
1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))/a^2/(a-b)^2
/(a+b)^3/d+1/2*b^2*sin(d*x+c)*cos(d*x+c)^(1/2)/a/(a^2-b^2)/d/(a+b*cos(d*x+c
))^2+3/4*b^2*(3*a^2-b^2)*sin(d*x+c)*cos(d*x+c)^(1/2)/a^2/(a^2-b^2)^2/d/(a+b
*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.84 (sec) , antiderivative size = 261, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {2881, 3134, 3138, 2719, 3081, 2720, 2884}

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^3}\,dx$$
$$= -\frac{(7a^2-b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4ad\,(a^2-b^2)^2} - \frac{3b(3a^2-b^2)\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{4a^2d\,(a^2-b^2)^2}$$
$$+ \frac{3b^2(3a^2-b^2)\sin(c+dx)\sqrt{\cos(c+dx)}}{4a^2d\,(a^2-b^2)^2\,(a+b\cos(c+dx))} + \frac{b^2\sin(c+dx)\sqrt{\cos(c+dx)}}{2ad\,(a^2-b^2)\,(a+b\cos(c+dx))^2}$$
$$+ \frac{3(5a^4-2a^2b^2+b^4)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4a^2d(a-b)^2(a+b)^3}$$

```
[In] Int[1/(Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])^3),x]
```

```
[Out] (-3*b*(3*a^2 - b^2)*EllipticE[(c + d*x)/2, 2])/(4*a^2*(a^2 - b^2)^2*d) - ((
7*a^2 - b^2)*EllipticF[(c + d*x)/2, 2])/(4*a*(a^2 - b^2)^2*d) + (3*(5*a^4 -
 2*a^2*b^2 + b^4)*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(4*a^2*(a - b)
^2*(a + b)^3*d) + (b^2*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(2*a*(a^2 - b^2)*d*
(a + b*Cos[c + d*x])^2) + (3*b^2*(3*a^2 - b^2)*Sqrt[Cos[c + d*x]]*Sin[c + d
*x])/(4*a^2*(a^2 - b^2)^2*d*(a + b*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] && !IntegerQ[n]) || !(IntegerQ[2*n
```

```
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{2a\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{\int\frac{\frac{1}{2}\left(4a^2-3b^2\right)-2ab\cos(c+dx)+\frac{1}{2}b^2\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2}\,dx}{2a\left(a^2-b^2\right)}\\
&= \frac{b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{2a\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{3b^2(3a^2-b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4a^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}\\
&\quad+\frac{\int\frac{\frac{1}{4}\left(8a^4-5a^2b^2+3b^4\right)-ab\left(4a^2-b^2\right)\cos(c+dx)-\frac{3}{4}b^2\left(3a^2-b^2\right)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{2a^2\left(a^2-b^2\right)^2}\\
&= \frac{b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{2a\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{3b^2(3a^2-b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4a^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}\\
&\quad-\frac{\int\frac{-\frac{1}{4}b\left(8a^4-5a^2b^2+3b^4\right)+\frac{1}{4}ab^2\left(7a^2-b^2\right)\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{2a^2b\left(a^2-b^2\right)^2}-\frac{\left(3b(3a^2-b^2)\right)\int\sqrt{\cos(c+dx)}\,dx}{8a^2\left(a^2-b^2\right)^2}\\
&= -\frac{3b(3a^2-b^2)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4a^2\left(a^2-b^2\right)^2d}+\frac{b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{2a\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}\\
&\quad+\frac{3b^2(3a^2-b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4a^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}-\frac{\left(7a^2-b^2\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{8a\left(a^2-b^2\right)^2}\\
&\quad+\frac{\left(3\left(5a^4-2a^2b^2+b^4\right)\right)\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{8a^2\left(a^2-b^2\right)^2}\\
&= -\frac{3b(3a^2-b^2)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4a^2\left(a^2-b^2\right)^2d}-\frac{\left(7a^2-b^2\right)\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4a\left(a^2-b^2\right)^2d}\\
&\quad+\frac{3\left(5a^4-2a^2b^2+b^4\right)\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4a^2(a-b)^2(a+b)^3d}\\
&\quad+\frac{b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{2a\left(a^2-b^2\right)d(a+b\cos(c+dx))^2}+\frac{3b^2(3a^2-b^2)\sqrt{\cos(c+dx)}\sin(c+dx)}{4a^2\left(a^2-b^2\right)^2d(a+b\cos(c+dx))}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.81 (sec) , antiderivative size = 301, normalized size of antiderivative = 1.15

$$
\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^3}\,dx
$$

$$
=\frac{\frac{4b^2\sqrt{\cos(c+dx)}\left(11a^3-5ab^2+\left(9a^2b-3b^3\right)\cos(c+dx)\right)\sin(c+dx)}{\left(a^2-b^2\right)^2(a+b\cos(c+dx))^2}+\frac{\frac{2\left(16a^4-19a^2b^2+9b^4\right)\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b}+\frac{16\left(-4a^3+ab^2\right)\left((a+b)\text{ Ellipti}\right.}{}}{}}{}
$$

```
[In] Integrate[1/(Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])^3),x]
```

```
[Out] ((4*b^2*Sqrt[Cos[c + d*x]]*(11*a^3 - 5*a*b^2 + (9*a^2*b - 3*b^3)*Cos[c + d*
x])*Sin[c + d*x])/((a^2 - b^2)^2*(a + b*Cos[c + d*x])^2) + ((2*(16*a^4 - 19
*a^2*b^2 + 9*b^4)*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(a + b) + (16*
(-4*a^3 + a*b^2)*((a + b)*EllipticF[(c + d*x)/2, 2] - a*EllipticPi[(2*b)/(a
 + b), (c + d*x)/2, 2]))/(a + b) - (6*(3*a^2 - b^2)*(-2*a*b*EllipticE[ArcSi
n[Sqrt[Cos[c + d*x]]], -1] + 2*a*(a + b)*EllipticF[ArcSin[Sqrt[Cos[c + d*x]
]], -1] + (-2*a^2 + b^2)*EllipticPi[-(b/a), ArcSin[Sqrt[Cos[c + d*x]]], -1]
)*Sin[c + d*x])/(a*Sqrt[Sin[c + d*x]^2]))/((a - b)^2*(a + b)^2))/(16*a^2*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1175 vs. 2(325) = 650.

Time = 6.32 (sec) , antiderivative size = 1176, normalized size of antiderivative = 4.51

method	result	size
default	Expression too large to display	1176

```
[In] int(1/cos(d*x+c)^(1/2)/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-1/a*b^2/(a^2-b
^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)
/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)^2-3/2*b^2*(3*a^2-b^2)/a^2/(a^2-b^2)^2*cos(1
/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos
(1/2*d*x+1/2*c)^2+a-b)-7/4/(a+b)/(a^2-b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/2/(a+b)/(a^2-b^2)/a*(sin(1
/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/
2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*b+
3/4/(a+b)/(a^2-b^2)/a^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)
^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(
cos(1/2*d*x+1/2*c),2^(1/2))*b^2-9/4*b/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1
/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+
1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+3/4*b^3/a^2/(a^2-b^2)
^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1
/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^
(1/2))+9/4*b/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c
)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE
(cos(1/2*d*x+1/2*c),2^(1/2))-3/4*b^3/a^2/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)
^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d
*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-15/2*a^2/(a^2-b^2)
^2/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1
)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos
(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+3/(a^2-b^2)^2/(-2*a*b+2*b^2)*b^3*(sin(1
/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/
2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b)
```

```
,2^(1/2))-3/2/a^2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b^5*(sin(1/2*d*x+1/2*c)^2)^(1/
2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1
/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2)))/sin(1/2*d
*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^3,x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(1/2)/(a+b*cos(d*x+c))**3,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^3}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^3\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^3*sqrt(cos(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^3}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^3\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^3*sqrt(cos(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^3}\,dx = \int \frac{1}{\sqrt{\cos(c+d\,x)}\,(a+b\,\cos(c+d\,x))^3}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))^3),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))^3), x)
```

3.601 $\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^3} dx$

Optimal result

Integrand size = 23, antiderivative size = 328

$$\begin{aligned}
&\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^3} dx \\
&= -\frac{(8a^4-29a^2b^2+15b^4)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4a^3(a^2-b^2)^2 d} + \frac{b(11a^2-5b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4a^2(a^2-b^2)^2 d} \\
&\quad - \frac{b(35a^4-38a^2b^2+15b^4)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4a^3(a-b)^2(a+b)^3 d} \\
&\quad + \frac{(8a^4-29a^2b^2+15b^4)\sin(c+dx)}{4a^3(a^2-b^2)^2 d\sqrt{\cos(c+dx)}} + \frac{b^2\sin(c+dx)}{2a(a^2-b^2)\,d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2} \\
&\quad + \frac{b^2(11a^2-5b^2)\sin(c+dx)}{4a^2(a^2-b^2)^2 d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}
\end{aligned}$$

```
[Out] -1/4*(8*a^4-29*a^2*b^2+15*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2
*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/a^3/(a^2-b^2)^2/d+1/4*b*(11*a^2-5
*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x
+1/2*c),2^(1/2))/a^2/(a^2-b^2)^2/d-1/4*b*(35*a^4-38*a^2*b^2+15*b^4)*(cos(1/
2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/
(a+b),2^(1/2))/a^3/(a-b)^2/(a+b)^3/d+1/4*(8*a^4-29*a^2*b^2+15*b^4)*sin(d*x+
c)/a^3/(a^2-b^2)^2/d/cos(d*x+c)^(1/2)+1/2*b^2*sin(d*x+c)/a/(a^2-b^2)/d/(a+b
*cos(d*x+c))^2/cos(d*x+c)^(1/2)+1/4*b^2*(11*a^2-5*b^2)*sin(d*x+c)/a^2/(a^2-
b^2)^2/d/(a+b*cos(d*x+c))/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 1.15 (sec) , antiderivative size = 328, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {2881, 3134, 3138, 2719, 3081, 2720, 2884}

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^3}\,dx$$
$$= \frac{b(11a^2-5b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4a^2d\,(a^2-b^2)^2}+\frac{b^2(11a^2-5b^2)\sin(c+dx)}{4a^2d\,(a^2-b^2)^2\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}$$
$$+\frac{b^2\sin(c+dx)}{2ad\,(a^2-b^2)\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2}$$
$$-\frac{(8a^4-29a^2b^2+15b^4)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4a^3d\,(a^2-b^2)^2}$$
$$-\frac{b(35a^4-38a^2b^2+15b^4)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4a^3d(a-b)^2(a+b)^3}$$
$$+\frac{(8a^4-29a^2b^2+15b^4)\sin(c+dx)}{4a^3d\,(a^2-b^2)^2\sqrt{\cos(c+dx)}}$$

```
[In] Int[1/(Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*x])^3),x]
```

```
[Out] -1/4*((8*a^4 - 29*a^2*b^2 + 15*b^4)*EllipticE[(c + d*x)/2, 2])/(a^3*(a^2 -
b^2)^2*d) + (b*(11*a^2 - 5*b^2)*EllipticF[(c + d*x)/2, 2])/(4*a^2*(a^2 - b^
2)^2*d) - (b*(35*a^4 - 38*a^2*b^2 + 15*b^4)*EllipticPi[(2*b)/(a + b), (c +
d*x)/2, 2])/(4*a^3*(a - b)^2*(a + b)^3*d) + ((8*a^4 - 29*a^2*b^2 + 15*b^4)*
Sin[c + d*x])/(4*a^3*(a^2 - b^2)^2*d*Sqrt[Cos[c + d*x]]) + (b^2*Sin[c + d*x
])/(2*a*(a^2 - b^2)*d*Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])^2) + (b^2*(11
*a^2 - 5*b^2)*Sin[c + d*x])/(4*a^2*(a^2 - b^2)^2*d*Sqrt[Cos[c + d*x]]*(a +
b*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
```

```
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] && !IntegerQ[n]) || !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] && !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] && !IntegerQ[
n]) || !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] && !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
```

```
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{b^2\sin(c+dx)}{2a\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2} + \frac{\int \frac{\frac{1}{2}\left(4a^2-5b^2\right)-2ab\cos(c+dx)+\frac{3}{2}b^2\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2}\,dx}{2a\left(a^2-b^2\right)}$$

$$= \frac{b^2\sin(c+dx)}{2a\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2} + \frac{b^2\left(11a^2-5b^2\right)\sin(c+dx)}{4a^2\left(a^2-b^2\right)^2d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))} + \frac{\int \frac{\frac{1}{4}\left(8a^4-29a^2b^2+15b^4\right)-ab\left(4a^2-b^2\right)\cos(c+dx)+\frac{1}{4}b^2\left(11a^2-5b^2\right)\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}\,dx}{2a^2\left(a^2-b^2\right)^2}$$

$$= \frac{\left(8a^4-29a^2b^2+15b^4\right)\sin(c+dx)}{4a^3\left(a^2-b^2\right)^2d\sqrt{\cos(c+dx)}} + \frac{b^2\sin(c+dx)}{2a\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2} + \frac{b^2\left(11a^2-5b^2\right)\sin(c+dx)}{4a^2\left(a^2-b^2\right)^2d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))} + \frac{\int \frac{-\frac{3}{8}b\left(8a^4-11a^2b^2+5b^4\right)-\frac{1}{2}a\left(2a^4-10a^2b^2+5b^4\right)\cos(c+dx)-\frac{1}{8}b\left(8a^4-29a^2b^2+15b^4\right)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{a^3\left(a^2-b^2\right)^2}$$

$$= \frac{\left(8a^4-29a^2b^2+15b^4\right)\sin(c+dx)}{4a^3\left(a^2-b^2\right)^2d\sqrt{\cos(c+dx)}} + \frac{b^2\sin(c+dx)}{2a\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^2} + \frac{b^2\left(11a^2-5b^2\right)\sin(c+dx)}{4a^2\left(a^2-b^2\right)^2d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))} - \frac{\int \frac{\frac{3}{8}b^2\left(8a^4-11a^2b^2+5b^4\right)-\frac{1}{8}ab^3\left(11a^2-5b^2\right)\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{a^3b\left(a^2-b^2\right)^2} - \frac{\left(8a^4-29a^2b^2+15b^4\right)\int\sqrt{\cos(c+dx)}\,dx}{8a^3\left(a^2-b^2\right)^2}$$

$$
\begin{aligned}
&= -\frac{(8a^4 - 29a^2b^2 + 15b^4) E\left(\frac{1}{2}(c+dx)\middle| 2\right)}{4a^3 (a^2 - b^2)^2 d} + \frac{(8a^4 - 29a^2b^2 + 15b^4) \sin(c+dx)}{4a^3 (a^2 - b^2)^2 d\sqrt{\cos(c+dx)}} \\
&+ \frac{b^2 \sin(c+dx)}{2a (a^2 - b^2) d\sqrt{\cos(c+dx)}(a + b\cos(c+dx))^2} \\
&+ \frac{b^2(11a^2 - 5b^2) \sin(c+dx)}{4a^2 (a^2 - b^2)^2 d\sqrt{\cos(c+dx)}(a + b\cos(c+dx))} \\
&+ \frac{(b(11a^2 - 5b^2)) \int \frac{1}{\sqrt{\cos(c+dx)}}\, dx}{8a^2 (a^2 - b^2)^2} \\
&- \frac{(b(35a^4 - 38a^2b^2 + 15b^4)) \int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\, dx}{8a^3 (a^2 - b^2)^2} \\
&= -\frac{(8a^4 - 29a^2b^2 + 15b^4) E\left(\frac{1}{2}(c+dx)\middle| 2\right)}{4a^3 (a^2 - b^2)^2 d} + \frac{b(11a^2 - 5b^2) \operatorname{EllipticF}\left(\frac{1}{2}(c+dx), 2\right)}{4a^2 (a^2 - b^2)^2 d} \\
&- \frac{b(35a^4 - 38a^2b^2 + 15b^4) \operatorname{EllipticPi}\left(\frac{2b}{a+b}, \frac{1}{2}(c+dx), 2\right)}{4a^3(a-b)^2(a+b)^3 d} \\
&+ \frac{(8a^4 - 29a^2b^2 + 15b^4) \sin(c+dx)}{4a^3 (a^2 - b^2)^2 d\sqrt{\cos(c+dx)}} \\
&+ \frac{b^2 \sin(c+dx)}{2a (a^2 - b^2) d\sqrt{\cos(c+dx)}(a + b\cos(c+dx))^2} \\
&+ \frac{b^2(11a^2 - 5b^2) \sin(c+dx)}{4a^2 (a^2 - b^2)^2 d\sqrt{\cos(c+dx)}(a + b\cos(c+dx))}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 2.66 (sec) , antiderivative size = 334, normalized size of antiderivative = 1.02

$$
\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^3}\, dx
$$

$$
= \frac{-\frac{\frac{2\left(56a^4b-95a^2b^3+45b^5\right)\operatorname{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b}+\frac{8a\left(2a^4-10a^2b^2+5b^4\right)\left(2\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)-\frac{2a\operatorname{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b}\right)}{b}+\frac{2\left(8a^4-29a^2b^2\cdots\right.}{\cdots}}{(a-b)^2(\cdots}}{\cdots}
$$

```
[In] Integrate[1/(Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*x])^3),x]
```

```
[Out] (-(((2*(56*a^4*b - 95*a^2*b^3 + 45*b^5)*EllipticPi[(2*b)/(a + b), (c + d*x)
/2, 2])/(a + b) + (8*a*(2*a^4 - 10*a^2*b^2 + 5*b^4)*(2*EllipticF[(c + d*x)/
2, 2] - (2*a*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2])/(a + b)))/b + (2*(8
*a^4 - 29*a^2*b^2 + 15*b^4)*(-2*a*b*EllipticE[ArcSin[Sqrt[Cos[c + d*x]]], -
1] + 2*a*(a + b)*EllipticF[ArcSin[Sqrt[Cos[c + d*x]]], -1] + (-2*a^2 + b^2)
*EllipticPi[-(b/a), ArcSin[Sqrt[Cos[c + d*x]]], -1])*Sin[c + d*x])/(a*b*Sqr
```

```
t[Sin[c + d*x]^2]))/((a - b)^2*(a + b)^2)) + 4*Sqrt[Cos[c + d*x]]*((b^3*(-1
5*a^3 + 9*a*b^2 + (-13*a^2*b + 7*b^3)*Cos[c + d*x])*Sin[c + d*x])/((a^2 - b
^2)^2*(a + b*Cos[c + d*x])^2) + 8*Tan[c + d*x]))/(16*a^3*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1964 vs. 2(388) = 776.

Time = 11.48 (sec) , antiderivative size = 1965, normalized size of antiderivative = 5.99

method	result	size
default	Expression too large to display	1965

```
[In] int(1/cos(d*x+c)^(3/2)/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/a^3/sin(1/2*d
*x+1/2*c)^2/(2*sin(1/2*d*x+1/2*c)^2-1)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x
+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-(sin(1/2*d*x+1/
2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c)
,2^(1/2)))-2/a*b*(-1/2/a*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1
/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)^2-3/4*b^
2*(3*a^2-b^2)/a^2/(a^2-b^2)^2*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+s
in(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-7/8/(a+b)/(a^2-b^
2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1
/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^
(1/2))+1/4/(a+b)/(a^2-b^2)/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1
/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellip
ticF(cos(1/2*d*x+1/2*c),2^(1/2))*b+3/8/(a+b)/(a^2-b^2)/a^2*(sin(1/2*d*x+1/2
*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin
(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*b^2-9/8*b/(a
^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-
2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/
2*c),2^(1/2))+3/8*b^3/a^2/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(
1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1
/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+9/8*b/(a^2-b^2)^2*(sin(1/2*d*x+1/
2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+si
n(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-3/8*b^3/a^2
/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)
/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x
+1/2*c),2^(1/2))-15/4*a^2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^
2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2
*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+3/2/
(a^2-b^2)^2/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x
+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ell
ipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))-3/4/a^2/(a^2-b^2)^2/(-2*a*b+
2*b^2)*b^5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(
```

```
-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+
1/2*c),-2*b/(a-b),2^(1/2)))+4*b^2/a^3/(-2*a*b+2*b^2)*(sin(1/2*d*x+1/2*c)^2)
^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d
*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))-2*b/a^
2*(-1/a*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d
*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d*x+
1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+
sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a^2-
b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2
*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2
*c),2^(1/2))+1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x
+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ell
ipticE(cos(1/2*d*x+1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c
)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^
(1/2))+1/a/(a^2-b^2)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*co
s(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^
(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))))/sin(1/2*d*x+1/2*c
)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^3,x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(3/2)/(a+b*cos(d*x+c))**3,x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^3}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^3}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^3\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^3*cos(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^3}\,dx = \int \frac{1}{\cos(c+d\,x)^{3/2}\,(a+b\,\cos(c+d\,x))^3}\,dx$$

```
[In] int(1/(cos(c + d*x)^(3/2)*(a + b*cos(c + d*x))^3),x)
[Out] int(1/(cos(c + d*x)^(3/2)*(a + b*cos(c + d*x))^3), x)
```

3.602 $\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 395

$$\begin{aligned}
&\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^3}\,dx \\
&= \frac{b(24a^4-65a^2b^2+35b^4)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4a^4\left(a^2-b^2\right)^2 d} \\
&\quad+\frac{(8a^4-61a^2b^2+35b^4)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{12a^3\left(a^2-b^2\right)^2 d} \\
&\quad+\frac{b^2(63a^4-86a^2b^2+35b^4)\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4a^4(a-b)^2(a+b)^3 d} \\
&\quad+\frac{(8a^4-61a^2b^2+35b^4)\sin(c+dx)}{12a^3\left(a^2-b^2\right)^2 d\cos^{\frac{3}{2}}(c+dx)}-\frac{b(24a^4-65a^2b^2+35b^4)\sin(c+dx)}{4a^4\left(a^2-b^2\right)^2 d\sqrt{\cos(c+dx)}} \\
&\quad+\frac{b^2\sin(c+dx)}{2a\left(a^2-b^2\right) d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2} \\
&\quad+\frac{b^2(13a^2-7b^2)\sin(c+dx)}{4a^2\left(a^2-b^2\right)^2 d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}
\end{aligned}$$

```
[Out] 1/4*b*(24*a^4-65*a^2*b^2+35*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1
/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/a^4/(a^2-b^2)^2/d+1/12*(8*a^4-6
1*a^2*b^2+35*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF
(sin(1/2*d*x+1/2*c),2^(1/2))/a^3/(a^2-b^2)^2/d+1/4*b^2*(63*a^4-86*a^2*b^2+3
5*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d
*x+1/2*c),2*b/(a+b),2^(1/2))/a^4/(a-b)^2/(a+b)^3/d+1/12*(8*a^4-61*a^2*b^2+3
5*b^4)*sin(d*x+c)/a^3/(a^2-b^2)^2/d/cos(d*x+c)^(3/2)+1/2*b^2*sin(d*x+c)/a/(
a^2-b^2)/d/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^2+1/4*b^2*(13*a^2-7*b^2)*sin(d
*x+c)/a^2/(a^2-b^2)^2/d/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))-1/4*b*(24*a^4-65*
a^2*b^2+35*b^4)*sin(d*x+c)/a^4/(a^2-b^2)^2/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 1.43 (sec) , antiderivative size = 395, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {2881, 3134, 3138, 2719, 3081, 2720, 2884}

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^3}\,dx = \frac{b^2(13a^2-7b^2)\sin(c+dx)}{4a^2d(a^2-b^2)^2\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))} + \frac{b^2\sin(c+dx)}{2ad(a^2-b^2)\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2} + \frac{b(24a^4-65a^2b^2+35b^4)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4a^4d(a^2-b^2)^2} + \frac{b^2(63a^4-86a^2b^2+35b^4)\operatorname{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4a^4d(a-b)^2(a+b)^3} - \frac{b(24a^4-65a^2b^2+35b^4)\sin(c+dx)}{4a^4d(a^2-b^2)^2\sqrt{\cos(c+dx)}} + \frac{(8a^4-61a^2b^2+35b^4)\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{12a^3d(a^2-b^2)^2} + \frac{(8a^4-61a^2b^2+35b^4)\sin(c+dx)}{12a^3d(a^2-b^2)^2\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Int[1/(Cos[c + d*x]^(5/2)*(a + b*Cos[c + d*x])^3),x]
```

```
[Out] (b*(24*a^4 - 65*a^2*b^2 + 35*b^4)*EllipticE[(c + d*x)/2, 2])/(4*a^4*(a^2 -
b^2)^2*d) + ((8*a^4 - 61*a^2*b^2 + 35*b^4)*EllipticF[(c + d*x)/2, 2])/(12*a
^3*(a^2 - b^2)^2*d) + (b^2*(63*a^4 - 86*a^2*b^2 + 35*b^4)*EllipticPi[(2*b)/
(a + b), (c + d*x)/2, 2])/(4*a^4*(a - b)^2*(a + b)^3*d) + ((8*a^4 - 61*a^2*
b^2 + 35*b^4)*Sin[c + d*x])/(12*a^3*(a^2 - b^2)^2*d*Cos[c + d*x]^(3/2)) - (
b*(24*a^4 - 65*a^2*b^2 + 35*b^4)*Sin[c + d*x])/(4*a^4*(a^2 - b^2)^2*d*Sqrt[
Cos[c + d*x]]) + (b^2*Sin[c + d*x])/(2*a*(a^2 - b^2)*d*Cos[c + d*x]^(3/2)*(
a + b*Cos[c + d*x])^2) + (b^2*(13*a^2 - 7*b^2)*Sin[c + d*x])/(4*a^2*(a^2 -
b^2)^2*d*Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3081

```
Int[(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)]))/((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[
B/d, Int[(a + b*Sin[e + f*x])^m, x], x] - Dist[(B*c - A*d)/d, Int[(a + b*Si
n[e + f*x])^m/(c + d*Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B
, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 3138

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
```

```
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)])), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[a + b*Sin[e + f*x]], x],
 x] - Dist[1/(b*d), Int[Simp[a*c*C - A*b*d + (b*c*C - b*B*d + a*C*d)*Sin[e
+ f*x], x]/(Sqrt[a + b*Sin[e + f*x]]*(c + d*Sin[e + f*x])), x], x] /; FreeQ
[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{b^2\sin(c+dx)}{2a(a^2-b^2)\,d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2} \\
&\quad+\frac{\int\frac{\frac{1}{2}(4a^2-7b^2)-2ab\cos(c+dx)+\frac{5}{2}b^2\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^2}\,dx}{2a(a^2-b^2)} \\
&= \frac{b^2\sin(c+dx)}{2a(a^2-b^2)\,d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2} \\
&\quad+\frac{b^2(13a^2-7b^2)\sin(c+dx)}{4a^2(a^2-b^2)^2\,d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))} \\
&\quad+\frac{\int\frac{\frac{1}{4}(8a^4-61a^2b^2+35b^4)-ab(4a^2-b^2)\cos(c+dx)+\frac{3}{4}b^2(13a^2-7b^2)\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))}\,dx}{2a^2(a^2-b^2)^2} \\
&= \frac{(8a^4-61a^2b^2+35b^4)\sin(c+dx)}{12a^3(a^2-b^2)^2\,d\cos^{\frac{3}{2}}(c+dx)}+\frac{b^2\sin(c+dx)}{2a(a^2-b^2)\,d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2} \\
&\quad+\frac{b^2(13a^2-7b^2)\sin(c+dx)}{4a^2(a^2-b^2)^2\,d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))} \\
&\quad+\frac{\int\frac{-\frac{3}{8}b(24a^4-65a^2b^2+35b^4)+\frac{1}{2}a(2a^4+14a^2b^2-7b^4)\cos(c+dx)+\frac{1}{8}b(8a^4-61a^2b^2+35b^4)\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}\,dx}{3a^3(a^2-b^2)^2} \\
&= \frac{(8a^4-61a^2b^2+35b^4)\sin(c+dx)}{12a^3(a^2-b^2)^2\,d\cos^{\frac{3}{2}}(c+dx)}-\frac{b(24a^4-65a^2b^2+35b^4)\sin(c+dx)}{4a^4(a^2-b^2)^2\,d\sqrt{\cos(c+dx)}} \\
&\quad+\frac{b^2\sin(c+dx)}{2a(a^2-b^2)\,d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2} \\
&\quad+\frac{b^2(13a^2-7b^2)\sin(c+dx)}{4a^2(a^2-b^2)^2\,d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))} \\
&\quad+\frac{2\int\frac{\frac{1}{16}(8a^6+128a^4b^2-223a^2b^4+105b^6)+\frac{1}{4}ab(20a^4-64a^2b^2+35b^4)\cos(c+dx)+\frac{3}{16}b^2(24a^4-65a^2b^2+35b^4)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{3a^4(a^2-b^2)^2}
\end{aligned}$$

$$=\frac{(8a^4-61a^2b^2+35b^4)\sin(c+dx)}{12a^3(a^2-b^2)^2 d\cos^{\frac{3}{2}}(c+dx)}-\frac{b(24a^4-65a^2b^2+35b^4)\sin(c+dx)}{4a^4(a^2-b^2)^2 d\sqrt{\cos(c+dx)}}$$
$$+\frac{b^2\sin(c+dx)}{2a(a^2-b^2)d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2}$$
$$+\frac{b^2(13a^2-7b^2)\sin(c+dx)}{4a^2(a^2-b^2)^2 d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}$$
$$-\frac{2\int\frac{-\frac{1}{16}b(8a^6+128a^4b^2-223a^2b^4+105b^6)-\frac{1}{16}ab^2(8a^4-61a^2b^2+35b^4)\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}dx}{3a^4b(a^2-b^2)^2}$$
$$+\frac{(b(24a^4-65a^2b^2+35b^4))\int\sqrt{\cos(c+dx)}\,dx}{8a^4(a^2-b^2)^2}$$

$$=\frac{b(24a^4-65a^2b^2+35b^4)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4a^4(a^2-b^2)^2 d}$$
$$+\frac{(8a^4-61a^2b^2+35b^4)\sin(c+dx)}{12a^3(a^2-b^2)^2 d\cos^{\frac{3}{2}}(c+dx)}-\frac{b(24a^4-65a^2b^2+35b^4)\sin(c+dx)}{4a^4(a^2-b^2)^2 d\sqrt{\cos(c+dx)}}$$
$$+\frac{b^2\sin(c+dx)}{2a(a^2-b^2)d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2}$$
$$+\frac{b^2(13a^2-7b^2)\sin(c+dx)}{4a^2(a^2-b^2)^2 d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}$$
$$+\frac{(b^2(63a^4-86a^2b^2+35b^4))\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}dx}{8a^4(a^2-b^2)^2}$$
$$+\frac{(8a^4-61a^2b^2+35b^4)\int\frac{1}{\sqrt{\cos(c+dx)}}dx}{24a^3(a^2-b^2)^2}$$

$$=\frac{b(24a^4-65a^2b^2+35b^4)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4a^4(a^2-b^2)^2 d}$$
$$+\frac{(8a^4-61a^2b^2+35b^4)\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{12a^3(a^2-b^2)^2 d}$$
$$+\frac{b^2(63a^4-86a^2b^2+35b^4)\operatorname{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4a^4(a-b)^2(a+b)^3 d}$$
$$+\frac{(8a^4-61a^2b^2+35b^4)\sin(c+dx)}{12a^3(a^2-b^2)^2 d\cos^{\frac{3}{2}}(c+dx)}-\frac{b(24a^4-65a^2b^2+35b^4)\sin(c+dx)}{4a^4(a^2-b^2)^2 d\sqrt{\cos(c+dx)}}$$
$$+\frac{b^2\sin(c+dx)}{2a(a^2-b^2)d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^2}$$
$$+\frac{b^2(13a^2-7b^2)\sin(c+dx)}{4a^2(a^2-b^2)^2 d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))}$$

Mathematica [A] (verified)

Time = 3.73 (sec) , antiderivative size = 349, normalized size of antiderivative = 0.88

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^3}\,dx = \frac{\frac{\frac{2\left(16a^6+328a^4b^2-641a^2b^4+315b^6\right)\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a+b}+\frac{16\left(20a^5-64a^3b^2+35ab^4\right)\left((a+b)\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)-a\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\right)}{a+b}+\frac{6(24}{}}{(a-b)}}{}$$

```
[In] Integrate[1/(Cos[c + d*x]^(5/2)*(a + b*Cos[c + d*x])^3),x]
```

```
[Out] (((2*(16*a^6 + 328*a^4*b^2 - 641*a^2*b^4 + 315*b^6)*EllipticPi[(2*b)/(a + b
), (c + d*x)/2, 2])/(a + b) + (16*(20*a^5 - 64*a^3*b^2 + 35*a*b^4)*((a + b)
*EllipticF[(c + d*x)/2, 2] - a*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2]))/
(a + b) + (6*(24*a^4 - 65*a^2*b^2 + 35*b^4)*(-2*a*b*EllipticE[ArcSin[Sqrt[C
os[c + d*x]]], -1] + 2*a*(a + b)*EllipticF[ArcSin[Sqrt[Cos[c + d*x]]], -1]
+ (-2*a^2 + b^2)*EllipticPi[-(b/a), ArcSin[Sqrt[Cos[c + d*x]]], -1])*Sin[c
+ d*x])/(a*Sqrt[Sin[c + d*x]^2]))/((a - b)^2*(a + b)^2) + 4*Sqrt[Cos[c + d*
x]]*((3*b^4*(19*a^3 - 13*a*b^2 + b*(17*a^2 - 11*b^2)*Cos[c + d*x])*Sin[c +
d*x])/((a^2 - b^2)^2*(a + b*Cos[c + d*x])^2) + 8*(-9*b + a*Sec[c + d*x])*Ta
n[c + d*x]))/(48*a^4*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2100 vs. 2(451) = 902.

Time = 15.66 (sec) , antiderivative size = 2101, normalized size of antiderivative = 5.32

method	result	size
default	Expression too large to display	2101

```
[In] int(1/cos(d*x+c)^(5/2)/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/a^3*(-1/6*cos
(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1
/2*d*x+1/2*c)^2-1/2)^2+1/3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2
*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellipti
cF(cos(1/2*d*x+1/2*c),2^(1/2)))-6/a^4*b/sin(1/2*d*x+1/2*c)^2/(2*sin(1/2*d*x
+1/2*c)^2-1)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/
2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d
*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))+2*b^2/a^2*(-1/2
/a*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/
2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)^2-3/4*b^2*(3*a^2-b^2)/a^2/(a^2
-b^2)^2*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(
```

```
1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-7/8/(a+b)/(a^2-b^2)*(sin(1/2*d*x+1/2*c)
^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/
2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/4/(a+b)/(a^2-
b^2)/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*s
in(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c
),2^(1/2))*b+3/8/(a+b)/(a^2-b^2)/a^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1
/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/
2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*b^2-9/8*b/(a^2-b^2)^2*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4
+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+3/8*b^3/
a^2/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1
/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*
d*x+1/2*c),2^(1/2))+9/8*b/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(
1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1
/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-3/8*b^3/a^2/(a^2-b^2)^2*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c
)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-15/4*
a^2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d
*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*E
llipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+3/2/(a^2-b^2)^2/(-2*a*b+2*
b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2
*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/
2*c),-2*b/(a-b),2^(1/2))-3/4/a^2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b^5*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^
4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1
/2)))-12*b^3/a^4/(-2*a*b+2*b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*
x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*El
lipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+4*b^2/a^3*(-1/a*b^2/(a^2-b^
2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/
(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a^2-b^2)*b/a*(sin(1/2*d
*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)
^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/2/(a
^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/
(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+
1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)
*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2
*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+1/a/(a^2-b^2
)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+
1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(co
s(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/
2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^3,x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(5/2)/(a+b*cos(d*x+c))**3,x)
[Out] Timed out
```

Maxima [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
[Out] Timed out
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^3}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^3\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^3*cos(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^3}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^{5/2}\,\left(a+b\,\cos\left(c+d\,x\right)\right)^3}\,dx$$

```
[In] int(1/(cos(c + d*x)^(5/2)*(a + b*cos(c + d*x))^3),x)
[Out] int(1/(cos(c + d*x)^(5/2)*(a + b*cos(c + d*x))^3), x)
```

3.603 $\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 438

$$\begin{aligned}\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}\,dx &= -\frac{(a-b)\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{4bd} \\ &+ \frac{\sqrt{a+b}(a+2b)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{4bd} \\ &+ \frac{\sqrt{a+b}(a^2-4b^2)\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{4b^2d} \\ &+ \frac{a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4bd\sqrt{\cos(c+dx)}} + \frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d}\end{aligned}$$

```
[Out] 1/4*a*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/b/d/cos(d*x+c)^(1/2)+1/2*sin(d*x+c)
*cos(d*x+c)^(1/2)*(a+b*cos(d*x+c))^(1/2)/d-1/4*(a-b)*cot(d*x+c)*EllipticE((
a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a
+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/b/d
+1/4*(a+2*b)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*
x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)
*(a*(1+sec(d*x+c))/(a-b))^(1/2)/b/d+1/4*(a^2-4*b^2)*cot(d*x+c)*EllipticPi((
a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b)/(a-b))^(
1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(
1/2)/b^2/d
```

Rubi [A] (verified)

Time = 1.08 (sec) , antiderivative size = 438, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used = {2900, 3140, 3132, 2888, 3077, 2895, 3073}

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}\,dx$$
$$= \frac{\sqrt{a+b}(a^2-4b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{4b^2d}$$
$$+\frac{\sqrt{a+b}(a+2b)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{4bd}$$
$$-\frac{(a-b)\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{4bd}$$
$$+\frac{\sin(c+dx)\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}{2d}+\frac{a\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{4bd\sqrt{\cos(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^(3/2)*Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] -1/4*((a - b)*Sqrt[a + b]*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c +
d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - S
ec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(b*d) + (Sqrt[
a + b]*(a + 2*b)*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sq
rt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*
x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(4*b*d) + (Sqrt[a + b]*
(a^2 - 4*b^2)*Cot[c + d*x]*EllipticPi[(a + b)/b, ArcSin[Sqrt[a + b*Cos[c +
d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - S
ec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(4*b^2*d) + (a
*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(4*b*d*Sqrt[Cos[c + d*x]]) + (Sqrt[
Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(2*d)
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
```

```
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 2900

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m - 1)*((c + d*Sin[e + f*x])^n/(f*(m + n))), x] + Dist[1/(d*(m + n)), In
t[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^(n - 1)*Simp[a^2*c*d*(m
 + n) + b*d*(b*c*(m - 1) + a*d*n) + (a*d*(2*b*c + a*d)*(m + n) - b*d*(a*c -
 b*d*(m + n - 1)))*Sin[e + f*x] + b*d*(b*c*n + a*d*(2*m + n - 1))*Sin[e + f
*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && N
eQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[0, m, 2] && LtQ[-1, n, 2] && N
eQ[m + n, 0] && (IntegerQ[m] || IntegersQ[2*m, 2*n])
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
- 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
```

```
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3140

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(Sqrt[c + d*Sin[e + f
*x]]/(d*f*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[1/(2*d), Int[(1/((a + b*Sin
[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]))*Simp[2*a*A*d - C*(b*c - a*d) -
2*(a*c*C - d*(A*b + a*B))*Sin[e + f*x] + (2*b*B*d - C*(b*c + a*d))*Sin[e +
f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*
d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d} + \frac{\int \frac{\frac{ab}{2}+b^2\cos(c+dx)+\frac{1}{2}ab\cos^2(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{2b}$$

$$= \frac{a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4bd\sqrt{\cos(c+dx)}} + \frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d} + \frac{\int \frac{-\frac{a^2b}{2}+ab^2\cos(c+dx)-\frac{1}{2}b(a^2-4b^2)\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{4b^2}$$

$$= \frac{a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4bd\sqrt{\cos(c+dx)}} + \frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d} + \frac{\int \frac{-\frac{a^2b}{2}+ab^2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{4b^2} - \frac{(a^2-4b^2)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx}{8b}$$

$$= \frac{\sqrt{a+b}(a^2-4b^2)\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1}{}}}{4b^2d} + \frac{a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4bd\sqrt{\cos(c+dx)}} + \frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d} - \frac{a^2\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{8b} + \frac{(a(a+2b))\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{8b}$$

$$= -\frac{(a-b)\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{4bd}$$
$$+\frac{\sqrt{a+b}(a+2b)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+}{a-b}}}{4bd}$$
$$+\frac{\sqrt{a+b}(a^2-4b^2)\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{a}}{4b^2d}$$
$$+\frac{a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4bd\sqrt{\cos(c+dx)}}+\frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d}$$

Mathematica [A] (verified)

Time = 7.18 (sec) , antiderivative size = 429, normalized size of antiderivative = 0.98

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}\,dx$$
$$=\frac{\sqrt{\cos(c+dx)}\left(4(a+b\cos(c+dx))\sin(c+dx)+\frac{2a(a+b)\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right)|\frac{-a+b}{a+b}\right)+4(a-2b)b\sqrt{}}{}\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)*Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*(4*(a + b*Cos[c + d*x])*Sin[c + d*x] + (2*a*(a + b)*Sqr
t[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(
c + d*x)/2]], (-a + b)/(a + b)] + 4*(a - 2*b)*b*Sqrt[(a + b*Cos[c + d*x])/(
(a + b)*(1 + Cos[c + d*x]))]*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(
a + b)] - 4*a^2*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*Ell
ipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 16*b^2*Sqrt[(a +
b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticPi[-1, ArcSin[Tan[(c
+ d*x)/2]], (-a + b)/(a + b)] + a*b*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*S
ec[(c + d*x)/2]*Sin[(3*(c + d*x))/2] + 2*a^2*Sqrt[Cos[c + d*x]/(1 + Cos[c +
 d*x])]*Tan[(c + d*x)/2] - a*b*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Tan[(c
 + d*x)/2])/(b*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])])))/(8*d*Sqrt[a + b*Cos
[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1687 vs. 2(396) = 792.

Time = 7.06 (sec) , antiderivative size = 1688, normalized size of antiderivative = 3.85

method	result	size
default	Expression too large to display	1688

```
[In] int(cos(d*x+c)^(3/2)*(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/d*(-EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c
)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*cos(
d*x+c)^2-EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+
c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b*cos
(d*x+c)^2+2*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*((a+c
os(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
a^2*cos(d*x+c)^2-8*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2)
)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)*b^2*cos(d*x+c)^2-2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*a*b*cos(d*x+c)^2+4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*
x+c)))^(1/2)*b^2*cos(d*x+c)^2+2*b^2*cos(d*x+c)^3*sin(d*x+c)-2*EllipticE(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(
a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*cos(d*x+c)-2*EllipticE(co
t(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/
(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b*cos(d*x+c)+4*EllipticPi(
cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x
+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*cos(d*x+c)-16*Ellip
ticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+c
os(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^2*cos(d*x+c)-4*
EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+
cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b*cos(d*x+c)+8
*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1
+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^2*cos(d*x+c)+
3*cos(d*x+c)^2*sin(d*x+c)*a*b+2*b^2*cos(d*x+c)^2*sin(d*x+c)-((a+cos(d*x+c)*
b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b
))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2-((a+cos(d*x+c)*b)/(1+cos(d*
x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(c
os(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b+2*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b
))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x
+c)/(1+cos(d*x+c)))^(1/2)*a^2-8*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/
2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1
+cos(d*x+c)))^(1/2)*b^2-2*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*Ell
ipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c
```

```
)))^(1/2)*a*b+4*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
b^2+a^2*cos(d*x+c)*sin(d*x+c)+2*a*b*cos(d*x+c)*sin(d*x+c))/(1+cos(d*x+c))/(
a+cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(1/2)/b
```

Fricas [F]

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}\,dx=\int \sqrt{b\cos\left(dx+c\right)+a}\cos\left(dx+c\right)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(3/2), x)
```

Sympy [F]

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}\,dx=\int \sqrt{a+b\cos\left(c+dx\right)}\cos^{\frac{3}{2}}\left(c+dx\right)dx$$

```
[In] integrate(cos(d*x+c)**(3/2)*(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(a + b*cos(c + d*x))*cos(c + d*x)**(3/2), x)
```

Maxima [F]

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}\,dx=\int \sqrt{b\cos\left(dx+c\right)+a}\cos\left(dx+c\right)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(3/2), x)
```

Giac [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}\,dx=\text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}\,dx = \int \cos\left(c+d\,x\right)^{3/2}\,\sqrt{a+b\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)*(a + b*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(3/2)*(a + b*cos(c + d*x))^(1/2), x)
```

3.604 $\int \sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 371

$$\int \sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\,dx = -\frac{(a-b)\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ad}$$
$$+\frac{\sqrt{a+b}\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{d}$$
$$-\frac{a\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{bd}$$
$$+\frac{\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[Out] sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)-(a-b)*cot(d*x+c)*Ellip
ticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/
2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/
2)/a/d+cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(
1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1
+sec(d*x+c))/(a-b))^(1/2)/d-a*cot(d*x+c)*EllipticPi((a+b*cos(d*x+c))^(1/2)/
(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(
1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/b/d
```

Rubi [A] (verified)

Time = 0.68 (sec) , antiderivative size = 371, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {2900, 3133, 2888, 12, 2880, 2895, 3073}

$$\begin{aligned}&\int \sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\,dx\\&=\frac{\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{d}\\&\quad-\frac{(a-b)\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{ad}\\&\quad-\frac{a\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{bd}\\&\quad+\frac{\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}\end{aligned}$$

```
[In] Int[Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] -(((a - b)*Sqrt[a + b]*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x
]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[
c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(a*d)) + (Sqrt[a
+ b]*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sq
rt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)
]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/d - (a*Sqrt[a + b]*Cot[c + d*x]*Ell
ipticPi[(a + b)/b, ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c
+ d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a
*(1 + Sec[c + d*x]))/(a - b)])/(b*d) + (Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*
x])/(d*Sqrt[Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2880

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin
[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[1/(a - b), Int[1/(Sqrt[a + b*Sin[
e + f*x]]*Sqrt[c + d*Sin[e + f*x]]), x], x] - Dist[b/(a - b), Int[(1 + Sin[
e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /;
FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0]
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 2900

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m - 1)*((c + d*Sin[e + f*x])^n/(f*(m + n))), x] + Dist[1/(d*(m + n)), In
t[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^(n - 1)*Simp[a^2*c*d*(m
 + n) + b*d*(b*c*(m - 1) + a*d*n) + (a*d*(2*b*c + a*d)*(m + n) - b*d*(a*c -
 b*d*(m + n - 1)))*Sin[e + f*x] + b*d*(b*c*n + a*d*(2*m + n - 1))*Sin[e + f
*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && N
eQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[0, m, 2] && LtQ[-1, n, 2] && N
eQ[m + n, 0] && (IntegerQ[m] || IntegersQ[2*m, 2*n])
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3133

```
Int[((A_.) + (C_.)*sin[(e_.) + (f_.)*(x_)]^2)/(((a_.) + (b_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :
> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]], x], x]
 + Dist[1/b^2, Int[(A*b^2 - a^2*C - 2*a*b*C*Sin[e + f*x])/((a + b*Sin[e + f
```

```
*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f, A,
 C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{\int \frac{-\frac{ab}{2}+\frac{1}{2}ab\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{b}$$

$$= \frac{\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{1}{2}a\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx + \frac{\int -\frac{ab}{2\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{b}$$

$$= -\frac{a\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+}{a-b}}}{bd} + \frac{\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} - \frac{1}{2}a\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= -\frac{a\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+}{a-b}}}{bd} + \frac{\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{1}{2}a\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx - \frac{1}{2}a\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= -\frac{(a-b)\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ad} + \frac{\sqrt{a+b}\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{d} - \frac{a\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+}{a-b}}}{bd} + \frac{\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 5.87 (sec) , antiderivative size = 314, normalized size of antiderivative = 0.85

$$\int \sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\,dx$$
$$= \frac{\sqrt{\cos(c+dx)}\left(\frac{2(a+b)\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right)|\frac{-a+b}{a+b}\right)}{\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}} - \frac{4a\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}\,\text{EllipticF}\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right),\right.}{\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}}}{}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*((2*(a + b)*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos
[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)])/Sqrt[Co
s[c + d*x]/(1 + Cos[c + d*x])] - (4*a*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1
 + Cos[c + d*x]))]*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)])/S
qrt[Cos[c + d*x]/(1 + Cos[c + d*x])] + (4*a*Sqrt[(a + b*Cos[c + d*x])/((a +
 b)*(1 + Cos[c + d*x]))]*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/
(a + b)])/Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])] + b*Sec[(c + d*x)/2]*Sin[(3
*(c + d*x))/2] + 2*a*Tan[(c + d*x)/2] - b*Tan[(c + d*x)/2]))/(2*d*Sqrt[a +
b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1084 vs. 2(343) = 686.

Time = 6.42 (sec) , antiderivative size = 1085, normalized size of antiderivative = 2.92

method	result	size
default	Expression too large to display	1085

```
[In] int(cos(d*x+c)^(1/2)*(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*cos(d*x+
c)^2-EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b*cos(d*x+c
)^2-2*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*cos(
d*x+c)^2+2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*cos
(d*x+c)^2-2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*co
s(d*x+c)-2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b*cos
```

```
(d*x+c)-4*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*
cos(d*x+c)+4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x
+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*c
os(d*x+c)+b*cos(d*x+c)^2*sin(d*x+c)-(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Ellip
ticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d
*x+c))/(a+b))^(1/2)*a-(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(cot(d*x+c
)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^
(1/2)*b-2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c
),-1,(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a+
2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)
/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a+sin(d*x+c)*c
os(d*x+c)*a)/(1+cos(d*x+c))/cos(d*x+c)^(1/2)/(a+cos(d*x+c)*b)^(1/2)
```

Fricas [F]

$$\int \sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\,dx = \int \sqrt{b\cos(dx+c)+a}\sqrt{\cos(dx+c)}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*sqrt(cos(d*x + c)), x)
```

Sympy [F]

$$\int \sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\,dx = \int \sqrt{a+b\cos(c+dx)}\sqrt{\cos(c+dx)}\,dx$$

```
[In] integrate(cos(d*x+c)**(1/2)*(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(a + b*cos(c + d*x))*sqrt(cos(c + d*x)), x)
```

Maxima [F]

$$\int \sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\,dx = \int \sqrt{b\cos(dx+c)+a}\sqrt{\cos(dx+c)}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(b*cos(d*x + c) + a)*sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\,dx = \int \sqrt{b\cos(dx+c)+a}\sqrt{\cos(dx+c)}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(b*cos(d*x + c) + a)*sqrt(cos(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\,dx = \int \sqrt{\cos(c+d\,x)}\,\sqrt{a+b\,\cos(c+d\,x)}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))^(1/2), x)
```

3.605 $\int \frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 135

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = -\frac{2\sqrt{\frac{a(1-\cos(c+dx))}{a+b\cos(c+dx)}}\sqrt{\frac{a(1+\cos(c+dx))}{a+b\cos(c+dx)}}(a+b\cos(c+dx))\csc(c+dx)\,\text{EllipticPi}\left(\frac{b}{a+b},\arcsin\left(\frac{\sqrt{a+b}\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\right),\right.}{\sqrt{a+b}d}$$

```
[Out] -2*(a+b*cos(d*x+c))*csc(d*x+c)*EllipticPi((a+b)^(1/2)*cos(d*x+c)^(1/2)/(a+b
*cos(d*x+c))^(1/2),b/(a+b),((-a+b)/(a+b))^(1/2))*(a*(1-cos(d*x+c))/(a+b*cos
(d*x+c)))^(1/2)*(a*(1+cos(d*x+c))/(a+b*cos(d*x+c)))^(1/2)/d/(a+b)^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.040, Rules used = {2890}

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = -\frac{2\csc(c+dx)\sqrt{\frac{a(1-\cos(c+dx))}{a+b\cos(c+dx)}}\sqrt{\frac{a(\cos(c+dx)+1)}{a+b\cos(c+dx)}}(a+b\cos(c+dx))\,\text{EllipticPi}\left(\frac{b}{a+b},\arcsin\left(\frac{\sqrt{a+b}\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\right),\right.}{d\sqrt{a+b}}$$

```
[In] Int[Sqrt[a + b*Cos[c + d*x]]/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (-2*Sqrt[(a*(1 - Cos[c + d*x]))/(a + b*Cos[c + d*x])]*Sqrt[(a*(1 + Cos[c +
d*x]))/(a + b*Cos[c + d*x])]*(a + b*Cos[c + d*x])*Csc[c + d*x]*EllipticPi[b
```

```
/(a + b), ArcSin[(Sqrt[a + b]*Sqrt[Cos[c + d*x]])/Sqrt[a + b*Cos[c + d*x]]]
, -((a - b)/(a + b))])/(Sqrt[a + b]*d)
```

Rule 2890

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Simp[2*((a + b*Sin[e + f*x])/(d*f*Rt[(a + b)/
(c + d), 2]*Cos[e + f*x]))*Sqrt[(b*c - a*d)*((1 + Sin[e + f*x])/((c - d)*(a
 + b*Sin[e + f*x])))]*Sqrt[(-(b*c - a*d))*((1 - Sin[e + f*x])/((c + d)*(a +
 b*Sin[e + f*x])))]*EllipticPi[b*((c + d)/(d*(a + b))), ArcSin[Rt[(a + b)/(
c + d), 2]*(Sqrt[c + d*Sin[e + f*x]]/Sqrt[a + b*Sin[e + f*x]])], (a - b)*((
c + d)/((a + b)*(c - d)))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && PosQ[(a + b)/(c + d)]
```

Rubi steps

integral =

$$-\frac{2\sqrt{\frac{a(1-\cos(c+dx))}{a+b\cos(c+dx)}}\sqrt{\frac{a(1+\cos(c+dx))}{a+b\cos(c+dx)}}(a+b\cos(c+dx))\csc(c+dx)\,\text{EllipticPi}\left(\frac{b}{a+b},\arcsin\left(\frac{\sqrt{a+b}\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\right),-\right.}{\sqrt{a+b}d}$$

Mathematica [A] (verified)

Time = 1.23 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.01

$$\int\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx$$
$$=\frac{2\sqrt{\cos(c+dx)}\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}\left((a-b)\,\text{EllipticF}\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right),\frac{-a+b}{a+b}\right)+2b\,\text{EllipticPi}\left(-1,\text{ar}\right.\right.}{d\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{a+b\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[a + b*Cos[c + d*x]]/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x])
)]*((a - b)*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 2*b*Ell
ipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]))/(d*Sqrt[Cos[c + d
*x]/(1 + Cos[c + d*x])]*Sqrt[a + b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 8.26 (sec) , antiderivative size = 181, normalized size of antiderivative = 1.34

method	result
default	$-\frac{2\sqrt{\frac{a+\cos(dx+c)b}{(1+\cos(dx+c))(a+b)}}\left(F\left(\cot(dx+c)-\csc(dx+c),\sqrt{-\frac{a-b}{a+b}}\right)a-F\left(\cot(dx+c)-\csc(dx+c),\sqrt{-\frac{a-b}{a+b}}\right)b+2b\Pi\left(\cot(dx+c)-\csc(dx+c\right.\right.}{d\sqrt{a+\cos(dx+c)b}\,\sqrt{\cos(dx+c)}}$

[In] int((a+cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)

[Out] -2/d*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a-EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b+2*b*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2)))/(a+cos(d*x+c)*b)^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(1+cos(d*x+c))/cos(d*x+c)^(1/2)

Fricas [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx=\int \frac{\sqrt{b\cos\left(dx+c\right)+a}}{\sqrt{\cos\left(dx+c\right)}}\,dx$$

[In] integrate((a+b*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(b*cos(d*x + c) + a)/sqrt(cos(d*x + c)), x)

Sympy [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx=\int \frac{\sqrt{a+b\cos\left(c+dx\right)}}{\sqrt{\cos\left(c+dx\right)}}\,dx$$

[In] integrate((a+b*cos(d*x+c))**(1/2)/cos(d*x+c)**(1/2),x)

[Out] Integral(sqrt(a + b*cos(c + d*x))/sqrt(cos(c + d*x)), x)

Maxima [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{\sqrt{b\cos\left(dx+c\right)+a}}{\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(b*cos(d*x + c) + a)/sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{\sqrt{b\cos\left(dx+c\right)+a}}{\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(b*cos(d*x + c) + a)/sqrt(cos(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{\sqrt{a+b\,\cos\left(c+d\,x\right)}}{\sqrt{\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(1/2)/cos(c + d*x)^(1/2),x)
[Out] int((a + b*cos(c + d*x))^(1/2)/cos(c + d*x)^(1/2), x)
```

3.606 $\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 229

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2(a-b)\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ad} - \frac{2(a-b)\sqrt{a+b}\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ad}$$

```
[Out] 2*(a-b)*cot(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^
(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(
1+sec(d*x+c))/(a-b))^(1/2)/a/d-2*(a-b)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c)
)^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(
1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/d
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used

$= \{2874, 2895, 3073\}$

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$
$$= \frac{2(a-b)\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{ad}$$
$$- \frac{2(a-b)\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{ad}$$

```
[In] Int[Sqrt[a + b*Cos[c + d*x]]/Cos[c + d*x]^(3/2),x]
```

```
[Out] (2*(a - b)*Sqrt[a + b]*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x
]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[
c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(a*d) - (2*(a - b
)*Sqrt[a + b]*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[
a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x])
)/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(a*d)
```

Rule 2874

```
Int[Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]/((a_.) + (b_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Dist[(c - d)/(a - b), Int[1/(Sqrt[a + b*Sin
[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]), x], x] - Dist[(b*c - a*d)/(a - b), In
t[(1 + Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rubi steps

$$\text{integral} = a\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx + (-a+b)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2(a-b)\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ad} - \frac{2(a-b)\sqrt{a+b}\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ad}$$

Mathematica [A] (verified)

Time = 2.22 (sec) , antiderivative size = 203, normalized size of antiderivative = 0.89

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = -\frac{\sqrt{a+b\cos(c+dx)}\sec^2\left(\frac{1}{2}(c+dx)\right)\left(\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}E\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right)|\frac{-a+b}{a+b}\right.\right.}{d\sqrt{\cos(c+}}$$

```
[In] Integrate[Sqrt[a + b*Cos[c + d*x]]/Cos[c + d*x]^(3/2),x]
```

```
[Out] -((Sqrt[a + b*Cos[c + d*x]]*Sec[(c + d*x)/2]^2*(Sqrt[Cos[c + d*x]]*Sqrt[1 +
 Cos[c + d*x]]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] - Sqrt
[Cos[c + d*x]]*Sqrt[1 + Cos[c + d*x]]*EllipticF[ArcSin[Tan[(c + d*x)/2]], (
-a + b)/(a + b)] - Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*
Sin[c + d*x]))/(d*Sqrt[Cos[c + d*x]]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1
+ Cos[c + d*x]))]))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 769 vs. $2(213) = 426$.

Time = 10.10 (sec) , antiderivative size = 770, normalized size of antiderivative = 3.36

method	result
default	$-\frac{2\left(\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2-1\right)\left(-\sqrt{-\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1}\sqrt{\frac{\left(\csc^2(dx+c)\right)a(1-\cos(dx+c))^2-\left(\csc^2(dx+c)\right)b(1-\cos}{a+b}}\right.}{}$

[In] int((a+cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(3/2),x,method=_RETURNVERBOSE)

[Out] -2/d*(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)*(-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b+csc(d*x+c)^3*(1-cos(d*x+c))^3*a-csc(d*x+c)^3*(1-cos(d*x+c))^3*b+a*(csc(d*x+c)-cot(d*x+c))+b*(csc(d*x+c)-cot(d*x+c)))*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2)/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(-(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(3/2)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)

Fricas [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{\sqrt{b\cos\left(dx+c\right)+a}}{\cos\left(dx+c\right)^{\frac{3}{2}}}\,dx$$

[In] integrate((a+b*cos(d*x+c))^(1/2)/cos(d*x+c)^(3/2),x, algorithm="fricas")

[Out] integral(sqrt(b*cos(d*x + c) + a)/cos(d*x + c)^(3/2), x)

Sympy [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{\sqrt{a+b\cos\left(c+dx\right)}}{\cos^{\frac{3}{2}}\left(c+dx\right)}\,dx$$

[In] integrate((a+b*cos(d*x+c))**(1/2)/cos(d*x+c)**(3/2),x)

[Out] Integral(sqrt(a + b*cos(c + d*x))/cos(c + d*x)**(3/2), x)

Maxima [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{\sqrt{b\cos\left(dx+c\right)+a}}{\cos\left(dx+c\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2)/cos(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate(sqrt(b*cos(d*x + c) + a)/cos(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{\sqrt{b\cos\left(dx+c\right)+a}}{\cos\left(dx+c\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2)/cos(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate(sqrt(b*cos(d*x + c) + a)/cos(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{\sqrt{a+b\,\cos\left(c+d\,x\right)}}{{\cos\left(c+d\,x\right)}^{3/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(1/2)/cos(c + d*x)^(3/2),x)
[Out] int((a + b*cos(c + d*x))^(1/2)/cos(c + d*x)^(3/2), x)
```

3.607 $\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 271

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2(a-b)b\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^2d} + \frac{2(a-b)\sqrt{a+b}\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3ad} + \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 2/3*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(3/2)+2/3*(a-b)*b*cot(d*
x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/
(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/
(a-b))^(1/2)/a^2/d+2/3*(a-b)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a
+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+
c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/d
```

Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 271, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2875, 3077, 2895, 3073}

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx$$
$$=\frac{2b(a-b)\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{3a^2d}$$
$$+\frac{2(a-b)\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{3ad}$$
$$+\frac{2\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{3d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Int[Sqrt[a + b*Cos[c + d*x]]/Cos[c + d*x]^(5/2),x]
```

```
[Out] (2*(a - b)*b*Sqrt[a + b]*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d
*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Se
c[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a^2*d) + (2*
(a - b)*Sqrt[a + b]*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/
(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c +
 d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a*d) + (2*Sqrt[a
+ b*Cos[c + d*x]]*Sin[c + d*x])/(3*d*Cos[c + d*x]^(3/2))
```

Rule 2875

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m + 1)*((c + d*Sin[e + f*x])^n/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m
 + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(
n - 1)*Simp[a*c*(m + 1) + b*d*n + (a*d*(m + 1) - b*c*(m + 2))*Sin[e + f*x]
- b*d*(m + n + 2)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x
] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m,
-1] && LtQ[0, n, 1] && IntegersQ[2*m, 2*n]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rubi steps

$$\text{integral} = \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{2}{3}\int \frac{\frac{b}{2}+\frac{1}{2}a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{1}{3}(a-b)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx + \frac{1}{3}b\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2(a-b)b\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^2d} + \frac{2(a-b)\sqrt{a+b}\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+}{a-b}}}{3ad} + \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [A] (verified)

Time = 5.47 (sec) , antiderivative size = 247, normalized size of antiderivative = 0.91

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx$$
$$= \frac{-2b(a+b)\cos^{\frac{3}{2}}(c+dx)\sqrt{1+\cos(c+dx)}\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right)|\frac{-a+b}{a+b}\right)+2a(a+}{}$$

```
[In] Integrate[Sqrt[a + b*Cos[c + d*x]]/Cos[c + d*x]^(5/2),x]
```

```
[Out] (-2*b*(a + b)*Cos[c + d*x]^(3/2)*Sqrt[1 + Cos[c + d*x]]*Sqrt[(a + b*Cos[c +
 d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-
a + b)/(a + b)] + 2*a*(a + b)*Cos[c + d*x]^(3/2)*Sqrt[1 + Cos[c + d*x]]*Sqr
t[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticF[ArcSin[Tan[(
c + d*x)/2]], (-a + b)/(a + b)] + (2*a^2 + a*b + b^2 + 2*a*(a + 2*b)*Cos[c
+ d*x] + b*(a + b)*Cos[2*(c + d*x)])*Tan[(c + d*x)/2])/(3*a*d*Cos[c + d*x]^
(3/2)*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1178 vs. 2(245) = 490.

Time = 12.65 (sec) , antiderivative size = 1179, normalized size of antiderivative = 4.35

method	result	size
default	Expression too large to display	1179

```
[In] int((a+cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3/d*(-(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/
(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*cos(
d*x+c)^3-(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))
/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b*cos
(d*x+c)^3+(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c)
)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b*co
s(d*x+c)^3+(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c
))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^2*c
os(d*x+c)^3-2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*
x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^
2*cos(d*x+c)^2-2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+
cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*a*b*cos(d*x+c)^2+2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(
(a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1
```

```
/2)*a*b*cos(d*x+c)^2+2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/
(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^
(1/2))*b^2*cos(d*x+c)^2-(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)
/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*a^2*cos(d*x+c)-EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2)
)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)*a*b*cos(d*x+c)+EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*a*b*cos(d*x+c)+(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1
+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*b^2*cos(d*x+c)+cos(d*x+c)^2*sin(d*x+c)*a*b+b^2*cos(d*x+c)^2*sin(d*x+c)
+a^2*cos(d*x+c)*sin(d*x+c)+2*a*b*cos(d*x+c)*sin(d*x+c)+a^2*sin(d*x+c))/(1+c
os(d*x+c))/(a+cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(3/2)/a
```

Fricas [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx=\int \frac{\sqrt{b\cos\left(dx+c\right)+a}}{\cos\left(dx+c\right)^{\frac{5}{2}}}\,dx$$

[In] integrate((a+b*cos(d*x+c))^(1/2)/cos(d*x+c)^(5/2),x, algorithm="fricas")

[Out] integral(sqrt(b*cos(d*x + c) + a)/cos(d*x + c)^(5/2), x)

Sympy [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx=\int \frac{\sqrt{a+b\cos\left(c+dx\right)}}{\cos^{\frac{5}{2}}\left(c+dx\right)}\,dx$$

[In] integrate((a+b*cos(d*x+c))**(1/2)/cos(d*x+c)**(5/2),x)

[Out] Integral(sqrt(a + b*cos(c + d*x))/cos(c + d*x)**(5/2), x)

Maxima [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx=\int \frac{\sqrt{b\cos\left(dx+c\right)+a}}{\cos\left(dx+c\right)^{\frac{5}{2}}}\,dx$$

[In] integrate((a+b*cos(d*x+c))^(1/2)/cos(d*x+c)^(5/2),x, algorithm="maxima")

[Out] integrate(sqrt(b*cos(d*x + c) + a)/cos(d*x + c)^(5/2), x)

Giac [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{\sqrt{b\cos\left(dx+c\right)+a}}{\cos\left(dx+c\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2)/cos(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate(sqrt(b*cos(d*x + c) + a)/cos(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{\sqrt{a+b\,\cos\left(c+d\,x\right)}}{{\cos\left(c+d\,x\right)}^{5/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(1/2)/cos(c + d*x)^(5/2),x)
[Out] int((a + b*cos(c + d*x))^(1/2)/cos(c + d*x)^(5/2), x)
```

3.608 $\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 329

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2(a-b)\sqrt{a+b}(9a^2-2b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{15a^3d} - \frac{2(a-b)\sqrt{a+b}(9a+2b)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{15a^2d} + \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{2b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15ad\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 2/5*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(5/2)+2/15*b*sin(d*x+c)*
(a+b*cos(d*x+c))^(1/2)/a/d/cos(d*x+c)^(3/2)+2/15*(a-b)*(9*a^2-2*b^2)*cot(d*
x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/
(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/
(a-b))^(1/2)/a^3/d-2/15*(a-b)*(9*a+2*b)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c
))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*
(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^2/d
```

Rubi [A] (verified)

Time = 0.74 (sec) , antiderivative size = 329, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2875, 3134, 3077, 2895, 3073}

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx =$$

$$-\frac{2(a-b)\sqrt{a+b}(9a+2b)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\Big(\arcsin\Big(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\Big),}{15a^2d}$$

$$+\frac{2(a-b)\sqrt{a+b}(9a^2-2b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\Big(\arcsin\Big(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\Big)|-\frac{a+b}{a-b}\Big)}{15a^3d}$$

$$+\frac{2b\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{15ad\cos^{\frac{3}{2}}(c+dx)}+\frac{2\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{5d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Int[Sqrt[a + b*Cos[c + d*x]]/Cos[c + d*x]^(7/2),x]
```

```
[Out] (2*(a - b)*Sqrt[a + b]*(9*a^2 - 2*b^2)*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a
 + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*S
qrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(
15*a^3*d) - (2*(a - b)*Sqrt[a + b]*(9*a + 2*b)*Cot[c + d*x]*EllipticF[ArcSi
n[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a
- b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a
- b)])/(15*a^2*d) + (2*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(5*d*Cos[c +
d*x]^(5/2)) + (2*b*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(15*a*d*Cos[c + d
*x]^(3/2))
```

Rule 2875

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m + 1)*((c + d*Sin[e + f*x])^n/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m
 + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(
n - 1)*Simp[a*c*(m + 1) + b*d*n + (a*d*(m + 1) - b*c*(m + 2))*Sin[e + f*x]
- b*d*(m + n + 2)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x
] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m,
-1] && LtQ[0, n, 1] && IntegersQ[2*m, 2*n]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
```

```
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rubi steps

$$\text{integral} = \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{2}{5}\int \frac{\frac{b}{2}+\frac{3}{2}a\cos(c+dx)+b\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{2b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15ad\cos^{\frac{3}{2}}(c+dx)} + \frac{4\int\frac{\frac{1}{4}(9a^2-2b^2)+\frac{7}{4}ab\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{15a}$$

$$= \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{2b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15ad\cos^{\frac{3}{2}}(c+dx)} - \frac{((a-b)(9a+2b))\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{15a} - \frac{(-9a^2+2b^2)\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{15a}$$

$$= \frac{2(a-b)\sqrt{a+b}(9a^2-2b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(}{a-}}}{15a^3d} - \frac{2(a-b)\sqrt{a+b}(9a+2b)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}}{15a^2d} + \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{2b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15ad\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [A] (verified)

Time = 10.46 (sec) , antiderivative size = 453, normalized size of antiderivative = 1.38

$$\int\frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}dx = \frac{8\cos^2\left(\frac{1}{2}(c+dx)\right)^{7/2}\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\cos(c+dx)\sec^2\left(\frac{1}{2}(c+dx)\right)}\left(-2(9a^3+9a^2b-2ab^2-2b^3)\sqrt{\frac{\cos(c+d}{1+\cos(c+}}\right.}{} + \frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\left(\frac{2\sec(c+dx)(9a^2\sin(c+dx)-2b^2\sin(c+dx))}{15a^2}+\frac{2b\sec(c+dx)\tan(c+dx)}{15a}+\frac{2}{5}\sec^2(c+d\right.}{d}$$

```
[In] Integrate[Sqrt[a + b*Cos[c + d*x]]/Cos[c + d*x]^(7/2),x]
```

```
[Out] (8*(Cos[(c + d*x)/2]^2)^(7/2)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[Co
s[c + d*x]*Sec[(c + d*x)/2]^2]*(-2*(9*a^3 + 9*a^2*b - 2*a*b^2 - 2*b^3)*Sqrt
[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + C
os[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 2*a*
(9*a^2 + 7*a*b - 2*b^2)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*C
os[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticF[ArcSin[Tan[(c + d*x)/2
]], (-a + b)/(a + b)] - (9*a^2 - 2*b^2)*Cos[c + d*x]*(a + b*Cos[c + d*x])*S
```

```
ec[(c + d*x)/2]^2*Tan[(c + d*x)/2]))/(15*a^2*d*Cos[c + d*x]^(3/2)*(1 + Cos[
c + d*x])^(3/2)*Sqrt[a + b*Cos[c + d*x]]) + (Sqrt[Cos[c + d*x]]*Sqrt[a + b*
Cos[c + d*x]]*((2*Sec[c + d*x]*(9*a^2*Sin[c + d*x] - 2*b^2*Sin[c + d*x]))/(
15*a^2) + (2*b*Sec[c + d*x]*Tan[c + d*x])/(15*a) + (2*Sec[c + d*x]^2*Tan[c
+ d*x])/5))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2104 vs. $2(297) = 594$.

Time = 12.11 (sec) , antiderivative size = 2105, normalized size of antiderivative = 6.40

method	result	size
default	Expression too large to display	2105

```
[In] int((a+cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/15/d*(-2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2
*cos(d*x+c)^4-7*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(
d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*
a^2*b*cos(d*x+c)^4+2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(
1/2)*a*b^2*cos(d*x+c)^4+18*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(
1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a
+b))^(1/2)*a^2*b*cos(d*x+c)^3-4*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+
b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c
))/(a+b))^(1/2)*a*b^2*cos(d*x+c)^3-14*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-
b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos
(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)^3+4*EllipticF(cot(d*x+c)-csc(d*x+c),
(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(
1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)^3+9*EllipticE(cot(d*x+c)-csc(d*
x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)
*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)^2-18*EllipticF(cot(d*x+c)-
csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(
d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^3+9*EllipticE(cot(d*x+
c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+c
os(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^2-2*EllipticE(cot(d
*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((
a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)^2-a*b^2*cos(d*x+
c)^2*sin(d*x+c)+4*a^2*b*cos(d*x+c)*sin(d*x+c)+3*sin(d*x+c)*cos(d*x+c)*a^3+4
*sin(d*x+c)*cos(d*x+c)^2*a^2*b+3*a^3*sin(d*x+c)-2*b^3*cos(d*x+c)^3*sin(d*x+
c)-2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d
*x+c)^2-7*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*
```

```
cos(d*x+c)^2+2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a
*b^2*cos(d*x+c)^2+9*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1
/2)*a^2*b*cos(d*x+c)^4+9*a^2*b*cos(d*x+c)^3*sin(d*x+c)+a*b^2*cos(d*x+c)^3*s
in(d*x+c)-9*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*
cos(d*x+c)^2+9*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a
^3*cos(d*x+c)^4-2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2
)*b^3*cos(d*x+c)^4-9*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(
1/2)*a^3*cos(d*x+c)^4+18*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/
2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b
))^(1/2)*a^3*cos(d*x+c)^3-4*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^
(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(
a+b))^(1/2)*b^3*cos(d*x+c)^3+9*a^3*cos(d*x+c)^2*sin(d*x+c))/(1+cos(d*x+c))/
(a+cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(5/2)/a^2
```

Fricas [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx=\int \frac{\sqrt{b\cos\left(dx+c\right)+a}}{\cos\left(dx+c\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2)/cos(d*x+c)^(7/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)/cos(d*x + c)^(7/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx=\text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(1/2)/cos(d*x+c)**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{\sqrt{b\cos\left(dx+c\right)+a}}{\cos\left(dx+c\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2)/cos(d*x+c)^(7/2),x, algorithm="maxima")
[Out] integrate(sqrt(b*cos(d*x + c) + a)/cos(d*x + c)^(7/2), x)
```

Giac [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{\sqrt{b\cos\left(dx+c\right)+a}}{\cos\left(dx+c\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2)/cos(d*x+c)^(7/2),x, algorithm="giac")
[Out] integrate(sqrt(b*cos(d*x + c) + a)/cos(d*x + c)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{\sqrt{a+b\,\cos\left(c+d\,x\right)}}{{\cos\left(c+d\,x\right)}^{7/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(1/2)/cos(c + d*x)^(7/2),x)
[Out] int((a + b*cos(c + d*x))^(1/2)/cos(c + d*x)^(7/2), x)
```

3.609 $\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 389

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{2(a-b)b\sqrt{a+b}(19a^2+8b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{105a^4d}$$
$$+\frac{2(a-b)\sqrt{a+b}(25a^2+6ab+8b^2)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{105a^3d}$$
$$+\frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)}+\frac{2b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{35ad\cos^{\frac{5}{2}}(c+dx)}$$
$$+\frac{2(25a^2-4b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105a^2d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 2/7*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(7/2)+2/35*b*sin(d*x+c)*
(a+b*cos(d*x+c))^(1/2)/a/d/cos(d*x+c)^(5/2)+2/105*(25*a^2-4*b^2)*sin(d*x+c)
*(a+b*cos(d*x+c))^(1/2)/a^2/d/cos(d*x+c)^(3/2)+2/105*(a-b)*b*(19*a^2+8*b^2)
*cot(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(
(-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d
*x+c))/(a-b))^(1/2)/a^4/d+2/105*(a-b)*(25*a^2+6*a*b+8*b^2)*cot(d*x+c)*Ellip
ticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/
2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/
2)/a^3/d
```

Rubi [A] (verified)

Time = 1.05 (sec) , antiderivative size = 389, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2875, 3134, 3077, 2895, 3073}

$$\begin{aligned}\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx &= \frac{2(25a^2-4b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{105a^2d\cos^{\frac{3}{2}}(c+dx)} \\ &+ \frac{2b(a-b)\sqrt{a+b}(19a^2+8b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right.}{105a^4d} \\ &+ \frac{2(a-b)\sqrt{a+b}(25a^2+6ab+8b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c}}{\sqrt{a+b}\sqrt{\cos(}}\right.\right.}{105a^3d} \\ &+ \frac{2b\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{35ad\cos^{\frac{5}{2}}(c+dx)} + \frac{2\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{7d\cos^{\frac{7}{2}}(c+dx)}\end{aligned}$$

```
[In] Int[Sqrt[a + b*Cos[c + d*x]]/Cos[c + d*x]^(9/2),x]
```

```
[Out] (2*(a - b)*b*Sqrt[a + b]*(19*a^2 + 8*b^2)*Cot[c + d*x]*EllipticE[ArcSin[Sqr
t[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))
]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)]
)/(105*a^4*d) + (2*(a - b)*Sqrt[a + b]*(25*a^2 + 6*a*b + 8*b^2)*Cot[c + d*x
]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]]
)], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + S
ec[c + d*x]))/(a - b)])/(105*a^3*d) + (2*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d
*x])/(7*d*Cos[c + d*x]^(7/2)) + (2*b*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])
/(35*a*d*Cos[c + d*x]^(5/2)) + (2*(25*a^2 - 4*b^2)*Sqrt[a + b*Cos[c + d*x]]
*Sin[c + d*x])/(105*a^2*d*Cos[c + d*x]^(3/2))
```

Rule 2875

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m + 1)*((c + d*Sin[e + f*x])^n/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m
 + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(
n - 1)*Simp[a*c*(m + 1) + b*d*n + (a*d*(m + 1) - b*c*(m + 2))*Sin[e + f*x]
- b*d*(m + n + 2)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x
] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m,
-1] && LtQ[0, n, 1] && IntegersQ[2*m, 2*n]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
```

```
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rubi steps

$$\text{integral} = \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{2}{7}\int \frac{\frac{b}{2}+\frac{5}{2}a\cos(c+dx)+2b\cos^2(c+dx)}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{2b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{35ad\cos^{\frac{5}{2}}(c+dx)} + \frac{4\int \frac{\frac{1}{4}(25a^2-4b^2)+\frac{23}{4}ab\cos(c+dx)+\frac{1}{2}b^2\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{35a}$$

$$= \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{2b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{35ad\cos^{\frac{5}{2}}(c+dx)} + \frac{2(25a^2-4b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105a^2d\cos^{\frac{3}{2}}(c+dx)} + \frac{8\int \frac{\frac{1}{8}b(19a^2+8b^2)+\frac{1}{8}a(25a^2+2b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{105a^2}$$

$$= \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{2b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{35ad\cos^{\frac{5}{2}}(c+dx)} + \frac{2(25a^2-4b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105a^2d\cos^{\frac{3}{2}}(c+dx)} + \frac{((a-b)(25a^2+6ab+8b^2))\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{105a^2} + \frac{1}{105}\left(b\left(19+\frac{8b^2}{a^2}\right)\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx$$

$$= \frac{2(a-b)b\sqrt{a+b}(19a^2+8b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec}{a}}}{105a^4d} + \frac{2(a-b)\sqrt{a+b}(25a^2+6ab+8b^2)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-s}{}}}{105a^3d} + \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{2b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{35ad\cos^{\frac{5}{2}}(c+dx)} + \frac{2(25a^2-4b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105a^2d\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.33 (sec) , antiderivative size = 1304, normalized size of antiderivative = 3.35

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx$$

$$= \frac{-\frac{4a(25a^4-17a^2b^2-8b^4)\sqrt{\frac{(a+b)\cot^2\left(\frac{1}{2}(c+dx)\right)}{-a+b}}\sqrt{-\frac{(a+b)\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\sqrt{\frac{(a+b\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\right.\right.}{(a+b)\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}}{}$$

$$+\frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\left(\frac{2\sec^2(c+dx)(25a^2\sin(c+dx)-4b^2\sin(c+dx))}{105a^2}+\frac{2\sec(c+dx)(19a^2b\sin(c+dx)+8b^3\sin(c+d}{105a^3}\right.}{d}$$

```
[In] Integrate[Sqrt[a + b*Cos[c + d*x]]/Cos[c + d*x]^(9/2),x]
```

```
[Out] ((-4*a*(25*a^4 - 17*a^2*b^2 - 8*b^4)*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a
+ b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos
[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a +
b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c +
d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - 4*a*(-19
*a^3*b - 8*a*b^3)*((Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a
+ b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c
 + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*C
sc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a +
b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (Sqrt[((a + b)*Cot[(c + d
*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sq
rt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a
/b), ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2
*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c +
d*x]])) + 2*(-19*a^2*b^2 - 8*b^4)*((I*Cos[(c + d*x)/2]*Sqrt[a + b*Cos[c + d
*x]]*EllipticE[I*ArcSinh[Sin[(c + d*x)/2]/Sqrt[Cos[c + d*x]]], (-2*a)/(-a -
 b)]*Sec[c + d*x])/(b*Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*Sqrt[((a + b*Co
s[c + d*x])*Sec[c + d*x])/(a + b)]) + (2*a*((a*Sqrt[((a + b)*Cot[(c + d*x)/
2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[(
(a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[S
qrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]
```

```
*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])
- (a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*
x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a
]*Csc[c + d*x]*EllipticPi[-(a/b), ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c
+ d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[
c + d*x]]*Sqrt[a + b*Cos[c + d*x]])))/b + (Sqrt[a + b*Cos[c + d*x]]*Sin[c +
 d*x])/(b*Sqrt[Cos[c + d*x]])))/(105*a^3*d) + (Sqrt[Cos[c + d*x]]*Sqrt[a +
b*Cos[c + d*x]]*((2*Sec[c + d*x]^2*(25*a^2*Sin[c + d*x] - 4*b^2*Sin[c + d*x
]))/(105*a^2) + (2*Sec[c + d*x]*(19*a^2*b*Sin[c + d*x] + 8*b^3*Sin[c + d*x]
))/(105*a^3) + (2*b*Sec[c + d*x]^2*Tan[c + d*x])/(35*a) + (2*Sec[c + d*x]^3
*Tan[c + d*x])/7))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2498 vs. $2(351) = 702$.

Time = 16.38 (sec) , antiderivative size = 2499, normalized size of antiderivative = 6.42

method	result	size
default	Expression too large to display	2499

```
[In] int((a+cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(9/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/105/d*(15*a^4*sin(d*x+c)-a^2*b^2*cos(d*x+c)^2*sin(d*x+c)+8*b^4*cos(d*x+c)
^4*sin(d*x+c)+25*a^4*cos(d*x+c)^2*sin(d*x+c)+19*a^2*b^2*cos(d*x+c)^4*sin(d*
x+c)+8*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)
*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^4*cos(d
*x+c)^5-25*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*
x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^4*c
os(d*x+c)^5+16*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+co
s(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b
^4*cos(d*x+c)^4-50*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((
a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*a^4*cos(d*x+c)^4+8*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*b^4*cos(d*x+c)^3-25*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*a^4*cos(d*x+c)^3+16*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b)
)^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)*a*b^3*cos(d*x+c)^4-38*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)
/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1
+cos(d*x+c)))^(1/2)*a^3*b*cos(d*x+c)^4-4*EllipticF(cot(d*x+c)-csc(d*x+c),(-
(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)*a^2*b^2*cos(d*x+c)^4-16*EllipticF(cot(d*x+c)-csc(d
*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^3*cos(d*x+c)^4+19*EllipticE(cot(d*x+c)
```

```
-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(
1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^3*b*cos(d*x+c)^3+19*EllipticE(cot(
d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a
+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b^2*cos(d*x+c)^3+8*Ellipti
cE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x
+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^3*cos(d*x+c)^3-19*E
llipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+c
os(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^3*b*cos(d*x+c)^
3-2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)
/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b^2*cos(
d*x+c)^3-8*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*
x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^3
*cos(d*x+c)^3+19*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+
cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*a^3*b*cos(d*x+c)^5+19*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2)
)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)*a^2*b^2*cos(d*x+c)^5+8*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b)
)^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)*a*b^3*cos(d*x+c)^5-19*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)
/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1
+cos(d*x+c)))^(1/2)*a^3*b*cos(d*x+c)^5-2*EllipticF(cot(d*x+c)-csc(d*x+c),(-
(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)*a^2*b^2*cos(d*x+c)^5-8*EllipticF(cot(d*x+c)-csc(d*
x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(c
os(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^3*cos(d*x+c)^5+38*EllipticE(cot(d*x+c)-
csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1
/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^3*b*cos(d*x+c)^4+38*EllipticE(cot(d
*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+
b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b^2*cos(d*x+c)^4+25*a^4*cos
(d*x+c)^3*sin(d*x+c)+15*a^4*cos(d*x+c)*sin(d*x+c)+18*a^3*b*cos(d*x+c)*sin(d
*x+c)+18*a^3*b*cos(d*x+c)^2*sin(d*x+c)+44*a^3*b*cos(d*x+c)^3*sin(d*x+c)-a^2
*b^2*cos(d*x+c)^3*sin(d*x+c)+4*a*b^3*cos(d*x+c)^3*sin(d*x+c)+25*a^3*b*cos(d
*x+c)^4*sin(d*x+c)-4*a*b^3*cos(d*x+c)^4*sin(d*x+c))/(1+cos(d*x+c))/(a+cos(d
*x+c)*b)^(1/2)/cos(d*x+c)^(7/2)/a^3
```

Fricas [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx=\int \frac{\sqrt{b\cos\left(dx+c\right)+a}}{\cos\left(dx+c\right)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2)/cos(d*x+c)^(9/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)/cos(d*x + c)^(9/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(1/2)/cos(d*x+c)**(9/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{\sqrt{b\cos(dx+c)+a}}{\cos(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2)/cos(d*x+c)^(9/2),x, algorithm="maxima")
[Out] integrate(sqrt(b*cos(d*x + c) + a)/cos(d*x + c)^(9/2), x)
```

Giac [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{\sqrt{b\cos(dx+c)+a}}{\cos(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2)/cos(d*x+c)^(9/2),x, algorithm="giac")
[Out] integrate(sqrt(b*cos(d*x + c) + a)/cos(d*x + c)^(9/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{\sqrt{a+b\,\cos(c+d\,x)}}{{\cos(c+d\,x)}^{9/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(1/2)/cos(c + d*x)^(9/2),x)
[Out] int((a + b*cos(c + d*x))^(1/2)/cos(c + d*x)^(9/2), x)
```

3.610 $\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 508

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}\,dx =$$
$$-\frac{(a-b)\sqrt{a+b}(3a^2+16b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{24abd}$$
$$+\frac{\sqrt{a+b}(a+2b)(3a+8b)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+}{a-b}}}{24bd}$$
$$+\frac{a\sqrt{a+b}(a^2-12b^2)\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+}{a-b}}}{8b^2d}$$
$$+\frac{(3a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{24bd\sqrt{\cos(c+dx)}}$$
$$+\frac{a\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d}$$
$$+\frac{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{3d}$$

```
[Out] 1/3*(a+b*cos(d*x+c))^(3/2)*sin(d*x+c)*cos(d*x+c)^(1/2)/d+1/24*(3*a^2+16*b^2
)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/b/d/cos(d*x+c)^(1/2)+1/4*a*sin(d*x+c)*c
os(d*x+c)^(1/2)*(a+b*cos(d*x+c))^(1/2)/d-1/24*(a-b)*(3*a^2+16*b^2)*cot(d*x+
c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a
-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a
-b))^(1/2)/a/b/d+1/24*(a+2*b)*(3*a+8*b)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c
))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*
(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/b/d+1/8*a*(a^2-1
2*b^2)*cot(d*x+c)*EllipticPi((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^
```

```
(1/2),(a+b)/b,((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1
/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/b^2/d
```

Rubi [A] (verified)

Time = 1.46 (sec) , antiderivative size = 508, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {2900, 3128, 3140, 3132, 2888, 3077, 2895, 3073}

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}\,dx =$$

$$-\frac{(a-b)\sqrt{a+b}(3a^2+16b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{24abd}$$
$$+\frac{a\sqrt{a+b}(a^2-12b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right.}{8b^2d}$$
$$+\frac{(3a^2+16b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{24bd\sqrt{\cos(c+dx)}}$$
$$+\frac{\sqrt{a+b}(a+2b)(3a+8b)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right.}{24bd}$$
$$+\frac{\sin(c+dx)\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}{3d}$$
$$+\frac{a\sin(c+dx)\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}{4d}$$

```
[In] Int[Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] -1/24*((a - b)*Sqrt[a + b]*(3*a^2 + 16*b^2)*Cot[c + d*x]*EllipticE[ArcSin[S
qrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b
))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b
)])/(a*b*d) + (Sqrt[a + b]*(a + 2*b)*(3*a + 8*b)*Cot[c + d*x]*EllipticF[Arc
Sin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(
a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(
a - b)])/(24*b*d) + (a*Sqrt[a + b]*(a^2 - 12*b^2)*Cot[c + d*x]*EllipticPi[(
a + b)/b, ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])]
, -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec
[c + d*x]))/(a - b)])/(8*b^2*d) + ((3*a^2 + 16*b^2)*Sqrt[a + b*Cos[c + d*x]
]*Sin[c + d*x])/(24*b*d*Sqrt[Cos[c + d*x]]) + (a*Sqrt[Cos[c + d*x]]*Sqrt[a
+ b*Cos[c + d*x]]*Sin[c + d*x])/(4*d) + (Sqrt[Cos[c + d*x]]*(a + b*Cos[c +
d*x])^(3/2)*Sin[c + d*x])/(3*d)
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
```

```
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 2900

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m - 1)*((c + d*Sin[e + f*x])^n/(f*(m + n))), x] + Dist[1/(d*(m + n)), In
t[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^(n - 1)*Simp[a^2*c*d*(m
 + n) + b*d*(b*c*(m - 1) + a*d*n) + (a*d*(2*b*c + a*d)*(m + n) - b*d*(a*c -
 b*d*(m + n - 1)))*Sin[e + f*x] + b*d*(b*c*n + a*d*(2*m + n - 1))*Sin[e + f
*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && N
eQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[0, m, 2] && LtQ[-1, n, 2] && N
eQ[m + n, 0] && (IntegerQ[m] || IntegersQ[2*m, 2*n])
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3128

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*sin[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_
.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n + 2))), x] + Dist[1/(d*(m +
n + 2)), Int[(a + b*Sin[e + f*x])^(m - 1)*(c + d*Sin[e + f*x])^n*Simp[a*A*d
*(m + n + 2) + C*(b*c*m + a*d*(n + 1)) + (d*(A*b + a*B)*(m + n + 2) - C*(a*
c - b*d*(m + n + 1)))*Sin[e + f*x] + (C*(a*d*m - b*c*(m + 1)) + b*B*d*(m +
n + 2))*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n},
 x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m
, 0] &&  !(IGtQ[n, 0] && ( !IntegerQ[m] || (EqQ[a, 0] && NeQ[c, 0])))
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
- 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3140

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(Sqrt[c + d*Sin[e + f
*x]]/(d*f*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[1/(2*d), Int[(1/((a + b*Sin
[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]))*Simp[2*a*A*d - C*(b*c - a*d) -
2*(a*c*C - d*(A*b + a*B))*Sin[e + f*x] + (2*b*B*d - C*(b*c + a*d))*Sin[e +
f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*
d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{3d} + \frac{\int \frac{\sqrt{a+b\cos(c+dx)}\left(\frac{ab}{2}+2b^2\cos(c+dx)+\frac{3}{2}ab\cos^2(c+dx)\right)}{\sqrt{\cos(c+dx)}}\,dx}{3b}$$

$$= \frac{a\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d} + \frac{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{3d} + \frac{\int \frac{\frac{7a^2b}{4}+\frac{13}{2}ab^2\cos(c+dx)+\frac{1}{4}b(3a^2+16b^2)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{6b}$$

$$= \frac{(3a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{24bd\sqrt{\cos(c+dx)}} + \frac{a\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d} + \frac{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{3d} + \frac{\int \frac{-\frac{1}{4}ab(3a^2+16b^2)+\frac{7}{2}a^2b^2\cos(c+dx)-\frac{3}{4}ab(a^2-12b^2)\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{12b^2}$$

$$= \frac{(3a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{24bd\sqrt{\cos(c+dx)}} + \frac{a\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d} + \frac{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{3d} + \frac{\int \frac{-\frac{1}{4}ab(3a^2+16b^2)+\frac{7}{2}a^2b^2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{12b^2} - \frac{(a(a^2-12b^2))\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}dx}{16b}$$

$$= \frac{a\sqrt{a+b}(a^2-12b^2)\cot(c+dx)\,\mathrm{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{}}{8b^2d} + \frac{(3a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{24bd\sqrt{\cos(c+dx)}} + \frac{a\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d} + \frac{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{3d} + \frac{(a(a+2b)(3a+8b))\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{48b} - \frac{(a(3a^2+16b^2))\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{48b}$$

$$= -\frac{(a-b)\sqrt{a+b}(3a^2+16b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\text{se}}{a}}}{24abd}$$

$$+\frac{\sqrt{a+b}(a+2b)(3a+8b)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{}}{24bd}$$

$$+\frac{a\sqrt{a+b}(a^2-12b^2)\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{}}{8b^2d}$$

$$+\frac{(3a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{24bd\sqrt{\cos(c+dx)}}$$

$$+\frac{a\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d}$$

$$+\frac{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{3d}$$

Mathematica [C] (warning: unable to verify)

Result contains complex when optimal does not.

Time = 16.90 (sec) , antiderivative size = 1189, normalized size of antiderivative = 2.34

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \frac{-\frac{4a(17a^2+16b^2)\sqrt{\frac{(a+b)\cot^2\left(\frac{1}{2}(c+dx)\right)}{-a+b}}\sqrt{-\frac{(a+b)\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\sqrt{\frac{(a+b\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\csc(c+dx)\,\text{EllipticF}\left(\text{a}\right.}{(a+b)\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}}{}$$

$$+\frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\left(\frac{7}{12}a\sin(c+dx)+\frac{1}{6}b\sin(2(c+dx))\right)}{d}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] ((-4*a*(17*a^2 + 16*b^2)*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-
(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*C
sc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*
x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(
(a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - 208*a^2*b*((Sqrt[((a
```

```
 + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d
*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x
]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2
]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a
 + b*Cos[c + d*x]]) - (Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-((
(a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc
[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a/b), ArcSin[Sqrt[((a + b*Cos
[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/
2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])) + 2*(3*a^2 + 16*b^2)
*((I*Cos[(c + d*x)/2]*Sqrt[a + b*Cos[c + d*x]]*EllipticE[I*ArcSinh[Sin[(c +
 d*x)/2]/Sqrt[Cos[c + d*x]]], (-2*a)/(-a - b)]*Sec[c + d*x])/(b*Sqrt[Cos[(c
 + d*x)/2]^2*Sec[c + d*x]]*Sqrt[((a + b*Cos[c + d*x])*Sec[c + d*x])/(a + b)
]) + (2*a*((a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*C
os[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x
)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c
+ d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqr
t[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (a*Sqrt[((a + b)*Cot[(c + d*x)/
2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[(
(a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a/b),
 ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/
(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]
])))/b + (Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(b*Sqrt[Cos[c + d*x]])))/(
48*d) + (Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]*((7*a*Sin[c + d*x])/12
 + (b*Sin[2*(c + d*x)])/6))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2310 vs. 2(460) = 920.

Time = 8.06 (sec) , antiderivative size = 2311, normalized size of antiderivative = 4.55

method	result	size
default	Expression too large to display	2311

```
[In] int(cos(d*x+c)^(3/2)*(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/24/d*(-3*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b
*cos(d*x+c)^2-3*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(
d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*
a^3*cos(d*x+c)^2-16*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1
/2)*b^3*cos(d*x+c)^2+22*a*b^2*cos(d*x+c)^2*sin(d*x+c)+14*a^2*b*cos(d*x+c)*s
in(d*x+c)+16*sin(d*x+c)*cos(d*x+c)^2*b^3+3*sin(d*x+c)*cos(d*x+c)*a^3+17*sin
(d*x+c)*cos(d*x+c)^2*a^2*b+16*sin(d*x+c)*cos(d*x+c)*a*b^2+8*b^3*cos(d*x+c)^
3*sin(d*x+c)-16*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(
```

d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*
a*b^2*cos(d*x+c)^2-14*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^
(1/2)*a^2*b*cos(d*x+c)^2+52*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^
(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(
a+b))^(1/2)*a*b^2*cos(d*x+c)^2-72*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-
b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos
(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)^2-6*EllipticE(cot(d*x+c)-csc(d*x+c),
(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(
1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)-32*EllipticE(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*
b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)-144*EllipticPi(cot(d*x+c)-c
sc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+co
s(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)-28*EllipticF(cot(d
*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((
a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)+104*EllipticF(
cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)+8*b^3*cos
(d*x+c)^4*sin(d*x+c)-3*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2)
)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))
^(1/2)*a^3-16*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^
3+6*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3-3*El
lipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b-16*EllipticE
(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2-72*EllipticPi(cot(d
*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2-14*EllipticF(cot(d*x+c
)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+co
s(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b+52*EllipticF(cot(d*x+c)-csc(d
x+c),(-(a-b)/(a+b))^(1/2))(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c
)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2-6*EllipticE(cot(d*x+c)-csc(d*x+c),(-
(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+
cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)-32*EllipticE(cot(d*x+c)-csc(d*x+c),
(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(
1+cos(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)+12*EllipticPi(cot(d*x+c)-csc(d*x+
c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c
)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)+6*EllipticPi(cot(d*x+c)-csc
(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(
d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^2+22*a*b^2*cos(d*x+c)^
3*sin(d*x+c))/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(1/2)/b

Fricas [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")
[Out] integral((b*cos(d*x + c)^2 + a*cos(d*x + c))*sqrt(b*cos(d*x + c) + a)*sqrt(
cos(d*x + c)), x)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(3/2)*(a+b*cos(d*x+c))**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*cos(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*cos(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}\,dx = \int \cos\left(c+d\,x\right)^{3/2}\left(a+b\,\cos\left(c+d\,x\right)\right)^{3/2}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)*(a + b*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)^(3/2)*(a + b*cos(c + d*x))^(3/2), x)
```

3.611 $\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 433

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}\,dx =$$

$$-\frac{5(a-b)\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{4d}$$

$$+\frac{\sqrt{a+b}(5a+2b)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{4d}$$

$$-\frac{\sqrt{a+b}(3a^2+4b^2)\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{4bd}$$

$$+\frac{3a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sqrt{\cos(c+dx)}}+\frac{(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{2d\sqrt{\cos(c+dx)}}$$

```
[Out] 1/2*(a+b*cos(d*x+c))^(3/2)*sin(d*x+c)/d/cos(d*x+c)^(1/2)+3/4*a*sin(d*x+c)*(
a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)-5/4*(a-b)*cot(d*x+c)*EllipticE((a+
b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b
)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/d+1/4
*(5*a+2*b)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+
c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(
a*(1+sec(d*x+c))/(a-b))^(1/2)/d-1/4*(3*a^2+4*b^2)*cot(d*x+c)*EllipticPi((a+
b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b)/(a-b))^(1/
2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/
2)/b/d
```

Rubi [A] (verified)

Time = 1.36 (sec) , antiderivative size = 433, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {2900, 3126, 3140, 3132, 2888, 3077, 2895, 3073}

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}\,dx =$$

$$-\frac{\sqrt{a+b}(3a^2+4b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{4bd}$$
$$+\frac{\sqrt{a+b}(5a+2b)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{4d}$$
$$-\frac{5(a-b)\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{4d}$$
$$+\frac{\sin(c+dx)(a+b\cos(c+dx))^{3/2}}{2d\sqrt{\cos(c+dx)}}+\frac{3a\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{4d\sqrt{\cos(c+dx)}}$$

```
[In] Int[Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-5*(a - b)*Sqrt[a + b]*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*
x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec
[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(4*d) + (Sqrt[a
+ b]*(5*a + 2*b)*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sq
rt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*
x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(4*d) - (Sqrt[a + b]*(3
*a^2 + 4*b^2)*Cot[c + d*x]*EllipticPi[(a + b)/b, ArcSin[Sqrt[a + b*Cos[c +
d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - S
ec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(4*b*d) + (3*a
*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(4*d*Sqrt[Cos[c + d*x]]) + ((a + b*
Cos[c + d*x])^(3/2)*Sin[c + d*x])/(2*d*Sqrt[Cos[c + d*x]])
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
```

```
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 2900

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m - 1)*((c + d*Sin[e + f*x])^n/(f*(m + n))), x] + Dist[1/(d*(m + n)), In
t[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^(n - 1)*Simp[a^2*c*d*(m
 + n) + b*d*(b*c*(m - 1) + a*d*n) + (a*d*(2*b*c + a*d)*(m + n) - b*d*(a*c -
 b*d*(m + n - 1)))*Sin[e + f*x] + b*d*(b*c*n + a*d*(2*m + n - 1))*Sin[e + f
*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && N
eQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[0, m, 2] && LtQ[-1, n, 2] && N
eQ[m + n, 0] && (IntegerQ[m] || IntegersQ[2*m, 2*n])
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3126

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(c^2*C - B*c*d + A*d^2))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(c^2 -
d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[e + f*x])^(m -
1)*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*d*(b*d*m + a*c*(n + 1)) + (c*C - B*d
)*(b*c*m + a*d*(n + 1)) - (d*(A*(a*d*(n + 2) - b*c*(n + 1)) + B*(b*d*(n + 1
```

```
) - a*c*(n + 2))) - C*(b*c*d*(n + 1) - a*(c^2 + d^2*(n + 1))))*Sin[e + f*x]
 + b*(d*(B*c - A*d)*(m + n + 2) - C*(c^2*(m + 1) + d^2*(n + 1)))*Sin[e + f*
x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d,
 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 0] && LtQ[n, -1]
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
- 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3140

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(Sqrt[c + d*Sin[e + f
*x]]/(d*f*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[1/(2*d), Int[(1/((a + b*Sin
[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]))*Simp[2*a*A*d - C*(b*c - a*d) -
2*(a*c*C - d*(A*b + a*B))*Sin[e + f*x] + (2*b*B*d - C*(b*c + a*d))*Sin[e +
f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*
d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{2d\sqrt{\cos(c+dx)}} + \frac{\int \frac{\sqrt{a+b\cos(c+dx)}\left(-\frac{ab}{2}+b^2\cos(c+dx)+\frac{3}{2}ab\cos^2(c+dx)\right)}{\cos^{\frac{3}{2}}(c+dx)}\,dx}{2b} \\
&= -\frac{a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d\sqrt{\cos(c+dx)}} + \frac{(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{2d\sqrt{\cos(c+dx)}} \\
&\quad + \frac{\int \frac{\frac{ab^2}{4}+\frac{1}{2}b(2a^2+b^2)\cos(c+dx)+\frac{5}{4}ab^2\cos^2(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{b} \\
&= \frac{3a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sqrt{\cos(c+dx)}} + \frac{(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{2d\sqrt{\cos(c+dx)}} \\
&\quad + \frac{\int \frac{-\frac{5}{4}a^2b^2+\frac{1}{2}ab^3\cos(c+dx)+\frac{1}{4}b^2(3a^2+4b^2)\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{2b^2}
\end{aligned}$$

$$= \frac{3a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sqrt{\cos(c+dx)}} + \frac{(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{2d\sqrt{\cos(c+dx)}} + \frac{\int \frac{-\frac{5}{4}a^2b^2+\frac{1}{2}ab^3\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{2b^2} + \frac{1}{8}(3a^2+4b^2)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}dx$$

$$= -\frac{\sqrt{a+b}(3a^2+4b^2)\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b}, \arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right), -\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{}}{4bd} + \frac{3a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sqrt{\cos(c+dx)}} + \frac{(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{2d\sqrt{\cos(c+dx)}} - \frac{1}{8}(5a^2)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx + \frac{1}{8}(a(5a+2b))\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx$$

$$= -\frac{5(a-b)\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{4d} + \frac{\sqrt{a+b}(5a+2b)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right), -\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec}{a-}}}{4d} - \frac{\sqrt{a+b}(3a^2+4b^2)\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b}, \arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right), -\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{}}{4bd} + \frac{3a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sqrt{\cos(c+dx)}} + \frac{(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{2d\sqrt{\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 7.43 (sec) , antiderivative size = 437, normalized size of antiderivative = 1.01

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}\,dx = \frac{\sqrt{\cos(c+dx)}\left(4b(a+b\cos(c+dx))\sin(c+dx) + \frac{10a(a+b)\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right)\right|}{}\right.}{}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*(4*b*(a + b*Cos[c + d*x])*Sin[c + d*x] + (10*a*(a + b)*
Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Ta
n[(c + d*x)/2]], (-a + b)/(a + b)] - 4*(4*a^2 - a*b + 2*b^2)*Sqrt[(a + b*Co
s[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticF[ArcSin[Tan[(c + d*x)/2]
```

```
], (-a + b)/(a + b)] + 12*a^2*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c
 + d*x]))]*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 16*
b^2*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticPi[-1,
ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 5*a*b*Sqrt[Cos[c + d*x]/(1 +
Cos[c + d*x])]*Sec[(c + d*x)/2]*Sin[(3*(c + d*x))/2] + 10*a^2*Sqrt[Cos[c +
d*x]/(1 + Cos[c + d*x])]*Tan[(c + d*x)/2] - 5*a*b*Sqrt[Cos[c + d*x]/(1 + Co
s[c + d*x])]*Tan[(c + d*x)/2])/Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]))/(8*d
*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1945 vs. 2(391) = 782.

Time = 7.20 (sec) , antiderivative size = 1946, normalized size of antiderivative = 4.49

method	result	size
default	Expression too large to display	1946

```
[In] int(cos(d*x+c)^(1/2)*(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/d*(-5*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x
+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b*co
s(d*x+c)^2-2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(
d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b
*cos(d*x+c)^2-10*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+
cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*a*b*cos(d*x+c)-4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a
+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2
)*a*b*cos(d*x+c)+7*cos(d*x+c)^2*sin(d*x+c)*a*b+2*a*b*cos(d*x+c)*sin(d*x+c)-
8*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*
b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^2*cos(d*
x+c)^2+4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+
c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^2*cos
(d*x+c)^2-10*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(
d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2
*cos(d*x+c)-12*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*((
a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*a^2*cos(d*x+c)-16*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/
2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)
))^(1/2)*b^2*cos(d*x+c)+8*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*b^2*cos(d*x+c)-5*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*El
lipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*a*b-2*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(co
t(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*a*b+2*b^2*cos(d*x+c)^2*sin(d*x+c)-5*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b
```

```
)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*a^2*cos(d*x+c)^2-6*EllipticPi(cot(d*x+c)-csc(d*x+c),-1
,(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*cos(d*x+c)^2+2*b^2*cos(d*x+c)^3*sin(d*x+c)+
5*a^2*cos(d*x+c)*sin(d*x+c)+8*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x
+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/
(a+b))^(1/2))*a^2-5*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE
(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*a^2-6*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticPi(cot(d*x+
c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^
2-8*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc
(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^2+4*((
a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c)
,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^2+8*(cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*Ellipti
cF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*cos(d*x+c)^2+16*(cos(d*x
+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*Ell
ipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*cos(d*x+c))/(1+cos(d
*x+c))/(a+cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(1/2)
```

Fricas [F]

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\sqrt{\cos(dx+c)}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")
[Out] integral((b*cos(d*x + c) + a)^(3/2)*sqrt(cos(d*x + c)), x)
```

Sympy [F]

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}\,dx = \int (a+b\cos(c+dx))^{\frac{3}{2}}\sqrt{\cos(c+dx)}\,dx$$

```
[In] integrate(cos(d*x+c)**(1/2)*(a+b*cos(d*x+c))**(3/2),x)
[Out] Integral((a + b*cos(c + d*x))**(3/2)*sqrt(cos(c + d*x)), x)
```

Maxima [F]

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\sqrt{\cos(dx+c)}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\sqrt{\cos(dx+c)}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*sqrt(cos(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}\,dx = \int \sqrt{\cos(c+d\,x)}\,(a+b\,\cos(c+d\,x))^{3/2}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))^(3/2), x)
```

3.612 $\int \frac{(a+b\cos(c+dx))^{3/2}}{\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 375

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sqrt{\cos(c+dx)}}\,dx = -\frac{(a-b)b\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ad} + \frac{\sqrt{a+b}(2a+b)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{d} - \frac{3a\sqrt{a+b}\cot(c+dx)\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{d} + \frac{b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[Out] b*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)-(a-b)*b*cot(d*x+c)*E
llipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))
^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))
^(1/2)/a/d+(2*a+b)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/
cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))
^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/d-3*a*cot(d*x+c)*EllipticPi((a+b*cos(
d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b)/(a-b))^(1/2))*(a
+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.94 (sec) , antiderivative size = 375, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {2900, 3132, 2888, 3077, 2895, 3073}

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sqrt{\cos(c+dx)}}\,dx = \frac{\sqrt{a+b}(2a+b)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{}}{\sqrt{a}}\right.\right.}{d}$$
$$-\frac{b(a-b)\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{ad}$$
$$-\frac{3a\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{d}$$
$$+\frac{b\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + b*Cos[c + d*x])^(3/2)/Sqrt[Cos[c + d*x]],x]
```

```
[Out] -(((a - b)*b*Sqrt[a + b]*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d
*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Se
c[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(a*d)) + (Sqrt[
a + b]*(2*a + b)*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sq
rt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*
x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/d - (3*a*Sqrt[a + b]*Co
t[c + d*x]*EllipticPi[(a + b)/b, ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a +
b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a
 + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/d + (b*Sqrt[a + b*Cos[c + d*x]
]*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]])
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
```

```
&& PosQ[(a + b)/d]
```

Rule 2900

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m - 1)*((c + d*Sin[e + f*x])^n/(f*(m + n))), x] + Dist[1/(d*(m + n)), In
t[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^(n - 1)*Simp[a^2*c*d*(m
 + n) + b*d*(b*c*(m - 1) + a*d*n) + (a*d*(2*b*c + a*d)*(m + n) - b*d*(a*c -
 b*d*(m + n - 1)))*Sin[e + f*x] + b*d*(b*c*n + a*d*(2*m + n - 1))*Sin[e + f
*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && N
eQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[0, m, 2] && LtQ[-1, n, 2] && N
eQ[m + n, 0] && (IntegerQ[m] || IntegersQ[2*m, 2*n])
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
- 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \int \frac{-\frac{ab}{2}+a^2\cos(c+dx)+\frac{3}{2}ab\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{1}{2}(3ab)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx + \int \frac{-\frac{ab}{2}+a^2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= -\frac{3a\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+}{a-b}}}{d} + \frac{b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} - \frac{1}{2}(ab)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx + \frac{1}{2}(a(2a+b))\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= -\frac{(a-b)b\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ad} + \frac{\sqrt{a+b}(2a+b)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+}{a-b}}}{d} - \frac{3a\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+}{a-b}}}{d} + \frac{b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 5.20 (sec) , antiderivative size = 339, normalized size of antiderivative = 0.90

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sqrt{\cos(c+dx)}}\,dx = -\frac{\sqrt{\cos(c+dx)}\sec^2\left(\frac{1}{2}(c+dx)\right)\left(2b(a+b)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right)|\frac{-a+b}{a+b}\right)}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(3/2)/Sqrt[Cos[c + d*x]],x]
```

```
[Out] -((Sqrt[Cos[c + d*x]]*Sec[(c + d*x)/2]^2*(2*b*(a + b)*Sqrt[Cos[c + d*x]/(1
+ Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*El
```

```
lipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 4*a*(a - 2*b)*Sqrt[Co
s[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[
c + d*x]))]*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 12*a*b*
Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1
 + Cos[c + d*x]))]*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b
)] + b*Cos[c + d*x]*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2*Tan[(c + d*x)/2
]))/(d*Sqrt[a + b*Cos[c + d*x]]*(-1 + Tan[(c + d*x)/2]^4)))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1362 vs. 2(347) = 694.

Time = 9.36 (sec) , antiderivative size = 1363, normalized size of antiderivative = 3.63

method	result	size
default	Expression too large to display	1363

```
[In] int((a+cos(d*x+c)*b)^(3/2)/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*
b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b*cos(d*
x+c)^2-(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(
a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^2*cos(d
*x+c)^2-6*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c)
)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a*
b*cos(d*x+c)^2-2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos
(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*a^2*cos(d*x+c)^2+4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(
(a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*a*b*cos(d*x+c)^2-2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2)
)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)*a*b*cos(d*x+c)-2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)
/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*b^2*cos(d*x+c)-12*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*
b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/
(a+b))^(1/2))*a*b*cos(d*x+c)-4*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*
x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)
/(a+b))^(1/2))*a^2*cos(d*x+c)+8*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+
b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*a*b*cos(d*x+c)+b^2*cos(d*x+c)^2*sin(d*x+c)-((a+cos(d*x+c)*b
)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b)
)^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b-(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-cs
c(d*x+c),(-(a-b)/(a+b))^(1/2))*b^2-6*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+
cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),
-1,(-(a-b)/(a+b))^(1/2))*a*b-2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*
```

```
x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)
/(a+b))^(1/2))*a^2+4*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*Elliptic
F(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(
1/2)*a*b+a*b*cos(d*x+c)*sin(d*x+c))/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)/c
os(d*x+c)^(1/2)
```

Fricas [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sqrt{\cos(c+dx)}}\,dx=\int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/cos(d*x+c)^(1/2),x, algorithm="fricas")
[Out] integral((b*cos(d*x + c) + a)^(3/2)/sqrt(cos(d*x + c)), x)
```

Sympy [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sqrt{\cos(c+dx)}}\,dx=\int \frac{(a+b\cos(c+dx))^{\frac{3}{2}}}{\sqrt{\cos(c+dx)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**(3/2)/cos(d*x+c)**(1/2),x)
[Out] Integral((a + b*cos(c + d*x))**(3/2)/sqrt(cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sqrt{\cos(c+dx)}}\,dx=\int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/cos(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)/sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/cos(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)/sqrt(cos(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(a+b\,\cos(c+d\,x))^{3/2}}{\sqrt{\cos(c+d\,x)}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(3/2)/cos(c + d*x)^(1/2),x)
[Out] int((a + b*cos(c + d*x))^(3/2)/cos(c + d*x)^(1/2), x)
```

3.613 $\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 337

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2(a-b)\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{d} - \frac{2(a-2b)\sqrt{a+b}\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{d} - \frac{2b\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{d}$$

```
[Out] 2*(a-b)*cot(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^
(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(
1+sec(d*x+c))/(a-b))^(1/2)/d-2*(a-2*b)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c)
)^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(
1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/d-2*b*cot(d*x+c)*
EllipticPi((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a
-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+
c))/(a-b))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.59 (sec) , antiderivative size = 337, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2877, 2888, 3077, 2895, 3073}

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = -\frac{2(a-2b)\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{d} + \frac{2(a-b)\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{d} - \frac{2b\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{d}$$

```
[In] Int[(a + b*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(3/2),x]
```

```
[Out] (2*(a - b)*Sqrt[a + b]*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x
]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[
c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/d - (2*(a - 2*b)*
Sqrt[a + b]*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a
+ b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/
(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/d - (2*b*Sqrt[a + b]*Cot[c +
 d*x]*EllipticPi[(a + b)/b, ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sq
rt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)
]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/d
```

Rule 2877

```
Int[((c_) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)/((a_.) + (b_.)*sin[(e_.) +
 (f_.)*(x_)])^(3/2), x_Symbol] :> Dist[d^2/b^2, Int[Sqrt[a + b*Sin[e + f*x]
]/Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[(b*c - a*d)/b^2, Int[Simp[b*c + a
*d + 2*b*d*Sin[e + f*x], x]/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e +
f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rubi steps

$$\text{integral} = a\int \frac{a+2b\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx + b^2\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= -\frac{2b\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+}{a-b}}}{d}$$

$$+ a^2\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$-(a(a-2b))\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2(a-b)\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{d}$$
$$- \frac{2(a-2b)\sqrt{a+b}\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec}{a-}}}{d}$$
$$- \frac{2b\sqrt{a+b}\cot(c+dx)\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c}{a-b}}}{d}$$

Mathematica [A] (verified)

Time = 8.60 (sec) , antiderivative size = 357, normalized size of antiderivative = 1.06

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2a(a+b\cos(c+dx))\sin(c+dx)+\cos(c+dx)\left(-\frac{2a(a+b)\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\left(\mathrm{ar}\right.}{\sqrt{\frac{\cos(c+}{1+\cos(c-}}}\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(3/2),x]
```

```
[Out] (2*a*(a + b*Cos[c + d*x])*Sin[c + d*x] + Cos[c + d*x]*((-2*a*(a + b)*Sqrt[(
a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c +
 d*x)/2]], (-a + b)/(a + b)])/Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])] + (2*(a
^2 + 2*a*b - b^2)*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*E
llipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)])/Sqrt[Cos[c + d*x]/(1
+ Cos[c + d*x])] + (4*b^2*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d
*x]))]*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)])/Sqrt[Cos
[c + d*x]/(1 + Cos[c + d*x])] - a*b*Sec[(c + d*x)/2]*Sin[(3*(c + d*x))/2] -
 2*a^2*Tan[(c + d*x)/2] + a*b*Tan[(c + d*x)/2]))/(d*Sqrt[Cos[c + d*x]]*Sqrt
[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1015 vs. 2(313) = 626.

Time = 10.74 (sec) , antiderivative size = 1016, normalized size of antiderivative = 3.01

method	result	size
default	Expression too large to display	1016

```
[In] int((a+cos(d*x+c)*b)^(3/2)/cos(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/d*(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)*(-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)
^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+
b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2-2
```

```
*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2
-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc
(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*
((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b
))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^2+(-csc(d*
x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+
c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(
-(a-b)/(a+b))^(1/2))*a^2+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x
+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*
EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b-2*(-csc(d*x+c)^2*
(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*
(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a
-b)/(a+b))^(1/2))*b^2+csc(d*x+c)^3*a^2*(1-cos(d*x+c))^3-csc(d*x+c)^3*a*b*(1
-cos(d*x+c))^3+a^2*(csc(d*x+c)-cot(d*x+c))+a*b*(csc(d*x+c)-cot(d*x+c)))*((c
sc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*
x+c)^2*(1-cos(d*x+c))^2+1))^(1/2)/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+
c)^2*b*(1-cos(d*x+c))^2+a+b)/(-(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c
)^2*(1-cos(d*x+c))^2+1))^(3/2)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)
```

Fricas [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/cos(d*x+c)^(3/2),x, algorithm="fricas")
[Out] integral((b*cos(d*x + c) + a)^(3/2)/cos(d*x + c)^(3/2), x)
```

Sympy [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{(a+b\cos(c+dx))^{\frac{3}{2}}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**(3/2)/cos(d*x+c)**(3/2),x)
[Out] Integral((a + b*cos(c + d*x))**(3/2)/cos(c + d*x)**(3/2), x)
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/cos(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)/cos(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/cos(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)/cos(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(a+b\,\cos(c+d\,x))^{3/2}}{\cos(c+d\,x)^{3/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(3/2)/cos(c + d*x)^(3/2),x)
[Out] int((a + b*cos(c + d*x))^(3/2)/cos(c + d*x)^(3/2), x)
```

3.614 $\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 277

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{8(a-b)b\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}}{3ad} + \frac{2(a-3b)(a-b)\sqrt{a+b}\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3ad} + \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 2/3*a*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(3/2)+8/3*(a-b)*b*cot(
d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b
)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c)
)/(a-b))^(1/2)/a/d+2/3*(a-3*b)*(a-b)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^
(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-
sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/d
```

Rubi [A] (verified)

Time = 0.50 (sec) , antiderivative size = 277, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.160$, Rules used

$= \{2878, 3077, 2895, 3073\}$

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2(a-3b)(a-b)\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(a\right.}{3ad}$$
$$+\frac{8b(a-b)\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{3ad}$$
$$+\frac{2a\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{3d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Int[(a + b*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(5/2),x]
```

```
[Out] (8*(a - b)*b*Sqrt[a + b]*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d
*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Se
c[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a*d) + (2*(a
 - 3*b)*(a - b)*Sqrt[a + b]*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c
+ d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 -
 Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a*d) + (2
*a*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(3*d*Cos[c + d*x]^(3/2))
```

Rule 2878

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*(a + b*Si
n[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n - 1)/(f*(m + 1)*(a^2 - b^2))),
 x] + Dist[1/((m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d
*Sin[e + f*x])^(n - 2)*Simp[c*(a*c - b*d)*(m + 1) + d*(b*c - a*d)*(n - 1) +
 (d*(a*c - b*d)*(m + 1) - c*(b*c - a*d)*(m + 2))*Sin[e + f*x] - d*(b*c - a*
d)*(m + n + 1)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &
& NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1]
 && LtQ[1, n, 2] && IntegersQ[2*m, 2*n]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
```

```
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rubi steps

$$\text{integral} = \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{2}{3}\int\frac{2ab+\frac{1}{2}(a^2+3b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{1}{3}((a-3b)(a-b))\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx + \frac{1}{3}(4ab)\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{8(a-b)b\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3ad} + \frac{2(a-3b)(a-b)\sqrt{a+b}\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\cdots}}{3ad} + \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [A] (verified)

Time = 3.26 (sec) , antiderivative size = 256, normalized size of antiderivative = 0.92

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{\frac{2(a+b\cos(c+dx))(a+4b\cos(c+dx))\sin(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}+2\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)}\left(-4b(a+b)E(\text{arcs}\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(5/2),x]
```

```
[Out] ((2*(a + b*Cos[c + d*x])*(a + 4*b*Cos[c + d*x])*Sin[c + d*x])/Cos[c + d*x]^
(3/2) + 2*Sqrt[Cos[(c + d*x)/2]^2]*(-4*b*(a + b)*EllipticE[ArcSin[Tan[(c +
d*x)/2]], (-a + b)/(a + b)]*Sqrt[((a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2)/
(a + b)] + (a^2 + 4*a*b + 3*b^2)*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a +
b)/(a + b)]*Sqrt[((a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2)/(a + b)] - 4*b*(
a + b*Cos[c + d*x])*Sqrt[Cos[c + d*x]*Sec[(c + d*x)/2]^2]*Tan[(c + d*x)/2])
)/(3*d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1449 vs. 2(251) = 502.

Time = 12.16 (sec) , antiderivative size = 1450, normalized size of antiderivative = 5.23

method	result	size
default	Expression too large to display	1450

```
[In] int((a+cos(d*x+c)*b)^(3/2)/cos(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3/d*((cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/
(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*cos(
d*x+c)^3+4*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c
))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b*c
os(d*x+c)^3+3*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos
(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^
2*cos(d*x+c)^3-4*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos
(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*a*b*cos(d*x+c)^3-4*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+
cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/
2))*b^2*cos(d*x+c)^3+2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/
(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^
(1/2))*a^2*cos(d*x+c)^2+8*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*a*b*cos(d*x+c)^2+6*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*
```

```
x+c)))^(1/2)*b^2*cos(d*x+c)^2-8*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+
b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*a*b*cos(d*x+c)^2-8*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+co
s(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(
a-b)/(a+b))^(1/2))*b^2*cos(d*x+c)^2+(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+c
os(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-
(a-b)/(a+b))^(1/2))*a^2*cos(d*x+c)+4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b
)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*a*b*cos(d*x+c)+3*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-
b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*b^2*cos(d*x+c)-4*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a
-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*a*b*cos(d*x+c)-4*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(
(a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c
),(-(a-b)/(a+b))^(1/2))*b^2*cos(d*x+c)-cos(d*x+c)^2*sin(d*x+c)*a*b-4*b^2*co
s(d*x+c)^2*sin(d*x+c)-a^2*cos(d*x+c)*sin(d*x+c)-5*a*b*cos(d*x+c)*sin(d*x+c)
-a^2*sin(d*x+c))/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(3/2)
```

Fricas [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\cos(dx+c)^{\frac{5}{2}}}\,dx$$

[In] integrate((a+b*cos(d*x+c))^(3/2)/cos(d*x+c)^(5/2),x, algorithm="fricas")

[Out] integral((b*cos(d*x + c) + a)^(3/2)/cos(d*x + c)^(5/2), x)

Sympy [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(a+b\cos(c+dx))^{\frac{3}{2}}}{\cos^{\frac{5}{2}}(c+dx)}\,dx$$

[In] integrate((a+b*cos(d*x+c))**(3/2)/cos(d*x+c)**(5/2),x)

[Out] Integral((a + b*cos(c + d*x))**(3/2)/cos(c + d*x)**(5/2), x)

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/cos(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)/cos(d*x + c)^(5/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/cos(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)/cos(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(a+b\,\cos(c+d\,x))^{3/2}}{\cos(c+d\,x)^{5/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(3/2)/cos(c + d*x)^(5/2),x)
[Out] int((a + b*cos(c + d*x))^(3/2)/cos(c + d*x)^(5/2), x)
```

3.615 $\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 325

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2(a-b)\sqrt{a+b}(3a^2+b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-}{}}}{5a^2d}$$
$$-\frac{2(a-b)(3a-b)\sqrt{a+b}\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx}{a-b}}}{5ad}$$
$$+\frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{4b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 2/5*a*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(5/2)+4/5*b*sin(d*x+c)
*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(3/2)+2/5*(a-b)*(3*a^2+b^2)*cot(d*x+c)
*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b
))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b
))^(1/2)/a^2/d-2/5*(a-b)*(3*a-b)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2
)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(
d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/d
```

Rubi [A] (verified)

Time = 0.78 (sec) , antiderivative size = 325, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used

$= \{2878, 3134, 3077, 2895, 3073\}$

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2(a-b)\sqrt{a+b}(3a^2+b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\Big(\arcsin}{5a^2d}$$
$$-\frac{2(a-b)(3a-b)\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+}{a-}\right.}{5ad}$$
$$+\frac{4b\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{5d\cos^{\frac{3}{2}}(c+dx)}+\frac{2a\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{5d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Int[(a + b*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(7/2),x]
```

```
[Out] (2*(a - b)*Sqrt[a + b]*(3*a^2 + b^2)*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a +
 b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqr
t[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(5*
a^2*d) - (2*(a - b)*(3*a - b)*Sqrt[a + b]*Cot[c + d*x]*EllipticF[ArcSin[Sqr
t[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))
]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)]
)/(5*a*d) + (2*a*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(5*d*Cos[c + d*x]^(
5/2)) + (4*b*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(5*d*Cos[c + d*x]^(3/2)
)
```

Rule 2878

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*(a + b*Si
n[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n - 1)/(f*(m + 1)*(a^2 - b^2))),
 x] + Dist[1/((m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d
*Sin[e + f*x])^(n - 2)*Simp[c*(a*c - b*d)*(m + 1) + d*(b*c - a*d)*(n - 1) +
 (d*(a*c - b*d)*(m + 1) - c*(b*c - a*d)*(m + 2))*Sin[e + f*x] - d*(b*c - a*
d)*(m + n + 1)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &
& NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1]
 && LtQ[1, n, 2] && IntegersQ[2*m, 2*n]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
```

```
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} \\
&\quad + \frac{2}{5}\int \frac{3ab+\frac{1}{2}(3a^2+5b^2)\cos(c+dx)+ab\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx \\
&= \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} \\
&\quad + \frac{4b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)} + \frac{4\int \frac{\frac{3}{4}a(3a^2+b^2)+3a^2b\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{15a}
\end{aligned}$$

$$= \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{4b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)} - \frac{1}{5}((a-b)(3a-b))\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx + \frac{1}{5}(3a^2+b^2)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx$$

$$= \frac{2(a-b)\sqrt{a+b}(3a^2+b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c}{a-b}}}{5a^2d} - \frac{2(a-b)(3a-b)\sqrt{a+b}\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right), -\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{}}{5ad} + \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{4b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [A] (verified)

Time = 9.81 (sec) , antiderivative size = 399, normalized size of antiderivative = 1.23

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{7}{2}}(c+dx)}dx = \frac{8\cos^2\left(\frac{1}{2}(c+dx)\right)^{7/2}\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\cos(c+dx)\sec^2\left(\frac{1}{2}(c+dx)\right)}\left(-2(3a^3+3a^2b+ab^2+b^3)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{}\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(7/2),x]
```

```
[Out] ((8*(Cos[(c + d*x)/2]^2)^(7/2)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[C
os[c + d*x]*Sec[(c + d*x)/2]^2]*(-2*(3*a^3 + 3*a^2*b + a*b^2 + b^3)*Sqrt[Co
s[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[
c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 2*a*(3*
a^2 + 4*a*b + b^2)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c
+ d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticF[ArcSin[Tan[(c + d*x)/2]], (
-a + b)/(a + b)] - (3*a^2 + b^2)*Cos[c + d*x]*(a + b*Cos[c + d*x])*Sec[(c +
 d*x)/2]^2*Tan[(c + d*x)/2]))/(1 + Cos[c + d*x])^(3/2) + (a + b*Cos[c + d*x
])*(5*a^2 + b^2 + 4*a*b*Cos[c + d*x] + (3*a^2 + b^2)*Cos[2*(c + d*x)])*Tan[
c + d*x])/(5*a*d*Cos[c + d*x]^(3/2)*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2103 vs. 2(293) = 586.

Time = 13.86 (sec) , antiderivative size = 2104, normalized size of antiderivative = 6.47

method	result	size
default	Expression too large to display	2104

```
[In] int((a+cos(d*x+c)*b)^(3/2)/cos(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/5/d*(-EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*c
os(d*x+c)^4+4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^
2*b*cos(d*x+c)^4+EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos
(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)
*a*b^2*cos(d*x+c)^4-6*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^
(1/2)*a^2*b*cos(d*x+c)^3-2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(
1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a
+b))^(1/2)*a*b^2*cos(d*x+c)^3+8*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+
b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c
))/(a+b))^(1/2)*a^2*b*cos(d*x+c)^3+2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b
)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(
d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)^3-3*EllipticE(cot(d*x+c)-csc(d*x+c),(
-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1
+cos(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)^2+6*EllipticF(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*
b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^3-3*EllipticE(cot(d*x+c)-csc(
d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+
c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^2-EllipticE(cot(d*x+c)-csc
(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x
+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)^2-3*a*b^2*cos(d*x+c)^2*si
n(d*x+c)-3*a^2*b*cos(d*x+c)*sin(d*x+c)-sin(d*x+c)*cos(d*x+c)*a^3-3*sin(d*x+
c)*cos(d*x+c)^2*a^2*b-a^3*sin(d*x+c)-b^3*cos(d*x+c)^3*sin(d*x+c)-EllipticE(
cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)^2+4*Ellip
ticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)^2+El
lipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)^2
-3*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x
+c)^4-3*a^2*b*cos(d*x+c)^3*sin(d*x+c)-2*a*b^2*cos(d*x+c)^3*sin(d*x+c)+3*Ell
ipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c
```

```
)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^2-3*
EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*
x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^4
-EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)^
4+3*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+
c)^4-6*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1
+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d
*x+c)^3-2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3*co
s(d*x+c)^3-3*a^3*cos(d*x+c)^2*sin(d*x+c))/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(
1/2)/cos(d*x+c)^(5/2)/a
```

Fricas [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/cos(d*x+c)^(7/2),x, algorithm="fricas")
[Out] integral((b*cos(d*x + c) + a)^(3/2)/cos(d*x + c)^(7/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(3/2)/cos(d*x+c)**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/cos(d*x+c)^(7/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)/cos(d*x + c)^(7/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/cos(d*x+c)^(7/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)/cos(d*x + c)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(a+b\,\cos(c+d\,x))^{3/2}}{\cos(c+d\,x)^{7/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(3/2)/cos(c + d*x)^(7/2),x)
[Out] int((a + b*cos(c + d*x))^(3/2)/cos(c + d*x)^(7/2), x)
```

3.616 $\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 387

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{4(a-b)b\sqrt{a+b}(41a^2-3b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\ldots}}{105a^3d}$$
$$+\frac{2(a-b)\sqrt{a+b}(25a^2-57ab-6b^2)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\ldots}{105a^2d}$$
$$+\frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)}+\frac{16b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)}$$
$$+\frac{2(25a^2+3b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105ad\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 2/7*a*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(7/2)+16/35*b*sin(d*x+
c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(5/2)+2/105*(25*a^2+3*b^2)*sin(d*x+c
)*(a+b*cos(d*x+c))^(1/2)/a/d/cos(d*x+c)^(3/2)+4/105*(a-b)*b*(41*a^2-3*b^2)*
cot(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((
-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*
x+c))/(a-b))^(1/2)/a^3/d+2/105*(a-b)*(25*a^2-57*a*b-6*b^2)*cot(d*x+c)*Ellip
ticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/
2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/
2)/a^2/d
```

Rubi [A] (verified)

Time = 1.10 (sec) , antiderivative size = 387, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2878, 3134, 3077, 2895, 3073}

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{2(a-b)\sqrt{a+b}(25a^2-57ab-6b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\mathrm{E}}{105a^2d}$$
$$+\frac{2(25a^2+3b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{105ad\cos^{\frac{3}{2}}(c+dx)}$$
$$+\frac{4b(a-b)\sqrt{a+b}(41a^2-3b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{105a^3d}$$
$$+\frac{16b\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{35d\cos^{\frac{5}{2}}(c+dx)}+\frac{2a\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{7d\cos^{\frac{7}{2}}(c+dx)}$$

```
[In] Int[(a + b*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(9/2),x]
```

```
[Out] (4*(a - b)*b*Sqrt[a + b]*(41*a^2 - 3*b^2)*Cot[c + d*x]*EllipticE[ArcSin[Sqr
t[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))
]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)]
)/(105*a^3*d) + (2*(a - b)*Sqrt[a + b]*(25*a^2 - 57*a*b - 6*b^2)*Cot[c + d*
x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]
])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 +
Sec[c + d*x]))/(a - b)])/(105*a^2*d) + (2*a*Sqrt[a + b*Cos[c + d*x]]*Sin[c
+ d*x])/(7*d*Cos[c + d*x]^(7/2)) + (16*b*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d
*x])/(35*d*Cos[c + d*x]^(5/2)) + (2*(25*a^2 + 3*b^2)*Sqrt[a + b*Cos[c + d*x
]]*Sin[c + d*x])/(105*a*d*Cos[c + d*x]^(3/2))
```

Rule 2878

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*(a + b*Si
n[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n - 1)/(f*(m + 1)*(a^2 - b^2))),
 x] + Dist[1/((m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d
*Sin[e + f*x])^(n - 2)*Simp[c*(a*c - b*d)*(m + 1) + d*(b*c - a*d)*(n - 1) +
 (d*(a*c - b*d)*(m + 1) - c*(b*c - a*d)*(m + 2))*Sin[e + f*x] - d*(b*c - a*
d)*(m + n + 1)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &
& NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1]
 && LtQ[1, n, 2] && IntegersQ[2*m, 2*n]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
```

```
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rubi steps

$$\text{integral} = \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{2}{7}\int \frac{4ab+\frac{1}{2}(5a^2+7b^2)\cos(c+dx)+2ab\cos^2(c+dx)}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{16b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)} + \frac{4\int \frac{\frac{1}{4}a(25a^2+3b^2)+11a^2b\cos(c+dx)+4ab^2\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{35a}$$

$$= \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{16b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)} + \frac{2(25a^2+3b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105ad\cos^{\frac{3}{2}}(c+dx)} + \frac{8\int \frac{\frac{1}{4}ab(41a^2-3b^2)+\frac{1}{8}a^2(25a^2+51b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{105a^2}$$

$$= \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{16b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)} + \frac{2(25a^2+3b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105ad\cos^{\frac{3}{2}}(c+dx)} + \frac{((a-b)(25a^2-57ab-6b^2))\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{105a} + \frac{(2b(41a^2-3b^2))\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{105a}$$

$$= \frac{4(a-b)b\sqrt{a+b}(41a^2-3b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\text{sec}}{a}}}{105a^3d} + \frac{2(a-b)\sqrt{a+b}(25a^2-57ab-6b^2)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-}{}}}{105a^2d} + \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{16b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{35d\cos^{\frac{5}{2}}(c+dx)} + \frac{2(25a^2+3b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{105ad\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.33 (sec) , antiderivative size = 1302, normalized size of antiderivative = 3.36

$$-\frac{4a(25a^4-31a^2b^2+6b^4)\sqrt{\frac{(a+b)\cot^2\left(\frac{1}{2}(c+dx)\right)}{-a+b}}\sqrt{-\frac{(a+b)\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\sqrt{\frac{(a+b\cos(c+dx))\csc^2\left(\right.}{a}}}{(a+b)\sqrt{\cos(c+dx)}\sqrt{}}$$

$$\int\frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{}{}$$

$$+\frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\left(\frac{2\sec^2(c+dx)(25a^2\sin(c+dx)+3b^2\sin(c+dx))}{105a}+\frac{4\sec(c+dx)(41a^2b\sin(c+dx)-3b^3\sin(c+dx))}{105a^2}\right.}{d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(9/2),x]
```

```
[Out] ((-4*a*(25*a^4 - 31*a^2*b^2 + 6*b^4)*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a
+ b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos
[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a +
b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c +
d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - 4*a*(-82
*a^3*b + 6*a*b^3)*((Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a
+ b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c
 + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*C
sc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a +
b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (Sqrt[((a + b)*Cot[(c + d
*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sq
rt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a
/b), ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2
*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c +
d*x]])) + 2*(-82*a^2*b^2 + 6*b^4)*((I*Cos[(c + d*x)/2]*Sqrt[a + b*Cos[c + d
*x]]*EllipticE[I*ArcSinh[Sin[(c + d*x)/2]/Sqrt[Cos[c + d*x]]], (-2*a)/(-a -
 b)]*Sec[c + d*x])/(b*Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*Sqrt[((a + b*Co
s[c + d*x])*Sec[c + d*x])/(a + b)]) + (2*a*((a*Sqrt[((a + b)*Cot[(c + d*x)/
2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[(
(a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[S
qrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]
*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])
- (a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*
```

```
x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a
]*Csc[c + d*x]*EllipticPi[-(a/b), ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c
+ d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[
c + d*x]]*Sqrt[a + b*Cos[c + d*x]])))/b + (Sqrt[a + b*Cos[c + d*x]]*Sin[c +
 d*x])/(b*Sqrt[Cos[c + d*x]])))/(105*a^2*d) + (Sqrt[Cos[c + d*x]]*Sqrt[a +
b*Cos[c + d*x]]*((2*Sec[c + d*x]^2*(25*a^2*Sin[c + d*x] + 3*b^2*Sin[c + d*x
]))/(105*a) + (4*Sec[c + d*x]*(41*a^2*b*Sin[c + d*x] - 3*b^3*Sin[c + d*x]))
/(105*a^2) + (16*b*Sec[c + d*x]^2*Tan[c + d*x])/35 + (2*a*Sec[c + d*x]^3*Ta
n[c + d*x])/7))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2498 vs. $2(349) = 698$.

Time = 15.87 (sec) , antiderivative size = 2499, normalized size of antiderivative = 6.46

method	result	size
default	Expression too large to display	2499

```
[In] int((a+cos(d*x+c)*b)^(3/2)/cos(d*x+c)^(9/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/105/d*(15*a^4*sin(d*x+c)+27*a^2*b^2*cos(d*x+c)^2*sin(d*x+c)-6*b^4*cos(d*x
+c)^4*sin(d*x+c)+25*a^4*cos(d*x+c)^2*sin(d*x+c)+82*a^2*b^2*cos(d*x+c)^4*sin
(d*x+c)-6*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x
+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^4*co
s(d*x+c)^5-25*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos
(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^
4*cos(d*x+c)^5-12*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a
+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2
)*b^4*cos(d*x+c)^4-50*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*a^4*cos(d*x+c)^4-6*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/
2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)
))^(1/2)*b^4*cos(d*x+c)^3-25*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*
x+c)))^(1/2)*a^4*cos(d*x+c)^3-12*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a
+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*a*b^3*cos(d*x+c)^4-164*EllipticF(cot(d*x+c)-csc(d*x+c),(-(
a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*a^3*b*cos(d*x+c)^4-102*EllipticF(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b^2*cos(d*x+c)^4+12*EllipticF(cot(d*x+c)
-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(
1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^3*cos(d*x+c)^4+82*EllipticE(cot(
d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a
+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^3*b*cos(d*x+c)^3+82*Elliptic
```

```
E(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+
c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b^2*cos(d*x+c)^3-6*E
llipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+c
os(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^3*cos(d*x+c)^
3-82*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b
)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^3*b*cos(d
*x+c)^3-51*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*
x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b
^2*cos(d*x+c)^3+6*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a
+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2
)*a*b^3*cos(d*x+c)^3+82*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2
))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*a^3*b*cos(d*x+c)^5+82*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b)
)^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)*a^2*b^2*cos(d*x+c)^5-6*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b
)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*a*b^3*cos(d*x+c)^5-82*EllipticF(cot(d*x+c)-csc(d*x+c),
(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*a^3*b*cos(d*x+c)^5-51*EllipticF(cot(d*x+c)-csc(d
*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b^2*cos(d*x+c)^5+6*EllipticF(cot(d*x+c
)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^
(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^3*cos(d*x+c)^5+164*EllipticE(co
t(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/
(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^3*b*cos(d*x+c)^4+164*Ellip
ticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d
*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b^2*cos(d*x+c)^4+
25*a^4*cos(d*x+c)^3*sin(d*x+c)+15*a^4*cos(d*x+c)*sin(d*x+c)+39*a^3*b*cos(d*
x+c)*sin(d*x+c)+39*a^3*b*cos(d*x+c)^2*sin(d*x+c)+107*a^3*b*cos(d*x+c)^3*sin
(d*x+c)+27*a^2*b^2*cos(d*x+c)^3*sin(d*x+c)-3*a*b^3*cos(d*x+c)^3*sin(d*x+c)+
25*a^3*b*cos(d*x+c)^4*sin(d*x+c)+3*a*b^3*cos(d*x+c)^4*sin(d*x+c))/(1+cos(d*
x+c))/(a+cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(7/2)/a^2
```

Fricas [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\cos(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/cos(d*x+c)^(9/2),x, algorithm="fricas")
[Out] integral((b*cos(d*x + c) + a)^(3/2)/cos(d*x + c)^(9/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(3/2)/cos(d*x+c)**(9/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\cos(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/cos(d*x+c)^(9/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)/cos(d*x + c)^(9/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\cos(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/cos(d*x+c)^(9/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)/cos(d*x + c)^(9/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(a+b\,\cos(c+d\,x))^{3/2}}{\cos(c+d\,x)^{9/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(3/2)/cos(c + d*x)^(9/2),x)
[Out] int((a + b*cos(c + d*x))^(3/2)/cos(c + d*x)^(9/2), x)
```

3.617 $\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 454

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \frac{2(a-b)\sqrt{a+b}(147a^4+33a^2b^2+8b^4)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\right.}{315a^4d}$$

$$-\frac{2(a-b)\sqrt{a+b}(147a^3-39a^2b-6ab^2-8b^3)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1}{}}}{315a^3d}$$

$$+\frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)}+\frac{20b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{63d\cos^{\frac{7}{2}}(c+dx)}$$

$$+\frac{2(49a^2+3b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315ad\cos^{\frac{5}{2}}(c+dx)}$$

$$+\frac{8b(22a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315a^2d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 2/9*a*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(9/2)+20/63*b*sin(d*x+
c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(7/2)+2/315*(49*a^2+3*b^2)*sin(d*x+c
)*(a+b*cos(d*x+c))^(1/2)/a/d/cos(d*x+c)^(5/2)+8/315*b*(22*a^2-b^2)*sin(d*x+
c)*(a+b*cos(d*x+c))^(1/2)/a^2/d/cos(d*x+c)^(3/2)+2/315*(a-b)*(147*a^4+33*a^
2*b^2+8*b^4)*cot(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*
x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)
*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^4/d-2/315*(a-b)*(147*a^3-39*a^2*b-6*a*b^2
-8*b^3)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^
(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(
1+sec(d*x+c))/(a-b))^(1/2)/a^3/d
```

Rubi [A] (verified)

Time = 1.47 (sec) , antiderivative size = 454, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2878, 3134, 3077, 2895, 3073}

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \frac{8b(22a^2-b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{315a^2d\cos^{\frac{3}{2}}(c+dx)} + \frac{2(49a^2+3b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{315ad\cos^{\frac{5}{2}}(c+dx)} + \frac{2(a-b)\sqrt{a+b}(147a^4+33a^2b^2+8b^4)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\right.}{315a^4d} - \frac{2(a-b)\sqrt{a+b}(147a^3-39a^2b-6ab^2-8b^3)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\operatorname{EllipticF}\left(\arcsin\left(\right.\right.}{315a^3d} + \frac{20b\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{63d\cos^{\frac{7}{2}}(c+dx)} + \frac{2a\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{9d\cos^{\frac{9}{2}}(c+dx)}$$

```
[In] Int[(a + b*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(11/2),x]
```

```
[Out] (2*(a - b)*Sqrt[a + b]*(147*a^4 + 33*a^2*b^2 + 8*b^4)*Cot[c + d*x]*Elliptic
E[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a +
 b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x
]))/(a - b)])/(315*a^4*d) - (2*(a - b)*Sqrt[a + b]*(147*a^3 - 39*a^2*b - 6*
a*b^2 - 8*b^3)*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt
[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]
))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(315*a^3*d) + (2*a*Sqrt[a
 + b*Cos[c + d*x]]*Sin[c + d*x])/(9*d*Cos[c + d*x]^(9/2)) + (20*b*Sqrt[a +
b*Cos[c + d*x]]*Sin[c + d*x])/(63*d*Cos[c + d*x]^(7/2)) + (2*(49*a^2 + 3*b^
2)*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(315*a*d*Cos[c + d*x]^(5/2)) + (8
*b*(22*a^2 - b^2)*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(315*a^2*d*Cos[c +
 d*x]^(3/2))
```

Rule 2878

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*(a + b*Si
n[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n - 1)/(f*(m + 1)*(a^2 - b^2))),
 x] + Dist[1/((m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d
*Sin[e + f*x])^(n - 2)*Simp[c*(a*c - b*d)*(m + 1) + d*(b*c - a*d)*(n - 1) +
 (d*(a*c - b*d)*(m + 1) - c*(b*c - a*d)*(m + 2))*Sin[e + f*x] - d*(b*c - a*
d)*(m + n + 1)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &
& NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1]
 && LtQ[1, n, 2] && IntegersQ[2*m, 2*n]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rubi steps

$$\text{integral} = \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)} + \frac{2}{9}\int \frac{5ab+\frac{1}{2}(7a^2+9b^2)\cos(c+dx)+3ab\cos^2(c+dx)}{\cos^{\frac{9}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)} + \frac{20b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{63d\cos^{\frac{7}{2}}(c+dx)} + \frac{4\int \frac{\frac{1}{4}a(49a^2+3b^2)+23a^2b\cos(c+dx)+10ab^2\cos^2(c+dx)}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{63a}$$

$$= \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)} + \frac{20b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{63d\cos^{\frac{7}{2}}(c+dx)} + \frac{2(49a^2+3b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315ad\cos^{\frac{5}{2}}(c+dx)} + \frac{8\int \frac{\frac{3}{2}ab(22a^2-b^2)+\frac{1}{8}a^2(147a^2+209b^2)\cos(c+dx)+\frac{1}{4}ab(49a^2+3b^2)\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{315a^2}$$

$$= \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)} + \frac{20b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{63d\cos^{\frac{7}{2}}(c+dx)} + \frac{2(49a^2+3b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315ad\cos^{\frac{5}{2}}(c+dx)} + \frac{8b(22a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315a^2d\cos^{\frac{3}{2}}(c+dx)} + \frac{16\int \frac{\frac{3}{16}a(147a^4+33a^2b^2+8b^4)+\frac{3}{8}a^2b(93a^2+b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{945a^3}$$

$$= \frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)} + \frac{20b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{63d\cos^{\frac{7}{2}}(c+dx)} + \frac{2(49a^2+3b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315ad\cos^{\frac{5}{2}}(c+dx)} + \frac{8b(22a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315a^2d\cos^{\frac{3}{2}}(c+dx)} - \frac{((a-b)(147a^3-39a^2b-6ab^2-8b^3))\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{315a^2} + \frac{(147a^4+33a^2b^2+8b^4)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{315a^2}$$

$$= \frac{2(a-b)\sqrt{a+b}(147a^4+33a^2b^2+8b^4)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}}{315a^4d}$$

$$-\frac{2(a-b)\sqrt{a+b}(147a^3-39a^2b-6ab^2-8b^3)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\right.}{315a^3d}$$

$$+\frac{2a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)}+\frac{20b\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{63d\cos^{\frac{7}{2}}(c+dx)}$$

$$+\frac{2(49a^2+3b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315ad\cos^{\frac{5}{2}}(c+dx)}$$

$$+\frac{8b(22a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315a^2d\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.43 (sec) , antiderivative size = 1368, normalized size of antiderivative = 3.01

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx =$$

$$-\frac{4a(-39a^4b+31a^2b^3+8b^5)\sqrt{\frac{(a+b)\cot^2\left(\frac{1}{2}(c+dx)\right)}{-a+b}}\sqrt{-\frac{(a+b)\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\sqrt{\frac{(a+b\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\right.}{(a+b)\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

$$-\frac{}{}$$

$$+\frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\left(\frac{2\sec^3(c+dx)(49a^2\sin(c+dx)+3b^2\sin(c+dx))}{315a}+\frac{8\sec^2(c+dx)(22a^2b\sin(c+dx)-b^3\sin(c+dx))}{315a^2}\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(3/2)/Cos[c + d*x]^(11/2),x]
```

```
[Out] -1/315*((-4*a*(-39*a^4*b + 31*a^2*b^3 + 8*b^5)*Sqrt[((a + b)*Cot[(c + d*x)/
2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[(
(a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[S
qrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]
*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])
- 4*a*(147*a^5 + 33*a^3*b^2 + 8*a*b^4)*((Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/
```

```
(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b
*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((
a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(
c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (Sqr
t[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(
c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c
+ d*x]*EllipticPi[-(a/b), ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2
]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]
]*Sqrt[a + b*Cos[c + d*x]])) + 2*(147*a^4*b + 33*a^2*b^3 + 8*b^5)*((I*Cos[(
c + d*x)/2]*Sqrt[a + b*Cos[c + d*x]]*EllipticE[I*ArcSinh[Sin[(c + d*x)/2]/S
qrt[Cos[c + d*x]]], (-2*a)/(-a - b)]*Sec[c + d*x])/(b*Sqrt[Cos[(c + d*x)/2]
^2*Sec[c + d*x]]*Sqrt[((a + b*Cos[c + d*x])*Sec[c + d*x])/(a + b)]) + (2*a*
((a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x
]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]
*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^
2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c +
d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a
+ b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos
[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a/b), ArcSin[Sq
rt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*
Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])))/b + (
Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(b*Sqrt[Cos[c + d*x]])))/(a^3*d) + (
Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]*((2*Sec[c + d*x]^3*(49*a^2*Sin[
c + d*x] + 3*b^2*Sin[c + d*x]))/(315*a) + (8*Sec[c + d*x]^2*(22*a^2*b*Sin[c
 + d*x] - b^3*Sin[c + d*x]))/(315*a^2) + (2*Sec[c + d*x]*(147*a^4*Sin[c + d
*x] + 33*a^2*b^2*Sin[c + d*x] + 8*b^4*Sin[c + d*x]))/(315*a^3) + (20*b*Sec[
c + d*x]^3*Tan[c + d*x])/63 + (2*a*Sec[c + d*x]^4*Tan[c + d*x])/9))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 3453 vs. $2(410) = 820$.

Time = 19.00 (sec) , antiderivative size = 3454, normalized size of antiderivative = 7.61

method	result	size
default	Expression too large to display	3454

```
[In] int((a+cos(d*x+c)*b)^(3/2)/cos(d*x+c)^(11/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/315/d*(4*a*b^4*cos(d*x+c)^4*sin(d*x+c)+35*a^5*sin(d*x+c)-2*EllipticF(cot(
d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(
(a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^3*cos(d*x+c)^4-8*Ellipti
cF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^4*cos(d*x+c)^4+147*
EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*
x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4*b*cos(d*x+c)
```

^6+33*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b^2*co
s(d*x+c)^6+33*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^
2*b^3*cos(d*x+c)^6+53*a^3*b^2*cos(d*x+c)^3*sin(d*x+c)-a^2*b^3*cos(d*x+c)^3*
sin(d*x+c)+147*a^4*b*cos(d*x+c)^5*sin(d*x+c)+88*a^3*b^2*cos(d*x+c)^5*sin(d*
x+c)+33*a^2*b^3*cos(d*x+c)^5*sin(d*x+c)-4*a*b^4*cos(d*x+c)^5*sin(d*x+c)+85*
a^4*b*cos(d*x+c)*sin(d*x+c)+85*a^4*b*cos(d*x+c)^2*sin(d*x+c)+53*a^3*b^2*cos
(d*x+c)^2*sin(d*x+c)+137*a^4*b*cos(d*x+c)^4*sin(d*x+c)+121*a^3*b^2*cos(d*x+
c)^4*sin(d*x+c)-a^2*b^3*cos(d*x+c)^4*sin(d*x+c)+137*a^4*b*cos(d*x+c)^3*sin(
d*x+c)+147*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^5*c
os(d*x+c)^6+8*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^
5*cos(d*x+c)^6-147*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(c
os(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/
2)*a^5*cos(d*x+c)^6+294*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2
))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b)
)^(1/2)*a^5*cos(d*x+c)^5+16*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^
(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(
a+b))^(1/2)*b^5*cos(d*x+c)^5-294*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a
+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+
c))/(a+b))^(1/2)*a^5*cos(d*x+c)^5+147*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-
b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos
(d*x+c))/(a+b))^(1/2)*a^5*cos(d*x+c)^4+8*EllipticE(cot(d*x+c)-csc(d*x+c),(-
(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+
cos(d*x+c))/(a+b))^(1/2)*b^5*cos(d*x+c)^4-147*EllipticF(cot(d*x+c)-csc(d*x+
c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b
)/(1+cos(d*x+c))/(a+b))^(1/2)*a^5*cos(d*x+c)^4+147*a^5*cos(d*x+c)^4*sin(d*x
+c)+8*b^5*cos(d*x+c)^5*sin(d*x+c)+35*a^5*cos(d*x+c)*sin(d*x+c)+49*a^5*cos(d
*x+c)^2*sin(d*x+c)+49*a^5*cos(d*x+c)^3*sin(d*x+c)+8*EllipticE(cot(d*x+c)-cs
c(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*
x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^4*cos(d*x+c)^6-186*EllipticF(cot(d*
x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a
+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4*b*cos(d*x+c)^6-33*EllipticF(
cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b^2*cos(d*x+c)^6-2*Ell
ipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^3*cos(d*x+c)^
6-8*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^4*cos(d*
x+c)^6+294*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4*b
*cos(d*x+c)^5+66*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos
(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)

```
*a^3*b^2*cos(d*x+c)^5+66*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/
2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b
))^(1/2)*a^2*b^3*cos(d*x+c)^5+16*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a
+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+
c))/(a+b))^(1/2)*a*b^4*cos(d*x+c)^5-372*EllipticF(cot(d*x+c)-csc(d*x+c),(-(
a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+c
os(d*x+c))/(a+b))^(1/2)*a^4*b*cos(d*x+c)^5-66*EllipticF(cot(d*x+c)-csc(d*x+
c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b
)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b^2*cos(d*x+c)^5-4*EllipticF(cot(d*x+c)-c
sc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d
*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^3*cos(d*x+c)^5-16*EllipticF(cot(
d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(
(a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^4*cos(d*x+c)^5+147*Ellipti
cE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4*b*cos(d*x+c)^4+33*E
llipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x
+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b^2*cos(d*x+c
)^4+33*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1
+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^3*c
os(d*x+c)^4+8*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*
b^4*cos(d*x+c)^4-186*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(
1/2)*a^4*b*cos(d*x+c)^4-33*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(
1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a
+b))^(1/2)*a^3*b^2*cos(d*x+c)^4)/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)/cos(
d*x+c)^(9/2)/a^3
```

Fricas [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx=\int \frac{(b\cos{(dx+c)}+a)^{\frac{3}{2}}}{\cos{(dx+c)}^{\frac{11}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/cos(d*x+c)^(11/2),x, algorithm="fricas")
[Out] integral((b*cos(d*x + c) + a)^(3/2)/cos(d*x + c)^(11/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(3/2)/cos(d*x+c)**(11/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\cos(dx+c)^{\frac{11}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/cos(d*x+c)^(11/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)/cos(d*x + c)^(11/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\cos(dx+c)^{\frac{11}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/cos(d*x+c)^(11/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)/cos(d*x + c)^(11/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \int \frac{(a+b\cos(c+d\,x))^{3/2}}{\cos(c+d\,x)^{11/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(3/2)/cos(c + d*x)^(11/2),x)
[Out] int((a + b*cos(c + d*x))^(3/2)/cos(c + d*x)^(11/2), x)
```

3.618 $\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{5/2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 506

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{5/2}\,dx = -\frac{(a-b)\sqrt{a+b}(33a^2+16b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{24ad}$$
$$+\frac{\sqrt{a+b}(33a^2+26ab+16b^2)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{24d}$$
$$-\frac{5a\sqrt{a+b}(a^2+4b^2)\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{8bd}$$
$$+\frac{(33a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{24d\sqrt{\cos(c+dx)}}$$
$$+\frac{13ab\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{12d}$$
$$+\frac{b^2\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d}$$

```
[Out] 1/3*b^2*cos(d*x+c)^(3/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+1/24*(33*a^2+1
6*b^2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)+13/12*a*b*sin(d
*x+c)*cos(d*x+c)^(1/2)*(a+b*cos(d*x+c))^(1/2)/d-1/24*(a-b)*(33*a^2+16*b^2)*
cot(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((
-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*
x+c))/(a-b))^(1/2)/a/d+1/24*(33*a^2+26*a*b+16*b^2)*cot(d*x+c)*EllipticF((a+
b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b
)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/d-5/8
*a*(a^2+4*b^2)*cot(d*x+c)*EllipticPi((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos
```

```
(d*x+c)^(1/2),(a+b)/b,((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(
a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/b/d
```

Rubi [A] (verified)

Time = 1.51 (sec) , antiderivative size = 506, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {2872, 3128, 3140, 3132, 2888, 3077, 2895, 3073}

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{5/2}\,dx = \frac{\sqrt{a+b}(33a^2+26ab+16b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+\ldots}}{\sqrt{a+b}\ldots}\right.\right.}{24d}$$
$$-\frac{(a-b)\sqrt{a+b}(33a^2+16b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{24ad}$$
$$-\frac{5a\sqrt{a+b}(a^2+4b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\ldots\right.}{8bd}$$
$$+\frac{(33a^2+16b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{24d\sqrt{\cos(c+dx)}}$$
$$+\frac{b^2\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{3d}$$
$$+\frac{13ab\sin(c+dx)\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}{12d}$$

```
[In] Int[Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] -1/24*((a - b)*Sqrt[a + b]*(33*a^2 + 16*b^2)*Cot[c + d*x]*EllipticE[ArcSin[
Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a -
b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a -
b)])/(a*d) + (Sqrt[a + b]*(33*a^2 + 26*a*b + 16*b^2)*Cot[c + d*x]*EllipticF
[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a +
b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]
))/(a - b)])/(24*d) - (5*a*Sqrt[a + b]*(a^2 + 4*b^2)*Cot[c + d*x]*EllipticP
i[(a + b)/b, ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]
])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 +
Sec[c + d*x]))/(a - b)])/(8*b*d) + ((33*a^2 + 16*b^2)*Sqrt[a + b*Cos[c + d*
x]]*Sin[c + d*x])/(24*d*Sqrt[Cos[c + d*x]]) + (13*a*b*Sqrt[Cos[c + d*x]]*Sq
rt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(12*d) + (b^2*Cos[c + d*x]^(3/2)*Sqrt[
a + b*Cos[c + d*x]]*Sin[c + d*x])/(3*d)
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
```

```
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

```
 && NeQ[A, B]
```

Rule 3128

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*sin[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_
.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n + 2))), x] + Dist[1/(d*(m +
n + 2)), Int[(a + b*Sin[e + f*x])^(m - 1)*(c + d*Sin[e + f*x])^n*Simp[a*A*d
*(m + n + 2) + C*(b*c*m + a*d*(n + 1)) + (d*(A*b + a*B)*(m + n + 2) - C*(a*
c - b*d*(m + n + 1)))*Sin[e + f*x] + (C*(a*d*m - b*c*(m + 1)) + b*B*d*(m +
n + 2))*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n},
 x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m
, 0] &&  !(IGtQ[n, 0] && ( !IntegerQ[m] || (EqQ[a, 0] && NeQ[c, 0])))
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
- 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3140

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(Sqrt[c + d*Sin[e + f
*x]]/(d*f*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[1/(2*d), Int[(1/((a + b*Sin
[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]))*Simp[2*a*A*d - C*(b*c - a*d) -
2*(a*c*C - d*(A*b + a*B))*Sin[e + f*x] + (2*b*B*d - C*(b*c + a*d))*Sin[e +
f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*
d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

integral

$$= \frac{b^2 \cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{1}{3}\int \frac{\sqrt{\cos(c+dx)}\left(\frac{3}{2}a(2a^2+b^2)+b(9a^2+2b^2)\cos(c+dx)+\frac{13}{2}ab^2\cos^2(c+dx)\right)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{13ab\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{12d} + \frac{b^2\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{\int \frac{\frac{13a^2b^2}{4}+\frac{1}{2}ab(12a^2+19b^2)\cos(c+dx)+\frac{1}{4}b^2(33a^2+16b^2)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{6b}$$

$$= \frac{(33a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{24d\sqrt{\cos(c+dx)}} + \frac{13ab\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{12d} + \frac{b^2\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{\int \frac{-\frac{1}{4}ab^2(33a^2+16b^2)+\frac{13}{2}a^2b^3\cos(c+dx)+\frac{15}{4}ab^2(a^2+4b^2)\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{12b^2}$$

$$= \frac{(33a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{24d\sqrt{\cos(c+dx)}} + \frac{13ab\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{12d} + \frac{b^2\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{\int \frac{-\frac{1}{4}ab^2(33a^2+16b^2)+\frac{13}{2}a^2b^3\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{12b^2} + \frac{1}{16}\left(5a\left(a^2+4b^2\right)\right)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}dx$$

$$= -\frac{5a\sqrt{a+b}(a^2+4b^2)\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b}, \arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right), -\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(}{a-}}}{8bd} + \frac{(33a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{24d\sqrt{\cos(c+dx)}} + \frac{13ab\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{12d} + \frac{b^2\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d} - \frac{1}{48}\left(a\left(33a^2+16b^2\right)\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx + \frac{1}{48}\left(a\left(33a^2+26ab+16b^2\right)\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx$$

$$=-\frac{(a-b)\sqrt{a+b}(33a^2+16b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx}{a-b}}}{24ad}$$

$$+\frac{\sqrt{a+b}(33a^2+26ab+16b^2)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(}{}}}{24d}$$

$$-\frac{5a\sqrt{a+b}(a^2+4b^2)\cot(c+dx)\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+se}{a}}}{8bd}$$

$$+\frac{(33a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{24d\sqrt{\cos(c+dx)}}$$

$$+\frac{13ab\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{12d}$$

$$+\frac{b^2\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d}$$

Mathematica [C] (warning: unable to verify)

Result contains complex when optimal does not.

Time = 16.79 (sec) , antiderivative size = 1203, normalized size of antiderivative = 2.38

$$\int\sqrt{\cos(c+dx)}(a+b\cos(c$$

$$-\frac{4a(59a^2b+16b^3)\sqrt{\frac{(a+b)\cot^2\left(\frac{1}{2}(c+dx)\right)}{-a+b}}\sqrt{-\frac{(a+b)\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\sqrt{\frac{(a+b\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\csc(c+dx)\operatorname{EllipticF}}{(a+b)\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

$$+dx))^{5/2}\,dx=\overline{\qquad\qquad}$$

$$+\frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\left(\frac{13}{12}ab\sin(c+dx)+\frac{1}{6}b^2\sin(2(c+dx))\right)}{d}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] ((-4*a*(59*a^2*b + 16*b^3)*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt
[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])
*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c +
d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)
/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - 4*a*(48*a^3 + 76*a
```

```
*b^2)*((Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c +
 d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2
)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)
/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[
c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-
a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*C
os[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a/b), ArcSin[
Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)
]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])) + 2*
(33*a^2*b + 16*b^3)*((I*Cos[(c + d*x)/2]*Sqrt[a + b*Cos[c + d*x]]*EllipticE
[I*ArcSinh[Sin[(c + d*x)/2]/Sqrt[Cos[c + d*x]]], (-2*a)/(-a - b)]*Sec[c + d
*x])/(b*Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*Sqrt[((a + b*Cos[c + d*x])*Se
c[c + d*x])/(a + b)]) + (2*a*((a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)
]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c +
 d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Co
s[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)
/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (a*Sqrt[((a
+ b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*
x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]
*EllipticPi[-(a/b), ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a
]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt
[a + b*Cos[c + d*x]])))/b + (Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(b*Sqrt
[Cos[c + d*x]])))/(48*d) + (Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]*((1
3*a*b*Sin[c + d*x])/12 + (b^2*Sin[2*(c + d*x)])/6))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2567 vs. $2(458) = 916$.

Time = 8.33 (sec) , antiderivative size = 2568, normalized size of antiderivative = 5.08

method	result	size
default	Expression too large to display	2568

```
[In] int(cos(d*x+c)^(1/2)*(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/24/d*(-33*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*
b*cos(d*x+c)^2-33*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2
)*a^3*cos(d*x+c)^2-16*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^
(1/2)*b^3*cos(d*x+c)^2+34*a*b^2*cos(d*x+c)^2*sin(d*x+c)+26*a^2*b*cos(d*x+c)
*sin(d*x+c)+16*sin(d*x+c)*cos(d*x+c)^2*b^3+33*sin(d*x+c)*cos(d*x+c)*a^3+59*
sin(d*x+c)*cos(d*x+c)^2*a^2*b+16*sin(d*x+c)*cos(d*x+c)*a*b^2+8*b^3*cos(d*x+
c)^3*sin(d*x+c)-16*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(c
```

os(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/
2)*a*b^2*cos(d*x+c)^2-26*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/
2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b
))^(1/2)*a^2*b*cos(d*x+c)^2+76*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b
))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c)
)/(a+b))^(1/2)*a*b^2*cos(d*x+c)^2-120*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(
-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1
+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)^2-66*EllipticE(cot(d*x+c)-csc(d*
x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)
*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)-32*EllipticE(cot(d*x+c)-cs
c(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*
x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)-240*EllipticPi(cot(d*x
+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(
(a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)-52*EllipticF(
cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)+152*Ellip
ticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)+96*E
llipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x
+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)+48
*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d
x+c)))^(1/2)((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3+8*b^3*cos(d
*x+c)^4*sin(d*x+c)-33*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^
(1/2)*a^3-16*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x
+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3
-30*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3-33*E
llipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x
+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b-16*Elliptic
E(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(
1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2-120*EllipticPi(cot
(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2-26*EllipticF(cot(d*x
+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+
cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b+76*EllipticF(cot(d*x+c)-csc
(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x
+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2-66*EllipticE(cot(d*x+c)-csc(d*x+c)
,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/
(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)-32*EllipticE(cot(d*x+c)-csc(d*x+
c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b
)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)-60*EllipticPi(cot(d*x+c)-csc(d
x+c),-1,(-(a-b)/(a+b))^(1/2))(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*
x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)-30*EllipticPi(cot(d*x+c)
-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+

```
cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^2+34*a*b^2*cos(d*x
+c)^3*sin(d*x+c)+48*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1
/2)*a^3*cos(d*x+c)^2)/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(1/2
)
```

Fricas [F]

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{5/2}\,dx = \int (b\cos{(dx+c)}+a)^{\frac{5}{2}}\sqrt{\cos{(dx+c)}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)*sqrt(b*cos(d*x + c
) + a)*sqrt(cos(d*x + c)), x)
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{5/2}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(1/2)*(a+b*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{5/2}\,dx = \int (b\cos{(dx+c)}+a)^{\frac{5}{2}}\sqrt{\cos{(dx+c)}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{5/2}\,dx = \int (b\cos(dx+c)+a)^{\frac{5}{2}}\sqrt{\cos(dx+c)}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sqrt(cos(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{5/2}\,dx = \int \sqrt{\cos(c+d\,x)}\,(a+b\,\cos(c+d\,x))^{5/2}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))^(5/2), x)
```

3.619 $\int \frac{(a+b\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 443

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx =$$

$$-\frac{9(a-b)b\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{4d}$$

$$+\frac{\sqrt{a+b}(8a^2+9ab+2b^2)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{4d}$$

$$-\frac{\sqrt{a+b}(15a^2+4b^2)\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{4d}$$

$$+\frac{9ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sqrt{\cos(c+dx)}}+\frac{b^2\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d}$$

```
[Out] 9/4*a*b*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)+1/2*b^2*sin(d*
x+c)*cos(d*x+c)^(1/2)*(a+b*cos(d*x+c))^(1/2)/d-9/4*(a-b)*b*cot(d*x+c)*Ellip
ticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/
2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/
2)/d+1/4*(8*a^2+9*a*b+2*b^2)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a
+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+
c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/d-1/4*(15*a^2+4*b^2)*cot(d*
x+c)*EllipticPi((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b
,((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec
(d*x+c))/(a-b))^(1/2)/d
```

Rubi [A] (verified)

Time = 1.17 (sec) , antiderivative size = 443, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {2872, 3140, 3132, 2888, 3077, 2895, 3073}

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx = \frac{\sqrt{a+b}(8a^2+9ab+2b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\right.}{4d}$$
$$-\frac{\sqrt{a+b}(15a^2+4b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a}{a}\right.}{4d}$$
$$-\frac{9b(a-b)\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{4d}$$
$$+\frac{b^2\sin(c+dx)\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}{2d}+\frac{9ab\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{4d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2)/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (-9*(a - b)*b*Sqrt[a + b]*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c +
d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - S
ec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(4*d) + (Sqrt[
a + b]*(8*a^2 + 9*a*b + 2*b^2)*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos
[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(
1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(4*d) - (
Sqrt[a + b]*(15*a^2 + 4*b^2)*Cot[c + d*x]*EllipticPi[(a + b)/b, ArcSin[Sqrt
[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]
*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])
/(4*d) + (9*a*b*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(4*d*Sqrt[Cos[c + d*
x]]) + (b^2*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(2*d)
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
- 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3140

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(Sqrt[c + d*Sin[e + f
*x]]/(d*f*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[1/(2*d), Int[(1/((a + b*Sin
[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]))*Simp[2*a*A*d - C*(b*c - a*d) -
2*(a*c*C - d*(A*b + a*B))*Sin[e + f*x] + (2*b*B*d - C*(b*c + a*d))*Sin[e +
f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*
d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{b^2\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d} + \frac{1}{2}\int \frac{\frac{1}{2}a(4a^2+b^2)+b(6a^2+b^2)\cos(c+dx)+\frac{9}{2}ab^2\cos^2(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{9ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sqrt{\cos(c+dx)}} + \frac{b^2\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d} + \frac{\int \frac{-\frac{9}{2}a^2b^2+ab(4a^2+b^2)\cos(c+dx)+\frac{1}{2}b^2(15a^2+4b^2)\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{4b}$$

$$= \frac{9ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sqrt{\cos(c+dx)}} + \frac{b^2\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d} + \frac{\int \frac{-\frac{9}{2}a^2b^2+ab(4a^2+b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{4b} + \frac{1}{8}\left(b\left(15a^2+4b^2\right)\right)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= -\frac{\sqrt{a+b}(15a^2+4b^2)\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}}{4d} + \frac{9ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sqrt{\cos(c+dx)}} + \frac{b^2\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d} - \frac{1}{8}\left(9a^2b\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx + \frac{1}{8}\left(a\left(8a^2+9ab+2b^2\right)\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= -\frac{9(a-b)b\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{4d}$$
$$+\frac{\sqrt{a+b}(8a^2+9ab+2b^2)\cot(c+dx)\,\mathrm{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{}}{4d}$$
$$-\frac{\sqrt{a+b}(15a^2+4b^2)\cot(c+dx)\,\mathrm{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{}}{4d}$$
$$+\frac{9ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sqrt{\cos(c+dx)}}$$
$$+\frac{b^2\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d}$$

Mathematica [A] (verified)

Time = 4.36 (sec) , antiderivative size = 329, normalized size of antiderivative = 0.74

$$\int\frac{(a+b\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx=\frac{2b^2\sqrt{\cos(c+dx)}(a+b\cos(c+dx))\sin(c+dx)+\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)}\left(9ab(a+\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(5/2)/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (2*b^2*Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])*Sin[c + d*x] + Sqrt[Cos[(c +
 d*x)/2]^2]*(9*a*b*(a + b)*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a
+ b)]*Sqrt[((a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2)/(a + b)] + 2*(4*a^3 -
12*a^2*b + a*b^2 - 2*b^3)*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a +
 b)]*Sqrt[((a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2)/(a + b)] + 2*b*(15*a^2
+ 4*b^2)*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[((
a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2)/(a + b)] + 9*a*b*(a + b*Cos[c + d*x
])*Sqrt[Cos[c + d*x]*Sec[(c + d*x)/2]^2]*Tan[(c + d*x)/2]))/(4*d*Sqrt[a + b
*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2231 vs. 2(401) = 802.

Time = 10.17 (sec) , antiderivative size = 2232, normalized size of antiderivative = 5.04

method	result	size
default	Expression too large to display	2232

```
[In] int((a+cos(d*x+c)*b)^(5/2)/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

[Out] -1/4/d*(9*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*
cos(d*x+c)^2-11*a*b^2*cos(d*x+c)^2*sin(d*x+c)-9*a^2*b*cos(d*x+c)*sin(d*x+c)
-2*sin(d*x+c)*cos(d*x+c)^2*b^3-2*sin(d*x+c)*cos(d*x+c)*a*b^2-2*b^3*cos(d*x+
c)^3*sin(d*x+c)+9*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2
)*a*b^2*cos(d*x+c)^2-24*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2
))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b)
)^(1/2)*a^2*b*cos(d*x+c)^2+2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/
(a+b))^(1/2)*a*b^2*cos(d*x+c)^2+18*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/
(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*
x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)+18*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a
-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+co
s(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)-48*EllipticF(cot(d*x+c)-csc(d*x+c),
(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(
1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)+4*EllipticF(cot(d*x+c)-csc(d*x+
c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b
)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)+16*EllipticF(cot(d*x+c)-csc(
d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+
c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)+8*EllipticF(cot(d*x+c)-csc
(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x
+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3+8*EllipticPi(cot(d*x+c)-csc(d*x+c),-
1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)
/(1+cos(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)^2-4*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-c
sc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^3*cos(d*x+c)^2+16*EllipticPi(cot(d*x+c)-c
sc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+co
s(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)-8*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^3*cos(d*x+c)+30*(cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticPi(
cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a^2*b+9*EllipticE(cot(d*x+c)
-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos
(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b+9*EllipticE(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*
b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2-24*EllipticF(cot(d*x+c)-csc(d*x+c),(-(
a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+c
os(d*x+c))/(a+b))^(1/2)*a^2*b+2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+
b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c
))/(a+b))^(1/2)*a*b^2+30*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))
^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/
(a+b))^(1/2)*a^2*b*cos(d*x+c)^2+60*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a
-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+co
s(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)+8*EllipticF(cot(d*x+c)-csc(d*x+c),(

```
-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1
+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^2+8*(cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc
(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*b^3-4*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((
a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c)
,(-(a-b)/(a+b))^(1/2))*b^3)/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)/cos(d*x+c
)^(1/2)
```

Fricas [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)*sqrt(b*cos(d*x + c
) + a)/sqrt(cos(d*x + c)), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(5/2)/cos(d*x+c)**(1/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((b*cos(d*x + c) + a)^(5/2)/sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)/sqrt(cos(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(a+b\,\cos(c+d\,x))^{5/2}}{\sqrt{\cos(c+d\,x)}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^(1/2),x)
[Out] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^(1/2), x)
```

3.620 $\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 445

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{(a-b)\sqrt{a+b}(2a^2-b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-s}{}}}{ad}$$
$$-\frac{\sqrt{a+b}(2a^2-6ab-b^2)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx}{a-b}}}{d}$$
$$-\frac{5ab\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{d}$$
$$+\frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}-\frac{(2a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[Out] 2*a^2*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)-(2*a^2-b^2)*sin(
d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)+(a-b)*(2*a^2-b^2)*cot(d*x+
c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a
-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a
-b))^(1/2)/a/d-(2*a^2-6*a*b-b^2)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2
)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(
d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/d-5*a*b*cot(d*x+c)*Elli
pticPi((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b)/
(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/
(a-b))^(1/2)/d
```

Rubi [A] (verified)

Time = 1.20 (sec) , antiderivative size = 445, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used = {2871, 3140, 3132, 2888, 3077, 2895, 3073}

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx =$$

$$-\frac{\sqrt{a+b}(2a^2-6ab-b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+}{a-}\right.}{d}$$

$$+\frac{(a-b)\sqrt{a+b}(2a^2-b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{ad}$$

$$-\frac{(2a^2-b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}+\frac{2a^2\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

$$-\frac{5ab\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{d}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(3/2),x]
```

```
[Out] ((a - b)*Sqrt[a + b]*(2*a^2 - b^2)*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b
*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[
(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(a*d)
 - (Sqrt[a + b]*(2*a^2 - 6*a*b - b^2)*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a
+ b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sq
rt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/d
- (5*a*b*Sqrt[a + b]*Cot[c + d*x]*EllipticPi[(a + b)/b, ArcSin[Sqrt[a + b*C
os[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a
*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/d + (2*
a^2*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]]) - ((2*a^2
 - b^2)*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]])
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
```

```
ntegersQ[2*m, 2*n])
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
```

```
- 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3140

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(Sqrt[c + d*Sin[e + f
*x]]/(d*f*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[1/(2*d), Int[(1/((a + b*Sin
[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]))*Simp[2*a*A*d - C*(b*c - a*d) -
2*(a*c*C - d*(A*b + a*B))*Sin[e + f*x] + (2*b*B*d - C*(b*c + a*d))*Sin[e +
f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*
d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + 2\int\frac{\frac{3a^2b}{2}-\frac{1}{2}a(a^2-3b^2)\cos(c+dx)-\frac{1}{2}b(2a^2-b^2)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} - \frac{(2a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{\int\frac{\frac{1}{2}ab(2a^2-b^2)+3a^2b^2\cos(c+dx)+\frac{5}{2}ab^3\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{b}$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} - \frac{(2a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{\int\frac{\frac{1}{2}ab(2a^2-b^2)+3a^2b^2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{b} + \frac{1}{2}(5ab^2)\int\frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= -\frac{5ab\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(}{a-}}}{d} + \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} - \frac{(2a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{1}{2}\left(a(2a^2-b^2)\right)\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx - \frac{1}{2}\left(a(2a^2-6ab-b^2)\right)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{(a-b)\sqrt{a+b}(2a^2-b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ad}$$
$$- \frac{\sqrt{a+b}(2a^2-6ab-b^2)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{}}{d}$$
$$- \frac{5ab\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c}{a-b}}}{d}$$
$$+ \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} - \frac{(2a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 11.99 (sec) , antiderivative size = 462, normalized size of antiderivative = 1.04

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\left(a^2\cos^2(c+dx)(a+b\cos(c+dx))\sin(c+dx)+\cos^2\left(\frac{1}{2}(c+dx)\right)^{5/2}\left(\frac{\cos(c+}{1+\cos(c}\right.\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(3/2),x]
```

```
[Out] (2*(a^2*Cos[c + d*x]^2*(a + b*Cos[c + d*x])*Sin[c + d*x] + (Cos[(c + d*x)/2
]^2)^(5/2)*(Cos[c + d*x]/(1 + Cos[c + d*x]))^(3/2)*Sqrt[1 + Cos[c + d*x]]*S
qrt[Cos[c + d*x]*Sec[(c + d*x)/2]^2]*(-2*(2*a^3 + 2*a^2*b - a*b^2 - b^3)*Sq
rt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 +
 Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 4*
a*(a^2 + 3*a*b - 3*b^2)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*C
os[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticF[ArcSin[Tan[(c + d*x)/2
]], (-a + b)/(a + b)] + 20*a*b^2*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt
[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticPi[-1, ArcSin[T
an[(c + d*x)/2]], (-a + b)/(a + b)] + ((2*a^2 - b^2)*(a + b*Cos[c + d*x])*S
ec[(c + d*x)/2]^3*(Sin[(c + d*x)/2] - Sin[(3*(c + d*x))/2]))/2)))/(d*Cos[c
+ d*x]^(5/2)*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2507 vs. 2(413) = 826.

Time = 10.91 (sec) , antiderivative size = 2508, normalized size of antiderivative = 5.64

method	result	size
default	Expression too large to display	2508

[In] int((a+cos(d*x+c)*b)^(5/2)/cos(d*x+c)^(3/2),x,method=_RETURNVERBOSE)

[Out] -1/d*(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2)*(2*a^3*(csc(d*x+c)-cot(d*x+c))+b^3*(csc(d*x+c)-cot(d*x+c))-2*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+2*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+a*b^2*(csc(d*x+c)-cot(d*x+c))+csc(d*x+c)^5*b^3*(1-cos(d*x+c))^5-6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b+6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2+2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2-10*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a*b^2-csc(d*x+c)^5*a*b^2*(1-cos(d*x+c))^5-2*csc(d*x+c)^5*a^2*b*(1-cos(d*x+c))^5-2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3+2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^3+2*csc(d*x+c)^5*a^3*(1-cos(d*x+c))^5-2*csc(d*x+c)^3*b^3*(1-cos(d*x+c))^3+4*csc(d*x+c)^3*a^3*(1-cos(d*x+c))^3+2*a^2*b*(csc(d*x+c)-cot(d*x+c))-6*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+6*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+2*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-c

```
os(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-csc(d*x+c)^2*EllipticE(cot(
d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))
^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))
^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-10*csc(d*x+c)^2*EllipticPi(cot(d*x+c)
-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+
1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+
a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2)/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*
x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^2/(-(csc(d
*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(3/2)
```

Fricas [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(3/2),x, algorithm="fricas")
[Out] integral((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)*sqrt(b*cos(d*x + c
) + a)/cos(d*x + c)^(3/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(5/2)/cos(d*x+c)**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)/cos(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)/cos(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(a+b\,\cos(c+d\,x))^{5/2}}{\cos(c+d\,x)^{3/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^(3/2),x)
[Out] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^(3/2), x)
```

3.621 $\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)} dx$

Optimal result

Integrand size = 25, antiderivative size = 392

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)} dx = \frac{14(a-b)b\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}}{3d}$$
$$+\frac{2\sqrt{a+b}(a^2-7ab+9b^2)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3d}$$
$$-\frac{2b^2\sqrt{a+b}\cot(c+dx)\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{d}$$
$$+\frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 2/3*a^2*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(3/2)+14/3*(a-b)*b*c
ot(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-
a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x
+c))/(a-b))^(1/2)/d+2/3*(a^2-7*a*b+9*b^2)*cot(d*x+c)*EllipticF((a+b*cos(d*x
+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(
a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/d-2*b^2*cot(d*
x+c)*EllipticPi((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b
,((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec
(d*x+c))/(a-b))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.83 (sec) , antiderivative size = 392, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {2871, 3132, 2888, 3077, 2895, 3073}

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2\sqrt{a+b}(a^2-7ab+9b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\right.}{3d}$$
$$+\frac{2a^2\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{3d\cos^{\frac{3}{2}}(c+dx)}$$
$$-\frac{2b^2\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{d}$$
$$+\frac{14b(a-b)\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{3d}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(5/2),x]
```

```
[Out] (14*(a - b)*b*Sqrt[a + b]*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c +
d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - S
ec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*d) + (2*Sqr
t[a + b]*(a^2 - 7*a*b + 9*b^2)*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos
[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(
1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*d) - (
2*b^2*Sqrt[a + b]*Cot[c + d*x]*EllipticPi[(a + b)/b, ArcSin[Sqrt[a + b*Cos[
c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1
 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/d + (2*a^2
*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(3*d*Cos[c + d*x]^(3/2))
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
- 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{2}{3}\int \frac{\frac{7a^2b}{2}+\frac{1}{2}a(a^2+9b^2)\cos(c+dx)+\frac{3}{2}b^3\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{2}{3}\int \frac{\frac{7a^2b}{2}+\frac{1}{2}a(a^2+9b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx + b^3\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= -\frac{2b^2\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(}{a-}}}{d} + \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{1}{3}\left(7a^2b\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx + \frac{1}{3}\left(a\left(a^2-7ab+9b^2\right)\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{14(a-b)b\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3d} + \frac{2\sqrt{a+b}(a^2-7ab+9b^2)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}}{3d} - \frac{2b^2\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(}{a-}}}{d} + \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [A] (verified)

Time = 4.62 (sec) , antiderivative size = 328, normalized size of antiderivative = 0.84

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{\frac{2a(a+b\cos(c+dx))(a+7b\cos(c+dx))\sin(c+dx)}{\cos^{\frac{3}{2}}(c+dx)}+2\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)}\left(-7ab(a+b)E(\text{arcs}\right.}{}$$

[In] Integrate[(a + b*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(5/2),x]

[Out] ((2*a*(a + b*Cos[c + d*x])*(a + 7*b*Cos[c + d*x])*Sin[c + d*x])/Cos[c + d*x
]^(3/2) + 2*Sqrt[Cos[(c + d*x)/2]^2]*(-7*a*b*(a + b)*EllipticE[ArcSin[Tan[(
c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[((a + b*Cos[c + d*x])*Sec[(c + d*x)/2]
^2)/(a + b)] + (a^3 + 7*a^2*b + 9*a*b^2 - 3*b^3)*EllipticF[ArcSin[Tan[(c +
d*x)/2]], (-a + b)/(a + b)]*Sqrt[((a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2)/
(a + b)] + 6*b^3*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]
*Sqrt[((a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2)/(a + b)] - 7*a*b*(a + b*Cos
[c + d*x])*Sqrt[Cos[c + d*x]*Sec[(c + d*x)/2]^2]*Tan[(c + d*x)/2]))/(3*d*Sq
rt[a + b*Cos[c + d*x]])

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2210 vs. 2(358) = 716.

Time = 12.26 (sec) , antiderivative size = 2211, normalized size of antiderivative = 5.64

method	result	size
default	Expression too large to display	2211

[In] int((a+cos(d*x+c)*b)^(5/2)/cos(d*x+c)^(5/2),x,method=_RETURNVERBOSE)

[Out] 2/3/d*(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-c
sc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2
)*(-csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*
(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-
csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-7*csc(d*
x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b*(-csc(d*
x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+
c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-9*csc(d*x+c)^2*E
llipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2*(-csc(d*x+c)^2*(
1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(
1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+3*csc(d*x+c)^2*(-csc(d*x
+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c
)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-
(a-b)/(a+b))^(1/2))*b^3*(1-cos(d*x+c))^2+7*csc(d*x+c)^2*EllipticE(cot(d*x+c

```
)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)
^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+
b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+7*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*
x+c),(-(a-b)/(a+b))^(1/2))*a*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(
(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b)
)^(1/2)*(1-cos(d*x+c))^2-6*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^
(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b
)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*b^
3*(1-cos(d*x+c))^2+7*csc(d*x+c)^5*a^2*b*(1-cos(d*x+c))^5-7*csc(d*x+c)^5*a*b
^2*(1-cos(d*x+c))^5+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2
*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*Ellip
ticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3+7*(-csc(d*x+c)^2*(1-co
s(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-co
s(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b)
)^(1/2))*a^2*b+9*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*
(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*Elliptic
F(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2-3*(-csc(d*x+c)^2*(1-cos
(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos
(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*b^3-7*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-
cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(c
ot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b-7*(-csc(d*x+c)^2*(1-cos(d*
x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*
x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*a*b^2+6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-c
os(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(c
ot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*b^3-2*csc(d*x+c)^3*a^3*(1-cos
(d*x+c))^3+2*csc(d*x+c)^3*a^2*b*(1-cos(d*x+c))^3+14*csc(d*x+c)^3*a*b^2*(1-c
os(d*x+c))^3-2*a^3*(csc(d*x+c)-cot(d*x+c))-9*a^2*b*(csc(d*x+c)-cot(d*x+c))-
7*a*b^2*(csc(d*x+c)-cot(d*x+c)))/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c
)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^2/(-(csc(d*x+
c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(5/2)
```

Fricas [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx=\int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)*sqrt(b*cos(d*x + c
) + a)/cos(d*x + c)^(5/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx=\text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(5/2)/cos(d*x+c)**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx=\int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)/cos(d*x + c)^(5/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx=\int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)/cos(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx=\int \frac{(a+b\cos(c+d\,x))^{5/2}}{\cos(c+d\,x)^{5/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^(5/2),x)
[Out] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^(5/2), x)
```

3.622 $\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)} dx$

Optimal result

Integrand size = 25, antiderivative size = 338

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)} dx = \frac{2(a-b)\sqrt{a+b}(9a^2+23b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{}}{15ad}$$

$$-\frac{2(a-b)\sqrt{a+b}(9a^2-8ab+15b^2)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{}}{15ad}$$

$$+\frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{22ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 2/5*a^2*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(5/2)+22/15*a*b*sin(
d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(3/2)+2/15*(a-b)*(9*a^2+23*b^2)*
cot(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((
-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*
x+c))/(a-b))^(1/2)/a/d-2/15*(a-b)*(9*a^2-8*a*b+15*b^2)*cot(d*x+c)*EllipticF
((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*
(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a
/d
```

Rubi [A] (verified)

Time = 0.84 (sec) , antiderivative size = 338, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2871, 3134, 3077, 2895, 3073}

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx =$$
$$-\frac{2(a-b)\sqrt{a+b}(9a^2-8ab+15b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\ldots\right)}{15ad}$$
$$+\frac{2(a-b)\sqrt{a+b}(9a^2+23b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{15ad}$$
$$+\frac{2a^2\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{22ab\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{15d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(7/2),x]
```

```
[Out] (2*(a - b)*Sqrt[a + b]*(9*a^2 + 23*b^2)*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[
a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*
Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/
(15*a*d) - (2*(a - b)*Sqrt[a + b]*(9*a^2 - 8*a*b + 15*b^2)*Cot[c + d*x]*Ell
ipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -
((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c
+ d*x]))/(a - b)])/(15*a*d) + (2*a^2*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])
/(5*d*Cos[c + d*x]^(5/2)) + (22*a*b*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/
(15*d*Cos[c + d*x]^(3/2))
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
```

```
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rubi steps

$$\text{integral} = \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{2}{5}\int \frac{\frac{11a^2b}{2}+\frac{3}{2}a(a^2+5b^2)\cos(c+dx)+\frac{1}{2}b(2a^2+5b^2)\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{22ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)} + \frac{4\int \frac{\frac{1}{4}a^2(9a^2+23b^2)+\frac{1}{4}ab(17a^2+15b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{15a}$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{22ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)} - \frac{1}{15}\left((a-b)\left(9a^2-8ab+15b^2\right)\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx + \frac{1}{15}\left(a\left(9a^2+23b^2\right)\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2(a-b)\sqrt{a+b}(9a^2+23b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(}{a-}}}{15ad} - \frac{2(a-b)\sqrt{a+b}(9a^2-8ab+15b^2)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-s}{}}}{15ad} + \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{22ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{15d\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [A] (verified)

Time = 7.80 (sec) , antiderivative size = 386, normalized size of antiderivative = 1.14

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{-4\cos^2\left(\frac{1}{2}(c+dx)\right)^{5/2}\left(\frac{\cos(c+dx)}{1+\cos(c+dx)}\right)^{3/2}\sqrt{1+\cos(c+dx)}\left((9a^3+9a^2b+23ab^2\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(7/2),x]
```

```
[Out] (-4*(Cos[(c + d*x)/2]^2)^(5/2)*(Cos[c + d*x]/(1 + Cos[c + d*x]))^(3/2)*Sqrt
[1 + Cos[c + d*x]]*((9*a^3 + 9*a^2*b + 23*a*b^2 + 23*b^3)*EllipticE[ArcSin[
Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sec[(c + d*x)/2]^2*Sqrt[((a + b*Cos[c
+ d*x])*Sec[(c + d*x)/2]^2)/(a + b)] - (9*a^3 + 17*a^2*b + 23*a*b^2 + 15*b^
3)*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sec[(c + d*x)/2]^2
```

```
*Sqrt[((a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2)/(a + b)] + (9*a^2 + 23*b^2)
*(a + b*Cos[c + d*x])*(Cos[c + d*x]*Sec[(c + d*x)/2]^2)^(3/2)*Sec[c + d*x]*
Tan[(c + d*x)/2]) + (a + b*Cos[c + d*x])*(15*a^2 + 23*b^2 + 22*a*b*Cos[c +
d*x] + (9*a^2 + 23*b^2)*Cos[2*(c + d*x)])*Tan[c + d*x])/(15*d*Cos[c + d*x]^
(3/2)*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2372 vs. 2(306) = 612.

Time = 14.09 (sec) , antiderivative size = 2373, normalized size of antiderivative = 7.02

method	result	size
default	Expression too large to display	2373

```
[In] int((a+cos(d*x+c)*b)^(5/2)/cos(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/15/d*(-23*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x
+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b
^2*cos(d*x+c)^4+17*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(c
os(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/
2)*a^2*b*cos(d*x+c)^4+23*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/
2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b
))^(1/2)*a*b^2*cos(d*x+c)^4-18*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b
))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c)
)/(a+b))^(1/2)*a^2*b*cos(d*x+c)^3-46*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b
)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(
d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)^3+34*EllipticF(cot(d*x+c)-csc(d*x+c),
(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(
1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)^3+46*EllipticF(cot(d*x+c)-csc(d
*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c
)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)^3-9*EllipticE(cot(d*x+c)-
csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(
d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)^2+18*EllipticF(cot(d
*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((
a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^3-9*EllipticE(co
t(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^2-23*Elliptic
E(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(
1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)^2-34*a*b^
2*cos(d*x+c)^2*sin(d*x+c)-14*a^2*b*cos(d*x+c)*sin(d*x+c)-3*sin(d*x+c)*cos(d
*x+c)*a^3-14*sin(d*x+c)*cos(d*x+c)^2*a^2*b-3*a^3*sin(d*x+c)-23*b^3*cos(d*x+
c)^3*sin(d*x+c)-23*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(c
os(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/
2)*a*b^2*cos(d*x+c)^2+17*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/
2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b
```

```
))^(1/2)*a^2*b*cos(d*x+c)^2+23*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b
))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c)
)/(a+b))^(1/2)*a*b^2*cos(d*x+c)^2-9*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)
/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d
*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)^4+15*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*b^3*cos(d*x+c)^2-9*a^2*b*cos(d*x+c)^3*sin(d*x+c)-
11*a*b^2*cos(d*x+c)^3*sin(d*x+c)+15*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)
/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d
*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)^4+30*EllipticF(cot(d*x+c)-csc(d*x+c),(-(
a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+c
os(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)^3+9*EllipticF(cot(d*x+c)-csc(d*x+c),
(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(
1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^2-9*EllipticE(cot(d*x+c)-csc(d*x+
c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b
)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^4-23*EllipticE(cot(d*x+c)-csc(
d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+
c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)^4+9*EllipticF(cot(d*x+c)-c
sc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d
*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^4-18*EllipticE(cot(d*x+
c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+c
os(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^3-46*EllipticE(cot(
d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(
(a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)^3-9*a^3*cos(d*x
+c)^2*sin(d*x+c))/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(5/2)
```

Fricas [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx=\int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)*sqrt(b*cos(d*x + c
) + a)/cos(d*x + c)^(7/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(5/2)/cos(d*x+c)**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(7/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)/cos(d*x + c)^(7/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(7/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)/cos(d*x + c)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(a+b\,\cos(c+d\,x))^{5/2}}{\cos(c+d\,x)^{7/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^(7/2),x)
[Out] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^(7/2), x)
```

3.623 $\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 387

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{2(a-b)b\sqrt{a+b}(29a^2+3b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{}}{21a^2d}$$
$$+\frac{2(a-b)\sqrt{a+b}(5a^2-24ab+3b^2)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{}}{21ad}$$
$$+\frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)}+\frac{6ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{5}{2}}(c+dx)}$$
$$+\frac{2(5a^2+9b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 2/7*a^2*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(7/2)+6/7*a*b*sin(d*
x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(5/2)+2/21*(5*a^2+9*b^2)*sin(d*x+c
)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(3/2)+2/21*(a-b)*b*(29*a^2+3*b^2)*cot
(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-
b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c
))/(a-b))^(1/2)/a^2/d+2/21*(a-b)*(5*a^2-24*a*b+3*b^2)*cot(d*x+c)*EllipticF(
(a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(
a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/
d
```

Rubi [A] (verified)

Time = 1.62 (sec) , antiderivative size = 387, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2871, 3134, 3077, 2895, 3073}

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{2(a-b)\sqrt{a+b}(5a^2-24ab+3b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\mathrm{F}}{21ad}$$
$$+\frac{2b(a-b)\sqrt{a+b}(29a^2+3b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{21a^2d}$$
$$+\frac{2(5a^2+9b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{21d\cos^{\frac{3}{2}}(c+dx)}$$
$$+\frac{2a^2\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{7d\cos^{\frac{7}{2}}(c+dx)}+\frac{6ab\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{7d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(9/2),x]
```

```
[Out] (2*(a - b)*b*Sqrt[a + b]*(29*a^2 + 3*b^2)*Cot[c + d*x]*EllipticE[ArcSin[Sqr
t[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))
]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)]
)/(21*a^2*d) + (2*(a - b)*Sqrt[a + b]*(5*a^2 - 24*a*b + 3*b^2)*Cot[c + d*x]
*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])
], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Se
c[c + d*x]))/(a - b)])/(21*a*d) + (2*a^2*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d
*x])/(7*d*Cos[c + d*x]^(7/2)) + (6*a*b*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x
])/(7*d*Cos[c + d*x]^(5/2)) + (2*(5*a^2 + 9*b^2)*Sqrt[a + b*Cos[c + d*x]]*S
in[c + d*x])/(21*d*Cos[c + d*x]^(3/2))
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rubi steps

$$\text{integral} = \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{2}{7}\int \frac{\frac{15a^2b}{2}+\frac{1}{2}a(5a^2+21b^2)\cos(c+dx)+\frac{1}{2}b(4a^2+7b^2)\cos^2(c+dx)}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{6ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{5}{2}}(c+dx)} + \frac{4\int \frac{\frac{5}{4}a^2(5a^2+9b^2)+\frac{5}{4}ab(13a^2+7b^2)\cos(c+dx)+\frac{15}{2}a^2b^2\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{35a}$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{6ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{5}{2}}(c+dx)} + \frac{2(5a^2+9b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)} + \frac{8\int \frac{\frac{5}{8}a^2b(29a^2+3b^2)+\frac{5}{8}a^3(5a^2+27b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{105a^2}$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{6ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{5}{2}}(c+dx)} + \frac{2(5a^2+9b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)} + \frac{1}{21}\left(b\left(29a^2+3b^2\right)\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx + \frac{1}{21}\left((a-b)\left(5a^2-24ab+3b^2\right)\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2(a-b)b\sqrt{a+b}(29a^2+3b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+s}{}}}{21a^2d} + \frac{2(a-b)\sqrt{a+b}(5a^2-24ab+3b^2)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-}{}}}{21ad} + \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{7}{2}}(c+dx)} + \frac{6ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{7d\cos^{\frac{5}{2}}(c+dx)} + \frac{2(5a^2+9b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{21d\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.37 (sec) , antiderivative size = 1302, normalized size of antiderivative = 3.36

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{-\frac{4a(5a^4-2a^2b^2-3b^4)\sqrt{\frac{(a+b)\cot^2\left(\frac{1}{2}(c+dx)\right)}{-a+b}}\sqrt{-\frac{(a+b)\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\sqrt{\frac{(a+b\cos(c+dx))\csc^2\left(\frac{1}{2}(c+\cdots\right.}{a}}}{(a+b)\sqrt{\cos(c+dx)}\sqrt{a-\cdots}}}{\cdots} + \frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\left(\frac{2}{21}\sec^2(c+dx)\left(5a^2\sin(c+dx)+9b^2\sin(c+dx)\right)+\frac{2\sec(c+dx)(29a^2b\sin(c+d\cdots}{21a}\right.}{d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(9/2),x]
```

```
[Out] ((-4*a*(5*a^4 - 2*a^2*b^2 - 3*b^4)*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a +
b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c
 + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*
Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*
x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - 4*a*(-29*a
^3*b - 3*a*b^3)*((Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a +
b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c +
 d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc
[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)
*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (Sqrt[((a + b)*Cot[(c + d*x
)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt
[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a/b
), ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a
)/(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*
x]])) + 2*(-29*a^2*b^2 - 3*b^4)*((I*Cos[(c + d*x)/2]*Sqrt[a + b*Cos[c + d*x
]]*EllipticE[I*ArcSinh[Sin[(c + d*x)/2]/Sqrt[Cos[c + d*x]]], (-2*a)/(-a - b
)]*Sec[c + d*x])/(b*Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*Sqrt[((a + b*Cos[
c + d*x])*Sec[c + d*x])/(a + b)]) + (2*a*((a*Sqrt[((a + b)*Cot[(c + d*x)/2]
^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a
 + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqr
t[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*S
in[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) -
(a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]
```

```
*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*
Csc[c + d*x]*EllipticPi[-(a/b), ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c +
d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c
+ d*x]]*Sqrt[a + b*Cos[c + d*x]])))/b + (Sqrt[a + b*Cos[c + d*x]]*Sin[c + d
*x])/(b*Sqrt[Cos[c + d*x]])))/(21*a*d) + (Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos
[c + d*x]]*((2*Sec[c + d*x]^2*(5*a^2*Sin[c + d*x] + 9*b^2*Sin[c + d*x]))/21
 + (2*Sec[c + d*x]*(29*a^2*b*Sin[c + d*x] + 3*b^3*Sin[c + d*x]))/(21*a) + (
6*a*b*Sec[c + d*x]^2*Tan[c + d*x])/7 + (2*a^2*Sec[c + d*x]^3*Tan[c + d*x])/
7))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2498 vs. $2(349) = 698$.

Time = 16.34 (sec) , antiderivative size = 2499, normalized size of antiderivative = 6.46

method	result	size
default	Expression too large to display	2499

```
[In] int((a+cos(d*x+c)*b)^(5/2)/cos(d*x+c)^(9/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/21/d*(-3*a^4*sin(d*x+c)-18*a^2*b^2*cos(d*x+c)^2*sin(d*x+c)-3*b^4*cos(d*x
+c)^4*sin(d*x+c)-5*a^4*cos(d*x+c)^2*sin(d*x+c)-29*a^2*b^2*cos(d*x+c)^4*sin(
d*x+c)-3*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+
c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^4*cos
(d*x+c)^5+5*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d
*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^4*
cos(d*x+c)^5-6*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+co
s(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b
^4*cos(d*x+c)^4+10*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((
a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*a^4*cos(d*x+c)^4-3*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*b^4*cos(d*x+c)^3+5*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/
2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)
))^(1/2)*a^4*cos(d*x+c)^3-6*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^
(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x
+c)))^(1/2)*a*b^3*cos(d*x+c)^4+58*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(
a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*a^3*b*cos(d*x+c)^4+54*EllipticF(cot(d*x+c)-csc(d*x+c),(-(
a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*a^2*b^2*cos(d*x+c)^4+6*EllipticF(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^3*cos(d*x+c)^4-29*EllipticE(cot(d*x+c)-c
sc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/
2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^3*b*cos(d*x+c)^3-29*EllipticE(cot(d*
```

```
x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b
))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b^2*cos(d*x+c)^3-3*EllipticE
(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c
))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^3*cos(d*x+c)^3+29*Ell
ipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos
(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^3*b*cos(d*x+c)^3+
27*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/
(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b^2*cos(d
*x+c)^3+3*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x
+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^3*
cos(d*x+c)^3-29*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+c
os(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
a^3*b*cos(d*x+c)^5-29*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*a^2*b^2*cos(d*x+c)^5-3*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*
x+c)))^(1/2)*a*b^3*cos(d*x+c)^5+29*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/
(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)*a^3*b*cos(d*x+c)^5+27*EllipticF(cot(d*x+c)-csc(d*x+c),(-
(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)*a^2*b^2*cos(d*x+c)^5+3*EllipticF(cot(d*x+c)-csc(d*
x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(c
os(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^3*cos(d*x+c)^5-58*EllipticE(cot(d*x+c)-
csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1
/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^3*b*cos(d*x+c)^4-58*EllipticE(cot(d
*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+
b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b^2*cos(d*x+c)^4-5*a^4*cos(
d*x+c)^3*sin(d*x+c)-3*a^4*cos(d*x+c)*sin(d*x+c)-12*a^3*b*cos(d*x+c)*sin(d*x
+c)-12*a^3*b*cos(d*x+c)^2*sin(d*x+c)-34*a^3*b*cos(d*x+c)^3*sin(d*x+c)-18*a^
2*b^2*cos(d*x+c)^3*sin(d*x+c)-12*a*b^3*cos(d*x+c)^3*sin(d*x+c)-5*a^3*b*cos(
d*x+c)^4*sin(d*x+c)-9*a*b^3*cos(d*x+c)^4*sin(d*x+c))/(1+cos(d*x+c))/(a+cos(
d*x+c)*b)^(1/2)/cos(d*x+c)^(7/2)/a
```

Fricas [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\cos(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(9/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)*sqrt(b*cos(d*x + c
) + a)/cos(d*x + c)^(9/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(5/2)/cos(d*x+c)**(9/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\cos(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(9/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)/cos(d*x + c)^(9/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\cos(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(9/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)/cos(d*x + c)^(9/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(a+b\,\cos(c+d\,x))^{5/2}}{\cos(c+d\,x)^{9/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^(9/2),x)
[Out] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^(9/2), x)
```

3.624 $\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 454

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \frac{2(a-b)\sqrt{a+b}(147a^4+279a^2b^2-10b^4)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right.\right.}{315a^3d}$$
$$-\frac{2(a-b)\sqrt{a+b}(147a^3-114a^2b+165ab^2+10b^3)\cot(c+dx)\,\mathrm{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{}}{315a^2d}$$
$$+\frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)}+\frac{38ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{63d\cos^{\frac{7}{2}}(c+dx)}$$
$$+\frac{2(49a^2+75b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315d\cos^{\frac{5}{2}}(c+dx)}$$
$$+\frac{2b(163a^2+5b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315ad\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 2/9*a^2*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(9/2)+38/63*a*b*sin(
d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(7/2)+2/315*(49*a^2+75*b^2)*sin(
d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(5/2)+2/315*b*(163*a^2+5*b^2)*si
n(d*x+c)*(a+b*cos(d*x+c))^(1/2)/a/d/cos(d*x+c)^(3/2)+2/315*(a-b)*(147*a^4+2
79*a^2*b^2-10*b^4)*cot(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/
cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))
^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^3/d-2/315*(a-b)*(147*a^3-114*a^2*b+
165*a*b^2+10*b^3)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/c
os(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^
(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^2/d
```

Rubi [A] (verified)

Time = 1.55 (sec) , antiderivative size = 454, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2871, 3134, 3077, 2895, 3073}

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \frac{2(49a^2+75b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{315d\cos^{\frac{5}{2}}(c+dx)} + \frac{2b(163a^2+5b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{315ad\cos^{\frac{3}{2}}(c+dx)} + \frac{2a^2\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{9d\cos^{\frac{9}{2}}(c+dx)} - \frac{2(a-b)\sqrt{a+b}(147a^3-114a^2b+165ab^2+10b^3)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\text{arc}\right.}{315a^2d} + \frac{2(a-b)\sqrt{a+b}(147a^4+279a^2b^2-10b^4)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx}}{\sqrt{a+b}\sqrt{\cos(c+dx}}\right.\right.}{315a^3d} + \frac{38ab\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{63d\cos^{\frac{7}{2}}(c+dx)}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(11/2),x]
```

```
[Out] (2*(a - b)*Sqrt[a + b]*(147*a^4 + 279*a^2*b^2 - 10*b^4)*Cot[c + d*x]*Ellipt
icE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a
 + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d
*x]))/(a - b)])/(315*a^3*d) - (2*(a - b)*Sqrt[a + b]*(147*a^3 - 114*a^2*b +
 165*a*b^2 + 10*b^3)*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]
/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c
+ d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(315*a^2*d) + (2*a^
2*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(9*d*Cos[c + d*x]^(9/2)) + (38*a*b
*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(63*d*Cos[c + d*x]^(7/2)) + (2*(49*
a^2 + 75*b^2)*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(315*d*Cos[c + d*x]^(5
/2)) + (2*b*(163*a^2 + 5*b^2)*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(315*a
*d*Cos[c + d*x]^(3/2))
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
```

ntegersQ[2*m, 2*n])

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
```

```
EqQ[a, 0])))
```

Rubi steps

$$\text{integral} = \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)} + \frac{2}{9}\int \frac{\frac{19a^2b}{2}+\frac{1}{2}a(7a^2+27b^2)\cos(c+dx)+\frac{3}{2}b(2a^2+3b^2)\cos^2(c+dx)}{\cos^{\frac{9}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)} + \frac{38ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{63d\cos^{\frac{7}{2}}(c+dx)} + \frac{4\int \frac{\frac{1}{4}a^2(49a^2+75b^2)+\frac{1}{4}ab(137a^2+63b^2)\cos(c+dx)+19a^2b^2\cos^2(c+dx)}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{63a}$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)} + \frac{38ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{63d\cos^{\frac{7}{2}}(c+dx)} + \frac{2(49a^2+75b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315d\cos^{\frac{5}{2}}(c+dx)} + \frac{8\int \frac{\frac{3}{8}a^2b(163a^2+5b^2)+\frac{1}{8}a^3(147a^2+605b^2)\cos(c+dx)+\frac{1}{4}a^2b(49a^2+75b^2)\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{315a^2}$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)} + \frac{38ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{63d\cos^{\frac{7}{2}}(c+dx)} + \frac{2(49a^2+75b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315d\cos^{\frac{5}{2}}(c+dx)} + \frac{2b(163a^2+5b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315ad\cos^{\frac{3}{2}}(c+dx)} + \frac{16\int \frac{\frac{3}{16}a^2(147a^4+279a^2b^2-10b^4)+\frac{3}{16}a^3b(261a^2+155b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{945a^3}$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)} + \frac{38ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{63d\cos^{\frac{7}{2}}(c+dx)}$$
$$+ \frac{2(49a^2+75b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315d\cos^{\frac{5}{2}}(c+dx)}$$
$$+ \frac{2b(163a^2+5b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315ad\cos^{\frac{3}{2}}(c+dx)}$$
$$- \frac{((a-b)(147a^3-114a^2b+165ab^2+10b^3))\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{315a}$$
$$+ \frac{(147a^4+279a^2b^2-10b^4)\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{315a}$$

$$= \frac{2(a-b)\sqrt{a+b}(147a^4+279a^2b^2-10b^4)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+}{a+b}}}{315a^3d}$$
$$- \frac{2(a-b)\sqrt{a+b}(147a^3-114a^2b+165ab^2+10b^3)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\right.}{315a^2d}$$
$$+ \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{9d\cos^{\frac{9}{2}}(c+dx)} + \frac{38ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{63d\cos^{\frac{7}{2}}(c+dx)}$$
$$+ \frac{2(49a^2+75b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315d\cos^{\frac{5}{2}}(c+dx)}$$
$$+ \frac{2b(163a^2+5b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{315ad\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.48 (sec) , antiderivative size = 1368, normalized size of antiderivative = 3.01

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx =$$

$$-\frac{4a(-114a^4b+124a^2b^3-10b^5)\sqrt{\frac{(a+b)\cot^2\left(\frac{1}{2}(c+dx)\right)}{-a+b}}\sqrt{-\frac{(a+b)\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\sqrt{\frac{(a+b\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\csc(c+dx)\,\text{EllipticF}\left(\text{ar}\right.}{(a+b)\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

$$-\frac{}{}$$

$$+\frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\left(\frac{2}{315}\sec^3(c+dx)\left(49a^2\sin(c+dx)+75b^2\sin(c+dx)\right)+\frac{2\sec^2(c+dx)(163a^2b}{}\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(11/2),x]
```

```
[Out] -1/315*((-4*a*(-114*a^4*b + 124*a^2*b^3 - 10*b^5)*Sqrt[((a + b)*Cot[(c + d*
x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqr
t[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSi
n[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a +
b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]
]) - 4*a*(147*a^5 + 279*a^3*b^2 - 10*a*b^4)*((Sqrt[((a + b)*Cot[(c + d*x)/2
]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((
a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sq
rt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*
Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) -
 (Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*
Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*C
sc[c + d*x]*EllipticPi[-(a/b), ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d
*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c +
 d*x]]*Sqrt[a + b*Cos[c + d*x]])) + 2*(147*a^4*b + 279*a^2*b^3 - 10*b^5)*((
I*Cos[(c + d*x)/2]*Sqrt[a + b*Cos[c + d*x]]*EllipticE[I*ArcSinh[Sin[(c + d*
x)/2]/Sqrt[Cos[c + d*x]]], (-2*a)/(-a - b)]*Sec[c + d*x])/(b*Sqrt[Cos[(c +
d*x)/2]^2*Sec[c + d*x]]*Sqrt[((a + b*Cos[c + d*x])*Sec[c + d*x])/(a + b)])
+ (2*a*((a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[
c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2
]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d
*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[C
os[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (a*Sqrt[((a + b)*Cot[(c + d*x)/2]^
2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a
```

```
+ b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a/b), Ar
cSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a
 + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]))
)/b + (Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(b*Sqrt[Cos[c + d*x]])))/(a^2
*d) + (Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]*((2*Sec[c + d*x]^3*(49*a
^2*Sin[c + d*x] + 75*b^2*Sin[c + d*x]))/315 + (2*Sec[c + d*x]^2*(163*a^2*b*
Sin[c + d*x] + 5*b^3*Sin[c + d*x]))/(315*a) + (2*Sec[c + d*x]*(147*a^4*Sin[
c + d*x] + 279*a^2*b^2*Sin[c + d*x] - 10*b^4*Sin[c + d*x]))/(315*a^2) + (38
*a*b*Sec[c + d*x]^3*Tan[c + d*x])/63 + (2*a^2*Sec[c + d*x]^4*Tan[c + d*x])/
9))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 3453 vs. $2(410) = 820$.

Time = 18.32 (sec) , antiderivative size = 3454, normalized size of antiderivative = 7.61

method	result	size
default	Expression too large to display	3454

```
[In] int((a+cos(d*x+c)*b)^(5/2)/cos(d*x+c)^(11/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/315/d*(5*a*b^4*cos(d*x+c)^4*sin(d*x+c)-35*a^5*sin(d*x+c)+155*EllipticF(c
ot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2
)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^3*cos(d*x+c)^4-10*Ell
ipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^4*cos(d*x+c)^4-
147*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4*b*cos(d*
x+c)^6-279*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b
^2*cos(d*x+c)^6-279*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1
/2)*a^2*b^3*cos(d*x+c)^6-170*a^3*b^2*cos(d*x+c)^3*sin(d*x+c)-80*a^2*b^3*cos
(d*x+c)^3*sin(d*x+c)-147*a^4*b*cos(d*x+c)^5*sin(d*x+c)-163*a^3*b^2*cos(d*x+
c)^5*sin(d*x+c)-279*a^2*b^3*cos(d*x+c)^5*sin(d*x+c)-5*a*b^4*cos(d*x+c)^5*si
n(d*x+c)-130*a^4*b*cos(d*x+c)*sin(d*x+c)-130*a^4*b*cos(d*x+c)^2*sin(d*x+c)-
170*a^3*b^2*cos(d*x+c)^2*sin(d*x+c)-212*a^4*b*cos(d*x+c)^4*sin(d*x+c)-442*a
^3*b^2*cos(d*x+c)^4*sin(d*x+c)-80*a^2*b^3*cos(d*x+c)^4*sin(d*x+c)-212*a^4*b
*cos(d*x+c)^3*sin(d*x+c)-147*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/
(a+b))^(1/2)*a^5*cos(d*x+c)^6+10*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a
+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+
c))/(a+b))^(1/2)*b^5*cos(d*x+c)^6+147*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-
b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos
(d*x+c))/(a+b))^(1/2)*a^5*cos(d*x+c)^6-294*EllipticE(cot(d*x+c)-csc(d*x+c),
```

(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^5*cos(d*x+c)^5+20*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^5*cos(d*x+c)^5+294*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^5*cos(d*x+c)^5-147*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^5*cos(d*x+c)^4+10*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^5*cos(d*x+c)^4+147*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^5*cos(d*x+c)^4-147*a^5*cos(d*x+c)^4*sin(d*x+c)+10*b^5*cos(d*x+c)^5*sin(d*x+c)-35*a^5*cos(d*x+c)*sin(d*x+c)-49*a^5*cos(d*x+c)^2*sin(d*x+c)-49*a^5*cos(d*x+c)^3*sin(d*x+c)+10*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^4*cos(d*x+c)^6+261*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4*b*cos(d*x+c)^6+279*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b^2*cos(d*x+c)^6+155*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^3*cos(d*x+c)^6-10*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^4*cos(d*x+c)^6-294*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4*b*cos(d*x+c)^5-558*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b^2*cos(d*x+c)^5-558*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^3*cos(d*x+c)^5+20*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^4*cos(d*x+c)^5+522*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4*b*cos(d*x+c)^5+558*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b^2*cos(d*x+c)^5+310*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^3*cos(d*x+c)^5-20*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^4*cos(d*x+c)^5-147*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4*b*cos(d*x+c)^4-279*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c)

```
)/(a+b))^(1/2)*a^3*b^2*cos(d*x+c)^4-279*EllipticE(cot(d*x+c)-csc(d*x+c),(-(
a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+c
os(d*x+c))/(a+b))^(1/2)*a^2*b^3*cos(d*x+c)^4+10*EllipticE(cot(d*x+c)-csc(d*
x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)
*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^4*cos(d*x+c)^4+261*EllipticF(cot(d*x+c)
-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos
(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4*b*cos(d*x+c)^4+279*EllipticF(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b^2*cos(d*x+c)^4)/(1+cos(
d*x+c))/(a+cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(9/2)/a^2
```

Fricas [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\cos(dx+c)^{\frac{11}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(11/2),x, algorithm="fricas")
[Out] integral((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)*sqrt(b*cos(d*x + c
) + a)/cos(d*x + c)^(11/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(5/2)/cos(d*x+c)**(11/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\cos(dx+c)^{\frac{11}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(11/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)/cos(d*x + c)^(11/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\cos(dx+c)^{\frac{11}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(11/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)/cos(d*x + c)^(11/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \int \frac{(a+b\,\cos(c+d\,x))^{5/2}}{\cos(c+d\,x)^{11/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^(11/2),x)
[Out] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^(11/2), x)
```

3.625 $\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{13}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 522

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{13}{2}}(c+dx)}\,dx = \frac{2(a-b)b\sqrt{a+b}(741a^4+51a^2b^2+8b^4)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\right.}{693a^4d}$$
$$+\frac{2(a-b)\sqrt{a+b}(135a^4-606a^3b+57a^2b^2+6ab^3+8b^4)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+}{a-}\right.}{693a^3d}$$
$$+\frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{11d\cos^{\frac{11}{2}}(c+dx)}+\frac{46ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{99d\cos^{\frac{9}{2}}(c+dx)}$$
$$+\frac{2(81a^2+113b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{693d\cos^{\frac{7}{2}}(c+dx)}$$
$$+\frac{2b(229a^2+3b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{693ad\cos^{\frac{5}{2}}(c+dx)}$$
$$+\frac{2(135a^4+205a^2b^2-4b^4)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{693a^2d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 2/11*a^2*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(11/2)+46/99*a*b*si
n(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(9/2)+2/693*(81*a^2+113*b^2)*s
in(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(7/2)+2/693*b*(229*a^2+3*b^2)
*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/a/d/cos(d*x+c)^(5/2)+2/693*(135*a^4+205*
a^2*b^2-4*b^4)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/a^2/d/cos(d*x+c)^(3/2)+2/6
93*(a-b)*b*(741*a^4+51*a^2*b^2+8*b^4)*cot(d*x+c)*EllipticE((a+b*cos(d*x+c))
^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1
-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^4/d+2/693*(a-b)*
(135*a^4-606*a^3*b+57*a^2*b^2+6*a*b^3+8*b^4)*cot(d*x+c)*EllipticF((a+b*cos(
d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2
)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^3/d
```

Rubi [A] (verified)

Time = 1.99 (sec) , antiderivative size = 522, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2871, 3134, 3077, 2895, 3073}

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{13}{2}}(c+dx)}\,dx = \frac{2(81a^2+113b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{693d\cos^{\frac{7}{2}}(c+dx)} + \frac{2b(229a^2+3b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{693ad\cos^{\frac{5}{2}}(c+dx)} + \frac{2a^2\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{11d\cos^{\frac{11}{2}}(c+dx)} + \frac{2b(a-b)\sqrt{a+b}(741a^4+51a^2b^2+8b^4)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\right.}{693a^4d} + \frac{2(135a^4+205a^2b^2-4b^4)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{693a^2d\cos^{\frac{3}{2}}(c+dx)} + \frac{2(a-b)\sqrt{a+b}(135a^4-606a^3b+57a^2b^2+6ab^3+8b^4)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}}{693a^3d} + \frac{46ab\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{99d\cos^{\frac{9}{2}}(c+dx)}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(13/2),x]
```

```
[Out] (2*(a - b)*b*Sqrt[a + b]*(741*a^4 + 51*a^2*b^2 + 8*b^4)*Cot[c + d*x]*Ellipt
icE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a
 + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d
*x]))/(a - b)])/(693*a^4*d) + (2*(a - b)*Sqrt[a + b]*(135*a^4 - 606*a^3*b +
 57*a^2*b^2 + 6*a*b^3 + 8*b^4)*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos
[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(
1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(693*a^3*
d) + (2*a^2*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(11*d*Cos[c + d*x]^(11/2
)) + (46*a*b*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(99*d*Cos[c + d*x]^(9/2
)) + (2*(81*a^2 + 113*b^2)*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(693*d*Co
s[c + d*x]^(7/2)) + (2*b*(229*a^2 + 3*b^2)*Sqrt[a + b*Cos[c + d*x]]*Sin[c +
 d*x])/(693*a*d*Cos[c + d*x]^(5/2)) + (2*(135*a^4 + 205*a^2*b^2 - 4*b^4)*Sq
rt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(693*a^2*d*Cos[c + d*x]^(3/2))
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
```

```
b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
```

```
c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{11d\cos^{\frac{11}{2}}(c+dx)} \\
&\quad+\frac{2}{11}\int\frac{\frac{23a^2b}{2}+\frac{3}{2}a(3a^2+11b^2)\cos(c+dx)+\frac{1}{2}b(8a^2+11b^2)\cos^2(c+dx)}{\cos^{\frac{11}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx \\
&= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{11d\cos^{\frac{11}{2}}(c+dx)}+\frac{46ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{99d\cos^{\frac{9}{2}}(c+dx)} \\
&\quad+\frac{4\int\frac{\frac{1}{4}a^2(81a^2+113b^2)+\frac{1}{4}ab(233a^2+99b^2)\cos(c+dx)+\frac{69}{2}a^2b^2\cos^2(c+dx)}{\cos^{\frac{9}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{99a} \\
&= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{11d\cos^{\frac{11}{2}}(c+dx)}+\frac{46ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{99d\cos^{\frac{9}{2}}(c+dx)} \\
&\quad+\frac{2(81a^2+113b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{693d\cos^{\frac{7}{2}}(c+dx)} \\
&\quad+\frac{8\int\frac{\frac{5}{8}a^2b(229a^2+3b^2)+\frac{1}{8}a^3(405a^2+1531b^2)\cos(c+dx)+\frac{1}{2}a^2b(81a^2+113b^2)\cos^2(c+dx)}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{693a^2} \\
&= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{11d\cos^{\frac{11}{2}}(c+dx)}+\frac{46ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{99d\cos^{\frac{9}{2}}(c+dx)} \\
&\quad+\frac{2(81a^2+113b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{693d\cos^{\frac{7}{2}}(c+dx)} \\
&\quad+\frac{2b(229a^2+3b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{693ad\cos^{\frac{5}{2}}(c+dx)} \\
&\quad+\frac{16\int\frac{\frac{15}{16}a^2(135a^4+205a^2b^2-4b^4)+\frac{5}{16}a^3b(1011a^2+461b^2)\cos(c+dx)+\frac{5}{8}a^2b^2(229a^2+3b^2)\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{3465a^3}
\end{aligned}$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{11d\cos^{\frac{11}{2}}(c+dx)} + \frac{46ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{99d\cos^{\frac{9}{2}}(c+dx)}$$
$$+ \frac{2(81a^2+113b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{693d\cos^{\frac{7}{2}}(c+dx)}$$
$$+ \frac{2b(229a^2+3b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{693ad\cos^{\frac{5}{2}}(c+dx)}$$
$$+ \frac{2(135a^4+205a^2b^2-4b^4)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{693a^2d\cos^{\frac{3}{2}}(c+dx)}$$
$$+ \frac{32\int \frac{\frac{15}{32}a^2b(741a^4+51a^2b^2+8b^4)+\frac{15}{32}a^3(135a^4+663a^2b^2+2b^4)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{10395a^4}$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{11d\cos^{\frac{11}{2}}(c+dx)} + \frac{46ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{99d\cos^{\frac{9}{2}}(c+dx)}$$
$$+ \frac{2(81a^2+113b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{693d\cos^{\frac{7}{2}}(c+dx)}$$
$$+ \frac{2b(229a^2+3b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{693ad\cos^{\frac{5}{2}}(c+dx)}$$
$$+ \frac{2(135a^4+205a^2b^2-4b^4)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{693a^2d\cos^{\frac{3}{2}}(c+dx)}$$
$$+ \frac{(b(741a^4+51a^2b^2+8b^4))\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{693a^2}$$
$$+ \frac{((a-b)(135a^4-606a^3b+57a^2b^2+6ab^3+8b^4))\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{693a^2}$$

$$= \frac{2(a-b)b\sqrt{a+b}(741a^4+51a^2b^2+8b^4)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+d}{a+b}}}{693a^4d}$$
$$+ \frac{2(a-b)\sqrt{a+b}(135a^4-606a^3b+57a^2b^2+6ab^3+8b^4)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c-}}{\sqrt{a+b}\sqrt{\cos(c}}\right.\right.}{693a^3d}$$
$$+ \frac{2a^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{11d\cos^{\frac{11}{2}}(c+dx)} + \frac{46ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{99d\cos^{\frac{9}{2}}(c+dx)}$$
$$+ \frac{2(81a^2+113b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{693d\cos^{\frac{7}{2}}(c+dx)}$$
$$+ \frac{2b(229a^2+3b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{693ad\cos^{\frac{5}{2}}(c+dx)}$$
$$+ \frac{2(135a^4+205a^2b^2-4b^4)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{693a^2d\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.57 (sec) , antiderivative size = 1431, normalized size of antiderivative = 2.74

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{13}{2}}(c+dx)}\,dx = -\frac{4a(135a^6-78a^4b^2-49a^2b^4-8b^6)\sqrt{\frac{(a+b)\cot^2\left(\frac{1}{2}(c+dx)\right)}{-a+b}}\sqrt{-\frac{(a+b)\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\sqrt{\frac{(a+b\cos(c+}{}}}{(a+b)\sqrt{\cos(c+}} + \frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\left(\frac{2}{693}\sec^4(c+dx)\left(81a^2\sin(c+dx)+113b^2\sin(c+dx)\right)+\frac{2\sec^3(c+dx)(229a}{}\right.}{}$$

[In] Integrate[(a + b*Cos[c + d*x])^(5/2)/Cos[c + d*x]^(13/2),x]

```
[Out] ((-4*a*(135*a^6 - 78*a^4*b^2 - 49*a^2*b^4 - 8*b^6)*Sqrt[((a + b)*Cot[(c + d
*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sq
rt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcS
in[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a +
 b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x
]]) - 4*a*(-741*a^5*b - 51*a^3*b^3 - 8*a*b^5)*((Sqrt[((a + b)*Cot[(c + d*x)
/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[
((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[
Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)
]*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])
 - (Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x
]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]
*Csc[c + d*x]*EllipticPi[-(a/b), ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c +
 d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c
 + d*x]]*Sqrt[a + b*Cos[c + d*x]])) + 2*(-741*a^4*b^2 - 51*a^2*b^4 - 8*b^6)
*((I*Cos[(c + d*x)/2]*Sqrt[a + b*Cos[c + d*x]]*EllipticE[I*ArcSinh[Sin[(c +
 d*x)/2]/Sqrt[Cos[c + d*x]]], (-2*a)/(-a - b)]*Sec[c + d*x])/(b*Sqrt[Cos[(c
 + d*x)/2]^2*Sec[c + d*x]]*Sqrt[((a + b*Cos[c + d*x])*Sec[c + d*x])/(a + b)
]) + (2*a*((a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*C
os[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x
)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c
+ d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqr
t[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (a*Sqrt[((a + b)*Cot[(c + d*x)/
```

```
2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[(
(a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a/b),
 ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/
(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]
])))/b + (Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(b*Sqrt[Cos[c + d*x]])))/(
693*a^3*d) + (Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]*((2*Sec[c + d*x]^
4*(81*a^2*Sin[c + d*x] + 113*b^2*Sin[c + d*x]))/693 + (2*Sec[c + d*x]^3*(22
9*a^2*b*Sin[c + d*x] + 3*b^3*Sin[c + d*x]))/(693*a) + (2*Sec[c + d*x]^2*(13
5*a^4*Sin[c + d*x] + 205*a^2*b^2*Sin[c + d*x] - 4*b^4*Sin[c + d*x]))/(693*a
^2) + (2*Sec[c + d*x]*(741*a^4*b*Sin[c + d*x] + 51*a^2*b^3*Sin[c + d*x] + 8
*b^5*Sin[c + d*x]))/(693*a^3) + (46*a*b*Sec[c + d*x]^4*Tan[c + d*x])/99 + (
2*a^2*Sec[c + d*x]^5*Tan[c + d*x])/11))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 3890 vs. $2(472) = 944$.

Time = 21.01 (sec) , antiderivative size = 3891, normalized size of antiderivative = 7.45

method	result	size
default	Expression too large to display	3891

```
[In] int((a+cos(d*x+c)*b)^(5/2)/cos(d*x+c)^(13/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/693/d*(135*a^6*cos(d*x+c)^5*sin(d*x+c)+135*a^6*cos(d*x+c)^4*sin(d*x+c)+81
*a^6*cos(d*x+c)^3*sin(d*x+c)+81*a^6*cos(d*x+c)^2*sin(d*x+c)+63*a^6*cos(d*x+
c)*sin(d*x+c)+8*b^6*cos(d*x+c)^6*sin(d*x+c)+63*a^6*sin(d*x+c)+8*(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*Ellipt
icE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^6*cos(d*x+c)^5-135*Ellipt
icF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^6*cos(d*x+c)^7+8*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2
)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^6*cos(d*x+c)^7-27
0*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^6*cos(d*x+c)
^6+16*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a
+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^6*cos(d*
x+c)^6-135*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^6*c
os(d*x+c)^5-8*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*
b^5*cos(d*x+c)^7+741*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1
+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*a^5*b*cos(d*x+c)^7+741*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c
)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a
+b))^(1/2))*a^4*b^2*cos(d*x+c)^7+51*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+c
```

os(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b^3*cos(d*x+c)^7+51*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^4*cos(d*x+c)^7+8*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^5*cos(d*x+c)^7-1482*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^5*b*cos(d*x+c)^6-1326*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4*b^2*cos(d*x+c)^6-102*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b^3*cos(d*x+c)^6-4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^4*cos(d*x+c)^6-16*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^5*cos(d*x+c)^6+1482*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^5*b*cos(d*x+c)^6+1482*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b^2*cos(d*x+c)^6+102*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b^3*cos(d*x+c)^6+102*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^4*cos(d*x+c)^6+16*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^5*cos(d*x+c)^6-741*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^5*b*cos(d*x+c)^5-663*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4*b^2*cos(d*x+c)^5-51*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b^3*cos(d*x+c)^5-2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^4*cos(d*x+c)^5-8*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^5*cos(d*x+c)^5+741*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^5*b*cos(d*x+c)^5+741*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b^2*cos(d*x+c)^5+51*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b^3*cos(d*x+c)^5+51*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-

```
csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^4*cos(d*x+c)^5+224*a^5*b*cos(d*x+c)*
sin(d*x+c)+310*a^5*b*cos(d*x+c)^3*sin(d*x+c)+274*a^4*b^2*cos(d*x+c)^3*sin(d
*x+c)+116*a^3*b^3*cos(d*x+c)^3*sin(d*x+c)+224*a^5*b*cos(d*x+c)^2*sin(d*x+c)
+274*a^4*b^2*cos(d*x+c)^2*sin(d*x+c)+876*a^5*b*cos(d*x+c)^5*sin(d*x+c)+434*
a^4*b^2*cos(d*x+c)^5*sin(d*x+c)+256*a^3*b^3*cos(d*x+c)^5*sin(d*x+c)-a^2*b^4
*cos(d*x+c)^5*sin(d*x+c)+4*a*b^5*cos(d*x+c)^5*sin(d*x+c)+135*a^5*b*cos(d*x+
c)^6*sin(d*x+c)+741*a^4*b^2*cos(d*x+c)^6*sin(d*x+c)+205*a^3*b^3*cos(d*x+c)^
6*sin(d*x+c)+51*a^2*b^4*cos(d*x+c)^6*sin(d*x+c)-4*a*b^5*cos(d*x+c)^6*sin(d*
x+c)+310*a^5*b*cos(d*x+c)^4*sin(d*x+c)+434*a^4*b^2*cos(d*x+c)^4*sin(d*x+c)+
116*a^3*b^3*cos(d*x+c)^4*sin(d*x+c)-a^2*b^4*cos(d*x+c)^4*sin(d*x+c)+8*(cos(
d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*
EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^5*cos(d*x+c)^5-74
1*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^5*b*cos(d*x+
c)^7-663*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4*b^2
*cos(d*x+c)^7-51*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos
(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)
*a^3*b^3*cos(d*x+c)^7-2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2
))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b)
)^(1/2)*a^2*b^4*cos(d*x+c)^7)/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)/cos(d*x
+c)^(11/2)/a^3
```

Fricas [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{13}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\cos(dx+c)^{\frac{13}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(13/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)*sqrt(b*cos(d*x + c
) + a)/cos(d*x + c)^(13/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{13}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(5/2)/cos(d*x+c)**(13/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{13}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\cos(dx+c)^{\frac{13}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(13/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)/cos(d*x + c)^(13/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{13}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\cos(dx+c)^{\frac{13}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/cos(d*x+c)^(13/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)/cos(d*x + c)^(13/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{13}{2}}(c+dx)}\,dx = \int \frac{(a+b\,\cos(c+d\,x))^{5/2}}{\cos(c+d\,x)^{13/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^(13/2),x)
[Out] int((a + b*cos(c + d*x))^(5/2)/cos(c + d*x)^(13/2), x)
```

3.626 $\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 379

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = -\frac{(a-b)\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{abd} + \frac{\sqrt{a+b}\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{bd} + \frac{a\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{b^2d} + \frac{\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{bd\sqrt{\cos(c+dx)}}$$

```
[Out] sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/b/d/cos(d*x+c)^(1/2)-(a-b)*cot(d*x+c)*Ell
ipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(
1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(
1/2)/a/b/d+cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+
c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(
a*(1+sec(d*x+c))/(a-b))^(1/2)/b/d+a*cot(d*x+c)*EllipticPi((a+b*cos(d*x+c))^
(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b)/(a-b))^(1/2))*(a+b)^(1/2
)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/b^2/d
```

Rubi [A] (verified)

Time = 0.90 (sec) , antiderivative size = 414, normalized size of antiderivative = 1.09, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {2899, 2888, 3082, 3072, 12, 2880, 2895, 3073}

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$
$$= \frac{a\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{b^2d}$$
$$+\frac{\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{bd}$$
$$-\frac{(a-b)\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{abd}$$
$$+\frac{\sin(c+dx)\sqrt{\cos(c+dx)}}{d\sqrt{a+b\cos(c+dx)}}+\frac{a\sin(c+dx)}{bd\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^(3/2)/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] -(((a - b)*Sqrt[a + b]*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x
]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[
c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(a*b*d)) + (Sqrt[
a + b]*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*
Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a +
b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(b*d) + (a*Sqrt[a + b]*Cot[c + d*
x]*EllipticPi[(a + b)/b, ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[
Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*S
qrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(b^2*d) + (a*Sin[c + d*x])/(b*d*Sqrt[C
os[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) + (Sqrt[Cos[c + d*x]]*Sin[c + d*x])/
(d*Sqrt[a + b*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2880

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin
[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[1/(a - b), Int[1/(Sqrt[a + b*Sin[
e + f*x]]*Sqrt[c + d*Sin[e + f*x]]), x], x] - Dist[b/(a - b), Int[(1 + Sin[
e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /;
FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
```

```
eQ[c^2 - d^2, 0]
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 2899

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)/Sqrt[(a_.) + (b_.)*sin[(e_.) + (f
_.)*(x_)]], x_Symbol] :> Dist[(-a)*(d/(2*b)), Int[Sqrt[d*Sin[e + f*x]]/Sqrt
[a + b*Sin[e + f*x]], x], x] + Dist[d/(2*b), Int[Sqrt[d*Sin[e + f*x]]*((a +
 2*b*Sin[e + f*x])/Sqrt[a + b*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, d, e,
f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3072

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(
x_)]]*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)), x_Symbol] :> Simp[2*(A
*b - a*B)*(Cos[e + f*x]/(f*(a^2 - b^2)*Sqrt[a + b*Sin[e + f*x]]*Sqrt[d*Sin[
e + f*x]])), x] + Dist[d/(a^2 - b^2), Int[(A*b - a*B + (a*A - b*B)*Sin[e +
f*x])/(Sqrt[a + b*Sin[e + f*x]]*(d*Sin[e + f*x])^(3/2)), x], x] /; FreeQ[{a
, b, d, e, f, A, B}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
```

```
PosQ[(c + d)/b]
```

Rule 3082

```
Int[Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[-2*B*Cos[e + f*x]*Sqrt[a + b*Sin[e + f*x]]*((c + d*Sin[e + f*x])^n/(f*(2*
n + 3))), x] + Dist[1/(2*n + 3), Int[((c + d*Sin[e + f*x])^(n - 1)/Sqrt[a +
 b*Sin[e + f*x]])*Simp[a*A*c*(2*n + 3) + B*(b*c + 2*a*d*n) + (B*(a*c + b*d)
*(2*n + 1) + A*(b*c + a*d)*(2*n + 3))*Sin[e + f*x] + (A*b*d*(2*n + 3) + B*(
a*d + 2*b*c*n))*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B
}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && EqQ
[n^2, 1/4]
```

Rubi steps

$$\text{integral} = \frac{\int \frac{\sqrt{\cos(c+dx)}(a+2b\cos(c+dx))}{\sqrt{a+b\cos(c+dx)}}\,dx}{2b} - \frac{a\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx}{2b}$$

$$= \frac{a\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b}, \arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right), -\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx)}{a-b}}}{b^2d} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+b\cos(c+dx)}} + \frac{\int \frac{2ab+2a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx}{4b}$$

$$= \frac{a\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b}, \arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right), -\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx)}{a-b}}}{b^2d} + \frac{a\sin(c+dx)}{bd\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+b\cos(c+dx)}} + \frac{\int \frac{-2a^3+2ab^2}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{4b(a^2-b^2)}$$

$$= \frac{a\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b}, \arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right), -\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx)}{a-b}}}{b^2d} + \frac{a\sin(c+dx)}{bd\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+b\cos(c+dx)}} - \frac{a\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{2b}$$

$$= \frac{a\sqrt{a+b}\cot(c+dx)\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{b^2d} + \frac{a\sin(c+dx)}{bd\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+b\cos(c+dx)}} + \frac{a\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{2b} - \frac{a\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{2b}$$

$$= -\frac{(a-b)\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{abd} + \frac{\sqrt{a+b}\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{bd} + \frac{a\sqrt{a+b}\cot(c+dx)\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+da}{a-b}}}{b^2d} + \frac{a\sin(c+dx)}{bd\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} + \frac{\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{a+b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 4.08 (sec) , antiderivative size = 224, normalized size of antiderivative = 0.59

$$\int\frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}dx = \frac{\cos^{\frac{3}{2}}(c+dx)\sec^2\left(\frac{1}{2}(c+dx)\right)\left((a+b)\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right)|\frac{-a+b}{a+b}\right)-2a\sqrt{\frac{a+b\cos}{(a+b)(1+c}}\right.}{2bd\left(\frac{\cos(c+dx)}{1+\cos(c+dx)}\right)^{3/2}}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (Cos[c + d*x]^(3/2)*Sec[(c + d*x)/2]^2*((a + b)*Sqrt[(a + b*Cos[c + d*x])/(
(a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(
a + b)] - 2*a*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*Ellip
ticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + Sqrt[Cos[c + d*x]/(
1 + Cos[c + d*x])]*(a + b*Cos[c + d*x])*Tan[(c + d*x)/2]))/(2*b*d*(Cos[c +
d*x]/(1 + Cos[c + d*x]))^(3/2)*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 833 vs. $2(351) = 702$.

Time = 8.93 (sec) , antiderivative size = 834, normalized size of antiderivative = 2.20

method	result
default	$\frac{-E\left(\cot(dx+c)-\csc(dx+c),\sqrt{-\frac{a-b}{a+b}}\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{\frac{a+\cos(dx+c)b}{(1+\cos(dx+c))(a+b)}}\,a\left(\cos^2(dx+c)\right)-E\left(\cot(dx+c)-\csc(dx+c),\sqrt{-\frac{a-b}{a+b}}\right)\sqrt{\frac{}{1}}}{}$

```
[In] int(cos(d*x+c)^(3/2)/(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/d*(-EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*cos(d*x+
c)^2-EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b*cos(d*x+c
)^2+2*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*cos(
d*x+c)^2-2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*cos
(d*x+c)-2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b*cos(
d*x+c)+4*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x
+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*c
os(d*x+c)+b*cos(d*x+c)^2*sin(d*x+c)-(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Ellip
ticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d
*x+c))/(a+b))^(1/2)*a-(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(cot(d*x+c
)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^
(1/2)*b+2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c
),-1,(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a+
sin(d*x+c)*cos(d*x+c)*a)/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(
1/2)/b
```

Fricas [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos(dx+c)^{\frac{3}{2}}}{\sqrt{b\cos(dx+c)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(cos(d*x + c)^(3/2)/sqrt(b*cos(d*x + c) + a), x)
```

Sympy [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] integrate(cos(d*x+c)**(3/2)/(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(cos(c + d*x)**(3/2)/sqrt(a + b*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos(dx+c)^{\frac{3}{2}}}{\sqrt{b\cos(dx+c)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(3/2)/sqrt(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos(dx+c)^{\frac{3}{2}}}{\sqrt{b\cos(dx+c)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(3/2)/sqrt(b*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos(c+d\,x)^{3/2}}{\sqrt{a+b\,\cos(c+d\,x)}}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)/(a + b*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(3/2)/(a + b*cos(c + d*x))^(1/2), x)
```

3.627 $\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 116

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = -\frac{2\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{bd}$$

```
[Out] -2*cot(d*x+c)*EllipticPi((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2
),(a+b)/b,((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*
(a*(1+sec(d*x+c))/(a-b))^(1/2)/b/d
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.040, Rules used = {2888}

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = -\frac{2\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{bd}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (-2*Sqrt[a + b]*Cot[c + d*x]*EllipticPi[(a + b)/b, ArcSin[Sqrt[a + b*Cos[c
 + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 -
 Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(b*d)
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rubi steps

$$\text{integral} = -\frac{2\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{bd}$$

Mathematica [A] (verified)

Time = 0.92 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.12

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = -\frac{2\sqrt{\cos(c+dx)}\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}\left(\text{EllipticF}\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right),\frac{-a+b}{a+b}\right)-2\,\text{EllipticPi}\left(-1,\arcsin\left(\right.\right.\right.}{d\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{a+b\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (-2*Sqrt[Cos[c + d*x]]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]
))]*(EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] - 2*EllipticPi[-
1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]))/(d*Sqrt[Cos[c + d*x]/(1 +
Cos[c + d*x])]*Sqrt[a + b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 7.71 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.25

method	result
default	$\frac{2\left(F\left(\cot(dx+c)-\csc(dx+c),\sqrt{-\frac{a-b}{a+b}}\right)-2\Pi\left(\cot(dx+c)-\csc(dx+c),-1,\sqrt{-\frac{a-b}{a+b}}\right)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{\frac{a+\cos(dx+c)b}{(1+\cos(dx+c))(a+b)}}(1+\cos(dx+c)}{d\sqrt{a+\cos(dx+c)b}\sqrt{\cos(dx+c)}}$

```
[In] int(cos(d*x+c)^(1/2)/(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d*(EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))-2*EllipticPi(cot
(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2)))*(cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)/(a+cos(d*x+c)*b)^(1/2)*(1
+cos(d*x+c))/cos(d*x+c)^(1/2)
```

Fricas [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(cos(d*x + c))/sqrt(b*cos(d*x + c) + a), x)
```

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(c+dx\right)}}{\sqrt{a+b\cos\left(c+dx\right)}}\,dx$$

```
[In] integrate(cos(d*x+c)**(1/2)/(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(cos(c + d*x))/sqrt(a + b*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(cos(d*x + c))/sqrt(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(cos(d*x + c))/sqrt(b*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(c+d\,x\right)}}{\sqrt{a+b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(a + b*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(1/2)/(a + b*cos(c + d*x))^(1/2), x)
```

3.628 $\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 109

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2\sqrt{a+b}\cot(c+dx)\,\mathrm{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ad}$$

```
[Out] 2*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),
((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(
d*x+c))/(a-b))^(1/2)/a/d
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.040$, Rules used = {2895}

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\mathrm{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{ad}$$

```
[In] Int[1/(Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]),x]
```

```
[Out] (2*Sqrt[a + b]*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt
[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]
))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(a*d)
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rubi steps

integral

$$= \frac{2\sqrt{a+b}\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ad}$$

Mathematica [A] (verified)

Time = 1.24 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.56

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx = -\frac{4(a+b)\cos^{\frac{3}{2}}(c+dx)\sqrt{-\frac{(a+b)\cot^2\left(\frac{1}{2}(c+dx)\right)}{a-b}}\sqrt{\frac{(a+b\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\sqrt{-\ldots}\right.\right.}{ad\sqrt{a+b\cos(c+dx)}\left(-\frac{(a+b)\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}\right)^{3/2}}$$

```
[In] Integrate[1/(Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]),x]
```

```
[Out] (-4*(a + b)*Cos[c + d*x]^(3/2)*Sqrt[-(((a + b)*Cot[(c + d*x)/2]^2)/(a - b))
]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[
ArcSin[Sqrt[-((a + b*Cos[c + d*x])/(a*(-1 + Cos[c + d*x])))]], (2*a)/(a - b
)])/(a*d*Sqrt[a + b*Cos[c + d*x]]*(-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]
^2)/a))^(3/2))
```

Maple [A] (verified)

Time = 8.49 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.02

method	result	size
default	$-\frac{2(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,F\left(\cot(dx+c)-\csc(dx+c),\sqrt{-\frac{a-b}{a+b}}\right)\sqrt{\frac{a+\cos(dx+c)b}{(1+\cos(dx+c))(a+b)}}}{d\sqrt{a+\cos(dx+c)b}\,\sqrt{\cos(dx+c)}}$	111

```
[In] int(1/cos(d*x+c)^(1/2)/(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/d*(1+cos(d*x+c))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)/(a+cos(d*x+c)*b)^(1/2
)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(
1+cos(d*x+c))/(a+b))^(1/2)/cos(d*x+c)^(1/2)
```

Fricas [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos(dx+c)+a}\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(b*cos(d*x + c)^2 + a*
cos(d*x + c)), x)
```

Sympy [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{a+b\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(1/2)/(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(1/(sqrt(a + b*cos(c + d*x))*sqrt(cos(c + d*x))), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos(dx+c)+a}\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*sqrt(cos(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos(dx+c)+a}\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*sqrt(cos(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{a+b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))^(1/2)), x)
```

3.629 $\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 224

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2(a-b)\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{a^2d} - \frac{2\sqrt{a+b}\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ad}$$

```
[Out] 2*(a-b)*cot(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^
(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(
1+sec(d*x+c))/(a-b))^(1/2)/a^2/d-2*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1
/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-se
c(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/d
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 224, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {2880, 2895, 3073}

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2(a-b)\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{a^2d} - \frac{2\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{ad}$$

```
[In] Int[1/(Cos[c + d*x]^(3/2)*Sqrt[a + b*Cos[c + d*x]]),x]
```

```
[Out] (2*(a - b)*Sqrt[a + b]*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x
]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[
c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(a^2*d) - (2*Sqrt
[a + b]*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]
*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a +
 b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(a*d)
```

Rule 2880

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin
[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[1/(a - b), Int[1/(Sqrt[a + b*Sin[
e + f*x]]*Sqrt[c + d*Sin[e + f*x]]), x], x] - Dist[b/(a - b), Int[(1 + Sin[
e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /;
FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rubi steps

$$\text{integral} = -\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx + \int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2(a-b)\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{a^2d}$$

$$-\frac{2\sqrt{a+b}\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ad}$$

Mathematica [A] (verified)

Time = 3.95 (sec) , antiderivative size = 211, normalized size of antiderivative = 0.94

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2\left(-\left((a+b)\sqrt{\cos(c+dx)}\sqrt{1+\cos(c+dx)}\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right)|\frac{-a+b}{a+b}\right)\right)+a\sqrt{}\right.}{ad\sqrt{c}}$$

```
[In] Integrate[1/(Cos[c + d*x]^(3/2)*Sqrt[a + b*Cos[c + d*x]]),x]
```

```
[Out] (2*(-((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[1 + Cos[c + d*x]]*Sqrt[(a + b*Cos[c +
 d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-
a + b)/(a + b)]) + a*Sqrt[Cos[c + d*x]]*Sqrt[1 + Cos[c + d*x]]*Sqrt[(a + b*
Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticF[ArcSin[Tan[(c + d*x)/
2]], (-a + b)/(a + b)] + (a + b*Cos[c + d*x])*Tan[(c + d*x)/2]))/(a*d*Sqrt[
Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 657 vs. 2(208) = 416.

Time = 11.28 (sec) , antiderivative size = 658, normalized size of antiderivative = 2.94

method	result
default	$-\frac{2\left(\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2-1\right)\left(-\sqrt{-\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1}\sqrt{\frac{\left(\csc^2(dx+c)\right)a(1-\cos(dx+c))^2-\left(\csc^2(dx+c)\right)b(1-\cos}{a+b}}\right.}{}$

```
[In] int(1/cos(d*x+c)^(3/2)/(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/d*(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)*(-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)
^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+
b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a+(-c
sc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc
(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*a+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(
d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/
2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b+csc(d*x+c)^3*(1-
cos(d*x+c))^3*a-csc(d*x+c)^3*(1-cos(d*x+c))^3*b+a*(csc(d*x+c)-cot(d*x+c))+b
*(csc(d*x+c)-cot(d*x+c)))*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*
(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2)/(csc(d*x+c)^
2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-
```

```
cos(d*x+c))^2+1)/(-(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d
*x+c))^2+1))^(3/2)/a
```

Fricas [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos(dx+c)+a}\cos(dx+c)^{\frac{3}{2}}}\,dx$$

[In] `integrate(1/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")`

[Out] `integral(sqrt(b*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(b*cos(d*x + c)^3 + a*cos(d*x + c)^2), x)`

Sympy [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{a+b\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}\,dx$$

[In] `integrate(1/cos(d*x+c)**(3/2)/(a+b*cos(d*x+c))**(1/2),x)`

[Out] `Integral(1/(sqrt(a + b*cos(c + d*x))*cos(c + d*x)**(3/2)), x)`

Maxima [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos(dx+c)+a}\cos(dx+c)^{\frac{3}{2}}}\,dx$$

[In] `integrate(1/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")`

[Out] `integrate(1/(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(3/2)), x)`

Giac [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos(dx+c)+a}\cos(dx+c)^{\frac{3}{2}}}\,dx$$

[In] `integrate(1/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")`

[Out] `integrate(1/(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(3/2)), x)`

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{1}{\cos\left(c+d\,x\right)^{3/2}\,\sqrt{a+b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(3/2)*(a + b*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(3/2)*(a + b*cos(c + d*x))^(1/2)), x)
```

3.630 $\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 274

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = -\frac{4(a-b)b\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^3d} + \frac{2\sqrt{a+b}(a+2b)\cot(c+dx)\,\mathrm{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^2d} + \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 2/3*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/a/d/cos(d*x+c)^(3/2)-4/3*(a-b)*b*cot(
d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b
)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c)
)/(a-b))^(1/2)/a^3/d+2/3*(a+2*b)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2
)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(
d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^2/d
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 274, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.160$, Rules used = {2881, 3077, 2895, 3073}

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = -\frac{4b(a-b)\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{3a^3d} + \frac{2\sqrt{a+b}(a+2b)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{3a^2d} + \frac{2\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{3ad\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Int[1/(Cos[c + d*x]^(5/2)*Sqrt[a + b*Cos[c + d*x]]),x]
```

```
[Out] (-4*(a - b)*b*Sqrt[a + b]*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c +
d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - S
ec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a^3*d) + (2
*Sqrt[a + b]*(a + 2*b)*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x
]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[
c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a^2*d) + (2*Sq
rt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(3*a*d*Cos[c + d*x]^(3/2))
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
```

```
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rubi steps

$$\text{integral} = \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)} + \frac{2\int \frac{-b+\frac{1}{2}a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{3a}$$

$$= \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)} - \frac{(2b)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{3a} + \frac{(a+2b)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{3a}$$

$$= -\frac{4(a-b)b\sqrt{a+b}\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^3d} + \frac{2\sqrt{a+b}(a+2b)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^2d} + \frac{2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3ad\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [A] (verified)

Time = 9.65 (sec) , antiderivative size = 339, normalized size of antiderivative = 1.24

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$
$$= \frac{2\left((a-2b\cos(c+dx))(a+b\cos(c+dx))\sin(c+dx)+\frac{8\cos^2\left(\frac{1}{2}(c+dx)\right)^{7/2}\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\cos(c+dx)\sec^2\left(\frac{1}{2}(c+dx)\right)}\left(2b\right.}{}\right.}{}$$

```
[In] Integrate[1/(Cos[c + d*x]^(5/2)*Sqrt[a + b*Cos[c + d*x]]),x]
```

```
[Out] (2*((a - 2*b*Cos[c + d*x])*(a + b*Cos[c + d*x])*Sin[c + d*x] + (8*(Cos[(c +
 d*x)/2]^2)^(7/2)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[Cos[c + d*x]*S
ec[(c + d*x)/2]^2]*(2*b*(a + b)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[
(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c
+ d*x)/2]], (-a + b)/(a + b)] + a*(a - 2*b)*Sqrt[Cos[c + d*x]/(1 + Cos[c +
d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticF[Ar
cSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + b*Cos[c + d*x]*(a + b*Cos[c + d
*x])*Sec[(c + d*x)/2]^2*Tan[(c + d*x)/2]))/(1 + Cos[c + d*x])^(3/2)))/(3*a^
2*d*Cos[c + d*x]^(3/2)*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1183 vs. 2(248) = 496.

Time = 13.14 (sec) , antiderivative size = 1184, normalized size of antiderivative = 4.32

method	result	size
default	Expression too large to display	1184

```
[In] int(1/cos(d*x+c)^(5/2)/(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3/d*((cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/
(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*cos(
d*x+c)^3-2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c
))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b*c
os(d*x+c)^3+2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*
x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*
b*cos(d*x+c)^3+2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos
(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*b^2*cos(d*x+c)^3+2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+
cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/
2))*a^2*cos(d*x+c)^2-4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2)
)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))
```

```
^(1/2)*a*b*cos(d*x+c)^2+4*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*a*b*cos(d*x+c)^2+4*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+
c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(
a+b))^(1/2))*b^2*cos(d*x+c)^2+(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x
+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/
(a+b))^(1/2))*a^2*cos(d*x+c)-2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b
))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)*a*b*cos(d*x+c)+2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+
b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*a*b*cos(d*x+c)+2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(
d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-
b)/(a+b))^(1/2))*b^2*cos(d*x+c)-cos(d*x+c)^2*sin(d*x+c)*a*b+2*b^2*cos(d*x+c
)^2*sin(d*x+c)-a^2*cos(d*x+c)*sin(d*x+c)+a*b*cos(d*x+c)*sin(d*x+c)-a^2*sin(
d*x+c))/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(3/2)/a^2
```

Fricas [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{1}{\sqrt{b\cos(dx+c)+a}\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(b*cos(d*x + c)^4 + a*
cos(d*x + c)^3), x)
```

Sympy [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{1}{\sqrt{a+b\cos(c+dx)}\cos^{\frac{5}{2}}(c+dx)}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(5/2)/(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(1/(sqrt(a + b*cos(c + d*x))*cos(c + d*x)**(5/2)), x)
```

Maxima [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos(dx+c)+a}\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(5/2)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos(dx+c)+a}\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\cos(c+d\,x)^{5/2}\,\sqrt{a+b\,\cos(c+d\,x)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(5/2)*(a + b*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(5/2)*(a + b*cos(c + d*x))^(1/2)), x)
```

3.631 $\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 465

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = -\frac{(3a^2-b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ab^2\sqrt{a+b}d} + \frac{(3a+b)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{b^2\sqrt{a+b}d} + \frac{3a\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{b^3d} - \frac{2a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} + \frac{(3a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{b^2(a^2-b^2)d\sqrt{\cos(c+dx)}}$$

```
[Out] -2*a^2*sin(d*x+c)*cos(d*x+c)^(1/2)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))^(1/2)+(3*
a^2-b^2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/b^2/(a^2-b^2)/d/cos(d*x+c)^(1/2)
-(3*a^2-b^2)*cot(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*
x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d
*x+c))/(a-b))^(1/2)/a/b^2/d/(a+b)^(1/2)+(3*a+b)*cot(d*x+c)*EllipticF((a+b*c
os(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a*(1-s
ec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/b^2/d/(a+b)^(1/2)+3*
a*cot(d*x+c)*EllipticPi((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2)
,(a+b)/b,((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(
a*(1+sec(d*x+c))/(a-b))^(1/2)/b^3/d
```

Rubi [A] (verified)

Time = 1.15 (sec) , antiderivative size = 465, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used = {2871, 3140, 3132, 2888, 3077, 2895, 3073}

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = -\frac{(3a^2-b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{ab^2d\sqrt{a+b}} - \frac{2a^2\sin(c+dx)\sqrt{\cos(c+dx)}}{bd(a^2-b^2)\sqrt{a+b\cos(c+dx)}} + \frac{(3a^2-b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{b^2d(a^2-b^2)\sqrt{\cos(c+dx)}} + \frac{3a\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{b^3d} + \frac{(3a+b)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{b^2d\sqrt{a+b}}$$

```
[In] Int[Cos[c + d*x]^(5/2)/(a + b*Cos[c + d*x])^(3/2),x]

[Out] -(((3*a^2 - b^2)*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sq
rt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*
x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(a*b^2*Sqrt[a + b]*d))
+ ((3*a + b)*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a
 + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))
/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(b^2*Sqrt[a + b]*d) + (3*a*
Sqrt[a + b]*Cot[c + d*x]*EllipticPi[(a + b)/b, ArcSin[Sqrt[a + b*Cos[c + d*
x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec
[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(b^3*d) - (2*a^2
*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(b*(a^2 - b^2)*d*Sqrt[a + b*Cos[c + d*x]]
) + ((3*a^2 - b^2)*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(b^2*(a^2 - b^2)*
d*Sqrt[Cos[c + d*x]])
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
```

```
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
```

```
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
- 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3140

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(Sqrt[c + d*Sin[e + f
*x]]/(d*f*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[1/(2*d), Int[(1/((a + b*Sin
[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]))*Simp[2*a*A*d - C*(b*c - a*d) -
2*(a*c*C - d*(A*b + a*B))*Sin[e + f*x] + (2*b*B*d - C*(b*c + a*d))*Sin[e +
f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*
d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\text{integral} = -\frac{2a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} - \frac{2\int \frac{\frac{a^2}{2}-\frac{1}{2}ab\cos(c+dx)-\frac{1}{2}(3a^2-b^2)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{b(a^2-b^2)}$$

$$= -\frac{2a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} + \frac{(3a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{b^2(a^2-b^2)d\sqrt{\cos(c+dx)}} - \frac{\int \frac{\frac{1}{2}a(3a^2-b^2)+a^2b\cos(c+dx)+\frac{3}{2}a(a^2-b^2)\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{b^2(a^2-b^2)}$$

$$= -\frac{2a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} + \frac{(3a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{b^2(a^2-b^2)d\sqrt{\cos(c+dx)}} - \frac{(3a)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx}{2b^2} - \frac{\int \frac{\frac{1}{2}a(3a^2-b^2)+a^2b\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{b^2(a^2-b^2)}$$

$$= \frac{3a\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+d}{a-b}}}{b^3d} - \frac{2a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}} + \frac{(3a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{b^2(a^2-b^2)d\sqrt{\cos(c+dx)}} + \frac{(a(3a+b))\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{2b^2(a+b)} - \frac{(a(3a^2-b^2))\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{2b^2(a^2-b^2)}$$

$$= -\frac{(3a^2-b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ab^2\sqrt{a+b}d}$$
$$+\frac{(3a+b)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{b^2\sqrt{a+b}d}$$
$$+\frac{3a\sqrt{a+b}\cot(c+dx)\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+}{a-b}}}{b^3d}$$
$$-\frac{2a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}}+\frac{(3a^2-b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{b^2(a^2-b^2)d\sqrt{\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.34 (sec) , antiderivative size = 1201, normalized size of antiderivative = 2.58

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{b(-a^2+b^2)d\sqrt{a+b\cos(c+dx)}}$$

$$-\frac{4a(a^2-b^2)\sqrt{\frac{(a+b)\cot^2\left(\frac{1}{2}(c+dx)\right)}{-a+b}}\sqrt{-\frac{(a+b)\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\sqrt{\frac{(a+b\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\sqrt{\frac{(a+b\cos(c+da}{}}\right.\right.}{(a+b)\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

$$+ \text{—}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*a^2*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(b*(-a^2 + b^2)*d*Sqrt[a + b*Cos[c
+ d*x]]) + ((-4*a*(a^2 - b^2)*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*S
qrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*
x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c
 + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]
^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - 8*a^2*b*((Sqrt[
((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c
+ d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c +
d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqr
t[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqr
t[a + b*Cos[c + d*x]]) - (Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[
```

```
-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*
Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a/b), ArcSin[Sqrt[((a + b*
Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*
x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])) + 2*(3*a^2 - b^2)
*((I*Cos[(c + d*x)/2]*Sqrt[a + b*Cos[c + d*x]]*EllipticE[I*ArcSinh[Sin[(c +
 d*x)/2]/Sqrt[Cos[c + d*x]]], (-2*a)/(-a - b)]*Sec[c + d*x])/(b*Sqrt[Cos[(c
 + d*x)/2]^2*Sec[c + d*x]]*Sqrt[((a + b*Cos[c + d*x])*Sec[c + d*x])/(a + b)
]) + (2*a*((a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*C
os[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x
)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c
+ d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqr
t[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (a*Sqrt[((a + b)*Cot[(c + d*x)/
2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[(
(a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a/b),
 ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/
(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]
])))/b + (Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(b*Sqrt[Cos[c + d*x]])))/(
2*(a - b)*b*(a + b)*d)
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 2525 vs. $2(433) = 866$.

Time = 9.31 (sec) , antiderivative size = 2526, normalized size of antiderivative = 5.43

method	result	size
default	Expression too large to display	2526

```
[In] int(cos(d*x+c)^(5/2)/(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^
(5/2)*(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^2*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2
-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1
/2)*(-3*a^3*(csc(d*x+c)-cot(d*x+c))+b^3*(csc(d*x+c)-cot(d*x+c))-6*(-csc(d*x
+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c
)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-
1,(-(a-b)/(a+b))^(1/2))*a^3+3*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),
(-(a-b)/(a+b))^(1/2))*a^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*
x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)
*(1-cos(d*x+c))^2-csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b
))^(1/2))*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-
cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+
c))^2-6*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^
2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*Elli
pticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a^3*(1-cos(d*x+c))^2+
a*b^2*(csc(d*x+c)-cot(d*x+c))+csc(d*x+c)^5*b^3*(1-cos(d*x+c))^5+2*csc(d*x+c
```

```
)^3*a^2*b*(1-cos(d*x+c))^3-2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc
(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1
/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b-2*(-csc(d*x
+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c
)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-
(a-b)/(a+b))^(1/2))*a*b^2+3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(
d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/
2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b-(-csc(d*x+c)
^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2
*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-
b)/(a+b))^(1/2))*a*b^2+6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x
+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*
EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a*b^2-csc(d*x+c)^
5*a*b^2*(1-cos(d*x+c))^5-3*csc(d*x+c)^5*a^2*b*(1-cos(d*x+c))^5+3*(-csc(d*x+
c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)
^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(
a-b)/(a+b))^(1/2))*a^3-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c
)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*El
lipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^3+3*csc(d*x+c)^5*a^3*
(1-cos(d*x+c))^5-2*csc(d*x+c)^3*b^3*(1-cos(d*x+c))^3+a^2*b*(csc(d*x+c)-cot(
d*x+c))-2*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2)
)*a^2*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*
x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-
2*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2*
(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-
csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+3*csc(d*
x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b*(-csc(d*
x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+
c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-csc(d*x+c)^2*Ell
ipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2*(-csc(d*x+c)^2*(1-
cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-
cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+6*csc(d*x+c)^2*EllipticPi(
cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a*b^2*(-csc(d*x+c)^2*(1-cos(
d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(
d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2)/(csc(d*x+c)^2*(1-cos(d*x+c))^
2-1)^3/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b
)/b^2/(a-b)/(a+b)
```

Fricas [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(5/2)/(b^2*cos(d*x + c)^2 +
2*a*b*cos(d*x + c) + a^2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)/(a+b*cos(d*x+c))**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(5/2)/(b*cos(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{5}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(5/2)/(b*cos(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)^{5/2}}{\left(a+b\,\cos\left(c+d\,x\right)\right)^{3/2}}\,dx$$

```
[In] int(cos(c + d*x)^(5/2)/(a + b*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)^(5/2)/(a + b*cos(c + d*x))^(3/2), x)
```

3.632 $\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 387

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{b\sqrt{a+b}d} - \frac{2\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{b\sqrt{a+b}d} - \frac{2\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{b^2d} - \frac{2a^2\sin(c+dx)}{b(a^2-b^2)\,d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

```
[Out] -2*a^2*sin(d*x+c)/b/(a^2-b^2)/d/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(1/2)+2*c
ot(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-
a-b)/(a-b))^(1/2))*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^
(1/2)/b/d/(a+b)^(1/2)-2*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(
1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a*(1-sec(d*x+c))/(a+b))^(1/2)*
(a*(1+sec(d*x+c))/(a-b))^(1/2)/b/d/(a+b)^(1/2)-2*cot(d*x+c)*EllipticPi((a+b
*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b)/(a-b))^(1/2
))*(a+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2
)/b^2/d
```

Rubi [A] (verified)

Time = 0.61 (sec) , antiderivative size = 387, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {2876, 2888, 2873, 2874, 2895, 3073}

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = -\frac{2a^2\sin(c+dx)}{bd\,(a^2-b^2)\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} - \frac{2\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{b^2d} - \frac{2\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{bd\sqrt{a+b}} + \frac{2\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{bd\sqrt{a+b}}$$

```
[In] Int[Cos[c + d*x]^(3/2)/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt
[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*
Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(b*Sqrt[a + b]*d) - (2*Cot[c + d*x]*E
llipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])],
 -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[
c + d*x]))/(a - b)])/(b*Sqrt[a + b]*d) - (2*Sqrt[a + b]*Cot[c + d*x]*Ellipt
icPi[(a + b)/b, ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d
*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1
 + Sec[c + d*x]))/(a - b)])/(b^2*d) - (2*a^2*Sin[c + d*x])/(b*(a^2 - b^2)*d
*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2873

```
Int[Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_
)])^(3/2), x_Symbol] :> Simp[-2*a*d*(Cos[e + f*x]/(f*(a^2 - b^2)*Sqrt[a + b
*Sin[e + f*x]]*Sqrt[d*Sin[e + f*x]])), x] - Dist[d^2/(a^2 - b^2), Int[Sqrt[
a + b*Sin[e + f*x]]/(d*Sin[e + f*x])^(3/2), x], x] /; FreeQ[{a, b, d, e, f}
, x] && NeQ[a^2 - b^2, 0]
```

Rule 2874

```
Int[Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]/((a_.) + (b_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Dist[(c - d)/(a - b), Int[1/(Sqrt[a + b*Sin
[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]), x], x] - Dist[(b*c - a*d)/(a - b), In
t[(1 + Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
```

```
^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2876

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)/((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(3/2), x_Symbol] :> Dist[d/b, Int[Sqrt[d*Sin[e + f*x]]/Sqrt[a + b*Sin
[e + f*x]], x], x] - Dist[a*(d/b), Int[Sqrt[d*Sin[e + f*x]]/(a + b*Sin[e +
f*x])^(3/2), x], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rubi steps

$$\text{integral} = \frac{\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx}{b} - \frac{a\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx}{b}$$

$$= -\frac{2\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{b^2d}$$

$$-\frac{2a^2\sin(c+dx)}{b(a^2-b^2)\,d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}+\frac{a\int\frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}dx}{b(a^2-b^2)}$$

$$= -\frac{2\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{b^2d}$$

$$-\frac{2a^2\sin(c+dx)}{b(a^2-b^2)\,d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

$$-\frac{a\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{b(a+b)}+\frac{a^2\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{b(a^2-b^2)}$$

$$= \frac{2\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{b\sqrt{a+b}d}$$

$$-\frac{2\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{b\sqrt{a+b}d}$$

$$-\frac{2\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{b^2d}$$

$$-\frac{2a^2\sin(c+dx)}{b(a^2-b^2)\,d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 9.19 (sec) , antiderivative size = 282, normalized size of antiderivative = 0.73

$$\int\frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx=\frac{\sqrt{\cos(c+dx)}\left(-2a(a+b)\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right)|\frac{-a+b}{a+b}\right)\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*(-2*a*(a + b)*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + C
os[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 2*b*
(a + b)*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticF[A
rcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] - 2*(a - b)*(-2*(a + b)*Sqrt[(a
+ b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticPi[-1, ArcSin[Tan[(
c + d*x)/2]], (-a + b)/(a + b)] + a*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*T
an[(c + d*x)/2])))/(b*(a^2 - b^2)*d*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*S
qrt[a + b*Cos[c + d*x]])
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 1035 vs. 2(359) = 718.

Time = 9.77 (sec) , antiderivative size = 1036, normalized size of antiderivative = 2.68

method	result	size
default	Expression too large to display	1036

```
[In] int(cos(d*x+c)^(3/2)/(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^
(3/2)*(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^2*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2
-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1
/2)*(-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+
c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c
)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(
1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)
/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^2+(-c
sc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc
(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*a^2+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((cs
c(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(
1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b-2*(-csc(d*x+
c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)
^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1
,(-(a-b)/(a+b))^(1/2))*a^2+2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc
(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1
/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*b^2+csc(d*x+c
)^3*a^2*(1-cos(d*x+c))^3-csc(d*x+c)^3*a*b*(1-cos(d*x+c))^3-a^2*(csc(d*x+c)-
cot(d*x+c))+a*b*(csc(d*x+c)-cot(d*x+c)))/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)^
2/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/b/(
a-b)/(a+b)
```

Fricas [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{3}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(3/2)/(b^2*cos(d*x + c)^2 +
2*a*b*cos(d*x + c) + a^2), x)
```

Sympy [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx=\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)**(3/2)/(a+b*cos(d*x+c))**(3/2),x)
[Out] Integral(cos(c + d*x)**(3/2)/(a + b*cos(c + d*x))**(3/2), x)
```

Maxima [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx=\int \frac{\cos(dx+c)^{\frac{3}{2}}}{(b\cos(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(3/2)/(b*cos(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx=\int \frac{\cos(dx+c)^{\frac{3}{2}}}{(b\cos(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(3/2)/(b*cos(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx=\int \frac{\cos(c+d\,x)^{3/2}}{(a+b\,\cos(c+d\,x))^{3/2}}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)/(a + b*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)^(3/2)/(a + b*cos(c + d*x))^(3/2), x)
```

3.633 $\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 266

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx = -\frac{2\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{a\sqrt{a+b}d} + \frac{2\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{a\sqrt{a+b}d} + \frac{2a\sin(c+dx)}{(a^2-b^2)\,d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

```
[Out] 2*a*sin(d*x+c)/(a^2-b^2)/d/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(1/2)-2*cot(d*
x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/
(a-b))^(1/2))*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)
/a/d/(a+b)^(1/2)+2*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/
cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1
+sec(d*x+c))/(a-b))^(1/2)/a/d/(a+b)^(1/2)
```

Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 266, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.160$, Rules used = {2873, 2874, 2895, 3073}

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2a\sin(c+dx)}{d(a^2-b^2)\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} + \frac{2\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{ad\sqrt{a+b}} - \frac{2\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{ad\sqrt{a+b}}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-2*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqr
t[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]
*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(a*Sqrt[a + b]*d) + (2*Cot[c + d*x]*
EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])]
, -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec
[c + d*x]))/(a - b)])/(a*Sqrt[a + b]*d) + (2*a*Sin[c + d*x])/((a^2 - b^2)*d
*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2873

```
Int[Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_
)])^(3/2), x_Symbol] :> Simp[-2*a*d*(Cos[e + f*x]/(f*(a^2 - b^2)*Sqrt[a + b
*Sin[e + f*x]]*Sqrt[d*Sin[e + f*x]])), x] - Dist[d^2/(a^2 - b^2), Int[Sqrt[
a + b*Sin[e + f*x]]/(d*Sin[e + f*x])^(3/2), x], x] /; FreeQ[{a, b, d, e, f}
, x] && NeQ[a^2 - b^2, 0]
```

Rule 2874

```
Int[Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]/((a_.) + (b_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Dist[(c - d)/(a - b), Int[1/(Sqrt[a + b*Sin
[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]), x], x] - Dist[(b*c - a*d)/(a - b), In
t[(1 + Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
```

```
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2a\sin(c+dx)}{(a^2-b^2)\,d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} - \frac{\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx}{a^2-b^2} \\
&= \frac{2a\sin(c+dx)}{(a^2-b^2)\,d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} \\
&\quad + \frac{\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{a+b} - \frac{a\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{a^2-b^2} \\
&= -\frac{2\cot(c+dx)E\Big(\arcsin\Big(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\Big)\,|-\frac{a+b}{a-b}\Big)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{a\sqrt{a+b}d} \\
&\quad + \frac{2\cot(c+dx)\,\text{EllipticF}\Big(\arcsin\Big(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\Big),-\frac{a+b}{a-b}\Big)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{a\sqrt{a+b}d} \\
&\quad + \frac{2a\sin(c+dx)}{(a^2-b^2)\,d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 3.65 (sec) , antiderivative size = 196, normalized size of antiderivative = 0.74

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2\Big((a+b)\sqrt{1+\cos(c+dx)}\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\Big(\arcsin\big(\tan\big(\tfrac{1}{2}(c+dx)\big)\big)\,|\frac{-a}{a+}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*((a + b)*Sqrt[1 + Cos[c + d*x]]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 +
Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] - (a
```

```
+ b)*Sqrt[1 + Cos[c + d*x]]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c +
 d*x]))]*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + (a - b)*Sq
rt[Cos[c + d*x]]*Tan[(c + d*x)/2]))/((a^2 - b^2)*d*Sqrt[a + b*Cos[c + d*x]]
)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 782 vs. $2(246) = 492$.

Time = 6.68 (sec) , antiderivative size = 783, normalized size of antiderivative = 2.94

method	result
default	$2\sqrt{-\frac{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2-1}{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1}}\left(\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1\right)\sqrt{\frac{\left(\csc^2(dx+c)\right)a(1-\cos(dx+c))^2-\left(\csc^2(dx+c)\right)b(1-\cos(dx+c))^2+a}{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1}}$

```
[In] int(cos(d*x+c)^(1/2)/(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^
(1/2)*(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-c
sc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2
)*(-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c)
)^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-
csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)
*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+
b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b+(-csc(d*x
+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c
)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-
(a-b)/(a+b))^(1/2))*a+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)
^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*Ell
ipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b+csc(d*x+c)^3*(1-cos(d*
x+c))^3*a-csc(d*x+c)^3*(1-cos(d*x+c))^3*b-a*(csc(d*x+c)-cot(d*x+c))+b*(csc(
d*x+c)-cot(d*x+c)))/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(
d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(a-b)/(a+b)
```

Fricas [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sqrt{\cos(dx+c)}}{(b\cos(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(b*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(b^2*cos(d*x + c)^2 +
2*a*b*cos(d*x + c) + a^2), x)
```

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sqrt{\cos\left(c+dx\right)}}{\left(a+b\cos\left(c+dx\right)\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)**(1/2)/(a+b*cos(d*x+c))**(3/2),x)
[Out] Integral(sqrt(cos(c + d*x))/(a + b*cos(c + d*x))**(3/2), x)
```

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(sqrt(cos(d*x + c))/(b*cos(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(sqrt(cos(d*x + c))/(b*cos(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sqrt{\cos\left(c+d\,x\right)}}{{\left(a+b\,\cos\left(c+d\,x\right)\right)}^{3/2}}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(a + b*cos(c + d*x))^(3/2),x)
[Out] int(cos(c + d*x)^(1/2)/(a + b*cos(c + d*x))^(3/2), x)
```

3.634 $\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 267

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2b\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}}{a^2\sqrt{a+b}d}$$

$$+\frac{2\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{a\sqrt{a+b}d}$$

$$-\frac{2b\sin(c+dx)}{(a^2-b^2)\,d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

```
[Out] -2*b*sin(d*x+c)/(a^2-b^2)/d/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(1/2)+2*b*cot
(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-
b)/(a-b))^(1/2))*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1
/2)/a^2/d/(a+b)^(1/2)+2*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(
1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a*(1-sec(d*x+c))/(a+b))^(1/2)*
(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/d/(a+b)^(1/2)
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 267, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used

$= \{2879, 3077, 2895, 3073\}$

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2b\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos}}{\sqrt{a+b}\sqrt{\cos}}\right.\right.}{a^2d\sqrt{a+b}}$$
$$-\frac{2b\sin(c+dx)}{d\left(a^2-b^2\right)\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{2\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{ad\sqrt{a+b}}$$

```
[In] Int[1/(Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])^(3/2)),x]
```

```
[Out] (2*b*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sq
rt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)
]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(a^2*Sqrt[a + b]*d) + (2*Cot[c + d*
x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]
])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 +
Sec[c + d*x]))/(a - b)])/(a*Sqrt[a + b]*d) - (2*b*Sin[c + d*x])/((a^2 - b^2
)*d*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2879

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*((a_) + (b_.)*sin[(e_.) + (f_.)*
(x_)])^(3/2)), x_Symbol] :> Simp[2*b*(Cos[e + f*x]/(f*(a^2 - b^2)*Sqrt[a +
b*Sin[e + f*x]]*Sqrt[d*Sin[e + f*x]])), x] + Dist[d/(a^2 - b^2), Int[(b + a
*Sin[e + f*x])/(Sqrt[a + b*Sin[e + f*x]]*(d*Sin[e + f*x])^(3/2)), x], x] /;
 FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
```

```
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{2b\sin(c+dx)}{(a^2-b^2)\,d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}+\frac{\int\frac{b+a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{a^2-b^2}\\
&= -\frac{2b\sin(c+dx)}{(a^2-b^2)\,d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\\
&\quad+\frac{\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{a+b}+\frac{b\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{a^2-b^2}\\
&= \frac{2b\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{a^2\sqrt{a+b}d}\\
&\quad+\frac{2\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{a\sqrt{a+b}d}\\
&\quad-\frac{2b\sin(c+dx)}{(a^2-b^2)\,d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 4.25 (sec) , antiderivative size = 202, normalized size of antiderivative = 0.76

$$\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx=\frac{2\left(-b(a+b)\sqrt{1+\cos(c+dx)}\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\left(\arcsin\left(\tan\left(\right.\right.\right.\right.}{}$$

```
[In] Integrate[1/(Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])^(3/2)),x]
```

```
[Out] (2*(-(b*(a + b)*Sqrt[1 + Cos[c + d*x]]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(
1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)])
+ a*(a + b)*Sqrt[1 + Cos[c + d*x]]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 +
Cos[c + d*x]))]*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + b*(
-a + b)*Sqrt[Cos[c + d*x]]*Tan[(c + d*x)/2]))/(a*(a^2 - b^2)*d*Sqrt[a + b*C
os[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 749 vs. 2(247) = 494.

Time = 10.47 (sec) , antiderivative size = 750, normalized size of antiderivative = 2.81

method	result
default	$\frac{2\left(-\sqrt{-(\csc^2(dx+c))(1-\cos(dx+c))^2+1}\,\sqrt{\frac{\left(\csc^2(dx+c)\right)a(1-\cos(dx+c))^2-\left(\csc^2(dx+c)\right)b(1-\cos(dx+c))^2+a+b}{a+b}}\,F\left(\cot(dx+c)-\csc(dx+\right.}{}$

[In] int(1/cos(d*x+c)^(1/2)/(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)

[Out] 2/d*(-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^2+csc(d*x+c)^3*a*b*(1-cos(d*x+c))^3-csc(d*x+c)^3*b^2*(1-cos(d*x+c))^3-a*b*(csc(d*x+c)-cot(d*x+c))+b^2*(csc(d*x+c)-cot(d*x+c)))*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2)/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(-(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2)/(a+b)/(a-b)/a

Fricas [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{3}{2}}\sqrt{\cos(dx+c)}}\,dx$$

[In] integrate(1/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")

[Out] integral(sqrt(b*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(b^2*cos(d*x + c)^3 + 2*a*b*cos(d*x + c)^2 + a^2*cos(d*x + c)), x)

Sympy [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(a+b\cos{(c+dx)})^{\frac{3}{2}}\sqrt{\cos{(c+dx)}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(1/2)/(a+b*cos(d*x+c))**(3/2),x)
[Out] Integral(1/((a + b*cos(c + d*x))**(3/2)*sqrt(cos(c + d*x))), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\cos{(dx+c)}+a)^{\frac{3}{2}}\sqrt{\cos{(dx+c)}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^(3/2)*sqrt(cos(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\cos{(dx+c)}+a)^{\frac{3}{2}}\sqrt{\cos{(dx+c)}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^(3/2)*sqrt(cos(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{\sqrt{\cos{(c+d\,x)}}\,{(a+b\,\cos{(c+d\,x)})}^{3/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))^(3/2)),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))^(3/2)), x)
```

3.635 $\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 285

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2(a^2-2b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-}{}}}{a^3\sqrt{a+b}d}$$
$$-\frac{2(a+2b)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{a^2\sqrt{a+b}d}$$
$$+\frac{2b^2\sin(c+dx)}{a(a^2-b^2)\,d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

```
[Out] 2*b^2*sin(d*x+c)/a/(a^2-b^2)/d/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(1/2)+2*(a
^2-2*b^2)*cot(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c
)^(1/2),((-a-b)/(a-b))^(1/2))*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+
c))/(a-b))^(1/2)/a^3/d/(a+b)^(1/2)-2*(a+2*b)*cot(d*x+c)*EllipticF((a+b*cos(
d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a*(1-sec(
d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^2/d/(a+b)^(1/2)
```

Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 285, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.160$, Rules used

$= \{2881, 3077, 2895, 3073\}$

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx =$$

$$-\frac{2(a+2b)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{a^2d\sqrt{a+b}}$$
$$+\frac{2b^2\sin(c+dx)}{ad\,(a^2-b^2)\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{2(a^2-2b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{a^3d\sqrt{a+b}}$$

```
[In] Int[1/(Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*x])^(3/2)),x]
```

```
[Out] (2*(a^2 - 2*b^2)*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sq
rt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*
x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(a^3*Sqrt[a + b]*d) - (
2*(a + 2*b)*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a
+ b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/
(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(a^2*Sqrt[a + b]*d) + (2*b^2
*Sin[c + d*x])/(a*(a^2 - b^2)*d*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]
)
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rubi steps

$$\text{integral} = \frac{2b^2\sin(c+dx)}{a\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} + \frac{2\int \frac{\frac{1}{2}\left(a^2-2b^2\right)-\frac{1}{2}ab\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{a\left(a^2-b^2\right)}$$

$$= \frac{2b^2\sin(c+dx)}{a\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} - \frac{(a+2b)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{a(a+b)} + \frac{\left(a^2-2b^2\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{a\left(a^2-b^2\right)}$$

$$= \frac{2(a^2-2b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{a^3\sqrt{a+b}d} - \frac{2(a+2b)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{a^2\sqrt{a+b}d} + \frac{2b^2\sin(c+dx)}{a\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.36 (sec) , antiderivative size = 1233, normalized size of antiderivative = 4.33

$$-\frac{4a(2a^2b-2b^3)\sqrt{\frac{(a+b)\cot^2\left(\frac{1}{2}(c+dx)\right)}{-a+b}}\sqrt{-\frac{(a+b)\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\sqrt{\frac{(a+b\cos(c+dx)}{}}}{(a+b)\sqrt{}}$$

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = \frac{}{}$$

$$+\frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\left(-\frac{2b^3\sin(c+dx)}{a^2(a^2-b^2)(a+b\cos(c+dx))}+\frac{2\tan(c+dx)}{a^2}\right)}{d}$$

```
[In] Integrate[1/(Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*x])^(3/2)),x]
```

```
[Out] ((-4*a*(2*a^2*b - 2*b^3)*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-
(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*C
sc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*
x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(
(a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - 4*a*(a^3 - 2*a*b^2)*
((Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*
Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*C
sc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)
/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*
x]]*Sqrt[a + b*Cos[c + d*x]]) - (Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)
]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c +
 d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a/b), ArcSin[Sqrt[(
(a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[
(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])) + 2*(a^2*b
 - 2*b^3)*((I*Cos[(c + d*x)/2]*Sqrt[a + b*Cos[c + d*x]]*EllipticE[I*ArcSinh
[Sin[(c + d*x)/2]/Sqrt[Cos[c + d*x]]], (-2*a)/(-a - b)]*Sec[c + d*x])/(b*Sq
rt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*Sqrt[((a + b*Cos[c + d*x])*Sec[c + d*x]
)/(a + b)]) + (2*a*((a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-((
(a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc
[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x]
)*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a
 + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (a*Sqrt[((a + b)*Cot[(
c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a
```

```
)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticP
i[-(a/b), ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]]
, (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos
[c + d*x]])))/b + (Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(b*Sqrt[Cos[c + d
*x]])))/(a^2*(-a + b)*(a + b)*d) + (Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d
*x]]*((-2*b^3*Sin[c + d*x])/(a^2*(a^2 - b^2)*(a + b*Cos[c + d*x])) + (2*Tan
[c + d*x])/a^2))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1227 vs. $2(265) = 530$.

Time = 12.92 (sec) , antiderivative size = 1228, normalized size of antiderivative = 4.31

method	result	size
default	Expression too large to display	1228

```
[In] int(1/cos(d*x+c)^(3/2)/(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/d*(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)*(-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)
^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+
b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3+(
-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-c
sc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d
*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b+2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2
)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a
+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2+(-cs
c(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(
d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+
c),(-(a-b)/(a+b))^(1/2))*a^3+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc
(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1
/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b-2*(-csc(d*x
+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c
)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-
(a-b)/(a+b))^(1/2))*a*b^2-2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(
d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/
2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^3+csc(d*x+c)^3*a
^3*(1-cos(d*x+c))^3-csc(d*x+c)^3*a^2*b*(1-cos(d*x+c))^3-2*csc(d*x+c)^3*a*b^
2*(1-cos(d*x+c))^3+2*csc(d*x+c)^3*b^3*(1-cos(d*x+c))^3+a^3*(csc(d*x+c)-cot(
d*x+c))+a^2*b*(csc(d*x+c)-cot(d*x+c))-2*b^3*(csc(d*x+c)-cot(d*x+c)))*((csc(
d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c
)^2*(1-cos(d*x+c))^2+1))^(1/2)/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^
2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(-(csc(d*x+c)^2
*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(3/2)/a^2/(a-b)/(a+
b)
```

Fricas [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^{\frac{3}{2}}}\,dx$$

[In] integrate(1/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")

[Out] integral(sqrt(b*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(b^2*cos(d*x + c)^4 + 2*a*b*cos(d*x + c)^3 + a^2*cos(d*x + c)^2), x)

Sympy [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(a+b\cos(c+dx))^{\frac{3}{2}}\cos^{\frac{3}{2}}(c+dx)}\,dx$$

[In] integrate(1/cos(d*x+c)**(3/2)/(a+b*cos(d*x+c))**(3/2),x)

[Out] Integral(1/((a + b*cos(c + d*x))**(3/2)*cos(c + d*x)**(3/2)), x)

Maxima [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^{\frac{3}{2}}}\,dx$$

[In] integrate(1/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")

[Out] integrate(1/((b*cos(d*x + c) + a)^(3/2)*cos(d*x + c)^(3/2)), x)

Giac [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^{\frac{3}{2}}}\,dx$$

[In] integrate(1/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")

[Out] integrate(1/((b*cos(d*x + c) + a)^(3/2)*cos(d*x + c)^(3/2)), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^{3/2}\,\left(a+b\,\cos\left(c+d\,x\right)\right)^{3/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(3/2)*(a + b*cos(c + d*x))^(3/2)),x)
[Out] int(1/(cos(c + d*x)^(3/2)*(a + b*cos(c + d*x))^(3/2)), x)
```

3.636 $\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 357

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = -\frac{2b(5a^2-8b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^4\sqrt{a+b}d} + \frac{2(a+2b)(a+4b)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^3\sqrt{a+b}d} + \frac{2b^2\sin(c+dx)}{a(a^2-b^2)d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}} + \frac{2(a^2-4b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3a^2(a^2-b^2)d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 2*b^2*sin(d*x+c)/a/(a^2-b^2)/d/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(1/2)+2/3*
(a^2-4*b^2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/a^2/(a^2-b^2)/d/cos(d*x+c)^(3
/2)-2/3*b*(5*a^2-8*b^2)*cot(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(
1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a*(1-sec(d*x+c))/(a+b))^(1/2)*
(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^4/d/(a+b)^(1/2)+2/3*(a+2*b)*(a+4*b)*cot(d*
x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/
(a-b))^(1/2))*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)
/a^3/d/(a+b)^(1/2)
```

Rubi [A] (verified)

Time = 0.84 (sec) , antiderivative size = 357, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2881, 3134, 3077, 2895, 3073}

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2(a+2b)(a+4b)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{Ellip}}{3a^3d\sqrt{a+b}}$$
$$+\frac{2b^2\sin(c+dx)}{ad\,(a^2-b^2)\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}+\frac{2(a^2-4b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{3a^2d\,(a^2-b^2)\cos^{\frac{3}{2}}(c+dx)}$$
$$-\frac{2b(5a^2-8b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{3a^4d\sqrt{a+b}}$$

```
[In] Int[1/(Cos[c + d*x]^(5/2)*(a + b*Cos[c + d*x])^(3/2)),x]
```

```
[Out] (-2*b*(5*a^2 - 8*b^2)*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x]
]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c
 + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a^4*Sqrt[a + b]
*d) + (2*(a + 2*b)*(a + 4*b)*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c
 + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1
- Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a^3*Sqrt
[a + b]*d) + (2*b^2*Sin[c + d*x])/(a*(a^2 - b^2)*d*Cos[c + d*x]^(3/2)*Sqrt[
a + b*Cos[c + d*x]]) + (2*(a^2 - 4*b^2)*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*
x])/(3*a^2*(a^2 - b^2)*d*Cos[c + d*x]^(3/2))
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
```

```
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] && !IntegerQ[
n]) || !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] && !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rubi steps

$$\text{integral} = \frac{2b^2\sin(c+dx)}{a\left(a^2-b^2\right)d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}} + \frac{2\int\frac{\frac{1}{2}\left(a^2-4b^2\right)-\frac{1}{2}ab\cos(c+dx)+b^2\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{a\left(a^2-b^2\right)}$$

$$=\frac{2b^2\sin(c+dx)}{a\left(a^2-b^2\right)d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}+\frac{2(a^2-4b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3a^2\left(a^2-b^2\right)d\cos^{\frac{3}{2}}(c+dx)}+\frac{4\int\frac{-\frac{1}{4}b(5a^2-8b^2)+\frac{1}{4}a(a^2+2b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{3a^2\left(a^2-b^2\right)}$$

$$=\frac{2b^2\sin(c+dx)}{a\left(a^2-b^2\right)d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}+\frac{2(a^2-4b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3a^2\left(a^2-b^2\right)d\cos^{\frac{3}{2}}(c+dx)}+\frac{((a+2b)(a+4b))\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{3a^2(a+b)}-\frac{(b(5a^2-8b^2))\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{3a^2\left(a^2-b^2\right)}$$

$$=-\frac{2b(5a^2-8b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^4\sqrt{a+b}d}+\frac{2(a+2b)(a+4b)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^3\sqrt{a+b}d}+\frac{2b^2\sin(c+dx)}{a\left(a^2-b^2\right)d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}+\frac{2(a^2-4b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3a^2\left(a^2-b^2\right)d\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.36 (sec) , antiderivative size = 1269, normalized size of antiderivative = 3.55

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = -\frac{4a(a^4+7a^2b^2-8b^4)\sqrt{\frac{(a+b)\cot^2\left(\frac{1}{2}(c+dx)\right)}{-a+b}}\sqrt{-\frac{(a+b)\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\sqrt{\frac{(a+b\cos(\cdots}{\cdots}}}{(a+b)\cdots}$$

$$+\frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\left(\frac{2b^4\sin(c+dx)}{a^3(a^2-b^2)(a+b\cos(c+dx))}-\frac{10b\tan(c+dx)}{3a^3}+\frac{2\sec(c+dx)\tan(c+dx)}{3a^2}\right)}{d}$$

```
[In] Integrate[1/(Cos[c + d*x]^(5/2)*(a + b*Cos[c + d*x])^(3/2)),x]
```

```
[Out] ((-4*a*(a^4 + 7*a^2*b^2 - 8*b^4)*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)
]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c +
 d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Co
s[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)
/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - 4*a*(5*a^3*b
 - 8*a*b^3)*((Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*C
os[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x
)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c
+ d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqr
t[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (Sqrt[((a + b)*Cot[(c + d*x)/2]
^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a
 + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a/b), A
rcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-
a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])
) + 2*(5*a^2*b^2 - 8*b^4)*((I*Cos[(c + d*x)/2]*Sqrt[a + b*Cos[c + d*x]]*Ell
ipticE[I*ArcSinh[Sin[(c + d*x)/2]/Sqrt[Cos[c + d*x]]], (-2*a)/(-a - b)]*Sec
[c + d*x])/(b*Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*Sqrt[((a + b*Cos[c + d*
x])*Sec[c + d*x])/(a + b)]) + (2*a*((a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-
a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*C
os[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a
+ b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c
+ d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (a*Sqr
t[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(
```

```
c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c
+ d*x]*EllipticPi[-(a/b), ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2
]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]
]*Sqrt[a + b*Cos[c + d*x]])))/b + (Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(
b*Sqrt[Cos[c + d*x]])))/(3*a^3*(a - b)*(a + b)*d) + (Sqrt[Cos[c + d*x]]*Sqr
t[a + b*Cos[c + d*x]]*((2*b^4*Sin[c + d*x])/(a^3*(a^2 - b^2)*(a + b*Cos[c +
 d*x])) - (10*b*Tan[c + d*x])/(3*a^3) + (2*Sec[c + d*x]*Tan[c + d*x])/(3*a^
2)))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2617 vs. $2(327) = 654$.

Time = 14.29 (sec) , antiderivative size = 2618, normalized size of antiderivative = 7.33

method	result	size
default	Expression too large to display	2618

```
[In] int(1/cos(d*x+c)^(5/2)/(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)

[Out] 2/3/d*(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)*(5*csc(d*x+c)^2*EllipticF(cot(d*x+c
)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)
^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+
b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-5*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/
(a+b))^(1/2))*a^3*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2
*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+2*Ell
ipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^2*(-csc(d*x+c)^2*(
1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(
1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+8*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)
/(a+b))^(1/2))*a*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^
2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+5*El
lipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b*(-csc(d*x+c)^2*(1
-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1
-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+5*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/
(a+b))^(1/2))*a^2*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)
^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-8*E
llipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^3*(-csc(d*x+c)^2*(
1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(
1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*a^4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((cs
c(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(
1/2)*(1-cos(d*x+c))^2-8*csc(d*x+c)^5*b^4*(1-cos(d*x+c))^5-2*csc(d*x+c)^3*a^
4*(1-cos(d*x+c))^3+16*csc(d*x+c)^3*b^4*(1-cos(d*x+c))^3+3*a^3*b*(csc(d*x+c)
-cot(d*x+c))+7*a^2*b^2*(csc(d*x+c)-cot(d*x+c))-2*csc(d*x+c)^2*EllipticF(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^2*(-csc(d*x+c)^2*(1-cos(d*x+
c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+
```

```
c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-8*csc(d*x+c)^2*EllipticF(cot(d*x+c
)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)
^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+
b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-5*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*
x+c),(-(a-b)/(a+b))^(1/2))*a^3*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(
(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b)
)^(1/2)*(1-cos(d*x+c))^2-5*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(
a-b)/(a+b))^(1/2))*a^2*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d
*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2
)*(1-cos(d*x+c))^2+8*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(
a+b))^(1/2))*a*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*
a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos
(d*x+c))^2-5*csc(d*x+c)^5*a^3*b*(1-cos(d*x+c))^5-8*csc(d*x+c)^3*a*b^3*(1-co
s(d*x+c))^3+5*csc(d*x+c)^5*a^2*b^2*(1-cos(d*x+c))^5+8*csc(d*x+c)^5*a*b^3*(1
-cos(d*x+c))^5+2*csc(d*x+c)^3*a^3*b*(1-cos(d*x+c))^3-8*csc(d*x+c)^3*a^2*b^2
*(1-cos(d*x+c))^3+EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4
*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2
-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-8*EllipticE(cot(d*x+c)-c
sc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2
)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a
+b))^(1/2)+8*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*b^4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d
*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2
-2*a^4*(csc(d*x+c)-cot(d*x+c))-8*b^4*(csc(d*x+c)-cot(d*x+c)))*((csc(d*x+c)^
2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-
cos(d*x+c))^2+1))^(1/2)/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-
cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^2/(-(csc(d*x+c)^2*(1-c
os(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(5/2)/(a+b)/(a-b)/a^3
```

Fricas [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(b*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(b^2*cos(d*x + c)^5 +
2*a*b*cos(d*x + c)^4 + a^2*cos(d*x + c)^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(5/2)/(a+b*cos(d*x+c))**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^(3/2)*cos(d*x + c)^(5/2)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^(3/2)*cos(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{\cos(c+d\,x)^{5/2}\,(a+b\,\cos(c+d\,x))^{3/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(5/2)*(a + b*cos(c + d*x))^(3/2)),x)
[Out] int(1/(cos(c + d*x)^(5/2)*(a + b*cos(c + d*x))^(3/2)), x)
```

3.637 $\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 433

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2(3a^4+8a^2b^2-16b^4)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+}{a-}\right.}{5a^5\sqrt{a+b}d}$$
$$-\frac{2(3a+4b)(a^2+4b^2)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{5a^4\sqrt{a+b}d}$$
$$+\frac{2b^2\sin(c+dx)}{a(a^2-b^2)d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}+\frac{2(a^2-6b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5a^2(a^2-b^2)d\cos^{\frac{5}{2}}(c+dx)}$$
$$-\frac{2b(3a^2-8b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5a^3(a^2-b^2)d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 2*b^2*sin(d*x+c)/a/(a^2-b^2)/d/cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(1/2)+2/5*
(a^2-6*b^2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/a^2/(a^2-b^2)/d/cos(d*x+c)^(5
/2)-2/5*b*(3*a^2-8*b^2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/a^3/(a^2-b^2)/d/c
os(d*x+c)^(3/2)+2/5*(3*a^4+8*a^2*b^2-16*b^4)*cot(d*x+c)*EllipticE((a+b*cos(
d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a*(1-sec(
d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^5/d/(a+b)^(1/2)-2/5*(
3*a+4*b)*(a^2+4*b^2)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2
)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*
(1+sec(d*x+c))/(a-b))^(1/2)/a^4/d/(a+b)^(1/2)
```

Rubi [A] (verified)

Time = 1.24 (sec) , antiderivative size = 433, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2881, 3134, 3077, 2895, 3073}

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2b^2\sin(c+dx)}{ad\,(a^2-b^2)\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{2(a^2-6b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{5a^2d\,(a^2-b^2)\cos^{\frac{5}{2}}(c+dx)}$$
$$-\frac{2(3a+4b)\,(a^2+4b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{5a^4d\sqrt{a+b}}$$
$$-\frac{2b(3a^2-8b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{5a^3d\,(a^2-b^2)\cos^{\frac{3}{2}}(c+dx)}$$
$$+\frac{2(3a^4+8a^2b^2-16b^4)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{5a^5d\sqrt{a+b}}$$

```
[In] Int[1/(Cos[c + d*x]^(7/2)*(a + b*Cos[c + d*x])^(3/2)),x]
```

```
[Out] (2*(3*a^4 + 8*a^2*b^2 - 16*b^4)*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Co
s[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*
(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(5*a^5*S
qrt[a + b]*d) - (2*(3*a + 4*b)*(a^2 + 4*b^2)*Cot[c + d*x]*EllipticF[ArcSin[
Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a -
b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a -
b)])/(5*a^4*Sqrt[a + b]*d) + (2*b^2*Sin[c + d*x])/(a*(a^2 - b^2)*d*Cos[c +
d*x]^(5/2)*Sqrt[a + b*Cos[c + d*x]]) + (2*(a^2 - 6*b^2)*Sqrt[a + b*Cos[c +
d*x]]*Sin[c + d*x])/(5*a^2*(a^2 - b^2)*d*Cos[c + d*x]^(5/2)) - (2*b*(3*a^2
- 8*b^2)*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(5*a^3*(a^2 - b^2)*d*Cos[c
+ d*x]^(3/2))
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rubi steps

$$\text{integral} = \frac{2b^2\sin(c+dx)}{a(a^2-b^2)d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}} + \frac{2\int\frac{\frac{1}{2}(a^2-6b^2)-\frac{1}{2}ab\cos(c+dx)+2b^2\cos^2(c+dx)}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{a(a^2-b^2)}$$

$$= \frac{2b^2\sin(c+dx)}{a(a^2-b^2)d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}} + \frac{2(a^2-6b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5a^2(a^2-b^2)d\cos^{\frac{5}{2}}(c+dx)} + \frac{4\int\frac{-\frac{3}{4}b(3a^2-8b^2)+\frac{1}{4}a(3a^2+2b^2)\cos(c+dx)+\frac{1}{2}b(a^2-6b^2)\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{5a^2(a^2-b^2)}$$

$$= \frac{2b^2\sin(c+dx)}{a(a^2-b^2)d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}} + \frac{2(a^2-6b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5a^2(a^2-b^2)d\cos^{\frac{5}{2}}(c+dx)} - \frac{2b(3a^2-8b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5a^3(a^2-b^2)d\cos^{\frac{3}{2}}(c+dx)} + \frac{8\int\frac{\frac{3}{8}(3a^4+8a^2b^2-16b^4)-\frac{3}{8}ab(a^2+4b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{15a^3(a^2-b^2)}$$

$$= \frac{2b^2\sin(c+dx)}{a(a^2-b^2)d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}} + \frac{2(a^2-6b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5a^2(a^2-b^2)d\cos^{\frac{5}{2}}(c+dx)} - \frac{2b(3a^2-8b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5a^3(a^2-b^2)d\cos^{\frac{3}{2}}(c+dx)} - \frac{((3a+4b)(a^2+4b^2))\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{5a^3(a+b)} + \frac{(3a^4+8a^2b^2-16b^4)\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{5a^3(a^2-b^2)}$$

$$= \frac{2(3a^4+8a^2b^2-16b^4)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{5a^5\sqrt{a+b}d}$$
$$- \frac{2(3a+4b)\left(a^2+4b^2\right)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1\cdots}{}}}{5a^4\sqrt{a+b}d}$$
$$+ \frac{2b^2\sin(c+dx)}{a\left(a^2-b^2\right)d\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}$$
$$+ \frac{2(a^2-6b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5a^2\left(a^2-b^2\right)d\cos^{\frac{5}{2}}(c+dx)}$$
$$- \frac{2b(3a^2-8b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{5a^3\left(a^2-b^2\right)d\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.42 (sec) , antiderivative size = 1314, normalized size of antiderivative = 3.03

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = \frac{\left(a^2+4b^2\right)\left(-\frac{4a\left(4a^2b-4b^3\right)\sqrt{\frac{(a+b)\cot^2\left(\frac{1}{2}(c+dx)\right)}{-a+b}}\sqrt{-\frac{(a+b)\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\cdots}{\cdots}\right.}{\cdots}$$
$$+ \frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\left(-\frac{2b^5\sin(c+dx)}{a^4(a^2-b^2)(a+b\cos(c+dx))}+\frac{2\sec(c+dx)\left(3a^2\sin(c+dx)+11b^2\sin(c+dx)\right)}{5a^4}-\frac{6b\sec(c+dx)\,\mathrm{ta}\cdots}{5a^3}\cdots\right.}{d}$$

```
[In] Integrate[1/(Cos[c + d*x]^(7/2)*(a + b*Cos[c + d*x])^(3/2)),x]
```

```
[Out] ((a^2 + 4*b^2)*((-4*a*(4*a^2*b - 4*b^3)*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(
-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*
Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a
 + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c
 + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - 4*a*(
3*a^3 - 4*a*b^2)*((Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a +
 b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c
+ d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Cs
```

```
c[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b
)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (Sqrt[((a + b)*Cot[(c + d*
x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqr
t[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a/
b), ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*
a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d
*x]])) + 2*(3*a^2*b - 4*b^3)*((I*Cos[(c + d*x)/2]*Sqrt[a + b*Cos[c + d*x]]*
EllipticE[I*ArcSinh[Sin[(c + d*x)/2]/Sqrt[Cos[c + d*x]]], (-2*a)/(-a - b)]*
Sec[c + d*x])/(b*Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*Sqrt[((a + b*Cos[c +
 d*x])*Sec[c + d*x])/(a + b)]) + (2*a*((a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)
/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a +
b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[(
(a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[
(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (a*
Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Cs
c[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc
[c + d*x]*EllipticPi[-(a/b), ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x
)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d
*x]]*Sqrt[a + b*Cos[c + d*x]])))/b + (Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x]
)/(b*Sqrt[Cos[c + d*x]]))))/(5*a^4*(-a + b)*(a + b)*d) + (Sqrt[Cos[c + d*x]
]*Sqrt[a + b*Cos[c + d*x]]*((-2*b^5*Sin[c + d*x])/(a^4*(a^2 - b^2)*(a + b*C
os[c + d*x])) + (2*Sec[c + d*x]*(3*a^2*Sin[c + d*x] + 11*b^2*Sin[c + d*x]))
/(5*a^4) - (6*b*Sec[c + d*x]*Tan[c + d*x])/(5*a^3) + (2*Sec[c + d*x]^2*Tan[
c + d*x])/(5*a^2)))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 3371 vs. 2(397) = 794.

Time = 16.78 (sec) , antiderivative size = 3372, normalized size of antiderivative = 7.79

method	result	size
default	Expression too large to display	3372

```
[In] int(1/cos(d*x+c)^(7/2)/(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/5/d*(-a^3*b^2*sin(d*x+c)+a^5*sin(d*x+c)+8*a*b^4*cos(d*x+c)^3*sin(d*x+c)-a
^3*b^2*cos(d*x+c)*sin(d*x+c)+2*a^2*b^3*cos(d*x+c)*sin(d*x+c)+2*a^2*b^3*cos(
d*x+c)^2*sin(d*x+c)-8*a*b^4*cos(d*x+c)^2*sin(d*x+c)-16*b^5*cos(d*x+c)^3*sin
(d*x+c)+4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^
3*cos(d*x+c)^4+16*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2
)*a*b^4*cos(d*x+c)^4-16*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2
))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*a^3*b^2*cos(d*x+c)^3+8*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b
```

))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)*a^2*b^3*cos(d*x+c)^3+32*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a
-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*a*b^4*cos(d*x+c)^3+3*EllipticE(cot(d*x+c)-csc(d*x+c)
,(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)*a^4*b*cos(d*x+c)^2+2*EllipticF(cot(d*x+c)-csc(d
x+c),(-(a-b)/(a+b))^(1/2))((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^4*b*cos(d*x+c)^3+6*EllipticE(cot(d*x+c)-
csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1
/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^4*b*cos(d*x+c)^3+16*EllipticE(cot(d
*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+
b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^3*b^2*cos(d*x+c)^3+16*Ellipti
cE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x
+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b^3*cos(d*x+c)^3-32
*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1
+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^4*cos(d*x+c
)^3-8*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*
b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^3*b^2*co
s(d*x+c)^2+4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(
d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2
*b^3*cos(d*x+c)^2+16*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*
((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(
1/2)*a*b^4*cos(d*x+c)^2+8*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*a^3*b^2*cos(d*x+c)^2-3*a^3*b^2*cos(d*x+c)^3*sin(d*x+c)+8*a^2*b^3*
cos(d*x+c)^3*sin(d*x+c)-2*a^4*b*cos(d*x+c)*sin(d*x+c)-2*a^4*b*cos(d*x+c)^2*
sin(d*x+c)+5*a^3*b^2*cos(d*x+c)^2*sin(d*x+c)+3*a^4*b*cos(d*x+c)^3*sin(d*x+c
)+3*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^5*cos(d*x+
c)^4-16*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^5*cos(
d*x+c)^4-3*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^5*c
os(d*x+c)^4+a^5*cos(d*x+c)*sin(d*x+c)+3*a^5*cos(d*x+c)^2*sin(d*x+c)+3*Ellip
ticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4*b*cos(d*x+c)^4+8*
EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*
x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b^2*cos(d*x+
c)^4+8*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1
+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^3*c
os(d*x+c)^4-16*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a
*b^4*cos(d*x+c)^4+EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2
)*a^4*b*cos(d*x+c)^4-8*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2)

```
)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))
^(1/2)*a^3*b^2*cos(d*x+c)^4+6*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b)
)^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)*a^5*cos(d*x+c)^3-32*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(
a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*b^5*cos(d*x+c)^3-6*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b
)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*a^5*cos(d*x+c)^3+3*EllipticE(cot(d*x+c)-csc(d*x+c),(-(
a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*a^5*cos(d*x+c)^2-16*EllipticE(cot(d*x+c)-csc(d*x+c)
,(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)*b^5*cos(d*x+c)^2-3*EllipticF(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^5*cos(d*x+c)^2+8*EllipticE(cot(d*x+c)-csc(
d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b^3*cos(d*x+c)^2-16*EllipticE(cot(d*x
+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b)
)^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^4*cos(d*x+c)^2+EllipticF(cot(
d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a
+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^4*b*cos(d*x+c)^2)/(1+cos(d*x
+c))/(a+cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(5/2)/(a+b)/(a-b)/a^4
```

Fricas [F]

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx=\int \frac{1}{(b\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(7/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(b^2*cos(d*x + c)^6 +
2*a*b*cos(d*x + c)^5 + a^2*cos(d*x + c)^4), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx=\text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(7/2)/(a+b*cos(d*x+c))**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(7/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^(3/2)*cos(d*x + c)^(7/2)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(7/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^(3/2)*cos(d*x + c)^(7/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{7}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{1}{\cos(c+d\,x)^{7/2}\,(a+b\,\cos(c+d\,x))^{3/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(7/2)*(a + b*cos(c + d*x))^(3/2)),x)
[Out] int(1/(cos(c + d*x)^(7/2)*(a + b*cos(c + d*x))^(3/2)), x)
```

3.638 $\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 497

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{2(3a^2-7b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\middle|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3(a-b)b^2(a+b)^{3/2}d} - \frac{2(3a^2+ab-6b^2)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3(a-b)b^2(a+b)^{3/2}d} - \frac{2\sqrt{a+b}\cot(c+dx)\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{b^3d} - \frac{2a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3b(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} - \frac{2a^2(3a^2-7b^2)\sin(c+dx)}{3b^2(a^2-b^2)^2d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

```
[Out] -2/3*a^2*sin(d*x+c)*cos(d*x+c)^(1/2)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))^(3/2)-2
/3*a^2*(3*a^2-7*b^2)*sin(d*x+c)/b^2/(a^2-b^2)^2/d/cos(d*x+c)^(1/2)/(a+b*cos
(d*x+c))^(1/2)+2/3*(3*a^2-7*b^2)*cot(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2
)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a*(1-sec(d*x+c))/(a+b
))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/(a-b)/b^2/(a+b)^(3/2)/d-2/3*(3*a^2+
a*b-6*b^2)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+
c)^(1/2),((-a-b)/(a-b))^(1/2))*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x
+c))/(a-b))^(1/2)/(a-b)/b^2/(a+b)^(3/2)/d-2*cot(d*x+c)*EllipticPi((a+b*cos(
d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b)/(a-b))^(1/2))*(a
+b)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/b^3
/d
```

Rubi [A] (verified)

Time = 1.22 (sec) , antiderivative size = 497, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used = {2871, 3130, 2888, 3072, 3077, 2895, 3073}

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx =$$
$$-\frac{2(3a^2+ab-6b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{3b^2d(a-b)(a+b)^{3/2}}$$
$$+\frac{2(3a^2-7b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{3b^2d(a-b)(a+b)^{3/2}}$$
$$-\frac{2a^2(3a^2-7b^2)\sin(c+dx)}{3b^2d(a^2-b^2)^2\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}-\frac{2a^2\sin(c+dx)\sqrt{\cos(c+dx)}}{3bd(a^2-b^2)(a+b\cos(c+dx))^{3/2}}$$
$$-\frac{2\sqrt{a+b}\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{b^3d}$$

```
[In] Int[Cos[c + d*x]^(5/2)/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*(3*a^2 - 7*b^2)*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(
Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c +
d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*(a - b)*b^2*(a + b
)^(3/2)*d) - (2*(3*a^2 + a*b - 6*b^2)*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a
+ b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sq
rt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3
*(a - b)*b^2*(a + b)^(3/2)*d) - (2*Sqrt[a + b]*Cot[c + d*x]*EllipticPi[(a +
 b)/b, ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -
((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c
+ d*x]))/(a - b)])/(b^3*d) - (2*a^2*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(3*b*(
a^2 - b^2)*d*(a + b*Cos[c + d*x])^(3/2)) - (2*a^2*(3*a^2 - 7*b^2)*Sin[c + d
*x])/(3*b^2*(a^2 - b^2)^2*d*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
```

```
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3072

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(
x_)]]*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)), x_Symbol] :> Simp[2*(A
*b - a*B)*(Cos[e + f*x]/(f*(a^2 - b^2)*Sqrt[a + b*Sin[e + f*x]]*Sqrt[d*Sin[
e + f*x]])), x] + Dist[d/(a^2 - b^2), Int[(A*b - a*B + (a*A - b*B)*Sin[e +
f*x])/(Sqrt[a + b*Sin[e + f*x]]*(d*Sin[e + f*x])^(3/2)), x], x] /; FreeQ[{a
, b, d, e, f, A, B}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
```

```
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, 
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3130

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_
)])^(3/2)), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[d*Sin[e + f*x]]/Sqrt[a + b*
Sin[e + f*x]], x], x] + Dist[1/b, Int[(A*b + (b*B - a*C)*Sin[e + f*x])/((a
+ b*Sin[e + f*x])^(3/2)*Sqrt[d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, d, e,
 f, A, B, C}, x] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = -\frac{2a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3b\left(a^2-b^2\right)d(a+b\cos(c+dx))^{3/2}} - \frac{2\int \frac{\frac{a^2}{2}-\frac{3}{2}ab\cos(c+dx)-\frac{3}{2}\left(a^2-b^2\right)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx}{3b\left(a^2-b^2\right)}$$

$$= -\frac{2a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3b\left(a^2-b^2\right)d(a+b\cos(c+dx))^{3/2}} + \frac{\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx}{b^2} - \frac{2\int \frac{\frac{a^2b}{2}+\left(-\frac{3ab^2}{2}+\frac{3}{2}a\left(a^2-b^2\right)\right)\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx}{3b^2\left(a^2-b^2\right)}$$

$$= -\frac{2\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+d}{a-b}}}{b^3d} - \frac{2a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3b\left(a^2-b^2\right)d(a+b\cos(c+dx))^{3/2}} - \frac{2a^2(3a^2-7b^2)\sin(c+dx)}{3b^2\left(a^2-b^2\right)^2d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} - \frac{2\int \frac{\frac{a^2b^2}{2}-a\left(-\frac{3ab^2}{2}+\frac{3}{2}a\left(a^2-b^2\right)\right)+\left(\frac{a^3b}{2}-b\left(-\frac{3ab^2}{2}+\frac{3}{2}a\left(a^2-b^2\right)\right)\right)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{3b^2\left(a^2-b^2\right)^2}$$

$$= -\frac{2\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{b^3d}$$
$$-\frac{2a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3b(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}}$$
$$-\frac{2a^2(3a^2-7b^2)\sin(c+dx)}{3b^2(a^2-b^2)^2\,d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$
$$-\frac{(a(3a^2+ab-6b^2))\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{3(a-b)b^2(a+b)^2}$$
$$+\frac{(a^2(3a^2-7b^2))\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{3b^2(a^2-b^2)^2}$$

$$= \frac{2(3a^2-7b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3(a-b)b^2(a+b)^{3/2}d}$$
$$-\frac{2(3a^2+ab-6b^2)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3(a-b)b^2(a+b)^{3/2}d}$$
$$-\frac{2\sqrt{a+b}\cot(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{b^3d}$$
$$-\frac{2a^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3b(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}}-\frac{2a^2(3a^2-7b^2)\sin(c+dx)}{3b^2(a^2-b^2)^2\,d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

Mathematica [C] (warning: unable to verify)

Result contains complex when optimal does not.

Time = 6.37 (sec) , antiderivative size = 1282, normalized size of antiderivative = 2.58

$$\int\frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}dx = \frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\left(\frac{2a^2\sin(c+dx)}{3b(-a^2+b^2)(a+b\cos(c+dx))^2}+\frac{2(3a^3\sin(c+dx)-7ab^2}{3b(-a^2+b^2)^2(a+b\cos}\right.}{d}$$

$$-\frac{4a(a^3-ab^2)\sqrt{\frac{(a+b)\cot^2\left(\frac{1}{2}(c+dx)\right)}{-a+b}}\sqrt{-\frac{(a+b)\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\sqrt{\frac{(a+b\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\sqrt{\frac{(a+b\cos(}{}}\right.\right.}{(a+b)\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

$$-$$

```
[In] Integrate[Cos[c + d*x]^(5/2)/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]*((2*a^2*Sin[c + d*x])/(3*b*(-a
^2 + b^2)*(a + b*Cos[c + d*x])^2) + (2*(3*a^3*Sin[c + d*x] - 7*a*b^2*Sin[c
+ d*x]))/(3*b*(-a^2 + b^2)^2*(a + b*Cos[c + d*x]))))/d - ((-4*a*(a^3 - a*b^
2)*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]
*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*
Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2
)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d
*x]]*Sqrt[a + b*Cos[c + d*x]]) - 4*a*(-(a^2*b) - 3*b^3)*((Sqrt[((a + b)*Cot
[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)
/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*Ellipti
cF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a
)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[
c + d*x]]) - (Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*C
os[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x
)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a/b), ArcSin[Sqrt[((a + b*Cos[c + d*x]
)*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(b*
Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])) + 2*(3*a^3 - 7*a*b^2)*((I*Cos
[(c + d*x)/2]*Sqrt[a + b*Cos[c + d*x]]*EllipticE[I*ArcSinh[Sin[(c + d*x)/2]
/Sqrt[Cos[c + d*x]]], (-2*a)/(-a - b)]*Sec[c + d*x])/(b*Sqrt[Cos[(c + d*x)/
2]^2*Sec[c + d*x]]*Sqrt[((a + b*Cos[c + d*x])*Sec[c + d*x])/(a + b)]) + (2*
a*((a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d
*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/
a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2
]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c
+ d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-
a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*C
os[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a/b), ArcSin[
Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)
]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])))/b +
 (Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(b*Sqrt[Cos[c + d*x]])))/(3*(a - b
)^2*b*(a + b)^2*d)
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 4444 vs. $2(457) = 914$.

Time = 9.72 (sec) , antiderivative size = 4445, normalized size of antiderivative = 8.94

method	result	size
default	Expression too large to display	4445

```
[In] int(cos(d*x+c)^(5/2)/(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1
```

))^(5/2)*(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^3*((csc(d*x+c)^2*a*(1-cos(d*x+c)
)^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))
^(1/2)*(-3*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+
c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*E
llipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^5*(1-cos(d*x+c))^2-3
*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-
cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(c
ot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^4*(1-cos(d*x+c))^2-6*(-csc(d
x+c)^2(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x
+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c)
,-1,(-(a-b)/(a+b))^(1/2))*a^4*b+12*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)
*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+
b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a^3*b^2
+12*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c)
)^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)
-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a^2*b^3-6*(-csc(d*x+c)^2*(1-cos(d*x+c)
)^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c)
)^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1
/2))*a*b^4-2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-c
os(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(co
t(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b-(-csc(d*x+c)^2*(1-cos(d*x+c
))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c
))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2)
)*a^3*b^2+7*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-co
s(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^3+9*(-csc(d*x+c)^2*(1-cos(d*
x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*
x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*a*b^4+6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-c
os(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(co
t(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b-4*(-csc(d*x+c)^2*(1-cos(d*x
+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x
+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/
2))*a^3*b^2-14*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1
-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(
cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^3-7*(-csc(d*x+c)^2*(1-cos
(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos
(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*a*b^4+3*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc
(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1
/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^5*(1-cos(d*x+c)
)^2+6*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*
a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*Ellipt
icPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a^4*b*(1-cos(d*x+c))^2+
12*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(

1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticP
i(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a^3*b^2*(1-cos(d*x+c))^2-1
2*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1
-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi
(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a^2*b^3*(1-cos(d*x+c))^2-6*
csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-c
os(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(c
ot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a*b^4*(1-cos(d*x+c))^2-2*csc(
d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d
*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*
x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b*(1-cos(d*x+c))^2+3*csc(d*x+c)^2
*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2
-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc
(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b^2*(1-cos(d*x+c))^2+5*csc(d*x+c)^2*(-csc
(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d
*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c
),(-(a-b)/(a+b))^(1/2))*a^2*b^3*(1-cos(d*x+c))^2-2*a^4*b*(csc(d*x+c)-cot(d*
x+c))+10*a^3*b^2*(csc(d*x+c)-cot(d*x+c))+2*a^2*b^3*(csc(d*x+c)-cot(d*x+c))-
7*a*b^4*(csc(d*x+c)-cot(d*x+c))+3*csc(d*x+c)^5*a^5*(1-cos(d*x+c))^5-3*a^5*(
csc(d*x+c)-cot(d*x+c))-6*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1
/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/
(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a^5*
(1-cos(d*x+c))^2+6*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((
csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))
^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*b^5*(1-cos
(d*x+c))^2+14*csc(d*x+c)^3*a*b^4*(1-cos(d*x+c))^3+3*(-csc(d*x+c)^2*(1-cos(d
x+c))^2+1)^(1/2)((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d
*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(
1/2))*b^5+3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-co
s(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^5-6*(-csc(d*x+c)^2*(1-cos(d*x+c)
)^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c)
)^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1
/2))*a^5-6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos
(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot
(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*b^5-6*csc(d*x+c)^5*a^4*b*(1-cos
(d*x+c))^5-4*csc(d*x+c)^5*a^3*b^2*(1-cos(d*x+c))^5+14*csc(d*x+c)^5*a^2*b^3*
(1-cos(d*x+c))^5-7*csc(d*x+c)^5*a*b^4*(1-cos(d*x+c))^5+8*csc(d*x+c)^3*a^4*b
*(1-cos(d*x+c))^3-6*csc(d*x+c)^3*a^3*b^2*(1-cos(d*x+c))^3-10*csc(d*x+c)^2*(
-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-c
sc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d
*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b^2*(1-cos(d*x+c))^2+7*csc(d*x+c)^2*(-csc(d
x+c)^2(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x
+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),
(-(a-b)/(a+b))^(1/2))*a*b^4*(1-cos(d*x+c))^2-16*csc(d*x+c)^3*a^2*b^3*(1-cos

```
(d*x+c))^3)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)^3/(csc(d*x+c)^2*a*(1-cos(d*x+
c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)^2/(a-b)^2/(a+b)^2/b^2
```

Fricas [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx=\int \frac{\cos{(dx+c)}^{\frac{5}{2}}}{(b\cos{(dx+c)}+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(5/2)/(b^3*cos(d*x + c)^3 +
3*a*b^2*cos(d*x + c)^2 + 3*a^2*b*cos(d*x + c) + a^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx=\text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)/(a+b*cos(d*x+c))**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx=\int \frac{\cos{(dx+c)}^{\frac{5}{2}}}{(b\cos{(dx+c)}+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(5/2)/(b*cos(d*x + c) + a)^(5/2), x)
```

Giac [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx=\int \frac{\cos{(dx+c)}^{\frac{5}{2}}}{(b\cos{(dx+c)}+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(5/2)/(b*cos(d*x + c) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)^{5/2}}{\left(a+b\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int(cos(c + d*x)^(5/2)/(a + b*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)^(5/2)/(a + b*cos(c + d*x))^(5/2), x)
```

3.639 $\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 342

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{8b\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a(a-b)(a+b)^{3/2}d} + \frac{2(a-3b)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a(a-b)(a+b)^{3/2}d} + \frac{2a\sqrt{\cos(c+dx)}\sin(c+dx)}{3(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} - \frac{8ab\sin(c+dx)}{3(a^2-b^2)^2d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

```
[Out] 2/3*a*sin(d*x+c)*cos(d*x+c)^(1/2)/(a^2-b^2)/d/(a+b*cos(d*x+c))^(3/2)-8/3*a*
b*sin(d*x+c)/(a^2-b^2)^2/d/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(1/2)+8/3*b*co
t(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a
-b)/(a-b))^(1/2))*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(
1/2)/a/(a-b)/(a+b)^(3/2)/d+2/3*(a-3*b)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c)
)^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a*(1-sec(d*x+c)
)/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/(a-b)/(a+b)^(3/2)/d
```

Rubi [A] (verified)

Time = 0.69 (sec) , antiderivative size = 342, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used

$= \{2878, 3072, 3077, 2895, 3073\}$

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = -\frac{8ab\sin(c+dx)}{3d\,(a^2-b^2)^2\,\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{2a\sin(c+dx)\sqrt{\cos(c+dx)}}{3d\,(a^2-b^2)\,(a+b\cos(c+dx))^{3/2}}$$
$$+\frac{2(a-3b)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{3ad(a-b)(a+b)^{3/2}}$$
$$+\frac{8b\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{3ad(a-b)(a+b)^{3/2}}$$

```
[In] Int[Cos[c + d*x]^(3/2)/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (8*b*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sq
rt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)
]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a*(a - b)*(a + b)^(3/2)*d) + (2*
(a - 3*b)*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a +
b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a
 + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a*(a - b)*(a + b)^(3/2)*d)
+ (2*a*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(3*(a^2 - b^2)*d*(a + b*Cos[c + d*x
])^(3/2)) - (8*a*b*Sin[c + d*x])/(3*(a^2 - b^2)^2*d*Sqrt[Cos[c + d*x]]*Sqrt
[a + b*Cos[c + d*x]])
```

Rule 2878

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*(a + b*Si
n[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n - 1)/(f*(m + 1)*(a^2 - b^2))),
 x] + Dist[1/((m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d
*Sin[e + f*x])^(n - 2)*Simp[c*(a*c - b*d)*(m + 1) + d*(b*c - a*d)*(n - 1) +
 (d*(a*c - b*d)*(m + 1) - c*(b*c - a*d)*(m + 2))*Sin[e + f*x] - d*(b*c - a*
d)*(m + n + 1)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &
& NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1]
 && LtQ[1, n, 2] && IntegersQ[2*m, 2*n]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3072

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(
x_)]]*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)), x_Symbol] :> Simp[2*(A
*b - a*B)*(Cos[e + f*x]/(f*(a^2 - b^2)*Sqrt[a + b*Sin[e + f*x]]*Sqrt[d*Sin[
e + f*x]])), x] + Dist[d/(a^2 - b^2), Int[(A*b - a*B + (a*A - b*B)*Sin[e +
f*x])/(Sqrt[a + b*Sin[e + f*x]]*(d*Sin[e + f*x])^(3/2)), x], x] /; FreeQ[{a
, b, d, e, f, A, B}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{2a\sqrt{\cos(c+dx)}\sin(c+dx)}{3(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} - \frac{2\int \frac{-\frac{a}{2}+\frac{3}{2}b\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx}{3(a^2-b^2)} \\
&= \frac{2a\sqrt{\cos(c+dx)}\sin(c+dx)}{3(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} \\
&\quad - \frac{8ab\sin(c+dx)}{3(a^2-b^2)^2 d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} - \frac{2\int \frac{-2ab+\left(-\frac{a^2}{2}-\frac{3b^2}{2}\right)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{3(a^2-b^2)^2} \\
&= \frac{2a\sqrt{\cos(c+dx)}\sin(c+dx)}{3(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} - \frac{8ab\sin(c+dx)}{3(a^2-b^2)^2 d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} \\
&\quad + \frac{(a-3b)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{3(a-b)(a+b)^2} + \frac{(4ab)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{3(a^2-b^2)^2}
\end{aligned}$$

$$= \frac{8b\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a(a-b)(a+b)^{3/2}d}$$
$$+ \frac{2(a-3b)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a(a-b)(a+b)^{3/2}d}$$
$$+ \frac{2a\sqrt{\cos(c+dx)}\sin(c+dx)}{3(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} - \frac{8ab\sin(c+dx)}{3(a^2-b^2)^2d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 4.27 (sec) , antiderivative size = 277, normalized size of antiderivative = 0.81

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{2\left(\sqrt{\cos(c+dx)}(a^3+3ab^2+4b^3\cos(c+dx))\sin(c+dx) - \sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)}\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*(Sqrt[Cos[c + d*x]]*(a^3 + 3*a*b^2 + 4*b^3*Cos[c + d*x])*Sin[c + d*x] -
Sqrt[Cos[(c + d*x)/2]^2]*(a + b*Cos[c + d*x])*(4*b*(a + b)*EllipticE[ArcSin
[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[((a + b*Cos[c + d*x])*Sec[(c + d
*x)/2]^2)/(a + b)] - (a^2 + 4*a*b + 3*b^2)*EllipticF[ArcSin[Tan[(c + d*x)/2
]], (-a + b)/(a + b)]*Sqrt[((a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2)/(a + b
)] + 4*b*(a + b*Cos[c + d*x])*Sqrt[Cos[c + d*x]*Sec[(c + d*x)/2]^2]*Tan[(c
+ d*x)/2])))/(3*(a^2 - b^2)^2*d*(a + b*Cos[c + d*x])^(3/2))
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 2128 vs. 2(310) = 620.

Time = 9.31 (sec) , antiderivative size = 2129, normalized size of antiderivative = 6.23

method	result	size
default	Expression too large to display	2129

```
[In] int(cos(d*x+c)^(3/2)/(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)
)^(3/2)*(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^2*((csc(d*x+c)^2*a*(1-cos(d*x+c))
^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^
(1/2)*(-csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*
a^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c)
)^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-3*cs
c(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b*(-cs
```

c(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(
d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+csc(d*x+c)^2
*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2*(-csc(d*x+c)^2
*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b
*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+3*csc(d*x+c)^2*(-csc(d
x+c)^2(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x
+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),
(-(a-b)/(a+b))^(1/2))*b^3*(1-cos(d*x+c))^2+4*csc(d*x+c)^2*EllipticE(cot(d*x
+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+
1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+
a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-4*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(
d*x+c),(-(a-b)/(a+b))^(1/2))*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(
(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b)
)^(1/2)*(1-cos(d*x+c))^2+4*csc(d*x+c)^5*a^2*b*(1-cos(d*x+c))^5-8*csc(d*x+c)
^5*a*b^2*(1-cos(d*x+c))^5+4*csc(d*x+c)^5*b^3*(1-cos(d*x+c))^5-(-csc(d*x+c)^
2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*
b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b
)/(a+b))^(1/2))*a^3-5*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)
^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*Ell
ipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b-7*(-csc(d*x+c)^2*(
1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(
1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(
a+b))^(1/2))*a*b^2-3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^
2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*Elli
pticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^3+4*(-csc(d*x+c)^2*(1-c
os(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-c
os(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b
))^(1/2))*a^2*b+8*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a
*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*Ellipti
cE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2+4*(-csc(d*x+c)^2*(1-co
s(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-co
s(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b)
)^(1/2))*b^3-2*csc(d*x+c)^3*a^3*(1-cos(d*x+c))^3+10*csc(d*x+c)^3*a*b^2*(1-c
os(d*x+c))^3-8*csc(d*x+c)^3*b^3*(1-cos(d*x+c))^3+2*a^3*(csc(d*x+c)-cot(d*x+
c))-4*a^2*b*(csc(d*x+c)-cot(d*x+c))-2*a*b^2*(csc(d*x+c)-cot(d*x+c))+4*b^3*(
csc(d*x+c)-cot(d*x+c)))/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)^2/(csc(d*x+c)^2*a
*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)^2/(a-b)^2/(a+b)^2

Fricas [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(dx+c)^{\frac{3}{2}}}{(b\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

[In] integrate(cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")

[Out] integral(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(3/2)/(b^3*cos(d*x + c)^3 + 3*a*b^2*cos(d*x + c)^2 + 3*a^2*b*cos(d*x + c) + a^3), x)

Sympy [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{\frac{5}{2}}}\,dx$$

[In] integrate(cos(d*x+c)**(3/2)/(a+b*cos(d*x+c))**(5/2),x)

[Out] Integral(cos(c + d*x)**(3/2)/(a + b*cos(c + d*x))**(5/2), x)

Maxima [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(dx+c)^{\frac{3}{2}}}{(b\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

[In] integrate(cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")

[Out] integrate(cos(d*x + c)^(3/2)/(b*cos(d*x + c) + a)^(5/2), x)

Giac [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(dx+c)^{\frac{3}{2}}}{(b\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

[In] integrate(cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")

[Out] integrate(cos(d*x + c)^(3/2)/(b*cos(d*x + c) + a)^(5/2), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)^{3/2}}{\left(a+b\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int(cos(c + d*x)^(3/2)/(a + b*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)^(3/2)/(a + b*cos(c + d*x))^(5/2), x)
```

3.640 $\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 359

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{5/2}}\,dx = -\frac{2(3a^2+b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^2(a-b)(a+b)^{3/2}d}$$
$$+\frac{2(3a-b)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a(a-b)(a+b)^{3/2}d}$$
$$-\frac{2b\sqrt{\cos(c+dx)}\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}}+\frac{2(3a^2+b^2)\sin(c+dx)}{3(a^2-b^2)^2\,d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

```
[Out] -2/3*b*sin(d*x+c)*cos(d*x+c)^(1/2)/(a^2-b^2)/d/(a+b*cos(d*x+c))^(3/2)+2/3*(
3*a^2+b^2)*sin(d*x+c)/(a^2-b^2)^2/d/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(1/2)
-2/3*(3*a^2+b^2)*cot(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/co
s(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+s
ec(d*x+c))/(a-b))^(1/2)/a^2/(a-b)/(a+b)^(3/2)/d+2/3*(3*a-b)*cot(d*x+c)*Elli
pticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1
/2))*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/(a-b)/
(a+b)^(3/2)/d
```

Rubi [A] (verified)

Time = 0.76 (sec) , antiderivative size = 359, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2875, 3072, 3077, 2895, 3073}

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{5/2}}\,dx = -\frac{2(3a^2+b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{3a^2d(a-b)(a+b)^{3/2}} + \frac{2(3a^2+b^2)\sin(c+dx)}{3d\,(a^2-b^2)^2\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} - \frac{2b\sin(c+dx)\sqrt{\cos(c+dx)}}{3d\,(a^2-b^2)\,(a+b\cos(c+dx))^{3/2}} + \frac{2(3a-b)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{3ad(a-b)(a+b)^{3/2}}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (-2*(3*a^2 + b^2)*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(S
qrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d
*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a^2*(a - b)*(a + b)
^(3/2)*d) + (2*(3*a - b)*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d
*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Se
c[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a*(a - b)*(a
 + b)^(3/2)*d) - (2*b*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(3*(a^2 - b^2)*d*(a
+ b*Cos[c + d*x])^(3/2)) + (2*(3*a^2 + b^2)*Sin[c + d*x])/(3*(a^2 - b^2)^2*
d*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2875

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m + 1)*((c + d*Sin[e + f*x])^n/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m
 + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(
n - 1)*Simp[a*c*(m + 1) + b*d*n + (a*d*(m + 1) - b*c*(m + 2))*Sin[e + f*x]
- b*d*(m + n + 2)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x
] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m,
-1] && LtQ[0, n, 1] && IntegersQ[2*m, 2*n]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
```

```
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3072

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(
x_)]]*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)), x_Symbol] :> Simp[2*(A
*b - a*B)*(Cos[e + f*x]/(f*(a^2 - b^2)*Sqrt[a + b*Sin[e + f*x]]*Sqrt[d*Sin[
e + f*x]])), x] + Dist[d/(a^2 - b^2), Int[(A*b - a*B + (a*A - b*B)*Sin[e +
f*x])/(Sqrt[a + b*Sin[e + f*x]]*(d*Sin[e + f*x])^(3/2)), x], x] /; FreeQ[{a
, b, d, e, f, A, B}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{2b\sqrt{\cos(c+dx)}\sin(c+dx)}{3(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} - \frac{2\int \frac{\frac{b}{2}-\frac{3}{2}a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx}{3(a^2-b^2)} \\
&= -\frac{2b\sqrt{\cos(c+dx)}\sin(c+dx)}{3(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} \\
&\quad + \frac{2(3a^2+b^2)\sin(c+dx)}{3(a^2-b^2)^2d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} - \frac{2\int \frac{\frac{3a^2}{2}+\frac{b^2}{2}+2ab\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{3(a^2-b^2)^2}
\end{aligned}$$

$$= -\frac{2b\sqrt{\cos(c+dx)}\sin(c+dx)}{3(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} + \frac{2(3a^2+b^2)\sin(c+dx)}{3(a^2-b^2)^2 d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

$$+ \frac{(3a-b)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{3(a-b)(a+b)^2} - \frac{(3a^2+b^2)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{3(a^2-b^2)^2}$$

$$= -\frac{2(3a^2+b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^2(a-b)(a+b)^{3/2}d}$$

$$+ \frac{2(3a-b)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right), -\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a(a-b)(a+b)^{3/2}d}$$

$$- \frac{2b\sqrt{\cos(c+dx)}\sin(c+dx)}{3(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} + \frac{2(3a^2+b^2)\sin(c+dx)}{3(a^2-b^2)^2 d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.33 (sec) , antiderivative size = 1273, normalized size of antiderivative = 3.55

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{5/2}}dx = \frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\left(-\frac{2b\sin(c+dx)}{3(a^2-b^2)(a+b\cos(c+dx))^2} - \frac{2(3a^2b\sin(c+dx)+b^3 \sin}{3a(a^2-b^2)^2(a+b\cos(}\right.}{d}$$

$$-\frac{4a(-a^2b+b^3)\sqrt{\frac{(a+b)\cot^2\left(\frac{1}{2}(c+dx)\right)}{-a+b}}\sqrt{-\frac{(a+b)\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\sqrt{\frac{(a+b\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\sqrt{\frac{(a+b\cos}{}}\right.\right.}{(a+b)\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

$$+$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]*((-2*b*Sin[c + d*x])/(3*(a^2 -
 b^2)*(a + b*Cos[c + d*x])^2) - (2*(3*a^2*b*Sin[c + d*x] + b^3*Sin[c + d*x]
))/(3*a*(a^2 - b^2)^2*(a + b*Cos[c + d*x]))))/d + ((-4*a*(-(a^2*b) + b^3)*S
qrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc
[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[
c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]
/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]
*Sqrt[a + b*Cos[c + d*x]]) - 4*a*(3*a^3 + a*b^2)*((Sqrt[((a + b)*Cot[(c + d
```

```
*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sq
rt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcS
in[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a +
 b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x
]]) - (Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c +
d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)
/a]*Csc[c + d*x]*EllipticPi[-(a/b), ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(
c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Co
s[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])) + 2*(3*a^2*b + b^3)*((I*Cos[(c + d*x
)/2]*Sqrt[a + b*Cos[c + d*x]]*EllipticE[I*ArcSinh[Sin[(c + d*x)/2]/Sqrt[Cos
[c + d*x]]], (-2*a)/(-a - b)]*Sec[c + d*x])/(b*Sqrt[Cos[(c + d*x)/2]^2*Sec[
c + d*x]]*Sqrt[((a + b*Cos[c + d*x])*Sec[c + d*x])/(a + b)]) + (2*a*((a*Sqr
t[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(
c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c
+ d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/S
qrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*S
qrt[a + b*Cos[c + d*x]]) - (a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*S
qrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*
x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a/b), ArcSin[Sqrt[((a
+ b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c
+ d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])))/b + (Sqrt[a
+ b*Cos[c + d*x]]*Sin[c + d*x])/(b*Sqrt[Cos[c + d*x]])))/(3*a*(a - b)^2*(a
+ b)^2*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2613 vs. $2(327) = 654$.

Time = 8.03 (sec) , antiderivative size = 2614, normalized size of antiderivative = 7.28

method	result	size
default	Expression too large to display	2614

```
[In] int(cos(d*x+c)^(1/2)/(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)
)^(1/2)*(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2
-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1
/2)*(-csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^
3*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c)
)^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-7*El
lipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b*(-csc(d*x+c)^2*(1
-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1
-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-5*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/
(a+b))^(1/2))*a^2*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)
^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-Ell
```

ipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+6*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+4*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-3*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+3*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*(1-cos(d*x+c))^2+csc(d*x+c)^5*b^4*(1-cos(d*x+c))^5-2*csc(d*x+c)^3*b^4*(1-cos(d*x+c))^3+2*a^3*b*(csc(d*x+c)-cot(d*x+c))+2*a^2*b^2*(csc(d*x+c)-cot(d*x+c))+3*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-2*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-2*a*b^3*(csc(d*x+c)-cot(d*x+c))+3*csc(d*x+c)^5*a^4*(1-cos(d*x+c))^5-6*csc(d*x+c)^5*a^3*b*(1-cos(d*x+c))^5+4*csc(d*x+c)^3*a*b^3*(1-cos(d*x+c))^3+4*csc(d*x+c)^5*a^2*b^2*(1-cos(d*x+c))^5-2*csc(d*x+c)^5*a*b^3*(1-cos(d*x+c))^5+4*csc(d*x+c)^3*a^3*b*(1-cos(d*x+c))^3-6*csc(d*x+c)^3*a^2*b^2*(1-cos(d*x+c))^3-3*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4-3*a^4*(csc(d*x+c)-cot(d*x+c))+b^4*(csc(d*x+c)-cot(d*x+c)))/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)^2/(a-b)^2/(a+b)^2/a

Fricas [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{5/2}}\,dx=\int \frac{\sqrt{\cos(dx+c)}}{(b\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(b^3*cos(d*x + c)^3 +
3*a*b^2*cos(d*x + c)^2 + 3*a^2*b*cos(d*x + c) + a^3), x)
```

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{5/2}}\,dx=\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)**(1/2)/(a+b*cos(d*x+c))**(5/2),x)
[Out] Integral(sqrt(cos(c + d*x))/(a + b*cos(c + d*x))**(5/2), x)
```

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{5/2}}\,dx=\int \frac{\sqrt{\cos(dx+c)}}{(b\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(sqrt(cos(d*x + c))/(b*cos(d*x + c) + a)^(5/2), x)
```

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{5/2}}\,dx=\int \frac{\sqrt{\cos(dx+c)}}{(b\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(sqrt(cos(d*x + c))/(b*cos(d*x + c) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\sqrt{\cos\left(c+d\,x\right)}}{\left(a+b\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(a + b*cos(c + d*x))^(5/2),x)
[Out] int(cos(c + d*x)^(1/2)/(a + b*cos(c + d*x))^(5/2), x)
```

3.641 $\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 381

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{5/2}}\,dx = \frac{4b(3a^2-b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1}{}}}{3a^3(a-b)(a+b)^{3/2}d}$$

$$+\frac{2(3a^2-3ab-2b^2)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^2(a-b)(a+b)^{3/2}d}$$

$$+\frac{2b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3a(a^2-b^2)d(a+b\cos(c+dx))^{3/2}}-\frac{4b(3a^2-b^2)\sin(c+dx)}{3a(a^2-b^2)^2d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

```
[Out] 2/3*b^2*sin(d*x+c)*cos(d*x+c)^(1/2)/a/(a^2-b^2)/d/(a+b*cos(d*x+c))^(3/2)-4/
3*b*(3*a^2-b^2)*sin(d*x+c)/a/(a^2-b^2)^2/d/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c)
)^(1/2)+4/3*b*(3*a^2-b^2)*cot(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)
^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a*(1-sec(d*x+c))/(a+b))^(1/2
)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^3/(a-b)/(a+b)^(3/2)/d+2/3*(3*a^2-3*a*b-2
*b^2)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1
/2),((-a-b)/(a-b))^(1/2))*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/
(a-b))^(1/2)/a^2/(a-b)/(a+b)^(3/2)/d
```

Rubi [A] (verified)

Time = 0.83 (sec) , antiderivative size = 381, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2881, 3072, 3077, 2895, 3073}

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{5/2}}\,dx = \frac{2(3a^2-3ab-2b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{El}}{3a^2d(a-b)(a+b)^{3/2}}$$
$$+\frac{2b^2\sin(c+dx)\sqrt{\cos(c+dx)}}{3ad\,(a^2-b^2)\,(a+b\cos(c+dx))^{3/2}}-\frac{4b(3a^2-b^2)\sin(c+dx)}{3ad\,(a^2-b^2)^2\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{4b(3a^2-b^2)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{3a^3d(a-b)(a+b)^{3/2}}$$

```
[In] Int[1/(Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])^(5/2)),x]
```

```
[Out] (4*b*(3*a^2 - b^2)*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(
Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c +
d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a^3*(a - b)*(a + b
)^(3/2)*d) + (2*(3*a^2 - 3*a*b - 2*b^2)*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[
a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*
Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/
(3*a^2*(a - b)*(a + b)^(3/2)*d) + (2*b^2*Sqrt[Cos[c + d*x]]*Sin[c + d*x])/(
3*a*(a^2 - b^2)*d*(a + b*Cos[c + d*x])^(3/2)) - (4*b*(3*a^2 - b^2)*Sin[c +
d*x])/(3*a*(a^2 - b^2)^2*d*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
```

```
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3072

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(
x_)]]*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)), x_Symbol] :> Simp[2*(A
*b - a*B)*(Cos[e + f*x]/(f*(a^2 - b^2)*Sqrt[a + b*Sin[e + f*x]]*Sqrt[d*Sin[
e + f*x]])), x] + Dist[d/(a^2 - b^2), Int[(A*b - a*B + (a*A - b*B)*Sin[e +
f*x])/(Sqrt[a + b*Sin[e + f*x]]*(d*Sin[e + f*x])^(3/2)), x], x] /; FreeQ[{a
, b, d, e, f, A, B}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rubi steps

$$\text{integral} = \frac{2b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3a\,(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{2\int \frac{\frac{1}{2}(3a^2-2b^2)-\frac{3}{2}ab\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx}{3a\,(a^2-b^2)}$$

$$= \frac{2b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3a\,(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} - \frac{4b(3a^2-b^2)\sin(c+dx)}{3a\,(a^2-b^2)^2\,d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} + \frac{2\int \frac{\frac{3a^2b}{2}+\frac{1}{2}b(3a^2-2b^2)+\left(\frac{3ab^2}{2}+\frac{1}{2}a(3a^2-2b^2)\right)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{3a\,(a^2-b^2)^2}$$

$$= \frac{2b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3a(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} - \frac{4b(3a^2-b^2)\sin(c+dx)}{3a(a^2-b^2)^2 d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} + \frac{(3a^2-3ab-2b^2)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{3a(a-b)(a+b)^2} + \frac{(2b(3a^2-b^2))\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{3a(a^2-b^2)^2}$$

$$= \frac{4b(3a^2-b^2)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^3(a-b)(a+b)^{3/2}d} + \frac{2(3a^2-3ab-2b^2)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+}{}}}{3a^2(a-b)(a+b)^{3/2}d} + \frac{2b^2\sqrt{\cos(c+dx)}\sin(c+dx)}{3a(a^2-b^2)d(a+b\cos(c+dx))^{3/2}} - \frac{4b(3a^2-b^2)\sin(c+dx)}{3a(a^2-b^2)^2 d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.29 (sec) , antiderivative size = 1296, normalized size of antiderivative = 3.40

$$\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{5/2}}dx = \frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\left(\frac{2b^2\sin(c+dx)}{3a(a^2-b^2)(a+b\cos(c+dx))^2}+\frac{4(3a^2}{3a^2}\right.}{d}$$

$$-\frac{4a(3a^4-5a^2b^2+2b^4)\sqrt{\frac{(a+b)\cot^2\left(\frac{1}{2}(c+dx)\right)}{-a+b}}\sqrt{-\frac{(a+b)\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\sqrt{\frac{(a+b\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{(}}{}\right.\right.}{(a+b)\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

$$+ \frac{}{}$$

```
[In] Integrate[1/(Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])^(5/2)),x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]*((2*b^2*Sin[c + d*x])/(3*a*(a^
2 - b^2)*(a + b*Cos[c + d*x])^2) + (4*(3*a^2*b^2*Sin[c + d*x] - b^4*Sin[c +
 d*x]))/(3*a^2*(a^2 - b^2)^2*(a + b*Cos[c + d*x]))))/d + ((-4*a*(3*a^4 - 5*
```

```
a^2*b^2 + 2*b^4)*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b
)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c +
d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[
(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)*
Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - 4*a*(-6*a^3*b + 2*a*b^3)*((S
qrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc
[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[
c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]
/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]
*Sqrt[a + b*Cos[c + d*x]]) - (Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*S
qrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*
x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a/b), ArcSin[Sqrt[((a
+ b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c
+ d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])) + 2*(-6*a^2*b
^2 + 2*b^4)*((I*Cos[(c + d*x)/2]*Sqrt[a + b*Cos[c + d*x]]*EllipticE[I*ArcSi
nh[Sin[(c + d*x)/2]/Sqrt[Cos[c + d*x]]], (-2*a)/(-a - b)]*Sec[c + d*x])/(b*
Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*Sqrt[((a + b*Cos[c + d*x])*Sec[c + d*
x])/(a + b)]) + (2*a*((a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-
(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*C
sc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*
x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(
(a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (a*Sqrt[((a + b)*Cot
[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)
/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*Ellipti
cPi[-(a/b), ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2
]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*C
os[c + d*x]])))/b + (Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(b*Sqrt[Cos[c +
 d*x]])))/(3*a^2*(a - b)^2*(a + b)^2*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2840 vs. $2(349) = 698$.

Time = 11.18 (sec) , antiderivative size = 2841, normalized size of antiderivative = 7.46

method	result	size
default	Expression too large to display	2841

```
[In] int(1/cos(d*x+c)^(1/2)/(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3/d*(-3*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c
)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*El
lipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^5*(1-cos(d*x+c))^2+6*
csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-c
os(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(co
t(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b*(1-cos(d*x+c))^2-2*csc(d*x+
```

c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c
))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)
-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^4*(1-cos(d*x+c))^2+2*csc(d*x+c)^2*(-c
sc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc
(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*b^5*(1-cos(d*x+c))^2-9*(-csc(d*x+c)^2*(1-cos(d*x+
c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+
c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2
))*a^4*b-7*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos
(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(
d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b^2+(-csc(d*x+c)^2*(1-cos(d*x+c
))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c
))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2)
)*a^2*b^3+2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-co
s(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^4+6*(-csc(d*x+c)^2*(1-cos(d*x+
c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+
c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2
))*a^4*b+12*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-co
s(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b^2+4*(-csc(d*x+c)^2*(1-cos(d*
x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*
x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*a^2*b^3-4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1
-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(
cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^4-2*csc(d*x+c)^5*b^5*(1-cos
(d*x+c))^5+4*csc(d*x+c)^3*b^5*(1-cos(d*x+c))^3-3*csc(d*x+c)^2*(-csc(d*x+c)^
2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*
b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b
)/(a+b))^(1/2))*a^4*b*(1-cos(d*x+c))^2+5*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos
(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos
(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*a^3*b^2*(1-cos(d*x+c))^2+3*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c
))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c
))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2)
)*a^2*b^3*(1-cos(d*x+c))^2-6*a^4*b*(csc(d*x+c)-cot(d*x+c))+2*a^3*b^2*(csc(d
*x+c)-cot(d*x+c))+8*a^2*b^3*(csc(d*x+c)-cot(d*x+c))-2*a*b^4*(csc(d*x+c)-cot
(d*x+c))-8*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+
c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*E
llipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^3*(1-cos(d*x+c))
^2-2*csc(d*x+c)^3*a*b^4*(1-cos(d*x+c))^3+6*csc(d*x+c)^5*a^4*b*(1-cos(d*x+c)
)^5-12*csc(d*x+c)^5*a^3*b^2*(1-cos(d*x+c))^5+4*csc(d*x+c)^5*a^2*b^3*(1-cos(
d*x+c))^5+4*csc(d*x+c)^5*a*b^4*(1-cos(d*x+c))^5+10*csc(d*x+c)^3*a^3*b^2*(1-
cos(d*x+c))^3-2*b^5*(csc(d*x+c)-cot(d*x+c))-12*csc(d*x+c)^3*a^2*b^3*(1-cos(
d*x+c))^3-3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-co

```
s(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^5-2*(-csc(d*x+c)^2*(1-cos(d*x+c)
)^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c)
)^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*b^5)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b
)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2)/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2
-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)^2/(-(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)
/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2)/a^2/(a+b)^2/(a-b)^2
```

Fricas [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{5}{2}}\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(b^3*cos(d*x + c)^4 +
3*a*b^2*cos(d*x + c)^3 + 3*a^2*b*cos(d*x + c)^2 + a^3*cos(d*x + c)), x)
```

Sympy [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{(a+b\cos(c+dx))^{\frac{5}{2}}\sqrt{\cos(c+dx)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(1/2)/(a+b*cos(d*x+c))**(5/2),x)
[Out] Integral(1/((a + b*cos(c + d*x))**(5/2)*sqrt(cos(c + d*x))), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{5}{2}}\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^(5/2)*sqrt(cos(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{5}{2}}\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^(5/2)*sqrt(cos(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{\sqrt{\cos(c+d\,x)}\,(a+b\,\cos(c+d\,x))^{5/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))^(5/2)),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(a + b*cos(c + d*x))^(5/2)), x)
```

3.642 $\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 398

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx = \frac{2(3a^4-15a^2b^2+8b^4)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+}{a-}\right.}{3a^4(a-b)(a+b)^{3/2}d}$$
$$-\frac{2(3a^3+9a^2b-6ab^2-8b^3)\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(}{a-}}}{3a^3(a-b)(a+b)^{3/2}d}$$
$$+\frac{2b^2\sin(c+dx)}{3a\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}$$
$$+\frac{8b^2(2a^2-b^2)\sin(c+dx)}{3a^2\left(a^2-b^2\right)^2d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

```
[Out] 2/3*b^2*sin(d*x+c)/a/(a^2-b^2)/d/(a+b*cos(d*x+c))^(3/2)/cos(d*x+c)^(1/2)+8/
3*b^2*(2*a^2-b^2)*sin(d*x+c)/a^2/(a^2-b^2)^2/d/cos(d*x+c)^(1/2)/(a+b*cos(d*
x+c))^(1/2)+2/3*(3*a^4-15*a^2*b^2+8*b^4)*cot(d*x+c)*EllipticE((a+b*cos(d*x+
c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a*(1-sec(d*x+
c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^4/(a-b)/(a+b)^(3/2)/d-2/3
*(3*a^3+9*a^2*b-6*a*b^2-8*b^3)*cot(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/
(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a*(1-sec(d*x+c))/(a+b))
^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^3/(a-b)/(a+b)^(3/2)/d
```

Rubi [A] (verified)

Time = 0.91 (sec) , antiderivative size = 398, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2881, 3134, 3077, 2895, 3073}

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx = \frac{8b^2(2a^2-b^2)\sin(c+dx)}{3a^2d\,(a^2-b^2)^2\,\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{2b^2\sin(c+dx)}{3ad\,(a^2-b^2)\,\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}$$
$$+\frac{2(3a^4-15a^2b^2+8b^4)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{3a^4d(a-b)(a+b)^{3/2}}$$
$$-\frac{2(3a^3+9a^2b-6ab^2-8b^3)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\right.}{3a^3d(a-b)(a+b)^{3/2}}$$

```
[In] Int[1/(Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*x])^(5/2)),x]
```

```
[Out] (2*(3*a^4 - 15*a^2*b^2 + 8*b^4)*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Co
s[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*
(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a^4*(
a - b)*(a + b)^(3/2)*d) - (2*(3*a^3 + 9*a^2*b - 6*a*b^2 - 8*b^3)*Cot[c + d*
x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]
])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 +
Sec[c + d*x]))/(a - b)])/(3*a^3*(a - b)*(a + b)^(3/2)*d) + (2*b^2*Sin[c + d
*x])/(3*a*(a^2 - b^2)*d*Sqrt[Cos[c + d*x]]*(a + b*Cos[c + d*x])^(3/2)) + (8
*b^2*(2*a^2 - b^2)*Sin[c + d*x])/(3*a^2*(a^2 - b^2)^2*d*Sqrt[Cos[c + d*x]]*
Sqrt[a + b*Cos[c + d*x]])
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
```

```
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rubi steps

$$\text{integral} = \frac{2b^2\sin(c+dx)}{3a\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}} + \frac{2\int\frac{\frac{1}{2}\left(3a^2-4b^2\right)-\frac{3}{2}ab\cos(c+dx)+b^2\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}dx}{3a\left(a^2-b^2\right)}$$

$$= \frac{2b^2\sin(c+dx)}{3a\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}} + \frac{8b^2(2a^2-b^2)\sin(c+dx)}{3a^2\left(a^2-b^2\right)^2d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} + \frac{4\int\frac{\frac{1}{4}\left(3a^4-15a^2b^2+8b^4\right)-\frac{1}{2}ab\left(3a^2-b^2\right)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{3a^2\left(a^2-b^2\right)^2}$$

$$= \frac{2b^2\sin(c+dx)}{3a\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}} + \frac{8b^2(2a^2-b^2)\sin(c+dx)}{3a^2\left(a^2-b^2\right)^2d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} - \frac{(3a^3+9a^2b-6ab^2-8b^3)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{3a^2(a-b)(a+b)^2} + \frac{(3a^4-15a^2b^2+8b^4)\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{3a^2\left(a^2-b^2\right)^2}$$

$$= \frac{2(3a^4-15a^2b^2+8b^4)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx)}{a-b}}}{3a^4(a-b)(a+b)^{3/2}d} - \frac{2(3a^3+9a^2b-6ab^2-8b^3)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+d}{a+b}}}{3a^3(a-b)(a+b)^{3/2}d} + \frac{2b^2\sin(c+dx)}{3a\left(a^2-b^2\right)d\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}} + \frac{8b^2(2a^2-b^2)\sin(c+dx)}{3a^2\left(a^2-b^2\right)^2d\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.40 (sec) , antiderivative size = 1321, normalized size of antiderivative = 3.32

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx =$$

$$-\frac{4a(9a^4b-17a^2b^3+8b^5)\sqrt{\frac{(a+b)\cot^2\left(\frac{1}{2}(c+dx)\right)}{-a+b}}\sqrt{-\frac{(a+b)\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\sqrt{\frac{(a+b\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}{a}}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\sqrt{\right.\right.}{(a+b)\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

$$-\frac{}{}$$

$$+\frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\left(-\frac{2b^3\sin(c+dx)}{3a^2(a^2-b^2)(a+b\cos(c+dx))^2}-\frac{2(9a^2b^3\sin(c+dx)-5b^5\sin(c+dx))}{3a^3(a^2-b^2)^2(a+b\cos(c+dx))}+\frac{2\tan(c+dx)}{a^3}\right)}{d}$$

```
[In] Integrate[1/(Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*x])^(5/2)),x]
```

```
[Out] -1/3*((-4*a*(9*a^4*b - 17*a^2*b^3 + 8*b^5)*Sqrt[((a + b)*Cot[(c + d*x)/2]^2
)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a +
 b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[
((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin
[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - 4*
a*(3*a^5 - 15*a^3*b^2 + 8*a*b^4)*((Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a +
b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c
 + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*
Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*
x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (Sqrt[((a
+ b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*
x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]
*EllipticPi[-(a/b), ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a
]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt
[a + b*Cos[c + d*x]])) + 2*(3*a^4*b - 15*a^2*b^3 + 8*b^5)*((I*Cos[(c + d*x)
/2]*Sqrt[a + b*Cos[c + d*x]]*EllipticE[I*ArcSinh[Sin[(c + d*x)/2]/Sqrt[Cos[
c + d*x]]], (-2*a)/(-a - b)]*Sec[c + d*x])/(b*Sqrt[Cos[(c + d*x)/2]^2*Sec[c
 + d*x]]*Sqrt[((a + b*Cos[c + d*x])*Sec[c + d*x])/(a + b)]) + (2*a*((a*Sqrt
[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c
 + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c +
 d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sq
```

```
rt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sq
rt[a + b*Cos[c + d*x]]) - (a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sq
rt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x
])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a/b), ArcSin[Sqrt[((a +
 b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c +
 d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])))/b + (Sqrt[a +
 b*Cos[c + d*x]]*Sin[c + d*x])/(b*Sqrt[Cos[c + d*x]])))/(a^3*(a - b)^2*(a +
 b)^2*d) + (Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]*((-2*b^3*Sin[c + d*
x])/(3*a^2*(a^2 - b^2)*(a + b*Cos[c + d*x])^2) - (2*(9*a^2*b^3*Sin[c + d*x]
 - 5*b^5*Sin[c + d*x]))/(3*a^3*(a^2 - b^2)^2*(a + b*Cos[c + d*x])) + (2*Tan
[c + d*x])/a^3))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 3674 vs. 2(366) = 732.

Time = 13.49 (sec) , antiderivative size = 3675, normalized size of antiderivative = 9.23

method	result	size
default	Expression too large to display	3675

```
[In] int(1/cos(d*x+c)^(3/2)/(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3/d*(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-
csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/
2)*(-3*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a
^6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))
^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+8*b^6
*(csc(d*x+c)-cot(d*x+c))-7*csc(d*x+c)^5*a^2*b^4*(1-cos(d*x+c))^5-16*csc(d*x
+c)^5*a*b^5*(1-cos(d*x+c))^5-18*csc(d*x+c)^3*a^4*b^2*(1-cos(d*x+c))^3-16*cs
c(d*x+c)^3*a^3*b^3*(1-cos(d*x+c))^3+36*csc(d*x+c)^3*a^2*b^4*(1-cos(d*x+c))^
3+8*csc(d*x+c)^3*a*b^5*(1-cos(d*x+c))^3-3*EllipticF(cot(d*x+c)-csc(d*x+c),(
-(a-b)/(a+b))^(1/2))*a^6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x
+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+
3*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^6*(-csc(d*x+c)^2*
(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*
(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+8*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b
)/(a+b))^(1/2))*b^6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2
*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-6*csc
(d*x+c)^5*a^5*b*(1-cos(d*x+c))^5-12*csc(d*x+c)^5*a^4*b^2*(1-cos(d*x+c))^5+3
0*csc(d*x+c)^5*a^3*b^3*(1-cos(d*x+c))^5+3*EllipticF(cot(d*x+c)-csc(d*x+c),(
-(a-b)/(a+b))^(1/2))*a^5*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d
*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2
)+21*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b^2*(-csc(d*
x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+
c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+13*EllipticF(cot(d*x+c)-csc(d*x+c
```

),(-(a-b)/(a+b))^(1/2))*a^3*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((
csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))
^(1/2)-10*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^4*(-c
sc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc
(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-8*EllipticF(cot(d*x+c)-csc(d
*x+c),(-(a-b)/(a+b))^(1/2))*a*b^5*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*
((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b
))^(1/2)+6*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^5*b*(-cs
c(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(
d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-12*EllipticE(cot(d*x+c)-csc(d
*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2
)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a
+b))^(1/2)-30*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b^3
*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2
-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-7*EllipticE(cot(d*x+c)-c
sc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^
(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b
)/(a+b))^(1/2)+16*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b
^5*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))
^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-18*csc(d*x+c)^2*Ellipt
icE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b^2*(-csc(d*x+c)^2*(1-c
os(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-c
os(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+23*csc(d*x+c)^2*EllipticE(c
ot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^4*(-csc(d*x+c)^2*(1-cos(d*
x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*
x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+9*csc(d*x+c)^2*EllipticF(cot(d*x
+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^5*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+
1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+
a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+9*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(
d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/
2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(
a+b))^(1/2)*(1-cos(d*x+c))^2-17*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c
),(-(a-b)/(a+b))^(1/2))*a^3*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((
csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))
^(1/2)*(1-cos(d*x+c))^2-6*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a
-b)/(a+b))^(1/2))*a^2*b^4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*
x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)
*(1-cos(d*x+c))^2+8*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a
+b))^(1/2))*a*b^5*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a
*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(
d*x+c))^2+6*csc(d*x+c)^3*a^6*(1-cos(d*x+c))^3-16*csc(d*x+c)^3*b^6*(1-cos(d*
x+c))^3-14*a^3*b^3*(csc(d*x+c)-cot(d*x+c))+8*a*b^5*(csc(d*x+c)-cot(d*x+c))+
6*a^5*b*(csc(d*x+c)-cot(d*x+c))+6*a^4*b^2*(csc(d*x+c)-cot(d*x+c))-17*a^2*b^
4*(csc(d*x+c)-cot(d*x+c))+3*csc(d*x+c)^5*a^6*(1-cos(d*x+c))^5+8*csc(d*x+c)^
5*b^6*(1-cos(d*x+c))^5+3*a^6*(csc(d*x+c)-cot(d*x+c))+3*csc(d*x+c)^2*Ellipti

```
cE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^6*(-csc(d*x+c)^2*(1-cos(d*
x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*
x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-8*csc(d*x+c)^2*EllipticE(cot(d*x
+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)
^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+
b)/(a+b))^(1/2)*(1-cos(d*x+c))^2)/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+
c)^2*b*(1-cos(d*x+c))^2+a+b)^2/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(-(csc(d*x
+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(3/2)/(a-b)^2/
(a+b)^2/a^3
```

Fricas [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{5}{2}}\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(b^3*cos(d*x + c)^5 +
3*a*b^2*cos(d*x + c)^4 + 3*a^2*b*cos(d*x + c)^3 + a^3*cos(d*x + c)^2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(3/2)/(a+b*cos(d*x+c))**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{5}{2}}\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^(5/2)*cos(d*x + c)^(3/2)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{5}{2}}\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^(5/2)*cos(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{\cos(c+d\,x)^{3/2}\,(a+b\,\cos(c+d\,x))^{5/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(3/2)*(a + b*cos(c + d*x))^(5/2)),x)
[Out] int(1/(cos(c + d*x)^(3/2)*(a + b*cos(c + d*x))^(5/2)), x)
```

3.643 $\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 473

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx = -\frac{8b(2a^4-7a^2b^2+4b^4)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^5(a-b)(a+b)^{3/2}d}$$
$$+\frac{2(a^4+9a^3b+16a^2b^2-12ab^3-16b^4)\cot(c+dx)\,\mathrm{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}}{3a^4(a-b)(a+b)^{3/2}d}$$
$$+\frac{2b^2\sin(c+dx)}{3a(a^2-b^2)\,d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}$$
$$+\frac{4b^2(5a^2-3b^2)\sin(c+dx)}{3a^2(a^2-b^2)^2\,d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{2(a^4-13a^2b^2+8b^4)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3a^3(a^2-b^2)^2\,d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 2/3*b^2*sin(d*x+c)/a/(a^2-b^2)/d/cos(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(3/2)+4/
3*b^2*(5*a^2-3*b^2)*sin(d*x+c)/a^2/(a^2-b^2)^2/d/cos(d*x+c)^(3/2)/(a+b*cos(
d*x+c))^(1/2)+2/3*(a^4-13*a^2*b^2+8*b^4)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/
a^3/(a^2-b^2)^2/d/cos(d*x+c)^(3/2)-8/3*b*(2*a^4-7*a^2*b^2+4*b^4)*cot(d*x+c)
*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b
))^(1/2))*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^5
/(a-b)/(a+b)^(3/2)/d+2/3*(a^4+9*a^3*b+16*a^2*b^2-12*a*b^3-16*b^4)*cot(d*x+c
)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-
b))^(1/2))*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^
4/(a-b)/(a+b)^(3/2)/d
```

Rubi [A] (verified)

Time = 1.31 (sec) , antiderivative size = 473, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2881, 3134, 3077, 2895, 3073}

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx = \frac{4b^2(5a^2-3b^2)\sin(c+dx)}{3a^2d\,(a^2-b^2)^2\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{2b^2\sin(c+dx)}{3ad\,(a^2-b^2)\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}$$
$$-\frac{8b(2a^4-7a^2b^2+4b^4)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{3a^5d(a-b)(a+b)^{3/2}}$$
$$+\frac{2(a^4+9a^3b+16a^2b^2-12ab^3-16b^4)\cot(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\right.}{3a^4d(a-b)(a+b)^{3/2}}$$
$$+\frac{2(a^4-13a^2b^2+8b^4)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{3a^3d\,(a^2-b^2)^2\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Int[1/(Cos[c + d*x]^(5/2)*(a + b*Cos[c + d*x])^(5/2)),x]
```

```
[Out] (-8*b*(2*a^4 - 7*a^2*b^2 + 4*b^4)*Cot[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*
Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(
a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a^5
*(a - b)*(a + b)^(3/2)*d) + (2*(a^4 + 9*a^3*b + 16*a^2*b^2 - 12*a*b^3 - 16*
b^4)*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sq
rt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)
]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a^4*(a - b)*(a + b)^(3/2)*d) + (
2*b^2*Sin[c + d*x])/(3*a*(a^2 - b^2)*d*Cos[c + d*x]^(3/2)*(a + b*Cos[c + d*
x])^(3/2)) + (4*b^2*(5*a^2 - 3*b^2)*Sin[c + d*x])/(3*a^2*(a^2 - b^2)^2*d*Co
s[c + d*x]^(3/2)*Sqrt[a + b*Cos[c + d*x]]) + (2*(a^4 - 13*a^2*b^2 + 8*b^4)*
Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(3*a^3*(a^2 - b^2)^2*d*Cos[c + d*x]^
(3/2))
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
```

```
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
```

```
EqQ[a, 0])))
```

Rubi steps

$$\text{integral} = \frac{2b^2\sin(c+dx)}{3a\left(a^2-b^2\right)d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}} + \frac{2\int\frac{\frac{3}{2}\left(a^2-2b^2\right)-\frac{3}{2}ab\cos(c+dx)+2b^2\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}dx}{3a\left(a^2-b^2\right)}$$

$$= \frac{2b^2\sin(c+dx)}{3a\left(a^2-b^2\right)d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}} + \frac{4b^2\left(5a^2-3b^2\right)\sin(c+dx)}{3a^2\left(a^2-b^2\right)^2d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}} + \frac{4\int\frac{\frac{3}{4}\left(a^4-13a^2b^2+8b^4\right)-\frac{1}{2}ab\left(3a^2-b^2\right)\cos(c+dx)+b^2\left(5a^2-3b^2\right)\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{3a^2\left(a^2-b^2\right)^2}$$

$$= \frac{2b^2\sin(c+dx)}{3a\left(a^2-b^2\right)d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}} + \frac{4b^2\left(5a^2-3b^2\right)\sin(c+dx)}{3a^2\left(a^2-b^2\right)^2d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}} + \frac{2\left(a^4-13a^2b^2+8b^4\right)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3a^3\left(a^2-b^2\right)^2d\cos^{\frac{3}{2}}(c+dx)} + \frac{8\int\frac{-\frac{3}{2}b\left(2a^4-7a^2b^2+4b^4\right)+\frac{3}{8}a\left(a^4+7a^2b^2-4b^4\right)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{9a^3\left(a^2-b^2\right)^2}$$

$$= \frac{2b^2\sin(c+dx)}{3a\left(a^2-b^2\right)d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}} + \frac{4b^2\left(5a^2-3b^2\right)\sin(c+dx)}{3a^2\left(a^2-b^2\right)^2d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}} + \frac{2\left(a^4-13a^2b^2+8b^4\right)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3a^3\left(a^2-b^2\right)^2d\cos^{\frac{3}{2}}(c+dx)} + \frac{\left(a^4+9a^3b+16a^2b^2-12ab^3-16b^4\right)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{3a^3(a-b)(a+b)^2} - \frac{\left(4b\left(2a^4-7a^2b^2+4b^4\right)\right)\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{3a^3\left(a^2-b^2\right)^2}$$

$$= -\frac{8b(2a^4-7a^2b^2+4b^4)\cot(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+}{a-b}}}{3a^5(a-b)(a+b)^{3/2}d}$$
$$+\frac{2(a^4+9a^3b+16a^2b^2-12ab^3-16b^4)\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{}}{3a^4(a-b)(a+b)^{3/2}d}$$
$$+\frac{2b^2\sin(c+dx)}{3a\left(a^2-b^2\right)d\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}$$
$$+\frac{4b^2(5a^2-3b^2)\sin(c+dx)}{3a^2\left(a^2-b^2\right)^2d\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{2(a^4-13a^2b^2+8b^4)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3a^3\left(a^2-b^2\right)^2d\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 6.44 (sec) , antiderivative size = 1351, normalized size of antiderivative = 2.86

$$-\frac{4a(a^6+15a^4b^2-32a^2b^4+16b^6)\sqrt{\frac{(a+b)\cot^2\left(\frac{1}{2}(c+dx)\right)}{-a+b}}\sqrt{-\frac{(a+b)\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx\right.}{a}}}{}$$

$$\int\frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx=\frac{}{}$$
$$+\frac{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\left(\frac{2b^4\sin(c+dx)}{3a^3(a^2-b^2)(a+b\cos(c+dx))^2}+\frac{8(3a^2b^4\sin(c+dx)-2b^6\sin(c+dx))}{3a^4(a^2-b^2)^2(a+b\cos(c+dx))}-\frac{16b\tan(c+dx)}{3a^4}+\frac{2\sec}{}\right.}{d}$$

```
[In] Integrate[1/(Cos[c + d*x]^(5/2)*(a + b*Cos[c + d*x])^(5/2)),x]
```

```
[Out] ((-4*a*(a^6 + 15*a^4*b^2 - 32*a^2*b^4 + 16*b^6)*Sqrt[((a + b)*Cot[(c + d*x)
/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[
((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[
Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)
]*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])
 - 4*a*(8*a^5*b - 28*a^3*b^3 + 16*a*b^5)*((Sqrt[((a + b)*Cot[(c + d*x)/2]^2
)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a +
 b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[
```

```
((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin
[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (S
qrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc
[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[
c + d*x]*EllipticPi[-(a/b), ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)
/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*
x]]*Sqrt[a + b*Cos[c + d*x]])) + 2*(8*a^4*b^2 - 28*a^2*b^4 + 16*b^6)*((I*Co
s[(c + d*x)/2]*Sqrt[a + b*Cos[c + d*x]]*EllipticE[I*ArcSinh[Sin[(c + d*x)/2
]/Sqrt[Cos[c + d*x]]], (-2*a)/(-a - b)]*Sec[c + d*x])/(b*Sqrt[Cos[(c + d*x)
/2]^2*Sec[c + d*x]]*Sqrt[((a + b*Cos[c + d*x])*Sec[c + d*x])/(a + b)]) + (2
*a*((a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(-a + b)]*Sqrt[-(((a + b)*Cos[c +
d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)
/a]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/
2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b)]*Sin[(c + d*x)/2]^4)/((a + b)*Sqrt[Cos[c
 + d*x]]*Sqrt[a + b*Cos[c + d*x]]) - (a*Sqrt[((a + b)*Cot[(c + d*x)/2]^2)/(
-a + b)]*Sqrt[-(((a + b)*Cos[c + d*x]*Csc[(c + d*x)/2]^2)/a)]*Sqrt[((a + b*
Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]*Csc[c + d*x]*EllipticPi[-(a/b), ArcSin
[Sqrt[((a + b*Cos[c + d*x])*Csc[(c + d*x)/2]^2)/a]/Sqrt[2]], (-2*a)/(-a + b
)]*Sin[(c + d*x)/2]^4)/(b*Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]])))/b
+ (Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(b*Sqrt[Cos[c + d*x]]))))/(3*a^4*(
a - b)^2*(a + b)^2*d) + (Sqrt[Cos[c + d*x]]*Sqrt[a + b*Cos[c + d*x]]*((2*b^
4*Sin[c + d*x])/(3*a^3*(a^2 - b^2)*(a + b*Cos[c + d*x])^2) + (8*(3*a^2*b^4*
Sin[c + d*x] - 2*b^6*Sin[c + d*x]))/(3*a^4*(a^2 - b^2)^2*(a + b*Cos[c + d*x
])) - (16*b*Tan[c + d*x])/(3*a^4) + (2*Sec[c + d*x]*Tan[c + d*x])/(3*a^3)))
/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 5223 vs. $2(435) = 870$.

Time = 15.91 (sec) , antiderivative size = 5224, normalized size of antiderivative = 11.04

method	result	size
default	Expression too large to display	5224

```
[In] int(1/cos(d*x+c)^(5/2)/(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] result too large to display
```

Fricas [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{5}{2}}\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*sqrt(cos(d*x + c))/(b^3*cos(d*x + c)^6 +
3*a*b^2*cos(d*x + c)^5 + 3*a^2*b*cos(d*x + c)^4 + a^3*cos(d*x + c)^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(5/2)/(a+b*cos(d*x+c))**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{5}{2}}\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^(5/2)*cos(d*x + c)^(5/2)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{5}{2}}\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^(5/2)*cos(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^{5/2}\,\left(a+b\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(5/2)*(a + b*cos(c + d*x))^(5/2)),x)
[Out] int(1/(cos(c + d*x)^(5/2)*(a + b*cos(c + d*x))^(5/2)), x)
```

3.644 $\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{2+3\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 32

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{2+3\cos(c+dx)}}\,dx = \frac{2\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right),\frac{1}{5}\right)}{\sqrt{5}d}$$

```
[Out] 2/5*EllipticF(sin(d*x+c)/(1+cos(d*x+c)),1/5*5^(1/2))/d*5^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.040$, Rules used = {2892}

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{2+3\cos(c+dx)}}\,dx = \frac{2\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{\cos(c+dx)+1}\right),\frac{1}{5}\right)}{\sqrt{5}d}$$

```
[In] Int[1/(Sqrt[Cos[c + d*x]]*Sqrt[2 + 3*Cos[c + d*x]]),x]
```

```
[Out] (2*EllipticF[ArcSin[Sin[c + d*x]/(1 + Cos[c + d*x])], 1/5])/(Sqrt[5]*d)
```

Rule 2892

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(d/(f*Sqrt[a + b*d]))*EllipticF[ArcSin[Co
s[e + f*x]/(1 + d*Sin[e + f*x])], -(a - b*d)/(a + b*d)], x] /; FreeQ[{a, b,
 d, e, f}, x] && LtQ[a^2 - b^2, 0] && EqQ[d^2, 1] && GtQ[b*d, 0]
```

Rubi steps

$$\text{integral} = \frac{2\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right),\frac{1}{5}\right)}{\sqrt{5}d}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 131 vs. $2(32) = 64$.

Time = 9.56 (sec) , antiderivative size = 131, normalized size of antiderivative = 4.09

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{2+3\cos(c+dx)}}\,dx$$
$$= \frac{2\sqrt{\cos(c+dx)}\sqrt{2+3\cos(c+dx)}\sqrt{\cot^2\left(\frac{1}{2}(c+dx)\right)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{1}{2}\sqrt{(2+3\cos(c+dx)}\right.\right.}{d\sqrt{\frac{-2-3\cos(c+dx)}{-1+\cos(c+dx)}}\sqrt{\frac{\cos(c+dx)}{-1+\cos(c+dx)}}}$$

```
[In] Integrate[1/(Sqrt[Cos[c + d*x]]*Sqrt[2 + 3*Cos[c + d*x]]),x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*Sqrt[2 + 3*Cos[c + d*x]]*Sqrt[Cot[(c + d*x)/2]^2]*Csc
[c + d*x]*EllipticF[ArcSin[Sqrt[(2 + 3*Cos[c + d*x])*Csc[(c + d*x)/2]^2]/2]
, -4])/(d*Sqrt[(-2 - 3*Cos[c + d*x])/(-1 + Cos[c + d*x])]*Sqrt[Cos[c + d*x]
/(-1 + Cos[c + d*x])])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 102 vs. $2(31) = 62$.

Time = 7.88 (sec) , antiderivative size = 103, normalized size of antiderivative = 3.22

method	result	size
default	$-\frac{(1+\cos(dx+c))\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{10}\sqrt{\frac{2+3\cos(dx+c)}{1+\cos(dx+c)}}F\left(\cot(dx+c)-\csc(dx+c),\frac{\sqrt{5}}{5}\right)}{5d\sqrt{2+3\cos(dx+c)}\sqrt{\cos(dx+c)}}$	103

```
[In] int(1/cos(d*x+c)^(1/2)/(2+3*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/5/d*(1+cos(d*x+c))*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)/(2+3*cos(d*
x+c))^(1/2)*10^(1/2)*((2+3*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)*EllipticF(cot(
d*x+c)-csc(d*x+c),1/5*5^(1/2))/cos(d*x+c)^(1/2)
```

Fricas [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{3\cos(dx+c)+2}\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(2+3*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(3*cos(d*x + c) + 2)*sqrt(cos(d*x + c))/(3*cos(d*x + c)^2 + 2*
cos(d*x + c)), x)
```

Sympy [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{3\cos(c+dx)+2}\sqrt{\cos(c+dx)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(1/2)/(2+3*cos(d*x+c))**(1/2),x)
[Out] Integral(1/(sqrt(3*cos(c + d*x) + 2)*sqrt(cos(c + d*x))), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{3\cos(dx+c)+2}\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(2+3*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(3*cos(d*x + c) + 2)*sqrt(cos(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{3\cos(dx+c)+2}\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(2+3*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(3*cos(d*x + c) + 2)*sqrt(cos(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{3\cos(c+dx)+2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(3*cos(c + d*x) + 2)^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(3*cos(c + d*x) + 2)^(1/2)), x)
```

3.645 $\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}\,dx = \frac{2\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right),5\right)}{d}$$

```
[Out] 2*EllipticF(sin(d*x+c)/(1+cos(d*x+c)),5^(1/2))/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.040, Rules used = {2892}

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}\,dx = \frac{2\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{\cos(c+dx)+1}\right),5\right)}{d}$$

```
[In] Int[1/(Sqrt[Cos[c + d*x]]*Sqrt[-2 + 3*Cos[c + d*x]]),x]
[Out] (2*EllipticF[ArcSin[Sin[c + d*x]/(1 + Cos[c + d*x])], 5])/d
```

Rule 2892

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(d/(f*Sqrt[a + b*d]))*EllipticF[ArcSin[Co
s[e + f*x]/(1 + d*Sin[e + f*x])], -(a - b*d)/(a + b*d)], x] /; FreeQ[{a, b,
 d, e, f}, x] && LtQ[a^2 - b^2, 0] && EqQ[d^2, 1] && GtQ[b*d, 0]
```

Rubi steps

$$\text{integral} = \frac{2\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right),5\right)}{d}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 156 vs. 2(25) = 50.

Time = 0.75 (sec) , antiderivative size = 156, normalized size of antiderivative = 6.24

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}\,dx$$
$$= \frac{4\sqrt{\cot^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{-\left((-2+3\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)\right)}\csc(c+dx)}{\sqrt{5}d\sqrt{\cos(c+dx)}\sqrt{-2+3}}$$

```
[In] Integrate[1/(Sqrt[Cos[c + d*x]]*Sqrt[-2 + 3*Cos[c + d*x]]),x]
```

```
[Out] (4*Sqrt[Cot[(c + d*x)/2]^2]*Sqrt[Cos[c + d*x]*Csc[(c + d*x)/2]^2]*Sqrt[-((-
2 + 3*Cos[c + d*x])*Csc[(c + d*x)/2]^2)]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt
[-((-2 + 3*Cos[c + d*x])*Csc[(c + d*x)/2]^2)]/2], 4/5]*Sin[(c + d*x)/2]^4)/
(Sqrt[5]*d*Sqrt[Cos[c + d*x]]*Sqrt[-2 + 3*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 94 vs. 2(26) = 52.

Time = 6.78 (sec) , antiderivative size = 95, normalized size of antiderivative = 3.80

method	result	size
default	$-\frac{2(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{\frac{-2+3\cos(dx+c)}{1+\cos(dx+c)}}\,F\left(\cot(dx+c)-\csc(dx+c),\sqrt{5}\right)}{d\sqrt{-2+3\cos(dx+c)}\sqrt{\cos(dx+c)}}$	95

```
[In] int(1/cos(d*x+c)^(1/2)/(-2+3*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/d*(1+cos(d*x+c))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)/(-2+3*cos(d*x+c))^(1/
2)*((-2+3*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c)
,5^(1/2))/cos(d*x+c)^(1/2)
```

Fricas [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{3\,\cos\left(dx+c\right)-2}\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(-2+3*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(3*cos(d*x + c) - 2)*sqrt(cos(d*x + c))/(3*cos(d*x + c)^2 - 2*
cos(d*x + c)), x)
```

Sympy [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{3\cos{(c+dx)}-2}\sqrt{\cos{(c+dx)}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(1/2)/(-2+3*cos(d*x+c))**(1/2),x)
[Out] Integral(1/(sqrt(3*cos(c + d*x) - 2)*sqrt(cos(c + d*x))), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{3\cos{(dx+c)}-2}\sqrt{\cos{(dx+c)}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(-2+3*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(3*cos(d*x + c) - 2)*sqrt(cos(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{3\cos{(dx+c)}-2}\sqrt{\cos{(dx+c)}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(-2+3*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(3*cos(d*x + c) - 2)*sqrt(cos(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos{(c+d\,x)}}\,\sqrt{3\cos{(c+d\,x)}-2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(3*cos(c + d*x) - 2)^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(3*cos(c + d*x) - 2)^(1/2)), x)
```

3.646 $\int \frac{1}{\sqrt{2-3\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 56

$$\int \frac{1}{\sqrt{2-3\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = -\frac{2\sqrt{-\cos(c+dx)}\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1-\cos(c+dx)}\right),\frac{1}{5}\right)}{\sqrt{5}d\sqrt{\cos(c+dx)}}$$

```
[Out] -2/5*EllipticF(sin(d*x+c)/(1-cos(d*x+c)),1/5*5^(1/2))*(-cos(d*x+c))^(1/2)/d
*5^(1/2)/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2893, 2892}

$$\int \frac{1}{\sqrt{2-3\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = -\frac{2\sqrt{-\cos(c+dx)}\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1-\cos(c+dx)}\right),\frac{1}{5}\right)}{\sqrt{5}d\sqrt{\cos(c+dx)}}$$

```
[In] Int[1/(Sqrt[2 - 3*Cos[c + d*x]]*Sqrt[Cos[c + d*x]]),x]
```

```
[Out] (-2*Sqrt[-Cos[c + d*x]]*EllipticF[ArcSin[Sin[c + d*x]/(1 - Cos[c + d*x])],
1/5])/(Sqrt[5]*d*Sqrt[Cos[c + d*x]])
```

Rule 2892

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(d/(f*Sqrt[a + b*d]))*EllipticF[ArcSin[Co
```

```
s[e + f*x]/(1 + d*Sin[e + f*x])], -(a - b*d)/(a + b*d)], x] /; FreeQ[{a, b,
 d, e, f}, x] && LtQ[a^2 - b^2, 0] && EqQ[d^2, 1] && GtQ[b*d, 0]
```

Rule 2893

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[Sign[b]*Sin[e + f*x]]/Sqrt[d*Sin[e + f*
x]], Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[Sign[b]*Sin[e + f*x]]), x], x] /;
 FreeQ[{a, b, d, e, f}, x] && LtQ[a^2 - b^2, 0] && GtQ[b^2, 0] &&  !(EqQ[d^
2, 1] && GtQ[b*d, 0])
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sqrt{-\cos(c+dx)}\int\frac{1}{\sqrt{2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx}{\sqrt{\cos(c+dx)}}\\ &= -\frac{2\sqrt{-\cos(c+dx)}\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1-\cos(c+dx)}\right),\frac{1}{5}\right)}{\sqrt{5}d\sqrt{\cos(c+dx)}}\end{aligned}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 143 vs. $2(56) = 112$.

Time = 1.71 (sec) , antiderivative size = 143, normalized size of antiderivative = 2.55

$$\int\frac{1}{\sqrt{2-3\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = -\frac{4\sqrt{\cot^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{(2-3\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}\csc(c+dx)\,\text{Elli}}{d\sqrt{2-3\cos(c+dx)}\sqrt{\cos(c+dx}}$$

```
[In] Integrate[1/(Sqrt[2 - 3*Cos[c + d*x]]*Sqrt[Cos[c + d*x]]),x]
```

```
[Out] (-4*Sqrt[Cot[(c + d*x)/2]^2]*Sqrt[(2 - 3*Cos[c + d*x])*Csc[(c + d*x)/2]^2]*
Sqrt[Cos[c + d*x]*Csc[(c + d*x)/2]^2]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[Co
s[c + d*x]*Csc[(c + d*x)/2]^2]/2], -4]*Sin[(c + d*x)/2]^4)/(d*Sqrt[2 - 3*Co
s[c + d*x]]*Sqrt[Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 106 vs. $2(51) = 102$.

Time = 7.70 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.91

method	result	size
default	$\frac{2(1+\cos(dx+c))\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{2-3\cos(dx+c)}\,\sqrt{\frac{-2+3\cos(dx+c)}{1+\cos(dx+c)}}\,F\left(\cot(dx+c)-\csc(dx+c),\sqrt{5}\right)}{d(-2+3\cos(dx+c))\sqrt{\cos(dx+c)}}$	107

```
[In] int(1/(2-3*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
[Out] 2/d*(1+cos(d*x+c))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(2-3*cos(d*x+c))^(1/2)
*((-2+3*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),5
^(1/2))/(-2+3*cos(d*x+c))/cos(d*x+c)^(1/2)
```

Fricas [F]

$$\int \frac{1}{\sqrt{2-3\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-3\,\cos\left(dx+c\right)+2}\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate(1/(2-3*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-3*cos(d*x + c) + 2)*sqrt(cos(d*x + c))/(3*cos(d*x + c)^2 -
2*cos(d*x + c)), x)
```

Sympy [F]

$$\int \frac{1}{\sqrt{2-3\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{2-3\cos\left(c+dx\right)}\sqrt{\cos\left(c+dx\right)}}\,dx$$

```
[In] integrate(1/(2-3*cos(d*x+c))**(1/2)/cos(d*x+c)**(1/2),x)
[Out] Integral(1/(sqrt(2 - 3*cos(c + d*x))*sqrt(cos(c + d*x))), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{2-3\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-3\,\cos\left(dx+c\right)+2}\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate(1/(2-3*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(-3*cos(d*x + c) + 2)*sqrt(cos(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{2-3\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-3\,\cos\left(dx+c\right)+2}\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate(1/(2-3*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(-3*cos(d*x + c) + 2)*sqrt(cos(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{2-3\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{2-3\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(2 - 3*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(2 - 3*cos(c + d*x))^(1/2)), x)
```

3.647 $\int \frac{1}{\sqrt{-2-3\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 49

$$\int \frac{1}{\sqrt{-2-3\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = -\frac{2\sqrt{-\cos(c+dx)}\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1-\cos(c+dx)}\right),5\right)}{d\sqrt{\cos(c+dx)}}$$

```
[Out] -2*EllipticF(sin(d*x+c)/(1-cos(d*x+c)),5^(1/2))*(-cos(d*x+c))^(1/2)/d/cos(d
*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2893, 2892}

$$\int \frac{1}{\sqrt{-2-3\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = -\frac{2\sqrt{-\cos(c+dx)}\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1-\cos(c+dx)}\right),5\right)}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[1/(Sqrt[-2 - 3*Cos[c + d*x]]*Sqrt[Cos[c + d*x]]),x]
```

```
[Out] (-2*Sqrt[-Cos[c + d*x]]*EllipticF[ArcSin[Sin[c + d*x]/(1 - Cos[c + d*x])],
5])/(d*Sqrt[Cos[c + d*x]])
```

Rule 2892

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(d/(f*Sqrt[a + b*d]))*EllipticF[ArcSin[Co
```

```
s[e + f*x]/(1 + d*Sin[e + f*x])], -(a - b*d)/(a + b*d)], x] /; FreeQ[{a, b,
 d, e, f}, x] && LtQ[a^2 - b^2, 0] && EqQ[d^2, 1] && GtQ[b*d, 0]
```

Rule 2893

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[Sign[b]*Sin[e + f*x]]/Sqrt[d*Sin[e + f*
x]], Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[Sign[b]*Sin[e + f*x]]), x], x] /;
 FreeQ[{a, b, d, e, f}, x] && LtQ[a^2 - b^2, 0] && GtQ[b^2, 0] &&  !(EqQ[d^
2, 1] && GtQ[b*d, 0])
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sqrt{-\cos(c+dx)}\int\frac{1}{\sqrt{-2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx}{\sqrt{\cos(c+dx)}}\\ &= -\frac{2\sqrt{-\cos(c+dx)}\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1-\cos(c+dx)}\right),5\right)}{d\sqrt{\cos(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 1.48 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.47

$$\int\frac{1}{\sqrt{-2-3\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \frac{2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right),\frac{1}{5}\right)}{\sqrt{5}d\sqrt{-2-3\cos(c+dx)}\sqrt{\frac{\cos(c+dx)}{2+3\cos(c+dx)}}}$$

```
[In] Integrate[1/(Sqrt[-2 - 3*Cos[c + d*x]]*Sqrt[Cos[c + d*x]]),x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*EllipticF[ArcSin[Tan[(c + d*x)/2]], 1/5])/(Sqrt[5]*d*
Sqrt[-2 - 3*Cos[c + d*x]]*Sqrt[Cos[c + d*x]/(2 + 3*Cos[c + d*x])])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 120 vs. 2(46) = 92.

Time = 7.79 (sec) , antiderivative size = 121, normalized size of antiderivative = 2.47

method	result	size
default	$-\frac{(1+\cos(dx+c))\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{-2-3\cos(dx+c)}\,\sqrt{10}\,\sqrt{\frac{2+3\cos(dx+c)}{1+\cos(dx+c)}}\,F\left(\frac{(\csc(dx+c)-\cot(dx+c))\sqrt{5}}{5},\sqrt{5}\right)\sqrt{5}}{5d(2+3\cos(dx+c))\sqrt{\cos(dx+c)}}$	121

```
[In] int(1/(-2-3*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/5/d*(1+cos(d*x+c))*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(-2-3*cos(d
*x+c))^(1/2)*10^(1/2)*((2+3*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)*EllipticF(1/5
*(csc(d*x+c)-cot(d*x+c))*5^(1/2),5^(1/2))/(2+3*cos(d*x+c))/cos(d*x+c)^(1/2)
*5^(1/2)
```

Fricas [F]

$$\int \frac{1}{\sqrt{-2-3\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-3\cos\left(dx+c\right)-2}\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate(1/(-2-3*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-3*cos(d*x + c) - 2)*sqrt(cos(d*x + c))/(3*cos(d*x + c)^2 +
2*cos(d*x + c)), x)
```

Sympy [F]

$$\int \frac{1}{\sqrt{-2-3\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-3\cos\left(c+dx\right)-2}\sqrt{\cos\left(c+dx\right)}}\,dx$$

```
[In] integrate(1/(-2-3*cos(d*x+c))**(1/2)/cos(d*x+c)**(1/2),x)
```

```
[Out] Integral(1/(sqrt(-3*cos(c + d*x) - 2)*sqrt(cos(c + d*x))), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{-2-3\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-3\cos\left(dx+c\right)-2}\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate(1/(-2-3*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-3*cos(d*x + c) - 2)*sqrt(cos(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{-2-3\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-3\,\cos\left(dx+c\right)-2}\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate(1/(-2-3*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(-3*cos(d*x + c) - 2)*sqrt(cos(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{-2-3\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{-3\,\cos\left(c+d\,x\right)-2}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(- 3*cos(c + d*x) - 2)^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(- 3*cos(c + d*x) - 2)^(1/2)), x)
```

3.648 $\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{3+2\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 58

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{3+2\cos(c+dx)}}\,dx = \frac{2\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{3+2\cos(c+dx)}}{\sqrt{5}\sqrt{\cos(c+dx)}}\right),-5\right)\sqrt{-\tan^2(c+dx)}}{d}$$

```
[Out] 2*cot(d*x+c)*EllipticF(1/5*(3+2*cos(d*x+c))^(1/2)*5^(1/2)/cos(d*x+c)^(1/2),
I*5^(1/2))*(-tan(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.040, Rules used = {2894}

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{3+2\cos(c+dx)}}\,dx = \frac{2\sqrt{-\tan^2(c+dx)}\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{2\cos(c+dx)+3}}{\sqrt{5}\sqrt{\cos(c+dx)}}\right),-5\right)}{d}$$

```
[In] Int[1/(Sqrt[Cos[c + d*x]]*Sqrt[3 + 2*Cos[c + d*x]]),x]
```

```
[Out] (2*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[3 + 2*Cos[c + d*x]]/(Sqrt[5]*Sqrt[Cos
[c + d*x]])], -5]*Sqrt[-Tan[c + d*x]^2])/d
```

Rule 2894

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*Sqrt[a^2]*(Sqrt[-Cot[e + f*x]^2]/(a*f*Sqr
```

```
t[a^2 - b^2]*Cot[e + f*x]))*Rt[(a + b)/d, 2]*EllipticF[ArcSin[Sqrt[a + b*Si
n[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]], -(a + b)/(a - b)], x] /
; FreeQ[{a, b, d, e, f}, x] && GtQ[a^2 - b^2, 0] && PosQ[(a + b)/d] && GtQ[
a^2, 0]
```

Rubi steps

$$\text{integral} = \frac{2\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{3+2\cos(c+dx)}}{\sqrt{5}\sqrt{\cos(c+dx)}}\right),-5\right)\sqrt{-\tan^2(c+dx)}}{d}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 140 vs. 2(58) = 116.

Time = 1.16 (sec) , antiderivative size = 140, normalized size of antiderivative = 2.41

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{3+2\cos(c+dx)}}\,dx = \frac{4\sqrt{\cos(c+dx)}\sqrt{3+2\cos(c+dx)}\sqrt{-\cot^2\left(\frac{1}{2}(c+dx)\right)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{(3+2\cos(c+dx))\csc^2\left(\frac{1}{2}\right.}}{\sqrt{6}}\right.\right.}{d\sqrt{-\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{(3+2\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}}$$

```
[In] Integrate[1/(Sqrt[Cos[c + d*x]]*Sqrt[3 + 2*Cos[c + d*x]]),x]
```

```
[Out] (4*Sqrt[Cos[c + d*x]]*Sqrt[3 + 2*Cos[c + d*x]]*Sqrt[-Cot[(c + d*x)/2]^2]*Cs
c[c + d*x]*EllipticF[ArcSin[Sqrt[(3 + 2*Cos[c + d*x])*Csc[(c + d*x)/2]^2]/S
qrt[6]], 6])/(d*Sqrt[-(Cos[c + d*x]*Csc[(c + d*x)/2]^2)]*Sqrt[(3 + 2*Cos[c
+ d*x])*Csc[(c + d*x)/2]^2])
```

Maple [A] (verified)

Time = 7.25 (sec) , antiderivative size = 104, normalized size of antiderivative = 1.79

method	result	size
default	$-\frac{(1+\cos(dx+c))\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{10}\sqrt{\frac{3+2\cos(dx+c)}{1+\cos(dx+c)}}\,F\left(\cot(dx+c)-\csc(dx+c),\frac{i\sqrt{5}}{5}\right)}{5d\sqrt{3+2\cos(dx+c)}\sqrt{\cos(dx+c)}}$	104

```
[In] int(1/cos(d*x+c)^(1/2)/(3+2*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/5/d*(1+cos(d*x+c))*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)/(3+2*cos(d*
x+c))^(1/2)*10^(1/2)*((3+2*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)*EllipticF(cot(
d*x+c)-csc(d*x+c),1/5*I*5^(1/2))/cos(d*x+c)^(1/2)
```

Fricas [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{3+2\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{2\cos(dx+c)+3}\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(3+2*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(2*cos(d*x + c) + 3)*sqrt(cos(d*x + c))/(2*cos(d*x + c)^2 + 3*
cos(d*x + c)), x)
```

Sympy [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{3+2\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{2\cos(c+dx)+3}\sqrt{\cos(c+dx)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(1/2)/(3+2*cos(d*x+c))**(1/2),x)
[Out] Integral(1/(sqrt(2*cos(c + d*x) + 3)*sqrt(cos(c + d*x))), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{3+2\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{2\cos(dx+c)+3}\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(3+2*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(2*cos(d*x + c) + 3)*sqrt(cos(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{3+2\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{2\cos(dx+c)+3}\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(3+2*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(2*cos(d*x + c) + 3)*sqrt(cos(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{3+2\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{2\,\cos\left(c+d\,x\right)+3}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(2*cos(c + d*x) + 3)^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(2*cos(c + d*x) + 3)^(1/2)), x)
```

3.649 $\int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 60

$$\int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \frac{2\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{3-2\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\right),-\frac{1}{5}\right)\sqrt{-\tan^2(c+dx)}}{\sqrt{5}d}$$

```
[Out] 2/5*cot(d*x+c)*EllipticF((3-2*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),1/5*I*5^(1
/2))*(-tan(d*x+c)^2)^(1/2)/d*5^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.040, Rules used = {2894}

$$\int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \frac{2\sqrt{-\tan^2(c+dx)}\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{3-2\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\right),-\frac{1}{5}\right)}{\sqrt{5}d}$$

```
[In] Int[1/(Sqrt[3 - 2*Cos[c + d*x]]*Sqrt[Cos[c + d*x]]),x]
```

```
[Out] (2*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[3 - 2*Cos[c + d*x]]/Sqrt[Cos[c + d*x]
]], -1/5]*Sqrt[-Tan[c + d*x]^2])/(Sqrt[5]*d)
```

Rule 2894

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*Sqrt[a^2]*(Sqrt[-Cot[e + f*x]^2]/(a*f*Sqr
```

```
t[a^2 - b^2]*Cot[e + f*x]))*Rt[(a + b)/d, 2]*EllipticF[ArcSin[Sqrt[a + b*Si
n[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]], -(a + b)/(a - b)], x] /
; FreeQ[{a, b, d, e, f}, x] && GtQ[a^2 - b^2, 0] && PosQ[(a + b)/d] && GtQ[
a^2, 0]
```

Rubi steps

$$\text{integral} = \frac{2\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{3-2\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\right),-\frac{1}{5}\right)\sqrt{-\tan^2(c+dx)}}{\sqrt{5}d}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 144 vs. $2(60) = 120$.

Time = 1.44 (sec) , antiderivative size = 144, normalized size of antiderivative = 2.40

$$\int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx$$
$$= \frac{4\sqrt{\cot^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{(3-2\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{-\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}\csc(c+dx)\,\text{Elli}}{d\sqrt{3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}$$

```
[In] Integrate[1/(Sqrt[3 - 2*Cos[c + d*x]]*Sqrt[Cos[c + d*x]]),x]
```

```
[Out] (4*Sqrt[Cot[(c + d*x)/2]^2]*Sqrt[(3 - 2*Cos[c + d*x])*Csc[(c + d*x)/2]^2]*S
qrt[-(Cos[c + d*x]*Csc[(c + d*x)/2]^2)]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[
Cos[c + d*x]/(-1 + Cos[c + d*x])]/Sqrt[3]], 6]*Sin[(c + d*x)/2]^4)/(d*Sqrt[
3 - 2*Cos[c + d*x]]*Sqrt[Cos[c + d*x]])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 112 vs. $2(54) = 108$.

Time = 7.54 (sec) , antiderivative size = 113, normalized size of antiderivative = 1.88

method	result	size
default	$\frac{(1+\cos(dx+c))\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{3-2\cos(dx+c)}\sqrt{-\frac{2(-3+2\cos(dx+c))}{1+\cos(dx+c)}}\,F\left(\cot(dx+c)-\csc(dx+c),i\sqrt{5}\right)}{d(-3+2\cos(dx+c))\sqrt{\cos(dx+c)}}$	113

```
[In] int(1/(3-2*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

[Out] 1/d*(1+cos(d*x+c))*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(3-2*cos(d*x+c))^(1/2)*(-2*(-3+2*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),I*5^(1/2))/(-3+2*cos(d*x+c))/cos(d*x+c)^(1/2)

Fricas [F]

$$\int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-2\cos(dx+c)+3}\sqrt{\cos(dx+c)}}\,dx$$

[In] integrate(1/(3-2*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-2*cos(d*x + c) + 3)*sqrt(cos(d*x + c))/(2*cos(d*x + c)^2 - 3*cos(d*x + c)), x)

Sympy [F]

$$\int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx$$

[In] integrate(1/(3-2*cos(d*x+c))**(1/2)/cos(d*x+c)**(1/2),x)

[Out] Integral(1/(sqrt(3 - 2*cos(c + d*x))*sqrt(cos(c + d*x))), x)

Maxima [F]

$$\int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-2\cos(dx+c)+3}\sqrt{\cos(dx+c)}}\,dx$$

[In] integrate(1/(3-2*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="maxima")

[Out] integrate(1/(sqrt(-2*cos(d*x + c) + 3)*sqrt(cos(d*x + c))), x)

Giac [F]

$$\int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-2\cos(dx+c)+3}\sqrt{\cos(dx+c)}}\,dx$$

[In] integrate(1/(3-2*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="giac")

[Out] integrate(1/(sqrt(-2*cos(d*x + c) + 3)*sqrt(cos(d*x + c))), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{3-2\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(3 - 2*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(3 - 2*cos(c + d*x))^(1/2)), x)
```

3.650 $\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{-3+2\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 84

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{-3+2\cos(c+dx)}}\,dx = -\frac{2\sqrt{-\cos(c+dx)}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{-3+2\cos(c+dx)}}{\sqrt{-\cos(c+dx)}}\right),-\frac{1}{5}\right)\sqrt{-\tan^2(c+dx)}}{\sqrt{5}d}$$

```
[Out] -2/5*csc(d*x+c)*EllipticF((-3+2*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),1/5*I
*5^(1/2))*(-cos(d*x+c))^(1/2)*cos(d*x+c)^(1/2)*(-tan(d*x+c)^2)^(1/2)/d*5^(1
/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 84, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2896, 2894}

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{-3+2\cos(c+dx)}}\,dx = -\frac{2\sqrt{-\cos(c+dx)}\sqrt{\cos(c+dx)}\sqrt{-\tan^2(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{2\cos(c+dx)-3}}{\sqrt{-\cos(c+dx)}}\right),-\frac{1}{5}\right)}{\sqrt{5}d}$$

```
[In] Int[1/(Sqrt[Cos[c + d*x]]*Sqrt[-3 + 2*Cos[c + d*x]]),x]
```

```
[Out] (-2*Sqrt[-Cos[c + d*x]]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSin[Sq
rt[-3 + 2*Cos[c + d*x]]/Sqrt[-Cos[c + d*x]]], -1/5]*Sqrt[-Tan[c + d*x]^2])/
(Sqrt[5]*d)
```

Rule 2894

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*Sqrt[a^2]*(Sqrt[-Cot[e + f*x]^2]/(a*f*Sqr
t[a^2 - b^2]*Cot[e + f*x]))*Rt[(a + b)/d, 2]*EllipticF[ArcSin[Sqrt[a + b*Si
n[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]], -(a + b)/(a - b)], x] /
; FreeQ[{a, b, d, e, f}, x] && GtQ[a^2 - b^2, 0] && PosQ[(a + b)/d] && GtQ[
a^2, 0]
```

Rule 2896

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(-d)*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]
, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[(-d)*Sin[e + f*x]]), x], x] /; FreeQ
[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0] && NegQ[(a + b)/d]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{-\cos(c+dx)}\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-3+2\cos(c+dx)}}\,dx}{\sqrt{\cos(c+dx)}}$$

$$= -\frac{2\sqrt{-\cos(c+dx)}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{-3+2\cos(c+dx)}}{\sqrt{-\cos(c+dx)}}\right),-\frac{1}{5}\right)\sqrt{-\tan^2(c}{\sqrt{5}d}$$

Mathematica [A] (verified)

Time = 1.04 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.71

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{-3+2\cos(c+dx)}}\,dx$$

$$= \frac{2\sqrt{\cos(c+dx)}\sqrt{\frac{-3+2\cos(c+dx)}{-1+\cos(c+dx)}}\sqrt{-\cot^2\left(\frac{1}{2}(c+dx)\right)}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{\frac{-3+2\cos(c+dx)}{-1+\cos(c+dx)}}}{\sqrt{3}}\right),\frac{6}{5}\right)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{5}d\sqrt{\frac{\cos(c+dx)}{-1+\cos(c+dx)}}\sqrt{-3+2\cos(c+dx)}}$$

```
[In] Integrate[1/(Sqrt[Cos[c + d*x]]*Sqrt[-3 + 2*Cos[c + d*x]]),x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*Sqrt[(-3 + 2*Cos[c + d*x])/(-1 + Cos[c + d*x])]*Sqrt[
-Cot[(c + d*x)/2]^2]*EllipticF[ArcSin[Sqrt[(-3 + 2*Cos[c + d*x])/(-1 + Cos[
c + d*x])]/Sqrt[3]], 6/5]*Tan[(c + d*x)/2])/(Sqrt[5]*d*Sqrt[Cos[c + d*x]/(-
1 + Cos[c + d*x])]*Sqrt[-3 + 2*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 7.30 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.33

method	result	size
default	$-\frac{i(1+\cos(dx+c))\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{-\frac{2(-3+2\cos(dx+c))}{1+\cos(dx+c)}}\,F\left(i(\csc(dx+c)-\cot(dx+c))\sqrt{5},\frac{i\sqrt{5}}{5}\right)\sqrt{5}}{5d\sqrt{-3+2\cos(dx+c)}\,\sqrt{\cos(dx+c)}}$	112

```
[In] int(1/cos(d*x+c)^(1/2)/(-3+2*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/5*I/d*(1+cos(d*x+c))*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)/(-3+2*cos
(d*x+c))^(1/2)*(-2*(-3+2*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(csc
(d*x+c)-cot(d*x+c))*5^(1/2),1/5*I*5^(1/2))/cos(d*x+c)^(1/2)*5^(1/2)
```

Fricas [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{2\,\cos\left(dx+c\right)-3}\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(-3+2*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(2*cos(d*x + c) - 3)*sqrt(cos(d*x + c))/(2*cos(d*x + c)^2 - 3*
cos(d*x + c)), x)
```

Sympy [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{2\cos\left(c+dx\right)-3}\sqrt{\cos\left(c+dx\right)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(1/2)/(-3+2*cos(d*x+c))**(1/2),x)
[Out] Integral(1/(sqrt(2*cos(c + d*x) - 3)*sqrt(cos(c + d*x))), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{2\,\cos\left(dx+c\right)-3}\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(-3+2*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(2*cos(d*x + c) - 3)*sqrt(cos(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{2\cos\left(dx+c\right)-3}\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/2)/(-3+2*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(2*cos(d*x + c) - 3)*sqrt(cos(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{2\cos\left(c+d\,x\right)-3}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(2*cos(c + d*x) - 3)^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(2*cos(c + d*x) - 3)^(1/2)), x)
```

3.651 $\int \frac{1}{\sqrt{-3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 82

$$\int \frac{1}{\sqrt{-3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = -\frac{2\sqrt{-\cos(c+dx)}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{-3-2\cos(c+dx)}}{\sqrt{5}\sqrt{-\cos(c+dx)}}\right),-5\right)\sqrt{-\tan^2(c+dx)}}{d}$$

```
[Out] -2*csc(d*x+c)*EllipticF(1/5*(-3-2*cos(d*x+c))^(1/2)*5^(1/2)/(-cos(d*x+c))^(
1/2),I*5^(1/2))*(-cos(d*x+c))^(1/2)*cos(d*x+c)^(1/2)*(-tan(d*x+c)^2)^(1/2)/
d
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.080$, Rules used = {2896, 2894}

$$\int \frac{1}{\sqrt{-3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = -\frac{2\sqrt{-\cos(c+dx)}\sqrt{\cos(c+dx)}\sqrt{-\tan^2(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{-2\cos(c+dx)-3}}{\sqrt{5}\sqrt{-\cos(c+dx)}}\right),-5\right)}{d}$$

```
[In] Int[1/(Sqrt[-3 - 2*Cos[c + d*x]]*Sqrt[Cos[c + d*x]]),x]
```

```
[Out] (-2*Sqrt[-Cos[c + d*x]]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSin[Sq
rt[-3 - 2*Cos[c + d*x]]/(Sqrt[5]*Sqrt[-Cos[c + d*x]])], -5]*Sqrt[-Tan[c + d
*x]^2])/d
```

Rule 2894

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*Sqrt[a^2]*(Sqrt[-Cot[e + f*x]^2]/(a*f*Sqr
t[a^2 - b^2]*Cot[e + f*x]))*Rt[(a + b)/d, 2]*EllipticF[ArcSin[Sqrt[a + b*Si
n[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]], -(a + b)/(a - b)], x] /
; FreeQ[{a, b, d, e, f}, x] && GtQ[a^2 - b^2, 0] && PosQ[(a + b)/d] && GtQ[
a^2, 0]
```

Rule 2896

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(-d)*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]
, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[(-d)*Sin[e + f*x]]), x], x] /; FreeQ
[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0] && NegQ[(a + b)/d]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{-\cos(c+dx)}\int \frac{1}{\sqrt{-3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx}{\sqrt{\cos(c+dx)}}$$

$$= -\frac{2\sqrt{-\cos(c+dx)}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{-3-2\cos(c+dx)}}{\sqrt{5}\sqrt{-\cos(c+dx)}}\right),-5\right)\sqrt{-\tan^2(c}{d}$$

Mathematica [A] (verified)

Time = 1.44 (sec) , antiderivative size = 153, normalized size of antiderivative = 1.87

$$\int \frac{1}{\sqrt{-3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{4\sqrt{\cot^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{-\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{(3+2\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}\csc(c+dx)\,\text{Elli}}{\sqrt{5}d\sqrt{-3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}$$

```
[In] Integrate[1/(Sqrt[-3 - 2*Cos[c + d*x]]*Sqrt[Cos[c + d*x]]),x]
```

```
[Out] (4*Sqrt[Cot[(c + d*x)/2]^2]*Sqrt[-(Cos[c + d*x]*Csc[(c + d*x)/2]^2)]*Sqrt[(
3 + 2*Cos[c + d*x])*Csc[(c + d*x)/2]^2]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[
5/3]*Sqrt[Cos[c + d*x]/(-1 + Cos[c + d*x])]], 6/5]*Sin[(c + d*x)/2]^4)/(Sqr
t[5]*d*Sqrt[-3 - 2*Cos[c + d*x]]*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 7.38 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.54

method	result	size
default	$\frac{i(1+\cos(dx+c))\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{-3-2\cos(dx+c)}\,\sqrt{10}\,\sqrt{\frac{3+2\cos(dx+c)}{1+\cos(dx+c)}}\,F\left(\frac{i(\csc(dx+c)-\cot(dx+c))\sqrt{5}}{5},i\sqrt{5}\right)\sqrt{5}}{5d(3+2\cos(dx+c))\sqrt{\cos(dx+c)}}$	126

[In] int(1/(-3-2*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)

[Out] 1/5*I/d*(1+cos(d*x+c))*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(-3-2*cos(d*x+c))^(1/2)*10^(1/2)*((3+2*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)*EllipticF(1/5*I*(csc(d*x+c)-cot(d*x+c))*5^(1/2),I*5^(1/2))/(3+2*cos(d*x+c))/cos(d*x+c)^(1/2)*5^(1/2)

Fricas [F]

$$\int \frac{1}{\sqrt{-3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx=\int \frac{1}{\sqrt{-2\,\cos\left(dx+c\right)-3}\sqrt{\cos\left(dx+c\right)}}\,dx$$

[In] integrate(1/(-3-2*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-2*cos(d*x + c) - 3)*sqrt(cos(d*x + c))/(2*cos(d*x + c)^2 + 3*cos(d*x + c)), x)

Sympy [F]

$$\int \frac{1}{\sqrt{-3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx=\int \frac{1}{\sqrt{-2\cos\left(c+dx\right)-3}\sqrt{\cos\left(c+dx\right)}}\,dx$$

[In] integrate(1/(-3-2*cos(d*x+c))**(1/2)/cos(d*x+c)**(1/2),x)

[Out] Integral(1/(sqrt(-2*cos(c + d*x) - 3)*sqrt(cos(c + d*x))), x)

Maxima [F]

$$\int \frac{1}{\sqrt{-3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx=\int \frac{1}{\sqrt{-2\,\cos\left(dx+c\right)-3}\sqrt{\cos\left(dx+c\right)}}\,dx$$

[In] integrate(1/(-3-2*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="maxima")

[Out] integrate(1/(sqrt(-2*cos(d*x + c) - 3)*sqrt(cos(d*x + c))), x)

Giac [F]

$$\int \frac{1}{\sqrt{-3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-2\cos\left(dx+c\right)-3}\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate(1/(-3-2*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(-2*cos(d*x + c) - 3)*sqrt(cos(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{-3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{-2\cos\left(c+d\,x\right)-3}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/2)*(- 2*cos(c + d*x) - 3)^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(1/2)*(- 2*cos(c + d*x) - 3)^(1/2)), x)
```

3.652 $\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{2+3\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 54

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{2+3\cos(c+dx)}}\,dx = \frac{2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right),\frac{1}{5}\right)}{\sqrt{5}d\sqrt{-\cos(c+dx)}}$$

```
[Out] 2/5*EllipticF(sin(d*x+c)/(1+cos(d*x+c)),1/5*5^(1/2))*cos(d*x+c)^(1/2)/d*5^(
1/2)/(-cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.074, Rules used = {2893, 2892}

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{2+3\cos(c+dx)}}\,dx = \frac{2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{\cos(c+dx)+1}\right),\frac{1}{5}\right)}{\sqrt{5}d\sqrt{-\cos(c+dx)}}$$

```
[In] Int[1/(Sqrt[-Cos[c + d*x]]*Sqrt[2 + 3*Cos[c + d*x]]),x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*EllipticF[ArcSin[Sin[c + d*x]/(1 + Cos[c + d*x])], 1/
5])/(Sqrt[5]*d*Sqrt[-Cos[c + d*x]])
```

Rule 2892

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(d/(f*Sqrt[a + b*d]))*EllipticF[ArcSin[Co
```

```
s[e + f*x]/(1 + d*Sin[e + f*x])], -(a - b*d)/(a + b*d)], x] /; FreeQ[{a, b,
 d, e, f}, x] && LtQ[a^2 - b^2, 0] && EqQ[d^2, 1] && GtQ[b*d, 0]
```

Rule 2893

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[Sign[b]*Sin[e + f*x]]/Sqrt[d*Sin[e + f*
x]], Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[Sign[b]*Sin[e + f*x]]), x], x] /;
 FreeQ[{a, b, d, e, f}, x] && LtQ[a^2 - b^2, 0] && GtQ[b^2, 0] &&  !(EqQ[d^
2, 1] && GtQ[b*d, 0])
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{2+3\cos(c+dx)}}\,dx}{\sqrt{-\cos(c+dx)}} \\ &= \frac{2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right),\frac{1}{5}\right)}{\sqrt{5}d\sqrt{-\cos(c+dx)}}\end{aligned}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 150 vs. $2(54) = 108$.

Time = 0.46 (sec) , antiderivative size = 150, normalized size of antiderivative = 2.78

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{2+3\cos(c+dx)}}\,dx = -\frac{4\sqrt{\cot^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{-\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{(2+3\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}\csc(c+dx)\,\mathrm{E}}{d\sqrt{-\cos(c+dx)}\sqrt{2+3\cos(}}$$

```
[In] Integrate[1/(Sqrt[-Cos[c + d*x]]*Sqrt[2 + 3*Cos[c + d*x]]),x]
```

```
[Out] (-4*Sqrt[Cot[(c + d*x)/2]^2]*Sqrt[-(Cos[c + d*x]*Csc[(c + d*x)/2]^2)]*Sqrt[
(2 + 3*Cos[c + d*x])*Csc[(c + d*x)/2]^2]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt
[(2 + 3*Cos[c + d*x])*Csc[(c + d*x)/2]^2]/2], -4]*Sin[(c + d*x)/2]^4)/(d*Sq
rt[-Cos[c + d*x]]*Sqrt[2 + 3*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 110 vs. 2(49) = 98.

Time = 7.25 (sec) , antiderivative size = 111, normalized size of antiderivative = 2.06

method	result	size
default	$\frac{(1+\cos(dx+c))F\left(\frac{(\csc(dx+c)-\cot(dx+c))\sqrt{5}}{5},\sqrt{5}\right)\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{10}\,\sqrt{\frac{2+3\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{5}}{5d\sqrt{2+3\cos(dx+c)}\,\sqrt{-\cos(dx+c)}}$	111

```
[In] int(1/(-cos(d*x+c))^(1/2)/(2+3*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/5/d*(1+cos(d*x+c))*EllipticF(1/5*(csc(d*x+c)-cot(d*x+c))*5^(1/2),5^(1/2))
*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*10^(1/2)*((2+3*cos(d*x+c))/(1+co
s(d*x+c)))^(1/2)/(2+3*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2)*5^(1/2)
```

Fricas [F]

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(dx+c\right)}\sqrt{3\,\cos\left(dx+c\right)+2}}\,dx$$

```
[In] integrate(1/(-cos(d*x+c))^(1/2)/(2+3*cos(d*x+c))^(1/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-cos(d*x + c))*sqrt(3*cos(d*x + c) + 2)/(3*cos(d*x + c)^2 +
2*cos(d*x + c)), x)
```

Sympy [F]

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(c+dx\right)}\sqrt{3\cos\left(c+dx\right)+2}}\,dx$$

```
[In] integrate(1/(-cos(d*x+c))**(1/2)/(2+3*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/(sqrt(-cos(c + d*x))*sqrt(3*cos(c + d*x) + 2)), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(dx+c\right)}\sqrt{3\,\cos\left(dx+c\right)+2}}\,dx$$

[In] integrate(1/(-cos(d*x+c))^(1/2)/(2+3*cos(d*x+c))^(1/2),x, algorithm="maxima
")

[Out] integrate(1/(sqrt(-cos(d*x + c))*sqrt(3*cos(d*x + c) + 2)), x)

Giac [F]

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(dx+c\right)}\sqrt{3\,\cos\left(dx+c\right)+2}}\,dx$$

[In] integrate(1/(-cos(d*x+c))^(1/2)/(2+3*cos(d*x+c))^(1/2),x, algorithm="giac")

[Out] integrate(1/(sqrt(-cos(d*x + c))*sqrt(3*cos(d*x + c) + 2)), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(c+d\,x\right)}\,\sqrt{3\,\cos\left(c+d\,x\right)+2}}\,dx$$

[In] int(1/((-cos(c + d*x))^(1/2)*(3*cos(c + d*x) + 2)^(1/2)),x)

[Out] int(1/((-cos(c + d*x))^(1/2)*(3*cos(c + d*x) + 2)^(1/2)), x)

3.653 $\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 47

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}\,dx = \frac{2\sqrt{\cos(c+dx)}\,\mathrm{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right),5\right)}{d\sqrt{-\cos(c+dx)}}$$

```
[Out] 2*EllipticF(sin(d*x+c)/(1+cos(d*x+c)),5^(1/2))*cos(d*x+c)^(1/2)/d/(-cos(d*x
+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.074, Rules used = {2893, 2892}

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}\,dx = \frac{2\sqrt{\cos(c+dx)}\,\mathrm{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{\cos(c+dx)+1}\right),5\right)}{d\sqrt{-\cos(c+dx)}}$$

```
[In] Int[1/(Sqrt[-Cos[c + d*x]]*Sqrt[-2 + 3*Cos[c + d*x]]),x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*EllipticF[ArcSin[Sin[c + d*x]/(1 + Cos[c + d*x])], 5]
)/(d*Sqrt[-Cos[c + d*x]])
```

Rule 2892

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(d/(f*Sqrt[a + b*d]))*EllipticF[ArcSin[Co
s[e + f*x]/(1 + d*Sin[e + f*x])], -(a - b*d)/(a + b*d)], x] /; FreeQ[{a, b,
 d, e, f}, x] && LtQ[a^2 - b^2, 0] && EqQ[d^2, 1] && GtQ[b*d, 0]
```

Rule 2893

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[Sign[b]*Sin[e + f*x]]/Sqrt[d*Sin[e + f*
x]], Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[Sign[b]*Sin[e + f*x]]), x], x] /;
 FreeQ[{a, b, d, e, f}, x] && LtQ[a^2 - b^2, 0] && GtQ[b^2, 0] &&  !(EqQ[d^
2, 1] && GtQ[b*d, 0])
```

Rubi steps

$$\text{integral} = \frac{\sqrt{\cos(c+dx)}\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}\,dx}{\sqrt{-\cos(c+dx)}}$$

$$= \frac{2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1+\cos(c+dx)}\right),5\right)}{d\sqrt{-\cos(c+dx)}}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 158 vs. $2(47) = 94$.

Time = 0.36 (sec) , antiderivative size = 158, normalized size of antiderivative = 3.36

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}\,dx$$
$$= \frac{4\sqrt{\cot^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{-\left((-2+3\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)\right)}\csc(c+dx)}{\sqrt{5}d\sqrt{-\cos(c+dx)}\sqrt{-2+3}}$$

```
[In] Integrate[1/(Sqrt[-Cos[c + d*x]]*Sqrt[-2 + 3*Cos[c + d*x]]),x]
```

```
[Out] (4*Sqrt[Cot[(c + d*x)/2]^2]*Sqrt[Cos[c + d*x]*Csc[(c + d*x)/2]^2]*Sqrt[-((-
2 + 3*Cos[c + d*x])*Csc[(c + d*x)/2]^2)]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt
[-((-2 + 3*Cos[c + d*x])*Csc[(c + d*x)/2]^2)]/2], 4/5]*Sin[(c + d*x)/2]^4)/
(Sqrt[5]*d*Sqrt[-Cos[c + d*x]]*Sqrt[-2 + 3*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 96 vs. $2(44) = 88$.

Time = 6.59 (sec) , antiderivative size = 97, normalized size of antiderivative = 2.06

method	result	size
default	$-\frac{2(1+\cos(dx+c))F\left(\cot(dx+c)-\csc(dx+c),\sqrt{5}\right)\sqrt{\frac{-2+3\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}{d\sqrt{-2+3\cos(dx+c)}\sqrt{-\cos(dx+c)}}$	97

[In] int(1/(-cos(d*x+c))^(1/2)/(-2+3*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)

[Out] -2/d*(1+cos(d*x+c))*EllipticF(cot(d*x+c)-csc(d*x+c),5^(1/2))*((-2+3*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)/(-2+3*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2)

Fricas [F]

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(dx+c\right)}\sqrt{3\,\cos\left(dx+c\right)-2}}\,dx$$

[In] integrate(1/(-cos(d*x+c))^(1/2)/(-2+3*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-cos(d*x + c))*sqrt(3*cos(d*x + c) - 2)/(3*cos(d*x + c)^2 - 2*cos(d*x + c)), x)

Sympy [F]

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(c+dx\right)}\sqrt{3\cos\left(c+dx\right)-2}}\,dx$$

[In] integrate(1/(-cos(d*x+c))**(1/2)/(-2+3*cos(d*x+c))**(1/2),x)

[Out] Integral(1/(sqrt(-cos(c + d*x))*sqrt(3*cos(c + d*x) - 2)), x)

Maxima [F]

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(dx+c\right)}\sqrt{3\,\cos\left(dx+c\right)-2}}\,dx$$

[In] integrate(1/(-cos(d*x+c))^(1/2)/(-2+3*cos(d*x+c))^(1/2),x, algorithm="maxima")

[Out] integrate(1/(sqrt(-cos(d*x + c))*sqrt(3*cos(d*x + c) - 2)), x)

Giac [F]

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(dx+c\right)}\sqrt{3\,\cos\left(dx+c\right)-2}}\,dx$$

```
[In] integrate(1/(-cos(d*x+c))^(1/2)/(-2+3*cos(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate(1/(sqrt(-cos(d*x + c))*sqrt(3*cos(d*x + c) - 2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(c+d\,x\right)}\,\sqrt{3\,\cos\left(c+d\,x\right)-2}}\,dx$$

```
[In] int(1/((-cos(c + d*x))^(1/2)*(3*cos(c + d*x) - 2)^(1/2)),x)
```

```
[Out] int(1/((-cos(c + d*x))^(1/2)*(3*cos(c + d*x) - 2)^(1/2)), x)
```

3.654 $\int \frac{1}{\sqrt{2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 34

$$\int \frac{1}{\sqrt{2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = -\frac{2\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1-\cos(c+dx)}\right),\frac{1}{5}\right)}{\sqrt{5}d}$$

```
[Out] -2/5*EllipticF(sin(d*x+c)/(1-cos(d*x+c)),1/5*5^(1/2))/d*5^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.037, Rules used = {2892}

$$\int \frac{1}{\sqrt{2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = -\frac{2\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1-\cos(c+dx)}\right),\frac{1}{5}\right)}{\sqrt{5}d}$$

```
[In] Int[1/(Sqrt[2 - 3*Cos[c + d*x]]*Sqrt[-Cos[c + d*x]]),x]
[Out] (-2*EllipticF[ArcSin[Sin[c + d*x]/(1 - Cos[c + d*x])], 1/5])/(Sqrt[5]*d)
```

Rule 2892

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(d/(f*Sqrt[a + b*d]))*EllipticF[ArcSin[Co
s[e + f*x]/(1 + d*Sin[e + f*x])], -(a - b*d)/(a + b*d)], x] /; FreeQ[{a, b,
 d, e, f}, x] && LtQ[a^2 - b^2, 0] && EqQ[d^2, 1] && GtQ[b*d, 0]
```

Rubi steps

$$\text{integral} = -\frac{2\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1-\cos(c+dx)}\right),\frac{1}{5}\right)}{\sqrt{5}d}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 145 vs. 2(34) = 68.

Time = 0.52 (sec) , antiderivative size = 145, normalized size of antiderivative = 4.26

$$\int \frac{1}{\sqrt{2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = -\frac{4\sqrt{\cot^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{(2-3\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}\csc(c+dx)\,\mathrm{Elli}}{d\sqrt{2-3\cos(c+dx)}\sqrt{-\cos(c+d}}$$

```
[In] Integrate[1/(Sqrt[2 - 3*Cos[c + d*x]]*Sqrt[-Cos[c + d*x]]),x]
```

```
[Out] (-4*Sqrt[Cot[(c + d*x)/2]^2]*Sqrt[(2 - 3*Cos[c + d*x])*Csc[(c + d*x)/2]^2]*
Sqrt[Cos[c + d*x]*Csc[(c + d*x)/2]^2]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[Co
s[c + d*x]*Csc[(c + d*x)/2]^2]/2], -4]*Sin[(c + d*x)/2]^4)/(d*Sqrt[2 - 3*Co
s[c + d*x]]*Sqrt[-Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 108 vs. 2(33) = 66.

Time = 6.04 (sec) , antiderivative size = 109, normalized size of antiderivative = 3.21

method	result	size
default	$\frac{2(1+\cos(dx+c))F\left(\cot(dx+c)-\csc(dx+c),\sqrt{5}\right)\sqrt{\frac{-2+3\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{2-3\cos(dx+c)}}{d\sqrt{-\cos(dx+c)}\,(-2+3\cos(dx+c))}$	109

```
[In] int(1/(2-3*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d*(1+cos(d*x+c))*EllipticF(cot(d*x+c)-csc(d*x+c),5^(1/2))*((-2+3*cos(d*x+
c))/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(2-3*cos(d*x+c)
)^(1/2)/(-cos(d*x+c))^(1/2)/(-2+3*cos(d*x+c))
```

Fricas [F]

$$\int \frac{1}{\sqrt{2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos(dx+c)}\sqrt{-3\cos(dx+c)+2}}\,dx$$

```
[In] integrate(1/(2-3*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-cos(d*x + c))*sqrt(-3*cos(d*x + c) + 2)/(3*cos(d*x + c)^2 -
2*cos(d*x + c)), x)
```

Sympy [F]

$$\int \frac{1}{\sqrt{2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos{(c+dx)}}\sqrt{2-3\cos{(c+dx)}}}\,dx$$

```
[In] integrate(1/(2-3*cos(d*x+c))**(1/2)/(-cos(d*x+c))**(1/2),x)
[Out] Integral(1/(sqrt(-cos(c + d*x))*sqrt(2 - 3*cos(c + d*x))), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(dx+c\right)}\sqrt{-3\,\cos\left(dx+c\right)+2}}\,dx$$

```
[In] integrate(1/(2-3*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),x, algorithm="maxima
")
[Out] integrate(1/(sqrt(-cos(d*x + c))*sqrt(-3*cos(d*x + c) + 2)), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(dx+c\right)}\sqrt{-3\,\cos\left(dx+c\right)+2}}\,dx$$

```
[In] integrate(1/(2-3*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(-cos(d*x + c))*sqrt(-3*cos(d*x + c) + 2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(c+d\,x\right)}\,\sqrt{2-3\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/((-cos(c + d*x))^(1/2)*(2 - 3*cos(c + d*x))^(1/2)),x)
[Out] int(1/((-cos(c + d*x))^(1/2)*(2 - 3*cos(c + d*x))^(1/2)), x)
```

3.655 $\int \frac{1}{\sqrt{-2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 27

$$\int \frac{1}{\sqrt{-2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = -\frac{2\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1-\cos(c+dx)}\right),5\right)}{d}$$

```
[Out] -2*EllipticF(sin(d*x+c)/(1-cos(d*x+c)),5^(1/2))/d
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.037, Rules used = {2892}

$$\int \frac{1}{\sqrt{-2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = -\frac{2\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1-\cos(c+dx)}\right),5\right)}{d}$$

```
[In] Int[1/(Sqrt[-2 - 3*Cos[c + d*x]]*Sqrt[-Cos[c + d*x]]),x]
[Out] (-2*EllipticF[ArcSin[Sin[c + d*x]/(1 - Cos[c + d*x])], 5])/d
```

Rule 2892

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(d/(f*Sqrt[a + b*d]))*EllipticF[ArcSin[Co
s[e + f*x]/(1 + d*Sin[e + f*x])], -(a - b*d)/(a + b*d)], x] /; FreeQ[{a, b,
 d, e, f}, x] && LtQ[a^2 - b^2, 0] && EqQ[d^2, 1] && GtQ[b*d, 0]
```

Rubi steps

$$\text{integral} = -\frac{2\,\text{EllipticF}\left(\arcsin\left(\frac{\sin(c+dx)}{1-\cos(c+dx)}\right),5\right)}{d}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 74 vs. $2(27) = 54$.

Time = 0.21 (sec) , antiderivative size = 74, normalized size of antiderivative = 2.74

$$\int \frac{1}{\sqrt{-2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = -\frac{2\sqrt{-\cos(c+dx)}\,\text{EllipticF}\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right),\frac{1}{5}\right)}{\sqrt{5}d\sqrt{-2-3\cos(c+dx)}\sqrt{\frac{\cos(c+dx)}{2+3\cos(c+dx)}}}$$

```
[In] Integrate[1/(Sqrt[-2 - 3*Cos[c + d*x]]*Sqrt[-Cos[c + d*x]]),x]
[Out] (-2*Sqrt[-Cos[c + d*x]]*EllipticF[ArcSin[Tan[(c + d*x)/2]], 1/5])/(Sqrt[5]*
d*Sqrt[-2 - 3*Cos[c + d*x]]*Sqrt[Cos[c + d*x]/(2 + 3*Cos[c + d*x])])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 116 vs. $2(28) = 56$.

Time = 6.84 (sec) , antiderivative size = 117, normalized size of antiderivative = 4.33

method	result	size
default	$\frac{(1+\cos(dx+c))F\left(\cot(dx+c)-\csc(dx+c),\frac{\sqrt{5}}{5}\right)\sqrt{10}\sqrt{\frac{2+3\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{-2-3\cos(dx+c)}}{5d\sqrt{-\cos(dx+c)}\,(2+3\cos(dx+c))}$	117

```
[In] int(1/(-2-3*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/5/d*(1+cos(d*x+c))*EllipticF(cot(d*x+c)-csc(d*x+c),1/5*5^(1/2))*10^(1/2)*
((2+3*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)*(-2-3*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2)/(2+3*cos(d*x+c))
```

Fricas [F]

$$\int \frac{1}{\sqrt{-2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos(dx+c)}\sqrt{-3\cos(dx+c)-2}}\,dx$$

```
[In] integrate(1/(-2-3*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),x, algorithm="frica
s")
[Out] integral(sqrt(-cos(d*x + c))*sqrt(-3*cos(d*x + c) - 2)/(3*cos(d*x + c)^2 +
2*cos(d*x + c)), x)
```

Sympy [F]

$$\int \frac{1}{\sqrt{-2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos{(c+dx)}}\sqrt{-3\cos{(c+dx)}-2}}\,dx$$

```
[In] integrate(1/(-2-3*cos(d*x+c))**(1/2)/(-cos(d*x+c))**(1/2),x)
[Out] Integral(1/(sqrt(-cos(c + d*x))*sqrt(-3*cos(c + d*x) - 2)), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{-2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos{(dx+c)}}\sqrt{-3\,\cos{(dx+c)}-2}}\,dx$$

```
[In] integrate(1/(-2-3*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),x, algorithm="maxim
a")
[Out] integrate(1/(sqrt(-cos(d*x + c))*sqrt(-3*cos(d*x + c) - 2)), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{-2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos{(dx+c)}}\sqrt{-3\,\cos{(dx+c)}-2}}\,dx$$

```
[In] integrate(1/(-2-3*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),x, algorithm="giac"
)
[Out] integrate(1/(sqrt(-cos(d*x + c))*sqrt(-3*cos(d*x + c) - 2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{-2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos{(c+d\,x)}}\,\sqrt{-3\,\cos{(c+d\,x)}-2}}\,dx$$

```
[In] int(1/((-cos(c + d*x))^(1/2)*(- 3*cos(c + d*x) - 2)^(1/2)),x)
[Out] int(1/((-cos(c + d*x))^(1/2)*(- 3*cos(c + d*x) - 2)^(1/2)), x)
```

3.656 $\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{3+2\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 80

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{3+2\cos(c+dx)}}\,dx = \frac{2\cos^{\frac{3}{2}}(c+dx)\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{3+2\cos(c+dx)}}{\sqrt{5}\sqrt{\cos(c+dx)}}\right),-5\right)\sqrt{-\tan^2(c+dx)}}{d\sqrt{-\cos(c+dx)}}$$

```
[Out] 2*cos(d*x+c)^(3/2)*csc(d*x+c)*EllipticF(1/5*(3+2*cos(d*x+c))^(1/2)*5^(1/2)/
cos(d*x+c)^(1/2),I*5^(1/2))*(-tan(d*x+c)^2)^(1/2)/d/(-cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.074, Rules used = {2896, 2894}

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{3+2\cos(c+dx)}}\,dx = \frac{2\cos^{\frac{3}{2}}(c+dx)\sqrt{-\tan^2(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{2\cos(c+dx)+3}}{\sqrt{5}\sqrt{\cos(c+dx)}}\right),-5\right)}{d\sqrt{-\cos(c+dx)}}$$

```
[In] Int[1/(Sqrt[-Cos[c + d*x]]*Sqrt[3 + 2*Cos[c + d*x]]),x]
```

```
[Out] (2*Cos[c + d*x]^(3/2)*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[3 + 2*Cos[c + d*x]
]/(Sqrt[5]*Sqrt[Cos[c + d*x]])], -5]*Sqrt[-Tan[c + d*x]^2])/(d*Sqrt[-Cos[c
+ d*x]])
```

Rule 2894

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*Sqrt[a^2]*(Sqrt[-Cot[e + f*x]^2]/(a*f*Sqr
t[a^2 - b^2]*Cot[e + f*x]))*Rt[(a + b)/d, 2]*EllipticF[ArcSin[Sqrt[a + b*Si
n[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]], -(a + b)/(a - b)], x] /
; FreeQ[{a, b, d, e, f}, x] && GtQ[a^2 - b^2, 0] && PosQ[(a + b)/d] && GtQ[
a^2, 0]
```

Rule 2896

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(-d)*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]
, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[(-d)*Sin[e + f*x]]), x], x] /; FreeQ
[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0] && NegQ[(a + b)/d]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{\cos(c+dx)}\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{3+2\cos(c+dx)}}\,dx}{\sqrt{-\cos(c+dx)}}$$

$$= \frac{2\cos^{\frac{3}{2}}(c+dx)\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{3+2\cos(c+dx)}}{\sqrt{5}\sqrt{\cos(c+dx)}}\right),-5\right)\sqrt{-\tan^2(c+dx)}}{d\sqrt{-\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.54 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.92

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{3+2\cos(c+dx)}}\,dx =$$

$$-\frac{4\sqrt{-\cot^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{-\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{(3+2\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}\csc(c+dx}{d\sqrt{-\cos(c+dx)}\sqrt{3+2\cos(c+dx}}$$

```
[In] Integrate[1/(Sqrt[-Cos[c + d*x]]*Sqrt[3 + 2*Cos[c + d*x]]),x]
```

```
[Out] (-4*Sqrt[-Cot[(c + d*x)/2]^2]*Sqrt[-(Cos[c + d*x]*Csc[(c + d*x)/2]^2)]*Sqrt
[(3 + 2*Cos[c + d*x])*Csc[(c + d*x)/2]^2]*Csc[c + d*x]*EllipticF[ArcSin[Sqr
t[(3 + 2*Cos[c + d*x])*Csc[(c + d*x)/2]^2]/Sqrt[6]], 6]*Sin[(c + d*x)/2]^4)
/(d*Sqrt[-Cos[c + d*x]]*Sqrt[3 + 2*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 7.54 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.45

method	result	size
default	$-\frac{i(1+\cos(dx+c))F\left(\frac{i(\csc(dx+c)-\cot(dx+c))\sqrt{5}}{5},i\sqrt{5}\right)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{10}\sqrt{\frac{3+2\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{5}}{5d\sqrt{3+2\cos(dx+c)}\sqrt{-\cos(dx+c)}}$	116

```
[In] int(1/(-cos(d*x+c))^(1/2)/(3+2*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/5*I/d*(1+cos(d*x+c))*EllipticF(1/5*I*(csc(d*x+c)-cot(d*x+c))*5^(1/2),I*5
^(1/2))*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*10^(1/2)*((3+2*cos(d*x+c)
)/(1+cos(d*x+c)))^(1/2)/(3+2*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2)*5^(1/2)
```

Fricas [F]

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{3+2\cos(c+dx)}}\,dx=\int \frac{1}{\sqrt{-\cos(dx+c)}\sqrt{2\cos(dx+c)+3}}\,dx$$

```
[In] integrate(1/(-cos(d*x+c))^(1/2)/(3+2*cos(d*x+c))^(1/2),x, algorithm="fricas
")
[Out] integral(-sqrt(-cos(d*x + c))*sqrt(2*cos(d*x + c) + 3)/(2*cos(d*x + c)^2 +
3*cos(d*x + c)), x)
```

Sympy [F]

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{3+2\cos(c+dx)}}\,dx=\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{2\cos(c+dx)+3}}\,dx$$

```
[In] integrate(1/(-cos(d*x+c))**(1/2)/(3+2*cos(d*x+c))**(1/2),x)
[Out] Integral(1/(sqrt(-cos(c + d*x))*sqrt(2*cos(c + d*x) + 3)), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{3+2\cos(c+dx)}}\,dx=\int \frac{1}{\sqrt{-\cos(dx+c)}\sqrt{2\cos(dx+c)+3}}\,dx$$

```
[In] integrate(1/(-cos(d*x+c))^(1/2)/(3+2*cos(d*x+c))^(1/2),x, algorithm="maxima
")
[Out] integrate(1/(sqrt(-cos(d*x + c))*sqrt(2*cos(d*x + c) + 3)), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{3+2\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(dx+c\right)}\sqrt{2\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(1/(-cos(d*x+c))^(1/2)/(3+2*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(-cos(d*x + c))*sqrt(2*cos(d*x + c) + 3)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{3+2\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(c+d\,x\right)}\,\sqrt{2\,\cos\left(c+d\,x\right)+3}}\,dx$$

```
[In] int(1/((-cos(c + d*x))^(1/2)*(2*cos(c + d*x) + 3)^(1/2)),x)
[Out] int(1/((-cos(c + d*x))^(1/2)*(2*cos(c + d*x) + 3)^(1/2)), x)
```

3.657 $\int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 82

$$\int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \frac{2\cos^{\frac{3}{2}}(c+dx)\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{3-2\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\right),-\frac{1}{5}\right)\sqrt{-\tan^2(c+dx)}}{\sqrt{5}d\sqrt{-\cos(c+dx)}}$$

```
[Out] 2/5*cos(d*x+c)^(3/2)*csc(d*x+c)*EllipticF((3-2*cos(d*x+c))^(1/2)/cos(d*x+c)
^(1/2),1/5*I*5^(1/2))*(-tan(d*x+c)^2)^(1/2)/d*5^(1/2)/(-cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.074, Rules used = {2896, 2894}

$$\int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \frac{2\cos^{\frac{3}{2}}(c+dx)\sqrt{-\tan^2(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{3-2\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\right),-\frac{1}{5}\right)}{\sqrt{5}d\sqrt{-\cos(c+dx)}}$$

```
[In] Int[1/(Sqrt[3 - 2*Cos[c + d*x]]*Sqrt[-Cos[c + d*x]]),x]
```

```
[Out] (2*Cos[c + d*x]^(3/2)*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[3 - 2*Cos[c + d*x]
]/Sqrt[Cos[c + d*x]]], -1/5]*Sqrt[-Tan[c + d*x]^2])/(Sqrt[5]*d*Sqrt[-Cos[c
+ d*x]])
```

Rule 2894

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*Sqrt[a^2]*(Sqrt[-Cot[e + f*x]^2]/(a*f*Sqr
t[a^2 - b^2]*Cot[e + f*x]))*Rt[(a + b)/d, 2]*EllipticF[ArcSin[Sqrt[a + b*Si
n[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]], -(a + b)/(a - b)], x] /
; FreeQ[{a, b, d, e, f}, x] && GtQ[a^2 - b^2, 0] && PosQ[(a + b)/d] && GtQ[
a^2, 0]
```

Rule 2896

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Dist[Sqrt[(-d)*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]
, Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[(-d)*Sin[e + f*x]]), x], x] /; FreeQ
[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0] && NegQ[(a + b)/d]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{\cos(c+dx)}\int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}\,dx}{\sqrt{-\cos(c+dx)}}$$

$$= \frac{2\cos^{\frac{3}{2}}(c+dx)\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{3-2\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\right),-\frac{1}{5}\right)\sqrt{-\tan^2(c+dx)}}{\sqrt{5}d\sqrt{-\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.46 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.78

$$\int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx$$

$$= \frac{4\sqrt{\cot^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{(3-2\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{-\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}\csc(c+dx)\,\text{Elli}}{d\sqrt{3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}$$

```
[In] Integrate[1/(Sqrt[3 - 2*Cos[c + d*x]]*Sqrt[-Cos[c + d*x]]),x]
```

```
[Out] (4*Sqrt[Cot[(c + d*x)/2]^2]*Sqrt[(3 - 2*Cos[c + d*x])*Csc[(c + d*x)/2]^2]*S
qrt[-(Cos[c + d*x]*Csc[(c + d*x)/2]^2)]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[
Cos[c + d*x]/(-1 + Cos[c + d*x])]/Sqrt[3]], 6]*Sin[(c + d*x)/2]^4)/(d*Sqrt[
3 - 2*Cos[c + d*x]]*Sqrt[-Cos[c + d*x]])
```

Maple [A] (verified)

Time = 6.40 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.29

method	result	size
default	$-\frac{2iF\left(i(\csc(dx+c)-\cot(dx+c))\sqrt{5},\frac{i\sqrt{5}}{5}\right)\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{3-2\cos(dx+c)}\,\sqrt{5}}{5d\sqrt{-\frac{2(-3+2\cos(dx+c))}{1+\cos(dx+c)}}\,\sqrt{-\cos(dx+c)}}$	106

```
[In] int(1/(3-2*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/5*I/d*EllipticF(I*(csc(d*x+c)-cot(d*x+c))*5^(1/2),1/5*I*5^(1/2))*2^(1/2)
*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)/(-2*(-3+2*cos(d*x+c))/(1+cos(d*x+c)))^(1
/2)*(3-2*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2)*5^(1/2)
```

Fricas [F]

$$\int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(dx+c\right)}\sqrt{-2\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(1/(3-2*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-cos(d*x + c))*sqrt(-2*cos(d*x + c) + 3)/(2*cos(d*x + c)^2 -
3*cos(d*x + c)), x)
```

Sympy [F]

$$\int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(c+dx\right)}\sqrt{3-2\cos\left(c+dx\right)}}\,dx$$

```
[In] integrate(1/(3-2*cos(d*x+c))**(1/2)/(-cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/(sqrt(-cos(c + d*x))*sqrt(3 - 2*cos(c + d*x))), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(dx+c\right)}\sqrt{-2\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(1/(3-2*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),x, algorithm="maxima
")
[Out] integrate(1/(sqrt(-cos(d*x + c))*sqrt(-2*cos(d*x + c) + 3)), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(dx+c\right)}\sqrt{-2\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(1/(3-2*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(-cos(d*x + c))*sqrt(-2*cos(d*x + c) + 3)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(c+d\,x\right)}\,\sqrt{3-2\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/((-cos(c + d*x))^(1/2)*(3 - 2*cos(c + d*x))^(1/2)),x)
[Out] int(1/((-cos(c + d*x))^(1/2)*(3 - 2*cos(c + d*x))^(1/2)), x)
```

3.658 $\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-3+2\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 62

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-3+2\cos(c+dx)}}\,dx = -\frac{2\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{-3+2\cos(c+dx)}}{\sqrt{-\cos(c+dx)}}\right),-\frac{1}{5}\right)\sqrt{-\tan^2(c+dx)}}{\sqrt{5}d}$$

```
[Out] -2/5*cot(d*x+c)*EllipticF((-3+2*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),1/5*I
*5^(1/2))*(-tan(d*x+c)^2)^(1/2)/d*5^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.037$, Rules used = {2894}

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-3+2\cos(c+dx)}}\,dx = -\frac{2\sqrt{-\tan^2(c+dx)}\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{2\cos(c+dx)-3}}{\sqrt{-\cos(c+dx)}}\right),-\frac{1}{5}\right)}{\sqrt{5}d}$$

```
[In] Int[1/(Sqrt[-Cos[c + d*x]]*Sqrt[-3 + 2*Cos[c + d*x]]),x]
```

```
[Out] (-2*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[-3 + 2*Cos[c + d*x]]/Sqrt[-Cos[c + d
*x]]], -1/5]*Sqrt[-Tan[c + d*x]^2])/(Sqrt[5]*d)
```

Rule 2894

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*Sqrt[a^2]*(Sqrt[-Cot[e + f*x]^2]/(a*f*Sqr
```

```
t[a^2 - b^2]*Cot[e + f*x]))*Rt[(a + b)/d, 2]*EllipticF[ArcSin[Sqrt[a + b*Si
n[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]], -(a + b)/(a - b)], x] /
; FreeQ[{a, b, d, e, f}, x] && GtQ[a^2 - b^2, 0] && PosQ[(a + b)/d] && GtQ[
a^2, 0]
```

Rubi steps

$$\text{integral} = -\frac{2\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{-3+2\cos(c+dx)}}{\sqrt{-\cos(c+dx)}}\right),-\frac{1}{5}\right)\sqrt{-\tan^2(c+dx)}}{\sqrt{5}d}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 160 vs. $2(62) = 124$.

Time = 0.56 (sec) , antiderivative size = 160, normalized size of antiderivative = 2.58

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-3+2\cos(c+dx)}}\,dx$$
$$= \frac{4\sqrt{-\cot^2\left(\frac{1}{2}(c+dx)\right)}\cot(c+dx)\sqrt{-\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{-\left((-3+2\cos(c+dx))\csc^2\left(\frac{1}{2}(c+\right.\right.}}{\sqrt{5}d(-\cos(c+dx))^{3/2}\sqrt{-3+2\cos(c+dx)}}$$

```
[In] Integrate[1/(Sqrt[-Cos[c + d*x]]*Sqrt[-3 + 2*Cos[c + d*x]]),x]
```

```
[Out] (4*Sqrt[-Cot[(c + d*x)/2]^2]*Cot[c + d*x]*Sqrt[-(Cos[c + d*x]*Csc[(c + d*x)
/2]^2)]*Sqrt[-((-3 + 2*Cos[c + d*x])*Csc[(c + d*x)/2]^2)]*EllipticF[ArcSin[
Sqrt[(-3 + 2*Cos[c + d*x])/(-1 + Cos[c + d*x])]/Sqrt[3]], 6/5]*Sin[(c + d*x
)/2]^4)/(Sqrt[5]*d*(-Cos[c + d*x])^(3/2)*Sqrt[-3 + 2*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 4.67 (sec) , antiderivative size = 96, normalized size of antiderivative = 1.55

method	result	size
default	$\frac{2F\left(\cot(dx+c)-\csc(dx+c),i\sqrt{5}\right)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{-3+2\cos(dx+c)}}{d\sqrt{-\frac{2(-3+2\cos(dx+c))}{1+\cos(dx+c)}}\sqrt{-\cos(dx+c)}}$	96

```
[In] int(1/(-cos(d*x+c))^(1/2)/(-3+2*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d*EllipticF(cot(d*x+c)-csc(d*x+c),I*5^(1/2))/(-2*(-3+2*cos(d*x+c))/(1+cos
(d*x+c)))^(1/2)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(-3+2*cos(d*x+c))
^(1/2)/(-cos(d*x+c))^(1/2)
```

Fricas [F]

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(dx+c\right)}\sqrt{2\,\cos\left(dx+c\right)-3}}\,dx$$

[In] integrate(1/(-cos(d*x+c))^(1/2)/(-3+2*cos(d*x+c))^(1/2),x, algorithm="frica s")

[Out] integral(-sqrt(-cos(d*x + c))*sqrt(2*cos(d*x + c) - 3)/(2*cos(d*x + c)^2 - 3*cos(d*x + c)), x)

Sympy [F]

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(c+dx\right)}\sqrt{2\cos\left(c+dx\right)-3}}\,dx$$

[In] integrate(1/(-cos(d*x+c))**(1/2)/(-3+2*cos(d*x+c))**(1/2),x)

[Out] Integral(1/(sqrt(-cos(c + d*x))*sqrt(2*cos(c + d*x) - 3)), x)

Maxima [F]

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(dx+c\right)}\sqrt{2\,\cos\left(dx+c\right)-3}}\,dx$$

[In] integrate(1/(-cos(d*x+c))^(1/2)/(-3+2*cos(d*x+c))^(1/2),x, algorithm="maxim a")

[Out] integrate(1/(sqrt(-cos(d*x + c))*sqrt(2*cos(d*x + c) - 3)), x)

Giac [F]

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(dx+c\right)}\sqrt{2\,\cos\left(dx+c\right)-3}}\,dx$$

[In] integrate(1/(-cos(d*x+c))^(1/2)/(-3+2*cos(d*x+c))^(1/2),x, algorithm="giac")

[Out] integrate(1/(sqrt(-cos(d*x + c))*sqrt(2*cos(d*x + c) - 3)), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(c+d\,x\right)}\,\sqrt{2\,\cos\left(c+d\,x\right)-3}}\,dx$$

```
[In] int(1/((-cos(c + d*x))^(1/2)*(2*cos(c + d*x) - 3)^(1/2)),x)
[Out] int(1/((-cos(c + d*x))^(1/2)*(2*cos(c + d*x) - 3)^(1/2)), x)
```

3.659 $\int \frac{1}{\sqrt{-3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 60

$$\int \frac{1}{\sqrt{-3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = -\frac{2\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{-3-2\cos(c+dx)}}{\sqrt{5}\sqrt{-\cos(c+dx)}}\right),-5\right)\sqrt{-\tan^2(c+dx)}}{d}$$

```
[Out] -2*cot(d*x+c)*EllipticF(1/5*(-3-2*cos(d*x+c))^(1/2)*5^(1/2)/(-cos(d*x+c))^(
1/2),I*5^(1/2))*(-tan(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.037$, Rules used = {2894}

$$\int \frac{1}{\sqrt{-3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = -\frac{2\sqrt{-\tan^2(c+dx)}\cot(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{-2\cos(c+dx)-3}}{\sqrt{5}\sqrt{-\cos(c+dx)}}\right),-5\right)}{d}$$

```
[In] Int[1/(Sqrt[-3 - 2*Cos[c + d*x]]*Sqrt[-Cos[c + d*x]]),x]
```

```
[Out] (-2*Cot[c + d*x]*EllipticF[ArcSin[Sqrt[-3 - 2*Cos[c + d*x]]/(Sqrt[5]*Sqrt[-
Cos[c + d*x]])], -5]*Sqrt[-Tan[c + d*x]^2])/d
```

Rule 2894

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*Sqrt[a^2]*(Sqrt[-Cot[e + f*x]^2]/(a*f*Sqr
```

```
t[a^2 - b^2]*Cot[e + f*x]))*Rt[(a + b)/d, 2]*EllipticF[ArcSin[Sqrt[a + b*Si
n[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]], -(a + b)/(a - b)], x] /
; FreeQ[{a, b, d, e, f}, x] && GtQ[a^2 - b^2, 0] && PosQ[(a + b)/d] && GtQ[
a^2, 0]
```

Rubi steps

$$\text{integral} = -\frac{2\cot(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{-3-2\cos(c+dx)}}{\sqrt{5}\sqrt{-\cos(c+dx)}}\right),-5\right)\sqrt{-\tan^2(c+dx)}}{d}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 155 vs. $2(60) = 120$.

Time = 0.44 (sec) , antiderivative size = 155, normalized size of antiderivative = 2.58

$$\int \frac{1}{\sqrt{-3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \frac{4\sqrt{\cot^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{-\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{(3+2\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}\csc(c+dx)\,\text{Elli}}{\sqrt{5}d\sqrt{-3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}$$

```
[In] Integrate[1/(Sqrt[-3 - 2*Cos[c + d*x]]*Sqrt[-Cos[c + d*x]]),x]
```

```
[Out] (4*Sqrt[Cot[(c + d*x)/2]^2]*Sqrt[-(Cos[c + d*x]*Csc[(c + d*x)/2]^2)]*Sqrt[(
3 + 2*Cos[c + d*x])*Csc[(c + d*x)/2]^2]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[
5/3]*Sqrt[Cos[c + d*x]/(-1 + Cos[c + d*x])]], 6/5]*Sin[(c + d*x)/2]^4)/(Sqr
t[5]*d*Sqrt[-3 - 2*Cos[c + d*x]]*Sqrt[-Cos[c + d*x]])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 117 vs. $2(57) = 114$.

Time = 6.84 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.97

method	result	size
default	$\frac{(1+\cos(dx+c))F\left(\cot(dx+c)-\csc(dx+c),\frac{i\sqrt{5}}{5}\right)\sqrt{10}\sqrt{\frac{3+2\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{-3-2\cos(dx+c)}}{5d\sqrt{-\cos(dx+c)}\,(3+2\cos(dx+c))}$	118

```
[In] int(1/(-3-2*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/5/d*(1+cos(d*x+c))*EllipticF(cot(d*x+c)-csc(d*x+c),1/5*I*5^(1/2))*10^(1/2
)*((3+2*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)
))^(1/2)*(-3-2*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2)/(3+2*cos(d*x+c))
```

Fricas [F]

$$\int \frac{1}{\sqrt{-3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos(dx+c)}\sqrt{-2\cos(dx+c)-3}}\,dx$$

```
[In] integrate(1/(-3-2*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] integral(sqrt(-cos(d*x + c))*sqrt(-2*cos(d*x + c) - 3)/(2*cos(d*x + c)^2 +
3*cos(d*x + c)), x)
```

Sympy [F]

$$\int \frac{1}{\sqrt{-3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos(c+dx)}\sqrt{-2\cos(c+dx)-3}}\,dx$$

```
[In] integrate(1/(-3-2*cos(d*x+c))**(1/2)/(-cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/(sqrt(-cos(c + d*x))*sqrt(-2*cos(c + d*x) - 3)), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{-3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos(dx+c)}\sqrt{-2\cos(dx+c)-3}}\,dx$$

```
[In] integrate(1/(-3-2*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] integrate(1/(sqrt(-cos(d*x + c))*sqrt(-2*cos(d*x + c) - 3)), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{-3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos(dx+c)}\sqrt{-2\cos(dx+c)-3}}\,dx$$

```
[In] integrate(1/(-3-2*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate(1/(sqrt(-cos(d*x + c))*sqrt(-2*cos(d*x + c) - 3)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{-3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{-\cos\left(c+d\,x\right)}\,\sqrt{-2\,\cos\left(c+d\,x\right)-3}}\,dx$$

```
[In] int(1/((-cos(c + d*x))^(1/2)*(- 2*cos(c + d*x) - 3)^(1/2)),x)
[Out] int(1/((-cos(c + d*x))^(1/2)*(- 2*cos(c + d*x) - 3)^(1/2)), x)
```

3.660 $\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{2+3\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 77

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{2+3\cos(c+dx)}}\,dx = -\frac{4\cot(c+dx)\,\text{EllipticPi}\left(\frac{5}{3},\arcsin\left(\frac{\sqrt{2+3\cos(c+dx)}}{\sqrt{5}\sqrt{\cos(c+dx)}}\right),5\right)\sqrt{-1-\sec(c+dx)}\sqrt{1-\sec(c+dx)}}{3d}$$

```
[Out] -4/3*cot(d*x+c)*EllipticPi(1/5*(2+3*cos(d*x+c))^(1/2)*5^(1/2)/cos(d*x+c)^(1
/2),5/3,5^(1/2))*(-1-sec(d*x+c))^(1/2)*(1-sec(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.040, Rules used = {2888}

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{2+3\cos(c+dx)}}\,dx = -\frac{4\cot(c+dx)\sqrt{-\sec(c+dx)-1}\sqrt{1-\sec(c+dx)}\,\text{EllipticPi}\left(\frac{5}{3},\arcsin\left(\frac{\sqrt{3\cos(c+dx)+2}}{\sqrt{5}\sqrt{\cos(c+dx)}}\right),5\right)}{3d}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/Sqrt[2 + 3*Cos[c + d*x]],x]
```

```
[Out] (-4*Cot[c + d*x]*EllipticPi[5/3, ArcSin[Sqrt[2 + 3*Cos[c + d*x]]/(Sqrt[5]*S
qrt[Cos[c + d*x]])], 5]*Sqrt[-1 - Sec[c + d*x]]*Sqrt[1 - Sec[c + d*x]])/(3*
d)
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rubi steps

integral =
$$-\frac{4\cot(c+dx)\,\text{EllipticPi}\left(\frac{5}{3},\arcsin\left(\frac{\sqrt{2+3\cos(c+dx)}}{\sqrt{5}\sqrt{\cos(c+dx)}}\right),5\right)\sqrt{-1-\sec(c+dx)}\sqrt{1-\sec(c+dx)}}{3d}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 175 vs. $2(77) = 154$.

Time = 12.63 (sec) , antiderivative size = 175, normalized size of antiderivative = 2.27

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{2+3\cos(c+dx)}}\,dx$$
$$=\frac{2\sqrt{\cos(c+dx)}\sqrt{2+3\cos(c+dx)}\sqrt{\cot^2\left(\frac{1}{2}(c+dx)\right)}\csc(c+dx)\left(3\,\text{EllipticF}\left(\arcsin\left(\frac{1}{2}\sqrt{(2+3\cos(c+d\right.\right.\right.}{3d\sqrt{\frac{-2-3\cos(c+dx)}{-1+\cos(c+dx)}}}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/Sqrt[2 + 3*Cos[c + d*x]],x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*Sqrt[2 + 3*Cos[c + d*x]]*Sqrt[Cot[(c + d*x)/2]^2]*Csc
[c + d*x]*(3*EllipticF[ArcSin[Sqrt[(2 + 3*Cos[c + d*x])*Csc[(c + d*x)/2]^2]
/2], -4] - 5*EllipticPi[-2/3, ArcSin[Sqrt[(2 + 3*Cos[c + d*x])*Csc[(c + d*x
)/2]^2]/2], -4]))/(3*d*Sqrt[(-2 - 3*Cos[c + d*x])/(-1 + Cos[c + d*x])]*Sqrt
[Cos[c + d*x]/(-1 + Cos[c + d*x])])
```

Maple [A] (verified)

Time = 6.27 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.66

method	result	siz
default	$\frac{\sqrt{2}\,\sqrt{10}\,\left(F\left(\cot(dx+c)-\csc(dx+c),\frac{\sqrt{5}}{5}\right)-2\Pi\left(\cot(dx+c)-\csc(dx+c),-1,\frac{\sqrt{5}}{5}\right)\right)\sqrt{\frac{2+3\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,(1+\cos(dx+c))}{5d\sqrt{2+3\cos(dx+c)}\,\sqrt{\cos(dx+c)}}$	128

```
[In] int(cos(d*x+c)^(1/2)/(2+3*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/5/d*2^(1/2)*10^(1/2)*(EllipticF(cot(d*x+c)-csc(d*x+c),1/5*5^(1/2))-2*Elli
pticPi(cot(d*x+c)-csc(d*x+c),-1,1/5*5^(1/2)))*((2+3*cos(d*x+c))/(1+cos(d*x+
c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)/(2+3*cos(d*x+c))^(1/2)*(1+cos(
d*x+c))/cos(d*x+c)^(1/2)
```

Fricas [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{3\,\cos\left(dx+c\right)+2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(2+3*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(cos(d*x + c))/sqrt(3*cos(d*x + c) + 2), x)
```

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(c+dx\right)}}{\sqrt{3\cos\left(c+dx\right)+2}}\,dx$$

```
[In] integrate(cos(d*x+c)**(1/2)/(2+3*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(cos(c + d*x))/sqrt(3*cos(c + d*x) + 2), x)
```

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{3\,\cos\left(dx+c\right)+2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(2+3*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(cos(d*x + c))/sqrt(3*cos(d*x + c) + 2), x)
```

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{3\,\cos\left(dx+c\right)+2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(2+3*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(cos(d*x + c))/sqrt(3*cos(d*x + c) + 2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(c+d\,x\right)}}{\sqrt{3\,\cos\left(c+d\,x\right)+2}}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(3*cos(c + d*x) + 2)^(1/2),x)
[Out] int(cos(c + d*x)^(1/2)/(3*cos(c + d*x) + 2)^(1/2), x)
```

3.661 $\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-2+3\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 75

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-2+3\cos(c+dx)}}\,dx = -\frac{4\cot(c+dx)\,\text{EllipticPi}\left(\frac{1}{3},\arcsin\left(\frac{\sqrt{-2+3\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\right),\frac{1}{5}\right)\sqrt{-1+\sec(c+dx)}\sqrt{1+\sec(c+dx)}}{3\sqrt{5}d}$$

```
[Out] -4/15*cot(d*x+c)*EllipticPi((-2+3*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),1/3,1/
5*5^(1/2))*(-1+sec(d*x+c))^(1/2)*(1+sec(d*x+c))^(1/2)/d*5^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.040$, Rules used = {2888}

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-2+3\cos(c+dx)}}\,dx = -\frac{4\cot(c+dx)\sqrt{\sec(c+dx)-1}\sqrt{\sec(c+dx)+1}\,\text{EllipticPi}\left(\frac{1}{3},\arcsin\left(\frac{\sqrt{3\cos(c+dx)-2}}{\sqrt{\cos(c+dx)}}\right),\frac{1}{5}\right)}{3\sqrt{5}d}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/Sqrt[-2 + 3*Cos[c + d*x]],x]
```

```
[Out] (-4*Cot[c + d*x]*EllipticPi[1/3, ArcSin[Sqrt[-2 + 3*Cos[c + d*x]]/Sqrt[Cos[
c + d*x]]], 1/5]*Sqrt[-1 + Sec[c + d*x]]*Sqrt[1 + Sec[c + d*x]])/(3*Sqrt[5]
*d)
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rubi steps

integral =

$$-\frac{4\cot(c+dx)\operatorname{EllipticPi}\left(\frac{1}{3},\arcsin\left(\frac{\sqrt{-2+3\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\right),\frac{1}{5}\right)\sqrt{-1+\sec(c+dx)}\sqrt{1+\sec(c+dx)}}{3\sqrt{5}d}$$

Mathematica [A] (verified)

Time = 0.72 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.87

$$\int\frac{\sqrt{\cos(c+dx)}}{\sqrt{-2+3\cos(c+dx)}}\,dx = -\frac{4\cos^2\left(\frac{1}{2}(c+dx)\right)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\frac{-2+3\cos(c+dx)}{1+\cos(c+dx)}}\left(\operatorname{EllipticF}\left(\arcsin\left(\sqrt{5}\tan\left(\frac{1}{2}(c+dx)\right)\right),\frac{1}{5}\right)-2\operatorname{EllipticPi}\right.}{\sqrt{5}d\sqrt{\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/Sqrt[-2 + 3*Cos[c + d*x]],x]
```

```
[Out] (-4*Cos[(c + d*x)/2]^2*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(-2 + 3*C
os[c + d*x])/(1 + Cos[c + d*x])]*(EllipticF[ArcSin[Sqrt[5]*Tan[(c + d*x)/2]
], 1/5] - 2*EllipticPi[-1/5, ArcSin[Sqrt[5]*Tan[(c + d*x)/2]], 1/5]))/(Sqrt
[5]*d*Sqrt[Cos[c + d*x]]*Sqrt[-2 + 3*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.67 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.57

method	result	size
default	$\frac{2\left(F\left(\cot(dx+c)-\csc(dx+c),\sqrt{5}\right)-2\Pi\left(\cot(dx+c)-\csc(dx+c),-1,\sqrt{5}\right)\right)\sqrt{\frac{-2+3\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,(1+\cos(dx+c))}{d\sqrt{-2+3\cos(dx+c)}\,\sqrt{\cos(dx+c)}}$	118

```
[In] int(cos(d*x+c)^(1/2)/(-2+3*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d*(EllipticF(cot(d*x+c)-csc(d*x+c),5^(1/2))-2*EllipticPi(cot(d*x+c)-csc(d
*x+c),-1,5^(1/2)))*((-2+3*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)/(-2+3*cos(d*x+c))^(1/2)*(1+cos(d*x+c))/cos(d*x+c)^(1/2)
```

Fricas [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-2+3\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{3\,\cos\left(dx+c\right)-2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(-2+3*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(cos(d*x + c))/sqrt(3*cos(d*x + c) - 2), x)
```

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-2+3\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(c+dx\right)}}{\sqrt{3\cos\left(c+dx\right)-2}}\,dx$$

```
[In] integrate(cos(d*x+c)**(1/2)/(-2+3*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(cos(c + d*x))/sqrt(3*cos(c + d*x) - 2), x)
```

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-2+3\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{3\,\cos\left(dx+c\right)-2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(-2+3*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(cos(d*x + c))/sqrt(3*cos(d*x + c) - 2), x)
```

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-2+3\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{3\,\cos\left(dx+c\right)-2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(-2+3*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(cos(d*x + c))/sqrt(3*cos(d*x + c) - 2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-2+3\cos(c+dx)}}\,dx=\int \frac{\sqrt{\cos\left(c+d\,x\right)}}{\sqrt{3\,\cos\left(c+d\,x\right)-2}}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(3*cos(c + d*x) - 2)^(1/2),x)
[Out] int(cos(c + d*x)^(1/2)/(3*cos(c + d*x) - 2)^(1/2), x)
```

3.662 $\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{2-3\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 99

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{2-3\cos(c+dx)}}\,dx = -\frac{4\cos^{\frac{3}{2}}(c+dx)\csc(c+dx)\,\text{EllipticPi}\left(\frac{1}{3},\arcsin\left(\frac{\sqrt{2-3\cos(c+dx)}}{\sqrt{-\cos(c+dx)}}\right),\frac{1}{5}\right)\sqrt{-1+\sec(c+dx)}\sqrt{1+\sec(c+d}{3\sqrt{5}d\sqrt{-\cos(c+dx)}}$$

```
[Out] -4/15*cos(d*x+c)^(3/2)*csc(d*x+c)*EllipticPi((2-3*cos(d*x+c))^(1/2)/(-cos(d
*x+c))^(1/2),1/3,1/5*5^(1/2))*(-1+sec(d*x+c))^(1/2)*(1+sec(d*x+c))^(1/2)/d*
5^(1/2)/(-cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2889, 2888}

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{2-3\cos(c+dx)}}\,dx = -\frac{4\cos^{\frac{3}{2}}(c+dx)\csc(c+dx)\sqrt{\sec(c+dx)-1}\sqrt{\sec(c+dx)+1}\,\text{EllipticPi}\left(\frac{1}{3},\arcsin\left(\frac{\sqrt{2-3\cos(c+dx)}}{\sqrt{-\cos(c+dx)}}\right),\frac{1}{5}\right)}{3\sqrt{5}d\sqrt{-\cos(c+dx)}}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/Sqrt[2 - 3*Cos[c + d*x]],x]
```

```
[Out] (-4*Cos[c + d*x]^(3/2)*Csc[c + d*x]*EllipticPi[1/3, ArcSin[Sqrt[2 - 3*Cos[c
 + d*x]]/Sqrt[-Cos[c + d*x]]], 1/5]*Sqrt[-1 + Sec[c + d*x]]*Sqrt[1 + Sec[c
+ d*x]])/(3*Sqrt[5]*d*Sqrt[-Cos[c + d*x]])
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2889

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[Sqrt[b*Sin[e + f*x]]/Sqrt[(-b)*Sin[e + f*x]], In
t[Sqrt[(-b)*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]], x], x] /; FreeQ[{b, c,
d, e, f}, x] && NeQ[c^2 - d^2, 0] && NegQ[(c + d)/b]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{\cos(c+dx)}\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{2-3\cos(c+dx)}}\,dx}{\sqrt{-\cos(c+dx)}}$$

$$= -\frac{4\cos^{\frac{3}{2}}(c+dx)\csc(c+dx)\,\text{EllipticPi}\left(\frac{1}{3},\arcsin\left(\frac{\sqrt{2-3\cos(c+dx)}}{\sqrt{-\cos(c+dx)}}\right),\frac{1}{5}\right)\sqrt{-1+\sec(c+dx)}\sqrt{1+\text{sec}}}{3\sqrt{5}d\sqrt{-\cos(c+dx)}}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 201 vs. 2(99) = 198.

Time = 1.62 (sec) , antiderivative size = 201, normalized size of antiderivative = 2.03

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{2-3\cos(c+dx)}}\,dx$$

$$= \frac{4\sqrt{\cot^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{-\left((-2+3\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)\right)}\csc(c+dx)}{}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/Sqrt[2 - 3*Cos[c + d*x]],x]
```

```
[Out] (4*Sqrt[Cot[(c + d*x)/2]^2]*Sqrt[Cos[c + d*x]*Csc[(c + d*x)/2]^2]*Sqrt[-((-
2 + 3*Cos[c + d*x])*Csc[(c + d*x)/2]^2)]*Csc[c + d*x]*(3*EllipticF[ArcSin[S
qrt[(2 - 3*Cos[c + d*x])*Csc[(c + d*x)/2]^2]/2], 4/5] - EllipticPi[2/3, Arc
Sin[Sqrt[(2 - 3*Cos[c + d*x])*Csc[(c + d*x)/2]^2]/2], 4/5])*Sin[(c + d*x)/2
]^4)/(3*Sqrt[5]*d*Sqrt[2 - 3*Cos[c + d*x]]*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 6.71 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.31

method	result
default	$-\frac{2\left(F\left(\cot(dx+c)-\csc(dx+c),\sqrt{5}\right)-2\Pi\left(\cot(dx+c)-\csc(dx+c),-1,\sqrt{5}\right)\right)\sqrt{\frac{-2+3\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{2-3\cos(dx+c)}\,(1+\mathrm{co}}{d\sqrt{\cos(dx+c)}\,(-2+3\cos(dx+c))}$

[In] int(cos(d*x+c)^(1/2)/(2-3*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)

[Out] -2/d*(EllipticF(cot(d*x+c)-csc(d*x+c),5^(1/2))-2*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,5^(1/2)))*((-2+3*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(2-3*cos(d*x+c))^(1/2)*(1+cos(d*x+c))/cos(d*x+c)^(1/2)/(-2+3*cos(d*x+c))

Fricas [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{-3\cos\left(dx+c\right)+2}}\,dx$$

[In] integrate(cos(d*x+c)^(1/2)/(2-3*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-3*cos(d*x + c) + 2)*sqrt(cos(d*x + c))/(3*cos(d*x + c) - 2), x)

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(c+dx\right)}}{\sqrt{2-3\cos\left(c+dx\right)}}\,dx$$

[In] integrate(cos(d*x+c)**(1/2)/(2-3*cos(d*x+c))**(1/2),x)

[Out] Integral(sqrt(cos(c + d*x))/sqrt(2 - 3*cos(c + d*x)), x)

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{-3\,\cos\left(dx+c\right)+2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(2-3*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(cos(d*x + c))/sqrt(-3*cos(d*x + c) + 2), x)
```

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{-3\,\cos\left(dx+c\right)+2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(2-3*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(cos(d*x + c))/sqrt(-3*cos(d*x + c) + 2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(c+d\,x\right)}}{\sqrt{2-3\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(2 - 3*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(1/2)/(2 - 3*cos(c + d*x))^(1/2), x)
```

3.663 $\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-2-3\cos(c+dx)}}\, dx$

Optimal result

Integrand size = 25, antiderivative size = 101

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-2-3\cos(c+dx)}}\, dx = -\frac{4\cos^{\frac{3}{2}}(c+dx)\csc(c+dx)\,\text{EllipticPi}\left(\frac{5}{3},\arcsin\left(\frac{\sqrt{-2-3\cos(c+dx)}}{\sqrt{5}\sqrt{-\cos(c+dx)}}\right),5\right)\sqrt{-1-\sec(c+dx)}\sqrt{1-\sec(c+}{3d\sqrt{-\cos(c+dx)}}$$

```
[Out] -4/3*cos(d*x+c)^(3/2)*csc(d*x+c)*EllipticPi(1/5*(-2-3*cos(d*x+c))^(1/2)*5^(
1/2)/(-cos(d*x+c))^(1/2),5/3,5^(1/2))*(-1-sec(d*x+c))^(1/2)*(1-sec(d*x+c))^
(1/2)/d/(-cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2889, 2888}

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-2-3\cos(c+dx)}}\, dx = -\frac{4\cos^{\frac{3}{2}}(c+dx)\csc(c+dx)\sqrt{-\sec(c+dx)-1}\sqrt{1-\sec(c+dx)}\,\text{EllipticPi}\left(\frac{5}{3},\arcsin\left(\frac{\sqrt{-3\cos(c+dx)-2}}{\sqrt{5}\sqrt{-\cos(c+dx)}}\right)}{3d\sqrt{-\cos(c+dx)}}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/Sqrt[-2 - 3*Cos[c + d*x]],x]
```

```
[Out] (-4*Cos[c + d*x]^(3/2)*Csc[c + d*x]*EllipticPi[5/3, ArcSin[Sqrt[-2 - 3*Cos[
c + d*x]]/(Sqrt[5]*Sqrt[-Cos[c + d*x]])], 5]*Sqrt[-1 - Sec[c + d*x]]*Sqrt[1
 - Sec[c + d*x]])/(3*d*Sqrt[-Cos[c + d*x]])
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2889

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[Sqrt[b*Sin[e + f*x]]/Sqrt[(-b)*Sin[e + f*x]], In
t[Sqrt[(-b)*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]], x], x] /; FreeQ[{b, c,
d, e, f}, x] && NeQ[c^2 - d^2, 0] && NegQ[(c + d)/b]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{\cos(c+dx)}\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2-3\cos(c+dx)}}\,dx}{\sqrt{-\cos(c+dx)}}$$

$$= -\frac{4\cos^{\frac{3}{2}}(c+dx)\csc(c+dx)\,\text{EllipticPi}\left(\frac{5}{3},\arcsin\left(\frac{\sqrt{-2-3\cos(c+dx)}}{\sqrt{5}\sqrt{-\cos(c+dx)}}\right),5\right)\sqrt{-1-\sec(c+dx)}\sqrt{1-\text{se}}}{3d\sqrt{-\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 1.50 (sec) , antiderivative size = 155, normalized size of antiderivative = 1.53

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-2-3\cos(c+dx)}}\,dx =$$

$$-\frac{4\cos^2\left(\frac{1}{2}(c+dx)\right)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{-\frac{(2+3\cos(c+dx))^2}{(1+\cos(c+dx))^2}}\left(\text{EllipticF}\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right),\frac{1}{5}\right)-2\,\text{EllipticPi}\right.}{\sqrt{5}d\sqrt{-2-3\cos(c+dx)}\sqrt{\cos(c+dx)}\sqrt{-\frac{2+3\cos(c+dx)}{1+\cos(c+dx)}}}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/Sqrt[-2 - 3*Cos[c + d*x]],x]
```

```
[Out] (-4*Cos[(c + d*x)/2]^2*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[-((2 + 3*
Cos[c + d*x])^2/(1 + Cos[c + d*x])^2)]*(EllipticF[ArcSin[Tan[(c + d*x)/2]],
 1/5] - 2*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], 1/5]))/(Sqrt[5]*d*Sqrt[-
2 - 3*Cos[c + d*x]]*Sqrt[Cos[c + d*x]]*Sqrt[-((2 + 3*Cos[c + d*x])/(1 + Cos
[c + d*x]))])
```

Maple [A] (verified)

Time = 6.59 (sec) , antiderivative size = 149, normalized size of antiderivative = 1.48

method	result
default	$\frac{\left(F\left(\frac{(\csc(dx+c)-\cot(dx+c))\sqrt{5}}{5},\sqrt{5}\right)-2\Pi\left(\frac{(\csc(dx+c)-\cot(dx+c))\sqrt{5}}{5},-5,\sqrt{5}\right)\right)\sqrt{2}\,\sqrt{10}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{\frac{2+3\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{-2-3\cos(dx+}}{5d\sqrt{\cos(dx+c)}\,(2+3\cos(dx+c))}$

[In] int(cos(d*x+c)^(1/2)/(-2-3*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)

[Out] 1/5/d*(EllipticF(1/5*(csc(d*x+c)-cot(d*x+c))*5^(1/2),5^(1/2))-2*EllipticPi(1/5*(csc(d*x+c)-cot(d*x+c))*5^(1/2),-5,5^(1/2)))*2^(1/2)*10^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((2+3*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)*(-2-3*cos(d*x+c))^(1/2)*(1+cos(d*x+c))/cos(d*x+c)^(1/2)/(2+3*cos(d*x+c))*5^(1/2)

Fricas [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{-3\,\cos\left(dx+c\right)-2}}\,dx$$

[In] integrate(cos(d*x+c)^(1/2)/(-2-3*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-3*cos(d*x + c) - 2)*sqrt(cos(d*x + c))/(3*cos(d*x + c) + 2), x)

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(c+dx\right)}}{\sqrt{-3\cos\left(c+dx\right)-2}}\,dx$$

[In] integrate(cos(d*x+c)**(1/2)/(-2-3*cos(d*x+c))**(1/2),x)

[Out] Integral(sqrt(cos(c + d*x))/sqrt(-3*cos(c + d*x) - 2), x)

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos(dx+c)}}{\sqrt{-3\cos(dx+c)-2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(-2-3*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(cos(d*x + c))/sqrt(-3*cos(d*x + c) - 2), x)
```

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos(dx+c)}}{\sqrt{-3\cos(dx+c)-2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(-2-3*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(cos(d*x + c))/sqrt(-3*cos(d*x + c) - 2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos(c+d\,x)}}{\sqrt{-3\cos(c+d\,x)-2}}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(- 3*cos(c + d*x) - 2)^(1/2),x)
[Out] int(cos(c + d*x)^(1/2)/(- 3*cos(c + d*x) - 2)^(1/2), x)
```

3.664 $\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3+2\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 73

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3+2\cos(c+dx)}}\,dx = -\frac{3\cot(c+dx)\,\text{EllipticPi}\left(\frac{5}{2},\arcsin\left(\frac{\sqrt{3+2\cos(c+dx)}}{\sqrt{5}\sqrt{\cos(c+dx)}}\right),-5\right)\sqrt{1-\sec(c+dx)}\sqrt{1+\sec(c+dx)}}{d}$$

```
[Out] -3*cot(d*x+c)*EllipticPi(1/5*(3+2*cos(d*x+c))^(1/2)*5^(1/2)/cos(d*x+c)^(1/2
),5/2,I*5^(1/2))*(1-sec(d*x+c))^(1/2)*(1+sec(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.040, Rules used = {2887}

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3+2\cos(c+dx)}}\,dx = -\frac{3\cot(c+dx)\sqrt{1-\sec(c+dx)}\sqrt{\sec(c+dx)+1}\,\text{EllipticPi}\left(\frac{5}{2},\arcsin\left(\frac{\sqrt{2\cos(c+dx)+3}}{\sqrt{5}\sqrt{\cos(c+dx)}}\right),-5\right)}{d}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/Sqrt[3 + 2*Cos[c + d*x]],x]
```

```
[Out] (-3*Cot[c + d*x]*EllipticPi[5/2, ArcSin[Sqrt[3 + 2*Cos[c + d*x]]/(Sqrt[5]*S
qrt[Cos[c + d*x]])], -5]*Sqrt[1 - Sec[c + d*x]]*Sqrt[1 + Sec[c + d*x]])/d
```

Rule 2887

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*c*Rt[b*(c + d), 2]*Tan[e + f*x]*Sqrt[1 + Csc[e
```

```
 + f*x]]*(Sqrt[1 - Csc[e + f*x]]/(d*f*Sqrt[c^2 - d^2]))*EllipticPi[(c + d)/
d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]],
-(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c^2 - d^2, 0] &&
PosQ[(c + d)/b] && GtQ[c^2, 0]
```

Rubi steps

$$\text{integral} = -\frac{3\cot(c+dx)\,\text{EllipticPi}\left(\frac{5}{2},\arcsin\left(\frac{\sqrt{3+2\cos(c+dx)}}{\sqrt{5}\sqrt{\cos(c+dx)}}\right),-5\right)\sqrt{1-\sec(c+dx)}\sqrt{1+\sec(c+dx)}}{d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.07 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.75

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3+2\cos(c+dx)}}\,dx = \frac{2i\sqrt{\cos(c+dx)}\sqrt{3+2\cos(c+dx)}\left(\text{EllipticF}\left(i\text{arcsinh}\left(\frac{\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{5}}\right),-5\right)-2\,\text{EllipticPi}\left(5,i\text{arcsinh}\left(\frac{\tan}{}\right.\right.\right.}{d\sqrt{(1+3\cos(c+dx)+\cos(2(c+dx)))\sec^4\left(\frac{1}{2}(c+dx)\right)}}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/Sqrt[3 + 2*Cos[c + d*x]],x]
```

```
[Out] ((2*I)*Sqrt[Cos[c + d*x]]*Sqrt[3 + 2*Cos[c + d*x]]*(EllipticF[I*ArcSinh[Tan
[(c + d*x)/2]/Sqrt[5]], -5] - 2*EllipticPi[5, I*ArcSinh[Tan[(c + d*x)/2]/Sq
rt[5]], -5])*Sec[(c + d*x)/2]^2)/(d*Sqrt[(1 + 3*Cos[c + d*x] + Cos[2*(c + d
*x)])*Sec[(c + d*x)/2]^4])
```

Maple [A] (verified)

Time = 6.73 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.78

method	result	si
default	$\frac{\left(F\left(\cot(dx+c)-\csc(dx+c),\frac{i\sqrt{5}}{5}\right)-2\Pi\left(\cot(dx+c)-\csc(dx+c),-1,\frac{i\sqrt{5}}{5}\right)\right)\sqrt{10}\,\sqrt{2}\,\sqrt{\frac{3+2\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,(1+\cos(dx+c))}{5d\sqrt{3+2\cos(dx+c)}\,\sqrt{\cos(dx+c)}}$	13

```
[In] int(cos(d*x+c)^(1/2)/(3+2*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/5/d*(EllipticF(cot(d*x+c)-csc(d*x+c),1/5*I*5^(1/2))-2*EllipticPi(cot(d*x+
c)-csc(d*x+c),-1,1/5*I*5^(1/2)))*10^(1/2)*2^(1/2)*((3+2*cos(d*x+c))/(1+cos(
d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)/(3+2*cos(d*x+c))^(1/2)*(1+
cos(d*x+c))/cos(d*x+c)^(1/2)
```

Fricas [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3+2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{2\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(3+2*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(cos(d*x + c))/sqrt(2*cos(d*x + c) + 3), x)
```

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3+2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(c+dx\right)}}{\sqrt{2\cos\left(c+dx\right)+3}}\,dx$$

```
[In] integrate(cos(d*x+c)**(1/2)/(3+2*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(cos(c + d*x))/sqrt(2*cos(c + d*x) + 3), x)
```

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3+2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{2\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(3+2*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(cos(d*x + c))/sqrt(2*cos(d*x + c) + 3), x)
```

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3+2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{2\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(3+2*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(cos(d*x + c))/sqrt(2*cos(d*x + c) + 3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3+2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(c+d\,x\right)}}{\sqrt{2\,\cos\left(c+d\,x\right)+3}}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(2*cos(c + d*x) + 3)^(1/2),x)
[Out] int(cos(c + d*x)^(1/2)/(2*cos(c + d*x) + 3)^(1/2), x)
```

3.665 $\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3-2\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 75

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3-2\cos(c+dx)}}\,dx = \frac{3\cot(c+dx)\,\text{EllipticPi}\left(-\frac{1}{2},\arcsin\left(\frac{\sqrt{3-2\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\right),-\frac{1}{5}\right)\sqrt{1-\sec(c+dx)}\sqrt{1+\sec(c+dx)}}{\sqrt{5}d}$$

```
[Out] 3/5*cot(d*x+c)*EllipticPi((3-2*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),-1/2,1/5*
I*5^(1/2))*(1-sec(d*x+c))^(1/2)*(1+sec(d*x+c))^(1/2)/d*5^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.040, Rules used = {2887}

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3-2\cos(c+dx)}}\,dx = \frac{3\cot(c+dx)\sqrt{1-\sec(c+dx)}\sqrt{\sec(c+dx)+1}\,\text{EllipticPi}\left(-\frac{1}{2},\arcsin\left(\frac{\sqrt{3-2\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\right),-\frac{1}{5}\right)}{\sqrt{5}d}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/Sqrt[3 - 2*Cos[c + d*x]],x]
```

```
[Out] (3*Cot[c + d*x]*EllipticPi[-1/2, ArcSin[Sqrt[3 - 2*Cos[c + d*x]]/Sqrt[Cos[c
 + d*x]]], -1/5]*Sqrt[1 - Sec[c + d*x]]*Sqrt[1 + Sec[c + d*x]])/(Sqrt[5]*d)
```

Rule 2887

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*c*Rt[b*(c + d), 2]*Tan[e + f*x]*Sqrt[1 + Csc[e
 + f*x]]*(Sqrt[1 - Csc[e + f*x]]/(d*f*Sqrt[c^2 - d^2]))*EllipticPi[(c + d)/
d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]],
-(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c^2 - d^2, 0] &&
PosQ[(c + d)/b] && GtQ[c^2, 0]
```

Rubi steps

integral

$$= \frac{3\cot(c+dx)\,\text{EllipticPi}\left(-\frac{1}{2}, \arcsin\left(\frac{\sqrt{3-2\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\right), -\frac{1}{5}\right)\sqrt{1-\sec(c+dx)}\sqrt{1+\sec(c+dx)}}{\sqrt{5}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.75 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.71

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3-2\cos(c+dx)}}\,dx$$

$$= \frac{2i\sqrt{\cos(c+dx)}\left(\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{5}\tan\left(\frac{1}{2}(c+dx)\right)\right), -\frac{1}{5}\right) - 2\,\text{EllipticPi}\left(\frac{1}{5}, i\text{arcsinh}\left(\sqrt{5}\tan\left(\frac{1}{2}(c+d\right.\right.\right.}{d\sqrt{30-20\cos(c+dx)}\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/Sqrt[3 - 2*Cos[c + d*x]],x]
```

```
[Out] ((2*I)*Sqrt[Cos[c + d*x]]*(EllipticF[I*ArcSinh[Sqrt[5]*Tan[(c + d*x)/2]], -
1/5] - 2*EllipticPi[1/5, I*ArcSinh[Sqrt[5]*Tan[(c + d*x)/2]], -1/5])*Sqrt[1
 + 5*Tan[(c + d*x)/2]^2])/(d*Sqrt[30 - 20*Cos[c + d*x]]*Sqrt[Cos[c + d*x]/(
1 + Cos[c + d*x])])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 139 vs. 2(65) = 130.

Time = 5.62 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.87

method	result
default	$-\frac{\sqrt{2}\left(F\left(\cot(dx+c)-\csc(dx+c), i\sqrt{5}\right)-2\Pi\left(\cot(dx+c)-\csc(dx+c), -1, i\sqrt{5}\right)\right)\sqrt{-\frac{2(-3+2\cos(dx+c))}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{3-2\cos(dx+c)}}{d\sqrt{\cos(dx+c)}\,(-3+2\cos(dx+c))}$

[In] int(cos(d*x+c)^(1/2)/(3-2*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)

[Out] -1/d*2^(1/2)*(EllipticF(cot(d*x+c)-csc(d*x+c),I*5^(1/2))-2*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,I*5^(1/2)))*(-2*(-3+2*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(3-2*cos(d*x+c))^(1/2)*(1+cos(d*x+c))/cos(d*x+c)^(1/2)/(-3+2*cos(d*x+c))

Fricas [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{-2\,\cos\left(dx+c\right)+3}}\,dx$$

[In] integrate(cos(d*x+c)^(1/2)/(3-2*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-2*cos(d*x + c) + 3)*sqrt(cos(d*x + c))/(2*cos(d*x + c) - 3), x)

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(c+dx\right)}}{\sqrt{3-2\cos\left(c+dx\right)}}\,dx$$

[In] integrate(cos(d*x+c)**(1/2)/(3-2*cos(d*x+c))**(1/2),x)

[Out] Integral(sqrt(cos(c + d*x))/sqrt(3 - 2*cos(c + d*x)), x)

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{-2\,\cos\left(dx+c\right)+3}}\,dx$$

[In] integrate(cos(d*x+c)^(1/2)/(3-2*cos(d*x+c))^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(cos(d*x + c))/sqrt(-2*cos(d*x + c) + 3), x)

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{-2\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(3-2*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(cos(d*x + c))/sqrt(-2*cos(d*x + c) + 3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(c+d\,x\right)}}{\sqrt{3-2\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(3 - 2*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(1/2)/(3 - 2*cos(c + d*x))^(1/2), x)
```

3.666 $\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-3+2\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 99

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-3+2\cos(c+dx)}}\,dx = \frac{3\cos^{\frac{3}{2}}(c+dx)\csc(c+dx)\,\text{EllipticPi}\left(-\frac{1}{2},\arcsin\left(\frac{\sqrt{-3+2\cos(c+dx)}}{\sqrt{-\cos(c+dx)}}\right),-\frac{1}{5}\right)\sqrt{1-\sec(c+dx)}\sqrt{1+\sec(c+dx)}}{\sqrt{5}d\sqrt{-\cos(c+dx)}}$$

```
[Out] 3/5*cos(d*x+c)^(3/2)*csc(d*x+c)*EllipticPi((-3+2*cos(d*x+c))^(1/2)/(-cos(d*
x+c))^(1/2),-1/2,1/5*I*5^(1/2))*(1-sec(d*x+c))^(1/2)*(1+sec(d*x+c))^(1/2)/d
*5^(1/2)/(-cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2889, 2887}

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-3+2\cos(c+dx)}}\,dx = \frac{3\cos^{\frac{3}{2}}(c+dx)\csc(c+dx)\sqrt{1-\sec(c+dx)}\sqrt{\sec(c+dx)+1}\,\text{EllipticPi}\left(-\frac{1}{2},\arcsin\left(\frac{\sqrt{2\cos(c+dx)-3}}{\sqrt{-\cos(c+dx)}}\right),-\frac{1}{5}\right)}{\sqrt{5}d\sqrt{-\cos(c+dx)}}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/Sqrt[-3 + 2*Cos[c + d*x]],x]
```

```
[Out] (3*Cos[c + d*x]^(3/2)*Csc[c + d*x]*EllipticPi[-1/2, ArcSin[Sqrt[-3 + 2*Cos[
c + d*x]]/Sqrt[-Cos[c + d*x]]], -1/5]*Sqrt[1 - Sec[c + d*x]]*Sqrt[1 + Sec[c
 + d*x]])/(Sqrt[5]*d*Sqrt[-Cos[c + d*x]])
```

Rule 2887

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*c*Rt[b*(c + d), 2]*Tan[e + f*x]*Sqrt[1 + Csc[e
 + f*x]]*(Sqrt[1 - Csc[e + f*x]]/(d*f*Sqrt[c^2 - d^2]))*EllipticPi[(c + d)/
d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]],
-(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c^2 - d^2, 0] &&
PosQ[(c + d)/b] && GtQ[c^2, 0]
```

Rule 2889

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[Sqrt[b*Sin[e + f*x]]/Sqrt[(-b)*Sin[e + f*x]], In
t[Sqrt[(-b)*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]], x], x] /; FreeQ[{b, c,
d, e, f}, x] && NeQ[c^2 - d^2, 0] && NegQ[(c + d)/b]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{\cos(c+dx)}\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3+2\cos(c+dx)}}\,dx}{\sqrt{-\cos(c+dx)}}$$

$$= \frac{3\cos^{\frac{3}{2}}(c+dx)\csc(c+dx)\,\text{EllipticPi}\left(-\frac{1}{2},\arcsin\left(\frac{\sqrt{-3+2\cos(c+dx)}}{\sqrt{-\cos(c+dx)}}\right),-\frac{1}{5}\right)\sqrt{1-\sec(c+dx)}\sqrt{1+\text{se}}}{\sqrt{5}d\sqrt{-\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.82 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.36

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-3+2\cos(c+dx)}}\,dx =$$

$$-\frac{2i\sqrt{-3+2\cos(c+dx)}\sqrt{\frac{\cos(c+dx)}{5+5\cos(c+dx)}}\left(\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{5}\tan\left(\frac{1}{2}(c+dx)\right)\right),-\frac{1}{5}\right)-2\,\text{EllipticPi}\left(\frac{1}{5},i\text{a}\right.\right.}{d\sqrt{\cos(c+dx)}\sqrt{\frac{3-2\cos(c+dx)}{1+\cos(c+dx)}}}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/Sqrt[-3 + 2*Cos[c + d*x]],x]
```

```
[Out] ((-2*I)*Sqrt[-3 + 2*Cos[c + d*x]]*Sqrt[Cos[c + d*x]/(5 + 5*Cos[c + d*x])]*(
EllipticF[I*ArcSinh[Sqrt[5]*Tan[(c + d*x)/2]], -1/5] - 2*EllipticPi[1/5, I*
ArcSinh[Sqrt[5]*Tan[(c + d*x)/2]], -1/5]))/(d*Sqrt[Cos[c + d*x]]*Sqrt[(3 -
2*Cos[c + d*x])/(1 + Cos[c + d*x])])
```

Maple [A] (verified)

Time = 7.06 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.45

method	result
default	$\frac{i\left(F\left(i(\csc(dx+c)-\cot(dx+c))\sqrt{5},\frac{i\sqrt{5}}{5}\right)-2\Pi\left(i(\csc(dx+c)-\cot(dx+c))\sqrt{5},\frac{1}{5},\frac{i\sqrt{5}}{5}\right)\right)\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{-\frac{2(-3+2\cos(dx+c))}{1+\cos(dx+c)}}\,(1+\cos}{5d\sqrt{-3+2\cos(dx+c)}\,\sqrt{\cos(dx+c)}}$

[In] int(cos(d*x+c)^(1/2)/(-3+2*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)

[Out] 1/5*I/d*(EllipticF(I*(csc(d*x+c)-cot(d*x+c))*5^(1/2),1/5*I*5^(1/2))-2*EllipticPi(I*(csc(d*x+c)-cot(d*x+c))*5^(1/2),1/5,1/5*I*5^(1/2)))*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(-2*(-3+2*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)/(-3+2*cos(d*x+c))^(1/2)*(1+cos(d*x+c))/cos(d*x+c)^(1/2)*5^(1/2)

Fricas [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{2\,\cos\left(dx+c\right)-3}}\,dx$$

[In] integrate(cos(d*x+c)^(1/2)/(-3+2*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(cos(d*x + c))/sqrt(2*cos(d*x + c) - 3), x)

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(c+dx\right)}}{\sqrt{2\cos\left(c+dx\right)-3}}\,dx$$

[In] integrate(cos(d*x+c)**(1/2)/(-3+2*cos(d*x+c))**(1/2),x)

[Out] Integral(sqrt(cos(c + d*x))/sqrt(2*cos(c + d*x) - 3), x)

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{2\,\cos\left(dx+c\right)-3}}\,dx$$

[In] integrate(cos(d*x+c)^(1/2)/(-3+2*cos(d*x+c))^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(cos(d*x + c))/sqrt(2*cos(d*x + c) - 3), x)

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos(dx+c)}}{\sqrt{2\cos(dx+c)-3}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)/(-3+2*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(cos(d*x + c))/sqrt(2*cos(d*x + c) - 3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos(c+d\,x)}}{\sqrt{2\cos(c+d\,x)-3}}\,dx$$

```
[In] int(cos(c + d*x)^(1/2)/(2*cos(c + d*x) - 3)^(1/2),x)
[Out] int(cos(c + d*x)^(1/2)/(2*cos(c + d*x) - 3)^(1/2), x)
```

3.667 $\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-3-2\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 97

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-3-2\cos(c+dx)}}\,dx = -\frac{3\cos^{\frac{3}{2}}(c+dx)\csc(c+dx)\,\text{EllipticPi}\left(\frac{5}{2},\arcsin\left(\frac{\sqrt{-3-2\cos(c+dx)}}{\sqrt{5}\sqrt{-\cos(c+dx)}}\right),-5\right)\sqrt{1-\sec(c+dx)}\sqrt{1+\sec(c+}{d\sqrt{-\cos(c+dx)}}$$

```
[Out] -3*cos(d*x+c)^(3/2)*csc(d*x+c)*EllipticPi(1/5*(-3-2*cos(d*x+c))^(1/2)*5^(1/
2)/(-cos(d*x+c))^(1/2),5/2,I*5^(1/2))*(1-sec(d*x+c))^(1/2)*(1+sec(d*x+c))^(
1/2)/d/(-cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2889, 2887}

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-3-2\cos(c+dx)}}\,dx = -\frac{3\cos^{\frac{3}{2}}(c+dx)\csc(c+dx)\sqrt{1-\sec(c+dx)}\sqrt{\sec(c+dx)+1}\,\text{EllipticPi}\left(\frac{5}{2},\arcsin\left(\frac{\sqrt{-2\cos(c+dx)-3}}{\sqrt{5}\sqrt{-\cos(c+dx)}}\right),-}{d\sqrt{-\cos(c+dx)}}$$

```
[In] Int[Sqrt[Cos[c + d*x]]/Sqrt[-3 - 2*Cos[c + d*x]],x]
```

```
[Out] (-3*Cos[c + d*x]^(3/2)*Csc[c + d*x]*EllipticPi[5/2, ArcSin[Sqrt[-3 - 2*Cos[
c + d*x]]/(Sqrt[5]*Sqrt[-Cos[c + d*x]])], -5]*Sqrt[1 - Sec[c + d*x]]*Sqrt[1
 + Sec[c + d*x]])/(d*Sqrt[-Cos[c + d*x]])
```

Rule 2887

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*c*Rt[b*(c + d), 2]*Tan[e + f*x]*Sqrt[1 + Csc[e
 + f*x]]*(Sqrt[1 - Csc[e + f*x]]/(d*f*Sqrt[c^2 - d^2]))*EllipticPi[(c + d)/
d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]],
-(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c^2 - d^2, 0] &&
PosQ[(c + d)/b] && GtQ[c^2, 0]
```

Rule 2889

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[Sqrt[b*Sin[e + f*x]]/Sqrt[(-b)*Sin[e + f*x]], In
t[Sqrt[(-b)*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]], x], x] /; FreeQ[{b, c,
d, e, f}, x] && NeQ[c^2 - d^2, 0] && NegQ[(c + d)/b]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{\cos(c+dx)}\int\frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3-2\cos(c+dx)}}\,dx}{\sqrt{-\cos(c+dx)}}$$

$$= -\frac{3\cos^{\frac{3}{2}}(c+dx)\csc(c+dx)\,\text{EllipticPi}\left(\frac{5}{2},\arcsin\left(\frac{\sqrt{-3-2\cos(c+dx)}}{\sqrt{5}\sqrt{-\cos(c+dx)}}\right),-5\right)\sqrt{1-\sec(c+dx)}\sqrt{1+\text{se}}}{d\sqrt{-\cos(c+dx)}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.66 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.30

$$\int\frac{\sqrt{\cos(c+dx)}}{\sqrt{-3-2\cos(c+dx)}}\,dx$$

$$= \frac{2i\cos^2\left(\frac{1}{2}(c+dx)\right)\left(\text{EllipticF}\left(i\text{arcsinh}\left(\frac{\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{5}}\right),-5\right)-2\,\text{EllipticPi}\left(5,i\text{arcsinh}\left(\frac{\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{5}}\right),-5\right)\right)}{d\sqrt{-3-2\cos(c+dx)}\sqrt{\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]/Sqrt[-3 - 2*Cos[c + d*x]],x]
```

```
[Out] ((2*I)*Cos[(c + d*x)/2]^2*(EllipticF[I*ArcSinh[Tan[(c + d*x)/2]/Sqrt[5]], -
5] - 2*EllipticPi[5, I*ArcSinh[Tan[(c + d*x)/2]/Sqrt[5]], -5])*Sqrt[Cos[c +
 d*x]*(3 + 2*Cos[c + d*x])*Sec[(c + d*x)/2]^4])/(d*Sqrt[-3 - 2*Cos[c + d*x]
]*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 6.82 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.63

method	result
default	$-\frac{i\sqrt{10}\,\sqrt{2}\,\left(F\left(\frac{i(\csc(dx+c)-\cot(dx+c))\sqrt{5}}{5},i\sqrt{5}\right)-2\Pi\left(\frac{i(\csc(dx+c)-\cot(dx+c))\sqrt{5}}{5},5,i\sqrt{5}\right)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{\frac{3+2\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{-3-2\cos}}{5d\sqrt{\cos(dx+c)}\,(3+2\cos(dx+c))}$

[In] int(cos(d*x+c)^(1/2)/(-3-2*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)

[Out] -1/5*I/d*10^(1/2)*2^(1/2)*(EllipticF(1/5*I*(csc(d*x+c)-cot(d*x+c))*5^(1/2), I*5^(1/2))-2*EllipticPi(1/5*I*(csc(d*x+c)-cot(d*x+c))*5^(1/2),5,I*5^(1/2))) *(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((3+2*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)* (-3-2*cos(d*x+c))^(1/2)*(1+cos(d*x+c))/cos(d*x+c)^(1/2)/(3+2*cos(d*x+c))*5^ (1/2)

Fricas [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{-2\,\cos\left(dx+c\right)-3}}\,dx$$

[In] integrate(cos(d*x+c)^(1/2)/(-3-2*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-2*cos(d*x + c) - 3)*sqrt(cos(d*x + c))/(2*cos(d*x + c) + 3) , x)

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(c+dx\right)}}{\sqrt{-2\cos\left(c+dx\right)-3}}\,dx$$

[In] integrate(cos(d*x+c)**(1/2)/(-3-2*cos(d*x+c))**(1/2),x)

[Out] Integral(sqrt(cos(c + d*x))/sqrt(-2*cos(c + d*x) - 3), x)

Maxima [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{-2\,\cos\left(dx+c\right)-3}}\,dx$$

[In] integrate(cos(d*x+c)^(1/2)/(-3-2*cos(d*x+c))^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(cos(d*x + c))/sqrt(-2*cos(d*x + c) - 3), x)

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(dx+c\right)}}{\sqrt{-2\,\cos\left(dx+c\right)-3}}\,dx$$

[In] integrate(cos(d*x+c)^(1/2)/(-3-2*cos(d*x+c))^(1/2),x, algorithm="giac")

[Out] integrate(sqrt(cos(d*x + c))/sqrt(-2*cos(d*x + c) - 3), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{-3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{\cos\left(c+d\,x\right)}}{\sqrt{-2\,\cos\left(c+d\,x\right)-3}}\,dx$$

[In] int(cos(c + d*x)^(1/2)/(- 2*cos(c + d*x) - 3)^(1/2),x)

[Out] int(cos(c + d*x)^(1/2)/(- 2*cos(c + d*x) - 3)^(1/2), x)

3.668 $\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{2+3\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 99

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{2+3\cos(c+dx)}}\,dx = -\frac{4\sqrt{-\cos(c+dx)}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{5}{3},\arcsin\left(\frac{\sqrt{2+3\cos(c+dx)}}{\sqrt{5}\sqrt{\cos(c+dx)}}\right),5\right)\sqrt{-1-\sec(c+dx}}{3d}$$

```
[Out] -4/3*csc(d*x+c)*EllipticPi(1/5*(2+3*cos(d*x+c))^(1/2)*5^(1/2)/cos(d*x+c)^(1
/2),5/3,5^(1/2))*(-cos(d*x+c))^(1/2)*cos(d*x+c)^(1/2)*(-1-sec(d*x+c))^(1/2)
*(1-sec(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.074$, Rules used = {2889, 2888}

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{2+3\cos(c+dx)}}\,dx = -\frac{4\sqrt{-\cos(c+dx)}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{-\sec(c+dx)-1}\sqrt{1-\sec(c+dx)}\,\text{EllipticPi}\left(\frac{5}{3},\arcsin\right.}{3d}$$

```
[In] Int[Sqrt[-Cos[c + d*x]]/Sqrt[2 + 3*Cos[c + d*x]],x]
```

```
[Out] (-4*Sqrt[-Cos[c + d*x]]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticPi[5/3, Arc
Sin[Sqrt[2 + 3*Cos[c + d*x]]/(Sqrt[5]*Sqrt[Cos[c + d*x]])], 5]*Sqrt[-1 - Se
c[c + d*x]]*Sqrt[1 - Sec[c + d*x]])/(3*d)
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2889

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[Sqrt[b*Sin[e + f*x]]/Sqrt[(-b)*Sin[e + f*x]], In
t[Sqrt[(-b)*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]], x], x] /; FreeQ[{b, c,
d, e, f}, x] && NeQ[c^2 - d^2, 0] && NegQ[(c + d)/b]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{-\cos(c+dx)}\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{2+3\cos(c+dx)}}\,dx}{\sqrt{\cos(c+dx)}}$$

$$= -\frac{4\sqrt{-\cos(c+dx)}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{5}{3},\arcsin\left(\frac{\sqrt{2+3\cos(c+dx)}}{\sqrt{5}\sqrt{\cos(c+dx)}}\right),5\right)\sqrt{-1-\sec(}{3d}$$

Mathematica [A] (verified)

Time = 0.62 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.96

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{2+3\cos(c+dx)}}\,dx$$

$$= \frac{4\sqrt{\cot^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{-\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{(2+3\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)}\csc(c+dx)\left(3\right.}{}$$

```
[In] Integrate[Sqrt[-Cos[c + d*x]]/Sqrt[2 + 3*Cos[c + d*x]],x]
```

```
[Out] (4*Sqrt[Cot[(c + d*x)/2]^2]*Sqrt[-(Cos[c + d*x]*Csc[(c + d*x)/2]^2)]*Sqrt[(
2 + 3*Cos[c + d*x])*Csc[(c + d*x)/2]^2]*Csc[c + d*x]*(3*EllipticF[ArcSin[Sq
rt[(2 + 3*Cos[c + d*x])*Csc[(c + d*x)/2]^2]/2], -4] - 5*EllipticPi[-2/3, Ar
cSin[Sqrt[(2 + 3*Cos[c + d*x])*Csc[(c + d*x)/2]^2]/2], -4])*Sin[(c + d*x)/2
]^4)/(3*d*Sqrt[-Cos[c + d*x]]*Sqrt[2 + 3*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 6.91 (sec) , antiderivative size = 139, normalized size of antiderivative = 1.40

method	result
default	$-\frac{\sqrt{-\cos(dx+c)}\left(F\left(\frac{(\csc(dx+c)-\cot(dx+c))\sqrt{5}}{5},\sqrt{5}\right)-2\Pi\left(\frac{(\csc(dx+c)-\cot(dx+c))\sqrt{5}}{5},-5,\sqrt{5}\right)\right)\sqrt{10}\sqrt{\frac{2+3\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{2}}{5d\sqrt{2+3\cos(dx+c)}}$

[In] int((-cos(d*x+c))^(1/2)/(2+3*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)

[Out] -1/5/d*(-cos(d*x+c))^(1/2)/(2+3*cos(d*x+c))^(1/2)*(EllipticF(1/5*(csc(d*x+c)-cot(d*x+c))*5^(1/2),5^(1/2))-2*EllipticPi(1/5*(csc(d*x+c)-cot(d*x+c))*5^(1/2),-5,5^(1/2)))*10^(1/2)*((2+3*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)*(1+sec(d*x+c))*5^(1/2)

Fricas [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos(dx+c)}}{\sqrt{3\cos(dx+c)+2}}\,dx$$

[In] integrate((-cos(d*x+c))^(1/2)/(2+3*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(-cos(d*x + c))/sqrt(3*cos(d*x + c) + 2), x)

Sympy [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{3\cos(c+dx)+2}}\,dx$$

[In] integrate((-cos(d*x+c))**(1/2)/(2+3*cos(d*x+c))**(1/2),x)

[Out] Integral(sqrt(-cos(c + d*x))/sqrt(3*cos(c + d*x) + 2), x)

Maxima [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos(dx+c)}}{\sqrt{3\cos(dx+c)+2}}\,dx$$

[In] integrate((-cos(d*x+c))^(1/2)/(2+3*cos(d*x+c))^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(-cos(d*x + c))/sqrt(3*cos(d*x + c) + 2), x)

Giac [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos(dx+c)}}{\sqrt{3\,\cos(dx+c)+2}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(2+3*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(-cos(d*x + c))/sqrt(3*cos(d*x + c) + 2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{2+3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos(c+d\,x)}}{\sqrt{3\,\cos(c+d\,x)+2}}\,dx$$

```
[In] int((-cos(c + d*x))^(1/2)/(3*cos(c + d*x) + 2)^(1/2),x)
[Out] int((-cos(c + d*x))^(1/2)/(3*cos(c + d*x) + 2)^(1/2), x)
```

3.669 $\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2+3\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 97

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2+3\cos(c+dx)}}\,dx = -\frac{4\sqrt{-\cos(c+dx)}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{1}{3},\arcsin\left(\frac{\sqrt{-2+3\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\right),\frac{1}{5}\right)\sqrt{-1+\sec(c+}}{3\sqrt{5}d}$$

```
[Out] -4/15*csc(d*x+c)*EllipticPi((-2+3*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),1/3,1/
5*5^(1/2))*(-cos(d*x+c))^(1/2)*cos(d*x+c)^(1/2)*(-1+sec(d*x+c))^(1/2)*(1+se
c(d*x+c))^(1/2)/d*5^(1/2)
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.074$, Rules used = {2889, 2888}

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2+3\cos(c+dx)}}\,dx = -\frac{4\sqrt{-\cos(c+dx)}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\sec(c+dx)-1}\sqrt{\sec(c+dx)+1}\,\text{EllipticPi}\left(\frac{1}{3},\arcsin\left(\right.\right.}{3\sqrt{5}d}$$

```
[In] Int[Sqrt[-Cos[c + d*x]]/Sqrt[-2 + 3*Cos[c + d*x]],x]
```

```
[Out] (-4*Sqrt[-Cos[c + d*x]]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticPi[1/3, Arc
Sin[Sqrt[-2 + 3*Cos[c + d*x]]/Sqrt[Cos[c + d*x]]], 1/5]*Sqrt[-1 + Sec[c + d
*x]]*Sqrt[1 + Sec[c + d*x]])/(3*Sqrt[5]*d)
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2889

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[Sqrt[b*Sin[e + f*x]]/Sqrt[(-b)*Sin[e + f*x]], In
t[Sqrt[(-b)*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]], x], x] /; FreeQ[{b, c,
d, e, f}, x] && NeQ[c^2 - d^2, 0] && NegQ[(c + d)/b]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{-\cos(c+dx)}\int\frac{\sqrt{\cos(c+dx)}}{\sqrt{-2+3\cos(c+dx)}}\,dx}{\sqrt{\cos(c+dx)}}$$

$$= -\frac{4\sqrt{-\cos(c+dx)}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{1}{3},\arcsin\left(\frac{\sqrt{-2+3\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\right),\frac{1}{5}\right)\sqrt{-1+\text{se}}}{3\sqrt{5}d}$$

Mathematica [A] (verified)

Time = 0.23 (sec) , antiderivative size = 142, normalized size of antiderivative = 1.46

$$\int\frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2+3\cos(c+dx)}}\,dx$$

$$= \frac{4\cos^2\left(\frac{1}{2}(c+dx)\right)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\frac{-2+3\cos(c+dx)}{1+\cos(c+dx)}}\left(\text{EllipticF}\left(\arcsin\left(\sqrt{5}\tan\left(\frac{1}{2}(c+dx)\right)\right),\frac{1}{5}\right)-2\,\text{EllipticPi}\left(-\right.\right.}{\sqrt{5}d\sqrt{-\cos(c+dx)}\sqrt{-2+3\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[-Cos[c + d*x]]/Sqrt[-2 + 3*Cos[c + d*x]],x]
```

```
[Out] (4*Cos[(c + d*x)/2]^2*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(-2 + 3*Co
s[c + d*x])/(1 + Cos[c + d*x])]*(EllipticF[ArcSin[Sqrt[5]*Tan[(c + d*x)/2]]
, 1/5] - 2*EllipticPi[-1/5, ArcSin[Sqrt[5]*Tan[(c + d*x)/2]], 1/5]))/(Sqrt[
5]*d*Sqrt[-Cos[c + d*x]]*Sqrt[-2 + 3*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 6.78 (sec) , antiderivative size = 120, normalized size of antiderivative = 1.24

method	result
default	$\frac{2\sqrt{-\cos(dx+c)}\left(F\left(\cot(dx+c)-\csc(dx+c),\sqrt{5}\right)-2\Pi\left(\cot(dx+c)-\csc(dx+c),-1,\sqrt{5}\right)\right)\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{\frac{-2+3\cos(dx+c)}{1+\cos(dx+c)}}\,(1+\sec(dx+c))}{d\sqrt{-2+3\cos(dx+c)}}$

```
[In] int((-cos(d*x+c))^(1/2)/(-2+3*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
[Out] 2/d*(-cos(d*x+c))^(1/2)/(-2+3*cos(d*x+c))^(1/2)*(EllipticF(cot(d*x+c)-csc(d
*x+c),5^(1/2))-2*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,5^(1/2)))*(cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*((-2+3*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)*(1+sec(d*x+c
))
```

Fricas [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2+3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(dx+c\right)}}{\sqrt{3\,\cos\left(dx+c\right)-2}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(-2+3*cos(d*x+c))^(1/2),x, algorithm="fricas"
)
[Out] integral(sqrt(-cos(d*x + c))/sqrt(3*cos(d*x + c) - 2), x)
```

Sympy [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2+3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(c+dx\right)}}{\sqrt{3\cos\left(c+dx\right)-2}}\,dx$$

```
[In] integrate((-cos(d*x+c))**(1/2)/(-2+3*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(-cos(c + d*x))/sqrt(3*cos(c + d*x) - 2), x)
```

Maxima [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2+3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos(dx+c)}}{\sqrt{3\,\cos(dx+c)-2}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(-2+3*cos(d*x+c))^(1/2),x, algorithm="maxima"
)
[Out] integrate(sqrt(-cos(d*x + c))/sqrt(3*cos(d*x + c) - 2), x)
```

Giac [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2+3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos(dx+c)}}{\sqrt{3\,\cos(dx+c)-2}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(-2+3*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(-cos(d*x + c))/sqrt(3*cos(d*x + c) - 2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2+3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos(c+d\,x)}}{\sqrt{3\,\cos(c+d\,x)-2}}\,dx$$

```
[In] int((-cos(c + d*x))^(1/2)/(3*cos(c + d*x) - 2)^(1/2),x)
[Out] int((-cos(c + d*x))^(1/2)/(3*cos(c + d*x) - 2)^(1/2), x)
```

3.670 $\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{2-3\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 77

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{2-3\cos(c+dx)}}\,dx = -\frac{4\cot(c+dx)\,\text{EllipticPi}\left(\frac{1}{3},\arcsin\left(\frac{\sqrt{2-3\cos(c+dx)}}{\sqrt{-\cos(c+dx)}}\right),\frac{1}{5}\right)\sqrt{-1+\sec(c+dx)}\sqrt{1+\sec(c+dx)}}{3\sqrt{5}d}$$

```
[Out] -4/15*cot(d*x+c)*EllipticPi((2-3*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),1/3,
1/5*5^(1/2))*(-1+sec(d*x+c))^(1/2)*(1+sec(d*x+c))^(1/2)/d*5^(1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.037, Rules used = {2888}

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{2-3\cos(c+dx)}}\,dx = -\frac{4\cot(c+dx)\sqrt{\sec(c+dx)-1}\sqrt{\sec(c+dx)+1}\,\text{EllipticPi}\left(\frac{1}{3},\arcsin\left(\frac{\sqrt{2-3\cos(c+dx)}}{\sqrt{-\cos(c+dx)}}\right),\frac{1}{5}\right)}{3\sqrt{5}d}$$

```
[In] Int[Sqrt[-Cos[c + d*x]]/Sqrt[2 - 3*Cos[c + d*x]],x]
```

```
[Out] (-4*Cot[c + d*x]*EllipticPi[1/3, ArcSin[Sqrt[2 - 3*Cos[c + d*x]]/Sqrt[-Cos[
c + d*x]]], 1/5]*Sqrt[-1 + Sec[c + d*x]]*Sqrt[1 + Sec[c + d*x]])/(3*Sqrt[5]
*d)
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rubi steps

integral =
$$-\frac{4\cot(c+dx)\,\text{EllipticPi}\left(\frac{1}{3},\arcsin\left(\frac{\sqrt{2-3\cos(c+dx)}}{\sqrt{-\cos(c+dx)}}\right),\frac{1}{5}\right)\sqrt{-1+\sec(c+dx)}\sqrt{1+\sec(c+dx)}}{3\sqrt{5}d}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 203 vs. 2(77) = 154.

Time = 0.74 (sec) , antiderivative size = 203, normalized size of antiderivative = 2.64

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{2-3\cos(c+dx)}}\,dx$$
$$= \frac{4\sqrt{\cot^2\left(\frac{1}{2}(c+dx)\right)}\cot(c+dx)\sqrt{\cos(c+dx)\csc^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{-\left((-2+3\cos(c+dx))\csc^2\left(\frac{1}{2}(c+dx)\right)\right)}}{}$$

```
[In] Integrate[Sqrt[-Cos[c + d*x]]/Sqrt[2 - 3*Cos[c + d*x]],x]
```

```
[Out] (4*Sqrt[Cot[(c + d*x)/2]^2]*Cot[c + d*x]*Sqrt[Cos[c + d*x]*Csc[(c + d*x)/2]
^2]*Sqrt[-((-2 + 3*Cos[c + d*x])*Csc[(c + d*x)/2]^2)]*(3*EllipticF[ArcSin[S
qrt[(2 - 3*Cos[c + d*x])*Csc[(c + d*x)/2]^2]/2], 4/5] - EllipticPi[2/3, Arc
Sin[Sqrt[(2 - 3*Cos[c + d*x])*Csc[(c + d*x)/2]^2]/2], 4/5])*Sin[(c + d*x)/2
]^4)/(3*Sqrt[5]*d*Sqrt[2 - 3*Cos[c + d*x]]*(-Cos[c + d*x])^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 131 vs. 2(64) = 128.

Time = 5.40 (sec) , antiderivative size = 132, normalized size of antiderivative = 1.71

method	result
default	$-\frac{2\sqrt{-\cos(dx+c)}\sqrt{2-3\cos(dx+c)}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{\frac{-2+3\cos(dx+c)}{1+\cos(dx+c)}}\left(F\left(\cot(dx+c)-\csc(dx+c),\sqrt{5}\right)-2\Pi\left(\cot(dx+c)-\csc(dx+c),-1\right.\right.}{d(-2+3\cos(dx+c))}$

```
[In] int((-cos(d*x+c))^(1/2)/(2-3*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/d*(-cos(d*x+c))^(1/2)*(2-3*cos(d*x+c))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)*((-2+3*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)*(EllipticF(cot(d*x+c)-csc(d
*x+c),5^(1/2))-2*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,5^(1/2)))/(-2+3*cos(d*
x+c))*(1+sec(d*x+c))
```

Fricas [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(dx+c\right)}}{\sqrt{-3\,\cos\left(dx+c\right)+2}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(2-3*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-cos(d*x + c))*sqrt(-3*cos(d*x + c) + 2)/(3*cos(d*x + c) - 2
), x)
```

Sympy [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(c+dx\right)}}{\sqrt{2-3\cos\left(c+dx\right)}}\,dx$$

```
[In] integrate((-cos(d*x+c))**(1/2)/(2-3*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(-cos(c + d*x))/sqrt(2 - 3*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(dx+c\right)}}{\sqrt{-3\,\cos\left(dx+c\right)+2}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(2-3*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-cos(d*x + c))/sqrt(-3*cos(d*x + c) + 2), x)
```

Giac [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(dx+c\right)}}{\sqrt{-3\,\cos\left(dx+c\right)+2}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(2-3*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(-cos(d*x + c))/sqrt(-3*cos(d*x + c) + 2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(c+d\,x\right)}}{\sqrt{2-3\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int((-cos(c + d*x))^(1/2)/(2 - 3*cos(c + d*x))^(1/2),x)
[Out] int((-cos(c + d*x))^(1/2)/(2 - 3*cos(c + d*x))^(1/2), x)
```

3.671 $\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2-3\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 79

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2-3\cos(c+dx)}}\,dx = -\frac{4\cot(c+dx)\,\text{EllipticPi}\left(\frac{5}{3},\arcsin\left(\frac{\sqrt{-2-3\cos(c+dx)}}{\sqrt{5}\sqrt{-\cos(c+dx)}}\right),5\right)\sqrt{-1-\sec(c+dx)}\sqrt{1-\sec(c+dx)}}{3d}$$

```
[Out] -4/3*cot(d*x+c)*EllipticPi(1/5*(-2-3*cos(d*x+c))^(1/2)*5^(1/2)/(-cos(d*x+c)
)^(1/2),5/3,5^(1/2))*(-1-sec(d*x+c))^(1/2)*(1-sec(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 79, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.037, Rules used = {2888}

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2-3\cos(c+dx)}}\,dx = -\frac{4\cot(c+dx)\sqrt{-\sec(c+dx)-1}\sqrt{1-\sec(c+dx)}\,\text{EllipticPi}\left(\frac{5}{3},\arcsin\left(\frac{\sqrt{-3\cos(c+dx)-2}}{\sqrt{5}\sqrt{-\cos(c+dx)}}\right),5\right)}{3d}$$

```
[In] Int[Sqrt[-Cos[c + d*x]]/Sqrt[-2 - 3*Cos[c + d*x]],x]
```

```
[Out] (-4*Cot[c + d*x]*EllipticPi[5/3, ArcSin[Sqrt[-2 - 3*Cos[c + d*x]]/(Sqrt[5]*
Sqrt[-Cos[c + d*x]])], 5]*Sqrt[-1 - Sec[c + d*x]]*Sqrt[1 - Sec[c + d*x]])/(
3*d)
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rubi steps

integral =
$$-\frac{4\cot(c+dx)\,\text{EllipticPi}\left(\frac{5}{3},\arcsin\left(\frac{\sqrt{-2-3\cos(c+dx)}}{\sqrt{5}\sqrt{-\cos(c+dx)}}\right),5\right)\sqrt{-1-\sec(c+dx)}\sqrt{1-\sec(c+dx)}}{3d}$$

Mathematica [A] (verified)

Time = 0.42 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.97

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2-3\cos(c+dx)}}\,dx$$
$$=\frac{4\cos^2\left(\frac{1}{2}(c+dx)\right)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{-\frac{(2+3\cos(c+dx))^2}{(1+\cos(c+dx))^2}}\left(\text{EllipticF}\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right),\frac{1}{5}\right)-2\,\text{EllipticPi}\left(-\right.\right.}{\sqrt{5}d\sqrt{-2-3\cos(c+dx)}\sqrt{-\cos(c+dx)}\sqrt{\frac{-2-3\cos(c+dx)}{1+\cos(c+dx)}}}$$

```
[In] Integrate[Sqrt[-Cos[c + d*x]]/Sqrt[-2 - 3*Cos[c + d*x]],x]
```

```
[Out] (4*Cos[(c + d*x)/2]^2*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[-((2 + 3*C
os[c + d*x])^2/(1 + Cos[c + d*x])^2)]*(EllipticF[ArcSin[Tan[(c + d*x)/2]],
1/5] - 2*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], 1/5]))/(Sqrt[5]*d*Sqrt[-2
 - 3*Cos[c + d*x]]*Sqrt[-Cos[c + d*x]]*Sqrt[(-2 - 3*Cos[c + d*x])/(1 + Cos[
c + d*x])])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 141 vs. 2(67) = 134.

Time = 6.50 (sec) , antiderivative size = 142, normalized size of antiderivative = 1.80

method	result
default	$-\frac{\sqrt{-\cos(dx+c)}\sqrt{-2-3\cos(dx+c)}\left(F\left(\cot(dx+c)-\csc(dx+c),\frac{\sqrt{5}}{5}\right)-2\Pi\left(\cot(dx+c)-\csc(dx+c),-1,\frac{\sqrt{5}}{5}\right)\right)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{10}\sqrt{}}{5d(2+3\cos(dx+c))}$

```
[In] int((-cos(d*x+c))^(1/2)/(-2-3*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/5/d*(-cos(d*x+c))^(1/2)*(-2-3*cos(d*x+c))^(1/2)*(EllipticF(cot(d*x+c)-cs
c(d*x+c),1/5*5^(1/2))-2*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,1/5*5^(1/2)))*2
^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*10^(1/2)*((2+3*cos(d*x+c))/(1+cos(
d*x+c)))^(1/2)/(2+3*cos(d*x+c))*(1+sec(d*x+c))
```

Fricas [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(dx+c\right)}}{\sqrt{-3\,\cos\left(dx+c\right)-2}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(-2-3*cos(d*x+c))^(1/2),x, algorithm="fricas"
)
```

```
[Out] integral(-sqrt(-cos(d*x + c))*sqrt(-3*cos(d*x + c) - 2)/(3*cos(d*x + c) + 2
), x)
```

Sympy [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(c+dx\right)}}{\sqrt{-3\cos\left(c+dx\right)-2}}\,dx$$

```
[In] integrate((-cos(d*x+c))**(1/2)/(-2-3*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(-cos(c + d*x))/sqrt(-3*cos(c + d*x) - 2), x)
```

Maxima [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(dx+c\right)}}{\sqrt{-3\,\cos\left(dx+c\right)-2}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(-2-3*cos(d*x+c))^(1/2),x, algorithm="maxima"
)
```

```
[Out] integrate(sqrt(-cos(d*x + c))/sqrt(-3*cos(d*x + c) - 2), x)
```

Giac [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(dx+c\right)}}{\sqrt{-3\,\cos\left(dx+c\right)-2}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(-2-3*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(-cos(d*x + c))/sqrt(-3*cos(d*x + c) - 2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2-3\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(c+d\,x\right)}}{\sqrt{-3\,\cos\left(c+d\,x\right)-2}}\,dx$$

```
[In] int((-cos(c + d*x))^(1/2)/(- 3*cos(c + d*x) - 2)^(1/2),x)
[Out] int((-cos(c + d*x))^(1/2)/(- 3*cos(c + d*x) - 2)^(1/2), x)
```

3.672 $\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{3+2\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 95

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{3+2\cos(c+dx)}}\,dx = -\frac{3\sqrt{-\cos(c+dx)}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{5}{2},\arcsin\left(\frac{\sqrt{3+2\cos(c+dx)}}{\sqrt{5}\sqrt{\cos(c+dx)}}\right),-5\right)\sqrt{1-\sec(c+dx)}}{d}$$

```
[Out] -3*csc(d*x+c)*EllipticPi(1/5*(3+2*cos(d*x+c))^(1/2)*5^(1/2)/cos(d*x+c)^(1/2
),5/2,I*5^(1/2))*(-cos(d*x+c))^(1/2)*cos(d*x+c)^(1/2)*(1-sec(d*x+c))^(1/2)*
(1+sec(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.074$, Rules used = {2889, 2887}

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{3+2\cos(c+dx)}}\,dx = -\frac{3\sqrt{-\cos(c+dx)}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{1-\sec(c+dx)}\sqrt{\sec(c+dx)+1}\,\text{EllipticPi}\left(\frac{5}{2},\arcsin\left(\right.\right.}{d}$$

```
[In] Int[Sqrt[-Cos[c + d*x]]/Sqrt[3 + 2*Cos[c + d*x]],x]
```

```
[Out] (-3*Sqrt[-Cos[c + d*x]]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticPi[5/2, Arc
Sin[Sqrt[3 + 2*Cos[c + d*x]]/(Sqrt[5]*Sqrt[Cos[c + d*x]])], -5]*Sqrt[1 - Se
c[c + d*x]]*Sqrt[1 + Sec[c + d*x]])/d
```

Rule 2887

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*c*Rt[b*(c + d), 2]*Tan[e + f*x]*Sqrt[1 + Csc[e
 + f*x]]*(Sqrt[1 - Csc[e + f*x]]/(d*f*Sqrt[c^2 - d^2]))*EllipticPi[(c + d)/
d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]],
-(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c^2 - d^2, 0] &&
PosQ[(c + d)/b] && GtQ[c^2, 0]
```

Rule 2889

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[Sqrt[b*Sin[e + f*x]]/Sqrt[(-b)*Sin[e + f*x]], In
t[Sqrt[(-b)*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]], x], x] /; FreeQ[{b, c,
d, e, f}, x] && NeQ[c^2 - d^2, 0] && NegQ[(c + d)/b]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{-\cos(c+dx)}\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3+2\cos(c+dx)}}\,dx}{\sqrt{\cos(c+dx)}}$$

$$= -\frac{3\sqrt{-\cos(c+dx)}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{5}{2},\arcsin\left(\frac{\sqrt{3+2\cos(c+dx)}}{\sqrt{5}\sqrt{\cos(c+dx)}}\right),-5\right)\sqrt{1-\sec(}}{d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.39 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.37

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{3+2\cos(c+dx)}}\,dx$$

$$= \frac{2i\sqrt{-\cos(c+dx)}\sqrt{3+2\cos(c+dx)}\left(\text{EllipticF}\left(i\text{arcsinh}\left(\frac{\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{5}}\right),-5\right)-2\,\text{EllipticPi}\left(5,i\text{arcsinh}\left(\right.\right.\right.}{d\sqrt{(1+3\cos(c+dx)+\cos(2(c+dx)))\sec^4\left(\frac{1}{2}(c+dx)\right)}}$$

```
[In] Integrate[Sqrt[-Cos[c + d*x]]/Sqrt[3 + 2*Cos[c + d*x]],x]
```

```
[Out] ((2*I)*Sqrt[-Cos[c + d*x]]*Sqrt[3 + 2*Cos[c + d*x]]*(EllipticF[I*ArcSinh[Ta
n[(c + d*x)/2]/Sqrt[5]], -5] - 2*EllipticPi[5, I*ArcSinh[Tan[(c + d*x)/2]/S
qrt[5]], -5])*Sec[(c + d*x)/2]^2)/(d*Sqrt[(1 + 3*Cos[c + d*x] + Cos[2*(c +
d*x)])*Sec[(c + d*x)/2]^4])
```

Maple [A] (verified)

Time = 6.62 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.56

method	result
default	$\frac{i\sqrt{-\cos(dx+c)}\,\sqrt{10}\,\sqrt{\frac{3+2\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{2}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\left(F\left(\frac{i(\csc(dx+c)-\cot(dx+c))\sqrt{5}}{5},i\sqrt{5}\right)-2\Pi\left(\frac{i(\csc(dx+c)-\cot(dx+c))\sqrt{5}}{5},5,i\sqrt{5}\right)\right)}{5d\sqrt{3+2\cos(dx+c)}}$

```
[In] int((-cos(d*x+c))^(1/2)/(3+2*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/5*I/d*(-cos(d*x+c))^(1/2)/(3+2*cos(d*x+c))^(1/2)*10^(1/2)*((3+2*cos(d*x+c
))/(1+cos(d*x+c)))^(1/2)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(Ellipti
cF(1/5*I*(csc(d*x+c)-cot(d*x+c))*5^(1/2),I*5^(1/2))-2*EllipticPi(1/5*I*(csc
(d*x+c)-cot(d*x+c))*5^(1/2),5,I*5^(1/2)))*(1+sec(d*x+c))*5^(1/2)
```

Fricas [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{3+2\cos(c+dx)}}\,dx=\int \frac{\sqrt{-\cos\left(dx+c\right)}}{\sqrt{2\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(3+2*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(-cos(d*x + c))/sqrt(2*cos(d*x + c) + 3), x)
```

Sympy [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{3+2\cos(c+dx)}}\,dx=\int \frac{\sqrt{-\cos\left(c+dx\right)}}{\sqrt{2\cos\left(c+dx\right)+3}}\,dx$$

```
[In] integrate((-cos(d*x+c))**(1/2)/(3+2*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(-cos(c + d*x))/sqrt(2*cos(c + d*x) + 3), x)
```

Maxima [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{3+2\cos(c+dx)}}\,dx=\int \frac{\sqrt{-\cos\left(dx+c\right)}}{\sqrt{2\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(3+2*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(-cos(d*x + c))/sqrt(2*cos(d*x + c) + 3), x)
```

Giac [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{3+2\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(dx+c\right)}}{\sqrt{2\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(3+2*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(-cos(d*x + c))/sqrt(2*cos(d*x + c) + 3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{3+2\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(c+d\,x\right)}}{\sqrt{2\,\cos\left(c+d\,x\right)+3}}\,dx$$

```
[In] int((-cos(c + d*x))^(1/2)/(2*cos(c + d*x) + 3)^(1/2),x)
[Out] int((-cos(c + d*x))^(1/2)/(2*cos(c + d*x) + 3)^(1/2), x)
```

3.673 $\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{3-2\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 97

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{3-2\cos(c+dx)}}\,dx = \frac{3\sqrt{-\cos(c+dx)}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(-\frac{1}{2},\arcsin\left(\frac{\sqrt{3-2\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\right),-\frac{1}{5}\right)\sqrt{1-\sec(c+dx)}}{\sqrt{5}d}$$

```
[Out] 3/5*csc(d*x+c)*EllipticPi((3-2*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2),-1/2,1/5*
I*5^(1/2))*(-cos(d*x+c))^(1/2)*cos(d*x+c)^(1/2)*(1-sec(d*x+c))^(1/2)*(1+sec
(d*x+c))^(1/2)/d*5^(1/2)
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.074, Rules used = {2889, 2887}

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{3-2\cos(c+dx)}}\,dx = \frac{3\sqrt{-\cos(c+dx)}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{1-\sec(c+dx)}\sqrt{\sec(c+dx)+1}\,\text{EllipticPi}\left(-\frac{1}{2},\arcsin\left(\frac{\sqrt{3-2\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\right),-\frac{1}{5}\right)}{\sqrt{5}d}$$

```
[In] Int[Sqrt[-Cos[c + d*x]]/Sqrt[3 - 2*Cos[c + d*x]],x]
```

```
[Out] (3*Sqrt[-Cos[c + d*x]]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticPi[-1/2, Arc
Sin[Sqrt[3 - 2*Cos[c + d*x]]/Sqrt[Cos[c + d*x]]], -1/5]*Sqrt[1 - Sec[c + d*
x]]*Sqrt[1 + Sec[c + d*x]])/(Sqrt[5]*d)
```

Rule 2887

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*c*Rt[b*(c + d), 2]*Tan[e + f*x]*Sqrt[1 + Csc[e
 + f*x]]*(Sqrt[1 - Csc[e + f*x]]/(d*f*Sqrt[c^2 - d^2]))*EllipticPi[(c + d)/
d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]],
-(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c^2 - d^2, 0] &&
PosQ[(c + d)/b] && GtQ[c^2, 0]
```

Rule 2889

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[Sqrt[b*Sin[e + f*x]]/Sqrt[(-b)*Sin[e + f*x]], In
t[Sqrt[(-b)*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]], x], x] /; FreeQ[{b, c,
d, e, f}, x] && NeQ[c^2 - d^2, 0] && NegQ[(c + d)/b]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{-\cos(c+dx)}\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{3-2\cos(c+dx)}}\,dx}{\sqrt{\cos(c+dx)}}$$

$$= \frac{3\sqrt{-\cos(c+dx)}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(-\frac{1}{2},\arcsin\left(\frac{\sqrt{3-2\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\right),-\frac{1}{5}\right)\sqrt{1-\sec(}{\sqrt{5}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.24 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.34

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{3-2\cos(c+dx)}}\,dx$$

$$= \frac{2i\sqrt{-\cos(c+dx)}\left(\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{5}\tan\left(\frac{1}{2}(c+dx)\right)\right),-\frac{1}{5}\right)-2\,\text{EllipticPi}\left(\frac{1}{5},i\text{arcsinh}\left(\sqrt{5}\tan\left(\frac{1}{2}(c+\right.\right.\right.}{d\sqrt{30-20\cos(c+dx)}\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}}$$

```
[In] Integrate[Sqrt[-Cos[c + d*x]]/Sqrt[3 - 2*Cos[c + d*x]],x]
```

```
[Out] ((2*I)*Sqrt[-Cos[c + d*x]]*(EllipticF[I*ArcSinh[Sqrt[5]*Tan[(c + d*x)/2]],
-1/5] - 2*EllipticPi[1/5, I*ArcSinh[Sqrt[5]*Tan[(c + d*x)/2]], -1/5])*Sqrt[
1 + 5*Tan[(c + d*x)/2]^2])/(d*Sqrt[30 - 20*Cos[c + d*x]]*Sqrt[Cos[c + d*x]/
(1 + Cos[c + d*x])])
```

Maple [A] (verified)

Time = 7.03 (sec) , antiderivative size = 160, normalized size of antiderivative = 1.65

method	result
default	$\frac{i\left(2\Pi\left(i(\csc(dx+c)-\cot(dx+c))\sqrt{5},\frac{1}{5},\frac{i\sqrt{5}}{5}\right)-F\left(i(\csc(dx+c)-\cot(dx+c))\sqrt{5},\frac{i\sqrt{5}}{5}\right)\right)\sqrt{-\cos(dx+c)}\,\sqrt{3-2\cos(dx+c)}\,\sqrt{2}\,\sqrt{\frac{\cos(dx+}{1+\cos(dx}}}{5d(-3+2\cos(dx+c))}$

```
[In] int((-cos(d*x+c))^(1/2)/(3-2*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/5*I/d*(2*EllipticPi(I*(csc(d*x+c)-cot(d*x+c))*5^(1/2),1/5,1/5*I*5^(1/2))-
EllipticF(I*(csc(d*x+c)-cot(d*x+c))*5^(1/2),1/5*I*5^(1/2)))*(-cos(d*x+c))^(
1/2)*(3-2*cos(d*x+c))^(1/2)*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(-2*(
-3+2*cos(d*x+c))/(1+cos(d*x+c)))^(1/2)/(-3+2*cos(d*x+c))*(1+sec(d*x+c))*5^(
1/2)
```

Fricas [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(dx+c\right)}}{\sqrt{-2\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(3-2*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-cos(d*x + c))*sqrt(-2*cos(d*x + c) + 3)/(2*cos(d*x + c) - 3
), x)
```

Sympy [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(c+dx\right)}}{\sqrt{3-2\cos\left(c+dx\right)}}\,dx$$

```
[In] integrate((-cos(d*x+c))**(1/2)/(3-2*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(-cos(c + d*x))/sqrt(3 - 2*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(dx+c\right)}}{\sqrt{-2\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(3-2*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(-cos(d*x + c))/sqrt(-2*cos(d*x + c) + 3), x)
```

Giac [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(dx+c\right)}}{\sqrt{-2\,\cos\left(dx+c\right)+3}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(3-2*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(-cos(d*x + c))/sqrt(-2*cos(d*x + c) + 3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(c+d\,x\right)}}{\sqrt{3-2\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int((-cos(c + d*x))^(1/2)/(3 - 2*cos(c + d*x))^(1/2),x)
[Out] int((-cos(c + d*x))^(1/2)/(3 - 2*cos(c + d*x))^(1/2), x)
```

3.674 $\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3+2\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 77

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3+2\cos(c+dx)}}\,dx = \frac{3\cot(c+dx)\,\text{EllipticPi}\left(-\frac{1}{2},\arcsin\left(\frac{\sqrt{-3+2\cos(c+dx)}}{\sqrt{-\cos(c+dx)}}\right),-\frac{1}{5}\right)\sqrt{1-\sec(c+dx)}\sqrt{1+\sec(c+dx)}}{\sqrt{5}d}$$

```
[Out] 3/5*cot(d*x+c)*EllipticPi((-3+2*cos(d*x+c))^(1/2)/(-cos(d*x+c))^(1/2),-1/2,
1/5*I*5^(1/2))*(1-sec(d*x+c))^(1/2)*(1+sec(d*x+c))^(1/2)/d*5^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.037$, Rules used = {2887}

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3+2\cos(c+dx)}}\,dx = \frac{3\cot(c+dx)\sqrt{1-\sec(c+dx)}\sqrt{\sec(c+dx)+1}\,\text{EllipticPi}\left(-\frac{1}{2},\arcsin\left(\frac{\sqrt{2\cos(c+dx)-3}}{\sqrt{-\cos(c+dx)}}\right),-\frac{1}{5}\right)}{\sqrt{5}d}$$

```
[In] Int[Sqrt[-Cos[c + d*x]]/Sqrt[-3 + 2*Cos[c + d*x]],x]
```

```
[Out] (3*Cot[c + d*x]*EllipticPi[-1/2, ArcSin[Sqrt[-3 + 2*Cos[c + d*x]]/Sqrt[-Cos
[c + d*x]]], -1/5]*Sqrt[1 - Sec[c + d*x]]*Sqrt[1 + Sec[c + d*x]])/(Sqrt[5]*
d)
```

Rule 2887

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*c*Rt[b*(c + d), 2]*Tan[e + f*x]*Sqrt[1 + Csc[e
 + f*x]]*(Sqrt[1 - Csc[e + f*x]]/(d*f*Sqrt[c^2 - d^2]))*EllipticPi[(c + d)/
d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]],
-(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c^2 - d^2, 0] &&
PosQ[(c + d)/b] && GtQ[c^2, 0]
```

Rubi steps

integral

$$= \frac{3\cot(c+dx)\,\text{EllipticPi}\left(-\frac{1}{2},\arcsin\left(\frac{\sqrt{-3+2\cos(c+dx)}}{\sqrt{-\cos(c+dx)}}\right),-\frac{1}{5}\right)\sqrt{1-\sec(c+dx)}\sqrt{1+\sec(c+dx)}}{\sqrt{5}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.18 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.82

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3+2\cos(c+dx)}}\,dx$$

$$= \frac{2i\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{-3+2\cos(c+dx)}\left(\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{5}\tan\left(\frac{1}{2}(c+dx)\right)\right),-\frac{1}{5}\right)-2\,\text{EllipticPi}\left(\frac{1}{5},i\text{arcsi}\right.\right.}{\sqrt{5}d\sqrt{-\cos(c+dx)}\sqrt{\frac{3-2\cos(c+dx)}{1+\cos(c+dx)}}}$$

```
[In] Integrate[Sqrt[-Cos[c + d*x]]/Sqrt[-3 + 2*Cos[c + d*x]],x]
```

```
[Out] ((2*I)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[-3 + 2*Cos[c + d*x]]*(Ell
ipticF[I*ArcSinh[Sqrt[5]*Tan[(c + d*x)/2]], -1/5] - 2*EllipticPi[1/5, I*Arc
Sinh[Sqrt[5]*Tan[(c + d*x)/2]], -1/5]))/(Sqrt[5]*d*Sqrt[-Cos[c + d*x]]*Sqrt
[(3 - 2*Cos[c + d*x])/(1 + Cos[c + d*x])])
```

Maple [A] (verified)

Time = 6.32 (sec) , antiderivative size = 129, normalized size of antiderivative = 1.68

method	result
default	$\frac{\sqrt{-\cos(dx+c)}\sqrt{-\frac{2(-3+2\cos(dx+c))}{1+\cos(dx+c)}}\left(F\left(\cot(dx+c)-\csc(dx+c),i\sqrt{5}\right)-2\Pi\left(\cot(dx+c)-\csc(dx+c),-1,i\sqrt{5}\right)\right)\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,(1+\text{s}}{d\sqrt{-3+2\cos(dx+c)}}$

```
[In] int((-cos(d*x+c))^(1/2)/(-3+2*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

[Out] 1/d/(-3+2*cos(d*x+c))^(1/2)*(-cos(d*x+c))^(1/2)*(-2*(-3+2*cos(d*x+c))/(1+co
s(d*x+c)))^(1/2)*(EllipticF(cot(d*x+c)-csc(d*x+c),I*5^(1/2))-2*EllipticPi(c
ot(d*x+c)-csc(d*x+c),-1,I*5^(1/2)))*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*(1+sec(d*x+c))

Fricas [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(dx+c\right)}}{\sqrt{2\,\cos\left(dx+c\right)-3}}\,dx$$

[In] integrate((-cos(d*x+c))^(1/2)/(-3+2*cos(d*x+c))^(1/2),x, algorithm="fricas"
)

[Out] integral(sqrt(-cos(d*x + c))/sqrt(2*cos(d*x + c) - 3), x)

Sympy [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(c+dx\right)}}{\sqrt{2\cos\left(c+dx\right)-3}}\,dx$$

[In] integrate((-cos(d*x+c))**(1/2)/(-3+2*cos(d*x+c))**(1/2),x)

[Out] Integral(sqrt(-cos(c + d*x))/sqrt(2*cos(c + d*x) - 3), x)

Maxima [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(dx+c\right)}}{\sqrt{2\,\cos\left(dx+c\right)-3}}\,dx$$

[In] integrate((-cos(d*x+c))^(1/2)/(-3+2*cos(d*x+c))^(1/2),x, algorithm="maxima"
)

[Out] integrate(sqrt(-cos(d*x + c))/sqrt(2*cos(d*x + c) - 3), x)

Giac [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(dx+c\right)}}{\sqrt{2\,\cos\left(dx+c\right)-3}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(-3+2*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(-cos(d*x + c))/sqrt(2*cos(d*x + c) - 3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3+2\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(c+d\,x\right)}}{\sqrt{2\,\cos\left(c+d\,x\right)-3}}\,dx$$

```
[In] int((-cos(c + d*x))^(1/2)/(2*cos(c + d*x) - 3)^(1/2),x)
[Out] int((-cos(c + d*x))^(1/2)/(2*cos(c + d*x) - 3)^(1/2), x)
```

3.675 $\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3-2\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 75

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3-2\cos(c+dx)}}\,dx = -\frac{3\cot(c+dx)\,\mathrm{EllipticPi}\left(\frac{5}{2},\arcsin\left(\frac{\sqrt{-3-2\cos(c+dx)}}{\sqrt{5}\sqrt{-\cos(c+dx)}}\right),-5\right)\sqrt{1-\sec(c+dx)}\sqrt{1+\sec(c+dx)}}{d}$$

```
[Out] -3*cot(d*x+c)*EllipticPi(1/5*(-3-2*cos(d*x+c))^(1/2)*5^(1/2)/(-cos(d*x+c))^
(1/2),5/2,I*5^(1/2))*(1-sec(d*x+c))^(1/2)*(1+sec(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.037$, Rules used = {2887}

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3-2\cos(c+dx)}}\,dx = -\frac{3\cot(c+dx)\sqrt{1-\sec(c+dx)}\sqrt{\sec(c+dx)+1}\,\mathrm{EllipticPi}\left(\frac{5}{2},\arcsin\left(\frac{\sqrt{-2\cos(c+dx)-3}}{\sqrt{5}\sqrt{-\cos(c+dx)}}\right),-5\right)}{d}$$

```
[In] Int[Sqrt[-Cos[c + d*x]]/Sqrt[-3 - 2*Cos[c + d*x]],x]
```

```
[Out] (-3*Cot[c + d*x]*EllipticPi[5/2, ArcSin[Sqrt[-3 - 2*Cos[c + d*x]]/(Sqrt[5]*
Sqrt[-Cos[c + d*x]])], -5]*Sqrt[1 - Sec[c + d*x]]*Sqrt[1 + Sec[c + d*x]])/d
```

Rule 2887

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*c*Rt[b*(c + d), 2]*Tan[e + f*x]*Sqrt[1 + Csc[e
```

```
 + f*x]]*(Sqrt[1 - Csc[e + f*x]]/(d*f*Sqrt[c^2 - d^2]))*EllipticPi[(c + d)/
d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]],
-(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c^2 - d^2, 0] &&
PosQ[(c + d)/b] && GtQ[c^2, 0]
```

Rubi steps

integral =

$$-\frac{3\cot(c+dx)\,\text{EllipticPi}\left(\frac{5}{2},\arcsin\left(\frac{\sqrt{-3-2\cos(c+dx)}}{\sqrt{5}\sqrt{-\cos(c+dx)}}\right),-5\right)\sqrt{1-\sec(c+dx)}\sqrt{1+\sec(c+dx)}}{d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.34 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.71

$$\int\frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3-2\cos(c+dx)}}\,dx =$$
$$-\frac{2i\cos^2\left(\frac{1}{2}(c+dx)\right)\left(\text{EllipticF}\left(i\text{arcsinh}\left(\frac{\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{5}}\right),-5\right)-2\,\text{EllipticPi}\left(5,i\text{arcsinh}\left(\frac{\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{5}}\right),-5\right.\right.}{d\sqrt{-3-2\cos(c+dx)}\sqrt{-\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[-Cos[c + d*x]]/Sqrt[-3 - 2*Cos[c + d*x]],x]
```

```
[Out] ((-2*I)*Cos[(c + d*x)/2]^2*(EllipticF[I*ArcSinh[Tan[(c + d*x)/2]/Sqrt[5]],
-5] - 2*EllipticPi[5, I*ArcSinh[Tan[(c + d*x)/2]/Sqrt[5]], -5])*Sqrt[Cos[c
+ d*x]*(3 + 2*Cos[c + d*x])*Sec[(c + d*x)/2]^4])/(d*Sqrt[-3 - 2*Cos[c + d*x
]]*Sqrt[-Cos[c + d*x]])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 143 vs. 2(68) = 136.

Time = 5.94 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.92

method	result
default	$-\frac{\sqrt{2}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\sqrt{-\cos(dx+c)}\sqrt{-3-2\cos(dx+c)}\left(F\left(\cot(dx+c)-\csc(dx+c),\frac{i\sqrt{5}}{5}\right)-2\Pi\left(\cot(dx+c)-\csc(dx+c),-1,\frac{i\sqrt{5}}{5}\right)\right)\sqrt{10}}{5d(3+2\cos(dx+c))}$

```
[In] int((-cos(d*x+c))^(1/2)/(-3-2*cos(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/5/d*2^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(-cos(d*x+c))^(1/2)*(-3-2*
cos(d*x+c))^(1/2)*(EllipticF(cot(d*x+c)-csc(d*x+c),1/5*I*5^(1/2))-2*Ellipti
```

```
cPi(cot(d*x+c)-csc(d*x+c),-1,1/5*I*5^(1/2)))*10^(1/2)*((3+2*cos(d*x+c))/(1+
cos(d*x+c)))^(1/2)/(3+2*cos(d*x+c))*(1+sec(d*x+c))
```

Fricas [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos(dx+c)}}{\sqrt{-2\cos(dx+c)-3}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(-3-2*cos(d*x+c))^(1/2),x, algorithm="fricas"
)
[Out] integral(-sqrt(-cos(d*x + c))*sqrt(-2*cos(d*x + c) - 3)/(2*cos(d*x + c) + 3
), x)
```

Sympy [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-2\cos(c+dx)-3}}\,dx$$

```
[In] integrate((-cos(d*x+c))**(1/2)/(-3-2*cos(d*x+c))**(1/2),x)
[Out] Integral(sqrt(-cos(c + d*x))/sqrt(-2*cos(c + d*x) - 3), x)
```

Maxima [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos(dx+c)}}{\sqrt{-2\cos(dx+c)-3}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(-3-2*cos(d*x+c))^(1/2),x, algorithm="maxima"
)
[Out] integrate(sqrt(-cos(d*x + c))/sqrt(-2*cos(d*x + c) - 3), x)
```

Giac [F]

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(dx+c\right)}}{\sqrt{-2\,\cos\left(dx+c\right)-3}}\,dx$$

```
[In] integrate((-cos(d*x+c))^(1/2)/(-3-2*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(-cos(d*x + c))/sqrt(-2*cos(d*x + c) - 3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{-\cos(c+dx)}}{\sqrt{-3-2\cos(c+dx)}}\,dx = \int \frac{\sqrt{-\cos\left(c+d\,x\right)}}{\sqrt{-2\,\cos\left(c+d\,x\right)-3}}\,dx$$

```
[In] int((-cos(c + d*x))^(1/2)/(- 2*cos(c + d*x) - 3)^(1/2),x)
[Out] int((-cos(c + d*x))^(1/2)/(- 2*cos(c + d*x) - 3)^(1/2), x)
```

3.676 $\int \frac{\cos^{\frac{2}{3}}(c+dx)}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 176

$$\int \frac{\cos^{\frac{2}{3}}(c+dx)}{a+b\cos(c+dx)}\,dx = -\frac{b\,\text{AppellF1}\left(\frac{1}{2},-\frac{1}{3},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\cos^{\frac{2}{3}}(c+dx)\sin(c+dx)}{(a^2-b^2)\,d\sqrt[3]{\cos^2(c+dx)}} + \frac{a\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{6},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\sqrt[6]{\cos^2(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d\sqrt[3]{\cos(c+dx)}}$$

```
[Out] -b*AppellF1(1/2,-1/3,1,3/2,sin(d*x+c)^2,-b^2*sin(d*x+c)^2/(a^2-b^2))*cos(d*
x+c)^(2/3)*sin(d*x+c)/(a^2-b^2)/d/(cos(d*x+c)^2)^(1/3)+a*AppellF1(1/2,1/6,1
,3/2,sin(d*x+c)^2,-b^2*sin(d*x+c)^2/(a^2-b^2))*(cos(d*x+c)^2)^(1/6)*sin(d*x
+c)/(a^2-b^2)/d/cos(d*x+c)^(1/3)
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used

$= \{2902, 3268, 440\}$

$$\int \frac{\cos^{\frac{2}{3}}(c+dx)}{a+b\cos(c+dx)}\,dx$$
$$= \frac{a\sin(c+dx)\sqrt[6]{\cos^2(c+dx)}\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{6},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)}{d\,(a^2-b^2)\sqrt[3]{\cos(c+dx)}}$$
$$- \frac{b\sin(c+dx)\cos^{\frac{2}{3}}(c+dx)\,\text{AppellF1}\left(\frac{1}{2},-\frac{1}{3},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)}{d\,(a^2-b^2)\sqrt[3]{\cos^2(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^(2/3)/(a + b*Cos[c + d*x]),x]
```

```
[Out] -((b*AppellF1[1/2, -1/3, 1, 3/2, Sin[c + d*x]^2, -((b^2*Sin[c + d*x]^2)/(a^
2 - b^2))]*Cos[c + d*x]^(2/3)*Sin[c + d*x])/((a^2 - b^2)*d*(Cos[c + d*x]^2)
^(1/3))) + (a*AppellF1[1/2, 1/6, 1, 3/2, Sin[c + d*x]^2, -((b^2*Sin[c + d*x
]^2)/(a^2 - b^2))]*(Cos[c + d*x]^2)^(1/6)*Sin[c + d*x])/((a^2 - b^2)*d*Cos[
c + d*x]^(1/3))
```

Rule 440

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[a^p*c^q*x*AppellF1[1/n, -p, -q, 1 + 1/n, (-b)*(x^n/a), (-d)*(x^n/c)
], x] /; FreeQ[{a, b, c, d, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[n, -1]
 && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 2902

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Dist[a, Int[(d*Sin[e + f*x])^n/(a^2 - b^2*Sin[e + f*x]^
2), x], x] - Dist[b/d, Int[(d*Sin[e + f*x])^(n + 1)/(a^2 - b^2*Sin[e + f*x]
^2), x], x] /; FreeQ[{a, b, d, e, f, n}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3268

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^2)^(p_.), x_Symbol] :> With[{ff = FreeFactors[Cos[e + f*x], x]}, Dist[(
-ff)*d^(2*IntPart[(m - 1)/2] + 1)*((d*Sin[e + f*x])^(2*FracPart[(m - 1)/2])
/(f*(Sin[e + f*x]^2)^FracPart[(m - 1)/2])), Subst[Int[(1 - ff^2*x^2)^((m -
1)/2)*(a + b - b*ff^2*x^2)^p, x], x, Cos[e + f*x]/ff], x]] /; FreeQ[{a, b,
d, e, f, m, p}, x] &&  !IntegerQ[m]
```

Rubi steps

$$\text{integral} = a\int \frac{\cos^{\frac{2}{3}}(c+dx)}{a^2-b^2\cos^2(c+dx)}\,dx - b\int \frac{\cos^{\frac{5}{3}}(c+dx)}{a^2-b^2\cos^2(c+dx)}\,dx$$

$$= -\frac{\left(b\cos^{\frac{2}{3}}(c+dx)\right)\text{Subst}\left(\int \frac{\sqrt[3]{1-x^2}}{a^2-b^2+b^2x^2}\,dx,x,\sin(c+dx)\right)}{d\sqrt[3]{\cos^2(c+dx)}} + \frac{\left(a\sqrt[6]{\cos^2(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt[6]{1-x^2}(a^2-b^2+b^2x^2)}\,dx,x,\sin(c+dx)\right)}{d\sqrt[3]{\cos(c+dx)}}$$

$$= -\frac{b\,\text{AppellF1}\left(\frac{1}{2},-\frac{1}{3},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\cos^{\frac{2}{3}}(c+dx)\sin(c+dx)}{(a^2-b^2)\,d\sqrt[3]{\cos^2(c+dx)}} + \frac{a\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{6},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\sqrt[6]{\cos^2(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d\sqrt[3]{\cos(c+dx)}}$$

Mathematica [B] (warning: unable to verify)

Leaf count is larger than twice the leaf count of optimal. 4614 vs. $2(176) = 352$.

Time = 34.42 (sec) , antiderivative size = 4614, normalized size of antiderivative = 26.22

$$\int \frac{\cos^{\frac{2}{3}}(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Result too large to show}$$

```
[In] Integrate[Cos[c + d*x]^(2/3)/(a + b*Cos[c + d*x]),x]
```

```
[Out] (9*(a^2 - b^2)*Sin[c + d*x]*((a*AppellF1[1/2, 1/3, 1, 3/2, -Tan[c + d*x]^2,
 -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[Sec[c + d*x]^2])/(9*(a^2 - b^2)*
AppellF1[1/2, 1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b
^2))] - 2*(3*a^2*AppellF1[3/2, 1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c +
 d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 4/3, 1, 5/2, -Tan[c + d*
x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2) + (b*AppellF1[1
/2, 5/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])/(-9
*(a^2 - b^2)*AppellF1[1/2, 5/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x
]^2)/(a^2 - b^2))] + (6*a^2*AppellF1[3/2, 5/6, 2, 5/2, -Tan[c + d*x]^2, -((
a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + 5*(a^2 - b^2)*AppellF1[3/2, 11/6, 1, 5/
2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2)))
/(d*Cos[c + d*x]^(1/3)*(a + b*Cos[c + d*x])*(Sec[c + d*x]^2)^(5/6)*(-b^2 +
a^2*Sec[c + d*x]^2)*((9*(a^2 - b^2)*(Sec[c + d*x]^2)^(1/6)*((a*AppellF1[1/2
, 1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[S
ec[c + d*x]^2])/(9*(a^2 - b^2)*AppellF1[1/2, 1/3, 1, 3/2, -Tan[c + d*x]^2,
-((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] - 2*(3*a^2*AppellF1[3/2, 1/3, 2, 5/2,
-Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF
1[3/2, 4/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*
Tan[c + d*x]^2) + (b*AppellF1[1/2, 5/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan
[c + d*x]^2)/(a^2 - b^2))])/(-9*(a^2 - b^2)*AppellF1[1/2, 5/6, 1, 3/2, -Tan
```

[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (6*a^2*AppellF1[3/2, 5/
6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + 5*(a^2 -
b^2)*AppellF1[3/2, 11/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(
a^2 - b^2))])*Tan[c + d*x]^2)))/(-b^2 + a^2*Sec[c + d*x]^2) - (18*a^2*(a^2
- b^2)*(Sec[c + d*x]^2)^(1/6)*Tan[c + d*x]^2*((a*AppellF1[1/2, 1/3, 1, 3/2,
-Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[Sec[c + d*x]^2]
)/(9*(a^2 - b^2)*AppellF1[1/2, 1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c +
d*x]^2)/(a^2 - b^2))] - 2*(3*a^2*AppellF1[3/2, 1/3, 2, 5/2, -Tan[c + d*x]^
2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 4/3, 1,
5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2
) + (b*AppellF1[1/2, 5/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(
a^2 - b^2))])/(-9*(a^2 - b^2)*AppellF1[1/2, 5/6, 1, 3/2, -Tan[c + d*x]^2, -
((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (6*a^2*AppellF1[3/2, 5/6, 2, 5/2, -Ta
n[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + 5*(a^2 - b^2)*AppellF1
[3/2, 11/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*
Tan[c + d*x]^2)))/(-b^2 + a^2*Sec[c + d*x]^2)^2 - (15*(a^2 - b^2)*Tan[c + d
x]^2((a*AppellF1[1/2, 1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2
)/(a^2 - b^2))]*Sqrt[Sec[c + d*x]^2])/(9*(a^2 - b^2)*AppellF1[1/2, 1/3, 1,
3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] - 2*(3*a^2*Appel
lF1[3/2, 1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]
+ (a^2 - b^2)*AppellF1[3/2, 4/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d
*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2) + (b*AppellF1[1/2, 5/6, 1, 3/2, -Tan[
c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])/(-9*(a^2 - b^2)*AppellF1[
1/2, 5/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (
6*a^2*AppellF1[3/2, 5/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a
^2 - b^2))] + 5*(a^2 - b^2)*AppellF1[3/2, 11/6, 1, 5/2, -Tan[c + d*x]^2, -(
(a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2)))/((Sec[c + d*x]^2)^(5/
6)*(-b^2 + a^2*Sec[c + d*x]^2)) + (9*(a^2 - b^2)*Tan[c + d*x]*((a*AppellF1[
1/2, 1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqr
t[Sec[c + d*x]^2]*Tan[c + d*x])/(9*(a^2 - b^2)*AppellF1[1/2, 1/3, 1, 3/2, -
Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] - 2*(3*a^2*AppellF1[3/
2, 1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^
2 - b^2)*AppellF1[3/2, 4/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)
/(a^2 - b^2))])*Tan[c + d*x]^2) + (a*Sqrt[Sec[c + d*x]^2]*((-2*a^2*AppellF1
[3/2, 1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Se
c[c + d*x]^2*Tan[c + d*x])/(3*(a^2 - b^2)) - (2*AppellF1[3/2, 4/3, 1, 5/2,
-Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c
+ d*x])/9))/(9*(a^2 - b^2)*AppellF1[1/2, 1/3, 1, 3/2, -Tan[c + d*x]^2, -((a
^2*Tan[c + d*x]^2)/(a^2 - b^2))] - 2*(3*a^2*AppellF1[3/2, 1/3, 2, 5/2, -Tan
[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/
2, 4/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[
c + d*x]^2) + (b*((-2*a^2*AppellF1[3/2, 5/6, 2, 5/2, -Tan[c + d*x]^2, -((a^
2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(3*(a^2 - b^2)
) - (5*AppellF1[3/2, 11/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/
(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/9))/(-9*(a^2 - b^2)*AppellF1[1/2

, 5/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (6*a^2*AppellF1[3/2, 5/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + 5*(a^2 - b^2)*AppellF1[3/2, 11/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2) - (a*AppellF1[1/2, 1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[Sec[c + d*x]^2]*(-4*(3*a^2*AppellF1[3/2, 1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 4/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Sec[c + d*x]^2*Tan[c + d*x] + 9*(a^2 - b^2)*((-2*a^2*AppellF1[3/2, 1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(3*(a^2 - b^2)) - (2*AppellF1[3/2, 4/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/9) - 2*Tan[c + d*x]^2*(3*a^2*((-12*a^2*AppellF1[5/2, 1/3, 3, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(5*(a^2 - b^2)) - (2*AppellF1[5/2, 4/3, 2, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/5) + (a^2 - b^2)*((-6*a^2*AppellF1[5/2, 4/3, 2, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(5*(a^2 - b^2)) - (8*AppellF1[5/2, 7/3, 1, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/5))))/(9*(a^2 - b^2)*AppellF1[1/2, 1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] - 2*(3*a^2*AppellF1[3/2, 1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 4/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2)^2 - (b*AppellF1[1/2, 5/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*(2*(6*a^2*AppellF1[3/2, 5/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + 5*(a^2 - b^2)*AppellF1[3/2, 11/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Sec[c + d*x]^2*Tan[c + d*x] - 9*(a^2 - b^2)*((-2*a^2*AppellF1[3/2, 5/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(3*(a^2 - b^2)) - (5*AppellF1[3/2, 11/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/9) + Tan[c + d*x]^2*(6*a^2*((-12*a^2*AppellF1[5/2, 5/6, 3, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(5*(a^2 - b^2)) - AppellF1[5/2, 11/6, 2, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x]) + 5*(a^2 - b^2)*((-6*a^2*AppellF1[5/2, 11/6, 2, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(5*(a^2 - b^2)) - (11*AppellF1[5/2, 17/6, 1, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/5))))/(-9*(a^2 - b^2)*AppellF1[1/2, 5/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (6*a^2*AppellF1[3/2, 5/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + 5*(a^2 - b^2)*AppellF1[3/2, 11/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2)^2))/((Sec[c + d*x]^2)^(5/6)*(-b^2 + a^2*Sec[c + d*x]^2))))

Maple [F]

$$\int \frac{\cos^{\frac{2}{3}}(dx+c)}{a+\cos(dx+c)\,b}dx$$

```
[In] int(cos(d*x+c)^(2/3)/(a+cos(d*x+c)*b),x)
[Out] int(cos(d*x+c)^(2/3)/(a+cos(d*x+c)*b),x)
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{2}{3}}(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(2/3)/(a+b*cos(d*x+c)),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{2}{3}}(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(2/3)/(a+b*cos(d*x+c)),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^{\frac{2}{3}}(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\cos(dx+c)^{\frac{2}{3}}}{b\cos(dx+c)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^(2/3)/(a+b*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(2/3)/(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\cos^{\frac{2}{3}}(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{2}{3}}}{b\cos\left(dx+c\right)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^(2/3)/(a+b*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(2/3)/(b*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{2}{3}}(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\cos\left(c+d\,x\right)^{2/3}}{a+b\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(cos(c + d*x)^(2/3)/(a + b*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^(2/3)/(a + b*cos(c + d*x)), x)
```

3.677 $\int \frac{\sqrt[3]{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 176

$$\int \frac{\sqrt[3]{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx = -\frac{b\,\text{AppellF1}\left(\frac{1}{2},-\frac{1}{6},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\sqrt[3]{\cos(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d\sqrt[6]{\cos^2(c+dx)}} + \frac{a\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\sqrt[3]{\cos^2(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d\cos^{\frac{2}{3}}(c+dx)}$$

```
[Out] -b*AppellF1(1/2,-1/6,1,3/2,sin(d*x+c)^2,-b^2*sin(d*x+c)^2/(a^2-b^2))*cos(d*
x+c)^(1/3)*sin(d*x+c)/(a^2-b^2)/d/(cos(d*x+c)^2)^(1/6)+a*AppellF1(1/2,1/3,1
,3/2,sin(d*x+c)^2,-b^2*sin(d*x+c)^2/(a^2-b^2))*(cos(d*x+c)^2)^(1/3)*sin(d*x
+c)/(a^2-b^2)/d/cos(d*x+c)^(2/3)
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.130$, Rules used

$= \{2902, 3268, 440\}$

$$\int \frac{\sqrt[3]{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx = \frac{a\sin(c+dx)\sqrt[3]{\cos^2(c+dx)}\,\mathrm{AppellF1}\left(\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)}{d\left(a^2-b^2\right)\cos^{\frac{2}{3}}(c+dx)} - \frac{b\sin(c+dx)\sqrt[3]{\cos(c+dx)}\,\mathrm{AppellF1}\left(\frac{1}{2},-\frac{1}{6},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)}{d\left(a^2-b^2\right)\sqrt[6]{\cos^2(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^(1/3)/(a + b*Cos[c + d*x]),x]
```

```
[Out] -((b*AppellF1[1/2, -1/6, 1, 3/2, Sin[c + d*x]^2, -((b^2*Sin[c + d*x]^2)/(a^
2 - b^2))]*Cos[c + d*x]^(1/3)*Sin[c + d*x])/((a^2 - b^2)*d*(Cos[c + d*x]^2)
^(1/6))) + (a*AppellF1[1/2, 1/3, 1, 3/2, Sin[c + d*x]^2, -((b^2*Sin[c + d*x
]^2)/(a^2 - b^2))]*(Cos[c + d*x]^2)^(1/3)*Sin[c + d*x])/((a^2 - b^2)*d*Cos[
c + d*x]^(2/3))
```

Rule 440

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[a^p*c^q*x*AppellF1[1/n, -p, -q, 1 + 1/n, (-b)*(x^n/a), (-d)*(x^n/c)
], x] /; FreeQ[{a, b, c, d, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[n, -1]
 && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 2902

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Dist[a, Int[(d*Sin[e + f*x])^n/(a^2 - b^2*Sin[e + f*x]^
2), x], x] - Dist[b/d, Int[(d*Sin[e + f*x])^(n + 1)/(a^2 - b^2*Sin[e + f*x]
^2), x], x] /; FreeQ[{a, b, d, e, f, n}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3268

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^2)^(p_.), x_Symbol] :> With[{ff = FreeFactors[Cos[e + f*x], x]}, Dist[(
-ff)*d^(2*IntPart[(m - 1)/2] + 1)*((d*Sin[e + f*x])^(2*FracPart[(m - 1)/2])
/(f*(Sin[e + f*x]^2)^FracPart[(m - 1)/2])), Subst[Int[(1 - ff^2*x^2)^((m -
1)/2)*(a + b - b*ff^2*x^2)^p, x], x, Cos[e + f*x]/ff], x]] /; FreeQ[{a, b,
d, e, f, m, p}, x] &&  !IntegerQ[m]
```

Rule steps

$$\text{integral} = a\int \frac{\sqrt[3]{\cos(c+dx)}}{a^2-b^2\cos^2(c+dx)}\,dx - b\int \frac{\cos^{\frac{4}{3}}(c+dx)}{a^2-b^2\cos^2(c+dx)}\,dx$$

$$= -\frac{\left(b\sqrt[3]{\cos(c+dx)}\right)\text{Subst}\left(\int \frac{\sqrt[6]{1-x^2}}{a^2-b^2+b^2x^2}\,dx, x, \sin(c+dx)\right)}{d\sqrt[6]{\cos^2(c+dx)}} + \frac{\left(a\sqrt[3]{\cos^2(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt[3]{1-x^2}(a^2-b^2+b^2x^2)}\,dx, x, \sin(c+dx)\right)}{d\cos^{\frac{2}{3}}(c+dx)}$$

$$= -\frac{b\,\text{AppellF1}\left(\frac{1}{2},-\frac{1}{6},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\sqrt[3]{\cos(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d\sqrt[6]{\cos^2(c+dx)}} + \frac{a\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\sqrt[3]{\cos^2(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d\cos^{\frac{2}{3}}(c+dx)}$$

Mathematica [B] (warning: unable to verify)

Leaf count is larger than twice the leaf count of optimal. 4613 vs. $2(176) = 352$.

Time = 34.33 (sec) , antiderivative size = 4613, normalized size of antiderivative = 26.21

$$\int \frac{\sqrt[3]{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx = \text{Result too large to show}$$

```
[In] Integrate[Cos[c + d*x]^(1/3)/(a + b*Cos[c + d*x]),x]
```

```
[Out] (9*(a^2 - b^2)*Sin[c + d*x]*((a*AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2,
 -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[Sec[c + d*x]^2])/(9*(a^2 - b^2)*
AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b
^2))] + (-6*a^2*AppellF1[3/2, 1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c +
d*x]^2)/(a^2 - b^2))] + (-a^2 + b^2)*AppellF1[3/2, 7/6, 1, 5/2, -Tan[c + d*
x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2) + (b*AppellF1[1
/2, 2/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])/(-9
*(a^2 - b^2)*AppellF1[1/2, 2/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x
]^2)/(a^2 - b^2))] + 2*(3*a^2*AppellF1[3/2, 2/3, 2, 5/2, -Tan[c + d*x]^2, -
((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + 2*(a^2 - b^2)*AppellF1[3/2, 5/3, 1, 5
/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2))
)/(d*Cos[c + d*x]^(2/3)*(a + b*Cos[c + d*x])*(Sec[c + d*x]^2)^(2/3)*(-b^2 +
 a^2*Sec[c + d*x]^2)*((9*(a^2 - b^2)*(Sec[c + d*x]^2)^(1/3)*((a*AppellF1[1/
2, 1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[
Sec[c + d*x]^2])/(9*(a^2 - b^2)*AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2,
 -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-6*a^2*AppellF1[3/2, 1/6, 2, 5/2,
-Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-a^2 + b^2)*Appell
F1[3/2, 7/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])
*Tan[c + d*x]^2) + (b*AppellF1[1/2, 2/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Ta
n[c + d*x]^2)/(a^2 - b^2))])/(-9*(a^2 - b^2)*AppellF1[1/2, 2/3, 1, 3/2, -Ta
```

n[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + 2*(3*a^2*AppellF1[3/2, 2/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + 2*(a^2 - b^2)*AppellF1[3/2, 5/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2)))/(-b^2 + a^2*Sec[c + d*x]^2) - (18*a^2*(a^2 - b^2)*(Sec[c + d*x]^2)^(1/3)*Tan[c + d*x]^2*((a*AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[Sec[c + d*x]^2])/(9*(a^2 - b^2)*AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-6*a^2*AppellF1[3/2, 1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-a^2 + b^2)*AppellF1[3/2, 7/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2) + (b*AppellF1[1/2, 2/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])/(-9*(a^2 - b^2)*AppellF1[1/2, 2/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + 2*(3*a^2*AppellF1[3/2, 2/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + 2*(a^2 - b^2)*AppellF1[3/2, 5/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2)))/(-b^2 + a^2*Sec[c + d*x]^2)^2 - (12*(a^2 - b^2)*Tan[c + d*x]^2*((a*AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[Sec[c + d*x]^2])/(9*(a^2 - b^2)*AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-6*a^2*AppellF1[3/2, 1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-a^2 + b^2)*AppellF1[3/2, 7/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2) + (b*AppellF1[1/2, 2/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])/(-9*(a^2 - b^2)*AppellF1[1/2, 2/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + 2*(3*a^2*AppellF1[3/2, 2/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + 2*(a^2 - b^2)*AppellF1[3/2, 5/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2)))/((Sec[c + d*x]^2)^(2/3)*(-b^2 + a^2*Sec[c + d*x]^2)) + (9*(a^2 - b^2)*Tan[c + d*x]*((a*AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[Sec[c + d*x]^2]*Tan[c + d*x])/(9*(a^2 - b^2)*AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-6*a^2*AppellF1[3/2, 1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-a^2 + b^2)*AppellF1[3/2, 7/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2) + (a*Sqrt[Sec[c + d*x]^2]*((-2*a^2*AppellF1[3/2, 1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(3*(a^2 - b^2)) - (AppellF1[3/2, 7/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/9))/(9*(a^2 - b^2)*AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-6*a^2*AppellF1[3/2, 1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-a^2 + b^2)*AppellF1[3/2, 7/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2) + (b*((-2*a^2*AppellF1[3/2, 2/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(3*(a^2 - b^2)) - (4*AppellF1[3/2, 5/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/9))/(-9*(a^2 - b^2)*AppellF1[1/

2, 2/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + 2*(
3*a^2*AppellF1[3/2, 2/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a
^2 - b^2))] + 2*(a^2 - b^2)*AppellF1[3/2, 5/3, 1, 5/2, -Tan[c + d*x]^2, -((
a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2) - (a*AppellF1[1/2, 1/6,
1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[Sec[c +
d*x]^2]*(2*(-6*a^2*AppellF1[3/2, 1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c
 + d*x]^2)/(a^2 - b^2))] + (-a^2 + b^2)*AppellF1[3/2, 7/6, 1, 5/2, -Tan[c +
 d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Sec[c + d*x]^2*Tan[c + d*x]
+ 9*(a^2 - b^2)*((-2*a^2*AppellF1[3/2, 1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2
*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(3*(a^2 - b^2))
 - (AppellF1[3/2, 7/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2
 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/9) + Tan[c + d*x]^2*(-6*a^2*((-12*a^
2*AppellF1[5/2, 1/6, 3, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 -
 b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(5*(a^2 - b^2)) - (AppellF1[5/2, 7/6,
2, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^
2*Tan[c + d*x])/5) + (-a^2 + b^2)*((-6*a^2*AppellF1[5/2, 7/6, 2, 7/2, -Tan[
c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x
])/(5*(a^2 - b^2)) - (7*AppellF1[5/2, 13/6, 1, 7/2, -Tan[c + d*x]^2, -((a^2
*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/5))))/(9*(a^2 -
 b^2)*AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a
^2 - b^2))] + (-6*a^2*AppellF1[3/2, 1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Ta
n[c + d*x]^2)/(a^2 - b^2))] + (-a^2 + b^2)*AppellF1[3/2, 7/6, 1, 5/2, -Tan[
c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2)^2 - (b*Ap
pellF1[1/2, 2/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2
))]*(4*(3*a^2*AppellF1[3/2, 2/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*
x]^2)/(a^2 - b^2))] + 2*(a^2 - b^2)*AppellF1[3/2, 5/3, 1, 5/2, -Tan[c + d*x
]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Sec[c + d*x]^2*Tan[c + d*x] - 9*
(a^2 - b^2)*((-2*a^2*AppellF1[3/2, 2/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan
[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(3*(a^2 - b^2)) - (
4*AppellF1[3/2, 5/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 -
 b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/9) + 2*Tan[c + d*x]^2*(3*a^2*((-12*a^2
*AppellF1[5/2, 2/3, 3, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 -
b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(5*(a^2 - b^2)) - (4*AppellF1[5/2, 5/3,
 2, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]
^2*Tan[c + d*x])/5) + 2*(a^2 - b^2)*((-6*a^2*AppellF1[5/2, 5/3, 2, 7/2, -Ta
n[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d
x])/(5(a^2 - b^2)) - 2*AppellF1[5/2, 8/3, 1, 7/2, -Tan[c + d*x]^2, -((a^2
*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x]))))/(-9*(a^2 - b
^2)*AppellF1[1/2, 2/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2
 - b^2))] + 2*(3*a^2*AppellF1[3/2, 2/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan
[c + d*x]^2)/(a^2 - b^2))] + 2*(a^2 - b^2)*AppellF1[3/2, 5/3, 1, 5/2, -Tan[
c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2)^2))/((Sec
[c + d*x]^2)^(2/3)*(-b^2 + a^2*Sec[c + d*x]^2))))

Maple [F]

$$\int \frac{\cos^{\frac{1}{3}}(dx+c)}{a+\cos(dx+c)\,b}dx$$

```
[In] int(cos(d*x+c)^(1/3)/(a+cos(d*x+c)*b),x)
[Out] int(cos(d*x+c)^(1/3)/(a+cos(d*x+c)*b),x)
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\sqrt[3]{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)^(1/3)/(a+b*cos(d*x+c)),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sqrt[3]{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(1/3)/(a+b*cos(d*x+c)),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sqrt[3]{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx = \int \frac{\cos(dx+c)^{\frac{1}{3}}}{b\cos(dx+c)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/3)/(a+b*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(1/3)/(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\sqrt[3]{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{1}{3}}}{b\cos\left(dx+c\right)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/3)/(a+b*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(1/3)/(b*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt[3]{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx = \int \frac{\cos\left(c+d\,x\right)^{1/3}}{a+b\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(cos(c + d*x)^(1/3)/(a + b*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^(1/3)/(a + b*cos(c + d*x)), x)
```

3.678 $\int \frac{1}{\sqrt[3]{\cos(c+dx)}(a+b\cos(c+dx))}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 176

$$\int \frac{1}{\sqrt[3]{\cos(c+dx)}(a+b\cos(c+dx))}\,dx = -\frac{b\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{6},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\sqrt[6]{\cos^2(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d\sqrt[3]{\cos(c+dx)}} + \frac{a\,\text{AppellF1}\left(\frac{1}{2},\frac{2}{3},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\cos^2(c+dx)^{2/3}\sin(c+dx)}{(a^2-b^2)\,d\cos^{\frac{4}{3}}(c+dx)}$$

```
[Out] -b*AppellF1(1/2,1/6,1,3/2,sin(d*x+c)^2,-b^2*sin(d*x+c)^2/(a^2-b^2))*(cos(d*
x+c)^2)^(1/6)*sin(d*x+c)/(a^2-b^2)/d/cos(d*x+c)^(1/3)+a*AppellF1(1/2,2/3,1,
3/2,sin(d*x+c)^2,-b^2*sin(d*x+c)^2/(a^2-b^2))*(cos(d*x+c)^2)^(2/3)*sin(d*x+
c)/(a^2-b^2)/d/cos(d*x+c)^(4/3)
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2902, 3268, 440}

$$\int \frac{1}{\sqrt[3]{\cos(c+dx)}(a+b\cos(c+dx))}\,dx = \frac{a\sin(c+dx)\cos^2(c+dx)^{2/3}\,\text{AppellF1}\left(\frac{1}{2},\frac{2}{3},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)}{d\,(a^2-b^2)\cos^{\frac{4}{3}}(c+dx)} - \frac{b\sin(c+dx)\sqrt[6]{\cos^2(c+dx)}\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{6},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)}{d\,(a^2-b^2)\sqrt[3]{\cos(c+dx)}}$$

```
[In] Int[1/(Cos[c + d*x]^(1/3)*(a + b*Cos[c + d*x])),x]
```

```
[Out] -((b*AppellF1[1/2, 1/6, 1, 3/2, Sin[c + d*x]^2, -((b^2*Sin[c + d*x]^2)/(a^2
 - b^2))]*(Cos[c + d*x]^2)^(1/6)*Sin[c + d*x])/((a^2 - b^2)*d*Cos[c + d*x]^
(1/3))) + (a*AppellF1[1/2, 2/3, 1, 3/2, Sin[c + d*x]^2, -((b^2*Sin[c + d*x]
^2)/(a^2 - b^2))]*(Cos[c + d*x]^2)^(2/3)*Sin[c + d*x])/((a^2 - b^2)*d*Cos[c
 + d*x]^(4/3))
```

Rule 440

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[a^p*c^q*x*AppellF1[1/n, -p, -q, 1 + 1/n, (-b)*(x^n/a), (-d)*(x^n/c)
], x] /; FreeQ[{a, b, c, d, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[n, -1]
 && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 2902

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Dist[a, Int[(d*Sin[e + f*x])^n/(a^2 - b^2*Sin[e + f*x]^
2), x], x] - Dist[b/d, Int[(d*Sin[e + f*x])^(n + 1)/(a^2 - b^2*Sin[e + f*x]
^2), x], x] /; FreeQ[{a, b, d, e, f, n}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3268

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^2)^(p_.), x_Symbol] :> With[{ff = FreeFactors[Cos[e + f*x], x]}, Dist[(
-ff)*d^(2*IntPart[(m - 1)/2] + 1)*((d*Sin[e + f*x])^(2*FracPart[(m - 1)/2])
/(f*(Sin[e + f*x]^2)^FracPart[(m - 1)/2])), Subst[Int[(1 - ff^2*x^2)^((m -
1)/2)*(a + b - b*ff^2*x^2)^p, x], x, Cos[e + f*x]/ff], x]] /; FreeQ[{a, b,
d, e, f, m, p}, x] &&  !IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= a\int \frac{1}{\sqrt[3]{\cos(c+dx)}\,(a^2-b^2\cos^2(c+dx))}\,dx - b\int \frac{\cos^{\frac{2}{3}}(c+dx)}{a^2-b^2\cos^2(c+dx)}\,dx \\
&= -\frac{\left(b\sqrt[6]{\cos^2(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt[6]{1-x^2}(a^2-b^2+b^2x^2)}\,dx, x, \sin(c+dx)\right)}{d\sqrt[3]{\cos(c+dx)}} \\
&\quad + \frac{\left(a\cos^2(c+dx)^{2/3}\right)\text{Subst}\left(\int \frac{1}{(1-x^2)^{2/3}(a^2-b^2+b^2x^2)}\,dx, x, \sin(c+dx)\right)}{d\cos^{\frac{4}{3}}(c+dx)} \\
&= -\frac{b\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{6},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\sqrt[6]{\cos^2(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d\sqrt[3]{\cos(c+dx)}} \\
&\quad + \frac{a\,\text{AppellF1}\left(\frac{1}{2},\frac{2}{3},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\cos^2(c+dx)^{2/3}\sin(c+dx)}{(a^2-b^2)\,d\cos^{\frac{4}{3}}(c+dx)}
\end{aligned}$$

Mathematica [B] (warning: unable to verify)

Leaf count is larger than twice the leaf count of optimal. 4605 vs. 2(176) = 352.

Time = 34.38 (sec) , antiderivative size = 4605, normalized size of antiderivative = 26.16

$$\int \frac{1}{\sqrt[3]{\cos(c+dx)}(a+b\cos(c+dx))}\,dx = \text{Result too large to show}$$

```
[In] Integrate[1/(Cos[c + d*x]^(1/3)*(a + b*Cos[c + d*x])),x]
```

```
[Out] (9*(a^2 - b^2)*Sin[c + d*x]*((a*AppellF1[1/2, -1/6, 1, 3/2, -Tan[c + d*x]^2
, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[Sec[c + d*x]^2])/(9*(a^2 - b^2)
*AppellF1[1/2, -1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 -
 b^2))] + (-6*a^2*AppellF1[3/2, -1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c
 + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 5/6, 1, 5/2, -Tan[c +
d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2) + (b*AppellF1
[1/2, 1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])/(
-9*(a^2 - b^2)*AppellF1[1/2, 1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d
*x]^2)/(a^2 - b^2))] + 2*(3*a^2*AppellF1[3/2, 1/3, 2, 5/2, -Tan[c + d*x]^2,
 -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 4/3, 1, 5
/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2))
)/(d*Cos[c + d*x]^(4/3)*(a + b*Cos[c + d*x])*(Sec[c + d*x]^2)^(1/3)*(-b^2 +
 a^2*Sec[c + d*x]^2)*((9*(a^2 - b^2)*(Sec[c + d*x]^2)^(2/3)*((a*AppellF1[1/
2, -1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt
[Sec[c + d*x]^2])/(9*(a^2 - b^2)*AppellF1[1/2, -1/6, 1, 3/2, -Tan[c + d*x]^
2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-6*a^2*AppellF1[3/2, -1/6, 2, 5/
2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*Appe
llF1[3/2, 5/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))
])*Tan[c + d*x]^2) + (b*AppellF1[1/2, 1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*
Tan[c + d*x]^2)/(a^2 - b^2))])/(-9*(a^2 - b^2)*AppellF1[1/2, 1/3, 1, 3/2, -
Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + 2*(3*a^2*AppellF1[3/
2, 1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^
2 - b^2)*AppellF1[3/2, 4/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)
/(a^2 - b^2))])*Tan[c + d*x]^2)))/(-b^2 + a^2*Sec[c + d*x]^2) - (18*a^2*(a^
2 - b^2)*(Sec[c + d*x]^2)^(2/3)*Tan[c + d*x]^2*((a*AppellF1[1/2, -1/6, 1, 3
/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[Sec[c + d*x]
^2])/(9*(a^2 - b^2)*AppellF1[1/2, -1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan
[c + d*x]^2)/(a^2 - b^2))] + (-6*a^2*AppellF1[3/2, -1/6, 2, 5/2, -Tan[c + d
*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 5/6
, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*
x]^2) + (b*AppellF1[1/2, 1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^
2)/(a^2 - b^2))])/(-9*(a^2 - b^2)*AppellF1[1/2, 1/3, 1, 3/2, -Tan[c + d*x]^
2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + 2*(3*a^2*AppellF1[3/2, 1/3, 2, 5/
2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*Appe
llF1[3/2, 4/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))
```

])*Tan[c + d*x]^2)))/(-b^2 + a^2*Sec[c + d*x]^2)^2 - (6*(a^2 - b^2)*Tan[c + d*x]^2*((a*AppellF1[1/2, -1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[Sec[c + d*x]^2])/(9*(a^2 - b^2)*AppellF1[1/2, -1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-6*a^2*AppellF1[3/2, -1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 5/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2) + (b*AppellF1[1/2, 1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])/(-9*(a^2 - b^2)*AppellF1[1/2, 1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + 2*(3*a^2*AppellF1[3/2, 1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 4/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2)))/((Sec[c + d*x]^2)^(1/3)*(-b^2 + a^2*Sec[c + d*x]^2)) + (9*(a^2 - b^2)*Tan[c + d*x]*((a*AppellF1[1/2, -1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[Sec[c + d*x]^2]*Tan[c + d*x])/(9*(a^2 - b^2)*AppellF1[1/2, -1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-6*a^2*AppellF1[3/2, -1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 5/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2) + (a*Sqrt[Sec[c + d*x]^2]*((-2*a^2*AppellF1[3/2, -1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(3*(a^2 - b^2)) + (AppellF1[3/2, 5/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/9))/(9*(a^2 - b^2)*AppellF1[1/2, -1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-6*a^2*AppellF1[3/2, -1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 5/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2) + (b*((-2*a^2*AppellF1[3/2, 1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(3*(a^2 - b^2)) - (2*AppellF1[3/2, 4/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/9))/(-9*(a^2 - b^2)*AppellF1[1/2, 1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + 2*(3*a^2*AppellF1[3/2, 1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 4/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2) - (a*AppellF1[1/2, -1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[Sec[c + d*x]^2]*(2*(-6*a^2*AppellF1[3/2, -1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 5/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Sec[c + d*x]^2*Tan[c + d*x] + 9*(a^2 - b^2)*((-2*a^2*AppellF1[3/2, -1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(3*(a^2 - b^2)) + (AppellF1[3/2, 5/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/9) + Tan[c + d*x]^2*(-6*a^2*((-12*a^2*AppellF1[5/2, -1/6, 3, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(5*(a^2 - b^2)) + (AppellF1[5/2, 5/6, 2, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d

```
*x]^2*Tan[c + d*x])/5) + (a^2 - b^2)*((-6*a^2*AppellF1[5/2, 5/6, 2, 7/2, -T
an[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c +
d*x])/(5*(a^2 - b^2)) - AppellF1[5/2, 11/6, 1, 7/2, -Tan[c + d*x]^2, -((a^2
*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x]))))/(9*(a^2 - b^
2)*AppellF1[1/2, -1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2
 - b^2))] + (-6*a^2*AppellF1[3/2, -1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan
[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 5/6, 1, 5/2, -Tan[c
+ d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2)^2 - (b*Appe
llF1[1/2, 1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))
]*(4*(3*a^2*AppellF1[3/2, 1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]
^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 4/3, 1, 5/2, -Tan[c + d*x]^2,
 -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Sec[c + d*x]^2*Tan[c + d*x] - 9*(a^2
 - b^2)*((-2*a^2*AppellF1[3/2, 1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c +
 d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(3*(a^2 - b^2)) - (2*Ap
pellF1[3/2, 4/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2
))]*Sec[c + d*x]^2*Tan[c + d*x])/9) + 2*Tan[c + d*x]^2*(3*a^2*((-12*a^2*App
ellF1[5/2, 1/3, 3, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2)
)]*Sec[c + d*x]^2*Tan[c + d*x])/(5*(a^2 - b^2)) - (2*AppellF1[5/2, 4/3, 2,
7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*T
an[c + d*x])/5) + (a^2 - b^2)*((-6*a^2*AppellF1[5/2, 4/3, 2, 7/2, -Tan[c +
d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(
5*(a^2 - b^2)) - (8*AppellF1[5/2, 7/3, 1, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[
c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/5))))/(-9*(a^2 - b^2
)*AppellF1[1/2, 1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 -
 b^2))] + 2*(3*a^2*AppellF1[3/2, 1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c
 + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 4/3, 1, 5/2, -Tan[c +
d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2)^2))/((Sec[c +
 d*x]^2)^(1/3)*(-b^2 + a^2*Sec[c + d*x]^2))))
```

Maple [F]

$$\int \frac{1}{\cos \left(dx+c\right)^{\frac{1}{3}} \left(a+\cos \left(dx+c\right) b\right)}dx$$

[In] `int(1/cos(d*x+c)^(1/3)/(a+cos(d*x+c)*b),x)`

[Out] `int(1/cos(d*x+c)^(1/3)/(a+cos(d*x+c)*b),x)`

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt[3]{\cos(c+dx)}(a+b\cos(c+dx))}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)^(1/3)/(a+b*cos(d*x+c)),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt[3]{\cos(c+dx)}(a+b\cos(c+dx))}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(1/3)/(a+b*cos(d*x+c)),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{\sqrt[3]{\cos(c+dx)}(a+b\cos(c+dx))}\,dx = \int \frac{1}{(b\cos(dx+c)+a)\cos(dx+c)^{\frac{1}{3}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/3)/(a+b*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)*cos(d*x + c)^(1/3)), x)
```

Giac [F]

$$\int \frac{1}{\sqrt[3]{\cos(c+dx)}(a+b\cos(c+dx))}\,dx = \int \frac{1}{(b\cos(dx+c)+a)\cos(dx+c)^{\frac{1}{3}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/3)/(a+b*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)*cos(d*x + c)^(1/3)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt[3]{\cos(c+dx)}(a+b\cos(c+dx))}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^{1/3}\,\left(a+b\,\cos\left(c+d\,x\right)\right)}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/3)*(a + b*cos(c + d*x))),x)
[Out] int(1/(cos(c + d*x)^(1/3)*(a + b*cos(c + d*x))), x)
```

3.679 $\int \frac{1}{\cos^{\frac{2}{3}}(c+dx)(a+b\cos(c+dx))} dx$

Optimal result

Integrand size = 23, antiderivative size = 176

$$\int \frac{1}{\cos^{\frac{2}{3}}(c+dx)(a+b\cos(c+dx))} dx = -\frac{b\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\sqrt[3]{\cos^2(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d\cos^{\frac{2}{3}}(c+dx)} + \frac{a\,\text{AppellF1}\left(\frac{1}{2},\frac{5}{6},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\cos^2(c+dx)^{5/6}\sin(c+dx)}{(a^2-b^2)\,d\cos^{\frac{5}{3}}(c+dx)}$$

```
[Out] -b*AppellF1(1/2,1/3,1,3/2,sin(d*x+c)^2,-b^2*sin(d*x+c)^2/(a^2-b^2))*(cos(d*
x+c)^2)^(1/3)*sin(d*x+c)/(a^2-b^2)/d/cos(d*x+c)^(2/3)+a*AppellF1(1/2,5/6,1,
3/2,sin(d*x+c)^2,-b^2*sin(d*x+c)^2/(a^2-b^2))*(cos(d*x+c)^2)^(5/6)*sin(d*x+
c)/(a^2-b^2)/d/cos(d*x+c)^(5/3)
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2902, 3268, 440}

$$\int \frac{1}{\cos^{\frac{2}{3}}(c+dx)(a+b\cos(c+dx))} dx = \frac{a\sin(c+dx)\cos^2(c+dx)^{5/6}\,\text{AppellF1}\left(\frac{1}{2},\frac{5}{6},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)}{d\,(a^2-b^2)\cos^{\frac{5}{3}}(c+dx)} - \frac{b\sin(c+dx)\sqrt[3]{\cos^2(c+dx)}\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)}{d\,(a^2-b^2)\cos^{\frac{2}{3}}(c+dx)}$$

```
[In] Int[1/(Cos[c + d*x]^(2/3)*(a + b*Cos[c + d*x])),x]
```

```
[Out] -((b*AppellF1[1/2, 1/3, 1, 3/2, Sin[c + d*x]^2, -((b^2*Sin[c + d*x]^2)/(a^2
 - b^2))]*(Cos[c + d*x]^2)^(1/3)*Sin[c + d*x])/((a^2 - b^2)*d*Cos[c + d*x]^
(2/3))) + (a*AppellF1[1/2, 5/6, 1, 3/2, Sin[c + d*x]^2, -((b^2*Sin[c + d*x]
^2)/(a^2 - b^2))]*(Cos[c + d*x]^2)^(5/6)*Sin[c + d*x])/((a^2 - b^2)*d*Cos[c
 + d*x]^(5/3))
```

Rule 440

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[a^p*c^q*x*AppellF1[1/n, -p, -q, 1 + 1/n, (-b)*(x^n/a), (-d)*(x^n/c)
], x] /; FreeQ[{a, b, c, d, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[n, -1]
 && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 2902

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Dist[a, Int[(d*Sin[e + f*x])^n/(a^2 - b^2*Sin[e + f*x]^
2), x], x] - Dist[b/d, Int[(d*Sin[e + f*x])^(n + 1)/(a^2 - b^2*Sin[e + f*x]
^2), x], x] /; FreeQ[{a, b, d, e, f, n}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3268

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^2)^(p_.), x_Symbol] :> With[{ff = FreeFactors[Cos[e + f*x], x]}, Dist[(
-ff)*d^(2*IntPart[(m - 1)/2] + 1)*((d*Sin[e + f*x])^(2*FracPart[(m - 1)/2])
/(f*(Sin[e + f*x]^2)^FracPart[(m - 1)/2])), Subst[Int[(1 - ff^2*x^2)^((m -
1)/2)*(a + b - b*ff^2*x^2)^p, x], x, Cos[e + f*x]/ff], x]] /; FreeQ[{a, b,
d, e, f, m, p}, x] &&  !IntegerQ[m]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= a\int \frac{1}{\cos^{\frac{2}{3}}(c+dx)\left(a^2-b^2\cos^2(c+dx)\right)}\,dx-b\int \frac{\sqrt[3]{\cos(c+dx)}}{a^2-b^2\cos^2(c+dx)}\,dx\\
&=-\frac{\left(b\sqrt[3]{\cos^2(c+dx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt[3]{1-x^2}(a^2-b^2+b^2x^2)}\,dx,x,\sin(c+dx)\right)}{d\cos^{\frac{2}{3}}(c+dx)}\\
&\quad+\frac{\left(a\cos^2(c+dx)^{5/6}\right)\text{Subst}\left(\int \frac{1}{(1-x^2)^{5/6}(a^2-b^2+b^2x^2)}\,dx,x,\sin(c+dx)\right)}{d\cos^{\frac{5}{3}}(c+dx)}\\
&=-\frac{b\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\sqrt[3]{\cos^2(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d\cos^{\frac{2}{3}}(c+dx)}\\
&\quad+\frac{a\,\text{AppellF1}\left(\frac{1}{2},\frac{5}{6},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\cos^2(c+dx)^{5/6}\sin(c+dx)}{(a^2-b^2)\,d\cos^{\frac{5}{3}}(c+dx)}
\end{aligned}
$$

Mathematica [B] (warning: unable to verify)

Leaf count is larger than twice the leaf count of optimal. 4608 vs. 2(176) = 352.

Time = 34.39 (sec) , antiderivative size = 4608, normalized size of antiderivative = 26.18

$$\int \frac{1}{\cos^{\frac{2}{3}}(c+dx)(a+b\cos(c+dx))}\,dx = \text{Result too large to show}$$

```
[In] Integrate[1/(Cos[c + d*x]^(2/3)*(a + b*Cos[c + d*x])),x]
```

```
[Out] (9*(a^2 - b^2)*Sin[c + d*x]*((a*AppellF1[1/2, -1/3, 1, 3/2, -Tan[c + d*x]^2
, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[Sec[c + d*x]^2])/(9*(a^2 - b^2)
*AppellF1[1/2, -1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 -
 b^2))] - 2*(3*a^2*AppellF1[3/2, -1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[
c + d*x]^2)/(a^2 - b^2))] + (-a^2 + b^2)*AppellF1[3/2, 2/3, 1, 5/2, -Tan[c
+ d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2) + (b*Appell
F1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])
/(-9*(a^2 - b^2)*AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c +
 d*x]^2)/(a^2 - b^2))] + (6*a^2*AppellF1[3/2, 1/6, 2, 5/2, -Tan[c + d*x]^2,
 -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 7/6, 1, 5
/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2))
)/(d*Cos[c + d*x]^(5/3)*(a + b*Cos[c + d*x])*(Sec[c + d*x]^2)^(1/6)*(-b^2 +
 a^2*Sec[c + d*x]^2)*((9*(a^2 - b^2)*(Sec[c + d*x]^2)^(5/6)*((a*AppellF1[1/
2, -1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt
[Sec[c + d*x]^2])/(9*(a^2 - b^2)*AppellF1[1/2, -1/3, 1, 3/2, -Tan[c + d*x]^
2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] - 2*(3*a^2*AppellF1[3/2, -1/3, 2, 5
/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-a^2 + b^2)*Ap
pellF1[3/2, 2/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2
))])*Tan[c + d*x]^2) + (b*AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^
2*Tan[c + d*x]^2)/(a^2 - b^2))])/(-9*(a^2 - b^2)*AppellF1[1/2, 1/6, 1, 3/2,
 -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (6*a^2*AppellF1[3/
2, 1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^
2 - b^2)*AppellF1[3/2, 7/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)
/(a^2 - b^2))])*Tan[c + d*x]^2)))/(-b^2 + a^2*Sec[c + d*x]^2) - (18*a^2*(a^
2 - b^2)*(Sec[c + d*x]^2)^(5/6)*Tan[c + d*x]^2*((a*AppellF1[1/2, -1/3, 1, 3
/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[Sec[c + d*x]
^2])/(9*(a^2 - b^2)*AppellF1[1/2, -1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan
[c + d*x]^2)/(a^2 - b^2))] - 2*(3*a^2*AppellF1[3/2, -1/3, 2, 5/2, -Tan[c +
d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-a^2 + b^2)*AppellF1[3/2, 2
/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c +
d*x]^2) + (b*AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x
]^2)/(a^2 - b^2))])/(-9*(a^2 - b^2)*AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x
]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (6*a^2*AppellF1[3/2, 1/6, 2, 5/
2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*Appe
llF1[3/2, 7/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))
```

])*Tan[c + d*x]^2)))/(-b^2 + a^2*Sec[c + d*x]^2)^2 - (3*(a^2 - b^2)*Tan[c + d*x]^2*((a*AppellF1[1/2, -1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[Sec[c + d*x]^2])/(9*(a^2 - b^2)*AppellF1[1/2, -1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] - 2*(3*a^2*AppellF1[3/2, -1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-a^2 + b^2)*AppellF1[3/2, 2/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2) + (b*AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])/(-9*(a^2 - b^2)*AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (6*a^2*AppellF1[3/2, 1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 7/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2)))/((Sec[c + d*x]^2)^(1/6)*(-b^2 + a^2*Sec[c + d*x]^2)) + (9*(a^2 - b^2)*Tan[c + d*x]*((a*AppellF1[1/2, -1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[Sec[c + d*x]^2]*Tan[c + d*x])/(9*(a^2 - b^2)*AppellF1[1/2, -1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] - 2*(3*a^2*AppellF1[3/2, -1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-a^2 + b^2)*AppellF1[3/2, 2/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2) + (a*Sqrt[Sec[c + d*x]^2]*((-2*a^2*AppellF1[3/2, -1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(3*(a^2 - b^2)) + (2*AppellF1[3/2, 2/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/9))/(9*(a^2 - b^2)*AppellF1[1/2, -1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] - 2*(3*a^2*AppellF1[3/2, -1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-a^2 + b^2)*AppellF1[3/2, 2/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2) + (b*((-2*a^2*AppellF1[3/2, 1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(3*(a^2 - b^2)) - (AppellF1[3/2, 7/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/9))/(-9*(a^2 - b^2)*AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (6*a^2*AppellF1[3/2, 1/6, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 7/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2) - (a*AppellF1[1/2, -1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sqrt[Sec[c + d*x]^2]*(-4*(3*a^2*AppellF1[3/2, -1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-a^2 + b^2)*AppellF1[3/2, 2/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Sec[c + d*x]^2*Tan[c + d*x] + 9*(a^2 - b^2)*((-2*a^2*AppellF1[3/2, -1/3, 2, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(3*(a^2 - b^2)) + (2*AppellF1[3/2, 2/3, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/9) - 2*Tan[c + d*x]^2*(3*a^2*((-12*a^2*AppellF1[5/2, -1/3, 3, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(5*(a^2 - b^2)) + (2*AppellF1[5/2, 2/3, 2, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*S

```
ec[c + d*x]^2*Tan[c + d*x])/5) + (-a^2 + b^2)*((-6*a^2*AppellF1[5/2, 2/3, 2
, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2
*Tan[c + d*x])/(5*(a^2 - b^2)) - (4*AppellF1[5/2, 5/3, 1, 7/2, -Tan[c + d*x
]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/5)))
)/(9*(a^2 - b^2)*AppellF1[1/2, -1/3, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c
+ d*x]^2)/(a^2 - b^2))] - 2*(3*a^2*AppellF1[3/2, -1/3, 2, 5/2, -Tan[c + d*x
]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (-a^2 + b^2)*AppellF1[3/2, 2/3,
 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x
]^2)^2 - (b*AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]
^2)/(a^2 - b^2))]*(2*(6*a^2*AppellF1[3/2, 1/6, 2, 5/2, -Tan[c + d*x]^2, -((
a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 7/6, 1, 5/2,
-Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Sec[c + d*x]^2*Tan[c
 + d*x] - 9*(a^2 - b^2)*((-2*a^2*AppellF1[3/2, 1/6, 2, 5/2, -Tan[c + d*x]^2
, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(3*(a^2
 - b^2)) - (AppellF1[3/2, 7/6, 1, 5/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]
^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/9) + Tan[c + d*x]^2*(6*a^2*(
(-12*a^2*AppellF1[5/2, 1/6, 3, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)
/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/(5*(a^2 - b^2)) - (AppellF1[5/2
, 7/6, 2, 7/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c
+ d*x]^2*Tan[c + d*x])/5) + (a^2 - b^2)*((-6*a^2*AppellF1[5/2, 7/6, 2, 7/2,
 -Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c
 + d*x])/(5*(a^2 - b^2)) - (7*AppellF1[5/2, 13/6, 1, 7/2, -Tan[c + d*x]^2,
-((a^2*Tan[c + d*x]^2)/(a^2 - b^2))]*Sec[c + d*x]^2*Tan[c + d*x])/5))))/(-9
*(a^2 - b^2)*AppellF1[1/2, 1/6, 1, 3/2, -Tan[c + d*x]^2, -((a^2*Tan[c + d*x
]^2)/(a^2 - b^2))] + (6*a^2*AppellF1[3/2, 1/6, 2, 5/2, -Tan[c + d*x]^2, -((
a^2*Tan[c + d*x]^2)/(a^2 - b^2))] + (a^2 - b^2)*AppellF1[3/2, 7/6, 1, 5/2,
-Tan[c + d*x]^2, -((a^2*Tan[c + d*x]^2)/(a^2 - b^2))])*Tan[c + d*x]^2)^2))/
((Sec[c + d*x]^2)^(1/6)*(-b^2 + a^2*Sec[c + d*x]^2))))
```

Maple [F]

$$\int \frac{1}{\cos (dx + c)^{\frac{2}{3}} (a + \cos (dx + c) b)} dx$$

```
[In] int(1/cos(d*x+c)^(2/3)/(a+cos(d*x+c)*b),x)
```

```
[Out] int(1/cos(d*x+c)^(2/3)/(a+cos(d*x+c)*b),x)
```

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{2}{3}}(c+dx)(a+b\cos(c+dx))}\,dx=\text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)^(2/3)/(a+b*cos(d*x+c)),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{2}{3}}(c+dx)(a+b\cos(c+dx))}\,dx=\text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(2/3)/(a+b*cos(d*x+c)),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{\cos^{\frac{2}{3}}(c+dx)(a+b\cos(c+dx))}\,dx=\int \frac{1}{(b\cos(dx+c)+a)\cos(dx+c)^{\frac{2}{3}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(2/3)/(a+b*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)*cos(d*x + c)^(2/3)), x)
```

Giac [F]

$$\int \frac{1}{\cos^{\frac{2}{3}}(c+dx)(a+b\cos(c+dx))}\,dx=\int \frac{1}{(b\cos(dx+c)+a)\cos(dx+c)^{\frac{2}{3}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(2/3)/(a+b*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)*cos(d*x + c)^(2/3)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{2}{3}}(c+dx)(a+b\cos(c+dx))}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^{2/3}\,\left(a+b\,\cos\left(c+d\,x\right)\right)}\,dx$$

```
[In] int(1/(cos(c + d*x)^(2/3)*(a + b*cos(c + d*x))),x)
[Out] int(1/(cos(c + d*x)^(2/3)*(a + b*cos(c + d*x))), x)
```

3.680 $\int \frac{\cos^{\frac{7}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{\cos^{\frac{7}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx=\text{Int}\left(\frac{\cos^{\frac{7}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}},x\right)$$

```
[Out] Unintegrable(cos(d*x+c)^(7/3)/(a+b*cos(d*x+c))^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\cos^{\frac{7}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{\cos^{\frac{7}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Int[Cos[c + d*x]^(7/3)/Sqrt[a + b*Cos[c + d*x]],x]
[Out] Defer[Int][Cos[c + d*x]^(7/3)/Sqrt[a + b*Cos[c + d*x]], x]
```

Rubi steps

$$\text{integral}=\int \frac{\cos^{\frac{7}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 122.06 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{\cos^{\frac{7}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{\cos^{\frac{7}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Integrate[Cos[c + d*x]^(7/3)/Sqrt[a + b*Cos[c + d*x]],x]
[Out] Integrate[Cos[c + d*x]^(7/3)/Sqrt[a + b*Cos[c + d*x]], x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.69 (sec) , antiderivative size = 21, normalized size of antiderivative = 0.84

$$\int \frac{\cos^{\frac{7}{3}}(dx+c)}{\sqrt{a+\cos(dx+c)\,b}}dx$$

```
[In] int(cos(d*x+c)^(7/3)/(a+cos(d*x+c)*b)^(1/2),x)
[Out] int(cos(d*x+c)^(7/3)/(a+cos(d*x+c)*b)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.80 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\cos^{\frac{7}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{\cos(dx+c)^{\frac{7}{3}}}{\sqrt{b\cos(dx+c)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(7/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(cos(d*x + c)^(7/3)/sqrt(b*cos(d*x + c) + a), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(7/3)/(a+b*cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [N/A]

Not integrable

Time = 1.34 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\cos^{\frac{7}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{7}{3}}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(7/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(7/3)/sqrt(b*cos(d*x + c) + a), x)
```

Giac [N/A]

Not integrable

Time = 22.41 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\cos^{\frac{7}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{7}{3}}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(7/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(7/3)/sqrt(b*cos(d*x + c) + a), x)
```

Mupad [N/A]

Not integrable

Time = 16.17 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\cos^{\frac{7}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{{\cos\left(c+d\,x\right)}^{7/3}}{\sqrt{a+b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(cos(c + d*x)^(7/3)/(a + b*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(7/3)/(a + b*cos(c + d*x))^(1/2), x)
```

3.681 $\int \frac{\cos^{\frac{5}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{\cos^{\frac{5}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \text{Int}\left(\frac{\cos^{\frac{5}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}},x\right)$$

```
[Out] Unintegrable(cos(d*x+c)^(5/3)/(a+b*cos(d*x+c))^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\cos^{\frac{5}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos^{\frac{5}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Int[Cos[c + d*x]^(5/3)/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] Defer[Int][Cos[c + d*x]^(5/3)/Sqrt[a + b*Cos[c + d*x]], x]
```

Rubi steps

$$\text{integral} = \int \frac{\cos^{\frac{5}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 55.73 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{\cos^{\frac{5}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{\cos^{\frac{5}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Integrate[Cos[c + d*x]^(5/3)/Sqrt[a + b*Cos[c + d*x]],x]
[Out] Integrate[Cos[c + d*x]^(5/3)/Sqrt[a + b*Cos[c + d*x]], x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.50 (sec) , antiderivative size = 21, normalized size of antiderivative = 0.84

$$\int \frac{\cos^{\frac{5}{3}}\left(dx+c\right)}{\sqrt{a+\cos\left(dx+c\right)b}}dx$$

```
[In] int(cos(d*x+c)^(5/3)/(a+cos(d*x+c)*b)^(1/2),x)
[Out] int(cos(d*x+c)^(5/3)/(a+cos(d*x+c)*b)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 1.06 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\cos^{\frac{5}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{\cos\left(dx+c\right)^{\frac{5}{3}}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(cos(d*x + c)^(5/3)/sqrt(b*cos(d*x + c) + a), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/3)/(a+b*cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [N/A]

Not integrable

Time = 0.82 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\cos^{\frac{5}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{5}{3}}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(5/3)/sqrt(b*cos(d*x + c) + a), x)
```

Giac [N/A]

Not integrable

Time = 23.57 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\cos^{\frac{5}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{5}{3}}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(5/3)/sqrt(b*cos(d*x + c) + a), x)
```

Mupad [N/A]

Not integrable

Time = 15.36 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\cos^{\frac{5}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{{\cos\left(c+d\,x\right)}^{5/3}}{\sqrt{a+b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(cos(c + d*x)^(5/3)/(a + b*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(5/3)/(a + b*cos(c + d*x))^(1/2), x)
```

3.682 $\int \frac{\cos^{\frac{4}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{\cos^{\frac{4}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \text{Int}\left(\frac{\cos^{\frac{4}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}},x\right)$$

```
[Out] Unintegrable(cos(d*x+c)^(4/3)/(a+b*cos(d*x+c))^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\cos^{\frac{4}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos^{\frac{4}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Int[Cos[c + d*x]^(4/3)/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] Defer[Int][Cos[c + d*x]^(4/3)/Sqrt[a + b*Cos[c + d*x]], x]
```

Rubi steps

$$\text{integral} = \int \frac{\cos^{\frac{4}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 33.04 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{\cos^{\frac{4}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos^{\frac{4}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Integrate[Cos[c + d*x]^(4/3)/Sqrt[a + b*Cos[c + d*x]],x]
[Out] Integrate[Cos[c + d*x]^(4/3)/Sqrt[a + b*Cos[c + d*x]], x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.58 (sec) , antiderivative size = 21, normalized size of antiderivative = 0.84

$$\int \frac{\cos^{\frac{4}{3}}\left(dx+c\right)}{\sqrt{a+\cos\left(dx+c\right)b}}dx$$

```
[In] int(cos(d*x+c)^(4/3)/(a+cos(d*x+c)*b)^(1/2),x)
[Out] int(cos(d*x+c)^(4/3)/(a+cos(d*x+c)*b)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.77 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\cos^{\frac{4}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{4}{3}}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(4/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(cos(d*x + c)^(4/3)/sqrt(b*cos(d*x + c) + a), x)
```

Sympy [N/A]

Not integrable

Time = 102.89 (sec) , antiderivative size = 24, normalized size of antiderivative = 0.96

$$\int \frac{\cos^{\frac{4}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos^{\frac{4}{3}}\left(c+dx\right)}{\sqrt{a+b\cos\left(c+dx\right)}}\,dx$$

```
[In] integrate(cos(d*x+c)**(4/3)/(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(cos(c + d*x)**(4/3)/sqrt(a + b*cos(c + d*x)), x)
```

Maxima [N/A]

Not integrable

Time = 0.79 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\cos^{\frac{4}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{4}{3}}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(4/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(4/3)/sqrt(b*cos(d*x + c) + a), x)
```

Giac [N/A]

Not integrable

Time = 20.09 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\cos^{\frac{4}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{4}{3}}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(4/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(4/3)/sqrt(b*cos(d*x + c) + a), x)
```

Mupad [N/A]

Not integrable

Time = 15.24 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\cos^{\frac{4}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos\left(c+d\,x\right)^{4/3}}{\sqrt{a+b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(cos(c + d*x)^(4/3)/(a + b*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(4/3)/(a + b*cos(c + d*x))^(1/2), x)
```

3.683 $\int \frac{\cos^{\frac{2}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{\cos^{\frac{2}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx=\operatorname{Int}\left(\frac{\cos^{\frac{2}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}},x\right)$$

```
[Out] Unintegrable(cos(d*x+c)^(2/3)/(a+b*cos(d*x+c))^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\cos^{\frac{2}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{\cos^{\frac{2}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Int[Cos[c + d*x]^(2/3)/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] Defer[Int][Cos[c + d*x]^(2/3)/Sqrt[a + b*Cos[c + d*x]], x]
```

Rubi steps

$$\text{integral}=\int \frac{\cos^{\frac{2}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 24.78 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{\cos^{\frac{2}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos^{\frac{2}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Integrate[Cos[c + d*x]^(2/3)/Sqrt[a + b*Cos[c + d*x]],x]
[Out] Integrate[Cos[c + d*x]^(2/3)/Sqrt[a + b*Cos[c + d*x]], x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.56 (sec) , antiderivative size = 21, normalized size of antiderivative = 0.84

$$\int \frac{\cos^{\frac{2}{3}}\left(dx+c\right)}{\sqrt{a+\cos\left(dx+c\right)b}}dx$$

```
[In] int(cos(d*x+c)^(2/3)/(a+cos(d*x+c)*b)^(1/2),x)
[Out] int(cos(d*x+c)^(2/3)/(a+cos(d*x+c)*b)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.99 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\cos^{\frac{2}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{2}{3}}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(2/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(cos(d*x + c)^(2/3)/sqrt(b*cos(d*x + c) + a), x)
```

Sympy [N/A]

Not integrable

Time = 2.46 (sec) , antiderivative size = 24, normalized size of antiderivative = 0.96

$$\int \frac{\cos^{\frac{2}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{\cos^{\frac{2}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] integrate(cos(d*x+c)**(2/3)/(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(cos(c + d*x)**(2/3)/sqrt(a + b*cos(c + d*x)), x)
```

Maxima [N/A]

Not integrable

Time = 0.79 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\cos^{\frac{2}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{\cos(dx+c)^{\frac{2}{3}}}{\sqrt{b\cos(dx+c)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(2/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(2/3)/sqrt(b*cos(d*x + c) + a), x)
```

Giac [N/A]

Not integrable

Time = 18.69 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\cos^{\frac{2}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{\cos(dx+c)^{\frac{2}{3}}}{\sqrt{b\cos(dx+c)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(2/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(2/3)/sqrt(b*cos(d*x + c) + a), x)
```

Mupad [N/A]

Not integrable

Time = 15.24 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\cos^{\frac{2}{3}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{{\cos\left(c+d\,x\right)}^{2/3}}{\sqrt{a+b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(cos(c + d*x)^(2/3)/(a + b*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(2/3)/(a + b*cos(c + d*x))^(1/2), x)
```

3.684 $\int \frac{\sqrt[3]{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{\sqrt[3]{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = \text{Int}\left(\frac{\sqrt[3]{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}},x\right)$$

```
[Out] Unintegrable(cos(d*x+c)^(1/3)/(a+b*cos(d*x+c))^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt[3]{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sqrt[3]{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Int[Cos[c + d*x]^(1/3)/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] Defer[Int][Cos[c + d*x]^(1/3)/Sqrt[a + b*Cos[c + d*x]], x]
```

Rubi steps

$$\text{integral} = \int \frac{\sqrt[3]{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 15.11 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{\sqrt[3]{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sqrt[3]{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Integrate[Cos[c + d*x]^(1/3)/Sqrt[a + b*Cos[c + d*x]],x]
[Out] Integrate[Cos[c + d*x]^(1/3)/Sqrt[a + b*Cos[c + d*x]], x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.62 (sec) , antiderivative size = 21, normalized size of antiderivative = 0.84

$$\int \frac{\cos^{\frac{1}{3}}(dx+c)}{\sqrt{a+\cos(dx+c)\,b}}dx$$

```
[In] int(cos(d*x+c)^(1/3)/(a+cos(d*x+c)*b)^(1/2),x)
[Out] int(cos(d*x+c)^(1/3)/(a+cos(d*x+c)*b)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.51 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\sqrt[3]{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos(dx+c)^{\frac{1}{3}}}{\sqrt{b\cos(dx+c)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(cos(d*x + c)^(1/3)/sqrt(b*cos(d*x + c) + a), x)
```

Sympy [N/A]

Not integrable

Time = 1.00 (sec) , antiderivative size = 24, normalized size of antiderivative = 0.96

$$\int \frac{\sqrt[3]{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sqrt[3]{\cos{(c+dx)}}}{\sqrt{a+b\cos{(c+dx)}}}\,dx$$

```
[In] integrate(cos(d*x+c)**(1/3)/(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(cos(c + d*x)**(1/3)/sqrt(a + b*cos(c + d*x)), x)
```

Maxima [N/A]

Not integrable

Time = 0.77 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\sqrt[3]{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{1}{3}}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^(1/3)/sqrt(b*cos(d*x + c) + a), x)
```

Giac [N/A]

Not integrable

Time = 18.06 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\sqrt[3]{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\cos\left(dx+c\right)^{\frac{1}{3}}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^(1/3)/sqrt(b*cos(d*x + c) + a), x)
```

Mupad [N/A]

Not integrable

Time = 15.90 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\sqrt[3]{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{{\cos\left(c+d\,x\right)}^{1/3}}{\sqrt{a+b\,\cos\left(c+d\,x\right)}} \,d x$$

```
[In] int(cos(c + d*x)^(1/3)/(a + b*cos(c + d*x))^(1/2),x)
[Out] int(cos(c + d*x)^(1/3)/(a + b*cos(c + d*x))^(1/2), x)
```

3.685 $\int \frac{1}{\sqrt[3]{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{1}{\sqrt[3]{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx = \text{Int}\left(\frac{1}{\sqrt[3]{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}},x\right)$$

```
[Out] Unintegrable(1/cos(d*x+c)^(1/3)/(a+b*cos(d*x+c))^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\sqrt[3]{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt[3]{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Int[1/(Cos[c + d*x]^(1/3)*Sqrt[a + b*Cos[c + d*x]]),x]
```

```
[Out] Defer[Int][1/(Cos[c + d*x]^(1/3)*Sqrt[a + b*Cos[c + d*x]]), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{\sqrt[3]{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 13.96 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{1}{\sqrt[3]{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt[3]{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Integrate[1/(Cos[c + d*x]^(1/3)*Sqrt[a + b*Cos[c + d*x]]),x]
[Out] Integrate[1/(Cos[c + d*x]^(1/3)*Sqrt[a + b*Cos[c + d*x]]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.69 (sec) , antiderivative size = 21, normalized size of antiderivative = 0.84

$$\int \frac{1}{\cos\left(dx+c\right)^{\frac{1}{3}}\sqrt{a+\cos\left(dx+c\right)b}}dx$$

```
[In] int(1/cos(d*x+c)^(1/3)/(a+cos(d*x+c)*b)^(1/2),x)
[Out] int(1/cos(d*x+c)^(1/3)/(a+cos(d*x+c)*b)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.37 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.76

$$\int \frac{1}{\sqrt[3]{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos\left(dx+c\right)+a}\cos\left(dx+c\right)^{\frac{1}{3}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(2/3)/(b*cos(d*x + c)^2 + a*
cos(d*x + c)), x)
```

Sympy [N/A]

Not integrable

Time = 0.56 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.04

$$\int \frac{1}{\sqrt[3]{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{a+b\cos{(c+dx)}}\sqrt[3]{\cos{(c+dx)}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(1/3)/(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(1/(sqrt(a + b*cos(c + d*x))*cos(c + d*x)**(1/3)), x)
```

Maxima [N/A]

Not integrable

Time = 0.81 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{\sqrt[3]{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos{(dx+c)}+a}\cos{(dx+c)}^{\frac{1}{3}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(1/3)), x)
```

Giac [N/A]

Not integrable

Time = 19.51 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{\sqrt[3]{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos{(dx+c)}+a}\cos{(dx+c)}^{\frac{1}{3}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(1/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(1/3)), x)
```

Mupad [N/A]

Not integrable

Time = 16.23 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{\sqrt[3]{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{1}{{\cos\left(c+d\,x\right)}^{1/3}\,\sqrt{a+b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(1/3)*(a + b*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(1/3)*(a + b*cos(c + d*x))^(1/2)), x)
```

3.686 $\int \frac{1}{\cos^{\frac{2}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{1}{\cos^{\frac{2}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \text{Int}\left(\frac{1}{\cos^{\frac{2}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}},x\right)$$

```
[Out] Unintegrable(1/cos(d*x+c)^(2/3)/(a+b*cos(d*x+c))^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.07 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{\cos^{\frac{2}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\cos^{\frac{2}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Int[1/(Cos[c + d*x]^(2/3)*Sqrt[a + b*Cos[c + d*x]]),x]
```

```
[Out] Defer[Int][1/(Cos[c + d*x]^(2/3)*Sqrt[a + b*Cos[c + d*x]]), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{\cos^{\frac{2}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.32 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{1}{\cos^{\frac{2}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\cos^{\frac{2}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Integrate[1/(Cos[c + d*x]^(2/3)*Sqrt[a + b*Cos[c + d*x]]),x]
[Out] Integrate[1/(Cos[c + d*x]^(2/3)*Sqrt[a + b*Cos[c + d*x]]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.58 (sec) , antiderivative size = 21, normalized size of antiderivative = 0.84

$$\int \frac{1}{\cos\left(dx+c\right)^{\frac{2}{3}}\sqrt{a+\cos\left(dx+c\right)b}}dx$$

```
[In] int(1/cos(d*x+c)^(2/3)/(a+cos(d*x+c)*b)^(1/2),x)
[Out] int(1/cos(d*x+c)^(2/3)/(a+cos(d*x+c)*b)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.35 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.76

$$\int \frac{1}{\cos^{\frac{2}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos\left(dx+c\right)+a}\cos\left(dx+c\right)^{\frac{2}{3}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(2/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(1/3)/(b*cos(d*x + c)^2 + a*
cos(d*x + c)), x)
```

Sympy [N/A]

Not integrable

Time = 1.26 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.04

$$\int \frac{1}{\cos^{\frac{2}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{1}{\sqrt{a+b\cos{(c+dx)}}\cos^{\frac{2}{3}}{(c+dx)}}\,dx$$

[In] integrate(1/cos(d*x+c)**(2/3)/(a+b*cos(d*x+c))**(1/2),x)

[Out] Integral(1/(sqrt(a + b*cos(c + d*x))*cos(c + d*x)**(2/3)), x)

Maxima [N/A]

Not integrable

Time = 0.80 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{\cos^{\frac{2}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{1}{\sqrt{b\cos{(dx+c)}+a}\cos{(dx+c)}^{\frac{2}{3}}}\,dx$$

[In] integrate(1/cos(d*x+c)^(2/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")

[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(2/3)), x)

Giac [N/A]

Not integrable

Time = 19.05 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{\cos^{\frac{2}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{1}{\sqrt{b\cos{(dx+c)}+a}\cos{(dx+c)}^{\frac{2}{3}}}\,dx$$

[In] integrate(1/cos(d*x+c)^(2/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")

[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(2/3)), x)

Mupad [N/A]

Not integrable

Time = 14.70 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{\cos^{\frac{2}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{1}{{\cos\left(c+d\,x\right)}^{2/3}\,\sqrt{a+b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(2/3)*(a + b*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(2/3)*(a + b*cos(c + d*x))^(1/2)), x)
```

3.687 $\int \frac{1}{\cos^{\frac{4}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{1}{\cos^{\frac{4}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx=\operatorname{Int}\left(\frac{1}{\cos^{\frac{4}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}},x\right)$$

```
[Out] Unintegrable(1/cos(d*x+c)^(4/3)/(a+b*cos(d*x+c))^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\cos^{\frac{4}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{1}{\cos^{\frac{4}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Int[1/(Cos[c + d*x]^(4/3)*Sqrt[a + b*Cos[c + d*x]]),x]
```

```
[Out] Defer[Int][1/(Cos[c + d*x]^(4/3)*Sqrt[a + b*Cos[c + d*x]]), x]
```

Rubi steps

$$\text{integral}=\int \frac{1}{\cos^{\frac{4}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 101.45 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{1}{\cos^{\frac{4}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\cos^{\frac{4}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Integrate[1/(Cos[c + d*x]^(4/3)*Sqrt[a + b*Cos[c + d*x]]),x]
[Out] Integrate[1/(Cos[c + d*x]^(4/3)*Sqrt[a + b*Cos[c + d*x]]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.54 (sec) , antiderivative size = 21, normalized size of antiderivative = 0.84

$$\int \frac{1}{\cos\left(dx+c\right)^{\frac{4}{3}}\sqrt{a+\cos\left(dx+c\right)b}}dx$$

```
[In] int(1/cos(d*x+c)^(4/3)/(a+cos(d*x+c)*b)^(1/2),x)
[Out] int(1/cos(d*x+c)^(4/3)/(a+cos(d*x+c)*b)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.34 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.84

$$\int \frac{1}{\cos^{\frac{4}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos\left(dx+c\right)+a}\cos\left(dx+c\right)^{\frac{4}{3}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(4/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(2/3)/(b*cos(d*x + c)^3 + a*
cos(d*x + c)^2), x)
```

Sympy [N/A]

Not integrable

Time = 9.84 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.04

$$\int \frac{1}{\cos^{\frac{4}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{a+b\cos(c+dx)}\cos^{\frac{4}{3}}(c+dx)}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(4/3)/(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(1/(sqrt(a + b*cos(c + d*x))*cos(c + d*x)**(4/3)), x)
```

Maxima [N/A]

Not integrable

Time = 0.83 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{\cos^{\frac{4}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos(dx+c)+a}\cos(dx+c)^{\frac{4}{3}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(4/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(4/3)), x)
```

Giac [N/A]

Not integrable

Time = 20.04 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{\cos^{\frac{4}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos(dx+c)+a}\cos(dx+c)^{\frac{4}{3}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(4/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(4/3)), x)
```

Mupad [N/A]

Not integrable

Time = 16.78 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{\cos^{\frac{4}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{1}{{\cos\left(c+d\,x\right)}^{4/3}\,\sqrt{a+b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(4/3)*(a + b*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(4/3)*(a + b*cos(c + d*x))^(1/2)), x)
```

3.688 $\int \frac{1}{\cos^{\frac{5}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{1}{\cos^{\frac{5}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \text{Int}\left(\frac{1}{\cos^{\frac{5}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}},x\right)$$

```
[Out] Unintegrable(1/cos(d*x+c)^(5/3)/(a+b*cos(d*x+c))^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.07 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\cos^{\frac{5}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\cos^{\frac{5}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Int[1/(Cos[c + d*x]^(5/3)*Sqrt[a + b*Cos[c + d*x]]),x]
```

```
[Out] Defer[Int][1/(Cos[c + d*x]^(5/3)*Sqrt[a + b*Cos[c + d*x]]), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{\cos^{\frac{5}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 83.83 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{1}{\cos^{\frac{5}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\cos^{\frac{5}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Integrate[1/(Cos[c + d*x]^(5/3)*Sqrt[a + b*Cos[c + d*x]]),x]
[Out] Integrate[1/(Cos[c + d*x]^(5/3)*Sqrt[a + b*Cos[c + d*x]]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.57 (sec) , antiderivative size = 21, normalized size of antiderivative = 0.84

$$\int \frac{1}{\cos\left(dx+c\right)^{\frac{5}{3}}\sqrt{a+\cos\left(dx+c\right)b}}dx$$

```
[In] int(1/cos(d*x+c)^(5/3)/(a+cos(d*x+c)*b)^(1/2),x)
[Out] int(1/cos(d*x+c)^(5/3)/(a+cos(d*x+c)*b)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.32 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.84

$$\int \frac{1}{\cos^{\frac{5}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos\left(dx+c\right)+a}\cos\left(dx+c\right)^{\frac{5}{3}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(1/3)/(b*cos(d*x + c)^3 + a*
cos(d*x + c)^2), x)
```

Sympy [N/A]

Not integrable

Time = 23.65 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.04

$$\int \frac{1}{\cos^{\frac{5}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{1}{\sqrt{a+b\cos{(c+dx)}}\cos^{\frac{5}{3}}{(c+dx)}}\,dx$$

```
[In] integrate(1/cos(d*x+c)**(5/3)/(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(1/(sqrt(a + b*cos(c + d*x))*cos(c + d*x)**(5/3)), x)
```

Maxima [N/A]

Not integrable

Time = 0.82 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{\cos^{\frac{5}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{1}{\sqrt{b\cos{(dx+c)}+a}\cos{(dx+c)}^{\frac{5}{3}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(5/3)), x)
```

Giac [N/A]

Not integrable

Time = 19.52 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{\cos^{\frac{5}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{1}{\sqrt{b\cos{(dx+c)}+a}\cos{(dx+c)}^{\frac{5}{3}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(5/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(5/3)), x)
```

Mupad [N/A]

Not integrable

Time = 14.68 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{\cos^{\frac{5}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\cos\left(c+d\,x\right)^{5/3}\,\sqrt{a+b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(5/3)*(a + b*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(5/3)*(a + b*cos(c + d*x))^(1/2)), x)
```

3.689 $\int \frac{1}{\cos^{\frac{7}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{1}{\cos^{\frac{7}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx=\operatorname{Int}\left(\frac{1}{\cos^{\frac{7}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}},x\right)$$

```
[Out] Unintegrable(1/cos(d*x+c)^(7/3)/(a+b*cos(d*x+c))^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\cos^{\frac{7}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{1}{\cos^{\frac{7}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Int[1/(Cos[c + d*x]^(7/3)*Sqrt[a + b*Cos[c + d*x]]),x]
```

```
[Out] Defer[Int][1/(Cos[c + d*x]^(7/3)*Sqrt[a + b*Cos[c + d*x]]), x]
```

Rubi steps

$$\text{integral}=\int \frac{1}{\cos^{\frac{7}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 103.35 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{1}{\cos^{\frac{7}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\cos^{\frac{7}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] Integrate[1/(Cos[c + d*x]^(7/3)*Sqrt[a + b*Cos[c + d*x]]),x]
[Out] Integrate[1/(Cos[c + d*x]^(7/3)*Sqrt[a + b*Cos[c + d*x]]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.43 (sec) , antiderivative size = 21, normalized size of antiderivative = 0.84

$$\int \frac{1}{\cos\left(dx+c\right)^{\frac{7}{3}}\sqrt{a+\cos\left(dx+c\right)b}}dx$$

```
[In] int(1/cos(d*x+c)^(7/3)/(a+cos(d*x+c)*b)^(1/2),x)
[Out] int(1/cos(d*x+c)^(7/3)/(a+cos(d*x+c)*b)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.37 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.84

$$\int \frac{1}{\cos^{\frac{7}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos\left(dx+c\right)+a}\cos\left(dx+c\right)^{\frac{7}{3}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(7/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(2/3)/(b*cos(d*x + c)^4 + a*
cos(d*x + c)^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\cos^{\frac{7}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(1/cos(d*x+c)**(7/3)/(a+b*cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [N/A]

Not integrable

Time = 0.83 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{\cos^{\frac{7}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos\left(dx+c\right)+a}\cos\left(dx+c\right)^{\frac{7}{3}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(7/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(7/3)), x)
```

Giac [N/A]

Not integrable

Time = 19.32 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{\cos^{\frac{7}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos\left(dx+c\right)+a}\cos\left(dx+c\right)^{\frac{7}{3}}}\,dx$$

```
[In] integrate(1/cos(d*x+c)^(7/3)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*cos(d*x + c)^(7/3)), x)
```

Mupad [N/A]

Not integrable

Time = 16.49 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{\cos^{\frac{7}{3}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{1}{{\cos\left(c+d\,x\right)}^{7/3}\,\sqrt{a+b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(cos(c + d*x)^(7/3)*(a + b*cos(c + d*x))^(1/2)),x)
[Out] int(1/(cos(c + d*x)^(7/3)*(a + b*cos(c + d*x))^(1/2)), x)
```

3.690 $\int (A+B\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 151

$$\int (A+B\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)\,dx = -\frac{6A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{6A\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} + \frac{2B\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{2A\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}$$

```
[Out] 2/3*B*sec(d*x+c)^(3/2)*sin(d*x+c)/d+2/5*A*sec(d*x+c)^(5/2)*sin(d*x+c)/d+6/5
*A*sin(d*x+c)*sec(d*x+c)^(1/2)/d-6/5*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2
*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+
c)^(1/2)/d+2/3*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(
sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used

= {3317, 3872, 3853, 3856, 2720, 2719}

$$\int (A+B\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)\,dx$$
$$=\frac{2A\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{5d}+\frac{6A\sin(c+dx)\sqrt{\sec(c+dx)}}{5d}$$
$$-\frac{6A\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2B\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3d}$$
$$+\frac{2B\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}$$

```
[In] Int[(A + B*Cos[c + d*x])*Sec[c + d*x]^(7/2),x]
```

```
[Out] (-6*A*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(5*d
) + (2*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(
3*d) + (6*A*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(5*d) + (2*B*Sec[c + d*x]^(3/2
)*Sin[c + d*x])/(3*d) + (2*A*Sec[c + d*x]^(5/2)*Sin[c + d*x])/(5*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

```
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \sec^{\frac{5}{2}}(c+dx)(B+A\sec(c+dx))\,dx \\
&= A\int \sec^{\frac{7}{2}}(c+dx)\,dx + B\int \sec^{\frac{5}{2}}(c+dx)\,dx \\
&= \frac{2B\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{2A\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} \\
&\quad + \frac{1}{5}(3A)\int \sec^{\frac{3}{2}}(c+dx)\,dx + \frac{1}{3}B\int \sqrt{\sec(c+dx)}\,dx \\
&= \frac{6A\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} + \frac{2B\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{2A\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} \\
&\quad - \frac{1}{5}(3A)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + \frac{1}{3}\left(B\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\
&\quad + \frac{6A\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} \\
&\quad + \frac{2B\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{2A\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} \\
&\quad - \frac{1}{5}\left(3A\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= -\frac{6A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\,2\right)\sqrt{\sec(c+dx)}}{5d} \\
&\quad + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\
&\quad + \frac{6A\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} \\
&\quad + \frac{2B\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{2A\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.40 (sec) , antiderivative size = 97, normalized size of antiderivative = 0.64

$$\int (A + B\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)\,dx$$
$$= \frac{\sec^{\frac{5}{2}}(c+dx)\left(-36A\cos^{\frac{5}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)+20B\cos^{\frac{5}{2}}(c+dx)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+21A\sin\right.}{30d}$$

```
[In] Integrate[(A + B*Cos[c + d*x])*Sec[c + d*x]^(7/2),x]
```

```
[Out] (Sec[c + d*x]^(5/2)*(-36*A*Cos[c + d*x]^(5/2)*EllipticE[(c + d*x)/2, 2] + 2
0*B*Cos[c + d*x]^(5/2)*EllipticF[(c + d*x)/2, 2] + 21*A*Sin[c + d*x] + 10*B
*Sin[2*(c + d*x)] + 9*A*Sin[3*(c + d*x)]))/(30*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 501 vs. 2(179) = 358.

Time = 22.51 (sec) , antiderivative size = 502, normalized size of antiderivative = 3.32

method	result
default	$-\frac{\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(2B\left(-\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}{6\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{1}{2}\right)^2}+\frac{\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}\right.\right.}}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right.\right.}}\right.\right.}{}$
parts	$-\frac{2A\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(24\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}E\left(c\right.\right.}{}$

```
[In] int((A+B*cos(d*x+c))*sec(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*B*(-1/6*cos(1
/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2
*d*x+1/2*c)^2-1/2)^2+1/3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c
)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF
(cos(1/2*d*x+1/2*c),2^(1/2)))+2/5*A/(8*sin(1/2*d*x+1/2*c)^6-12*sin(1/2*d*x+
1/2*c)^4+6*sin(1/2*d*x+1/2*c)^2-1)/sin(1/2*d*x+1/2*c)^2*(24*cos(1/2*d*x+1/2
*c)*sin(1/2*d*x+1/2*c)^6-12*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1
/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^4-2
4*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+12*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/
2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1
/2*d*x+1/2*c)^2+8*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-3*(sin(1/2*d*x+1/
2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c)
```

```
,2^(1/2)))*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2))/sin(1/2*d*
x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 188, normalized size of antiderivative = 1.25

$$\int (A+B\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)\,dx$$

$$= \frac{-5i\sqrt{2}B\cos(dx+c)^2\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\,\sin(dx+c))+5i\sqrt{2}B\cos(dx+c)^2\,\text{wei}}{}$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] 1/15*(-5*I*sqrt(2)*B*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x + c)
 + I*sin(d*x + c)) + 5*I*sqrt(2)*B*cos(d*x + c)^2*weierstrassPInverse(-4, 0
, cos(d*x + c) - I*sin(d*x + c)) - 9*I*sqrt(2)*A*cos(d*x + c)^2*weierstrass
Zeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 9*
I*sqrt(2)*A*cos(d*x + c)^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0
, cos(d*x + c) - I*sin(d*x + c))) + 2*(9*A*cos(d*x + c)^2 + 5*B*cos(d*x + c
) + 3*A)*sin(d*x + c)/sqrt(cos(d*x + c)))/(d*cos(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int (A+B\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)**(7/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (A+B\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)\,dx = \int (B\cos(dx+c)+A)\sec(dx+c)^{\frac{7}{2}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^(7/2),x, algorithm="maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^(7/2), x)
```

Giac [F]

$$\int (A+B\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)\,dx=\int (B\cos(dx+c)+A)\sec(dx+c)^{\frac{7}{2}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^(7/2),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (A+B\cos(c+dx))\sec^{\frac{7}{2}}(c+dx)\,dx=\int (A+B\,\cos(c+d\,x))\left(\frac{1}{\cos(c+d\,x)}\right)^{7/2}dx$$

```
[In] int((A + B*cos(c + d*x))*(1/cos(c + d*x))^(7/2),x)
[Out] int((A + B*cos(c + d*x))*(1/cos(c + d*x))^(7/2), x)
```

3.691 $\int (A+B\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 123

$$\begin{aligned}\int (A+B\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)\,dx &= -\frac{2B\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d}\\&\quad+\frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d}\\&\quad+\frac{2B\sqrt{\sec(c+dx)}\sin(c+dx)}{d}+\frac{2A\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}\end{aligned}$$

```
[Out] 2/3*A*sec(d*x+c)^(3/2)*sin(d*x+c)/d+2*B*sin(d*x+c)*sec(d*x+c)^(1/2)/d-2*B*(
cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c)
,2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+2/3*A*(cos(1/2*d*x+1/2*c)^2)^
(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(
1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 123, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {3317, 3872, 3853, 3856, 2719, 2720}

$$\begin{aligned}\int (A+B\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)\,dx &= \frac{2A\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3d}+\frac{2A\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}\\&\quad+\frac{2B\sin(c+dx)\sqrt{\sec(c+dx)}}{d}-\frac{2B\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}\end{aligned}$$

```
[In] Int[(A + B*Cos[c + d*x])*Sec[c + d*x]^(5/2),x]
```

```
[Out] (-2*B*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/d +
(2*A*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3*d)
 + (2*B*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/d + (2*A*Sec[c + d*x]^(3/2)*Sin[c
+ d*x])/(3*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rubi steps

$$\text{integral} = \int \sec^{\frac{3}{2}}(c+dx)(B+A\sec(c+dx))\,dx$$

$$
\begin{aligned}
&= A\int \sec^{\frac{5}{2}}(c+dx)\,dx + B\int \sec^{\frac{3}{2}}(c+dx)\,dx \\
&= \frac{2B\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{2A\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} \\
&\quad + \frac{1}{3}A\int \sqrt{\sec(c+dx)}\,dx - B\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx \\
&= \frac{2B\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{2A\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} \\
&\quad + \frac{1}{3}\left(A\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&\quad - \left(B\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= -\frac{2B\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} \\
&\quad + \frac{2A\sqrt{\cos(c+dx)}\,\mathrm{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\
&\quad + \frac{2B\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{2A\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.28 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.69

$$
\int (A+B\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)\,dx
= \frac{\sec^{\frac{3}{2}}(c+dx)\left(-6B\cos^{\frac{3}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)+2A\cos^{\frac{3}{2}}(c+dx)\,\mathrm{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+2(A+3B\,\mathrm{c}\right.}{3d}
$$

```
[In] Integrate[(A + B*Cos[c + d*x])*Sec[c + d*x]^(5/2),x]
```

```
[Out] (Sec[c + d*x]^(3/2)*(-6*B*Cos[c + d*x]^(3/2)*EllipticE[(c + d*x)/2, 2] + 2*
A*Cos[c + d*x]^(3/2)*EllipticF[(c + d*x)/2, 2] + 2*(A + 3*B*Cos[c + d*x])*S
in[c + d*x]))/(3*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 396 vs. $2(159) = 318$.

Time = 20.42 (sec) , antiderivative size = 397, normalized size of antiderivative = 3.23

method	result
default	$\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(2A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12\cdots}{\cdots}$
parts	$-\frac{2A\left(-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx}{2}}\cdots}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cdots}$

```
[In] int((A+B*cos(d*x+c))*sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)/(4*sin(1/2*d*
x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)/sin(1/2*d*x+1/2*c)^3*(2*A*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*(2*sin(1/2*d*x+1/2*c
)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2-12*B*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c
)^4+6*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*
(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2+2*A*cos(1/2*d*x+1/2*c
)*sin(1/2*d*x+1/2*c)^2-A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)
^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+6*B*cos(1/2*d*x+1/2*c)*si
n(1/2*d*x+1/2*c)^2-3*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2
-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c)^4+s
in(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 167, normalized size of antiderivative = 1.36

$$\int (A+B\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{-i\sqrt{2}A\cos(dx+c)\,\mathrm{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+i\sqrt{2}A\cos(dx+c)\,\mathrm{weiers}\cdots}{\cdots}$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/3*(-I*sqrt(2)*A*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c)) + I*sqrt(2)*A*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x
 + c) - I*sin(d*x + c)) - 3*I*sqrt(2)*B*cos(d*x + c)*weierstrassZeta(-4, 0,
 weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 3*I*sqrt(2)*B
*cos(d*x + c)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c
```

```
) - I*sin(d*x + c))) + 2*(3*B*cos(d*x + c) + A)*sin(d*x + c)/sqrt(cos(d*x +
 c)))/(d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int (A+B\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (A+B\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)\,dx = \int (B\cos(dx+c)+A)\sec(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^(5/2), x)
```

Giac [F]

$$\int (A+B\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)\,dx = \int (B\cos(dx+c)+A)\sec(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (A+B\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)\,dx = \int (A+B\,\cos(c+d\,x))\,{\left(\frac{1}{\cos(c+d\,x)}\right)}^{5/2}\,dx$$

```
[In] int((A + B*cos(c + d*x))*(1/cos(c + d*x))^(5/2),x)
[Out] int((A + B*cos(c + d*x))*(1/cos(c + d*x))^(5/2), x)
```

3.692 $\int (A+B\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 97

$$\int (A+B\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)\,dx = -\frac{2A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2A\sqrt{\sec(c+dx)}\sin(c+dx)}{d}$$

```
[Out] 2*A*sin(d*x+c)*sec(d*x+c)^(1/2)/d-2*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*
d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c
)^(1/2)/d+2*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin
(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {3317, 3872, 3856, 2720, 3853, 2719}

$$\int (A+B\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{2A\sin(c+dx)\sqrt{\sec(c+dx)}}{d} - \frac{2A\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2B\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}$$

```
[In] Int[(A + B*Cos[c + d*x])*Sec[c + d*x]^(3/2),x]
```

[Out] (-2*A*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/d + (2*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/d + (2*A*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/d

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \int \sqrt{\sec(c+dx)}(B+A\sec(c+dx))\,dx \\ &= A\int \sec^{\frac{3}{2}}(c+dx)\,dx + B\int \sqrt{\sec(c+dx)}\,dx\end{aligned}$$

$$= \frac{2A\sqrt{\sec(c+dx)}\sin(c+dx)}{d} - A\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + \left(B\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2A\sqrt{\sec(c+dx)}\sin(c+dx)}{d} - \left(A\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx$$

$$= -\frac{2A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2A\sqrt{\sec(c+dx)}\sin(c+dx)}{d}$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.73

$$\int (A+B\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{2\sqrt{\sec(c+dx)}\left(-A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)+B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+A\sin(c+\right.}{d}$$

```
[In] Integrate[(A + B*Cos[c + d*x])*Sec[c + d*x]^(3/2),x]
[Out] (2*Sqrt[Sec[c + d*x]]*(-(A*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]) +
B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2] + A*Sin[c + d*x]))/d
```

Maple [A] (verified)

Time = 5.72 (sec) , antiderivative size = 150, normalized size of antiderivative = 1.55

method	result
default	$\frac{4A\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-2B\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right.\right.}}{\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$
parts	$-\frac{2A\left(-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\right.\right.}\right.}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int((A+B*cos(d*x+c))*sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2*(2*A*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2-A*(sin(1/2*d*x+1/2*c)^2)^(1/
2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-B
*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(co
s(1/2*d*x+1/2*c),2^(1/2)))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1
/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.28

$$\int (A+B\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)\,dx$$
$$=\frac{-i\sqrt{2}B\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\,\sin(dx+c))+i\sqrt{2}B\text{weierstrassPInverse}(-4,0,\cos(d}{}$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] (-I*sqrt(2)*B*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + I
*sqrt(2)*B*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - I*sq
rt(2)*A*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c))) + I*sqrt(2)*A*weierstrassZeta(-4, 0, weierstrassPInverse(-4,
 0, cos(d*x + c) - I*sin(d*x + c))) + 2*A*sin(d*x + c)/sqrt(cos(d*x + c)))/
d
```

Sympy [F]

$$\int (A+B\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)\,dx=\int (A+B\cos{(c+dx)})\sec^{\frac{3}{2}}{(c+dx)}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)**(3/2),x)
[Out] Integral((A + B*cos(c + d*x))*sec(c + d*x)**(3/2), x)
```

Maxima [F]

$$\int (A+B\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)\,dx=\int (B\cos{(dx+c)}+A)\sec{(dx+c)}^{\frac{3}{2}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^(3/2), x)
```

Giac [F]

$$\int (A+B\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)\,dx=\int (B\cos{(dx+c)}+A)\sec{(dx+c)}^{\frac{3}{2}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (A+B\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)\,dx=\int (A+B\,\cos{(c+d\,x)})\,{\left(\frac{1}{\cos{(c+d\,x)}}\right)}^{3/2}\,dx$$

```
[In] int((A + B*cos(c + d*x))*(1/cos(c + d*x))^(3/2),x)
[Out] int((A + B*cos(c + d*x))*(1/cos(c + d*x))^(3/2), x)
```

3.693 $\int (A+B\cos(c+dx))\sqrt{\sec(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 75

$$\int (A+B\cos(c+dx))\sqrt{\sec(c+dx)}\,dx = \frac{2B\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d}$$

```
[Out] 2*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1
/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+2*A*(cos(1/2*d*x+1/2*c)^
2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c
)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {3317, 3872, 3856, 2719, 2720}

$$\int (A+B\cos(c+dx))\sqrt{\sec(c+dx)}\,dx = \frac{2A\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{2B\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}$$

```
[In] Int[(A + B*Cos[c + d*x])*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (2*B*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/d + (
2*A*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/d
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \frac{B + A\sec(c+dx)}{\sqrt{\sec(c+dx)}}\,dx \\
&= A\int \sqrt{\sec(c+dx)}\,dx + B\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx \\
&= \left(A\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&\quad + \left(B\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= \frac{2B\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} \\
&\quad + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.23 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.69

$$\int (A+B\cos(c+dx))\sqrt{\sec(c+dx)}\,dx = \frac{2\sqrt{\cos(c+dx)}\left(BE\left(\frac{1}{2}(c+dx)\middle|2\right)+A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\right)\sqrt{\sec(c+dx)}}{d}$$

[In] Integrate[(A + B*Cos[c + d*x])*Sqrt[Sec[c + d*x]],x]

[Out] (2*Sqrt[Cos[c + d*x]]*(B*EllipticE[(c + d*x)/2, 2] + A*EllipticF[(c + d*x)/2, 2])*Sqrt[Sec[c + d*x]])/d

Maple [A] (verified)

Time = 4.86 (sec) , antiderivative size = 152, normalized size of antiderivative = 2.03

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\left(AF\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-BE\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\cdots\right.\right.}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}+\frac{2B\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\cdots\right.\right.\right.}}{\sqrt{-\cdots}}$
risch	$-\frac{iB\left(e^{2i(dx+c)}+1\right)\sqrt{2}\sqrt{\frac{e^{i(dx+c)}}{e^{2i(dx+c)}+1}}\,e^{-i(dx+c)}}{d}-\frac{i\left(\frac{iA\sqrt{-i\left(e^{i(dx+c)}+i\right)}\sqrt{2}\sqrt{i\left(e^{i(dx+c)}-i\right)}\sqrt{ie^{i(dx+c)}}\,F\left(\sqrt{-i\left(e^{i(dx+c)}+i\right)},\frac{\sqrt{2}}{2}\right)}{\sqrt{e^{3i(dx+c)}+e^{i(dx+c)}}}+\cdots\right.}{\cdots}$

[In] int((A+B*cos(d*x+c))*sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)

[Out] -2*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*(A*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-B*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.43

$$\int (A+B\cos(c+dx))\sqrt{\sec(c+dx)}\,dx$$
$$= \frac{-i\sqrt{2}A\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\sin{(dx+c)})+i\sqrt{2}A\text{weierstrassPInverse}(-4,0,\cos{(}}{}$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^(1/2),x, algorithm="fricas")
[Out] (-I*sqrt(2)*A*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + I
*sqrt(2)*A*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + I*sq
rt(2)*B*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c))) - I*sqrt(2)*B*weierstrassZeta(-4, 0, weierstrassPInverse(-4,
 0, cos(d*x + c) - I*sin(d*x + c))))/d
```

Sympy [F]

$$\int (A+B\cos(c+dx))\sqrt{\sec(c+dx)}\,dx = \int (A+B\cos{(c+dx)})\sqrt{\sec{(c+dx)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)**(1/2),x)
[Out] Integral((A + B*cos(c + d*x))*sqrt(sec(c + d*x)), x)
```

Maxima [F]

$$\int (A+B\cos(c+dx))\sqrt{\sec(c+dx)}\,dx = \int (B\cos{(dx+c)}+A)\sqrt{\sec{(dx+c)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)*sqrt(sec(d*x + c)), x)
```

Giac [F]

$$\int (A+B\cos(c+dx))\sqrt{\sec(c+dx)}\,dx = \int (B\cos(dx+c)+A)\sqrt{\sec(dx+c)}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)*sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int (A+B\cos(c+dx))\sqrt{\sec(c+dx)}\,dx = \int (A+B\,\cos(c+d\,x))\,\sqrt{\frac{1}{\cos(c+d\,x)}}\,dx$$

```
[In] int((A + B*cos(c + d*x))*(1/cos(c + d*x))^(1/2),x)
[Out] int((A + B*cos(c + d*x))*(1/cos(c + d*x))^(1/2), x)
```

3.694 $\int \frac{A+B\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 101

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx = \frac{2A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2B\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}$$

```
[Out] 2/3*B*sin(d*x+c)/d/sec(d*x+c)^(1/2)+2*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/
2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x
+c)^(1/2)/d+2/3*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF
(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {3317, 3872, 3854, 3856, 2720, 2719}

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx = \frac{2A\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d} + \frac{2B\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}$$

```
[In] Int[(A + B*Cos[c + d*x])/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (2*A*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/d + (
2*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3*d)
+ (2*B*Sin[c + d*x])/(3*d*Sqrt[Sec[c + d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \frac{B+A\sec(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx \\
&= A\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + B\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx
\end{aligned}
$$

$$= \frac{2B\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{1}{3}B\int \sqrt{\sec(c+dx)}\,dx + \left(A\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx$$

$$= \frac{2A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2B\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{1}{3}\left(B\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{2A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2B\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.25 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.75

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx = \frac{\sqrt{\sec(c+dx)}\left(6A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right) + B\left(2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right) + \sin(2(c-\right.\right.}{3d}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/Sqrt[Sec[c + d*x]],x]
[Out] (Sqrt[Sec[c + d*x]]*(6*A*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2] + B*(
2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2] + Sin[2*(c + d*x)])))/(3*d)
```

Maple [A] (verified)

Time = 7.76 (sec) , antiderivative size = 229, normalized size of antiderivative = 2.27

method	result
default	$\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-4B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+3A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E\left(\cos\left(\frac{d}{}\right.\right.\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{}\right.}$
parts	$\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d} - \frac{2B\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\right.\right.\right.}}{}$

```
[In] int((A+B*cos(d*x+c))/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-4*B*cos(1/2*d
*x+1/2*c)*sin(1/2*d*x+1/2*c)^4+3*A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*
d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+2*B*cos(1/2*d*x
+1/2*c)*sin(1/2*d*x+1/2*c)^2-B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+
1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))/(-2*sin(1/2*d*x+1/
2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)
^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.24

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx = \frac{2\,B\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-i\,\sqrt{2}B\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i\,\sin\left(dx+c\right))+i\,\sqrt{2}B\text{we}}{}$$

```
[In] integrate((A+B*cos(d*x+c))/sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/3*(2*B*sqrt(cos(d*x + c))*sin(d*x + c) - I*sqrt(2)*B*weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c)) + I*sqrt(2)*B*weierstrassPInverse(-4,
 0, cos(d*x + c) - I*sin(d*x + c)) + 3*I*sqrt(2)*A*weierstrassZeta(-4, 0, w
eierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*I*sqrt(2)*A*w
eierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x +
 c))))/d
```

Sympy [F]

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{A+B\cos\left(c+dx\right)}{\sqrt{\sec\left(c+dx\right)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/sec(d*x+c)**(1/2),x)
```

```
[Out] Integral((A + B*cos(c + d*x))/sqrt(sec(c + d*x)), x)
```

Maxima [F]

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx=\int \frac{B\cos\left(dx+c\right)+A}{\sqrt{\sec\left(dx+c\right)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)/sqrt(sec(d*x + c)), x)
```

Giac [F]

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx=\int \frac{B\cos\left(dx+c\right)+A}{\sqrt{\sec\left(dx+c\right)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)/sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\sec(c+dx)}}\,dx=\int \frac{A+B\,\cos\left(c+d\,x\right)}{\sqrt{\frac{1}{\cos(c+d\,x)}}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(1/cos(c + d*x))^(1/2),x)
[Out] int((A + B*cos(c + d*x))/(1/cos(c + d*x))^(1/2), x)
```

3.695 $\int \frac{A+B\cos(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 127

$$\int \frac{A+B\cos(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{6B\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2B\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{2A\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}$$

```
[Out] 2/5*B*sin(d*x+c)/d/sec(d*x+c)^(3/2)+2/3*A*sin(d*x+c)/d/sec(d*x+c)^(1/2)+6/5
*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/
2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+2/3*A*(cos(1/2*d*x+1/2*c)
^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+
c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 127, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {3317, 3872, 3854, 3856, 2719, 2720}

$$\int \frac{A+B\cos(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{2A\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{2A\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2B\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{6B\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}$$

```
[In] Int[(A + B*Cos[c + d*x])/Sec[c + d*x]^(3/2),x]
```

```
[Out] (6*B*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(5*d)
 + (2*A*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3
*d) + (2*B*Sin[c + d*x])/(5*d*Sec[c + d*x]^(3/2)) + (2*A*Sin[c + d*x])/(3*d
*Sqrt[Sec[c + d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \frac{B+A\sec(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx\\
&= A\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx+B\int \frac{1}{\sec^{\frac{5}{2}}(c+dx)}\,dx\\
&= \frac{2B\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)}+\frac{2A\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}+\frac{1}{3}A\int \sqrt{\sec(c+dx)}\,dx+\frac{1}{5}(3B)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx\\
&= \frac{2B\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)}+\frac{2A\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}\\
&\quad+\frac{1}{3}\left(A\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\\
&\quad+\frac{1}{5}\left(3B\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx\\
&= \frac{6B\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d}\\
&\quad+\frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d}\\
&\quad+\frac{2B\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)}+\frac{2A\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.39 (sec) , antiderivative size = 88, normalized size of antiderivative = 0.69

$$\int \frac{A+B\cos(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx$$
$$=\frac{\sqrt{\sec(c+dx)}\Big(18B\sqrt{\cos(c+dx)}E\big(\tfrac{1}{2}(c+dx)\big|\,2\big)+10A\sqrt{\cos(c+dx)}\operatorname{EllipticF}\big(\tfrac{1}{2}(c+dx),2\big)+(5A+3\ldots}{15d}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/Sec[c + d*x]^(3/2),x]
```

```
[Out] (Sqrt[Sec[c + d*x]]*(18*B*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2] + 10
*A*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2] + (5*A + 3*B*Cos[c + d*x])*
Sin[2*(c + d*x)]))/(15*d)
```

Maple [A] (verified)

Time = 8.60 (sec) , antiderivative size = 262, normalized size of antiderivative = 2.06

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-24B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(20A+24B)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+(-10\ldots\right.}{15\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\ldots\right.\right.}}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\ldots}\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int((A+B*cos(d*x+c))/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/15*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-24*B*cos(1/
2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+(20*A+24*B)*sin(1/2*d*x+1/2*c)^4*cos(1/2*
d*x+1/2*c)+(-10*A-6*B)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+5*A*(sin(1/2
*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x
+1/2*c),2^(1/2))-9*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1
)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-2*sin(1/2*d*x+1/2*c)^4+sin
(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2
)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.14

$$\int \frac{A+B\cos(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \frac{-5i\sqrt{2}A\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+5i\sqrt{2}A\text{weierstrassPInverse}(-4,0,\cos}{}$$

```
[In] integrate((A+B*cos(d*x+c))/sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/15*(-5*I*sqrt(2)*A*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x +
c)) + 5*I*sqrt(2)*A*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c
)) + 9*I*sqrt(2)*B*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*
x + c) + I*sin(d*x + c))) - 9*I*sqrt(2)*B*weierstrassZeta(-4, 0, weierstras
sPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(3*B*cos(d*x + c)^2 +
5*A*cos(d*x + c))*sin(d*x + c)/sqrt(cos(d*x + c)))/d
```

Sympy [F]

$$\int \frac{A+B\cos(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{A+B\cos(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/sec(d*x+c)**(3/2),x)
```

```
[Out] Integral((A + B*cos(c + d*x))/sec(c + d*x)**(3/2), x)
```

Maxima [F]

$$\int \frac{A+B\cos(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{B\cos(dx+c)+A}{\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/sec(d*x+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)/sec(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \frac{A+B\cos(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{B\cos\left(dx+c\right)+A}{\sec\left(dx+c\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)/sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{A+B\,\cos\left(c+d\,x\right)}{{\left(\frac{1}{\cos\left(c+d\,x\right)}\right)}^{3/2}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(1/cos(c + d*x))^(3/2),x)
[Out] int((A + B*cos(c + d*x))/(1/cos(c + d*x))^(3/2), x)
```

3.696 $\int \frac{A+B\cos(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 151

$$\int \frac{A+B\cos(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{6A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{10B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} + \frac{2B\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{2A\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{10B\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}$$

```
[Out] 2/7*B*sin(d*x+c)/d/sec(d*x+c)^(5/2)+2/5*A*sin(d*x+c)/d/sec(d*x+c)^(3/2)+10/
21*B*sin(d*x+c)/d/sec(d*x+c)^(1/2)+6/5*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1
/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*
x+c)^(1/2)/d+10/21*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {3317, 3872, 3854, 3856, 2720, 2719}

$$\int \frac{A+B\cos(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{2A\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{6A\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{2B\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{10B\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{10B\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d}$$

```
[In] Int[(A + B*Cos[c + d*x])/Sec[c + d*x]^(5/2),x]
```

```
[Out] (6*A*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(5*d)
 + (10*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(
21*d) + (2*B*Sin[c + d*x])/(7*d*Sec[c + d*x]^(5/2)) + (2*A*Sin[c + d*x])/(5
*d*Sec[c + d*x]^(3/2)) + (10*B*Sin[c + d*x])/(21*d*Sqrt[Sec[c + d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \frac{B + A\sec(c+dx)}{\sec^{\frac{7}{2}}(c+dx)}\,dx \\
&= A\int \frac{1}{\sec^{\frac{5}{2}}(c+dx)}\,dx + B\int \frac{1}{\sec^{\frac{7}{2}}(c+dx)}\,dx \\
&= \frac{2B\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{2A\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{1}{5}(3A)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + \frac{1}{7}(5B)\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{2B\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{2A\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{10B\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{1}{21}(5B)\int \sqrt{\sec(c+dx)}\,dx \\
&\quad + \frac{1}{5}\left(3A\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= \frac{6A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{2B\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{2A\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} \\
&\quad + \frac{10B\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{1}{21}\left(5B\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{6A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} \\
&\quad + \frac{10B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} \\
&\quad + \frac{2B\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{2A\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{10B\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.56 (sec) , antiderivative size = 99, normalized size of antiderivative = 0.66

$$\int \frac{A+B\cos(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx$$
$$= \frac{\sqrt{\sec(c+dx)}\Big(252A\sqrt{\cos(c+dx)}E\big(\tfrac{1}{2}(c+dx)\big|2\big)+100B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\tfrac{1}{2}(c+dx),2\right)+(65B}{210d}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/Sec[c + d*x]^(5/2),x]
```

```
[Out] (Sqrt[Sec[c + d*x]]*(252*A*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2] + 1
00*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2] + (65*B + 42*A*Cos[c + d*
x] + 15*B*Cos[2*(c + d*x)])*Sin[2*(c + d*x)]))/(210*d)
```

Maple [A] (verified)

Time = 9.77 (sec) , antiderivative size = 290, normalized size of antiderivative = 1.92

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(240B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(-168A-360B)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+(\right.}{}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right.}{5\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}\right.\right.}}$

```
[In] int((A+B*cos(d*x+c))/sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/105*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(240*B*cos(1
/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8+(-168*A-360*B)*sin(1/2*d*x+1/2*c)^6*cos(
1/2*d*x+1/2*c)+(168*A+280*B)*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+(-42*A
-80*B)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-63*A*(sin(1/2*d*x+1/2*c)^2)^
(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)
)+25*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Ellipt
icF(cos(1/2*d*x+1/2*c),2^(1/2)))/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c
)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.03

$$\int \frac{A+B\cos(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx$$
$$= \frac{-25i\sqrt{2}B\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+25i\sqrt{2}B\text{weierstrassPInverse}(-4,0,c}{}$$

```
[In] integrate((A+B*cos(d*x+c))/sec(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/105*(-25*I*sqrt(2)*B*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x
+ c)) + 25*I*sqrt(2)*B*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x
+ c)) + 63*I*sqrt(2)*A*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, co
s(d*x + c) + I*sin(d*x + c))) - 63*I*sqrt(2)*A*weierstrassZeta(-4, 0, weier
strassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(15*B*cos(d*x + c
)^3 + 21*A*cos(d*x + c)^2 + 25*B*cos(d*x + c))*sin(d*x + c)/sqrt(cos(d*x +
c)))/d
```

Sympy [F]

$$\int \frac{A+B\cos(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{A+B\cos(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/sec(d*x+c)**(5/2),x)
```

```
[Out] Integral((A + B*cos(c + d*x))/sec(c + d*x)**(5/2), x)
```

Maxima [F]

$$\int \frac{A+B\cos(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{B\cos(dx+c)+A}{\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/sec(d*x+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)/sec(d*x + c)^(5/2), x)
```

Giac [F]

$$\int \frac{A+B\cos(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{B\cos\left(dx+c\right)+A}{\sec\left(dx+c\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)/sec(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{A+B\,\cos\left(c+d\,x\right)}{{\left(\frac{1}{\cos\left(c+d\,x\right)}\right)}^{5/2}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(1/cos(c + d*x))^(5/2),x)
[Out] int((A + B*cos(c + d*x))/(1/cos(c + d*x))^(5/2), x)
```

3.697 $\int (a+b\cos(c+dx))^2\sec^{\frac{9}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 200

$$\begin{aligned}
&\int (a+b\cos(c+dx))^2\sec^{\frac{9}{2}}(c+dx)\,dx \\
&= -\frac{12ab\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} \\
&\quad+\frac{2(5a^2+7b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} \\
&\quad+\frac{12ab\sqrt{\sec(c+dx)}\sin(c+dx)}{5d}+\frac{2(5a^2+7b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d} \\
&\quad+\frac{4ab\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{2a^2\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d}
\end{aligned}$$

```
[Out] 2/21*(5*a^2+7*b^2)*sec(d*x+c)^(3/2)*sin(d*x+c)/d+4/5*a*b*sec(d*x+c)^(5/2)*s
in(d*x+c)/d+2/7*a^2*sec(d*x+c)^(7/2)*sin(d*x+c)/d+12/5*a*b*sin(d*x+c)*sec(d
*x+c)^(1/2)/d-12/5*a*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elli
pticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+2/21*
(5*a^2+7*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin
(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 200, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {3317, 3873, 3853, 3856, 2719, 4131, 2720}

$$\int (a+b\cos(c+dx))^2\sec^{\frac{9}{2}}(c+dx)\,dx$$
$$= \frac{2(5a^2+7b^2)\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{21d} + \frac{2(5a^2+7b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{2a^2\sin(c+dx)\sec^{\frac{7}{2}}(c+dx)}{7d} + \frac{4ab\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{5d} + \frac{12ab\sin(c+dx)\sqrt{\sec(c+dx)}}{5d} - \frac{12ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}$$

```
[In] Int[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^(9/2),x]
```

```
[Out] (-12*a*b*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(
5*d) + (2*(5*a^2 + 7*b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt
[Sec[c + d*x]])/(21*d) + (12*a*b*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(5*d) + (
2*(5*a^2 + 7*b^2)*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(21*d) + (4*a*b*Sec[c +
d*x]^(5/2)*Sin[c + d*x])/(5*d) + (2*a^2*Sec[c + d*x]^(7/2)*Sin[c + d*x])/(7
*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
```

```
Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3873

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^2, x_Symbol] :> Dist[2*a*(b/d), Int[(d*Csc[e + f*x])^(n + 1), x], x]
+ Int[(d*Csc[e + f*x])^n*(a^2 + b^2*Csc[e + f*x]^2), x] /; FreeQ[{a, b, d,
e, f, n}, x]
```

Rule 4131

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[(-C)*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*(m + 1)
)), x] + Dist[(C*m + A*(m + 1))/(m + 1), Int[(b*Csc[e + f*x])^m, x], x] /;
FreeQ[{b, e, f, A, C, m}, x] && NeQ[C*m + A*(m + 1), 0] && !LeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \sec^{\frac{5}{2}}(c+dx)(b+a\sec(c+dx))^2\,dx\\
&= (2ab)\int \sec^{\frac{7}{2}}(c+dx)\,dx+\int \sec^{\frac{5}{2}}(c+dx)\left(b^2+a^2\sec^2(c+dx)\right)\,dx\\
&= \frac{4ab\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{2a^2\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d}\\
&\quad+\frac{1}{5}(6ab)\int \sec^{\frac{3}{2}}(c+dx)\,dx+\frac{1}{7}\left(5a^2+7b^2\right)\int \sec^{\frac{5}{2}}(c+dx)\,dx\\
&= \frac{12ab\sqrt{\sec(c+dx)}\sin(c+dx)}{5d}+\frac{2(5a^2+7b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d}\\
&\quad+\frac{4ab\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{2a^2\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d}\\
&\quad-\frac{1}{5}(6ab)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx+\frac{1}{21}\left(5a^2+7b^2\right)\int \sqrt{\sec(c+dx)}\,dx
\end{aligned}
$$

$$= \frac{12ab\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} + \frac{2(5a^2+7b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d} + \frac{4ab\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a^2\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d} - \frac{1}{5}\left(6ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx + \frac{1}{21}\left(\left(5a^2+7b^2\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= -\frac{12ab\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{2(5a^2+7b^2)\sqrt{\cos(c+dx)}\,\mathrm{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} + \frac{12ab\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} + \frac{2(5a^2+7b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d} + \frac{4ab\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a^2\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d}$$

Mathematica [A] (verified)

Time = 0.93 (sec) , antiderivative size = 139, normalized size of antiderivative = 0.70

$$\int (a+b\cos(c+dx))^2\sec^{\frac{9}{2}}(c+dx)\,dx = \frac{\sec^{\frac{7}{2}}(c+dx)\left(-504ab\cos^{\frac{7}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)+20(5a^2+7b^2)\cos^{\frac{7}{2}}(c+dx)\,\mathrm{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\right.}{210}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^(9/2),x]
```

```
[Out] (Sec[c + d*x]^(7/2)*(-504*a*b*Cos[c + d*x]^(7/2)*EllipticE[(c + d*x)/2, 2]
+ 20*(5*a^2 + 7*b^2)*Cos[c + d*x]^(7/2)*EllipticF[(c + d*x)/2, 2] + 2*(55*a
^2 + 35*b^2 + 273*a*b*Cos[c + d*x] + 5*(5*a^2 + 7*b^2)*Cos[2*(c + d*x)] + 6
3*a*b*Cos[3*(c + d*x)])*Sin[c + d*x]))/(210*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 688 vs. 2(224) = 448.

Time = 112.04 (sec) , antiderivative size = 689, normalized size of antiderivative = 3.44

method	result	size
default	Expression too large to display	689
parts	Expression too large to display	821

```
[In] int((a+cos(d*x+c)*b)^2*sec(d*x+c)^(9/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*b^2*(-1/6*cos
(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1
/2*d*x+1/2*c)^2-1/2)^2+1/3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2
*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellipti
cF(cos(1/2*d*x+1/2*c),2^(1/2)))+2*a^2*(-1/56*cos(1/2*d*x+1/2*c)*(-2*sin(1/2
*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^4-5/42
*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(c
os(1/2*d*x+1/2*c)^2-1/2)^2+5/21*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*
x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*El
lipticF(cos(1/2*d*x+1/2*c),2^(1/2)))+4/5*a*b/sin(1/2*d*x+1/2*c)^2/(8*sin(1/
2*d*x+1/2*c)^6-12*sin(1/2*d*x+1/2*c)^4+6*sin(1/2*d*x+1/2*c)^2-1)*(24*cos(1/
2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6-12*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(
1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1
/2*c)^4-24*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+12*(2*sin(1/2*d*x+1/2*c)
^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/
2))*sin(1/2*d*x+1/2*c)^2+8*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-3*(sin(1
/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d
*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2))/s
in(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 235, normalized size of antiderivative = 1.18

$$\int (a+b\cos(c+dx))^2\sec^{\frac{9}{2}}(c+dx)\,dx$$

$$= \frac{-126i\sqrt{2}ab\cos{(dx+c)}^3\,\mathrm{weierstrassZeta}(-4,0,\mathrm{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin{(dx+c)}))}{}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^(9/2),x, algorithm="fricas")
```

```
[Out] 1/105*(-126*I*sqrt(2)*a*b*cos(d*x + c)^3*weierstrassZeta(-4, 0, weierstrass
PInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 126*I*sqrt(2)*a*b*cos(d*x
 + c)^3*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*
sin(d*x + c))) - 5*sqrt(2)*(5*I*a^2 + 7*I*b^2)*cos(d*x + c)^3*weierstrassPI
nverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) - 5*sqrt(2)*(-5*I*a^2 - 7*I*b^
2)*cos(d*x + c)^3*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))
 + 2*(126*a*b*cos(d*x + c)^3 + 42*a*b*cos(d*x + c) + 5*(5*a^2 + 7*b^2)*cos(
d*x + c)^2 + 15*a^2)*sin(d*x + c)/sqrt(cos(d*x + c)))/(d*cos(d*x + c)^3)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^2\sec^{\frac{9}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**2*sec(d*x+c)**(9/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^2\sec^{\frac{9}{2}}(c+dx)\,dx = \int (b\cos(dx+c)+a)^2\sec(dx+c)^{\frac{9}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^(9/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^2*sec(d*x + c)^(9/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^2\sec^{\frac{9}{2}}(c+dx)\,dx = \int (b\cos(dx+c)+a)^2\sec(dx+c)^{\frac{9}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^(9/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^2*sec(d*x + c)^(9/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^2\sec^{\frac{9}{2}}(c+dx)\,dx = \int \left(\frac{1}{\cos(c+d\,x)}\right)^{9/2}(a+b\,\cos(c+d\,x))^2\,dx$$

```
[In] int((1/cos(c + d*x))^(9/2)*(a + b*cos(c + d*x))^2,x)
[Out] int((1/cos(c + d*x))^(9/2)*(a + b*cos(c + d*x))^2, x)
```

3.698 $\int (a+b\cos(c+dx))^2 \sec^{\frac{7}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 175

$$\begin{aligned}\int (a+b\cos(c+dx))^2 \sec^{\frac{7}{2}}(c+dx)\,dx &= -\frac{2(3a^2+5b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} \\ &\quad+\frac{4ab\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\ &\quad+\frac{2(3a^2+5b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} \\ &\quad+\frac{4ab\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}+\frac{2a^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}\end{aligned}$$

```
[Out] 4/3*a*b*sec(d*x+c)^(3/2)*sin(d*x+c)/d+2/5*a^2*sec(d*x+c)^(5/2)*sin(d*x+c)/d
+2/5*(3*a^2+5*b^2)*sin(d*x+c)*sec(d*x+c)^(1/2)/d-2/5*(3*a^2+5*b^2)*(cos(1/2
*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2
))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+4/3*a*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)
/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*
sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 175, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {3317, 3873, 3853, 3856, 2720, 4131, 2719}

$$\int (a+b\cos(c+dx))^2\sec^{\frac{7}{2}}(c+dx)\,dx$$
$$=\frac{2(3a^2+5b^2)\sin(c+dx)\sqrt{\sec(c+dx)}}{5d}-\frac{2(3a^2+5b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}+\frac{2a^2\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{5d}+\frac{4ab\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3d}+\frac{4ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}$$

```
[In] Int[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^(7/2),x]
```

```
[Out] (-2*(3*a^2 + 5*b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c
 + d*x]])/(5*d) + (4*a*b*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[
Sec[c + d*x]])/(3*d) + (2*(3*a^2 + 5*b^2)*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/
(5*d) + (4*a*b*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(3*d) + (2*a^2*Sec[c + d*x]
^(5/2)*Sin[c + d*x])/(5*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
```

```
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3873

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^2, x_Symbol] :> Dist[2*a*(b/d), Int[(d*Csc[e + f*x])^(n + 1), x], x]
+ Int[(d*Csc[e + f*x])^n*(a^2 + b^2*Csc[e + f*x]^2), x] /; FreeQ[{a, b, d,
e, f, n}, x]
```

Rule 4131

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[(-C)*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*(m + 1)
)), x] + Dist[(C*m + A*(m + 1))/(m + 1), Int[(b*Csc[e + f*x])^m, x], x] /;
FreeQ[{b, e, f, A, C, m}, x] && NeQ[C*m + A*(m + 1), 0] && !LeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \sec^{\frac{3}{2}}(c+dx)(b+a\sec(c+dx))^2\,dx\\
&= (2ab)\int \sec^{\frac{5}{2}}(c+dx)\,dx+\int \sec^{\frac{3}{2}}(c+dx)\left(b^2+a^2\sec^2(c+dx)\right)\,dx\\
&= \frac{4ab\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}+\frac{2a^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}\\
&\quad+\frac{1}{3}(2ab)\int \sqrt{\sec(c+dx)}\,dx+\frac{1}{5}\left(3a^2+5b^2\right)\int \sec^{\frac{3}{2}}(c+dx)\,dx\\
&= \frac{2(3a^2+5b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{5d}+\frac{4ab\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}\\
&\quad+\frac{2a^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}+\frac{1}{5}\left(-3a^2-5b^2\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx\\
&\quad+\frac{1}{3}\left(2ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{4ab\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\
&+ \frac{2(3a^2+5b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} \\
&+ \frac{4ab\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{2a^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} \\
&+ \frac{1}{5}\left((-3a^2-5b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx \\
&= -\frac{2(3a^2+5b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} \\
&+ \frac{4ab\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\
&+ \frac{2(3a^2+5b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} \\
&+ \frac{4ab\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{2a^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.19 (sec) , antiderivative size = 126, normalized size of antiderivative = 0.72

$$
\int(a+b\cos(c+dx))^2\sec^{\frac{7}{2}}(c+dx)\,dx = \frac{\sec^{\frac{5}{2}}(c+dx)\left(-12(3a^2+5b^2)\cos^{\frac{5}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)+40ab\cos^{\frac{5}{2}}(c+dx)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\right.}{30d}
$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^(7/2),x]
```

```
[Out] (Sec[c + d*x]^(5/2)*(-12*(3*a^2 + 5*b^2)*Cos[c + d*x]^(5/2)*EllipticE[(c +
d*x)/2, 2] + 40*a*b*Cos[c + d*x]^(5/2)*EllipticF[(c + d*x)/2, 2] + 2*(15*(a
^2 + b^2) + 20*a*b*Cos[c + d*x] + 3*(3*a^2 + 5*b^2)*Cos[2*(c + d*x)])*Sin[c
 + d*x]))/(30*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 632 vs. 2(203) = 406.

Time = 111.08 (sec) , antiderivative size = 633, normalized size of antiderivative = 3.62

method	result
default	$-\frac{\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\frac{2a^2\left(24\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}E\left(\cos\left(\frac{dx}{2}+\right.\right.\right.}{}\right.}{}$
parts	Expression too large to display

[In] int((a+cos(d*x+c)*b)^2*sec(d*x+c)^(7/2),x,method=_RETURNVERBOSE)

[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/5*a^2/(8*sin(1/2*d*x+1/2*c)^6-12*sin(1/2*d*x+1/2*c)^4+6*sin(1/2*d*x+1/2*c)^2-1)/sin(1/2*d*x+1/2*c)^2*(24*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6-12*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^4-24*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+12*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2+8*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)+2*b^2/sin(1/2*d*x+1/2*c)^2/(2*sin(1/2*d*x+1/2*c)^2-1)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))+4*a*b*(-1/6*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^2+1/3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 223, normalized size of antiderivative = 1.27

$$\int (a+b\cos(c+dx))^2\sec^{\frac{7}{2}}(c+dx)\,dx$$

$$=\frac{-10i\sqrt{2}ab\cos(dx+c)^2\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+10i\sqrt{2}ab\cos(dx+c)^2}{}$$

[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^(7/2),x, algorithm="fricas")

[Out] 1/15*(-10*I*sqrt(2)*a*b*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 10*I*sqrt(2)*a*b*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 3*sqrt(2)*(3*I*a^2 + 5*I*b^2)*cos(d*x + c)^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) +

```
I*sin(d*x + c))) - 3*sqrt(2)*(-3*I*a^2 - 5*I*b^2)*cos(d*x + c)^2*weierstra
ssZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) +
2*(10*a*b*cos(d*x + c) + 3*(3*a^2 + 5*b^2)*cos(d*x + c)^2 + 3*a^2)*sin(d*x
+ c)/sqrt(cos(d*x + c)))/(d*cos(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^2\sec^{\frac{7}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**2*sec(d*x+c)**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^2\sec^{\frac{7}{2}}(c+dx)\,dx = \int (b\cos(dx+c)+a)^2\sec(dx+c)^{\frac{7}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^(7/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^2*sec(d*x + c)^(7/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^2\sec^{\frac{7}{2}}(c+dx)\,dx = \int (b\cos(dx+c)+a)^2\sec(dx+c)^{\frac{7}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^(7/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^2*sec(d*x + c)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^2\sec^{\frac{7}{2}}(c+dx)\,dx = \int \left(\frac{1}{\cos(c+d\,x)}\right)^{7/2}(a+b\,\cos(c+d\,x))^2\,dx$$

```
[In] int((1/cos(c + d*x))^(7/2)*(a + b*cos(c + d*x))^2,x)
[Out] int((1/cos(c + d*x))^(7/2)*(a + b*cos(c + d*x))^2, x)
```

3.699 $\int (a+b\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 135

$$\begin{aligned}\int (a+b\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)\,dx &= -\frac{4ab\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} \\ &\quad+\frac{2(a^2+3b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\ &\quad+\frac{4ab\sqrt{\sec(c+dx)}\sin(c+dx)}{d}+\frac{2a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}\end{aligned}$$

```
[Out] 2/3*a^2*sec(d*x+c)^(3/2)*sin(d*x+c)/d+4*a*b*sin(d*x+c)*sec(d*x+c)^(1/2)/d-4
*a*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+
1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+2/3*(a^2+3*b^2)*(cos(1/
2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/
2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used

$= \{3317, 3873, 3853, 3856, 2719, 4131, 2720\}$

$$\int (a+b\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)\,dx$$
$$= \frac{2(a^2+3b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2a^2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3d} + \frac{4ab\sin(c+dx)\sqrt{\sec(c+dx)}}{d} - \frac{4ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}$$

```
[In] Int[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^(5/2),x]
```

```
[Out] (-4*a*b*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/d
+ (2*(a^2 + 3*b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c
+ d*x]])/(3*d) + (4*a*b*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/d + (2*a^2*Sec[c +
 d*x]^(3/2)*Sin[c + d*x])/(3*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

```
EqQ[n^2, 1/4]
```

Rule 3873

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^2, x_Symbol] :> Dist[2*a*(b/d), Int[(d*Csc[e + f*x])^(n + 1), x], x]
+ Int[(d*Csc[e + f*x])^n*(a^2 + b^2*Csc[e + f*x]^2), x] /; FreeQ[{a, b, d,
e, f, n}, x]
```

Rule 4131

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[(-C)*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*(m + 1)
)), x] + Dist[(C*m + A*(m + 1))/(m + 1), Int[(b*Csc[e + f*x])^m, x], x] /;
FreeQ[{b, e, f, A, C, m}, x] && NeQ[C*m + A*(m + 1), 0] &&  !LeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \sqrt{\sec(c+dx)}(b+a\sec(c+dx))^2\,dx\\
&= (2ab)\int \sec^{\frac{3}{2}}(c+dx)\,dx + \int \sqrt{\sec(c+dx)}\left(b^2+a^2\sec^2(c+dx)\right)\,dx\\
&= \frac{4ab\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{2a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}\\
&\quad - (2ab)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + \frac{1}{3}\left(a^2+3b^2\right)\int \sqrt{\sec(c+dx)}\,dx\\
&= \frac{4ab\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{2a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}\\
&\quad - \left(2ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx\\
&\quad + \frac{1}{3}\left(\left(a^2+3b^2\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx\\
&= -\frac{4ab\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d}\\
&\quad + \frac{2(a^2+3b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d}\\
&\quad + \frac{4ab\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{2a^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.49 (sec) , antiderivative size = 93, normalized size of antiderivative = 0.69

$$\int (a+b\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)\,dx$$
$$=\frac{2\sec^{\frac{3}{2}}(c+dx)\left(-6ab\cos^{\frac{3}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)+(a^2+3b^2)\cos^{\frac{3}{2}}(c+dx)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+a\right.}{3d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^(5/2),x]
```

```
[Out] (2*Sec[c + d*x]^(3/2)*(-6*a*b*Cos[c + d*x]^(3/2)*EllipticE[(c + d*x)/2, 2]
+ (a^2 + 3*b^2)*Cos[c + d*x]^(3/2)*EllipticF[(c + d*x)/2, 2] + a*(a + 6*b*C
os[c + d*x])*Sin[c + d*x]))/(3*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 512 vs. 2(171) = 342.

Time = 106.69 (sec) , antiderivative size = 513, normalized size of antiderivative = 3.80

method	result
default	$-\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(24\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)ab-2F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\right.}{}$
parts	$-\frac{2a^2\left(-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx}{2}}\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right.}$

```
[In] int((a+cos(d*x+c)*b)^2*sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)/(4*sin(1/2*d
*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)/sin(1/2*d*x+1/2*c)^3*(24*cos(1/2*d*x+
1/2*c)*sin(1/2*d*x+1/2*c)^4*a*b-2*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*(2*
sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*
c)^2*a^2-6*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*(2*sin(1/2*d*x+1/2*c)^2-1)
^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)^2*b^2-12*EllipticE(c
os(1/2*d*x+1/2*c),2^(1/2))*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/
2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)^2*a*b-2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2
*c)^2*a^2-12*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*a*b+a^2*(sin(1/2*d*x+1
/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c
),2^(1/2))+3*b^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1
/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+6*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2
*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*a*b)*(
```

```
-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*cos(1/2*d*x+1/2*c)^2
-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 190, normalized size of antiderivative = 1.41

$$\int (a+b\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)\,dx$$
$$=\frac{-6i\sqrt{2}ab\cos(dx+c)\,\text{weierstrassZeta}(-4,0,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c)))+6}{}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/3*(-6*I*sqrt(2)*a*b*cos(d*x + c)*weierstrassZeta(-4, 0, weierstrassPInver
se(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 6*I*sqrt(2)*a*b*cos(d*x + c)*we
ierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x +
c))) + sqrt(2)*(-I*a^2 - 3*I*b^2)*cos(d*x + c)*weierstrassPInverse(-4, 0, c
os(d*x + c) + I*sin(d*x + c)) + sqrt(2)*(I*a^2 + 3*I*b^2)*cos(d*x + c)*weie
rstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 2*(6*a*b*cos(d*x +
c) + a^2)*sin(d*x + c)/sqrt(cos(d*x + c)))/(d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)\,dx=\text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**2*sec(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^2\sec(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((b*cos(d*x + c) + a)^2*sec(d*x + c)^(5/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^2\sec(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^2*sec(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)\,dx=\int \left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}(a+b\,\cos(c+d\,x))^2\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^2,x)
[Out] int((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^2, x)
```

3.700 $\int (a+b\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 108

$$\begin{aligned}\int (a+b\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)\,dx &= -\frac{2(a^2-b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} \\ &\quad+\frac{4ab\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} \\ &\quad+\frac{2a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{d}\end{aligned}$$

```
[Out] 2*a^2*sin(d*x+c)*sec(d*x+c)^(1/2)/d-2*(a^2-b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2
)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)
*sec(d*x+c)^(1/2)/d+4*a*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*E
llipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {3317, 3873, 3856, 2720, 4131, 2719}

$$\begin{aligned}\int (a+b\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)\,dx &= -\frac{2(a^2-b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2a^2\sin(c+dx)\sqrt{\sec(c+dx)}}{d} \\ &\quad+\frac{4ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}\end{aligned}$$

```
[In] Int[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^(3/2),x]
```

```
[Out] (-2*(a^2 - b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d
*x]])/d + (4*a*b*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c +
d*x]])/d + (2*a^2*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/d
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3873

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^2, x_Symbol] :> Dist[2*a*(b/d), Int[(d*Csc[e + f*x])^(n + 1), x], x]
+ Int[(d*Csc[e + f*x])^n*(a^2 + b^2*Csc[e + f*x]^2), x] /; FreeQ[{a, b, d,
e, f, n}, x]
```

Rule 4131

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[(-C)*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*(m + 1)
)), x] + Dist[(C*m + A*(m + 1))/(m + 1), Int[(b*Csc[e + f*x])^m, x], x] /;
FreeQ[{b, e, f, A, C, m}, x] && NeQ[C*m + A*(m + 1), 0] &&  !LeQ[m, -1]
```

Rubi steps

$$\text{integral} = \int \frac{(b + a\sec(c+dx))^2}{\sqrt{\sec(c+dx)}}\,dx$$

$$= (2ab)\int \sqrt{\sec(c+dx)}\,dx + \int \frac{b^2 + a^2\sec^2(c+dx)}{\sqrt{\sec(c+dx)}}\,dx$$

$$= \frac{2a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \left(-a^2+b^2\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + \left(2ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{4ab\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \left(\left(-a^2+b^2\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx$$

$$= -\frac{2(a^2-b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{4ab\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{d}$$

Mathematica [A] (verified)

Time = 0.75 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.77

$$\int (a+b\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{2\sqrt{\sec(c+dx)}\left(-\left((a^2-b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\right)+a\left(2b\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\right.\right.}{d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^(3/2),x]
```

```
[Out] (2*Sqrt[Sec[c + d*x]]*(-((a^2 - b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)
/2, 2]) + a*(2*b*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2] + a*Sin[c + d
*x])))/d
```

Maple [A] (verified)

Time = 8.49 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.87

method	result
default	$\frac{4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a^2-4ab\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\right.\right.}}{\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$
parts	$-\frac{2a^2\left(-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{-2\left(\sin^4\left(\frac{dx}{2}\right.\right.}\right.}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int((a+cos(d*x+c)*b)^2*sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2*(2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*a^2-2*a*b*(sin(1/2*d*x+1/2*c)^
2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1
/2))-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Elliptic
E(cos(1/2*d*x+1/2*c),2^(1/2))*a^2+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d
*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*b^2)/sin(1/2*d*x
+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.35

$$\int (a+b\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)\,dx$$
$$=\frac{-2i\sqrt{2}ab\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+2i\sqrt{2}ab\text{weierstrassPInverse}(-4,0,\text{c}}{}$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] (-2*I*sqrt(2)*a*b*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))
 + 2*I*sqrt(2)*a*b*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)
) + 2*a^2*sin(d*x + c)/sqrt(cos(d*x + c)) + sqrt(2)*(-I*a^2 + I*b^2)*weiers
trassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)))
 + sqrt(2)*(I*a^2 - I*b^2)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0
, cos(d*x + c) - I*sin(d*x + c))))/d
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**2*sec(d*x+c)**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)\,dx = \int (b\cos(dx+c)+a)^2\sec(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^2*sec(d*x + c)^(3/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)\,dx = \int (b\cos(dx+c)+a)^2\sec(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^2*sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)\,dx = \int \left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}(a+b\,\cos(c+d\,x))^2\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^2,x)
[Out] int((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^2, x)
```

3.701 $\int (a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 112

$$\begin{aligned}\int (a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}\,dx &= \frac{4ab\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d}\\&\quad+\frac{2(3a^2+b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d}+\frac{2b^2\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}\end{aligned}$$

```
[Out] 2/3*b^2*sin(d*x+c)/d/sec(d*x+c)^(1/2)+4*a*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/co
s(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec
(d*x+c)^(1/2)/d+2/3*(3*a^2+b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/
2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2
)/d
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {3317, 3873, 3856, 2719, 4130, 2720}

$$\begin{aligned}\int (a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}\,dx &= \frac{2(3a^2+b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}\\&\quad+\frac{4ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2b^2\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}\end{aligned}$$

```
[In] Int[(a + b*Cos[c + d*x])^2*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (4*a*b*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/d +
 (2*(3*a^2 + b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c +
 d*x]])/(3*d) + (2*b^2*Sin[c + d*x])/(3*d*Sqrt[Sec[c + d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3873

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^2, x_Symbol] :> Dist[2*a*(b/d), Int[(d*Csc[e + f*x])^(n + 1), x], x]
+ Int[(d*Csc[e + f*x])^n*(a^2 + b^2*Csc[e + f*x]^2), x] /; FreeQ[{a, b, d,
e, f, n}, x]
```

Rule 4130

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[A*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*m)), x] +
Dist[(C*m + A*(m + 1))/(b^2*m), Int[(b*Csc[e + f*x])^(m + 2), x], x] /; Fre
eQ[{b, e, f, A, C}, x] && NeQ[C*m + A*(m + 1), 0] && LeQ[m, -1]
```

Rubi steps

$$\text{integral} = \int \frac{(b + a\sec(c+dx))^2}{\sec^{\frac{3}{2}}(c+dx)}\,dx$$

$$= (2ab)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + \int \frac{b^2 + a^2\sec^2(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \frac{2b^2\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} - \frac{1}{3}(-3a^2-b^2)\int \sqrt{\sec(c+dx)}\,dx + \left(2ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx$$

$$= \frac{4ab\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2b^2\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} - \frac{1}{3}\left((-3a^2-b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{4ab\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2(3a^2+b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2b^2\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.62 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.78

$$\int (a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}\,dx = \frac{\sqrt{\sec(c+dx)}\left(12ab\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right) + 2(3a^2+b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right) + \right.}{3d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2*Sqrt[Sec[c + d*x]],x]
[Out] (Sqrt[Sec[c + d*x]]*(12*a*b*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2] +
2*(3*a^2 + b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2] + b^2*Sin[2*(c
 + d*x)]))/(3*d)
```

Maple [A] (verified)

Time = 8.32 (sec) , antiderivative size = 283, normalized size of antiderivative = 2.53

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^2-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^2+3a^2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}\right.\right.}}$
parts	$-\frac{2a^2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}-\frac{2b^2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}\right.\right.\right.}}{}$

```
[In] int((a+cos(d*x+c)*b)^2*sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(4*cos(1/2*d*x
+1/2*c)*sin(1/2*d*x+1/2*c)^4*b^2-2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*
b^2+3*a^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Ell
ipticF(cos(1/2*d*x+1/2*c),2^(1/2))+b^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(
1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-6*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+
1/2*c),2^(1/2))*a*b)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/s
in(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 147, normalized size of antiderivative = 1.31

$$\int (a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}\,dx$$
$$=\frac{2\,b^2\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)+6i\sqrt{2}ab\text{weierstrassZeta}(-4,0,\text{weierstrassPInverse}(-4,0,\cos\left(dx+c\right)+i$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/3*(2*b^2*sqrt(cos(d*x + c))*sin(d*x + c) + 6*I*sqrt(2)*a*b*weierstrassZet
a(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 6*I*s
qrt(2)*a*b*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) -
 I*sin(d*x + c))) + sqrt(2)*(-3*I*a^2 - I*b^2)*weierstrassPInverse(-4, 0, c
os(d*x + c) + I*sin(d*x + c)) + sqrt(2)*(3*I*a^2 + I*b^2)*weierstrassPInver
se(-4, 0, cos(d*x + c) - I*sin(d*x + c)))/d
```

Sympy [F]

$$\int (a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}\,dx = \int (a+b\cos{(c+dx)})^2\,\sqrt{\sec{(c+dx)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**2*sec(d*x+c)**(1/2),x)
[Out] Integral((a + b*cos(c + d*x))**2*sqrt(sec(c + d*x)), x)
```

Maxima [F]

$$\int (a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}\,dx = \int (b\cos{(dx+c)}+a)^2\sqrt{\sec{(dx+c)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^2*sqrt(sec(d*x + c)), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}\,dx = \int (b\cos{(dx+c)}+a)^2\sqrt{\sec{(dx+c)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^2*sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}\,dx = \int \sqrt{\frac{1}{\cos{(c+d\,x)}}}\,(a+b\,\cos{(c+d\,x)})^2\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^2,x)
[Out] int((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^2, x)
```

3.702 $\int \frac{(a+b\cos(c+dx))^2}{\sqrt{\sec(c+dx)}} dx$

Optimal result

Integrand size = 23, antiderivative size = 141

$$\int \frac{(a+b\cos(c+dx))^2}{\sqrt{\sec(c+dx)}} dx = \frac{2(5a^2+3b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{4ab\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2b^2\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{4ab\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}$$

```
[Out] 2/5*b^2*sin(d*x+c)/d/sec(d*x+c)^(3/2)+4/3*a*b*sin(d*x+c)/d/sec(d*x+c)^(1/2)
+2/5*(5*a^2+3*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elliptic
E(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+4/3*a*b*(
cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c)
,2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {3317, 3873, 3854, 3856, 2720, 4130, 2719}

$$\int \frac{(a+b\cos(c+dx))^2}{\sqrt{\sec(c+dx)}}\,dx = \frac{2(5a^2+3b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{4ab\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{4ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d} + \frac{2b^2\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)}$$

```
[In] Int[(a + b*Cos[c + d*x])^2/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (2*(5*a^2 + 3*b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(5*d) + (4*a*b*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3*d) + (2*b^2*Sin[c + d*x])/(5*d*Sec[c + d*x]^(3/2)) + (4*a*b*Sin[c + d*x])/(3*d*Sqrt[Sec[c + d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] && !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3873

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^2, x_Symbol] :> Dist[2*a*(b/d), Int[(d*Csc[e + f*x])^(n + 1), x], x]
+ Int[(d*Csc[e + f*x])^n*(a^2 + b^2*Csc[e + f*x]^2), x] /; FreeQ[{a, b, d,
e, f, n}, x]
```

Rule 4130

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[A*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*m)), x] +
Dist[(C*m + A*(m + 1))/(b^2*m), Int[(b*Csc[e + f*x])^(m + 2), x], x] /; Fre
eQ[{b, e, f, A, C}, x] && NeQ[C*m + A*(m + 1), 0] && LeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \frac{(b+a\sec(c+dx))^2}{\sec^{\frac{5}{2}}(c+dx)}\,dx \\
&= (2ab)\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx + \int \frac{b^2+a^2\sec^2(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{2b^2\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{4ab\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{1}{3}(2ab)\int \sqrt{\sec(c+dx)}\,dx \\
&\quad - \frac{1}{5}(-5a^2-3b^2)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx \\
&= \frac{2b^2\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{4ab\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} \\
&\quad + \frac{1}{3}\left(2ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&\quad - \frac{1}{5}\left((-5a^2-3b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= \frac{2(5a^2+3b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} \\
&\quad + \frac{4ab\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\
&\quad + \frac{2b^2\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{4ab\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.85 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.71

$$\int \frac{(a+b\cos(c+dx))^2}{\sqrt{\sec(c+dx)}}\,dx = \frac{\sqrt{\sec(c+dx)}\Big(6(5a^2+3b^2)\sqrt{\cos(c+dx)}E\big(\frac{1}{2}(c+dx)\big|2\big)+20ab\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right) -}{15d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (Sqrt[Sec[c + d*x]]*(6*(5*a^2 + 3*b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*
x)/2, 2] + 20*a*b*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2] + b*(10*a +
3*b*Cos[c + d*x])*Sin[2*(c + d*x)]))/(15*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 356 vs. $2(173) = 346$.

Time = 10.21 (sec) , antiderivative size = 357, normalized size of antiderivative = 2.53

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-24\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^2+40\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)ab+24\cos\left(\frac{dx}{2}+\right.\right.}{}$
parts	$\frac{2a^2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d} - \frac{2b^2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\right.\right.\right.}}{}$

```
[In] int((a+cos(d*x+c)*b)^2/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/15*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-24*cos(1/2*
d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6*b^2+40*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c
)^4*a*b+24*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4*b^2-20*cos(1/2*d*x+1/2*c
)*sin(1/2*d*x+1/2*c)^2*a*b-6*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*b^2+10
*a*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Elliptic
F(cos(1/2*d*x+1/2*c),2^(1/2))-15*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*
x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*a^2-9*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/
2*c),2^(1/2))*b^2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin
(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.21

$$\int \frac{(a+b\cos(c+dx))^2}{\sqrt{\sec(c+dx)}}\,dx$$

$$= \frac{-10i\sqrt{2}ab\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+10i\sqrt{2}ab\text{weierstrassPInverse}(-4,0,\cdots}{}$$

```
[In] integrate((a+b*cos(d*x+c))^2/sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/15*(-10*I*sqrt(2)*a*b*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x
 + c)) + 10*I*sqrt(2)*a*b*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d
*x + c)) - 3*sqrt(2)*(-5*I*a^2 - 3*I*b^2)*weierstrassZeta(-4, 0, weierstras
sPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*sqrt(2)*(5*I*a^2 + 3*I
*b^2)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*si
n(d*x + c))) + 2*(3*b^2*cos(d*x + c)^2 + 10*a*b*cos(d*x + c))*sin(d*x + c)/
sqrt(cos(d*x + c)))/d
```

Sympy [F]

$$\int \frac{(a+b\cos(c+dx))^2}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(a+b\cos(c+dx))^2}{\sqrt{\sec(c+dx)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**2/sec(d*x+c)**(1/2),x)
```

```
[Out] Integral((a + b*cos(c + d*x))**2/sqrt(sec(c + d*x)), x)
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^2}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(b\cos(dx+c)+a)^2}{\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2/sec(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((b*cos(d*x + c) + a)^2/sqrt(sec(d*x + c)), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^2}{\sqrt{\sec(c+dx)}}\,dx=\int \frac{(b\cos(dx+c)+a)^2}{\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^2/sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^2}{\sqrt{\sec(c+dx)}}\,dx=\int \frac{(a+b\cos(c+d\,x))^2}{\sqrt{\frac{1}{\cos(c+d\,x)}}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^2/(1/cos(c + d*x))^(1/2),x)
[Out] int((a + b*cos(c + d*x))^2/(1/cos(c + d*x))^(1/2), x)
```

3.703 $\int \frac{(a+b\cos(c+dx))^2}{\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 175

$$\int \frac{(a+b\cos(c+dx))^2}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{12ab\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{2(7a^2+5b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} + \frac{2b^2\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{4ab\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{2(7a^2+5b^2)\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}$$

```
[Out] 2/7*b^2*sin(d*x+c)/d/sec(d*x+c)^(5/2)+4/5*a*b*sin(d*x+c)/d/sec(d*x+c)^(3/2)
+2/21*(7*a^2+5*b^2)*sin(d*x+c)/d/sec(d*x+c)^(1/2)+12/5*a*b*(cos(1/2*d*x+1/2
*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d
*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+2/21*(7*a^2+5*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1
/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/
2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 175, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used

= {3317, 3873, 3854, 3856, 2719, 4130, 2720}

$$\int \frac{(a+b\cos(c+dx))^2}{\sec^{\frac{3}{2}}(c+dx)}\,dx$$
$$= \frac{2(7a^2+5b^2)\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{2(7a^2+5b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{4ab\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{12ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{2b^2\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)}$$

```
[In] Int[(a + b*Cos[c + d*x])^2/Sec[c + d*x]^(3/2),x]
```

```
[Out] (12*a*b*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(5
*d) + (2*(7*a^2 + 5*b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[
Sec[c + d*x]])/(21*d) + (2*b^2*Sin[c + d*x])/(7*d*Sec[c + d*x]^(5/2)) + (4*
a*b*Sin[c + d*x])/(5*d*Sec[c + d*x]^(3/2)) + (2*(7*a^2 + 5*b^2)*Sin[c + d*x
])/(21*d*Sqrt[Sec[c + d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3873

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^2, x_Symbol] :> Dist[2*a*(b/d), Int[(d*Csc[e + f*x])^(n + 1), x], x]
+ Int[(d*Csc[e + f*x])^n*(a^2 + b^2*Csc[e + f*x]^2), x] /; FreeQ[{a, b, d,
e, f, n}, x]
```

Rule 4130

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[A*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*m)), x] +
Dist[(C*m + A*(m + 1))/(b^2*m), Int[(b*Csc[e + f*x])^(m + 2), x], x] /; Fre
eQ[{b, e, f, A, C}, x] && NeQ[C*m + A*(m + 1), 0] && LeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \frac{(b+a\sec(c+dx))^2}{\sec^{\frac{7}{2}}(c+dx)}\,dx\\
&= (2ab)\int \frac{1}{\sec^{\frac{5}{2}}(c+dx)}\,dx+\int \frac{b^2+a^2\sec^2(c+dx)}{\sec^{\frac{7}{2}}(c+dx)}\,dx\\
&= \frac{2b^2\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)}+\frac{4ab\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)}+\frac{1}{5}(6ab)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx\\
&\quad -\frac{1}{7}\left(-7a^2-5b^2\right)\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx\\
&= \frac{2b^2\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)}+\frac{4ab\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)}+\frac{2(7a^2+5b^2)\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}\\
&\quad -\frac{1}{21}\left(-7a^2-5b^2\right)\int \sqrt{\sec(c+dx)}\,dx\\
&\quad +\frac{1}{5}\left(6ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx\\
&= \frac{12ab\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d}\\
&\quad +\frac{2b^2\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)}+\frac{4ab\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)}+\frac{2(7a^2+5b^2)\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}\\
&\quad -\frac{1}{21}\left(\left(-7a^2-5b^2\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx
\end{aligned}
$$

$$= \frac{12ab\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{2(7a^2+5b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} + \frac{2b^2\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{4ab\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{2(7a^2+5b^2)\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 1.08 (sec) , antiderivative size = 120, normalized size of antiderivative = 0.69

$$\int \frac{(a+b\cos(c+dx))^2}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{\sqrt{\sec(c+dx)}\left(504ab\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)+20(7a^2+5b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right.\right.}{210d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2/Sec[c + d*x]^(3/2),x]
```

```
[Out] (Sqrt[Sec[c + d*x]]*(504*a*b*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2] +
 20*(7*a^2 + 5*b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2] + (70*a^2
+ 65*b^2 + 84*a*b*Cos[c + d*x] + 15*b^2*Cos[2*(c + d*x)])*Sin[2*(c + d*x)])
)/(210*d)
```

Maple [A] (verified)

Time = 12.08 (sec) , antiderivative size = 362, normalized size of antiderivative = 2.07

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(240\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^2+(-336ab-360b^2)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\right.}{}$
parts	$-\frac{2a^2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{\right.}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int((a+cos(d*x+c)*b)^2/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/105*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(240*cos(1/2
*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8*b^2+(-336*a*b-360*b^2)*sin(1/2*d*x+1/2*c)^
6*cos(1/2*d*x+1/2*c)+(140*a^2+336*a*b+280*b^2)*sin(1/2*d*x+1/2*c)^4*cos(1/2
*d*x+1/2*c)+(-70*a^2-84*a*b-80*b^2)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)
+35*a^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Ellip
ticF(cos(1/2*d*x+1/2*c),2^(1/2))+25*b^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin
```

```
(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-126*(sin(1
/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d
*x+1/2*c),2^(1/2))*a*b)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2
)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 191, normalized size of antiderivative = 1.09

$$\int \frac{(a+b\cos(c+dx))^2}{\sec^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \frac{126i\sqrt{2}ab\text{weierstrassZeta}(-4,0,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c)))-126i\sqrt{2}ab\text{wei}}{}$$

```
[In] integrate((a+b*cos(d*x+c))^2/sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/105*(126*I*sqrt(2)*a*b*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0,
cos(d*x + c) + I*sin(d*x + c))) - 126*I*sqrt(2)*a*b*weierstrassZeta(-4, 0,
weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - 5*sqrt(2)*(7*I
*a^2 + 5*I*b^2)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)) -
 5*sqrt(2)*(-7*I*a^2 - 5*I*b^2)*weierstrassPInverse(-4, 0, cos(d*x + c) - I
*sin(d*x + c)) + 2*(15*b^2*cos(d*x + c)^3 + 42*a*b*cos(d*x + c)^2 + 5*(7*a^
2 + 5*b^2)*cos(d*x + c))*sin(d*x + c)/sqrt(cos(d*x + c)))/d
```

Sympy [F]

$$\int \frac{(a+b\cos(c+dx))^2}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(a+b\cos(c+dx))^2}{\sec^{\frac{3}{2}}(c+dx)}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**2/sec(d*x+c)**(3/2),x)
```

```
[Out] Integral((a + b*cos(c + d*x))**2/sec(c + d*x)**(3/2), x)
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^2}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^2}{\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2/sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^2/sec(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^2}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^2}{\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^2/sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^2}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(a+b\,\cos(c+d\,x))^2}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^2/(1/cos(c + d*x))^(3/2),x)
[Out] int((a + b*cos(c + d*x))^2/(1/cos(c + d*x))^(3/2), x)
```

3.704 $\int \frac{(a+b\cos(c+dx))^2}{\sec^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 200

$$\int \frac{(a+b\cos(c+dx))^2}{\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{2(9a^2+7b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{15d} + \frac{20ab\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} + \frac{2b^2\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)} + \frac{4ab\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{2(9a^2+7b^2)\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)} + \frac{20ab\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}$$

```
[Out] 2/9*b^2*sin(d*x+c)/d/sec(d*x+c)^(7/2)+4/7*a*b*sin(d*x+c)/d/sec(d*x+c)^(5/2)
+2/45*(9*a^2+7*b^2)*sin(d*x+c)/d/sec(d*x+c)^(3/2)+20/21*a*b*sin(d*x+c)/d/se
c(d*x+c)^(1/2)+2/15*(9*a^2+7*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+
1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1
/2)/d+20/21*a*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(s
in(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 200, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {3317, 3873, 3854, 3856, 2720, 4130, 2719}

$$\int \frac{(a+b\cos(c+dx))^2}{\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{2(9a^2+7b^2)\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)} + \frac{2(9a^2+7b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15d} + \frac{4ab\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{20ab\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{20ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{2b^2\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)}$$

```
[In] Int[(a + b*Cos[c + d*x])^2/Sec[c + d*x]^(5/2),x]
```

```
[Out] (2*(9*a^2 + 7*b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c
+ d*x]])/(15*d) + (20*a*b*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt
[Sec[c + d*x]])/(21*d) + (2*b^2*Sin[c + d*x])/(9*d*Sec[c + d*x]^(7/2)) + (4
*a*b*Sin[c + d*x])/(7*d*Sec[c + d*x]^(5/2)) + (2*(9*a^2 + 7*b^2)*Sin[c + d*
x])/(45*d*Sec[c + d*x]^(3/2)) + (20*a*b*Sin[c + d*x])/(21*d*Sqrt[Sec[c + d*
x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
```

```
d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3873

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^2, x_Symbol] :> Dist[2*a*(b/d), Int[(d*Csc[e + f*x])^(n + 1), x], x]
+ Int[(d*Csc[e + f*x])^n*(a^2 + b^2*Csc[e + f*x]^2), x] /; FreeQ[{a, b, d,
e, f, n}, x]
```

Rule 4130

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[A*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*m)), x] +
Dist[(C*m + A*(m + 1))/(b^2*m), Int[(b*Csc[e + f*x])^(m + 2), x], x] /; Fre
eQ[{b, e, f, A, C}, x] && NeQ[C*m + A*(m + 1), 0] && LeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \frac{(b+a\sec(c+dx))^2}{\sec^{\frac{9}{2}}(c+dx)}\,dx \\
&= (2ab)\int \frac{1}{\sec^{\frac{7}{2}}(c+dx)}\,dx+\int \frac{b^2+a^2\sec^2(c+dx)}{\sec^{\frac{9}{2}}(c+dx)}\,dx \\
&= \frac{2b^2\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)}+\frac{4ab\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)}+\frac{1}{7}(10ab)\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx \\
&\quad -\frac{1}{9}\left(-9a^2-7b^2\right)\int \frac{1}{\sec^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{2b^2\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)}+\frac{4ab\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)}+\frac{2(9a^2+7b^2)\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)}+\frac{20ab\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} \\
&\quad +\frac{1}{21}(10ab)\int \sqrt{\sec(c+dx)}\,dx-\frac{1}{15}\left(-9a^2-7b^2\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx \\
&= \frac{2b^2\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)}+\frac{4ab\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)}+\frac{2(9a^2+7b^2)\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)} \\
&\quad +\frac{20ab\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}+\frac{1}{21}\left(10ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&\quad -\frac{1}{15}\left(\left(-9a^2-7b^2\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx
\end{aligned}
$$

$$= \frac{2(9a^2+7b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{15d} + \frac{20ab\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} + \frac{2b^2\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)} + \frac{4ab\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{2(9a^2+7b^2)\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)} + \frac{20ab\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 1.44 (sec) , antiderivative size = 135, normalized size of antiderivative = 0.68

$$\int \frac{(a+b\cos(c+dx))^2}{\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{\sqrt{\sec(c+dx)}\left(168(9a^2+7b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)+1200ab\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx)\right.\right.}{126}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2/Sec[c + d*x]^(5/2),x]
```

```
[Out] (Sqrt[Sec[c + d*x]]*(168*(9*a^2 + 7*b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c +
d*x)/2, 2] + 1200*a*b*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2] + (7*(36
*a^2 + 43*b^2)*Cos[c + d*x] + 5*b*(156*a + 36*a*Cos[2*(c + d*x)] + 7*b*Cos[
3*(c + d*x)]))*Sin[2*(c + d*x)]))/(1260*d)
```

Maple [A] (verified)

Time = 13.89 (sec) , antiderivative size = 398, normalized size of antiderivative = 1.99

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-1120\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^2+(1440ab+2240b^2)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\right.\right.}{}$
parts	$-\frac{2a^2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right.\right.}{5\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{d}{}\right.\right.}}$

```
[In] int((a+cos(d*x+c)*b)^2/sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/315*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-1120*cos(1
/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^10*b^2+(1440*a*b+2240*b^2)*sin(1/2*d*x+1/2
*c)^8*cos(1/2*d*x+1/2*c)+(-504*a^2-2160*a*b-2072*b^2)*sin(1/2*d*x+1/2*c)^6*
cos(1/2*d*x+1/2*c)+(504*a^2+1680*a*b+952*b^2)*sin(1/2*d*x+1/2*c)^4*cos(1/2*
d*x+1/2*c)+(-126*a^2-480*a*b-168*b^2)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*
c)+150*a*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*El
```

```
lipticF(cos(1/2*d*x+1/2*c),2^(1/2))-189*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin
(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*a^2-147*(s
in(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1
/2*d*x+1/2*c),2^(1/2))*b^2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^
(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.02

$$\int \frac{(a+b\cos(c+dx))^2}{\sec^{\frac{5}{2}}(c+dx)}\,dx$$

$$= \frac{-150i\sqrt{2}ab\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+150i\sqrt{2}ab\text{weierstrassPInverse}(-4,0}{}$$

```
[In] integrate((a+b*cos(d*x+c))^2/sec(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/315*(-150*I*sqrt(2)*a*b*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d
*x + c)) + 150*I*sqrt(2)*a*b*weierstrassPInverse(-4, 0, cos(d*x + c) - I*si
n(d*x + c)) - 21*sqrt(2)*(-9*I*a^2 - 7*I*b^2)*weierstrassZeta(-4, 0, weiers
trassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 21*sqrt(2)*(9*I*a^2
+ 7*I*b^2)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) -
 I*sin(d*x + c))) + 2*(35*b^2*cos(d*x + c)^4 + 90*a*b*cos(d*x + c)^3 + 150*
a*b*cos(d*x + c) + 7*(9*a^2 + 7*b^2)*cos(d*x + c)^2)*sin(d*x + c)/sqrt(cos(
d*x + c)))/d
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^2}{\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**2/sec(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^2}{\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^2}{\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2/sec(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^2/sec(d*x + c)^(5/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^2}{\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^2}{\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2/sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^2/sec(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^2}{\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(a+b\cos(c+d\,x))^2}{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^2/(1/cos(c + d*x))^(5/2),x)
[Out] int((a + b*cos(c + d*x))^2/(1/cos(c + d*x))^(5/2), x)
```

3.705 $\int (a+b\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 234

$$\begin{aligned}\int (a+b\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)\,dx&=-\frac{2b(9a^2+5b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d}\\&\quad+\frac{2a(5a^2+21b^2)\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d}\\&\quad+\frac{2b(9a^2+5b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{5d}+\frac{2a(5a^2+21b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d}\\&\quad+\frac{32a^2b\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{35d}+\frac{2a^2\sec^{\frac{5}{2}}(c+dx)(b+a\sec(c+dx))\sin(c+dx)}{7d}\end{aligned}$$

```
[Out] 2/21*a*(5*a^2+21*b^2)*sec(d*x+c)^(3/2)*sin(d*x+c)/d+32/35*a^2*b*sec(d*x+c)^
(5/2)*sin(d*x+c)/d+2/7*a^2*sec(d*x+c)^(5/2)*(b+a*sec(d*x+c))*sin(d*x+c)/d+2
/5*b*(9*a^2+5*b^2)*sin(d*x+c)*sec(d*x+c)^(1/2)/d-2/5*b*(9*a^2+5*b^2)*(cos(1
/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1
/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+2/21*a*(5*a^2+21*b^2)*(cos(1/2*d*x
+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*c
os(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 234, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {3317, 3927, 4132, 3853, 3856, 2720, 4131, 2719}

$$\int (a+b\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)\,dx$$
$$=\frac{2a(5a^2+21b^2)\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{21d}+\frac{2b(9a^2+5b^2)\sin(c+dx)\sqrt{\sec(c+dx)}}{5d}$$
$$+\frac{2a(5a^2+21b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d}$$
$$-\frac{2b(9a^2+5b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}$$
$$+\frac{2a^2\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)(a\sec(c+dx)+b)}{7d}+\frac{32a^2b\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{35d}$$

```
[In] Int[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^(9/2),x]
```

```
[Out] (-2*b*(9*a^2 + 5*b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec
[c + d*x]])/(5*d) + (2*a*(5*a^2 + 21*b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c +
 d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(21*d) + (2*b*(9*a^2 + 5*b^2)*Sqrt[Sec[c +
d*x]]*Sin[c + d*x])/(5*d) + (2*a*(5*a^2 + 21*b^2)*Sec[c + d*x]^(3/2)*Sin[c
+ d*x])/(21*d) + (32*a^2*b*Sec[c + d*x]^(5/2)*Sin[c + d*x])/(35*d) + (2*a^2
*Sec[c + d*x]^(5/2)*(b + a*Sec[c + d*x])*Sin[c + d*x])/(7*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
```

```
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3927

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-b^2)*Cot[e + f*x]*(a + b*Csc[e + f*x])^(m -
2)*((d*Csc[e + f*x])^n/(f*(m + n - 1))), x] + Dist[1/(d*(m + n - 1)), Int[(
a + b*Csc[e + f*x])^(m - 3)*(d*Csc[e + f*x])^n*Simp[a^3*d*(m + n - 1) + a*b
^2*d*n + b*(b^2*d*(m + n - 2) + 3*a^2*d*(m + n - 1))*Csc[e + f*x] + a*b^2*d
*(3*m + 2*n - 4)*Csc[e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f, n}, x]
 && NeQ[a^2 - b^2, 0] && GtQ[m, 2] && (IntegerQ[m] || IntegersQ[2*m, 2*n])
&&  !(IGtQ[n, 2] &&  !IntegerQ[m])
```

Rule 4131

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[(-C)*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*(m + 1)
)), x] + Dist[(C*m + A*(m + 1))/(m + 1), Int[(b*Csc[e + f*x])^m, x], x] /;
FreeQ[{b, e, f, A, C, m}, x] && NeQ[C*m + A*(m + 1), 0] &&  !LeQ[m, -1]
```

Rule 4132

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*((A_.) + csc[(e_.) + (f_.)*(x_)]*
(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.)), x_Symbol] :> Dist[B/b, Int[(b*Csc
[e + f*x])^(m + 1), x], x] + Int[(b*Csc[e + f*x])^m*(A + C*Csc[e + f*x]^2),
 x] /; FreeQ[{b, e, f, A, B, C, m}, x]
```

Rubi steps

$$\begin{aligned} \text{integral} &= \int \sec^{\frac{3}{2}}(c+dx)(b+a\sec(c+dx))^3\,dx \\ &= \frac{2a^2\sec^{\frac{5}{2}}(c+dx)(b+a\sec(c+dx))\sin(c+dx)}{7d} + \frac{2}{7}\int \sec^{\frac{3}{2}}(c+dx)\left(\frac{1}{2}b(3a^2+7b^2)\right. \\ &\quad \left. + \frac{1}{2}a(5a^2+21b^2)\sec(c+dx) + 8a^2b\sec^2(c+dx)\right)\,dx \end{aligned}$$

$$
\begin{aligned}
&= \frac{2a^2\sec^{\frac{5}{2}}(c+dx)(b+a\sec(c+dx))\sin(c+dx)}{7d} \\
&\quad + \frac{2}{7}\int \sec^{\frac{3}{2}}(c+dx)\left(\frac{1}{2}b\left(3a^2+7b^2\right)+8a^2b\sec^2(c+dx)\right)dx \\
&\quad + \frac{1}{7}\left(a\left(5a^2+21b^2\right)\right)\int \sec^{\frac{5}{2}}(c+dx)\,dx \\
&= \frac{2a(5a^2+21b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d} + \frac{32a^2b\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{35d} \\
&\quad + \frac{2a^2\sec^{\frac{5}{2}}(c+dx)(b+a\sec(c+dx))\sin(c+dx)}{7d} \\
&\quad + \frac{1}{5}\left(b\left(9a^2+5b^2\right)\right)\int \sec^{\frac{3}{2}}(c+dx)\,dx + \frac{1}{21}\left(a\left(5a^2+21b^2\right)\right)\int \sqrt{\sec(c+dx)}\,dx \\
&= \frac{2b(9a^2+5b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} + \frac{2a(5a^2+21b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d} \\
&\quad + \frac{32a^2b\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{35d} + \frac{2a^2\sec^{\frac{5}{2}}(c+dx)(b+a\sec(c+dx))\sin(c+dx)}{7d} \\
&\quad - \frac{1}{5}\left(b\left(9a^2+5b^2\right)\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx \\
&\quad + \frac{1}{21}\left(a\left(5a^2+21b^2\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{2a(5a^2+21b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} \\
&\quad + \frac{2b(9a^2+5b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} \\
&\quad + \frac{2a(5a^2+21b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d} + \frac{32a^2b\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{35d} \\
&\quad + \frac{2a^2\sec^{\frac{5}{2}}(c+dx)(b+a\sec(c+dx))\sin(c+dx)}{7d} \\
&\quad - \frac{1}{5}\left(b\left(9a^2+5b^2\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= -\frac{2b(9a^2+5b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} \\
&\quad + \frac{2a(5a^2+21b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} \\
&\quad + \frac{2b(9a^2+5b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} \\
&\quad + \frac{2a(5a^2+21b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d} + \frac{32a^2b\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{35d} \\
&\quad + \frac{2a^2\sec^{\frac{5}{2}}(c+dx)(b+a\sec(c+dx))\sin(c+dx)}{7d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.25 (sec) , antiderivative size = 191, normalized size of antiderivative = 0.82

$$\int (a+b\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)\,dx$$
$$=\frac{\sec^{\frac{7}{2}}(c+dx)\left(-42b(9a^2+5b^2)\cos^{\frac{7}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)+10a(5a^2+21b^2)\cos^{\frac{7}{2}}(c+dx)\,\text{EllipticF}\left(\frac{1}{2}(c\right.\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^(9/2),x]
```

```
[Out] (Sec[c + d*x]^(7/2)*(-42*b*(9*a^2 + 5*b^2)*Cos[c + d*x]^(7/2)*EllipticE[(c
+ d*x)/2, 2] + 10*a*(5*a^2 + 21*b^2)*Cos[c + d*x]^(7/2)*EllipticF[(c + d*x)
/2, 2] + 30*a^3*Sin[c + d*x] + 50*a^3*Cos[c + d*x]^2*Sin[c + d*x] + 210*a*b
^2*Cos[c + d*x]^2*Sin[c + d*x] + 378*a^2*b*Cos[c + d*x]^3*Sin[c + d*x] + 21
0*b^3*Cos[c + d*x]^3*Sin[c + d*x] + 63*a^2*b*Sin[2*(c + d*x)]))/(105*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 819 vs. 2(258) = 516.

Time = 506.96 (sec) , antiderivative size = 820, normalized size of antiderivative = 3.50

method	result	size
default	Expression too large to display	820
parts	Expression too large to display	1008

```
[In] int((a+cos(d*x+c)*b)^3*sec(d*x+c)^(9/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*a^3*(-1/56*co
s(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(
1/2*d*x+1/2*c)^2-1/2)^4-5/42*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+si
n(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^2+5/21*(sin(1/2*d*x+1/
2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+si
n(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))+2*b^3/sin(
1/2*d*x+1/2*c)^2/(2*sin(1/2*d*x+1/2*c)^2-1)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/
2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-(sin(1/2*d
*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1
/2*c),2^(1/2)))+6/5*a^2*b/sin(1/2*d*x+1/2*c)^2/(8*sin(1/2*d*x+1/2*c)^6-12*s
in(1/2*d*x+1/2*c)^4+6*sin(1/2*d*x+1/2*c)^2-1)*(24*cos(1/2*d*x+1/2*c)*sin(1/
2*d*x+1/2*c)^6-12*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(
1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^4-24*sin(1/2*
d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+12*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/
2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2
*c)^2+8*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-3*(sin(1/2*d*x+1/2*c)^2)^(1
```

```
/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))
*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)+6*a*b^2*(-1/6*cos(1/2
*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d
*x+1/2*c)^2-1/2)^2+1/3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^
2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(c
os(1/2*d*x+1/2*c),2^(1/2))))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^
(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.15

$$\int (a+b\cos(c+dx))^3 \sec^{\frac{9}{2}}(c+dx)\,dx =$$

$$-\frac{5\sqrt{2}(5i\,a^3+21i\,ab^2)\cos{(dx+c)}^3\,\mathrm{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin{(dx+c)})+5\sqrt{2}(-5\cdots}{\cdots}$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^(9/2),x, algorithm="fricas")
```

```
[Out] -1/105*(5*sqrt(2)*(5*I*a^3 + 21*I*a*b^2)*cos(d*x + c)^3*weierstrassPInverse
(-4, 0, cos(d*x + c) + I*sin(d*x + c)) + 5*sqrt(2)*(-5*I*a^3 - 21*I*a*b^2)*
cos(d*x + c)^3*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) +
21*sqrt(2)*(9*I*a^2*b + 5*I*b^3)*cos(d*x + c)^3*weierstrassZeta(-4, 0, weie
rstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 21*sqrt(2)*(-9*I*a
^2*b - 5*I*b^3)*cos(d*x + c)^3*weierstrassZeta(-4, 0, weierstrassPInverse(-
4, 0, cos(d*x + c) - I*sin(d*x + c))) - 2*(63*a^2*b*cos(d*x + c) + 21*(9*a^
2*b + 5*b^3)*cos(d*x + c)^3 + 15*a^3 + 5*(5*a^3 + 21*a*b^2)*cos(d*x + c)^2)
*sin(d*x + c)/sqrt(cos(d*x + c)))/(d*cos(d*x + c)^3)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^3 \sec^{\frac{9}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**3*sec(d*x+c)**(9/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^3\sec(dx+c)^{\frac{9}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^(9/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^3*sec(d*x + c)^(9/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^3\sec(dx+c)^{\frac{9}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^(9/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^3*sec(d*x + c)^(9/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^3\sec^{\frac{9}{2}}(c+dx)\,dx=\int \left(\frac{1}{\cos(c+d\,x)}\right)^{9/2}(a+b\,\cos(c+d\,x))^3\,dx$$

```
[In] int((1/cos(c + d*x))^(9/2)*(a + b*cos(c + d*x))^3,x)
[Out] int((1/cos(c + d*x))^(9/2)*(a + b*cos(c + d*x))^3, x)
```

3.706 $\int (a+b\cos(c+dx))^3\sec^{\frac{7}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 189

$$\begin{aligned}\int (a+b\cos(c+dx))^3\sec^{\frac{7}{2}}(c+dx)\,dx &= -\frac{6a(a^2+5b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} \\ &\quad+\frac{2b(a^2+b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} \\ &\quad+\frac{6a(a^2+5b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{5d}+\frac{8a^2b\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} \\ &\quad+\frac{2a^2\sec^{\frac{3}{2}}(c+dx)(b+a\sec(c+dx))\sin(c+dx)}{5d}\end{aligned}$$

```
[Out] 8/5*a^2*b*sec(d*x+c)^(3/2)*sin(d*x+c)/d+2/5*a^2*sec(d*x+c)^(3/2)*(b+a*sec(d
*x+c))*sin(d*x+c)/d+6/5*a*(a^2+5*b^2)*sin(d*x+c)*sec(d*x+c)^(1/2)/d-6/5*a*(
a^2+5*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/
2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+2*b*(a^2+b^2)*(co
s(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2
^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 189, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {3317, 3927, 4132, 3853, 3856, 2719, 4131, 2720}

$$\int (a+b\cos(c+dx))^3\sec^{\frac{7}{2}}(c+dx)\,dx$$
$$=\frac{6a(a^2+5b^2)\sin(c+dx)\sqrt{\sec(c+dx)}}{5d}$$
$$+\frac{2b(a^2+b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d}$$
$$-\frac{6a(a^2+5b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d}$$
$$+\frac{8a^2b\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{5d}+\frac{2a^2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)(a\sec(c+dx)+b)}{5d}$$

```
[In] Int[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^(7/2),x]
```

```
[Out] (-6*a*(a^2 + 5*b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c
 + d*x]])/(5*d) + (2*b*(a^2 + b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2
, 2]*Sqrt[Sec[c + d*x]])/d + (6*a*(a^2 + 5*b^2)*Sqrt[Sec[c + d*x]]*Sin[c +
d*x])/(5*d) + (8*a^2*b*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(5*d) + (2*a^2*Sec[
c + d*x]^(3/2)*(b + a*Sec[c + d*x])*Sin[c + d*x])/(5*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
```

```
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3927

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-b^2)*Cot[e + f*x]*(a + b*Csc[e + f*x])^(m -
2)*((d*Csc[e + f*x])^n/(f*(m + n - 1))), x] + Dist[1/(d*(m + n - 1)), Int[(
a + b*Csc[e + f*x])^(m - 3)*(d*Csc[e + f*x])^n*Simp[a^3*d*(m + n - 1) + a*b
^2*d*n + b*(b^2*d*(m + n - 2) + 3*a^2*d*(m + n - 1))*Csc[e + f*x] + a*b^2*d
*(3*m + 2*n - 4)*Csc[e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f, n}, x]
 && NeQ[a^2 - b^2, 0] && GtQ[m, 2] && (IntegerQ[m] || IntegersQ[2*m, 2*n])
&&  !(IGtQ[n, 2] &&  !IntegerQ[m])
```

Rule 4131

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[(-C)*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*(m + 1)
)), x] + Dist[(C*m + A*(m + 1))/(m + 1), Int[(b*Csc[e + f*x])^m, x], x] /;
FreeQ[{b, e, f, A, C, m}, x] && NeQ[C*m + A*(m + 1), 0] &&  !LeQ[m, -1]
```

Rule 4132

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*((A_.) + csc[(e_.) + (f_.)*(x_)]*
(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.)), x_Symbol] :> Dist[B/b, Int[(b*Csc
[e + f*x])^(m + 1), x], x] + Int[(b*Csc[e + f*x])^m*(A + C*Csc[e + f*x]^2),
 x] /; FreeQ[{b, e, f, A, B, C, m}, x]
```

Rubi steps

$$\text{integral} = \int \sqrt{\sec(c+dx)}(b+a\sec(c+dx))^3\,dx$$

$$= \frac{2a^2\sec^{\frac{3}{2}}(c+dx)(b+a\sec(c+dx))\sin(c+dx)}{5d} + \frac{2}{5}\int \sqrt{\sec(c+dx)}\left(\frac{1}{2}b(a^2+5b^2) + \frac{3}{2}a(a^2+5b^2)\sec(c+dx) + 6a^2b\sec^2(c+dx)\right)\,dx$$

$$
\begin{aligned}
&= \frac{2a^2\sec^{\frac{3}{2}}(c+dx)(b+a\sec(c+dx))\sin(c+dx)}{5d} \\
&\quad + \frac{2}{5}\int \sqrt{\sec(c+dx)}\left(\frac{1}{2}b(a^2+5b^2)+6a^2b\sec^2(c+dx)\right)\,dx \\
&\quad + \frac{1}{5}\left(3a(a^2+5b^2)\right)\int \sec^{\frac{3}{2}}(c+dx)\,dx \\
&= \frac{6a(a^2+5b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} + \frac{8a^2b\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} \\
&\quad + \frac{2a^2\sec^{\frac{3}{2}}(c+dx)(b+a\sec(c+dx))\sin(c+dx)}{5d} \\
&\quad + \left(b(a^2+b^2)\right)\int \sqrt{\sec(c+dx)}\,dx - \frac{1}{5}\left(3a(a^2+5b^2)\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx \\
&= \frac{6a(a^2+5b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} + \frac{8a^2b\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} \\
&\quad + \frac{2a^2\sec^{\frac{3}{2}}(c+dx)(b+a\sec(c+dx))\sin(c+dx)}{5d} \\
&\quad + \left(b(a^2+b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx \\
&\quad - \frac{1}{5}\left(3a(a^2+5b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx \\
&= -\frac{6a(a^2+5b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} \\
&\quad + \frac{2b(a^2+b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} \\
&\quad + \frac{6a(a^2+5b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{5d} + \frac{8a^2b\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} \\
&\quad + \frac{2a^2\sec^{\frac{3}{2}}(c+dx)(b+a\sec(c+dx))\sin(c+dx)}{5d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.38 (sec) , antiderivative size = 134, normalized size of antiderivative = 0.71

$$
\int (a+b\cos(c+dx))^3\sec^{\frac{7}{2}}(c+dx)\,dx
$$

$$
= \frac{2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\left(-3a(a^2+5b^2)\,E\left(\frac{1}{2}(c+dx)\middle|2\right)+5b(a^2+b^2)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\frac{a(5(\cdots}{}\right.}{5d}
$$

```
[In] Integrate[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^(7/2),x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*(-3*a*(a^2 + 5*b^2)*EllipticE[(c +
 d*x)/2, 2] + 5*b*(a^2 + b^2)*EllipticF[(c + d*x)/2, 2] + (a*(5*(a^2 + 3*b^
2) + 10*a*b*Cos[c + d*x] + 3*(a^2 + 5*b^2)*Cos[2*(c + d*x)])*Sin[c + d*x])/
(2*Cos[c + d*x]^(5/2))))/(5*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 710 vs. 2(219) = 438.

Time = 482.10 (sec) , antiderivative size = 711, normalized size of antiderivative = 3.76

method	result	size
default	Expression too large to display	711
parts	Expression too large to display	898

```
[In] int((a+cos(d*x+c)*b)^3*sec(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*b^3*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c
)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+2/5*a
^3/(8*sin(1/2*d*x+1/2*c)^6-12*sin(1/2*d*x+1/2*c)^4+6*sin(1/2*d*x+1/2*c)^2-1
)/sin(1/2*d*x+1/2*c)^2*(24*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6-12*(2*si
n(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*
d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^4-24*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*
x+1/2*c)+12*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*E
llipticE(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2+8*sin(1/2*d*x+1/2
*c)^2*cos(1/2*d*x+1/2*c)-3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*
c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c)
^4+sin(1/2*d*x+1/2*c)^2)^(1/2)+6*a^2*b*(-1/6*cos(1/2*d*x+1/2*c)*(-2*sin(1/2
*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2*d*x+1/2*c)^2-1/2)^2+1/3*
(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*
d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/
2)))+6*a*b^2/sin(1/2*d*x+1/2*c)^2/(2*sin(1/2*d*x+1/2*c)^2-1)*(-2*sin(1/2*d*
x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+
1/2*c)-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Ellipt
icE(cos(1/2*d*x+1/2*c),2^(1/2))))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^
2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 244, normalized size of antiderivative = 1.29

$$\int (a+b\cos(c+dx))^3 \sec^{\frac{7}{2}}(c+dx)\,dx =$$

$$-\frac{5\sqrt{2}(i\,a^2b+i\,b^3)\cos{(dx+c)}^2\,\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin{(dx+c)})+5\sqrt{2}(-i\,a^2b-$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^(7/2),x, algorithm="fricas")
```

```
[Out] -1/5*(5*sqrt(2)*(I*a^2*b + I*b^3)*cos(d*x + c)^2*weierstrassPInverse(-4, 0,
 cos(d*x + c) + I*sin(d*x + c)) + 5*sqrt(2)*(-I*a^2*b - I*b^3)*cos(d*x + c)
^2*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 3*sqrt(2)*(I
*a^3 + 5*I*a*b^2)*cos(d*x + c)^2*weierstrassZeta(-4, 0, weierstrassPInverse
(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 3*sqrt(2)*(-I*a^3 - 5*I*a*b^2)*co
s(d*x + c)^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c)
 - I*sin(d*x + c))) - 2*(5*a^2*b*cos(d*x + c) + a^3 + 3*(a^3 + 5*a*b^2)*cos
(d*x + c)^2)*sin(d*x + c)/sqrt(cos(d*x + c)))/(d*cos(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^3 \sec^{\frac{7}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**3*sec(d*x+c)**(7/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^3 \sec^{\frac{7}{2}}(c+dx)\,dx = \int (b\cos{(dx+c)}+a)^3\sec{(dx+c)}^{\frac{7}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^(7/2),x, algorithm="maxima")
```

```
[Out] integrate((b*cos(d*x + c) + a)^3*sec(d*x + c)^(7/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^3 \sec^{\frac{7}{2}}(c+dx)\,dx = \int (b\cos(dx+c)+a)^3 \sec(dx+c)^{\frac{7}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^(7/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^3*sec(d*x + c)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^3 \sec^{\frac{7}{2}}(c+dx)\,dx = \int \left(\frac{1}{\cos(c+d\,x)}\right)^{7/2} (a+b\,\cos(c+d\,x))^3\,dx$$

```
[In] int((1/cos(c + d*x))^(7/2)*(a + b*cos(c + d*x))^3,x)
[Out] int((1/cos(c + d*x))^(7/2)*(a + b*cos(c + d*x))^3, x)
```

3.707 $\int (a+b\cos(c+dx))^3 \sec^{\frac{5}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 160

$$\begin{aligned}
&\int (a+b\cos(c+dx))^3 \sec^{\frac{5}{2}}(c+dx)\,dx \\
&= -\frac{2b(3a^2-b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} \\
&\quad+\frac{2a(a^2+9b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} \\
&\quad+\frac{16a^2b\sqrt{\sec(c+dx)}\sin(c+dx)}{3d}+\frac{2a^2\sqrt{\sec(c+dx)}(b+a\sec(c+dx))\sin(c+dx)}{3d}
\end{aligned}$$

```
[Out] 16/3*a^2*b*sin(d*x+c)*sec(d*x+c)^(1/2)/d+2/3*a^2*(b+a*sec(d*x+c))*sin(d*x+c
)*sec(d*x+c)^(1/2)/d-2*b*(3*a^2-b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d
*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)
^(1/2)/d+2/3*a*(a^2+9*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*
EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 160, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used

$= \{3317, 3927, 4132, 3856, 2720, 4131, 2719\}$

$$\int (a+b\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)\,dx$$
$$= \frac{2a(a^2+9b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}$$
$$- \frac{2b(3a^2-b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}$$
$$+ \frac{2a^2\sin(c+dx)\sqrt{\sec(c+dx)}(a\sec(c+dx)+b)}{3d} + \frac{16a^2b\sin(c+dx)\sqrt{\sec(c+dx)}}{3d}$$

```
[In] Int[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^(5/2),x]
```

```
[Out] (-2*b*(3*a^2 - b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c
 + d*x]])/d + (2*a*(a^2 + 9*b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2,
2]*Sqrt[Sec[c + d*x]])/(3*d) + (16*a^2*b*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(
3*d) + (2*a^2*Sqrt[Sec[c + d*x]]*(b + a*Sec[c + d*x])*Sin[c + d*x])/(3*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3927

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-b^2)*Cot[e + f*x]*(a + b*Csc[e + f*x])^(m -
2)*((d*Csc[e + f*x])^n/(f*(m + n - 1))), x] + Dist[1/(d*(m + n - 1)), Int[(
a + b*Csc[e + f*x])^(m - 3)*(d*Csc[e + f*x])^n*Simp[a^3*d*(m + n - 1) + a*b
```

```
^2*d*n + b*(b^2*d*(m + n - 2) + 3*a^2*d*(m + n - 1))*Csc[e + f*x] + a*b^2*d
*(3*m + 2*n - 4)*Csc[e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f, n}, x]
 && NeQ[a^2 - b^2, 0] && GtQ[m, 2] && (IntegerQ[m] || IntegersQ[2*m, 2*n])
&&  !(IGtQ[n, 2] &&  !IntegerQ[m])
```

Rule 4131

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[(-C)*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*(m + 1)
)), x] + Dist[(C*m + A*(m + 1))/(m + 1), Int[(b*Csc[e + f*x])^m, x], x] /;
FreeQ[{b, e, f, A, C, m}, x] && NeQ[C*m + A*(m + 1), 0] &&  !LeQ[m, -1]
```

Rule 4132

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*((A_.) + csc[(e_.) + (f_.)*(x_)]*
(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.)), x_Symbol] :> Dist[B/b, Int[(b*Csc
[e + f*x])^(m + 1), x], x] + Int[(b*Csc[e + f*x])^m*(A + C*Csc[e + f*x]^2),
 x] /; FreeQ[{b, e, f, A, B, C, m}, x]
```

Rubi steps

$$\text{integral} = \int \frac{(b+a\sec(c+dx))^3}{\sqrt{\sec(c+dx)}}\,dx$$

$$= \frac{2a^2\sqrt{\sec(c+dx)}(b+a\sec(c+dx))\sin(c+dx)}{3d} + \frac{2}{3}\int \frac{-\frac{1}{2}b(a^2-3b^2)+\frac{1}{2}a(a^2+9b^2)\sec(c+dx)+4a^2b\sec^2(c+dx)}{\sqrt{\sec(c+dx)}}\,dx$$

$$= \frac{2a^2\sqrt{\sec(c+dx)}(b+a\sec(c+dx))\sin(c+dx)}{3d} + \frac{2}{3}\int \frac{-\frac{1}{2}b(a^2-3b^2)+4a^2b\sec^2(c+dx)}{\sqrt{\sec(c+dx)}}\,dx + \frac{1}{3}\left(a\left(a^2+9b^2\right)\right)\int \sqrt{\sec(c+dx)}\,dx$$

$$= \frac{16a^2b\sqrt{\sec(c+dx)}\sin(c+dx)}{3d} + \frac{2a^2\sqrt{\sec(c+dx)}(b+a\sec(c+dx))\sin(c+dx)}{3d} - \left(b\left(3a^2-b^2\right)\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + \frac{1}{3}\left(a\left(a^2+9b^2\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{2a(a^2+9b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{16a^2b\sqrt{\sec(c+dx)}\sin(c+dx)}{3d} + \frac{2a^2\sqrt{\sec(c+dx)}(b+a\sec(c+dx))\sin(c+dx)}{3d} - \left(b(3a^2-b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx$$

$$= -\frac{2b(3a^2-b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2a(a^2+9b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{16a^2b\sqrt{\sec(c+dx)}\sin(c+dx)}{3d} + \frac{2a^2\sqrt{\sec(c+dx)}(b+a\sec(c+dx))\sin(c+dx)}{3d}$$

Mathematica [A] (verified)

Time = 1.01 (sec) , antiderivative size = 106, normalized size of antiderivative = 0.66

$$\int(a+b\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{\sec^{\frac{3}{2}}(c+dx)\left(6b(-3a^2+b^2)\cos^{\frac{3}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)+a\left(2(a^2+9b^2)\cos^{\frac{3}{2}}(c+dx)\,\text{EllipticF}\left(\frac{1}{2}(c+\right.\right.\right.}{3d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^(5/2),x]
[Out] (Sec[c + d*x]^(3/2)*(6*b*(-3*a^2 + b^2)*Cos[c + d*x]^(3/2)*EllipticE[(c + d
*x)/2, 2] + a*(2*(a^2 + 9*b^2)*Cos[c + d*x]^(3/2)*EllipticF[(c + d*x)/2, 2]
 + 2*a*(a + 9*b*Cos[c + d*x])*Sin[c + d*x])))/(3*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 629 vs. 2(194) = 388.

Time = 483.02 (sec) , antiderivative size = 630, normalized size of antiderivative = 3.94

method	result
default	$-\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(36\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a^2b-2\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}F(c\right.}{}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*b)^3*sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)/(4*sin(1/2*d
*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)/sin(1/2*d*x+1/2*c)^3*(36*cos(1/2*d*x+
1/2*c)*sin(1/2*d*x+1/2*c)^4*a^2*b-2*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1
/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/
2*c)^2*a^3-18*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)
*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2*a*b^2-18*(2*sin
(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d
*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2*a^2*b+6*(2*sin(1/2*d*x+1/2*c)^2-1)^
(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*si
n(1/2*d*x+1/2*c)^2*b^3-2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*a^3-18*cos
(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*a^2*b+a^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)
*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+9*a
*b^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Elliptic
F(cos(1/2*d*x+1/2*c),2^(1/2))+9*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x
+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*a^2*b-3*(sin(1/2*d
*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1
/2*c),2^(1/2))*b^3)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2
*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 214, normalized size of antiderivative = 1.34

$$\int (a+b\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{\sqrt{2}(-i\,a^3-9i\,ab^2)\cos{(dx+c)}\,\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin{(dx+c)})+\sqrt{2}(i\,a^3+9i\,ab^2}{}$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/3*(sqrt(2)*(-I*a^3 - 9*I*a*b^2)*cos(d*x + c)*weierstrassPInverse(-4, 0, c
os(d*x + c) + I*sin(d*x + c)) + sqrt(2)*(I*a^3 + 9*I*a*b^2)*cos(d*x + c)*we
ierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 3*sqrt(2)*(3*I*a^
2*b - I*b^3)*cos(d*x + c)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0,
 cos(d*x + c) + I*sin(d*x + c))) - 3*sqrt(2)*(-3*I*a^2*b + I*b^3)*cos(d*x +
 c)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(
d*x + c))) + 2*(9*a^2*b*cos(d*x + c) + a^3)*sin(d*x + c)/sqrt(cos(d*x + c))
)/(d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**3*sec(d*x+c)**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)\,dx = \int (b\cos(dx+c)+a)^3\sec(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^3*sec(d*x + c)^(5/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)\,dx = \int (b\cos(dx+c)+a)^3\sec(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^3*sec(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)\,dx = \int \left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}(a+b\,\cos(c+d\,x))^3\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^3,x)
[Out] int((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^3, x)
```

3.708 $\int (a+b\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 23, antiderivative size = 166

$$\begin{aligned}&\int (a+b\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)\,dx\\&=-\frac{2a(a^2-3b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d}\\&\quad+\frac{2b(9a^2+b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d}\\&\quad+\frac{2a(3a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3d}+\frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}\end{aligned}$$

```
[Out] 2/3*b^2*(b+a*sec(d*x+c))*sin(d*x+c)/d/sec(d*x+c)^(1/2)+2/3*a*(3*a^2-b^2)*si
n(d*x+c)*sec(d*x+c)^(1/2)/d-2*a*(a^2-3*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/co
s(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec
(d*x+c)^(1/2)/d+2/3*b*(9*a^2+b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+
1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1
/2)/d
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 166, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used

= {3317, 3926, 4132, 3856, 2720, 4131, 2719}

$$\int (a+b\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)\,dx$$
$$=\frac{2a(3a^2-b^2)\sin(c+dx)\sqrt{\sec(c+dx)}}{3d}+\frac{2b(9a^2+b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d}-\frac{2a(a^2-3b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d}+\frac{2b^2\sin(c+dx)(a\sec(c+dx)+b)}{3d\sqrt{\sec(c+dx)}}$$

```
[In] Int[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^(3/2),x]
```

```
[Out] (-2*a*(a^2 - 3*b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c
 + d*x]])/d + (2*b*(9*a^2 + b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2,
2]*Sqrt[Sec[c + d*x]])/(3*d) + (2*a*(3*a^2 - b^2)*Sqrt[Sec[c + d*x]]*Sin[c
+ d*x])/(3*d) + (2*b^2*(b + a*Sec[c + d*x])*Sin[c + d*x])/(3*d*Sqrt[Sec[c +
 d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3926

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[a^2*Cot[e + f*x]*(a + b*Csc[e + f*x])^(m - 2)*
((d*Csc[e + f*x])^n/(f*n)), x] - Dist[1/(d*n), Int[(a + b*Csc[e + f*x])^(m
- 3)*(d*Csc[e + f*x])^(n + 1)*Simp[a^2*b*(m - 2*n - 2) - a*(3*b^2*n + a^2*(
n + 1))*Csc[e + f*x] - b*(b^2*n + a^2*(m + n - 1))*Csc[e + f*x]^2, x], x],
x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0] && GtQ[m, 2] && ((Inte
gerQ[m] && LtQ[n, -1]) || (IntegersQ[m + 1/2, 2*n] && LeQ[n, -1]))
```

Rule 4131

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[(-C)*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*(m + 1)
)), x] + Dist[(C*m + A*(m + 1))/(m + 1), Int[(b*Csc[e + f*x])^m, x], x] /;
FreeQ[{b, e, f, A, C, m}, x] && NeQ[C*m + A*(m + 1), 0] &&  !LeQ[m, -1]
```

Rule 4132

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*((A_.) + csc[(e_.) + (f_.)*(x_)]*
(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.)), x_Symbol] :> Dist[B/b, Int[(b*Csc
[e + f*x])^(m + 1), x], x] + Int[(b*Csc[e + f*x])^m*(A + C*Csc[e + f*x]^2),
 x] /; FreeQ[{b, e, f, A, B, C, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \frac{(b+a\sec(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx \\
&= \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} \\
&\quad+\frac{2}{3}\int \frac{4ab^2+\frac{1}{2}b(9a^2+b^2)\sec(c+dx)+\frac{1}{2}a(3a^2-b^2)\sec^2(c+dx)}{\sqrt{\sec(c+dx)}}\,dx \\
&= \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}+\frac{2}{3}\int \frac{4ab^2+\frac{1}{2}a(3a^2-b^2)\sec^2(c+dx)}{\sqrt{\sec(c+dx)}}\,dx \\
&\quad+\frac{1}{3}\left(b\left(9a^2+b^2\right)\right)\int \sqrt{\sec(c+dx)}\,dx \\
&= \frac{2a(3a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3d} \\
&\quad+\frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}-\left(a\left(a^2-3b^2\right)\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx \\
&\quad+\frac{1}{3}\left(b\left(9a^2+b^2\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx
\end{aligned}$$

$$= \frac{2b(9a^2+b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2a(3a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3d} + \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} - \left(a(a^2-3b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx$$

$$= -\frac{2a(a^2-3b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{d} + \frac{2b(9a^2+b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3d} + \frac{2a(3a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3d} + \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.91 (sec) , antiderivative size = 108, normalized size of antiderivative = 0.65

$$\int (a+b\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{\sqrt{\sec(c+dx)}\left(-6a(a^2-3b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)+2b(9a^2+b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+\right.\right.}{3d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^(3/2),x]
[Out] (Sqrt[Sec[c + d*x]]*(-6*a*(a^2 - 3*b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d
*x)/2, 2] + 2*b*(9*a^2 + b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]
+ 2*(3*a^3 + b^3*Cos[c + d*x])*Sin[c + d*x]))/(3*d)
```

Maple [A] (verified)

Time = 8.46 (sec) , antiderivative size = 303, normalized size of antiderivative = 1.83

method	result
default	$-\frac{2\left(4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3-6\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a^3-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3+9a^2b\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\right.}{}$
parts	$-\frac{2a^3\left(-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{-2\left(\sin^4\left(\frac{d}{}\right.\right.\right.}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int((a+cos(d*x+c)*b)^3*sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*(4*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4*b^3-6*cos(1/2*d*x+1/2*c)*si
n(1/2*d*x+1/2*c)^2*a^3-2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*b^3+9*a^2*
b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(c
os(1/2*d*x+1/2*c),2^(1/2))+b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+
1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+3*(sin(1/2*d*x+1/2*
c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2
^(1/2))*a^3-9*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)
*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*a*b^2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2
*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 182, normalized size of antiderivative = 1.10

$$\int (a+b\cos(c+dx))^3 \sec^{\frac{3}{2}}(c+dx)\,dx$$
$$= \frac{\sqrt{2}(-9i\,a^2b-i\,b^3)\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin{(dx+c)})+\sqrt{2}(9i\,a^2b+i\,b^3)\text{weierstrassP}}{}$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/3*(sqrt(2)*(-9*I*a^2*b - I*b^3)*weierstrassPInverse(-4, 0, cos(d*x + c) +
 I*sin(d*x + c)) + sqrt(2)*(9*I*a^2*b + I*b^3)*weierstrassPInverse(-4, 0, c
os(d*x + c) - I*sin(d*x + c)) - 3*sqrt(2)*(I*a^3 - 3*I*a*b^2)*weierstrassZe
ta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*sq
rt(2)*(-I*a^3 + 3*I*a*b^2)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0
, cos(d*x + c) - I*sin(d*x + c))) + 2*(b^3*cos(d*x + c) + 3*a^3)*sin(d*x +
c)/sqrt(cos(d*x + c)))/d
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^3 \sec^{\frac{3}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**3*sec(d*x+c)**(3/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^3\sec(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^3*sec(d*x + c)^(3/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^3\sec(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^3*sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)\,dx=\int \left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}(a+b\,\cos(c+d\,x))^3\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^3,x)
[Out] int((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^3, x)
```

3.709 $\int (a+b\cos(c+dx))^3\sqrt{\sec(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 156

$$\begin{aligned}\int (a+b\cos(c+dx))^3\sqrt{\sec(c+dx)}\,dx &= \frac{6b(5a^2+b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d}\\ &\quad+\frac{2a(a^2+b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d}\\ &\quad+\frac{8ab^2\sin(c+dx)}{5d\sqrt{\sec(c+dx)}}+\frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)}\end{aligned}$$

```
[Out] 2/5*b^2*(b+a*sec(d*x+c))*sin(d*x+c)/d/sec(d*x+c)^(3/2)+8/5*a*b^2*sin(d*x+c)
/d/sec(d*x+c)^(1/2)+6/5*b*(5*a^2+b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*
d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c
)^(1/2)/d+2*a*(a^2+b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ell
ipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used

= {3317, 3926, 4132, 3856, 2719, 4130, 2720}

$$\int (a+b\cos(c+dx))^3\sqrt{\sec(c+dx)}\,dx$$
$$= \frac{2a(a^2+b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d} + \frac{6b(5a^2+b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{2b^2\sin(c+dx)(a\sec(c+dx)+b)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{8ab^2\sin(c+dx)}{5d\sqrt{\sec(c+dx)}}$$

```
[In] Int[(a + b*Cos[c + d*x])^3*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (6*b*(5*a^2 + b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c
+ d*x]])/(5*d) + (2*a*(a^2 + b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2,
 2]*Sqrt[Sec[c + d*x]])/d + (8*a*b^2*Sin[c + d*x])/(5*d*Sqrt[Sec[c + d*x]])
 + (2*b^2*(b + a*Sec[c + d*x])*Sin[c + d*x])/(5*d*Sec[c + d*x]^(3/2))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3926

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[a^2*Cot[e + f*x]*(a + b*Csc[e + f*x])^(m - 2)*
((d*Csc[e + f*x])^n/(f*n)), x] - Dist[1/(d*n), Int[(a + b*Csc[e + f*x])^(m
- 3)*(d*Csc[e + f*x])^(n + 1)*Simp[a^2*b*(m - 2*n - 2) - a*(3*b^2*n + a^2*(
```

```
n + 1))*Csc[e + f*x] - b*(b^2*n + a^2*(m + n - 1))*Csc[e + f*x]^2, x], x],
x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0] && GtQ[m, 2] && ((Inte
gerQ[m] && LtQ[n, -1]) || (IntegersQ[m + 1/2, 2*n] && LeQ[n, -1]))
```

Rule 4130

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[A*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*m)), x] +
Dist[(C*m + A*(m + 1))/(b^2*m), Int[(b*Csc[e + f*x])^(m + 2), x], x] /; Fre
eQ[{b, e, f, A, C}, x] && NeQ[C*m + A*(m + 1), 0] && LeQ[m, -1]
```

Rule 4132

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*((A_.) + csc[(e_.) + (f_.)*(x_)]*
(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.)), x_Symbol] :> Dist[B/b, Int[(b*Csc
[e + f*x])^(m + 1), x], x] + Int[(b*Csc[e + f*x])^m*(A + C*Csc[e + f*x]^2),
 x] /; FreeQ[{b, e, f, A, B, C, m}, x]
```

Rubi steps

$$\text{integral} = \int \frac{(b+a\sec(c+dx))^3}{\sec^{\frac{5}{2}}(c+dx)}\,dx$$

$$= \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{2}{5}\int \frac{6ab^2+\frac{3}{2}b(5a^2+b^2)\sec(c+dx)+\frac{1}{2}a(5a^2+b^2)\sec^2(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \frac{2}{5}\int \frac{6ab^2+\frac{1}{2}a(5a^2+b^2)\sec^2(c+dx)}{\sec^{\frac{3}{2}}(c+dx)}\,dx + \frac{1}{5}\left(3b\left(5a^2+b^2\right)\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx$$

$$= \frac{8ab^2\sin(c+dx)}{5d\sqrt{\sec(c+dx)}} + \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \left(a\left(a^2+b^2\right)\right)\int \sqrt{\sec(c+dx)}\,dx + \frac{1}{5}\left(3b\left(5a^2+b^2\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx$$

$$= \frac{6b(5a^2+b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{8ab^2\sin(c+dx)}{5d\sqrt{\sec(c+dx)}} + \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)} + \left(a\left(a^2+b^2\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{6b(5a^2+b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{2a(a^2+b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{d} + \frac{8ab^2\sin(c+dx)}{5d\sqrt{\sec(c+dx)}} + \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{5d\sec^{\frac{3}{2}}(c+dx)}$$

Mathematica [A] (verified)

Time = 0.82 (sec) , antiderivative size = 106, normalized size of antiderivative = 0.68

$$\int (a+b\cos(c+dx))^3\sqrt{\sec(c+dx)}\,dx = \frac{\sqrt{\sec(c+dx)}\left(6b(5a^2+b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)+10a(a^2+b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+\right.\right.}{5d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^3*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (Sqrt[Sec[c + d*x]]*(6*b*(5*a^2 + b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*
x)/2, 2] + 10*a*(a^2 + b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2] +
b^2*(5*a + b*Cos[c + d*x])*Sin[2*(c + d*x)]))/(5*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 411 vs. 2(190) = 380.

Time = 9.71 (sec) , antiderivative size = 412, normalized size of antiderivative = 2.64

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\left(-8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3+20\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a\,b^2+8\cos\left(\frac{dx}{2}+\right.\right.}{}$
parts	$-\frac{2a^3\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d} - \frac{2b^3\sqrt{\left(2\left(\cos^2\left(\frac{d}{}\right.\right.\right.}}{}$

```
[In] int((a+cos(d*x+c)*b)^3*sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/5*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-8*cos(1/2*d*
x+1/2*c)*sin(1/2*d*x+1/2*c)^6*b^3+20*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^
4*a*b^2+8*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4*b^3-10*cos(1/2*d*x+1/2*c)
*sin(1/2*d*x+1/2*c)^2*a*b^2-2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*b^3+5
*a^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Elliptic
F(cos(1/2*d*x+1/2*c),2^(1/2))+5*a*b^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1
```

```
/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-15*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+
1/2*c),2^(1/2))*a^2*b-3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^
2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*b^3)/(-2*sin(1/2*d*x+1/2*c
)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-
1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 193, normalized size of antiderivative = 1.24

$$\int (a+b\cos(c+dx))^3\sqrt{\sec(c+dx)}\,dx =$$

$$-\frac{5\sqrt{2}(i\,a^3+i\,ab^2)\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin{(dx+c)})+5\sqrt{2}(-i\,a^3-i\,ab^2)\text{weierstra}}{}$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/5*(5*sqrt(2)*(I*a^3 + I*a*b^2)*weierstrassPInverse(-4, 0, cos(d*x + c) +
 I*sin(d*x + c)) + 5*sqrt(2)*(-I*a^3 - I*a*b^2)*weierstrassPInverse(-4, 0,
cos(d*x + c) - I*sin(d*x + c)) + 3*sqrt(2)*(-5*I*a^2*b - I*b^3)*weierstrass
Zeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) + 3*
sqrt(2)*(5*I*a^2*b + I*b^3)*weierstrassZeta(-4, 0, weierstrassPInverse(-4,
0, cos(d*x + c) - I*sin(d*x + c))) - 2*(b^3*cos(d*x + c)^2 + 5*a*b^2*cos(d*
x + c))*sin(d*x + c)/sqrt(cos(d*x + c)))/d
```

Sympy [F]

$$\int (a+b\cos(c+dx))^3\sqrt{\sec(c+dx)}\,dx = \int (a+b\cos{(c+dx)})^3\sqrt{\sec{(c+dx)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**3*sec(d*x+c)**(1/2),x)
```

```
[Out] Integral((a + b*cos(c + d*x))**3*sqrt(sec(c + d*x)), x)
```

Maxima [F]

$$\int (a+b\cos(c+dx))^3\sqrt{\sec(c+dx)}\,dx = \int (b\cos(dx+c)+a)^3\sqrt{\sec(dx+c)}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^3*sqrt(sec(d*x + c)), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^3\sqrt{\sec(c+dx)}\,dx = \int (b\cos(dx+c)+a)^3\sqrt{\sec(dx+c)}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^3*sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^3\sqrt{\sec(c+dx)}\,dx = \int \sqrt{\frac{1}{\cos(c+d\,x)}}\,(a+b\,\cos(c+d\,x))^3\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^3,x)
[Out] int((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^3, x)
```

3.710 $\int \frac{(a+b\cos(c+dx))^3}{\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 199

$$\int \frac{(a+b\cos(c+dx))^3}{\sqrt{\sec(c+dx)}}\,dx = \frac{2a(5a^2+9b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{2b(21a^2+5b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} + \frac{32ab^2\sin(c+dx)}{35d\sec^{\frac{3}{2}}(c+dx)} + \frac{2b(21a^2+5b^2)\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)}$$

```
[Out] 32/35*a*b^2*sin(d*x+c)/d/sec(d*x+c)^(3/2)+2/7*b^2*(b+a*sec(d*x+c))*sin(d*x+
c)/d/sec(d*x+c)^(5/2)+2/21*b*(21*a^2+5*b^2)*sin(d*x+c)/d/sec(d*x+c)^(1/2)+2
/5*a*(5*a^2+9*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elliptic
E(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+2/21*b*(2
1*a^2+5*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(
1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 199, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.348$, Rules used

$= \{3317, 3926, 4132, 3854, 3856, 2720, 4130, 2719\}$

$$\int \frac{(a+b\cos(c+dx))^3}{\sqrt{\sec(c+dx)}}\,dx = \frac{2b(21a^2+5b^2)\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{2b(21a^2+5b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d} + \frac{2a(5a^2+9b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d} + \frac{2b^2\sin(c+dx)(a\sec(c+dx)+b)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{32ab^2\sin(c+dx)}{35d\sec^{\frac{3}{2}}(c+dx)}$$

```
[In] Int[(a + b*Cos[c + d*x])^3/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (2*a*(5*a^2 + 9*b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[
c + d*x]])/(5*d) + (2*b*(21*a^2 + 5*b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c +
d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(21*d) + (32*a*b^2*Sin[c + d*x])/(35*d*Sec[c
 + d*x]^(3/2)) + (2*b*(21*a^2 + 5*b^2)*Sin[c + d*x])/(21*d*Sqrt[Sec[c + d*x
]]) + (2*b^2*(b + a*Sec[c + d*x])*Sin[c + d*x])/(7*d*Sec[c + d*x]^(5/2))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3926

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[a^2*Cot[e + f*x]*(a + b*Csc[e + f*x])^(m - 2)*
((d*Csc[e + f*x])^n/(f*n)), x] - Dist[1/(d*n), Int[(a + b*Csc[e + f*x])^(m
- 3)*(d*Csc[e + f*x])^(n + 1)*Simp[a^2*b*(m - 2*n - 2) - a*(3*b^2*n + a^2*(
n + 1))*Csc[e + f*x] - b*(b^2*n + a^2*(m + n - 1))*Csc[e + f*x]^2, x], x],
x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0] && GtQ[m, 2] && ((Inte
gerQ[m] && LtQ[n, -1]) || (IntegersQ[m + 1/2, 2*n] && LeQ[n, -1]))
```

Rule 4130

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[A*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*m)), x] +
Dist[(C*m + A*(m + 1))/(b^2*m), Int[(b*Csc[e + f*x])^(m + 2), x], x] /; Fre
eQ[{b, e, f, A, C}, x] && NeQ[C*m + A*(m + 1), 0] && LeQ[m, -1]
```

Rule 4132

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*((A_.) + csc[(e_.) + (f_.)*(x_)]*
(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.)), x_Symbol] :> Dist[B/b, Int[(b*Csc
[e + f*x])^(m + 1), x], x] + Int[(b*Csc[e + f*x])^m*(A + C*Csc[e + f*x]^2),
 x] /; FreeQ[{b, e, f, A, B, C, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \frac{(b+a\sec(c+dx))^3}{\sec^{\frac{7}{2}}(c+dx)}\,dx \\
&= \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} \\
&\quad+\frac{2}{7}\int \frac{8ab^2+\frac{1}{2}b(21a^2+5b^2)\sec(c+dx)+\frac{1}{2}a(7a^2+3b^2)\sec^2(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)}+\frac{2}{7}\int \frac{8ab^2+\frac{1}{2}a(7a^2+3b^2)\sec^2(c+dx)}{\sec^{\frac{5}{2}}(c+dx)}\,dx \\
&\quad+\frac{1}{7}\left(b\left(21a^2+5b^2\right)\right)\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx
\end{aligned}$$

$$= \frac{32ab^2\sin(c+dx)}{35d\sec^{\frac{3}{2}}(c+dx)} + \frac{2b(21a^2+5b^2)\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{1}{21}\left(b(21a^2+5b^2)\right)\int\sqrt{\sec(c+dx)}\,dx + \frac{1}{5}\left(a(5a^2+9b^2)\right)\int\frac{1}{\sqrt{\sec(c+dx)}}\,dx$$

$$= \frac{32ab^2\sin(c+dx)}{35d\sec^{\frac{3}{2}}(c+dx)} + \frac{2b(21a^2+5b^2)\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)} + \frac{1}{21}\left(b(21a^2+5b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx + \frac{1}{5}\left(a(5a^2+9b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx$$

$$= \frac{2a(5a^2+9b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{5d} + \frac{2b(21a^2+5b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} + \frac{32ab^2\sin(c+dx)}{35d\sec^{\frac{3}{2}}(c+dx)} + \frac{2b(21a^2+5b^2)\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{7d\sec^{\frac{5}{2}}(c+dx)}$$

Mathematica [A] (verified)

Time = 1.23 (sec) , antiderivative size = 132, normalized size of antiderivative = 0.66

$$\int\frac{(a+b\cos(c+dx))^3}{\sqrt{\sec(c+dx)}}\,dx = \frac{\sqrt{\sec(c+dx)}\left(84a(5a^2+9b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)+20b(21a^2+5b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\right.\right.}{210d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^3/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (Sqrt[Sec[c + d*x]]*(84*a*(5*a^2 + 9*b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c +
 d*x)/2, 2] + 20*b*(21*a^2 + 5*b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/
2, 2] + b*(210*a^2 + 65*b^2 + 126*a*b*Cos[c + d*x] + 15*b^2*Cos[2*(c + d*x)
])*Sin[2*(c + d*x)]))/(210*d)
```

Maple [A] (verified)

Time = 11.24 (sec) , antiderivative size = 421, normalized size of antiderivative = 2.12

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\left(240\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3+\left(-504a\,b^2-360b^3\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\right.}{}$
parts	Expression too large to display

```
[In] int((a+cos(d*x+c)*b)^3/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/105*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(240*cos(1/2
*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8*b^3+(-504*a*b^2-360*b^3)*sin(1/2*d*x+1/2*c
)^6*cos(1/2*d*x+1/2*c)+(420*a^2*b+504*a*b^2+280*b^3)*sin(1/2*d*x+1/2*c)^4*c
os(1/2*d*x+1/2*c)+(-210*a^2*b-126*a*b^2-80*b^3)*sin(1/2*d*x+1/2*c)^2*cos(1/
2*d*x+1/2*c)+105*a^2*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2
-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+25*b^3*(sin(1/2*d*x+1/2*c)^
2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1
/2))-105*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Elli
pticE(cos(1/2*d*x+1/2*c),2^(1/2))*a^3-189*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*s
in(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*a*b^2)/(
-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*c
os(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 216, normalized size of antiderivative = 1.09

$$\int \frac{(a+b\cos(c+dx))^3}{\sqrt{\sec(c+dx)}}\,dx =$$

$$-\frac{5\sqrt{2}(21i\,a^2b+5i\,b^3)\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin{(dx+c)})+5\sqrt{2}(-21i\,a^2b-5i\,b^3)\text{w}}{}$$

```
[In] integrate((a+b*cos(d*x+c))^3/sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/105*(5*sqrt(2)*(21*I*a^2*b + 5*I*b^3)*weierstrassPInverse(-4, 0, cos(d*x
 + c) + I*sin(d*x + c)) + 5*sqrt(2)*(-21*I*a^2*b - 5*I*b^3)*weierstrassPInv
erse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 21*sqrt(2)*(-5*I*a^3 - 9*I*a*b
^2)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(
d*x + c))) + 21*sqrt(2)*(5*I*a^3 + 9*I*a*b^2)*weierstrassZeta(-4, 0, weiers
trassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - 2*(15*b^3*cos(d*x +
c)^3 + 63*a*b^2*cos(d*x + c)^2 + 5*(21*a^2*b + 5*b^3)*cos(d*x + c))*sin(d*x
 + c)/sqrt(cos(d*x + c)))/d
```

Sympy [F]

$$\int \frac{(a+b\cos(c+dx))^3}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(a+b\cos{(c+dx)})^3}{\sqrt{\sec{(c+dx)}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**3/sec(d*x+c)**(1/2),x)
[Out] Integral((a + b*cos(c + d*x))**3/sqrt(sec(c + d*x)), x)
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^3}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(b\cos{(dx+c)}+a)^3}{\sqrt{\sec{(dx+c)}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3/sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^3/sqrt(sec(d*x + c)), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^3}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(b\cos{(dx+c)}+a)^3}{\sqrt{\sec{(dx+c)}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^3/sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^3}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(a+b\,\cos{(c+d\,x)})^3}{\sqrt{\frac{1}{\cos(c+d\,x)}}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^3/(1/cos(c + d*x))^(1/2),x)
[Out] int((a + b*cos(c + d*x))^3/(1/cos(c + d*x))^(1/2), x)
```

3.711 $\int \frac{(a+b\cos(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 234

$$\begin{aligned}\int \frac{(a+b\cos(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx &= \frac{2b(27a^2+7b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{15d} \\ &\quad+\frac{2a(7a^2+15b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} \\ &\quad+\frac{40ab^2\sin(c+dx)}{63d\sec^{\frac{5}{2}}(c+dx)}+\frac{2b(27a^2+7b^2)\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)} \\ &\quad+\frac{2a(7a^2+15b^2)\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}+\frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)}\end{aligned}$$

```
[Out] 40/63*a*b^2*sin(d*x+c)/d/sec(d*x+c)^(5/2)+2/45*b*(27*a^2+7*b^2)*sin(d*x+c)/
d/sec(d*x+c)^(3/2)+2/9*b^2*(b+a*sec(d*x+c))*sin(d*x+c)/d/sec(d*x+c)^(7/2)+2
/21*a*(7*a^2+15*b^2)*sin(d*x+c)/d/sec(d*x+c)^(1/2)+2/15*b*(27*a^2+7*b^2)*(c
os(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),
2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d+2/21*a*(7*a^2+15*b^2)*(cos(1/2
*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2
))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.32 (sec) , antiderivative size = 234, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {3317, 3926, 4132, 3854, 3856, 2719, 4130, 2720}

$$\int \frac{(a+b\cos(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{2b(27a^2+7b^2)\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)}+\frac{2a(7a^2+15b^2)\sin(c+dx)}{21d\sqrt{\sec(c+dx)}}+\frac{2a(7a^2+15b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d}+\frac{2b(27a^2+7b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15d}+\frac{2b^2\sin(c+dx)(a\sec(c+dx)+b)}{9d\sec^{\frac{7}{2}}(c+dx)}+\frac{40ab^2\sin(c+dx)}{63d\sec^{\frac{5}{2}}(c+dx)}$$

```
[In] Int[(a + b*Cos[c + d*x])^3/Sec[c + d*x]^(3/2),x]
```

```
[Out] (2*b*(27*a^2 + 7*b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec
[c + d*x]])/(15*d) + (2*a*(7*a^2 + 15*b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c
+ d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(21*d) + (40*a*b^2*Sin[c + d*x])/(63*d*Sec
[c + d*x]^(5/2)) + (2*b*(27*a^2 + 7*b^2)*Sin[c + d*x])/(45*d*Sec[c + d*x]^(
3/2)) + (2*a*(7*a^2 + 15*b^2)*Sin[c + d*x])/(21*d*Sqrt[Sec[c + d*x]]) + (2*
b^2*(b + a*Sec[c + d*x])*Sin[c + d*x])/(9*d*Sec[c + d*x]^(7/2))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3854

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Csc[c + d*x])^(n + 1)/(b*d*n)), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
```

```
d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3926

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[a^2*Cot[e + f*x]*(a + b*Csc[e + f*x])^(m - 2)*
((d*Csc[e + f*x])^n/(f*n)), x] - Dist[1/(d*n), Int[(a + b*Csc[e + f*x])^(m
- 3)*(d*Csc[e + f*x])^(n + 1)*Simp[a^2*b*(m - 2*n - 2) - a*(3*b^2*n + a^2*(
n + 1))*Csc[e + f*x] - b*(b^2*n + a^2*(m + n - 1))*Csc[e + f*x]^2, x], x],
x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0] && GtQ[m, 2] && ((Inte
gerQ[m] && LtQ[n, -1]) || (IntegersQ[m + 1/2, 2*n] && LeQ[n, -1]))
```

Rule 4130

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[A*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*m)), x] +
Dist[(C*m + A*(m + 1))/(b^2*m), Int[(b*Csc[e + f*x])^(m + 2), x], x] /; Fre
eQ[{b, e, f, A, C}, x] && NeQ[C*m + A*(m + 1), 0] && LeQ[m, -1]
```

Rule 4132

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*((A_.) + csc[(e_.) + (f_.)*(x_)]*
(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.)), x_Symbol] :> Dist[B/b, Int[(b*Csc
[e + f*x])^(m + 1), x], x] + Int[(b*Csc[e + f*x])^m*(A + C*Csc[e + f*x]^2),
 x] /; FreeQ[{b, e, f, A, B, C, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \int \frac{(b+a\sec(c+dx))^3}{\sec^{\frac{9}{2}}(c+dx)}\,dx\\ &= \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)}\\ &\quad+\frac{2}{9}\int \frac{10ab^2+\frac{1}{2}b(27a^2+7b^2)\sec(c+dx)+\frac{1}{2}a(9a^2+5b^2)\sec^2(c+dx)}{\sec^{\frac{7}{2}}(c+dx)}\,dx\end{aligned}$$

$$= \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)} + \frac{2}{9}\int \frac{10ab^2+\frac{1}{2}a(9a^2+5b^2)\sec^2(c+dx)}{\sec^{\frac{7}{2}}(c+dx)}\,dx + \frac{1}{9}\left(b\left(27a^2+7b^2\right)\right)\int \frac{1}{\sec^{\frac{5}{2}}(c+dx)}\,dx$$

$$= \frac{40ab^2\sin(c+dx)}{63d\sec^{\frac{5}{2}}(c+dx)} + \frac{2b(27a^2+7b^2)\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)} + \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)} + \frac{1}{15}\left(b\left(27a^2+7b^2\right)\right)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx + \frac{1}{7}\left(a\left(7a^2+15b^2\right)\right)\int \frac{1}{\sec^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \frac{40ab^2\sin(c+dx)}{63d\sec^{\frac{5}{2}}(c+dx)} + \frac{2b(27a^2+7b^2)\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)} + \frac{2a(7a^2+15b^2)\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)} + \frac{1}{21}\left(a\left(7a^2+15b^2\right)\right)\int \sqrt{\sec(c+dx)}\,dx + \frac{1}{15}\left(b\left(27a^2+7b^2\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx$$

$$= \frac{2b(27a^2+7b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{15d} + \frac{40ab^2\sin(c+dx)}{63d\sec^{\frac{5}{2}}(c+dx)} + \frac{2b(27a^2+7b^2)\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)} + \frac{2a(7a^2+15b^2)\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)} + \frac{1}{21}\left(a\left(7a^2+15b^2\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx$$

$$= \frac{2b(27a^2+7b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{15d} + \frac{2a(7a^2+15b^2)\sqrt{\cos(c+dx)}\,\mathrm{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{21d} + \frac{40ab^2\sin(c+dx)}{63d\sec^{\frac{5}{2}}(c+dx)} + \frac{2b(27a^2+7b^2)\sin(c+dx)}{45d\sec^{\frac{3}{2}}(c+dx)} + \frac{2a(7a^2+15b^2)\sin(c+dx)}{21d\sqrt{\sec(c+dx)}} + \frac{2b^2(b+a\sec(c+dx))\sin(c+dx)}{9d\sec^{\frac{7}{2}}(c+dx)}$$

Mathematica [A] (verified)

Time = 1.53 (sec) , antiderivative size = 159, normalized size of antiderivative = 0.68

$$\int \frac{(a+b\cos(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{\sqrt{\sec(c+dx)}\Big(168b(27a^2+7b^2)\sqrt{\cos(c+dx)}E\big(\tfrac{1}{2}(c+dx)\big|\,2\big)+120a(7a^2+15b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}}{}$$

[In] Integrate[(a + b*Cos[c + d*x])^3/Sec[c + d*x]^(3/2),x]

[Out] (Sqrt[Sec[c + d*x]]*(168*b*(27*a^2 + 7*b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2] + 120*a*(7*a^2 + 15*b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2] + (7*b*(108*a^2 + 43*b^2)*Cos[c + d*x] + 5*(84*a^3 + 234*a*b^2 + 54*a*b^2*Cos[2*(c + d*x)] + 7*b^3*Cos[3*(c + d*x)]))*Sin[2*(c + d*x)]))/(1260*d)

Maple [A] (verified)

Time = 13.29 (sec) , antiderivative size = 470, normalized size of antiderivative = 2.01

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-1120\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3+(2160a\,b^2+2240b^3)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\right.\right.}{}$
parts	Expression too large to display

[In] int((a+cos(d*x+c)*b)^3/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)

[Out] -2/315*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-1120*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^10*b^3+(2160*a*b^2+2240*b^3)*sin(1/2*d*x+1/2*c)^8*cos(1/2*d*x+1/2*c)+(-1512*a^2*b-3240*a*b^2-2072*b^3)*sin(1/2*d*x+1/2*c)^6*cos(1/2*d*x+1/2*c)+(420*a^3+1512*a^2*b+2520*a*b^2+952*b^3)*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+(-210*a^3-378*a^2*b-720*a*b^2-168*b^3)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+105*a^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+225*a*b^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-567*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*a^2*b-147*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*b^3)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.02

$$\int \frac{(a+b\cos(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx =$$

$$-\frac{15\sqrt{2}(7i\,a^3+15i\,ab^2)\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\,\sin(dx+c))+15\sqrt{2}(-7i\,a^3-15i\,a$$

```
[In] integrate((a+b*cos(d*x+c))^3/sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/315*(15*sqrt(2)*(7*I*a^3 + 15*I*a*b^2)*weierstrassPInverse(-4, 0, cos(d*
x + c) + I*sin(d*x + c)) + 15*sqrt(2)*(-7*I*a^3 - 15*I*a*b^2)*weierstrassPI
nverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) + 21*sqrt(2)*(-27*I*a^2*b - 7*
I*b^3)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*s
in(d*x + c))) + 21*sqrt(2)*(27*I*a^2*b + 7*I*b^3)*weierstrassZeta(-4, 0, we
ierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) - 2*(35*b^3*cos(d*
x + c)^4 + 135*a*b^2*cos(d*x + c)^3 + 7*(27*a^2*b + 7*b^3)*cos(d*x + c)^2 +
 15*(7*a^3 + 15*a*b^2)*cos(d*x + c))*sin(d*x + c)/sqrt(cos(d*x + c)))/d
```

Sympy [F]

$$\int \frac{(a+b\cos(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(a+b\cos(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**3/sec(d*x+c)**(3/2),x)
```

```
[Out] Integral((a + b*cos(c + d*x))**3/sec(c + d*x)**(3/2), x)
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^3}{\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3/sec(d*x+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((b*cos(d*x + c) + a)^3/sec(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^3}{\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^3/sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^3}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(a+b\,\cos(c+d\,x))^3}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^3/(1/cos(c + d*x))^(3/2),x)
[Out] int((a + b*cos(c + d*x))^3/(1/cos(c + d*x))^(3/2), x)
```

3.712 $\int \frac{\sec^{\frac{5}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 188

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{2b\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a^2d} + \frac{2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3ad} + \frac{2b^2\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{a^2(a+b)d} - \frac{2b\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d} + \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3ad}$$

```
[Out] 2/3*sec(d*x+c)^(3/2)*sin(d*x+c)/a/d-2*b*sin(d*x+c)*sec(d*x+c)^(1/2)/a^2/d+2
*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/
2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^2/d+2/3*(cos(1/2*d*x+1/2*
c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*
x+c)^(1/2)*sec(d*x+c)^(1/2)/a/d+2*b^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*
d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))*cos(d*x+c)^(1/2
)*sec(d*x+c)^(1/2)/a^2/(a+b)/d
```

Rubi [A] (verified)

Time = 0.61 (sec) , antiderivative size = 188, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {3317, 3936, 4187, 4191, 3934, 2884, 3872, 3856, 2719, 2720}

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{2b^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a^2d(a+b)} - \frac{2b\sin(c+dx)\sqrt{\sec(c+dx)}}{a^2d} + \frac{2b\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d} + \frac{2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3ad} + \frac{2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3ad}$$

```
[In] Int[Sec[c + d*x]^(5/2)/(a + b*Cos[c + d*x]),x]
```

```
[Out] (2*b*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a^2*
d) + (2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3
*a*d) + (2*b^2*Sqrt[Cos[c + d*x]]*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2]
*Sqrt[Sec[c + d*x]])/(a^2*(a + b)*d) - (2*b*Sqrt[Sec[c + d*x]]*Sin[c + d*x]
)/(a^2*d) + (2*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(3*a*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
```

```
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3934

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(3/2)/(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[d*Sqrt[d*Sin[e + f*x]]*Sqrt[d*Csc[e + f*x]], Int[1
/(Sqrt[d*Sin[e + f*x]]*(b + a*Sin[e + f*x])), x], x] /; FreeQ[{a, b, d, e,
f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3936

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)/(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_)), x_Symbol] :> Simp[(-d^3)*Cot[e + f*x]*((d*Csc[e + f*x])^(n - 3)/(b*f*
(n - 2))), x] + Dist[d^3/(b*(n - 2)), Int[(d*Csc[e + f*x])^(n - 3)*(Simp[a*
(n - 3) + b*(n - 3)*Csc[e + f*x] - a*(n - 2)*Csc[e + f*x]^2, x]/(a + b*Csc[
e + f*x])), x], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0] && GtQ
[n, 3]
```

Rule 4187

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))*(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))^(m_), x_Symbol] :> Simp[(-C)*d*Cot[e + f*x]*(a + b*Csc[e + f*x])^(m + 1
)*((d*Csc[e + f*x])^(n - 1)/(b*f*(m + n + 1))), x] + Dist[d/(b*(m + n + 1))
, Int[(a + b*Csc[e + f*x])^m*(d*Csc[e + f*x])^(n - 1)*Simp[a*C*(n - 1) + (A
*b*(m + n + 1) + b*C*(m + n))*Csc[e + f*x] + (b*B*(m + n + 1) - a*C*n)*Csc[
e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f, A, B, C, m}, x] && NeQ[a^2
- b^2, 0] && GtQ[n, 0]
```

Rule 4191

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))/(Sqrt[csc[(e_.) + (f_.)*(x_)]*(d_.)]*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
```

```
_))), x_Symbol] :> Dist[(A*b^2 - a*b*B + a^2*C)/(a^2*d^2), Int[(d*Csc[e + f
*x])^(3/2)/(a + b*Csc[e + f*x]), x], x] + Dist[1/a^2, Int[(a*A - (A*b - a*B
)*Csc[e + f*x])/Sqrt[d*Csc[e + f*x]], x], x] /; FreeQ[{a, b, d, e, f, A, B,
 C}, x] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \int \frac{\sec^{\frac{7}{2}}(c+dx)}{b+a\sec(c+dx)}\,dx$$

$$= \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3ad} + \frac{2\int \frac{\sqrt{\sec(c+dx)}\left(\frac{b}{2}+\frac{1}{2}a\sec(c+dx)-\frac{3}{2}b\sec^2(c+dx)\right)}{b+a\sec(c+dx)}\,dx}{3a}$$

$$= -\frac{2b\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d} + \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3ad} + \frac{4\int \frac{\frac{3b^2}{4}+ab\sec(c+dx)+\frac{1}{4}\left(a^2+3b^2\right)\sec^2(c+dx)}{\sqrt{\sec(c+dx)}(b+a\sec(c+dx))}\,dx}{3a^2}$$

$$= -\frac{2b\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d} + \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3ad} + \frac{4\int \frac{\frac{3b^3}{4}+\frac{1}{4}ab^2\sec(c+dx)}{\sqrt{\sec(c+dx)}}\,dx}{3a^2b^2} + \frac{b^2\int \frac{\sec^{\frac{3}{2}}(c+dx)}{b+a\sec(c+dx)}\,dx}{a^2}$$

$$= -\frac{2b\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d} + \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3ad} + \frac{\int \sqrt{\sec(c+dx)}\,dx}{3a} + \frac{b\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx}{a^2} + \frac{\left(b^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{a^2}$$

$$= \frac{2b^2\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{a^2(a+b)d} - \frac{2b\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d} + \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3ad} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3a} + \frac{\left(b\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{a^2}$$

$$
\begin{aligned}
&= \frac{2b\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a^2d} \\
&\quad + \frac{2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3ad} \\
&\quad + \frac{2b^2\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{a^2(a+b)d} \\
&\quad - \frac{2b\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2d} + \frac{2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3ad}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 35.18 (sec) , antiderivative size = 165, normalized size of antiderivative = 0.88

$$
\int \frac{\sec^{\frac{5}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = -\frac{\cot(c+dx)\left(-a^2\sec^{\frac{5}{2}}(c+dx)+a^2\cos(2(c+dx))\sec^{\frac{5}{2}}(c+dx)+6abE\left(\arcsin\left(\sqrt{\sec(c+dx)}\right)\middle|-1\right)\right.}{}
$$

```
[In] Integrate[Sec[c + d*x]^(5/2)/(a + b*Cos[c + d*x]),x]
```

```
[Out] -1/3*(Cot[c + d*x]*(-(a^2*Sec[c + d*x]^(5/2)) + a^2*Cos[2*(c + d*x)]*Sec[c
+ d*x]^(5/2) + 6*a*b*EllipticE[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[-Tan[c
+ d*x]^2] - 2*(a^2 + 3*a*b + 3*b^2)*EllipticF[ArcSin[Sqrt[Sec[c + d*x]]], -
1]*Sqrt[-Tan[c + d*x]^2] + 6*b^2*EllipticPi[-(a/b), ArcSin[Sqrt[Sec[c + d*x
]]], -1]*Sqrt[-Tan[c + d*x]^2]))/(a^3*d)
```

Maple [A] (verified)

Time = 11.16 (sec) , antiderivative size = 425, normalized size of antiderivative = 2.26

method	result
default	$-\frac{\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\frac{-\frac{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}{3\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)-\frac{1}{2}\right)^2}+\frac{2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right.\right.}}{3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+}}}{a}\right.}{}$

```
[In] int(sec(d*x+c)^(5/2)/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/a*(-1/6*cos(1
/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1/2
*d*x+1/2*c)^2-1/2)^2+1/3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c
```

```
)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF
(cos(1/2*d*x+1/2*c),2^(1/2)))-2/a^2*b/sin(1/2*d*x+1/2*c)^2/(2*sin(1/2*d*x+1
/2*c)^2-1)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*
d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x
+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))-4*b^3/a^2/(-2*a*b
+2*b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*
sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2
*c),-2*b/(a-b),2^(1/2)))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2
)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+b*cos(d*x+c)),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(5/2)/(a+b*cos(d*x+c)),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\sec(dx+c)^{\frac{5}{2}}}{b\cos(dx+c)+a}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+b*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^(5/2)/(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{b\cos\left(dx+c\right)+a}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+b*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(5/2)/(b*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}}{a+b\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)/(a + b*cos(c + d*x)),x)
[Out] int((1/cos(c + d*x))^(5/2)/(a + b*cos(c + d*x)), x)
```

3.713 $\int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 117

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = -\frac{2\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{ad} - \frac{2b\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{a(a+b)d} + \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{ad}$$

```
[Out] 2*sin(d*x+c)*sec(d*x+c)^(1/2)/a/d-2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*
x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^
(1/2)/a/d-2*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(si
n(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a/(a+
b)/d
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {3317, 3935, 3853, 3856, 2719, 3934, 2884}

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = -\frac{2b\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{ad(a+b)} + \frac{2\sin(c+dx)\sqrt{\sec(c+dx)}}{ad} - \frac{2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad}$$

```
[In] Int[Sec[c + d*x]^(3/2)/(a + b*Cos[c + d*x]),x]
```

```
[Out] (-2*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a*d)
- (2*b*Sqrt[Cos[c + d*x]]*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2]*Sqrt[Se
c[c + d*x]])/(a*(a + b)*d) + (2*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(a*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3934

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(3/2)/(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[d*Sqrt[d*Sin[e + f*x]]*Sqrt[d*Csc[e + f*x]], Int[1
/(Sqrt[d*Sin[e + f*x]]*(b + a*Sin[e + f*x])), x], x] /; FreeQ[{a, b, d, e,
f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3935

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(5/2)/(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[d/b, Int[(d*Csc[e + f*x])^(3/2), x], x] - Dist[a*(
d/b), Int[(d*Csc[e + f*x])^(3/2)/(a + b*Csc[e + f*x]), x], x] /; FreeQ[{a,
b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \int \frac{\sec^{\frac{5}{2}}(c+dx)}{b+a\sec(c+dx)}\,dx\\
&= \frac{\int \sec^{\frac{3}{2}}(c+dx)\,dx}{a} - \frac{b\int \frac{\sec^{\frac{3}{2}}(c+dx)}{b+a\sec(c+dx)}\,dx}{a}\\
&= \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{ad} - \frac{\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx}{a}\\
&\quad - \frac{\left(b\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{a}\\
&= -\frac{2b\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{a(a+b)d}\\
&\quad + \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{ad} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{a}\\
&= -\frac{2\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{ad}\\
&\quad - \frac{2b\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{a(a+b)d}\\
&\quad + \frac{2\sqrt{\sec(c+dx)}\sin(c+dx)}{ad}\end{aligned}$$

Mathematica [A] (verified)

Time = 14.83 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.71

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{2\cot(c+dx)\left(aE\left(\arcsin\left(\sqrt{\sec(c+dx)}\right)\middle|-1\right)-(a+b)\,\text{EllipticF}\left(\arcsin\left(\sqrt{\sec(c+dx)}\right),-1\right)+b\,\text{Ell}\right.}{a^2d}$$

```
[In] Integrate[Sec[c + d*x]^(3/2)/(a + b*Cos[c + d*x]),x]
```

```
[Out] (2*Cot[c + d*x]*(a*EllipticE[ArcSin[Sqrt[Sec[c + d*x]]], -1] - (a + b)*Elli
pticF[ArcSin[Sqrt[Sec[c + d*x]]], -1] + b*EllipticPi[-(a/b), ArcSin[Sqrt[Se
c[c + d*x]]], -1])*Sqrt[-Tan[c + d*x]^2])/(a^2*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 353 vs. $2(159) = 318$.

Time = 3.50 (sec) , antiderivative size = 354, normalized size of antiderivative = 3.03

method	result
default	$-\frac{2\left(-2\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,(a-b)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+}{2}}}{}$

```
[In] int(sec(d*x+c)^(3/2)/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
```

```
[Out] -2*(-2*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(a-b)*cos(1/2*d
*x+1/2*c)*sin(1/2*d*x+1/2*c)^2+(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Elli
pticE(cos(1/2*d*x+1/2*c),2^(1/2))*a-(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/
2*c)^2)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)
*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*b-b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*
sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1
/2))*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2))/a/(-2*sin(1/2*d*
x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(a-b)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*
d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+b*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx$$

```
[In] integrate(sec(d*x+c)**(3/2)/(a+b*cos(d*x+c)),x)
```

```
[Out] Integral(sec(c + d*x)**(3/2)/(a + b*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{3}{2}}}{b\cos\left(dx+c\right)+a}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+b*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^(3/2)/(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{3}{2}}}{b\cos\left(dx+c\right)+a}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+b*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(3/2)/(b*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}{a+b\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)/(a + b*cos(c + d*x)),x)
[Out] int((1/cos(c + d*x))^(3/2)/(a + b*cos(c + d*x)), x)
```

3.714 $\int \frac{\sqrt{\sec(c+dx)}}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 49

$$\int \frac{\sqrt{\sec(c+dx)}}{a+b\cos(c+dx)}\,dx=\frac{2\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{(a+b)d}$$

```
[Out] 2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/
2*c),2*b/(a+b),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/(a+b)/d
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {3317, 3934, 2884}

$$\int \frac{\sqrt{\sec(c+dx)}}{a+b\cos(c+dx)}\,dx=\frac{2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{d(a+b)}$$

```
[In] Int[Sqrt[Sec[c + d*x]]/(a + b*Cos[c + d*x]),x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2]*Sqrt[Sec[c
+ d*x]])/((a + b)*d)
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3934

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(3/2)/(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[d*Sqrt[d*Sin[e + f*x]]*Sqrt[d*Csc[e + f*x]], Int[1
/(Sqrt[d*Sin[e + f*x]]*(b + a*Sin[e + f*x])), x], x] /; FreeQ[{a, b, d, e,
f}, x] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \frac{\sec^{\frac{3}{2}}(c+dx)}{b+a\sec(c+dx)}\,dx\\
&= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx\\
&= \frac{2\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{(a+b)d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.28 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.29

$$\int \frac{\sqrt{\sec(c+dx)}}{a+b\cos(c+dx)}\,dx = \frac{2\cot(c+dx)\left(\text{EllipticF}\left(\arcsin\left(\sqrt{\sec(c+dx)}\right),-1\right)-\text{EllipticPi}\left(-\frac{a}{b},\arcsin\left(\sqrt{\sec(c+dx)}\right),-1\right)\right)\sqrt{}}{ad}$$

```
[In] Integrate[Sqrt[Sec[c + d*x]]/(a + b*Cos[c + d*x]),x]
```

```
[Out] (2*Cot[c + d*x]*(EllipticF[ArcSin[Sqrt[Sec[c + d*x]]], -1] - EllipticPi[-(a
/b), ArcSin[Sqrt[Sec[c + d*x]]], -1])*Sqrt[-Tan[c + d*x]^2])/(a*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 149 vs. $2(71) = 142$.

Time = 1.82 (sec) , antiderivative size = 150, normalized size of antiderivative = 3.06

method	result	size
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,\Pi\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),-\frac{2b}{a-b},\sqrt{2}\right)}{(a-b)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$	150

```
[In] int(sec(d*x+c)^(1/2)/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
```

```
[Out] -2*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2
*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c
),-2*b/(a-b),2^(1/2))/(a-b)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^
(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{a+b\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+b*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{a+b\cos(c+dx)}\,dx = \int \frac{\sqrt{\sec(c+dx)}}{a+b\cos(c+dx)}\,dx$$

```
[In] integrate(sec(d*x+c)**(1/2)/(a+b*cos(d*x+c)),x)
```

```
[Out] Integral(sqrt(sec(c + d*x))/(a + b*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{a+b\cos(c+dx)}\,dx = \int \frac{\sqrt{\sec\left(dx+c\right)}}{b\cos\left(dx+c\right)+a}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+b*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(sqrt(sec(d*x + c))/(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{a+b\cos(c+dx)}\,dx = \int \frac{\sqrt{\sec\left(dx+c\right)}}{b\cos\left(dx+c\right)+a}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+b*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(sqrt(sec(d*x + c))/(b*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{a+b\cos(c+dx)}\,dx = \int \frac{\sqrt{\frac{1}{\cos(c+d\,x)}}}{a+b\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)/(a + b*cos(c + d*x)),x)
[Out] int((1/cos(c + d*x))^(1/2)/(a + b*cos(c + d*x)), x)
```

3.715 $\int \frac{1}{(a+b\cos(c+dx))\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 93

$$\int \frac{1}{(a+b\cos(c+dx))\sqrt{\sec(c+dx)}}\,dx = \frac{2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{bd} - \frac{2a\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{b(a+b)d}$$

```
[Out] 2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2
*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/b/d-2*a*(cos(1/2*d*x+1/2*c)^
2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2)
)*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/b/(a+b)/d
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 93, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {3317, 3933, 2882, 2720, 2884}

$$\int \frac{1}{(a+b\cos(c+dx))\sqrt{\sec(c+dx)}}\,dx = \frac{2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{bd} - \frac{2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{bd(a+b)}$$

```
[In] Int[1/((a + b*Cos[c + d*x])*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(b*d) -
 (2*a*Sqrt[Cos[c + d*x]]*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2]*Sqrt[Sec
[c + d*x]])/(b*(a + b)*d)
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2882

```
Int[Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]/((a_.) + (b_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[d/b, Int[1/Sqrt[c + d*Sin[e + f*x]], x], x]
 + Dist[(b*c - a*d)/b, Int[1/((a + b*Sin[e + f*x])*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 -
 b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3933

```
Int[Sqrt[csc[(e_.) + (f_.)*(x_)]*(d_.)]/(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_)), x_Symbol] :> Dist[Sqrt[d*Sin[e + f*x]]*(Sqrt[d*Csc[e + f*x]]/d), Int[S
qrt[d*Sin[e + f*x]]/(b + a*Sin[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f},
x] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \int \frac{\sqrt{\sec(c+dx)}}{b+a\sec(c+dx)}\,dx$$

$$= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{a+b\cos(c+dx)}\,dx$$

$$= \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{b} - \frac{\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{b}$$

$$= \frac{2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{bd} - \frac{2a\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{b(a+b)d}$$

Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 47, normalized size of antiderivative = 0.51

$$\int \frac{1}{(a+b\cos(c+dx))\sqrt{\sec(c+dx)}}\,dx = \frac{2\cot(c+dx)\,\text{EllipticPi}\left(-\frac{a}{b},\arcsin\left(\sqrt{\sec(c+dx)}\right),-1\right)\sqrt{-\tan^2(c+dx)}}{bd}$$

```
[In] Integrate[1/((a + b*Cos[c + d*x])*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (2*Cot[c + d*x]*EllipticPi[-(a/b), ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[-Ta
n[c + d*x]^2])/(b*d)
```

Maple [A] (verified)

Time = 2.50 (sec) , antiderivative size = 188, normalized size of antiderivative = 2.02

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\left(F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)a-F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right.\right.}{(a-b)b\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,d}$

```
[In] int(1/(a+cos(d*x+c)*b)/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2
*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c
),2^(1/2))*a-EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*b-a*EllipticPi(cos(1/2*d
*x+1/2*c),-2*b/(a-b),2^(1/2)))/(a-b)/b/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x
+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))\sqrt{\sec(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+b*cos(d*x+c))/sec(d*x+c)^(1/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \frac{1}{(a+b\cos(c+dx))\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{(a+b\cos{(c+dx)})\sqrt{\sec{(c+dx)}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))/sec(d*x+c)**(1/2),x)
[Out] Integral(1/((a + b*cos(c + d*x))*sqrt(sec(c + d*x))), x)
```

Maxima [F]

$$\int \frac{1}{(a+b\cos(c+dx))\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{(b\cos{(dx+c)}+a)\sqrt{\sec{(dx+c)}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))/sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)*sqrt(sec(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{(a+b\cos(c+dx))\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{(b\cos{(dx+c)}+a)\sqrt{\sec{(dx+c)}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)*sqrt(sec(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{\sqrt{\frac{1}{\cos(c+d\,x)}}\,\left(a+b\,\cos\left(c+d\,x\right)\right)}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))),x)
[Out] int(1/((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))), x)
```

3.716 $\int \frac{1}{(a+b\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 135

$$\int \frac{1}{(a+b\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{bd} - \frac{2a\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{b^2d} + \frac{2a^2\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{b^2(a+b)d}$$

```
[Out] 2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2
*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/b/d-2*a*(cos(1/2*d*x+1/2*c)^
2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c
)^(1/2)*sec(d*x+c)^(1/2)/b^2/d+2*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d
*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))*cos(d*x+c)^(1/2)
*sec(d*x+c)^(1/2)/b^2/(a+b)/d
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.348$, Rules used

= {3317, 3937, 3934, 2884, 3872, 3856, 2719, 2720}

$$\int \frac{1}{(a+b\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)}\,dx$$
$$= \frac{2a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{b^2d(a+b)} - \frac{2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b^2d} + \frac{2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{bd}$$

```
[In] Int[1/((a + b*Cos[c + d*x])*Sec[c + d*x]^(3/2)),x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(b*d) -
 (2*a*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(b^2
*d) + (2*a^2*Sqrt[Cos[c + d*x]]*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2]*S
qrt[Sec[c + d*x]])/(b^2*(a + b)*d)
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

```
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3934

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(3/2)/(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[d*Sqrt[d*Sin[e + f*x]]*Sqrt[d*Csc[e + f*x]], Int[1
/(Sqrt[d*Sin[e + f*x]]*(b + a*Sin[e + f*x])), x], x] /; FreeQ[{a, b, d, e,
f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3937

```
Int[1/(Sqrt[csc[(e_.) + (f_.)*(x_)]*(d_.)]*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
 (a_))), x_Symbol] :> Dist[b^2/(a^2*d^2), Int[(d*Csc[e + f*x])^(3/2)/(a + b
*Csc[e + f*x]), x], x] + Dist[1/a^2, Int[(a - b*Csc[e + f*x])/Sqrt[d*Csc[e
+ f*x]], x], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \frac{1}{\sqrt{\sec(c+dx)}(b+a\sec(c+dx))}\,dx \\
&= \frac{\int \frac{b-a\sec(c+dx)}{\sqrt{\sec(c+dx)}}\,dx}{b^2}+\frac{a^2\int \frac{\sec^{\frac{3}{2}}(c+dx)}{b+a\sec(c+dx)}\,dx}{b^2} \\
&= -\frac{a\int \sqrt{\sec(c+dx)}\,dx}{b^2}+\frac{\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx}{b} \\
&\quad+\frac{\left(a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{b^2} \\
&= \frac{2a^2\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{b^2(a+b)d} \\
&\quad-\frac{\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{b^2} \\
&\quad+\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{b}
\end{aligned}
$$

$$= \frac{2\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{bd} - \frac{2a\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{b^2d} + \frac{2a^2\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{b^2(a+b)d}$$

Mathematica [A] (verified)

Time = 19.53 (sec) , antiderivative size = 176, normalized size of antiderivative = 1.30

$$\int \frac{1}{(a+b\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{\cot(c+dx)\left(-b\sec^{\frac{3}{2}}(c+dx)-b\cos(2(c+dx))\sec^{\frac{3}{2}}(c+dx)+b\sec^{\frac{7}{2}}(c+dx)+b\cos(2(c+dx))\sec^{\frac{7}{2}}(c-\right.}{}$$

```
[In] Integrate[1/((a + b*Cos[c + d*x])*Sec[c + d*x]^(3/2)),x]
```

```
[Out] (Cot[c + d*x]*(-(b*Sec[c + d*x]^(3/2)) - b*Cos[2*(c + d*x)]*Sec[c + d*x]^(3
/2) + b*Sec[c + d*x]^(7/2) + b*Cos[2*(c + d*x)]*Sec[c + d*x]^(7/2) - 2*b*El
lipticE[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[-Tan[c + d*x]^2] + 2*b*Ellipti
cF[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[-Tan[c + d*x]^2] - 2*a*EllipticPi[-
(a/b), ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[-Tan[c + d*x]^2]))/(b^2*d)
```

Maple [A] (verified)

Time = 3.78 (sec) , antiderivative size = 227, normalized size of antiderivative = 1.68

method	result
default	$\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\left(F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)a^2-F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\right.}{b^2(a-b)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2\left(\cos\right.}}$

```
[In] int(1/(a+cos(d*x+c)*b)/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2*
c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*(EllipticF(cos(1/2*d*x+1/2*c)
,2^(1/2))*a^2-EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*a*b+EllipticE(cos(1/2*d
*x+1/2*c),2^(1/2))*a*b-EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*b^2-a^2*Ellipt
icPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2)))/b^2/(a-b)/(-2*sin(1/2*d*x+1/2*
c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2
-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+b*cos(d*x+c))/sec(d*x+c)^(3/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \frac{1}{(a+b\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{(a+b\cos{(c+dx)})\sec^{\frac{3}{2}}{(c+dx)}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))/sec(d*x+c)**(3/2),x)
[Out] Integral(1/((a + b*cos(c + d*x))*sec(c + d*x)**(3/2)), x)
```

Maxima [F]

$$\int \frac{1}{(a+b\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos{(dx+c)}+a)\sec{(dx+c)}^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))/sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)*sec(d*x + c)^(3/2)), x)
```

Giac [F]

$$\int \frac{1}{(a+b\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos{(dx+c)}+a)\sec{(dx+c)}^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)*sec(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}\,\left(a+b\,\cos\left(c+d\,x\right)\right)}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))),x)
[Out] int(1/((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))), x)
```

3.717 $\int \frac{1}{(a+b\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 172

$$\int \frac{1}{(a+b\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)}\,dx = -\frac{2a\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{b^2d} + \frac{2(3a^2+b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3b^3d} - \frac{2a^3\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{b^3(a+b)d} + \frac{2\sin(c+dx)}{3bd\sqrt{\sec(c+dx)}}$$

```
[Out] 2/3*sin(d*x+c)/b/d/sec(d*x+c)^(1/2)-2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/
2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x
+c)^(1/2)/b^2/d+2/3*(3*a^2+b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/
2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2
)/b^3/d-2*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(si
n(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/b^3/(
a+b)/d
```

Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.391$, Rules used = {3317, 3938, 4191, 3934, 2884, 3872, 3856, 2719, 2720}

$$\int \frac{1}{(a+b\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)}\,dx = -\frac{2a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{b^3d(a+b)} + \frac{2(3a^2+b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^3d} - \frac{2a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^2d} + \frac{2\sin(c+dx)}{3bd\sqrt{\sec(c+dx)}}$$

```
[In] Int[1/((a + b*Cos[c + d*x])*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (-2*a*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(b^2
*d) + (2*(3*a^2 + b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Se
c[c + d*x]])/(3*b^3*d) - (2*a^3*Sqrt[Cos[c + d*x]]*EllipticPi[(2*b)/(a + b)
, (c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(b^3*(a + b)*d) + (2*Sin[c + d*x])/(3
*b*d*Sqrt[Sec[c + d*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
```

```
!IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3934

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(3/2)/(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[d*Sqrt[d*Sin[e + f*x]]*Sqrt[d*Csc[e + f*x]], Int[1
/(Sqrt[d*Sin[e + f*x]]*(b + a*Sin[e + f*x])), x], x] /; FreeQ[{a, b, d, e,
f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3938

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)/(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_)), x_Symbol] :> Simp[Cot[e + f*x]*((d*Csc[e + f*x])^n/(a*f*n)), x] - Dis
t[1/(a*d*n), Int[((d*Csc[e + f*x])^(n + 1)/(a + b*Csc[e + f*x]))*Simp[b*n -
 a*(n + 1)*Csc[e + f*x] - b*(n + 1)*Csc[e + f*x]^2, x], x], x] /; FreeQ[{a,
 b, d, e, f}, x] && NeQ[a^2 - b^2, 0] && LeQ[n, -1] && IntegerQ[2*n]
```

Rule 4191

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))/(Sqrt[csc[(e_.) + (f_.)*(x_)]*(d_.)]*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))), x_Symbol] :> Dist[(A*b^2 - a*b*B + a^2*C)/(a^2*d^2), Int[(d*Csc[e + f
*x])^(3/2)/(a + b*Csc[e + f*x]), x], x] + Dist[1/a^2, Int[(a*A - (A*b - a*B
)*Csc[e + f*x])/Sqrt[d*Csc[e + f*x]], x], x] /; FreeQ[{a, b, d, e, f, A, B,
 C}, x] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \int \frac{1}{\sec^{\frac{3}{2}}(c+dx)(b+a\sec(c+dx))}\,dx$$

$$= \frac{2\sin(c+dx)}{3bd\sqrt{\sec(c+dx)}} + \frac{2\int \frac{-\frac{3a}{2}+\frac{1}{2}b\sec(c+dx)+\frac{1}{2}a\sec^2(c+dx)}{\sqrt{\sec(c+dx)}(b+a\sec(c+dx))}\,dx}{3b}$$

$$= \frac{2\sin(c+dx)}{3bd\sqrt{\sec(c+dx)}} + \frac{2\int \frac{-\frac{3ab}{2}-\left(-\frac{3a^2}{2}-\frac{b^2}{2}\right)\sec(c+dx)}{\sqrt{\sec(c+dx)}}dx}{3b^3} - \frac{a^3\int \frac{\sec^{\frac{3}{2}}(c+dx)}{b+a\sec(c+dx)}dx}{b^3}$$

$$= \frac{2\sin(c+dx)}{3bd\sqrt{\sec(c+dx)}} - \frac{a\int \frac{1}{\sqrt{\sec(c+dx)}}dx}{b^2} + \frac{(3a^2+b^2)\int \sqrt{\sec(c+dx)}dx}{3b^3} - \frac{\left(a^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}dx}{b^3}$$

$$= -\frac{2a^3\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{b^3(a+b)d} + \frac{2\sin(c+dx)}{3bd\sqrt{\sec(c+dx)}} - \frac{\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}dx}{b^2} + \frac{\left((3a^2+b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}dx}{3b^3}$$

$$= -\frac{2a\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{b^2d} + \frac{2(3a^2+b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3b^3d} - \frac{2a^3\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{b^3(a+b)d} + \frac{2\sin(c+dx)}{3bd\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 21.42 (sec) , antiderivative size = 196, normalized size of antiderivative = 1.14

$$\int \frac{1}{(a+b\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)}dx = -\frac{\cot(c+dx)\left(-b^2\sqrt{\sec(c+dx)}+6ab\sec^{\frac{3}{2}}(c+dx)-6ab\cos(2(c+dx))\sec^{\frac{3}{2}}(c+dx)+b^2\cos(3(c+dx)\right.}{}$$

```
[In] Integrate[1/((a + b*Cos[c + d*x])*Sec[c + d*x]^(5/2)),x]
```

```
[Out] -1/6*(Cot[c + d*x]*(-(b^2*Sqrt[Sec[c + d*x]]) + 6*a*b*Sec[c + d*x]^(3/2) -
6*a*b*Cos[2*(c + d*x)]*Sec[c + d*x]^(3/2) + b^2*Cos[3*(c + d*x)]*Sec[c + d*
x]^(3/2) - 12*a*b*EllipticE[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[-Tan[c + d
*x]^2] + 4*(3*a - b)*b*EllipticF[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[-Tan[
c + d*x]^2] - 12*a^2*EllipticPi[-(a/b), ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqr
t[-Tan[c + d*x]^2]))/(b^3*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 551 vs. 2(232) = 464.

Time = 3.93 (sec) , antiderivative size = 552, normalized size of antiderivative = 3.21

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a b^2-4\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b^3-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\mathrm{si}\right.\right.}{}$

```
[In] int(1/(a+cos(d*x+c)*b)/sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*((2*cos(1/2*d*x+1/2*c)^2-1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(4*cos(1/2*d*x
+1/2*c)*sin(1/2*d*x+1/2*c)^4*a*b^2-4*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^
4*b^3-2*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2*a*b^2+2*cos(1/2*d*x+1/2*c)*
sin(1/2*d*x+1/2*c)^2*b^3+3*a^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+
1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-3*a^2*b*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/
2*c),2^(1/2))+a*b^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)
^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-b^3*(sin(1/2*d*x+1/2*c)^2)^(1/
2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+3
*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(co
s(1/2*d*x+1/2*c),2^(1/2))*a^2*b-3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d
*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*a*b^2-3*a^3*(sin
(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticPi(cos(1/
2*d*x+1/2*c),-2*b/(a-b),2^(1/2)))/b^3/(a-b)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/
2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+b*cos(d*x+c))/sec(d*x+c)^(5/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+b*cos(d*x+c))/sec(d*x+c)**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+b\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos(dx+c)+a)\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))/sec(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)*sec(d*x + c)^(5/2)), x)
```

Giac [F]

$$\int \frac{1}{(a+b\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos(dx+c)+a)\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))/sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)*sec(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}\,(a+b\,\cos(c+d\,x))}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))),x)
[Out] int(1/((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))), x)
```

3.718 $\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 341

$$\begin{aligned}\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx &= \frac{b(4a^2-5b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a^3(a^2-b^2)\,d}\\ &+\frac{(2a^2-5b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3a^2(a^2-b^2)\,d}\\ &+\frac{b^2(7a^2-5b^2)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{a^3(a-b)(a+b)^2d}\\ &-\frac{b(4a^2-5b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{a^3(a^2-b^2)\,d}\\ &+\frac{(2a^2-5b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2(a^2-b^2)\,d}+\frac{b^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{a(a^2-b^2)\,d(b+a\sec(c+dx))}\end{aligned}$$

```
[Out] 1/3*(2*a^2-5*b^2)*sec(d*x+c)^(3/2)*sin(d*x+c)/a^2/(a^2-b^2)/d+b^2*sec(d*x+c
)^(5/2)*sin(d*x+c)/a/(a^2-b^2)/d/(b+a*sec(d*x+c))-b*(4*a^2-5*b^2)*sin(d*x+c
)*sec(d*x+c)^(1/2)/a^3/(a^2-b^2)/d+b*(4*a^2-5*b^2)*(cos(1/2*d*x+1/2*c)^2)^(
1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1
/2)*sec(d*x+c)^(1/2)/a^3/(a^2-b^2)/d+1/3*(2*a^2-5*b^2)*(cos(1/2*d*x+1/2*c)^
2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c
)^(1/2)*sec(d*x+c)^(1/2)/a^2/(a^2-b^2)/d+b^2*(7*a^2-5*b^2)*(cos(1/2*d*x+1/2
*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(
1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^3/(a-b)/(a+b)^2/d
```

Rubi [A] (verified)

Time = 1.10 (sec) , antiderivative size = 341, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {3317, 3930, 4187, 4191, 3934, 2884, 3872, 3856, 2719, 2720}

$$\begin{aligned}
&\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx \\
&= \frac{b^2\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{ad\,(a^2-b^2)\,(a\sec(c+dx)+b)} + \frac{(2a^2-5b^2)\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3a^2d\,(a^2-b^2)} \\
&\quad + \frac{(2a^2-5b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3a^2d\,(a^2-b^2)} \\
&\quad - \frac{b(4a^2-5b^2)\sin(c+dx)\sqrt{\sec(c+dx)}}{a^3d\,(a^2-b^2)} \\
&\quad + \frac{b(4a^2-5b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{a^3d\,(a^2-b^2)} \\
&\quad + \frac{b^2(7a^2-5b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a^3d(a-b)(a+b)^2}
\end{aligned}$$

```
[In] Int[Sec[c + d*x]^(5/2)/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (b*(4*a^2 - 5*b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c
+ d*x]])/(a^3*(a^2 - b^2)*d) + ((2*a^2 - 5*b^2)*Sqrt[Cos[c + d*x]]*Elliptic
F[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(3*a^2*(a^2 - b^2)*d) + (b^2*(7*a^2 -
 5*b^2)*Sqrt[Cos[c + d*x]]*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2]*Sqrt[S
ec[c + d*x]])/(a^3*(a - b)*(a + b)^2*d) - (b*(4*a^2 - 5*b^2)*Sqrt[Sec[c + d
*x]]*Sin[c + d*x])/(a^3*(a^2 - b^2)*d) + ((2*a^2 - 5*b^2)*Sec[c + d*x]^(3/2
)*Sin[c + d*x])/(3*a^2*(a^2 - b^2)*d) + (b^2*Sec[c + d*x]^(5/2)*Sin[c + d*x
])/(a*(a^2 - b^2)*d*(b + a*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
```

```
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3930

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-a^2)*d^3*Cot[e + f*x]*(a + b*Csc[e + f*x])^(
m + 1)*((d*Csc[e + f*x])^(n - 3)/(b*f*(m + 1)*(a^2 - b^2))), x] + Dist[d^3/
(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^
(n - 3)*Simp[a^2*(n - 3) + a*b*(m + 1)*Csc[e + f*x] - (a^2*(n - 2) + b^2*(m
 + 1))*Csc[e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 -
 b^2, 0] && LtQ[m, -1] && (IGtQ[n, 3] || (IntegersQ[n + 1/2, 2*m] && GtQ[n,
 2]))
```

Rule 3934

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(3/2)/(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[d*Sqrt[d*Sin[e + f*x]]*Sqrt[d*Csc[e + f*x]], Int[1
/(Sqrt[d*Sin[e + f*x]]*(b + a*Sin[e + f*x])), x], x] /; FreeQ[{a, b, d, e,
f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 4187

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))*(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))^(m_), x_Symbol] :> Simp[(-C)*d*Cot[e + f*x]*(a + b*Csc[e + f*x])^(m + 1
)*((d*Csc[e + f*x])^(n - 1)/(b*f*(m + n + 1))), x] + Dist[d/(b*(m + n + 1))
```

```
, Int[(a + b*Csc[e + f*x])^m*(d*Csc[e + f*x])^(n - 1)*Simp[a*C*(n - 1) + (A
*b*(m + n + 1) + b*C*(m + n))*Csc[e + f*x] + (b*B*(m + n + 1) - a*C*n)*Csc[
e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f, A, B, C, m}, x] && NeQ[a^2
- b^2, 0] && GtQ[n, 0]
```

Rule 4191

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))/(Sqrt[csc[(e_.) + (f_.)*(x_)]*(d_.)]*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))), x_Symbol] :> Dist[(A*b^2 - a*b*B + a^2*C)/(a^2*d^2), Int[(d*Csc[e + f
*x])^(3/2)/(a + b*Csc[e + f*x]), x], x] + Dist[1/a^2, Int[(a*A - (A*b - a*B
)*Csc[e + f*x])/Sqrt[d*Csc[e + f*x]], x], x] /; FreeQ[{a, b, d, e, f, A, B,
 C}, x] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \int \frac{\sec^{\frac{9}{2}}(c+dx)}{(b+a\sec(c+dx))^2}\,dx$$

$$= \frac{b^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{a\,(a^2-b^2)\,d(b+a\sec(c+dx))} + \frac{\int \frac{\sec^{\frac{3}{2}}(c+dx)\left(\frac{3b^2}{2}-ab\sec(c+dx)+\frac{1}{2}(2a^2-5b^2)\sec^2(c+dx)\right)}{b+a\sec(c+dx)}\,dx}{a\,(a^2-b^2)}$$

$$= \frac{(2a^2-5b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2\,(a^2-b^2)\,d} + \frac{b^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{a\,(a^2-b^2)\,d(b+a\sec(c+dx))} + \frac{2\int \frac{\sqrt{\sec(c+dx)}\left(\frac{1}{4}b(2a^2-5b^2)+\frac{1}{2}a(a^2+2b^2)\sec(c+dx)-\frac{3}{4}b(4a^2-5b^2)\sec^2(c+dx)\right)}{b+a\sec(c+dx)}\,dx}{3a^2\,(a^2-b^2)}$$

$$= -\frac{b(4a^2-5b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{a^3\,(a^2-b^2)\,d} + \frac{(2a^2-5b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2\,(a^2-b^2)\,d} + \frac{b^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{a\,(a^2-b^2)\,d(b+a\sec(c+dx))} + \frac{4\int \frac{\frac{3}{8}b^2(4a^2-5b^2)+\frac{1}{4}ab(7a^2-10b^2)\sec(c+dx)+\frac{1}{8}(2a^4+16a^2b^2-15b^4)\sec^2(c+dx)}{\sqrt{\sec(c+dx)}(b+a\sec(c+dx))}\,dx}{3a^3\,(a^2-b^2)}$$

$$= -\frac{b(4a^2-5b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{a^3\,(a^2-b^2)\,d} + \frac{(2a^2-5b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2\,(a^2-b^2)\,d} + \frac{b^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{a\,(a^2-b^2)\,d(b+a\sec(c+dx))} + \frac{4\int \frac{\frac{3}{8}b^3(4a^2-5b^2)-\left(-\frac{1}{4}ab^2(7a^2-10b^2)+\frac{3}{8}ab^2(4a^2-5b^2)\right)\sec(c+dx)}{\sqrt{\sec(c+dx)}}\,dx}{3a^3b^2\,(a^2-b^2)} + \frac{(b^2(7a^2-5b^2))\int \frac{\sec^{\frac{3}{2}}(c+dx)}{b+a\sec(c+dx)}\,dx}{2a^3\,(a^2-b^2)}$$

$$= -\frac{b(4a^2-5b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{a^3(a^2-b^2)d} + \frac{(2a^2-5b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2(a^2-b^2)d} + \frac{b^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{a(a^2-b^2)d(b+a\sec(c+dx))} + \frac{(2a^2-5b^2)\int\sqrt{\sec(c+dx)}\,dx}{6a^2(a^2-b^2)} + \frac{(b(4a^2-5b^2))\int\frac{1}{\sqrt{\sec(c+dx)}}\,dx}{2a^3(a^2-b^2)} + \frac{\left(b^2(7a^2-5b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{2a^3(a^2-b^2)}$$

$$= \frac{b^2(7a^2-5b^2)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{a^3(a-b)(a+b)^2d} - \frac{b(4a^2-5b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{a^3(a^2-b^2)d} + \frac{(2a^2-5b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2(a^2-b^2)d} + \frac{b^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{a(a^2-b^2)d(b+a\sec(c+dx))} + \frac{\left((2a^2-5b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{6a^2(a^2-b^2)} + \frac{\left(b(4a^2-5b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx}{2a^3(a^2-b^2)}$$

$$= \frac{b(4a^2-5b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a^3(a^2-b^2)d} + \frac{(2a^2-5b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{3a^2(a^2-b^2)d} + \frac{b^2(7a^2-5b^2)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{a^3(a-b)(a+b)^2d} - \frac{b(4a^2-5b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{a^3(a^2-b^2)d} + \frac{(2a^2-5b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2(a^2-b^2)d} + \frac{b^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{a(a^2-b^2)d(b+a\sec(c+dx))}$$

Mathematica [A] (verified)

Time = 4.85 (sec) , antiderivative size = 294, normalized size of antiderivative = 0.86

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$
$$= \frac{\frac{2a\left(\frac{3b^2(-4a^2+5b^2)\sin(c+dx)}{a^2-b^2}+2a(-5b+a\sec(c+dx))\tan(c+dx)\right)}{(a+b\cos(c+dx))\sqrt{\sec(c+dx)}}+\frac{\cot(c+dx)\left(-6ab(4a^2-5b^2)E\left(\arcsin\left(\sqrt{\sec(c+dx)}\right)\middle|-1\right)\sqrt{-\tan^2(c+dx)}\right.}{}}{}$$

```
[In] Integrate[Sec[c + d*x]^(5/2)/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] ((2*a*((3*b^2*(-4*a^2 + 5*b^2)*Sin[c + d*x])/(a^2 - b^2) + 2*a*(-5*b + a*Se
c[c + d*x])*Tan[c + d*x]))/((a + b*Cos[c + d*x])*Sqrt[Sec[c + d*x]]) + (Cot
[c + d*x]*(-6*a*b*(4*a^2 - 5*b^2)*EllipticE[ArcSin[Sqrt[Sec[c + d*x]]], -1]
*Sqrt[-Tan[c + d*x]^2] + 2*(2*a^4 + 12*a^3*b + 16*a^2*b^2 - 15*a*b^3 - 15*b
^4)*EllipticF[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[-Tan[c + d*x]^2] + 6*b*(
a*(4*a^2 - 5*b^2)*Sec[c + d*x]^(3/2)*Sin[c + d*x]^2 + b*(-7*a^2 + 5*b^2)*El
lipticPi[-(a/b), ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[-Tan[c + d*x]^2])))/(
(a - b)*(a + b)))/(6*a^4*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 980 vs. 2(397) = 794.

Time = 37.46 (sec) , antiderivative size = 981, normalized size of antiderivative = 2.88

method	result	size
default	Expression too large to display	981

```
[In] int(sec(d*x+c)^(5/2)/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/a^2*(-1/6*cos
(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1
/2*d*x+1/2*c)^2-1/2)^2+1/3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2
*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellipti
cF(cos(1/2*d*x+1/2*c),2^(1/2)))-4/a^3*b/sin(1/2*d*x+1/2*c)^2/(2*sin(1/2*d*x
+1/2*c)^2-1)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/
2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d
*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))+2*b^2/a^2*(-1/a
*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*
c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d*x+1/2*c)^
2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2
*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a^2-b^2)*b/
a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/
```

```
2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(
1/2))+1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)
^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(
cos(1/2*d*x+1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2
*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin
(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+
1/a/(a^2-b^2)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d
*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*E
llipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2)))-8*b^3/a^3/(-2*a*b+2*b^2)*
(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*
d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b
/(a-b),2^(1/2)))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+b*cos(d*x+c))^2,x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(5/2)/(a+b*cos(d*x+c))**2,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^(5/2)/(b*cos(d*x + c) + a)^2, x)
```

Giac [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+b*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(5/2)/(b*cos(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}}{\left(a+b\,\cos\left(c+d\,x\right)\right)^2}\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)/(a + b*cos(c + d*x))^2,x)
[Out] int((1/cos(c + d*x))^(5/2)/(a + b*cos(c + d*x))^2, x)
```

3.719 $\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 277

$$\begin{aligned}\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx &= -\frac{(2a^2-3b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a^2(a^2-b^2)d} \\ &+\frac{b\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{a(a^2-b^2)d} \\ &-\frac{b(5a^2-3b^2)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{a^2(a-b)(a+b)^2d} \\ &+\frac{(2a^2-3b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2(a^2-b^2)d}+\frac{b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{a(a^2-b^2)d(b+a\sec(c+dx))}\end{aligned}$$

```
[Out] b^2*sec(d*x+c)^(3/2)*sin(d*x+c)/a/(a^2-b^2)/d/(b+a*sec(d*x+c))+(2*a^2-3*b^2
)*sin(d*x+c)*sec(d*x+c)^(1/2)/a^2/(a^2-b^2)/d-(2*a^2-3*b^2)*(cos(1/2*d*x+1/
2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(
d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^2/(a^2-b^2)/d+b*(cos(1/2*d*x+1/2*c)^2)^(1/2
)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)
*sec(d*x+c)^(1/2)/a/(a^2-b^2)/d-b*(5*a^2-3*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2
)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))*cos(d
*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^2/(a-b)/(a+b)^2/d
```

Rubi [A] (verified)

Time = 0.75 (sec) , antiderivative size = 277, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {3317, 3930, 4187, 4191, 3934, 2884, 3872, 3856, 2719, 2720}

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \frac{b^2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{ad\,(a^2-b^2)\,(a\sec(c+dx)+b)} + \frac{(2a^2-3b^2)\sin(c+dx)\sqrt{\sec(c+dx)}}{a^2d\,(a^2-b^2)} + \frac{b\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{ad\,(a^2-b^2)} - \frac{(2a^2-3b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d\,(a^2-b^2)} - \frac{b(5a^2-3b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{a^2d(a-b)(a+b)^2}$$

```
[In] Int[Sec[c + d*x]^(3/2)/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] -(((2*a^2 - 3*b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c
+ d*x]])/(a^2*(a^2 - b^2)*d)) + (b*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2
, 2]*Sqrt[Sec[c + d*x]])/(a*(a^2 - b^2)*d) - (b*(5*a^2 - 3*b^2)*Sqrt[Cos[c
+ d*x]]*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a^2*
(a - b)*(a + b)^2*d) + ((2*a^2 - 3*b^2)*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(a
^2*(a^2 - b^2)*d) + (b^2*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(a*(a^2 - b^2)*d*
(b + a*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3930

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-a^2)*d^3*Cot[e + f*x]*(a + b*Csc[e + f*x])^(
m + 1)*((d*Csc[e + f*x])^(n - 3)/(b*f*(m + 1)*(a^2 - b^2))), x] + Dist[d^3/
(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^
(n - 3)*Simp[a^2*(n - 3) + a*b*(m + 1)*Csc[e + f*x] - (a^2*(n - 2) + b^2*(m
 + 1))*Csc[e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 -
 b^2, 0] && LtQ[m, -1] && (IGtQ[n, 3] || (IntegersQ[n + 1/2, 2*m] && GtQ[n,
 2]))
```

Rule 3934

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(3/2)/(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[d*Sqrt[d*Sin[e + f*x]]*Sqrt[d*Csc[e + f*x]], Int[1
/(Sqrt[d*Sin[e + f*x]]*(b + a*Sin[e + f*x])), x], x] /; FreeQ[{a, b, d, e,
f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 4187

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))*(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))^(m_), x_Symbol] :> Simp[(-C)*d*Cot[e + f*x]*(a + b*Csc[e + f*x])^(m + 1
)*((d*Csc[e + f*x])^(n - 1)/(b*f*(m + n + 1))), x] + Dist[d/(b*(m + n + 1))
, Int[(a + b*Csc[e + f*x])^m*(d*Csc[e + f*x])^(n - 1)*Simp[a*C*(n - 1) + (A
*b*(m + n + 1) + b*C*(m + n))*Csc[e + f*x] + (b*B*(m + n + 1) - a*C*n)*Csc[
e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f, A, B, C, m}, x] && NeQ[a^2
```

```
- b^2, 0] && GtQ[n, 0]
```

Rule 4191

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))/(Sqrt[csc[(e_.) + (f_.)*(x_)]*(d_.)]*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))), x_Symbol] :> Dist[(A*b^2 - a*b*B + a^2*C)/(a^2*d^2), Int[(d*Csc[e + f
*x])^(3/2)/(a + b*Csc[e + f*x]), x], x] + Dist[1/a^2, Int[(a*A - (A*b - a*B
)*Csc[e + f*x])/Sqrt[d*Csc[e + f*x]], x], x] /; FreeQ[{a, b, d, e, f, A, B,
 C}, x] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \int \frac{\sec^{\frac{7}{2}}(c+dx)}{(b+a\sec(c+dx))^2}\,dx$$

$$= \frac{b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{a(a^2-b^2)d(b+a\sec(c+dx))} + \frac{\int \frac{\sqrt{\sec(c+dx)}\left(\frac{b^2}{2}-ab\sec(c+dx)+\frac{1}{2}(2a^2-3b^2)\sec^2(c+dx)\right)}{b+a\sec(c+dx)}\,dx}{a(a^2-b^2)}$$

$$= \frac{(2a^2-3b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2(a^2-b^2)d} + \frac{b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{a(a^2-b^2)d(b+a\sec(c+dx))} + \frac{2\int \frac{-\frac{1}{4}b(2a^2-3b^2)-\frac{1}{2}a(a^2-2b^2)\sec(c+dx)-\frac{1}{4}b(4a^2-3b^2)\sec^2(c+dx)}{\sqrt{\sec(c+dx)}(b+a\sec(c+dx))}\,dx}{a^2(a^2-b^2)}$$

$$= \frac{(2a^2-3b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2(a^2-b^2)d} + \frac{b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{a(a^2-b^2)d(b+a\sec(c+dx))} + \frac{2\int \frac{-\frac{1}{4}b^2(2a^2-3b^2)-\left(-\frac{1}{4}ab(2a^2-3b^2)+\frac{1}{2}ab(a^2-2b^2)\right)\sec(c+dx)}{\sqrt{\sec(c+dx)}}\,dx}{a^2b^2(a^2-b^2)} - \frac{(b(5a^2-3b^2))\int \frac{\sec^{\frac{3}{2}}(c+dx)}{b+a\sec(c+dx)}\,dx}{2a^2(a^2-b^2)}$$

$$= \frac{(2a^2-3b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2(a^2-b^2)d} + \frac{b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{a(a^2-b^2)d(b+a\sec(c+dx))} + \frac{b\int\sqrt{\sec(c+dx)}\,dx}{2a(a^2-b^2)} - \frac{(2a^2-3b^2)\int\frac{1}{\sqrt{\sec(c+dx)}}\,dx}{2a^2(a^2-b^2)} - \frac{\left(b(5a^2-3b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{2a^2(a^2-b^2)}$$

$$= -\frac{b(5a^2-3b^2)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{a^2(a-b)(a+b)^2d} + \frac{(2a^2-3b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2(a^2-b^2)\,d} + \frac{b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{a(a^2-b^2)\,d(b+a\sec(c+dx))} + \frac{\left(b\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}dx}{2a(a^2-b^2)} - \frac{\left((2a^2-3b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}dx}{2a^2(a^2-b^2)}$$

$$= -\frac{(2a^2-3b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a^2(a^2-b^2)\,d} + \frac{b\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{a(a^2-b^2)\,d} - \frac{b(5a^2-3b^2)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{a^2(a-b)(a+b)^2d} + \frac{(2a^2-3b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{a^2(a^2-b^2)\,d} + \frac{b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{a(a^2-b^2)\,d(b+a\sec(c+dx))}$$

Mathematica [A] (verified)

Time = 2.78 (sec) , antiderivative size = 351, normalized size of antiderivative = 1.27

$$\int\frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^2}dx = \frac{\frac{2a(2a^2b-3b^3+2a(a^2-b^2)\sec(c+dx))\sin(c+dx)}{(a^2-b^2)(a+b\cos(c+dx))\sqrt{\sec(c+dx)}} + \frac{\cot(c+dx)\left(-2a^3\sec^{\frac{3}{2}}(c+dx)+3ab^2\sec^{\frac{3}{2}}(c+dx)+2a^3\cos(2(c+dx))\sec^{\frac{3}{2}}(c+dx)-3ab^2\cos(2(\cdots\right.}{\cdots}}{\cdots}$$

```
[In] Integrate[Sec[c + d*x]^(3/2)/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] ((2*a*(2*a^2*b - 3*b^3 + 2*a*(a^2 - b^2)*Sec[c + d*x])*Sin[c + d*x])/((a^2
- b^2)*(a + b*Cos[c + d*x])*Sqrt[Sec[c + d*x]]) + (Cot[c + d*x]*(-2*a^3*Sec
[c + d*x]^(3/2) + 3*a*b^2*Sec[c + d*x]^(3/2) + 2*a^3*Cos[2*(c + d*x)]*Sec[c
 + d*x]^(3/2) - 3*a*b^2*Cos[2*(c + d*x)]*Sec[c + d*x]^(3/2) + 2*a*(2*a^2 -
3*b^2)*EllipticE[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[-Tan[c + d*x]^2] - 2*
(2*a^3 + 4*a^2*b - 3*a*b^2 - 3*b^3)*EllipticF[ArcSin[Sqrt[Sec[c + d*x]]], -
1]*Sqrt[-Tan[c + d*x]^2] + 10*a^2*b*EllipticPi[-(a/b), ArcSin[Sqrt[Sec[c +
d*x]]], -1]*Sqrt[-Tan[c + d*x]^2] - 6*b^3*EllipticPi[-(a/b), ArcSin[Sqrt[Se
c[c + d*x]]], -1]*Sqrt[-Tan[c + d*x]^2]))/((a - b)*(a + b)))/(2*a^3*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 846 vs. $2(339) = 678$.

Time = 5.98 (sec) , antiderivative size = 847, normalized size of antiderivative = 3.06

method	result	size
default	Expression too large to display	847

```
[In] int(sec(d*x+c)^(3/2)/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/a^2/sin(1/2*d
*x+1/2*c)^2/(2*sin(1/2*d*x+1/2*c)^2-1)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x
+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-(sin(1/2*d*x+1/
2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c)
,2^(1/2)))+4*b^2/a^2/(-2*a*b+2*b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/
2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2
)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))-2/a*b*(-1/a*b^2/(a^2-b^
2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/
(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a^2-b^2)*b/a*(sin(1/2*d
*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)
^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/2/(a
^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/
(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+
1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)
*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2
*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+1/a/(a^2-b^2
)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+
1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(co
s(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/
2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+b*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$

```
[In] integrate(sec(d*x+c)**(3/2)/(a+b*cos(d*x+c))**2,x)
[Out] Integral(sec(c + d*x)**(3/2)/(a + b*cos(c + d*x))**2, x)
```

Maxima [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\sec(dx+c)^{\frac{3}{2}}}{(b\cos(dx+c)+a)^2}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^(3/2)/(b*cos(d*x + c) + a)^2, x)
```

Giac [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\sec(dx+c)^{\frac{3}{2}}}{(b\cos(dx+c)+a)^2}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+b*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(3/2)/(b*cos(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}{(a+b\,\cos(c+d\,x))^2}\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)/(a + b*cos(c + d*x))^2,x)
[Out] int((1/cos(c + d*x))^(3/2)/(a + b*cos(c + d*x))^2, x)
```

3.720 $\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 217

$$
\begin{aligned}
\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^2}\,dx
&= -\frac{b\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a\left(a^2-b^2\right)d} \\
&\quad -\frac{\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{\left(a^2-b^2\right)d} \\
&\quad +\frac{\left(3a^2-b^2\right)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{a(a-b)(a+b)^2d} \\
&\quad +\frac{b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{a\left(a^2-b^2\right)d(b+a\sec(c+dx))}
\end{aligned}
$$

```
[Out] b^2*sin(d*x+c)*sec(d*x+c)^(1/2)/a/(a^2-b^2)/d/(b+a*sec(d*x+c))-b*(cos(1/2*d
*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))
*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a/(a^2-b^2)/d-(cos(1/2*d*x+1/2*c)^2)^(1/
2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2
)*sec(d*x+c)^(1/2)/(a^2-b^2)/d+(3*a^2-b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos
(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))*cos(d*x+c)
^(1/2)*sec(d*x+c)^(1/2)/a/(a-b)/(a+b)^2/d
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.391$, Rules used = {3317, 3930, 4191, 3934, 2884, 3872, 3856, 2719, 2720}

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^2}\,dx$$
$$= \frac{b^2\sin(c+dx)\sqrt{\sec(c+dx)}}{ad\,(a^2-b^2)\,(a\sec(c+dx)+b)} - \frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\,(a^2-b^2)}$$
$$- \frac{b\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad\,(a^2-b^2)}$$
$$+ \frac{(3a^2-b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{ad(a-b)(a+b)^2}$$

```
[In] Int[Sqrt[Sec[c + d*x]]/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] -((b*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a*(a
^2 - b^2)*d)) - (Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c +
d*x]])/((a^2 - b^2)*d) + ((3*a^2 - b^2)*Sqrt[Cos[c + d*x]]*EllipticPi[(2*b)
/(a + b), (c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(a*(a - b)*(a + b)^2*d) + (b^
2*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(a*(a^2 - b^2)*d*(b + a*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
```

```
!IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3930

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-a^2)*d^3*Cot[e + f*x]*(a + b*Csc[e + f*x])^(
m + 1)*((d*Csc[e + f*x])^(n - 3)/(b*f*(m + 1)*(a^2 - b^2))), x] + Dist[d^3/
(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^
(n - 3)*Simp[a^2*(n - 3) + a*b*(m + 1)*Csc[e + f*x] - (a^2*(n - 2) + b^2*(m
 + 1))*Csc[e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 -
 b^2, 0] && LtQ[m, -1] && (IGtQ[n, 3] || (IntegersQ[n + 1/2, 2*m] && GtQ[n,
 2]))
```

Rule 3934

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(3/2)/(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[d*Sqrt[d*Sin[e + f*x]]*Sqrt[d*Csc[e + f*x]], Int[1
/(Sqrt[d*Sin[e + f*x]]*(b + a*Sin[e + f*x])), x], x] /; FreeQ[{a, b, d, e,
f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 4191

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))/(Sqrt[csc[(e_.) + (f_.)*(x_)]*(d_.)]*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))), x_Symbol] :> Dist[(A*b^2 - a*b*B + a^2*C)/(a^2*d^2), Int[(d*Csc[e + f
*x])^(3/2)/(a + b*Csc[e + f*x]), x], x] + Dist[1/a^2, Int[(a*A - (A*b - a*B
)*Csc[e + f*x])/Sqrt[d*Csc[e + f*x]], x], x] /; FreeQ[{a, b, d, e, f, A, B,
 C}, x] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \int \frac{\sec^{\frac{5}{2}}(c+dx)}{(b+a\sec(c+dx))^2}\,dx$$

$$=\frac{b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{a(a^2-b^2)d(b+a\sec(c+dx))}+\frac{\int\frac{-\frac{b^2}{2}-ab\sec(c+dx)+\frac{1}{2}(2a^2-b^2)\sec^2(c+dx)}{\sqrt{\sec(c+dx)}(b+a\sec(c+dx))}dx}{a(a^2-b^2)}$$

$$=\frac{b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{a(a^2-b^2)d(b+a\sec(c+dx))}+\frac{\int\frac{-\frac{b^3}{2}-\frac{1}{2}ab^2\sec(c+dx)}{\sqrt{\sec(c+dx)}}dx}{ab^2(a^2-b^2)}+\frac{(3a^2-b^2)\int\frac{\sec^{\frac{3}{2}}(c+dx)}{b+a\sec(c+dx)}dx}{2a(a^2-b^2)}$$

$$=\frac{b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{a(a^2-b^2)d(b+a\sec(c+dx))}-\frac{\int\sqrt{\sec(c+dx)}dx}{2(a^2-b^2)}-\frac{b\int\frac{1}{\sqrt{\sec(c+dx)}}dx}{2a(a^2-b^2)}+\frac{\left((3a^2-b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}dx}{2a(a^2-b^2)}$$

$$=\frac{(3a^2-b^2)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{a(a-b)(a+b)^2d}+\frac{b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{a(a^2-b^2)d(b+a\sec(c+dx))}-\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}dx}{2(a^2-b^2)}-\frac{\left(b\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}dx}{2a(a^2-b^2)}$$

$$=-\frac{b\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{a(a^2-b^2)d}-\frac{\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{(a^2-b^2)d}+\frac{(3a^2-b^2)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{a(a-b)(a+b)^2d}+\frac{b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{a(a^2-b^2)d(b+a\sec(c+dx))}$$

Mathematica [A] (verified)

Time = 5.34 (sec) , antiderivative size = 297, normalized size of antiderivative = 1.37

$$\int\frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^2}dx$$

$$=\frac{2ab^2\sin(c+dx)}{(a^2-b^2)(a+b\cos(c+dx))\sqrt{\sec(c+dx)}}+\frac{\cot(c+dx)\left(ab\sec^{\frac{3}{2}}(c+dx)+ab\cos(2(c+dx))\sec^{\frac{3}{2}}(c+dx)-ab\sec^{\frac{7}{2}}(c+dx)-ab\cos(2(c+dx))\sec^{\frac{7}{2}}(c+dx)-\right.}{}$$

```
[In] Integrate[Sqrt[Sec[c + d*x]]/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] ((2*a*b^2*Sin[c + d*x])/((a^2 - b^2)*(a + b*Cos[c + d*x])*Sqrt[Sec[c + d*x]
]) + (Cot[c + d*x]*(a*b*Sec[c + d*x]^(3/2) + a*b*Cos[2*(c + d*x)]*Sec[c + d
```

```
*x]^(3/2) - a*b*Sec[c + d*x]^(7/2) - a*b*Cos[2*(c + d*x)]*Sec[c + d*x]^(7/2
) + 2*a*b*EllipticE[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[-Tan[c + d*x]^2] +
 2*(2*a^2 - a*b - b^2)*EllipticF[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[-Tan[
c + d*x]^2] - 6*a^2*EllipticPi[-(a/b), ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt
[-Tan[c + d*x]^2] + 2*b^2*EllipticPi[-(a/b), ArcSin[Sqrt[Sec[c + d*x]]], -1
]*Sqrt[-Tan[c + d*x]^2]))/((a - b)*(a + b)))/(2*a^2*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 611 vs. $2(281) = 562$.

Time = 4.03 (sec) , antiderivative size = 612, normalized size of antiderivative = 2.82

method	result
default	$-\frac{\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-\frac{2b^2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}{a\left(a^2-b^2\right)\left(2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b\right)}-\frac{\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\right.\right.}}{a(a+b)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\right.\right.}}\right.}{}$

```
[In] int(sec(d*x+c)^(1/2)/(a+cos(d*x+c)*b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2/a*b^2/(a^2-b
^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)
/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/a/(a+b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*
cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2
)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/(a^2-b^2)*b/a*(sin(1/2*d*x+
1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+
sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/(a^2-b^
2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*s
in(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c
),2^(1/2))-6*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*
cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2
)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+2/a/(a^2-b^2)/(-2
*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1
/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2
*d*x+1/2*c),-2*b/(a-b),2^(1/2)))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2
-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+b*cos(d*x+c))^2,x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\sqrt{\sec{(c+dx)}}}{(a+b\cos{(c+dx)})^2}\,dx$$

```
[In] integrate(sec(d*x+c)**(1/2)/(a+b*cos(d*x+c))**2,x)
[Out] Integral(sqrt(sec(c + d*x))/(a + b*cos(c + d*x))**2, x)
```

Maxima [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\sqrt{\sec{(dx+c)}}}{(b\cos{(dx+c)}+a)^2}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(sqrt(sec(d*x + c))/(b*cos(d*x + c) + a)^2, x)
```

Giac [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\sqrt{\sec{(dx+c)}}}{(b\cos{(dx+c)}+a)^2}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+b*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(sqrt(sec(d*x + c))/(b*cos(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^2}\,dx = \int \frac{\sqrt{\frac{1}{\cos(c+d\,x)}}}{(a+b\,\cos(c+d\,x))^2}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)/(a + b*cos(c + d*x))^2,x)
[Out] int((1/cos(c + d*x))^(1/2)/(a + b*cos(c + d*x))^2, x)
```

3.721 $\int \frac{1}{(a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 208

$$
\begin{aligned}
&\int \frac{1}{(a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}}\,dx \\
&= \frac{\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\,2\right)\sqrt{\sec(c+dx)}}{(a^2-b^2)\,d} \\
&\quad + \frac{a\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{b\,(a^2-b^2)\,d} \\
&\quad - \frac{(a^2+b^2)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{(a-b)b(a+b)^2d} \\
&\quad - \frac{b\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(b+a\sec(c+dx))}
\end{aligned}
$$

```
[Out] -b*sin(d*x+c)*sec(d*x+c)^(1/2)/(a^2-b^2)/d/(b+a*sec(d*x+c))+(cos(1/2*d*x+1/
2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(
d*x+c)^(1/2)*sec(d*x+c)^(1/2)/(a^2-b^2)/d+a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/co
s(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec
(d*x+c)^(1/2)/b/(a^2-b^2)/d-(a^2+b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*
d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))*cos(d*x+c)^(1/2
)*sec(d*x+c)^(1/2)/(a-b)/b/(a+b)^2/d
```

Rubi [A] (verified)

Time = 0.51 (sec) , antiderivative size = 208, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.391$, Rules used = {3317, 3929, 4191, 3934, 2884, 3872, 3856, 2719, 2720}

$$\begin{aligned}\int \frac{1}{(a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}}\,dx &= -\frac{b\sin(c+dx)\sqrt{\sec(c+dx)}}{d\left(a^2-b^2\right)(a\sec(c+dx)+b)}+\frac{a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{bd\left(a^2-b^2\right)}\\ &\quad+\frac{\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\left(a^2-b^2\right)}\\ &\quad-\frac{\left(a^2+b^2\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{bd(a-b)(a+b)^2}\end{aligned}$$

```
[In] Int[1/((a + b*Cos[c + d*x])^2*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/((a^2 - b
^2)*d) + (a*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]]
)/(b*(a^2 - b^2)*d) - ((a^2 + b^2)*Sqrt[Cos[c + d*x]]*EllipticPi[(2*b)/(a +
 b), (c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/((a - b)*b*(a + b)^2*d) - (b*Sqrt[
Sec[c + d*x]]*Sin[c + d*x])/((a^2 - b^2)*d*(b + a*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
```

```
!IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3929

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[a*d^2*Cot[e + f*x]*(a + b*Csc[e + f*x])^(m + 1
)*((d*Csc[e + f*x])^(n - 2)/(f*(m + 1)*(a^2 - b^2))), x] - Dist[d^2/((m + 1
)*(a^2 - b^2)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^(n - 2)*(
a*(n - 2) + b*(m + 1)*Csc[e + f*x] - a*(m + n)*Csc[e + f*x]^2), x], x] /; F
reeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0] && LtQ[m, -1] && LtQ[1, n, 2]
 && IntegersQ[2*m, 2*n]
```

Rule 3934

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(3/2)/(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[d*Sqrt[d*Sin[e + f*x]]*Sqrt[d*Csc[e + f*x]], Int[1
/(Sqrt[d*Sin[e + f*x]]*(b + a*Sin[e + f*x])), x], x] /; FreeQ[{a, b, d, e,
f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 4191

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))/(Sqrt[csc[(e_.) + (f_.)*(x_)]*(d_.)]*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))), x_Symbol] :> Dist[(A*b^2 - a*b*B + a^2*C)/(a^2*d^2), Int[(d*Csc[e + f
*x])^(3/2)/(a + b*Csc[e + f*x]), x], x] + Dist[1/a^2, Int[(a*A - (A*b - a*B
)*Csc[e + f*x])/Sqrt[d*Csc[e + f*x]], x], x] /; FreeQ[{a, b, d, e, f, A, B,
 C}, x] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \int \frac{\sec^{\frac{3}{2}}(c+dx)}{(b+a\sec(c+dx))^2}\,dx$$

$$
\begin{aligned}
&= -\frac{b\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(b+a\sec(c+dx))} - \frac{\int \frac{-\frac{b}{2}-a\sec(c+dx)+\frac{1}{2}b\sec^2(c+dx)}{\sqrt{\sec(c+dx)}(b+a\sec(c+dx))}dx}{a^2-b^2} \\
&= -\frac{b\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(b+a\sec(c+dx))} - \frac{\int \frac{-\frac{b^2}{2}-\frac{1}{2}ab\sec(c+dx)}{\sqrt{\sec(c+dx)}}dx}{b^2(a^2-b^2)} - \frac{(a^2+b^2)\int \frac{\sec^{\frac{3}{2}}(c+dx)}{b+a\sec(c+dx)}dx}{2b(a^2-b^2)} \\
&= -\frac{b\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(b+a\sec(c+dx))} + \frac{\int \frac{1}{\sqrt{\sec(c+dx)}}dx}{2(a^2-b^2)} + \frac{a\int \sqrt{\sec(c+dx)}\,dx}{2b(a^2-b^2)} \\
&\quad - \frac{\left((a^2+b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}dx}{2b(a^2-b^2)} \\
&= -\frac{(a^2+b^2)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{(a-b)b(a+b)^2d} \\
&\quad - \frac{b\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(b+a\sec(c+dx))} \\
&\quad + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{2(a^2-b^2)} \\
&\quad + \frac{\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}dx}{2b(a^2-b^2)} \\
&= \frac{\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{(a^2-b^2)\,d} \\
&\quad + \frac{a\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{b(a^2-b^2)\,d} \\
&\quad - \frac{(a^2+b^2)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{(a-b)b(a+b)^2d} \\
&\quad - \frac{b\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(b+a\sec(c+dx))}
\end{aligned}
$$

Mathematica [B] (warning: unable to verify)

Leaf count is larger than twice the leaf count of optimal. 574 vs. $2(208) = 416$.

Time = 6.41 (sec) , antiderivative size = 574, normalized size of antiderivative = 2.76

$$
\int \frac{1}{(a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}}\,dx = \frac{\sqrt{\sec(c+dx)}\left(-\frac{\sin(c+dx)}{a^2-b^2}+\frac{a\sin(c+dx)}{(a^2-b^2)(a+b\cos(c+dx))}\right)}{d}
$$
$$
+ \frac{-\frac{2b\cos^2(c+dx)\left(\text{EllipticF}\left(\arcsin\left(\sqrt{\sec(c+dx)}\right),-1\right)-\text{EllipticPi}\left(-\frac{a}{b},\arcsin\left(\sqrt{\sec(c+dx)}\right),-1\right)\right)(b+a\sec(c+dx))\sqrt{1-\sec^2(c+dx)}\sin(c+d}{a(a+b\cos(c+dx))(1-\cos^2(c+dx))}}{}
$$

[In] Integrate[1/((a + b*Cos[c + d*x])^2*Sqrt[Sec[c + d*x]]),x]

[Out] (Sqrt[Sec[c + d*x]]*(-(Sin[c + d*x]/(a^2 - b^2)) + (a*Sin[c + d*x])/((a^2 - b^2)*(a + b*Cos[c + d*x]))))/d + ((-2*b*Cos[c + d*x]^2*(EllipticF[ArcSin[Sqrt[Sec[c + d*x]]], -1] - EllipticPi[-(a/b), ArcSin[Sqrt[Sec[c + d*x]]], -1])*(b + a*Sec[c + d*x])*Sqrt[1 - Sec[c + d*x]^2]*Sin[c + d*x])/(a*(a + b*Cos[c + d*x])*(1 - Cos[c + d*x]^2)) + (8*a*Cos[c + d*x]^2*EllipticPi[-(a/b), ArcSin[Sqrt[Sec[c + d*x]]], -1]*(b + a*Sec[c + d*x])*Sqrt[1 - Sec[c + d*x]^2]*Sin[c + d*x])/(b*(a + b*Cos[c + d*x])*(1 - Cos[c + d*x]^2)) + (Cos[2*(c + d*x)]*(b + a*Sec[c + d*x])*(-4*a*b + 4*a*b*Sec[c + d*x]^2 - 4*a*b*EllipticE[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[Sec[c + d*x]]*Sqrt[1 - Sec[c + d*x]^2] + 2*(2*a - b)*b*EllipticF[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[Sec[c + d*x]]*Sqrt[1 - Sec[c + d*x]^2] - 4*a^2*EllipticPi[-(a/b), ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[Sec[c + d*x]]*Sqrt[1 - Sec[c + d*x]^2] + 2*b^2*EllipticPi[-(a/b), ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[Sec[c + d*x]]*Sqrt[1 - Sec[c + d*x]^2])*Sin[c + d*x])/(a*b*(a + b*Cos[c + d*x])*(1 - Cos[c + d*x]^2)*Sqrt[Sec[c + d*x]]*(2 - Sec[c + d*x]^2)))/(4*(a - b)*(a + b)*d)

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 712 vs. $2(272) = 544$.

Time = 5.33 (sec) , antiderivative size = 713, normalized size of antiderivative = 3.43

method	result
default	$-\frac{\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-\frac{4\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,\Pi\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),-\frac{2b}{a-b},\sqrt{2}\right)}{\left(-2ab+2b^2\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)}}-\frac{2a\left(-\frac{b^2\cos\left(\frac{dx}{2}+\right.}{a\left(a\right.}\right.}{}\right.}{}$

[In] int(1/(a+cos(d*x+c)*b)^2/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)

[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-4/(-2*a*b+2*b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))-2/b*a*(-1/a*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2

```
*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2
)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d
*x+1/2*c),-2*b/(a-b),2^(1/2))+1/a/(a^2-b^2)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4
+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/
2))))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+b*cos(d*x+c))^2/sec(d*x+c)^(1/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \frac{1}{(a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{(a+b\cos{(c+dx)})^2\sqrt{\sec{(c+dx)}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))**2/sec(d*x+c)**(1/2),x)
[Out] Integral(1/((a + b*cos(c + d*x))**2*sqrt(sec(c + d*x))), x)
```

Maxima [F]

$$\int \frac{1}{(a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{(b\cos{(dx+c)}+a)^2\sqrt{\sec{(dx+c)}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^2/sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^2*sqrt(sec(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{(a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^2\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^2/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^2*sqrt(sec(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{\sqrt{\frac{1}{\cos(c+d\,x)}}\,(a+b\,\cos(c+d\,x))^2}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^2),x)
[Out] int(1/((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^2), x)
```

3.722 $\int \frac{1}{(a+b\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 223

$$\begin{aligned}\int \frac{1}{(a+b\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)}\,dx &= -\frac{a\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{b(a^2-b^2)d} \\ &\quad+\frac{(a^2-2b^2)\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{b^2(a^2-b^2)d} \\ &\quad-\frac{a(a^2-3b^2)\sqrt{\cos(c+dx)}\operatorname{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{(a-b)b^2(a+b)^2d} \\ &\quad+\frac{a\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)d(b+a\sec(c+dx))}\end{aligned}$$

```
[Out] a*sin(d*x+c)*sec(d*x+c)^(1/2)/(a^2-b^2)/d/(b+a*sec(d*x+c))-a*(cos(1/2*d*x+1
/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos
(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/b/(a^2-b^2)/d+(a^2-2*b^2)*(cos(1/2*d*x+1/2*c
)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x
+c)^(1/2)*sec(d*x+c)^(1/2)/b^2/(a^2-b^2)/d-a*(a^2-3*b^2)*(cos(1/2*d*x+1/2*c
)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/
2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/(a-b)/b^2/(a+b)^2/d
```

Rubi [A] (verified)

Time = 0.60 (sec) , antiderivative size = 223, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.391$, Rules used = {3317, 3928, 4191, 3934, 2884, 3872, 3856, 2719, 2720}

$$\int \frac{1}{(a+b\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{a\sin(c+dx)\sqrt{\sec(c+dx)}}{d(a^2-b^2)(a\sec(c+dx)+b)} + \frac{(a^2-2b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b^2d(a^2-b^2)} - \frac{a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{bd(a^2-b^2)} - \frac{a(a^2-3b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{b^2d(a-b)(a+b)^2}$$

```
[In] Int[1/((a + b*Cos[c + d*x])^2*Sec[c + d*x]^(3/2)),x]
```

```
[Out] -((a*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(b*(a
^2 - b^2)*d)) + ((a^2 - 2*b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]
*Sqrt[Sec[c + d*x]])/(b^2*(a^2 - b^2)*d) - (a*(a^2 - 3*b^2)*Sqrt[Cos[c + d*
x]]*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/((a - b)*
b^2*(a + b)^2*d) + (a*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/((a^2 - b^2)*d*(b +
a*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3928

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-b)*d*Cot[e + f*x]*(a + b*Csc[e + f*x])^(m +
1)*((d*Csc[e + f*x])^(n - 1)/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m + 1)
*(a^2 - b^2)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^(n - 1)*Si
mp[b*d*(n - 1) + a*d*(m + 1)*Csc[e + f*x] - b*d*(m + n + 1)*Csc[e + f*x]^2,
 x], x], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0] && LtQ[m, -1]
 && LtQ[0, n, 1] && IntegersQ[2*m, 2*n]
```

Rule 3934

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(3/2)/(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[d*Sqrt[d*Sin[e + f*x]]*Sqrt[d*Csc[e + f*x]], Int[1
/(Sqrt[d*Sin[e + f*x]]*(b + a*Sin[e + f*x])), x], x] /; FreeQ[{a, b, d, e,
f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 4191

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))/(Sqrt[csc[(e_.) + (f_.)*(x_)]*(d_.)]*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))), x_Symbol] :> Dist[(A*b^2 - a*b*B + a^2*C)/(a^2*d^2), Int[(d*Csc[e + f
*x])^(3/2)/(a + b*Csc[e + f*x]), x], x] + Dist[1/a^2, Int[(a*A - (A*b - a*B
)*Csc[e + f*x])/Sqrt[d*Csc[e + f*x]], x], x] /; FreeQ[{a, b, d, e, f, A, B,
 C}, x] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \int \frac{\sqrt{\sec(c+dx)}}{(b+a\sec(c+dx))^2}\,dx$$

$$= \frac{a\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(b+a\sec(c+dx))} + \frac{\int \frac{-\frac{a}{2}-b\sec(c+dx)+\frac{1}{2}a\sec^2(c+dx)}{\sqrt{\sec(c+dx)}(b+a\sec(c+dx))}\,dx}{a^2-b^2}$$

$$= \frac{a\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(b+a\sec(c+dx))} + \frac{\left(a\left(3-\frac{a^2}{b^2}\right)\right)\int \frac{\sec^{\frac{3}{2}}(c+dx)}{b+a\sec(c+dx)}\,dx}{2(a^2-b^2)} + \frac{\int \frac{-\frac{ab}{2}-\left(-\frac{a^2}{2}+b^2\right)\sec(c+dx)}{\sqrt{\sec(c+dx)}}\,dx}{b^2(a^2-b^2)}$$

$$= \frac{a\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(b+a\sec(c+dx))} - \frac{a\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx}{2b(a^2-b^2)} + \frac{(a^2-2b^2)\int \sqrt{\sec(c+dx)}\,dx}{2b^2(a^2-b^2)}$$
$$+ \frac{\left(a\left(3-\frac{a^2}{b^2}\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{2(a^2-b^2)}$$

$$= -\frac{a(a^2-3b^2)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{(a-b)b^2(a+b)^2d}$$
$$+ \frac{a\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(b+a\sec(c+dx))}$$
$$- \frac{\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{2b(a^2-b^2)}$$
$$+ \frac{\left((a^2-2b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{2b^2(a^2-b^2)}$$

$$= -\frac{a\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{b(a^2-b^2)\,d}$$
$$+ \frac{(a^2-2b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{b^2(a^2-b^2)\,d}$$
$$- \frac{a(a^2-3b^2)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{(a-b)b^2(a+b)^2d}$$
$$+ \frac{a\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d(b+a\sec(c+dx))}$$

Mathematica [A] (verified)

Time = 3.40 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.12

$$\int \frac{1}{(a+b\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)}\,dx$$
$$= \frac{\cos(2(c+dx))\csc(c+dx)\sec^{\frac{3}{2}}(c+dx)\left(-b(-a+b)(a+b\cos(c+dx))\,\text{EllipticF}\left(\arcsin\left(\sqrt{\sec(c+dx)}\right.\right.\right.}{}$$

```
[In] Integrate[1/((a + b*Cos[c + d*x])^2*Sec[c + d*x]^(3/2)),x]
```

```
[Out] (Cos[2*(c + d*x)]*Csc[c + d*x]*Sec[c + d*x]^(3/2)*(-(b*(-a + b)*(a + b*Cos[
c + d*x])*EllipticF[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[Sec[c + d*x]]*Sqrt
[-Tan[c + d*x]^2]) - (a^2 - 3*b^2)*(a + b*Cos[c + d*x])*EllipticPi[-(a/b),
ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[Sec[c + d*x]]*Sqrt[-Tan[c + d*x]^2] +
a*b*(a*Tan[c + d*x]^2 - (a + b*Cos[c + d*x])*EllipticE[ArcSin[Sqrt[Sec[c +
d*x]]], -1]*Sqrt[Sec[c + d*x]]*Sqrt[-Tan[c + d*x]^2])))/((a - b)*b^2*(a + b
)*d*(b + a*Sec[c + d*x])*(-2 + Sec[c + d*x]^2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 793 vs. 2(287) = 574.

Time = 5.53 (sec) , antiderivative size = 794, normalized size of antiderivative = 3.56

method	result	size
default	Expression too large to display	794

```
[In] int(1/(a+cos(d*x+c)*b)^2/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/b^2*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c
)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+2*a^2
/b^2*(-1/a*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/
2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d
*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)
^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a
^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/
(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+
1/2*c),2^(1/2))+1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*
d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*
EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1
/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/
2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b)
,2^(1/2))+1/a/(a^2-b^2)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
```

```
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2)))+8*a/b/(-2*a*b+2
*b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*si
n(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c
),-2*b/(a-b),2^(1/2)))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/
d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+b*cos(d*x+c))^2/sec(d*x+c)^(3/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \frac{1}{(a+b\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{(a+b\cos{(c+dx)})^2\sec^{\frac{3}{2}}{(c+dx)}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))**2/sec(d*x+c)**(3/2),x)
[Out] Integral(1/((a + b*cos(c + d*x))**2*sec(c + d*x)**(3/2)), x)
```

Maxima [F]

$$\int \frac{1}{(a+b\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos{(dx+c)}+a)^2\sec{(dx+c)}^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^2/sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^2*sec(d*x + c)^(3/2)), x)
```

Giac [F]

$$\int \frac{1}{(a+b\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^2\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^2/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^2*sec(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^2\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}\,(a+b\,\cos(c+d\,x))^2}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^2),x)
[Out] int(1/((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^2), x)
```

3.723 $\int \frac{1}{(a+b\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 245

$$\begin{aligned}\int \frac{1}{(a+b\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)}\,dx &= \frac{(3a^2-2b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{b^2(a^2-b^2)d} \\ &\quad - \frac{a(3a^2-4b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{b^3(a^2-b^2)d} \\ &\quad + \frac{a^2(3a^2-5b^2)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{(a-b)b^3(a+b)^2d} \\ &\quad - \frac{a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{b(a^2-b^2)d(b+a\sec(c+dx))}\end{aligned}$$

```
[Out] -a^2*sin(d*x+c)*sec(d*x+c)^(1/2)/b/(a^2-b^2)/d/(b+a*sec(d*x+c))+(3*a^2-2*b^
2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/
2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/b^2/(a^2-b^2)/d-a*(3*a^2-4*
b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+
1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/b^3/(a^2-b^2)/d+a^2*(3*a^
2-5*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2
*d*x+1/2*c),2*b/(a+b),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/(a-b)/b^3/
(a+b)^2/d
```

Rubi [A] (verified)

Time = 0.60 (sec) , antiderivative size = 245, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {3317, 3932, 4191, 3934, 2884, 3872, 3856, 2719, 2720}

$$\begin{aligned}\int \frac{1}{(a+b\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)}\,dx &= -\frac{a^2\sin(c+dx)\sqrt{\sec(c+dx)}}{bd\,(a^2-b^2)\,(a\sec(c+dx)+b)} \\ &\quad+\frac{(3a^2-2b^2)\,\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{b^2d\,(a^2-b^2)} \\ &\quad-\frac{a(3a^2-4b^2)\,\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b^3d\,(a^2-b^2)} \\ &\quad+\frac{a^2(3a^2-5b^2)\,\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{b^3d(a-b)(a+b)^2}\end{aligned}$$

```
[In] Int[1/((a + b*Cos[c + d*x])^2*Sec[c + d*x]^(5/2)),x]
```

```
[Out] ((3*a^2 - 2*b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c +
d*x]])/(b^2*(a^2 - b^2)*d) - (a*(3*a^2 - 4*b^2)*Sqrt[Cos[c + d*x]]*Elliptic
F[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(b^3*(a^2 - b^2)*d) + (a^2*(3*a^2 - 5
*b^2)*Sqrt[Cos[c + d*x]]*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2]*Sqrt[Sec
[c + d*x]])/((a - b)*b^3*(a + b)^2*d) - (a^2*Sqrt[Sec[c + d*x]]*Sin[c + d*x
])/(b*(a^2 - b^2)*d*(b + a*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3932

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[b^2*Cot[e + f*x]*(a + b*Csc[e + f*x])^(m + 1)*
((d*Csc[e + f*x])^n/(a*f*(m + 1)*(a^2 - b^2))), x] + Dist[1/(a*(m + 1)*(a^2
 - b^2)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^n*(a^2*(m + 1)
- b^2*(m + n + 1) - a*b*(m + 1)*Csc[e + f*x] + b^2*(m + n + 2)*Csc[e + f*x]
^2), x], x] /; FreeQ[{a, b, d, e, f, n}, x] && NeQ[a^2 - b^2, 0] && LtQ[m,
-1] && IntegersQ[2*m, 2*n]
```

Rule 3934

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(3/2)/(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[d*Sqrt[d*Sin[e + f*x]]*Sqrt[d*Csc[e + f*x]], Int[1
/(Sqrt[d*Sin[e + f*x]]*(b + a*Sin[e + f*x])), x], x] /; FreeQ[{a, b, d, e,
f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 4191

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))/(Sqrt[csc[(e_.) + (f_.)*(x_)]*(d_.)]*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))), x_Symbol] :> Dist[(A*b^2 - a*b*B + a^2*C)/(a^2*d^2), Int[(d*Csc[e + f
*x])^(3/2)/(a + b*Csc[e + f*x]), x], x] + Dist[1/a^2, Int[(a*A - (A*b - a*B
)*Csc[e + f*x])/Sqrt[d*Csc[e + f*x]], x], x] /; FreeQ[{a, b, d, e, f, A, B,
 C}, x] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \int \frac{1}{\sqrt{\sec(c+dx)}(b+a\sec(c+dx))^2}\,dx$$

$$= -\frac{a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{b(a^2-b^2)\,d(b+a\sec(c+dx))} + \frac{\int \frac{\frac{3a^2}{2}-b^2+ab\sec(c+dx)-\frac{1}{2}a^2\sec^2(c+dx)}{\sqrt{\sec(c+dx)}(b+a\sec(c+dx))}\,dx}{b(a^2-b^2)}$$

$$= -\frac{a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{b(a^2-b^2)\,d(b+a\sec(c+dx))} + \frac{\int \frac{b\left(\frac{3a^2}{2}-b^2\right)-\left(-ab^2+a\left(\frac{3a^2}{2}-b^2\right)\right)\sec(c+dx)}{\sqrt{\sec(c+dx)}}\,dx}{b^3(a^2-b^2)} + \frac{(a^2(3a^2-5b^2))\int \frac{\sec^{\frac{3}{2}}(c+dx)}{b+a\sec(c+dx)}\,dx}{2b^3(a^2-b^2)}$$

$$= -\frac{a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{b(a^2-b^2)\,d(b+a\sec(c+dx))} - \frac{(a(3a^2-4b^2))\int\sqrt{\sec(c+dx)}\,dx}{2b^3(a^2-b^2)} + \frac{(3a^2-2b^2)\int\frac{1}{\sqrt{\sec(c+dx)}}\,dx}{2b^2(a^2-b^2)} + \frac{\left(a^2(3a^2-5b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{2b^3(a^2-b^2)}$$

$$= \frac{a^2(3a^2-5b^2)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{(a-b)b^3(a+b)^2d} - \frac{a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{b(a^2-b^2)\,d(b+a\sec(c+dx))} - \frac{\left(a(3a^2-4b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{2b^3(a^2-b^2)} + \frac{\left((3a^2-2b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx}{2b^2(a^2-b^2)}$$

$$= \frac{(3a^2-2b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{b^2(a^2-b^2)\,d} - \frac{a(3a^2-4b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{b^3(a^2-b^2)\,d} + \frac{a^2(3a^2-5b^2)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{(a-b)b^3(a+b)^2d} - \frac{a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{b(a^2-b^2)\,d(b+a\sec(c+dx))}$$

Mathematica [A] (verified)

Time = 3.83 (sec) , antiderivative size = 319, normalized size of antiderivative = 1.30

$$\int \frac{1}{(a+b\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)}\,dx$$
$$= \frac{4a^2\sin(c+dx)}{b(-a^2+b^2)(a+b\cos(c+dx))\sqrt{\sec(c+dx)}} - \frac{2\cot(c+dx)\left(-3a^2b\sec^{\frac{3}{2}}(c+dx)+2b^3\sec^{\frac{3}{2}}(c+dx)+3a^2b\cos(2(c+dx))\sec^{\frac{3}{2}}(c+dx)-2b^3\cos(2(c+dx))\right.}{}$$

```
[In] Integrate[1/((a + b*Cos[c + d*x])^2*Sec[c + d*x]^(5/2)),x]
```

```
[Out] ((4*a^2*Sin[c + d*x])/(b*(-a^2 + b^2)*(a + b*Cos[c + d*x])*Sqrt[Sec[c + d*x
]]) - (2*Cot[c + d*x]*(-3*a^2*b*Sec[c + d*x]^(3/2) + 2*b^3*Sec[c + d*x]^(3/
2) + 3*a^2*b*Cos[2*(c + d*x)]*Sec[c + d*x]^(3/2) - 2*b^3*Cos[2*(c + d*x)]*S
ec[c + d*x]^(3/2) + 2*b*(3*a^2 - 2*b^2)*EllipticE[ArcSin[Sqrt[Sec[c + d*x]]
], -1]*Sqrt[-Tan[c + d*x]^2] + 2*b*(-3*a^2 + a*b + 2*b^2)*EllipticF[ArcSin[
Sqrt[Sec[c + d*x]]], -1]*Sqrt[-Tan[c + d*x]^2] + 6*a^3*EllipticPi[-(a/b), A
rcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[-Tan[c + d*x]^2] - 10*a*b^2*EllipticPi[
-(a/b), ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[-Tan[c + d*x]^2]))/((a - b)*b^
3*(a + b)))/(4*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 814 vs. 2(309) = 618.

Time = 6.51 (sec) , antiderivative size = 815, normalized size of antiderivative = 3.33

method	result	size
default	Expression too large to display	815

```
[In] int(1/(a+cos(d*x+c)*b)^2/sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2/b^3/(-2*sin(
1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/
2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*a+
b*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))-12/b^2*a^2/(-2*a*b+2*b^2)*(sin(1/2
*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*
c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2
^(1/2))-2/b^3*a^3*(-1/a*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/
2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+
b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1
/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^
(1/2))-1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c
)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF
(cos(1/2*d*x+1/2*c),2^(1/2))+1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)
```

```
*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2
*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*
b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*s
in(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*
c),-2*b/(a-b),2^(1/2))+1/a/(a^2-b^2)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)
^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/
2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))))/s
in(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+b*cos(d*x+c))^2/sec(d*x+c)^(5/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+b*cos(d*x+c))**2/sec(d*x+c)**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+b\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^2\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^2/sec(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^2*sec(d*x + c)^(5/2)), x)
```

Giac [F]

$$\int \frac{1}{(a+b\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)}\,dx=\int \frac{1}{(b\cos(dx+c)+a)^2\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^2/sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^2*sec(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^2\sec^{\frac{5}{2}}(c+dx)}\,dx=\int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}\,(a+b\,\cos(c+d\,x))^2}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^2),x)
[Out] int(1/((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^2), x)
```

3.724 $\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 455

$$
\begin{aligned}
\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx
&= \frac{b(24a^4-65a^2b^2+35b^4)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{4a^4(a^2-b^2)^2d} \\
&+ \frac{(8a^4-61a^2b^2+35b^4)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{12a^3(a^2-b^2)^2d} \\
&+ \frac{b^2(63a^4-86a^2b^2+35b^4)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4a^4(a-b)^2(a+b)^3d} \\
&- \frac{b(24a^4-65a^2b^2+35b^4)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a^4(a^2-b^2)^2d} \\
&+ \frac{(8a^4-61a^2b^2+35b^4)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12a^3(a^2-b^2)^2d} \\
&+ \frac{b^2\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)d(b+a\sec(c+dx))^2} + \frac{b^2(13a^2-7b^2)\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{4a^2(a^2-b^2)^2d(b+a\sec(c+dx))}
\end{aligned}
$$

```
[Out] 1/12*(8*a^4-61*a^2*b^2+35*b^4)*sec(d*x+c)^(3/2)*sin(d*x+c)/a^3/(a^2-b^2)^2/
d+1/2*b^2*sec(d*x+c)^(7/2)*sin(d*x+c)/a/(a^2-b^2)/d/(b+a*sec(d*x+c))^2+1/4*
b^2*(13*a^2-7*b^2)*sec(d*x+c)^(5/2)*sin(d*x+c)/a^2/(a^2-b^2)^2/d/(b+a*sec(d
*x+c))-1/4*b*(24*a^4-65*a^2*b^2+35*b^4)*sin(d*x+c)*sec(d*x+c)^(1/2)/a^4/(a^
2-b^2)^2/d+1/4*b*(24*a^4-65*a^2*b^2+35*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/co
s(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec
(d*x+c)^(1/2)/a^4/(a^2-b^2)^2/d+1/12*(8*a^4-61*a^2*b^2+35*b^4)*(cos(1/2*d*x
+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*c
os(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^3/(a^2-b^2)^2/d+1/4*b^2*(63*a^4-86*a^2*b
```

```
^2+35*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1
/2*d*x+1/2*c),2*b/(a+b),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^4/(a-b
)^2/(a+b)^3/d
```

Rubi [A] (verified)

Time = 1.53 (sec) , antiderivative size = 455, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.478$, Rules used = {3317, 3930, 4183, 4187, 4191, 3934, 2884, 3872, 3856, 2719, 2720}

$$\begin{aligned}
&\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx \\
&= \frac{b^2\sin(c+dx)\sec^{\frac{7}{2}}(c+dx)}{2ad\,(a^2-b^2)\,(a\sec(c+dx)+b)^2}+\frac{b^2(13a^2-7b^2)\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{4a^2d\,(a^2-b^2)^2\,(a\sec(c+dx)+b)} \\
&\quad -\frac{b(24a^4-65a^2b^2+35b^4)\sin(c+dx)\sqrt{\sec(c+dx)}}{4a^4d\,(a^2-b^2)^2} \\
&\quad +\frac{b(24a^4-65a^2b^2+35b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4a^4d\,(a^2-b^2)^2} \\
&\quad +\frac{b^2(63a^4-86a^2b^2+35b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4a^4d(a-b)^2(a+b)^3} \\
&\quad +\frac{(8a^4-61a^2b^2+35b^4)\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{12a^3d\,(a^2-b^2)^2} \\
&\quad +\frac{(8a^4-61a^2b^2+35b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{12a^3d\,(a^2-b^2)^2}
\end{aligned}$$

```
[In] Int[Sec[c + d*x]^(5/2)/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (b*(24*a^4 - 65*a^2*b^2 + 35*b^4)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2,
 2]*Sqrt[Sec[c + d*x]])/(4*a^4*(a^2 - b^2)^2*d) + ((8*a^4 - 61*a^2*b^2 + 35
*b^4)*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(12*
a^3*(a^2 - b^2)^2*d) + (b^2*(63*a^4 - 86*a^2*b^2 + 35*b^4)*Sqrt[Cos[c + d*x
]]*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(4*a^4*(a
- b)^2*(a + b)^3*d) - (b*(24*a^4 - 65*a^2*b^2 + 35*b^4)*Sqrt[Sec[c + d*x]]*
Sin[c + d*x])/(4*a^4*(a^2 - b^2)^2*d) + ((8*a^4 - 61*a^2*b^2 + 35*b^4)*Sec[
c + d*x]^(3/2)*Sin[c + d*x])/(12*a^3*(a^2 - b^2)^2*d) + (b^2*Sec[c + d*x]^(
7/2)*Sin[c + d*x])/(2*a*(a^2 - b^2)*d*(b + a*Sec[c + d*x])^2) + (b^2*(13*a^
2 - 7*b^2)*Sec[c + d*x]^(5/2)*Sin[c + d*x])/(4*a^2*(a^2 - b^2)^2*d*(b + a*S
ec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3930

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-a^2)*d^3*Cot[e + f*x]*(a + b*Csc[e + f*x])^(
m + 1)*((d*Csc[e + f*x])^(n - 3)/(b*f*(m + 1)*(a^2 - b^2))), x] + Dist[d^3/
(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^
(n - 3)*Simp[a^2*(n - 3) + a*b*(m + 1)*Csc[e + f*x] - (a^2*(n - 2) + b^2*(m
 + 1))*Csc[e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 -
 b^2, 0] && LtQ[m, -1] && (IGtQ[n, 3] || (IntegersQ[n + 1/2, 2*m] && GtQ[n,
 2]))
```

Rule 3934

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(3/2)/(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[d*Sqrt[d*Sin[e + f*x]]*Sqrt[d*Csc[e + f*x]], Int[1
```

```
/(Sqrt[d*Sin[e + f*x]]*(b + a*Sin[e + f*x])), x], x] /; FreeQ[{a, b, d, e,
f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 4183

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))*(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))^(m_), x_Symbol] :> Simp[(-d)*(A*b^2 - a*b*B + a^2*C)*Cot[e + f*x]*(a +
b*Csc[e + f*x])^(m + 1)*((d*Csc[e + f*x])^(n - 1)/(b*f*(a^2 - b^2)*(m + 1))
), x] + Dist[d/(b*(a^2 - b^2)*(m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d
*Csc[e + f*x])^(n - 1)*Simp[A*b^2*(n - 1) - a*(b*B - a*C)*(n - 1) + b*(a*A
- b*B + a*C)*(m + 1)*Csc[e + f*x] - (b*(A*b - a*B)*(m + n + 1) + C*(a^2*n +
 b^2*(m + 1)))*Csc[e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f, A, B, C}
, x] && NeQ[a^2 - b^2, 0] && LtQ[m, -1] && GtQ[n, 0]
```

Rule 4187

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))*(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))^(m_), x_Symbol] :> Simp[(-C)*d*Cot[e + f*x]*(a + b*Csc[e + f*x])^(m + 1
)*((d*Csc[e + f*x])^(n - 1)/(b*f*(m + n + 1))), x] + Dist[d/(b*(m + n + 1))
, Int[(a + b*Csc[e + f*x])^m*(d*Csc[e + f*x])^(n - 1)*Simp[a*C*(n - 1) + (A
*b*(m + n + 1) + b*C*(m + n))*Csc[e + f*x] + (b*B*(m + n + 1) - a*C*n)*Csc[
e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f, A, B, C, m}, x] && NeQ[a^2
- b^2, 0] && GtQ[n, 0]
```

Rule 4191

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))/(Sqrt[csc[(e_.) + (f_.)*(x_)]*(d_.)]*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))), x_Symbol] :> Dist[(A*b^2 - a*b*B + a^2*C)/(a^2*d^2), Int[(d*Csc[e + f
*x])^(3/2)/(a + b*Csc[e + f*x]), x], x] + Dist[1/a^2, Int[(a*A - (A*b - a*B
)*Csc[e + f*x])/Sqrt[d*Csc[e + f*x]], x], x] /; FreeQ[{a, b, d, e, f, A, B,
 C}, x] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \int \frac{\sec^{\frac{11}{2}}(c+dx)}{(b+a\sec(c+dx))^3}\,dx$$

$$= \frac{b^2\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)\,d(b+a\sec(c+dx))^2} + \frac{\int \frac{\sec^{\frac{5}{2}}(c+dx)\left(\frac{5b^2}{2}-2ab\sec(c+dx)+\frac{1}{2}(4a^2-7b^2)\sec^2(c+dx)\right)}{(b+a\sec(c+dx))^2}\,dx}{2a(a^2-b^2)}$$

$$= \frac{b^2 \sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)d(b+a\sec(c+dx))^2} + \frac{b^2(13a^2-7b^2)\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{4a^2(a^2-b^2)^2 d(b+a\sec(c+dx))} + \frac{\int \frac{\sec^{\frac{3}{2}}(c+dx)\left(\frac{3}{4}b^2(13a^2-7b^2)-ab(4a^2-b^2)\sec(c+dx)+\frac{1}{4}(8a^4-61a^2b^2+35b^4)\sec^2(c+dx)\right)}{b+a\sec(c+dx)}dx}{2a^2(a^2-b^2)^2}$$

$$= \frac{(8a^4-61a^2b^2+35b^4)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12a^3(a^2-b^2)^2 d} + \frac{b^2 \sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)d(b+a\sec(c+dx))^2} + \frac{b^2(13a^2-7b^2)\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{4a^2(a^2-b^2)^2 d(b+a\sec(c+dx))} + \frac{\int \frac{\sqrt{\sec(c+dx)}\left(\frac{1}{8}b(8a^4-61a^2b^2+35b^4)+\frac{1}{2}a(2a^4+14a^2b^2-7b^4)\sec(c+dx)-\frac{3}{8}b(24a^4-65a^2b^2+35b^4)\sec^2(c+dx)\right)}{b+a\sec(c+dx)}dx}{3a^3(a^2-b^2)^2}$$

$$= -\frac{b(24a^4-65a^2b^2+35b^4)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a^4(a^2-b^2)^2 d} + \frac{(8a^4-61a^2b^2+35b^4)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12a^3(a^2-b^2)^2 d} + \frac{b^2 \sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)d(b+a\sec(c+dx))^2} + \frac{b^2(13a^2-7b^2)\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{4a^2(a^2-b^2)^2 d(b+a\sec(c+dx))} + \frac{2\int \frac{\frac{3}{16}b^2(24a^4-65a^2b^2+35b^4)+\frac{1}{4}ab(20a^4-64a^2b^2+35b^4)\sec(c+dx)+\frac{1}{16}(8a^6+128a^4b^2-223a^2b^4+105b^6)\sec^2(c+dx)}{\sqrt{\sec(c+dx)}(b+a\sec(c+dx))}dx}{3a^4(a^2-b^2)^2}$$

$$= -\frac{b(24a^4-65a^2b^2+35b^4)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a^4(a^2-b^2)^2 d} + \frac{(8a^4-61a^2b^2+35b^4)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12a^3(a^2-b^2)^2 d} + \frac{b^2 \sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)d(b+a\sec(c+dx))^2} + \frac{b^2(13a^2-7b^2)\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{4a^2(a^2-b^2)^2 d(b+a\sec(c+dx))} + \frac{2\int \frac{\frac{3}{16}b^3(24a^4-65a^2b^2+35b^4)-\left(\frac{3}{16}ab^2(24a^4-65a^2b^2+35b^4)-\frac{1}{4}ab^2(20a^4-64a^2b^2+35b^4)\right)\sec(c+dx)}{\sqrt{\sec(c+dx)}}dx}{3a^4b^2(a^2-b^2)^2} + \frac{(b^2(63a^4-86a^2b^2+35b^4))\int \frac{\sec^{\frac{3}{2}}(c+dx)}{b+a\sec(c+dx)}dx}{8a^4(a^2-b^2)^2}$$

$$= -\frac{b(24a^4 - 65a^2b^2 + 35b^4)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a^4(a^2-b^2)^2 d} + \frac{(8a^4 - 61a^2b^2 + 35b^4)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12a^3(a^2-b^2)^2 d} + \frac{b^2\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)d(b+a\sec(c+dx))^2} + \frac{b^2(13a^2-7b^2)\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{4a^2(a^2-b^2)^2 d(b+a\sec(c+dx))} + \frac{(b(24a^4-65a^2b^2+35b^4))\int\frac{1}{\sqrt{\sec(c+dx)}}dx}{8a^4(a^2-b^2)^2} + \frac{(8a^4-61a^2b^2+35b^4)\int\sqrt{\sec(c+dx)}dx}{24a^3(a^2-b^2)^2} + \frac{\left(b^2(63a^4-86a^2b^2+35b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}dx}{8a^4(a^2-b^2)^2}$$

$$= \frac{b^2(63a^4-86a^2b^2+35b^4)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4a^4(a-b)^2(a+b)^3 d} - \frac{b(24a^4-65a^2b^2+35b^4)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a^4(a^2-b^2)^2 d} + \frac{(8a^4-61a^2b^2+35b^4)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12a^3(a^2-b^2)^2 d} + \frac{b^2\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)d(b+a\sec(c+dx))^2} + \frac{b^2(13a^2-7b^2)\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{4a^2(a^2-b^2)^2 d(b+a\sec(c+dx))} + \frac{\left(b(24a^4-65a^2b^2+35b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}dx}{8a^4(a^2-b^2)^2} + \frac{\left((8a^4-61a^2b^2+35b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}dx}{24a^3(a^2-b^2)^2}$$

$$= \frac{b(24a^4-65a^2b^2+35b^4)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{4a^4\left(a^2-b^2\right)^2d}$$
$$+\frac{(8a^4-61a^2b^2+35b^4)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{12a^3\left(a^2-b^2\right)^2d}$$
$$+\frac{b^2(63a^4-86a^2b^2+35b^4)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4a^4(a-b)^2(a+b)^3d}$$
$$-\frac{b(24a^4-65a^2b^2+35b^4)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a^4\left(a^2-b^2\right)^2d}$$
$$+\frac{(8a^4-61a^2b^2+35b^4)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{12a^3\left(a^2-b^2\right)^2d}$$
$$+\frac{b^2\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{2a\left(a^2-b^2\right)d(b+a\sec(c+dx))^2}+\frac{b^2(13a^2-7b^2)\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{4a^2\left(a^2-b^2\right)^2d(b+a\sec(c+dx))}$$

Mathematica [A] (warning: unable to verify)

Time = 6.60 (sec) , antiderivative size = 747, normalized size of antiderivative = 1.64

$$\int\frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx$$
$$=\frac{\frac{2(16a^6+328a^4b^2-641a^2b^4+315b^6)\cos^2(c+dx)\left(\text{EllipticF}\left(\arcsin\left(\sqrt{\sec(c+dx)}\right),-1\right)-\text{EllipticPi}\left(-\frac{a}{b},\arcsin\left(\sqrt{\sec(c+dx)}\right),-1\right)\right)(b+a\sec(c+d}{a(a+b\cos(c+dx))(1-\cos^2(c+dx))}}{}$$
$$+\frac{\sqrt{\sec(c+dx)}\left(-\frac{b(24a^4-65a^2b^2+35b^4)\sin(c+dx)}{4a^4(a^2-b^2)^2}-\frac{b^3\sin(c+dx)}{2a^2(a^2-b^2)(a+b\cos(c+dx))^2}-\frac{3(5a^2b^3\sin(c+dx)-3b^5\sin(c+dx))}{4a^3(a^2-b^2)^2(a+b\cos(c+dx))}+\frac{2\tan}{3}\right.}{d}$$

```
[In] Integrate[Sec[c + d*x]^(5/2)/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] ((2*(16*a^6 + 328*a^4*b^2 - 641*a^2*b^4 + 315*b^6)*Cos[c + d*x]^2*(Elliptic
F[ArcSin[Sqrt[Sec[c + d*x]]], -1] - EllipticPi[-(a/b), ArcSin[Sqrt[Sec[c +
d*x]]], -1])*(b + a*Sec[c + d*x])*Sqrt[1 - Sec[c + d*x]^2]*Sin[c + d*x])/(a
*(a + b*Cos[c + d*x])*(1 - Cos[c + d*x]^2)) + (2*(160*a^5*b - 512*a^3*b^3 +
 280*a*b^5)*Cos[c + d*x]^2*EllipticPi[-(a/b), ArcSin[Sqrt[Sec[c + d*x]]], -
1]*(b + a*Sec[c + d*x])*Sqrt[1 - Sec[c + d*x]^2]*Sin[c + d*x])/(b*(a + b*Co
s[c + d*x])*(1 - Cos[c + d*x]^2)) + ((72*a^4*b^2 - 195*a^2*b^4 + 105*b^6)*C
os[2*(c + d*x)]*(b + a*Sec[c + d*x])*(-4*a*b + 4*a*b*Sec[c + d*x]^2 - 4*a*b
*EllipticE[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[Sec[c + d*x]]*Sqrt[1 - Sec[
c + d*x]^2] + 2*(2*a - b)*b*EllipticF[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[
Sec[c + d*x]]*Sqrt[1 - Sec[c + d*x]^2] - 4*a^2*EllipticPi[-(a/b), ArcSin[Sq
rt[Sec[c + d*x]]], -1]*Sqrt[Sec[c + d*x]]*Sqrt[1 - Sec[c + d*x]^2] + 2*b^2*
EllipticPi[-(a/b), ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[Sec[c + d*x]]*Sqrt[
1 - Sec[c + d*x]^2])*Sin[c + d*x])/(a*b^2*(a + b*Cos[c + d*x])*(1 - Cos[c +
 d*x]^2)*Sqrt[Sec[c + d*x]]*(2 - Sec[c + d*x]^2)))/(48*a^4*(a - b)^2*(a + b
```

```
)^2*d) + (Sqrt[Sec[c + d*x]]*(-1/4*(b*(24*a^4 - 65*a^2*b^2 + 35*b^4)*Sin[c
+ d*x])/(a^4*(a^2 - b^2)^2) - (b^3*Sin[c + d*x])/(2*a^2*(a^2 - b^2)*(a + b*
Cos[c + d*x])^2) - (3*(5*a^2*b^3*Sin[c + d*x] - 3*b^5*Sin[c + d*x]))/(4*a^3
*(a^2 - b^2)^2*(a + b*Cos[c + d*x])) + (2*Tan[c + d*x])/(3*a^3)))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2100 vs. $2(499) = 998$.

Time = 160.23 (sec) , antiderivative size = 2101, normalized size of antiderivative = 4.62

method	result	size
default	Expression too large to display	2101

```
[In] int(sec(d*x+c)^(5/2)/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/a^3*(-1/6*cos
(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(cos(1
/2*d*x+1/2*c)^2-1/2)^2+1/3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2
*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellipti
cF(cos(1/2*d*x+1/2*c),2^(1/2)))-6/a^4*b/sin(1/2*d*x+1/2*c)^2/(2*sin(1/2*d*x
+1/2*c)^2-1)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/
2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d
*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))+2*b^2/a^2*(-1/2
/a*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/
2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)^2-3/4*b^2*(3*a^2-b^2)/a^2/(a^2
-b^2)^2*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(
1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-7/8/(a+b)/(a^2-b^2)*(sin(1/2*d*x+1/2*c)
^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/
2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/4/(a+b)/(a^2-
b^2)/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*s
in(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c
),2^(1/2))*b+3/8/(a+b)/(a^2-b^2)/a^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1
/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/
2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*b^2-9/8*b/(a^2-b^2)^2*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4
+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+3/8*b^3/
a^2/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1
/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*
d*x+1/2*c),2^(1/2))+9/8*b/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(
1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1
/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-3/8*b^3/a^2/(a^2-b^2)^2*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c
)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-15/4*
a^2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d
*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*E
```

```
llipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+3/2/(a^2-b^2)^2/(-2*a*b+2*
b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2
*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/
2*c),-2*b/(a-b),2^(1/2))-3/4/a^2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b^5*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^
4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1
/2)))-12*b^3/a^4/(-2*a*b+2*b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*
x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*El
lipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+4*b^2/a^3*(-1/a*b^2/(a^2-b^
2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/
(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a^2-b^2)*b/a*(sin(1/2*d
*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)
^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/2/(a
^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/
(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+
1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)
*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2
*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+1/a/(a^2-b^2
)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+
1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(co
s(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/
2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+b*cos(d*x+c))^3,x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(5/2)/(a+b*cos(d*x+c))**3,x)
[Out] Timed out
```

Maxima [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
[Out] Timed out
```

Giac [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^3}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+b*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(5/2)/(b*cos(d*x + c) + a)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}}{\left(a+b\,\cos\left(c+d\,x\right)\right)^3}\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)/(a + b*cos(c + d*x))^3,x)
[Out] int((1/cos(c + d*x))^(5/2)/(a + b*cos(c + d*x))^3, x)
```

3.725 $\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^3} dx$

Optimal result

Integrand size = 23, antiderivative size = 388

$$\begin{aligned}
\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^3} dx
&= -\frac{(8a^4-29a^2b^2+15b^4)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{4a^3(a^2-b^2)^2 d} \\
&\quad + \frac{b(11a^2-5b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4a^2(a^2-b^2)^2 d} \\
&\quad - \frac{b(35a^4-38a^2b^2+15b^4)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4a^3(a-b)^2(a+b)^3 d} \\
&\quad + \frac{(8a^4-29a^2b^2+15b^4)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a^3(a^2-b^2)^2 d} \\
&\quad + \frac{b^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)d(b+a\sec(c+dx))^2} + \frac{b^2(11a^2-5b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4a^2(a^2-b^2)^2 d(b+a\sec(c+dx))}
\end{aligned}$$

```
[Out] 1/2*b^2*sec(d*x+c)^(5/2)*sin(d*x+c)/a/(a^2-b^2)/d/(b+a*sec(d*x+c))^2+1/4*b^
2*(11*a^2-5*b^2)*sec(d*x+c)^(3/2)*sin(d*x+c)/a^2/(a^2-b^2)^2/d/(b+a*sec(d*x
+c))+1/4*(8*a^4-29*a^2*b^2+15*b^4)*sin(d*x+c)*sec(d*x+c)^(1/2)/a^3/(a^2-b^2
)^2/d-1/4*(8*a^4-29*a^2*b^2+15*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*
x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^
(1/2)/a^3/(a^2-b^2)^2/d+1/4*b*(11*a^2-5*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/c
os(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*se
c(d*x+c)^(1/2)/a^2/(a^2-b^2)^2/d-1/4*b*(35*a^4-38*a^2*b^2+15*b^4)*(cos(1/2*
d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a
+b),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^3/(a-b)^2/(a+b)^3/d
```

Rubi [A] (verified)

Time = 1.15 (sec) , antiderivative size = 388, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.478$, Rules used = {3317, 3930, 4183, 4187, 4191, 3934, 2884, 3872, 3856, 2719, 2720}

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \frac{b^2\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)}{2ad\,(a^2-b^2)\,(a\sec(c+dx)+b)^2}+\frac{b^2(11a^2-5b^2)\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{4a^2d\,(a^2-b^2)^2\,(a\sec(c+dx)+b)}+\frac{b(11a^2-5b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4a^2d\,(a^2-b^2)^2}+\frac{(8a^4-29a^2b^2+15b^4)\sin(c+dx)\sqrt{\sec(c+dx)}}{4a^3d\,(a^2-b^2)^2}-\frac{(8a^4-29a^2b^2+15b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4a^3d\,(a^2-b^2)^2}-\frac{b(35a^4-38a^2b^2+15b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4a^3d(a-b)^2(a+b)^3}$$

```
[In] Int[Sec[c + d*x]^(3/2)/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] -1/4*((8*a^4 - 29*a^2*b^2 + 15*b^4)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/
2, 2]*Sqrt[Sec[c + d*x]])/(a^3*(a^2 - b^2)^2*d) + (b*(11*a^2 - 5*b^2)*Sqrt[
Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(4*a^2*(a^2 - b
^2)^2*d) - (b*(35*a^4 - 38*a^2*b^2 + 15*b^4)*Sqrt[Cos[c + d*x]]*EllipticPi[
(2*b)/(a + b), (c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(4*a^3*(a - b)^2*(a + b)
^3*d) + ((8*a^4 - 29*a^2*b^2 + 15*b^4)*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(4*
a^3*(a^2 - b^2)^2*d) + (b^2*Sec[c + d*x]^(5/2)*Sin[c + d*x])/(2*a*(a^2 - b^
2)*d*(b + a*Sec[c + d*x])^2) + (b^2*(11*a^2 - 5*b^2)*Sec[c + d*x]^(3/2)*Sin
[c + d*x])/(4*a^2*(a^2 - b^2)^2*d*(b + a*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
```

```
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3930

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-a^2)*d^3*Cot[e + f*x]*(a + b*Csc[e + f*x])^(
m + 1)*((d*Csc[e + f*x])^(n - 3)/(b*f*(m + 1)*(a^2 - b^2))), x] + Dist[d^3/
(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^
(n - 3)*Simp[a^2*(n - 3) + a*b*(m + 1)*Csc[e + f*x] - (a^2*(n - 2) + b^2*(m
 + 1))*Csc[e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 -
 b^2, 0] && LtQ[m, -1] && (IGtQ[n, 3] || (IntegersQ[n + 1/2, 2*m] && GtQ[n,
 2]))
```

Rule 3934

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(3/2)/(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[d*Sqrt[d*Sin[e + f*x]]*Sqrt[d*Csc[e + f*x]], Int[1
/(Sqrt[d*Sin[e + f*x]]*(b + a*Sin[e + f*x])), x], x] /; FreeQ[{a, b, d, e,
f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 4183

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))*(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))^(m_), x_Symbol] :> Simp[(-d)*(A*b^2 - a*b*B + a^2*C)*Cot[e + f*x]*(a +
```

```
b*Csc[e + f*x])^(m + 1)*((d*Csc[e + f*x])^(n - 1)/(b*f*(a^2 - b^2)*(m + 1))
), x] + Dist[d/(b*(a^2 - b^2)*(m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d
*Csc[e + f*x])^(n - 1)*Simp[A*b^2*(n - 1) - a*(b*B - a*C)*(n - 1) + b*(a*A
- b*B + a*C)*(m + 1)*Csc[e + f*x] - (b*(A*b - a*B)*(m + n + 1) + C*(a^2*n +
 b^2*(m + 1)))*Csc[e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f, A, B, C}
, x] && NeQ[a^2 - b^2, 0] && LtQ[m, -1] && GtQ[n, 0]
```

Rule 4187

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))*(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))^(m_), x_Symbol] :> Simp[(-C)*d*Cot[e + f*x]*(a + b*Csc[e + f*x])^(m + 1
)*((d*Csc[e + f*x])^(n - 1)/(b*f*(m + n + 1))), x] + Dist[d/(b*(m + n + 1))
, Int[(a + b*Csc[e + f*x])^m*(d*Csc[e + f*x])^(n - 1)*Simp[a*C*(n - 1) + (A
*b*(m + n + 1) + b*C*(m + n))*Csc[e + f*x] + (b*B*(m + n + 1) - a*C*n)*Csc[
e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f, A, B, C, m}, x] && NeQ[a^2
- b^2, 0] && GtQ[n, 0]
```

Rule 4191

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))/(Sqrt[csc[(e_.) + (f_.)*(x_)]*(d_.)]*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))), x_Symbol] :> Dist[(A*b^2 - a*b*B + a^2*C)/(a^2*d^2), Int[(d*Csc[e + f
*x])^(3/2)/(a + b*Csc[e + f*x]), x], x] + Dist[1/a^2, Int[(a*A - (A*b - a*B
)*Csc[e + f*x])/Sqrt[d*Csc[e + f*x]], x], x] /; FreeQ[{a, b, d, e, f, A, B,
 C}, x] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \int \frac{\sec^{\frac{9}{2}}(c+dx)}{(b+a\sec(c+dx))^3}\,dx$$

$$= \frac{b^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{2a\,(a^2-b^2)\,d(b+a\sec(c+dx))^2} + \frac{\int \frac{\sec^{\frac{3}{2}}(c+dx)\left(\frac{3b^2}{2}-2ab\sec(c+dx)+\frac{1}{2}(4a^2-5b^2)\sec^2(c+dx)\right)}{(b+a\sec(c+dx))^2}\,dx}{2a\,(a^2-b^2)}$$

$$= \frac{b^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{2a\,(a^2-b^2)\,d(b+a\sec(c+dx))^2} + \frac{b^2(11a^2-5b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4a^2\,(a^2-b^2)^2\,d(b+a\sec(c+dx))} + \frac{\int \frac{\sqrt{\sec(c+dx)}\left(\frac{1}{4}b^2(11a^2-5b^2)-ab(4a^2-b^2)\sec(c+dx)+\frac{1}{4}(8a^4-29a^2b^2+15b^4)\sec^2(c+dx)\right)}{b+a\sec(c+dx)}\,dx}{2a^2\,(a^2-b^2)^2}$$

$$= \frac{(8a^4-29a^2b^2+15b^4)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a^3(a^2-b^2)^2d} + \frac{b^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)d(b+a\sec(c+dx))^2} + \frac{b^2(11a^2-5b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4a^2(a^2-b^2)^2d(b+a\sec(c+dx))} + \frac{\int \frac{-\frac{1}{8}b(8a^4-29a^2b^2+15b^4)-\frac{1}{2}a(2a^4-10a^2b^2+5b^4)\sec(c+dx)-\frac{3}{8}b(8a^4-11a^2b^2+5b^4)\sec^2(c+dx)}{\sqrt{\sec(c+dx)}(b+a\sec(c+dx))}dx}{a^3(a^2-b^2)^2}$$

$$= \frac{(8a^4-29a^2b^2+15b^4)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a^3(a^2-b^2)^2d} + \frac{b^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)d(b+a\sec(c+dx))^2} + \frac{b^2(11a^2-5b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4a^2(a^2-b^2)^2d(b+a\sec(c+dx))} + \frac{\int \frac{-\frac{1}{8}b^2(8a^4-29a^2b^2+15b^4)-\left(\frac{1}{2}ab(2a^4-10a^2b^2+5b^4)-\frac{1}{8}ab(8a^4-29a^2b^2+15b^4)\right)\sec(c+dx)}{\sqrt{\sec(c+dx)}}dx}{a^3b^2(a^2-b^2)^2} - \frac{(b(35a^4-38a^2b^2+15b^4))\int \frac{\sec^{\frac{3}{2}}(c+dx)}{b+a\sec(c+dx)}dx}{8a^3(a^2-b^2)^2}$$

$$= \frac{(8a^4-29a^2b^2+15b^4)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a^3(a^2-b^2)^2d} + \frac{b^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)d(b+a\sec(c+dx))^2} + \frac{b^2(11a^2-5b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4a^2(a^2-b^2)^2d(b+a\sec(c+dx))} + \frac{(b(11a^2-5b^2))\int\sqrt{\sec(c+dx)}dx}{8a^2(a^2-b^2)^2} - \frac{(8a^4-29a^2b^2+15b^4)\int\frac{1}{\sqrt{\sec(c+dx)}}dx}{8a^3(a^2-b^2)^2} - \frac{\left(b(35a^4-38a^2b^2+15b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}dx}{8a^3(a^2-b^2)^2}$$

$$= -\frac{b(35a^4-38a^2b^2+15b^4)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4a^3(a-b)^2(a+b)^3d} + \frac{(8a^4-29a^2b^2+15b^4)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a^3(a^2-b^2)^2d} + \frac{b^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)d(b+a\sec(c+dx))^2} + \frac{b^2(11a^2-5b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4a^2(a^2-b^2)^2d(b+a\sec(c+dx))} + \frac{\left(b(11a^2-5b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}dx}{8a^2(a^2-b^2)^2} - \frac{\left((8a^4-29a^2b^2+15b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}dx}{8a^3(a^2-b^2)^2}$$

$$= -\frac{(8a^4 - 29a^2b^2 + 15b^4)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{4a^3(a^2-b^2)^2 d}$$
$$+ \frac{b(11a^2-5b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4a^2(a^2-b^2)^2 d}$$
$$- \frac{b(35a^4 - 38a^2b^2 + 15b^4)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4a^3(a-b)^2(a+b)^3 d}$$
$$+ \frac{(8a^4 - 29a^2b^2 + 15b^4)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a^3(a^2-b^2)^2 d}$$
$$+ \frac{b^2\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)d(b+a\sec(c+dx))^2} + \frac{b^2(11a^2-5b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{4a^2(a^2-b^2)^2 d(b+a\sec(c+dx))}$$

Mathematica [A] (verified)

Time = 6.05 (sec) , antiderivative size = 532, normalized size of antiderivative = 1.37

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx$$
$$= \frac{\frac{2a\left(16a^6-24a^4b^2-13a^2b^4+15b^6+\left(32a^5b-94a^3b^3+50ab^5\right)\cos(c+dx)+\left(8a^4b^2-29a^2b^4+15b^6\right)\cos(2(c+dx))\right)\tan(c+dx)}{(a^2-b^2)^2} - \frac{4\cos(c+dx)(a+b\cos(c}{}}{}$$

```
[In] Integrate[Sec[c + d*x]^(3/2)/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] ((2*a*(16*a^6 - 24*a^4*b^2 - 13*a^2*b^4 + 15*b^6 + (32*a^5*b - 94*a^3*b^3 +
 50*a*b^5)*Cos[c + d*x] + (8*a^4*b^2 - 29*a^2*b^4 + 15*b^6)*Cos[2*(c + d*x)
])*Tan[c + d*x])/(a^2 - b^2)^2 - (4*Cos[c + d*x]*(a + b*Cos[c + d*x])*Cot[c
 + d*x]*(b + a*Sec[c + d*x])*(-8*a^5 + 29*a^3*b^2 - 15*a*b^4 + 8*a^5*Sec[c
+ d*x]^2 - 29*a^3*b^2*Sec[c + d*x]^2 + 15*a*b^4*Sec[c + d*x]^2 - a*(8*a^4 -
 29*a^2*b^2 + 15*b^4)*EllipticE[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[Sec[c
+ d*x]]*Sqrt[-Tan[c + d*x]^2] + (8*a^5 + 24*a^4*b - 29*a^3*b^2 - 33*a^2*b^3
 + 15*a*b^4 + 15*b^5)*EllipticF[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[Sec[c
+ d*x]]*Sqrt[-Tan[c + d*x]^2] - 35*a^4*b*EllipticPi[-(a/b), ArcSin[Sqrt[Sec
[c + d*x]]], -1]*Sqrt[Sec[c + d*x]]*Sqrt[-Tan[c + d*x]^2] + 38*a^2*b^3*Elli
pticPi[-(a/b), ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[Sec[c + d*x]]*Sqrt[-Tan
[c + d*x]^2] - 15*b^5*EllipticPi[-(a/b), ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sq
rt[Sec[c + d*x]]*Sqrt[-Tan[c + d*x]^2]))/((a - b)^2*(a + b)^2))/(16*a^4*d*(
a + b*Cos[c + d*x])^2*Sqrt[Sec[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1964 vs. 2(436) = 872.

Time = 10.03 (sec) , antiderivative size = 1965, normalized size of antiderivative = 5.06

method	result	size
default	Expression too large to display	1965

```
[In] int(sec(d*x+c)^(3/2)/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/a^3/sin(1/2*d
*x+1/2*c)^2/(2*sin(1/2*d*x+1/2*c)^2-1)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x
+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-(sin(1/2*d*x+1/
2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c)
,2^(1/2)))-2/a*b*(-1/2/a*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1
/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)^2-3/4*b^
2*(3*a^2-b^2)/a^2/(a^2-b^2)^2*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+s
in(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-7/8/(a+b)/(a^2-b^
2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1
/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^
(1/2))+1/4/(a+b)/(a^2-b^2)/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1
/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellip
ticF(cos(1/2*d*x+1/2*c),2^(1/2))*b+3/8/(a+b)/(a^2-b^2)/a^2*(sin(1/2*d*x+1/2
*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin
(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*b^2-9/8*b/(a
^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-
2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/
2*c),2^(1/2))+3/8*b^3/a^2/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(
1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1
/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+9/8*b/(a^2-b^2)^2*(sin(1/2*d*x+1/
2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+si
n(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-3/8*b^3/a^2
/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)
/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x
+1/2*c),2^(1/2))-15/4*a^2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^
2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2
*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+3/2/
(a^2-b^2)^2/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x
+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ell
ipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))-3/4/a^2/(a^2-b^2)^2/(-2*a*b+
2*b^2)*b^5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(
-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+
1/2*c),-2*b/(a-b),2^(1/2)))+4*b^2/a^3/(-2*a*b+2*b^2)*(sin(1/2*d*x+1/2*c)^2)
^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d
*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))-2*b/a^
```

```
2*(-1/a*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d
*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d*x+
1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+
sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a^2-
b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2
*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2
*c),2^(1/2))+1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x
+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ell
ipticE(cos(1/2*d*x+1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c
)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^
(1/2))+1/a/(a^2-b^2)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*co
s(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^
(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))))/sin(1/2*d*x+1/2*c
)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+b*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx$$

```
[In] integrate(sec(d*x+c)**(3/2)/(a+b*cos(d*x+c))**3,x)
```

```
[Out] Integral(sec(c + d*x)**(3/2)/(a + b*cos(c + d*x))**3, x)
```

Maxima [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
[Out] Timed out
```

Giac [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\sec(dx+c)^{\frac{3}{2}}}{(b\cos(dx+c)+a)^3}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+b*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(3/2)/(b*cos(d*x + c) + a)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}{(a+b\,\cos(c+d\,x))^3}\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)/(a + b*cos(c + d*x))^3,x)
[Out] int((1/cos(c + d*x))^(3/2)/(a + b*cos(c + d*x))^3, x)
```

3.726 $\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 321

$$\begin{aligned}
&\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^3}\,dx \\
&= -\frac{3b(3a^2-b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{4a^2(a^2-b^2)^2 d} \\
&\quad -\frac{(7a^2-b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4a(a^2-b^2)^2 d} \\
&\quad +\frac{3(5a^4-2a^2b^2+b^4)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4a^2(a-b)^2(a+b)^3 d} \\
&\quad +\frac{b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)\,d(b+a\sec(c+dx))^2}+\frac{3b^2(3a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a^2(a^2-b^2)^2 d(b+a\sec(c+dx))}
\end{aligned}$$

```
[Out] 1/2*b^2*sec(d*x+c)^(3/2)*sin(d*x+c)/a/(a^2-b^2)/d/(b+a*sec(d*x+c))^2+3/4*b^
2*(3*a^2-b^2)*sin(d*x+c)*sec(d*x+c)^(1/2)/a^2/(a^2-b^2)^2/d/(b+a*sec(d*x+c)
)-3/4*b*(3*a^2-b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipti
cE(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a^2/(a^2-b
^2)^2/d-1/4*(7*a^2-b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ell
ipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a/(a^2
-b^2)^2/d+3/4*(5*a^4-2*a^2*b^2+b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*
x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))*cos(d*x+c)^(1/2)*
sec(d*x+c)^(1/2)/a^2/(a-b)^2/(a+b)^3/d
```

Rubi [A] (verified)

Time = 0.84 (sec) , antiderivative size = 321, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {3317, 3930, 4183, 4191, 3934, 2884, 3872, 3856, 2719, 2720}

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^3}\,dx$$
$$= \frac{b^2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{2ad\,(a^2-b^2)\,(a\sec(c+dx)+b)^2}+\frac{3b^2(3a^2-b^2)\sin(c+dx)\sqrt{\sec(c+dx)}}{4a^2d\,(a^2-b^2)^2\,(a\sec(c+dx)+b)}$$
$$-\frac{(7a^2-b^2)\,\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4ad\,(a^2-b^2)^2}$$
$$-\frac{3b(3a^2-b^2)\,\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{4a^2d\,(a^2-b^2)^2}$$
$$+\frac{3(5a^4-2a^2b^2+b^4)\,\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4a^2d(a-b)^2(a+b)^3}$$

```
[In] Int[Sqrt[Sec[c + d*x]]/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (-3*b*(3*a^2 - b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c
 + d*x]])/(4*a^2*(a^2 - b^2)^2*d) - ((7*a^2 - b^2)*Sqrt[Cos[c + d*x]]*Ellip
ticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(4*a*(a^2 - b^2)^2*d) + (3*(5*a^4
- 2*a^2*b^2 + b^4)*Sqrt[Cos[c + d*x]]*EllipticPi[(2*b)/(a + b), (c + d*x)/2
, 2]*Sqrt[Sec[c + d*x]])/(4*a^2*(a - b)^2*(a + b)^3*d) + (b^2*Sec[c + d*x]^
(3/2)*Sin[c + d*x])/(2*a*(a^2 - b^2)*d*(b + a*Sec[c + d*x])^2) + (3*b^2*(3*
a^2 - b^2)*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(4*a^2*(a^2 - b^2)^2*d*(b + a*S
ec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
```

0] && GtQ[c + d, 0]

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3930

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-a^2)*d^3*Cot[e + f*x]*(a + b*Csc[e + f*x])^(
m + 1)*((d*Csc[e + f*x])^(n - 3)/(b*f*(m + 1)*(a^2 - b^2))), x] + Dist[d^3/
(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^
(n - 3)*Simp[a^2*(n - 3) + a*b*(m + 1)*Csc[e + f*x] - (a^2*(n - 2) + b^2*(m
 + 1))*Csc[e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 -
 b^2, 0] && LtQ[m, -1] && (IGtQ[n, 3] || (IntegersQ[n + 1/2, 2*m] && GtQ[n,
 2]))
```

Rule 3934

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(3/2)/(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[d*Sqrt[d*Sin[e + f*x]]*Sqrt[d*Csc[e + f*x]], Int[1
/(Sqrt[d*Sin[e + f*x]]*(b + a*Sin[e + f*x])), x], x] /; FreeQ[{a, b, d, e,
f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 4183

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))*(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))^(m_), x_Symbol] :> Simp[(-d)*(A*b^2 - a*b*B + a^2*C)*Cot[e + f*x]*(a +
b*Csc[e + f*x])^(m + 1)*((d*Csc[e + f*x])^(n - 1)/(b*f*(a^2 - b^2)*(m + 1))
), x] + Dist[d/(b*(a^2 - b^2)*(m + 1)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d
```

```
*Csc[e + f*x])^(n - 1)*Simp[A*b^2*(n - 1) - a*(b*B - a*C)*(n - 1) + b*(a*A
- b*B + a*C)*(m + 1)*Csc[e + f*x] - (b*(A*b - a*B)*(m + n + 1) + C*(a^2*n +
 b^2*(m + 1)))*Csc[e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f, A, B, C}
, x] && NeQ[a^2 - b^2, 0] && LtQ[m, -1] && GtQ[n, 0]
```

Rule 4191

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))/(Sqrt[csc[(e_.) + (f_.)*(x_)]*(d_.)]*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))), x_Symbol] :> Dist[(A*b^2 - a*b*B + a^2*C)/(a^2*d^2), Int[(d*Csc[e + f
*x])^(3/2)/(a + b*Csc[e + f*x]), x], x] + Dist[1/a^2, Int[(a*A - (A*b - a*B
)*Csc[e + f*x])/Sqrt[d*Csc[e + f*x]], x], x] /; FreeQ[{a, b, d, e, f, A, B,
 C}, x] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \int \frac{\sec^{\frac{7}{2}}(c+dx)}{(b+a\sec(c+dx))^3}\,dx$$

$$= \frac{b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)\,d(b+a\sec(c+dx))^2} + \frac{\int \frac{\sqrt{\sec(c+dx)}\left(\frac{b^2}{2}-2ab\sec(c+dx)+\frac{1}{2}(4a^2-3b^2)\sec^2(c+dx)\right)}{(b+a\sec(c+dx))^2}\,dx}{2a(a^2-b^2)}$$

$$= \frac{b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)\,d(b+a\sec(c+dx))^2} + \frac{3b^2(3a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a^2(a^2-b^2)^2\,d(b+a\sec(c+dx))} + \frac{\int \frac{-\frac{3}{4}b^2(3a^2-b^2)-ab(4a^2-b^2)\sec(c+dx)+\frac{1}{4}(8a^4-5a^2b^2+3b^4)\sec^2(c+dx)}{\sqrt{\sec(c+dx)}(b+a\sec(c+dx))}\,dx}{2a^2(a^2-b^2)^2}$$

$$= \frac{b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)\,d(b+a\sec(c+dx))^2} + \frac{3b^2(3a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a^2(a^2-b^2)^2\,d(b+a\sec(c+dx))} + \frac{\int \frac{-\frac{3}{4}b^3(3a^2-b^2)-\left(-\frac{3}{4}ab^2(3a^2-b^2)+ab^2(4a^2-b^2)\right)\sec(c+dx)}{\sqrt{\sec(c+dx)}}\,dx}{2a^2b^2(a^2-b^2)^2} + \frac{(3(5a^4-2a^2b^2+b^4))\int \frac{\sec^{\frac{3}{2}}(c+dx)}{b+a\sec(c+dx)}\,dx}{8a^2(a^2-b^2)^2}$$

$$= \frac{b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)\,d(b+a\sec(c+dx))^2} + \frac{3b^2(3a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a^2(a^2-b^2)^2\,d(b+a\sec(c+dx))} - \frac{(3b(3a^2-b^2))\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx}{8a^2(a^2-b^2)^2} - \frac{(7a^2-b^2)\int\sqrt{\sec(c+dx)}\,dx}{8a(a^2-b^2)^2} + \frac{\left(3(5a^4-2a^2b^2+b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{8a^2(a^2-b^2)^2}$$

$$= \frac{3(5a^4 - 2a^2b^2 + b^4)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b}, \frac{1}{2}(c+dx), 2\right)\sqrt{\sec(c+dx)}}{4a^2(a-b)^2(a+b)^3 d} + \frac{b^2 \sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)\,d(b+a\sec(c+dx))^2} + \frac{3b^2(3a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a^2(a^2-b^2)^2 d(b+a\sec(c+dx))} - \frac{\left(3b(3a^2-b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx}{8a^2(a^2-b^2)^2} - \frac{\left((7a^2-b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{8a(a^2-b^2)^2}$$

$$= -\frac{3b(3a^2-b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{4a^2(a^2-b^2)^2 d} - \frac{(7a^2-b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx), 2\right)\sqrt{\sec(c+dx)}}{4a(a^2-b^2)^2 d} + \frac{3(5a^4-2a^2b^2+b^4)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b}, \frac{1}{2}(c+dx), 2\right)\sqrt{\sec(c+dx)}}{4a^2(a-b)^2(a+b)^3 d} + \frac{b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2a(a^2-b^2)\,d(b+a\sec(c+dx))^2} + \frac{3b^2(3a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a^2(a^2-b^2)^2 d(b+a\sec(c+dx))}$$

Mathematica [A] (verified)

Time = 5.36 (sec) , antiderivative size = 341, normalized size of antiderivative = 1.06

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^3}\,dx$$

$$= \frac{\frac{4ab^2(11a^3-5ab^2+(9a^2b-3b^3)\cos(c+dx))\sin(c+dx)}{(a^2-b^2)^2} + \frac{4\cos(c+dx)(a+b\cos(c+dx))\cot(c+dx)(b+a\sec(c+dx))\left(3ab(3a^2-b^2)E\left(\arcsin\left(\sqrt{\sec(c\right.\right.\right.}{}}{}$$

```
[In] Integrate[Sqrt[Sec[c + d*x]]/(a + b*Cos[c + d*x])^3,x]
```

```
[Out] ((4*a*b^2*(11*a^3 - 5*a*b^2 + (9*a^2*b - 3*b^3)*Cos[c + d*x])*Sin[c + d*x])
/(a^2 - b^2)^2 + (4*Cos[c + d*x]*(a + b*Cos[c + d*x])*Cot[c + d*x]*(b + a*S
ec[c + d*x])*(3*a*b*(3*a^2 - b^2)*EllipticE[ArcSin[Sqrt[Sec[c + d*x]]], -1]
*Sqrt[Sec[c + d*x]]*Sqrt[-Tan[c + d*x]^2] + (8*a^4 - 9*a^3*b - 5*a^2*b^2 +
3*a*b^3 + 3*b^4)*EllipticF[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[Sec[c + d*x
]]*Sqrt[-Tan[c + d*x]^2] - 3*(a*b*(3*a^2 - b^2)*Tan[c + d*x]^2 + (5*a^4 - 2
*a^2*b^2 + b^4)*EllipticPi[-(a/b), ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[Sec
[c + d*x]]*Sqrt[-Tan[c + d*x]^2])))/((a - b)^2*(a + b)^2))/(16*a^3*d*(a + b
*Cos[c + d*x])^2*Sqrt[Sec[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1175 vs. 2(373) = 746.

Time = 5.52 (sec) , antiderivative size = 1176, normalized size of antiderivative = 3.66

method	result	size
default	Expression too large to display	1176

```
[In] int(sec(d*x+c)^(1/2)/(a+cos(d*x+c)*b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-1/a*b^2/(a^2-b
^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)
/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)^2-3/2*b^2*(3*a^2-b^2)/a^2/(a^2-b^2)^2*cos(1
/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos
(1/2*d*x+1/2*c)^2+a-b)-7/4/(a+b)/(a^2-b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/2/(a+b)/(a^2-b^2)/a*(sin(1
/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/
2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*b+
3/4/(a+b)/(a^2-b^2)/a^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)
^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(
cos(1/2*d*x+1/2*c),2^(1/2))*b^2-9/4*b/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1
/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+
1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+3/4*b^3/a^2/(a^2-b^2)
^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1
/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^
(1/2))+9/4*b/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c
)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE
(cos(1/2*d*x+1/2*c),2^(1/2))-3/4*b^3/a^2/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)
^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d
*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-15/2*a^2/(a^2-b^2)
^2/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1
)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos
(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+3/(a^2-b^2)^2/(-2*a*b+2*b^2)*b^3*(sin(1
/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/
2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b)
,2^(1/2))-3/2/a^2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b^5*(sin(1/2*d*x+1/2*c)^2)^(1/
2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1
/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2)))/sin(1/2*d
*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^3}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+b*cos(d*x+c))^3,x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\sqrt{\sec{(c+dx)}}}{(a+b\cos{(c+dx)})^3}\,dx$$

```
[In] integrate(sec(d*x+c)**(1/2)/(a+b*cos(d*x+c))**3,x)
[Out] Integral(sqrt(sec(c + d*x))/(a + b*cos(c + d*x))**3, x)
```

Maxima [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\sqrt{\sec{(dx+c)}}}{(b\cos{(dx+c)}+a)^3}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+b*cos(d*x+c))^3,x, algorithm="maxima")
[Out] integrate(sqrt(sec(d*x + c))/(b*cos(d*x + c) + a)^3, x)
```

Giac [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\sqrt{\sec{(dx+c)}}}{(b\cos{(dx+c)}+a)^3}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+b*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate(sqrt(sec(d*x + c))/(b*cos(d*x + c) + a)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^3}\,dx = \int \frac{\sqrt{\frac{1}{\cos(c+d\,x)}}}{\left(a+b\,\cos\left(c+d\,x\right)\right)^3}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)/(a + b*cos(c + d*x))^3,x)
[Out] int((1/cos(c + d*x))^(1/2)/(a + b*cos(c + d*x))^3, x)
```

3.727 $\int \frac{1}{(a+b\cos(c+dx))^3\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 317

$$\begin{aligned}\int \frac{1}{(a+b\cos(c+dx))^3\sqrt{\sec(c+dx)}}\,dx &= \frac{(5a^2+b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{4a\left(a^2-b^2\right)^2 d} \\ &\quad+\frac{3(a^2+b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4b\left(a^2-b^2\right)^2 d} \\ &\quad-\frac{(3a^4+10a^2b^2-b^4)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4a(a-b)^2b(a+b)^3d} \\ &\quad+\frac{b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{2a\left(a^2-b^2\right)d(b+a\sec(c+dx))^2}-\frac{b(7a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a\left(a^2-b^2\right)^2 d(b+a\sec(c+dx))}\end{aligned}$$

```
[Out] 1/2*b^2*sin(d*x+c)*sec(d*x+c)^(1/2)/a/(a^2-b^2)/d/(b+a*sec(d*x+c))^2-1/4*b*
(7*a^2-b^2)*sin(d*x+c)*sec(d*x+c)^(1/2)/a/(a^2-b^2)^2/d/(b+a*sec(d*x+c))+1/
4*(5*a^2+b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin
(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/a/(a^2-b^2)^2/d+
3/4*(a^2+b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin
(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/b/(a^2-b^2)^2/d-
1/4*(3*a^4+10*a^2*b^2-b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*
EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c
)^(1/2)/a/(a-b)^2/b/(a+b)^3/d
```

Rubi [A] (verified)

Time = 0.82 (sec) , antiderivative size = 317, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {3317, 3930, 4185, 4191, 3934, 2884, 3872, 3856, 2719, 2720}

$$\begin{aligned} &\int \frac{1}{(a+b\cos(c+dx))^3\sqrt{\sec(c+dx)}}\,dx \\ &= \frac{b^2\sin(c+dx)\sqrt{\sec(c+dx)}}{2ad\,(a^2-b^2)\,(a\sec(c+dx)+b)^2} - \frac{b(7a^2-b^2)\sin(c+dx)\sqrt{\sec(c+dx)}}{4ad\,(a^2-b^2)^2\,(a\sec(c+dx)+b)} \\ &\quad + \frac{3(a^2+b^2)\,\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4bd\,(a^2-b^2)^2} \\ &\quad + \frac{(5a^2+b^2)\,\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{4ad\,(a^2-b^2)^2} \\ &\quad - \frac{(3a^4+10a^2b^2-b^4)\,\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4abd(a-b)^2(a+b)^3} \end{aligned}$$

```
[In] Int[1/((a + b*Cos[c + d*x])^3*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] ((5*a^2 + b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c + d*
x]])/(4*a*(a^2 - b^2)^2*d) + (3*(a^2 + b^2)*Sqrt[Cos[c + d*x]]*EllipticF[(c
 + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(4*b*(a^2 - b^2)^2*d) - ((3*a^4 + 10*a^2*
b^2 - b^4)*Sqrt[Cos[c + d*x]]*EllipticPi[(2*b)/(a + b), (c + d*x)/2, 2]*Sqr
t[Sec[c + d*x]])/(4*a*(a - b)^2*b*(a + b)^3*d) + (b^2*Sqrt[Sec[c + d*x]]*Si
n[c + d*x])/(2*a*(a^2 - b^2)*d*(b + a*Sec[c + d*x])^2) - (b*(7*a^2 - b^2)*S
qrt[Sec[c + d*x]]*Sin[c + d*x])/(4*a*(a^2 - b^2)^2*d*(b + a*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3930

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-a^2)*d^3*Cot[e + f*x]*(a + b*Csc[e + f*x])^(
m + 1)*((d*Csc[e + f*x])^(n - 3)/(b*f*(m + 1)*(a^2 - b^2))), x] + Dist[d^3/
(b*(m + 1)*(a^2 - b^2)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^
(n - 3)*Simp[a^2*(n - 3) + a*b*(m + 1)*Csc[e + f*x] - (a^2*(n - 2) + b^2*(m
 + 1))*Csc[e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 -
 b^2, 0] && LtQ[m, -1] && (IGtQ[n, 3] || (IntegersQ[n + 1/2, 2*m] && GtQ[n,
 2]))
```

Rule 3934

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(3/2)/(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[d*Sqrt[d*Sin[e + f*x]]*Sqrt[d*Csc[e + f*x]], Int[1
/(Sqrt[d*Sin[e + f*x]]*(b + a*Sin[e + f*x])), x], x] /; FreeQ[{a, b, d, e,
f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 4185

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))*(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))^(m_), x_Symbol] :> Simp[(A*b^2 - a*b*B + a^2*C)*Cot[e + f*x]*(a + b*Csc
[e + f*x])^(m + 1)*((d*Csc[e + f*x])^n/(a*f*(m + 1)*(a^2 - b^2))), x] + Dis
t[1/(a*(m + 1)*(a^2 - b^2)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*
x])^n*Simp[a*(a*A - b*B + a*C)*(m + 1) - (A*b^2 - a*b*B + a^2*C)*(m + n + 1
) - a*(A*b - a*B + b*C)*(m + 1)*Csc[e + f*x] + (A*b^2 - a*b*B + a^2*C)*(m +
```

```
n + 2)*Csc[e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f, A, B, C, n}, x]
 && NeQ[a^2 - b^2, 0] && LtQ[m, -1] &&  !(ILtQ[m + 1/2, 0] && ILtQ[n, 0])
```

Rule 4191

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))/(Sqrt[csc[(e_.) + (f_.)*(x_)]*(d_.)]*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))), x_Symbol] :> Dist[(A*b^2 - a*b*B + a^2*C)/(a^2*d^2), Int[(d*Csc[e + f
*x])^(3/2)/(a + b*Csc[e + f*x]), x], x] + Dist[1/a^2, Int[(a*A - (A*b - a*B
)*Csc[e + f*x])/Sqrt[d*Csc[e + f*x]], x], x] /; FreeQ[{a, b, d, e, f, A, B,
 C}, x] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \int \frac{\sec^{\frac{5}{2}}(c+dx)}{(b+a\sec(c+dx))^3}\,dx$$

$$= \frac{b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{2a(a^2-b^2)d(b+a\sec(c+dx))^2} + \frac{\int \frac{-\frac{b^2}{2}-2ab\sec(c+dx)+\frac{1}{2}(4a^2-b^2)\sec^2(c+dx)}{\sqrt{\sec(c+dx)}(b+a\sec(c+dx))^2}\,dx}{2a(a^2-b^2)}$$

$$= \frac{b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{2a(a^2-b^2)d(b+a\sec(c+dx))^2} - \frac{b(7a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a(a^2-b^2)^2d(b+a\sec(c+dx))} + \frac{\int \frac{\frac{1}{4}b^2(5a^2+b^2)+ab(2a^2+b^2)\sec(c+dx)-\frac{1}{4}b^2(7a^2-b^2)\sec^2(c+dx)}{\sqrt{\sec(c+dx)}(b+a\sec(c+dx))}\,dx}{2ab(a^2-b^2)^2}$$

$$= \frac{b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{2a(a^2-b^2)d(b+a\sec(c+dx))^2} - \frac{b(7a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a(a^2-b^2)^2d(b+a\sec(c+dx))} + \frac{\int \frac{\frac{1}{4}b^3(5a^2+b^2)-\left(-ab^2(2a^2+b^2)+\frac{1}{4}ab^2(5a^2+b^2)\right)\sec(c+dx)}{\sqrt{\sec(c+dx)}}\,dx}{2ab^3(a^2-b^2)^2} - \frac{(3a^4+10a^2b^2-b^4)\int \frac{\sec^{\frac{3}{2}}(c+dx)}{b+a\sec(c+dx)}\,dx}{8ab(a^2-b^2)^2}$$

$$= \frac{b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{2a(a^2-b^2)d(b+a\sec(c+dx))^2} - \frac{b(7a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a(a^2-b^2)^2d(b+a\sec(c+dx))} + \frac{(3(a^2+b^2))\int\sqrt{\sec(c+dx)}\,dx}{8b(a^2-b^2)^2} + \frac{(5a^2+b^2)\int\frac{1}{\sqrt{\sec(c+dx)}}\,dx}{8a(a^2-b^2)^2} - \frac{\left((3a^4+10a^2b^2-b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{8ab(a^2-b^2)^2}$$

$$= -\frac{(3a^4+10a^2b^2-b^4)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4a(a-b)^2b(a+b)^3d}$$
$$+\frac{b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{2a(a^2-b^2)\,d(b+a\sec(c+dx))^2}-\frac{b(7a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a(a^2-b^2)^2\,d(b+a\sec(c+dx))}$$
$$+\frac{\left(3(a^2+b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{8b(a^2-b^2)^2}$$
$$+\frac{\left((5a^2+b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx}{8a(a^2-b^2)^2}$$
$$=\frac{(5a^2+b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{4a(a^2-b^2)^2d}$$
$$+\frac{3(a^2+b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4b(a^2-b^2)^2d}$$
$$-\frac{(3a^4+10a^2b^2-b^4)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4a(a-b)^2b(a+b)^3d}$$
$$+\frac{b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{2a(a^2-b^2)\,d(b+a\sec(c+dx))^2}-\frac{b(7a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4a(a^2-b^2)^2\,d(b+a\sec(c+dx))}$$

Mathematica [A] (verified)

Time = 3.71 (sec) , antiderivative size = 395, normalized size of antiderivative = 1.25

$$\int\frac{1}{(a+b\cos(c+dx))^3\sqrt{\sec(c+dx)}}\,dx$$
$$=\frac{-\frac{4b(7a^3-ab^2+b(5a^2+b^2)\cos(c+dx))\sin(c+dx)}{a(a^2-b^2)^2(a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}}+\frac{2\cot(c+dx)\left(5a^3b\sec^{\frac{3}{2}}(c+dx)+ab^3\sec^{\frac{3}{2}}(c+dx)-5a^3b\cos(2(c+dx))\sec^{\frac{3}{2}}(c+dx)-ab^3\cos(2(\right.}{}}{}$$

```
[In] Integrate[1/((a + b*Cos[c + d*x])^3*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] ((-4*b*(7*a^3 - a*b^2 + b*(5*a^2 + b^2)*Cos[c + d*x])*Sin[c + d*x])/(a*(a^2
 - b^2)^2*(a + b*Cos[c + d*x])^2*Sqrt[Sec[c + d*x]]) + (2*Cot[c + d*x]*(5*a
^3*b*Sec[c + d*x]^(3/2) + a*b^3*Sec[c + d*x]^(3/2) - 5*a^3*b*Cos[2*(c + d*x
)]*Sec[c + d*x]^(3/2) - a*b^3*Cos[2*(c + d*x)]*Sec[c + d*x]^(3/2) - 2*a*b*(
5*a^2 + b^2)*EllipticE[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[-Tan[c + d*x]^2
] + 2*b*(5*a^3 - 7*a^2*b + a*b^2 + b^3)*EllipticF[ArcSin[Sqrt[Sec[c + d*x]]
], -1]*Sqrt[-Tan[c + d*x]^2] + 6*a^4*EllipticPi[-(a/b), ArcSin[Sqrt[Sec[c +
 d*x]]], -1]*Sqrt[-Tan[c + d*x]^2] + 20*a^2*b^2*EllipticPi[-(a/b), ArcSin[S
qrt[Sec[c + d*x]]], -1]*Sqrt[-Tan[c + d*x]^2] - 2*b^4*EllipticPi[-(a/b), Ar
cSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[-Tan[c + d*x]^2]))/(a^2*(a - b)^2*b*(a +
 b)^2))/(16*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1735 vs. 2(369) = 738.

Time = 8.23 (sec) , antiderivative size = 1736, normalized size of antiderivative = 5.48

method	result	size
default	Expression too large to display	1736

```
[In] int(1/(a+cos(d*x+c)*b)^3/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/b*(-1/a*b^2/(
a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^
(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d*x+1/2*c)^2)^(1/
2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1
/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a^2-b^2)*b/a*(sin
(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+
1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+
1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^
(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/
2*d*x+1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)
^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d
*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+1/a/(a
^2-b^2)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2
*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellipti
cPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2)))-2/b*a*(-1/2/a*b^2/(a^2-b^2)*cos
(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*c
os(1/2*d*x+1/2*c)^2+a-b)^2-3/4*b^2*(3*a^2-b^2)/a^2/(a^2-b^2)^2*cos(1/2*d*x+
1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*
x+1/2*c)^2+a-b)-7/8/(a+b)/(a^2-b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/
2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2
)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/4/(a+b)/(a^2-b^2)/a*(sin(1/2*d*x+
1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+
sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*b+3/8/(a+
b)/(a^2-b^2)/a^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(
1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2
*d*x+1/2*c),2^(1/2))*b^2-9/8*b/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+3/8*b^3/a^2/(a^2-b^2)^2*(sin
(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+
1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+
9/8*b/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^
(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/
2*d*x+1/2*c),2^(1/2))-3/8*b^3/a^2/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*
(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*
c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-15/4*a^2/(a^2-b^2)^2/(-2*
```

```
a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)
/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*
x+1/2*c),-2*b/(a-b),2^(1/2))+3/2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^
4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1
/2))-3/4/a^2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b^5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-
2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)
^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))))/sin(1/2*d*x+1
/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^3\sqrt{\sec(c+dx)}}\,dx=\text{Timed out}$$

```
[In] integrate(1/(a+b*cos(d*x+c))^3/sec(d*x+c)^(1/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \frac{1}{(a+b\cos(c+dx))^3\sqrt{\sec(c+dx)}}\,dx=\int \frac{1}{\left(a+b\cos\left(c+dx\right)\right)^3\sqrt{\sec\left(c+dx\right)}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))**3/sec(d*x+c)**(1/2),x)
[Out] Integral(1/((a + b*cos(c + d*x))**3*sqrt(sec(c + d*x))), x)
```

Maxima [F]

$$\int \frac{1}{(a+b\cos(c+dx))^3\sqrt{\sec(c+dx)}}\,dx=\int \frac{1}{\left(b\cos\left(dx+c\right)+a\right)^3\sqrt{\sec\left(dx+c\right)}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^3/sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^3*sqrt(sec(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{(a+b\cos(c+dx))^3\sqrt{\sec(c+dx)}}\,dx=\int \frac{1}{(b\cos(dx+c)+a)^3\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^3/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^3*sqrt(sec(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^3\sqrt{\sec(c+dx)}}\,dx=\int \frac{1}{\sqrt{\frac{1}{\cos(c+d\,x)}}\,(a+b\,\cos(c+d\,x))^3}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^3),x)
[Out] int(1/((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^3), x)
```

3.728 $\int \frac{1}{(a+b\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 302

$$\begin{aligned}
&\int \frac{1}{(a+b\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)}\,dx\\
&= -\frac{(a^2+5b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{4b(a^2-b^2)^2d}\\
&\quad+\frac{a(a^2-7b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4b^2(a^2-b^2)^2d}\\
&\quad-\frac{(a^4-10a^2b^2-3b^4)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4(a-b)^2b^2(a+b)^3d}\\
&\quad-\frac{b\sqrt{\sec(c+dx)}\sin(c+dx)}{2(a^2-b^2)d(b+a\sec(c+dx))^2}+\frac{3(a^2+b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4(a^2-b^2)^2d(b+a\sec(c+dx))}
\end{aligned}$$

```
[Out] -1/2*b*sin(d*x+c)*sec(d*x+c)^(1/2)/(a^2-b^2)/d/(b+a*sec(d*x+c))^2+3/4*(a^2+
b^2)*sin(d*x+c)*sec(d*x+c)^(1/2)/(a^2-b^2)^2/d/(b+a*sec(d*x+c))-1/4*(a^2+5*
b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+
1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/b/(a^2-b^2)^2/d+1/4*a*(a^
2-7*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*
d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/b^2/(a^2-b^2)^2/d-1/4
*(a^4-10*a^2*b^2-3*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ell
ipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(
1/2)/(a-b)^2/b^2/(a+b)^3/d
```

Rubi [A] (verified)

Time = 0.76 (sec) , antiderivative size = 302, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.435$, Rules used = {3317, 3929, 4185, 4191, 3934, 2884, 3872, 3856, 2719, 2720}

$$\int \frac{1}{(a+b\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{3(a^2+b^2)\sin(c+dx)\sqrt{\sec(c+dx)}}{4d(a^2-b^2)^2(a\sec(c+dx)+b)} - \frac{b\sin(c+dx)\sqrt{\sec(c+dx)}}{2d(a^2-b^2)(a\sec(c+dx)+b)^2} + \frac{a(a^2-7b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4b^2d(a^2-b^2)^2} - \frac{(a^2+5b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4bd(a^2-b^2)^2} - \frac{(a^4-10a^2b^2-3b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4b^2d(a-b)^2(a+b)^3}$$

```
[In] Int[1/((a + b*Cos[c + d*x])^3*Sec[c + d*x]^(3/2)),x]
```

```
[Out] -1/4*((a^2 + 5*b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c
 + d*x]])/(b*(a^2 - b^2)^2*d) + (a*(a^2 - 7*b^2)*Sqrt[Cos[c + d*x]]*Ellipti
cF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(4*b^2*(a^2 - b^2)^2*d) - ((a^4 - 10
*a^2*b^2 - 3*b^4)*Sqrt[Cos[c + d*x]]*EllipticPi[(2*b)/(a + b), (c + d*x)/2,
 2]*Sqrt[Sec[c + d*x]])/(4*(a - b)^2*b^2*(a + b)^3*d) - (b*Sqrt[Sec[c + d*x
]]*Sin[c + d*x])/(2*(a^2 - b^2)*d*(b + a*Sec[c + d*x])^2) + (3*(a^2 + b^2)*
Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(4*(a^2 - b^2)^2*d*(b + a*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
0] && GtQ[c + d, 0]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3929

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[a*d^2*Cot[e + f*x]*(a + b*Csc[e + f*x])^(m + 1
)*((d*Csc[e + f*x])^(n - 2)/(f*(m + 1)*(a^2 - b^2))), x] - Dist[d^2/((m + 1
)*(a^2 - b^2)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^(n - 2)*(
a*(n - 2) + b*(m + 1)*Csc[e + f*x] - a*(m + n)*Csc[e + f*x]^2), x], x] /; F
reeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0] && LtQ[m, -1] && LtQ[1, n, 2]
 && IntegersQ[2*m, 2*n]
```

Rule 3934

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(3/2)/(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[d*Sqrt[d*Sin[e + f*x]]*Sqrt[d*Csc[e + f*x]], Int[1
/(Sqrt[d*Sin[e + f*x]]*(b + a*Sin[e + f*x])), x], x] /; FreeQ[{a, b, d, e,
f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 4185

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))*(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))^(m_), x_Symbol] :> Simp[(A*b^2 - a*b*B + a^2*C)*Cot[e + f*x]*(a + b*Csc
[e + f*x])^(m + 1)*((d*Csc[e + f*x])^n/(a*f*(m + 1)*(a^2 - b^2))), x] + Dis
t[1/(a*(m + 1)*(a^2 - b^2)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*
x])^n*Simp[a*(a*A - b*B + a*C)*(m + 1) - (A*b^2 - a*b*B + a^2*C)*(m + n + 1
) - a*(A*b - a*B + b*C)*(m + 1)*Csc[e + f*x] + (A*b^2 - a*b*B + a^2*C)*(m +
 n + 2)*Csc[e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f, A, B, C, n}, x]
```

```
&& NeQ[a^2 - b^2, 0] && LtQ[m, -1] &&  !(ILtQ[m + 1/2, 0] && ILtQ[n, 0])
```

Rule 4191

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))/(Sqrt[csc[(e_.) + (f_.)*(x_)]*(d_.)]*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))), x_Symbol] :> Dist[(A*b^2 - a*b*B + a^2*C)/(a^2*d^2), Int[(d*Csc[e + f
*x])^(3/2)/(a + b*Csc[e + f*x]), x], x] + Dist[1/a^2, Int[(a*A - (A*b - a*B
)*Csc[e + f*x])/Sqrt[d*Csc[e + f*x]], x], x] /; FreeQ[{a, b, d, e, f, A, B,
 C}, x] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \frac{\sec^{\frac{3}{2}}(c+dx)}{(b+a\sec(c+dx))^3}\,dx \\
&= -\frac{b\sqrt{\sec(c+dx)}\sin(c+dx)}{2(a^2-b^2)d(b+a\sec(c+dx))^2} - \frac{\int \frac{-\frac{b}{2}-2a\sec(c+dx)+\frac{3}{2}b\sec^2(c+dx)}{\sqrt{\sec(c+dx)}(b+a\sec(c+dx))^2}\,dx}{2(a^2-b^2)} \\
&= -\frac{b\sqrt{\sec(c+dx)}\sin(c+dx)}{2(a^2-b^2)d(b+a\sec(c+dx))^2} + \frac{3(a^2+b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4(a^2-b^2)^2d(b+a\sec(c+dx))} \\
&\quad - \frac{\int \frac{\frac{1}{4}b(a^2+5b^2)+3ab^2\sec(c+dx)-\frac{3}{4}b(a^2+b^2)\sec^2(c+dx)}{\sqrt{\sec(c+dx)}(b+a\sec(c+dx))}\,dx}{2b(a^2-b^2)^2} \\
&= -\frac{b\sqrt{\sec(c+dx)}\sin(c+dx)}{2(a^2-b^2)d(b+a\sec(c+dx))^2} + \frac{3(a^2+b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4(a^2-b^2)^2d(b+a\sec(c+dx))} \\
&\quad - \frac{\int \frac{\frac{1}{4}b^2(a^2+5b^2)-\left(-3ab^3+\frac{1}{4}ab(a^2+5b^2)\right)\sec(c+dx)}{\sqrt{\sec(c+dx)}}\,dx}{2b^3(a^2-b^2)^2} \\
&\quad - \frac{(a^4-10a^2b^2-3b^4)\int \frac{\sec^{\frac{3}{2}}(c+dx)}{b+a\sec(c+dx)}\,dx}{8b^2(a^2-b^2)^2} \\
&= -\frac{b\sqrt{\sec(c+dx)}\sin(c+dx)}{2(a^2-b^2)d(b+a\sec(c+dx))^2} + \frac{3(a^2+b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4(a^2-b^2)^2d(b+a\sec(c+dx))} \\
&\quad + \frac{(a(a^2-7b^2))\int \sqrt{\sec(c+dx)}\,dx}{8b^2(a^2-b^2)^2} - \frac{(a^2+5b^2)\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx}{8b(a^2-b^2)^2} \\
&\quad - \frac{\left((a^4-10a^2b^2-3b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{8b^2(a^2-b^2)^2}
\end{aligned}$$

$$= -\frac{(a^4 - 10a^2b^2 - 3b^4)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b}, \frac{1}{2}(c+dx), 2\right)\sqrt{\sec(c+dx)}}{4(a-b)^2b^2(a+b)^3d} - \frac{b\sqrt{\sec(c+dx)}\sin(c+dx)}{2(a^2-b^2)\,d(b+a\sec(c+dx))^2} + \frac{3(a^2+b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4(a^2-b^2)^2\,d(b+a\sec(c+dx))} + \frac{\left(a(a^2-7b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{8b^2(a^2-b^2)^2} - \frac{\left((a^2+5b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx}{8b(a^2-b^2)^2}$$

$$= -\frac{(a^2+5b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{4b(a^2-b^2)^2\,d} + \frac{a(a^2-7b^2)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx), 2\right)\sqrt{\sec(c+dx)}}{4b^2(a^2-b^2)^2\,d} - \frac{(a^4-10a^2b^2-3b^4)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b}, \frac{1}{2}(c+dx), 2\right)\sqrt{\sec(c+dx)}}{4(a-b)^2b^2(a+b)^3d} - \frac{b\sqrt{\sec(c+dx)}\sin(c+dx)}{2(a^2-b^2)\,d(b+a\sec(c+dx))^2} + \frac{3(a^2+b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4(a^2-b^2)^2\,d(b+a\sec(c+dx))}$$

Mathematica [A] (verified)

Time = 5.00 (sec) , antiderivative size = 429, normalized size of antiderivative = 1.42

$$\int\frac{1}{(a+b\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \frac{\frac{4b^2(3a(a^2+b^2)+b(a^2+5b^2)\cos(c+dx))\sin(c+dx)}{(a^2-b^2)^2} + \frac{4\cos(c+dx)(a+b\cos(c+dx))\cot(c+dx)(b+a\sec(c+dx))\left(a^3b+5ab^3-a^3b\sec^2(c+dx)-5ab^3\,\text{s}\right.}{}}{}$$

```
[In] Integrate[1/((a + b*Cos[c + d*x])^3*Sec[c + d*x]^(3/2)),x]
```

```
[Out] ((4*b^2*(3*a*(a^2 + b^2) + b*(a^2 + 5*b^2)*Cos[c + d*x])*Sin[c + d*x])/(a^2
 - b^2)^2 + (4*Cos[c + d*x]*(a + b*Cos[c + d*x])*Cot[c + d*x]*(b + a*Sec[c
+ d*x])*(a^3*b + 5*a*b^3 - a^3*b*Sec[c + d*x]^2 - 5*a*b^3*Sec[c + d*x]^2 +
a*b*(a^2 + 5*b^2)*EllipticE[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[Sec[c + d*
x]]*Sqrt[-Tan[c + d*x]^2] + b*(-a^3 + 3*a^2*b - 5*a*b^2 + 3*b^3)*EllipticF[
ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[Sec[c + d*x]]*Sqrt[-Tan[c + d*x]^2] +
a^4*EllipticPi[-(a/b), ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[Sec[c + d*x]]*S
qrt[-Tan[c + d*x]^2] - 10*a^2*b^2*EllipticPi[-(a/b), ArcSin[Sqrt[Sec[c + d*
x]]], -1]*Sqrt[Sec[c + d*x]]*Sqrt[-Tan[c + d*x]^2] - 3*b^4*EllipticPi[-(a/b
), ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[Sec[c + d*x]]*Sqrt[-Tan[c + d*x]^2]
))/(a*(a - b)^2*(a + b)^2))/(16*b^2*d*(a + b*Cos[c + d*x])^2*Sqrt[Sec[c + d
*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1835 vs. 2(354) = 708.

Time = 8.52 (sec) , antiderivative size = 1836, normalized size of antiderivative = 6.08

method	result	size
default	Expression too large to display	1836

```
[In] int(1/(a+cos(d*x+c)*b)^3/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-4/b/(-2*a*b+2*
b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin
(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c)
,-2*b/(a-b),2^(1/2))+2*a^2/b^2*(-1/2/a*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2
*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2
+a-b)^2-3/4*b^2*(3*a^2-b^2)/a^2/(a^2-b^2)^2*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*
d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-7/8
/(a+b)/(a^2-b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(
1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2
*d*x+1/2*c),2^(1/2))+1/4/(a+b)/(a^2-b^2)/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*b+3/8/(a+b)/(a^2-b^2)/a^2*(s
in(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*
x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)
)*b^2-9/8*b/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)
^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(
cos(1/2*d*x+1/2*c),2^(1/2))+3/8*b^3/a^2/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^
(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*
x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+9/8*b/(a^2-b^2)^2*(
sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d
*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2
))-3/8*b^3/a^2/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2
*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellipti
cE(cos(1/2*d*x+1/2*c),2^(1/2))-15/4*a^2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b*(sin(1
/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/
2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b)
,2^(1/2))+3/2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(
-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c
)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))-3/4/a^2/(a^2-b
^2)^2/(-2*a*b+2*b^2)*b^5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c
)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticP
i(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2)))-4*a/b^2*(-1/a*b^2/(a^2-b^2)*cos(1
/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos
(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2
*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)
```

```
*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c
)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1
/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/2/(a^2-b^2)*
b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(
1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2
^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos
(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(
1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+1/a/(a^2-b^2)/(-2*a*
b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)
/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*
x+1/2*c),-2*b/(a-b),2^(1/2))))/sin(1/2*d*x+1/2*c)/(2*cos(1/2*d*x+1/2*c)^2-1
)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+b*cos(d*x+c))^3/sec(d*x+c)^(3/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+b*cos(d*x+c))**3/sec(d*x+c)**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+b\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^3\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^3/sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^3*sec(d*x + c)^(3/2)), x)
```

Giac [F]

$$\int \frac{1}{(a+b\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^3\sec(dx+c)^{\frac{3}{2}}}\,dx$$

[In] integrate(1/(a+b*cos(d*x+c))^3/sec(d*x+c)^(3/2),x, algorithm="giac")

[Out] integrate(1/((b*cos(d*x + c) + a)^3*sec(d*x + c)^(3/2)), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^3\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}\,(a+b\,\cos(c+d\,x))^3}\,dx$$

[In] int(1/((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^3),x)

[Out] int(1/((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^3), x)

3.729 $\int \frac{1}{(a+b\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 319

$$\begin{aligned}
&\int \frac{1}{(a+b\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)}\,dx \\
&= -\frac{3a(a^2-3b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{4b^2(a^2-b^2)^2 d} \\
&\quad+\frac{(3a^4-5a^2b^2+8b^4)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4b^3(a^2-b^2)^2 d} \\
&\quad-\frac{3a(a^4-2a^2b^2+5b^4)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4(a-b)^2b^3(a+b)^3 d} \\
&\quad+\frac{a\sqrt{\sec(c+dx)}\sin(c+dx)}{2(a^2-b^2)\,d(b+a\sec(c+dx))^2}+\frac{a(a^2-7b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4b(a^2-b^2)^2 d(b+a\sec(c+dx))}
\end{aligned}$$

```
[Out] 1/2*a*sin(d*x+c)*sec(d*x+c)^(1/2)/(a^2-b^2)/d/(b+a*sec(d*x+c))^2+1/4*a*(a^2
-7*b^2)*sin(d*x+c)*sec(d*x+c)^(1/2)/b/(a^2-b^2)^2/d/(b+a*sec(d*x+c))-3/4*a*
(a^2-3*b^2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1
/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/b^2/(a^2-b^2)^2/d+
1/4*(3*a^4-5*a^2*b^2+8*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)
*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*sec(d*x+c)^(1/2)/b^
3/(a^2-b^2)^2/d-3/4*a*(a^4-2*a^2*b^2+5*b^4)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/co
s(1/2*d*x+1/2*c)*EllipticPi(sin(1/2*d*x+1/2*c),2*b/(a+b),2^(1/2))*cos(d*x+c
)^(1/2)*sec(d*x+c)^(1/2)/(a-b)^2/b^3/(a+b)^3/d
```

Rubi [A] (verified)

Time = 0.80 (sec) , antiderivative size = 319, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {3317, 3928, 4185, 4191, 3934, 2884, 3872, 3856, 2719, 2720}

$$\begin{aligned}&\int \frac{1}{(a+b\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)}\,dx\\&=\frac{a(a^2-7b^2)\sin(c+dx)\sqrt{\sec(c+dx)}}{4bd\,(a^2-b^2)^2\,(a\sec(c+dx)+b)}+\frac{a\sin(c+dx)\sqrt{\sec(c+dx)}}{2d\,(a^2-b^2)\,(a\sec(c+dx)+b)^2}\\&\quad-\frac{3a(a^2-3b^2)\,\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{4b^2d\,(a^2-b^2)^2}\\&\quad+\frac{(3a^4-5a^2b^2+8b^4)\,\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{4b^3d\,(a^2-b^2)^2}\\&\quad-\frac{3a(a^4-2a^2b^2+5b^4)\,\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)}{4b^3d(a-b)^2(a+b)^3}\end{aligned}$$

```
[In] Int[1/((a + b*Cos[c + d*x])^3*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (-3*a*(a^2 - 3*b^2)*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]*Sqrt[Sec[c
 + d*x]])/(4*b^2*(a^2 - b^2)^2*d) + ((3*a^4 - 5*a^2*b^2 + 8*b^4)*Sqrt[Cos[c
 + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(4*b^3*(a^2 - b^2)^2
*d) - (3*a*(a^4 - 2*a^2*b^2 + 5*b^4)*Sqrt[Cos[c + d*x]]*EllipticPi[(2*b)/(a
 + b), (c + d*x)/2, 2]*Sqrt[Sec[c + d*x]])/(4*(a - b)^2*b^3*(a + b)^3*d) +
(a*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(2*(a^2 - b^2)*d*(b + a*Sec[c + d*x])^2
) + (a*(a^2 - 7*b^2)*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(4*b*(a^2 - b^2)^2*d*
(b + a*Sec[c + d*x]))
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2884

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])*Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(2/(f*(a + b)*Sqrt[c + d]))*EllipticPi[
2*(b/(a + b)), (1/2)*(e - Pi/2 + f*x), 2*(d/(c + d))], x] /; FreeQ[{a, b, c
, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2,
```

```
0] && GtQ[c + d, 0]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3856

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rule 3928

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-b)*d*Cot[e + f*x]*(a + b*Csc[e + f*x])^(m +
1)*((d*Csc[e + f*x])^(n - 1)/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m + 1)
*(a^2 - b^2)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*x])^(n - 1)*Si
mp[b*d*(n - 1) + a*d*(m + 1)*Csc[e + f*x] - b*d*(m + n + 1)*Csc[e + f*x]^2,
 x], x], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0] && LtQ[m, -1]
 && LtQ[0, n, 1] && IntegersQ[2*m, 2*n]
```

Rule 3934

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(3/2)/(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[d*Sqrt[d*Sin[e + f*x]]*Sqrt[d*Csc[e + f*x]], Int[1
/(Sqrt[d*Sin[e + f*x]]*(b + a*Sin[e + f*x])), x], x] /; FreeQ[{a, b, d, e,
f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 4185

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))*(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))^(m_), x_Symbol] :> Simp[(A*b^2 - a*b*B + a^2*C)*Cot[e + f*x]*(a + b*Csc
[e + f*x])^(m + 1)*((d*Csc[e + f*x])^n/(a*f*(m + 1)*(a^2 - b^2))), x] + Dis
t[1/(a*(m + 1)*(a^2 - b^2)), Int[(a + b*Csc[e + f*x])^(m + 1)*(d*Csc[e + f*
x])^n*Simp[a*(a*A - b*B + a*C)*(m + 1) - (A*b^2 - a*b*B + a^2*C)*(m + n + 1
```

```
) - a*(A*b - a*B + b*C)*(m + 1)*Csc[e + f*x] + (A*b^2 - a*b*B + a^2*C)*(m +
 n + 2)*Csc[e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f, A, B, C, n}, x]
 && NeQ[a^2 - b^2, 0] && LtQ[m, -1] &&  !(ILtQ[m + 1/2, 0] && ILtQ[n, 0])
```

Rule 4191

```
Int[((A_.) + csc[(e_.) + (f_.)*(x_)]*(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.
))/(Sqrt[csc[(e_.) + (f_.)*(x_)]*(d_.)]*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (a
_))), x_Symbol] :> Dist[(A*b^2 - a*b*B + a^2*C)/(a^2*d^2), Int[(d*Csc[e + f
*x])^(3/2)/(a + b*Csc[e + f*x]), x], x] + Dist[1/a^2, Int[(a*A - (A*b - a*B
)*Csc[e + f*x])/Sqrt[d*Csc[e + f*x]], x], x] /; FreeQ[{a, b, d, e, f, A, B,
 C}, x] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \frac{\sqrt{\sec(c+dx)}}{(b+a\sec(c+dx))^3}\,dx \\
&= \frac{a\sqrt{\sec(c+dx)}\sin(c+dx)}{2(a^2-b^2)\,d(b+a\sec(c+dx))^2} + \frac{\int \frac{-\frac{a}{2}-2b\sec(c+dx)+\frac{3}{2}a\sec^2(c+dx)}{\sqrt{\sec(c+dx)}(b+a\sec(c+dx))^2}\,dx}{2(a^2-b^2)} \\
&= \frac{a\sqrt{\sec(c+dx)}\sin(c+dx)}{2(a^2-b^2)\,d(b+a\sec(c+dx))^2} + \frac{a(a^2-7b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4b(a^2-b^2)^2\,d(b+a\sec(c+dx))} \\
&\quad + \frac{\int \frac{-\frac{3}{4}a(a^2-3b^2)+b(a^2+2b^2)\sec(c+dx)+\frac{1}{4}a(a^2-7b^2)\sec^2(c+dx)}{\sqrt{\sec(c+dx)}(b+a\sec(c+dx))}\,dx}{2b(a^2-b^2)^2} \\
&= \frac{a\sqrt{\sec(c+dx)}\sin(c+dx)}{2(a^2-b^2)\,d(b+a\sec(c+dx))^2} + \frac{a(a^2-7b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4b(a^2-b^2)^2\,d(b+a\sec(c+dx))} \\
&\quad + \frac{\int \frac{-\frac{3}{4}ab(a^2-3b^2)-\left(-\frac{3}{4}a^2(a^2-3b^2)-b^2(a^2+2b^2)\right)\sec(c+dx)}{\sqrt{\sec(c+dx)}}\,dx}{2b^3(a^2-b^2)^2} \\
&\quad - \frac{(3a(a^4-2a^2b^2+5b^4))\int \frac{\sec^{\frac{3}{2}}(c+dx)}{b+a\sec(c+dx)}\,dx}{8b^3(a^2-b^2)^2} \\
&= \frac{a\sqrt{\sec(c+dx)}\sin(c+dx)}{2(a^2-b^2)\,d(b+a\sec(c+dx))^2} + \frac{a(a^2-7b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4b(a^2-b^2)^2\,d(b+a\sec(c+dx))} \\
&\quad - \frac{(3a(a^2-3b^2))\int \frac{1}{\sqrt{\sec(c+dx)}}\,dx}{8b^2(a^2-b^2)^2} + \frac{(3a^4-5a^2b^2+8b^4)\int \sqrt{\sec(c+dx)}\,dx}{8b^3(a^2-b^2)^2} \\
&\quad - \frac{\left(3a(a^4-2a^2b^2+5b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))}\,dx}{8b^3(a^2-b^2)^2}
\end{aligned}
$$

$$= -\frac{3a(a^4-2a^2b^2+5b^4)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4(a-b)^2b^3(a+b)^3d}$$
$$+\frac{a\sqrt{\sec(c+dx)}\sin(c+dx)}{2(a^2-b^2)\,d(b+a\sec(c+dx))^2}+\frac{a(a^2-7b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4b(a^2-b^2)^2\,d(b+a\sec(c+dx))}$$
$$-\frac{\left(3a(a^2-3b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx}{8b^2(a^2-b^2)^2}$$
$$+\frac{\left((3a^4-5a^2b^2+8b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{8b^3(a^2-b^2)^2}$$
$$= -\frac{3a(a^2-3b^2)\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{\sec(c+dx)}}{4b^2(a^2-b^2)^2\,d}$$
$$+\frac{(3a^4-5a^2b^2+8b^4)\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4b^3(a^2-b^2)^2\,d}$$
$$-\frac{3a(a^4-2a^2b^2+5b^4)\sqrt{\cos(c+dx)}\,\text{EllipticPi}\left(\frac{2b}{a+b},\frac{1}{2}(c+dx),2\right)\sqrt{\sec(c+dx)}}{4(a-b)^2b^3(a+b)^3d}$$
$$+\frac{a\sqrt{\sec(c+dx)}\sin(c+dx)}{2(a^2-b^2)\,d(b+a\sec(c+dx))^2}+\frac{a(a^2-7b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{4b(a^2-b^2)^2\,d(b+a\sec(c+dx))}$$

Mathematica [A] (verified)

Time = 3.55 (sec) , antiderivative size = 280, normalized size of antiderivative = 0.88

$$\int\frac{1}{(a+b\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)}\,dx$$
$$=\frac{\frac{2ab^2(a^3-7ab^2+3b(a^2-3b^2)\cos(c+dx))\sin(c+dx)}{(a^2-b^2)^2(a+b\cos(c+dx))^2\sqrt{\sec(c+dx)}}+\frac{\cot(c+dx)\left(-6ab(a^2-3b^2)\sec^{\frac{3}{2}}(c+dx)\sin^2(c+dx)+6ab(a^2-3b^2)E\left(\arcsin\left(\sqrt{\sec(c+dx)}\right)\right.\right.}{}}{}$$

```
[In] Integrate[1/((a + b*Cos[c + d*x])^3*Sec[c + d*x]^(5/2)),x]
```

```
[Out] ((2*a*b^2*(a^3 - 7*a*b^2 + 3*b*(a^2 - 3*b^2)*Cos[c + d*x])*Sin[c + d*x])/((
a^2 - b^2)^2*(a + b*Cos[c + d*x])^2*Sqrt[Sec[c + d*x]]) + (Cot[c + d*x]*(-6
*a*b*(a^2 - 3*b^2)*Sec[c + d*x]^(3/2)*Sin[c + d*x]^2 + 6*a*b*(a^2 - 3*b^2)*
EllipticE[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt[-Tan[c + d*x]^2] - 2*b*(3*a^
3 - a^2*b - 9*a*b^2 + 7*b^3)*EllipticF[ArcSin[Sqrt[Sec[c + d*x]]], -1]*Sqrt
[-Tan[c + d*x]^2] + 6*(a^4 - 2*a^2*b^2 + 5*b^4)*EllipticPi[-(a/b), ArcSin[S
qrt[Sec[c + d*x]]], -1]*Sqrt[-Tan[c + d*x]^2]))/((a - b)^2*(a + b)^2))/(8*b
^3*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1913 vs. 2(371) = 742.

Time = 9.08 (sec) , antiderivative size = 1914, normalized size of antiderivative = 6.00

method	result	size
default	Expression too large to display	1914

```
[In] int(1/(a+cos(d*x+c)*b)^3/sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-(-2*cos(1/2*d*x+1/2*c)^2+1)*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2/b^3*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c
)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-2/b^3
*a^3*(-1/2/a*b^2/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(
1/2*d*x+1/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)^2-3/4*b^2*(3*a^2-b^2
)/a^2/(a^2-b^2)^2*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1
/2*c)^2)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-7/8/(a+b)/(a^2-b^2)*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c
)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+1/4/(
a+b)/(a^2-b^2)/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(
1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2
*d*x+1/2*c),2^(1/2))*b+3/8/(a+b)/(a^2-b^2)/a^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)
*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2
*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*b^2-9/8*b/(a^2-b^2)^2*(s
in(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*
x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)
)+3/8*b^3/a^2/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*
c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Elliptic
F(cos(1/2*d*x+1/2*c),2^(1/2))+9/8*b/(a^2-b^2)^2*(sin(1/2*d*x+1/2*c)^2)^(1/2
)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/
2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-3/8*b^3/a^2/(a^2-b^2)^2
*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2
*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1
/2))-15/4*a^2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2
*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^
2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+3/2/(a^2-b^2)^2/
(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)
^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(
1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))-3/4/a^2/(a^2-b^2)^2/(-2*a*b+2*b^2)*b^5*(
sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d
*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/
(a-b),2^(1/2)))+12/b^2*a/(-2*a*b+2*b^2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*co
s(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^
(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+6/b^3*a^2*(-1/a*b^2
/(a^2-b^2)*cos(1/2*d*x+1/2*c)*(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2
```

```
)^(1/2)/(2*b*cos(1/2*d*x+1/2*c)^2+a-b)-1/2/a/(a+b)*(sin(1/2*d*x+1/2*c)^2)^(
1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x
+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-1/2/(a^2-b^2)*b/a*(s
in(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*
x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)
)+1/2/(a^2-b^2)*b/a*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1
)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(
1/2*d*x+1/2*c),2^(1/2))-3*a/(a^2-b^2)/(-2*a*b+2*b^2)*b*(sin(1/2*d*x+1/2*c)^
2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2
*d*x+1/2*c)^2)^(1/2)*EllipticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))+1/a/
(a^2-b^2)/(-2*a*b+2*b^2)*b^3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1
/2*c)^2+1)^(1/2)/(-2*sin(1/2*d*x+1/2*c)^4+sin(1/2*d*x+1/2*c)^2)^(1/2)*Ellip
ticPi(cos(1/2*d*x+1/2*c),-2*b/(a-b),2^(1/2))))/sin(1/2*d*x+1/2*c)/(2*cos(1/
2*d*x+1/2*c)^2-1)^(1/2)/d
```

Fricas [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+b*cos(d*x+c))^3/sec(d*x+c)^(5/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+b*cos(d*x+c))**3/sec(d*x+c)**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+b\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^3\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^3/sec(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^3*sec(d*x + c)^(5/2)), x)
```

Giac [F]

$$\int \frac{1}{(a+b\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^3\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^3/sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^3*sec(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^3\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}\,(a+b\,\cos(c+d\,x))^3}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^3),x)
[Out] int(1/((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^3), x)
```

3.730 $\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 369

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\,dx = \frac{2(a-b)\sqrt{a+b}(9a^2-2b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{a(}}{15a^3d\sqrt{\sec(c+dx)}} - \frac{2(a-b)\sqrt{a+b}(9a+2b)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c}{a+b}}}{15a^2d\sqrt{\sec(c+dx)}} + \frac{2b\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15ad} + \frac{2\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}$$

```
[Out] 2/15*b*sec(d*x+c)^(3/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/a/d+2/5*sec(d*x+c
)^(5/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+2/15*(a-b)*(9*a^2-2*b^2)*csc(d*
x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/
(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(
a*(1+sec(d*x+c))/(a-b))^(1/2)/a^3/d/sec(d*x+c)^(1/2)-2/15*(a-b)*(9*a+2*b)*c
sc(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-
a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1
/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^2/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.87 (sec) , antiderivative size = 369, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4307, 2875, 3134, 3077, 2895, 3073}

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\,dx =$$
$$-\frac{2(a-b)\sqrt{a+b}(9a+2b)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a}}{\sqrt{a+}}\right.\right.}{15a^2d\sqrt{\sec(c+dx)}}$$
$$+\frac{2(a-b)\sqrt{a+b}(9a^2-2b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c}}{\sqrt{a+b}\sqrt{\cos(}}\right.\right.}{15a^3d\sqrt{\sec(c+dx)}}$$
$$+\frac{2\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{5d}$$
$$+\frac{2b\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{15ad}$$

```
[In] Int[Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(7/2),x]
```

```
[Out] (2*(a - b)*Sqrt[a + b]*(9*a^2 - 2*b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*Elli
pticE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -(
(a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c +
 d*x]))/(a - b)])/(15*a^3*d*Sqrt[Sec[c + d*x]]) - (2*(a - b)*Sqrt[a + b]*(9
*a + 2*b)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c
 + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1
- Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(15*a^2*d*S
qrt[Sec[c + d*x]]) + (2*b*Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(3/2)*Sin[c
 + d*x])/(15*a*d) + (2*Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(5/2)*Sin[c +
d*x])/(5*d)
```

Rule 2875

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m + 1)*((c + d*Sin[e + f*x])^n/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m
 + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(
n - 1)*Simp[a*c*(m + 1) + b*d*n + (a*d*(m + 1) - b*c*(m + 2))*Sin[e + f*x]
- b*d*(m + n + 2)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x
] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m,
-1] && LtQ[0, n, 1] && IntegersQ[2*m, 2*n]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
```

```
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
```

```
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{7}{2}}(c+dx)}\,dx$$

$$= \frac{2\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{1}{5}\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{b}{2}+\frac{3}{2}a\cos(c+dx)+b\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2b\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15ad} + \frac{2\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{\left(4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{1}{4}(9a^2-2b^2)+\frac{7}{4}ab\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{15a}$$

$$= \frac{2b\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15ad} + \frac{2\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} - \frac{\left((a-b)(9a+2b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{15a} - \frac{\left((-9a^2+2b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{15a}$$

$$= \frac{2(a-b)\sqrt{a+b}(9a^2-2b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c}{a+}}}{15a^3d\sqrt{\sec(c+dx)}} - \frac{2(a-b)\sqrt{a+b}(9a+2b)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{}}{15a^2d\sqrt{\sec(c+dx)}} + \frac{2b\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15ad} + \frac{2\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}$$

Mathematica [A] (verified)

Time = 23.41 (sec) , antiderivative size = 353, normalized size of antiderivative = 0.96

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\,dx$$
$$=\frac{2\left(\frac{\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)\sec(c+dx)}\left(-2(9a^3+9a^2b-2ab^2-2b^3)E\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right)|\frac{-a+b}{a+b}\right)\sqrt{\frac{1}{1+\sec(c+dx)}}\sqrt{\frac{b+a\sec(c+dx)}{(a+b)(1+\sec(c+dx))}}+2a(9a^2+7ab-\right.}{\sqrt{s}}$$

[In] Integrate[Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(7/2),x]

[Out] (2*((Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*(-2*(9*a^3 + 9*a^2*b - 2*a*b^2 - 2*b^3)*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[(1 + Sec[c + d*x])^(-1)]*Sqrt[(b + a*Sec[c + d*x])/((a + b)*(1 + Sec[c + d*x]))] + 2*a*(9*a^2 + 7*a*b - 2*b^2)*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[(1 + Sec[c + d*x])^(-1)]*Sqrt[(b + a*Sec[c + d*x])/((a + b)*(1 + Sec[c + d*x]))] - (9*a^2 - 2*b^2)*Cos[c + d*x]*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2*Tan[(c + d*x)/2]))/Sqrt[Sec[(c + d*x)/2]^2] + (a + b*Cos[c + d*x])*Sqrt[Sec[c + d*x]]*((9*a^2 - 2*b^2)*Sin[c + d*x] + a*(b + 3*a*Sec[c + d*x])*Tan[c + d*x])))/(15*a^2*d*Sqrt[a + b*Cos[c + d*x]])

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2114 vs. 2(329) = 658.

Time = 10.36 (sec) , antiderivative size = 2115, normalized size of antiderivative = 5.73

method	result	size
default	Expression too large to display	2115

[In] int(sec(d*x+c)^(7/2)*(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)

[Out] -2/15/d*sec(d*x+c)^(7/2)/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)*(4*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)^4+14*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)^4-4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)^4-9*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)^3+2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)^3+7*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos

```
(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)
*a^2*b*cos(d*x+c)^3-2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^
(1/2)*a*b^2*cos(d*x+c)^3+9*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(
1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a
+b))^(1/2)*a^3*cos(d*x+c)^3-3*sin(d*x+c)*cos(d*x+c)*a^3-4*sin(d*x+c)*cos(d*
x+c)^2*a^2*b-18*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(
d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*
a^2*b*cos(d*x+c)^4+9*cos(d*x+c)^5*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(
a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*a^3-9*cos(d*x+c)^5*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b)
)^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(
-(a-b)/(a+b))^(1/2))*a^3+2*b^3*cos(d*x+c)^4*sin(d*x+c)-4*a^2*b*cos(d*x+c)^3
*sin(d*x+c)+a*b^2*cos(d*x+c)^3*sin(d*x+c)+7*cos(d*x+c)^5*EllipticF(cot(d*x+
c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))
^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b-2*cos(d*x+c)^5*EllipticF(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(
a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^2-9*cos(d*x+c)^5*((a+cos(
d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Ell
ipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b+2*cos(d*x+c)^5*((a
+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2
)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2-18*EllipticE(
cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^4+4*Ellipti
cE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)^4+18*Ell
ipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^4-9*
EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*
x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^3
+2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c
)^3-3*a^3*cos(d*x+c)^2*sin(d*x+c)+2*cos(d*x+c)^5*((a+cos(d*x+c)*b)/(1+cos(d
*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(cot(d*x+c)-
csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^3-9*cos(d*x+c)^3*a^3*sin(d*x+c)-9*cos(d*
x+c)^4*a^2*b*sin(d*x+c)-cos(d*x+c)^4*a*b^2*sin(d*x+c))/a^2
```

Fricas [F]

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\,dx=\int \sqrt{b\cos\left(dx+c\right)+a}\sec\left(dx+c\right)^{\frac{7}{2}}\,dx$$

```
[In] integrate(sec(d*x+c)^(7/2)*(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^(7/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\,dx=\text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(7/2)*(a+b*cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\,dx=\int \sqrt{b\cos\left(dx+c\right)+a}\sec\left(dx+c\right)^{\frac{7}{2}}\,dx$$

```
[In] integrate(sec(d*x+c)^(7/2)*(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^(7/2), x)
```

Giac [F]

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\,dx=\int \sqrt{b\cos\left(dx+c\right)+a}\sec\left(dx+c\right)^{\frac{7}{2}}\,dx$$

```
[In] integrate(sec(d*x+c)^(7/2)*(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\,dx = \int \left(\frac{1}{\cos\left(c+d\,x\right)}\right)^{7/2}\sqrt{a+b\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int((1/cos(c + d*x))^(7/2)*(a + b*cos(c + d*x))^(1/2),x)
[Out] int((1/cos(c + d*x))^(7/2)*(a + b*cos(c + d*x))^(1/2), x)
```

3.731 $\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 311

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{2(a-b)b\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^2d\sqrt{\sec(c+dx)}} + \frac{2(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1}{}}}{3ad\sqrt{\sec(c+dx)}} + \frac{2\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}$$

```
[Out] 2/3*sec(d*x+c)^(3/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+2/3*(a-b)*b*csc(d*
x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/
(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(
a*(1+sec(d*x+c))/(a-b))^(1/2)/a^2/d/sec(d*x+c)^(1/2)+2/3*(a-b)*csc(d*x+c)*E
llipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))
^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+s
ec(d*x+c))/(a-b))^(1/2)/a/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.57 (sec) , antiderivative size = 311, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4307, 2875, 3077, 2895, 3073}

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\,dx$$
$$= \frac{2b(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{3a^2d\sqrt{\sec(c+dx)}}$$
$$+\frac{2(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{3ad\sqrt{\sec(c+dx)}}$$
$$+\frac{2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{3d}$$

```
[In] Int[Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(5/2),x]
```

```
[Out] (2*(a - b)*b*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[S
qrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b
))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b
)])/(3*a^2*d*Sqrt[Sec[c + d*x]]) + (2*(a - b)*Sqrt[a + b]*Sqrt[Cos[c + d*x]
]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[
Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*S
qrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a*d*Sqrt[Sec[c + d*x]]) + (2*Sqrt[a
 + b*Cos[c + d*x]]*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(3*d)
```

Rule 2875

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m + 1)*((c + d*Sin[e + f*x])^n/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m
 + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(
n - 1)*Simp[a*c*(m + 1) + b*d*n + (a*d*(m + 1) - b*c*(m + 2))*Sin[e + f*x]
- b*d*(m + n + 2)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x
] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m,
-1] && LtQ[0, n, 1] && IntegersQ[2*m, 2*n]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
```

```
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{5}{2}}(c+dx)}\,dx \\
&= \frac{2\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} \\
&\quad + \frac{1}{3}\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{b}{2}+\frac{1}{2}a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx \\
&= \frac{2\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} \\
&\quad + \frac{1}{3}\left((a-b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx \\
&\quad + \frac{1}{3}\left(b\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx
\end{aligned}$$

$$= \frac{2(a-b)b\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1-}{}}}{3a^2d\sqrt{\sec(c+dx)}}$$
$$+ \frac{2(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\mathrm{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c-}{a+b}}}{3ad\sqrt{\sec(c+dx)}}$$
$$+ \frac{2\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}$$

Mathematica [A] (verified)

Time = 14.47 (sec) , antiderivative size = 261, normalized size of antiderivative = 0.84

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\,dx$$
$$= \frac{\sqrt{\sec(c+dx)}\left(-4b(a+b)\cos^2\left(\frac{1}{2}(c+dx)\right)\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right)|\frac{-a+b}{a+b}\right)\sqrt{\frac{1}{1+\sec(c}}}{}$$

```
[In] Integrate[Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(5/2),x]
```

```
[Out] (Sqrt[Sec[c + d*x]]*(-4*b*(a + b)*Cos[(c + d*x)/2]^2*Sqrt[(a + b*Cos[c + d*
x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a +
 b)/(a + b)]*Sqrt[(1 + Sec[c + d*x])^(-1)] + 4*a*(a + b)*Cos[(c + d*x)/2]^2
*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticF[ArcSin[T
an[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[(1 + Sec[c + d*x])^(-1)] + (2*a^2
+ a*b + b^2 + 2*a*(a + 2*b)*Cos[c + d*x] + b*(a + b)*Cos[2*(c + d*x)])*Sec[
c + d*x]*Tan[(c + d*x)/2]))/(3*a*d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1200 vs. 2(277) = 554.

Time = 11.34 (sec) , antiderivative size = 1201, normalized size of antiderivative = 3.86

method	result	size
default	Expression too large to display	1201

```
[In] int(sec(d*x+c)^(5/2)*(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3/d*sec(d*x+c)^(5/2)/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)*(cos(d*x+c)^4
*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1
+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2+cos(d*x+c)^
4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(
```

```
1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b-cos(d*x+c)
^4*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b-cos(d*x+c
)^4*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)
))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^2+2*(cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*E
llipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*cos(d*x+c)^3+2*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2
)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b*cos(d*x+c)^3-2*
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(
1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b*cos(d*x+c)^3
-2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b)
)^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^2*cos(d*x+c
)^3+(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b
))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*cos(d*x+
c)^2+EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b
)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b*cos(d*x
+c)^2-EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*
b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b*cos(d*
x+c)^2-(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(
a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^2*cos(d
*x+c)^2-a*b*cos(d*x+c)^3*sin(d*x+c)-b^2*cos(d*x+c)^3*sin(d*x+c)-a^2*cos(d*x
+c)^2*sin(d*x+c)-2*cos(d*x+c)^2*sin(d*x+c)*a*b-a^2*cos(d*x+c)*sin(d*x+c))/a
```

Fricas [F]

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\,dx=\int \sqrt{b\cos\left(dx+c\right)+a}\sec\left(dx+c\right)^{\frac{5}{2}}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)*(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^(5/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\,dx=\text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(5/2)*(a+b*cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\,dx=\int \sqrt{b\cos\left(dx+c\right)+a}\sec\left(dx+c\right)^{\frac{5}{2}}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)*(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^(5/2), x)
```

Giac [F]

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\,dx=\int \sqrt{b\cos\left(dx+c\right)+a}\sec\left(dx+c\right)^{\frac{5}{2}}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)*(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\,dx=\int {\left(\frac{1}{\cos\left(c+d\,x\right)}\right)}^{5/2}\,\sqrt{a+b\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^(1/2),x)
[Out] int((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^(1/2), x)
```

3.732 $\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 269

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{2(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ad\sqrt{\sec(c+dx)}} - \frac{2(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1}{}}}{ad\sqrt{\sec(c+dx)}}$$

```
[Out] 2*(a-b)*csc(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^
(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/
(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/d/sec(d*x+c)^(1/2)-2*(a-b)*cs
c(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a
-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/
2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 269, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used

$= \{4307, 2874, 2895, 3073\}$

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\,dx$$
$$= \frac{2(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{ad\sqrt{\sec(c+dx)}}$$
$$- \frac{2(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\right)}{ad\sqrt{\sec(c+dx)}}$$

```
[In] Int[Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(3/2),x]
```

```
[Out] (2*(a - b)*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[Sqr
t[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))
]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)]
)/(a*d*Sqrt[Sec[c + d*x]]) - (2*(a - b)*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[
c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c
+ d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a
*(1 + Sec[c + d*x]))/(a - b)])/(a*d*Sqrt[Sec[c + d*x]])
```

Rule 2874

```
Int[Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]/((a_.) + (b_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Dist[(c - d)/(a - b), Int[1/(Sqrt[a + b*Sin
[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]), x], x] - Dist[(b*c - a*d)/(a - b), In
t[(1 + Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
```

```
PosQ[(c + d)/b]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$
$$= \left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx + \left((-a+b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx$$
$$= \frac{2(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+se}{a}}}{ad\sqrt{\sec(c+dx)}} - \frac{2(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+a}{a+b}}}{ad\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 4.53 (sec) , antiderivative size = 215, normalized size of antiderivative = 0.80

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\,dx$$
$$= \frac{2\left((a+b\cos(c+dx))\sqrt{\sec(c+dx)}\sin(c+dx)+\frac{-\frac{(a+b)\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}\left(E\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right)|\frac{-a+b}{a+b}\right)-\text{EllipticF}\left(\arcsin\right.\right.}{\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}}}{\sqrt{\sec^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{\cos^2\left(\frac{1}{2}(c+dx\right.}}\right.}{d\sqrt{a+b\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(3/2),x]
[Out] (2*((a + b*Cos[c + d*x])*Sqrt[Sec[c + d*x]]*Sin[c + d*x] + (-(((a + b)*Sqrt
[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*(EllipticE[ArcSin[Tan[(
c + d*x)/2]], (-a + b)/(a + b)] - EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a +
 b)/(a + b)]))/Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]) - (a + b*Cos[c + d*x]
)*Tan[(c + d*x)/2])/(Sqrt[Sec[(c + d*x)/2]^2]*Sqrt[Cos[(c + d*x)/2]^2*Sec[c
 + d*x]])))/(d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 769 vs. $2(245) = 490$.

Time = 9.09 (sec) , antiderivative size = 770, normalized size of antiderivative = 2.86

method	result
default	$-\frac{2\left(-\frac{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1}{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2-1}\right)^{\frac{3}{2}}\left(\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2-1\right)\left(-\sqrt{-\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1}\sqrt{\frac{\left(\csc^2(dx+c)\right.}{}}\right.}{}$

```
[In] int(sec(d*x+c)^(3/2)*(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1))
^(3/2)*(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)*(-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+
1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+
a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a-(
-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-c
sc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d
*x+c),(-(a-b)/(a+b))^(1/2))*b+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((cs
c(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(
1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a+(-csc(d*x+c)^2
*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b
*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)
/(a+b))^(1/2))*b+csc(d*x+c)^3*(1-cos(d*x+c))^3*a-csc(d*x+c)^3*(1-cos(d*x+c)
)^3*b+a*(csc(d*x+c)-cot(d*x+c))+b*(csc(d*x+c)-cot(d*x+c)))*((csc(d*x+c)^2*a
*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos
(d*x+c))^2+1))^(1/2)/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos
(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)
```

Fricas [F]

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\,dx = \int \sqrt{b\cos(dx+c)+a}\sec(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)*(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^(3/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(3/2)*(a+b*cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\,dx = \int \sqrt{b\cos(dx+c)+a}\sec(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)*(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\,dx = \int \sqrt{b\cos(dx+c)+a}\sec(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)*(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\,dx = \int \left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}\sqrt{a+b\,\cos(c+d\,x)}\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^(1/2),x)
[Out] int((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^(1/2), x)
```

3.733 $\int \sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 155

$$\int \sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\,dx = -\frac{2\sqrt{\cos(c+dx)}\sqrt{\frac{a(1-\cos(c+dx))}{a+b\cos(c+dx)}}\sqrt{\frac{a(1+\cos(c+dx))}{a+b\cos(c+dx)}}(a+b\cos(c+dx))\csc(c+dx)\,\text{EllipticPi}\left(\frac{b}{a+b},\arcsin\left(\frac{\sqrt{a+b}\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\right),\frac{-a+b}{a+b}\right)\sqrt{\sec(c+dx)}}{\sqrt{a+b}d}$$

```
[Out] -2*(a+b*cos(d*x+c))*csc(d*x+c)*EllipticPi((a+b)^(1/2)*cos(d*x+c)^(1/2)/(a+b
*cos(d*x+c))^(1/2),b/(a+b),((-a+b)/(a+b))^(1/2))*cos(d*x+c)^(1/2)*(a*(1-cos
(d*x+c))/(a+b*cos(d*x+c)))^(1/2)*(a*(1+cos(d*x+c))/(a+b*cos(d*x+c)))^(1/2)*
sec(d*x+c)^(1/2)/d/(a+b)^(1/2)
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 155, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.080$, Rules used = {4307, 2890}

$$\int \sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\,dx = -\frac{2\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\sec(c+dx)}\sqrt{\frac{a(1-\cos(c+dx))}{a+b\cos(c+dx)}}\sqrt{\frac{a(\cos(c+dx)+1)}{a+b\cos(c+dx)}}(a+b\cos(c+dx))\,\text{EllipticPi}\left(\frac{b}{a+b},\arcsin\left(\frac{\sqrt{a+b}\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\right),\frac{b-a}{a+b}\right)}{d\sqrt{a+b}}$$

```
[In] Int[Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (-2*Sqrt[Cos[c + d*x]]*Sqrt[(a*(1 - Cos[c + d*x]))/(a + b*Cos[c + d*x])]*Sq
rt[(a*(1 + Cos[c + d*x]))/(a + b*Cos[c + d*x])]*(a + b*Cos[c + d*x])*Csc[c
+ d*x]*EllipticPi[b/(a + b), ArcSin[(Sqrt[a + b]*Sqrt[Cos[c + d*x]])/Sqrt[a
```

```
 + b*Cos[c + d*x]]], -((a - b)/(a + b))]*Sqrt[Sec[c + d*x]])/(Sqrt[a + b]*d
)
```

Rule 2890

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Simp[2*((a + b*Sin[e + f*x])/(d*f*Rt[(a + b)/
(c + d), 2]*Cos[e + f*x]))*Sqrt[(b*c - a*d)*((1 + Sin[e + f*x])/((c - d)*(a
 + b*Sin[e + f*x])))]*Sqrt[(-(b*c - a*d))*((1 - Sin[e + f*x])/((c + d)*(a +
 b*Sin[e + f*x])))]*EllipticPi[b*((c + d)/(d*(a + b))), ArcSin[Rt[(a + b)/(
c + d), 2]*(Sqrt[c + d*Sin[e + f*x]]/Sqrt[a + b*Sin[e + f*x]])], (a - b)*((
c + d)/((a + b)*(c - d)))], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && PosQ[(a + b)/(c + d)]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}\,dx$$

$$= -\frac{2\sqrt{\cos(c+dx)}\sqrt{\frac{a(1-\cos(c+dx))}{a+b\cos(c+dx)}}\sqrt{\frac{a(1+\cos(c+dx))}{a+b\cos(c+dx)}}(a+b\cos(c+dx))\csc(c+dx)\,\text{EllipticPi}\left(\frac{b}{a+b},\text{arcs}\right.}{\sqrt{a+b}d}$$

Mathematica [A] (verified)

Time = 1.51 (sec) , antiderivative size = 146, normalized size of antiderivative = 0.94

$$\int \sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\,dx$$

$$= \frac{2\sqrt{a+b\cos(c+dx)}\left((a-b)\,\text{EllipticF}\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right),\frac{-a+b}{a+b}\right)+2b\,\text{EllipticPi}\left(-1,\arcsin\left(\tan\left(\frac{1}{2}\right.\right.\right.\right.}{(a+b)d\sqrt{\frac{(a+b\cos(c+dx))\sec^2\left(\frac{1}{2}(c+dx)\right)}{a+b}}}$$

```
[In] Integrate[Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (2*Sqrt[a + b*Cos[c + d*x]]*((a - b)*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-
a + b)/(a + b)] + 2*b*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a
+ b)])*Sqrt[Cos[c + d*x]*Sec[(c + d*x)/2]^2]*Sqrt[Sec[c + d*x]])/((a + b)*d
*Sqrt[((a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2)/(a + b)])
```

Maple [A] (verified)

Time = 8.20 (sec) , antiderivative size = 181, normalized size of antiderivative = 1.17

method	result
default	$-\frac{2\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\sqrt{\frac{a+\cos(dx+c)b}{(1+\cos(dx+c))(a+b)}}\,\left(F\left(\cot(dx+c)-\csc(dx+c),\sqrt{-\frac{a-b}{a+b}}\right)a-F\left(\cot(dx+c)-\csc(dx+c),\sqrt{-\frac{a-b}{a+b}}\right)b+2b\Pi\left(\cot(dx\right.\right.}{d\sqrt{a+\cos(dx+c)b}}$

[In] int((a+cos(d*x+c)*b)^(1/2)*sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)

[Out] -2/d*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a-EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b+2*b*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2)))/(a+cos(d*x+c)*b)^(1/2)*sec(d*x+c)^(1/2)*(1+cos(d*x+c))

Fricas [F]

$$\int \sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\,dx=\int \sqrt{b\cos\left(dx+c\right)+a}\sqrt{\sec\left(dx+c\right)}\,dx$$

[In] integrate((a+b*cos(d*x+c))^(1/2)*sec(d*x+c)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(b*cos(d*x + c) + a)*sqrt(sec(d*x + c)), x)

Sympy [F]

$$\int \sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\,dx=\int \sqrt{a+b\cos\left(c+dx\right)}\sqrt{\sec\left(c+dx\right)}\,dx$$

[In] integrate((a+b*cos(d*x+c))**(1/2)*sec(d*x+c)**(1/2),x)

[Out] Integral(sqrt(a + b*cos(c + d*x))*sqrt(sec(c + d*x)), x)

Maxima [F]

$$\int \sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\,dx=\int \sqrt{b\cos\left(dx+c\right)+a}\sqrt{\sec\left(dx+c\right)}\,dx$$

[In] integrate((a+b*cos(d*x+c))^(1/2)*sec(d*x+c)^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(b*cos(d*x + c) + a)*sqrt(sec(d*x + c)), x)

Giac [F]

$$\int \sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\,dx = \int \sqrt{b\cos\left(dx+c\right)+a}\sqrt{\sec\left(dx+c\right)}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2)*sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(b*cos(d*x + c) + a)*sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\,dx = \int \sqrt{\frac{1}{\cos\left(c+d\,x\right)}}\,\sqrt{a+b\,\cos\left(c+d\,x\right)}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^(1/2),x)
[Out] int((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^(1/2), x)
```

3.734 $\int \frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 431

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{\sec(c+dx)}}\,dx = -\frac{(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ad\sqrt{\sec(c+dx)}} + \frac{\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{d\sqrt{\sec(c+dx)}} - \frac{a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{bd\sqrt{\sec(c+dx)}} + \frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d}$$

```
[Out] sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)*sec(d*x+c)^(1/2)/d-(a-b)*csc(d*x+c)*Ellip
ticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/
2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d
*x+c))/(a-b))^(1/2)/a/d/sec(d*x+c)^(1/2)+csc(d*x+c)*EllipticF((a+b*cos(d*x+
c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*co
s(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2
)/d/sec(d*x+c)^(1/2)-a*csc(d*x+c)*EllipticPi((a+b*cos(d*x+c))^(1/2)/(a+b)^(
1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^
(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/b/d/sec
(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 1.05 (sec) , antiderivative size = 431, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {4307, 2900, 3133, 2888, 12, 2880, 2895, 3073}

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{\sec(c+dx)}}\,dx$$
$$= \frac{\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{d\sqrt{\sec(c+dx)}}$$
$$-\frac{(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{ad\sqrt{\sec(c+dx)}}$$
$$-\frac{a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\right.}{bd\sqrt{\sec(c+dx)}}$$
$$+\frac{\sin(c+dx)\sqrt{\sec(c+dx)}\sqrt{a+b\cos(c+dx)}}{d}$$

```
[In] Int[Sqrt[a + b*Cos[c + d*x]]/Sqrt[Sec[c + d*x]],x]
```

```
[Out] -(((a - b)*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[Sqr
t[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))
]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)]
)/(a*d*Sqrt[Sec[c + d*x]])) + (Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*
EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])]
, -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec
[c + d*x]))/(a - b)])/(d*Sqrt[Sec[c + d*x]]) - (a*Sqrt[a + b]*Sqrt[Cos[c +
d*x]]*Csc[c + d*x]*EllipticPi[(a + b)/b, ArcSin[Sqrt[a + b*Cos[c + d*x]]/(S
qrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d
*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(b*d*Sqrt[Sec[c + d*x]
]) + (Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/d
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2880

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin
[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[1/(a - b), Int[1/(Sqrt[a + b*Sin[
e + f*x]]*Sqrt[c + d*Sin[e + f*x]]), x], x] - Dist[b/(a - b), Int[(1 + Sin[
e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /;
FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
```

```
eQ[c^2 - d^2, 0]
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 2900

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m - 1)*((c + d*Sin[e + f*x])^n/(f*(m + n))), x] + Dist[1/(d*(m + n)), In
t[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^(n - 1)*Simp[a^2*c*d*(m
 + n) + b*d*(b*c*(m - 1) + a*d*n) + (a*d*(2*b*c + a*d)*(m + n) - b*d*(a*c -
 b*d*(m + n - 1)))*Sin[e + f*x] + b*d*(b*c*n + a*d*(2*m + n - 1))*Sin[e + f
*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && N
eQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[0, m, 2] && LtQ[-1, n, 2] && N
eQ[m + n, 0] && (IntegerQ[m] || IntegersQ[2*m, 2*n])
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3133

```
Int[((A_.) + (C_.)*sin[(e_.) + (f_.)*(x_)]^2)/(((a_.) + (b_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :
```

```
> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/Sqrt[c + d*Sin[e + f*x]], x], x]
 + Dist[1/b^2, Int[(A*b^2 - a^2*C - 2*a*b*C*Sin[e + f*x])/((a + b*Sin[e + f
*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f, A,
 C}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}\,dx$$

$$= \frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{-\frac{ab}{2}+\frac{1}{2}ab\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{b}$$

$$= \frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{1}{2}\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int-\frac{ab}{2\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{b}$$

$$= -\frac{a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx)}{a+b}}}{bd\sqrt{\sec(c+dx)}} + \frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d} - \frac{1}{2}\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= -\frac{a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+d}{a+b}}}{bd\sqrt{\sec(c+dx)}}$$
$$+\frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d}$$
$$+\frac{1}{2}\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx$$
$$-\frac{1}{2}\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx$$

$$= -\frac{(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1}{}}}{ad\sqrt{\sec(c+dx)}}$$
$$+\frac{\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(}{}}}{d\sqrt{\sec(c+dx)}}$$
$$-\frac{a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+d}{a+b}}}{bd\sqrt{\sec(c+dx)}}$$
$$+\frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d}$$

Mathematica [B] (warning: unable to verify)

Leaf count is larger than twice the leaf count of optimal. 2995 vs. $2(431) = 862$.

Time = 19.00 (sec) , antiderivative size = 2995, normalized size of antiderivative = 6.95

$$\int\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{\sec(c+dx)}}dx = \text{Result too large to show}$$

```
[In] Integrate[Sqrt[a + b*Cos[c + d*x]]/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (Sec[(c + d*x)/2]^2*Sqrt[1 + Sec[c + d*x]]*(8*(a + b)*Sqrt[Cos[c + d*x]/(1
+ Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*El
lipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 16*a*Sqrt[Cos[c + d*x
]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x])
)]*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] - 16*a*Ellipt
icF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[(1 + Sec[c + d*x])^(-1
)]*Sqrt[(b + a*Sec[c + d*x])/((a + b)*(1 + Sec[c + d*x]))] + 2*(a + b*Cos[c
 + d*x])*Sec[(c + d*x)/2]^3*(-Sin[(c + d*x)/2] + Sin[(3*(c + d*x))/2])))/(1
6*d*((1 + Cos[c + d*x])^(-1))^(3/2)*Sqrt[Sec[c + d*x]]*((b*Sec[(c + d*x)/2]
^2*Sqrt[1 + Sec[c + d*x]]*Sin[c + d*x]*(8*(a + b)*Sqrt[Cos[c + d*x]/(1 + Co
```

s[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*Elliptic E[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 16*a*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] - 16*a*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[(1 + Sec[c + d*x])^(-1)]*Sqrt[(b + a*Sec[c + d*x])/((a + b)*(1 + Sec[c + d*x]))] + 2*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^3*(-Sin[(c + d*x)/2] + Sin[(3*(c + d*x))/2])))/(32*((1 + Cos[c + d*x])^(-1))^(3/2)*(a + b*Cos[c + d*x])^(3/2)) - (3*Sec[(c + d*x)/2]^2*Sqrt[1 + Sec[c + d*x]]*Sin[c + d*x]*(8*(a + b)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 16*a*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] - 16*a*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[(1 + Sec[c + d*x])^(-1)]*Sqrt[(b + a*Sec[c + d*x])/((a + b)*(1 + Sec[c + d*x]))] + 2*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^3*(-Sin[(c + d*x)/2] + Sin[(3*(c + d*x))/2])))/(32*Sqrt[(1 + Cos[c + d*x])^(-1)]*Sqrt[a + b*Cos[c + d*x]]) + (Sec[(c + d*x)/2]^2*Sqrt[1 + Sec[c + d*x]]*(8*(a + b)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 16*a*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] - 16*a*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[(1 + Sec[c + d*x])^(-1)]*Sqrt[(b + a*Sec[c + d*x])/((a + b)*(1 + Sec[c + d*x]))] + 2*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^3*(-Sin[(c + d*x)/2] + Sin[(3*(c + d*x))/2]))*Tan[(c + d*x)/2])/(16*((1 + Cos[c + d*x])^(-1))^(3/2)*Sqrt[a + b*Cos[c + d*x]]) + (Sec[(c + d*x)/2]^2*Sec[c + d*x]*(8*(a + b)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 16*a*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] - 16*a*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[(1 + Sec[c + d*x])^(-1)]*Sqrt[(b + a*Sec[c + d*x])/((a + b)*(1 + Sec[c + d*x]))] + 2*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^3*(-Sin[(c + d*x)/2] + Sin[(3*(c + d*x))/2]))*Tan[c + d*x])/(32*((1 + Cos[c + d*x])^(-1))^(3/2)*Sqrt[a + b*Cos[c + d*x]]*Sqrt[1 + Sec[c + d*x]]) + (Sec[(c + d*x)/2]^2*Sqrt[1 + Sec[c + d*x]]*(2*(a + b*Cos[c + d*x])*(-1/2*Cos[(c + d*x)/2] + (3*Cos[(3*(c + d*x))/2])/2)*Sec[(c + d*x)/2]^3 + (4*(a + b)*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*((Cos[c + d*x]*Sin[c + d*x])/(1 + Cos[c + d*x])^2 - Sin[c + d*x]/(1 + Cos[c + d*x])))/Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])] + (8*a*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*((Cos[c + d*x]*Sin[c + d*x])/(1 + Cos[c + d*x])^2 - Sin[c + d*x]/(1 + Cos[c + d*x])))/Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])] + (4*(a + b)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*(-((b*Sin[c

```
 + d*x])/((a + b)*(1 + Cos[c + d*x]))) + ((a + b*Cos[c + d*x])*Sin[c + d*x]
)/((a + b)*(1 + Cos[c + d*x])^2)))/Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 +
Cos[c + d*x]))] + (8*a*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*EllipticPi[-1,
 ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*(-((b*Sin[c + d*x])/((a + b)*(
1 + Cos[c + d*x]))) + ((a + b*Cos[c + d*x])*Sin[c + d*x])/((a + b)*(1 + Cos
[c + d*x])^2)))/Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))] - 2
*b*Sec[(c + d*x)/2]^3*Sin[c + d*x]*(-Sin[(c + d*x)/2] + Sin[(3*(c + d*x))/2
]) + 3*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^3*(-Sin[(c + d*x)/2] + Sin[(3*
(c + d*x))/2])*Tan[(c + d*x)/2] - (8*a*Sec[(c + d*x)/2]^2*Sqrt[(1 + Sec[c +
 d*x])^(-1)]*Sqrt[(b + a*Sec[c + d*x])/((a + b)*(1 + Sec[c + d*x]))])/(Sqrt
[1 - Tan[(c + d*x)/2]^2]*Sqrt[1 - ((-a + b)*Tan[(c + d*x)/2]^2)/(a + b)]) +
 (8*a*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a +
 b)*(1 + Cos[c + d*x]))]*Sec[(c + d*x)/2]^2)/(Sqrt[1 - Tan[(c + d*x)/2]^2]*
(1 + Tan[(c + d*x)/2]^2)*Sqrt[1 - ((-a + b)*Tan[(c + d*x)/2]^2)/(a + b)]) +
 (4*(a + b)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])
/((a + b)*(1 + Cos[c + d*x]))]*Sec[(c + d*x)/2]^2*Sqrt[1 - ((-a + b)*Tan[(c
 + d*x)/2]^2)/(a + b)])/Sqrt[1 - Tan[(c + d*x)/2]^2] + 8*a*EllipticF[ArcSin
[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sec[c + d*x]*((1 + Sec[c + d*x])^(-1)
)^(3/2)*Sqrt[(b + a*Sec[c + d*x])/((a + b)*(1 + Sec[c + d*x]))]*Tan[c + d*x
] - (8*a*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[(1 + Se
c[c + d*x])^(-1)]*((a*Sec[c + d*x]*Tan[c + d*x])/((a + b)*(1 + Sec[c + d*x]
)) - (Sec[c + d*x]*(b + a*Sec[c + d*x])*Tan[c + d*x])/((a + b)*(1 + Sec[c +
 d*x])^2)))/Sqrt[(b + a*Sec[c + d*x])/((a + b)*(1 + Sec[c + d*x]))]))/(16*(
(1 + Cos[c + d*x])^(-1))^(3/2)*Sqrt[a + b*Cos[c + d*x]])))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1068 vs. $2(391) = 782$.

Time = 6.16 (sec) , antiderivative size = 1069, normalized size of antiderivative = 2.48

method	result	size
default	Expression too large to display	1069

```
[In] int((a+cos(d*x+c)*b)^(1/2)/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)/sec(d*x+c)^(1/2)*(2*EllipticF(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*cos(d*x+c)-EllipticE(cot(d*
x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a
+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*cos(d*x+c)-EllipticE(cot(d*x+c
)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+co
s(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b*cos(d*x+c)-2*EllipticPi(cot(d*x+c
)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a
+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*cos(d*x+c)+4*(cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+
```

```
cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a-2*(cos(d*x+c)/(1+cos(d*x+c)))^(
1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b
)/(1+cos(d*x+c))/(a+b))^(1/2)*a-2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Ellipti
cE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x
+c))/(a+b))^(1/2)*b-4*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticPi(cot(d*x+
c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+
b))^(1/2)*a+2*sec(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(cot(d*
x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b
))^(1/2)*a-sec(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(cot(d*x+c
)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^
(1/2)*a-sec(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(cot(d*x+c)-c
sc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/
2)*b-2*sec(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticPi(cot(d*x+c)-c
sc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^
(1/2)*a+sin(d*x+c)*cos(d*x+c)*b+a*sin(d*x+c))
```

Fricas [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{\sqrt{b\cos\left(dx+c\right)+a}}{\sqrt{\sec\left(dx+c\right)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)/sqrt(sec(d*x + c)), x)
```

Sympy [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{\sqrt{a+b\cos\left(c+dx\right)}}{\sqrt{\sec\left(c+dx\right)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**(1/2)/sec(d*x+c)**(1/2),x)
[Out] Integral(sqrt(a + b*cos(c + d*x))/sqrt(sec(c + d*x)), x)
```

Maxima [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{\sqrt{b\cos\left(dx+c\right)+a}}{\sqrt{\sec\left(dx+c\right)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(b*cos(d*x + c) + a)/sqrt(sec(d*x + c)), x)
```

Giac [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{\sqrt{b\cos\left(dx+c\right)+a}}{\sqrt{\sec\left(dx+c\right)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(b*cos(d*x + c) + a)/sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{\sqrt{a+b\,\cos\left(c+d\,x\right)}}{\sqrt{\frac{1}{\cos\left(c+d\,x\right)}}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(1/2)/(1/cos(c + d*x))^(1/2),x)
[Out] int((a + b*cos(c + d*x))^(1/2)/(1/cos(c + d*x))^(1/2), x)
```

3.735 $\int \frac{\sqrt{a+b\cos(c+dx)}}{\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 498

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = -\frac{(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{4bd\sqrt{\sec(c+dx)}} + \frac{\sqrt{a+b}(a+2b)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1}{}}}{4bd\sqrt{\sec(c+dx)}} + \frac{\sqrt{a+b}(a^2-4b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+d}{a+b}}}{4b^2d\sqrt{\sec(c+dx)}} + \frac{\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d\sqrt{\sec(c+dx)}} + \frac{a\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4bd}$$

```
[Out] 1/2*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/sec(d*x+c)^(1/2)+1/4*a*sin(d*x+c)*(
a+b*cos(d*x+c))^(1/2)*sec(d*x+c)^(1/2)/b/d-1/4*(a-b)*csc(d*x+c)*EllipticE((
a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a
+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))
/(a-b))^(1/2)/b/d/sec(d*x+c)^(1/2)+1/4*(a+2*b)*csc(d*x+c)*EllipticF((a+b*co
s(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1
/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b)
)^(1/2)/b/d/sec(d*x+c)^(1/2)+1/4*(a^2-4*b^2)*csc(d*x+c)*EllipticPi((a+b*cos
(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b)/(a-b))^(1/2))*(
a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c)
)/(a-b))^(1/2)/b^2/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 1.20 (sec) , antiderivative size = 498, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {4307, 2900, 3140, 3132, 2888, 3077, 2895, 3073}

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sec^{\frac{3}{2}}(c+dx)}\,dx$$
$$= \frac{\sqrt{a+b}(a^2-4b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos}}{\sqrt{a+b}\sqrt{\cos}}\right.\right.}{4b^2d\sqrt{\sec(c+dx)}}$$
$$+\frac{\sqrt{a+b}(a+2b)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx}}\right.\right.}{4bd\sqrt{\sec(c+dx)}}$$
$$-\frac{(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right.}{4bd\sqrt{\sec(c+dx)}}$$
$$+\frac{a\sin(c+dx)\sqrt{\sec(c+dx)}\sqrt{a+b\cos(c+dx)}}{4bd}+\frac{\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{2d\sqrt{\sec(c+dx)}}$$

```
[In] Int[Sqrt[a + b*Cos[c + d*x]]/Sec[c + d*x]^(3/2),x]
```

```
[Out] -1/4*((a - b)*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[
Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a -
b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a -
b)])/(b*d*Sqrt[Sec[c + d*x]]) + (Sqrt[a + b]*(a + 2*b)*Sqrt[Cos[c + d*x]]*C
sc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos
[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt
[(a*(1 + Sec[c + d*x]))/(a - b)])/(4*b*d*Sqrt[Sec[c + d*x]]) + (Sqrt[a + b]
*(a^2 - 4*b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticPi[(a + b)/b, ArcSin
[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a -
 b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a -
 b)])/(4*b^2*d*Sqrt[Sec[c + d*x]]) + (Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x]
)/(2*d*Sqrt[Sec[c + d*x]]) + (a*Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]
*Sin[c + d*x])/(4*b*d)
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 2900

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m - 1)*((c + d*Sin[e + f*x])^n/(f*(m + n))), x] + Dist[1/(d*(m + n)), In
t[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^(n - 1)*Simp[a^2*c*d*(m
 + n) + b*d*(b*c*(m - 1) + a*d*n) + (a*d*(2*b*c + a*d)*(m + n) - b*d*(a*c -
 b*d*(m + n - 1)))*Sin[e + f*x] + b*d*(b*c*n + a*d*(2*m + n - 1))*Sin[e + f
*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && N
eQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[0, m, 2] && LtQ[-1, n, 2] && N
eQ[m + n, 0] && (IntegerQ[m] || IntegersQ[2*m, 2*n])
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
```

```
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
 - 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3140

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(Sqrt[c + d*Sin[e + f
*x]]/(d*f*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[1/(2*d), Int[(1/((a + b*Sin
[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]))*Simp[2*a*A*d - C*(b*c - a*d) -
2*(a*c*C - d*(A*b + a*B))*Sin[e + f*x] + (2*b*B*d - C*(b*c + a*d))*Sin[e +
f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*
d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}\,dx \\
&= \frac{\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d\sqrt{\sec(c+dx)}} \\
&\quad+\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\frac{ab}{2}+b^2\cos(c+dx)+\frac{1}{2}ab\cos^2(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{2b} \\
&= \frac{\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d\sqrt{\sec(c+dx)}}+\frac{a\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4bd} \\
&\quad+\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{-\frac{a^2b}{2}+ab^2\cos(c+dx)-\frac{1}{2}b(a^2-4b^2)\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{4b^2} \\
&= \frac{\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d\sqrt{\sec(c+dx)}}+\frac{a\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4bd} \\
&\quad+\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{-\frac{a^2b}{2}+ab^2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{4b^2} \\
&\quad-\frac{\left((a^2-4b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx}{8b}
\end{aligned}$$

$$= \frac{\sqrt{a+b}(a^2-4b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-s}{}}}{4b^2d\sqrt{\sec(c+dx)}}$$
$$+\frac{\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d\sqrt{\sec(c+dx)}}+\frac{a\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4bd}$$
$$-\frac{\left(a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{8b}$$
$$+\frac{\left(a(a+2b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{8b}$$
$$=$$
$$-\frac{(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+s}{}}}{4bd\sqrt{\sec(c+dx)}}$$
$$+\frac{\sqrt{a+b}(a+2b)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+d}{a+b}}}{4bd\sqrt{\sec(c+dx)}}$$
$$+\frac{\sqrt{a+b}(a^2-4b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(}{}}}{4b^2d\sqrt{\sec(c+dx)}}$$
$$+\frac{\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d\sqrt{\sec(c+dx)}}+\frac{a\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4bd}$$

Mathematica [A] (warning: unable to verify)

Time = 15.95 (sec) , antiderivative size = 837, normalized size of antiderivative = 1.68

$$\int\frac{\sqrt{a+b\cos(c+dx)}}{\sec^{\frac{3}{2}}(c+dx)}dx=\frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(2(c+dx))}{4d}$$
$$+\frac{-a^2\tan\left(\frac{1}{2}(c+dx)\right)-ab\tan\left(\frac{1}{2}(c+dx)\right)+2ab\tan^3\left(\frac{1}{2}(c+dx)\right)+a^2\tan^5\left(\frac{1}{2}(c+dx)\right)-ab\tan^5\left(\frac{1}{2}(c+\right.}{}$$

```
[In] Integrate[Sqrt[a + b*Cos[c + d*x]]/Sec[c + d*x]^(3/2),x]
```

```
[Out] (Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*Sin[2*(c + d*x)])/(4*d) + (-(a
^2*Tan[(c + d*x)/2]) - a*b*Tan[(c + d*x)/2] + 2*a*b*Tan[(c + d*x)/2]^3 + a^
2*Tan[(c + d*x)/2]^5 - a*b*Tan[(c + d*x)/2]^5 + 2*a^2*EllipticPi[-1, ArcSin
[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqrt[(a
+ b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] - 8*b^2*Ellipti
cPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/
```

```
2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] +
 2*a^2*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Tan[(c +
d*x)/2]^2*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 -
 b*Tan[(c + d*x)/2]^2)/(a + b)] - 8*b^2*EllipticPi[-1, ArcSin[Tan[(c + d*x)
/2]], (-a + b)/(a + b)]*Tan[(c + d*x)/2]^2*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqr
t[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] - a*(a + b
)*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d
*x)/2]^2]*(1 + Tan[(c + d*x)/2]^2)*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*T
an[(c + d*x)/2]^2)/(a + b)] - 2*(a - 2*b)*b*EllipticF[ArcSin[Tan[(c + d*x)/
2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/2]^2]*(1 + Tan[(c + d*x)/2]^2
)*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)])/(4*b
*d*Sqrt[(1 - Tan[(c + d*x)/2]^2)^(-1)]*(-1 + Tan[(c + d*x)/2]^2)*(1 + Tan[(
c + d*x)/2]^2)^(3/2)*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2
]^2)/(1 + Tan[(c + d*x)/2]^2)])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1654 vs. $2(444) = 888$.

Time = 7.52 (sec) , antiderivative size = 1655, normalized size of antiderivative = 3.32

method	result	size
default	Expression too large to display	1655

```
[In] int((a+cos(d*x+c)*b)^(1/2)/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/d/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)/sec(d*x+c)^(3/2)*(2*((a+cos(d*
x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)
/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b-4*((a+cos(d*x+c)*b)/(1
+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^2+((a+cos(d*x+c)*b)/(1+cos(d*x+c))
/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*a^2+((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2
)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)*a*b-2*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*Elliptic
Pi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)
))^(1/2)*a^2+8*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticPi(cot
(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*b^2+4*sec(d*x+c)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(
(a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*a*b-8*sec(d*x+c)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*
((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(
1/2)*b^2+2*sec(d*x+c)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*a^2+2*sec(d*x+c)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2)
)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))
```

```
^(1/2)*a*b-4*sec(d*x+c)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^
(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x
+c)))^(1/2)*a^2+16*sec(d*x+c)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(
a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*b^2-2*cos(d*x+c)*b^2*sin(d*x+c)+2*sec(d*x+c)^2*EllipticF(
cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c)
)/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b-4*sec(d*x+c)^2*Ellipti
cF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x
+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^2+sec(d*x+c)^2*Ellipt
icE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*
x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2+sec(d*x+c)^2*Ellip
ticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d
*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b-2*sec(d*x+c)^2*El
lipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(
1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2+8*sec(d*x+
c)^2*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+
c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^2-3*a
*b*sin(d*x+c)-2*sin(d*x+c)*b^2-tan(d*x+c)*a^2-2*tan(d*x+c)*a*b)/b
```

Fricas [F(-1)]

Timed out.

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2)/sec(d*x+c)^(3/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{\sqrt{a+b\cos{(c+dx)}}}{\sec^{\frac{3}{2}}{(c+dx)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**(1/2)/sec(d*x+c)**(3/2),x)
[Out] Integral(sqrt(a + b*cos(c + d*x))/sec(c + d*x)**(3/2), x)
```

Maxima [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{\sqrt{b\cos(dx+c)+a}}{\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2)/sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate(sqrt(b*cos(d*x + c) + a)/sec(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{\sqrt{b\cos(dx+c)+a}}{\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/2)/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate(sqrt(b*cos(d*x + c) + a)/sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{a+b\cos(c+dx)}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{\sqrt{a+b\,\cos(c+d\,x)}}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(1/2)/(1/cos(c + d*x))^(3/2),x)
[Out] int((a + b*cos(c + d*x))^(1/2)/(1/cos(c + d*x))^(3/2), x)
```

3.736 $\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{9}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 427

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \frac{4(a-b)b\sqrt{a+b}(41a^2-3b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec}{a}}}{105a^3d\sqrt{\sec(c+dx)}}$$
$$+\frac{2(a-b)\sqrt{a+b}(25a^2-57ab-6b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{}}{105a^2d\sqrt{\sec(c+dx)}}$$
$$+\frac{2(25a^2+3b^2)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{105ad}$$
$$+\frac{16b\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{35d}$$
$$+\frac{2a\sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d}$$

```
[Out] 2/105*(25*a^2+3*b^2)*sec(d*x+c)^(3/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/a/d
+16/35*b*sec(d*x+c)^(5/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+2/7*a*sec(d*x
+c)^(7/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+4/105*(a-b)*b*(41*a^2-3*b^2)*
csc(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((
-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(
1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^3/d/sec(d*x+c)^(1/2)+2/105*(a-b)*(25*
a^2-57*a*b-6*b^2)*csc(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/c
os(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-se
c(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^2/d/sec(d*x+c)^(1/2
)
```

Rubi [A] (verified)

Time = 1.19 (sec) , antiderivative size = 427, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4307, 2878, 3134, 3077, 2895, 3073}

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \frac{2(a-b)\sqrt{a+b}(25a^2-57ab-6b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{Ellipt}}{105a^2d\sqrt{\sec(c+dx)}} + \frac{2(25a^2+3b^2)\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{105ad} + \frac{4b(a-b)\sqrt{a+b}(41a^2-3b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+}}{\sqrt{a+b}\sqrt{\cos(c}}\right.\right.}{105a^3d\sqrt{\sec(c+dx)}} + \frac{2a\sin(c+dx)\sec^{\frac{7}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{7d} + \frac{16b\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{35d}$$

```
[In] Int[(a + b*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(9/2),x]
```

```
[Out] (4*(a - b)*b*Sqrt[a + b]*(41*a^2 - 3*b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*E
llipticE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])],
 -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[
c + d*x]))/(a - b)])/(105*a^3*d*Sqrt[Sec[c + d*x]]) + (2*(a - b)*Sqrt[a + b
]*(25*a^2 - 57*a*b - 6*b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSi
n[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a
- b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a
- b)])/(105*a^2*d*Sqrt[Sec[c + d*x]]) + (2*(25*a^2 + 3*b^2)*Sqrt[a + b*Cos[
c + d*x]]*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(105*a*d) + (16*b*Sqrt[a + b*Cos
[c + d*x]]*Sec[c + d*x]^(5/2)*Sin[c + d*x])/(35*d) + (2*a*Sqrt[a + b*Cos[c
+ d*x]]*Sec[c + d*x]^(7/2)*Sin[c + d*x])/(7*d)
```

Rule 2878

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*(a + b*Si
n[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n - 1)/(f*(m + 1)*(a^2 - b^2))),
 x] + Dist[1/((m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d
*Sin[e + f*x])^(n - 2)*Simp[c*(a*c - b*d)*(m + 1) + d*(b*c - a*d)*(n - 1) +
 (d*(a*c - b*d)*(m + 1) - c*(b*c - a*d)*(m + 2))*Sin[e + f*x] - d*(b*c - a*
d)*(m + n + 1)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &
& NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1]
 && LtQ[1, n, 2] && IntegersQ[2*m, 2*n]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx$$

$$= \frac{2a\sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{1}{7}\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{4ab+\frac{1}{2}(5a^2+7b^2)\cos(c+dx)+2ab\cos^2(c+dx)}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{16b\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{35d} + \frac{2a\sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{\left(4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{1}{4}a(25a^2+3b^2)+11a^2b\cos(c+dx)+4ab^2\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{35a}$$

$$= \frac{2(25a^2+3b^2)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{105ad} + \frac{16b\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{35d} + \frac{2a\sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{\left(8\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{1}{4}ab(41a^2-3b^2)+\frac{1}{8}a^2(25a^2+51b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{105a^2}$$

$$= \frac{2(25a^2+3b^2)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{105ad} + \frac{16b\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{35d} + \frac{2a\sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{\left((a-b)(25a^2-57ab-6b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{105a} + \frac{\left(2b(41a^2-3b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{105a}$$

$$= \frac{4(a-b)b\sqrt{a+b}(41a^2-3b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec}{a+}}}{105a^3d\sqrt{\sec(c+dx)}}$$
$$+ \frac{2(a-b)\sqrt{a+b}(25a^2-57ab-6b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\right.}{105a^2d\sqrt{\sec(c+dx)}}$$
$$+ \frac{2(25a^2+3b^2)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{105ad}$$
$$+ \frac{16b\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{35d}$$
$$+ \frac{2a\sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d}$$

Mathematica [A] (verified)

Time = 11.05 (sec) , antiderivative size = 441, normalized size of antiderivative = 1.03

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \frac{4\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)\sec(c+dx)}\left(2b(-41a^3-41a^2b+3ab^2+3b^3)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\right.}{}$$
$$+ \frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\left(-\frac{4b(-41a^2+3b^2)\sin(c+dx)}{105a^2}+\frac{2\sec(c+dx)(25a^2\sin(c+dx)+3b^2\sin(c+dx))}{105a}+\frac{16}{35}b\sec(c+\right.}{d}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(9/2),x]
```

```
[Out] (4*Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*(2*b*(-41*a^3 - 41*a^2*b + 3*a*b^2
 + 3*b^3)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/(
(a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(
a + b)] + a*(25*a^3 + 82*a^2*b + 51*a*b^2 - 6*b^3)*Sqrt[Cos[c + d*x]/(1 + C
os[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*Ellip
ticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + b*(-41*a^2 + 3*b^2)*Cos[
c + d*x]*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2*Tan[(c + d*x)/2]))/(105*a^
2*d*Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[(c + d*x)/2]^2]) + (Sqrt[a + b*Cos[c
+ d*x]]*Sqrt[Sec[c + d*x]]*((-4*b*(-41*a^2 + 3*b^2)*Sin[c + d*x])/(105*a^2)
 + (2*Sec[c + d*x]*(25*a^2*Sin[c + d*x] + 3*b^2*Sin[c + d*x]))/(105*a) + (1
6*b*Sec[c + d*x]*Tan[c + d*x])/35 + (2*a*Sec[c + d*x]^2*Tan[c + d*x])/7))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2508 vs. 2(381) = 762.

Time = 15.28 (sec) , antiderivative size = 2509, normalized size of antiderivative = 5.88

method	result	size
default	Expression too large to display	2509

```
[In] int((a+cos(d*x+c)*b)^(3/2)*sec(d*x+c)^(9/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/105/d*sec(d*x+c)^(9/2)/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)*(25*a^4*cos(
d*x+c)^4*sin(d*x+c)+15*a^4*cos(d*x+c)^2*sin(d*x+c)+27*a^2*b^2*cos(d*x+c)^4*
sin(d*x+c)-6*cos(d*x+c)^5*b^4*sin(d*x+c)-12*EllipticE(cot(d*x+c)-csc(d*x+c)
,(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)*b^4*cos(d*x+c)^5-50*EllipticF(cot(d*x+c)-csc(d*
x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(c
os(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^4*cos(d*x+c)^5-6*EllipticE(cot(d*x+c)-csc
(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)
*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^4*cos(d*x+c)^4-25*EllipticF(cot(d*x+c)
-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(
1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^4*cos(d*x+c)^4-6*EllipticE(cot(d*x
+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b)
)^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^3*cos(d*x+c)^4-82*EllipticF(c
ot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))
/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^3*b*cos(d*x+c)^4-51*Ellip
ticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d
*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b^2*cos(d*x+c)^4+
6*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(
1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^3*cos(d*x+
c)^4+164*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+
c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^3*b*c
os(d*x+c)^5+164*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+c
os(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
a^2*b^2*cos(d*x+c)^5-12*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2
))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*a*b^3*cos(d*x+c)^5-164*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b
))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)*a^3*b*cos(d*x+c)^5-102*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-
b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*a^2*b^2*cos(d*x+c)^5+12*EllipticF(cot(d*x+c)-csc(d*x+
c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos
(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^3*cos(d*x+c)^5+82*EllipticE(cot(d*x+c)-cs
c(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2
)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^3*b*cos(d*x+c)^4+82*EllipticE(cot(d*x
+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b)
```

```
)^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b^2*cos(d*x+c)^4-6*cos(d*x+c)
^6*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b)
)^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^4-25*cos(d*
x+c)^6*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(
a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4-82*co
s(d*x+c)^6*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c
))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b
-51*cos(d*x+c)^6*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos
(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*a^2*b^2+6*cos(d*x+c)^6*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)
/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*a*b^3+82*cos(d*x+c)^6*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x
+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/
(a+b))^(1/2))*a^3*b+82*cos(d*x+c)^6*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+c
os(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-
(a-b)/(a+b))^(1/2))*a^2*b^2-6*cos(d*x+c)^6*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2
)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*
x+c),(-(a-b)/(a+b))^(1/2))*a*b^3+25*a^4*cos(d*x+c)^3*sin(d*x+c)+15*a^4*cos(
d*x+c)*sin(d*x+c)+25*cos(d*x+c)^5*a^3*b*sin(d*x+c)+82*cos(d*x+c)^5*a^2*b^2*
sin(d*x+c)+3*cos(d*x+c)^5*a*b^3*sin(d*x+c)+39*a^3*b*cos(d*x+c)^2*sin(d*x+c)
+39*a^3*b*cos(d*x+c)^3*sin(d*x+c)+27*a^2*b^2*cos(d*x+c)^3*sin(d*x+c)+107*a^
3*b*cos(d*x+c)^4*sin(d*x+c)-3*a*b^3*cos(d*x+c)^4*sin(d*x+c))/a^2
```

Fricas [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{9}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{9}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^(9/2),x, algorithm="fricas")
[Out] integral((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^(9/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{9}{2}}(c+dx)\,dx=\text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(3/2)*sec(d*x+c)**(9/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{9}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{9}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^(9/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^(9/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{9}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{9}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^(9/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^(9/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{9}{2}}(c+dx)\,dx=\int \left(\frac{1}{\cos(c+d\,x)}\right)^{9/2}(a+b\,\cos(c+d\,x))^{3/2}\,dx$$

```
[In] int((1/cos(c + d*x))^(9/2)*(a + b*cos(c + d*x))^(3/2),x)
[Out] int((1/cos(c + d*x))^(9/2)*(a + b*cos(c + d*x))^(3/2), x)
```

3.737 $\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{7}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 365

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{7}{2}}(c+dx)\,dx = \frac{2(a-b)\sqrt{a+b}(3a^2+b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+}{a+b}}}{5a^2d\sqrt{\sec(c+dx)}}$$
$$-\frac{2(a-b)(3a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}}{5ad\sqrt{\sec(c+dx)}}$$
$$+\frac{4b\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d}$$
$$+\frac{2a\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}$$

```
[Out] 4/5*b*sec(d*x+c)^(3/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+2/5*a*sec(d*x+c)
^(5/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+2/5*(a-b)*(3*a^2+b^2)*csc(d*x+c)
*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b
))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1
+sec(d*x+c))/(a-b))^(1/2)/a^2/d/sec(d*x+c)^(1/2)-2/5*(a-b)*(3*a-b)*csc(d*x+
c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a
-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*
(1+sec(d*x+c))/(a-b))^(1/2)/a/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.87 (sec) , antiderivative size = 365, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4307, 2878, 3134, 3077, 2895, 3073}

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{7}{2}}(c+dx)\,dx = \frac{2(a-b)\sqrt{a+b}(3a^2+b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+}}{\sqrt{a+b}}\right.\right.}{5a^2d\sqrt{\sec(c+dx)}}$$
$$-\frac{2(a-b)(3a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos}}{\sqrt{a+b}\sqrt{c}}\right.\right.}{5ad\sqrt{\sec(c+dx)}}$$
$$+\frac{2a\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{5d}$$
$$+\frac{4b\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{5d}$$

```
[In] Int[(a + b*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(7/2),x]
```

```
[Out] (2*(a - b)*Sqrt[a + b]*(3*a^2 + b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*Ellipt
icE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a
 + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d
*x]))/(a - b)])/(5*a^2*d*Sqrt[Sec[c + d*x]]) - (2*(a - b)*(3*a - b)*Sqrt[a
+ b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*
x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec
[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(5*a*d*Sqrt[Sec[
c + d*x]]) + (4*b*Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(3/2)*Sin[c + d*x])
/(5*d) + (2*a*Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(5/2)*Sin[c + d*x])/(5*
d)
```

Rule 2878

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*(a + b*Si
n[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n - 1)/(f*(m + 1)*(a^2 - b^2))),
 x] + Dist[1/((m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d
*Sin[e + f*x])^(n - 2)*Simp[c*(a*c - b*d)*(m + 1) + d*(b*c - a*d)*(n - 1) +
 (d*(a*c - b*d)*(m + 1) - c*(b*c - a*d)*(m + 2))*Sin[e + f*x] - d*(b*c - a*
d)*(m + n + 1)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &
& NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1]
 && LtQ[1, n, 2] && IntegersQ[2*m, 2*n]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
```

```
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx$$

$$= \frac{2a\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{1}{5}\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{3ab+\frac{1}{2}(3a^2+5b^2)\cos(c+dx)+ab\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{4b\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{\left(4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{3}{4}a(3a^2+b^2)+3a^2b\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{15a}$$

$$= \frac{4b\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} - \frac{1}{5}\left((a-b)(3a-b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx + \frac{1}{5}\left((3a^2+b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2(a-b)\sqrt{a+b}(3a^2+b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+}{a+b}}}{5a^2d\sqrt{\sec(c+dx)}} - \frac{2(a-b)(3a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{}}{5ad\sqrt{\sec(c+dx)}} + \frac{4b\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{2a\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}$$

Mathematica [A] (verified)

Time = 8.11 (sec) , antiderivative size = 345, normalized size of antiderivative = 0.95

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{7}{2}}(c+dx)\,dx = \frac{2\left(\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)\sec(c+dx)}\left(-2(3a^3+3a^2b+ab^2+b^3)E\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right)\middle|\frac{-a+b}{a+b}\right)\sqrt{\frac{1}{1+\sec(c+dx)}}\sqrt{\frac{b+a\sec(c+dx)}{(a+b)(1+\sec(c+dx))}}+2a(3\cdots\right.\right.}{\cdots}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(7/2),x]
```

```
[Out] (2*((Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*(-2*(3*a^3 + 3*a^2*b + a*b^2 + b
^3)*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[(1 + Sec[c +
 d*x])^(-1)]*Sqrt[(b + a*Sec[c + d*x])/((a + b)*(1 + Sec[c + d*x]))] + 2*a*
(3*a^2 + 4*a*b + b^2)*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]
*Sqrt[(1 + Sec[c + d*x])^(-1)]*Sqrt[(b + a*Sec[c + d*x])/((a + b)*(1 + Sec[
c + d*x]))] - (3*a^2 + b^2)*Cos[c + d*x]*(a + b*Cos[c + d*x])*Sec[(c + d*x)
/2]^2*Tan[(c + d*x)/2]))/Sqrt[Sec[(c + d*x)/2]^2] + (a + b*Cos[c + d*x])*Sq
rt[Sec[c + d*x]]*((3*a^2 + b^2)*Sin[c + d*x] + a*(2*b + a*Sec[c + d*x])*Tan
[c + d*x])))/(5*a*d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2113 vs. $2(325) = 650$.

Time = 13.08 (sec) , antiderivative size = 2114, normalized size of antiderivative = 5.79

method	result	size
default	Expression too large to display	2114

```
[In] int((a+cos(d*x+c)*b)^(3/2)*sec(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/5/d*sec(d*x+c)^(7/2)/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)*(-2*EllipticE
(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)^4+8*Elli
pticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)
))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)^4+2
*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c
)^4-3*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*cos(
d*x+c)^3-EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*c
os(d*x+c)^3+4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*
```

x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^
2*b*cos(d*x+c)^3+EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos
(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)
*a*b^2*cos(d*x+c)^3+3*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^
(1/2)*a^3*cos(d*x+c)^3-sin(d*x+c)*cos(d*x+c)*a^3-3*sin(d*x+c)*cos(d*x+c)^2*
a^2*b-6*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*co
s(d*x+c)^4+3*cos(d*x+c)^5*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*a^3-3*cos(d*x+c)^5*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(
a+b))^(1/2))*a^3-b^3*cos(d*x+c)^4*sin(d*x+c)-3*a^2*b*cos(d*x+c)^3*sin(d*x+c
)-3*a*b^2*cos(d*x+c)^3*sin(d*x+c)+4*cos(d*x+c)^5*EllipticF(cot(d*x+c)-csc(d
x+c),(-(a-b)/(a+b))^(1/2))((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b+cos(d*x+c)^5*EllipticF(cot(d*x+c)-cs
c(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2
)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^2-3*cos(d*x+c)^5*((a+cos(d*x+c)*b)/
(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b-cos(d*x+c)^5*((a+cos(d*x+c)*
b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(
cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2-6*EllipticE(cot(d*x+c)-cs
c(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*
x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^4-2*EllipticE(cot(d*x+c)
-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos
(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)^4+6*EllipticF(cot(d*x
+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+
cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^4-3*EllipticE(cot(
d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(
(a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^3-EllipticE(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)^3-a^3*cos(d*x+
c)^2*sin(d*x+c)-cos(d*x+c)^5*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(
a+b))^(1/2))*b^3-3*cos(d*x+c)^3*a^3*sin(d*x+c)-3*cos(d*x+c)^4*a^2*b*sin(d*x
+c)-2*cos(d*x+c)^4*a*b^2*sin(d*x+c))/a

Fricas [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{7}{2}}(c+dx)\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{7}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^(7/2),x, algorithm="fricas")
[Out] integral((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^(7/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{7}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(3/2)*sec(d*x+c)**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{7}{2}}(c+dx)\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{7}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^(7/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^(7/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{7}{2}}(c+dx)\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{7}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^(7/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{7}{2}}(c+dx)\,dx=\int \left(\frac{1}{\cos{(c+d\,x)}}\right)^{7/2}\,{\left(a+b\,\cos{(c+d\,x)}\right)}^{3/2}\,dx$$

```
[In] int((1/cos(c + d*x))^(7/2)*(a + b*cos(c + d*x))^(3/2),x)
[Out] int((1/cos(c + d*x))^(7/2)*(a + b*cos(c + d*x))^(3/2), x)
```

3.738 $\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 317

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{8(a-b)b\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+}{}}}{3ad\sqrt{\sec(c+dx)}} + \frac{2(a-3b)(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}}{3ad\sqrt{\sec(c+dx)}} + \frac{2a\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}$$

```
[Out] 2/3*a*sec(d*x+c)^(3/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+8/3*(a-b)*b*csc(
d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b
)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)
*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/d/sec(d*x+c)^(1/2)+2/3*(a-3*b)*(a-b)*csc(
d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b
)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)
*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.64 (sec) , antiderivative size = 317, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4307, 2878, 3077, 2895, 3073}

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{2(a-3b)(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\right.}{3ad\sqrt{\sec(c+dx)}} + \frac{8b(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{3ad\sqrt{\sec(c+dx)}} + \frac{2a\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{3d}$$

```
[In] Int[(a + b*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(5/2),x]
```

```
[Out] (8*(a - b)*b*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[S
qrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b
))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b
)])/(3*a*d*Sqrt[Sec[c + d*x]]) + (2*(a - 3*b)*(a - b)*Sqrt[a + b]*Sqrt[Cos[
c + d*x]]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a +
b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a
 + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a*d*Sqrt[Sec[c + d*x]]) + (
2*a*Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(3*d)
```

Rule 2878

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*(a + b*Si
n[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n - 1)/(f*(m + 1)*(a^2 - b^2))),
 x] + Dist[1/((m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d
*Sin[e + f*x])^(n - 2)*Simp[c*(a*c - b*d)*(m + 1) + d*(b*c - a*d)*(n - 1) +
 (d*(a*c - b*d)*(m + 1) - c*(b*c - a*d)*(m + 2))*Sin[e + f*x] - d*(b*c - a*
d)*(m + n + 1)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &
& NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1]
 && LtQ[1, n, 2] && IntegersQ[2*m, 2*n]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
```

```
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx$$

$$= \frac{2a\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{1}{3}\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{2ab+\frac{1}{2}(a^2+3b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2a\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{1}{3}\Big((a-3b)(a-b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\Big)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx + \frac{1}{3}\left(4ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{8(a-b)b\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1-}{}}}{3ad\sqrt{\sec(c+dx)}}$$
$$+ \frac{2(a-3b)(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{}}{3ad\sqrt{\sec(c+dx)}}$$
$$+ \frac{2a\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}$$

Mathematica [A] (verified)

Time = 4.90 (sec) , antiderivative size = 291, normalized size of antiderivative = 0.92

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{\sqrt{\sec(c+dx)}\left(4\cos^2\left(\frac{1}{2}(c+dx)\right)\left(-4b(a+b)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\left(\arcsin\left(\tan\left(\frac{1}{2}(c\right.\right.\right.\right.\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(5/2),x]
```

```
[Out] (Sqrt[Sec[c + d*x]]*(4*Cos[(c + d*x)/2]^2*(-4*b*(a + b)*Sqrt[Cos[c + d*x]/(
1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*
EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + (a^2 + 4*a*b + 3*b^
2)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)
*(1 + Cos[c + d*x]))]*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]
 + b*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^3*(Sin[(c + d*x)/2] - Sin[(3*(c
+ d*x))/2])) + 2*(a + b*Cos[c + d*x])*(a + 4*b*Cos[c + d*x])*Tan[c + d*x]))
/(3*d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1468 vs. 2(283) = 566.

Time = 11.98 (sec) , antiderivative size = 1469, normalized size of antiderivative = 4.63

method	result	size
default	Expression too large to display	1469

```
[In] int((a+cos(d*x+c)*b)^(3/2)*sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3/d*sec(d*x+c)^(5/2)/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)*(4*cos(d*x+c)^
4*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b+4*cos(d*x+
```

```
c)^4*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^2-cos(d*x
+c)^4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*
b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2-4*cos(
d*x+c)^4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+
c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b-3*c
os(d*x+c)^4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d
*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^2+
8*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))
^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b*cos(d*x+c)
^3+8*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+
b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^2*cos(d*x
+c)^3-2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/
(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*cos(
d*x+c)^3-8*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c
))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b*c
os(d*x+c)^3-6*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos
(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^
2*cos(d*x+c)^3+4*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+
cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*a*b*cos(d*x+c)^2+4*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+
cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/
2))*b^2*cos(d*x+c)^2-(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1
+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*a^2*cos(d*x+c)^2-4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2
))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*a*b*cos(d*x+c)^2-3*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(
1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*b^2*cos(d*x+c)^2+a*b*cos(d*x+c)^3*sin(d*x+c)+4*b^2*cos(d*x+c)^3*
sin(d*x+c)+a^2*cos(d*x+c)^2*sin(d*x+c)+5*cos(d*x+c)^2*sin(d*x+c)*a*b+a^2*co
s(d*x+c)*sin(d*x+c))
```

Fricas [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^(5/2),x, algorithm="fricas")
[Out] integral((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^(5/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(3/2)*sec(d*x+c)**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^(5/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)\,dx = \int \left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}(a+b\,\cos(c+d\,x))^{3/2}\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^(3/2),x)
[Out] int((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^(3/2), x)
```

3.739 $\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 397

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{2(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{d\sqrt{\sec(c+dx)}} - \frac{2(a-2b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{d\sqrt{\sec(c+dx)}} - \frac{2b\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{d\sqrt{\sec(c+dx)}}$$

```
[Out] 2*(a-b)*csc(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^
(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/
(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/d/sec(d*x+c)^(1/2)-2*(a-2*b)*cs
c(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a
-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/
2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/d/sec(d*x+c)^(1/2)-2*b*csc(d*x+c)*Ellipti
cPi((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b)/(a-
b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(
1+sec(d*x+c))/(a-b))^(1/2)/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.69 (sec) , antiderivative size = 397, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4307, 2877, 2888, 3077, 2895, 3073}

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)\,dx =$$
$$-\frac{2(a-2b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right.\right.}{d\sqrt{\sec(c+dx)}}$$
$$+\frac{2(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{d\sqrt{\sec(c+dx)}}$$
$$-\frac{2b\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\right.}{d\sqrt{\sec(c+dx)}}$$

```
[In] Int[(a + b*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(3/2),x]
```

```
[Out] (2*(a - b)*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[Sqr
t[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))
]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)]
)/(d*Sqrt[Sec[c + d*x]]) - (2*(a - 2*b)*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[
c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c
+ d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a
*(1 + Sec[c + d*x]))/(a - b)])/(d*Sqrt[Sec[c + d*x]]) - (2*b*Sqrt[a + b]*Sq
rt[Cos[c + d*x]]*Csc[c + d*x]*EllipticPi[(a + b)/b, ArcSin[Sqrt[a + b*Cos[c
 + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1
- Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(d*Sqrt[Sec
[c + d*x]])
```

Rule 2877

```
Int[((c_) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)/((a_.) + (b_.)*sin[(e_.) +
 (f_.)*(x_)])^(3/2), x_Symbol] :> Dist[d^2/b^2, Int[Sqrt[a + b*Sin[e + f*x]
]/Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[(b*c - a*d)/b^2, Int[Simp[b*c + a
*d + 2*b*d*Sin[e + f*x], x]/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e +
f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[
a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
```

```
d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{(a+b\cos(c+dx))^{3/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{a+2b\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx + \left(b^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= -\frac{2b\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+}{a+b}}}{d\sqrt{\sec(c+dx)}} + \left(a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx + \left(a(-a+2b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+}{}}}{d\sqrt{\sec(c+dx)}} - \frac{2(a-2b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(}{a+}}}{d\sqrt{\sec(c+dx)}} - \frac{2b\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+}{a+b}}}{d\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 15.74 (sec) , antiderivative size = 639, normalized size of antiderivative = 1.61

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{2a\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{2\left(a^2\tan\left(\frac{1}{2}(c+dx)\right)+ab\tan\left(\frac{1}{2}(c+dx)\right)-2ab\tan^3\left(\frac{1}{2}(c+dx)\right)-a^2\tan^5\left(\frac{1}{2}(c+dx)\right)+ab\tan^5\left(\frac{1}{2}(c+\right.\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(3/2),x]
```

```
[Out] (2*a*Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/d + (2*(a^2*
Tan[(c + d*x)/2] + a*b*Tan[(c + d*x)/2] - 2*a*b*Tan[(c + d*x)/2]^3 - a^2*Ta
n[(c + d*x)/2]^5 + a*b*Tan[(c + d*x)/2]^5 - 2*b^2*EllipticPi[-1, ArcSin[Tan
[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqrt[(a + b
+ a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] - 2*b^2*EllipticPi[
-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Tan[(c + d*x)/2]^2*Sqrt[1 -
 Tan[(c + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2
```

```
]^2)/(a + b)] + a*(a + b)*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a +
 b)]*Sqrt[1 - Tan[(c + d*x)/2]^2]*(1 + Tan[(c + d*x)/2]^2)*Sqrt[(a + b + a*
Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] - (a^2 + 2*a*b - b^2)*E
llipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)
/2]^2]*(1 + Tan[(c + d*x)/2]^2)*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[
(c + d*x)/2]^2)/(a + b)]))/(d*Sqrt[(1 - Tan[(c + d*x)/2]^2)^(-1)]*(-1 + Tan
[(c + d*x)/2]^2)*(1 + Tan[(c + d*x)/2]^2)^(3/2)*Sqrt[(a + b + a*Tan[(c + d*
x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(1 + Tan[(c + d*x)/2]^2)])
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 1015 vs. 2(361) = 722.

Time = 10.27 (sec) , antiderivative size = 1016, normalized size of antiderivative = 2.56

method	result	size
default	Expression too large to display	1016

```
[In] int((a+cos(d*x+c)*b)^(3/2)*sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1))
^(3/2)*(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)*(-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+
1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+
a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2
-2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))
^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-c
sc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2
)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a
+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^2+(-csc(
d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*
x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c)
,(-(a-b)/(a+b))^(1/2))*a^2+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d
*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2
)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b-2*(-csc(d*x+c)^
2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*
b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-
(a-b)/(a+b))^(1/2))*b^2+csc(d*x+c)^3*a^2*(1-cos(d*x+c))^3-csc(d*x+c)^3*a*b*
(1-cos(d*x+c))^3+a^2*(csc(d*x+c)-cot(d*x+c))+a*b*(csc(d*x+c)-cot(d*x+c)))*(
(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(
d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2)/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*
x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)
```

Fricas [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^(3/2),x, algorithm="fricas")
[Out] integral((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^(3/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)\,dx=\text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(3/2)*sec(d*x+c)**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^(3/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)\,dx=\int \left(\frac{1}{\cos\left(c+d\,x\right)}\right)^{3/2}\,{\left(a+b\,\cos\left(c+d\,x\right)\right)}^{3/2}\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^(3/2),x)
[Out] int((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^(3/2), x)
```

3.740 $\int (a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 435

$$\int (a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\,dx =$$

$$-\frac{(a-b)b\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ad\sqrt{\sec(c+dx)}}$$

$$+\frac{\sqrt{a+b}(2a+b)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\text{s}}{}}}{d\sqrt{\sec(c+dx)}}$$

$$-\frac{3a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\text{s}}{}}}{d\sqrt{\sec(c+dx)}}$$

$$+\frac{b\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d}$$

```
[Out] b*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)*sec(d*x+c)^(1/2)/d-(a-b)*b*csc(d*x+c)*E
llipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))
^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+s
ec(d*x+c))/(a-b))^(1/2)/a/d/sec(d*x+c)^(1/2)+(2*a+b)*csc(d*x+c)*EllipticF((
a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a
+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))
/(a-b))^(1/2)/d/sec(d*x+c)^(1/2)-3*a*csc(d*x+c)*EllipticPi((a+b*cos(d*x+c))
^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b)/(a-b))^(1/2))*(a+b)^(1/
2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))
^(1/2)/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.85 (sec) , antiderivative size = 435, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used = {4307, 2900, 3132, 2888, 3077, 2895, 3073}

$$\int (a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\,dx = \frac{\sqrt{a+b}(2a+b)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\cdots\right)}{d\sqrt{\sec(c+dx)}}$$
$$-\frac{b(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{ad\sqrt{\sec(c+dx)}}$$
$$-\frac{3a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),\cdots\right)}{d\sqrt{\sec(c+dx)}}$$
$$+\frac{b\sin(c+dx)\sqrt{\sec(c+dx)}\sqrt{a+b\cos(c+dx)}}{d}$$

```
[In] Int[(a + b*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x]],x]
```

```
[Out] -(((a - b)*b*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[S
qrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b
))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b
)])/(a*d*Sqrt[Sec[c + d*x]])) + (Sqrt[a + b]*(2*a + b)*Sqrt[Cos[c + d*x]]*C
sc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos
[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt
[(a*(1 + Sec[c + d*x]))/(a - b)])/(d*Sqrt[Sec[c + d*x]]) - (3*a*Sqrt[a + b]
*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticPi[(a + b)/b, ArcSin[Sqrt[a + b*Co
s[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*
(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(d*Sqrt[
Sec[c + d*x]]) + (b*Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*Sin[c + d*x
])/d
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 2900

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m - 1)*((c + d*Sin[e + f*x])^n/(f*(m + n))), x] + Dist[1/(d*(m + n)), In
t[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^(n - 1)*Simp[a^2*c*d*(m
 + n) + b*d*(b*c*(m - 1) + a*d*n) + (a*d*(2*b*c + a*d)*(m + n) - b*d*(a*c -
 b*d*(m + n - 1)))*Sin[e + f*x] + b*d*(b*c*n + a*d*(2*m + n - 1))*Sin[e + f
*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && N
eQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[0, m, 2] && LtQ[-1, n, 2] && N
eQ[m + n, 0] && (IntegerQ[m] || IntegersQ[2*m, 2*n])
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
- 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
```

```
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{(a+b\cos(c+dx))^{3/2}}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{b\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d} \\
&\quad + \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{ab}{2}+a^2\cos(c+dx)+\frac{3}{2}ab\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx \\
&= \frac{b\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d} \\
&\quad + \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{ab}{2}+a^2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx \\
&\quad + \frac{1}{2}\left(3ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx \\
&= \\
&\quad -\frac{3a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+d}{a+b}}}{d\sqrt{\sec(c+dx)}} \\
&\quad + \frac{b\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d} \\
&\quad - \frac{1}{2}\left(ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx \\
&\quad + \frac{1}{2}\left(a(2a+b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx
\end{aligned}
$$

$$= -\frac{(a-b)b\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(}{}}}{ad\sqrt{\sec(c+dx)}}$$
$$+\frac{\sqrt{a+b}(2a+b)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c-}{a+b}}}{d\sqrt{\sec(c+dx)}}$$
$$-\frac{3a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+}{a+b}}}{d\sqrt{\sec(c+dx)}}$$
$$+\frac{b\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d}$$

Mathematica [A] (verified)

Time = 9.10 (sec) , antiderivative size = 322, normalized size of antiderivative = 0.74

$$\int (a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\,dx = \frac{\cos^2\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}\left(2b(a+b)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E(\text{arcsi}\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (Cos[(c + d*x)/2]^2*Sqrt[Sec[c + d*x]]*(2*b*(a + b)*Sqrt[Cos[c + d*x]/(1 +
Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*Elli
pticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 4*a*(a - 2*b)*Sqrt[Cos[
c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c
+ d*x]))]*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 12*a*b*Sq
rt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 +
 Cos[c + d*x]))]*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]
 + b*Cos[c + d*x]*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2*Tan[(c + d*x)/2])
)/(d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1361 vs. 2(395) = 790.

Time = 8.99 (sec) , antiderivative size = 1362, normalized size of antiderivative = 3.13

method	result	size
default	Expression too large to display	1362

```
[In] int((a+cos(d*x+c)*b)^(3/2)*sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/d*(EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*
b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b*cos(d*
x+c)^2+(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(
a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^2*cos(d
*x+c)^2+6*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c)
)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a*
b*cos(d*x+c)^2+2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos
(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*a^2*cos(d*x+c)^2-4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(
(a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*a*b*cos(d*x+c)^2+2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2)
)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)*a*b*cos(d*x+c)+2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)
/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*b^2*cos(d*x+c)+12*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*
b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/
(a+b))^(1/2))*a*b*cos(d*x+c)+4*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*
x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)
/(a+b))^(1/2))*a^2*cos(d*x+c)-8*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+
b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*a*b*cos(d*x+c)+((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2
)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)*a*b+(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+c
os(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2
))*b^2+6*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))
/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a*b
+2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b)
)^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2-4*((a+cos
(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a
-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b-b^2*cos(d*x+c)^2*si
n(d*x+c)-a*b*cos(d*x+c)*sin(d*x+c))*sec(d*x+c)^(1/2)/(1+cos(d*x+c))/(a+cos(
d*x+c)*b)^(1/2)
```

Fricas [F]

$$\int (a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\,dx=\int (b\cos(dx+c)+a)^{\frac{3}{2}}\sqrt{\sec(dx+c)}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^(1/2),x, algorithm="fricas")
[Out] integral((b*cos(d*x + c) + a)^(3/2)*sqrt(sec(d*x + c)), x)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(3/2)*sec(d*x+c)**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\sqrt{\sec(dx+c)}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*sqrt(sec(d*x + c)), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\,dx = \int (b\cos(dx+c)+a)^{\frac{3}{2}}\sqrt{\sec(dx+c)}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)*sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)*sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\,dx = \int \sqrt{\frac{1}{\cos(c+d\,x)}}\,(a+b\,\cos(c+d\,x))^{3/2}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^(3/2),x)
[Out] int((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^(3/2), x)
```

3.741 $\int \frac{(a+b\cos(c+dx))^{3/2}}{\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 493

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sqrt{\sec(c+dx)}}\,dx =$$

$$-\frac{5(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{4d\sqrt{\sec(c+dx)}}$$

$$+\frac{\sqrt{a+b}(5a+2b)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+s}{}}}{4d\sqrt{\sec(c+dx)}}$$

$$-\frac{\sqrt{a+b}(3a^2+4b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx)}{a+b}}}{4bd\sqrt{\sec(c+dx)}}$$

$$+\frac{3a\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4d}$$

$$+\frac{(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\sin(c+dx)}{2d}$$

```
[Out] 1/2*(a+b*cos(d*x+c))^(3/2)*sin(d*x+c)*sec(d*x+c)^(1/2)/d+3/4*a*sin(d*x+c)*(
a+b*cos(d*x+c))^(1/2)*sec(d*x+c)^(1/2)/d-5/4*(a-b)*csc(d*x+c)*EllipticE((a+
b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b
)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(
a-b))^(1/2)/d/sec(d*x+c)^(1/2)+1/4*(5*a+2*b)*csc(d*x+c)*EllipticF((a+b*cos(
d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2
)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^
(1/2)/d/sec(d*x+c)^(1/2)-1/4*(3*a^2+4*b^2)*csc(d*x+c)*EllipticPi((a+b*cos(d
*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b)/(a-b))^(1/2))*(a+
b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/
(a-b))^(1/2)/b/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 1.47 (sec) , antiderivative size = 493, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {4307, 2900, 3126, 3140, 3132, 2888, 3077, 2895, 3073}

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sqrt{\sec(c+dx)}}\,dx = -\frac{\sqrt{a+b}(3a^2+4b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\ldots\right)}{4bd\sqrt{\sec(c+dx)}}$$
$$+\frac{\sqrt{a+b}(5a+2b)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\ldots\right)}{4d\sqrt{\sec(c+dx)}}$$
$$-\frac{5(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{4d\sqrt{\sec(c+dx)}}$$
$$+\frac{\sin(c+dx)\sqrt{\sec(c+dx)}(a+b\cos(c+dx))^{3/2}}{2d}$$
$$+\frac{3a\sin(c+dx)\sqrt{\sec(c+dx)}\sqrt{a+b\cos(c+dx)}}{4d}$$

```
[In] Int[(a + b*Cos[c + d*x])^(3/2)/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (-5*(a - b)*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[Sq
rt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b)
)]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)
])/(4*d*Sqrt[Sec[c + d*x]]) + (Sqrt[a + b]*(5*a + 2*b)*Sqrt[Cos[c + d*x]]*C
sc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos
[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt
[(a*(1 + Sec[c + d*x]))/(a - b)])/(4*d*Sqrt[Sec[c + d*x]]) - (Sqrt[a + b]*(
3*a^2 + 4*b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticPi[(a + b)/b, ArcSin
[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a -
 b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a -
 b)])/(4*b*d*Sqrt[Sec[c + d*x]]) + (3*a*Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c
 + d*x]]*Sin[c + d*x])/(4*d) + ((a + b*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x
]]*Sin[c + d*x])/(2*d)
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
```

```
d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 2900

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m - 1)*((c + d*Sin[e + f*x])^n/(f*(m + n))), x] + Dist[1/(d*(m + n)), In
t[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^(n - 1)*Simp[a^2*c*d*(m
 + n) + b*d*(b*c*(m - 1) + a*d*n) + (a*d*(2*b*c + a*d)*(m + n) - b*d*(a*c -
 b*d*(m + n - 1)))*Sin[e + f*x] + b*d*(b*c*n + a*d*(2*m + n - 1))*Sin[e + f
*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && N
eQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[0, m, 2] && LtQ[-1, n, 2] && N
eQ[m + n, 0] && (IntegerQ[m] || IntegersQ[2*m, 2*n])
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3126

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
```

```
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(c^2*C - B*c*d + A*d^2))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(n + 1)*(c^2 -
d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[e + f*x])^(m -
1)*(c + d*Sin[e + f*x])^(n + 1)*Simp[A*d*(b*d*m + a*c*(n + 1)) + (c*C - B*d
)*(b*c*m + a*d*(n + 1)) - (d*(A*(a*d*(n + 2) - b*c*(n + 1)) + B*(b*d*(n + 1
) - a*c*(n + 2))) - C*(b*c*d*(n + 1) - a*(c^2 + d^2*(n + 1))))*Sin[e + f*x]
 + b*(d*(B*c - A*d)*(m + n + 2) - C*(c^2*(m + 1) + d^2*(n + 1)))*Sin[e + f*
x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d,
 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 0] && LtQ[n, -1]
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
- 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3140

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(Sqrt[c + d*Sin[e + f
*x]]/(d*f*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[1/(2*d), Int[(1/((a + b*Sin
[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]))*Simp[2*a*A*d - C*(b*c - a*d) -
2*(a*c*C - d*(A*b + a*B))*Sin[e + f*x] + (2*b*B*d - C*(b*c + a*d))*Sin[e +
f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*
d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}\,dx$$

$$= \frac{(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\sin(c+dx)}{2d} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+b\cos(c+dx)}\left(-\frac{ab}{2}+b^2\cos(c+dx)+\frac{3}{2}ab\cos^2(c+dx)\right)}{\cos^{\frac{3}{2}}(c+dx)}\,dx}{2b}$$

$$= -\frac{a\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{2d} + \frac{(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\sin(c+dx)}{2d} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{ab^2}{4}+\frac{1}{2}b(2a^2+b^2)\cos(c+dx)+\frac{5}{4}ab^2\cos^2(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{b}$$

$$= \frac{3a\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4d} + \frac{(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\sin(c+dx)}{2d} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{5}{4}a^2b^2+\frac{1}{2}ab^3\cos(c+dx)+\frac{1}{4}b^2(3a^2+4b^2)\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{2b^2}$$

$$= \frac{3a\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4d} + \frac{(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\sin(c+dx)}{2d} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{5}{4}a^2b^2+\frac{1}{2}ab^3\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{2b^2} + \frac{1}{8}\left(\left(3a^2+4b^2\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}dx$$

$$= -\frac{\sqrt{a+b}(3a^2+4b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\cdots}}{4bd\sqrt{\sec(c+dx)}} + \frac{3a\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4d} + \frac{(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\sin(c+dx)}{2d} - \frac{1}{8}\left(5a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx + \frac{1}{8}\left(a(5a+2b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx$$

$$= -\frac{5(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{a(}}{4d\sqrt{\sec(c+dx)}}$$

$$+\frac{\sqrt{a+b}(5a+2b)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(}{a+}}}{4d\sqrt{\sec(c+dx)}}$$

$$-\frac{\sqrt{a+b}(3a^2+4b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{}}{4bd\sqrt{\sec(c+dx)}}$$

$$+\frac{3a\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4d}$$

$$+\frac{(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}\sin(c+dx)}{2d}$$

Mathematica [A] (verified)

Time = 15.85 (sec) , antiderivative size = 845, normalized size of antiderivative = 1.71

$$\int\frac{(a+b\cos(c+dx))^{3/2}}{\sqrt{\sec(c+dx)}}\,dx=\frac{b\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(2(c+dx))}{4d}$$

$$-\frac{5a^2\tan\left(\frac{1}{2}(c+dx)\right)+5ab\tan\left(\frac{1}{2}(c+dx)\right)-10ab\tan^3\left(\frac{1}{2}(c+dx)\right)-5a^2\tan^5\left(\frac{1}{2}(c+dx)\right)+5ab\tan^5\left(\frac{1}{2}(c\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(3/2)/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (b*Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*Sin[2*(c + d*x)])/(4*d) - (5
*a^2*Tan[(c + d*x)/2] + 5*a*b*Tan[(c + d*x)/2] - 10*a*b*Tan[(c + d*x)/2]^3
- 5*a^2*Tan[(c + d*x)/2]^5 + 5*a*b*Tan[(c + d*x)/2]^5 + 6*a^2*EllipticPi[-1
, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/2]^2]*
Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] + 8*b^2
*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c
 + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a
 + b)] + 6*a^2*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*T
an[(c + d*x)/2]^2*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x
)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] + 8*b^2*EllipticPi[-1, ArcSin[Tan[(
c + d*x)/2]], (-a + b)/(a + b)]*Tan[(c + d*x)/2]^2*Sqrt[1 - Tan[(c + d*x)/2
]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] +
5*a*(a + b)*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 -
Tan[(c + d*x)/2]^2]*(1 + Tan[(c + d*x)/2]^2)*Sqrt[(a + b + a*Tan[(c + d*x)/
2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] - 2*(4*a^2 - a*b + 2*b^2)*EllipticF[A
rcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/2]^2]*(1
```

```
+ Tan[(c + d*x)/2]^2)*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/
2]^2)/(a + b)])/(4*d*Sqrt[(1 - Tan[(c + d*x)/2]^2)^(-1)]*(-1 + Tan[(c + d*x
)/2]^2)*(1 + Tan[(c + d*x)/2]^2)^(3/2)*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 -
 b*Tan[(c + d*x)/2]^2)/(1 + Tan[(c + d*x)/2]^2)])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1915 vs. $2(439) = 878$.

Time = 7.58 (sec) , antiderivative size = 1916, normalized size of antiderivative = 3.89

method	result	size
default	Expression too large to display	1916

```
[In] int((a+cos(d*x+c)*b)^(3/2)/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/d/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)/sec(d*x+c)^(1/2)*(5*EllipticE(
cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c)
)/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b*cos(d*x+c)+2*EllipticF
(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c
))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b*cos(d*x+c)-2*a*b*sin(
d*x+c)-4*sec(d*x+c)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(
(a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*b^2+5*sec(d*x+c)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*
((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(
1/2)*a^2+6*sec(d*x+c)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1
/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*a^2+8*sec(d*x+c)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b
))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)*b^2-7*a*b*cos(d*x+c)*sin(d*x+c)+5*EllipticE(cot(d*x+c)-csc(d
*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*cos(d*x+c)+6*EllipticPi(cot(d*x+c)-csc
(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1
/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*cos(d*x+c)+8*EllipticPi(cot(d*x+c
)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b
))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^2*cos(d*x+c)-4*EllipticF(cot(d
*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+
b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^2*cos(d*x+c)+10*((a+cos(d*x+c
)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a
+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b+4*((a+cos(d*x+c)*b)/(1+co
s(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2)
)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b-2*b^2*cos(d*x+c)^2*sin(d*x+c)-5*a^2
*sin(d*x+c)-8*sec(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b
)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b)
)^(1/2))*a^2+2*sec(d*x+c)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c
```

```
)))^(1/2)*a*b+5*sec(d*x+c)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(
1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*a*b-16*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+co
s(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2)
)*a^2-2*cos(d*x+c)*b^2*sin(d*x+c)+10*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b)
)^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*a^2+12*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*E
llipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*a^2+16*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*Ellipt
icPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*b^2-8*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(co
t(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*b^2-8*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(
a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*cos(d
*x+c))
```

Fricas [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sqrt{\sec(c+dx)}}\,dx=\int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2),x, algorithm="fricas")
[Out] integral((b*cos(d*x + c) + a)^(3/2)/sqrt(sec(d*x + c)), x)
```

Sympy [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sqrt{\sec(c+dx)}}\,dx=\int \frac{(a+b\cos(c+dx))^{\frac{3}{2}}}{\sqrt{\sec(c+dx)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**(3/2)/sec(d*x+c)**(1/2),x)
[Out] Integral((a + b*cos(c + d*x))**(3/2)/sqrt(sec(c + d*x)), x)
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)/sqrt(sec(d*x + c)), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)/sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(a+b\,\cos(c+d\,x))^{3/2}}{\sqrt{\frac{1}{\cos(c+d\,x)}}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(3/2)/(1/cos(c + d*x))^(1/2),x)
[Out] int((a + b*cos(c + d*x))^(3/2)/(1/cos(c + d*x))^(1/2), x)
```

3.742 $\int \frac{(a+b\cos(c+dx))^{3/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 568

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = -\frac{(a-b)\sqrt{a+b}(3a^2+16b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{}}{24abd\sqrt{\sec(c+dx)}}$$
$$+\frac{\sqrt{a+b}(a+2b)(3a+8b)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+d}{a+b}}}{24bd\sqrt{\sec(c+dx)}}$$
$$+\frac{a\sqrt{a+b}(a^2-12b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+}{a+b}}}{8b^2d\sqrt{\sec(c+dx)}}$$
$$+\frac{a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sqrt{\sec(c+dx)}}+\frac{(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}$$
$$+\frac{(3a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{24bd}$$

```
[Out] 1/3*(a+b*cos(d*x+c))^(3/2)*sin(d*x+c)/d/sec(d*x+c)^(1/2)+1/4*a*sin(d*x+c)*(
a+b*cos(d*x+c))^(1/2)/d/sec(d*x+c)^(1/2)+1/24*(3*a^2+16*b^2)*sin(d*x+c)*(a+
b*cos(d*x+c))^(1/2)*sec(d*x+c)^(1/2)/b/d-1/24*(a-b)*(3*a^2+16*b^2)*csc(d*x+
c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a
-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*
(1+sec(d*x+c))/(a-b))^(1/2)/a/b/d/sec(d*x+c)^(1/2)+1/24*(a+2*b)*(3*a+8*b)*c
sc(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-
a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1
/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/b/d/sec(d*x+c)^(1/2)+1/8*a*(a^2-12*b^2)*
```

```
csc(d*x+c)*EllipticPi((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(
a+b)/b,((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))
/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/b^2/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 1.57 (sec) , antiderivative size = 568, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {4307, 2900, 3128, 3140, 3132, 2888, 3077, 2895, 3073}

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = -\frac{(a-b)\sqrt{a+b}(3a^2+16b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\right.}{24abd\sqrt{\sec(c+dx)}}$$
$$+\frac{a\sqrt{a+b}(a^2-12b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\right.}{8b^2d\sqrt{\sec(c+dx)}}$$
$$+\frac{(3a^2+16b^2)\sin(c+dx)\sqrt{\sec(c+dx)}\sqrt{a+b\cos(c+dx)}}{24bd}$$
$$+\frac{\sqrt{a+b}(a+2b)(3a+8b)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\right.}{24bd\sqrt{\sec(c+dx)}}$$
$$+\frac{\sin(c+dx)(a+b\cos(c+dx))^{3/2}}{3d\sqrt{\sec(c+dx)}}+\frac{a\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{4d\sqrt{\sec(c+dx)}}$$

```
[In] Int[(a + b*Cos[c + d*x])^(3/2)/Sec[c + d*x]^(3/2),x]
```

```
[Out] -1/24*((a - b)*Sqrt[a + b]*(3*a^2 + 16*b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]
*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])
], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Se
c[c + d*x]))/(a - b)])/(a*b*d*Sqrt[Sec[c + d*x]]) + (Sqrt[a + b]*(a + 2*b)*
(3*a + 8*b)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos
[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(
1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(24*b*d*S
qrt[Sec[c + d*x]]) + (a*Sqrt[a + b]*(a^2 - 12*b^2)*Sqrt[Cos[c + d*x]]*Csc[c
 + d*x]*EllipticPi[(a + b)/b, ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*
Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a +
b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(8*b^2*d*Sqrt[Sec[c + d*x]]) + (a
*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(4*d*Sqrt[Sec[c + d*x]]) + ((a + b*
Cos[c + d*x])^(3/2)*Sin[c + d*x])/(3*d*Sqrt[Sec[c + d*x]]) + ((3*a^2 + 16*b
^2)*Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(24*b*d)
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 2900

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m - 1)*((c + d*Sin[e + f*x])^n/(f*(m + n))), x] + Dist[1/(d*(m + n)), In
t[(a + b*Sin[e + f*x])^(m - 2)*(c + d*Sin[e + f*x])^(n - 1)*Simp[a^2*c*d*(m
 + n) + b*d*(b*c*(m - 1) + a*d*n) + (a*d*(2*b*c + a*d)*(m + n) - b*d*(a*c -
 b*d*(m + n - 1)))*Sin[e + f*x] + b*d*(b*c*n + a*d*(2*m + n - 1))*Sin[e + f
*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && N
eQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[0, m, 2] && LtQ[-1, n, 2] && N
eQ[m + n, 0] && (IntegerQ[m] || IntegersQ[2*m, 2*n])
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

```
&& NeQ[A, B]
```

Rule 3128

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*sin[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_
.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n + 2))), x] + Dist[1/(d*(m +
n + 2)), Int[(a + b*Sin[e + f*x])^(m - 1)*(c + d*Sin[e + f*x])^n*Simp[a*A*d
*(m + n + 2) + C*(b*c*m + a*d*(n + 1)) + (d*(A*b + a*B)*(m + n + 2) - C*(a*
c - b*d*(m + n + 1)))*Sin[e + f*x] + (C*(a*d*m - b*c*(m + 1)) + b*B*d*(m +
n + 2))*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n},
 x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m
, 0] &&  !(IGtQ[n, 0] && ( !IntegerQ[m] || (EqQ[a, 0] && NeQ[c, 0])))
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
- 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3140

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(Sqrt[c + d*Sin[e + f
*x]]/(d*f*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[1/(2*d), Int[(1/((a + b*Sin
[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]))*Simp[2*a*A*d - C*(b*c - a*d) -
2*(a*c*C - d*(A*b + a*B))*Sin[e + f*x] + (2*b*B*d - C*(b*c + a*d))*Sin[e +
f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*
d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}\,dx$$

$$
= \frac{(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+b\cos(c+dx)}\left(\frac{ab}{2}+2b^2\cos(c+dx)+\frac{3}{2}ab\cos^2(c+dx)\right)}{\sqrt{\cos(c+dx)}}dx}{3b}
$$

$$
= \frac{a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sqrt{\sec(c+dx)}} + \frac{(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{7a^2b}{4}+\frac{13}{2}ab^2\cos(c+dx)+\frac{1}{4}b(3a^2+16b^2)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{6b}
$$

$$
= \frac{a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sqrt{\sec(c+dx)}} + \frac{(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{(3a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{24bd} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{1}{4}ab(3a^2+16b^2)+\frac{7}{2}a^2b^2\cos(c+dx)-\frac{3}{4}ab(a^2-12b^2)\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{12b^2}
$$

$$
= \frac{a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sqrt{\sec(c+dx)}} + \frac{(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{(3a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{24bd} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{1}{4}ab(3a^2+16b^2)+\frac{7}{2}a^2b^2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{12b^2} - \frac{\left(a(a^2-12b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}dx}{16b}
$$

$$
= \frac{a\sqrt{a+b}(a^2-12b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\ }}{8b^2d\sqrt{\sec(c+dx)}} + \frac{a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sqrt{\sec(c+dx)}} + \frac{(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{3d\sqrt{\sec(c+dx)}} + \frac{(3a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{24bd} + \frac{\left(a(a+2b)(3a+8b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{48b} - \frac{\left(a(3a^2+16b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{48b}
$$

$$= -\frac{(a-b)\sqrt{a+b}(3a^2+16b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec}{a-}}}{24abd\sqrt{\sec(c+dx)}}$$
$$+\frac{\sqrt{a+b}(a+2b)(3a+8b)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{}}{24bd\sqrt{\sec(c+dx)}}$$
$$+\frac{a\sqrt{a+b}(a^2-12b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{}}{8b^2d\sqrt{\sec(c+dx)}}$$
$$+\frac{a\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sqrt{\sec(c+dx)}}+\frac{(a+b\cos(c+dx))^{3/2}\sin(c+dx)}{3d\sqrt{\sec(c+dx)}}$$
$$+\frac{(3a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{24bd}$$

Mathematica [A] (verified)

Time = 14.80 (sec) , antiderivative size = 961, normalized size of antiderivative = 1.69

$$\int\frac{(a+b\cos(c+dx))^{3/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx=\frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\left(\frac{1}{12}b\sin(c+dx)+\frac{7}{24}a\sin(2(c+dx))+\frac{1}{12}b\,\text{si}\right.}{d}$$
$$+\frac{\sqrt{\frac{1}{1-\tan^2\left(\frac{1}{2}(c+dx)\right)}}\left(3a^3\tan\left(\frac{1}{2}(c+dx)\right)+3a^2b\tan\left(\frac{1}{2}(c+dx)\right)+16ab^2\tan\left(\frac{1}{2}(c+dx)\right)+16b^3\tan\left(\frac{1}{2}(c+dx\right.\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(3/2)/Sec[c + d*x]^(3/2),x]
```

```
[Out] (Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*((b*Sin[c + d*x])/12 + (7*a*Si
n[2*(c + d*x)])/24 + (b*Sin[3*(c + d*x)])/12))/d + (Sqrt[(1 - Tan[(c + d*x)
/2]^2)^(-1)]*(3*a^3*Tan[(c + d*x)/2] + 3*a^2*b*Tan[(c + d*x)/2] + 16*a*b^2*
Tan[(c + d*x)/2] + 16*b^3*Tan[(c + d*x)/2] - 6*a^2*b*Tan[(c + d*x)/2]^3 - 3
2*b^3*Tan[(c + d*x)/2]^3 - 3*a^3*Tan[(c + d*x)/2]^5 + 3*a^2*b*Tan[(c + d*x)
/2]^5 - 16*a*b^2*Tan[(c + d*x)/2]^5 + 16*b^3*Tan[(c + d*x)/2]^5 - 6*a^3*Ell
ipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d
*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b
)] + 72*a*b^2*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sq
rt[1 - Tan[(c + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c +
d*x)/2]^2)/(a + b)] - 6*a^3*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a +
b)/(a + b)]*Tan[(c + d*x)/2]^2*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqrt[(a + b + a
*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] + 72*a*b^2*EllipticPi[
-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Tan[(c + d*x)/2]^2*Sqrt[1 -
 Tan[(c + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2
]^2)/(a + b)] + (3*a^3 + 3*a^2*b + 16*a*b^2 + 16*b^3)*EllipticE[ArcSin[Tan[
```

```
(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/2]^2]*(1 + Tan[(c +
 d*x)/2]^2)*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a +
 b)] + 2*a*(7*a - 26*b)*b*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a +
 b)]*Sqrt[1 - Tan[(c + d*x)/2]^2]*(1 + Tan[(c + d*x)/2]^2)*Sqrt[(a + b + a*
Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)]))/(24*b*d*(1 + Tan[(c +
 d*x)/2]^2)^(3/2)*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2
)/(1 + Tan[(c + d*x)/2]^2)])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2264 vs. 2(508) = 1016.

Time = 8.30 (sec) , antiderivative size = 2265, normalized size of antiderivative = 3.99

method	result	size
default	Expression too large to display	2265

```
[In] int((a+cos(d*x+c)*b)^(3/2)/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/24/d/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)/sec(d*x+c)^(3/2)*(-8*sin(d*x+
c)*cos(d*x+c)^2*b^3-22*sin(d*x+c)*cos(d*x+c)*a*b^2-22*sin(d*x+c)*a*b^2-17*s
in(d*x+c)*a^2*b-16*b^3*sin(d*x+c)-3*a^3*tan(d*x+c)-8*b^3*cos(d*x+c)*sin(d*x
+c)-104*sec(d*x+c)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(c
os(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/
2)*a*b^2+14*sec(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/
2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b
))^(1/2)*a^2*b-52*sec(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b
))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c)
)/(a+b))^(1/2)*a*b^2+3*sec(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)
/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d
*x+c))/(a+b))^(1/2)*a^2*b+16*sec(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(
-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1
+cos(d*x+c))/(a+b))^(1/2)*a*b^2+72*sec(d*x+c)^2*EllipticPi(cot(d*x+c)-csc(d
*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*
x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2+6*sec(d*x+c)*EllipticE(cot(d*x+c)
-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos
(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b-14*a^2*b*tan(d*x+c)+6*sec(d*x+
c)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3+32*sec(d*
x+c)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3-12*sec(
d*x+c)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3+3
*sec(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^
3+16*sec(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(co
```

```
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2
)*b^3-6*sec(d*x+c)^2*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/
2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b
))^(1/2)*a^3+3*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a
^3+16*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3-6*Elli
pticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*
x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3+3*EllipticE(
cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b+16*EllipticE(cot(d*x
+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+
cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2+72*EllipticPi(cot(d*x+c)-cs
c(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos
(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2+14*EllipticF(cot(d*x+c)-csc(d*
x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)
*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b-52*EllipticF(cot(d*x+c)-csc(d*x+c),(-
(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+
cos(d*x+c))/(a+b))^(1/2)*a*b^2-16*tan(d*x+c)*a*b^2+32*sec(d*x+c)*EllipticE(
cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2+144*sec(d*x+c)*Ellip
ticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x
+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2+28*sec(d*x+
c)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b)/b
```

Fricas [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/sec(d*x+c)^(3/2),x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(a+b\cos(c+dx))^{\frac{3}{2}}}{\sec^{\frac{3}{2}}(c+dx)}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**(3/2)/sec(d*x+c)**(3/2),x)
[Out] Integral((a + b*cos(c + d*x))**(3/2)/sec(c + d*x)**(3/2), x)
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)/sec(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{3}{2}}}{\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(3/2)/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(3/2)/sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{3/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(a+b\cos(c+dx))^{3/2}}{\left(\frac{1}{\cos(c+dx)}\right)^{3/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(3/2)/(1/cos(c + d*x))^(3/2),x)
[Out] int((a + b*cos(c + d*x))^(3/2)/(1/cos(c + d*x))^(3/2), x)
```

3.743 $\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{11}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 494

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{11}{2}}(c+dx)\,dx = \frac{2(a-b)\sqrt{a+b}(147a^4+279a^2b^2-10b^4)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a-}{a-}\right.}{315a^3d\sqrt{\sec(c+dx)}}$$
$$-\frac{2(a-b)\sqrt{a+b}(147a^3-114a^2b+165ab^2+10b^3)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+d}}{\sqrt{a+b}\sqrt{\cos(c+d}}\right.\right.}{315a^2d\sqrt{\sec(c+dx)}}$$
$$+\frac{2b(163a^2+5b^2)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{315ad}$$
$$+\frac{2(49a^2+75b^2)\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{315d}$$
$$+\frac{38ab\sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{63d}$$
$$+\frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\sin(c+dx)}{9d}$$

```
[Out] 2/315*b*(163*a^2+5*b^2)*sec(d*x+c)^(3/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/
a/d+2/315*(49*a^2+75*b^2)*sec(d*x+c)^(5/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2
)/d+38/63*a*b*sec(d*x+c)^(7/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+2/9*a^2*
sec(d*x+c)^(9/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+2/315*(a-b)*(147*a^4+2
79*a^2*b^2-10*b^4)*csc(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/
cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-s
ec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^3/d/sec(d*x+c)^(1/
2)-2/315*(a-b)*(147*a^3-114*a^2*b+165*a*b^2+10*b^3)*csc(d*x+c)*EllipticF((a
+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+
```

```
b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/
(a-b))^(1/2)/a^2/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 1.77 (sec) , antiderivative size = 494, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4307, 2871, 3134, 3077, 2895, 3073}

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{11}{2}}(c+dx)\,dx = \frac{2(49a^2+75b^2)\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{315d} + \frac{2b(163a^2+5b^2)\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{315ad} + \frac{2a^2\sin(c+dx)\sec^{\frac{9}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{9d} - \frac{2(a-b)\sqrt{a+b}(147a^3-114a^2b+165ab^2+10b^3)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}}{315a^2d\sqrt{\sec(c+dx)}} + \frac{2(a-b)\sqrt{a+b}(147a^4+279a^2b^2-10b^4)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\right.}{315a^3d\sqrt{\sec(c+dx)}} + \frac{38ab\sin(c+dx)\sec^{\frac{7}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{63d}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(11/2),x]
```

```
[Out] (2*(a - b)*Sqrt[a + b]*(147*a^4 + 279*a^2*b^2 - 10*b^4)*Sqrt[Cos[c + d*x]]*
Csc[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Co
s[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqr
t[(a*(1 + Sec[c + d*x]))/(a - b)])/(315*a^3*d*Sqrt[Sec[c + d*x]]) - (2*(a -
 b)*Sqrt[a + b]*(147*a^3 - 114*a^2*b + 165*a*b^2 + 10*b^3)*Sqrt[Cos[c + d*x
]]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt
[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*
Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(315*a^2*d*Sqrt[Sec[c + d*x]]) + (2*b
*(163*a^2 + 5*b^2)*Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(3/2)*Sin[c + d*x]
)/(315*a*d) + (2*(49*a^2 + 75*b^2)*Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(5
/2)*Sin[c + d*x])/(315*d) + (38*a*b*Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(
7/2)*Sin[c + d*x])/(63*d) + (2*a^2*Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(9
/2)*Sin[c + d*x])/(9*d)
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
```

```
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
```

```
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{11}{2}}(c+dx)}\,dx$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\sin(c+dx)}{9d} + \frac{1}{9}\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{19a^2b}{2}+\frac{1}{2}a(7a^2+27b^2)\cos(c+dx)+\frac{3}{2}b(2a^2+3b^2)\cos^2(c+\ldots}{\cos^{\frac{9}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}$$

$$= \frac{38ab\sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{63d} + \frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\sin(c+dx)}{9d} + \frac{\left(4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{1}{4}a^2(49a^2+75b^2)+\frac{1}{4}ab(137a^2+63b^2)\cos(c+dx)+19a^2b^2\cos^2(c+dx)}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{63a}$$

$$= \frac{2(49a^2+75b^2)\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{315d} + \frac{38ab\sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{63d} + \frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\sin(c+dx)}{9d} + \frac{\left(8\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{3}{8}a^2b(163a^2+5b^2)+\frac{1}{8}a^3(147a^2+605b^2)\cos(c+dx)+\frac{1}{4}a^2b(49a^2+75b^2)\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}}{315a^2}$$

$$=\frac{2b(163a^2+5b^2)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{315ad}+\frac{2(49a^2+75b^2)\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{315d}+\frac{38ab\sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{63d}+\frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\sin(c+dx)}{9d}+\frac{\left(16\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\frac{3}{16}a^2(147a^4+279a^2b^2-10b^4)+\frac{3}{16}a^3b(261a^2+155b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{945a^3}$$

$$=\frac{2b(163a^2+5b^2)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{315ad}+\frac{2(49a^2+75b^2)\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{315d}+\frac{38ab\sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{63d}+\frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\sin(c+dx)}{9d}-\frac{\left((a-b)(147a^3-114a^2b+165ab^2+10b^3)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx}}}{315a}+\frac{\left((147a^4+279a^2b^2-10b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{315a}$$

$$=\frac{2(a-b)\sqrt{a+b}(147a^4+279a^2b^2-10b^4)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+}{a-}\right.}{315a^3d\sqrt{\sec(c+dx)}}-\frac{2(a-b)\sqrt{a+b}(147a^3-114a^2b+165ab^2+10b^3)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\surd}{\surd}\right.\right.}{315a^2d\sqrt{\sec(c+dx)}}+\frac{2b(163a^2+5b^2)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{315ad}+\frac{2(49a^2+75b^2)\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{315d}+\frac{38ab\sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{63d}+\frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{9}{2}}(c+dx)\sin(c+dx)}{9d}$$

Mathematica [A] (verified)

Time = 12.64 (sec) , antiderivative size = 521, normalized size of antiderivative = 1.05

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{11}{2}}(c+dx)\,dx = \frac{2\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)\sec(c+dx)}\left(-2(147a^5+147a^4b+279a^3b^2+279a^2b^3-10ab^4-10b^5)\sqrt{\frac{\cos}{1+\cos}}\right.}{} + \frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\left(\frac{2(147a^4+279a^2b^2-10b^4)\sin(c+dx)}{315a^2}+\frac{2}{315}\sec^2(c+dx)\left(49a^2\sin(c+dx)+75b^2\sin\right.\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(11/2),x]
```

```
[Out] (2*Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*(-2*(147*a^5 + 147*a^4*b + 279*a^3
*b^2 + 279*a^2*b^3 - 10*a*b^4 - 10*b^5)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x]
)]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin
[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 2*a*(147*a^4 + 261*a^3*b + 279*a^2*
b^2 + 155*a*b^3 - 10*b^4)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b
*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticF[ArcSin[Tan[(c + d*x)
/2]], (-a + b)/(a + b)] - (147*a^4 + 279*a^2*b^2 - 10*b^4)*Cos[c + d*x]*(a
+ b*Cos[c + d*x])*Sec[(c + d*x)/2]^2*Tan[(c + d*x)/2]))/(315*a^2*d*Sqrt[a +
 b*Cos[c + d*x]]*Sqrt[Sec[(c + d*x)/2]^2]) + (Sqrt[a + b*Cos[c + d*x]]*Sqrt
[Sec[c + d*x]]*((2*(147*a^4 + 279*a^2*b^2 - 10*b^4)*Sin[c + d*x])/(315*a^2)
 + (2*Sec[c + d*x]^2*(49*a^2*Sin[c + d*x] + 75*b^2*Sin[c + d*x]))/315 + (2*
Sec[c + d*x]*(163*a^2*b*Sin[c + d*x] + 5*b^3*Sin[c + d*x]))/(315*a) + (38*a
*b*Sec[c + d*x]^2*Tan[c + d*x])/63 + (2*a^2*Sec[c + d*x]^3*Tan[c + d*x])/9)
)/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 3463 vs. 2(442) = 884.

Time = 1052.19 (sec) , antiderivative size = 3464, normalized size of antiderivative = 7.01

method	result	size
default	Expression too large to display	3464

```
[In] int((a+cos(d*x+c)*b)^(5/2)*sec(d*x+c)^(11/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/315/d*sec(d*x+c)^(11/2)/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)*(294*Ellipt
icE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4*b*cos(d*x+c)^6+558
*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b^2*cos(d*x
```

+c)^6+558*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^
3*cos(d*x+c)^6+170*a^3*b^2*cos(d*x+c)^3*sin(d*x+c)+212*a^4*b*cos(d*x+c)^5*s
in(d*x+c)+442*a^3*b^2*cos(d*x+c)^5*sin(d*x+c)+80*a^2*b^3*cos(d*x+c)^5*sin(d
*x+c)-5*a*b^4*cos(d*x+c)^5*sin(d*x+c)+130*a^4*b*cos(d*x+c)^2*sin(d*x+c)+212
*a^4*b*cos(d*x+c)^4*sin(d*x+c)+170*a^3*b^2*cos(d*x+c)^4*sin(d*x+c)+80*a^2*b
^3*cos(d*x+c)^4*sin(d*x+c)+130*a^4*b*cos(d*x+c)^3*sin(d*x+c)+147*cos(d*x+c)
^7*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^5-10*cos(d*
x+c)^7*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x
+c)))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^5-147*c
os(d*x+c)^7*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^5+
294*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^5*cos(d*x+
c)^6-20*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^5*cos(
d*x+c)^6-294*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x
+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^5
*cos(d*x+c)^6+147*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2
)*a^5*cos(d*x+c)^5-10*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^
(1/2)*b^5*cos(d*x+c)^5-147*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(
1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a
+b))^(1/2)*a^5*cos(d*x+c)^5+49*a^5*cos(d*x+c)^4*sin(d*x+c)+35*a^5*cos(d*x+c
)*sin(d*x+c)+35*a^5*cos(d*x+c)^2*sin(d*x+c)+49*a^5*cos(d*x+c)^3*sin(d*x+c)-
10*cos(d*x+c)^6*b^5*sin(d*x+c)+147*cos(d*x+c)^5*a^5*sin(d*x+c)-20*EllipticE
(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^4*cos(d*x+c)^6-522*El
lipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4*b*cos(d*x+c)^6
-558*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b^2*cos
(d*x+c)^6-310*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^
2*b^3*cos(d*x+c)^6+20*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^
(1/2)*a*b^4*cos(d*x+c)^6+147*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/
(a+b))^(1/2)*a^4*b*cos(d*x+c)^5+279*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)
/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d
*x+c))/(a+b))^(1/2)*a^3*b^2*cos(d*x+c)^5+279*EllipticE(cot(d*x+c)-csc(d*x+c
),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)
/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^3*cos(d*x+c)^5-10*EllipticE(cot(d*x+c)-c

```
sc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d
*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^4*cos(d*x+c)^5-261*EllipticF(cot(d
*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((
a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4*b*cos(d*x+c)^5-279*Elliptic
F(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(
1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b^2*cos(d*x+c)^5-155
*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^3*cos(d*x
+c)^5+10*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^4*c
os(d*x+c)^5+147*cos(d*x+c)^7*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(
a+b))^(1/2))*a^4*b+279*cos(d*x+c)^7*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))
^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-
(a-b)/(a+b))^(1/2))*a^3*b^2+279*cos(d*x+c)^7*((a+cos(d*x+c)*b)/(1+cos(d*x+c
))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(cot(d*x+c)-csc(
d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^3-10*cos(d*x+c)^7*((a+cos(d*x+c)*b)/(1+c
os(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(cot(d*x
+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^4-261*cos(d*x+c)^7*((a+cos(d*x+c)*
b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(
cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b-279*cos(d*x+c)^7*((a+cos(
d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Ell
ipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b^2-155*cos(d*x+c)^7
*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^3+10*cos(
d*x+c)^7*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^4+1
47*cos(d*x+c)^6*a^4*b*sin(d*x+c)+163*cos(d*x+c)^6*a^3*b^2*sin(d*x+c)+279*co
s(d*x+c)^6*a^2*b^3*sin(d*x+c)+5*cos(d*x+c)^6*a*b^4*sin(d*x+c))/a^2
```

Fricas [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{11}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{11}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^(11/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)*sqrt(b*cos(d*x + c
) + a)*sec(d*x + c)^(11/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{11}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(5/2)*sec(d*x+c)**(11/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{11}{2}}(c+dx)\,dx = \int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{11}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^(11/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^(11/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{11}{2}}(c+dx)\,dx = \int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{11}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^(11/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^(11/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{11}{2}}(c+dx)\,dx = \int \left(\frac{1}{\cos(c+d\,x)}\right)^{11/2}(a+b\,\cos(c+d\,x))^{5/2}\,dx$$

```
[In] int((1/cos(c + d*x))^(11/2)*(a + b*cos(c + d*x))^(5/2),x)
[Out] int((1/cos(c + d*x))^(11/2)*(a + b*cos(c + d*x))^(5/2), x)
```

3.744 $\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{9}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 427

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \frac{2(a-b)b\sqrt{a+b}(29a^2+3b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-s}{}}}{21a^2d\sqrt{\sec(c+dx)}} + \frac{2(a-b)\sqrt{a+b}(5a^2-24ab+3b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{}}{21ad\sqrt{\sec(c+dx)}} + \frac{2(5a^2+9b^2)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d} + \frac{6ab\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d}$$

```
[Out] 2/21*(5*a^2+9*b^2)*sec(d*x+c)^(3/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+6/7
*a*b*sec(d*x+c)^(5/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+2/7*a^2*sec(d*x+c
)^(7/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+2/21*(a-b)*b*(29*a^2+3*b^2)*csc
(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-
b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2
)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^2/d/sec(d*x+c)^(1/2)+2/21*(a-b)*(5*a^2-2
4*a*b+3*b^2)*csc(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*
x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x
+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 1.28 (sec) , antiderivative size = 427, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4307, 2871, 3134, 3077, 2895, 3073}

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \frac{2(a-b)\sqrt{a+b}(5a^2-24ab+3b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{21ad\sqrt{\sec(c+dx)}} + \frac{2b(a-b)\sqrt{a+b}(29a^2+3b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{21a^2d\sqrt{\sec(c+dx)}} + \frac{2(5a^2+9b^2)\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{21d} + \frac{2a^2\sin(c+dx)\sec^{\frac{7}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{7d} + \frac{6ab\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{7d}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(9/2),x]
```

```
[Out] (2*(a - b)*b*Sqrt[a + b]*(29*a^2 + 3*b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*E
llipticE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])],
 -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[
c + d*x]))/(a - b)])/(21*a^2*d*Sqrt[Sec[c + d*x]]) + (2*(a - b)*Sqrt[a + b]
*(5*a^2 - 24*a*b + 3*b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSin[
Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a -
b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a -
b)])/(21*a*d*Sqrt[Sec[c + d*x]]) + (2*(5*a^2 + 9*b^2)*Sqrt[a + b*Cos[c + d*
x]]*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(21*d) + (6*a*b*Sqrt[a + b*Cos[c + d*x
]]*Sec[c + d*x]^(5/2)*Sin[c + d*x])/(7*d) + (2*a^2*Sqrt[a + b*Cos[c + d*x]]
*Sec[c + d*x]^(7/2)*Sin[c + d*x])/(7*d)
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
```

```
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
```

```
EqQ[a, 0])))
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] && !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{9}{2}}(c+dx)}\,dx$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{1}{7}\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{15a^2b}{2}+\frac{1}{2}a(5a^2+21b^2)\cos(c+dx)+\frac{1}{2}b(4a^2+7b^2)\cos^2(c+}{\cos^{\frac{7}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}$$

$$= \frac{6ab\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{\left(4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{5}{4}a^2(5a^2+9b^2)+\frac{5}{4}ab(13a^2+7b^2)\cos(c+dx)+\frac{15}{2}a^2b^2\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{35a}$$

$$= \frac{2(5a^2+9b^2)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d} + \frac{6ab\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{\left(8\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{5}{8}a^2b(29a^2+3b^2)+\frac{5}{8}a^3(5a^2+27b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{105a^2}$$

$$= \frac{2(5a^2+9b^2)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d} + \frac{6ab\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{1}{21}\left(b(29a^2+3b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx + \frac{1}{21}\left((a-b)(5a^2-24ab+3b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx$$

$$= \frac{2(a-b)b\sqrt{a+b}(29a^2+3b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{21a^2d\sqrt{\sec(c+dx)}} + \frac{2(a-b)\sqrt{a+b}(5a^2-24ab+3b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right), -\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{21ad\sqrt{\sec(c+dx)}} + \frac{2(5a^2+9b^2)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{21d} + \frac{6ab\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{7d} + \frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{7}{2}}(c+dx)\sin(c+dx)}{7d}$$

Mathematica [A] (verified)

Time = 9.85 (sec) , antiderivative size = 387, normalized size of antiderivative = 0.91

$$\int(a+b\cos(c+dx))^{5/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \frac{2\left(\frac{\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)\sec(c+dx)}\left(-2b(29a^3+29a^2b+3ab^2+3b^3)E\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right)|\frac{-a+b}{a+b}\right)\sqrt{\frac{1}{1+\sec(c+dx)}}\sqrt{\frac{b+a\sec(c+dx)}{(a+b)(1+\sec(c+dx))}}\cdots\right)}{\cdots}\cdots\right)}{\cdots}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(9/2),x]
```

```
[Out] (2*((Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*(-2*b*(29*a^3 + 29*a^2*b + 3*a*b
^2 + 3*b^3)*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[(1 +
 Sec[c + d*x])^(-1)]*Sqrt[(b + a*Sec[c + d*x])/((a + b)*(1 + Sec[c + d*x]))
] + 2*a*(5*a^3 + 29*a^2*b + 27*a*b^2 + 3*b^3)*EllipticF[ArcSin[Tan[(c + d*x
)/2]], (-a + b)/(a + b)]*Sqrt[(1 + Sec[c + d*x])^(-1)]*Sqrt[(b + a*Sec[c +
```

```
d*x])/((a + b)*(1 + Sec[c + d*x]))] - b*(29*a^2 + 3*b^2)*Cos[c + d*x]*(a +
b*Cos[c + d*x])*Sec[(c + d*x)/2]^2*Tan[(c + d*x)/2]))/Sqrt[Sec[(c + d*x)/2]
^2] + (a + b*Cos[c + d*x])*Sqrt[Sec[c + d*x]]*(b*(29*a^2 + 3*b^2)*Sin[c + d
*x] + a*(5*a^2 + 9*b^2 + 9*a*b*Sec[c + d*x] + 3*a^2*Sec[c + d*x]^2)*Tan[c +
 d*x])))/(21*a*d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2508 vs. 2(381) = 762.

Time = 1590.09 (sec) , antiderivative size = 2509, normalized size of antiderivative = 5.88

method	result	size
default	Expression too large to display	2509

```
[In] int((a+cos(d*x+c)*b)^(5/2)*sec(d*x+c)^(9/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/21/d*sec(d*x+c)^(9/2)/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)*(5*a^4*cos(d*
x+c)^4*sin(d*x+c)+3*a^4*cos(d*x+c)^2*sin(d*x+c)+18*a^2*b^2*cos(d*x+c)^4*sin
(d*x+c)+3*cos(d*x+c)^5*b^4*sin(d*x+c)+6*EllipticE(cot(d*x+c)-csc(d*x+c),(-(
a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*b^4*cos(d*x+c)^5-10*EllipticF(cot(d*x+c)-csc(d*x+c)
,(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)*a^4*cos(d*x+c)^5+3*EllipticE(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^4*cos(d*x+c)^4-5*EllipticF(cot(d*x+c)-csc(
d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^4*cos(d*x+c)^4+3*EllipticE(cot(d*x+c)-c
sc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/
2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^3*cos(d*x+c)^4-29*EllipticF(cot(d*
x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b
))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^3*b*cos(d*x+c)^4-27*EllipticF(
cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c)
)/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b^2*cos(d*x+c)^4-3*Ell
ipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos
(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^3*cos(d*x+c)^4+
58*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/
(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^3*b*cos(d*x
+c)^5+58*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+
c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b^2
*cos(d*x+c)^5+6*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+c
os(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
a*b^3*cos(d*x+c)^5-58*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*a^3*b*cos(d*x+c)^5-54*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^
(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x
```

```
+c)))^(1/2)*a^2*b^2*cos(d*x+c)^5-6*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/
(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)*a*b^3*cos(d*x+c)^5+29*EllipticE(cot(d*x+c)-csc(d*x+c),(-
(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)*a^3*b*cos(d*x+c)^4+29*EllipticE(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b^2*cos(d*x+c)^4+3*cos(d*x+c)^6*(cos(d*x
+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*Ell
ipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^4-5*cos(d*x+c)^6*(cos(
d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*
EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4-29*cos(d*x+c)^6*(
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1
/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b-27*cos(d*x+
c)^6*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+
b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^2-3*c
os(d*x+c)^6*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+
c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^
3+29*cos(d*x+c)^6*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+co
s(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2)
)*a^3*b+29*cos(d*x+c)^6*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)
/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*a^2*b^2+3*cos(d*x+c)^6*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*
x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)
/(a+b))^(1/2))*a*b^3+5*a^4*cos(d*x+c)^3*sin(d*x+c)+3*a^4*cos(d*x+c)*sin(d*x
+c)+5*cos(d*x+c)^5*a^3*b*sin(d*x+c)+29*cos(d*x+c)^5*a^2*b^2*sin(d*x+c)+9*co
s(d*x+c)^5*a*b^3*sin(d*x+c)+12*a^3*b*cos(d*x+c)^2*sin(d*x+c)+12*a^3*b*cos(d
*x+c)^3*sin(d*x+c)+18*a^2*b^2*cos(d*x+c)^3*sin(d*x+c)+34*a^3*b*cos(d*x+c)^4
*sin(d*x+c)+12*a*b^3*cos(d*x+c)^4*sin(d*x+c))/a
```

Fricas [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{9}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{9}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^(9/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)*sqrt(b*cos(d*x + c
) + a)*sec(d*x + c)^(9/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(5/2)*sec(d*x+c)**(9/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{9}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^(9/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^(9/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{9}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^(9/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^(9/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{9}{2}}(c+dx)\,dx = \int \left(\frac{1}{\cos(c+d\,x)}\right)^{9/2}(a+b\,\cos(c+d\,x))^{5/2}\,dx$$

```
[In] int((1/cos(c + d*x))^(9/2)*(a + b*cos(c + d*x))^(5/2),x)
[Out] int((1/cos(c + d*x))^(9/2)*(a + b*cos(c + d*x))^(5/2), x)
```

3.745 $\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 378

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)\,dx = \frac{2(a-b)\sqrt{a+b}(9a^2+23b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\mathrm{se}}{a}}}{15ad\sqrt{\sec(c+dx)}} - \frac{2(a-b)\sqrt{a+b}(9a^2-8ab+15b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\mathrm{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{}}{15ad\sqrt{\sec(c+dx)}} + \frac{22ab\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d} + \frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}$$

```
[Out] 22/15*a*b*sec(d*x+c)^(3/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+2/5*a^2*sec(
d*x+c)^(5/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+2/15*(a-b)*(9*a^2+23*b^2)*
csc(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((
-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(
1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/d/sec(d*x+c)^(1/2)-2/15*(a-b)*(9*a^2-
8*a*b+15*b^2)*csc(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d
*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*
x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 1.37 (sec) , antiderivative size = 378, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4307, 2871, 3134, 3077, 2895, 3073}

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)\,dx =$$
$$-\frac{2(a-b)\sqrt{a+b}(9a^2-8ab+15b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\right.}{15ad\sqrt{\sec(c+dx)}}$$
$$+\frac{2(a-b)\sqrt{a+b}(9a^2+23b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx}}{\sqrt{a+b}\sqrt{\cos(c+dx}}\right.\right.}{15ad\sqrt{\sec(c+dx)}}$$
$$+\frac{2a^2\sin(c+dx)\sec^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{5d}$$
$$+\frac{22ab\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{15d}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(7/2),x]
```

```
[Out] (2*(a - b)*Sqrt[a + b]*(9*a^2 + 23*b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*Ell
ipticE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -
((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c
+ d*x]))/(a - b)])/(15*a*d*Sqrt[Sec[c + d*x]]) - (2*(a - b)*Sqrt[a + b]*(9*
a^2 - 8*a*b + 15*b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt
[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]
*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])
/(15*a*d*Sqrt[Sec[c + d*x]]) + (22*a*b*Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x
]^(3/2)*Sin[c + d*x])/(15*d) + (2*a^2*Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]
^(5/2)*Sin[c + d*x])/(5*d)
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{7}{2}}(c+dx)}\,dx$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{1}{5}\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{11a^2b}{2}+\frac{3}{2}a(a^2+5b^2)\cos(c+dx)+\frac{1}{2}b(2a^2+5b^2)\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}$$

$$= \frac{22ab\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d} + \frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} + \frac{\left(4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{1}{4}a^2(9a^2+23b^2)+\frac{1}{4}ab(17a^2+15b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{15a}$$

$$= \frac{22ab\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d} + \frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d} - \frac{1}{15}\left((a-b)\left(9a^2-8ab+15b^2\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx + \frac{1}{15}\left(a\left(9a^2+23b^2\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2(a-b)\sqrt{a+b}(9a^2+23b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c}{a+b}}}{15ad\sqrt{\sec(c+dx)}} - \frac{2(a-b)\sqrt{a+b}(9a^2-8ab+15b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),}{15ad\sqrt{\sec(c+dx)}} + \frac{22ab\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{15d} + \frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sin(c+dx)}{5d}$$

Mathematica [A] (verified)

Time = 9.55 (sec) , antiderivative size = 376, normalized size of antiderivative = 0.99

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)\,dx = \frac{2\left(2(9a^3+9a^2b+23ab^2+23b^3)E\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right)|\frac{-a+b}{a+b}\right)\sqrt{\frac{1}{1+\sec(c+dx)}}\sqrt{\frac{b+a\sec(c+dx)}{(a+b)(1+\sec(c+dx))}}-2(9a^3+17a^2b+23ab^2+15b^3)\,\mathrm{Ell}\cdots}{\sqrt{\sec^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{\cos^2\left(\frac{1}{2}\cdots\right.}}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(7/2),x]
```

```
[Out] ((2*(2*(9*a^3 + 9*a^2*b + 23*a*b^2 + 23*b^3)*EllipticE[ArcSin[Tan[(c + d*x)
/2]], (-a + b)/(a + b)]*Sqrt[(1 + Sec[c + d*x])^(-1)]*Sqrt[(b + a*Sec[c + d
*x])/((a + b)*(1 + Sec[c + d*x]))] - 2*(9*a^3 + 17*a^2*b + 23*a*b^2 + 15*b^
3)*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[(1 + Sec[c +
d*x])^(-1)]*Sqrt[(b + a*Sec[c + d*x])/((a + b)*(1 + Sec[c + d*x]))] + (9*a^
2 + 23*b^2)*Cos[c + d*x]*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2*Tan[(c + d
*x)/2]))/(Sqrt[Sec[(c + d*x)/2]^2]*Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*(-
1 + Tan[(c + d*x)/2]^2)) + 2*(a + b*Cos[c + d*x])*Sqrt[Sec[c + d*x]]*((9*a^
2 + 23*b^2)*Sin[c + d*x] + a*(11*b + 3*a*Sec[c + d*x])*Tan[c + d*x]))/(15*d
*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2382 vs. 2(338) = 676.

Time = 1036.66 (sec) , antiderivative size = 2383, normalized size of antiderivative = 6.30

method	result	size
default	Expression too large to display	2383

```
[In] int((a+cos(d*x+c)*b)^(5/2)*sec(d*x+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/15/d*sec(d*x+c)^(7/2)/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)*(46*EllipticE
(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)^4-34*Ell
ipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)^4-
46*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x
+c)^4+9*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*co
s(d*x+c)^3+23*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*
```

b^2*cos(d*x+c)^3-17*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1
/2)*a^2*b*cos(d*x+c)^3-23*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+
b))^(1/2)*a*b^2*cos(d*x+c)^3-9*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b
))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c)
)/(a+b))^(1/2)*a^3*cos(d*x+c)^3+3*sin(d*x+c)*cos(d*x+c)*a^3+14*sin(d*x+c)*c
os(d*x+c)^2*a^2*b+18*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(
1/2)*a^2*b*cos(d*x+c)^4-9*cos(d*x+c)^5*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a
-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*a^3+9*cos(d*x+c)^5*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/
(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*a^3+23*b^3*cos(d*x+c)^4*sin(d*x+c)+14*a^2*b*cos(d
*x+c)^3*sin(d*x+c)+34*a*b^2*cos(d*x+c)^3*sin(d*x+c)-30*EllipticF(cot(d*x+c)
-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos
(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)^4-15*EllipticF(cot(d*
x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a
+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)^3-17*cos(d*x+c)^5
*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1
+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*b-23*cos(d*
x+c)^5*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)
*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b^2+9*c
os(d*x+c)^5*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*
b+23*cos(d*x+c)^5*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2)
)*a*b^2+18*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*c
os(d*x+c)^4+46*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b
^3*cos(d*x+c)^4-18*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(c
os(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/
2)*a^3*cos(d*x+c)^4+9*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^
(1/2)*a^3*cos(d*x+c)^3+23*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+
b))^(1/2)*b^3*cos(d*x+c)^3+3*a^3*cos(d*x+c)^2*sin(d*x+c)+23*cos(d*x+c)^5*((
a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^3+9*cos(d*x+c)^3
*a^3*sin(d*x+c)+9*cos(d*x+c)^4*a^2*b*sin(d*x+c)+11*cos(d*x+c)^4*a*b^2*sin(d
*x+c)-15*cos(d*x+c)^5*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*b^3)

Fricas [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)\,dx=\int (b\cos{(dx+c)}+a)^{\frac{5}{2}}\sec{(dx+c)}^{\frac{7}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^(7/2),x, algorithm="fricas")
[Out] integral((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)*sqrt(b*cos(d*x + c
) + a)*sec(d*x + c)^(7/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)\,dx=\text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(5/2)*sec(d*x+c)**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)\,dx=\int (b\cos{(dx+c)}+a)^{\frac{5}{2}}\sec{(dx+c)}^{\frac{7}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^(7/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^(7/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)\,dx=\int (b\cos{(dx+c)}+a)^{\frac{5}{2}}\sec{(dx+c)}^{\frac{7}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^(7/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{7}{2}}(c+dx)\,dx=\int \left(\frac{1}{\cos(c+d\,x)}\right)^{7/2}(a+b\,\cos(c+d\,x))^{5/2}\,dx$$

```
[In] int((1/cos(c + d*x))^(7/2)*(a + b*cos(c + d*x))^(5/2),x)
[Out] int((1/cos(c + d*x))^(7/2)*(a + b*cos(c + d*x))^(5/2), x)
```

3.746 $\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 452

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{14(a-b)b\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{a}}{3d\sqrt{\sec(c+dx)}}$$

$$+\frac{2\sqrt{a+b}(a^2-7ab+9b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+}{a+b}}}{3d\sqrt{\sec(c+dx)}}$$

$$-\frac{2b^2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{a(1+}}{d\sqrt{\sec(c+dx)}}$$

$$+\frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}$$

```
[Out] 2/3*a^2*sec(d*x+c)^(3/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d+14/3*(a-b)*b*c
sc(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-
a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1
/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/d/sec(d*x+c)^(1/2)+2/3*(a^2-7*a*b+9*b^2)
*csc(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(
(-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^
(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/d/sec(d*x+c)^(1/2)-2*b^2*csc(d*x+c)*El
lipticPi((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b
)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)
*(a*(1+sec(d*x+c))/(a-b))^(1/2)/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.97 (sec) , antiderivative size = 452, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used = {4307, 2871, 3132, 2888, 3077, 2895, 3073}

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{2\sqrt{a+b}(a^2-7ab+9b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\text{EllipticF}\left(\arcsin\right.}{3d\sqrt{\sec(c+dx)}} + \frac{2a^2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{3d} - \frac{2b^2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),\right.}{d\sqrt{\sec(c+dx)}} + \frac{14b(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{3d\sqrt{\sec(c+dx)}}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(5/2),x]
```

```
[Out] (14*(a - b)*b*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[
Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a -
b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a -
b)])/(3*d*Sqrt[Sec[c + d*x]]) + (2*Sqrt[a + b]*(a^2 - 7*a*b + 9*b^2)*Sqrt[C
os[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a
 + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))
/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*d*Sqrt[Sec[c + d*x]]) -
(2*b^2*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticPi[(a + b)/b, Ar
cSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/
(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/
(a - b)])/(d*Sqrt[Sec[c + d*x]]) + (2*a^2*Sqrt[a + b*Cos[c + d*x]]*Sec[c +
d*x]^(3/2)*Sin[c + d*x])/(3*d)
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
```

```
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
```

```
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
- 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{5}{2}}(c+dx)}\,dx$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{1}{3}\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\frac{7a^2b}{2}+\frac{1}{2}a(a^2+9b^2)\cos(c+dx)+\frac{3}{2}b^3\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{1}{3}\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\frac{7a^2b}{2}+\frac{1}{2}a(a^2+9b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx + \left(b^3\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= -\frac{2b^2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+}{a+b}}}{d\sqrt{\sec(c+dx)}} + \frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d} + \frac{1}{3}\left(7a^2b\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx + \frac{1}{3}\left(a\left(a^2-7ab+9b^2\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{14(a-b)b\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(}{}}}{3d\sqrt{\sec(c+dx)}}$$

$$+\frac{2\sqrt{a+b}(a^2-7ab+9b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{3d\sqrt{\sec(c+dx)}}$$

$$-\frac{2b^2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c}{a+b}}}{d\sqrt{\sec(c+dx)}}$$

$$+\frac{2a^2\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3d}$$

Mathematica [A] (verified)

Time = 9.62 (sec) , antiderivative size = 377, normalized size of antiderivative = 0.83

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)\,dx = \frac{\sqrt{\sec(c+dx)}\left(-\cos^2\left(\frac{1}{2}(c+dx)\right)\left(28ab(a+b)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\left(\arcsin\left(\tan\left(\frac{1}{2}(c\right.\right.\right.\right.\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(5/2),x]
```

```
[Out] (Sqrt[Sec[c + d*x]]*(-(Cos[(c + d*x)/2]^2*(28*a*b*(a + b)*Sqrt[Cos[c + d*x]
/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))
]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] - 4*(a^3 + 7*a^2*b
+ 9*a*b^2 - 3*b^3)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c
+ d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticF[ArcSin[Tan[(c + d*x)/2]], (
-a + b)/(a + b)] - 24*b^3*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b
*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticPi[-1, ArcSin[Tan[(c +
 d*x)/2]], (-a + b)/(a + b)] + 14*a*b*Cos[c + d*x]*(a + b*Cos[c + d*x])*Sec
[(c + d*x)/2]^2*Tan[(c + d*x)/2])) + 2*a*(a + b*Cos[c + d*x])*(a + 7*b*Cos[
c + d*x])*Tan[c + d*x]))/(3*d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 2210 vs. 2(406) = 812.

Time = 1044.13 (sec) , antiderivative size = 2211, normalized size of antiderivative = 4.89

method	result	size
default	Expression too large to display	2211

```
[In] int((a+cos(d*x+c)*b)^(5/2)*sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)

[Out] 2/3/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)
)^(5/2)*(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2
-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1
/2)*(-csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^
3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^
2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-7*csc(
d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b*(-csc(
d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*
x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-9*csc(d*x+c)^2
*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2*(-csc(d*x+c)^2
*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b
*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+3*csc(d*x+c)^2*(-csc(d
*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x
+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),
(-(a-b)/(a+b))^(1/2))*b^3*(1-cos(d*x+c))^2+7*csc(d*x+c)^2*EllipticE(cot(d*x
+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+
1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+
a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+7*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(
d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)
*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+
b))^(1/2)*(1-cos(d*x+c))^2-6*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1
)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a
+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*
b^3*(1-cos(d*x+c))^2+7*csc(d*x+c)^5*a^2*b*(1-cos(d*x+c))^5-7*csc(d*x+c)^5*a
*b^2*(1-cos(d*x+c))^5+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)
^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*Ell
ipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3+7*(-csc(d*x+c)^2*(1-
cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-
cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+
b))^(1/2))*a^2*b+9*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*
a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*Ellipt
icF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2-3*(-csc(d*x+c)^2*(1-c
os(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-c
os(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b
))^(1/2))*b^3-7*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(
1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE
(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b-7*(-csc(d*x+c)^2*(1-cos(
d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(
d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^
(1/2))*a*b^2+6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1
-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi
(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*b^3-2*csc(d*x+c)^3*a^3*(1-c
os(d*x+c))^3+2*csc(d*x+c)^3*a^2*b*(1-cos(d*x+c))^3+14*csc(d*x+c)^3*a*b^2*(1
```

```
-cos(d*x+c))^3-2*a^3*(csc(d*x+c)-cot(d*x+c))-9*a^2*b*(csc(d*x+c)-cot(d*x+c)
)-7*a*b^2*(csc(d*x+c)-cot(d*x+c)))/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x
+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^2
```

Fricas [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^(5/2),x, algorithm="fricas")
[Out] integral((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)*sqrt(b*cos(d*x + c
) + a)*sec(d*x + c)^(5/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)\,dx=\text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(5/2)*sec(d*x+c)**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^(5/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)\,dx=\int \left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}(a+b\,\cos(c+d\,x))^{5/2}\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^(5/2),x)
[Out] int((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^(5/2), x)
```

3.747 $\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)\,dx$

Optimal result

Integrand size = 25, antiderivative size = 505

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{(a-b)\sqrt{a+b}(2a^2-b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+}{a+b}}}{ad\sqrt{\sec(c+dx)}}$$
$$-\frac{\sqrt{a+b}(2a^2-6ab-b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+d}{a+b}}}{d\sqrt{\sec(c+dx)}}$$
$$-\frac{5ab\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1-}{}}}{d\sqrt{\sec(c+dx)}}$$
$$+\frac{2a^2\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d}$$
$$-\frac{(2a^2-b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d}$$

```
[Out] 2*a^2*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)*sec(d*x+c)^(1/2)/d-(2*a^2-b^2)*sin(
d*x+c)*(a+b*cos(d*x+c))^(1/2)*sec(d*x+c)^(1/2)/d+(a-b)*(2*a^2-b^2)*csc(d*x+
c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a
-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*
(1+sec(d*x+c))/(a-b))^(1/2)/a/d/sec(d*x+c)^(1/2)-(2*a^2-6*a*b-b^2)*csc(d*x+
c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a
-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*
(1+sec(d*x+c))/(a-b))^(1/2)/d/sec(d*x+c)^(1/2)-5*a*b*csc(d*x+c)*EllipticPi(
(a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b)/(a-b))^
(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+se
c(d*x+c))/(a-b))^(1/2)/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 1.59 (sec) , antiderivative size = 505, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {4307, 2871, 3140, 3132, 2888, 3077, 2895, 3073}

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)\,dx = -\frac{\sqrt{a+b}(2a^2-6ab-b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(}}{\sqrt{a+b}\sqrt{\cos}}\right.\right.}{d\sqrt{\sec(c+dx)}} + \frac{(a-b)\sqrt{a+b}(2a^2-b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\right.}{ad\sqrt{\sec(c+dx)}} - \frac{(2a^2-b^2)\sin(c+dx)\sqrt{\sec(c+dx)}\sqrt{a+b\cos(c+dx)}}{d} + \frac{2a^2\sin(c+dx)\sqrt{\sec(c+dx)}\sqrt{a+b\cos(c+dx)}}{d} - \frac{5ab\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),\right.}{d\sqrt{\sec(c+dx)}}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(3/2),x]
```

```
[Out] ((a - b)*Sqrt[a + b]*(2*a^2 - b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*Elliptic
E[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a +
 b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x
]))/(a - b)])/(a*d*Sqrt[Sec[c + d*x]]) - (Sqrt[a + b]*(2*a^2 - 6*a*b - b^2)
*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/
(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c +
 d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(d*Sqrt[Sec[c + d*x]
]) - (5*a*b*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticPi[(a + b)/
b, ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a
+ b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*
x]))/(a - b)])/(d*Sqrt[Sec[c + d*x]]) + (2*a^2*Sqrt[a + b*Cos[c + d*x]]*Sqr
t[Sec[c + d*x]]*Sin[c + d*x])/d - ((2*a^2 - b^2)*Sqrt[a + b*Cos[c + d*x]]*S
qrt[Sec[c + d*x]]*Sin[c + d*x])/d
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
```

```
b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
- 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3140

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(Sqrt[c + d*Sin[e + f
*x]]/(d*f*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[1/(2*d), Int[(1/((a + b*Sin
[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]))*Simp[2*a*A*d - C*(b*c - a*d) -
2*(a*c*C - d*(A*b + a*B))*Sin[e + f*x] + (2*b*B*d - C*(b*c + a*d))*Sin[e +
f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*
d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{(a+b\cos(c+dx))^{5/2}}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{3a^2b}{2}-\frac{1}{2}a(a^2-3b^2)\cos(c+dx)-\frac{1}{2}b(2a^2-b^2)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,d$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d} - \frac{(2a^2-b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{1}{2}ab(2a^2-b^2)+3a^2b^2\cos(c+dx)+\frac{5}{2}ab^3\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{b}$$

$$= \frac{2a^2\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d} - \frac{(2a^2-b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{1}{2}ab(2a^2-b^2)+3a^2b^2\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{b} + \frac{1}{2}\left(5ab^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}dx$$

$$= -\frac{5ab\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b}, \arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right), -\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c}{a+b}}}{d\sqrt{\sec(c+dx)}} + \frac{2a^2\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d} - \frac{(2a^2-b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d} + \frac{1}{2}\left(a(2a^2-b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx - \frac{1}{2}\left(a(2a^2-6ab-b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx$$

$$= \frac{(a-b)\sqrt{a+b}(2a^2-b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+d}{a+b}}}{ad\sqrt{\sec(c+dx)}} - \frac{\sqrt{a+b}(2a^2-6ab-b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right), -\frac{a+b}{a-b}\right)\sqrt{}}{d\sqrt{\sec(c+dx)}} - \frac{5ab\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b}, \arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right), -\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c}{a+b}}}{d\sqrt{\sec(c+dx)}} + \frac{2a^2\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d} - \frac{(2a^2-b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{d}$$

Mathematica [A] (verified)

Time = 11.19 (sec) , antiderivative size = 421, normalized size of antiderivative = 0.83

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)\,dx = \frac{2a^2(a+b\cos(c+dx))\sqrt{\sec(c+dx)}\sin(c+dx)+\frac{\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)\sec(c+dx)}\left(-2(2a^3+2a^2b-ab^2-b^3)\sqrt{\frac{\cos(c+d}{1+\cos(c+}}\right.}{}}{}$$

[In] Integrate[(a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(3/2),x]

[Out] (2*a^2*(a + b*Cos[c + d*x])*Sqrt[Sec[c + d*x]]*Sin[c + d*x] + (Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*(-2*(2*a^3 + 2*a^2*b - a*b^2 - b^3)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 4*a*(a^2 + 3*a*b - 3*b^2)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + 20*a*b^2*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + ((2*a^2 - b^2)*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^3*(Sin[(c + d*x)/2] - Sin[(3*(c + d*x))/2]))/2))/Sqrt[Sec[(c + d*x)/2]^2])/(d*Sqrt[a + b*Cos[c + d*x]])

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 2507 vs. 2(461) = 922.

Time = 10.07 (sec) , antiderivative size = 2508, normalized size of antiderivative = 4.97

method	result	size
default	Expression too large to display	2508

[In] int((a+cos(d*x+c)*b)^(5/2)*sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)

[Out] -1/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1))^(3/2)*(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2)*(2*a^3*(csc(d*x+c)-cot(d*x+c))+b^3*(csc(d*x+c)-cot(d*x+c))-2*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+2*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-csc(d*x+c)^2*EllipticE(cot(d*x+c)

-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+a*b^2*(csc(d*x+c)-cot(d*x+c))+csc(d*x+c)^5*b^3*(1-cos(d*x+c))^5-6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b+6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2+2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2-10*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a*b^2-csc(d*x+c)^5*a*b^2*(1-cos(d*x+c))^5-2*csc(d*x+c)^5*a^2*b*(1-cos(d*x+c))^5-2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3+2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^3+2*csc(d*x+c)^5*a^3*(1-cos(d*x+c))^5-2*csc(d*x+c)^3*b^3*(1-cos(d*x+c))^3+4*csc(d*x+c)^3*a^3*(1-cos(d*x+c))^3+2*a^2*b*(csc(d*x+c)-cot(d*x+c))-6*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+6*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+2*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-10*csc(d*x+c)^2*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2)/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^2

Fricas [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^(3/2),x, algorithm="fricas")
[Out] integral((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)*sqrt(b*cos(d*x + c
) + a)*sec(d*x + c)^(3/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)\,dx=\text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(5/2)*sec(d*x+c)**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^(3/2), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)\,dx=\int (b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)\,dx=\int \left(\frac{1}{\cos\left(c+d\,x\right)}\right)^{3/2}\,\left(a+b\,\cos\left(c+d\,x\right)\right)^{5/2}\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^(5/2),x)
[Out] int((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^(5/2), x)
```

3.748 $\int (a+b\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 503

$$\int (a+b\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}\,dx =$$

$$-\frac{9(a-b)b\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{4d\sqrt{\sec(c+dx)}}$$

$$+\frac{\sqrt{a+b}(8a^2+9ab+2b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx}{a+b}}}{4d\sqrt{\sec(c+dx)}}$$

$$-\frac{\sqrt{a+b}(15a^2+4b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+d}{a+b}}}{4d\sqrt{\sec(c+dx)}}$$

$$+\frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d\sqrt{\sec(c+dx)}}+\frac{9ab\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4d}$$

```
[Out] 1/2*b^2*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/sec(d*x+c)^(1/2)+9/4*a*b*sin(d*
x+c)*(a+b*cos(d*x+c))^(1/2)*sec(d*x+c)^(1/2)/d-9/4*(a-b)*b*csc(d*x+c)*Ellip
ticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/
2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d
*x+c))/(a-b))^(1/2)/d/sec(d*x+c)^(1/2)+1/4*(8*a^2+9*a*b+2*b^2)*csc(d*x+c)*E
llipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))
^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+s
ec(d*x+c))/(a-b))^(1/2)/d/sec(d*x+c)^(1/2)-1/4*(15*a^2+4*b^2)*csc(d*x+c)*El
lipticPi((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b
)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)
*(a*(1+sec(d*x+c))/(a-b))^(1/2)/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 1.25 (sec) , antiderivative size = 503, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {4307, 2872, 3140, 3132, 2888, 3077, 2895, 3073}

$$\int (a + b\cos(c + dx))^{5/2}\sqrt{\sec(c + dx)}\,dx = \frac{\sqrt{a+b}(8a^2 + 9ab + 2b^2)\sqrt{\cos(c + dx)}\csc(c + dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1}{a-b}}}{4d\sqrt{\sec(c + dx)}}$$
$$- \frac{\sqrt{a+b}(15a^2 + 4b^2)\sqrt{\cos(c + dx)}\csc(c + dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\operatorname{EllipticPi}\left(\frac{a+b}{b}, \arcsin\left(\frac{\sqrt{a+b}}{\sqrt{a+b}\sqrt{}}\right.\right.}{4d\sqrt{\sec(c + dx)}}$$
$$- \frac{9b(a-b)\sqrt{a+b}\sqrt{\cos(c + dx)}\csc(c + dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{4d\sqrt{\sec(c + dx)}}$$
$$+ \frac{b^2\sin(c + dx)\sqrt{a + b\cos(c + dx)}}{2d\sqrt{\sec(c + dx)}} + \frac{9ab\sin(c + dx)\sqrt{\sec(c + dx)}\sqrt{a + b\cos(c + dx)}}{4d}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2)*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (-9*(a - b)*b*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[
Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a -
b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a -
b)])/(4*d*Sqrt[Sec[c + d*x]]) + (Sqrt[a + b]*(8*a^2 + 9*a*b + 2*b^2)*Sqrt[C
os[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a
 + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))
/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(4*d*Sqrt[Sec[c + d*x]]) -
(Sqrt[a + b]*(15*a^2 + 4*b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticPi[(a
 + b)/b, ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])],
 -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[
c + d*x]))/(a - b)])/(4*d*Sqrt[Sec[c + d*x]]) + (b^2*Sqrt[a + b*Cos[c + d*x
]]*Sin[c + d*x])/(2*d*Sqrt[Sec[c + d*x]]) + (9*a*b*Sqrt[a + b*Cos[c + d*x]]
*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(4*d)
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
```

```
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
```

```
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
- 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3140

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(Sqrt[c + d*Sin[e + f
*x]]/(d*f*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[1/(2*d), Int[(1/((a + b*Sin
[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]))*Simp[2*a*A*d - C*(b*c - a*d) -
2*(a*c*C - d*(A*b + a*B))*Sin[e + f*x] + (2*b*B*d - C*(b*c + a*d))*Sin[e +
f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*
d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{(a+b\cos(c+dx))^{5/2}}{\sqrt{\cos(c+dx)}}\,dx \\
&= \frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d\sqrt{\sec(c+dx)}} \\
&\quad+\frac{1}{2}\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{1}{2}a(4a^2+b^2)+b(6a^2+b^2)\cos(c+dx)+\frac{9}{2}ab^2\cos^2(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}} \\
&= \frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d\sqrt{\sec(c+dx)}}+\frac{9ab\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4d} \\
&\quad+\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{9}{2}a^2b^2+ab(4a^2+b^2)\cos(c+dx)+\frac{1}{2}b^2(15a^2+4b^2)\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{4b}
\end{aligned}
$$

$$= \frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d\sqrt{\sec(c+dx)}} + \frac{9ab\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4d} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{9}{2}a^2b^2+ab(4a^2+b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{4b} + \frac{1}{8}\left(b(15a^2+4b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}dx$$

$$= -\frac{\sqrt{a+b}(15a^2+4b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{}}{4d\sqrt{\sec(c+dx)}} + \frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d\sqrt{\sec(c+dx)}} + \frac{9ab\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4d} - \frac{1}{8}\left(9a^2b\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx + \frac{1}{8}\left(a(8a^2+9ab+2b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx$$

$$= -\frac{9(a-b)b\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(}{}}}{4d\sqrt{\sec(c+dx)}} + \frac{\sqrt{a+b}(8a^2+9ab+2b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{}}{4d\sqrt{\sec(c+dx)}} - \frac{\sqrt{a+b}(15a^2+4b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{}}{4d\sqrt{\sec(c+dx)}} + \frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2d\sqrt{\sec(c+dx)}} + \frac{9ab\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4d}$$

Mathematica [A] (verified)

Time = 8.07 (sec) , antiderivative size = 421, normalized size of antiderivative = 0.84

$$\int (a+b\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}\,dx = \frac{b^2(a+b\cos(c+dx))\sqrt{\sec(c+dx)}\sin(2(c+dx)) + \frac{-18ab(a+b)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\frac{a+b\,c}{(a+b)(1-}}}{}}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(5/2)*Sqrt[Sec[c + d*x]],x]
```

```
[Out] (b^2*(a + b*Cos[c + d*x])*Sqrt[Sec[c + d*x]]*Sin[2*(c + d*x)] + (-18*a*b*(a
 + b)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a +
 b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a +
b)] - 4*(4*a^3 - 12*a^2*b + a*b^2 - 2*b^3)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d
*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticF[Arc
Sin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] - 4*b*(15*a^2 + 4*b^2)*Sqrt[Cos[c
+ d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c +
d*x]))]*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] - 9*a*b*
Cos[c + d*x]*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2*Tan[(c + d*x)/2])/(Sqr
t[Sec[(c + d*x)/2]^2]*Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*(-1 + Tan[(c +
d*x)/2]^2)))/(4*d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2231 vs. 2(449) = 898.

Time = 9.31 (sec) , antiderivative size = 2232, normalized size of antiderivative = 4.44

method	result	size
default	Expression too large to display	2232

```
[In] int((a+cos(d*x+c)*b)^(5/2)*sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/d*(-9*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*
cos(d*x+c)^2+11*a*b^2*cos(d*x+c)^2*sin(d*x+c)+9*a^2*b*cos(d*x+c)*sin(d*x+c)
+2*sin(d*x+c)*cos(d*x+c)^2*b^3+2*sin(d*x+c)*cos(d*x+c)*a*b^2+2*b^3*cos(d*x+
c)^3*sin(d*x+c)-9*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2
)*a*b^2*cos(d*x+c)^2+24*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2
))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b)
)^(1/2)*a^2*b*cos(d*x+c)^2-2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/
```

(a+b))^(1/2)*a*b^2*cos(d*x+c)^2-18*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/
(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*
x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)-18*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a
-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+co
s(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)+48*EllipticF(cot(d*x+c)-csc(d*x+c),
(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(
1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)-4*EllipticF(cot(d*x+c)-csc(d*x+
c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b
)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)-16*EllipticF(cot(d*x+c)-csc(
d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+
c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)-8*EllipticF(cot(d*x+c)-csc
(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x
+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3-8*EllipticPi(cot(d*x+c)-csc(d*x+c),-
1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)
/(1+cos(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)^2+4*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-c
sc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^3*cos(d*x+c)^2-16*EllipticPi(cot(d*x+c)-c
sc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+co
s(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)+8*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^3*cos(d*x+c)-30*(cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticPi(
cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a^2*b-9*EllipticE(cot(d*x+c)
-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos
(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b-9*EllipticE(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*
b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2+24*EllipticF(cot(d*x+c)-csc(d*x+c),(-(
a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+c
os(d*x+c))/(a+b))^(1/2)*a^2*b-2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+
b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c
))/(a+b))^(1/2)*a*b^2-30*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))
^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/
(a+b))^(1/2)*a^2*b*cos(d*x+c)^2-60*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a
-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+co
s(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)-8*EllipticF(cot(d*x+c)-csc(d*x+c),(
-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1
+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)^2-8*(cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc
(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*b^3+4*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((
a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c)
,(-(a-b)/(a+b))^(1/2))*b^3)*sec(d*x+c)^(1/2)/(1+cos(d*x+c))/(a+cos(d*x+c)*b
)^(1/2)

Fricas [F]

$$\int (a+b\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}\,dx=\int (b\cos(dx+c)+a)^{\frac{5}{2}}\sqrt{\sec(dx+c)}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^(1/2),x, algorithm="fricas")
[Out] integral((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)*sqrt(b*cos(d*x + c
) + a)*sqrt(sec(d*x + c)), x)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}\,dx=\text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(5/2)*sec(d*x+c)**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}\,dx=\int (b\cos(dx+c)+a)^{\frac{5}{2}}\sqrt{\sec(dx+c)}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sqrt(sec(d*x + c)), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}\,dx=\int (b\cos(dx+c)+a)^{\frac{5}{2}}\sqrt{\sec(dx+c)}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)*sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)*sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}\,dx=\int \sqrt{\frac{1}{\cos\left(c+d\,x\right)}}\,{\left(a+b\,\cos\left(c+d\,x\right)\right)}^{5/2}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^(5/2),x)
[Out] int((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^(5/2), x)
```

3.749 $\int \frac{(a+b\cos(c+dx))^{5/2}}{\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 566

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sqrt{\sec(c+dx)}}\,dx =$$

$$-\frac{(a-b)\sqrt{a+b}(33a^2+16b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{}}{24ad\sqrt{\sec(c+dx)}}$$

$$+\frac{\sqrt{a+b}(33a^2+26ab+16b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\text{se}}{a}}}{24d\sqrt{\sec(c+dx)}}$$

$$-\frac{5a\sqrt{a+b}(a^2+4b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+}{a+b}}}{8bd\sqrt{\sec(c+dx)}}$$

$$+\frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)}+\frac{13ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{12d\sqrt{\sec(c+dx)}}$$

$$+\frac{(33a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{24d}$$

```
[Out] 1/3*b^2*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/sec(d*x+c)^(3/2)+13/12*a*b*sin(
d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/sec(d*x+c)^(1/2)+1/24*(33*a^2+16*b^2)*sin(d
*x+c)*(a+b*cos(d*x+c))^(1/2)*sec(d*x+c)^(1/2)/d-1/24*(a-b)*(33*a^2+16*b^2)*
csc(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((
-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(
1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/d/sec(d*x+c)^(1/2)+1/24*(33*a^2+26*a*
b+16*b^2)*csc(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c
)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c)
)/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/d/sec(d*x+c)^(1/2)-5/8*a*(a^2
```

```
+4*b^2)*csc(d*x+c)*EllipticPi((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)
^(1/2),(a+b)/b,((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec
(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/b/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 1.70 (sec) , antiderivative size = 566, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.360$, Rules used = {4307, 2872, 3128, 3140, 3132, 2888, 3077, 2895, 3073}

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sqrt{\sec(c+dx)}}\,dx = \frac{\sqrt{a+b}(33a^2+26ab+16b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\ldots}{24d\sqrt{\sec(c+dx)}}$$
$$-\frac{(a-b)\sqrt{a+b}(33a^2+16b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\ldots\right)}{24ad\sqrt{\sec(c+dx)}}$$
$$-\frac{5a\sqrt{a+b}(a^2+4b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\ldots\right)}{8bd\sqrt{\sec(c+dx)}}$$
$$+\frac{(33a^2+16b^2)\sin(c+dx)\sqrt{\sec(c+dx)}\sqrt{a+b\cos(c+dx)}}{24d}$$
$$+\frac{b^2\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{3d\sec^{\frac{3}{2}}(c+dx)}+\frac{13ab\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{12d\sqrt{\sec(c+dx)}}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2)/Sqrt[Sec[c + d*x]],x]
```

```
[Out] -1/24*((a - b)*Sqrt[a + b]*(33*a^2 + 16*b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x
]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]]
)], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + S
ec[c + d*x]))/(a - b)])/(a*d*Sqrt[Sec[c + d*x]]) + (Sqrt[a + b]*(33*a^2 + 2
6*a*b + 16*b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b
*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[
(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(24*d
*Sqrt[Sec[c + d*x]]) - (5*a*Sqrt[a + b]*(a^2 + 4*b^2)*Sqrt[Cos[c + d*x]]*Cs
c[c + d*x]*EllipticPi[(a + b)/b, ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a +
b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a
 + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(8*b*d*Sqrt[Sec[c + d*x]]) + (
b^2*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(3*d*Sec[c + d*x]^(3/2)) + (13*a
*b*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x])/(12*d*Sqrt[Sec[c + d*x]]) + ((33*
a^2 + 16*b^2)*Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(24
*d)
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
```

```
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

```
&& NeQ[A, B]
```

Rule 3128

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*sin[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_
.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n + 2))), x] + Dist[1/(d*(m +
n + 2)), Int[(a + b*Sin[e + f*x])^(m - 1)*(c + d*Sin[e + f*x])^n*Simp[a*A*d
*(m + n + 2) + C*(b*c*m + a*d*(n + 1)) + (d*(A*b + a*B)*(m + n + 2) - C*(a*
c - b*d*(m + n + 1)))*Sin[e + f*x] + (C*(a*d*m - b*c*(m + 1)) + b*B*d*(m +
n + 2))*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n},
 x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m
, 0] &&  !(IGtQ[n, 0] && ( !IntegerQ[m] || (EqQ[a, 0] && NeQ[c, 0])))
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
- 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3140

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(Sqrt[c + d*Sin[e + f
*x]]/(d*f*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[1/(2*d), Int[(1/((a + b*Sin
[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]))*Simp[2*a*A*d - C*(b*c - a*d) -
2*(a*c*C - d*(A*b + a*B))*Sin[e + f*x] + (2*b*B*d - C*(b*c + a*d))*Sin[e +
f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*
d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{5/2}\,dx$$

$$= \frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)} + \frac{1}{3}\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}\left(\frac{3}{2}a(2a^2+b^2)+b(9a^2+2b^2)\cos(c+dx)+\frac{13}{2}\right.}{\sqrt{a+b\cos(c+dx)}}$$

$$= \frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)} + \frac{13ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{12d\sqrt{\sec(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{13a^2b^2}{4}+\frac{1}{2}ab(12a^2+19b^2)\cos(c+dx)+\frac{1}{4}b^2(33a^2+16b^2)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{6b}$$

$$= \frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)} + \frac{13ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{12d\sqrt{\sec(c+dx)}} + \frac{(33a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{24d} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{1}{4}ab^2(33a^2+16b^2)+\frac{13}{2}a^2b^3\cos(c+dx)+\frac{15}{4}ab^2(a^2+4b^2)\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{12b^2}$$

$$= \frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)} + \frac{13ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{12d\sqrt{\sec(c+dx)}} + \frac{(33a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{24d} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{1}{4}ab^2(33a^2+16b^2)+\frac{13}{2}a^2b^3\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{12b^2} + \frac{1}{16}\left(5a(a^2+4b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}dx$$

$$= -\frac{5a\sqrt{a+b}(a^2+4b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{8bd\sqrt{\sec(c+dx)}} + \frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)} + \frac{13ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{12d\sqrt{\sec(c+dx)}} + \frac{(33a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{24d} - \frac{1}{48}\left(a(33a^2+16b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx + \frac{1}{48}\left(a(33a^2+26ab+16b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx$$

$$= -\frac{(a-b)\sqrt{a+b}(33a^2+16b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\mathrm{se}}{}}}{24ad\sqrt{\sec(c+dx)}}$$
$$+\frac{\sqrt{a+b}(33a^2+26ab+16b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\mathrm{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{24d\sqrt{\sec(c+dx)}}$$
$$-\frac{5a\sqrt{a+b}(a^2+4b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\mathrm{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{}}{8bd\sqrt{\sec(c+dx)}}$$
$$+\frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{3d\sec^{\frac{3}{2}}(c+dx)}+\frac{13ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{12d\sqrt{\sec(c+dx)}}$$
$$+\frac{(33a^2+16b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{24d}$$

Mathematica [A] (verified)

Time = 14.79 (sec) , antiderivative size = 970, normalized size of antiderivative = 1.71

$$\int\frac{(a+b\cos(c+dx))^{5/2}}{\sqrt{\sec(c+dx)}}\,dx=\frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\left(\frac{1}{12}b^2\sin(c+dx)+\frac{13}{24}ab\sin(2(c+dx))+\frac{1}{12}b\right.}{d}$$
$$+\frac{\sqrt{\frac{1}{1-\tan^2\left(\frac{1}{2}(c+dx)\right)}}\left(33a^3\tan\left(\frac{1}{2}(c+dx)\right)+33a^2b\tan\left(\frac{1}{2}(c+dx)\right)+16ab^2\tan\left(\frac{1}{2}(c+dx)\right)+16b^3\tan\left(\frac{1}{2}(c+\right.\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(5/2)/Sqrt[Sec[c + d*x]],x]
```

```
[Out] (Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*((b^2*Sin[c + d*x])/12 + (13*a
*b*Sin[2*(c + d*x)])/24 + (b^2*Sin[3*(c + d*x)])/12))/d + (Sqrt[(1 - Tan[(c
 + d*x)/2]^2)^(-1)]*(33*a^3*Tan[(c + d*x)/2] + 33*a^2*b*Tan[(c + d*x)/2] +
16*a*b^2*Tan[(c + d*x)/2] + 16*b^3*Tan[(c + d*x)/2] - 66*a^2*b*Tan[(c + d*x
)/2]^3 - 32*b^3*Tan[(c + d*x)/2]^3 - 33*a^3*Tan[(c + d*x)/2]^5 + 33*a^2*b*T
an[(c + d*x)/2]^5 - 16*a*b^2*Tan[(c + d*x)/2]^5 + 16*b^3*Tan[(c + d*x)/2]^5
 + 30*a^3*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1
 - Tan[(c + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)
/2]^2)/(a + b)] + 120*a*b^2*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a +
b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2
 - b*Tan[(c + d*x)/2]^2)/(a + b)] + 30*a^3*EllipticPi[-1, ArcSin[Tan[(c + d
*x)/2]], (-a + b)/(a + b)]*Tan[(c + d*x)/2]^2*Sqrt[1 - Tan[(c + d*x)/2]^2]*
Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] + 120*a
*b^2*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Tan[(c + d*
x)/2]^2*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b
*Tan[(c + d*x)/2]^2)/(a + b)] + (33*a^3 + 33*a^2*b + 16*a*b^2 + 16*b^3)*Ell
```

```
ipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/2
]^2]*(1 + Tan[(c + d*x)/2]^2)*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c
 + d*x)/2]^2)/(a + b)] - 2*a*(24*a^2 - 13*a*b + 38*b^2)*EllipticF[ArcSin[Ta
n[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/2]^2]*(1 + Tan[(c
 + d*x)/2]^2)*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a
 + b)]))/(24*d*(1 + Tan[(c + d*x)/2]^2)^(3/2)*Sqrt[(a + b + a*Tan[(c + d*x)
/2]^2 - b*Tan[(c + d*x)/2]^2)/(1 + Tan[(c + d*x)/2]^2)])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2525 vs. 2(506) = 1012.

Time = 9.10 (sec) , antiderivative size = 2526, normalized size of antiderivative = 4.46

method	result	size
default	Expression too large to display	2526

```
[In] int((a+cos(d*x+c)*b)^(5/2)/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/24/d/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)/sec(d*x+c)^(1/2)*(-34*a*b^2*c
os(d*x+c)^2*sin(d*x+c)-59*a^2*b*cos(d*x+c)*sin(d*x+c)-8*sin(d*x+c)*cos(d*x+
c)^2*b^3-34*sin(d*x+c)*cos(d*x+c)*a*b^2-16*sin(d*x+c)*a*b^2-26*sin(d*x+c)*a
^2*b-33*a^3*sin(d*x+c)-8*b^3*cos(d*x+c)^3*sin(d*x+c)-16*b^3*cos(d*x+c)*sin(
d*x+c)-76*sec(d*x+c)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(
1/2)*a*b^2+33*sec(d*x+c)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/
2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b
))^(1/2)*a^2*b+33*sec(d*x+c)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/
(a+b))^(1/2)*a^3+16*sec(d*x+c)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b
))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c)
)/(a+b))^(1/2)*b^3+30*sec(d*x+c)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b
)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(
d*x+c))/(a+b))^(1/2)*a^3+33*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^
(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(
a+b))^(1/2)*a^2*b*cos(d*x+c)+16*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+
b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c
))/(a+b))^(1/2)*a*b^2*cos(d*x+c)+120*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-
(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+
cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)+26*EllipticF(cot(d*x+c)-csc(d*x+c
),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)
/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b*cos(d*x+c)-76*EllipticF(cot(d*x+c)-csc(d
*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c
)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2*cos(d*x+c)-48*EllipticF(cot(d*x+c)-c
sc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d
*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)-96*EllipticF(cot(d*x+c)
```

```
-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos
(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3-48*sec(d*x+c)*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3+66*EllipticE(cot(d*x+c)-csc(d*
x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)
*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3+32*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a
-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+co
s(d*x+c))/(a+b))^(1/2)*b^3+60*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(
a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x
+c))/(a+b))^(1/2)*a^3+66*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/
2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b
))^(1/2)*a^2*b+32*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2
)*a*b^2+240*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(
d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*
a*b^2+52*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b-1
52*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^2+33*Elli
pticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)
))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+c)+16*El
lipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^3*cos(d*x+c)+30*
EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*cos(d*x+
c)+16*sec(d*x+c)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos
(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)
*a*b^2+120*sec(d*x+c)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1
/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+
b))^(1/2)*a*b^2+26*sec(d*x+c)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b)
)^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))
/(a+b))^(1/2)*a^2*b)
```

Fricas [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sqrt{\sec(c+dx)}}\,dx=\int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)*sqrt(b*cos(d*x + c
) + a)/sqrt(sec(d*x + c)), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sqrt{\sec(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(5/2)/sec(d*x+c)**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)/sqrt(sec(d*x + c)), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)/sqrt(sec(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sqrt{\sec(c+dx)}}\,dx = \int \frac{(a+b\,\cos(c+d\,x))^{5/2}}{\sqrt{\frac{1}{\cos(c+d\,x)}}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(5/2)/(1/cos(c + d*x))^(1/2),x)
[Out] int((a + b*cos(c + d*x))^(5/2)/(1/cos(c + d*x))^(1/2), x)
```

3.750 $\int \frac{(a+b\cos(c+dx))^{5/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 638

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx =$$

$$-\frac{(a-b)\sqrt{a+b}(15a^2+284b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{}}{192bd\sqrt{\sec(c+dx)}}$$

$$+\frac{\sqrt{a+b}(15a^3+118a^2b+284ab^2+72b^3)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{192bd\sqrt{\sec(c+dx)}}$$

$$+\frac{\sqrt{a+b}(5a^4-120a^2b^2-48b^4)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{}}{64b^2d\sqrt{\sec(c+dx)}}$$

$$+\frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sec^{\frac{5}{2}}(c+dx)}+\frac{17ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{24d\sec^{\frac{3}{2}}(c+dx)}$$

$$+\frac{(59a^2+36b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{96d\sqrt{\sec(c+dx)}}$$

$$+\frac{a(15a^2+284b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{192bd}$$

```
[Out] 1/4*b^2*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/sec(d*x+c)^(5/2)+17/24*a*b*sin(
d*x+c)*(a+b*cos(d*x+c))^(1/2)/d/sec(d*x+c)^(3/2)+1/96*(59*a^2+36*b^2)*sin(d
*x+c)*(a+b*cos(d*x+c))^(1/2)/d/sec(d*x+c)^(1/2)+1/192*a*(15*a^2+284*b^2)*si
n(d*x+c)*(a+b*cos(d*x+c))^(1/2)*sec(d*x+c)^(1/2)/b/d-1/192*(a-b)*(15*a^2+28
4*b^2)*csc(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(
1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(
a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/b/d/sec(d*x+c)^(1/2)+1/192*(15*a
```

```
^3+118*a^2*b+284*a*b^2+72*b^3)*csc(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/
(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(
1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/b/d/sec(
d*x+c)^(1/2)+1/64*(5*a^4-120*a^2*b^2-48*b^4)*csc(d*x+c)*EllipticPi((a+b*cos
(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b)/(a-b))^(1/2))*(
a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c)
)/(a-b))^(1/2)/b^2/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 2.27 (sec) , antiderivative size = 638, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.360$, Rules used = {4307, 2872, 3128, 3140, 3132, 2888, 3077, 2895, 3073}

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx =$$

$$-\frac{(a-b)\sqrt{a+b}(15a^2+284b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c}}{\sqrt{a+b}\sqrt{\cos(c}}\right.\right.}{192bd\sqrt{\sec(c+dx)}}$$

$$+\frac{(59a^2+36b^2)\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{96d\sqrt{\sec(c+dx)}}$$

$$+\frac{a(15a^2+284b^2)\sin(c+dx)\sqrt{\sec(c+dx)}\sqrt{a+b\cos(c+dx)}}{192bd}$$

$$+\frac{\sqrt{a+b}(5a^4-120a^2b^2-48b^4)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\text{arcs}\right.}{64b^2d\sqrt{\sec(c+dx)}}$$

$$+\frac{\sqrt{a+b}(15a^3+118a^2b+284ab^2+72b^3)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}}{192bd\sqrt{\sec(c+dx)}}$$

$$+\frac{b^2\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{4d\sec^{\frac{5}{2}}(c+dx)}+\frac{17ab\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{24d\sec^{\frac{3}{2}}(c+dx)}$$

```
[In] Int[(a + b*Cos[c + d*x])^(5/2)/Sec[c + d*x]^(3/2),x]
```

```
[Out] -1/192*((a - b)*Sqrt[a + b]*(15*a^2 + 284*b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d
*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x
]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 +
 Sec[c + d*x]))/(a - b)])/(b*d*Sqrt[Sec[c + d*x]]) + (Sqrt[a + b]*(15*a^3 +
 118*a^2*b + 284*a*b^2 + 72*b^3)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticF[
ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b
)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x])
)/(a - b)])/(192*b*d*Sqrt[Sec[c + d*x]]) + (Sqrt[a + b]*(5*a^4 - 120*a^2*b^
2 - 48*b^4)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticPi[(a + b)/b, ArcSin[Sq
```

```
rt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b)
)]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)
])/(64*b^2*d*Sqrt[Sec[c + d*x]]) + (b^2*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*
x])/(4*d*Sec[c + d*x]^(5/2)) + (17*a*b*Sqrt[a + b*Cos[c + d*x]]*Sin[c + d*x
])/(24*d*Sec[c + d*x]^(3/2)) + ((59*a^2 + 36*b^2)*Sqrt[a + b*Cos[c + d*x]]*
Sin[c + d*x])/(96*d*Sqrt[Sec[c + d*x]]) + (a*(15*a^2 + 284*b^2)*Sqrt[a + b*
Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(192*b*d)
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
```

```
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3128

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*sin[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_
.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(a + b*Sin[e + f*x
])^m*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n + 2))), x] + Dist[1/(d*(m +
n + 2)), Int[(a + b*Sin[e + f*x])^(m - 1)*(c + d*Sin[e + f*x])^n*Simp[a*A*d
*(m + n + 2) + C*(b*c*m + a*d*(n + 1)) + (d*(A*b + a*B)*(m + n + 2) - C*(a*
c - b*d*(m + n + 1)))*Sin[e + f*x] + (C*(a*d*m - b*c*(m + 1)) + b*B*d*(m +
n + 2))*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n},
 x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m
, 0] &&  !(IGtQ[n, 0] && ( !IntegerQ[m] || (EqQ[a, 0] && NeQ[c, 0])))
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
- 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3140

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(Sqrt[c + d*Sin[e + f
*x]]/(d*f*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[1/(2*d), Int[(1/((a + b*Sin
[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]))*Simp[2*a*A*d - C*(b*c - a*d) -
2*(a*c*C - d*(A*b + a*B))*Sin[e + f*x] + (2*b*B*d - C*(b*c + a*d))*Sin[e +
f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*
d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}\,dx$$

$$= \frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sec^{\frac{5}{2}}(c+dx)} + \frac{1}{4}\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{3}{2}}(c+dx)\left(\frac{1}{2}a(8a^2+5b^2)+3b(4a^2+b^2)\cos(c+dx)+\frac{17}{2}c\right.}{\sqrt{a+b\cos(c+dx)}}$$

$$= \frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sec^{\frac{5}{2}}(c+dx)} + \frac{17ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{24d\sec^{\frac{3}{2}}(c+dx)} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}\left(\frac{51a^2b^2}{4}+\frac{1}{2}ab(24a^2+49b^2)\cos(c+dx)+\frac{1}{4}b^2(59a^2+36b^2)\cos^2(c+dx)\right)}{\sqrt{a+b\cos(c+dx)}}\,dx}{12b}$$

$$= \frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sec^{\frac{5}{2}}(c+dx)} + \frac{17ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{24d\sec^{\frac{3}{2}}(c+dx)} + \frac{(59a^2+36b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{96d\sqrt{\sec(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{1}{8}ab^2(59a^2+36b^2)+\frac{1}{4}b^3(161a^2+36b^2)\cos(c+dx)+\frac{1}{8}ab^2(15a^2+284b^2)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{24b^2}$$

$$= \frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sec^{\frac{5}{2}}(c+dx)} + \frac{17ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{24d\sec^{\frac{3}{2}}(c+dx)} + \frac{(59a^2+36b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{96d\sqrt{\sec(c+dx)}} + \frac{a(15a^2+284b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{192bd} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{1}{8}a^2b^2(15a^2+284b^2)+\frac{1}{4}ab^3(59a^2+36b^2)\cos(c+dx)-\frac{3}{8}b^2(5a^4-120a^2b^2-48b^4)\cos^2(c}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}}{48b^3}$$

$$= \frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sec^{\frac{5}{2}}(c+dx)} + \frac{17ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{24d\sec^{\frac{3}{2}}(c+dx)}$$
$$+ \frac{(59a^2+36b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{96d\sqrt{\sec(c+dx)}}$$
$$+ \frac{a(15a^2+284b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{192bd}$$
$$+ \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{1}{8}a^2b^2(15a^2+284b^2)+\frac{1}{4}ab^3(59a^2+36b^2)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{48b^3}$$
$$- \frac{\left((5a^4-120a^2b^2-48b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx}{128b}$$

$$= \frac{\sqrt{a+b}(5a^4-120a^2b^2-48b^4)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),\right.}{64b^2d\sqrt{\sec(c+dx)}}$$
$$+ \frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sec^{\frac{5}{2}}(c+dx)} + \frac{17ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{24d\sec^{\frac{3}{2}}(c+dx)}$$
$$+ \frac{(59a^2+36b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{96d\sqrt{\sec(c+dx)}}$$
$$+ \frac{a(15a^2+284b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{192bd}$$
$$- \frac{\left(a^2(15a^2+284b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{384b}$$
$$+ \frac{\left(a(15a^3+118a^2b+284ab^2+72b^3)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{384b}$$

$$=$$
$$- \frac{(a-b)\sqrt{a+b}(15a^2+284b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1}{}}}{192bd\sqrt{\sec(c+dx)}}$$
$$+ \frac{\sqrt{a+b}(15a^3+118a^2b+284ab^2+72b^3)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c}}{\sqrt{a+b}\sqrt{\cos(}}\right.\right.}{192bd\sqrt{\sec(c+dx)}}$$
$$+ \frac{\sqrt{a+b}(5a^4-120a^2b^2-48b^4)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right.\right.}{64b^2d\sqrt{\sec(c+dx)}}$$
$$+ \frac{b^2\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{4d\sec^{\frac{5}{2}}(c+dx)} + \frac{17ab\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{24d\sec^{\frac{3}{2}}(c+dx)}$$
$$+ \frac{(59a^2+36b^2)\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{96d\sqrt{\sec(c+dx)}}$$
$$+ \frac{a(15a^2+284b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{192bd}$$

Mathematica [A] (verified)

Time = 13.88 (sec) , antiderivative size = 1226, normalized size of antiderivative = 1.92

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\left(\frac{17}{96}ab\sin(c+dx)+\frac{1}{192}(59a^2+48b^2)\sin(2(c+dx)\right.}{d}$$

$$+\frac{-15a^4\tan\left(\frac{1}{2}(c+dx)\right)-15a^3b\tan\left(\frac{1}{2}(c+dx)\right)-284a^2b^2\tan\left(\frac{1}{2}(c+dx)\right)-284ab^3\tan\left(\frac{1}{2}(c+dx)\right)+30a^3}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(5/2)/Sec[c + d*x]^(3/2),x]
```

```
[Out] (Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*((17*a*b*Sin[c + d*x])/96 + ((
59*a^2 + 48*b^2)*Sin[2*(c + d*x)])/192 + (17*a*b*Sin[3*(c + d*x)])/96 + (b^
2*Sin[4*(c + d*x)])/32))/d + (-15*a^4*Tan[(c + d*x)/2] - 15*a^3*b*Tan[(c +
d*x)/2] - 284*a^2*b^2*Tan[(c + d*x)/2] - 284*a*b^3*Tan[(c + d*x)/2] + 30*a^
3*b*Tan[(c + d*x)/2]^3 + 568*a*b^3*Tan[(c + d*x)/2]^3 + 15*a^4*Tan[(c + d*x
)/2]^5 - 15*a^3*b*Tan[(c + d*x)/2]^5 + 284*a^2*b^2*Tan[(c + d*x)/2]^5 - 284
*a*b^3*Tan[(c + d*x)/2]^5 + 30*a^4*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]],
 (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*
x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] - 720*a^2*b^2*EllipticPi[-1, ArcSi
n[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqrt[(a
 + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] - 288*b^4*Elli
pticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*
x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)
] + 30*a^4*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Tan[(
c + d*x)/2]^2*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]
^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] - 720*a^2*b^2*EllipticPi[-1, ArcSin[Tan
[(c + d*x)/2]], (-a + b)/(a + b)]*Tan[(c + d*x)/2]^2*Sqrt[1 - Tan[(c + d*x)
/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)]
 - 288*b^4*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Tan[(c
 + d*x)/2]^2*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^
2 - b*Tan[(c + d*x)/2]^2)/(a + b)] - a*(15*a^3 + 15*a^2*b + 284*a*b^2 + 284
*b^3)*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c
 + d*x)/2]^2]*(1 + Tan[(c + d*x)/2]^2)*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 -
 b*Tan[(c + d*x)/2]^2)/(a + b)] + 2*b*(-59*a^3 + 322*a^2*b - 36*a*b^2 + 72*
b^3)*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c
+ d*x)/2]^2]*(1 + Tan[(c + d*x)/2]^2)*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 -
b*Tan[(c + d*x)/2]^2)/(a + b)])/(192*b*d*Sqrt[(1 - Tan[(c + d*x)/2]^2)^(-1)
]*(-1 + Tan[(c + d*x)/2]^2)*(1 + Tan[(c + d*x)/2]^2)^(3/2)*Sqrt[(a + b + a*
Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(1 + Tan[(c + d*x)/2]^2)])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 3158 vs. 2(572) = 1144.

Time = 10.01 (sec) , antiderivative size = 3159, normalized size of antiderivative = 4.95

method	result	size
default	Expression too large to display	3159

```
[In] int((a+cos(d*x+c)*b)^(5/2)/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/192/d/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)/sec(d*x+c)^(3/2)*(-254*sin(d
*x+c)*a^2*b^2-15*a^4*tan(d*x+c)-48*b^4*cos(d*x+c)^2*sin(d*x+c)-118*a^3*b*ta
n(d*x+c)-72*tan(d*x+c)*a*b^3-133*sin(d*x+c)*a^3*b-356*sin(d*x+c)*a*b^3-72*s
in(d*x+c)*b^4-30*sec(d*x+c)^2*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(
a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x
+c))/(a+b))^(1/2)*a^4+288*sec(d*x+c)^2*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,
(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(
1+cos(d*x+c))/(a+b))^(1/2)*b^4+15*sec(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*
b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4-60*sec(d*x+c)*EllipticPi(cot(d*x+c)-csc(
d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d
*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4+576*sec(d*x+c)*EllipticPi(cot(d*x+
c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((
a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^4+30*sec(d*x+c)*EllipticE(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4-144*sec(d*x+c)^2*Elliptic
F(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(
1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^4-288*sec(d*x+c)*Ellip
ticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b^4+118*EllipticF(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b-644*EllipticF(cot(d*x+c
)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+co
s(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^2+72*EllipticF(cot(d*x+c)-csc
(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x
+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^3+720*EllipticPi(cot(d*x+c)-csc(d*x+
c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c
)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^2+15*EllipticE(cot(d*x+c)-csc(d*x+c)
,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/
(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b+284*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-
b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos
(d*x+c))/(a+b))^(1/2)*a^2*b^2+284*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(
a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x
+c))/(a+b))^(1/2)*a*b^3-144*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^
(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(
```

a+b))^(1/2)*b^4-184*a*b^3*cos(d*x+c)^2*sin(d*x+c)-254*a^2*b^2*cos(d*x+c)*si
n(d*x+c)-184*a*b^3*cos(d*x+c)*sin(d*x+c)-30*EllipticPi(cot(d*x+c)-csc(d*x+c
),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)
*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^4+288*EllipticPi(cot(d*x+c)-csc(d*x+c),-1
,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/
(1+cos(d*x+c))/(a+b))^(1/2)*b^4+15*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/
(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*
x+c))/(a+b))^(1/2)*a^4-48*b^4*cos(d*x+c)^3*sin(d*x+c)-284*tan(d*x+c)*a^2*b^
2-72*cos(d*x+c)*b^4*sin(d*x+c)-1288*sec(d*x+c)*EllipticF(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*
b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^2+144*sec(d*x+c)*EllipticF(cot(d*x+c)-
csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(
d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a*b^3+1440*sec(d*x+c)*EllipticPi(cot(
d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2
)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^2+30*sec(d*x+c)*Ellip
ticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b+568*sec(d*x+c)*
EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*
x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^2+118*sec(
d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b-6
44*sec(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(
d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*
a^2*b^2+72*sec(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2
))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b)
)^(1/2)*a*b^3+568*sec(d*x+c)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/
(a+b))^(1/2)*a*b^3+236*sec(d*x+c)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(
a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x
+c))/(a+b))^(1/2)*a^3*b+284*sec(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-
(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+
cos(d*x+c))/(a+b))^(1/2)*a*b^3+720*sec(d*x+c)^2*EllipticPi(cot(d*x+c)-csc(d
x+c),-1,(-(a-b)/(a+b))^(1/2))(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*
x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^2+15*sec(d*x+c)^2*EllipticE(cot(d
*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((
a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^3*b+284*sec(d*x+c)^2*Elliptic
E(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(
1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a^2*b^2)/b

Fricas [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/sec(d*x+c)^(3/2),x, algorithm="fricas")
[Out] integral((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)*sqrt(b*cos(d*x + c
) + a)/sec(d*x + c)^(3/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))**(5/2)/sec(d*x+c)**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)/sec(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(b\cos(dx+c)+a)^{\frac{5}{2}}}{\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(5/2)/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^(5/2)/sec(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\cos(c+dx))^{5/2}}{\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(a+b\,\cos\left(c+d\,x\right))^{5/2}}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}\,dx$$

```
[In] int((a + b*cos(c + d*x))^(5/2)/(1/cos(c + d*x))^(3/2),x)
[Out] int((a + b*cos(c + d*x))^(5/2)/(1/cos(c + d*x))^(3/2), x)
```

3.751 $\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 314

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = -\frac{4(a-b)b\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^3d\sqrt{\sec(c+dx)}} + \frac{2\sqrt{a+b}(a+2b)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^2d\sqrt{\sec(c+dx)}} + \frac{2\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3ad}$$

```
[Out] 2/3*sec(d*x+c)^(3/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/a/d-4/3*(a-b)*b*csc(
d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b
)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)
*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^3/d/sec(d*x+c)^(1/2)+2/3*(a+2*b)*csc(d*x+
c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a
-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*
(1+sec(d*x+c))/(a-b))^(1/2)/a^2/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.57 (sec) , antiderivative size = 314, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4307, 2881, 3077, 2895, 3073}

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = -\frac{4b(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{3a^3d\sqrt{\sec(c+dx)}} + \frac{2\sqrt{a+b}(a+2b)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{3a^2d\sqrt{\sec(c+dx)}} + \frac{2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{3ad}$$

```
[In] Int[Sec[c + d*x]^(5/2)/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (-4*(a - b)*b*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[
Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a -
b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a -
b)])/(3*a^3*d*Sqrt[Sec[c + d*x]]) + (2*Sqrt[a + b]*(a + 2*b)*Sqrt[Cos[c + d
*x]]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sq
rt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)
]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a^2*d*Sqrt[Sec[c + d*x]]) + (2*S
qrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(3*a*d)
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] && !IntegerQ[n]) || !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] && !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
```

```
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3ad} + \frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-b+\frac{1}{2}a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{3a}$$

$$= \frac{2\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3ad} - \frac{\left(2b\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{3a} + \frac{\left((a+2b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{3a}$$

$$= -\frac{4(a-b)b\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{a(}}{3a^3d\sqrt{\sec(c+dx)}} + \frac{2\sqrt{a+b}(a+2b)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+}{a+b}}}{3a^2d\sqrt{\sec(c+dx)}} + \frac{2\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3ad}$$

Mathematica [A] (warning: unable to verify)

Time = 10.70 (sec) , antiderivative size = 322, normalized size of antiderivative = 1.03

$$\int\frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}dx = \frac{4\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)\sec(c+dx)}\left(2b(a+b)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right)|\frac{-a+b}{a+b}\right.}{} + \frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\left(-\frac{4b\sin(c+dx)}{3a^2}+\frac{2\tan(c+dx)}{3a}\right)}{d}$$

```
[In] Integrate[Sec[c + d*x]^(5/2)/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (4*Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*(2*b*(a + b)*Sqrt[Cos[c + d*x]/(1
+ Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*El
lipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + a*(a - 2*b)*Sqrt[Cos[
c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c
+ d*x]))]*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + b*Cos[c +
 d*x]*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2*Tan[(c + d*x)/2]))/(3*a^2*d*S
qrt[a + b*Cos[c + d*x]]*Sqrt[Sec[(c + d*x)/2]^2]) + (Sqrt[a + b*Cos[c + d*x
]]*Sqrt[Sec[c + d*x]]*((-4*b*Sin[c + d*x])/(3*a^2) + (2*Tan[c + d*x])/(3*a)
))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1201 vs. 2(280) = 560.

Time = 12.19 (sec) , antiderivative size = 1202, normalized size of antiderivative = 3.83

method	result	size
default	Expression too large to display	1202

```
[In] int(sec(d*x+c)^(5/2)/(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3/d*sec(d*x+c)^(5/2)/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)*(-cos(d*x+c)^4
*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1
+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2+2*cos(d*x+c
)^4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)
/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b-2*cos(d*
x+c)^4*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x
+c)))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b-2*cos
(d*x+c)^4*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^2-2*
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(
1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*cos(d*x+c)^3
+4*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b)
)^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b*cos(d*x+c
)^3-4*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a
+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b*cos(d*
x+c)^3-4*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))
/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^2*cos
(d*x+c)^3-(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c)
)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*co
s(d*x+c)^2+2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(
d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b
*cos(d*x+c)^2-2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+c
os(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
a*b*cos(d*x+c)^2-2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x+c)*b)/(1+c
os(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2
))*b^2*cos(d*x+c)^2+a*b*cos(d*x+c)^3*sin(d*x+c)-2*b^2*cos(d*x+c)^3*sin(d*x+
c)+a^2*cos(d*x+c)^2*sin(d*x+c)-cos(d*x+c)^2*sin(d*x+c)*a*b+a^2*cos(d*x+c)*s
in(d*x+c))/a^2
```

Fricas [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(sec(d*x + c)^(5/2)/sqrt(b*cos(d*x + c) + a), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(5/2)/(a+b*cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^(5/2)/sqrt(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(5/2)/sqrt(b*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}}{\sqrt{a+b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)/(a + b*cos(c + d*x))^(1/2),x)
[Out] int((1/cos(c + d*x))^(5/2)/(a + b*cos(c + d*x))^(1/2), x)
```

3.752 $\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 264

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{a^2d\sqrt{\sec(c+dx)}} - \frac{2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+d}{a-b}}}{ad\sqrt{\sec(c+dx)}}$$

```
[Out] 2*(a-b)*csc(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^
(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/
(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^2/d/sec(d*x+c)^(1/2)-2*csc(d*
x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/
(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(
a*(1+sec(d*x+c))/(a-b))^(1/2)/a/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 264, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used

$= \{4307, 2880, 2895, 3073\}$

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$
$$= \frac{2(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{a^2d\sqrt{\sec(c+dx)}}$$
$$-\frac{2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a}{a}\right.}{ad\sqrt{\sec(c+dx)}}$$

```
[In] Int[Sec[c + d*x]^(3/2)/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (2*(a - b)*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[Sqr
t[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))
]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)]
)/(a^2*d*Sqrt[Sec[c + d*x]]) - (2*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*
x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]
])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 +
Sec[c + d*x]))/(a - b)])/(a*d*Sqrt[Sec[c + d*x]])
```

Rule 2880

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin
[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[1/(a - b), Int[1/(Sqrt[a + b*Sin[
e + f*x]]*Sqrt[c + d*Sin[e + f*x]]), x], x] - Dist[b/(a - b), Int[(1 + Sin[
e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /;
FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
```

```
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx \\
&= -\left(\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx\right) \\
&\quad+\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx \\
&= \frac{2(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\text{se}}{a}}}{a^2d\sqrt{\sec(c+dx)}} \\
&\quad-\frac{2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(}{}}}{ad\sqrt{\sec(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 11.24 (sec) , antiderivative size = 296, normalized size of antiderivative = 1.12

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{ad} - \frac{2\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)\sec(c+dx)}\left(2(a+b)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right)|\frac{-a+}{a+b}\right.\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^(3/2)/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (2*Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(a*d) - (2*Sqr
t[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*(2*(a + b)*Sqrt[Cos[c + d*x]/(1 + Cos[c
+ d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticE[
ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] - 2*a*Sqrt[Cos[c + d*x]/(1 + Co
s[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*Ellipt
icF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + Cos[c + d*x]*(a + b*Cos[c
 + d*x])*Sec[(c + d*x)/2]^2*Tan[(c + d*x)/2]))/(a*d*Sqrt[a + b*Cos[c + d*x]
]*Sqrt[Sec[(c + d*x)/2]^2])
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 657 vs. $2(240) = 480$.

Time = 10.20 (sec) , antiderivative size = 658, normalized size of antiderivative = 2.49

method	result
default	$-\frac{2\left(-\frac{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1}{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2-1}\right)^{\frac{3}{2}}\left(\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2-1\right)\left(-\sqrt{-\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1}\sqrt{\frac{\left(\csc^2(dx+c)\right.}{}}\cdots\right.}{}$

```
[In] int(sec(d*x+c)^(3/2)/(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1))
^(3/2)*(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)*(-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+
1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+
a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a+(
-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-c
sc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d
*x+c),(-(a-b)/(a+b))^(1/2))*a+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((cs
c(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(
1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b+csc(d*x+c)^3*(
1-cos(d*x+c))^3*a-csc(d*x+c)^3*(1-cos(d*x+c))^3*b+a*(csc(d*x+c)-cot(d*x+c))
+b*(csc(d*x+c)-cot(d*x+c)))*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*
b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2)/(csc(d*x+c
)^2*(1-cos(d*x+c))^2+1)/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-
cos(d*x+c))^2+a+b)/a
```

Fricas [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{3}{2}}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sec(d*x + c)^(3/2)/sqrt(b*cos(d*x + c) + a), x)
```

Sympy [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

```
[In] integrate(sec(d*x+c)**(3/2)/(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(sec(c + d*x)**(3/2)/sqrt(a + b*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sec(dx+c)^{\frac{3}{2}}}{\sqrt{b\cos(dx+c)+a}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^(3/2)/sqrt(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sec(dx+c)^{\frac{3}{2}}}{\sqrt{b\cos(dx+c)+a}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(3/2)/sqrt(b*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}{\sqrt{a+b\,\cos(c+d\,x)}}\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)/(a + b*cos(c + d*x))^(1/2),x)
[Out] int((1/cos(c + d*x))^(3/2)/(a + b*cos(c + d*x))^(1/2), x)
```

3.753 $\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 129

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ad\sqrt{\sec(c+dx)}}$$

```
[Out] 2*csc(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),
((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))
^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 129, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {4307, 2895}

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{ad\sqrt{\sec(c+dx)}}$$

```
[In] Int[Sqrt[Sec[c + d*x]]/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (2*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*
Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(
```

```
a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(a*d*S
qrt[Sec[c + d*x]])
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+}{}}}{ad\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.81 (sec) , antiderivative size = 103, normalized size of antiderivative = 0.80

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}\,\text{EllipticF}\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right),\frac{-a+b}{a+b}\right)}{d\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}}$$

```
[In] Integrate[Sqrt[Sec[c + d*x]]/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (2*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticF[ArcSin
[Tan[(c + d*x)/2]], (-a + b)/(a + b)])/(d*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*
x])]*Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]])
```

Maple [A] (verified)

Time = 7.81 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.86

method	result	size
default	$-\frac{2(1+\cos(dx+c))\left(\sqrt{\sec}(dx+c)\right)F\left(\cot(dx+c)-\csc(dx+c),\sqrt{-\frac{a-b}{a+b}}\right)\sqrt{\frac{a+\cos(dx+c)b}{(1+\cos(dx+c))(a+b)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}{d\sqrt{a+\cos(dx+c)b}}$	111

[In] int(sec(d*x+c)^(1/2)/(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)

[Out] -2/d*(1+cos(d*x+c))*sec(d*x+c)^(1/2)/(a+cos(d*x+c)*b)^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)

Fricas [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{\sqrt{\sec\left(dx+c\right)}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

[In] integrate(sec(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(sec(d*x + c))/sqrt(b*cos(d*x + c) + a), x)

Sympy [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{\sqrt{\sec\left(c+dx\right)}}{\sqrt{a+b\cos\left(c+dx\right)}}\,dx$$

[In] integrate(sec(d*x+c)**(1/2)/(a+b*cos(d*x+c))**(1/2),x)

[Out] Integral(sqrt(sec(c + d*x))/sqrt(a + b*cos(c + d*x)), x)

Maxima [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx=\int \frac{\sqrt{\sec\left(dx+c\right)}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

[In] integrate(sec(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(sec(d*x + c))/sqrt(b*cos(d*x + c) + a), x)

Giac [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sqrt{\sec\left(dx+c\right)}}{\sqrt{b\cos\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(sec(d*x + c))/sqrt(b*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx = \int \frac{\sqrt{\frac{1}{\cos(c+d\,x)}}}{\sqrt{a+b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)/(a + b*cos(c + d*x))^(1/2),x)
[Out] int((1/cos(c + d*x))^(1/2)/(a + b*cos(c + d*x))^(1/2), x)
```

3.754 $\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 136

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx = -\frac{2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1}{}}}{bd\sqrt{\sec(c+dx)}}$$

```
[Out] -2*csc(d*x+c)*EllipticPi((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2
),(a+b)/b,((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+
c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/b/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {4307, 2888}

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx = -\frac{2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\right.}{bd\sqrt{\sec(c+dx)}}$$

```
[In] Int[1/(Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (-2*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticPi[(a + b)/b, ArcSi
n[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a
```

```
- b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a
- b)])/(b*d*Sqrt[Sec[c + d*x]])
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= -\frac{2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx)}{a+b}}}{bd\sqrt{\sec(c+dx)}}$$

Mathematica [A] (verified)

Time = 1.71 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.07

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx = -\frac{2\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}\left(\text{EllipticF}\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right),\frac{-a+b}{a+b}\right)-2\,\text{EllipticPi}\left(-1,\arcsin\left(\text{ta}\right.\right.\right.}{d\sqrt{\frac{1}{1+\cos(c+dx)}}\sqrt{a+b\cos(c+dx)}}$$

```
[In] Integrate[1/(Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (-2*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b
)*(1 + Cos[c + d*x]))]*(EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b
)] - 2*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)])*Sqrt[1 +
 Sec[c + d*x]])/(d*Sqrt[(1 + Cos[c + d*x])^(-1)]*Sqrt[a + b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 7.10 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.01

method	result	size
default	$\frac{2\sqrt{\frac{a+\cos(dx+c)b}{(1+\cos(dx+c))(a+b)}}\left(F\left(\cot(dx+c)-\csc(dx+c),\sqrt{-\frac{a-b}{a+b}}\right)-2\Pi\left(\cot(dx+c)-\csc(dx+c),-1,\sqrt{-\frac{a-b}{a+b}}\right)\right)}{d\sqrt{a+\cos(dx+c)b}\,\sqrt{\sec(dx+c)}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}}$	137

```
[In] int(1/(a+cos(d*x+c)*b)^(1/2)/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d/(a+cos(d*x+c)*b)^(1/2)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(E
llipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))-2*EllipticPi(cot(d*x+c
)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2)))/sec(d*x+c)^(1/2)/(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)
```

Fricas [F]

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx=\int \frac{1}{\sqrt{b\cos(dx+c)+a}\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(b*cos(d*x + c) + a)*sqrt(sec(d*x + c))), x)
```

Sympy [F]

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx=\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))**(1/2)/sec(d*x+c)**(1/2),x)
```

```
[Out] Integral(1/(sqrt(a + b*cos(c + d*x))*sqrt(sec(c + d*x))), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx=\int \frac{1}{\sqrt{b\cos(dx+c)+a}\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*sqrt(sec(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\cos\left(dx+c\right)+a}\sqrt{\sec\left(dx+c\right)}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*sqrt(sec(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{\sqrt{\frac{1}{\cos(c+d\,x)}}\,\sqrt{a+b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^(1/2)),x)
[Out] int(1/((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^(1/2)), x)
```

3.755 $\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 474

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx = -\frac{(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{abd\sqrt{\sec(c+dx)}} + \frac{\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{bd\sqrt{\sec(c+dx)}} + \frac{a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{b^2d\sqrt{\sec(c+dx)}} + \frac{\sin(c+dx)}{d\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}} + \frac{a\sqrt{\sec(c+dx)}\sin(c+dx)}{bd\sqrt{a+b\cos(c+dx)}}$$

```
[Out] sin(d*x+c)/d/(a+b*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2)+a*sin(d*x+c)*sec(d*x+c
)^(1/2)/b/d/(a+b*cos(d*x+c))^(1/2)-(a-b)*csc(d*x+c)*EllipticE((a+b*cos(d*x+
c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*co
s(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2
)/a/b/d/sec(d*x+c)^(1/2)+csc(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^
(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(
a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/b/d/sec(d*x+c)
^(1/2)+a*csc(d*x+c)*EllipticPi((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c
)^(1/2),(a+b)/b,((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-se
c(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/b^2/d/sec(d*x+c)^(1/2
)
```

Rubi [A] (verified)

Time = 0.97 (sec) , antiderivative size = 474, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {4307, 2899, 2888, 3082, 3072, 12, 2880, 2895, 3073}

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx$$
$$= \frac{a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\right.}{b^2d\sqrt{\sec(c+dx)}}$$
$$+\frac{\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{bd\sqrt{\sec(c+dx)}}$$
$$-\frac{(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{abd\sqrt{\sec(c+dx)}}$$
$$+\frac{a\sin(c+dx)\sqrt{\sec(c+dx)}}{bd\sqrt{a+b\cos(c+dx)}}+\frac{\sin(c+dx)}{d\sqrt{\sec(c+dx)}\sqrt{a+b\cos(c+dx)}}$$

```
[In] Int[1/(Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(3/2)),x]
```

```
[Out] -(((a - b)*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[Sqr
t[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))
]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)]
)/(a*b*d*Sqrt[Sec[c + d*x]])) + (Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x
]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]]
)], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + S
ec[c + d*x]))/(a - b)])/(b*d*Sqrt[Sec[c + d*x]]) + (a*Sqrt[a + b]*Sqrt[Cos[
c + d*x]]*Csc[c + d*x]*EllipticPi[(a + b)/b, ArcSin[Sqrt[a + b*Cos[c + d*x]
]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c
 + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(b^2*d*Sqrt[Sec[c
+ d*x]]) + Sin[c + d*x]/(d*Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]) + (
a*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(b*d*Sqrt[a + b*Cos[c + d*x]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2880

```
Int[1/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin
[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[1/(a - b), Int[1/(Sqrt[a + b*Sin[
e + f*x]]*Sqrt[c + d*Sin[e + f*x]]), x], x] - Dist[b/(a - b), Int[(1 + Sin[
e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /;
```

```
FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0]
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 2899

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)/Sqrt[(a_.) + (b_.)*sin[(e_.) + (f
_.)*(x_)]], x_Symbol] :> Dist[(-a)*(d/(2*b)), Int[Sqrt[d*Sin[e + f*x]]/Sqrt
[a + b*Sin[e + f*x]], x], x] + Dist[d/(2*b), Int[Sqrt[d*Sin[e + f*x]]*((a +
 2*b*Sin[e + f*x])/Sqrt[a + b*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, d, e,
f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3072

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(
x_)]]*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)), x_Symbol] :> Simp[2*(A
*b - a*B)*(Cos[e + f*x]/(f*(a^2 - b^2)*Sqrt[a + b*Sin[e + f*x]]*Sqrt[d*Sin[
e + f*x]])), x] + Dist[d/(a^2 - b^2), Int[(A*b - a*B + (a*A - b*B)*Sin[e +
f*x])/(Sqrt[a + b*Sin[e + f*x]]*(d*Sin[e + f*x])^(3/2)), x], x] /; FreeQ[{a
, b, d, e, f, A, B}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
```

```
PosQ[(c + d)/b]
```

Rule 3082

```
Int[Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*((A_.) + (B_.)*sin[(e_.) +
(f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Sim
p[-2*B*Cos[e + f*x]*Sqrt[a + b*Sin[e + f*x]]*((c + d*Sin[e + f*x])^n/(f*(2*
n + 3))), x] + Dist[1/(2*n + 3), Int[((c + d*Sin[e + f*x])^(n - 1)/Sqrt[a +
 b*Sin[e + f*x]])*Simp[a*A*c*(2*n + 3) + B*(b*c + 2*a*d*n) + (B*(a*c + b*d)
*(2*n + 1) + A*(b*c + a*d)*(2*n + 3))*Sin[e + f*x] + (A*b*d*(2*n + 3) + B*(
a*d + 2*b*c*n))*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B
}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && EqQ
[n^2, 1/4]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{3}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$

$$= \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}(a+2b\cos(c+dx))}{\sqrt{a+b\cos(c+dx)}}\,dx}{2b} - \frac{\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx}{2b}$$

$$= \frac{a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{}}{b^2d\sqrt{\sec(c+dx)}} + \frac{\sin(c+dx)}{d\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{2ab+2a^2\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx}{4b}$$

$$= \frac{a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}}{b^2d\sqrt{\sec(c+dx)}}$$
$$+\frac{\sin(c+dx)}{d\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}}+\frac{a\sqrt{\sec(c+dx)}\sin(c+dx)}{bd\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{-2a^3+2ab^2}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{4b(a^2-b^2)}$$

$$= \frac{a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}}{b^2d\sqrt{\sec(c+dx)}}$$
$$+\frac{\sin(c+dx)}{d\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}}+\frac{a\sqrt{\sec(c+dx)}\sin(c+dx)}{bd\sqrt{a+b\cos(c+dx)}}$$
$$-\frac{\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{2b}$$

$$= \frac{a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}}{b^2d\sqrt{\sec(c+dx)}}$$
$$+\frac{\sin(c+dx)}{d\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}}+\frac{a\sqrt{\sec(c+dx)}\sin(c+dx)}{bd\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{2b}$$
$$-\frac{\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{2b}$$

$$=$$
$$-\frac{(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1}{}}}{abd\sqrt{\sec(c+dx)}}$$
$$+\frac{\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(}{}}}{bd\sqrt{\sec(c+dx)}}$$
$$+\frac{a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+d}{a+b}}}{b^2d\sqrt{\sec(c+dx)}}$$
$$+\frac{\sin(c+dx)}{d\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}}+\frac{a\sqrt{\sec(c+dx)}\sin(c+dx)}{bd\sqrt{a+b\cos(c+dx)}}$$

Mathematica [A] (warning: unable to verify)

Time = 5.16 (sec) , antiderivative size = 235, normalized size of antiderivative = 0.50

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx$$
$$= \frac{2\cos(c+dx)\sqrt{\frac{\cos(c+dx)}{(1+\cos(c+dx))^2}}\left(\cos^2\left(\frac{1}{2}(c+dx)\right)\sec(c+dx)\right)^{3/2}\left((a+b)E\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right)|\frac{-a+b}{a+b}\right)\sqrt{\right.}{}$$

```
[In] Integrate[1/(Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(3/2)),x]
```

```
[Out] (2*Cos[c + d*x]*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])^2]*(Cos[(c + d*x)/2]^2
*Sec[c + d*x])^(3/2)*((a + b)*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/
(a + b)]*Sqrt[((a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2)/(a + b)] - 2*a*Elli
pticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[((a + b*Cos[c +
 d*x])*Sec[(c + d*x)/2]^2)/(a + b)] + (a + b*Cos[c + d*x])*Sqrt[Cos[c + d*x
]*Sec[(c + d*x)/2]^2]*Tan[(c + d*x)/2]))/(b*d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 7.86 (sec) , antiderivative size = 820, normalized size of antiderivative = 1.73

method	result
default	$-\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,E\left(\cot(dx+c)-\csc(dx+c),\sqrt{-\frac{a-b}{a+b}}\right)\sqrt{\frac{a+\cos(dx+c)b}{(1+\cos(dx+c))(a+b)}}\,a-\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,E\left(\cot(dx+c)-\csc(dx+c),\sqrt{-\frac{a-b}{a+b}}\right)\sqrt{\frac{}{(1}}$

```
[In] int(1/sec(d*x+c)^(3/2)/(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)/sec(d*x+c)^(3/2)*(-(cos(d*x+c)/(1
+cos(d*x+c)))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*(
(a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a-(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*
b)/(1+cos(d*x+c))/(a+b))^(1/2)*b+2*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Ellipt
icPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+co
s(d*x+c))/(a+b))^(1/2)*a-2*sec(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Ell
ipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos
(d*x+c))/(a+b))^(1/2)*a-2*sec(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Elli
pticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(
d*x+c))/(a+b))^(1/2)*b+4*sec(d*x+c)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Ellip
ticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+c
os(d*x+c))/(a+b))^(1/2)*a+b*sin(d*x+c)-sec(d*x+c)^2*EllipticE(cot(d*x+c)-cs
c(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*
x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a-sec(d*x+c)^2*EllipticE(cot(d*x+c)-csc
```

```
(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+cos(d*x
+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*b+2*sec(d*x+c)^2*EllipticPi(cot(d*x+c)-c
sc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*((a+co
s(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*a+tan(d*x+c)*a)/b
```

Fricas [F]

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{1}{\sqrt{b\cos\left(dx+c\right)+a}\sec\left(dx+c\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/sec(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(1/(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^(3/2)), x)
```

Sympy [F]

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{1}{\sqrt{a+b\cos\left(c+dx\right)}\sec^{\frac{3}{2}}\left(c+dx\right)}\,dx$$

```
[In] integrate(1/sec(d*x+c)**(3/2)/(a+b*cos(d*x+c))**(1/2),x)
[Out] Integral(1/(sqrt(a + b*cos(c + d*x))*sec(c + d*x)**(3/2)), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{1}{\sqrt{b\cos\left(dx+c\right)+a}\sec\left(dx+c\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/sec(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^(3/2)), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{1}{\sqrt{b\cos\left(dx+c\right)+a}\sec\left(dx+c\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/sec(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}\,\sqrt{a+b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^(1/2)),x)
[Out] int(1/((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^(1/2)), x)
```

3.756 $\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 505

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)}\,dx$$
$$= \frac{3(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{4b^2d\sqrt{\sec(c+dx)}}$$
$$- \frac{(3a-2b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\cdots}}{4b^2d\sqrt{\sec(c+dx)}}$$
$$- \frac{\sqrt{a+b}(3a^2+4b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(\cdots}{a+\cdots}}}{4b^3d\sqrt{\sec(c+dx)}}$$
$$+ \frac{\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2bd\sqrt{\sec(c+dx)}} - \frac{3a\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4b^2d}$$

```
[Out] 1/2*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/b/d/sec(d*x+c)^(1/2)-3/4*a*sin(d*x+c)
*(a+b*cos(d*x+c))^(1/2)*sec(d*x+c)^(1/2)/b^2/d+3/4*(a-b)*csc(d*x+c)*Ellipti
cE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2)
)*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x
+c))/(a-b))^(1/2)/b^2/d/sec(d*x+c)^(1/2)-1/4*(3*a-2*b)*csc(d*x+c)*EllipticF
((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*
(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c
))/(a-b))^(1/2)/b^2/d/sec(d*x+c)^(1/2)-1/4*(3*a^2+4*b^2)*csc(d*x+c)*Ellipti
cPi((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b)/(a-
b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(
1+sec(d*x+c))/(a-b))^(1/2)/b^3/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 1.16 (sec) , antiderivative size = 505, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {4307, 2872, 3140, 3132, 2888, 3077, 2895, 3073}

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)}\,dx = -\frac{\sqrt{a+b}(3a^2+4b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b}}{\sqrt{a+b}\sqrt{}}\right.\right.}{4b^3d\sqrt{\sec(c+dx)}} - \frac{(3a-2b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx}}\right.\right.}{4b^2d\sqrt{\sec(c+dx)}} + \frac{3(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right.}{4b^2d\sqrt{\sec(c+dx)}} - \frac{3a\sin(c+dx)\sqrt{\sec(c+dx)}\sqrt{a+b\cos(c+dx)}}{4b^2d} + \frac{\sin(c+dx)\sqrt{a+b\cos(c+dx)}}{2bd\sqrt{\sec(c+dx)}}$$

```
[In] Int[1/(Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (3*(a - b)*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[Sqr
t[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))
]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)]
)/(4*b^2*d*Sqrt[Sec[c + d*x]]) - ((3*a - 2*b)*Sqrt[a + b]*Sqrt[Cos[c + d*x]
]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[
Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*S
qrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(4*b^2*d*Sqrt[Sec[c + d*x]]) - (Sqrt[a
 + b]*(3*a^2 + 4*b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticPi[(a + b)/b,
 ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a +
b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]
))/(a - b)])/(4*b^3*d*Sqrt[Sec[c + d*x]]) + (Sqrt[a + b*Cos[c + d*x]]*Sin[c
 + d*x])/(2*b*d*Sqrt[Sec[c + d*x]]) - (3*a*Sqrt[a + b*Cos[c + d*x]]*Sqrt[Se
c[c + d*x]]*Sin[c + d*x])/(4*b^2*d)
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
```

```
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
```

```
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
- 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3140

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(Sqrt[c + d*Sin[e + f
*x]]/(d*f*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[1/(2*d), Int[(1/((a + b*Sin
[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]))*Simp[2*a*A*d - C*(b*c - a*d) -
2*(a*c*C - d*(A*b + a*B))*Sin[e + f*x] + (2*b*B*d - C*(b*c + a*d))*Sin[e +
f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*
d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{5}{2}}(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx \\
&= \frac{\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2bd\sqrt{\sec(c+dx)}}+\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{a}{2}+b\cos(c+dx)-\frac{3}{2}a\cos^2(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{2b} \\
&= \frac{\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2bd\sqrt{\sec(c+dx)}}-\frac{3a\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4b^2d} \\
&\quad +\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{3a^2}{2}+ab\cos(c+dx)+\frac{1}{2}(3a^2+4b^2)\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{4b^2} \\
&= \frac{\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2bd\sqrt{\sec(c+dx)}}-\frac{3a\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4b^2d} \\
&\quad +\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{3a^2}{2}+ab\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{4b^2} \\
&\quad +\frac{\left((3a^2+4b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx}{8b^2}
\end{aligned}$$

$$= -\frac{\sqrt{a+b}(3a^2+4b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{}}{4b^3d\sqrt{\sec(c+dx)}}$$
$$+\frac{\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2bd\sqrt{\sec(c+dx)}}-\frac{3a\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4b^2d}$$
$$+\frac{\left(3a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{8b^2}$$
$$-\frac{\left(a(3a-2b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{8b^2}$$

$$=\frac{3(a-b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+}{}}}{4b^2d\sqrt{\sec(c+dx)}}$$
$$-\frac{(3a-2b)\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(}{a+}}}{4b^2d\sqrt{\sec(c+dx)}}$$
$$-\frac{\sqrt{a+b}(3a^2+4b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{}}{4b^3d\sqrt{\sec(c+dx)}}$$
$$+\frac{\sqrt{a+b\cos(c+dx)}\sin(c+dx)}{2bd\sqrt{\sec(c+dx)}}-\frac{3a\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{4b^2d}$$

Mathematica [A] (verified)

Time = 12.71 (sec) , antiderivative size = 678, normalized size of antiderivative = 1.34

$$\int\frac{1}{\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)}dx=\frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(2(c+dx))}{4bd}$$
$$-\frac{\sec\left(\frac{1}{2}(c+dx)\right)\sqrt{\sec(c+dx)}\left(24a(a+b)\cos^3\left(\frac{1}{2}(c+dx)\right)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E(\arcsin(\tan\right.}{}$$

```
[In] Integrate[1/(Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*Sin[2*(c + d*x)])/(4*b*d) - (S
ec[(c + d*x)/2]*Sqrt[Sec[c + d*x]]*(24*a*(a + b)*Cos[(c + d*x)/2]^3*Sqrt[Co
s[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[
c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] - 16*(a -
 2*b)*b*Cos[(c + d*x)/2]^3*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a +
b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticF[ArcSin[Tan[(c + d*x
)/2]], (-a + b)/(a + b)] - 36*a^2*Cos[(c + d*x)/2]*EllipticPi[-1, ArcSin[Ta
n[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[(1 + Sec[c + d*x])^(-1)]*Sqrt[(b +
```

```
a*Sec[c + d*x])/((a + b)*(1 + Sec[c + d*x]))] - 48*b^2*Cos[(c + d*x)/2]*Ell
ipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[(1 + Sec[c + d
*x])^(-1)]*Sqrt[(b + a*Sec[c + d*x])/((a + b)*(1 + Sec[c + d*x]))] - 12*a^2
*Cos[(3*(c + d*x))/2]*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a
+ b)]*Sqrt[(1 + Sec[c + d*x])^(-1)]*Sqrt[(b + a*Sec[c + d*x])/((a + b)*(1 +
 Sec[c + d*x]))] - 16*b^2*Cos[(3*(c + d*x))/2]*EllipticPi[-1, ArcSin[Tan[(c
 + d*x)/2]], (-a + b)/(a + b)]*Sqrt[(1 + Sec[c + d*x])^(-1)]*Sqrt[(b + a*Se
c[c + d*x])/((a + b)*(1 + Sec[c + d*x]))] - 6*a^2*Sin[(c + d*x)/2] + 6*a*b*
Sin[(c + d*x)/2] + 6*a^2*Sin[(3*(c + d*x))/2] - 3*a*b*Sin[(3*(c + d*x))/2]
+ 3*a*b*Sin[(5*(c + d*x))/2]))/(16*b^2*d*Sqrt[a + b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1688 vs. $2(451) = 902$.

Time = 8.53 (sec) , antiderivative size = 1689, normalized size of antiderivative = 3.34

method	result	size
default	Expression too large to display	1689

```
[In] int(1/sec(d*x+c)^(5/2)/(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/d*sec(d*x+c)^(1/2)*(-2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(
1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*a*b*cos(d*x+c)^2+4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b)
)^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)*b^2*cos(d*x+c)^2+3*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a
+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*a^2*cos(d*x+c)^2+3*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)
/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1
+cos(d*x+c)))^(1/2)*a*b*cos(d*x+c)^2-6*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,
(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*a^2*cos(d*x+c)^2-8*EllipticPi(cot(d*x+c)-csc(d*x
+c),-1,(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^2*cos(d*x+c)^2+2*b^2*cos(d*x+c)^3*sin(d
*x+c)-4*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+c
)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b*cos(
d*x+c)+8*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x+
c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^2*cos
(d*x+c)+6*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*x
+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2*co
s(d*x+c)+6*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*((a+cos(d*
x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b*c
os(d*x+c)-12*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*((a+
cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*a^2*cos(d*x+c)-16*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2)
```

```
)*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)*b^2*cos(d*x+c)-cos(d*x+c)^2*sin(d*x+c)*a*b+2*b^2*cos(d*x+c)^2*sin(d*
x+c)-2*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-c
sc(d*x+c),(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b+4*((a
+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),
(-(a-b)/(a+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*b^2+3*((a+cos(d*x+c
)*b)/(1+cos(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a
+b))^(1/2))*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2+3*((a+cos(d*x+c)*b)/(1+co
s(d*x+c))/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2)
)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*a*b-6*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/
(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos
(d*x+c)/(1+cos(d*x+c)))^(1/2)*a^2-8*((a+cos(d*x+c)*b)/(1+cos(d*x+c))/(a+b))
^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*b^2-3*a^2*cos(d*x+c)*sin(d*x+c)+2*a*b*cos(d*x+c)*si
n(d*x+c))/(1+cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2)/b^2
```

Fricas [F]

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)}\,dx=\int \frac{1}{\sqrt{b\cos\left(dx+c\right)+a}\sec\left(dx+c\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/sec(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] integral(1/(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^(5/2)), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)}\,dx=\text{Timed out}$$

```
[In] integrate(1/sec(d*x+c)**(5/2)/(a+b*cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)}\,dx=\int \frac{1}{\sqrt{b\cos(dx+c)+a}\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/sec(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^(5/2)), x)
```

Giac [F]

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)}\,dx=\int \frac{1}{\sqrt{b\cos(dx+c)+a}\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/sec(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{a+b\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)}\,dx=\int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}\,\sqrt{a+b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^(1/2)),x)
[Out] int(1/((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^(1/2)), x)
```

3.757 $\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 397

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx =$$

$$-\frac{2b(5a^2-8b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^4\sqrt{a+b}d\sqrt{\sec(c+dx)}}$$

$$+\frac{2(a+2b)(a+4b)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{a(}}{3a^3\sqrt{a+b}d\sqrt{\sec(c+dx)}}$$

$$+\frac{2b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{a(a^2-b^2)d\sqrt{a+b\cos(c+dx)}}+\frac{2(a^2-4b^2)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2(a^2-b^2)d}$$

```
[Out] 2*b^2*sec(d*x+c)^(3/2)*sin(d*x+c)/a/(a^2-b^2)/d/(a+b*cos(d*x+c))^(1/2)+2/3*
(a^2-4*b^2)*sec(d*x+c)^(3/2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)/a^2/(a^2-b^2
)/d-2/3*b*(5*a^2-8*b^2)*csc(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(
1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+
c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^4/d/(a+b)^(1/2)/sec(d*x+c
)^(1/2)+2/3*(a+2*b)*(a+4*b)*csc(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+
b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*cos(d*x+c)^(1/2)*(a*(1-sec(
d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^3/d/(a+b)^(1/2)/sec(d
*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.97 (sec) , antiderivative size = 397, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4307, 2881, 3134, 3077, 2895, 3073}

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2(a+2b)(a+4b)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{Ellip}}{3a^3d\sqrt{a+b}\sqrt{\sec(c+dx)}}$$

$$+\frac{2b^2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{ad(a^2-b^2)\sqrt{a+b\cos(c+dx)}}+\frac{2(a^2-4b^2)\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{3a^2d(a^2-b^2)}-\frac{2b(5a^2-8b^2)}{}$$

```
[In] Int[Sec[c + d*x]^(5/2)/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-2*b*(5*a^2 - 8*b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[Sqrt
[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]
*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])
/(3*a^4*Sqrt[a + b]*d*Sqrt[Sec[c + d*x]]) + (2*(a + 2*b)*(a + 4*b)*Sqrt[Cos
[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a +
 b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(
a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a^3*Sqrt[a + b]*d*Sqrt[Sec
[c + d*x]]) + (2*b^2*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(a*(a^2 - b^2)*d*Sqrt
[a + b*Cos[c + d*x]]) + (2*(a^2 - 4*b^2)*Sqrt[a + b*Cos[c + d*x]]*Sec[c + d
*x]^(3/2)*Sin[c + d*x])/(3*a^2*(a^2 - b^2)*d)
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
```

```
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx$$

$$= \frac{2b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{a\left(a^2-b^2\right)d\sqrt{a+b\cos(c+dx)}} + \frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{1}{2}\left(a^2-4b^2\right)-\frac{1}{2}ab\cos(c+dx)+b^2\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{a\left(a^2-b^2\right)}$$

$$= \frac{2b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{a\left(a^2-b^2\right)d\sqrt{a+b\cos(c+dx)}} + \frac{2\left(a^2-4b^2\right)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2\left(a^2-b^2\right)d} + \frac{\left(4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{1}{4}b\left(5a^2-8b^2\right)+\frac{1}{4}a\left(a^2+2b^2\right)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{3a^2\left(a^2-b^2\right)}$$

$$= \frac{2b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{a\left(a^2-b^2\right)d\sqrt{a+b\cos(c+dx)}} + \frac{2\left(a^2-4b^2\right)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2\left(a^2-b^2\right)d} + \frac{\left((a-b)(a+2b)(a+4b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{3a^2\left(a^2-b^2\right)} - \frac{\left(b\left(5a^2-8b^2\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{3a^2\left(a^2-b^2\right)}$$

$$= -\frac{2b\left(5a^2-8b^2\right)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+s}{}}}{3a^4\sqrt{a+b}d\sqrt{\sec(c+dx)}} + \frac{2(a+2b)(a+4b)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c}{a+b}}}{3a^3\sqrt{a+b}d\sqrt{\sec(c+dx)}} + \frac{2b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{a\left(a^2-b^2\right)d\sqrt{a+b\cos(c+dx)}} + \frac{2\left(a^2-4b^2\right)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2\left(a^2-b^2\right)d}$$

Mathematica [A] (warning: unable to verify)

Time = 11.41 (sec) , antiderivative size = 440, normalized size of antiderivative = 1.11

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = -\frac{2\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)\sec(c+dx)}\left(2b(-5a^3-5a^2b+8ab^2+8b^3)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\left(\arcsin\left(\mathrm{t}\right.\right.\right.}{}$$

$$+\frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\left(-\frac{2b(5a^2-8b^2)\sin(c+dx)}{3a^3(a^2-b^2)}-\frac{2b^3\sin(c+dx)}{a^2(a^2-b^2)(a+b\cos(c+dx))}+\frac{2\tan(c+dx)}{3a^2}\right)}{d}$$

```
[In] Integrate[Sec[c + d*x]^(5/2)/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-2*Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*(2*b*(-5*a^3 - 5*a^2*b + 8*a*b^2
+ 8*b^3)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((
a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a
 + b)] - 2*a*(a^3 - 5*a^2*b + 2*a*b^2 + 8*b^3)*Sqrt[Cos[c + d*x]/(1 + Cos[c
 + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticF
[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + b*(-5*a^2 + 8*b^2)*Cos[c + d
*x]*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2*Tan[(c + d*x)/2]))/(3*a^3*(a^2
- b^2)*d*Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[(c + d*x)/2]^2]) + (Sqrt[a + b*C
os[c + d*x]]*Sqrt[Sec[c + d*x]]*((-2*b*(5*a^2 - 8*b^2)*Sin[c + d*x])/(3*a^3
*(a^2 - b^2)) - (2*b^3*Sin[c + d*x])/(a^2*(a^2 - b^2)*(a + b*Cos[c + d*x]))
 + (2*Tan[c + d*x])/(3*a^2)))/d
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 2617 vs. 2(359) = 718.

Time = 12.46 (sec) , antiderivative size = 2618, normalized size of antiderivative = 6.59

method	result	size
default	Expression too large to display	2618

```
[In] int(sec(d*x+c)^(5/2)/(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)
)^(5/2)*(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)*(5*csc(d*x+c)^2*EllipticF(cot(d*x
+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+
1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+
a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-5*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b
)/(a+b))^(1/2))*a^3*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)
^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+2*E
```

llipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^2*(-csc(d*x+c)^2
*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b
*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+8*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-
b)/(a+b))^(1/2))*a*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c
)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+5*
EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b*(-csc(d*x+c)^2*
(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*
(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+5*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b
)/(a+b))^(1/2))*a^2*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+
c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-8
*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^3*(-csc(d*x+c)^2
*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b
*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d
*x+c),(-(a-b)/(a+b))^(1/2))*a^4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((
csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))
^(1/2)*(1-cos(d*x+c))^2-8*csc(d*x+c)^5*b^4*(1-cos(d*x+c))^5-2*csc(d*x+c)^3*
a^4*(1-cos(d*x+c))^3+16*csc(d*x+c)^3*b^4*(1-cos(d*x+c))^3+3*a^3*b*(csc(d*x+
c)-cot(d*x+c))+7*a^2*b^2*(csc(d*x+c)-cot(d*x+c))-2*csc(d*x+c)^2*EllipticF(c
ot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^2*(-csc(d*x+c)^2*(1-cos(d*
x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*
x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-8*csc(d*x+c)^2*EllipticF(cot(d*x
+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+
1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+
a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-5*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(
d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)
*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+
b))^(1/2)*(1-cos(d*x+c))^2-5*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(
-(a-b)/(a+b))^(1/2))*a^2*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc
(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1
/2)*(1-cos(d*x+c))^2+8*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)
/(a+b))^(1/2))*a*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^
2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-c
os(d*x+c))^2-5*csc(d*x+c)^5*a^3*b*(1-cos(d*x+c))^5-8*csc(d*x+c)^3*a*b^3*(1-
cos(d*x+c))^3+5*csc(d*x+c)^5*a^2*b^2*(1-cos(d*x+c))^5+8*csc(d*x+c)^5*a*b^3*
(1-cos(d*x+c))^5+2*csc(d*x+c)^3*a^3*b*(1-cos(d*x+c))^3-8*csc(d*x+c)^3*a^2*b
^2*(1-cos(d*x+c))^3+EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a
^4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))
^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-8*EllipticE(cot(d*x+c)
-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1
/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/
(a+b))^(1/2)+8*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^
(1/2))*b^4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos
(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))
^2-2*a^4*(csc(d*x+c)-cot(d*x+c))-8*b^4*(csc(d*x+c)-cot(d*x+c)))*((csc(d*x+c
)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(

```
1-cos(d*x+c))^2+1))^(1/2)/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(
1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^2/(a+b)/(a-b)/a^3
```

Fricas [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^(5/2)/(b^2*cos(d*x + c)^2 +
2*a*b*cos(d*x + c) + a^2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(5/2)/(a+b*cos(d*x+c))**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^(5/2)/(b*cos(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(5/2)/(b*cos(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx=\int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}}{(a+b\,\cos\left(c+d\,x\right))^{3/2}}\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)/(a + b*cos(c + d*x))^(3/2),x)
[Out] int((1/cos(c + d*x))^(5/2)/(a + b*cos(c + d*x))^(3/2), x)
```

3.758 $\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 325

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2(a^2-2b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(\cdots}{}}}{a^3\sqrt{a+b}d\sqrt{\sec(c+dx)}}$$
$$-\frac{2(a+2b)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+d\cdots}{a-b}}}{a^2\sqrt{a+b}d\sqrt{\sec(c+dx)}}$$
$$+\frac{2b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{a(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] 2*b^2*sin(d*x+c)*sec(d*x+c)^(1/2)/a/(a^2-b^2)/d/(a+b*cos(d*x+c))^(1/2)+2*(a
^2-2*b^2)*csc(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c
)^(1/2),((-a-b)/(a-b))^(1/2))*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/
2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^3/d/(a+b)^(1/2)/sec(d*x+c)^(1/2)-2*(a+2
*b)*csc(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2
),((-a-b)/(a-b))^(1/2))*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*
(1+sec(d*x+c))/(a-b))^(1/2)/a^2/d/(a+b)^(1/2)/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.67 (sec) , antiderivative size = 325, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4307, 2881, 3077, 2895, 3073}

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = -\frac{2(a+2b)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{a^2d\sqrt{a+b}\sqrt{\sec(c+dx)}} + \frac{2b^2\sin(c+dx)\sqrt{\sec(c+dx)}}{ad(a^2-b^2)\sqrt{a+b\cos(c+dx)}} + \frac{2(a^2-2b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{a^3d\sqrt{a+b}\sqrt{\sec(c+dx)}}$$

```
[In] Int[Sec[c + d*x]^(3/2)/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*(a^2 - 2*b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[Sqrt[a +
b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt
[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(a^3
*Sqrt[a + b]*d*Sqrt[Sec[c + d*x]]) - (2*(a + 2*b)*Sqrt[Cos[c + d*x]]*Csc[c
+ d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c +
d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(
1 + Sec[c + d*x]))/(a - b)])/(a^2*Sqrt[a + b]*d*Sqrt[Sec[c + d*x]]) + (2*b^
2*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(a*(a^2 - b^2)*d*Sqrt[a + b*Cos[c + d*x]
])
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
```

```
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx$$

$$= \frac{2b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{a\,(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}} + \frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{1}{2}(a^2-2b^2)-\frac{1}{2}ab\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{a\,(a^2-b^2)}$$

$$= \frac{2b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{a(a^2-b^2)d\sqrt{a+b\cos(c+dx)}}$$
$$- \frac{\left((a-b)(a+2b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{a(a^2-b^2)}$$
$$- \frac{\left((-a^2+2b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{a(a^2-b^2)}$$

$$= \frac{2(a^2-2b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+}{a-b}}}{a^3\sqrt{a+b}d\sqrt{\sec(c+dx)}}$$
$$- \frac{2(a+2b)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{}}{a^2\sqrt{a+b}d\sqrt{\sec(c+dx)}}$$
$$+ \frac{2b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{a(a^2-b^2)d\sqrt{a+b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 7.42 (sec) , antiderivative size = 369, normalized size of antiderivative = 1.14

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2\left((ab^2+(a^2-2b^2)(a+b\cos(c+dx)))\sqrt{\sec^2\left(\frac{1}{2}(c+dx)\right)}\sqrt{\sec(c+dx)}\sin(c}{}$$

```
[In] Integrate[Sec[c + d*x]^(3/2)/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*((a*b^2 + (a^2 - 2*b^2)*(a + b*Cos[c + d*x]))*Sqrt[Sec[(c + d*x)/2]^2]*S
qrt[Sec[c + d*x]]*Sin[c + d*x] - Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*(2*(
a^3 + a^2*b - 2*a*b^2 - 2*b^3)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(
a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c +
 d*x)/2]], (-a + b)/(a + b)] - 2*a*(a^2 - a*b - 2*b^2)*Sqrt[Cos[c + d*x]/(1
 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*E
llipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + (a^2 - 2*b^2)*Cos[c
+ d*x]*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2*Tan[(c + d*x)/2])))/(a^2*(a^
2 - b^2)*d*Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[(c + d*x)/2]^2])
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 1227 vs. 2(297) = 594.

Time = 11.52 (sec) , antiderivative size = 1228, normalized size of antiderivative = 3.78

method	result	size
default	Expression too large to display	1228

```
[In] int(sec(d*x+c)^(3/2)/(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1))
^(3/2)*(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)*(-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+
1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+
a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3
+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2
-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc
(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b+2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1
/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/
(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2+(-
csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-cs
c(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*
x+c),(-(a-b)/(a+b))^(1/2))*a^3+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((c
sc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^
(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b-2*(-csc(d
*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x
+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),
(-(a-b)/(a+b))^(1/2))*a*b^2-2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((cs
c(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(
1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^3+csc(d*x+c)^3
*a^3*(1-cos(d*x+c))^3-csc(d*x+c)^3*a^2*b*(1-cos(d*x+c))^3-2*csc(d*x+c)^3*a*
b^2*(1-cos(d*x+c))^3+2*csc(d*x+c)^3*b^3*(1-cos(d*x+c))^3+a^3*(csc(d*x+c)-co
t(d*x+c))+a^2*b*(csc(d*x+c)-cot(d*x+c))-2*b^3*(csc(d*x+c)-cot(d*x+c)))*((cs
c(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x
+c)^2*(1-cos(d*x+c))^2+1))^(1/2)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(csc(d*x
+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/a^2/(a-b)/(a+
b)
```

Fricas [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{3}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^(3/2)/(b^2*cos(d*x + c)^2 +
2*a*b*cos(d*x + c) + a^2), x)
```

Sympy [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec^{\frac{3}{2}}\left(c+dx\right)}{\left(a+b\cos\left(c+dx\right)\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)**(3/2)/(a+b*cos(d*x+c))**(3/2),x)
[Out] Integral(sec(c + d*x)**(3/2)/(a + b*cos(c + d*x))**(3/2), x)
```

Maxima [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{3}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^(3/2)/(b*cos(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{3}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(3/2)/(b*cos(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}{\left(a+b\,\cos\left(c+d\,x\right)\right)^{3/2}}\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)/(a + b*cos(c + d*x))^(3/2),x)
[Out] int((1/cos(c + d*x))^(3/2)/(a + b*cos(c + d*x))^(3/2), x)
```

3.759 $\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 307

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2b\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\cdots}}{a^2\sqrt{a+b}d\sqrt{\sec(c+dx)}}$$
$$+\frac{2\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{a\sqrt{a+b}d\sqrt{\sec(c+dx)}}$$
$$-\frac{2b\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] -2*b*sin(d*x+c)*sec(d*x+c)^(1/2)/(a^2-b^2)/d/(a+b*cos(d*x+c))^(1/2)+2*b*csc
(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-
b)/(a-b))^(1/2))*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(
d*x+c))/(a-b))^(1/2)/a^2/d/(a+b)^(1/2)/sec(d*x+c)^(1/2)+2*csc(d*x+c)*Ellipt
icF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2
))*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))
^(1/2)/a/d/(a+b)^(1/2)/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 307, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used

$= \{4307, 2879, 3077, 2895, 3073\}$

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2b\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos}}{\sqrt{a+b}\sqrt{\cos}}\right.\right.}{a^2d\sqrt{a+b}\sqrt{\sec(c+dx)}}$$
$$-\frac{2b\sin(c+dx)\sqrt{\sec(c+dx)}}{d\left(a^2-b^2\right)\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{2\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{ad\sqrt{a+b}\sqrt{\sec(c+dx)}}$$

```
[In] Int[Sqrt[Sec[c + d*x]]/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*b*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*
x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec
[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(a^2*Sqrt[a + b]
*d*Sqrt[Sec[c + d*x]]) + (2*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSi
n[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a
- b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a
- b)])/(a*Sqrt[a + b]*d*Sqrt[Sec[c + d*x]]) - (2*b*Sqrt[Sec[c + d*x]]*Sin[c
 + d*x])/((a^2 - b^2)*d*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2879

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*((a_) + (b_.)*sin[(e_.) + (f_.)*
(x_)])^(3/2)), x_Symbol] :> Simp[2*b*(Cos[e + f*x]/(f*(a^2 - b^2)*Sqrt[a +
b*Sin[e + f*x]]*Sqrt[d*Sin[e + f*x]])), x] + Dist[d/(a^2 - b^2), Int[(b + a
*Sin[e + f*x])/(Sqrt[a + b*Sin[e + f*x]]*(d*Sin[e + f*x])^(3/2)), x], x] /;
 FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
```

```
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx$$

$$= -\frac{2b\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}} + \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{b+a\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{a^2-b^2}$$

$$= -\frac{2b\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}} + \frac{\left((a-b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{a^2-b^2} + \frac{\left(b\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{a^2-b^2}$$

$$= \frac{2b\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{a^2\sqrt{a+b}d\sqrt{\sec(c+dx)}} + \frac{2\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{a\sqrt{a+b}d\sqrt{\sec(c+dx)}} - \frac{2b\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 6.23 (sec) , antiderivative size = 237, normalized size of antiderivative = 0.77

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx = \frac{2\sqrt{\sec(c+dx)}\Big(-2b(a+b)\cos^2\left(\frac{1}{2}(c+dx)\right)\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\big(\arcsin\left(\tan\right.}{}$$

```
[In] Integrate[Sqrt[Sec[c + d*x]]/(a + b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*Sqrt[Sec[c + d*x]]*(-2*b*(a + b)*Cos[(c + d*x)/2]^2*Sqrt[(a + b*Cos[c +
d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a
 + b)/(a + b)]*Sqrt[(1 + Sec[c + d*x])^(-1)] + 2*a*(a + b)*Cos[(c + d*x)/2]
^2*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticF[ArcSin
[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[(1 + Sec[c + d*x])^(-1)] + b*(-a
 + b)*Cos[c + d*x]*Tan[(c + d*x)/2]))/(a*(a^2 - b^2)*d*Sqrt[a + b*Cos[c + d
*x]])
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 749 vs. 2(279) = 558.

Time = 9.05 (sec) , antiderivative size = 750, normalized size of antiderivative = 2.44

method	result
default	$\frac{2\sqrt{-\frac{(\csc^2(dx+c))(1-\cos(dx+c))^2+1}{(\csc^2(dx+c))(1-\cos(dx+c))^2-1}}\sqrt{\frac{(\csc^2(dx+c))a(1-\cos(dx+c))^2-(\csc^2(dx+c))b(1-\cos(dx+c))^2+a+b}{(\csc^2(dx+c))(1-\cos(dx+c))^2+1}}\left(-\sqrt{-(\csc^2(dx+c))(1-\cos(d\right.}{}$

```
[In] int(sec(d*x+c)^(1/2)/(a+cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1))^
(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b
)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2)*(-(-csc(d*x+c)^2*(1-cos(d*x+c))^
2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^
2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a
^2-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))
^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-c
sc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2
)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a
+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b+(-csc(
d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*
x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c)
,(-(a-b)/(a+b))^(1/2))*b^2+csc(d*x+c)^3*a*b*(1-cos(d*x+c))^3-csc(d*x+c)^3*b
^2*(1-cos(d*x+c))^3-a*b*(csc(d*x+c)-cot(d*x+c))+b^2*(csc(d*x+c)-cot(d*x+c))
```

```
)/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/a/(
a-b)/(a+b)
```

Fricas [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sqrt{\sec\left(dx+c\right)}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*sqrt(sec(d*x + c))/(b^2*cos(d*x + c)^2 +
2*a*b*cos(d*x + c) + a^2), x)
```

Sympy [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sqrt{\sec\left(c+dx\right)}}{\left(a+b\cos\left(c+dx\right)\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)**(1/2)/(a+b*cos(d*x+c))**(3/2),x)
[Out] Integral(sqrt(sec(c + d*x))/(a + b*cos(c + d*x))**(3/2), x)
```

Maxima [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sqrt{\sec\left(dx+c\right)}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(sqrt(sec(d*x + c))/(b*cos(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sqrt{\sec\left(dx+c\right)}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(sqrt(sec(d*x + c))/(b*cos(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sqrt{\frac{1}{\cos(c+d\,x)}}}{(a+b\,\cos(c+d\,x))^{3/2}}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)/(a + b*cos(c + d*x))^(3/2),x)
[Out] int((1/cos(c + d*x))^(1/2)/(a + b*cos(c + d*x))^(3/2), x)
```

3.760 $\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 306

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\,dx = -\frac{2\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{a\sqrt{a+b}d\sqrt{\sec(c+dx)}}$$
$$+\frac{2\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{a\sqrt{a+b}d\sqrt{\sec(c+dx)}}$$
$$+\frac{2a\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] 2*a*sin(d*x+c)*sec(d*x+c)^(1/2)/(a^2-b^2)/d/(a+b*cos(d*x+c))^(1/2)-2*csc(d*
x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/
(a-b))^(1/2))*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x
+c))/(a-b))^(1/2)/a/d/(a+b)^(1/2)/sec(d*x+c)^(1/2)+2*csc(d*x+c)*EllipticF((
a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*co
s(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2
)/a/d/(a+b)^(1/2)/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.50 (sec) , antiderivative size = 306, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4307, 2873, 2874, 2895, 3073}

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\,dx = \frac{2a\sin(c+dx)\sqrt{\sec(c+dx)}}{d(a^2-b^2)\sqrt{a+b\cos(c+dx)}} + \frac{2\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{ad\sqrt{a+b}\sqrt{\sec(c+dx)}} - \frac{2\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{ad\sqrt{a+b}\sqrt{\sec(c+dx)}}$$

```
[In] Int[1/((a + b*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (-2*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x
]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[
c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(a*Sqrt[a + b]*d*
Sqrt[Sec[c + d*x]]) + (2*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSin[S
qrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b
))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b
)])/(a*Sqrt[a + b]*d*Sqrt[Sec[c + d*x]]) + (2*a*Sqrt[Sec[c + d*x]]*Sin[c +
d*x])/((a^2 - b^2)*d*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2873

```
Int[Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_
)])^(3/2), x_Symbol] :> Simp[-2*a*d*(Cos[e + f*x]/(f*(a^2 - b^2)*Sqrt[a + b
*Sin[e + f*x]]*Sqrt[d*Sin[e + f*x]])), x] - Dist[d^2/(a^2 - b^2), Int[Sqrt[
a + b*Sin[e + f*x]]/(d*Sin[e + f*x])^(3/2), x], x] /; FreeQ[{a, b, d, e, f}
, x] && NeQ[a^2 - b^2, 0]
```

Rule 2874

```
Int[Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]/((a_.) + (b_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Dist[(c - d)/(a - b), Int[1/(Sqrt[a + b*Sin
[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]), x], x] - Dist[(b*c - a*d)/(a - b), In
t[(1 + Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
```

```
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx$$

$$= \frac{2a\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx}{a^2-b^2}$$

$$= \frac{2a\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}} - \frac{\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{a^2-b^2} - \frac{\left((-a+b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{a^2-b^2}$$

$$= -\frac{2\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{a\sqrt{a+b}d\sqrt{\sec(c+dx)}} + \frac{2\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+}{a-b}}}{a\sqrt{a+b}d\sqrt{\sec(c+dx)}} + \frac{2a\sqrt{\sec(c+dx)}\sin(c+dx)}{(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 2.62 (sec) , antiderivative size = 235, normalized size of antiderivative = 0.77

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\,dx = \frac{\sec^2\left(\frac{1}{2}(c+dx)\right)\left((a+b\cos(c+dx))E\left(\arcsin\left(\tan\left(\frac{1}{2}(c+dx)\right)\right.\right.\right.}{(a^2 -}$$

```
[In] Integrate[1/((a + b*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (Sec[(c + d*x)/2]^2*((a + b*Cos[c + d*x])*EllipticE[ArcSin[Tan[(c + d*x)/2]
], (-a + b)/(a + b)] - (a + b*Cos[c + d*x])*EllipticF[ArcSin[Tan[(c + d*x)/
2]], (-a + b)/(a + b)] + (a - b)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt
[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*Sin[c + d*x]))/((a^2 -
b^2)*d*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[a + b*Cos[c + d*x]]*Sqrt[
(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*Sqrt[Sec[c + d*x]])
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 782 vs. 2(278) = 556.

Time = 6.09 (sec) , antiderivative size = 783, normalized size of antiderivative = 2.56

method	result
default	$\frac{2\left(\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1\right)\sqrt{\frac{\left(\csc^2(dx+c)\right)a(1-\cos(dx+c))^2-\left(\csc^2(dx+c)\right)b(1-\cos(dx+c))^2+a+b}{\left(\csc^2(dx+c)\right)(1-\cos(dx+c))^2+1}}\left(-\sqrt{-(\csc^2(dx+c))(1-\cos(\right.}{}$

```
[In] int(1/(a+cos(d*x+c)*b)^(3/2)/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d*(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc
(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2)*
(-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^
2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-cs
c(d*x+c),(-(a-b)/(a+b))^(1/2))*a-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(
(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b)
)^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b+(-csc(d*x+c
)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^
2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a
-b)/(a+b))^(1/2))*a+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2
*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*Ellip
ticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b+csc(d*x+c)^3*(1-cos(d*x+
c))^3*a-csc(d*x+c)^3*(1-cos(d*x+c))^3*b-a*(csc(d*x+c)-cot(d*x+c))+b*(csc(d*
x+c)-cot(d*x+c)))/(-(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(csc(d*x+c)^2*(1-cos(
```

```
d*x+c))^2-1))^(1/2)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*a*(1-co
s(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a-b)/(a+b)
```

Fricas [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\,dx=\int \frac{1}{(b\cos(dx+c)+a)^{\frac{3}{2}}\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)/((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c)
 + a^2)*sqrt(sec(d*x + c))), x)
```

Sympy [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\,dx=\int \frac{1}{(a+b\cos(c+dx))^{\frac{3}{2}}\sqrt{\sec(c+dx)}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))**(3/2)/sec(d*x+c)**(1/2),x)
[Out] Integral(1/((a + b*cos(c + d*x))**(3/2)*sqrt(sec(c + d*x))), x)
```

Maxima [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\,dx=\int \frac{1}{(b\cos(dx+c)+a)^{\frac{3}{2}}\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^(3/2)*sqrt(sec(d*x + c))), x)
```

Giac [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\,dx=\int \frac{1}{(b\cos(dx+c)+a)^{\frac{3}{2}}\sqrt{\sec(dx+c)}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^(3/2)*sqrt(sec(d*x + c))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\,dx=\int \frac{1}{\sqrt{\frac{1}{\cos(c+d\,x)}}\,\left(a+b\,\cos\left(c+d\,x\right)\right)^{3/2}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^(3/2)),x)
[Out] int(1/((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^(3/2)), x)
```

3.761 $\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 447

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{a}}{b\sqrt{a+b}d\sqrt{\sec(c+dx)}}$$

$$-\frac{2\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{b\sqrt{a+b}d\sqrt{\sec(c+dx)}}$$

$$-\frac{2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(}{a-}}}{b^2d\sqrt{\sec(c+dx)}}$$

$$-\frac{2a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] -2*a^2*sin(d*x+c)*sec(d*x+c)^(1/2)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))^(1/2)+2*c
sc(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-
a-b)/(a-b))^(1/2))*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+se
c(d*x+c))/(a-b))^(1/2)/b/d/(a+b)^(1/2)/sec(d*x+c)^(1/2)-2*csc(d*x+c)*Ellipt
icF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2
))*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))
^(1/2)/b/d/(a+b)^(1/2)/sec(d*x+c)^(1/2)-2*csc(d*x+c)*EllipticPi((a+b*cos(d*
x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b)/(a-b))^(1/2))*(a+b
)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(
a-b))^(1/2)/b^2/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.74 (sec) , antiderivative size = 447, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {4307, 2876, 2888, 2873, 2874, 2895, 3073}

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = -\frac{2a^2\sin(c+dx)\sqrt{\sec(c+dx)}}{bd\,(a^2-b^2)\,\sqrt{a+b\cos(c+dx)}}$$
$$-\frac{2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),\right.}{b^2d\sqrt{\sec(c+dx)}}$$
$$-\frac{2\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{bd\sqrt{a+b}\sqrt{\sec(c+dx)}}$$
$$+\frac{2\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{bd\sqrt{a+b}\sqrt{\sec(c+dx)}}$$

```
[In] Int[1/((a + b*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(3/2)),x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*x]
]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c
 + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(b*Sqrt[a + b]*d*S
qrt[Sec[c + d*x]]) - (2*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSin[Sq
rt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b)
)]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)
])/(b*Sqrt[a + b]*d*Sqrt[Sec[c + d*x]]) - (2*Sqrt[a + b]*Sqrt[Cos[c + d*x]]
*Csc[c + d*x]*EllipticPi[(a + b)/b, ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a
 + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))
/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(b^2*d*Sqrt[Sec[c + d*x]])
- (2*a^2*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(b*(a^2 - b^2)*d*Sqrt[a + b*Cos[c
 + d*x]])
```

Rule 2873

```
Int[Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_
)])^(3/2), x_Symbol] :> Simp[-2*a*d*(Cos[e + f*x]/(f*(a^2 - b^2)*Sqrt[a + b
*Sin[e + f*x]]*Sqrt[d*Sin[e + f*x]])), x] - Dist[d^2/(a^2 - b^2), Int[Sqrt[
a + b*Sin[e + f*x]]/(d*Sin[e + f*x])^(3/2), x], x] /; FreeQ[{a, b, d, e, f}
, x] && NeQ[a^2 - b^2, 0]
```

Rule 2874

```
Int[Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]/((a_.) + (b_.)*sin[(e_.) + (
f_.)*(x_)])^(3/2), x_Symbol] :> Dist[(c - d)/(a - b), Int[1/(Sqrt[a + b*Sin
[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]), x], x] - Dist[(b*c - a*d)/(a - b), In
```

t[(1 + Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]

Rule 2876

Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2), x_Symbol] :> Dist[d/b, Int[Sqrt[d*Sin[e + f*x]]/Sqrt[a + b*Sin[e + f*x]], x], x] - Dist[a*(d/b), Int[Sqrt[d*Sin[e + f*x]]/(a + b*Sin[e + f*x])^(3/2), x], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]

Rule 2888

Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] && PosQ[(c + d)/b]

Rule 2895

Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqrt[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*EllipticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0] && PosQ[(a + b)/d]

Rule 3073

Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] && PosQ[(c + d)/b]

Rule 4307

Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a + b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x] /; FreeQ[{a, b, c, m}, x] && !IntegerQ[m] && KnownSineIntegrandQ[u, x]

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx$$

$$= \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx}{b} - \frac{\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{3/2}}\,dx}{b}$$

$$= -\frac{2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+d}{a+b}}}{b^2d\sqrt{\sec(c+dx)}} - \frac{2a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{b(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}} + \frac{\left(a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{a+b\cos(c+dx)}}{\cos^{\frac{3}{2}}(c+dx)}\,dx}{b(a^2-b^2)}$$

$$= -\frac{2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+d}{a+b}}}{b^2d\sqrt{\sec(c+dx)}} - \frac{2a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{b(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}} + \frac{\left(a^2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{b(a^2-b^2)} + \frac{\left(a(-a+b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{b(a^2-b^2)}$$

$$= \frac{2\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{b\sqrt{a+b}d\sqrt{\sec(c+dx)}} - \frac{2\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c}{a-b}}}{b\sqrt{a+b}d\sqrt{\sec(c+dx)}} - \frac{2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+d}{a+b}}}{b^2d\sqrt{\sec(c+dx)}} - \frac{2a^2\sqrt{\sec(c+dx)}\sin(c+dx)}{b(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 15.62 (sec) , antiderivative size = 893, normalized size of antiderivative = 2.00

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\left(\frac{2a\sin(c+dx)}{b(a^2-b^2)}+\frac{2a^2\sin(c+dx)}{b(-a^2+b^2)(a+b\cos(c+dx))}\right)}{d}$$
$$-\frac{2\left(-a^2\tan\left(\frac{1}{2}(c+dx)\right)-ab\tan\left(\frac{1}{2}(c+dx)\right)+2ab\tan^3\left(\frac{1}{2}(c+dx)\right)+a^2\tan^5\left(\frac{1}{2}(c+dx)\right)-ab\tan^5\left(\frac{1}{2}(c+\right.\right.}{}$$

```
[In] Integrate[1/((a + b*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(3/2)),x]
```

```
[Out] (Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*((2*a*Sin[c + d*x])/(b*(a^2 -
b^2)) + (2*a^2*Sin[c + d*x])/(b*(-a^2 + b^2)*(a + b*Cos[c + d*x]))))/d - (2
*(-(a^2*Tan[(c + d*x)/2]) - a*b*Tan[(c + d*x)/2] + 2*a*b*Tan[(c + d*x)/2]^3
 + a^2*Tan[(c + d*x)/2]^5 - a*b*Tan[(c + d*x)/2]^5 + 2*a^2*EllipticPi[-1, A
rcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqr
t[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] - 2*b^2*El
lipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c +
d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a +
b)] + 2*a^2*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Tan[
(c + d*x)/2]^2*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2
]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] - 2*b^2*EllipticPi[-1, ArcSin[Tan[(c +
 d*x)/2]], (-a + b)/(a + b)]*Tan[(c + d*x)/2]^2*Sqrt[1 - Tan[(c + d*x)/2]^2
]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] - a*(
a + b)*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(
c + d*x)/2]^2]*(1 + Tan[(c + d*x)/2]^2)*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2
- b*Tan[(c + d*x)/2]^2)/(a + b)] + b*(a + b)*EllipticF[ArcSin[Tan[(c + d*x)
/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/2]^2]*(1 + Tan[(c + d*x)/2]^
2)*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)]))/(b
*(a^2 - b^2)*d*Sqrt[(1 - Tan[(c + d*x)/2]^2)^(-1)]*(-1 + Tan[(c + d*x)/2]^2
)*(1 + Tan[(c + d*x)/2]^2)^(3/2)*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan
[(c + d*x)/2]^2)/(1 + Tan[(c + d*x)/2]^2)])
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 1035 vs. $2(407) = 814$.

Time = 8.92 (sec) , antiderivative size = 1036, normalized size of antiderivative = 2.32

method	result	size
default	Expression too large to display	1036

[In] int(1/(a+cos(d*x+c)*b)^(3/2)/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)

[Out] 2/d*(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^2*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2)*(-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^2+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b-2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a^2+2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*b^2+csc(d*x+c)^3*a^2*(1-cos(d*x+c))^3-csc(d*x+c)^3*a*b*(1-cos(d*x+c))^3-a^2*(csc(d*x+c)-cot(d*x+c))+a*b*(csc(d*x+c)-cot(d*x+c)))/(-(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1))^(3/2)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)^2/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/b/(a-b)/(a+b)

Fricas [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\,dx=\int \frac{1}{(b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{3}{2}}}\,dx$$

[In] integrate(1/(a+b*cos(d*x+c))^(3/2)/sec(d*x+c)^(3/2),x, algorithm="fricas")

[Out] integral(sqrt(b*cos(d*x + c) + a)/((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)*sec(d*x + c)^(3/2)), x)

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\,dx=\text{Timed out}$$

[In] integrate(1/(a+b*cos(d*x+c))**(3/2)/sec(d*x+c)**(3/2),x)

[Out] Timed out

Maxima [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(3/2)/sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^(3/2)), x)
```

Giac [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(3/2)/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}(a+b\,\cos(c+d\,x))^{3/2}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^(3/2)),x)
[Out] int(1/((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^(3/2)), x)
```

3.762 $\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 525

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = -\frac{(3a^2-b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{ab^2\sqrt{a+b}d\sqrt{\sec(c+dx)}}$$
$$+\frac{(3a+b)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx)}{a-b}}}{b^2\sqrt{a+b}d\sqrt{\sec(c+dx)}}$$
$$+\frac{3a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+s}{}}}{b^3d\sqrt{\sec(c+dx)}}$$
$$-\frac{2a^2\sin(c+dx)}{b(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}}$$
$$+\frac{(3a^2-b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{b^2(a^2-b^2)\,d}$$

```
[Out] -2*a^2*sin(d*x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))^(1/2)/sec(d*x+c)^(1/2)+(3*
a^2-b^2)*sin(d*x+c)*(a+b*cos(d*x+c))^(1/2)*sec(d*x+c)^(1/2)/b^2/(a^2-b^2)/d
-(3*a^2-b^2)*csc(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*
x+c)^(1/2),((-a-b)/(a-b))^(1/2))*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^
(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/b^2/d/(a+b)^(1/2)/sec(d*x+c)^(1/2)+(
3*a+b)*csc(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(
1/2),((-a-b)/(a-b))^(1/2))*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*
(a*(1+sec(d*x+c))/(a-b))^(1/2)/b^2/d/(a+b)^(1/2)/sec(d*x+c)^(1/2)+3*a*csc(d
*x+c)*EllipticPi((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/
b,((-a-b)/(a-b))^(1/2))*(a+b)^(1/2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b
))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/b^3/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 1.27 (sec) , antiderivative size = 525, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {4307, 2871, 3140, 3132, 2888, 3077, 2895, 3073}

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)}\,dx =$$
$$-\frac{(3a^2-b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{ab^2d\sqrt{a+b}\sqrt{\sec(c+dx)}}$$
$$-\frac{2a^2\sin(c+dx)}{bd(a^2-b^2)\sqrt{\sec(c+dx)}\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{(3a^2-b^2)\sin(c+dx)\sqrt{\sec(c+dx)}\sqrt{a+b\cos(c+dx)}}{b^2d(a^2-b^2)}$$
$$+\frac{3a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\right.}{b^3d\sqrt{\sec(c+dx)}}$$
$$+\frac{(3a+b)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{b^2d\sqrt{a+b}\sqrt{\sec(c+dx)}}$$

```
[In] Int[1/((a + b*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(5/2)),x]
```

```
[Out] -(((3*a^2 - b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[Sqrt[a +
b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt
[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(a*b
^2*Sqrt[a + b]*d*Sqrt[Sec[c + d*x]])) + ((3*a + b)*Sqrt[Cos[c + d*x]]*Csc[c
 + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c +
 d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*
(1 + Sec[c + d*x]))/(a - b)])/(b^2*Sqrt[a + b]*d*Sqrt[Sec[c + d*x]]) + (3*a
*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticPi[(a + b)/b, ArcSin[S
qrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b
))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b
)])/(b^3*d*Sqrt[Sec[c + d*x]]) - (2*a^2*Sin[c + d*x])/(b*(a^2 - b^2)*d*Sqrt
[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]) + ((3*a^2 - b^2)*Sqrt[a + b*Cos[c
+ d*x]]*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(b^2*(a^2 - b^2)*d)
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
```

```
b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3132

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)*Sqrt[(c_.) + (d_.)*sin[(e
_.) + (f_.)*(x_)]]), x_Symbol] :> Dist[C/b^2, Int[Sqrt[a + b*Sin[e + f*x]]/
Sqrt[c + d*Sin[e + f*x]], x], x] + Dist[1/b^2, Int[(A*b^2 - a^2*C + b*(b*B
- 2*a*C)*Sin[e + f*x])/((a + b*Sin[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]
), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] &&
NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 3140

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(c_) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]]), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*(Sqrt[c + d*Sin[e + f
*x]]/(d*f*Sqrt[a + b*Sin[e + f*x]])), x] + Dist[1/(2*d), Int[(1/((a + b*Sin
[e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]))*Simp[2*a*A*d - C*(b*c - a*d) -
2*(a*c*C - d*(A*b + a*B))*Sin[e + f*x] + (2*b*B*d - C*(b*c + a*d))*Sin[e +
f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*
d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{3/2}}\,dx \\
&= -\frac{2a^2\sin(c+dx)}{b\,(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}} \\
&\quad -\frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{a^2}{2}-\frac{1}{2}ab\cos(c+dx)-\frac{1}{2}(3a^2-b^2)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{b\,(a^2-b^2)} \\
&= -\frac{2a^2\sin(c+dx)}{b\,(a^2-b^2)\,d\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}} \\
&\quad +\frac{(3a^2-b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{b^2\,(a^2-b^2)\,d} \\
&\quad -\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{1}{2}a(3a^2-b^2)+a^2b\cos(c+dx)+\frac{3}{2}a(a^2-b^2)\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{b^2\,(a^2-b^2)}
\end{aligned}
$$

$$= -\frac{2a^2 \sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}} + \frac{(3a^2-b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{b^2(a^2-b^2)d} - \frac{\left(3a\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}dx}{2b^2} - \frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{1}{2}a(3a^2-b^2)+a^2b\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{b^2(a^2-b^2)}$$

$$= \frac{3a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b}, \arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right), -\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx}{a+b}}}{b^3d\sqrt{\sec(c+dx)}} - \frac{2a^2\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}} + \frac{(3a^2-b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{b^2(a^2-b^2)d} + \frac{\left(a(a-b)(3a+b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{2b^2(a^2-b^2)} - \frac{\left(a(3a^2-b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{2b^2(a^2-b^2)}$$

$$= -\frac{(3a^2-b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec}{a-}}}{ab^2\sqrt{a+b}d\sqrt{\sec(c+dx)}} + \frac{(3a+b)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right), -\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{}}{b^2\sqrt{a+b}d\sqrt{\sec(c+dx)}} + \frac{3a\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b}, \arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right), -\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+}{a+b}}}{b^3d\sqrt{\sec(c+dx)}} - \frac{2a^2\sin(c+dx)}{b(a^2-b^2)d\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}} + \frac{(3a^2-b^2)\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\sin(c+dx)}{b^2(a^2-b^2)d}$$

Mathematica [A] (verified)

Time = 13.21 (sec) , antiderivative size = 1025, normalized size of antiderivative = 1.95

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\left(-\frac{2a^2\sin(c+dx)}{b^2(a^2-b^2)}-\frac{2a^3\sin(c+dx)}{b^2(-a^2+b^2)(a+b\cos}\right.}{d}$$
$$-\frac{\sqrt{\frac{1}{1-\tan^2\left(\frac{1}{2}(c+dx)\right)}}\sqrt{\frac{a+b+a\tan^2\left(\frac{1}{2}(c+dx)\right)-b\tan^2\left(\frac{1}{2}(c+dx)\right)}{1+\tan^2\left(\frac{1}{2}(c+dx)\right)}}\left(-3a^3\tan\left(\frac{1}{2}(c+dx)\right)-3a^2b\tan\left(\frac{1}{2}(c+dx)\right)+ab^2\tan\right.}{}$$

```
[In] Integrate[1/((a + b*Cos[c + d*x])^(3/2)*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*((-2*a^2*Sin[c + d*x])/(b^2*(a
^2 - b^2)) - (2*a^3*Sin[c + d*x])/(b^2*(-a^2 + b^2)*(a + b*Cos[c + d*x]))))
/d - (Sqrt[(1 - Tan[(c + d*x)/2]^2)^(-1)]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^
2 - b*Tan[(c + d*x)/2]^2)/(1 + Tan[(c + d*x)/2]^2)]*(-3*a^3*Tan[(c + d*x)/2
] - 3*a^2*b*Tan[(c + d*x)/2] + a*b^2*Tan[(c + d*x)/2] + b^3*Tan[(c + d*x)/2
] + 6*a^2*b*Tan[(c + d*x)/2]^3 - 2*b^3*Tan[(c + d*x)/2]^3 + 3*a^3*Tan[(c +
d*x)/2]^5 - 3*a^2*b*Tan[(c + d*x)/2]^5 - a*b^2*Tan[(c + d*x)/2]^5 + b^3*Tan
[(c + d*x)/2]^5 + 6*a^3*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(
a + b)]*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b
*Tan[(c + d*x)/2]^2)/(a + b)] - 6*a*b^2*EllipticPi[-1, ArcSin[Tan[(c + d*x)
/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c
 + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] + 6*a^3*EllipticPi[-1, ArcSin
[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Tan[(c + d*x)/2]^2*Sqrt[1 - Tan[(c +
d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a +
b)] - 6*a*b^2*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Ta
n[(c + d*x)/2]^2*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)
/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] - (3*a^3 + 3*a^2*b - a*b^2 - b^3)*El
lipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/
2]^2]*(1 + Tan[(c + d*x)/2]^2)*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(
c + d*x)/2]^2)/(a + b)] + 2*a*b*(a + b)*EllipticF[ArcSin[Tan[(c + d*x)/2]],
 (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/2]^2]*(1 + Tan[(c + d*x)/2]^2)*Sq
rt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)]))/(b^2*(-
a^2 + b^2)*d*Sqrt[1 + Tan[(c + d*x)/2]^2]*(b*(-1 + Tan[(c + d*x)/2]^2) - a*
(1 + Tan[(c + d*x)/2]^2)))
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 2525 vs. 2(481) = 962.

Time = 8.87 (sec) , antiderivative size = 2526, normalized size of antiderivative = 4.81

method	result	size
default	Expression too large to display	2526

```
[In] int(1/(a+cos(d*x+c)*b)^(3/2)/sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)

[Out] 1/d*(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^2*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-c
sc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2
)*(-3*a^3*(csc(d*x+c)-cot(d*x+c))+b^3*(csc(d*x+c)-cot(d*x+c))-6*(-csc(d*x+c
)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^
2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,
(-(a-b)/(a+b))^(1/2))*a^3+3*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-
(a-b)/(a+b))^(1/2))*a^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+
c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(
1-cos(d*x+c))^2-csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-co
s(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c)
)^2-6*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*
a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*Ellipt
icPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a^3*(1-cos(d*x+c))^2+a*
b^2*(csc(d*x+c)-cot(d*x+c))+csc(d*x+c)^5*b^3*(1-cos(d*x+c))^5+2*csc(d*x+c)^
3*a^2*b*(1-cos(d*x+c))^3-2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d
*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2
)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b-2*(-csc(d*x+c
)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^
2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a
-b)/(a+b))^(1/2))*a*b^2+3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*
x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)
*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b-(-csc(d*x+c)^2
*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b
*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)
/(a+b))^(1/2))*a*b^2+6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c
)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*El
lipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a*b^2-csc(d*x+c)^5*
a*b^2*(1-cos(d*x+c))^5-3*csc(d*x+c)^5*a^2*b*(1-cos(d*x+c))^5+3*(-csc(d*x+c)
^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2
*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-
b)/(a+b))^(1/2))*a^3-(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^
2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*Elli
pticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^3+3*csc(d*x+c)^5*a^3*(1
-cos(d*x+c))^5-2*csc(d*x+c)^3*b^3*(1-cos(d*x+c))^3+a^2*b*(csc(d*x+c)-cot(d*
```

```
x+c))-2*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*
a^2*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+
c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-2*
csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2*(-
csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-cs
c(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+3*csc(d*x+
c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b*(-csc(d*x+
c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)
^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-csc(d*x+c)^2*Ellip
ticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2*(-csc(d*x+c)^2*(1-co
s(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-co
s(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+6*csc(d*x+c)^2*EllipticPi(co
t(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a*b^2*(-csc(d*x+c)^2*(1-cos(d*
x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*
x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2)/(-(csc(d*x+c)^2*(1-cos(d*x+c))^
2+1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1))^(5/2)/(csc(d*x+c)^2*(1-cos(d*x+c))^
2-1)^3/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b
)/b^2/(a-b)/(a+b)
```

Fricas [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(3/2)/sec(d*x+c)^(5/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)/((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c)
 + a^2)*sec(d*x + c)^(5/2)), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+b*cos(d*x+c))**(3/2)/sec(d*x+c)**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(3/2)/sec(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^(5/2)), x)
```

Giac [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(3/2)/sec(d*x+c)^(5/2),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^(3/2)*sec(d*x + c)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^{3/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}\,(a+b\,\cos(c+d\,x))^{3/2}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^(3/2)),x)
[Out] int(1/((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^(3/2)), x)
```

3.763 $\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 513

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = -\frac{8b(2a^4-7a^2b^2+4b^4)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(}{a-}}}{3a^5(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}}$$
$$+\frac{2(a^4+9a^3b+16a^2b^2-12ab^3-16b^4)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{3a^4(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}}$$
$$+\frac{2b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a(a^2-b^2)d(a+b\cos(c+dx))^{3/2}}+\frac{4b^2(5a^2-3b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2(a^2-b^2)^2d\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{2(a^4-13a^2b^2+8b^4)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^3(a^2-b^2)^2d}$$

```
[Out] 2/3*b^2*sec(d*x+c)^(3/2)*sin(d*x+c)/a/(a^2-b^2)/d/(a+b*cos(d*x+c))^(3/2)+4/
3*b^2*(5*a^2-3*b^2)*sec(d*x+c)^(3/2)*sin(d*x+c)/a^2/(a^2-b^2)^2/d/(a+b*cos(
d*x+c))^(1/2)+2/3*(a^4-13*a^2*b^2+8*b^4)*sec(d*x+c)^(3/2)*sin(d*x+c)*(a+b*c
os(d*x+c))^(1/2)/a^3/(a^2-b^2)^2/d-8/3*b*(2*a^4-7*a^2*b^2+4*b^4)*csc(d*x+c)
*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b
))^(1/2))*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))
/(a-b))^(1/2)/a^5/(a-b)/(a+b)^(3/2)/d/sec(d*x+c)^(1/2)+2/3*(a^4+9*a^3*b+16*
a^2*b^2-12*a*b^3-16*b^4)*csc(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^
(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*cos(d*x+c)^(1/2)*(a*(1-sec(d*x
+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^4/(a-b)/(a+b)^(3/2)/d/se
c(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 1.46 (sec) , antiderivative size = 513, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4307, 2881, 3134, 3077, 2895, 3073}

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{4b^2(5a^2-3b^2)\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3a^2d\,(a^2-b^2)^2\sqrt{a+b\cos(c+dx)}} + \frac{2b^2\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)}{3ad\,(a^2-b^2)\,(a+b\cos(c+dx))^{3/2}} - \frac{8b(2a^4-7a^2b^2+4b^4)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|}{3a^5d(a-b)(a+b)^{3/2}\sqrt{\sec(c+dx)}} + \frac{2(a^4+9a^3b+16a^2b^2-12ab^3-16b^4)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\text{EllipticF}\left(a\right.}{3a^4d(a-b)(a+b)^{3/2}\sqrt{\sec(c+dx)}} + \frac{2(a^4-13a^2b^2+8b^4)\sin(c+dx)\sec^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}{3a^3d\,(a^2-b^2)^2}$$

```
[In] Int[Sec[c + d*x]^(5/2)/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (-8*b*(2*a^4 - 7*a^2*b^2 + 4*b^4)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE
[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a +
b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]
))/(a - b)])/(3*a^5*(a - b)*(a + b)^(3/2)*d*Sqrt[Sec[c + d*x]]) + (2*(a^4 +
 9*a^3*b + 16*a^2*b^2 - 12*a*b^3 - 16*b^4)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*
EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])]
, -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec
[c + d*x]))/(a - b)])/(3*a^4*(a - b)*(a + b)^(3/2)*d*Sqrt[Sec[c + d*x]]) +
(2*b^2*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(3*a*(a^2 - b^2)*d*(a + b*Cos[c + d
*x])^(3/2)) + (4*b^2*(5*a^2 - 3*b^2)*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(3*a^
2*(a^2 - b^2)^2*d*Sqrt[a + b*Cos[c + d*x]]) + (2*(a^4 - 13*a^2*b^2 + 8*b^4)
*Sqrt[a + b*Cos[c + d*x]]*Sec[c + d*x]^(3/2)*Sin[c + d*x])/(3*a^3*(a^2 - b^
2)^2*d)
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
```

```
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] && !IntegerQ[n]) || !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] && !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] && !IntegerQ[
n]) || !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] && !IntegerQ[m]) ||
```

```
EqQ[a, 0])))
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx$$

$$= \frac{2b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a\,(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{3}{2}(a^2-2b^2)-\frac{3}{2}ab\cos(c+dx)+2b^2\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx}{3a\,(a^2-b^2)}$$

$$= \frac{2b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a\,(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{4b^2(5a^2-3b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2\,(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}} + \frac{\left(4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{3}{4}(a^4-13a^2b^2+8b^4)-\frac{1}{2}ab(3a^2-b^2)\cos(c+dx)+b^2(5a^2-3b^2)\cos^2(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{3a^2\,(a^2-b^2)^2}$$

$$= \frac{2b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a\,(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{4b^2(5a^2-3b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2\,(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}} + \frac{2(a^4-13a^2b^2+8b^4)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^3\,(a^2-b^2)^2\,d} + \frac{\left(8\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{-\frac{3}{2}b(2a^4-7a^2b^2+4b^4)+\frac{3}{8}a(a^4+7a^2b^2-4b^4)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{9a^3\,(a^2-b^2)^2}$$

$$= \frac{2b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a\,(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}} + \frac{4b^2(5a^2-3b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2\,(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}} + \frac{2(a^4-13a^2b^2+8b^4)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^3\,(a^2-b^2)^2\,d} + \frac{\left((a-b)\,(a^4+9a^3b+16a^2b^2-12ab^3-16b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c}}}{3a^3\,(a^2-b^2)^2} - \frac{\left(4b(2a^4-7a^2b^2+4b^4)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{3a^3\,(a^2-b^2)^2}$$

$$=-\frac{8b(2a^4-7a^2b^2+4b^4)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx)}{a+b}}}{3a^5(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}}$$
$$+\frac{2(a^4+9a^3b+16a^2b^2-12ab^3-16b^4)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right.\right.}{3a^4(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}}$$
$$+\frac{2b^2\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}}+\frac{4b^2(5a^2-3b^2)\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^2(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{2(a^4-13a^2b^2+8b^4)\sqrt{a+b\cos(c+dx)}\sec^{\frac{3}{2}}(c+dx)\sin(c+dx)}{3a^3(a^2-b^2)^2\,d}$$

Mathematica [A] (warning: unable to verify)

Time = 13.24 (sec) , antiderivative size = 546, normalized size of antiderivative = 1.06

$$\int\frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx=\frac{4\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)\sec(c+dx)}\left(4b(2a^5+2a^4b-7a^3b^2-7a^2b^3+4ab^4+4b^5)\right.}{}$$
$$+\frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\left(-\frac{8b(2a^4-7a^2b^2+4b^4)\sin(c+dx)}{3a^4(a^2-b^2)^2}-\frac{2b^3\sin(c+dx)}{3a^2(a^2-b^2)(a+b\cos(c+dx))^2}-\frac{2(11a^2b^3\sin(c+dx)-7b^5\sin}{3a^3(a^2-b^2)^2(a+b\cos(c}\right.}{d}$$

```
[In] Integrate[Sec[c + d*x]^(5/2)/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (4*Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*(4*b*(2*a^5 + 2*a^4*b - 7*a^3*b^2
- 7*a^2*b^3 + 4*a*b^4 + 4*b^5)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(
a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c +
 d*x)/2]], (-a + b)/(a + b)] + a*(a^5 - 8*a^4*b + 7*a^3*b^2 + 28*a^2*b^3 -
4*a*b^4 - 16*b^5)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c +
 d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-
a + b)/(a + b)] + 2*b*(2*a^4 - 7*a^2*b^2 + 4*b^4)*Cos[c + d*x]*(a + b*Cos[c
 + d*x])*Sec[(c + d*x)/2]^2*Tan[(c + d*x)/2]))/(3*a^4*(a^2 - b^2)^2*d*Sqrt[
a + b*Cos[c + d*x]]*Sqrt[Sec[(c + d*x)/2]^2]) + (Sqrt[a + b*Cos[c + d*x]]*S
qrt[Sec[c + d*x]]*((-8*b*(2*a^4 - 7*a^2*b^2 + 4*b^4)*Sin[c + d*x])/(3*a^4*(
a^2 - b^2)^2) - (2*b^3*Sin[c + d*x])/(3*a^2*(a^2 - b^2)*(a + b*Cos[c + d*x]
)^2) - (2*(11*a^2*b^3*Sin[c + d*x] - 7*b^5*Sin[c + d*x]))/(3*a^3*(a^2 - b^2
)^2*(a + b*Cos[c + d*x])) + (2*Tan[c + d*x])/(3*a^3)))/d
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 5848 vs. $2(467) = 934$.

Time = 13.99 (sec) , antiderivative size = 5849, normalized size of antiderivative = 11.40

method	result	size
default	Expression too large to display	5849

```
[In] int(sec(d*x+c)^(5/2)/(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
[Out] result too large to display
```

Fricas [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^(5/2)/(b^3*cos(d*x + c)^3 +
3*a*b^2*cos(d*x + c)^2 + 3*a^2*b*cos(d*x + c) + a^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(5/2)/(a+b*cos(d*x+c))**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^(5/2)/(b*cos(d*x + c) + a)^(5/2), x)
```

Giac [F]

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\sec\left(dx+c\right)^{\frac{5}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(5/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(5/2)/(b*cos(d*x + c) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}}{\left(a+b\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int((1/cos(c + d*x))^(5/2)/(a + b*cos(c + d*x))^(5/2),x)
[Out] int((1/cos(c + d*x))^(5/2)/(a + b*cos(c + d*x))^(5/2), x)
```

3.764 $\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 438

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{2(3a^4-15a^2b^2+8b^4)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\right.}{3a^4(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}}$$
$$-\frac{2(3a^3+9a^2b-6ab^2-8b^3)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec}{a+}}}{3a^3(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}}$$
$$+\frac{2b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{3a\,(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}}+\frac{8b^2(2a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3a^2\,(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] 2/3*b^2*sin(d*x+c)*sec(d*x+c)^(1/2)/a/(a^2-b^2)/d/(a+b*cos(d*x+c))^(3/2)+8/
3*b^2*(2*a^2-b^2)*sin(d*x+c)*sec(d*x+c)^(1/2)/a^2/(a^2-b^2)^2/d/(a+b*cos(d*
x+c))^(1/2)+2/3*(3*a^4-15*a^2*b^2+8*b^4)*csc(d*x+c)*EllipticE((a+b*cos(d*x+
c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*cos(d*x+c)^(1/
2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^4/(a-b)/
(a+b)^(3/2)/d/sec(d*x+c)^(1/2)-2/3*(3*a^3+9*a^2*b-6*a*b^2-8*b^3)*csc(d*x+c)
*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b
))^(1/2))*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))
/(a-b))^(1/2)/a^3/(a-b)/(a+b)^(3/2)/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 1.06 (sec) , antiderivative size = 438, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {4307, 2881, 3134, 3077, 2895, 3073}

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{8b^2(2a^2-b^2)\sin(c+dx)\sqrt{\sec(c+dx)}}{3a^2d\,(a^2-b^2)^2\,\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{2b^2\sin(c+dx)\sqrt{\sec(c+dx)}}{3ad\,(a^2-b^2)\,(a+b\cos(c+dx))^{3/2}}$$
$$+\frac{2(3a^4-15a^2b^2+8b^4)\,\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\right.}{3a^4d(a-b)(a+b)^{3/2}\sqrt{\sec(c+dx)}}$$
$$-\frac{2(3a^3+9a^2b-6ab^2-8b^3)\,\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+}}{\sqrt{a+b}}\right.\right.}{3a^3d(a-b)(a+b)^{3/2}\sqrt{\sec(c+dx)}}$$

```
[In] Int[Sec[c + d*x]^(3/2)/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*(3*a^4 - 15*a^2*b^2 + 8*b^4)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[A
rcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)
/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))
/(a - b)])/(3*a^4*(a - b)*(a + b)^(3/2)*d*Sqrt[Sec[c + d*x]]) - (2*(3*a^3 +
 9*a^2*b - 6*a*b^2 - 8*b^3)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSi
n[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a
- b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a
- b)])/(3*a^3*(a - b)*(a + b)^(3/2)*d*Sqrt[Sec[c + d*x]]) + (2*b^2*Sqrt[Sec
[c + d*x]]*Sin[c + d*x])/(3*a*(a^2 - b^2)*d*(a + b*Cos[c + d*x])^(3/2)) + (
8*b^2*(2*a^2 - b^2)*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(3*a^2*(a^2 - b^2)^2*d
*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] && !IntegerQ[n]) || !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] && !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3134

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-(A*b^2 - a*b*B + a^2*C))*Cos[e + f*x
]*(a + b*Sin[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*
c - a*d)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[
(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[(m + 1)*(b*c - a*d
)*(a*A - b*B + a*C) + d*(A*b^2 - a*b*B + a^2*C)*(m + n + 2) - (c*(A*b^2 - a
*b*B + a^2*C) + (m + 1)*(b*c - a*d)*(A*b - a*B + b*C))*Sin[e + f*x] - d*(A*
b^2 - a*b*B + a^2*C)*(m + n + 3)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b,
 c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && N
eQ[c^2 - d^2, 0] && LtQ[m, -1] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[
n]) ||  !(IntegerQ[2*n] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) ||
 EqQ[a, 0])))
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
```

```
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{5/2}}\,dx$$

$$= \frac{2b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{3a\left(a^2-b^2\right)d(a+b\cos(c+dx))^{3/2}} + \frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{1}{2}\left(3a^2-4b^2\right)-\frac{3}{2}ab\cos(c+dx)+b^2\cos^2(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(a+b\cos(c+dx))^{3/2}}\,dx}{3a\left(a^2-b^2\right)}$$

$$= \frac{2b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{3a\left(a^2-b^2\right)d(a+b\cos(c+dx))^{3/2}} + \frac{8b^2(2a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3a^2\left(a^2-b^2\right)^2 d\sqrt{a+b\cos(c+dx)}} + \frac{\left(4\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{1}{4}\left(3a^4-15a^2b^2+8b^4\right)-\frac{1}{2}ab\left(3a^2-b^2\right)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{3a^2\left(a^2-b^2\right)^2}$$

$$= \frac{2b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{3a\left(a^2-b^2\right)d(a+b\cos(c+dx))^{3/2}} + \frac{8b^2(2a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3a^2\left(a^2-b^2\right)^2 d\sqrt{a+b\cos(c+dx)}} - \frac{\left((a-b)\left(3a^3+9a^2b-6ab^2-8b^3\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{3a^2\left(a^2-b^2\right)^2} - \frac{\left(\left(-3a^4+15a^2b^2-8b^4\right)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{3a^2\left(a^2-b^2\right)^2}$$

$$= \frac{2(3a^4-15a^2b^2+8b^4)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{}}{3a^4(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}} - \frac{2(3a^3+9a^2b-6ab^2-8b^3)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{3a^3(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}} + \frac{2b^2\sqrt{\sec(c+dx)}\sin(c+dx)}{3a\left(a^2-b^2\right)d(a+b\cos(c+dx))^{3/2}} + \frac{8b^2(2a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3a^2\left(a^2-b^2\right)^2 d\sqrt{a+b\cos(c+dx)}}$$

Mathematica [A] (warning: unable to verify)

Time = 12.97 (sec) , antiderivative size = 525, normalized size of antiderivative = 1.20

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\left(\frac{2(3a^4-15a^2b^2+8b^4)\sin(c+dx)}{3a^3(a^2-b^2)^2}+\frac{2b^2\sin(c+dx)}{3a(a^2-b^2)(a+b\cos(c\ldots}\right.}{d}$$
$$+\frac{2\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)\sec(c+dx)}\left(-2(3a^5+3a^4b-15a^3b^2-15a^2b^3+8ab^4+8b^5)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\frac{a+b\cos(c\ldots}{(a+b)(1+\cos\ldots}}\right.}{}$$

```
[In] Integrate[Sec[c + d*x]^(3/2)/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*((2*(3*a^4 - 15*a^2*b^2 + 8*b^
4)*Sin[c + d*x])/(3*a^3*(a^2 - b^2)^2) + (2*b^2*Sin[c + d*x])/(3*a*(a^2 - b
^2)*(a + b*Cos[c + d*x])^2) + (8*(2*a^2*b^2*Sin[c + d*x] - b^4*Sin[c + d*x]
))/(3*a^2*(a^2 - b^2)^2*(a + b*Cos[c + d*x]))))/d + (2*Sqrt[Cos[(c + d*x)/2
]^2*Sec[c + d*x]]*(-2*(3*a^5 + 3*a^4*b - 15*a^3*b^2 - 15*a^2*b^3 + 8*a*b^4
+ 8*b^5)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((
a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a
 + b)] + 2*a*(3*a^4 - 6*a^3*b - 15*a^2*b^2 + 2*a*b^3 + 8*b^4)*Sqrt[Cos[c +
d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*
x]))]*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] - (3*a^4 - 15*a
^2*b^2 + 8*b^4)*Cos[c + d*x]*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2*Tan[(c
 + d*x)/2]))/(3*a^3*(a^2 - b^2)^2*d*Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[(c +
d*x)/2]^2])
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 3674 vs. 2(398) = 796.

Time = 11.88 (sec) , antiderivative size = 3675, normalized size of antiderivative = 8.39

method	result	size
default	Expression too large to display	3675

```
[In] int(sec(d*x+c)^(3/2)/(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1
))^(3/2)*(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^
2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(
1/2)*(-3*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))
*a^6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c
))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+8*b
^6*(csc(d*x+c)-cot(d*x+c))-7*csc(d*x+c)^5*a^2*b^4*(1-cos(d*x+c))^5-16*csc(d
*x+c)^5*a*b^5*(1-cos(d*x+c))^5-18*csc(d*x+c)^3*a^4*b^2*(1-cos(d*x+c))^3-16*
```

csc(d*x+c)^3*a^3*b^3*(1-cos(d*x+c))^3+36*csc(d*x+c)^3*a^2*b^4*(1-cos(d*x+c)
)^3+8*csc(d*x+c)^3*a*b^5*(1-cos(d*x+c))^3-3*EllipticF(cot(d*x+c)-csc(d*x+c)
,(-(a-b)/(a+b))^(1/2))*a^6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d
*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2
)+3*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^6*(-csc(d*x+c)^
2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*
b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+8*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a
-b)/(a+b))^(1/2))*b^6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)
^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-6*c
sc(d*x+c)^5*a^5*b*(1-cos(d*x+c))^5-12*csc(d*x+c)^5*a^4*b^2*(1-cos(d*x+c))^5
+30*csc(d*x+c)^5*a^3*b^3*(1-cos(d*x+c))^5+3*EllipticF(cot(d*x+c)-csc(d*x+c)
,(-(a-b)/(a+b))^(1/2))*a^5*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc
(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1
/2)+21*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b^2*(-csc(
d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*
x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+13*EllipticF(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*a^3*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*
((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b
))^(1/2)-10*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^4*(
-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-c
sc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-8*EllipticF(cot(d*x+c)-csc
(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^5*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2
)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a
+b))^(1/2)+6*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^5*b*(-
csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-cs
c(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-12*EllipticE(cot(d*x+c)-csc
(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1
/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/
(a+b))^(1/2)-30*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b
^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))
^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-7*EllipticE(cot(d*x+c)
-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1
)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a
+b)/(a+b))^(1/2)+16*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a
b^5(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c
))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-18*csc(d*x+c)^2*Elli
pticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b^2*(-csc(d*x+c)^2*(1
-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1
-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+23*csc(d*x+c)^2*EllipticE
(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^4*(-csc(d*x+c)^2*(1-cos(
d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(
d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+9*csc(d*x+c)^2*EllipticF(cot(d
*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^5*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^
2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^
2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+9*csc(d*x+c)^2*EllipticF(cot(d*x+c)-cs

```
c(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(
1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)
/(a+b))^(1/2)*(1-cos(d*x+c))^2-17*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*a^3*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*
((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b
))^(1/2)*(1-cos(d*x+c))^2-6*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-
(a-b)/(a+b))^(1/2))*a^2*b^4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(
d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/
2)*(1-cos(d*x+c))^2+8*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/
(a+b))^(1/2))*a*b^5*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2
*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-co
s(d*x+c))^2+6*csc(d*x+c)^3*a^6*(1-cos(d*x+c))^3-16*csc(d*x+c)^3*b^6*(1-cos(
d*x+c))^3-14*a^3*b^3*(csc(d*x+c)-cot(d*x+c))+8*a*b^5*(csc(d*x+c)-cot(d*x+c)
)+6*a^5*b*(csc(d*x+c)-cot(d*x+c))+6*a^4*b^2*(csc(d*x+c)-cot(d*x+c))-17*a^2*
b^4*(csc(d*x+c)-cot(d*x+c))+3*csc(d*x+c)^5*a^6*(1-cos(d*x+c))^5+8*csc(d*x+c
)^5*b^6*(1-cos(d*x+c))^5+3*a^6*(csc(d*x+c)-cot(d*x+c))+3*csc(d*x+c)^2*Ellip
ticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^6*(-csc(d*x+c)^2*(1-cos(
d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(
d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-8*csc(d*x+c)^2*EllipticE(cot(d
*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+
1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+
a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(csc(
d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)^2/(a-b)^2/
a^3/(a+b)^2
```

Fricas [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx=\int \frac{\sec\left(dx+c\right)^{\frac{3}{2}}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(b*cos(d*x + c) + a)*sec(d*x + c)^(3/2)/(b^3*cos(d*x + c)^3 +
3*a*b^2*cos(d*x + c)^2 + 3*a^2*b*cos(d*x + c) + a^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(3/2)/(a+b*cos(d*x+c))**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\sec(dx+c)^{\frac{3}{2}}}{(b\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(sec(d*x + c)^(3/2)/(b*cos(d*x + c) + a)^(5/2), x)
```

Giac [F]

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\sec(dx+c)^{\frac{3}{2}}}{(b\cos(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(3/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^(3/2)/(b*cos(d*x + c) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sec^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}}{(a+b\,\cos(c+d\,x))^{5/2}}\,dx$$

```
[In] int((1/cos(c + d*x))^(3/2)/(a + b*cos(c + d*x))^(5/2),x)
[Out] int((1/cos(c + d*x))^(3/2)/(a + b*cos(c + d*x))^(5/2), x)
```

3.765 $\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 421

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{4b(3a^2-b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{a\cdots}}{3a^3(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}}$$
$$+\frac{2(3a^2-3ab-2b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\cdots}}{3a^2(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}}$$
$$+\frac{2b^2\sin(c+dx)}{3a(a^2-b^2)d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}-\frac{4b(3a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3a(a^2-b^2)^2d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] 2/3*b^2*sin(d*x+c)/a/(a^2-b^2)/d/(a+b*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2)-4/
3*b*(3*a^2-b^2)*sin(d*x+c)*sec(d*x+c)^(1/2)/a/(a^2-b^2)^2/d/(a+b*cos(d*x+c)
)^(1/2)+4/3*b*(3*a^2-b^2)*csc(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)
^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*cos(d*x+c)^(1/2)*(a*(1-sec(d*
x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^3/(a-b)/(a+b)^(3/2)/d/s
ec(d*x+c)^(1/2)+2/3*(3*a^2-3*a*b-2*b^2)*csc(d*x+c)*EllipticF((a+b*cos(d*x+c
))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*cos(d*x+c)^(1/2
)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^2/(a-b)/(
a+b)^(3/2)/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 1.00 (sec) , antiderivative size = 421, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4307, 2881, 3072, 3077, 2895, 3073}

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^{5/2}}\,dx = \frac{2(3a^2-3ab-2b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{Elli}}{3a^2d(a-b)(a+b)^{3/2}\sqrt{\sec(c+dx)}} + \frac{2b^2\sin(c+dx)}{3ad(a^2-b^2)\sqrt{\sec(c+dx)}(a+b\cos(c+dx))^{3/2}} - \frac{4b(3a^2-b^2)\sin(c+dx)\sqrt{\sec(c+dx)}}{3ad(a^2-b^2)^2\sqrt{a+b\cos(c+dx)}} + \frac{4b(3a^2-b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{3a^3d(a-b)(a+b)^{3/2}\sqrt{\sec(c+dx)}}$$

```
[In] Int[Sqrt[Sec[c + d*x]]/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (4*b*(3*a^2 - b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[Sqrt[a
+ b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sq
rt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3
*a^3*(a - b)*(a + b)^(3/2)*d*Sqrt[Sec[c + d*x]]) + (2*(3*a^2 - 3*a*b - 2*b^
2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]
]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c
 + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a^2*(a - b)*(a
+ b)^(3/2)*d*Sqrt[Sec[c + d*x]]) + (2*b^2*Sin[c + d*x])/(3*a*(a^2 - b^2)*d*
(a + b*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*x]]) - (4*b*(3*a^2 - b^2)*Sqrt[Se
c[c + d*x]]*Sin[c + d*x])/(3*a*(a^2 - b^2)^2*d*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2881

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m + 1)*((c + d*Sin[e + f*x])^(n + 1)/(f*(m + 1)*(b*c - a*d)*(a^2 - b^2
))), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x]
)^(m + 1)*(c + d*Sin[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) + b^2*d*(m + n
+ 2) - (b^2*c + b*(b*c - a*d)*(m + 1))*Sin[e + f*x] - b^2*d*(m + n + 3)*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1] && IntegersQ[2
*m, 2*n] && ((EqQ[a, 0] && IntegerQ[m] &&  !IntegerQ[n]) ||  !(IntegerQ[2*n
] && LtQ[n, -1] && ((IntegerQ[n] &&  !IntegerQ[m]) || EqQ[a, 0])))
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
```

```
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3072

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(
x_)]]*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)), x_Symbol] :> Simp[2*(A
*b - a*B)*(Cos[e + f*x]/(f*(a^2 - b^2)*Sqrt[a + b*Sin[e + f*x]]*Sqrt[d*Sin[
e + f*x]])), x] + Dist[d/(a^2 - b^2), Int[(A*b - a*B + (a*A - b*B)*Sin[e +
f*x])/(Sqrt[a + b*Sin[e + f*x]]*(d*Sin[e + f*x])^(3/2)), x], x] /; FreeQ[{a
, b, d, e, f, A, B}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{5/2}}\,dx$$

$$= \frac{2b^2\sin(c+dx)}{3a(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{1}{2}(3a^2-2b^2)-\frac{3}{2}ab\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}dx}{3a(a^2-b^2)}$$

$$= \frac{2b^2\sin(c+dx)}{3a(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{4b(3a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3a(a^2-b^2)^2 d\sqrt{a+b\cos(c+dx)}} + \frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{3a^2b}{2}+\frac{1}{2}b(3a^2-2b^2)+\left(\frac{3ab^2}{2}+\frac{1}{2}a(3a^2-2b^2)\right)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{3a(a^2-b^2)^2}$$

$$= \frac{2b^2\sin(c+dx)}{3a(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{4b(3a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3a(a^2-b^2)^2 d\sqrt{a+b\cos(c+dx)}} + \frac{\left((a-b)(3a^2-3ab-2b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right.}{3a(a^2-b^2)^2} + \frac{\left(2b(3a^2-b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{3a(a^2-b^2)^2}$$

$$= \frac{4b(3a^2-b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c-}{a-b}}}{3a^3(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}} + \frac{2(3a^2-3ab-2b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\text{sec}}{a}}}{3a^2(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}} + \frac{2b^2\sin(c+dx)}{3a(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{4b(3a^2-b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3a(a^2-b^2)^2 d\sqrt{a+b\cos(c+dx)}}$$

Mathematica [A] (warning: unable to verify)

Time = 11.20 (sec) , antiderivative size = 471, normalized size of antiderivative = 1.12

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^{5/2}}dx = \frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\left(\frac{4b(3a^2-b^2)\sin(c+dx)}{3a^2(a^2-b^2)^2}-\frac{2b\sin(c+dx)}{3(a^2-b^2)(a+b\cos(c+dx))^2}-\right.}{d} + \frac{4\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)\sec(c+dx)}\left(2b(-3a^3-3a^2b+ab^2+b^3)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\left(\arcsin\left(\tan\left(\right.\right.\right.\right.}{}$$

```
[In] Integrate[Sqrt[Sec[c + d*x]]/(a + b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*((4*b*(3*a^2 - b^2)*Sin[c + d*
x])/(3*a^2*(a^2 - b^2)^2) - (2*b*Sin[c + d*x])/(3*(a^2 - b^2)*(a + b*Cos[c
+ d*x])^2) - (2*(5*a^2*b*Sin[c + d*x] - b^3*Sin[c + d*x]))/(3*a*(a^2 - b^2)
^2*(a + b*Cos[c + d*x]))))/d + (4*Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*(2*
b*(-3*a^3 - 3*a^2*b + a*b^2 + b^3)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sq
rt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[
(c + d*x)/2]], (-a + b)/(a + b)] + a*(3*a^3 + 6*a^2*b + a*b^2 - 2*b^3)*Sqrt
[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + C
os[c + d*x]))]*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] + b*(-
3*a^2 + b^2)*Cos[c + d*x]*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2*Tan[(c +
d*x)/2]))/(3*(a^3 - a*b^2)^2*d*Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[(c + d*x)/
2]^2])
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 2840 vs. $2(381) = 762$.

Time = 9.68 (sec) , antiderivative size = 2841, normalized size of antiderivative = 6.75

method	result	size
default	Expression too large to display	2841

```
[In] int(sec(d*x+c)^(1/2)/(a+cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3/d*(-(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)
)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a
+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2)*(-3*csc(d*x+c)^2*(-csc(d*x+c)^
2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*
b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b
)/(a+b))^(1/2))*a^5*(1-cos(d*x+c))^2+6*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d
*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d
*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(
1/2))*a^4*b*(1-cos(d*x+c))^2-2*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2
+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2
+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*
b^4*(1-cos(d*x+c))^2+2*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2
)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a
+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^5*(1-cos
(d*x+c))^2-9*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-c
os(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(co
t(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b-7*(-csc(d*x+c)^2*(1-cos(d*x
+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x
+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/
2))*a^3*b^2+(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-co
s(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^3+2*(-csc(d*x+c)^2*(1-cos(d*
```

x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*
x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*a*b^4+6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-c
os(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(co
t(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b+12*(-csc(d*x+c)^2*(1-cos(d*
x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*
x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*a^3*b^2+4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1
-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(
cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^3-4*(-csc(d*x+c)^2*(1-cos
(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos
(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*a*b^4-2*csc(d*x+c)^5*b^5*(1-cos(d*x+c))^5+4*csc(d*x+c)^3*b^5*(1-cos
(d*x+c))^3-3*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*
x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)
*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b*(1-cos(d*x+c))
^2+5*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a
*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*Ellipti
cF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b^2*(1-cos(d*x+c))^2+3*c
sc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-co
s(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^3*(1-cos(d*x+c))^2-6*a^4*b*(
csc(d*x+c)-cot(d*x+c))+2*a^3*b^2*(csc(d*x+c)-cot(d*x+c))+8*a^2*b^3*(csc(d*x
+c)-cot(d*x+c))-2*a*b^4*(csc(d*x+c)-cot(d*x+c))-8*csc(d*x+c)^2*(-csc(d*x+c)
^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2
b(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-
b)/(a+b))^(1/2))*a^2*b^3*(1-cos(d*x+c))^2-2*csc(d*x+c)^3*a*b^4*(1-cos(d*x+c
))^3+6*csc(d*x+c)^5*a^4*b*(1-cos(d*x+c))^5-12*csc(d*x+c)^5*a^3*b^2*(1-cos(d
*x+c))^5+4*csc(d*x+c)^5*a^2*b^3*(1-cos(d*x+c))^5+4*csc(d*x+c)^5*a*b^4*(1-co
s(d*x+c))^5+10*csc(d*x+c)^3*a^3*b^2*(1-cos(d*x+c))^3-2*b^5*(csc(d*x+c)-cot(
d*x+c))-12*csc(d*x+c)^3*a^2*b^3*(1-cos(d*x+c))^3-3*(-csc(d*x+c)^2*(1-cos(d*
x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*
x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1
/2))*a^5-2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos
(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(
d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^5)/(csc(d*x+c)^2*a*(1-cos(d*x+c))
^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)^2/(a-b)^2/(a+b)^2/a^2

Fricas [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\sqrt{\sec\left(dx+c\right)}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)*sqrt(sec(d*x + c))/(b^3*cos(d*x + c)^3 +
3*a*b^2*cos(d*x + c)^2 + 3*a^2*b*cos(d*x + c) + a^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(sec(d*x+c)**(1/2)/(a+b*cos(d*x+c))**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\sqrt{\sec\left(dx+c\right)}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(sqrt(sec(d*x + c))/(b*cos(d*x + c) + a)^(5/2), x)
```

Giac [F]

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\sqrt{\sec\left(dx+c\right)}}{\left(b\cos\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(sec(d*x+c)^(1/2)/(a+b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(sqrt(sec(d*x + c))/(b*cos(d*x + c) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\sec(c+dx)}}{(a+b\cos(c+dx))^{5/2}}\,dx = \int \frac{\sqrt{\frac{1}{\cos(c+d\,x)}}}{\left(a+b\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int((1/cos(c + d*x))^(1/2)/(a + b*cos(c + d*x))^(5/2),x)
[Out] int((1/cos(c + d*x))^(1/2)/(a + b*cos(c + d*x))^(5/2), x)
```

3.766 $\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 399

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\,dx = -\frac{2(3a^2+b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a^2(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}}$$
$$+\frac{2(3a-b)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}}$$
$$-\frac{2b\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}+\frac{2(3a^2+b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] -2/3*b*sin(d*x+c)/(a^2-b^2)/d/(a+b*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2)+2/3*(
3*a^2+b^2)*sin(d*x+c)*sec(d*x+c)^(1/2)/(a^2-b^2)^2/d/(a+b*cos(d*x+c))^(1/2)
-2/3*(3*a^2+b^2)*csc(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/co
s(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+
b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a^2/(a-b)/(a+b)^(3/2)/d/sec(d*x+c)
^(1/2)+2/3*(3*a-b)*csc(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/
cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(
a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/a/(a-b)/(a+b)^(3/2)/d/sec(d*x+c)
^(1/2)
```

Rubi [A] (verified)

Time = 0.88 (sec) , antiderivative size = 399, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4307, 2875, 3072, 3077, 2895, 3073}

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\,dx = -\frac{2(3a^2+b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{3a^2d(a-b)(a+b)^{3/2}\sqrt{\sec(c+dx)}} + \frac{2(3a^2+b^2)\sin(c+dx)\sqrt{\sec(c+dx)}}{3d(a^2-b^2)^2\sqrt{a+b\cos(c+dx)}} - \frac{2b\sin(c+dx)}{3d(a^2-b^2)\sqrt{\sec(c+dx)}(a+b\cos(c+dx))^{3/2}} + \frac{2(3a-b)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{3ad(a-b)(a+b)^{3/2}\sqrt{\sec(c+dx)}}$$

```
[In] Int[1/((a + b*Cos[c + d*x])^(5/2)*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (-2*(3*a^2 + b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[Sqrt[a +
 b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqr
t[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*
a^2*(a - b)*(a + b)^(3/2)*d*Sqrt[Sec[c + d*x]]) + (2*(3*a - b)*Sqrt[Cos[c +
 d*x]]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*
Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a +
b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a*(a - b)*(a + b)^(3/2)*d*Sqrt
[Sec[c + d*x]]) - (2*b*Sin[c + d*x])/(3*(a^2 - b^2)*d*(a + b*Cos[c + d*x])^
(3/2)*Sqrt[Sec[c + d*x]]) + (2*(3*a^2 + b^2)*Sqrt[Sec[c + d*x]]*Sin[c + d*x
])/(3*(a^2 - b^2)^2*d*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2875

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[e + f*x]*(a + b*Sin[e + f*x]
)^(m + 1)*((c + d*Sin[e + f*x])^n/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m
 + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d*Sin[e + f*x])^(
n - 1)*Simp[a*c*(m + 1) + b*d*n + (a*d*(m + 1) - b*c*(m + 2))*Sin[e + f*x]
- b*d*(m + n + 2)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x
] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m,
-1] && LtQ[0, n, 1] && IntegersQ[2*m, 2*n]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
```

```
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3072

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(
x_)]]*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)), x_Symbol] :> Simp[2*(A
*b - a*B)*(Cos[e + f*x]/(f*(a^2 - b^2)*Sqrt[a + b*Sin[e + f*x]]*Sqrt[d*Sin[
e + f*x]])), x] + Dist[d/(a^2 - b^2), Int[(A*b - a*B + (a*A - b*B)*Sin[e +
f*x])/(Sqrt[a + b*Sin[e + f*x]]*(d*Sin[e + f*x])^(3/2)), x], x] /; FreeQ[{a
, b, d, e, f, A, B}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\sqrt{\cos(c+dx)}}{(a+b\cos(c+dx))^{5/2}}\,dx$$

$$= -\frac{2b\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{b}{2}-\frac{3}{2}a\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx}{3(a^2-b^2)}$$

$$= -\frac{2b\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{2(3a^2+b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}} - \frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\frac{3a^2}{2}+\frac{b^2}{2}+2ab\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{3(a^2-b^2)^2}$$

$$= -\frac{2b\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{2(3a^2+b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}} + \frac{\left((a-b)(3a-b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{}{\sqrt{\cos(c+d}}}{3(a^2-b^2)^2} + \frac{\left((-3a^2-b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{3(a^2-b^2)^2}$$

$$= -\frac{2(3a^2+b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(}{a-}}}{3a^2(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}} + \frac{2(3a-b)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a}{}}}{3a(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}} - \frac{2b\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} + \frac{2(3a^2+b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}}$$

Mathematica [A] (warning: unable to verify)

Time = 10.78 (sec) , antiderivative size = 455, normalized size of antiderivative = 1.14

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\,dx = \frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\left(-\frac{2(3a^2+b^2)\sin(c+dx)}{3a(a^2-b^2)^2}+\frac{2a}{3(a^2-b^2)(}\right.}{d}$$
$$-\frac{2\sqrt{\cos^2\left(\frac{1}{2}(c+dx)\right)\sec(c+dx)}\left(-2(3a^3+3a^2b+ab^2+b^3)\sqrt{\frac{\cos(c+dx)}{1+\cos(c+dx)}}\sqrt{\frac{a+b\cos(c+dx)}{(a+b)(1+\cos(c+dx))}}E\left(\arcsin\left(\tan\right.\right.\right.}{}$$

```
[In] Integrate[1/((a + b*Cos[c + d*x])^(5/2)*Sqrt[Sec[c + d*x]]),x]
```

```
[Out] (Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*((-2*(3*a^2 + b^2)*Sin[c + d*x
])/(3*a*(a^2 - b^2)^2) + (2*a*Sin[c + d*x])/(3*(a^2 - b^2)*(a + b*Cos[c + d
*x])^2) + (4*(a^2*Sin[c + d*x] + b^2*Sin[c + d*x]))/(3*(a^2 - b^2)^2*(a + b
*Cos[c + d*x]))))/d - (2*Sqrt[Cos[(c + d*x)/2]^2*Sec[c + d*x]]*(-2*(3*a^3 +
 3*a^2*b + a*b^2 + b^3)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*C
os[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*EllipticE[ArcSin[Tan[(c + d*x)/2
]], (-a + b)/(a + b)] + 2*a*(3*a^2 + 4*a*b + b^2)*Sqrt[Cos[c + d*x]/(1 + Co
s[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))]*Ellipt
icF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] - (3*a^2 + b^2)*Cos[c + d*x
]*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^2*Tan[(c + d*x)/2]))/(3*a*(a^2 - b^
2)^2*d*Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[(c + d*x)/2]^2])
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 2613 vs. 2(359) = 718.

Time = 7.94 (sec) , antiderivative size = 2614, normalized size of antiderivative = 6.55

method	result	size
default	Expression too large to display	2614

```
[In] int(1/(a+cos(d*x+c)*b)^(5/2)/sec(d*x+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3/d*(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-c
sc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1/2
)*(-csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*
b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^
2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-7*Elli
pticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b*(-csc(d*x+c)^2*(1-c
os(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-c
os(d*x+c))^2+a+b)/(a+b))^(1/2)-5*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a
+b))^(1/2))*a^2*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2
```

a(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+6*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+4*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-3*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+3*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*(1-cos(d*x+c))^2+csc(d*x+c)^5*b^4*(1-cos(d*x+c))^5-2*csc(d*x+c)^3*b^4*(1-cos(d*x+c))^3+2*a^3*b*(csc(d*x+c)-cot(d*x+c))+2*a^2*b^2*(csc(d*x+c)-cot(d*x+c))+3*csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-2*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-2*a*b^3*(csc(d*x+c)-cot(d*x+c))+3*csc(d*x+c)^5*a^4*(1-cos(d*x+c))^5-6*csc(d*x+c)^5*a^3*b*(1-cos(d*x+c))^5+4*csc(d*x+c)^3*a*b^3*(1-cos(d*x+c))^3+4*csc(d*x+c)^5*a^2*b^2*(1-cos(d*x+c))^5-2*csc(d*x+c)^5*a*b^3*(1-cos(d*x+c))^5+4*csc(d*x+c)^3*a^3*b*(1-cos(d*x+c))^3-6*csc(d*x+c)^3*a^2*b^2*(1-cos(d*x+c))^3-3*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)+EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)-csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^4*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4-3*a^4*(csc(d*x+c)-cot(d*x+c))+b^4*(csc(d*x+c)-cot(d*x+c)))/(-(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1))^(1/2)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)/(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)^2/(a-b)^2/(a+b)^2/a

Fricas [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{5}{2}}\sqrt{\sec(dx+c)}}\,dx$$

[In] integrate(1/(a+b*cos(d*x+c))^(5/2)/sec(d*x+c)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(b*cos(d*x + c) + a)/((b^3*cos(d*x + c)^3 + 3*a*b^2*cos(d*x + c)^2 + 3*a^2*b*cos(d*x + c) + a^3)*sqrt(sec(d*x + c))), x)

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\,dx = \text{Timed out}$$

[In] integrate(1/(a+b*cos(d*x+c))**(5/2)/sec(d*x+c)**(1/2),x)

[Out] Timed out

Maxima [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{5}{2}}\sqrt{\sec(dx+c)}}\,dx$$

[In] integrate(1/(a+b*cos(d*x+c))^(5/2)/sec(d*x+c)^(1/2),x, algorithm="maxima")

[Out] integrate(1/((b*cos(d*x + c) + a)^(5/2)*sqrt(sec(d*x + c))), x)

Giac [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{5}{2}}\sqrt{\sec(dx+c)}}\,dx$$

[In] integrate(1/(a+b*cos(d*x+c))^(5/2)/sec(d*x+c)^(1/2),x, algorithm="giac")

[Out] integrate(1/((b*cos(d*x + c) + a)^(5/2)*sqrt(sec(d*x + c))), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sqrt{\sec(c+dx)}}\,dx=\int \frac{1}{\sqrt{\frac{1}{\cos(c+d\,x)}}\,\left(a+b\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^(5/2)),x)
[Out] int(1/((1/cos(c + d*x))^(1/2)*(a + b*cos(c + d*x))^(5/2)), x)
```

3.767 $\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 382

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \frac{8b\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\cdots}}{3a(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}}$$
$$+\frac{2(a-3b)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}\cdots}{3a(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}}$$
$$+\frac{2a\sin(c+dx)}{3(a^2-b^2)d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}-\frac{8ab\sqrt{\sec(c+dx)}\sin(c+dx)}{3(a^2-b^2)^2d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] 2/3*a*sin(d*x+c)/(a^2-b^2)/d/(a+b*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2)-8/3*a*
b*sin(d*x+c)*sec(d*x+c)^(1/2)/(a^2-b^2)^2/d/(a+b*cos(d*x+c))^(1/2)+8/3*b*cs
c(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a
-b)/(a-b))^(1/2))*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec
(d*x+c))/(a-b))^(1/2)/a/(a-b)/(a+b)^(3/2)/d/sec(d*x+c)^(1/2)+2/3*(a-3*b)*cs
c(d*x+c)*EllipticF((a+b*cos(d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a
-b)/(a-b))^(1/2))*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec
(d*x+c))/(a-b))^(1/2)/a/(a-b)/(a+b)^(3/2)/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.85 (sec) , antiderivative size = 382, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {4307, 2878, 3072, 3077, 2895, 3073}

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = -\frac{8ab\sin(c+dx)\sqrt{\sec(c+dx)}}{3d\,(a^2-b^2)^2\sqrt{a+b\cos(c+dx)}} + \frac{2a\sin(c+dx)}{3d\,(a^2-b^2)\sqrt{\sec(c+dx)}(a+b\cos(c+dx))^{3/2}} + \frac{2(a-3b)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)}{3ad(a-b)(a+b)^{3/2}\sqrt{\sec(c+dx)}} + \frac{8b\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{3ad(a-b)(a+b)^{3/2}\sqrt{\sec(c+dx)}}$$

```
[In] Int[1/((a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(3/2)),x]
```

```
[Out] (8*b*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[Sqrt[a + b*Cos[c + d*
x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec
[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*a*(a - b)*(a
+ b)^(3/2)*d*Sqrt[Sec[c + d*x]]) + (2*(a - 3*b)*Sqrt[Cos[c + d*x]]*Csc[c +
d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*
x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1
+ Sec[c + d*x]))/(a - b)])/(3*a*(a - b)*(a + b)^(3/2)*d*Sqrt[Sec[c + d*x]])
 + (2*a*Sin[c + d*x])/(3*(a^2 - b^2)*d*(a + b*Cos[c + d*x])^(3/2)*Sqrt[Sec[
c + d*x]]) - (8*a*b*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(3*(a^2 - b^2)^2*d*Sqr
t[a + b*Cos[c + d*x]])
```

Rule 2878

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*(a + b*Si
n[e + f*x])^(m + 1)*((c + d*Sin[e + f*x])^(n - 1)/(f*(m + 1)*(a^2 - b^2))),
 x] + Dist[1/((m + 1)*(a^2 - b^2)), Int[(a + b*Sin[e + f*x])^(m + 1)*(c + d
*Sin[e + f*x])^(n - 2)*Simp[c*(a*c - b*d)*(m + 1) + d*(b*c - a*d)*(n - 1) +
 (d*(a*c - b*d)*(m + 1) - c*(b*c - a*d)*(m + 2))*Sin[e + f*x] - d*(b*c - a*
d)*(m + n + 1)*Sin[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] &
& NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && LtQ[m, -1]
 && LtQ[1, n, 2] && IntegersQ[2*m, 2*n]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
```

```
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3072

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(
x_)]]*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)), x_Symbol] :> Simp[2*(A
*b - a*B)*(Cos[e + f*x]/(f*(a^2 - b^2)*Sqrt[a + b*Sin[e + f*x]]*Sqrt[d*Sin[
e + f*x]])), x] + Dist[d/(a^2 - b^2), Int[(A*b - a*B + (a*A - b*B)*Sin[e +
f*x])/(Sqrt[a + b*Sin[e + f*x]]*(d*Sin[e + f*x])^(3/2)), x], x] /; FreeQ[{a
, b, d, e, f, A, B}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\text{integral} = \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int \frac{\cos^{\frac{3}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx$$

$$= \frac{2a\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{-\frac{a}{2}+\frac{3}{2}b\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx}{3(a^2-b^2)}$$

$$= \frac{2a\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{8ab\sqrt{\sec(c+dx)}\sin(c+dx)}{3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}} - \frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{-2ab+\left(-\frac{a^2}{2}-\frac{3b^2}{2}\right)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{3(a^2-b^2)^2}$$

$$= \frac{2a\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{8ab\sqrt{\sec(c+dx)}\sin(c+dx)}{3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}} + \frac{\left((a-3b)(a-b)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}\,dx}{3(a^2-b^2)^2} + \frac{\left(4ab\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}\,dx}{3(a^2-b^2)^2}$$

$$= \frac{8b\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c+dx))}{a-b}}}{3a(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}} + \frac{2(a-3b)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{}{}}}{3a(a-b)(a+b)^{3/2}d\sqrt{\sec(c+dx)}} + \frac{2a\sin(c+dx)}{3(a^2-b^2)\,d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}} - \frac{8ab\sqrt{\sec(c+dx)}\sin(c+dx)}{3(a^2-b^2)^2\,d\sqrt{a+b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 5.65 (sec) , antiderivative size = 359, normalized size of antiderivative = 0.94

$$\int\frac{1}{(a+b\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = -\frac{2\sqrt{\sec(c+dx)}\left(a^2(a^2-b^2)\sin(c+dx)-a(a^2-5b^2)(a+b\cos(c+dx))\sin(c+dx)-4b^2(a+b\cos(c+dx\right.}{}$$

```
[In] Integrate[1/((a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(3/2)),x]
```

```
[Out] (-2*Sqrt[Sec[c + d*x]]*(a^2*(a^2 - b^2)*Sin[c + d*x] - a*(a^2 - 5*b^2)*(a +
 b*Cos[c + d*x])*Sin[c + d*x] - 4*b^2*(a + b*Cos[c + d*x])^2*Sin[c + d*x] +
 2*b*Cos[(c + d*x)/2]^2*(a + b*Cos[c + d*x])*(4*b*(a + b)*Sqrt[Cos[c + d*x]
/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a + b)*(1 + Cos[c + d*x]))
]*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)] - (a^2 + 4*a*b + 3*
b^2)*Sqrt[Cos[c + d*x]/(1 + Cos[c + d*x])]*Sqrt[(a + b*Cos[c + d*x])/((a +
b)*(1 + Cos[c + d*x]))]*EllipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b
)] - b*(a + b*Cos[c + d*x])*Sec[(c + d*x)/2]^3*(Sin[(c + d*x)/2] - Sin[(3*(
c + d*x))/2]))))/(3*b*(a^2 - b^2)^2*d*(a + b*Cos[c + d*x])^(3/2))
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 2128 vs. $2(342) = 684$.

Time = 8.40 (sec) , antiderivative size = 2129, normalized size of antiderivative = 5.57

method	result	size
default	Expression too large to display	2129

```
[In] int(1/(a+cos(d*x+c)*b)^(5/2)/sec(d*x+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3/d*(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^2*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2
-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(1
/2)*(-csc(d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^
3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^
2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-3*csc(
d*x+c)^2*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b*(-csc(
d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*
x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+csc(d*x+c)^2*E
llipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2*(-csc(d*x+c)^2*(
1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(
1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*(1-cos(d*x+c))^2+3*csc(d*x+c)^2*(-csc(d*x
+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c
)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-
(a-b)/(a+b))^(1/2))*b^3*(1-cos(d*x+c))^2+4*csc(d*x+c)^2*EllipticE(cot(d*x+c
)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)
^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+
b)/(a+b))^(1/2)*(1-cos(d*x+c))^2-4*csc(d*x+c)^2*EllipticE(cot(d*x+c)-csc(d*
x+c),(-(a-b)/(a+b))^(1/2))*b^3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((c
sc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^
(1/2)*(1-cos(d*x+c))^2+4*csc(d*x+c)^5*a^2*b*(1-cos(d*x+c))^5-8*csc(d*x+c)^5
*a*b^2*(1-cos(d*x+c))^5+4*csc(d*x+c)^5*b^3*(1-cos(d*x+c))^5-(-csc(d*x+c)^2*
(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*
(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/
(a+b))^(1/2))*a^3-5*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2
*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*Ellip
```

```
ticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b-7*(-csc(d*x+c)^2*(1-
cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-
cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+
b))^(1/2))*a*b^2-3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*
a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*Ellipt
icF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^3+4*(-csc(d*x+c)^2*(1-cos
(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos
(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))
^(1/2))*a^2*b+8*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(
1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE
(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^2+4*(-csc(d*x+c)^2*(1-cos(
d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(
d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^
(1/2))*b^3-2*csc(d*x+c)^3*a^3*(1-cos(d*x+c))^3+10*csc(d*x+c)^3*a*b^2*(1-cos
(d*x+c))^3-8*csc(d*x+c)^3*b^3*(1-cos(d*x+c))^3+2*a^3*(csc(d*x+c)-cot(d*x+c)
)-4*a^2*b*(csc(d*x+c)-cot(d*x+c))-2*a*b^2*(csc(d*x+c)-cot(d*x+c))+4*b^3*(cs
c(d*x+c)-cot(d*x+c)))/(-(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(csc(d*x+c)^2*(1-
cos(d*x+c))^2-1))^(3/2)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)^2/(csc(d*x+c)^2*a
*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)^2/(a-b)^2/(a+b)^2
```

Fricas [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(5/2)/sec(d*x+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(b*cos(d*x + c) + a)/((b^3*cos(d*x + c)^3 + 3*a*b^2*cos(d*x +
c)^2 + 3*a^2*b*cos(d*x + c) + a^3)*sec(d*x + c)^(3/2)), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+b*cos(d*x+c))**(5/2)/sec(d*x+c)**(3/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(5/2)/sec(d*x+c)^(3/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^(3/2)), x)
```

Giac [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(5/2)/sec(d*x+c)^(3/2),x, algorithm="giac")
[Out] integrate(1/((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sec^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{3/2}\,(a+b\,\cos(c+d\,x))^{5/2}}\,dx$$

```
[In] int(1/((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^(5/2)),x)
[Out] int(1/((1/cos(c + d*x))^(3/2)*(a + b*cos(c + d*x))^(5/2)), x)
```

3.768 $\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 557

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{2(3a^2-7b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\right.}{3(a-b)b^2(a+b)^{3/2}d\sqrt{\sec(c+}}$$

$$-\frac{2(3a^2+ab-6b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1}{}}}{3(a-b)b^2(a+b)^{3/2}d\sqrt{\sec(c+dx)}}$$

$$-\frac{2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\operatorname{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(}{a-}}}{b^3d\sqrt{\sec(c+dx)}}$$

$$-\frac{2a^2\sin(c+dx)}{3b(a^2-b^2)d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$

$$-\frac{2a^2(3a^2-7b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3b^2(a^2-b^2)^2d\sqrt{a+b\cos(c+dx)}}$$

```
[Out] -2/3*a^2*sin(d*x+c)/b/(a^2-b^2)/d/(a+b*cos(d*x+c))^(3/2)/sec(d*x+c)^(1/2)-2
/3*a^2*(3*a^2-7*b^2)*sin(d*x+c)*sec(d*x+c)^(1/2)/b^2/(a^2-b^2)^2/d/(a+b*cos
(d*x+c))^(1/2)+2/3*(3*a^2-7*b^2)*csc(d*x+c)*EllipticE((a+b*cos(d*x+c))^(1/2
)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*cos(d*x+c)^(1/2)*(a*(1
-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/(a-b)/b^2/(a+b)^(3
/2)/d/sec(d*x+c)^(1/2)-2/3*(3*a^2+a*b-6*b^2)*csc(d*x+c)*EllipticF((a+b*cos(
d*x+c))^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),((-a-b)/(a-b))^(1/2))*cos(d*x+c)
^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))^(1/2)/(a-b)/
b^2/(a+b)^(3/2)/d/sec(d*x+c)^(1/2)-2*csc(d*x+c)*EllipticPi((a+b*cos(d*x+c))
^(1/2)/(a+b)^(1/2)/cos(d*x+c)^(1/2),(a+b)/b,((-a-b)/(a-b))^(1/2))*(a+b)^(1/
2)*cos(d*x+c)^(1/2)*(a*(1-sec(d*x+c))/(a+b))^(1/2)*(a*(1+sec(d*x+c))/(a-b))
^(1/2)/b^3/d/sec(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 1.40 (sec) , antiderivative size = 557, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {4307, 2871, 3130, 2888, 3072, 3077, 2895, 3073}

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\,dx =$$
$$-\frac{2(3a^2+ab-6b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)\right.}{3b^2d(a-b)(a+b)^{3/2}\sqrt{\sec(c+dx)}}$$
$$+\frac{2(3a^2-7b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)}{3b^2d(a-b)(a+b)^{3/2}\sqrt{\sec(c+dx)}}$$
$$-\frac{2a^2(3a^2-7b^2)\sin(c+dx)\sqrt{\sec(c+dx)}}{3b^2d\,(a^2-b^2)^2\sqrt{a+b\cos(c+dx)}}$$
$$-\frac{2a^2\sin(c+dx)}{3bd\,(a^2-b^2)\sqrt{\sec(c+dx)}(a+b\cos(c+dx))^{3/2}}$$
$$-\frac{2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(\sec(c+dx)+1)}{a-b}}\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),\right.}{b^3d\sqrt{\sec(c+dx)}}$$

```
[In] Int[1/((a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (2*(3*a^2 - 7*b^2)*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticE[ArcSin[Sqrt[a
+ b*Cos[c + d*x]]/(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sq
rt[(a*(1 - Sec[c + d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3
*(a - b)*b^2*(a + b)^(3/2)*d*Sqrt[Sec[c + d*x]]) - (2*(3*a^2 + a*b - 6*b^2)
*Sqrt[Cos[c + d*x]]*Csc[c + d*x]*EllipticF[ArcSin[Sqrt[a + b*Cos[c + d*x]]/
(Sqrt[a + b]*Sqrt[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c +
 d*x]))/(a + b)]*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(3*(a - b)*b^2*(a +
b)^(3/2)*d*Sqrt[Sec[c + d*x]]) - (2*Sqrt[a + b]*Sqrt[Cos[c + d*x]]*Csc[c +
d*x]*EllipticPi[(a + b)/b, ArcSin[Sqrt[a + b*Cos[c + d*x]]/(Sqrt[a + b]*Sqr
t[Cos[c + d*x]])], -((a + b)/(a - b))]*Sqrt[(a*(1 - Sec[c + d*x]))/(a + b)]
*Sqrt[(a*(1 + Sec[c + d*x]))/(a - b)])/(b^3*d*Sqrt[Sec[c + d*x]]) - (2*a^2*
Sin[c + d*x])/(3*b*(a^2 - b^2)*d*(a + b*Cos[c + d*x])^(3/2)*Sqrt[Sec[c + d*
x]]) - (2*a^2*(3*a^2 - 7*b^2)*Sqrt[Sec[c + d*x]]*Sin[c + d*x])/(3*b^2*(a^2
- b^2)^2*d*Sqrt[a + b*Cos[c + d*x]])
```

Rule 2871

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-(b^2*c^2 - 2*a*b*c*d + a^2*d^2))*Co
s[e + f*x]*(a + b*Sin[e + f*x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*
(n + 1)*(c^2 - d^2))), x] + Dist[1/(d*(n + 1)*(c^2 - d^2)), Int[(a + b*Sin[
```

```
e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^(n + 1)*Simp[b*(m - 2)*(b*c - a*d)^2
 + a*d*(n + 1)*(c*(a^2 + b^2) - 2*a*b*d) + (b*(n + 1)*(a*b*c^2 + c*d*(a^2 +
 b^2) - 3*a*b*d^2) - a*(n + 2)*(b*c - a*d)^2)*Sin[e + f*x] + b*(b^2*(c^2 -
d^2) - m*(b*c - a*d)^2 + d*n*(2*a*b*c - d*(a^2 + b^2)))*Sin[e + f*x]^2, x],
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b
^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && LtQ[n, -1] && (IntegerQ[m] || I
ntegersQ[2*m, 2*n])
```

Rule 2888

```
Int[Sqrt[(b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Simp[2*b*(Tan[e + f*x]/(d*f))*Rt[(c + d)/b, 2]*Sqrt[c
*((1 + Csc[e + f*x])/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*Ellipti
cPi[(c + d)/d, ArcSin[Sqrt[c + d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c +
 d)/b, 2]], -(c + d)/(c - d)], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 -
 d^2, 0] && PosQ[(c + d)/b]
```

Rule 2895

```
Int[1/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*sin[(e_.) + (f
_.)*(x_)]]), x_Symbol] :> Simp[-2*(Tan[e + f*x]/(a*f))*Rt[(a + b)/d, 2]*Sqr
t[a*((1 - Csc[e + f*x])/(a + b))]*Sqrt[a*((1 + Csc[e + f*x])/(a - b))]*Elli
pticF[ArcSin[Sqrt[a + b*Sin[e + f*x]]/Sqrt[d*Sin[e + f*x]]/Rt[(a + b)/d, 2]
], -(a + b)/(a - b)], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 - b^2, 0]
&& PosQ[(a + b)/d]
```

Rule 3072

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(
x_)]]*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(3/2)), x_Symbol] :> Simp[2*(A
*b - a*B)*(Cos[e + f*x]/(f*(a^2 - b^2)*Sqrt[a + b*Sin[e + f*x]]*Sqrt[d*Sin[
e + f*x]])), x] + Dist[d/(a^2 - b^2), Int[(A*b - a*B + (a*A - b*B)*Sin[e +
f*x])/(Sqrt[a + b*Sin[e + f*x]]*(d*Sin[e + f*x])^(3/2)), x], x] /; FreeQ[{a
, b, d, e, f, A, B}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3073

```
Int[((A_) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((b_.)*sin[(e_.) + (f_.)*(x_)])
^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> Simp[-2*A*
(c - d)*(Tan[e + f*x]/(f*b*c^2))*Rt[(c + d)/b, 2]*Sqrt[c*((1 + Csc[e + f*x]
)/(c - d))]*Sqrt[c*((1 - Csc[e + f*x])/(c + d))]*EllipticE[ArcSin[Sqrt[c +
d*Sin[e + f*x]]/Sqrt[b*Sin[e + f*x]]/Rt[(c + d)/b, 2]], -(c + d)/(c - d)],
x] /; FreeQ[{b, c, d, e, f, A, B}, x] && NeQ[c^2 - d^2, 0] && EqQ[A, B] &&
PosQ[(c + d)/b]
```

Rule 3077

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)])/(((a_.) + (b_.)*sin[(e_.) + (f_
.)*(x_)])^(3/2)*Sqrt[(c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]]), x_Symbol] :> D
ist[(A - B)/(a - b), Int[1/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x
]]), x], x] - Dist[(A*b - a*B)/(a - b), Int[(1 + Sin[e + f*x])/((a + b*Sin[
e + f*x])^(3/2)*Sqrt[c + d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, c, d, e,
f, A, B}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0]
 && NeQ[A, B]
```

Rule 3130

```
Int[((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^
2)/(Sqrt[(d_.)*sin[(e_.) + (f_.)*(x_)]]*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_
)])^(3/2)), x_Symbol] :> Dist[C/(b*d), Int[Sqrt[d*Sin[e + f*x]]/Sqrt[a + b*
Sin[e + f*x]], x], x] + Dist[1/b, Int[(A*b + (b*B - a*C)*Sin[e + f*x])/((a
+ b*Sin[e + f*x])^(3/2)*Sqrt[d*Sin[e + f*x]]), x], x] /; FreeQ[{a, b, d, e,
 f, A, B, C}, x] && NeQ[a^2 - b^2, 0]
```

Rule 4307

```
Int[(csc[(a_.) + (b_.)*(x_)]*(c_.))^(m_.)*(u_), x_Symbol] :> Dist[(c*Csc[a
+ b*x])^m*(c*Sin[a + b*x])^m, Int[ActivateTrig[u]/(c*Sin[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownSineIntegrandQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\cos^{\frac{5}{2}}(c+dx)}{(a+b\cos(c+dx))^{5/2}}\,dx\\
&= -\frac{2a^2\sin(c+dx)}{3b\left(a^2-b^2\right)d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\\
&\quad-\frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\frac{a^2}{2}-\frac{3}{2}ab\cos(c+dx)-\frac{3}{2}\left(a^2-b^2\right)\cos^2(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx}{3b\left(a^2-b^2\right)}\\
&= -\frac{2a^2\sin(c+dx)}{3b\left(a^2-b^2\right)d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}\\
&\quad+\frac{\left(\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\sqrt{\cos(c+dx)}}{\sqrt{a+b\cos(c+dx)}}\,dx}{b^2}\\
&\quad-\frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\frac{a^2b}{2}+\left(-\frac{3ab^2}{2}+\frac{3}{2}a\left(a^2-b^2\right)\right)\cos(c+dx)}{\sqrt{\cos(c+dx)}(a+b\cos(c+dx))^{3/2}}\,dx}{3b^2\left(a^2-b^2\right)}
\end{aligned}$$

$$= -\frac{2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx)}{a+b}}}{b^3d\sqrt{\sec(c+dx)}}$$
$$-\frac{2a^2\sin(c+dx)}{3b\left(a^2-b^2\right)d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$
$$-\frac{2a^2(3a^2-7b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3b^2\left(a^2-b^2\right)^2d\sqrt{a+b\cos(c+dx)}}$$
$$-\frac{\left(2\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{\frac{a^2b^2}{2}-a\left(-\frac{3ab^2}{2}+\frac{3}{2}a(a^2-b^2)\right)+\left(\frac{a^3b}{2}-b\left(-\frac{3ab^2}{2}+\frac{3}{2}a(a^2-b^2)\right)\right)\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{3b^2\left(a^2-b^2\right)^2}$$

$$= -\frac{2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx)}{a+b}}}{b^3d\sqrt{\sec(c+dx)}}$$
$$-\frac{2a^2\sin(c+dx)}{3b\left(a^2-b^2\right)d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$
$$-\frac{2a^2(3a^2-7b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3b^2\left(a^2-b^2\right)^2d\sqrt{a+b\cos(c+dx)}}$$
$$+\frac{\left(a^2(3a^2-7b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1+\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{a+b\cos(c+dx)}}dx}{3b^2\left(a^2-b^2\right)^2}$$
$$-\frac{\left(a(a-b)(3a^2+ab-6b^2)\sqrt{\cos(c+dx)}\sqrt{\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}\sqrt{a+b\cos(c+dx)}}dx}{3b^2\left(a^2-b^2\right)^2}$$

$$= \frac{2(3a^2-7b^2)\sqrt{\cos(c+dx)}\csc(c+dx)E\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right)|-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx))}{a+b}}\sqrt{\frac{a(1+\sec(c-}{a-b}}}{3(a-b)b^2(a+b)^{3/2}d\sqrt{\sec(c+dx)}}$$
$$-\frac{2(3a^2+ab-6b^2)\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(}{a+}}}{3(a-b)b^2(a+b)^{3/2}d\sqrt{\sec(c+dx)}}$$
$$-\frac{2\sqrt{a+b}\sqrt{\cos(c+dx)}\csc(c+dx)\,\text{EllipticPi}\left(\frac{a+b}{b},\arcsin\left(\frac{\sqrt{a+b\cos(c+dx)}}{\sqrt{a+b}\sqrt{\cos(c+dx)}}\right),-\frac{a+b}{a-b}\right)\sqrt{\frac{a(1-\sec(c+dx)}{a+b}}}{b^3d\sqrt{\sec(c+dx)}}$$
$$-\frac{2a^2\sin(c+dx)}{3b\left(a^2-b^2\right)d(a+b\cos(c+dx))^{3/2}\sqrt{\sec(c+dx)}}$$
$$-\frac{2a^2(3a^2-7b^2)\sqrt{\sec(c+dx)}\sin(c+dx)}{3b^2\left(a^2-b^2\right)^2d\sqrt{a+b\cos(c+dx)}}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 1335 vs. 2(557) = 1114.

Time = 12.43 (sec) , antiderivative size = 1335, normalized size of antiderivative = 2.40

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \frac{\sqrt{a+b\cos(c+dx)}\sqrt{\sec(c+dx)}\left(\frac{2a(3a^2-7b^2)\sin(c+dx)}{3b^2(a^2-b^2)^2} - \frac{2a}{3b^2(-a^2+b}\right.}{d}$$
$$+\frac{2\sqrt{\frac{a+b+a\tan^2\left(\frac{1}{2}(c+dx)\right)-b\tan^2\left(\frac{1}{2}(c+dx)\right)}{1+\tan^2\left(\frac{1}{2}(c+dx)\right)}}\left(-3a^4\tan\left(\frac{1}{2}(c+dx)\right)-3a^3b\tan\left(\frac{1}{2}(c+dx)\right)+7a^2b^2\tan\left(\frac{1}{2}(c+dx)\right)\right.}{}$$

```
[In] Integrate[1/((a + b*Cos[c + d*x])^(5/2)*Sec[c + d*x]^(5/2)),x]
```

```
[Out] (Sqrt[a + b*Cos[c + d*x]]*Sqrt[Sec[c + d*x]]*((2*a*(3*a^2 - 7*b^2)*Sin[c +
d*x])/(3*b^2*(a^2 - b^2)^2) - (2*a^3*Sin[c + d*x])/(3*b^2*(-a^2 + b^2)*(a +
 b*Cos[c + d*x])^2) - (8*(a^4*Sin[c + d*x] - 2*a^2*b^2*Sin[c + d*x]))/(3*b^
2*(-a^2 + b^2)^2*(a + b*Cos[c + d*x]))))/d + (2*Sqrt[(a + b + a*Tan[(c + d*
x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(1 + Tan[(c + d*x)/2]^2)]*(-3*a^4*Tan[(c +
d*x)/2] - 3*a^3*b*Tan[(c + d*x)/2] + 7*a^2*b^2*Tan[(c + d*x)/2] + 7*a*b^3*T
an[(c + d*x)/2] + 6*a^3*b*Tan[(c + d*x)/2]^3 - 14*a*b^3*Tan[(c + d*x)/2]^3
+ 3*a^4*Tan[(c + d*x)/2]^5 - 3*a^3*b*Tan[(c + d*x)/2]^5 - 7*a^2*b^2*Tan[(c
+ d*x)/2]^5 + 7*a*b^3*Tan[(c + d*x)/2]^5 + 6*a^4*EllipticPi[-1, ArcSin[Tan[
(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqrt[(a + b +
 a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] - 12*a^2*b^2*Ellipti
cPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/
2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] +
 6*b^4*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 -
Tan[(c + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]
^2)/(a + b)] + 6*a^4*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a +
 b)]*Tan[(c + d*x)/2]^2*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c
 + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] - 12*a^2*b^2*EllipticPi[-1, A
rcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Tan[(c + d*x)/2]^2*Sqrt[1 - Tan[
(c + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/
(a + b)] + 6*b^4*EllipticPi[-1, ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]
*Tan[(c + d*x)/2]^2*Sqrt[1 - Tan[(c + d*x)/2]^2]*Sqrt[(a + b + a*Tan[(c + d
*x)/2]^2 - b*Tan[(c + d*x)/2]^2)/(a + b)] - a*(3*a^3 + 3*a^2*b - 7*a*b^2 -
7*b^3)*EllipticE[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(
c + d*x)/2]^2]*(1 + Tan[(c + d*x)/2]^2)*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2
- b*Tan[(c + d*x)/2]^2)/(a + b)] - b*(-2*a^3 + a^2*b + 6*a*b^2 + 3*b^3)*Ell
ipticF[ArcSin[Tan[(c + d*x)/2]], (-a + b)/(a + b)]*Sqrt[1 - Tan[(c + d*x)/2
]^2]*(1 + Tan[(c + d*x)/2]^2)*Sqrt[(a + b + a*Tan[(c + d*x)/2]^2 - b*Tan[(c
 + d*x)/2]^2)/(a + b)]))/(3*b^2*(a^2 - b^2)^2*d*(-1 + Tan[(c + d*x)/2]^2)*S
qrt[(1 + Tan[(c + d*x)/2]^2)/(1 - Tan[(c + d*x)/2]^2)]*(b*(-1 + Tan[(c + d*
x)/2]^2) - a*(1 + Tan[(c + d*x)/2]^2)))
```

Maple [B] (warning: unable to verify)

Leaf count of result is larger than twice the leaf count of optimal. 4444 vs. $2(505) = 1010$.

Time = 9.52 (sec) , antiderivative size = 4445, normalized size of antiderivative = 7.98

method	result	size
default	Expression too large to display	4445

```
[In] int(1/(a+cos(d*x+c)*b)^(5/2)/sec(d*x+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3/d*(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^3*((csc(d*x+c)^2*a*(1-cos(d*x+c))^
2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(csc(d*x+c)^2*(1-cos(d*x+c))^2+1))^(
1/2)*(-3*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)
^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*Ell
ipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^5*(1-cos(d*x+c))^2-3*c
sc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-co
s(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot
(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^4*(1-cos(d*x+c))^2-6*(-csc(d*x
+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c
)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-
1,(-(a-b)/(a+b))^(1/2))*a^4*b+12*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*(
(csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b)
)^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a^3*b^2+1
2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^
2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-c
sc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a^2*b^3-6*(-csc(d*x+c)^2*(1-cos(d*x+c))^
2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^
2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2
))*a*b^4-2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos
(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(
d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b-(-csc(d*x+c)^2*(1-cos(d*x+c))
^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))
^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*
a^3*b^2+7*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(
d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d
*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^3+9*(-csc(d*x+c)^2*(1-cos(d*x+
c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+
c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2
))*a*b^4+6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos
(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(
d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b-4*(-csc(d*x+c)^2*(1-cos(d*x+c
))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c
))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2)
)*a^3*b^2-14*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-c
os(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(co
```

t(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^3-7*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a*b^4+3*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^5*(1-cos(d*x+c))^2+6*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a^4*b*(1-cos(d*x+c))^2+12*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a^3*b^2*(1-cos(d*x+c))^2-12*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a^2*b^3*(1-cos(d*x+c))^2-6*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a*b^4*(1-cos(d*x+c))^2-2*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^4*b*(1-cos(d*x+c))^2+3*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^3*b^2*(1-cos(d*x+c))^2+5*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^2*b^3*(1-cos(d*x+c))^2-2*a^4*b*(csc(d*x+c)-cot(d*x+c))+10*a^3*b^2*(csc(d*x+c)-cot(d*x+c))+2*a^2*b^3*(csc(d*x+c)-cot(d*x+c))-7*a*b^4*(csc(d*x+c)-cot(d*x+c))+3*csc(d*x+c)^5*a^5*(1-cos(d*x+c))^5-3*a^5*(csc(d*x+c)-cot(d*x+c))-6*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a^5*(1-cos(d*x+c))^2+6*csc(d*x+c)^2*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*b^5*(1-cos(d*x+c))^2+14*csc(d*x+c)^3*a*b^4*(1-cos(d*x+c))^3+3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticF(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*b^5+3*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-(a-b)/(a+b))^(1/2))*a^5-6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*a^5-6*(-csc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticPi(cot(d

```
*x+c)-csc(d*x+c),-1,(-(a-b)/(a+b))^(1/2))*b^5-6*csc(d*x+c)^5*a^4*b*(1-cos(d
*x+c))^5-4*csc(d*x+c)^5*a^3*b^2*(1-cos(d*x+c))^5+14*csc(d*x+c)^5*a^2*b^3*(1
-cos(d*x+c))^5-7*csc(d*x+c)^5*a*b^4*(1-cos(d*x+c))^5+8*csc(d*x+c)^3*a^4*b*(
1-cos(d*x+c))^3-6*csc(d*x+c)^3*a^3*b^2*(1-cos(d*x+c))^3-10*csc(d*x+c)^2*(-c
sc(d*x+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc
(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x
+c),(-(a-b)/(a+b))^(1/2))*a^3*b^2*(1-cos(d*x+c))^2+7*csc(d*x+c)^2*(-csc(d*x
+c)^2*(1-cos(d*x+c))^2+1)^(1/2)*((csc(d*x+c)^2*a*(1-cos(d*x+c))^2-csc(d*x+c
)^2*b*(1-cos(d*x+c))^2+a+b)/(a+b))^(1/2)*EllipticE(cot(d*x+c)-csc(d*x+c),(-
(a-b)/(a+b))^(1/2))*a*b^4*(1-cos(d*x+c))^2-16*csc(d*x+c)^3*a^2*b^3*(1-cos(d
*x+c))^3)/(-(csc(d*x+c)^2*(1-cos(d*x+c))^2+1)/(csc(d*x+c)^2*(1-cos(d*x+c))^
2-1))^(5/2)/(csc(d*x+c)^2*(1-cos(d*x+c))^2-1)^3/(csc(d*x+c)^2*a*(1-cos(d*x+
c))^2-csc(d*x+c)^2*b*(1-cos(d*x+c))^2+a+b)^2/(a-b)^2/(a+b)^2/b^2
```

Fricas [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(5/2)/sec(d*x+c)^(5/2),x, algorithm="fricas")
[Out] integral(sqrt(b*cos(d*x + c) + a)/((b^3*cos(d*x + c)^3 + 3*a*b^2*cos(d*x +
c)^2 + 3*a^2*b*cos(d*x + c) + a^3)*sec(d*x + c)^(5/2)), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(1/(a+b*cos(d*x+c))**(5/2)/sec(d*x+c)**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*cos(d*x+c))^(5/2)/sec(d*x+c)^(5/2),x, algorithm="maxima")
[Out] integrate(1/((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^(5/2)), x)
```

Giac [F]

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{(b\cos(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^{\frac{5}{2}}}\,dx$$

[In] integrate(1/(a+b*cos(d*x+c))^(5/2)/sec(d*x+c)^(5/2),x, algorithm="giac")

[Out] integrate(1/((b*cos(d*x + c) + a)^(5/2)*sec(d*x + c)^(5/2)), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\cos(c+dx))^{5/2}\sec^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{1}{\left(\frac{1}{\cos(c+d\,x)}\right)^{5/2}\,(a+b\,\cos(c+d\,x))^{5/2}}\,dx$$

[In] int(1/((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^(5/2)),x)

[Out] int(1/((1/cos(c + d*x))^(5/2)*(a + b*cos(c + d*x))^(5/2)), x)

3.769 $\int \cos^m(c+dx)(a+b\cos(c+dx))^4\,dx$

Optimal result

Integrand size = 21, antiderivative size = 330

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^4\,dx = \frac{b^2(b^2(3+m)+a^2(22+5m))\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)(4+m)} + \frac{2ab^3(5+m)\cos^{2+m}(c+dx)\sin(c+dx)}{d(3+m)(4+m)} + \frac{b^2\cos^{1+m}(c+dx)(a+b\cos(c+dx))^2\sin(c+dx)}{d(4+m)} - \frac{(b^4(3+4m+m^2)+6a^2b^2(4+5m+m^2)+a^4(8+6m+m^2))\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{}\right.}{d(1+m)(2+m)(4+m)\sqrt{\sin^2(c+dx)}} - \frac{4ab(b^2(2+m)+a^2(3+m))\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2+m)(3+m)\sqrt{\sin^2(c+dx)}}$$

```
[Out] b^2*(b^2*(3+m)+a^2*(22+5*m))*cos(d*x+c)^(1+m)*sin(d*x+c)/d/(2+m)/(4+m)+2*a*
b^3*(5+m)*cos(d*x+c)^(2+m)*sin(d*x+c)/d/(3+m)/(4+m)+b^2*cos(d*x+c)^(1+m)*(a
+b*cos(d*x+c))^2*sin(d*x+c)/d/(4+m)-(b^4*(m^2+4*m+3)+6*a^2*b^2*(m^2+5*m+4)+
a^4*(m^2+6*m+8))*cos(d*x+c)^(1+m)*hypergeom([1/2, 1/2+1/2*m],[3/2+1/2*m],co
s(d*x+c)^2)*sin(d*x+c)/d/(4+m)/(m^2+3*m+2)/(sin(d*x+c)^2)^(1/2)-4*a*b*(b^2*
(2+m)+a^2*(3+m))*cos(d*x+c)^(2+m)*hypergeom([1/2, 1+1/2*m],[2+1/2*m],cos(d*
x+c)^2)*sin(d*x+c)/d/(2+m)/(3+m)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.79 (sec) , antiderivative size = 330, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$, Rules used = {2872, 3112, 3102, 2827, 2722}

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^4\,dx =$$

$$-\frac{4ab(a^2(m+3)+b^2(m+2))\sin(c+dx)\cos^{m+2}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},\cos^2(c+dx)\right.}{d(m+2)(m+3)\sqrt{\sin^2(c+dx)}}$$
$$+\frac{b^2(a^2(5m+22)+b^2(m+3))\sin(c+dx)\cos^{m+1}(c+dx)}{d(m+2)(m+4)}$$
$$-\frac{(a^4(m^2+6m+8)+6a^2b^2(m^2+5m+4)+b^4(m^2+4m+3))\sin(c+dx)\cos^{m+1}(c+dx)\,\text{Hypergeome}}{d(m+1)(m+2)(m+4)\sqrt{\sin^2(c+dx)}}$$
$$+\frac{2ab^3(m+5)\sin(c+dx)\cos^{m+2}(c+dx)}{d(m+3)(m+4)}$$
$$+\frac{b^2\sin(c+dx)\cos^{m+1}(c+dx)(a+b\cos(c+dx))^2}{d(m+4)}$$

```
[In] Int[Cos[c + d*x]^m*(a + b*Cos[c + d*x])^4,x]
```

```
[Out] (b^2*(b^2*(3 + m) + a^2*(22 + 5*m))*Cos[c + d*x]^(1 + m)*Sin[c + d*x])/(d*(
2 + m)*(4 + m)) + (2*a*b^3*(5 + m)*Cos[c + d*x]^(2 + m)*Sin[c + d*x])/(d*(3
 + m)*(4 + m)) + (b^2*Cos[c + d*x]^(1 + m)*(a + b*Cos[c + d*x])^2*Sin[c + d
*x])/(d*(4 + m)) - ((b^4*(3 + 4*m + m^2) + 6*a^2*b^2*(4 + 5*m + m^2) + a^4*
(8 + 6*m + m^2))*Cos[c + d*x]^(1 + m)*Hypergeometric2F1[1/2, (1 + m)/2, (3
+ m)/2, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(1 + m)*(2 + m)*(4 + m)*Sqrt[Sin[c
 + d*x]^2]) - (4*a*b*(b^2*(2 + m) + a^2*(3 + m))*Cos[c + d*x]^(2 + m)*Hyper
geometric2F1[1/2, (2 + m)/2, (4 + m)/2, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(2
 + m)*(3 + m)*Sqrt[Sin[c + d*x]^2])
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rule 3112

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((c_) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])*((A_.) + (B_.)*sin[(e_.) + (f_.)*(x_)] + (C_.)*sin[(e_.) + (f
_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*d*Cos[e + f*x]*Sin[e + f*x]*((a + b*Si
n[e + f*x])^(m + 1)/(b*f*(m + 3))), x] + Dist[1/(b*(m + 3)), Int[(a + b*Sin
[e + f*x])^m*Simp[a*C*d + A*b*c*(m + 3) + b*(B*c*(m + 3) + d*(C*(m + 2) + A
*(m + 3)))*Sin[e + f*x] - (2*a*C*d - b*(c*C + B*d)*(m + 3))*Sin[e + f*x]^2,
 x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, m}, x] && NeQ[b*c - a*d, 0
] && NeQ[a^2 - b^2, 0] &&  !LtQ[m, -1]
```

Rubi steps

$$\text{integral} = \frac{b^2\cos^{1+m}(c+dx)(a+b\cos(c+dx))^2\sin(c+dx)}{d(4+m)} + \frac{\int\cos^m(c+dx)(a+b\cos(c+dx))\left(a(b^2(1+m)+a^2(4+m))+b(b^2(3+m)+3a^2(4+m))\cos(c+dx)\right.}{4+m}$$

$$= \frac{2ab^3(5+m)\cos^{2+m}(c+dx)\sin(c+dx)}{d(3+m)(4+m)} + \frac{b^2\cos^{1+m}(c+dx)(a+b\cos(c+dx))^2\sin(c+dx)}{d(4+m)} + \frac{\int\cos^m(c+dx)\left(a^2(3+m)\left(b^2(1+m)+a^2(4+m)\right)+4ab(4+m)\left(b^2(2+m)+a^2(3+m)\right)\cos(c\right.}{12+7m+m^2}$$

$$= \frac{b^2(b^2(3+m)+a^2(22+5m))\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)(4+m)} + \frac{2ab^3(5+m)\cos^{2+m}(c+dx)\sin(c+dx)}{d(3+m)(4+m)} + \frac{b^2\cos^{1+m}(c+dx)(a+b\cos(c+dx))^2\sin(c+dx)}{d(4+m)} + \frac{\int\cos^m(c+dx)\left((3+m)\left(b^4(3+4m+m^2)+6a^2b^2(4+5m+m^2)+a^4(8+6m+m^2)\right)+4ab(2\right.}{24+26m+9m^2+m^3}$$

$$= \frac{b^2(b^2(3+m)+a^2(22+5m))\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)(4+m)} + \frac{2ab^3(5+m)\cos^{2+m}(c+dx)\sin(c+dx)}{d(3+m)(4+m)} + \frac{b^2\cos^{1+m}(c+dx)(a+b\cos(c+dx))^2\sin(c+dx)}{d(4+m)} + \left(4ab\left(a^2+\frac{b^2(2+m)}{3+m}\right)\right)\int\cos^{1+m}(c+dx)\,dx + \frac{(b^4(3+4m+m^2)+6a^2b^2(4+5m+m^2)+a^4(8+6m+m^2))\int\cos^m(c+dx)\,dx}{8+6m+m^2}$$

$$= \frac{b^2(b^2(3+m)+a^2(22+5m))\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)(4+m)} + \frac{2ab^3(5+m)\cos^{2+m}(c+dx)\sin(c+dx)}{d(3+m)(4+m)} + \frac{b^2\cos^{1+m}(c+dx)(a+b\cos(c+dx))^2\sin(c+dx)}{d(4+m)} - \frac{(b^4(3+4m+m^2)+6a^2b^2(4+5m+m^2)+a^4(8+6m+m^2))\cos^{1+m}(c+dx)\,\text{Hypergeometric}}{d(1+m)(8+6m+m^2)\sqrt{\sin^2(c+dx)}} - \frac{4ab\left(a^2+\frac{b^2(2+m)}{3+m}\right)\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2+m)\sqrt{\sin^2(c+dx)}}$$

Mathematica [A] (verified)

Time = 1.10 (sec) , antiderivative size = 242, normalized size of antiderivative = 0.73

$$\int\cos^m(c+dx)(a+b\cos(c+dx))^4\,dx = \frac{\cos^{1+m}(c+dx)\csc(c+dx)\left(-\frac{a^4\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)}{1+m}+b\cos(c+dx)\left(-\frac{4a^3\,\text{Hypergeometric2F1}}{2}\right.\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^m*(a + b*Cos[c + d*x])^4,x]
```

```
[Out] (Cos[c + d*x]^(1 + m)*Csc[c + d*x]*(-((a^4*Hypergeometric2F1[1/2, (1 + m)/2
, (3 + m)/2, Cos[c + d*x]^2])/(1 + m)) + b*Cos[c + d*x]*((-4*a^3*Hypergeome
tric2F1[1/2, (2 + m)/2, (4 + m)/2, Cos[c + d*x]^2])/(2 + m) + b*Cos[c + d*x
]*((-6*a^2*Hypergeometric2F1[1/2, (3 + m)/2, (5 + m)/2, Cos[c + d*x]^2])/(3
 + m) + b*Cos[c + d*x]*((-4*a*Hypergeometric2F1[1/2, (4 + m)/2, (6 + m)/2,
Cos[c + d*x]^2])/(4 + m) - (b*Cos[c + d*x]*Hypergeometric2F1[1/2, (5 + m)/2
, (7 + m)/2, Cos[c + d*x]^2])/(5 + m)))))*Sqrt[Sin[c + d*x]^2])/d
```

Maple [F]

$$\int (\cos^m (dx + c)) (a + \cos (dx + c) b)^4 \, dx$$

```
[In] int(cos(d*x+c)^m*(a+cos(d*x+c)*b)^4,x)
```

```
[Out] int(cos(d*x+c)^m*(a+cos(d*x+c)*b)^4,x)
```

Fricas [F]

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^4 \, dx = \int (b\cos (dx+c)+a)^4 \cos (dx+c)^m \, dx$$

```
[In] integrate(cos(d*x+c)^m*(a+b*cos(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] integral((b^4*cos(d*x + c)^4 + 4*a*b^3*cos(d*x + c)^3 + 6*a^2*b^2*cos(d*x +
 c)^2 + 4*a^3*b*cos(d*x + c) + a^4)*cos(d*x + c)^m, x)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^4 \, dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**m*(a+b*cos(d*x+c))**4,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^4\,dx = \int (b\cos(dx+c)+a)^4\cos(dx+c)^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(a+b*cos(d*x+c))^4,x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^4*cos(d*x + c)^m, x)
```

Giac [F]

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^4\,dx = \int (b\cos(dx+c)+a)^4\cos(dx+c)^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(a+b*cos(d*x+c))^4,x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^4*cos(d*x + c)^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^4\,dx = \int \cos(c+d\,x)^m\,(a+b\,\cos(c+d\,x))^4\,dx$$

```
[In] int(cos(c + d*x)^m*(a + b*cos(c + d*x))^4,x)
[Out] int(cos(c + d*x)^m*(a + b*cos(c + d*x))^4, x)
```

3.770 $\int \cos^m(c+dx)(a+b\cos(c+dx))^3\,dx$

Optimal result

Integrand size = 21, antiderivative size = 250

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^3\,dx = \frac{ab^2(7+2m)\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)(3+m)} + \frac{b^2\cos^{1+m}(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{d(3+m)} - \frac{a(3b^2(1+m)+a^2(2+m))\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(1+m)(2+m)\sqrt{\sin^2(c+dx)}} - \frac{b(b^2(2+m)+3a^2(3+m))\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2+m)(3+m)\sqrt{\sin^2(c+dx)}}$$

```
[Out] a*b^2*(7+2*m)*cos(d*x+c)^(1+m)*sin(d*x+c)/d/(2+m)/(3+m)+b^2*cos(d*x+c)^(1+m
)*(a+b*cos(d*x+c))*sin(d*x+c)/d/(3+m)-a*(3*b^2*(1+m)+a^2*(2+m))*cos(d*x+c)^
(1+m)*hypergeom([1/2, 1/2+1/2*m],[3/2+1/2*m],cos(d*x+c)^2)*sin(d*x+c)/d/(1+
m)/(2+m)/(sin(d*x+c)^2)^(1/2)-b*(b^2*(2+m)+3*a^2*(3+m))*cos(d*x+c)^(2+m)*hy
pergeom([1/2, 1+1/2*m],[2+1/2*m],cos(d*x+c)^2)*sin(d*x+c)/d/(2+m)/(3+m)/(si
n(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used

$= \{2872, 3102, 2827, 2722\}$

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^3\,dx = -\frac{a(a^2(m+2)+3b^2(m+1))\sin(c+dx)\cos^{m+1}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},\cos^2(c+dx)\right)}{d(m+1)(m+2)\sqrt{\sin^2(c+dx)}} - \frac{b(3a^2(m+3)+b^2(m+2))\sin(c+dx)\cos^{m+2}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},\cos^2(c+dx)\right)}{d(m+2)(m+3)\sqrt{\sin^2(c+dx)}} + \frac{ab^2(2m+7)\sin(c+dx)\cos^{m+1}(c+dx)}{d(m+2)(m+3)} + \frac{b^2\sin(c+dx)\cos^{m+1}(c+dx)(a+b\cos(c+dx))}{d(m+3)}$$

```
[In] Int[Cos[c + d*x]^m*(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (a*b^2*(7 + 2*m)*Cos[c + d*x]^(1 + m)*Sin[c + d*x])/(d*(2 + m)*(3 + m)) + (
b^2*Cos[c + d*x]^(1 + m)*(a + b*Cos[c + d*x])*Sin[c + d*x])/(d*(3 + m)) - (
a*(3*b^2*(1 + m) + a^2*(2 + m))*Cos[c + d*x]^(1 + m)*Hypergeometric2F1[1/2,
 (1 + m)/2, (3 + m)/2, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(1 + m)*(2 + m)*Sqr
t[Sin[c + d*x]^2]) - (b*(b^2*(2 + m) + 3*a^2*(3 + m))*Cos[c + d*x]^(2 + m)*
Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, Cos[c + d*x]^2]*Sin[c + d*x])/
(d*(2 + m)*(3 + m)*Sqrt[Sin[c + d*x]^2])
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 2872

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b^2)*Cos[e + f*x]*(a + b*Sin[e + f*
x])^(m - 2)*((c + d*Sin[e + f*x])^(n + 1)/(d*f*(m + n))), x] + Dist[1/(d*(m
 + n)), Int[(a + b*Sin[e + f*x])^(m - 3)*(c + d*Sin[e + f*x])^n*Simp[a^3*d*
(m + n) + b^2*(b*c*(m - 2) + a*d*(n + 1)) - b*(a*b*c - b^2*d*(m + n - 1) -
3*a^2*d*(m + n))*Sin[e + f*x] - b^2*(b*c*(m - 1) - a*d*(3*m + 2*n - 2))*Sin
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d
, 0] && NeQ[a^2 - b^2, 0] && NeQ[c^2 - d^2, 0] && GtQ[m, 2] && (IntegerQ[m]
```

```
 || IntegersQ[2*m, 2*n]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[a, 0] &
& NeQ[c, 0])))
```

Rule 3102

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*sin[(e_.)
+ (f_.)*(x_)] + (C_.)*sin[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(-C)*Co
s[e + f*x]*((a + b*Sin[e + f*x])^(m + 1)/(b*f*(m + 2))), x] + Dist[1/(b*(m
+ 2)), Int[(a + b*Sin[e + f*x])^m*Simp[A*b*(m + 2) + b*C*(m + 1) + (b*B*(m
+ 2) - a*C)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x]
&&  !LtQ[m, -1]
```

Rubi steps

$$\text{integral} = \frac{b^2\cos^{1+m}(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{d(3+m)} + \frac{\int \cos^m(c+dx)\left(a(b^2(1+m)+a^2(3+m))+b(b^2(2+m)+3a^2(3+m))\cos(c+dx)+ab^2(7+2m)\cos^2\right.}{3+m}$$

$$= \frac{ab^2(7+2m)\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)(3+m)} + \frac{b^2\cos^{1+m}(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{d(3+m)} + \frac{\int \cos^m(c+dx)\left(a(3+m)\left(3b^2(1+m)+a^2(2+m)\right)+b(2+m)\left(b^2(2+m)+3a^2(3+m)\right)\cos(c\right.}{6+5m+m^2}$$

$$= \frac{ab^2(7+2m)\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)(3+m)} + \frac{b^2\cos^{1+m}(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{d(3+m)} + \left(a\left(a^2+\frac{3b^2(1+m)}{2+m}\right)\right)\int\cos^m(c+dx)\,dx + \left(b\left(3a^2+\frac{b^2(2+m)}{3+m}\right)\right)\int\cos^{1+m}(c+dx)\,dx$$

$$= \frac{ab^2(7+2m)\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)(3+m)} + \frac{b^2\cos^{1+m}(c+dx)(a+b\cos(c+dx))\sin(c+dx)}{d(3+m)} - \frac{a\left(a^2+\frac{3b^2(1+m)}{2+m}\right)\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(1+m)\sqrt{\sin^2(c+dx)}} - \frac{b\left(3a^2+\frac{b^2(2+m)}{3+m}\right)\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2+m)\sqrt{\sin^2(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.54 (sec) , antiderivative size = 197, normalized size of antiderivative = 0.79

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^3\,dx = \frac{\cos^{1+m}(c+dx)\csc(c+dx)\left(-\frac{a^3\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)}{1+m}+b\cos(c+dx)\left(-\frac{3a^2\,\text{Hypergeometric2F1}}{2}\right.\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^m*(a + b*Cos[c + d*x])^3,x]
```

```
[Out] (Cos[c + d*x]^(1 + m)*Csc[c + d*x]*(-((a^3*Hypergeometric2F1[1/2, (1 + m)/2
, (3 + m)/2, Cos[c + d*x]^2])/(1 + m)) + b*Cos[c + d*x]*((-3*a^2*Hypergeome
tric2F1[1/2, (2 + m)/2, (4 + m)/2, Cos[c + d*x]^2])/(2 + m) + b*Cos[c + d*x
]*((-3*a*Hypergeometric2F1[1/2, (3 + m)/2, (5 + m)/2, Cos[c + d*x]^2])/(3 +
 m) - (b*Cos[c + d*x]*Hypergeometric2F1[1/2, (4 + m)/2, (6 + m)/2, Cos[c +
d*x]^2])/(4 + m))))*Sqrt[Sin[c + d*x]^2])/d
```

Maple [F]

$$\int (\cos^m(dx+c))\,(a+\cos(dx+c)\,b)^3\,dx$$

```
[In] int(cos(d*x+c)^m*(a+cos(d*x+c)*b)^3,x)
```

```
[Out] int(cos(d*x+c)^m*(a+cos(d*x+c)*b)^3,x)
```

Fricas [F]

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^3\,dx = \int (b\cos(dx+c)+a)^3\cos(dx+c)^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(a+b*cos(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] integral((b^3*cos(d*x + c)^3 + 3*a*b^2*cos(d*x + c)^2 + 3*a^2*b*cos(d*x + c
) + a^3)*cos(d*x + c)^m, x)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^3\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**m*(a+b*cos(d*x+c))**3,x)
[Out] Timed out
```

Maxima [F]

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^3\,dx = \int (b\cos(dx+c)+a)^3\cos(dx+c)^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(a+b*cos(d*x+c))^3,x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^3*cos(d*x + c)^m, x)
```

Giac [F]

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^3\,dx = \int (b\cos(dx+c)+a)^3\cos(dx+c)^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(a+b*cos(d*x+c))^3,x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^3*cos(d*x + c)^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^3\,dx = \int \cos(c+d\,x)^m\,(a+b\,\cos(c+d\,x))^3\,dx$$

```
[In] int(cos(c + d*x)^m*(a + b*cos(c + d*x))^3,x)
[Out] int(cos(c + d*x)^m*(a + b*cos(c + d*x))^3, x)
```

3.771 $\int \cos^m(c+dx)(a+b\cos(c+dx))^2\,dx$

Optimal result

Integrand size = 21, antiderivative size = 179

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^2\,dx = \frac{b^2\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)} - \frac{(b^2(1+m)+a^2(2+m))\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(1+m)(2+m)\sqrt{\sin^2(c+dx)}} - \frac{2ab\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2+m)\sqrt{\sin^2(c+dx)}}$$

```
[Out] b^2*cos(d*x+c)^(1+m)*sin(d*x+c)/d/(2+m)-(b^2*(1+m)+a^2*(2+m))*cos(d*x+c)^(1
+m)*hypergeom([1/2, 1/2+1/2*m],[3/2+1/2*m],cos(d*x+c)^2)*sin(d*x+c)/d/(1+m)
/(2+m)/(sin(d*x+c)^2)^(1/2)-2*a*b*cos(d*x+c)^(2+m)*hypergeom([1/2, 1+1/2*m]
,[2+1/2*m],cos(d*x+c)^2)*sin(d*x+c)/d/(2+m)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 179, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2868, 2722, 3093}

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^2\,dx = -\frac{(a^2(m+2)+b^2(m+1))\sin(c+dx)\cos^{m+1}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},\cos^2(c+dx)\right)}{d(m+1)(m+2)\sqrt{\sin^2(c+dx)}} - \frac{2ab\sin(c+dx)\cos^{m+2}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},\cos^2(c+dx)\right)}{d(m+2)\sqrt{\sin^2(c+dx)}} + \frac{b^2\sin(c+dx)\cos^{m+1}(c+dx)}{d(m+2)}$$

```
[In] Int[Cos[c + d*x]^m*(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (b^2*Cos[c + d*x]^(1 + m)*Sin[c + d*x])/(d*(2 + m)) - ((b^2*(1 + m) + a^2*(
2 + m))*Cos[c + d*x]^(1 + m)*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, C
os[c + d*x]^2]*Sin[c + d*x])/(d*(1 + m)*(2 + m)*Sqrt[Sin[c + d*x]^2]) - (2*
a*b*Cos[c + d*x]^(2 + m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, Cos[c
 + d*x]^2]*Sin[c + d*x])/(d*(2 + m)*Sqrt[Sin[c + d*x]^2])
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2868

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)])^2, x_Symbol] :> Dist[2*c*(d/b), Int[(b*Sin[e + f*x])^(m + 1), x], x] +
 Int[(b*Sin[e + f*x])^m*(c^2 + d^2*Sin[e + f*x]^2), x] /; FreeQ[{b, c, d, e
, f, m}, x]
```

Rule 3093

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_.)*((A_) + (C_.)*sin[(e_.) + (f_.)*(
x_)]^2), x_Symbol] :> Simp[(-C)*Cos[e + f*x]*((b*Sin[e + f*x])^(m + 1)/(b*f
*(m + 2))), x] + Dist[(A*(m + 2) + C*(m + 1))/(m + 2), Int[(b*Sin[e + f*x])
^m, x], x] /; FreeQ[{b, e, f, A, C, m}, x] &&  !LtQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= (2ab)\int \cos^{1+m}(c+dx)\,dx+\int \cos^m(c+dx)\left(a^2+b^2\cos^2(c+dx)\right)\,dx\\
&= \frac{b^2\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)}\\
&\quad -\frac{2ab\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2+m)\sqrt{\sin^2(c+dx)}}\\
&\quad +\left(a^2+\frac{b^2(1+m)}{2+m}\right)\int \cos^m(c+dx)\,dx\\
&= \frac{b^2\cos^{1+m}(c+dx)\sin(c+dx)}{d(2+m)}\\
&\quad -\frac{\left(a^2+\frac{b^2(1+m)}{2+m}\right)\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(1+m)\sqrt{\sin^2(c+dx)}}\\
&\quad -\frac{2ab\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2+m)\sqrt{\sin^2(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 168, normalized size of antiderivative = 0.94

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^2\,dx =$$
$$-\frac{\cos^{1+m}(c+dx)\csc(c+dx)\left(a^2(6+5m+m^2)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)+b(1+\cdots\right.}{\cdots}$$

```
[In] Integrate[Cos[c + d*x]^m*(a + b*Cos[c + d*x])^2,x]
```

```
[Out] -((Cos[c + d*x]^(1 + m)*Csc[c + d*x]*(a^2*(6 + 5*m + m^2)*Hypergeometric2F1
[1/2, (1 + m)/2, (3 + m)/2, Cos[c + d*x]^2] + b*(1 + m)*Cos[c + d*x]*(2*a*(
3 + m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, Cos[c + d*x]^2] + b*(2
+ m)*Cos[c + d*x]*Hypergeometric2F1[1/2, (3 + m)/2, (5 + m)/2, Cos[c + d*x]
^2]))*Sqrt[Sin[c + d*x]^2])/(d*(1 + m)*(2 + m)*(3 + m)))
```

Maple [F]

$$\int (\cos^m(dx+c))\,(a+\cos(dx+c)\,b)^2\,dx$$

```
[In] int(cos(d*x+c)^m*(a+cos(d*x+c)*b)^2,x)
```

```
[Out] int(cos(d*x+c)^m*(a+cos(d*x+c)*b)^2,x)
```

Fricas [F]

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^2\,dx = \int (b\cos(dx+c)+a)^2\cos(dx+c)^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(a+b*cos(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)*cos(d*x + c)^m, x)
```

Sympy [F]

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^2\,dx = \int (a+b\cos(c+dx))^2\cos^m(c+dx)\,dx$$

```
[In] integrate(cos(d*x+c)**m*(a+b*cos(d*x+c))**2,x)
```

```
[Out] Integral((a + b*cos(c + d*x))**2*cos(c + d*x)**m, x)
```

Maxima [F]

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^2\,dx = \int (b\cos(dx+c)+a)^2\cos(dx+c)^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(a+b*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^2*cos(d*x + c)^m, x)
```

Giac [F]

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^2\,dx = \int (b\cos(dx+c)+a)^2\cos(dx+c)^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(a+b*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^2*cos(d*x + c)^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^m(c+dx)(a+b\cos(c+dx))^2\,dx = \int \cos(c+d\,x)^m\,(a+b\,\cos(c+d\,x))^2\,dx$$

```
[In] int(cos(c + d*x)^m*(a + b*cos(c + d*x))^2,x)
[Out] int(cos(c + d*x)^m*(a + b*cos(c + d*x))^2, x)
```

3.772 $\int \cos^m(c+dx)(a+b\cos(c+dx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 131

$$\int \cos^m(c+dx)(a+b\cos(c+dx))\,dx = -\frac{a\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(1+m)\sqrt{\sin^2(c+dx)}} - \frac{b\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2+m)\sqrt{\sin^2(c+dx)}}$$

```
[Out] -a*cos(d*x+c)^(1+m)*hypergeom([1/2, 1/2+1/2*m],[3/2+1/2*m],cos(d*x+c)^2)*si
n(d*x+c)/d/(1+m)/(sin(d*x+c)^2)^(1/2)-b*cos(d*x+c)^(2+m)*hypergeom([1/2, 1+
1/2*m],[2+1/2*m],cos(d*x+c)^2)*sin(d*x+c)/d/(2+m)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2827, 2722}

$$\int \cos^m(c+dx)(a+b\cos(c+dx))\,dx = -\frac{a\sin(c+dx)\cos^{m+1}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},\cos^2(c+dx)\right)}{d(m+1)\sqrt{\sin^2(c+dx)}} - \frac{b\sin(c+dx)\cos^{m+2}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},\cos^2(c+dx)\right)}{d(m+2)\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^m*(a + b*Cos[c + d*x]),x]
```

```
[Out] -((a*Cos[c + d*x]^(1 + m)*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, Cos[
c + d*x]^2]*Sin[c + d*x])/(d*(1 + m)*Sqrt[Sin[c + d*x]^2])) - (b*Cos[c + d*
x]^(2 + m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, Cos[c + d*x]^2]*Sin
[c + d*x])/(d*(2 + m)*Sqrt[Sin[c + d*x]^2])
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned} \text{integral} &= a\int \cos^m(c+dx)\,dx + b\int \cos^{1+m}(c+dx)\,dx \\ &= -\frac{a\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(1+m)\sqrt{\sin^2(c+dx)}} \\ &\quad -\frac{b\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2+m)\sqrt{\sin^2(c+dx)}} \end{aligned}$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 112, normalized size of antiderivative = 0.85

$$\int \cos^m(c+dx)(a+b\cos(c+dx))\,dx = -\frac{\cos^{1+m}(c+dx)\csc(c+dx)\left(a(2+m)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\cos^2(c+dx)\right)+b(1+m)\cos(c\right.}{d(1+m)(2+m)}$$

```
[In] Integrate[Cos[c + d*x]^m*(a + b*Cos[c + d*x]),x]
```

```
[Out] -((Cos[c + d*x]^(1 + m)*Csc[c + d*x]*(a*(2 + m)*Hypergeometric2F1[1/2, (1 +
 m)/2, (3 + m)/2, Cos[c + d*x]^2] + b*(1 + m)*Cos[c + d*x]*Hypergeometric2F
1[1/2, (2 + m)/2, (4 + m)/2, Cos[c + d*x]^2])*Sqrt[Sin[c + d*x]^2])/(d*(1 +
 m)*(2 + m)))
```

Maple [F]

$$\int \left(\cos^{m}\left(dx+c\right)\right)\left(a+\cos\left(dx+c\right)b\right)dx$$

```
[In] int(cos(d*x+c)^m*(a+cos(d*x+c)*b),x)
[Out] int(cos(d*x+c)^m*(a+cos(d*x+c)*b),x)
```

Fricas [F]

$$\int \cos^m(c+dx)(a+b\cos(c+dx))\,dx = \int (b\cos\left(dx+c\right)+a)\cos\left(dx+c\right)^{m}\,dx$$

```
[In] integrate(cos(d*x+c)^m*(a+b*cos(d*x+c)),x, algorithm="fricas")
[Out] integral((b*cos(d*x + c) + a)*cos(d*x + c)^m, x)
```

Sympy [F]

$$\int \cos^m(c+dx)(a+b\cos(c+dx))\,dx = \int (a+b\cos\left(c+dx\right))\cos^{m}\left(c+dx\right)dx$$

```
[In] integrate(cos(d*x+c)**m*(a+b*cos(d*x+c)),x)
[Out] Integral((a + b*cos(c + d*x))*cos(c + d*x)**m, x)
```

Maxima [F]

$$\int \cos^m(c+dx)(a+b\cos(c+dx))\,dx = \int (b\cos\left(dx+c\right)+a)\cos\left(dx+c\right)^{m}\,dx$$

```
[In] integrate(cos(d*x+c)^m*(a+b*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)*cos(d*x + c)^m, x)
```

Giac [F]

$$\int \cos^m(c+dx)(a+b\cos(c+dx))\,dx = \int (b\cos(dx+c)+a)\cos(dx+c)^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(a+b*cos(d*x+c)),x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)*cos(d*x + c)^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^m(c+dx)(a+b\cos(c+dx))\,dx = \int \cos(c+d\,x)^m\,(a+b\,\cos(c+d\,x))\,dx$$

```
[In] int(cos(c + d*x)^m*(a + b*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^m*(a + b*cos(c + d*x)), x)
```

3.773 $\int \frac{\cos^m(c+dx)}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 190

$$\int \frac{\cos^m(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{a\,\text{AppellF1}\left(\frac{1}{2},\frac{1-m}{2},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\cos^{-1+m}(c+dx)\cos^2(c+dx)^{\frac{1-m}{2}}\sin(c+dx)}{(a^2-b^2)\,d} - \frac{b\,\text{AppellF1}\left(\frac{1}{2},-\frac{m}{2},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\cos^m(c+dx)\cos^2(c+dx)^{-m/2}\sin(c+dx)}{(a^2-b^2)\,d}$$

```
[Out] a*AppellF1(1/2,1/2-1/2*m,1,3/2,sin(d*x+c)^2,-b^2*sin(d*x+c)^2/(a^2-b^2))*co
s(d*x+c)^(-1+m)*(cos(d*x+c)^2)^(1/2-1/2*m)*sin(d*x+c)/(a^2-b^2)/d-b*AppellF
1(1/2,-1/2*m,1,3/2,sin(d*x+c)^2,-b^2*sin(d*x+c)^2/(a^2-b^2))*cos(d*x+c)^m*s
in(d*x+c)/(a^2-b^2)/d/((cos(d*x+c)^2)^(1/2*m))
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 190, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2902, 3268, 440}

$$\int \frac{\cos^m(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{a\sin(c+dx)\cos^{m-1}(c+dx)\cos^2(c+dx)^{\frac{1-m}{2}}\,\text{AppellF1}\left(\frac{1}{2},\frac{1-m}{2},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)}{d\,(a^2-b^2)} - \frac{b\sin(c+dx)\cos^m(c+dx)\cos^2(c+dx)^{-m/2}\,\text{AppellF1}\left(\frac{1}{2},-\frac{m}{2},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)}{d\,(a^2-b^2)}$$

```
[In] Int[Cos[c + d*x]^m/(a + b*Cos[c + d*x]),x]
```

```
[Out] (a*AppellF1[1/2, (1 - m)/2, 1, 3/2, Sin[c + d*x]^2, -((b^2*Sin[c + d*x]^2)/
(a^2 - b^2))]*Cos[c + d*x]^(-1 + m)*(Cos[c + d*x]^2)^((1 - m)/2)*Sin[c + d*
x])/((a^2 - b^2)*d) - (b*AppellF1[1/2, -1/2*m, 1, 3/2, Sin[c + d*x]^2, -((b
^2*Sin[c + d*x]^2)/(a^2 - b^2))]*Cos[c + d*x]^m*Sin[c + d*x])/((a^2 - b^2)*
d*(Cos[c + d*x]^2)^(m/2))
```

Rule 440

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[a^p*c^q*x*AppellF1[1/n, -p, -q, 1 + 1/n, (-b)*(x^n/a), (-d)*(x^n/c)
], x] /; FreeQ[{a, b, c, d, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[n, -1]
 && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 2902

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Dist[a, Int[(d*Sin[e + f*x])^n/(a^2 - b^2*Sin[e + f*x]^
2), x], x] - Dist[b/d, Int[(d*Sin[e + f*x])^(n + 1)/(a^2 - b^2*Sin[e + f*x]
^2), x], x] /; FreeQ[{a, b, d, e, f, n}, x] && NeQ[a^2 - b^2, 0]
```

Rule 3268

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^2)^(p_.), x_Symbol] :> With[{ff = FreeFactors[Cos[e + f*x], x]}, Dist[(
-ff)*d^(2*IntPart[(m - 1)/2] + 1)*((d*Sin[e + f*x])^(2*FracPart[(m - 1)/2])
/(f*(Sin[e + f*x]^2)^FracPart[(m - 1)/2])), Subst[Int[(1 - ff^2*x^2)^((m -
1)/2)*(a + b - b*ff^2*x^2)^p, x], x, Cos[e + f*x]/ff], x]] /; FreeQ[{a, b,
d, e, f, m, p}, x] && !IntegerQ[m]
```

Rubi steps

$$\text{integral} = a\int \frac{\cos^m(c+dx)}{a^2-b^2\cos^2(c+dx)}\,dx - b\int \frac{\cos^{1+m}(c+dx)}{a^2-b^2\cos^2(c+dx)}\,dx$$

$$= \frac{\left(a\cos^{2\left(-\frac{1}{2}+\frac{m}{2}\right)}(c+dx)\cos^2(c+dx)^{\frac{1}{2}-\frac{m}{2}}\right)\operatorname{Subst}\left(\int \frac{(1-x^2)^{\frac{1}{2}(-1+m)}}{a^2-b^2+b^2x^2}\,dx, x, \sin(c+dx)\right)}{d} - \frac{\left(b\cos^m(c+dx)\cos^2(c+dx)^{-m/2}\right)\operatorname{Subst}\left(\int \frac{(1-x^2)^{m/2}}{a^2-b^2+b^2x^2}\,dx, x, \sin(c+dx)\right)}{d}$$

$$= \frac{a\operatorname{AppellF1}\left(\frac{1}{2},\frac{1-m}{2},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\cos^{-1+m}(c+dx)\cos^2(c+dx)^{\frac{1-m}{2}}\sin(c+dx)}{(a^2-b^2)\,d} - \frac{b\operatorname{AppellF1}\left(\frac{1}{2},-\frac{m}{2},1,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\cos^m(c+dx)\cos^2(c+dx)^{-m/2}\sin(c+dx)}{(a^2-b^2)\,d}$$

Mathematica [B] (warning: unable to verify)

Leaf count is larger than twice the leaf count of optimal. 6534 vs. 2(190) = 380.

Time = 23.38 (sec) , antiderivative size = 6534, normalized size of antiderivative = 34.39

$$\int \frac{\cos^m(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Result too large to show}$$

```
[In] Integrate[Cos[c + d*x]^m/(a + b*Cos[c + d*x]),x]
[Out] Result too large to show
```

Maple [F]

$$\int \frac{\cos^m(dx+c)}{a+\cos(dx+c)\,b}dx$$

```
[In] int(cos(d*x+c)^m/(a+cos(d*x+c)*b),x)
[Out] int(cos(d*x+c)^m/(a+cos(d*x+c)*b),x)
```

Fricas [F]

$$\int \frac{\cos^m(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\cos(dx+c)^m}{b\cos(dx+c)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^m/(a+b*cos(d*x+c)),x, algorithm="fricas")
[Out] integral(cos(d*x + c)^m/(b*cos(d*x + c) + a), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^m(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**m/(a+b*cos(d*x+c)),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^m(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\cos(dx+c)^m}{b\cos(dx+c)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^m/(a+b*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^m/(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{\cos^m(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\cos(dx+c)^m}{b\cos(dx+c)+a}\,dx$$

```
[In] integrate(cos(d*x+c)^m/(a+b*cos(d*x+c)),x, algorithm="giac")
[Out] integrate(cos(d*x + c)^m/(b*cos(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^m(c+dx)}{a+b\cos(c+dx)}\,dx = \int \frac{\cos(c+d\,x)^m}{a+b\,\cos(c+d\,x)}\,dx$$

```
[In] int(cos(c + d*x)^m/(a + b*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^m/(a + b*cos(c + d*x)), x)
```

3.774 $\int \frac{\cos^m(c+dx)}{(a+b\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 294

$$\int \frac{\cos^m(c+dx)}{(a+b\cos(c+dx))^2}\,dx = \frac{b^2\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{2}(-1-m),2,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\cos^{1+m}(c+dx)\cos^2(c+dx)^{\frac{1}{2}(-1-m)}\sin(c+dx)}{(a^2-b^2)^2\,d} + \frac{a^2\,\text{AppellF1}\left(\frac{1}{2},\frac{1-m}{2},2,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\cos^{-1+m}(c+dx)\cos^2(c+dx)^{\frac{1-m}{2}}\sin(c+dx)}{(a^2-b^2)^2\,d} - \frac{2ab\,\text{AppellF1}\left(\frac{1}{2},-\frac{m}{2},2,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\cos^m(c+dx)\cos^2(c+dx)^{-m/2}\sin(c+dx)}{(a^2-b^2)^2\,d}$$

```
[Out] b^2*AppellF1(1/2,-1/2-1/2*m,2,3/2,sin(d*x+c)^2,-b^2*sin(d*x+c)^2/(a^2-b^2))
*cos(d*x+c)^(1+m)*(cos(d*x+c)^2)^(-1/2-1/2*m)*sin(d*x+c)/(a^2-b^2)^2/d+a^2*
AppellF1(1/2,1/2-1/2*m,2,3/2,sin(d*x+c)^2,-b^2*sin(d*x+c)^2/(a^2-b^2))*cos(
d*x+c)^(-1+m)*(cos(d*x+c)^2)^(1/2-1/2*m)*sin(d*x+c)/(a^2-b^2)^2/d-2*a*b*App
ellF1(1/2,-1/2*m,2,3/2,sin(d*x+c)^2,-b^2*sin(d*x+c)^2/(a^2-b^2))*cos(d*x+c)
^m*sin(d*x+c)/(a^2-b^2)^2/d/((cos(d*x+c)^2)^(1/2*m))
```

Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 294, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2903, 3268, 440}

$$\int \frac{\cos^m(c+dx)}{(a+b\cos(c+dx))^2}\,dx$$
$$=\frac{b^2\sin(c+dx)\cos^{m+1}(c+dx)\cos^2(c+dx)^{\frac{1}{2}(-m-1)}\operatorname{AppellF1}\left(\frac{1}{2},\frac{1}{2}(-m-1),2,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)}{d(a^2-b^2)^2}$$
$$+\frac{a^2\sin(c+dx)\cos^{m-1}(c+dx)\cos^2(c+dx)^{\frac{1-m}{2}}\operatorname{AppellF1}\left(\frac{1}{2},\frac{1-m}{2},2,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)}{d(a^2-b^2)^2}$$
$$-\frac{2ab\sin(c+dx)\cos^m(c+dx)\cos^2(c+dx)^{-m/2}\operatorname{AppellF1}\left(\frac{1}{2},-\frac{m}{2},2,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)}{d(a^2-b^2)^2}$$

```
[In] Int[Cos[c + d*x]^m/(a + b*Cos[c + d*x])^2,x]
```

```
[Out] (b^2*AppellF1[1/2, (-1 - m)/2, 2, 3/2, Sin[c + d*x]^2, -((b^2*Sin[c + d*x]^
2)/(a^2 - b^2))]*Cos[c + d*x]^(1 + m)*(Cos[c + d*x]^2)^((-1 - m)/2)*Sin[c +
 d*x])/((a^2 - b^2)^2*d) + (a^2*AppellF1[1/2, (1 - m)/2, 2, 3/2, Sin[c + d*
x]^2, -((b^2*Sin[c + d*x]^2)/(a^2 - b^2))]*Cos[c + d*x]^(-1 + m)*(Cos[c + d
*x]^2)^((1 - m)/2)*Sin[c + d*x])/((a^2 - b^2)^2*d) - (2*a*b*AppellF1[1/2, -
1/2*m, 2, 3/2, Sin[c + d*x]^2, -((b^2*Sin[c + d*x]^2)/(a^2 - b^2))]*Cos[c +
 d*x]^m*Sin[c + d*x])/((a^2 - b^2)^2*d*(Cos[c + d*x]^2)^(m/2))
```

Rule 440

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[a^p*c^q*x*AppellF1[1/n, -p, -q, 1 + 1/n, (-b)*(x^n/a), (-d)*(x^n/c)
], x] /; FreeQ[{a, b, c, d, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[n, -1]
 && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 2903

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(
x_)])^(m_.), x_Symbol] :> Int[ExpandTrig[(d*sin[e + f*x])^n*(1/((a - b*sin[
e + f*x])^m/(a^2 - b^2*sin[e + f*x]^2)^m)), x], x] /; FreeQ[{a, b, d, e, f,
 n}, x] && NeQ[a^2 - b^2, 0] && ILtQ[m, -1]
```

Rule 3268

```
Int[((d_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^2)^(p_.), x_Symbol] :> With[{ff = FreeFactors[Cos[e + f*x], x]}, Dist[(
-ff)*d^(2*IntPart[(m - 1)/2] + 1)*((d*Sin[e + f*x])^(2*FracPart[(m - 1)/2])
```

```
/(f*(Sin[e + f*x]^2)^FracPart[(m - 1)/2])), Subst[Int[(1 - ff^2*x^2)^((m -
1)/2)*(a + b - b*ff^2*x^2)^p, x], x, Cos[e + f*x]/ff], x]] /; FreeQ[{a, b,
d, e, f, m, p}, x] &&  !IntegerQ[m]
```

Rubi steps

$$\text{integral} = \int \left(\frac{a^2\cos^m(c+dx)}{\left(a^2-b^2\cos^2(c+dx)\right)^2} - \frac{2ab\cos^{1+m}(c+dx)}{\left(a^2-b^2\cos^2(c+dx)\right)^2} + \frac{b^2\cos^{2+m}(c+dx)}{\left(-a^2+b^2\cos^2(c+dx)\right)^2}\right) dx$$

$$= a^2\int \frac{\cos^m(c+dx)}{\left(a^2-b^2\cos^2(c+dx)\right)^2}\,dx - (2ab)\int \frac{\cos^{1+m}(c+dx)}{\left(a^2-b^2\cos^2(c+dx)\right)^2}\,dx + b^2\int \frac{\cos^{2+m}(c+dx)}{\left(-a^2+b^2\cos^2(c+dx)\right)^2}\,dx$$

$$= \frac{\left(b^2\cos^{2\left(\frac{1}{2}+\frac{m}{2}\right)}(c+dx)\cos^2(c+dx)^{-\frac{1}{2}-\frac{m}{2}}\right)\text{Subst}\left(\int \frac{\left(1-x^2\right)^{\frac{1+m}{2}}}{\left(-a^2+b^2-b^2x^2\right)^2}\,dx, x, \sin(c+dx)\right)}{d} + \frac{\left(a^2\cos^{2\left(-\frac{1}{2}+\frac{m}{2}\right)}(c+dx)\cos^2(c+dx)^{\frac{1}{2}-\frac{m}{2}}\right)\text{Subst}\left(\int \frac{\left(1-x^2\right)^{\frac{1}{2}(-1+m)}}{\left(a^2-b^2+b^2x^2\right)^2}\,dx, x, \sin(c+dx)\right)}{d} - \frac{\left(2ab\cos^m(c+dx)\cos^2(c+dx)^{-m/2}\right)\text{Subst}\left(\int \frac{\left(1-x^2\right)^{m/2}}{\left(a^2-b^2+b^2x^2\right)^2}\,dx, x, \sin(c+dx)\right)}{d}$$

$$= \frac{b^2\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{2}(-1-m),2,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\cos^{1+m}(c+dx)\cos^2(c+dx)^{\frac{1}{2}(-1-m)}\,\text{s}}{\left(a^2-b^2\right)^2 d} + \frac{a^2\,\text{AppellF1}\left(\frac{1}{2},\frac{1-m}{2},2,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\cos^{-1+m}(c+dx)\cos^2(c+dx)^{\frac{1-m}{2}}\sin(c+}{\left(a^2-b^2\right)^2 d} - \frac{2ab\,\text{AppellF1}\left(\frac{1}{2},-\frac{m}{2},2,\frac{3}{2},\sin^2(c+dx),-\frac{b^2\sin^2(c+dx)}{a^2-b^2}\right)\cos^m(c+dx)\cos^2(c+dx)^{-m/2}\sin(c+d}{\left(a^2-b^2\right)^2 d}$$

Mathematica [B] (warning: unable to verify)

Leaf count is larger than twice the leaf count of optimal. 7214 vs. 2(294) = 588.

Time = 28.60 (sec) , antiderivative size = 7214, normalized size of antiderivative = 24.54

$$\int \frac{\cos^m(c+dx)}{(a+b\cos(c+dx))^2} dx = \text{Result too large to show}$$

```
[In] Integrate[Cos[c + d*x]^m/(a + b*Cos[c + d*x])^2,x]
[Out] Result too large to show
```

Maple [F]

$$\int \frac{\cos^m(dx+c)}{(a+\cos(dx+c)\,b)^2} dx$$

```
[In] int(cos(d*x+c)^m/(a+cos(d*x+c)*b)^2,x)
[Out] int(cos(d*x+c)^m/(a+cos(d*x+c)*b)^2,x)
```

Fricas [F]

$$\int \frac{\cos^m(c+dx)}{(a+b\cos(c+dx))^2} dx = \int \frac{\cos(dx+c)^m}{(b\cos(dx+c)+a)^2} dx$$

```
[In] integrate(cos(d*x+c)^m/(a+b*cos(d*x+c))^2,x, algorithm="fricas")
[Out] integral(cos(d*x + c)^m/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^m(c+dx)}{(a+b\cos(c+dx))^2} dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**m/(a+b*cos(d*x+c))**2,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^m(c+dx)}{(a+b\cos(c+dx))^2}\,dx=\int \frac{\cos\left(dx+c\right)^m}{\left(b\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^m/(a+b*cos(d*x+c))^2,x, algorithm="maxima")
[Out] integrate(cos(d*x + c)^m/(b*cos(d*x + c) + a)^2, x)
```

Giac [F]

$$\int \frac{\cos^m(c+dx)}{(a+b\cos(c+dx))^2}\,dx=\int \frac{\cos\left(dx+c\right)^m}{\left(b\cos\left(dx+c\right)+a\right)^2}\,dx$$

```
[In] integrate(cos(d*x+c)^m/(a+b*cos(d*x+c))^2,x, algorithm="giac")
[Out] integrate(cos(d*x + c)^m/(b*cos(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^m(c+dx)}{(a+b\cos(c+dx))^2}\,dx=\int \frac{{\cos\left(c+d\,x\right)}^m}{{\left(a+b\,\cos\left(c+d\,x\right)\right)}^2}\,dx$$

```
[In] int(cos(c + d*x)^m/(a + b*cos(c + d*x))^2,x)
[Out] int(cos(c + d*x)^m/(a + b*cos(c + d*x))^2, x)
```

3.775 $\int (a+b\cos(c+dx))^3\sec^m(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 282

$$\int (a+b\cos(c+dx))^3\sec^m(c+dx)\,dx = -\frac{a^2b(1-2m)\sec^{-2+m}(c+dx)\sin(c+dx)}{d(1-m)(2-m)} - \frac{a^2\sec^{-2+m}(c+dx)(b+a\sec(c+dx))\sin(c+dx)}{d(1-m)} - \frac{b(b^2(2-m)+3a^2(3-m))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{4-m}{2},\frac{6-m}{2},\cos^2(c+dx)\right)\sec^{-4+m}(c+dx)\sin(c+dx)}{d(2-m)(4-m)\sqrt{\sin^2(c+dx)}} - \frac{a(3b^2(1-m)+a^2(2-m))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3-m}{2},\frac{5-m}{2},\cos^2(c+dx)\right)\sec^{-3+m}(c+dx)\sin(c+dx)}{d(1-m)(3-m)\sqrt{\sin^2(c+dx)}}$$

```
[Out] -a^2*b*(1-2*m)*sec(d*x+c)^(-2+m)*sin(d*x+c)/d/(m^2-3*m+2)-a^2*sec(d*x+c)^(-
2+m)*(b+a*sec(d*x+c))*sin(d*x+c)/d/(1-m)-b*(b^2*(2-m)+3*a^2*(3-m))*hypergeo
m([1/2, 2-1/2*m],[3-1/2*m],cos(d*x+c)^2)*sec(d*x+c)^(-4+m)*sin(d*x+c)/d/(m^
2-6*m+8)/(sin(d*x+c)^2)^(1/2)-a*(3*b^2*(1-m)+a^2*(2-m))*hypergeom([1/2, 3/2
-1/2*m],[5/2-1/2*m],cos(d*x+c)^2)*sec(d*x+c)^(-3+m)*sin(d*x+c)/d/(m^2-4*m+3
)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 282, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used

$= \{3317, 3927, 4132, 3857, 2722, 4131\}$

$$\int (a+b\cos(c+dx))^3\sec^m(c+dx)\,dx = -\frac{b(3a^2(3-m)+b^2(2-m))\sin(c+dx)\sec^{m-4}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{4-m}{2},\frac{6-m}{2},\cos^2(c+dx)\right)}{d(2-m)(4-m)\sqrt{\sin^2(c+dx)}} - \frac{a(a^2(2-m)+3b^2(1-m))\sin(c+dx)\sec^{m-3}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3-m}{2},\frac{5-m}{2},\cos^2(c+dx)\right)}{d(1-m)(3-m)\sqrt{\sin^2(c+dx)}} - \frac{a^2\sin(c+dx)\sec^{m-2}(c+dx)(a\sec(c+dx)+b)}{d(1-m)} - \frac{a^2b(1-2m)\sin(c+dx)\sec^{m-2}(c+dx)}{d(1-m)(2-m)}$$

```
[In] Int[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^m,x]
```

```
[Out] -((a^2*b*(1 - 2*m)*Sec[c + d*x]^(-2 + m)*Sin[c + d*x])/(d*(1 - m)*(2 - m)))
 - (a^2*Sec[c + d*x]^(-2 + m)*(b + a*Sec[c + d*x])*Sin[c + d*x])/(d*(1 - m)
) - (b*(b^2*(2 - m) + 3*a^2*(3 - m))*Hypergeometric2F1[1/2, (4 - m)/2, (6 -
 m)/2, Cos[c + d*x]^2]*Sec[c + d*x]^(-4 + m)*Sin[c + d*x])/(d*(2 - m)*(4 -
m)*Sqrt[Sin[c + d*x]^2]) - (a*(3*b^2*(1 - m) + a^2*(2 - m))*Hypergeometric2
F1[1/2, (3 - m)/2, (5 - m)/2, Cos[c + d*x]^2]*Sec[c + d*x]^(-3 + m)*Sin[c +
 d*x])/(d*(1 - m)*(3 - m)*Sqrt[Sin[c + d*x]^2])
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3857

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(b*Csc[c + d*x]
)^(n - 1)*((Sin[c + d*x]/b)^(n - 1)*Int[1/(Sin[c + d*x]/b)^n, x]), x] /; Fr
eeQ[{b, c, d, n}, x] &&  !IntegerQ[n]
```

Rule 3927

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_)*(csc[(e_.) + (f_.)*(x_)]*(b_.) + (
a_))^(m_), x_Symbol] :> Simp[(-b^2)*Cot[e + f*x]*(a + b*Csc[e + f*x])^(m -
```

```
2)*((d*Csc[e + f*x])^n/(f*(m + n - 1))), x] + Dist[1/(d*(m + n - 1)), Int[(
a + b*Csc[e + f*x])^(m - 3)*(d*Csc[e + f*x])^n*Simp[a^3*d*(m + n - 1) + a*b
^2*d*n + b*(b^2*d*(m + n - 2) + 3*a^2*d*(m + n - 1))*Csc[e + f*x] + a*b^2*d
*(3*m + 2*n - 4)*Csc[e + f*x]^2, x], x], x] /; FreeQ[{a, b, d, e, f, n}, x]
 && NeQ[a^2 - b^2, 0] && GtQ[m, 2] && (IntegerQ[m] || IntegersQ[2*m, 2*n])
&&  !(IGtQ[n, 2] &&  !IntegerQ[m])
```

Rule 4131

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[(-C)*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*(m + 1)
)), x] + Dist[(C*m + A*(m + 1))/(m + 1), Int[(b*Csc[e + f*x])^m, x], x] /;
FreeQ[{b, e, f, A, C, m}, x] && NeQ[C*m + A*(m + 1), 0] &&  !LeQ[m, -1]
```

Rule 4132

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*((A_.) + csc[(e_.) + (f_.)*(x_)]*
(B_.) + csc[(e_.) + (f_.)*(x_)]^2*(C_.)), x_Symbol] :> Dist[B/b, Int[(b*Csc
[e + f*x])^(m + 1), x], x] + Int[(b*Csc[e + f*x])^m*(A + C*Csc[e + f*x]^2),
 x] /; FreeQ[{b, e, f, A, B, C, m}, x]
```

Rubi steps

$$\text{integral} = \int \sec^{-3+m}(c+dx)(b+a\sec(c+dx))^3\,dx$$

$$= -\frac{a^2\sec^{-2+m}(c+dx)(b+a\sec(c+dx))\sin(c+dx)}{d(1-m)} + \frac{\int \sec^{-3+m}(c+dx)\left(-b(b^2(1-m)+a^2(3-m))-a(3b^2(1-m)+a^2(2-m))\sec(c+dx)-a^2b(\right.}{-1+m}$$

$$= -\frac{a^2\sec^{-2+m}(c+dx)(b+a\sec(c+dx))\sin(c+dx)}{d(1-m)} + \left(a\left(3b^2+\frac{a^2(2-m)}{1-m}\right)\right)\int \sec^{-2+m}(c+dx)\,dx + \frac{\int \sec^{-3+m}(c+dx)\left(-b(b^2(1-m)+a^2(3-m))-a^2b(1-2m)\sec^2(c+dx)\right)\,dx}{-1+m}$$

$$= -\frac{a^2b(1-2m)\sec^{-2+m}(c+dx)\sin(c+dx)}{d(1-m)(2-m)} - \frac{a^2\sec^{-2+m}(c+dx)(b+a\sec(c+dx))\sin(c+dx)}{d(1-m)} + \left(b\left(b^2+\frac{3a^2(3-m)}{2-m}\right)\right)\int \sec^{-3+m}(c+dx)\,dx + \left(a\left(3b^2+\frac{a^2(2-m)}{1-m}\right)\cos^m(c+dx)\sec^m(c+dx)\right)\int \cos^{2-m}(c+dx)\,dx$$

$$= -\frac{a^2b(1-2m)\sec^{-2+m}(c+dx)\sin(c+dx)}{d(1-m)(2-m)} - \frac{a^2\sec^{-2+m}(c+dx)(b+a\sec(c+dx))\sin(c+dx)}{d(1-m)} - \frac{a\left(3b^2+\frac{a^2(2-m)}{1-m}\right)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3-m}{2},\frac{5-m}{2},\cos^2(c+dx)\right)\sec^{-3+m}(c+dx)\sin(c+dx)}{d(3-m)\sqrt{\sin^2(c+dx)}} + \left(b\left(b^2+\frac{3a^2(3-m)}{2-m}\right)\cos^m(c+dx)\sec^m(c+dx)\right)\int\cos^{3-m}(c+dx)\,dx$$

$$= -\frac{a^2b(1-2m)\sec^{-2+m}(c+dx)\sin(c+dx)}{d(1-m)(2-m)} - \frac{a^2\sec^{-2+m}(c+dx)(b+a\sec(c+dx))\sin(c+dx)}{d(1-m)} - \frac{b\left(b^2+\frac{3a^2(3-m)}{2-m}\right)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{4-m}{2},\frac{6-m}{2},\cos^2(c+dx)\right)\sec^{-4+m}(c+dx)\sin(c+dx)}{d(4-m)\sqrt{\sin^2(c+dx)}} - \frac{a\left(3b^2+\frac{a^2(2-m)}{1-m}\right)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3-m}{2},\frac{5-m}{2},\cos^2(c+dx)\right)\sec^{-3+m}(c+dx)\sin(c+dx)}{d(3-m)\sqrt{\sin^2(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.54 (sec) , antiderivative size = 222, normalized size of antiderivative = 0.79

$$\int(a+b\cos(c+dx))^3\sec^m(c+dx)\,dx$$
$$= \frac{\csc(c+dx)\sec^{-4+m}(c+dx)\left(b^3m(2-3m+m^2)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(-3+m),\frac{1}{2}(-1+m),\sec^2(c+\right.\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^3*Sec[c + d*x]^m,x]
```

```
[Out] (Csc[c + d*x]*Sec[c + d*x]^(-4 + m)*(b^3*m*(2 - 3*m + m^2)*Hypergeometric2F
1[1/2, (-3 + m)/2, (-1 + m)/2, Sec[c + d*x]^2] + (a*(-3 + m)*(6*b^2*(-1 + m
)*m*Cos[c + d*x]^2*Hypergeometric2F1[1/2, (-2 + m)/2, m/2, Sec[c + d*x]^2]
+ 2*a*(-2 + m)*(3*b*m*Cos[c + d*x]*Hypergeometric2F1[1/2, (-1 + m)/2, (1 +
m)/2, Sec[c + d*x]^2] + a*(-1 + m)*Hypergeometric2F1[1/2, m/2, (2 + m)/2, S
ec[c + d*x]^2]))*Sec[c + d*x]^3)/2)*Sqrt[-Tan[c + d*x]^2])/(d*(-3 + m)*(-2
+ m)*(-1 + m)*m)
```

Maple [F]

$$\int (a + \cos(dx + c)\, b)^3 (\sec^m (dx + c))\, dx$$

```
[In] int((a+cos(d*x+c)*b)^3*sec(d*x+c)^m,x)
[Out] int((a+cos(d*x+c)*b)^3*sec(d*x+c)^m,x)
```

Fricas [F]

$$\int (a + b\cos(c + dx))^3 \sec^m(c + dx)\, dx = \int (b\cos(dx + c) + a)^3 \sec(dx + c)^m\, dx$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^m,x, algorithm="fricas")
[Out] integral((b^3*cos(d*x + c)^3 + 3*a*b^2*cos(d*x + c)^2 + 3*a^2*b*cos(d*x + c
) + a^3)*sec(d*x + c)^m, x)
```

Sympy [F]

$$\int (a + b\cos(c + dx))^3 \sec^m(c + dx)\, dx = \int (a + b\cos(c + dx))^3 \sec^m(c + dx)\, dx$$

```
[In] integrate((a+b*cos(d*x+c))**3*sec(d*x+c)**m,x)
[Out] Integral((a + b*cos(c + d*x))**3*sec(c + d*x)**m, x)
```

Maxima [F]

$$\int (a + b\cos(c + dx))^3 \sec^m(c + dx)\, dx = \int (b\cos(dx + c) + a)^3 \sec(dx + c)^m\, dx$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^m,x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^3*sec(d*x + c)^m, x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^3\sec^m(c+dx)\,dx=\int (b\cos(dx+c)+a)^3\sec(dx+c)^m\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^3*sec(d*x+c)^m,x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^3*sec(d*x + c)^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^3\sec^m(c+dx)\,dx=\int \left(\frac{1}{\cos(c+d\,x)}\right)^m\,(a+b\,\cos(c+d\,x))^3\,dx$$

```
[In] int((1/cos(c + d*x))^m*(a + b*cos(c + d*x))^3,x)
[Out] int((1/cos(c + d*x))^m*(a + b*cos(c + d*x))^3, x)
```

3.776 $\int (a+b\cos(c+dx))^2\sec^m(c+dx)\,dx$

Optimal result

Integrand size = 21, antiderivative size = 200

$$\int (a+b\cos(c+dx))^2\sec^m(c+dx)\,dx = -\frac{a^2\sec^{-1+m}(c+dx)\sin(c+dx)}{d(1-m)} - \frac{(b^2(1-m)+a^2(2-m))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3-m}{2},\frac{5-m}{2},\cos^2(c+dx)\right)\sec^{-3+m}(c+dx)\sin(c+dx)}{d(1-m)(3-m)\sqrt{\sin^2(c+dx)}} - \frac{2ab\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2-m}{2},\frac{4-m}{2},\cos^2(c+dx)\right)\sec^{-2+m}(c+dx)\sin(c+dx)}{d(2-m)\sqrt{\sin^2(c+dx)}}$$

```
[Out] -a^2*sec(d*x+c)^(-1+m)*sin(d*x+c)/d/(1-m)-(b^2*(1-m)+a^2*(2-m))*hypergeom([
1/2, 3/2-1/2*m],[5/2-1/2*m],cos(d*x+c)^2)*sec(d*x+c)^(-3+m)*sin(d*x+c)/d/(m
^2-4*m+3)/(sin(d*x+c)^2)^(1/2)-2*a*b*hypergeom([1/2, 1-1/2*m],[2-1/2*m],cos
(d*x+c)^2)*sec(d*x+c)^(-2+m)*sin(d*x+c)/d/(2-m)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 200, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {3317, 3873, 3857, 2722, 4131}

$$\int (a+b\cos(c+dx))^2\sec^m(c+dx)\,dx = -\frac{(a^2(2-m)+b^2(1-m))\sin(c+dx)\sec^{m-3}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3-m}{2},\frac{5-m}{2},\cos^2(c+dx)\right)}{d(1-m)(3-m)\sqrt{\sin^2(c+dx)}} - \frac{a^2\sin(c+dx)\sec^{m-1}(c+dx)}{d(1-m)} - \frac{2ab\sin(c+dx)\sec^{m-2}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2-m}{2},\frac{4-m}{2},\cos^2(c+dx)\right)}{d(2-m)\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^m,x]
```

```
[Out] -((a^2*Sec[c + d*x]^(-1 + m)*Sin[c + d*x])/(d*(1 - m))) - ((b^2*(1 - m) + a
^2*(2 - m))*Hypergeometric2F1[1/2, (3 - m)/2, (5 - m)/2, Cos[c + d*x]^2]*Se
c[c + d*x]^(-3 + m)*Sin[c + d*x])/(d*(1 - m)*(3 - m)*Sqrt[Sin[c + d*x]^2])
- (2*a*b*Hypergeometric2F1[1/2, (2 - m)/2, (4 - m)/2, Cos[c + d*x]^2]*Sec[c
 + d*x]^(-2 + m)*Sin[c + d*x])/(d*(2 - m)*Sqrt[Sin[c + d*x]^2])
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3857

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(b*Csc[c + d*x]
)^(n - 1)*((Sin[c + d*x]/b)^(n - 1)*Int[1/(Sin[c + d*x]/b)^n, x]), x] /; Fr
eeQ[{b, c, d, n}, x] &&  !IntegerQ[n]
```

Rule 3873

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_))^2, x_Symbol] :> Dist[2*a*(b/d), Int[(d*Csc[e + f*x])^(n + 1), x], x]
+ Int[(d*Csc[e + f*x])^n*(a^2 + b^2*Csc[e + f*x]^2), x] /; FreeQ[{a, b, d,
e, f, n}, x]
```

Rule 4131

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(m_.)*(csc[(e_.) + (f_.)*(x_)]^2*(C_.)
+ (A_)), x_Symbol] :> Simp[(-C)*Cot[e + f*x]*((b*Csc[e + f*x])^m/(f*(m + 1)
)), x] + Dist[(C*m + A*(m + 1))/(m + 1), Int[(b*Csc[e + f*x])^m, x], x] /;
FreeQ[{b, e, f, A, C, m}, x] && NeQ[C*m + A*(m + 1), 0] &&  !LeQ[m, -1]
```

Rubi steps

$$\text{integral} = \int \sec^{-2+m}(c+dx)(b+a\sec(c+dx))^2\,dx$$

$$= (2ab)\int \sec^{-1+m}(c+dx)\,dx + \int \sec^{-2+m}(c+dx)\left(b^2+a^2\sec^2(c+dx)\right)\,dx$$

$$= -\frac{a^2\sec^{-1+m}(c+dx)\sin(c+dx)}{d(1-m)} + \left(b^2+\frac{a^2(2-m)}{1-m}\right)\int \sec^{-2+m}(c+dx)\,dx + \left(2ab\cos^m(c+dx)\sec^m(c+dx)\right)\int \cos^{1-m}(c+dx)\,dx$$

$$= -\frac{a^2\sec^{-1+m}(c+dx)\sin(c+dx)}{d(1-m)} - \frac{2ab\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2-m}{2},\frac{4-m}{2},\cos^2(c+dx)\right)\sec^{-2+m}(c+dx)\sin(c+dx)}{d(2-m)\sqrt{\sin^2(c+dx)}} + \left(\left(b^2+\frac{a^2(2-m)}{1-m}\right)\cos^m(c+dx)\sec^m(c+dx)\right)\int \cos^{2-m}(c+dx)\,dx$$

$$= -\frac{a^2\sec^{-1+m}(c+dx)\sin(c+dx)}{d(1-m)} - \frac{\left(b^2+\frac{a^2(2-m)}{1-m}\right)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3-m}{2},\frac{5-m}{2},\cos^2(c+dx)\right)\sec^{-3+m}(c+dx)\sin(c+dx)}{d(3-m)\sqrt{\sin^2(c+dx)}} - \frac{2ab\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2-m}{2},\frac{4-m}{2},\cos^2(c+dx)\right)\sec^{-2+m}(c+dx)\sin(c+dx)}{d(2-m)\sqrt{\sin^2(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 159, normalized size of antiderivative = 0.80

$$\int (a+b\cos(c+dx))^2\sec^m(c+dx)\,dx = \frac{\csc(c+dx)\sec^{-3+m}(c+dx)\left(b^2(-1+m)m\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(-2+m),\frac{m}{2},\sec^2(c+dx)\right)+a(-2+\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^2*Sec[c + d*x]^m,x]
```

```
[Out] (Csc[c + d*x]*Sec[c + d*x]^(-3 + m)*(b^2*(-1 + m)*m*Hypergeometric2F1[1/2,
(-2 + m)/2, m/2, Sec[c + d*x]^2] + a*(-2 + m)*(2*b*m*Cos[c + d*x]*Hypergeom
etric2F1[1/2, (-1 + m)/2, (1 + m)/2, Sec[c + d*x]^2] + a*(-1 + m)*Hypergeom
etric2F1[1/2, m/2, (2 + m)/2, Sec[c + d*x]^2])*Sec[c + d*x]^2)*Sqrt[-Tan[c
+ d*x]^2])/(d*(-2 + m)*(-1 + m)*m)
```

Maple [F]

$$\int (a+\cos (dx+c) b)^2 (\sec^m (dx+c)) dx$$

```
[In] int((a+cos(d*x+c)*b)^2*sec(d*x+c)^m,x)
[Out] int((a+cos(d*x+c)*b)^2*sec(d*x+c)^m,x)
```

Fricas [F]

$$\int (a+b\cos(c+dx))^2 \sec^m(c+dx) dx = \int (b\cos (dx+c)+a)^2 \sec (dx+c)^m dx$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^m,x, algorithm="fricas")
[Out] integral((b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)*sec(d*x + c)^m, x)
```

Sympy [F]

$$\int (a+b\cos(c+dx))^2 \sec^m(c+dx) dx = \int (a+b\cos (c+dx))^2 \sec^m (c+dx) dx$$

```
[In] integrate((a+b*cos(d*x+c))**2*sec(d*x+c)**m,x)
[Out] Integral((a + b*cos(c + d*x))**2*sec(c + d*x)**m, x)
```

Maxima [F]

$$\int (a+b\cos(c+dx))^2 \sec^m(c+dx) dx = \int (b\cos (dx+c)+a)^2 \sec (dx+c)^m dx$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^m,x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)^2*sec(d*x + c)^m, x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^2 \sec^m(c+dx)\,dx = \int (b\cos(dx+c)+a)^2 \sec(dx+c)^m\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^2*sec(d*x+c)^m,x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)^2*sec(d*x + c)^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^2 \sec^m(c+dx)\,dx = \int \left(\frac{1}{\cos(c+d\,x)}\right)^m (a+b\,\cos(c+d\,x))^2\,dx$$

```
[In] int((1/cos(c + d*x))^m*(a + b*cos(c + d*x))^2,x)
[Out] int((1/cos(c + d*x))^m*(a + b*cos(c + d*x))^2, x)
```

3.777 $\int (a+b\cos(c+dx))\sec^m(c+dx)\,dx$

Optimal result

Integrand size = 19, antiderivative size = 143

$$\int (a+b\cos(c+dx))\sec^m(c+dx)\,dx = -\frac{b\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2-m}{2},\frac{4-m}{2},\cos^2(c+dx)\right)\sec^{-2+m}(c+dx)\sin(c+dx)}{d(2-m)\sqrt{\sin^2(c+dx)}} - \frac{a\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1-m}{2},\frac{3-m}{2},\cos^2(c+dx)\right)\sec^{-1+m}(c+dx)\sin(c+dx)}{d(1-m)\sqrt{\sin^2(c+dx)}}$$

```
[Out] -b*hypergeom([1/2, 1-1/2*m],[2-1/2*m],cos(d*x+c)^2)*sec(d*x+c)^(-2+m)*sin(d
*x+c)/d/(2-m)/(sin(d*x+c)^2)^(1/2)-a*hypergeom([1/2, 1/2-1/2*m],[3/2-1/2*m]
,cos(d*x+c)^2)*sec(d*x+c)^(-1+m)*sin(d*x+c)/d/(1-m)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 143, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.211$, Rules used = {3317, 3872, 3857, 2722}

$$\int (a+b\cos(c+dx))\sec^m(c+dx)\,dx = -\frac{a\sin(c+dx)\sec^{m-1}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1-m}{2},\frac{3-m}{2},\cos^2(c+dx)\right)}{d(1-m)\sqrt{\sin^2(c+dx)}} - \frac{b\sin(c+dx)\sec^{m-2}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2-m}{2},\frac{4-m}{2},\cos^2(c+dx)\right)}{d(2-m)\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(a + b*Cos[c + d*x])*Sec[c + d*x]^m,x]
```

```
[Out] -((b*Hypergeometric2F1[1/2, (2 - m)/2, (4 - m)/2, Cos[c + d*x]^2]*Sec[c + d
*x]^(-2 + m)*Sin[c + d*x])/(d*(2 - m)*Sqrt[Sin[c + d*x]^2])) - (a*Hypergeom
etric2F1[1/2, (1 - m)/2, (3 - m)/2, Cos[c + d*x]^2]*Sec[c + d*x]^(-1 + m)*S
in[c + d*x])/(d*(1 - m)*Sqrt[Sin[c + d*x]^2])
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 3317

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x
_)]^(n_.))^(p_.), x_Symbol] :> Dist[d^(n*p), Int[(d*Csc[e + f*x])^(m - n*p)
*(b + a*Csc[e + f*x]^n)^p, x], x] /; FreeQ[{a, b, d, e, f, m, n, p}, x] &&
 !IntegerQ[m] && IntegersQ[n, p]
```

Rule 3857

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(b*Csc[c + d*x]
)^(n - 1)*((Sin[c + d*x]/b)^(n - 1)*Int[1/(Sin[c + d*x]/b)^n, x]), x] /; Fr
eeQ[{b, c, d, n}, x] &&  !IntegerQ[n]
```

Rule 3872

```
Int[(csc[(e_.) + (f_.)*(x_)]*(d_.))^(n_.)*(csc[(e_.) + (f_.)*(x_)]*(b_.) +
(a_)), x_Symbol] :> Dist[a, Int[(d*Csc[e + f*x])^n, x], x] + Dist[b/d, Int[
(d*Csc[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \sec^{-1+m}(c+dx)(b+a\sec(c+dx))\,dx\\
&= a\int \sec^m(c+dx)\,dx+b\int \sec^{-1+m}(c+dx)\,dx\\
&= \left(a\cos^m(c+dx)\sec^m(c+dx)\right)\int \cos^{-m}(c+dx)\,dx\\
&\quad+\left(b\cos^m(c+dx)\sec^m(c+dx)\right)\int \cos^{1-m}(c+dx)\,dx\\
&= -\frac{b\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2-m}{2},\frac{4-m}{2},\cos^2(c+dx)\right)\sec^{-2+m}(c+dx)\sin(c+dx)}{d(2-m)\sqrt{\sin^2(c+dx)}}\\
&\quad-\frac{a\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1-m}{2},\frac{3-m}{2},\cos^2(c+dx)\right)\sec^{-1+m}(c+dx)\sin(c+dx)}{d(1-m)\sqrt{\sin^2(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.75

$$\int (a+b\cos(c+dx))\sec^m(c+dx)\,dx$$
$$=\frac{\csc(c+dx)\left(bm\cos(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(-1+m),\frac{1+m}{2},\sec^2(c+dx)\right)+a(-1+m)\,\text{Hyperg}\right.}{d(-1+m)m}$$

```
[In] Integrate[(a + b*Cos[c + d*x])*Sec[c + d*x]^m,x]
```

```
[Out] (Csc[c + d*x]*(b*m*Cos[c + d*x]*Hypergeometric2F1[1/2, (-1 + m)/2, (1 + m)/
2, Sec[c + d*x]^2] + a*(-1 + m)*Hypergeometric2F1[1/2, m/2, (2 + m)/2, Sec[
c + d*x]^2])*Sec[c + d*x]^(-1 + m)*Sqrt[-Tan[c + d*x]^2])/(d*(-1 + m)*m)
```

Maple [F]

$$\int (a+\cos(dx+c)\,b)\left(\sec^m(dx+c)\right)dx$$

```
[In] int((a+cos(d*x+c)*b)*sec(d*x+c)^m,x)
```

```
[Out] int((a+cos(d*x+c)*b)*sec(d*x+c)^m,x)
```

Fricas [F]

$$\int (a+b\cos(c+dx))\sec^m(c+dx)\,dx=\int (b\cos(dx+c)+a)\sec(dx+c)^m\,dx$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)^m,x, algorithm="fricas")
```

```
[Out] integral((b*cos(d*x + c) + a)*sec(d*x + c)^m, x)
```

Sympy [F]

$$\int (a+b\cos(c+dx))\sec^m(c+dx)\,dx=\int (a+b\cos(c+dx))\sec^m(c+dx)\,dx$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)**m,x)
```

```
[Out] Integral((a + b*cos(c + d*x))*sec(c + d*x)**m, x)
```

Maxima [F]

$$\int (a+b\cos(c+dx))\sec^m(c+dx)\,dx = \int (b\cos(dx+c)+a)\sec(dx+c)^m\,dx$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)^m,x, algorithm="maxima")
[Out] integrate((b*cos(d*x + c) + a)*sec(d*x + c)^m, x)
```

Giac [F]

$$\int (a+b\cos(c+dx))\sec^m(c+dx)\,dx = \int (b\cos(dx+c)+a)\sec(dx+c)^m\,dx$$

```
[In] integrate((a+b*cos(d*x+c))*sec(d*x+c)^m,x, algorithm="giac")
[Out] integrate((b*cos(d*x + c) + a)*sec(d*x + c)^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))\sec^m(c+dx)\,dx = \int \left(\frac{1}{\cos(c+d\,x)}\right)^m (a+b\,\cos(c+d\,x))\,dx$$

```
[In] int((1/cos(c + d*x))^m*(a + b*cos(c + d*x)),x)
[Out] int((1/cos(c + d*x))^m*(a + b*cos(c + d*x)), x)
```

3.778 $\int \frac{\sqrt{1-\cos(x)}}{\sqrt{a-\cos(x)}} \, dx$

Optimal result

Integrand size = 21, antiderivative size = 26

$$\int \frac{\sqrt{1-\cos(x)}}{\sqrt{a-\cos(x)}} \, dx = -2\arctan\left(\frac{\sin(x)}{\sqrt{1-\cos(x)}\sqrt{a-\cos(x)}}\right)$$

```
[Out] -2*arctan(sin(x)/(1-cos(x))^(1/2)/(a-cos(x))^(1/2))
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2854, 210}

$$\int \frac{\sqrt{1-\cos(x)}}{\sqrt{a-\cos(x)}} \, dx = -2\arctan\left(\frac{\sin(x)}{\sqrt{1-\cos(x)}\sqrt{a-\cos(x)}}\right)$$

```
[In] Int[Sqrt[1 - Cos[x]]/Sqrt[a - Cos[x]],x]
[Out] -2*ArcTan[Sin[x]/(Sqrt[1 - Cos[x]]*Sqrt[a - Cos[x]])]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 2854

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b + d*x^2), x], x
```

```
, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]))], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= 2\text{Subst}\left(\int \frac{1}{-1-x^2}\,dx, x, \frac{\sin(x)}{\sqrt{1-\cos(x)}\sqrt{a-\cos(x)}}\right)\\ &= -2\arctan\left(\frac{\sin(x)}{\sqrt{1-\cos(x)}\sqrt{a-\cos(x)}}\right)\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.10 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.81

$$\int \frac{\sqrt{1-\cos(x)}}{\sqrt{a-\cos(x)}}\,dx = i\sqrt{2-2\cos(x)}\csc\left(\frac{x}{2}\right)\log\left(i\sqrt{2}\cos\left(\frac{x}{2}\right)+\sqrt{a-\cos(x)}\right)$$

```
[In] Integrate[Sqrt[1 - Cos[x]]/Sqrt[a - Cos[x]],x]
[Out] I*Sqrt[2 - 2*Cos[x]]*Csc[x/2]*Log[I*Sqrt[2]*Cos[x/2] + Sqrt[a - Cos[x]]]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 64 vs. 2(22) = 44.

Time = 2.12 (sec) , antiderivative size = 65, normalized size of antiderivative = 2.50

method	result	size
default	$-\frac{\csc(x)(2-2\cos(x))^{\frac{3}{2}}\sqrt{a-\cos(x)}\,\arctan\left(\frac{\sqrt{-\frac{2(-a+\cos(x))}{\cos(x)+1}}\sqrt{2}}{2}\right)}{(\cos(x)-1)\sqrt{-\frac{2(-a+\cos(x))}{\cos(x)+1}}}$	65

```
[In] int((1-cos(x))^(1/2)/(a-cos(x))^(1/2),x,method=_RETURNVERBOSE)
[Out] -csc(x)*(2-2*cos(x))^(3/2)*(a-cos(x))^(1/2)*arctan(1/2*(-2*(-a+cos(x))/(cos
(x)+1))^(1/2)*2^(1/2))/(cos(x)-1)/(-2*(-a+cos(x))/(cos(x)+1))^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.15

$$\int \frac{\sqrt{1-\cos(x)}}{\sqrt{a-\cos(x)}}\,dx = \arctan\left(\frac{(a-2\cos(x)-1)\sqrt{-\cos(x)+1}}{2\sqrt{a-\cos(x)}\sin(x)}\right)$$

```
[In] integrate((1-cos(x))^(1/2)/(a-cos(x))^(1/2),x, algorithm="fricas")
[Out] arctan(1/2*(a - 2*cos(x) - 1)*sqrt(-cos(x) + 1)/(sqrt(a - cos(x))*sin(x)))
```

Sympy [F]

$$\int \frac{\sqrt{1-\cos(x)}}{\sqrt{a-\cos(x)}}\,dx = \int \frac{\sqrt{1-\cos(x)}}{\sqrt{a-\cos(x)}}\,dx$$

```
[In] integrate((1-cos(x))**(1/2)/(a-cos(x))**(1/2),x)
[Out] Integral(sqrt(1 - cos(x))/sqrt(a - cos(x)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{1-\cos(x)}}{\sqrt{a-\cos(x)}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((1-cos(x))^(1/2)/(a-cos(x))^(1/2),x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(a-1>0)', see `assume?` for more det
ails)Is
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 71 vs. $2(22) = 44$.

Time = 0.34 (sec) , antiderivative size = 71, normalized size of antiderivative = 2.73

$$\int \frac{\sqrt{1-\cos(x)}}{\sqrt{a-\cos(x)}}\,dx$$
$$=4\arctan\left(-\frac{1}{4}\sqrt{2}\left(\sqrt{a-1}\tan\left(\frac{1}{4}x\right)^2-\sqrt{a\tan\left(\frac{1}{4}x\right)^4-\tan\left(\frac{1}{4}x\right)^4+2\,a\tan\left(\frac{1}{4}x\right)^2+6\tan\left(\frac{1}{4}x\right)\right.\right.\right.$$

```
[In] integrate((1-cos(x))^(1/2)/(a-cos(x))^(1/2),x, algorithm="giac")
```

```
[Out] 4*arctan(-1/4*sqrt(2)*(sqrt(a - 1)*tan(1/4*x)^2 - sqrt(a*tan(1/4*x)^4 - tan
(1/4*x)^4 + 2*a*tan(1/4*x)^2 + 6*tan(1/4*x)^2 + a - 1) + sqrt(a - 1)))*sgn(
sin(1/2*x))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{1-\cos(x)}}{\sqrt{a-\cos(x)}}\,dx = \int \frac{\sqrt{1-\cos(x)}}{\sqrt{a-\cos(x)}}\,dx$$

```
[In] int((1 - cos(x))^(1/2)/(a - cos(x))^(1/2),x)
```

```
[Out] int((1 - cos(x))^(1/2)/(a - cos(x))^(1/2), x)
```

3.779 $\int \sqrt{\frac{1-\cos(x)}{a-\cos(x)}}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 65

$$\int \sqrt{\frac{1-\cos(x)}{a-\cos(x)}}\,dx = -\frac{2\arctan\left(\frac{\sin(x)}{\sqrt{1-\cos(x)}\sqrt{a-\cos(x)}}\right)\sqrt{\frac{1-\cos(x)}{a-\cos(x)}}\sqrt{a-\cos(x)}}{\sqrt{1-\cos(x)}}$$

```
[Out] -2*arctan(sin(x)/(1-cos(x))^(1/2)/(a-cos(x))^(1/2))*((1-cos(x))/(a-cos(x)))
^(1/2)*(a-cos(x))^(1/2)/(1-cos(x))^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {4485, 2854, 210}

$$\int \sqrt{\frac{1-\cos(x)}{a-\cos(x)}}\,dx = -\frac{2\sqrt{\frac{1-\cos(x)}{a-\cos(x)}}\sqrt{a-\cos(x)}\arctan\left(\frac{\sin(x)}{\sqrt{1-\cos(x)}\sqrt{a-\cos(x)}}\right)}{\sqrt{1-\cos(x)}}$$

```
[In] Int[Sqrt[(1 - Cos[x])/(a - Cos[x])],x]
```

```
[Out] (-2*ArcTan[Sin[x]/(Sqrt[1 - Cos[x]]*Sqrt[a - Cos[x]])]*Sqrt[(1 - Cos[x])/(a
 - Cos[x])]*Sqrt[a - Cos[x]])/Sqrt[1 - Cos[x]]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 2854

```
Int[Sqrt[(a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]]/Sqrt[(c_.) + (d_.)*sin[(e_.)
 + (f_.)*(x_)]], x_Symbol] :> Dist[-2*(b/f), Subst[Int[1/(b + d*x^2), x], x
, b*(Cos[e + f*x]/(Sqrt[a + b*Sin[e + f*x]]*Sqrt[c + d*Sin[e + f*x]]))], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0]
&& NeQ[c^2 - d^2, 0]
```

Rule 4485

```
Int[(u_.)*((v_)^(m_.)*(w_)^(n_.))^(p_), x_Symbol] :> With[{uu = ActivateTri
g[u], vv = ActivateTrig[v], ww = ActivateTrig[w]}, Dist[(vv^m*ww^n)^FracPar
t[p]/(vv^(m*FracPart[p])*ww^(n*FracPart[p])), Int[uu*vv^(m*p)*ww^(n*p), x],
 x]] /; FreeQ[{m, n, p}, x] &&  !IntegerQ[p] && ( !InertTrigFreeQ[v] ||  !I
nertTrigFreeQ[w])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\left(\sqrt{\frac{1-\cos(x)}{a-\cos(x)}}\sqrt{a-\cos(x)}\right)\int\frac{\sqrt{1-\cos(x)}}{\sqrt{a-\cos(x)}}\,dx}{\sqrt{1-\cos(x)}}\\
&= \frac{\left(2\sqrt{\frac{1-\cos(x)}{a-\cos(x)}}\sqrt{a-\cos(x)}\right)\text{Subst}\left(\int\frac{1}{-1-x^2}\,dx,x,\frac{\sin(x)}{\sqrt{1-\cos(x)}\sqrt{a-\cos(x)}}\right)}{\sqrt{1-\cos(x)}}\\
&= -\frac{2\arctan\left(\frac{\sin(x)}{\sqrt{1-\cos(x)}\sqrt{a-\cos(x)}}\right)\sqrt{\frac{1-\cos(x)}{a-\cos(x)}}\sqrt{a-\cos(x)}}{\sqrt{1-\cos(x)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.98

$$\int\sqrt{\frac{1-\cos(x)}{a-\cos(x)}}\,dx = -\sqrt{2}\sqrt{\frac{-1+\cos(x)}{-a+\cos(x)}}\sqrt{-a+\cos(x)}\csc\left(\frac{x}{2}\right)\log\left(\sqrt{2}\cos\left(\frac{x}{2}\right)+\sqrt{-a+\cos(x)}\right)$$

```
[In] Integrate[Sqrt[(1 - Cos[x])/(a - Cos[x])],x]
[Out] -(Sqrt[2]*Sqrt[(-1 + Cos[x])/(-a + Cos[x])]*Sqrt[-a + Cos[x]]*Csc[x/2]*Log[
Sqrt[2]*Cos[x/2] + Sqrt[-a + Cos[x]]])
```

Maple [A] (verified)

Time = 1.27 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.97

method	result	size
default	$\sqrt{2}\,\sqrt{\frac{\cos(x)-1}{-a+\cos(x)}}\,\sqrt{-\frac{2(-a+\cos(x))}{\cos(x)+1}}\,\arctan\left(\frac{\sqrt{-\frac{2(-a+\cos(x))}{\cos(x)+1}}\,\sqrt{2}}{2}\right)(\cot(x)+\csc(x))$	63

```
[In] int(((1-cos(x))/(a-cos(x)))^(1/2),x,method=_RETURNVERBOSE)
[Out] 2^(1/2)*((cos(x)-1)/(-a+cos(x)))^(1/2)*(-2*(-a+cos(x))/(cos(x)+1))^(1/2)*ar
ctan(1/2*(-2*(-a+cos(x))/(cos(x)+1))^(1/2)*2^(1/2))*(cot(x)+csc(x))
```

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 32, normalized size of antiderivative = 0.49

$$\int \sqrt{\frac{1-\cos(x)}{a-\cos(x)}}\,dx = -\arctan\left(-\frac{(a-2\cos(x)-1)\sqrt{-\frac{\cos(x)-1}{a-\cos(x)}}}{2\sin(x)}\right)$$

```
[In] integrate(((1-cos(x))/(a-cos(x)))^(1/2),x, algorithm="fricas")
[Out] -arctan(-1/2*(a - 2*cos(x) - 1)*sqrt(-(cos(x) - 1)/(a - cos(x)))/sin(x))
```

Sympy [F]

$$\int \sqrt{\frac{1-\cos(x)}{a-\cos(x)}}\,dx = \int \sqrt{\frac{1-\cos(x)}{a-\cos(x)}}\,dx$$

```
[In] integrate(((1-cos(x))/(a-cos(x)))**(1/2),x)
[Out] Integral(sqrt((1 - cos(x))/(a - cos(x))), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{\frac{1-\cos(x)}{a-\cos(x)}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(((1-cos(x))/(a-cos(x)))^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(a-1>0)', see `assume?` for more det
ails)Is
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 46, normalized size of antiderivative = 0.71

$$\int \sqrt{\frac{1-\cos(x)}{a-\cos(x)}}\,dx = 2 \arctan\left(\frac{1}{2}\sqrt{2}\sqrt{a\tan\left(\frac{1}{2}x\right)^2+\tan\left(\frac{1}{2}x\right)^2+a-1}\right)\operatorname{sgn}\left(\tan\left(\frac{1}{2}x\right)^3+\tan\left(\frac{1}{2}x\right)\right)\operatorname{sgn}(a-\cos(x))$$

```
[In] integrate(((1-cos(x))/(a-cos(x)))^(1/2),x, algorithm="giac")
```

```
[Out] 2*arctan(1/2*sqrt(2)*sqrt(a*tan(1/2*x)^2 + tan(1/2*x)^2 + a - 1))*sgn(tan(1
/2*x)^3 + tan(1/2*x))*sgn(a - cos(x))
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{\frac{1-\cos(x)}{a-\cos(x)}}\,dx = \int \sqrt{-\frac{\cos(x)-1}{a-\cos(x)}}\,dx$$

```
[In] int((-(cos(x) - 1)/(a - cos(x)))^(1/2),x)
```

```
[Out] int((-(cos(x) - 1)/(a - cos(x)))^(1/2), x)
```

3.780 $\int (a+a\cos(c+dx)) \left(-\frac{B}{2}+B\cos(c+dx)\right) dx$

Optimal result

Integrand size = 25, antiderivative size = 37

$$\int (a+a\cos(c+dx)) \left(-\frac{B}{2}+B\cos(c+dx)\right) dx = \frac{aB\sin(c+dx)}{2d}+\frac{aB\cos(c+dx)\sin(c+dx)}{2d}$$

```
[Out] 1/2*a*B*sin(d*x+c)/d+1/2*a*B*cos(d*x+c)*sin(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.040, Rules used = {2813}

$$\int (a+a\cos(c+dx)) \left(-\frac{B}{2}+B\cos(c+dx)\right) dx = \frac{aB\sin(c+dx)}{2d}+\frac{aB\sin(c+dx)\cos(c+dx)}{2d}$$

```
[In] Int[(a + a*Cos[c + d*x])*(-1/2*B + B*Cos[c + d*x]),x]
```

```
[Out] (a*B*Sin[c + d*x])/(2*d) + (a*B*Cos[c + d*x]*Sin[c + d*x])/(2*d)
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rubi steps

$$\text{integral} = \frac{aB\sin(c+dx)}{2d} + \frac{aB\cos(c+dx)\sin(c+dx)}{2d}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 29, normalized size of antiderivative = 0.78

$$\int (a+a\cos(c+dx))\left(-\frac{B}{2}+B\cos(c+dx)\right)\,dx = \frac{aB(2c+2\sin(c+dx)+\sin(2(c+dx)))}{4d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])*(-1/2*B + B*Cos[c + d*x]),x]
[Out] (a*B*(2*c + 2*Sin[c + d*x] + Sin[2*(c + d*x)]))/(4*d)
```

Maple [A] (verified)

Time = 0.80 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.70

method	result	size
parallelrisch	$\frac{Ba(2\sin(dx+c)+\sin(2dx+2c))}{4d}$	26
risch	$\frac{aB\sin(dx+c)}{2d}+\frac{Ba\sin(2dx+2c)}{4d}$	31
norman	$\frac{2Ba\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^2}$	32
parts	$\frac{Ba\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}-\frac{aBx}{2}+\frac{aB\sin(dx+c)}{2d}$	48
derivativedivides	$\frac{2Ba\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+Ba\sin(dx+c)-Ba(dx+c)}{2d}$	51
default	$\frac{2Ba\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)+Ba\sin(dx+c)-Ba(dx+c)}{2d}$	51

```
[In] int((a+cos(d*x+c)*a)*(-1/2*B+B*cos(d*x+c)),x,method=_RETURNVERBOSE)
[Out] 1/4*B*a*(2*sin(d*x+c)+sin(2*d*x+2*c))/d
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 24, normalized size of antiderivative = 0.65

$$\int (a+a\cos(c+dx))\left(-\frac{B}{2}+B\cos(c+dx)\right)\,dx=\frac{(Ba\cos{(dx+c)}+Ba)\sin{(dx+c)}}{2\,d}$$

```
[In] integrate((a+a*cos(d*x+c))*(-1/2*B+B*cos(d*x+c)),x, algorithm="fricas")
[Out] 1/2*(B*a*cos(d*x + c) + B*a)*sin(d*x + c)/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 87 vs. 2(32) = 64.

Time = 0.10 (sec) , antiderivative size = 87, normalized size of antiderivative = 2.35

$$\int (a+a\cos(c+dx))\left(-\frac{B}{2}+B\cos(c+dx)\right)\,dx$$
$$=\begin{cases}\frac{Bax\sin^2{(c+dx)}}{2}+\frac{Bax\cos^2{(c+dx)}}{2}-\frac{Bax}{2}+\frac{Ba\sin{(c+dx)}\cos{(c+dx)}}{2d}+\frac{Ba\sin{(c+dx)}}{2d} & \text{for } d\neq 0\\ x\left(B\cos{(c)}-\frac{B}{2}\right)(a\cos{(c)}+a) & \text{otherwise}\end{cases}$$

```
[In] integrate((a+a*cos(d*x+c))*(-1/2*B+B*cos(d*x+c)),x)
[Out] Piecewise((B*a*x*sin(c + d*x)**2/2 + B*a*x*cos(c + d*x)**2/2 - B*a*x/2 + B*
a*sin(c + d*x)*cos(c + d*x)/(2*d) + B*a*sin(c + d*x)/(2*d), Ne(d, 0)), (x*(
B*cos(c) - B/2)*(a*cos(c) + a), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.21 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.22

$$\int (a+a\cos(c+dx))\left(-\frac{B}{2}+B\cos(c+dx)\right)\,dx$$
$$=\frac{(2\,dx+2\,c+\sin{(2\,dx+2\,c)})Ba-2\,(dx+c)Ba+2\,Ba\sin{(dx+c)}}{4\,d}$$

```
[In] integrate((a+a*cos(d*x+c))*(-1/2*B+B*cos(d*x+c)),x, algorithm="maxima")
[Out] 1/4*((2*d*x + 2*c + sin(2*d*x + 2*c))*B*a - 2*(d*x + c)*B*a + 2*B*a*sin(d*x
 + c))/d
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 30, normalized size of antiderivative = 0.81

$$\int (a+a\cos(c+dx))\left(-\frac{B}{2}+B\cos(c+dx)\right)\,dx=\frac{Ba\sin(2\,dx+2\,c)}{4\,d}+\frac{Ba\sin(dx+c)}{2\,d}$$

```
[In] integrate((a+a*cos(d*x+c))*(-1/2*B+B*cos(d*x+c)),x, algorithm="giac")
[Out] 1/4*B*a*sin(2*d*x + 2*c)/d + 1/2*B*a*sin(d*x + c)/d
```

Mupad [B] (verification not implemented)

Time = 14.61 (sec) , antiderivative size = 25, normalized size of antiderivative = 0.68

$$\int (a+a\cos(c+dx))\left(-\frac{B}{2}+B\cos(c+dx)\right)\,dx=\frac{B\,a\,(2\,\sin(c+d\,x)+\sin(2\,c+2\,d\,x))}{4\,d}$$

```
[In] int(-(B/2 - B*cos(c + d*x))*(a + a*cos(c + d*x)),x)
[Out] (B*a*(2*sin(c + d*x) + sin(2*c + 2*d*x)))/(4*d)
```

3.781 $\int (a+a\cos(c+dx))^4 \left(-\frac{4B}{5}+B\cos(c+dx)\right) dx$

Optimal result

Integrand size = 27, antiderivative size = 26

$$\int (a+a\cos(c+dx))^4 \left(-\frac{4B}{5}+B\cos(c+dx)\right) dx = \frac{B(a+a\cos(c+dx))^4\sin(c+dx)}{5d}$$

```
[Out] 1/5*B*(a+a*cos(d*x+c))^4*sin(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.037$, Rules used = {2828}

$$\int (a+a\cos(c+dx))^4 \left(-\frac{4B}{5}+B\cos(c+dx)\right) dx = \frac{B\sin(c+dx)(a\cos(c+dx)+a)^4}{5d}$$

```
[In] Int[(a + a*Cos[c + d*x])^4*((-4*B)/5 + B*Cos[c + d*x]),x]
```

```
[Out] (B*(a + a*Cos[c + d*x])^4*Sin[c + d*x])/(5*d)
```

Rule 2828

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(f
*(m + 1))), x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] && E
qQ[a^2 - b^2, 0] && EqQ[a*d*m + b*c*(m + 1), 0]
```

Rubi steps

$$\text{integral} = \frac{B(a+a\cos(c+dx))^4\sin(c+dx)}{5d}$$

Mathematica [A] (verified)

Time = 0.50 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.04

$$\int (a+a\cos(c+dx))^4\left(-\frac{4B}{5}+B\cos(c+dx)\right)\,dx=\frac{a^4B(1+\cos(c+dx))^4\sin(c+dx)}{5d}$$

[In] Integrate[(a + a*Cos[c + d*x])^4*((-4*B)/5 + B*Cos[c + d*x]),x]

[Out] (a^4*B*(1 + Cos[c + d*x])^4*Sin[c + d*x])/(5*d)

Maple [A] (verified)

Time = 3.22 (sec) , antiderivative size = 34, normalized size of antiderivative = 1.31

method	result
norman	$\frac{32B\,a^4\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{5d\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^5}$
parallelrisch	$\frac{B\,a^4(42\sin(dx+c)+\sin(5dx+5c)+8\sin(4dx+4c)+27\sin(3dx+3c)+48\sin(2dx+2c))}{80d}$
risch	$\frac{21B\,a^4\sin(dx+c)}{40d}+\frac{B\,a^4\sin(5dx+5c)}{80d}+\frac{B\,a^4\sin(4dx+4c)}{10d}+\frac{27B\,a^4\sin(3dx+3c)}{80d}+\frac{3B\,a^4\sin(2dx+2c)}{5d}$
derivativedivides	$\frac{16B\,a^4\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+B\,a^4\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)+\frac{14B\,a^4\left(2+\right.}{}}{5d}$
default	$\frac{16B\,a^4\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)+B\,a^4\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)+\frac{14B\,a^4\left(2+\right.}{}}{5d}$
parts	$\frac{B\,a^4\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5d}-\frac{4B\,a^4x}{5}-\frac{11B\,a^4\sin(dx+c)}{5d}-\frac{4B\,a^4\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\right.}{5d}$

[In] int((a+cos(d*x+c)*a)^4*(-4/5*B+B*cos(d*x+c)),x,method=_RETURNVERBOSE)

[Out] 32/5*B*a^4/d*tan(1/2*d*x+1/2*c)/(1+tan(1/2*d*x+1/2*c)^2)^5

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 70 vs. $2(24) = 48$.

Time = 0.31 (sec) , antiderivative size = 70, normalized size of antiderivative = 2.69

$$\int (a+a\cos(c+dx))^4\left(-\frac{4B}{5}+B\cos(c+dx)\right)\,dx = \frac{\left(Ba^4\cos\left(dx+c\right)^4+4\,Ba^4\cos\left(dx+c\right)^3+6\,Ba^4\cos\left(dx+c\right)^2+4\,Ba^4\cos\left(dx+c\right)+Ba^4\right)\sin\left(dx+c\right)}{5\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^4*(-4/5*B+B*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/5*(B*a^4*cos(d*x + c)^4 + 4*B*a^4*cos(d*x + c)^3 + 6*B*a^4*cos(d*x + c)^2
 + 4*B*a^4*cos(d*x + c) + B*a^4)*sin(d*x + c)/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 333 vs. $2(22) = 44$.

Time = 0.34 (sec) , antiderivative size = 333, normalized size of antiderivative = 12.81

$$\int (a+a\cos(c+dx))^4\left(-\frac{4B}{5}+B\cos(c+dx)\right)\,dx = \begin{cases} \frac{6Ba^4x\sin^4\left(c+dx\right)}{5}+\frac{12Ba^4x\sin^2\left(c+dx\right)\cos^2\left(c+dx\right)}{5}-\frac{2Ba^4x\sin^2\left(c+dx\right)}{5}+\frac{6Ba^4x\cos^4\left(c+dx\right)}{5}-\frac{2Ba^4x\cos^2\left(c+dx\right)}{5}-\frac{4Ba^4x}{5}+ \\ x\left(B\cos\left(c\right)-\frac{4B}{5}\right)\left(a\cos\left(c\right)+a\right)^4 \end{cases}$$

```
[In] integrate((a+a*cos(d*x+c))**4*(-4/5*B+B*cos(d*x+c)),x)
```

```
[Out] Piecewise((6*B*a**4*x*sin(c + d*x)**4/5 + 12*B*a**4*x*sin(c + d*x)**2*cos(c
 + d*x)**2/5 - 2*B*a**4*x*sin(c + d*x)**2/5 + 6*B*a**4*x*cos(c + d*x)**4/5
- 2*B*a**4*x*cos(c + d*x)**2/5 - 4*B*a**4*x/5 + 8*B*a**4*sin(c + d*x)**5/(1
5*d) + 4*B*a**4*sin(c + d*x)**3*cos(c + d*x)**2/(3*d) + 6*B*a**4*sin(c + d*
x)**3*cos(c + d*x)/(5*d) + 28*B*a**4*sin(c + d*x)**3/(15*d) + B*a**4*sin(c
+ d*x)*cos(c + d*x)**4/d + 2*B*a**4*sin(c + d*x)*cos(c + d*x)**3/d + 14*B*a
**4*sin(c + d*x)*cos(c + d*x)**2/(5*d) - 2*B*a**4*sin(c + d*x)*cos(c + d*x)
/(5*d) - 11*B*a**4*sin(c + d*x)/(5*d), Ne(d, 0)), (x*(B*cos(c) - 4*B/5)*(a*
cos(c) + a)**4, True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 144 vs. 2(24) = 48.

Time = 0.22 (sec) , antiderivative size = 144, normalized size of antiderivative = 5.54

$$\int (a + a\cos(c + dx))^4 \left(-\frac{4B}{5} + B\cos(c + dx)\right) dx = \frac{2\left(3 \sin\left(dx+c\right)^5 - 10 \sin\left(dx+c\right)^3 + 15 \sin\left(dx+c\right)\right)Ba^4 - 28\left(\sin\left(dx+c\right)^3 - 3 \sin\left(dx+c\right)\right)Ba^4 + 3(1}{}$$

```
[In] integrate((a+a*cos(d*x+c))^4*(-4/5*B+B*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/30*(2*(3*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*sin(d*x + c))*B*a^4 - 28
*(sin(d*x + c)^3 - 3*sin(d*x + c))*B*a^4 + 3*(12*d*x + 12*c + sin(4*d*x + 4
*c) + 8*sin(2*d*x + 2*c))*B*a^4 - 6*(2*d*x + 2*c + sin(2*d*x + 2*c))*B*a^4
- 24*(d*x + c)*B*a^4 - 66*B*a^4*sin(d*x + c))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 88 vs. 2(24) = 48.

Time = 0.32 (sec) , antiderivative size = 88, normalized size of antiderivative = 3.38

$$\int (a + a\cos(c + dx))^4 \left(-\frac{4B}{5} + B\cos(c + dx)\right) dx = \frac{Ba^4 \sin\left(5\,dx + 5\,c\right)}{80\,d} + \frac{Ba^4 \sin\left(4\,dx + 4\,c\right)}{10\,d} + \frac{27\,Ba^4 \sin\left(3\,dx + 3\,c\right)}{80\,d} + \frac{3\,Ba^4 \sin\left(2\,dx + 2\,c\right)}{5\,d} + \frac{21\,Ba^4 \sin\left(dx + c\right)}{40\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^4*(-4/5*B+B*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/80*B*a^4*sin(5*d*x + 5*c)/d + 1/10*B*a^4*sin(4*d*x + 4*c)/d + 27/80*B*a^4
*sin(3*d*x + 3*c)/d + 3/5*B*a^4*sin(2*d*x + 2*c)/d + 21/40*B*a^4*sin(d*x +
c)/d
```

Mupad [B] (verification not implemented)

Time = 14.50 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.12

$$\int (a + a\cos(c + dx))^4 \left(-\frac{4B}{5} + B\cos(c + dx)\right) dx = \frac{32\,B\,a^4 \cos\left(\frac{c}{2} + \frac{d\,x}{2}\right)^9 \sin\left(\frac{c}{2} + \frac{d\,x}{2}\right)}{5\,d}$$

```
[In] int(-((4*B)/5 - B*cos(c + d*x))*(a + a*cos(c + d*x))^4,x)
```

```
[Out] (32*B*a^4*cos(c/2 + (d*x)/2)^9*sin(c/2 + (d*x)/2))/(5*d)
```

3.782 $\int (a+a\cos(c+dx))^n \left(-\frac{Bn}{1+n}+B\cos(c+dx)\right) dx$

Optimal result

Integrand size = 31, antiderivative size = 28

$$\int (a+a\cos(c+dx))^n \left(-\frac{Bn}{1+n}+B\cos(c+dx)\right) dx = \frac{B(a+a\cos(c+dx))^n\sin(c+dx)}{d(1+n)}$$

```
[Out] B*(a+a*cos(d*x+c))^n*sin(d*x+c)/d/(1+n)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.032, Rules used = {2828}

$$\int (a+a\cos(c+dx))^n \left(-\frac{Bn}{1+n}+B\cos(c+dx)\right) dx = \frac{B\sin(c+dx)(a\cos(c+dx)+a)^n}{d(n+1)}$$

```
[In] Int[(a + a*Cos[c + d*x])^n*(-((B*n)/(1 + n)) + B*Cos[c + d*x]),x]
```

```
[Out] (B*(a + a*Cos[c + d*x])^n*Sin[c + d*x])/(d*(1 + n))
```

Rule 2828

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(f
*(m + 1))), x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] && E
qQ[a^2 - b^2, 0] && EqQ[a*d*m + b*c*(m + 1), 0]
```

Rubi steps

$$\text{integral} = \frac{B(a+a\cos(c+dx))^n\sin(c+dx)}{d(1+n)}$$

Mathematica [A] (verified)

Time = 0.81 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int (a+a\cos(c+dx))^n \left(-\frac{Bn}{1+n}+B\cos(c+dx)\right) dx = \frac{B(a(1+\cos(c+dx)))^n\sin(c+dx)}{d(1+n)}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^n*(-((B*n)/(1 + n)) + B*Cos[c + d*x]),x]
[Out] (B*(a*(1 + Cos[c + d*x]))^n*Sin[c + d*x])/(d*(1 + n))
```

Maple [A] (verified)

Time = 5.98 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

method	result
parallelrisch	$\frac{B(a(1+\cos(dx+c)))^n\sin(dx+c)}{d(1+n)}$
norman	$\frac{2B\tan\left(\frac{dx}{2}+\frac{c}{2}\right)e^{n\ln\left(a+\frac{\left(1-\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)a}{1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)}}{d(1+n)\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}$
risch	$B\left(e^{i(dx+c)}\right)^{-n}(\sin(dx)\cos(c)+\cos(dx)\sin(c))\left(e^{i(dx+c)}+1\right)^{2n}a^n\left(\frac{1}{2}\right)^n e^{-\frac{i\pi n\left(\operatorname{csgn}\left(i\left(e^{2i(dx+c)}+2e^{i(dx+c)}+1\right)\right)\operatorname{csgn}\left(i\left(e^{i(dx+c)}+1\right.\right.\right.}{}}$

```
[In] int((a+cos(d*x+c)*a)^n*(-B*n/(1+n)+B*cos(d*x+c)),x,method=_RETURNVERBOSE)
[Out] B/d/(1+n)*(a*(1+cos(d*x+c)))^n*sin(d*x+c)
```

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int (a+a\cos(c+dx))^n \left(-\frac{Bn}{1+n}+B\cos(c+dx)\right) dx = \frac{(a\cos(dx+c)+a)^n B\sin(dx+c)}{dn+d}$$

```
[In] integrate((a+a*cos(d*x+c))^n*(-B*n/(1+n)+B*cos(d*x+c)),x, algorithm="fricas
")
[Out] (a*cos(d*x + c) + a)^n*B*sin(d*x + c)/(d*n + d)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 114 vs. $2(24) = 48$.

Time = 1.69 (sec) , antiderivative size = 114, normalized size of antiderivative = 4.07

$$\int (a + a\cos(c + dx))^n \left(-\frac{Bn}{1+n} + B\cos(c + dx)\right) dx = \begin{cases} \frac{2B\left(a - \frac{a\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)}{\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+1} + \frac{a}{\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+1}\right)^n \tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{dn\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+dn+d\tan^2\left(\frac{c}{2}+\frac{dx}{2}\right)+d} & \text{for } d \neq 0 \\ x(a\cos(c)+a)^n\left(-\frac{Bn}{n+1}+B\cos(c)\right) & \text{otherwise} \end{cases}$$

```
[In] integrate((a+a*cos(d*x+c))**n*(-B*n/(1+n)+B*cos(d*x+c)),x)
```

```
[Out] Piecewise((2*B*(a - a*tan(c/2 + d*x/2)**2/(tan(c/2 + d*x/2)**2 + 1) + a/(ta
n(c/2 + d*x/2)**2 + 1))**n*tan(c/2 + d*x/2)/(d*n*tan(c/2 + d*x/2)**2 + d*n
+ d*tan(c/2 + d*x/2)**2 + d), Ne(d, 0)), (x*(a*cos(c) + a)**n*(-B*n/(n + 1)
 + B*cos(c)), True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 143 vs. $2(28) = 56$.

Time = 0.45 (sec) , antiderivative size = 143, normalized size of antiderivative = 5.11

$$\int (a + a\cos(c + dx))^n \left(-\frac{Bn}{1+n} + B\cos(c + dx)\right) dx = -\frac{\left(\cos(dx+c)^2 + \sin(dx+c)^2 + 2\cos(dx+c) + 1\right)^n Ba^n \sin\left(-(dx+c)(n+1) + 2n\arctan(\sin(dx+\right.}{}$$

```
[In] integrate((a+a*cos(d*x+c))^n*(-B*n/(1+n)+B*cos(d*x+c)),x, algorithm="maxima
")
```

```
[Out] -1/2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)^n*B*a^n*sin(-(
d*x + c)*(n + 1) + 2*n*arctan2(sin(d*x + c), cos(d*x + c) + 1)) - (cos(d*x
+ c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)^n*B*a^n*sin(-(d*x + c)*(n - 1
) + 2*n*arctan2(sin(d*x + c), cos(d*x + c) + 1)))/(2^n*d*(n + 1))
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1370 vs. $2(28) = 56$.

Time = 7.95 (sec) , antiderivative size = 1370, normalized size of antiderivative = 48.93

$$\int (a + a\cos(c + dx))^n \left(-\frac{Bn}{1+n} + B\cos(c + dx)\right) dx = \text{Too large to display}$$

```
[In] integrate((a+a*cos(d*x+c))^n*(-B*n/(1+n)+B*cos(d*x+c)),x, algorithm="giac")
```

```
[Out] -2*(B*(sqrt(-tan(d*x + c)^4*tan(1/2*d*x + 1/2*c)^4 + 2*tan(d*x + c)^4*tan(1
/2*d*x + 1/2*c)^2 - tan(d*x + c)^2*tan(1/2*d*x + 1/2*c)^4 + 3*tan(d*x + c)^
4 + 6*tan(d*x + c)^2*tan(1/2*d*x + 1/2*c)^2 + 7*tan(d*x + c)^2 + 4*tan(1/2*
d*x + 1/2*c)^2 + 4)*abs(a)/(tan(d*x + c)^2*tan(1/2*d*x + 1/2*c)^2 + tan(d*x
 + c)^2 + tan(1/2*d*x + 1/2*c)^2 + 1))^n*tan(-1/4*pi*n*sgn(4*a*tan(1/2*d*x
+ 1/2*c)^2 - 4*a)*sgn(a)*sgn(tan(1/2*d*x + 1/2*c)) + 1/4*pi*n*sgn(tan(1/2*d
*x + 1/2*c)^2 - 1)*sgn(tan(1/2*d*x + 1/2*c)) - 1/4*pi*n*sgn(a)*sgn(tan(1/2*
d*x + 1/2*c)) + pi*n*floor(1/4*sgn(4*a*tan(1/2*d*x + 1/2*c)^2 - 4*a)*sgn(a)
*sgn(tan(1/2*d*x + 1/2*c)) - 1/4*sgn(tan(1/2*d*x + 1/2*c)^2 - 1)*sgn(tan(1/
2*d*x + 1/2*c)) + 1/4*sgn(a)*sgn(tan(1/2*d*x + 1/2*c)) - 1/4*sgn(tan(1/2*d*
x + 1/2*c)) + 1/2) + 1/4*pi*n*sgn(tan(1/2*d*x + 1/2*c)))^2*tan(1/2*d*x + 1/
2*c) - B*(sqrt(-tan(d*x + c)^4*tan(1/2*d*x + 1/2*c)^4 + 2*tan(d*x + c)^4*ta
n(1/2*d*x + 1/2*c)^2 - tan(d*x + c)^2*tan(1/2*d*x + 1/2*c)^4 + 3*tan(d*x +
c)^4 + 6*tan(d*x + c)^2*tan(1/2*d*x + 1/2*c)^2 + 7*tan(d*x + c)^2 + 4*tan(1
/2*d*x + 1/2*c)^2 + 4)*abs(a)/(tan(d*x + c)^2*tan(1/2*d*x + 1/2*c)^2 + tan(
d*x + c)^2 + tan(1/2*d*x + 1/2*c)^2 + 1))^n*tan(1/2*d*x + 1/2*c))/(d*n*tan(
-1/4*pi*n*sgn(4*a*tan(1/2*d*x + 1/2*c)^2 - 4*a)*sgn(a)*sgn(tan(1/2*d*x + 1/
2*c)) + 1/4*pi*n*sgn(tan(1/2*d*x + 1/2*c)^2 - 1)*sgn(tan(1/2*d*x + 1/2*c))
- 1/4*pi*n*sgn(a)*sgn(tan(1/2*d*x + 1/2*c)) + pi*n*floor(1/4*sgn(4*a*tan(1/
2*d*x + 1/2*c)^2 - 4*a)*sgn(a)*sgn(tan(1/2*d*x + 1/2*c)) - 1/4*sgn(tan(1/2*
d*x + 1/2*c)^2 - 1)*sgn(tan(1/2*d*x + 1/2*c)) + 1/4*sgn(a)*sgn(tan(1/2*d*x
+ 1/2*c)) - 1/4*sgn(tan(1/2*d*x + 1/2*c)) + 1/2) + 1/4*pi*n*sgn(tan(1/2*d*x
 + 1/2*c)))^2*tan(1/2*d*x + 1/2*c)^2 + d*tan(-1/4*pi*n*sgn(4*a*tan(1/2*d*x
+ 1/2*c)^2 - 4*a)*sgn(a)*sgn(tan(1/2*d*x + 1/2*c)) + 1/4*pi*n*sgn(tan(1/2*d
*x + 1/2*c)^2 - 1)*sgn(tan(1/2*d*x + 1/2*c)) - 1/4*pi*n*sgn(a)*sgn(tan(1/2*
d*x + 1/2*c)) + pi*n*floor(1/4*sgn(4*a*tan(1/2*d*x + 1/2*c)^2 - 4*a)*sgn(a)
*sgn(tan(1/2*d*x + 1/2*c)) - 1/4*sgn(tan(1/2*d*x + 1/2*c)^2 - 1)*sgn(tan(1/
2*d*x + 1/2*c)) + 1/4*sgn(a)*sgn(tan(1/2*d*x + 1/2*c)) - 1/4*sgn(tan(1/2*d*
x + 1/2*c)) + 1/2) + 1/4*pi*n*sgn(tan(1/2*d*x + 1/2*c)))^2*tan(1/2*d*x + 1/
2*c)^2 + d*n*tan(-1/4*pi*n*sgn(4*a*tan(1/2*d*x + 1/2*c)^2 - 4*a)*sgn(a)*sgn
(tan(1/2*d*x + 1/2*c)) + 1/4*pi*n*sgn(tan(1/2*d*x + 1/2*c)^2 - 1)*sgn(tan(1
/2*d*x + 1/2*c)) - 1/4*pi*n*sgn(a)*sgn(tan(1/2*d*x + 1/2*c)) + pi*n*floor(1
/4*sgn(4*a*tan(1/2*d*x + 1/2*c)^2 - 4*a)*sgn(a)*sgn(tan(1/2*d*x + 1/2*c)) -
 1/4*sgn(tan(1/2*d*x + 1/2*c)^2 - 1)*sgn(tan(1/2*d*x + 1/2*c)) + 1/4*sgn(a)
*sgn(tan(1/2*d*x + 1/2*c)) - 1/4*sgn(tan(1/2*d*x + 1/2*c)) + 1/2) + 1/4*pi*
```

```
n*sgn(tan(1/2*d*x + 1/2*c)))^2 + d*n*tan(1/2*d*x + 1/2*c)^2 + d*tan(-1/4*pi
*n*sgn(4*a*tan(1/2*d*x + 1/2*c)^2 - 4*a)*sgn(a)*sgn(tan(1/2*d*x + 1/2*c)) +
 1/4*pi*n*sgn(tan(1/2*d*x + 1/2*c)^2 - 1)*sgn(tan(1/2*d*x + 1/2*c)) - 1/4*p
i*n*sgn(a)*sgn(tan(1/2*d*x + 1/2*c)) + pi*n*floor(1/4*sgn(4*a*tan(1/2*d*x +
 1/2*c)^2 - 4*a)*sgn(a)*sgn(tan(1/2*d*x + 1/2*c)) - 1/4*sgn(tan(1/2*d*x + 1
/2*c)^2 - 1)*sgn(tan(1/2*d*x + 1/2*c)) + 1/4*sgn(a)*sgn(tan(1/2*d*x + 1/2*c
)) - 1/4*sgn(tan(1/2*d*x + 1/2*c)) + 1/2) + 1/4*pi*n*sgn(tan(1/2*d*x + 1/2*
c)))^2 + d*tan(1/2*d*x + 1/2*c)^2 + d*n + d)
```

Mupad [B] (verification not implemented)

Time = 14.65 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int (a+a\cos(c+dx))^n \left(-\frac{Bn}{1+n}+B\cos(c+dx)\right)\,dx=\frac{B\,\sin\left(c+d\,x\right)\,\left(a\left(\cos\left(c+d\,x\right)+1\right)\right)^n}{d\,\left(n+1\right)}$$

```
[In] int((B*cos(c + d*x) - (B*n)/(n + 1))*(a + a*cos(c + d*x))^n,x)
[Out] (B*sin(c + d*x)*(a*(cos(c + d*x) + 1))^n)/(d*(n + 1))
```

3.783 $\int \frac{-\frac{3B}{2}+B\cos(c+dx)}{(a+a\cos(c+dx))^3}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 26

$$\int \frac{-\frac{3B}{2}+B\cos(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{B\sin(c+dx)}{2d(a+a\cos(c+dx))^3}$$

```
[Out] -1/2*B*sin(d*x+c)/d/(a+a*cos(d*x+c))^3
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.037, Rules used = {2828}

$$\int \frac{-\frac{3B}{2}+B\cos(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{B\sin(c+dx)}{2d(a\cos(c+dx)+a)^3}$$

```
[In] Int[((-3*B)/2 + B*Cos[c + d*x])/(a + a*Cos[c + d*x])^3,x]
```

```
[Out] -1/2*(B*Sin[c + d*x])/(d*(a + a*Cos[c + d*x])^3)
```

Rule 2828

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(f
*(m + 1))), x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] && E
qQ[a^2 - b^2, 0] && EqQ[a*d*m + b*c*(m + 1), 0]
```

Rubi steps

$$\text{integral} = -\frac{B\sin(c+dx)}{2d(a+a\cos(c+dx))^3}$$

Mathematica [A] (verified)

Time = 0.50 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.04

$$\int \frac{-\frac{3B}{2}+B\cos(c+dx)}{(a+a\cos(c+dx))^3}\,dx=-\frac{B\sin(c+dx)}{2a^3d(1+\cos(c+dx))^3}$$

```
[In] Integrate[((-3*B)/2 + B*Cos[c + d*x])/(a + a*Cos[c + d*x])^3,x]
[Out] -1/2*(B*Sin[c + d*x])/(a^3*d*(1 + Cos[c + d*x])^3)
```

Maple [A] (verified)

Time = 0.95 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.15

method	result	size
parallelrisch	$-\frac{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sec^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)B}{8a^3d}$	30
risch	$\frac{2iB\left(e^{3i(dx+c)}-e^{2i(dx+c)}\right)}{d\,a^3\left(e^{i(dx+c)}+1\right)^5}$	45
derivativedivides	$\frac{B\left(-\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8d\,a^3}$	48
default	$\frac{B\left(-\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8d\,a^3}$	48
norman	$\frac{-\frac{B\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{8ad}-\frac{3B\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8ad}-\frac{3B\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8ad}-\frac{B\left(\tan^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{8ad}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a^2}$	99

```
[In] int((-3/2*B+B*cos(d*x+c))/(a+cos(d*x+c)*a)^3,x,method=_RETURNVERBOSE)
[Out] -1/8*tan(1/2*d*x+1/2*c)*sec(1/2*d*x+1/2*c)^4*B/a^3/d
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 56 vs. 2(24) = 48.

Time = 0.27 (sec) , antiderivative size = 56, normalized size of antiderivative = 2.15

$$\int \frac{-\frac{3B}{2}+B\cos(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{B\sin(dx+c)}{2\left(a^3d\cos(dx+c)^3+3\,a^3d\cos(dx+c)^2+3\,a^3d\cos(dx+c)+a^3d\right)}$$

```
[In] integrate((-3/2*B+B*cos(d*x+c))/(a+a*cos(d*x+c))^3,x, algorithm="fricas")
[Out] -1/2*B*sin(d*x + c)/(a^3*d*cos(d*x + c)^3 + 3*a^3*d*cos(d*x + c)^2 + 3*a^3*
d*cos(d*x + c) + a^3*d)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 80 vs. $2(24) = 48$.

Time = 0.82 (sec) , antiderivative size = 80, normalized size of antiderivative = 3.08

$$\int \frac{-\frac{3B}{2} + B\cos(c+dx)}{(a+a\cos(c+dx))^3}\,dx = \begin{cases} -\frac{B\tan^5\left(\frac{c}{2}+\frac{dx}{2}\right)}{8a^3d} - \frac{B\tan^3\left(\frac{c}{2}+\frac{dx}{2}\right)}{4a^3d} - \frac{B\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{8a^3d} & \text{for } d \neq 0 \\ \frac{x\left(B\cos\left(c\right)-\frac{3B}{2}\right)}{\left(a\cos\left(c\right)+a\right)^3} & \text{otherwise} \end{cases}$$

```
[In] integrate((-3/2*B+B*cos(d*x+c))/(a+a*cos(d*x+c))**3,x)
```

```
[Out] Piecewise((-B*tan(c/2 + d*x/2)**5/(8*a**3*d) - B*tan(c/2 + d*x/2)**3/(4*a**
3*d) - B*tan(c/2 + d*x/2)/(8*a**3*d), Ne(d, 0)), (x*(B*cos(c) - 3*B/2)/(a*c
os(c) + a)**3, True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 115 vs. $2(24) = 48$.

Time = 0.22 (sec) , antiderivative size = 115, normalized size of antiderivative = 4.42

$$\int \frac{-\frac{3B}{2} + B\cos(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{\frac{B\left(\frac{15\sin(dx+c)}{\cos(dx+c)+1} + \frac{10\sin(dx+c)^3}{(\cos(dx+c)+1)^3} + \frac{3\sin(dx+c)^5}{(\cos(dx+c)+1)^5}\right)}{a^3} - \frac{2B\left(\frac{5\sin(dx+c)}{\cos(dx+c)+1} - \frac{\sin(dx+c)^5}{(\cos(dx+c)+1)^5}\right)}{a^3}}{40\,d}$$

```
[In] integrate((-3/2*B+B*cos(d*x+c))/(a+a*cos(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/40*(B*(15*sin(d*x + c)/(cos(d*x + c) + 1) + 10*sin(d*x + c)^3/(cos(d*x +
 c) + 1)^3 + 3*sin(d*x + c)^5/(cos(d*x + c) + 1)^5)/a^3 - 2*B*(5*sin(d*x +
c)/(cos(d*x + c) + 1) - sin(d*x + c)^5/(cos(d*x + c) + 1)^5)/a^3)/d
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.81

$$\int \frac{-\frac{3B}{2} + B\cos(c+dx)}{(a+a\cos(c+dx))^3}\,dx = -\frac{B\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5 + 2\,B\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3 + B\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{8\,a^3d}$$

```
[In] integrate((-3/2*B+B*cos(d*x+c))/(a+a*cos(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/8*(B*tan(1/2*d*x + 1/2*c)^5 + 2*B*tan(1/2*d*x + 1/2*c)^3 + B*tan(1/2*d*x
 + 1/2*c))/(a^3*d)
```

Mupad [B] (verification not implemented)

Time = 14.14 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.27

$$\int \frac{-\frac{3B}{2}+B\cos(c+dx)}{(a+a\cos(c+dx))^3}\,dx=-\frac{B\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)^2}{8\,a^3\,d}$$

```
[In] int(-((3*B)/2 - B*cos(c + d*x))/(a + a*cos(c + d*x))^3,x)
[Out] -(B*tan(c/2 + (d*x)/2)*(tan(c/2 + (d*x)/2)^2 + 1)^2)/(8*a^3*d)
```

3.784 $\int (a+a\cos(c+dx))^{3/2} \left(-\frac{3B}{5}+B\cos(c+dx)\right) dx$

Optimal result

Integrand size = 29, antiderivative size = 28

$$\int (a+a\cos(c+dx))^{3/2} \left(-\frac{3B}{5}+B\cos(c+dx)\right) dx = \frac{2B(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{5d}$$

```
[Out] 2/5*B*(a+a*cos(d*x+c))^(3/2)*sin(d*x+c)/d
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.034, Rules used = {2828}

$$\int (a+a\cos(c+dx))^{3/2} \left(-\frac{3B}{5}+B\cos(c+dx)\right) dx = \frac{2B\sin(c+dx)(a\cos(c+dx)+a)^{3/2}}{5d}$$

```
[In] Int[(a + a*Cos[c + d*x])^(3/2)*((-3*B)/5 + B*Cos[c + d*x]),x]
```

```
[Out] (2*B*(a + a*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(5*d)
```

Rule 2828

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(f
*(m + 1))), x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] && E
qQ[a^2 - b^2, 0] && EqQ[a*d*m + b*c*(m + 1), 0]
```

Rubi steps

$$\text{integral} = \frac{2B(a+a\cos(c+dx))^{3/2}\sin(c+dx)}{5d}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.61

$$\int (a+a\cos(c+dx))^{3/2}\left(-\frac{3B}{5}+B\cos(c+dx)\right)dx=\frac{8aB\cos^3\left(\frac{1}{2}(c+dx)\right)\sqrt{a(1+\cos(c+dx))}\sin\left(\frac{1}{2}(c+dx)\right)}{5d}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(3/2)*((-3*B)/5 + B*Cos[c + d*x]),x]
[Out] (8*a*B*Cos[(c + d*x)/2]^3*Sqrt[a*(1 + Cos[c + d*x])]*Sin[(c + d*x)/2])/(5*d
)
```

Maple [A] (verified)

Time = 2.32 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.71

method	result
default	$\frac{8\left(\cos^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a^2\sin\left(\frac{dx}{2}+\frac{c}{2}\right)B\sqrt{2}}{5\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$
parts	$\frac{4B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)a^2\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\left(2\left(\cos^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)+2\right)\sqrt{2}}{5\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}-\frac{4B\,a^2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)+2\right)\sqrt{2}}{5\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$

```
[In] int((a+cos(d*x+c)*a)^(3/2)*(-3/5*B+B*cos(d*x+c)),x,method=_RETURNVERBOSE)
[Out] 8/5*cos(1/2*d*x+1/2*c)^5*a^2*sin(1/2*d*x+1/2*c)*B*2^(1/2)/(a*cos(1/2*d*x+1/
2*c)^2)^(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 36, normalized size of antiderivative = 1.29

$$\int (a+a\cos(c+dx))^{3/2}\left(-\frac{3B}{5}+B\cos(c+dx)\right)dx=\frac{2\left(Ba\cos\left(dx+c\right)+Ba\right)\sqrt{a\cos\left(dx+c\right)+a}\sin\left(dx+c\right)}{5\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*(-3/5*B+B*cos(d*x+c)),x, algorithm="fricas
")
[Out] 2/5*(B*a*cos(d*x + c) + B*a)*sqrt(a*cos(d*x + c) + a)*sin(d*x + c)/d
```

Sympy [F]

$$\int (a+a\cos(c+dx))^{3/2}\left(-\frac{3B}{5}+B\cos(c+dx)\right)\,dx = \frac{B\left(\int\left(-3a\sqrt{a\cos(c+dx)+a}\right)dx+\int 2a\sqrt{a\cos(c+dx)+a}\cos(c+dx)\,dx+\int 5a\right.}{5}$$

```
[In] integrate((a+a*cos(d*x+c))**(3/2)*(-3/5*B+B*cos(d*x+c)),x)
[Out] B*(Integral(-3*a*sqrt(a*cos(c + d*x) + a), x) + Integral(2*a*sqrt(a*cos(c +
 d*x) + a)*cos(c + d*x), x) + Integral(5*a*sqrt(a*cos(c + d*x) + a)*cos(c +
 d*x)**2, x))/5
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 92 vs. $2(24) = 48$.

Time = 0.38 (sec) , antiderivative size = 92, normalized size of antiderivative = 3.29

$$\int (a+a\cos(c+dx))^{3/2}\left(-\frac{3B}{5}+B\cos(c+dx)\right)\,dx = \frac{\left(\sqrt{2}a\sin\left(\frac{5}{2}\,dx+\frac{5}{2}\,c\right)+5\,\sqrt{2}a\sin\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)+20\,\sqrt{2}a\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)B\sqrt{a}-2\,(\sqrt{2}}{10\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*(-3/5*B+B*cos(d*x+c)),x, algorithm="maxima
")
[Out] 1/10*((sqrt(2)*a*sin(5/2*d*x + 5/2*c) + 5*sqrt(2)*a*sin(3/2*d*x + 3/2*c) +
20*sqrt(2)*a*sin(1/2*d*x + 1/2*c))*B*sqrt(a) - 2*(sqrt(2)*a*sin(3/2*d*x + 3
/2*c) + 9*sqrt(2)*a*sin(1/2*d*x + 1/2*c))*B*sqrt(a))/d
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 80 vs. $2(24) = 48$.

Time = 0.32 (sec) , antiderivative size = 80, normalized size of antiderivative = 2.86

$$\int (a+a\cos(c+dx))^{3/2}\left(-\frac{3B}{5}+B\cos(c+dx)\right)\,dx = \frac{\sqrt{2}\left(Ba\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{5}{2}\,dx+\frac{5}{2}\,c\right)+3\,Ba\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sin\left(\frac{3}{2}\,dx+\frac{3}{2}\right.\right.}{10\,d}$$

```
[In] integrate((a+a*cos(d*x+c))^(3/2)*(-3/5*B+B*cos(d*x+c)),x, algorithm="giac")
[Out] 1/10*sqrt(2)*(B*a*sgn(cos(1/2*d*x + 1/2*c))*sin(5/2*d*x + 5/2*c) + 3*B*a*sg
n(cos(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c) + 2*B*a*sgn(cos(1/2*d*x + 1/2*
c))*sin(1/2*d*x + 1/2*c))*sqrt(a)/d
```

Mupad [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{3/2}\left(-\frac{3B}{5}+B\cos(c+dx)\right)\,dx=\int -\left(\frac{3\,B}{5}-B\,\cos\left(c+d\,x\right)\right)\,\left(a+a\,\cos\left(c+d\,x\right)\right)^{3/2}\,dx$$

```
[In] int(-((3*B)/5 - B*cos(c + d*x))*(a + a*cos(c + d*x))^(3/2),x)
[Out] int(-((3*B)/5 - B*cos(c + d*x))*(a + a*cos(c + d*x))^(3/2), x)
```

3.785 $\int \frac{B+B\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 26

$$\int \frac{B+B\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx=\frac{2B\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}$$

```
[Out] 2*B*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {21, 2725}

$$\int \frac{B+B\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx=\frac{2B\sin(c+dx)}{d\sqrt{a\cos(c+dx)+a}}$$

```
[In] Int[(B + B*Cos[c + d*x])/Sqrt[a + a*Cos[c + d*x]],x]
```

```
[Out] (2*B*Sin[c + d*x])/(d*Sqrt[a + a*Cos[c + d*x]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 2725

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[-2*b*(Cos
[c + d*x]/(d*Sqrt[a + b*Sin[c + d*x]])), x] /; FreeQ[{a, b, c, d}, x] && Eq
```

```
Q[a^2 - b^2, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{B\int \sqrt{a+a\cos(c+dx)}\,dx}{a}\\ &= \frac{2B\sin(c+dx)}{d\sqrt{a+a\cos(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.27

$$\int \frac{B+B\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{2B\sqrt{a(1+\cos(c+dx))}\tan\left(\frac{1}{2}(c+dx)\right)}{ad}$$

```
[In] Integrate[(B + B*Cos[c + d*x])/Sqrt[a + a*Cos[c + d*x]],x]
[Out] (2*B*Sqrt[a*(1 + Cos[c + d*x])]*Tan[(c + d*x)/2])/(a*d)
```

Maple [A] (verified)

Time = 2.10 (sec) , antiderivative size = 43, normalized size of antiderivative = 1.65

method	result
default	$\frac{2B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{2}}{\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$
risch	$-\frac{iB\sqrt{2}\left(e^{i(dx+c)}-1\right)\left(1+e^{-i(dx+c)}\right)}{\sqrt{a\left(e^{i(dx+c)}+1\right)^2 e^{-i(dx+c)}}\,d}$
parts	$\frac{B\sqrt{2}\,\mathrm{am}^{-1}\left(\frac{dx}{2}+\frac{c}{2}\middle\|1\right)}{d\sec\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\mathrm{csgn}\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\right)} - \frac{B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\sqrt{2}\ln\left(\frac{4\sqrt{a}\sqrt{a\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}+4a}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)\right.}{a^{\frac{3}{2}}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$

```
[In] int((B+B*cos(d*x+c))/(a+cos(d*x+c)*a)^(1/2),x,method=_RETURNVERBOSE)
[Out] 2*B*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)*2^(1/2)/(a*cos(1/2*d*x+1/2*c)^2)^
(1/2)/d
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 36, normalized size of antiderivative = 1.38

$$\int \frac{B+B\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \frac{2\sqrt{a\cos\left(dx+c\right)+a}B\sin\left(dx+c\right)}{ad\cos\left(dx+c\right)+ad}$$

```
[In] integrate((B+B*cos(d*x+c))/(a+a*cos(d*x+c))^(1/2),x, algorithm="fricas")
[Out] 2*sqrt(a*cos(d*x + c) + a)*B*sin(d*x + c)/(a*d*cos(d*x + c) + a*d)
```

Sympy [F]

$$\int \frac{B+B\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = B\left(\int \frac{\cos\left(c+dx\right)}{\sqrt{a\cos\left(c+dx\right)+a}}\,dx+\int \frac{1}{\sqrt{a\cos\left(c+dx\right)+a}}\,dx\right)$$

```
[In] integrate((B+B*cos(d*x+c))/(a+a*cos(d*x+c))**(1/2),x)
[Out] B*(Integral(cos(c + d*x)/sqrt(a*cos(c + d*x) + a), x) + Integral(1/sqrt(a*c
os(c + d*x) + a), x))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 19040 vs. 2(24) = 48.

Time = 0.60 (sec) , antiderivative size = 19040, normalized size of antiderivative = 732.31

$$\int \frac{B+B\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate((B+B*cos(d*x+c))/(a+a*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] 1/12*(6*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*B/sqrt(a) - (12*sqrt(2)*cos(3/2*d
*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*
x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
```

sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2
+ 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*
c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*
x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x +
1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x +
1/2*c)^2 + (12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*c
os(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2
*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2
*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(
1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x
+ c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2
*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2
*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2
*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 -
3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2
*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(
1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x +
1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)

*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1
/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*
sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^
2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x +
1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/
2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/
2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2
*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(
2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x +
1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c
) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*
c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1
/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x +
c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos
(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1)
- sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)

)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2)
)*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*l
og(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
 + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin
(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 +
(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
 sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2
*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin
(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/
2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/
2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2
+ 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)
*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*
c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt
(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(2/3*arctan2
(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + ((3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c
) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2
+ 12*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sq
rt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x +
 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
+ 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/
2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(
1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x
+ 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*
d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x
 + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2
*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x
 + 1/2*c)^2 + 12*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt

(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + (12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 1

2*sqrt(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2

+ (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*s
in(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1
/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(
1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos
(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))
*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(
2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/
2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*sin(2/3*arcta
n2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - 2*((8*sqrt(2)*cos(1/2*d
*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(
1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*
d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin
(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*si
n(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) + 2*(8*s
qrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d
*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1
/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x
 + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2
*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2
)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/2*d*x + 3/2*c) - 2*(8*sqrt(2)
*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x +
 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2
+ 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/
2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*
(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x
+ c) + 2*(12*sqrt(2)*cos(3/2*d*x + 3/2*c)^3*sin(d*x + c) - 12*(sqrt(2)*cos(
d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^3 - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)
^3 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)
)*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/

2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2
*d*x + 1/2*c))*sin(d*x + c)^2 + 24*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c
) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c)
)*cos(d*x + c) + 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c
)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*
x + 1/2*c))*cos(3/2*d*x + 3/2*c)^2 - (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*
(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)
^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(c
os(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1
) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2
*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2
*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + 3*(sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 + ((3*sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (3*sqrt(2)*log(cos(
1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
 3*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*
d*x + 1/2*c) + 1) - 8*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 12*sqr
t(2)*cos(3/2*d*x + 3/2*c)*sin(d*x + c) + 2*(3*sqrt(2)*log(cos(1/2*d*x + 1/2
*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3*sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1) - 20*sqrt(2)*sin(1/2*d*x + 1/2*c))*cos(d*x + c) + 3*sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - 3
*sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*
x + 1/2*c) + 1) - 32*sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c)^2 -
 (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/
2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*co
s(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
+ 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)
^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/
2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c
))*sin(d*x + c)^2 + 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2
+ sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c
)^2 - 2*((8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*
log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c

) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*si
n(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)^2 + (8*sqrt(2)*
cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/
2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log
(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) +
 1))*cos(1/2*d*x + 1/2*c))*sin(d*x + c)^2 + 8*sqrt(2)*cos(1/2*d*x + 1/2*c)*
sin(1/2*d*x + 1/2*c) + 2*(8*sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(1/2*d*x + 1/2*
c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin
(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c))*cos(d*x + c)
 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c) - 6*(sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c))*cos(3/
2*d*x + 3/2*c) - 2*(8*sqrt(2)*sin(1/2*d*x + 1/2*c)^3 - 3*(sqrt(2)*log(cos(1
/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) -
sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x
 + 1/2*c) + 1))*cos(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c
)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(co
s(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1)
)*sin(1/2*d*x + 1/2*c)^2 + 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*s
in(1/2*d*x + 1/2*c))*cos(d*x + c) - 2*(6*(sqrt(2)*cos(d*x + c) + sqrt(2))*c
os(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(
cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) +
1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/
2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)^2 + (8*
sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + si
n(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*
x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/
2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 12*(sqrt(2)*cos(d*x + c)*cos(1/2*d
*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d
*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 1
1*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(
1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c) - 3*(sqrt(2)*log(cos(1/2*d*x + 1
/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*lo
g(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c)
+ 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)
*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2*d*x + 1/2*c) - 6*((sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co

s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqr
t(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*c
os(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x +
 c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x +
 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)
*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d
*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d
*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x +
3/2*c))*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*cos(2
/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 3*((sqrt(2)*cos(d
*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(
3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2)*cos(d*x + c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c
)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2
*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*
cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) +
 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*
x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x +
 c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) +
sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(2/3*arctan2(sin(3/2
*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)
*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2
+ (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
 + c)^2 + ((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos
(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
+ 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c
) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2
*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)
*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x +
 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x
 + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(
3/2*d*x + 3/2*c)))^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x
 + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(
1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*
c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/

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2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*((sqrt(
2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(
2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(
1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)
^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(s
qrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*s
in(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1
/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 +
 sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(
2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/
2*d*x + 3/2*c))*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))
) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2
*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(
2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*log(cos(1/3*arctan2(sin(3/2*
d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + sin(1/3*arctan2(sin(3/2*d*x + 3/2*
c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(
3/2*d*x + 3/2*c))) + 1) - 3*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)
^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + ((s
qrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + s
qrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*
sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*
sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 +
 (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x
+ c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 +
2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*
c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*c
os(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)
^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)
^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*s
qrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*si
n(3/2*d*x + 3/2*c))*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2
*c)))^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(
d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^
2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + ((sqrt(2)*cos(d*x + c)
^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x
 + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c
)^2)*cos(d*x + c)^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*
sqrt(2)*cos(d*x + c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d
*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*co
s(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
+ c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
```

```
 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)
)*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/
2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)
*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))
*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + sqrt(2)*c
os(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x
 + c)^2*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2
+ 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c
))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1
/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(
d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sq
rt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)
^2 + (sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x +
 c) + sqrt(2))*sin(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + s
qrt(2)*sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c
)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*
x + c)*cos(1/2*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3
/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)
*cos(d*x + c) + 2*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/
2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*cos(2/3*arctan2(
sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2*(sqrt(2)*cos(d*x + c)^2*si
n(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*sqrt(2
)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(1/2*d*x + 1/2*c))*sin(3/2
*d*x + 3/2*c))*log(cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*
c)))^2 + sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - 2
*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) - 2*(6*(
sqrt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (8*sqrt(2)*sin(1/2
*d*x + 1/2*c)^2 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2
*c)^2 + 2*sin(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 +
sin(1/2*d*x + 1/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c)
+ 2*sqrt(2))*cos(d*x + c)^2 + (8*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt(2
)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2
*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 - 2*
sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*sin(d*x + c)^2
 + 6*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + 14*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 + 1
2*(sqrt(2)*cos(d*x + c)*cos(1/2*d*x + 1/2*c) - sqrt(2)*sin(d*x + c)*sin(1/2
*d*x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(3*s
qrt(2)*cos(1/2*d*x + 1/2*c)^2 + 11*sqrt(2)*sin(1/2*d*x + 1/2*c)^2 - 3*(sqrt
(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1
/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 -
2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*cos(d*x + c)
 - 3*(sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2 + 2*sin(1
```

/2*d*x + 1/2*c) + 1) - sqrt(2)*log(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1
/2*c)^2 - 2*sin(1/2*d*x + 1/2*c) + 1))*sin(1/2*d*x + 1/2*c) + 2*sqrt(2))*si
n(3/2*d*x + 3/2*c) - 4*(2*sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2))*sin(1/2
*d*x + 1/2*c) - 12*((sqrt(2)*cos(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sq
rt(2)*cos(d*x + c) + sqrt(2))*cos(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x
 + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 + (sqrt(2)*cos
(d*x + c)^2 + sqrt(2)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c) + sqrt(2))*si
n(3/2*d*x + 3/2*c)^2 + (sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*
x + 1/2*c)^2)*sin(d*x + c)^2 + sqrt(2)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin
(1/2*d*x + 1/2*c)^2 + 2*(sqrt(2)*cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + sqrt
(2)*cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*sqrt(2)*cos(d*x + c)*cos(1/2*d*
x + 1/2*c) + sqrt(2)*cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(sqrt(2
)*cos(1/2*d*x + 1/2*c)^2 + sqrt(2)*sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + 2
*(sqrt(2)*cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sqrt(2)*sin(d*x + c)^2*sin(
1/2*d*x + 1/2*c) + 2*sqrt(2)*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sqrt(2)*si
n(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c))*sin(1/3*arctan2(sin(3/2*d*x + 3/2
*c), cos(3/2*d*x + 3/2*c))))*B/(((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d
*x + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x
 + 1/2*c)^2)*cos(d*x + c)^2 + ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x
 + c) + 1)*cos(3/2*d*x + 3/2*c)^2 + (cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x +
 1/2*c)^2)*cos(d*x + c)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x +
c) + 1)*sin(3/2*d*x + 3/2*c)^2 + (cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/
2*c)^2)*sin(d*x + c)^2 + 2*(cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + cos(1/2*d
*x + 1/2*c)*sin(d*x + c)^2 + 2*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + cos(1/2*
d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*
x + 1/2*c)^2)*cos(d*x + c) + cos(1/2*d*x + 1/2*c)^2 + 2*(cos(d*x + c)^2*sin
(1/2*d*x + 1/2*c) + sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*cos(d*x + c)*si
n(1/2*d*x + 1/2*c) + sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c) + sin(1/2*d
*x + 1/2*c)^2)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))
^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3
/2*c)^2 + (cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
+ ((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x + 3/2
*c)^2 + (cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c)^2 +
(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x + 3/2*c)
^2 + (cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2 + 2*(
cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 +
 2*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + cos(1/2*d*x + 1/2*c))*cos(3/2*d*x +
3/2*c) + 2*(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) +
 cos(1/2*d*x + 1/2*c)^2 + 2*(cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + sin(d*x
+ c)^2*sin(1/2*d*x + 1/2*c) + 2*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + sin(1/2
*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c) + sin(1/2*d*x + 1/2*c)^2)*sin(2/3*arcta
n2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*(cos(d*x + c)^2*cos(1
/2*d*x + 1/2*c) + cos(1/2*d*x + 1/2*c)*sin(d*x + c)^2 + 2*cos(d*x + c)*cos(
1/2*d*x + 1/2*c) + cos(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) + 2*(cos(1/2*
d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c) + cos(1/2*d*x + 1/2*c

```
)^2 + 2*((cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*cos(3/2*d*x
 + 3/2*c)^2 + (cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2)*cos(d*x + c
)^2 + (cos(d*x + c)^2 + sin(d*x + c)^2 + 2*cos(d*x + c) + 1)*sin(3/2*d*x +
3/2*c)^2 + (cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2)*sin(d*x + c)^2
 + 2*(cos(d*x + c)^2*cos(1/2*d*x + 1/2*c) + cos(1/2*d*x + 1/2*c)*sin(d*x +
c)^2 + 2*cos(d*x + c)*cos(1/2*d*x + 1/2*c) + cos(1/2*d*x + 1/2*c))*cos(3/2*
d*x + 3/2*c) + 2*(cos(1/2*d*x + 1/2*c)^2 + sin(1/2*d*x + 1/2*c)^2)*cos(d*x
+ c) + cos(1/2*d*x + 1/2*c)^2 + 2*(cos(d*x + c)^2*sin(1/2*d*x + 1/2*c) + si
n(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*cos(d*x + c)*sin(1/2*d*x + 1/2*c) + s
in(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c) + sin(1/2*d*x + 1/2*c)^2)*cos(2/3
*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2*(cos(d*x + c)^2*s
in(1/2*d*x + 1/2*c) + sin(d*x + c)^2*sin(1/2*d*x + 1/2*c) + 2*cos(d*x + c)*
sin(1/2*d*x + 1/2*c) + sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c) + sin(1/2
*d*x + 1/2*c)^2)*sqrt(a)))/d
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.27

$$\int \frac{B+B\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx=\frac{2\sqrt{2}B\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{\sqrt{a}d\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}$$

```
[In] integrate((B+B*cos(d*x+c))/(a+a*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] 2*sqrt(2)*B*sin(1/2*d*x + 1/2*c)/(sqrt(a)*d*sgn(cos(1/2*d*x + 1/2*c)))
```

Mupad [B] (verification not implemented)

Time = 14.71 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.42

$$\int \frac{B+B\cos(c+dx)}{\sqrt{a+a\cos(c+dx)}}\,dx=\frac{2\,B\,\sin\left(c+d\,x\right)\,\sqrt{a\,\left(\cos\left(c+d\,x\right)+1\right)}}{a\,d\,\left(\cos\left(c+d\,x\right)+1\right)}$$

```
[In] int((B + B*cos(c + d*x))/(a + a*cos(c + d*x))^(1/2),x)
[Out] (2*B*sin(c + d*x)*(a*(cos(c + d*x) + 1))^(1/2))/(a*d*(cos(c + d*x) + 1))
```

3.786 $\int \frac{-\frac{5B}{3}+B\cos(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 28

$$\int \frac{-\frac{5B}{3}+B\cos(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx=-\frac{2B\sin(c+dx)}{3d(a+a\cos(c+dx))^{5/2}}$$

```
[Out] -2/3*B*sin(d*x+c)/d/(a+a*cos(d*x+c))^(5/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.034, Rules used = {2828}

$$\int \frac{-\frac{5B}{3}+B\cos(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx=-\frac{2B\sin(c+dx)}{3d(a\cos(c+dx)+a)^{5/2}}$$

```
[In] Int[((-5*B)/3 + B*Cos[c + d*x])/(a + a*Cos[c + d*x])^(5/2),x]
```

```
[Out] (-2*B*Sin[c + d*x])/(3*d*(a + a*Cos[c + d*x])^(5/2))
```

Rule 2828

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (
f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(f
*(m + 1))), x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] && E
qQ[a^2 - b^2, 0] && EqQ[a*d*m + b*c*(m + 1), 0]
```

Rubi steps

$$\text{integral}=-\frac{2B\sin(c+dx)}{3d(a+a\cos(c+dx))^{5/2}}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{-\frac{5B}{3}+B\cos(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = -\frac{2B\sin(c+dx)}{3d(a(1+\cos(c+dx)))^{5/2}}$$

```
[In] Integrate[((-5*B)/3 + B*Cos[c + d*x])/(a + a*Cos[c + d*x])^(5/2),x]
[Out] (-2*B*Sin[c + d*x])/(3*d*(a*(1 + Cos[c + d*x]))^(5/2))
```

Maple [A] (verified)

Time = 3.46 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.71

method	result
default	$-\frac{\sin\left(\frac{dx}{2}+\frac{c}{2}\right)B\sqrt{2}}{6\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^{3}a^{2}\sqrt{a\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$
parts	$\frac{B\sqrt{a\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(5\sqrt{2}\,\ln\left(\frac{4\sqrt{a}\,\sqrt{a\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}+4a}{\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}\right)a\left(\cos^{4}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+5\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\sqrt{a\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{2}\,\sqrt{a}-2\sqrt{2}\right.}{32\cos\left(\frac{dx}{2}+\frac{c}{2}\right)^{3}a^{\frac{7}{2}}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{a\left(\cos^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,d}$

```
[In] int((-5/3*B+B*cos(d*x+c))/(a+cos(d*x+c)*a)^(5/2),x,method=_RETURNVERBOSE)
[Out] -1/6/cos(1/2*d*x+1/2*c)^3/a^2*sin(1/2*d*x+1/2*c)*B*2^(1/2)/(a*cos(1/2*d*x+1
/2*c)^2)^(1/2)/d
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 68 vs. $2(24) = 48$.

Time = 0.29 (sec) , antiderivative size = 68, normalized size of antiderivative = 2.43

$$\int \frac{-\frac{5B}{3}+B\cos(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = -\frac{2\sqrt{a\cos(dx+c)+a}B\sin(dx+c)}{3\left(a^{3}d\cos(dx+c)^{3}+3a^{3}d\cos(dx+c)^{2}+3a^{3}d\cos(dx+c)+a^{3}d\right)}$$

```
[In] integrate((-5/3*B+B*cos(d*x+c))/(a+a*cos(d*x+c))^(5/2),x, algorithm="fricas
")
[Out] -2/3*sqrt(a*cos(d*x + c) + a)*B*sin(d*x + c)/(a^3*d*cos(d*x + c)^3 + 3*a^3*
d*cos(d*x + c)^2 + 3*a^3*d*cos(d*x + c) + a^3*d)
```

Sympy [F]

$$\int \frac{-\frac{5B}{3}+B\cos(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \frac{B\left(\int \frac{3\cos(c+dx)}{a^2\sqrt{a\cos(c+dx)+a}\cos^2(c+dx)+2a^2\sqrt{a\cos(c+dx)+a}\cos(c+dx)+a^2\sqrt{a\cos(c+dx)+a}}\,dx+\int\right.}{3}$$

```
[In] integrate((-5/3*B+B*cos(d*x+c))/(a+a*cos(d*x+c))**(5/2),x)
```

```
[Out] B*(Integral(3*cos(c + d*x)/(a**2*sqrt(a*cos(c + d*x) + a)*cos(c + d*x)**2 +
 2*a**2*sqrt(a*cos(c + d*x) + a)*cos(c + d*x) + a**2*sqrt(a*cos(c + d*x) +
a)), x) + Integral(-5/(a**2*sqrt(a*cos(c + d*x) + a)*cos(c + d*x)**2 + 2*a*
*2*sqrt(a*cos(c + d*x) + a)*cos(c + d*x) + a**2*sqrt(a*cos(c + d*x) + a)),
x))/3
```

Maxima [F(-1)]

Timed out.

$$\int \frac{-\frac{5B}{3}+B\cos(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate((-5/3*B+B*cos(d*x+c))/(a+a*cos(d*x+c))^(5/2),x, algorithm="maxima
")
```

```
[Out] Timed out
```

Giac [A] (verification not implemented)

none

Time = 0.70 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.71

$$\int \frac{-\frac{5B}{3}+B\cos(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx = -\frac{\sqrt{2}B\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)}{6\left(\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)^2 a^{\frac{5}{2}}d\,\mathrm{sgn}\left(\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}$$

```
[In] integrate((-5/3*B+B*cos(d*x+c))/(a+a*cos(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] -1/6*sqrt(2)*B*sin(1/2*d*x + 1/2*c)/((sin(1/2*d*x + 1/2*c)^2 - 1)^2*a^(5/2)
*d*sgn(cos(1/2*d*x + 1/2*c)))
```

Mupad [B] (verification not implemented)

Time = 19.54 (sec) , antiderivative size = 85, normalized size of antiderivative = 3.04

$$\int \frac{-\frac{5B}{3}+B\cos(c+dx)}{(a+a\cos(c+dx))^{5/2}}\,dx=\frac{8\,B\,\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,\sqrt{a+a\,\left(\frac{\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}}{2}+\frac{\mathrm{e}^{c\,1\mathrm{i}+d\,x\,1\mathrm{i}}}{2}\right)}\,\left(\mathrm{e}^{c\,1\mathrm{i}+d\,x\,1\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)}{3\,a^3\,d\,{\left(\mathrm{e}^{c\,1\mathrm{i}+d\,x\,1\mathrm{i}}+1\right)}^5}$$

```
[In] int(-((5*B)/3 - B*cos(c + d*x))/(a + a*cos(c + d*x))^(5/2),x)
```

```
[Out] (8*B*exp(c*2i + d*x*2i)*(a + a*(exp(- c*1i - d*x*1i)/2 + exp(c*1i + d*x*1i)
/2))^(1/2)*(exp(c*1i + d*x*1i)*1i - 1i))/(3*a^3*d*(exp(c*1i + d*x*1i) + 1)^
5)
```

3.787 $\int (a+a\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 25, antiderivative size = 104

$$\int (a+a\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx = \frac{3B(a+a\cos(c+dx))^{2/3}\sin(c+dx)}{5d} + \frac{2\sqrt[6]{2}(5A+2B)(a+a\cos(c+dx))^{2/3}\,\text{Hypergeometric2F1}\left(-\frac{1}{6},\frac{1}{2},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx))\right)\sin(c+dx)}{5d(1+\cos(c+dx))^{7/6}}$$

```
[Out] 3/5*B*(a+a*cos(d*x+c))^(2/3)*sin(d*x+c)/d+2/5*2^(1/6)*(5*A+2*B)*(a+a*cos(d*
x+c))^(2/3)*hypergeom([-1/6, 1/2],[3/2],1/2-1/2*cos(d*x+c))*sin(d*x+c)/d/(1
+cos(d*x+c))^(7/6)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 104, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {2830, 2731, 2730}

$$\int (a+a\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx = \frac{2\sqrt[6]{2}(5A+2B)\sin(c+dx)(a\cos(c+dx)+a)^{2/3}\,\text{Hypergeometric2F1}\left(-\frac{1}{6},\frac{1}{2},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx))\right)}{5d(\cos(c+dx)+1)^{7/6}} + \frac{3B\sin(c+dx)(a\cos(c+dx)+a)^{2/3}}{5d}$$

```
[In] Int[(a + a*Cos[c + d*x])^(2/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (3*B*(a + a*Cos[c + d*x])^(2/3)*Sin[c + d*x])/(5*d) + (2*2^(1/6)*(5*A + 2*B
)*(a + a*Cos[c + d*x])^(2/3)*Hypergeometric2F1[-1/6, 1/2, 3/2, (1 - Cos[c +
 d*x])/2]*Sin[c + d*x])/(5*d*(1 + Cos[c + d*x])^(7/6))
```

Rule 2730

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-2^(n +
 1/2))*a^(n - 1/2)*b*(Cos[c + d*x]/(d*Sqrt[a + b*Sin[c + d*x]]))*Hypergeome
tric2F1[1/2, 1/2 - n, 3/2, (1/2)*(1 - b*(Sin[c + d*x]/a))], x] /; FreeQ[{a,
 b, c, d, n}, x] && EqQ[a^2 - b^2, 0] &&  !IntegerQ[2*n] && GtQ[a, 0]
```

Rule 2731

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[a^IntPar
t[n]*((a + b*Sin[c + d*x])^FracPart[n]/(1 + (b/a)*Sin[c + d*x])^FracPart[n]
), Int[(1 + (b/a)*Sin[c + d*x])^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && E
qQ[a^2 - b^2, 0] &&  !IntegerQ[2*n] &&  !GtQ[a, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rubi steps

$$\text{integral} = \frac{3B(a+a\cos(c+dx))^{2/3}\sin(c+dx)}{5d} + \frac{1}{5}(5A+2B)\int (a+a\cos(c+dx))^{2/3}\,dx$$

$$= \frac{3B(a+a\cos(c+dx))^{2/3}\sin(c+dx)}{5d} + \frac{\left((5A+2B)(a+a\cos(c+dx))^{2/3}\right)\int (1+\cos(c+dx))^{2/3}\,dx}{5(1+\cos(c+dx))^{2/3}}$$

$$= \frac{3B(a+a\cos(c+dx))^{2/3}\sin(c+dx)}{5d} + \frac{2\sqrt[6]{2}(5A+2B)(a+a\cos(c+dx))^{2/3}\,\text{Hypergeometric2F1}\left(-\frac{1}{6},\frac{1}{2},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx))\right)\sin(c+}{5d(1+\cos(c+dx))^{7/6}}$$

Mathematica [A] (verified)

Time = 0.56 (sec) , antiderivative size = 164, normalized size of antiderivative = 1.58

$$\int (a+a\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx = \frac{(a(1+\cos(c+dx)))^{2/3}\sec^2\left(\frac{1}{2}(c+dx)\right)\left(3\,2^{5/6}(5A+4B+2B\cos(c+dx))\sqrt[6]{1-\cos\left(\right.}\right.}{}$$

[In] Integrate[(a + a*Cos[c + d*x])^(2/3)*(A + B*Cos[c + d*x]),x]

[Out] ((a*(1 + Cos[c + d*x]))^(2/3)*Sec[(c + d*x)/2]^2*(3*2^(5/6)*(5*A + 4*B + 2*B*Cos[c + d*x])*(1 - Cos[d*x - 2*ArcTan[Cot[c/2]]])^(1/6)*Sin[c + d*x] - 2*(5*A + 2*B)*Hypergeometric2F1[1/2, 5/6, 3/2, Cos[(d*x)/2 - ArcTan[Cot[c/2]]]^2]*Sin[d*x - 2*ArcTan[Cot[c/2]]]))/(20*2^(5/6)*d*(1 - Cos[d*x - 2*ArcTan[Cot[c/2]]])^(1/6))

Maple [F]

$$\int (a+\cos(dx+c)\,a)^{\frac{2}{3}}\,(A+B\cos(dx+c))\,dx$$

[In] int((a+cos(d*x+c)*a)^(2/3)*(A+B*cos(d*x+c)),x)

[Out] int((a+cos(d*x+c)*a)^(2/3)*(A+B*cos(d*x+c)),x)

Fricas [F]

$$\int (a+a\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(a\cos(dx+c)+a)^{\frac{2}{3}}\,dx$$

[In] integrate((a+a*cos(d*x+c))^(2/3)*(A+B*cos(d*x+c)),x, algorithm="fricas")

[Out] integral((B*cos(d*x + c) + A)*(a*cos(d*x + c) + a)^(2/3), x)

Sympy [F]

$$\int (a+a\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx=\int (a(\cos{(c+dx)}+1))^{\frac{2}{3}}\,(A+B\cos{(c+dx)})\,\,dx$$

```
[In] integrate((a+a*cos(d*x+c))**(2/3)*(A+B*cos(d*x+c)),x)
[Out] Integral((a*(cos(c + d*x) + 1))**(2/3)*(A + B*cos(c + d*x)), x)
```

Maxima [F]

$$\int (a+a\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx=\int (B\cos{(dx+c)}+A)(a\cos{(dx+c)}+a)^{\frac{2}{3}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^(2/3)*(A+B*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)*(a*cos(d*x + c) + a)^(2/3), x)
```

Giac [F]

$$\int (a+a\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx=\int (B\cos{(dx+c)}+A)(a\cos{(dx+c)}+a)^{\frac{2}{3}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^(2/3)*(A+B*cos(d*x+c)),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)*(a*cos(d*x + c) + a)^(2/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+a\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx=\int (A+B\,\cos{(c+d\,x)})\,{(a+a\,\cos{(c+d\,x)})}^{2/3}\,dx$$

```
[In] int((A + B*cos(c + d*x))*(a + a*cos(c + d*x))^(2/3),x)
[Out] int((A + B*cos(c + d*x))*(a + a*cos(c + d*x))^(2/3), x)
```

3.788 $\int \sqrt[3]{a+a\cos(c+dx)}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 25, antiderivative size = 102

$$\int \sqrt[3]{a+a\cos(c+dx)}(A+B\cos(c+dx))\,dx = \frac{3B\sqrt[3]{a+a\cos(c+dx)}\sin(c+dx)}{4d} + \frac{(4A+B)\sqrt[3]{a+a\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx))\right)\sin(c+dx)}{2\sqrt[6]{2}d(1+\cos(c+dx))^{5/6}}$$

```
[Out] 3/4*B*(a+a*cos(d*x+c))^(1/3)*sin(d*x+c)/d+1/4*(4*A+B)*(a+a*cos(d*x+c))^(1/3
)*hypergeom([1/6, 1/2],[3/2],1/2-1/2*cos(d*x+c))*sin(d*x+c)*2^(5/6)/d/(1+co
s(d*x+c))^(5/6)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 102, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {2830, 2731, 2730}

$$\int \sqrt[3]{a+a\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$= \frac{(4A+B)\sin(c+dx)\sqrt[3]{a\cos(c+dx)+a}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx))\right)}{2\sqrt[6]{2}d(\cos(c+dx)+1)^{5/6}} + \frac{3B\sin(c+dx)\sqrt[3]{a\cos(c+dx)+a}}{4d}$$

```
[In] Int[(a + a*Cos[c + d*x])^(1/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (3*B*(a + a*Cos[c + d*x])^(1/3)*Sin[c + d*x])/(4*d) + ((4*A + B)*(a + a*Cos
[c + d*x])^(1/3)*Hypergeometric2F1[1/6, 1/2, 3/2, (1 - Cos[c + d*x])/2]*Sin
[c + d*x])/(2*2^(1/6)*d*(1 + Cos[c + d*x])^(5/6))
```

Rule 2730

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-2^(n +
 1/2))*a^(n - 1/2)*b*(Cos[c + d*x]/(d*Sqrt[a + b*Sin[c + d*x]]))*Hypergeome
tric2F1[1/2, 1/2 - n, 3/2, (1/2)*(1 - b*(Sin[c + d*x]/a))], x] /; FreeQ[{a,
 b, c, d, n}, x] && EqQ[a^2 - b^2, 0] &&  !IntegerQ[2*n] && GtQ[a, 0]
```

Rule 2731

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[a^IntPar
t[n]*((a + b*Sin[c + d*x])^FracPart[n]/(1 + (b/a)*Sin[c + d*x])^FracPart[n]
), Int[(1 + (b/a)*Sin[c + d*x])^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && E
qQ[a^2 - b^2, 0] &&  !IntegerQ[2*n] &&  !GtQ[a, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{3B\sqrt[3]{a+a\cos(c+dx)}\sin(c+dx)}{4d}+\frac{1}{4}(4A+B)\int\sqrt[3]{a+a\cos(c+dx)}\,dx\\ &= \frac{3B\sqrt[3]{a+a\cos(c+dx)}\sin(c+dx)}{4d}+\frac{\left((4A+B)\sqrt[3]{a+a\cos(c+dx)}\right)\int\sqrt[3]{1+\cos(c+dx)}\,dx}{4\sqrt[3]{1+\cos(c+dx)}}\\ &= \frac{3B\sqrt[3]{a+a\cos(c+dx)}\sin(c+dx)}{4d}\\ &\quad+\frac{(4A+B)\sqrt[3]{a+a\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx))\right)\sin(c+dx)}{2\sqrt[6]{2}d(1+\cos(c+dx))^{5/6}}\end{aligned}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 304 vs. $2(102) = 204$.

Time = 3.49 (sec) , antiderivative size = 304, normalized size of antiderivative = 2.98

$$\int\sqrt[3]{a+a\cos(c+dx)}(A+B\cos(c+dx))\,dx$$

$$=\frac{\sqrt[3]{a(1+\cos(c+dx))}\left(-6(4A+B)\cot\left(\frac{c}{2}\right)\sqrt{\sec^2\left(\frac{c}{2}\right)}+5(4A+B)\cos\left(\frac{1}{2}\left(c-dx-2\arctan\left(\tan\left(\frac{c}{2}\right)\right)\right)\right)\right.}{}$$

```
[In] Integrate[(a + a*Cos[c + d*x])^(1/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] ((a*(1 + Cos[c + d*x]))^(1/3)*(-6*(4*A + B)*Cot[c/2]*Sqrt[Sec[c/2]^2] + 5*(
4*A + B)*Cos[(c - d*x - 2*ArcTan[Tan[c/2]])/2]*Csc[c/2]*Sec[c/2]*Sec[(c + d
*x)/2] + 4*A*Cos[(c + d*x + 2*ArcTan[Tan[c/2]])/2]*Csc[c/2]*Sec[c/2]*Sec[(c
 + d*x)/2] + B*Cos[(c + d*x + 2*ArcTan[Tan[c/2]])/2]*Csc[c/2]*Sec[c/2]*Sec[
(c + d*x)/2] + 6*B*Sqrt[Sec[c/2]^2]*Sin[c + d*x] - (4*(4*A + B)*Hypergeomet
ricPFQ[{-1/2, -1/6}, {5/6}, Cos[(d*x)/2 + ArcTan[Tan[c/2]]]^2]*Sec[c/2]*Sec
[(c + d*x)/2]*Sin[(d*x)/2 + ArcTan[Tan[c/2]]])/Sqrt[Sin[(d*x)/2 + ArcTan[Ta
n[c/2]]]^2]))/(8*d*Sqrt[Sec[c/2]^2])
```

Maple [F]

$$\int (a + \cos (dx + c) a)^{\frac{1}{3}} (A + B \cos (dx + c))\, dx$$

```
[In] int((a+cos(d*x+c)*a)^(1/3)*(A+B*cos(d*x+c)),x)
```

```
[Out] int((a+cos(d*x+c)*a)^(1/3)*(A+B*cos(d*x+c)),x)
```

Fricas [F]

$$\int \sqrt[3]{a + a\cos(c + dx)}(A + B\cos(c + dx))\, dx = \int (B \cos (dx + c) + A)(a \cos (dx + c) + a)^{\frac{1}{3}}\, dx$$

```
[In] integrate((a+a*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] integral((B*cos(d*x + c) + A)*(a*cos(d*x + c) + a)^(1/3), x)
```

Sympy [F]

$$\int \sqrt[3]{a + a\cos(c + dx)}(A + B\cos(c + dx))\, dx = \int \sqrt[3]{a (\cos (c + dx) + 1)}(A + B \cos (c + dx))\ dx$$

```
[In] integrate((a+a*cos(d*x+c))**(1/3)*(A+B*cos(d*x+c)),x)
```

```
[Out] Integral((a*(cos(c + d*x) + 1))**(1/3)*(A + B*cos(c + d*x)), x)
```

Maxima [F]

$$\int \sqrt[3]{a+a\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\int (B\cos(dx+c)+A)(a\cos(dx+c)+a)^{\frac{1}{3}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)*(a*cos(d*x + c) + a)^(1/3), x)
```

Giac [F]

$$\int \sqrt[3]{a+a\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\int (B\cos(dx+c)+A)(a\cos(dx+c)+a)^{\frac{1}{3}}\,dx$$

```
[In] integrate((a+a*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c)),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)*(a*cos(d*x + c) + a)^(1/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt[3]{a+a\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\int (A+B\,\cos(c+d\,x))\,\left(a+a\,\cos(c+d\,x)\right)^{1/3}\,dx$$

```
[In] int((A + B*cos(c + d*x))*(a + a*cos(c + d*x))^(1/3),x)
[Out] int((A + B*cos(c + d*x))*(a + a*cos(c + d*x))^(1/3), x)
```

3.789 $\int \frac{A+B\cos(c+dx)}{\sqrt[3]{a+a\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 101

$$\int \frac{A+B\cos(c+dx)}{\sqrt[3]{a+a\cos(c+dx)}}\,dx = \frac{3B\sin(c+dx)}{2d\sqrt[3]{a+a\cos(c+dx)}} + \frac{(2A-B)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{6},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx))\right)\sin(c+dx)}{2^{5/6}d\sqrt[6]{1+\cos(c+dx)}\sqrt[3]{a+a\cos(c+dx)}}$$

```
[Out] 3/2*B*sin(d*x+c)/d/(a+a*cos(d*x+c))^(1/3)+1/2*(2*A-B)*hypergeom([1/2, 5/6],
[3/2],1/2-1/2*cos(d*x+c))*sin(d*x+c)*2^(1/6)/d/(1+cos(d*x+c))^(1/6)/(a+a*co
s(d*x+c))^(1/3)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {2830, 2731, 2730}

$$\int \frac{A+B\cos(c+dx)}{\sqrt[3]{a+a\cos(c+dx)}}\,dx = \frac{(2A-B)\sin(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{6},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx))\right)}{2^{5/6}d\sqrt[6]{\cos(c+dx)+1}\sqrt[3]{a\cos(c+dx)+a}} + \frac{3B\sin(c+dx)}{2d\sqrt[3]{a\cos(c+dx)+a}}$$

```
[In] Int[(A + B*Cos[c + d*x])/(a + a*Cos[c + d*x])^(1/3),x]
```

```
[Out] (3*B*Sin[c + d*x])/(2*d*(a + a*Cos[c + d*x])^(1/3)) + ((2*A - B)*Hypergeome
tric2F1[1/2, 5/6, 3/2, (1 - Cos[c + d*x])/2]*Sin[c + d*x])/(2^(5/6)*d*(1 +
Cos[c + d*x])^(1/6)*(a + a*Cos[c + d*x])^(1/3))
```

Rule 2730

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-2^(n +
 1/2))*a^(n - 1/2)*b*(Cos[c + d*x]/(d*Sqrt[a + b*Sin[c + d*x]]))*Hypergeome
tric2F1[1/2, 1/2 - n, 3/2, (1/2)*(1 - b*(Sin[c + d*x]/a))], x] /; FreeQ[{a,
 b, c, d, n}, x] && EqQ[a^2 - b^2, 0] &&  !IntegerQ[2*n] && GtQ[a, 0]
```

Rule 2731

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[a^IntPar
t[n]*((a + b*Sin[c + d*x])^FracPart[n]/(1 + (b/a)*Sin[c + d*x])^FracPart[n]
), Int[(1 + (b/a)*Sin[c + d*x])^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && E
qQ[a^2 - b^2, 0] &&  !IntegerQ[2*n] &&  !GtQ[a, 0]
```

Rule 2830

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-d)*Cos[e + f*x]*((a + b*Sin[e + f*x])^m/(
f*(m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(b*(m + 1)), Int[(a + b*Sin[e
+ f*x])^m, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &
& EqQ[a^2 - b^2, 0] &&  !LtQ[m, -2^(-1)]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{3B\sin(c+dx)}{2d\sqrt[3]{a+a\cos(c+dx)}}+\frac{1}{2}(2A-B)\int\frac{1}{\sqrt[3]{a+a\cos(c+dx)}}\,dx\\
&= \frac{3B\sin(c+dx)}{2d\sqrt[3]{a+a\cos(c+dx)}}+\frac{\left((2A-B)\sqrt[3]{1+\cos(c+dx)}\right)\int\frac{1}{\sqrt[3]{1+\cos(c+dx)}}\,dx}{2\sqrt[3]{a+a\cos(c+dx)}}\\
&= \frac{3B\sin(c+dx)}{2d\sqrt[3]{a+a\cos(c+dx)}}\\
&\quad+\frac{(2A-B)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{6},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx))\right)\sin(c+dx)}{2^{5/6}d\sqrt[6]{1+\cos(c+dx)}\sqrt[3]{a+a\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.38 (sec) , antiderivative size = 133, normalized size of antiderivative = 1.32

$$\int \frac{A+B\cos(c+dx)}{\sqrt[3]{a+a\cos(c+dx)}}\,dx$$
$$= \frac{3\ 2^{5/6}B\sqrt[6]{1-\cos\left(dx-2\arctan\left(\cot\left(\frac{c}{2}\right)\right)\right)}\sin(c+dx)-2(2A-B)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{6},\frac{3}{2},\cos^2\left(\right.\right.}{4d\sqrt[3]{a(1+\cos(c+dx))}\sqrt[6]{\sin^2\left(\frac{dx}{2}-\arctan\left(\cot\left(\frac{c}{2}\right)\right)\right.}}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/(a + a*Cos[c + d*x])^(1/3),x]
```

```
[Out] (3*2^(5/6)*B*(1 - Cos[d*x - 2*ArcTan[Cot[c/2]]])^(1/6)*Sin[c + d*x] - 2*(2*
A - B)*Hypergeometric2F1[1/2, 5/6, 3/2, Cos[(d*x)/2 - ArcTan[Cot[c/2]]]^2]*
Sin[d*x - 2*ArcTan[Cot[c/2]]])/(4*d*(a*(1 + Cos[c + d*x]))^(1/3)*(Sin[(d*x)
/2 - ArcTan[Cot[c/2]]]^2)^(1/6))
```

Maple [F]

$$\int \frac{A+B\cos(dx+c)}{(a+\cos(dx+c)\,a)^{\frac{1}{3}}}dx$$

```
[In] int((A+B*cos(d*x+c))/(a+cos(d*x+c)*a)^(1/3),x)
```

```
[Out] int((A+B*cos(d*x+c))/(a+cos(d*x+c)*a)^(1/3),x)
```

Fricas [F]

$$\int \frac{A+B\cos(c+dx)}{\sqrt[3]{a+a\cos(c+dx)}}\,dx = \int \frac{B\cos(dx+c)+A}{(a\cos(dx+c)+a)^{\frac{1}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(a+a*cos(d*x+c))^(1/3),x, algorithm="fricas")
```

```
[Out] integral((B*cos(d*x + c) + A)/(a*cos(d*x + c) + a)^(1/3), x)
```

Sympy [F]

$$\int \frac{A+B\cos(c+dx)}{\sqrt[3]{a+a\cos(c+dx)}}\,dx=\int \frac{A+B\cos{(c+dx)}}{\sqrt[3]{a\left(\cos{(c+dx)}+1\right)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(a+a*cos(d*x+c))**(1/3),x)
[Out] Integral((A + B*cos(c + d*x))/(a*(cos(c + d*x) + 1))**(1/3), x)
```

Maxima [F]

$$\int \frac{A+B\cos(c+dx)}{\sqrt[3]{a+a\cos(c+dx)}}\,dx=\int \frac{B\cos{(dx+c)}+A}{\left(a\cos{(dx+c)}+a\right)^{\frac{1}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(a+a*cos(d*x+c))^(1/3),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)/(a*cos(d*x + c) + a)^(1/3), x)
```

Giac [F]

$$\int \frac{A+B\cos(c+dx)}{\sqrt[3]{a+a\cos(c+dx)}}\,dx=\int \frac{B\cos{(dx+c)}+A}{\left(a\cos{(dx+c)}+a\right)^{\frac{1}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(a+a*cos(d*x+c))^(1/3),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)/(a*cos(d*x + c) + a)^(1/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{\sqrt[3]{a+a\cos(c+dx)}}\,dx=\int \frac{A+B\,\cos\left(c+d\,x\right)}{{\left(a+a\,\cos\left(c+d\,x\right)\right)}^{1/3}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(a + a*cos(c + d*x))^(1/3),x)
[Out] int((A + B*cos(c + d*x))/(a + a*cos(c + d*x))^(1/3), x)
```

3.790 $\int \frac{A+B\cos(c+dx)}{(a+a\cos(c+dx))^{2/3}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 105

$$\int \frac{A+B\cos(c+dx)}{(a+a\cos(c+dx))^{2/3}}\,dx=\frac{3(A-B)\sin(c+dx)}{d(a+a\cos(c+dx))^{2/3}} - \frac{2^{5/6}(A-2B)\sqrt[3]{a+a\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx))\right)\sin(c+dx)}{ad(1+\cos(c+dx))^{5/6}}$$

```
[Out] 3*(A-B)*sin(d*x+c)/d/(a+a*cos(d*x+c))^(2/3)-2^(5/6)*(A-2*B)*(a+a*cos(d*x+c)
)^(1/3)*hypergeom([1/6, 1/2],[3/2],1/2-1/2*cos(d*x+c))*sin(d*x+c)/a/d/(1+co
s(d*x+c))^(5/6)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {2829, 2731, 2730}

$$\int \frac{A+B\cos(c+dx)}{(a+a\cos(c+dx))^{2/3}}\,dx=\frac{3(A-B)\sin(c+dx)}{d(a\cos(c+dx)+a)^{2/3}} - \frac{2^{5/6}(A-2B)\sin(c+dx)\sqrt[3]{a\cos(c+dx)+a}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx))\right)}{ad(\cos(c+dx)+1)^{5/6}}$$

```
[In] Int[(A + B*Cos[c + d*x])/(a + a*Cos[c + d*x])^(2/3),x]
```

```
[Out] (3*(A - B)*Sin[c + d*x])/(d*(a + a*Cos[c + d*x])^(2/3)) - (2^(5/6)*(A - 2*B
)*(a + a*Cos[c + d*x])^(1/3)*Hypergeometric2F1[1/6, 1/2, 3/2, (1 - Cos[c +
d*x])/2]*Sin[c + d*x])/(a*d*(1 + Cos[c + d*x])^(5/6))
```

Rule 2730

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-2^(n +
 1/2))*a^(n - 1/2)*b*(Cos[c + d*x]/(d*Sqrt[a + b*Sin[c + d*x]]))*Hypergeome
tric2F1[1/2, 1/2 - n, 3/2, (1/2)*(1 - b*(Sin[c + d*x]/a))], x] /; FreeQ[{a,
 b, c, d, n}, x] && EqQ[a^2 - b^2, 0] &&  !IntegerQ[2*n] && GtQ[a, 0]
```

Rule 2731

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[a^IntPar
t[n]*((a + b*Sin[c + d*x])^FracPart[n]/(1 + (b/a)*Sin[c + d*x])^FracPart[n]
), Int[(1 + (b/a)*Sin[c + d*x])^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && E
qQ[a^2 - b^2, 0] &&  !IntegerQ[2*n] &&  !GtQ[a, 0]
```

Rule 2829

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(b*c - a*d)*Cos[e + f*x]*((a + b*Sin[e + f*
x])^m/(a*f*(2*m + 1))), x] + Dist[(a*d*m + b*c*(m + 1))/(a*b*(2*m + 1)), In
t[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && N
eQ[b*c - a*d, 0] && EqQ[a^2 - b^2, 0] && LtQ[m, -2^(-1)]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{3(A-B)\sin(c+dx)}{d(a+a\cos(c+dx))^{2/3}} - \frac{(A-2B)\int\sqrt[3]{a+a\cos(c+dx)}\,dx}{a} \\
&= \frac{3(A-B)\sin(c+dx)}{d(a+a\cos(c+dx))^{2/3}} - \frac{\left((A-2B)\sqrt[3]{a+a\cos(c+dx)}\right)\int\sqrt[3]{1+\cos(c+dx)}\,dx}{a\sqrt[3]{1+\cos(c+dx)}} \\
&= \frac{3(A-B)\sin(c+dx)}{d(a+a\cos(c+dx))^{2/3}} \\
&\quad - \frac{2^{5/6}(A-2B)\sqrt[3]{a+a\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx))\right)\sin(c+dx)}{ad(1+\cos(c+dx))^{5/6}}
\end{aligned}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 254 vs. 2(105) = 210.

Time = 1.99 (sec) , antiderivative size = 254, normalized size of antiderivative = 2.42

$$\int\frac{A+B\cos(c+dx)}{(a+a\cos(c+dx))^{2/3}}\,dx = \frac{\cos\left(\frac{1}{2}(c+dx)\right)\left(4(A-2B)\,{}_2F_1\left(-\frac{1}{2},-\frac{1}{6};\frac{5}{6};\cos^2\left(\frac{dx}{2}+\arctan\left(\tan\left(\frac{c}{2}\right)\right)\right)\right)\sec\right.}{}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/(a + a*Cos[c + d*x])^(2/3),x]
```

```
[Out] (Cos[(c + d*x)/2]*(4*(A - 2*B)*HypergeometricPFQ[{-1/2, -1/6}, {5/6}, Cos[(
d*x)/2 + ArcTan[Tan[c/2]]]^2]*Sec[c/2]*Sin[(d*x)/2 + ArcTan[Tan[c/2]]] - Cs
c[c/2]*(5*(A - 2*B)*Cos[(c - d*x - 2*ArcTan[Tan[c/2]])/2]*Sec[c/2] + (A - 2
*B)*Cos[(c + d*x + 2*ArcTan[Tan[c/2]])/2]*Sec[c/2] + 3*((-2*A + 3*B)*Cos[(d
*x)/2] + B*Cos[c + (d*x)/2])*Sqrt[Sec[c/2]^2])*Sqrt[Sin[(d*x)/2 + ArcTan[Ta
n[c/2]]]^2]))/(d*(a*(1 + Cos[c + d*x]))^(2/3)*Sqrt[Sec[c/2]^2]*Sqrt[Sin[(d*
x)/2 + ArcTan[Tan[c/2]]]^2])
```

Maple [F]

$$\int \frac{A+B\cos\left(dx+c\right)}{\left(a+\cos\left(dx+c\right)a\right)^{\frac{2}{3}}}dx$$

```
[In] int((A+B*cos(d*x+c))/(a+cos(d*x+c)*a)^(2/3),x)
[Out] int((A+B*cos(d*x+c))/(a+cos(d*x+c)*a)^(2/3),x)
```

Fricas [F]

$$\int \frac{A+B\cos(c+dx)}{(a+a\cos(c+dx))^{2/3}}\,dx=\int \frac{B\cos\left(dx+c\right)+A}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{2}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(a+a*cos(d*x+c))^(2/3),x, algorithm="fricas")
[Out] integral((B*cos(d*x + c) + A)/(a*cos(d*x + c) + a)^(2/3), x)
```

Sympy [F]

$$\int \frac{A+B\cos(c+dx)}{(a+a\cos(c+dx))^{2/3}}\,dx=\int \frac{A+B\cos\left(c+dx\right)}{\left(a\left(\cos\left(c+dx\right)+1\right)\right)^{\frac{2}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(a+a*cos(d*x+c))**(2/3),x)
[Out] Integral((A + B*cos(c + d*x))/(a*(cos(c + d*x) + 1))**(2/3), x)
```

Maxima [F]

$$\int \frac{A+B\cos(c+dx)}{(a+a\cos(c+dx))^{2/3}}\,dx = \int \frac{B\cos\left(dx+c\right)+A}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{2}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(a+a*cos(d*x+c))^(2/3),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)/(a*cos(d*x + c) + a)^(2/3), x)
```

Giac [F]

$$\int \frac{A+B\cos(c+dx)}{(a+a\cos(c+dx))^{2/3}}\,dx = \int \frac{B\cos\left(dx+c\right)+A}{\left(a\cos\left(dx+c\right)+a\right)^{\frac{2}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(a+a*cos(d*x+c))^(2/3),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)/(a*cos(d*x + c) + a)^(2/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{(a+a\cos(c+dx))^{2/3}}\,dx = \int \frac{A+B\,\cos\left(c+d\,x\right)}{{\left(a+a\,\cos\left(c+d\,x\right)\right)}^{2/3}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(a + a*cos(c + d*x))^(2/3),x)
[Out] int((A + B*cos(c + d*x))/(a + a*cos(c + d*x))^(2/3), x)
```

3.791 $\int \frac{\frac{bB}{a}+B\cos(c+dx)}{a+b\cos(c+dx)}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 63

$$\int \frac{\frac{bB}{a}+B\cos(c+dx)}{a+b\cos(c+dx)}\,dx=\frac{Bx}{b}-\frac{2\sqrt{a-b}\sqrt{a+b}B\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{abd}$$

```
[Out] B*x/b-2*B*arctan((a-b)^(1/2)*tan(1/2*d*x+1/2*c)/(a+b)^(1/2))*(a-b)^(1/2)*(a
+b)^(1/2)/a/b/d
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.107, Rules used = {2814, 2738, 211}

$$\int \frac{\frac{bB}{a}+B\cos(c+dx)}{a+b\cos(c+dx)}\,dx=\frac{Bx}{b}-\frac{2B\sqrt{a-b}\sqrt{a+b}\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{abd}$$

```
[In] Int[((b*B)/a + B*Cos[c + d*x])/(a + b*Cos[c + d*x]),x]
```

```
[Out] (B*x)/b - (2*Sqrt[a - b]*Sqrt[a + b]*B*ArcTan[(Sqrt[a - b]*Tan[(c + d*x)/2]
)/Sqrt[a + b]])/(a*b*d)
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2738

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[2*(e/d), Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{Bx}{b} - \frac{\left(aB - \frac{b^2B}{a}\right)\int \frac{1}{a+b\cos(c+dx)}\,dx}{b}\\
&= \frac{Bx}{b} - \frac{\left(2\left(a-\frac{b^2}{a}\right)B\right)\text{Subst}\left(\int \frac{1}{a+b+(a-b)x^2}\,dx, x, \tan\left(\frac{1}{2}(c+dx)\right)\right)}{bd}\\
&= \frac{Bx}{b} - \frac{2\sqrt{a-b}\sqrt{a+b}B\arctan\left(\frac{\sqrt{a-b}\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{a+b}}\right)}{abd}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 64, normalized size of antiderivative = 1.02

$$\int \frac{\frac{bB}{a}+B\cos(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{B\left(a(c+dx)+2\sqrt{-a^2+b^2}\text{arctanh}\left(\frac{(-a+b)\tan\left(\frac{1}{2}(c+dx)\right)}{\sqrt{-a^2+b^2}}\right)\right)}{abd}$$

```
[In] Integrate[((b*B)/a + B*Cos[c + d*x])/(a + b*Cos[c + d*x]),x]
[Out] (B*(a*(c + d*x) + 2*Sqrt[-a^2 + b^2]*ArcTanh[((-a + b)*Tan[(c + d*x)/2])/Sq
rt[-a^2 + b^2]]))/(a*b*d)
```

Maple [A] (verified)

Time = 0.90 (sec) , antiderivative size = 77, normalized size of antiderivative = 1.22

method	result	size
derivativedivides	$\frac{2B\left(\frac{a\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{b}-\frac{(a-b)(a+b)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{b\sqrt{(a-b)(a+b)}}\right)}{da}$	77
default	$\frac{2B\left(\frac{a\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{b}-\frac{(a-b)(a+b)\arctan\left(\frac{(a-b)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\sqrt{(a-b)(a+b)}}\right)}{b\sqrt{(a-b)(a+b)}}\right)}{da}$	77
risch	$\frac{Bx}{b}+\frac{\sqrt{-a^2+b^2}\,B\ln\left(\mathrm{e}^{i(dx+c)}+\frac{i\sqrt{-a^2+b^2}+a}{b}\right)}{dba}-\frac{\sqrt{-a^2+b^2}\,B\ln\left(\mathrm{e}^{i(dx+c)}-\frac{i\sqrt{-a^2+b^2}-a}{b}\right)}{dba}$	118

```
[In] int((b*B/a+B*cos(d*x+c))/(a+cos(d*x+c)*b),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d*B/a*(1/b*a*arctan(tan(1/2*d*x+1/2*c))-(a-b)*(a+b)/b/((a-b)*(a+b))^(1/2)
*arctan((a-b)*tan(1/2*d*x+1/2*c)/((a-b)*(a+b))^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 194, normalized size of antiderivative = 3.08

$$\int \frac{\frac{bB}{a}+B\cos(c+dx)}{a+b\cos(c+dx)}\,dx = \left[\frac{2\,Badx+\sqrt{-a^2+b^2}B\log\left(\frac{2\,ab\cos(dx+c)+(2\,a^2-b^2)\cos(dx+c)^2+2\,\sqrt{-a^2+b^2}(a\cos(dx+c)+b)\sin(dx+c)-a^2+2\,b^2}{b^2\cos(dx+c)^2+2\,ab\cos(dx+c)+a^2}\right)}{2\,abd},\frac{Badx-}{}\right.$$

```
[In] integrate((b*B/a+B*cos(d*x+c))/(a+b*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] [1/2*(2*B*a*d*x + sqrt(-a^2 + b^2)*B*log((2*a*b*cos(d*x + c) + (2*a^2 - b^2
)*cos(d*x + c)^2 + 2*sqrt(-a^2 + b^2)*(a*cos(d*x + c) + b)*sin(d*x + c) - a
^2 + 2*b^2)/(b^2*cos(d*x + c)^2 + 2*a*b*cos(d*x + c) + a^2)))/(a*b*d), (B*a
*d*x - sqrt(a^2 - b^2)*B*arctan(-(a*cos(d*x + c) + b)/(sqrt(a^2 - b^2)*sin(
d*x + c))))/(a*b*d)]
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 233 vs. 2(51) = 102.

Time = 17.20 (sec) , antiderivative size = 233, normalized size of antiderivative = 3.70

$$\int \frac{\frac{bB}{a}+B\cos(c+dx)}{a+b\cos(c+dx)}\,dx = \begin{cases} \text{NaN} \\ \frac{B\sin(c+dx)}{ad} \\ \frac{x\left(B\cos(c)+\frac{Bb}{a}\right)}{a+b\cos(c)} \\ \frac{Bx}{b} \\ \frac{Bx}{b} - \frac{B\log\left(-\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}+\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}{bd\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}} + \frac{B\log\left(\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}+\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}{bd\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}} - \frac{B\log\left(-\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}+\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}{ad\sqrt{-\frac{a}{a-b}-\frac{b}{a-b}}} + \frac{B}{} \end{cases}$$

```
[In] integrate((b*B/a+B*cos(d*x+c))/(a+b*cos(d*x+c)),x)
```

```
[Out] Piecewise((nan, Eq(a, 0) & Eq(b, 0) & Eq(d, 0)), (B*sin(c + d*x)/(a*d), Eq(
b, 0)), (x*(B*cos(c) + B*b/a)/(a + b*cos(c)), Eq(d, 0)), (B*x/b, Eq(a, b) |
 Eq(a, -b)), (B*x/b - B*log(-sqrt(-a/(a - b) - b/(a - b)) + tan(c/2 + d*x/2
))/(b*d*sqrt(-a/(a - b) - b/(a - b))) + B*log(sqrt(-a/(a - b) - b/(a - b))
+ tan(c/2 + d*x/2))/(b*d*sqrt(-a/(a - b) - b/(a - b))) - B*log(-sqrt(-a/(a
- b) - b/(a - b)) + tan(c/2 + d*x/2))/(a*d*sqrt(-a/(a - b) - b/(a - b))) +
B*log(sqrt(-a/(a - b) - b/(a - b)) + tan(c/2 + d*x/2))/(a*d*sqrt(-a/(a - b)
 - b/(a - b))), True))
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\frac{bB}{a}+B\cos(c+dx)}{a+b\cos(c+dx)}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((b*B/a+B*cos(d*x+c))/(a+b*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b^2-4*a^2>0)', see `assume?` for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 281 vs. $2(54) = 108$.

Time = 0.31 (sec) , antiderivative size = 281, normalized size of antiderivative = 4.46

$$\int \frac{\frac{bB}{a} + B\cos(c+dx)}{a+b\cos(c+dx)}\,dx = -\frac{\frac{\left(\sqrt{a^2-b^2}B|a-b||a||b|+(2a^2+ab)\sqrt{a^2-b^2}B|a-b|\right)\left(\pi\left\lfloor\frac{dx+c}{2\pi}+\frac{1}{2}\right\rfloor+\arctan\left(\frac{\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\sqrt{\frac{a^2+\sqrt{a^4-(a^2+ab)(a^2-ab)}}{a^2-ab}}}\right)\right)}{(a-b)a^2b^2+(a^3-a^2b)|a||b|} + \frac{(2Ba^3-Ba^2b-Bab^2-Ba|a|}{}}{d}$$

[In] integrate((b*B/a+B*cos(d*x+c))/(a+b*cos(d*x+c)),x, algorithm="giac")

[Out] -((sqrt(a^2 - b^2)*B*abs(a - b)*abs(a)*abs(b) + (2*a^2 + a*b)*sqrt(a^2 - b^2)*B*abs(a - b))*(pi*floor(1/2*(d*x + c)/pi + 1/2) + arctan(tan(1/2*d*x + 1/2*c)/sqrt((a^2 + sqrt(a^4 - (a^2 + a*b)*(a^2 - a*b)))/(a^2 - a*b))))/((a - b)*a^2*b^2 + (a^3 - a^2*b)*abs(a)*abs(b)) + (2*B*a^3 - B*a^2*b - B*a*b^2 - B*a*abs(a)*abs(b) + B*b*abs(a)*abs(b))*(pi*floor(1/2*(d*x + c)/pi + 1/2) + arctan(tan(1/2*d*x + 1/2*c)/sqrt((a^2 - sqrt(a^4 - (a^2 + a*b)*(a^2 - a*b)))/(a^2 - a*b))))/(a^2*b^2 - a^2*abs(a)*abs(b)))/d

Mupad [B] (verification not implemented)

Time = 14.59 (sec) , antiderivative size = 93, normalized size of antiderivative = 1.48

$$\int \frac{\frac{bB}{a} + B\cos(c+dx)}{a+b\cos(c+dx)}\,dx = \frac{2B\,\mathrm{atan}\left(\frac{\sin\left(\frac{c}{2}+\frac{dx}{2}\right)}{\cos\left(\frac{c}{2}+\frac{dx}{2}\right)}\right)}{b\,d} + \frac{2B\,\mathrm{atanh}\left(\frac{\sin\left(\frac{c}{2}+\frac{dx}{2}\right)\sqrt{b^2-a^2}}{\cos\left(\frac{c}{2}+\frac{dx}{2}\right)(a+b)}\right)\sqrt{b^2-a^2}}{a\,b\,d}$$

[In] int((B*cos(c + d*x) + (B*b)/a)/(a + b*cos(c + d*x)),x)

[Out] (2*B*atan(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/(b*d) + (2*B*atanh((sin(c/2 + (d*x)/2)*(b^2 - a^2)^(1/2))/(cos(c/2 + (d*x)/2)*(a + b)))*(b^2 - a^2)^(1/2))/(a*b*d)

3.792 $\int \frac{a+b\cos(c+dx)}{(b+a\cos(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 22

$$\int \frac{a+b\cos(c+dx)}{(b+a\cos(c+dx))^2}\,dx = \frac{\sin(c+dx)}{d(b+a\cos(c+dx))}$$

```
[Out] sin(d*x+c)/d/(b+a*cos(d*x+c))
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2833, 8}

$$\int \frac{a+b\cos(c+dx)}{(b+a\cos(c+dx))^2}\,dx = \frac{\sin(c+dx)}{d(a\cos(c+dx)+b)}$$

```
[In] Int[(a + b*Cos[c + d*x])/(b + a*Cos[c + d*x])^2,x]
[Out] Sin[c + d*x]/(d*(b + a*Cos[c + d*x]))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2833

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Simp[(-(b*c - a*d))*Cos[e + f*x]*((a + b*Sin[e +
 f*x])^(m + 1)/(f*(m + 1)*(a^2 - b^2))), x] + Dist[1/((m + 1)*(a^2 - b^2)),
 Int[(a + b*Sin[e + f*x])^(m + 1)*Simp[(a*c - b*d)*(m + 1) - (b*c - a*d)*(m
 + 2)*Sin[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c -
```

```
a*d, 0] && NeQ[a^2 - b^2, 0] && LtQ[m, -1] && IntegerQ[2*m]
```

Rubi steps

$$\begin{aligned} \text{integral} &= \frac{\sin(c+dx)}{d(b+a\cos(c+dx))} + \frac{\int 0\,dx}{a^2-b^2} \\ &= \frac{\sin(c+dx)}{d(b+a\cos(c+dx))} \end{aligned}$$

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{a+b\cos(c+dx)}{(b+a\cos(c+dx))^2}\,dx = \frac{\sin(c+dx)}{d(b+a\cos(c+dx))}$$

```
[In] Integrate[(a + b*Cos[c + d*x])/(b + a*Cos[c + d*x])^2,x]
[Out] Sin[c + d*x]/(d*(b + a*Cos[c + d*x]))
```

Maple [A] (verified)

Time = 0.85 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.05

method	result	size
parallelrisch	$\frac{\sin(dx+c)}{d(b+\cos(dx+c)a)}$	23
risch	$\frac{2i\left(b\,\mathrm{e}^{i(dx+c)}+a\right)}{ad\left(a\,\mathrm{e}^{2i(dx+c)}+2b\,\mathrm{e}^{i(dx+c)}+a\right)}$	50
derivativedivides	$-\frac{2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-a-b\right)}$	51
default	$-\frac{2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-a-b\right)}$	51
norman	$\frac{-\frac{2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d}-\frac{2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d}}{\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\left(\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a-b\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-a-b\right)}$	84

```
[In] int((a+cos(d*x+c)*b)/(b+cos(d*x+c)*a)^2,x,method=_RETURNVERBOSE)
[Out] sin(d*x+c)/d/(b+cos(d*x+c)*a)
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{a+b\cos(c+dx)}{(b+a\cos(c+dx))^2}\,dx = \frac{\sin(dx+c)}{ad\cos(dx+c)+bd}$$

```
[In] integrate((a+b*cos(d*x+c))/(b+a*cos(d*x+c))^2,x, algorithm="fricas")
[Out] sin(d*x + c)/(a*d*cos(d*x + c) + b*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{a+b\cos(c+dx)}{(b+a\cos(c+dx))^2}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*cos(d*x+c))/(b+a*cos(d*x+c))**2,x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\cos(c+dx)}{(b+a\cos(c+dx))^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*cos(d*x+c))/(b+a*cos(d*x+c))^2,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a^2-4*b^2>0)', see `assume?` for
more de
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 50 vs. 2(22) = 44.

Time = 0.30 (sec) , antiderivative size = 50, normalized size of antiderivative = 2.27

$$\int \frac{a+b\cos(c+dx)}{(b+a\cos(c+dx))^2}\,dx = -\frac{2\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{\left(a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-a-b\right)d}$$

```
[In] integrate((a+b*cos(d*x+c))/(b+a*cos(d*x+c))^2,x, algorithm="giac")
[Out] -2*tan(1/2*d*x + 1/2*c)/((a*tan(1/2*d*x + 1/2*c)^2 - b*tan(1/2*d*x + 1/2*c)
^2 - a - b)*d)
```

Mupad [B] (verification not implemented)

Time = 14.61 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.68

$$\int \frac{a+b\cos(c+dx)}{(b+a\cos(c+dx))^2}\,dx = \frac{2\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{d\,\left((b-a)\,\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2+a+b\right)}$$

```
[In] int((a + b*cos(c + d*x))/(b + a*cos(c + d*x))^2,x)
[Out] (2*tan(c/2 + (d*x)/2))/(d*(a + b - tan(c/2 + (d*x)/2)^2*(a - b)))
```

3.793 $\int \frac{3+\cos(c+dx)}{2-\cos(c+dx)} dx$

Optimal result

Integrand size = 21, antiderivative size = 47

$$\int \frac{3+\cos(c+dx)}{2-\cos(c+dx)} dx = -x+\frac{5x}{\sqrt{3}}+\frac{10\arctan\left(\frac{\sin(c+dx)}{2+\sqrt{3}-\cos(c+dx)}\right)}{\sqrt{3}d}$$

```
[Out] -x+5/3*x*3^(1/2)+10/3*arctan(sin(d*x+c)/(2-cos(d*x+c)+3^(1/2)))/d*3^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2814, 2736}

$$\int \frac{3+\cos(c+dx)}{2-\cos(c+dx)} dx = \frac{10\arctan\left(\frac{\sin(c+dx)}{-\cos(c+dx)+\sqrt{3}+2}\right)}{\sqrt{3}d}+\frac{5x}{\sqrt{3}}-x$$

```
[In] Int[(3 + Cos[c + d*x])/(2 - Cos[c + d*x]),x]
```

```
[Out] -x + (5*x)/Sqrt[3] + (10*ArcTan[Sin[c + d*x]/(2 + Sqrt[3] - Cos[c + d*x])])
/(Sqrt[3]*d)
```

Rule 2736

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{q = Rt[
a^2 - b^2, 2]}, Simp[x/q, x] + Simp[(2/(d*q))*ArcTan[b*(Cos[c + d*x]/(a + q
 + b*Sin[c + d*x]))], x]] /; FreeQ[{a, b, c, d}, x] && GtQ[a^2 - b^2, 0] &&
 PosQ[a]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -x + 5\int \frac{1}{2-\cos(c+dx)}\,dx\\ &= -x + \frac{5x}{\sqrt{3}} + \frac{10\arctan\left(\frac{\sin(c+dx)}{2+\sqrt{3}-\cos(c+dx)}\right)}{\sqrt{3}d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.66

$$\int \frac{3+\cos(c+dx)}{2-\cos(c+dx)}\,dx = -x + \frac{10\arctan\left(\sqrt{3}\tan\left(\frac{1}{2}(c+dx)\right)\right)}{\sqrt{3}d}$$

```
[In] Integrate[(3 + Cos[c + d*x])/(2 - Cos[c + d*x]),x]
[Out] -x + (10*ArcTan[Sqrt[3]*Tan[(c + d*x)/2]])/(Sqrt[3]*d)
```

Maple [A] (verified)

Time = 1.02 (sec) , antiderivative size = 37, normalized size of antiderivative = 0.79

method	result	size
derivativedivides	$\frac{-2\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\frac{10\sqrt{3}\,\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{3}\right)}{3}}{d}$	37
default	$\frac{-2\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\frac{10\sqrt{3}\,\arctan\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{3}\right)}{3}}{d}$	37
risch	$-x+\frac{5i\sqrt{3}\,\ln\left(e^{i(dx+c)}-\sqrt{3}-2\right)}{3d}-\frac{5i\sqrt{3}\,\ln\left(e^{i(dx+c)}+\sqrt{3}-2\right)}{3d}$	55

```
[In] int((3+cos(d*x+c))/(2-cos(d*x+c)),x,method=_RETURNVERBOSE)
[Out] 1/d*(-2*arctan(tan(1/2*d*x+1/2*c))+10/3*3^(1/2)*arctan(tan(1/2*d*x+1/2*c)*3
^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 43, normalized size of antiderivative = 0.91

$$\int \frac{3+\cos(c+dx)}{2-\cos(c+dx)}\,dx = -\frac{3\,dx + 5\,\sqrt{3}\arctan\left(\frac{2\,\sqrt{3}\cos(dx+c)-\sqrt{3}}{3\,\sin(dx+c)}\right)}{3\,d}$$

```
[In] integrate((3+cos(d*x+c))/(2-cos(d*x+c)),x, algorithm="fricas")
[Out] -1/3*(3*d*x + 5*sqrt(3)*arctan(1/3*(2*sqrt(3)*cos(d*x + c) - sqrt(3))/sin(d
*x + c)))/d
```

Sympy [A] (verification not implemented)

Time = 1.04 (sec) , antiderivative size = 56, normalized size of antiderivative = 1.19

$$\int \frac{3+\cos(c+dx)}{2-\cos(c+dx)}\,dx = \begin{cases} -x + \frac{10\sqrt{3}\left(\operatorname{atan}\left(\sqrt{3}\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)+\pi\left\lfloor\frac{\frac{c}{2}+\frac{dx}{2}-\frac{\pi}{2}}{\pi}\right\rfloor\right)}{3d} & \text{for } d \neq 0 \\ \frac{x(\cos(c)+3)}{2-\cos(c)} & \text{otherwise} \end{cases}$$

```
[In] integrate((3+cos(d*x+c))/(2-cos(d*x+c)),x)
[Out] Piecewise((-x + 10*sqrt(3)*(atan(sqrt(3)*tan(c/2 + d*x/2)) + pi*floor((c/2
+ d*x/2 - pi/2)/pi))/(3*d), Ne(d, 0)), (x*(cos(c) + 3)/(2 - cos(c)), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 52, normalized size of antiderivative = 1.11

$$\int \frac{3+\cos(c+dx)}{2-\cos(c+dx)}\,dx = \frac{2\left(5\,\sqrt{3}\arctan\left(\frac{\sqrt{3}\sin(dx+c)}{\cos(dx+c)+1}\right) - 3\,\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)\right)}{3\,d}$$

```
[In] integrate((3+cos(d*x+c))/(2-cos(d*x+c)),x, algorithm="maxima")
[Out] 2/3*(5*sqrt(3)*arctan(sqrt(3)*sin(d*x + c)/(cos(d*x + c) + 1)) - 3*arctan(s
in(d*x + c)/(cos(d*x + c) + 1)))/d
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.53

$$\int \frac{3+\cos(c+dx)}{2-\cos(c+dx)}\,dx = -\frac{3\,dx-5\,\sqrt{3}\left(dx+c+2\,\arctan\left(-\frac{\sqrt{3}\sin(dx+c)-3\,\sin(dx+c)}{\sqrt{3}\cos(dx+c)+\sqrt{3}-3\,\cos(dx+c)+3}\right)\right)+3\,c}{3\,d}$$

```
[In] integrate((3+cos(d*x+c))/(2-cos(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/3*(3*d*x - 5*sqrt(3)*(d*x + c + 2*arctan(-(sqrt(3)*sin(d*x + c) - 3*sin(
d*x + c))/(sqrt(3)*cos(d*x + c) + sqrt(3) - 3*cos(d*x + c) + 3))) + 3*c)/d
```

Mupad [B] (verification not implemented)

Time = 14.31 (sec) , antiderivative size = 74, normalized size of antiderivative = 1.57

$$\int \frac{3+\cos(c+dx)}{2-\cos(c+dx)}\,dx = \frac{\left(\frac{\pi-\frac{5\,\pi\,\sqrt{3}}{3}}{d}-\frac{\pi+\frac{5\,\pi\,\sqrt{3}}{3}}{d}\right)\,\left(\mathrm{atan}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)-\frac{d\,x}{2}\right)}{\pi} - \frac{d\,x-\frac{10\,\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{3}}{d}$$

```
[In] int(-(cos(c + d*x) + 3)/(cos(c + d*x) - 2),x)
```

```
[Out] (((pi - (5*3^(1/2)*pi)/3)/d - (pi + (5*3^(1/2)*pi)/3)/d)*(atan(tan(c/2 + (d
*x)/2)) - (d*x)/2))/pi - (d*x - (10*3^(1/2)*atan(3^(1/2)*tan(c/2 + (d*x)/2)
))/3)/d
```

3.794 $\int \frac{aB+bB\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 58

$$\int \frac{aB+bB\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2B\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[Out] 2*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1
/2*c),2^(1/2)*(b/(a+b))^(1/2))*(a+b*cos(d*x+c))^(1/2)/d/((a+b*cos(d*x+c))/(
a+b))^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.107, Rules used = {21, 2734, 2732}

$$\int \frac{aB+bB\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx = \frac{2B\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[In] Int[(a*B + b*B*Cos[c + d*x])/Sqrt[a + b*Cos[c + d*x]],x]
```

```
[Out] (2*B*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(d*Sqr
t[(a + b*Cos[c + d*x])/(a + b)])
```

<u>Rule 21</u>

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
```

```
 a + b*x])
```

Rule 2732

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[2*(Sqrt[a
 + b]/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2*(b/(a + b))], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[a^2 - b^2, 0] && GtQ[a + b, 0]
```

Rule 2734

```
Int[Sqrt[(a_) + (b_.)*sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Dist[Sqrt[a +
b*Sin[c + d*x]]/Sqrt[(a + b*Sin[c + d*x])/(a + b)], Int[Sqrt[a/(a + b) + (b
/(a + b))*Sin[c + d*x]], x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2 - b^2,
 0] &&  !GtQ[a + b, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= B\int \sqrt{a+b\cos(c+dx)}\,dx\\ &= \frac{\left(B\sqrt{a+b\cos(c+dx)}\right)\int \sqrt{\frac{a}{a+b}+\frac{b\cos(c+dx)}{a+b}}\,dx}{\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\\ &= \frac{2B\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 58, normalized size of antiderivative = 1.00

$$\int \frac{aB+bB\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx=\frac{2B\sqrt{a+b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)|\frac{2b}{a+b}\right)}{d\sqrt{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[In] Integrate[(a*B + b*B*Cos[c + d*x])/Sqrt[a + b*Cos[c + d*x]],x]
[Out] (2*B*Sqrt[a + b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, (2*b)/(a + b)])/(d*Sqr
t[(a + b*Cos[c + d*x])/(a + b)])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 170 vs. $2(83) = 166$.

Time = 5.17 (sec) , antiderivative size = 171, normalized size of antiderivative = 2.95

method	result
default	$-\frac{2\sqrt{\left(2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,B\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{\frac{2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b}{a-b}}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{-\frac{2b}{a-b}}\right)(a-b)}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+(a+b)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a+b}\,d}$
parts	$\frac{2Ba\sqrt{-\frac{2b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-a-b}{a+b}}\,\mathrm{am}^{-1}\left(\frac{dx}{2}+\frac{c}{2}\middle\vert\frac{\sqrt{2}\sqrt{b}}{\sqrt{a+b}}\right)}{d\sqrt{2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b}}+\frac{2B\sqrt{\left(2b\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+a-b\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{\frac{2b(\mathrm{co}}{}}}{\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+(a+}}$
risch	Expression too large to display

```
[In] int((B*a+b*B*cos(d*x+c))/(a+cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)*sin(1/2*d*x+1/2*c)^2)^(1/2)*B*(sin(1/2*d
*x+1/2*c)^2)^(1/2)*((2*b*cos(1/2*d*x+1/2*c)^2+a-b)/(a-b))^(1/2)*EllipticE(c
os(1/2*d*x+1/2*c),(-2*b/(a-b))^(1/2))*(a-b)/(-2*sin(1/2*d*x+1/2*c)^4*b+(a+b
)*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x+1/2*c)/(-2*b*sin(1/2*d*x+1/2*c)^2
+a+b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 359, normalized size of antiderivative = 6.19

$$\int \frac{aB+bB\cos(c+dx)}{\sqrt{a+b\cos(c+dx)}}\,dx$$
$$=\frac{-i\sqrt{2}Ba\sqrt{b}\text{weierstrassPInverse}\left(\frac{4\,(4\,a^2-3\,b^2)}{3\,b^2},-\frac{8\,(8\,a^3-9\,ab^2)}{27\,b^3},\frac{3\,b\cos(dx+c)+3i\,b\sin(dx+c)+2\,a}{3\,b}\right)+i\sqrt{2}Ba\sqrt{b}\text{weiers}}{}$$

```
[In] integrate((a*B+b*B*cos(d*x+c))/(a+b*cos(d*x+c))^(1/2),x, algorithm="fricas"
)
```

```
[Out] 1/3*(-I*sqrt(2)*B*a*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8
/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a
)/b) + I*sqrt(2)*B*a*sqrt(b)*weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -
8/27*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*
a)/b) + 3*I*sqrt(2)*B*b^(3/2)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/2
7*(8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27
*(8*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) + 3*I*b*sin(d*x + c) + 2*a)/b
)) - 3*I*sqrt(2)*B*b^(3/2)*weierstrassZeta(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(
```

```
8*a^3 - 9*a*b^2)/b^3, weierstrassPInverse(4/3*(4*a^2 - 3*b^2)/b^2, -8/27*(8
*a^3 - 9*a*b^2)/b^3, 1/3*(3*b*cos(d*x + c) - 3*I*b*sin(d*x + c) + 2*a)/b)))
/(b*d)
```

Sympy [F]

$$\int \frac{aB + bB\cos(c + dx)}{\sqrt{a + b\cos(c + dx)}}\,dx = B\int \sqrt{a + b\cos{(c + dx)}}\,dx$$

```
[In] integrate((a*B+b*B*cos(d*x+c))/(a+b*cos(d*x+c))**(1/2),x)
[Out] B*Integral(sqrt(a + b*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{aB + bB\cos(c + dx)}{\sqrt{a + b\cos(c + dx)}}\,dx = \int \frac{Bb\cos{(dx + c)} + Ba}{\sqrt{b\cos{(dx + c)} + a}}\,dx$$

```
[In] integrate((a*B+b*B*cos(d*x+c))/(a+b*cos(d*x+c))^(1/2),x, algorithm="maxima"
)
[Out] integrate((B*b*cos(d*x + c) + B*a)/sqrt(b*cos(d*x + c) + a), x)
```

Giac [F]

$$\int \frac{aB + bB\cos(c + dx)}{\sqrt{a + b\cos(c + dx)}}\,dx = \int \frac{Bb\cos{(dx + c)} + Ba}{\sqrt{b\cos{(dx + c)} + a}}\,dx$$

```
[In] integrate((a*B+b*B*cos(d*x+c))/(a+b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate((B*b*cos(d*x + c) + B*a)/sqrt(b*cos(d*x + c) + a), x)
```

Mupad [B] (verification not implemented)

Time = 14.54 (sec) , antiderivative size = 56, normalized size of antiderivative = 0.97

$$\int \frac{aB + bB\cos(c + dx)}{\sqrt{a + b\cos(c + dx)}}\,dx = \frac{2\,B\,\mathrm{E}\left(\frac{c}{2} + \frac{d\,x}{2}\middle|\frac{2\,b}{a+b}\right)\,\left(a + b\right)\,\sqrt{\frac{a+b\,\cos(c+d\,x)}{a+b}}}{d\,\sqrt{a + b\,\cos{(c + d\,x)}}}$$

```
[In] int((B*a + B*b*cos(c + d*x))/(a + b*cos(c + d*x))^(1/2),x)
[Out] (2*B*ellipticE(c/2 + (d*x)/2, (2*b)/(a + b))*(a + b)*((a + b*cos(c + d*x))/
(a + b))^(1/2))/(d*(a + b*cos(c + d*x))^(1/2))
```

3.795 $\int (a+b\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 25, antiderivative size = 229

$$\int (a+b\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx=\frac{\sqrt{2}(a+b)B\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{2},-\frac{5}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)(a+b\cos(c+dx)}{bd\sqrt{1+\cos(c+dx)}\left(\frac{a+b\cos(c+dx)}{a+b}\right)^{2/3}}+\frac{\sqrt{2}(Ab-aB)\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{2},-\frac{2}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)(a+b\cos(c+dx))^{2/3}\sin(c+dx)}{bd\sqrt{1+\cos(c+dx)}\left(\frac{a+b\cos(c+dx)}{a+b}\right)^{2/3}}$$

```
[Out] (a+b)*B*AppellF1(1/2,-5/3,1/2,3/2,b*(1-cos(d*x+c))/(a+b),1/2-1/2*cos(d*x+c)
)*(a+b*cos(d*x+c))^(2/3)*sin(d*x+c)*2^(1/2)/b/d/((a+b*cos(d*x+c))/(a+b))^(2
/3)/(1+cos(d*x+c))^(1/2)+(A*b-B*a)*AppellF1(1/2,-2/3,1/2,3/2,b*(1-cos(d*x+c
))/(a+b),1/2-1/2*cos(d*x+c))*(a+b*cos(d*x+c))^(2/3)*sin(d*x+c)*2^(1/2)/b/d/
((a+b*cos(d*x+c))/(a+b))^(2/3)/(1+cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used

$= \{2835, 2744, 144, 143\}$

$$\int (a+b\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx = \frac{\sqrt{2}(Ab-aB)\sin(c+dx)(a+b\cos(c+dx))^{2/3}\operatorname{AppellF1}\left(\frac{1}{2},\frac{1}{2},-\frac{2}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx\right.}{bd\sqrt{\cos(c+dx)+1}\left(\frac{a+b\cos(c+dx)}{a+b}\right)^{2/3}} + \frac{\sqrt{2}B(a+b)\sin(c+dx)(a+b\cos(c+dx))^{2/3}\operatorname{AppellF1}\left(\frac{1}{2},\frac{1}{2},-\frac{5}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)}{bd\sqrt{\cos(c+dx)+1}\left(\frac{a+b\cos(c+dx)}{a+b}\right)^{2/3}}$$

```
[In] Int[(a + b*Cos[c + d*x])^(2/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (Sqrt[2]*(a + b)*B*AppellF1[1/2, 1/2, -5/3, 3/2, (1 - Cos[c + d*x])/2, (b*(
1 - Cos[c + d*x]))/(a + b)]*(a + b*Cos[c + d*x])^(2/3)*Sin[c + d*x])/(b*d*S
qrt[1 + Cos[c + d*x]]*((a + b*Cos[c + d*x])/(a + b))^(2/3)) + (Sqrt[2]*(A*b
 - a*B)*AppellF1[1/2, 1/2, -2/3, 3/2, (1 - Cos[c + d*x])/2, (b*(1 - Cos[c +
 d*x]))/(a + b)]*(a + b*Cos[c + d*x])^(2/3)*Sin[c + d*x])/(b*d*Sqrt[1 + Cos
[c + d*x]]*((a + b*Cos[c + d*x])/(a + b))^(2/3))
```

Rule 143

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_), x_Symbol] :> Simp[((a + b*x)^(m + 1)/(b*(m + 1)*(b/(b*c - a*d))^n*(b
/(b*e - a*f))^p))*AppellF1[m + 1, -n, -p, m + 2, (-d)*((a + b*x)/(b*c - a*d
)), (-f)*((a + b*x)/(b*e - a*f))], x] /; FreeQ[{a, b, c, d, e, f, m, n, p},
 x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !IntegerQ[p] && GtQ[b/(b*c - a*d)
, 0] && GtQ[b/(b*e - a*f), 0] &&  !(GtQ[d/(d*a - c*b), 0] && GtQ[d/(d*e - c
*f), 0] && SimplerQ[c + d*x, a + b*x]) &&  !(GtQ[f/(f*a - e*b), 0] && GtQ[f
/(f*c - e*d), 0] && SimplerQ[e + f*x, a + b*x])
```

Rule 144

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_), x_Symbol] :> Dist[(e + f*x)^FracPart[p]/((b/(b*e - a*f))^IntPart[p]*
(b*((e + f*x)/(b*e - a*f)))^FracPart[p]), Int[(a + b*x)^m*(c + d*x)^n*(b*(e
/(b*e - a*f)) + b*f*(x/(b*e - a*f)))^p, x], x] /; FreeQ[{a, b, c, d, e, f,
m, n, p}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !IntegerQ[p] && GtQ[b/(b
*c - a*d), 0] &&  !GtQ[b/(b*e - a*f), 0]
```

Rule 2744

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[Cos[c +
d*x]/(d*Sqrt[1 + Sin[c + d*x]]*Sqrt[1 - Sin[c + d*x]]), Subst[Int[(a + b*x)
^n/(Sqrt[1 + x]*Sqrt[1 - x]), x], x, Sin[c + d*x]], x] /; FreeQ[{a, b, c, d
```

```
, n}, x] && NeQ[a^2 - b^2, 0] &&  !IntegerQ[2*n]
```

Rule 2835

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[(b*c - a*d)/b, Int[(a + b*Sin[e + f*x])^m,
x], x] + Dist[d/b, Int[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b,
 c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \frac{B\int (a+b\cos(c+dx))^{5/3}\,dx}{b} + \frac{(Ab-aB)\int (a+b\cos(c+dx))^{2/3}\,dx}{b}$$

$$= -\frac{(B\sin(c+dx))\text{Subst}\left(\int \frac{(a+bx)^{5/3}}{\sqrt{1-x}\sqrt{1+x}}\,dx, x, \cos(c+dx)\right)}{bd\sqrt{1-\cos(c+dx)}\sqrt{1+\cos(c+dx)}} - \frac{((Ab-aB)\sin(c+dx))\text{Subst}\left(\int \frac{(a+bx)^{2/3}}{\sqrt{1-x}\sqrt{1+x}}\,dx, x, \cos(c+dx)\right)}{bd\sqrt{1-\cos(c+dx)}\sqrt{1+\cos(c+dx)}}$$

$$= \frac{\left((-a-b)B(a+b\cos(c+dx))^{2/3}\sin(c+dx)\right)\text{Subst}\left(\int \frac{\left(-\frac{a}{-a-b}-\frac{bx}{-a-b}\right)^{5/3}}{\sqrt{1-x}\sqrt{1+x}}\,dx, x, \cos(c+dx)\right)}{bd\sqrt{1-\cos(c+dx)}\sqrt{1+\cos(c+dx)}\left(-\frac{a+b\cos(c+dx)}{-a-b}\right)^{2/3}} - \frac{\left((Ab-aB)(a+b\cos(c+dx))^{2/3}\sin(c+dx)\right)\text{Subst}\left(\int \frac{\left(-\frac{a}{-a-b}-\frac{bx}{-a-b}\right)^{2/3}}{\sqrt{1-x}\sqrt{1+x}}\,dx, x, \cos(c+dx)\right)}{bd\sqrt{1-\cos(c+dx)}\sqrt{1+\cos(c+dx)}\left(-\frac{a+b\cos(c+dx)}{-a-b}\right)^{2/3}}$$

$$= \frac{\sqrt{2}(a+b)B\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{2},-\frac{5}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)(a+b\cos(c+dx))^{2/3}\sin(c-}{bd\sqrt{1+\cos(c+dx)}\left(\frac{a+b\cos(c+dx)}{a+b}\right)^{2/3}} + \frac{\sqrt{2}(Ab-aB)\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{2},-\frac{2}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)(a+b\cos(c+dx))^{2/3}\sin}{bd\sqrt{1+\cos(c+dx)}\left(\frac{a+b\cos(c+dx)}{a+b}\right)^{2/3}}$$

Mathematica [A] (verified)

Time = 1.52 (sec) , antiderivative size = 259, normalized size of antiderivative = 1.13

$$\int (a+b\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx=\frac{3(a+b\cos(c+dx))^{2/3}\left(5(a^2-b^2)\,B\,\text{AppellF1}\left(\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},\frac{a+b\cos(c+dx)}{a-b},\frac{a+b\cos(c+dx)}{a+b}\right)\sqrt{-\cdots}\right.}{\cdots}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(2/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (3*(a + b*Cos[c + d*x])^(2/3)*(5*(a^2 - b^2)*B*AppellF1[2/3, 1/2, 1/2, 5/3,
 (a + b*Cos[c + d*x])/(a - b), (a + b*Cos[c + d*x])/(a + b)]*Sqrt[-((b*(-1
+ Cos[c + d*x]))/(a + b))]*Sqrt[-((b*(1 + Cos[c + d*x]))/(a - b))]*Csc[c +
d*x] - (5*A*b + 2*a*B)*AppellF1[5/3, 1/2, 1/2, 8/3, (a + b*Cos[c + d*x])/(a
 - b), (a + b*Cos[c + d*x])/(a + b)]*Sqrt[-((b*(-1 + Cos[c + d*x]))/(a + b)
)]*Sqrt[(b*(1 + Cos[c + d*x]))/(-a + b)]*(a + b*Cos[c + d*x])*Csc[c + d*x]
+ 5*b^2*B*Sin[c + d*x]))/(25*b^2*d)
```

Maple [F]

$$\int \left(a+\cos \left(dx+c\right) b\right)^{\frac{2}{3}} \left(A+B\cos \left(dx+c\right)\right)dx$$

```
[In] int((a+cos(d*x+c)*b)^(2/3)*(A+B*cos(d*x+c)),x)
```

```
[Out] int((a+cos(d*x+c)*b)^(2/3)*(A+B*cos(d*x+c)),x)
```

Fricas [F]

$$\int (a+b\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx=\int (B\cos \left(dx+c\right)+A)(b\cos \left(dx+c\right)+a)^{\frac{2}{3}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(2/3)*(A+B*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c) + a)^(2/3), x)
```

Sympy [F]

$$\int (a+b\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx = \int (A+B\cos{(c+dx)})\,(a+b\cos{(c+dx)})^{\frac{2}{3}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**(2/3)*(A+B*cos(d*x+c)),x)
[Out] Integral((A + B*cos(c + d*x))*(a + b*cos(c + d*x))**(2/3), x)
```

Maxima [F]

$$\int (a+b\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx = \int (B\cos{(dx+c)}+A)(b\cos{(dx+c)}+a)^{\frac{2}{3}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(2/3)*(A+B*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c) + a)^(2/3), x)
```

Giac [F]

$$\int (a+b\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx = \int (B\cos{(dx+c)}+A)(b\cos{(dx+c)}+a)^{\frac{2}{3}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(2/3)*(A+B*cos(d*x+c)),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c) + a)^(2/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx = \int (A+B\,\cos{(c+d\,x)})\,\left(a+b\,\cos{(c+d\,x)}\right)^{2/3}\,dx$$

```
[In] int((A + B*cos(c + d*x))*(a + b*cos(c + d*x))^(2/3),x)
[Out] int((A + B*cos(c + d*x))*(a + b*cos(c + d*x))^(2/3), x)
```

3.796 $\int \sqrt[3]{a+b\cos(c+dx)}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 25, antiderivative size = 229

$$\int \sqrt[3]{a+b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \frac{\sqrt{2}(a+b)B\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{2},-\frac{4}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)\sqrt[3]{a+b\cos(c+dx)}\sin(c+dx)}{bd\sqrt{1+\cos(c+dx)}\sqrt[3]{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{\sqrt{2}(Ab-aB)\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{2},-\frac{1}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)\sqrt[3]{a+b\cos(c+dx)}\sin(c+dx)}{bd\sqrt{1+\cos(c+dx)}\sqrt[3]{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[Out] (a+b)*B*AppellF1(1/2,-4/3,1/2,3/2,b*(1-cos(d*x+c))/(a+b),1/2-1/2*cos(d*x+c)
)*(a+b*cos(d*x+c))^(1/3)*sin(d*x+c)*2^(1/2)/b/d/((a+b*cos(d*x+c))/(a+b))^(1
/3)/(1+cos(d*x+c))^(1/2)+(A*b-B*a)*AppellF1(1/2,-1/3,1/2,3/2,b*(1-cos(d*x+c
))/(a+b),1/2-1/2*cos(d*x+c))*(a+b*cos(d*x+c))^(1/3)*sin(d*x+c)*2^(1/2)/b/d/
((a+b*cos(d*x+c))/(a+b))^(1/3)/(1+cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.160$, Rules used

= {2835, 2744, 144, 143}

$$\int \sqrt[3]{a+b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\frac{\sqrt{2}(Ab-aB)\sin(c+dx)\sqrt[3]{a+b\cos(c+dx)}\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{2},-\frac{1}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)}{bd\sqrt{\cos(c+dx)+1}\sqrt[3]{\frac{a+b\cos(c+dx)}{a+b}}}$$
$$+\frac{\sqrt{2}B(a+b)\sin(c+dx)\sqrt[3]{a+b\cos(c+dx)}\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{2},-\frac{4}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)}{bd\sqrt{\cos(c+dx)+1}\sqrt[3]{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[In] Int[(a + b*Cos[c + d*x])^(1/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (Sqrt[2]*(a + b)*B*AppellF1[1/2, 1/2, -4/3, 3/2, (1 - Cos[c + d*x])/2, (b*(
1 - Cos[c + d*x]))/(a + b)]*(a + b*Cos[c + d*x])^(1/3)*Sin[c + d*x])/(b*d*S
qrt[1 + Cos[c + d*x]]*((a + b*Cos[c + d*x])/(a + b))^(1/3)) + (Sqrt[2]*(A*b
 - a*B)*AppellF1[1/2, 1/2, -1/3, 3/2, (1 - Cos[c + d*x])/2, (b*(1 - Cos[c +
 d*x]))/(a + b)]*(a + b*Cos[c + d*x])^(1/3)*Sin[c + d*x])/(b*d*Sqrt[1 + Cos
[c + d*x]]*((a + b*Cos[c + d*x])/(a + b))^(1/3))
```

Rule 143

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_), x_Symbol] :> Simp[((a + b*x)^(m + 1)/(b*(m + 1)*(b/(b*c - a*d))^n*(b
/(b*e - a*f))^p))*AppellF1[m + 1, -n, -p, m + 2, (-d)*((a + b*x)/(b*c - a*d
)), (-f)*((a + b*x)/(b*e - a*f))], x] /; FreeQ[{a, b, c, d, e, f, m, n, p},
 x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !IntegerQ[p] && GtQ[b/(b*c - a*d)
, 0] && GtQ[b/(b*e - a*f), 0] &&  !(GtQ[d/(d*a - c*b), 0] && GtQ[d/(d*e - c
*f), 0] && SimplerQ[c + d*x, a + b*x]) &&  !(GtQ[f/(f*a - e*b), 0] && GtQ[f
/(f*c - e*d), 0] && SimplerQ[e + f*x, a + b*x])
```

Rule 144

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_), x_Symbol] :> Dist[(e + f*x)^FracPart[p]/((b/(b*e - a*f))^IntPart[p]*
(b*((e + f*x)/(b*e - a*f)))^FracPart[p]), Int[(a + b*x)^m*(c + d*x)^n*(b*(e
/(b*e - a*f)) + b*f*(x/(b*e - a*f)))^p, x], x] /; FreeQ[{a, b, c, d, e, f,
m, n, p}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !IntegerQ[p] && GtQ[b/(b
*c - a*d), 0] &&  !GtQ[b/(b*e - a*f), 0]
```

Rule 2744

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[Cos[c +
d*x]/(d*Sqrt[1 + Sin[c + d*x]]*Sqrt[1 - Sin[c + d*x]]), Subst[Int[(a + b*x)
^n/(Sqrt[1 + x]*Sqrt[1 - x]), x], x, Sin[c + d*x]], x] /; FreeQ[{a, b, c, d
```

```
, n}, x] && NeQ[a^2 - b^2, 0] &&  !IntegerQ[2*n]
```

Rule 2835

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[(b*c - a*d)/b, Int[(a + b*Sin[e + f*x])^m,
x], x] + Dist[d/b, Int[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b,
 c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \frac{B\int (a+b\cos(c+dx))^{4/3}\,dx}{b} + \frac{(Ab-aB)\int \sqrt[3]{a+b\cos(c+dx)}\,dx}{b}$$

$$= -\frac{(B\sin(c+dx))\text{Subst}\left(\int \frac{(a+bx)^{4/3}}{\sqrt{1-x}\sqrt{1+x}}\,dx, x, \cos(c+dx)\right)}{bd\sqrt{1-\cos(c+dx)}\sqrt{1+\cos(c+dx)}} - \frac{((Ab-aB)\sin(c+dx))\text{Subst}\left(\int \frac{\sqrt[3]{a+bx}}{\sqrt{1-x}\sqrt{1+x}}\,dx, x, \cos(c+dx)\right)}{bd\sqrt{1-\cos(c+dx)}\sqrt{1+\cos(c+dx)}}$$

$$= \frac{\left((-a-b)B\sqrt[3]{a+b\cos(c+dx)}\sin(c+dx)\right)\text{Subst}\left(\int \frac{\left(-\frac{a}{-a-b}-\frac{bx}{-a-b}\right)^{4/3}}{\sqrt{1-x}\sqrt{1+x}}\,dx, x, \cos(c+dx)\right)}{bd\sqrt{1-\cos(c+dx)}\sqrt{1+\cos(c+dx)}\sqrt[3]{-\frac{a+b\cos(c+dx)}{-a-b}}} - \frac{\left((Ab-aB)\sqrt[3]{a+b\cos(c+dx)}\sin(c+dx)\right)\text{Subst}\left(\int \frac{\sqrt[3]{-\frac{a}{-a-b}-\frac{bx}{-a-b}}}{\sqrt{1-x}\sqrt{1+x}}\,dx, x, \cos(c+dx)\right)}{bd\sqrt{1-\cos(c+dx)}\sqrt{1+\cos(c+dx)}\sqrt[3]{-\frac{a+b\cos(c+dx)}{-a-b}}}$$

$$= \frac{\sqrt{2}(a+b)B\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{2},-\frac{4}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)\sqrt[3]{a+b\cos(c+dx)}\sin(c+d}{bd\sqrt{1+\cos(c+dx)}\sqrt[3]{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{\sqrt{2}(Ab-aB)\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{2},-\frac{1}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)\sqrt[3]{a+b\cos(c+dx)}\sin(c}{bd\sqrt{1+\cos(c+dx)}\sqrt[3]{\frac{a+b\cos(c+dx)}{a+b}}}$$

Mathematica [A] (verified)

Time = 1.41 (sec) , antiderivative size = 253, normalized size of antiderivative = 1.10

$$\int \sqrt[3]{a+b\cos(c+dx)}(A+B\cos(c+dx))\,dx =$$

$$-\frac{3\sqrt[3]{a+b\cos(c+dx)}\csc(c+dx)\left(4(-a^2+b^2)B\operatorname{AppellF1}\left(\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},\frac{a+b\cos(c+dx)}{a-b},\frac{a+b\cos(c+dx)}{a+b}\right)\sqrt{-\frac{b(-}{}}\right.}{}$$

```
[In] Integrate[(a + b*Cos[c + d*x])^(1/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-3*(a + b*Cos[c + d*x])^(1/3)*Csc[c + d*x]*(4*(-a^2 + b^2)*B*AppellF1[1/3,
 1/2, 1/2, 4/3, (a + b*Cos[c + d*x])/(a - b), (a + b*Cos[c + d*x])/(a + b)]
*Sqrt[-((b*(-1 + Cos[c + d*x]))/(a + b))]*Sqrt[-((b*(1 + Cos[c + d*x]))/(a
- b))] + (4*A*b + a*B)*AppellF1[4/3, 1/2, 1/2, 7/3, (a + b*Cos[c + d*x])/(a
 - b), (a + b*Cos[c + d*x])/(a + b)]*Sqrt[-((b*(-1 + Cos[c + d*x]))/(a + b)
)]*Sqrt[(b*(1 + Cos[c + d*x]))/(-a + b)]*(a + b*Cos[c + d*x]) - 4*b^2*B*Sin
[c + d*x]^2))/(16*b^2*d)
```

Maple [F]

$$\int \left(a+\cos\left(dx+c\right)b\right)^{\frac{1}{3}}\left(A+B\cos\left(dx+c\right)\right)dx$$

```
[In] int((a+cos(d*x+c)*b)^(1/3)*(A+B*cos(d*x+c)),x)
```

```
[Out] int((a+cos(d*x+c)*b)^(1/3)*(A+B*cos(d*x+c)),x)
```

Fricas [F]

$$\int \sqrt[3]{a+b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \int \left(B\cos\left(dx+c\right)+A\right)\left(b\cos\left(dx+c\right)+a\right)^{\frac{1}{3}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c) + a)^(1/3), x)
```

Sympy [F]

$$\int \sqrt[3]{a+b\cos(c+dx)}(A+B\cos(c+dx))\,dx=\int (A+B\cos{(c+dx)})\sqrt[3]{a+b\cos{(c+dx)}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))**(1/3)*(A+B*cos(d*x+c)),x)
[Out] Integral((A + B*cos(c + d*x))*(a + b*cos(c + d*x))**(1/3), x)
```

Maxima [F]

$$\int \sqrt[3]{a+b\cos(c+dx)}(A+B\cos(c+dx))\,dx=\int (B\cos{(dx+c)}+A)(b\cos{(dx+c)}+a)^{\frac{1}{3}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c) + a)^(1/3), x)
```

Giac [F]

$$\int \sqrt[3]{a+b\cos(c+dx)}(A+B\cos(c+dx))\,dx=\int (B\cos{(dx+c)}+A)(b\cos{(dx+c)}+a)^{\frac{1}{3}}\,dx$$

```
[In] integrate((a+b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c)),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c) + a)^(1/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt[3]{a+b\cos(c+dx)}(A+B\cos(c+dx))\,dx=\int (A+B\cos{(c+d\,x)})\,{(a+b\cos{(c+d\,x)})}^{1/3}\,dx$$

```
[In] int((A + B*cos(c + d*x))*(a + b*cos(c + d*x))^(1/3),x)
[Out] int((A + B*cos(c + d*x))*(a + b*cos(c + d*x))^(1/3), x)
```

3.797 $\int \frac{A+B\cos(c+dx)}{\sqrt[3]{a+b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 226

$$\int \frac{A+B\cos(c+dx)}{\sqrt[3]{a+b\cos(c+dx)}}\,dx = \frac{\sqrt{2}B\,\mathrm{AppellF1}\left(\frac{1}{2},\frac{1}{2},-\frac{2}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)(a+b\cos(c+dx))^{2/3}\sin(c+dx)}{bd\sqrt{1+\cos(c+dx)}\left(\frac{a+b\cos(c+dx)}{a+b}\right)^{2/3}} + \frac{\sqrt{2}(Ab-aB)\,\mathrm{AppellF1}\left(\frac{1}{2},\frac{1}{2},\frac{1}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)\sqrt[3]{\frac{a+b\cos(c+dx)}{a+b}}\sin(c+dx)}{bd\sqrt{1+\cos(c+dx)}\sqrt[3]{a+b\cos(c+dx)}}$$

```
[Out] B*AppellF1(1/2,-2/3,1/2,3/2,b*(1-cos(d*x+c))/(a+b),1/2-1/2*cos(d*x+c))*(a+b
*cos(d*x+c))^(2/3)*sin(d*x+c)*2^(1/2)/b/d/((a+b*cos(d*x+c))/(a+b))^(2/3)/(1
+cos(d*x+c))^(1/2)+(A*b-B*a)*AppellF1(1/2,1/3,1/2,3/2,b*(1-cos(d*x+c))/(a+b
),1/2-1/2*cos(d*x+c))*((a+b*cos(d*x+c))/(a+b))^(1/3)*sin(d*x+c)*2^(1/2)/b/d
/(a+b*cos(d*x+c))^(1/3)/(1+cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 226, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used

$= \{2835, 2744, 144, 143\}$

$$\int \frac{A+B\cos(c+dx)}{\sqrt[3]{a+b\cos(c+dx)}}\,dx$$

$$= \frac{\sqrt{2}(Ab-aB)\sin(c+dx)\sqrt[3]{\frac{a+b\cos(c+dx)}{a+b}}\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{2},\frac{1}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)}{bd\sqrt{\cos(c+dx)+1}\sqrt[3]{a+b\cos(c+dx)}}$$
$$+ \frac{\sqrt{2}B\sin(c+dx)(a+b\cos(c+dx))^{2/3}\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{2},-\frac{2}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)}{bd\sqrt{\cos(c+dx)+1}\left(\frac{a+b\cos(c+dx)}{a+b}\right)^{2/3}}$$

```
[In] Int[(A + B*Cos[c + d*x])/(a + b*Cos[c + d*x])^(1/3),x]
```

```
[Out] (Sqrt[2]*B*AppellF1[1/2, 1/2, -2/3, 3/2, (1 - Cos[c + d*x])/2, (b*(1 - Cos[
c + d*x]))/(a + b)]*(a + b*Cos[c + d*x])^(2/3)*Sin[c + d*x])/(b*d*Sqrt[1 +
Cos[c + d*x]]*((a + b*Cos[c + d*x])/(a + b))^(2/3)) + (Sqrt[2]*(A*b - a*B)*
AppellF1[1/2, 1/2, 1/3, 3/2, (1 - Cos[c + d*x])/2, (b*(1 - Cos[c + d*x]))/(
a + b)]*((a + b*Cos[c + d*x])/(a + b))^(1/3)*Sin[c + d*x])/(b*d*Sqrt[1 + Co
s[c + d*x]]*(a + b*Cos[c + d*x])^(1/3))
```

Rule 143

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_), x_Symbol] :> Simp[((a + b*x)^(m + 1)/(b*(m + 1)*(b/(b*c - a*d))^n*(b
/(b*e - a*f))^p))*AppellF1[m + 1, -n, -p, m + 2, (-d)*((a + b*x)/(b*c - a*d
)), (-f)*((a + b*x)/(b*e - a*f))], x] /; FreeQ[{a, b, c, d, e, f, m, n, p},
 x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !IntegerQ[p] && GtQ[b/(b*c - a*d)
, 0] && GtQ[b/(b*e - a*f), 0] &&  !(GtQ[d/(d*a - c*b), 0] && GtQ[d/(d*e - c
*f), 0] && SimplerQ[c + d*x, a + b*x]) &&  !(GtQ[f/(f*a - e*b), 0] && GtQ[f
/(f*c - e*d), 0] && SimplerQ[e + f*x, a + b*x])
```

Rule 144

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_), x_Symbol] :> Dist[(e + f*x)^FracPart[p]/((b/(b*e - a*f))^IntPart[p]*
(b*((e + f*x)/(b*e - a*f)))^FracPart[p]), Int[(a + b*x)^m*(c + d*x)^n*(b*(e
/(b*e - a*f)) + b*f*(x/(b*e - a*f)))^p, x], x] /; FreeQ[{a, b, c, d, e, f,
m, n, p}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !IntegerQ[p] && GtQ[b/(b
*c - a*d), 0] &&  !GtQ[b/(b*e - a*f), 0]
```

Rule 2744

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[Cos[c +
d*x]/(d*Sqrt[1 + Sin[c + d*x]]*Sqrt[1 - Sin[c + d*x]]), Subst[Int[(a + b*x)
^n/(Sqrt[1 + x]*Sqrt[1 - x]), x], x, Sin[c + d*x]], x] /; FreeQ[{a, b, c, d
```

```
, n}, x] && NeQ[a^2 - b^2, 0] &&  !IntegerQ[2*n]
```

Rule 2835

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[(b*c - a*d)/b, Int[(a + b*Sin[e + f*x])^m,
x], x] + Dist[d/b, Int[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b,
 c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \frac{B\int(a+b\cos(c+dx))^{2/3}\,dx}{b} + \frac{(Ab-aB)\int\frac{1}{\sqrt[3]{a+b\cos(c+dx)}}\,dx}{b}$$

$$= -\frac{(B\sin(c+dx))\text{Subst}\left(\int\frac{(a+bx)^{2/3}}{\sqrt{1-x}\sqrt{1+x}}\,dx,x,\cos(c+dx)\right)}{bd\sqrt{1-\cos(c+dx)}\sqrt{1+\cos(c+dx)}} - \frac{((Ab-aB)\sin(c+dx))\text{Subst}\left(\int\frac{1}{\sqrt{1-x}\sqrt{1+x}\sqrt[3]{a+bx}}\,dx,x,\cos(c+dx)\right)}{bd\sqrt{1-\cos(c+dx)}\sqrt{1+\cos(c+dx)}}$$

$$= -\frac{\left(B(a+b\cos(c+dx))^{2/3}\sin(c+dx)\right)\text{Subst}\left(\int\frac{\left(-\frac{a}{-a-b}-\frac{bx}{-a-b}\right)^{2/3}}{\sqrt{1-x}\sqrt{1+x}}\,dx,x,\cos(c+dx)\right)}{bd\sqrt{1-\cos(c+dx)}\sqrt{1+\cos(c+dx)}\left(-\frac{a+b\cos(c+dx)}{-a-b}\right)^{2/3}} - \frac{\left((Ab-aB)\sqrt[3]{-\frac{a+b\cos(c+dx)}{-a-b}}\sin(c+dx)\right)\text{Subst}\left(\int\frac{1}{\sqrt{1-x}\sqrt{1+x}\sqrt[3]{-\frac{a}{-a-b}-\frac{bx}{-a-b}}}\,dx,x,\ldots\right.}{bd\sqrt{1-\cos(c+dx)}\sqrt{1+\cos(c+dx)}\sqrt[3]{a+b\cos(c+dx)}}$$

$$= \frac{\sqrt{2}B\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{2},-\frac{2}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)(a+b\cos(c+dx))^{2/3}\sin(c+dx)}{bd\sqrt{1+\cos(c+dx)}\left(\frac{a+b\cos(c+dx)}{a+b}\right)^{2/3}} + \frac{\sqrt{2}(Ab-aB)\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{2},\frac{1}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)\sqrt[3]{\frac{a+b\cos(c+dx)}{a+b}}\sin(c\ldots}{bd\sqrt{1+\cos(c+dx)}\sqrt[3]{a+b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.46 (sec) , antiderivative size = 189, normalized size of antiderivative = 0.84

$$\int \frac{A+B\cos(c+dx)}{\sqrt[3]{a+b\cos(c+dx)}}\,dx = -\frac{3\sqrt{-\frac{b(-1+\cos(c+dx))}{a+b}}\sqrt{\frac{b(1+\cos(c+dx))}{-a+b}}(a+b\cos(c+dx))^{2/3}\left(5(Ab-aB)\operatorname{AppellF1}\left(\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},\frac{a+b\cos(c+dx)}{a-b},\ldots\right.\right.}{10b^2d}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/(a + b*Cos[c + d*x])^(1/3),x]
[Out] (-3*Sqrt[-((b*(-1 + Cos[c + d*x]))/(a + b))]*Sqrt[(b*(1 + Cos[c + d*x]))/(-
a + b)]*(a + b*Cos[c + d*x])^(2/3)*(5*(A*b - a*B)*AppellF1[2/3, 1/2, 1/2, 5
/3, (a + b*Cos[c + d*x])/(a - b), (a + b*Cos[c + d*x])/(a + b)] + 2*B*Appel
lF1[5/3, 1/2, 1/2, 8/3, (a + b*Cos[c + d*x])/(a - b), (a + b*Cos[c + d*x])/
(a + b)]*(a + b*Cos[c + d*x]))*Csc[c + d*x])/(10*b^2*d)
```

Maple [F]

$$\int \frac{A+B\cos(dx+c)}{(a+\cos(dx+c)\,b)^{\frac{1}{3}}}dx$$

```
[In] int((A+B*cos(d*x+c))/(a+cos(d*x+c)*b)^(1/3),x)
[Out] int((A+B*cos(d*x+c))/(a+cos(d*x+c)*b)^(1/3),x)
```

Fricas [F]

$$\int \frac{A+B\cos(c+dx)}{\sqrt[3]{a+b\cos(c+dx)}}\,dx = \int \frac{B\cos(dx+c)+A}{(b\cos(dx+c)+a)^{\frac{1}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(a+b*cos(d*x+c))^(1/3),x, algorithm="fricas")
[Out] integral((B*cos(d*x + c) + A)/(b*cos(d*x + c) + a)^(1/3), x)
```

Sympy [F]

$$\int \frac{A+B\cos(c+dx)}{\sqrt[3]{a+b\cos(c+dx)}}\,dx=\int \frac{A+B\cos{(c+dx)}}{\sqrt[3]{a+b\cos{(c+dx)}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(a+b*cos(d*x+c))**(1/3),x)
[Out] Integral((A + B*cos(c + d*x))/(a + b*cos(c + d*x))**(1/3), x)
```

Maxima [F]

$$\int \frac{A+B\cos(c+dx)}{\sqrt[3]{a+b\cos(c+dx)}}\,dx=\int \frac{B\cos{(dx+c)}+A}{(b\cos{(dx+c)}+a)^{\frac{1}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(a+b*cos(d*x+c))^(1/3),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)/(b*cos(d*x + c) + a)^(1/3), x)
```

Giac [F]

$$\int \frac{A+B\cos(c+dx)}{\sqrt[3]{a+b\cos(c+dx)}}\,dx=\int \frac{B\cos{(dx+c)}+A}{(b\cos{(dx+c)}+a)^{\frac{1}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(a+b*cos(d*x+c))^(1/3),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)/(b*cos(d*x + c) + a)^(1/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{\sqrt[3]{a+b\cos(c+dx)}}\,dx=\int \frac{A+B\,\cos\left(c+d\,x\right)}{{\left(a+b\,\cos\left(c+d\,x\right)\right)}^{1/3}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(a + b*cos(c + d*x))^(1/3),x)
[Out] int((A + B*cos(c + d*x))/(a + b*cos(c + d*x))^(1/3), x)
```

3.798 $\int \frac{A+B\cos(c+dx)}{(a+b\cos(c+dx))^{2/3}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 226

$$\int \frac{A+B\cos(c+dx)}{(a+b\cos(c+dx))^{2/3}}\,dx = \frac{\sqrt{2}B\operatorname{AppellF1}\left(\frac{1}{2},\frac{1}{2},-\frac{1}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)\sqrt[3]{a+b\cos(c+}}{bd\sqrt{1+\cos(c+dx)}\sqrt[3]{\frac{a+b\cos(c+dx)}{a+b}}}$$
$$+\frac{\sqrt{2}(Ab-aB)\operatorname{AppellF1}\left(\frac{1}{2},\frac{1}{2},\frac{2}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)\left(\frac{a+b\cos(c+dx)}{a+b}\right)^{2/3}\sin(c+dx)}{bd\sqrt{1+\cos(c+dx)}(a+b\cos(c+dx))^{2/3}}$$

```
[Out] B*AppellF1(1/2,-1/3,1/2,3/2,b*(1-cos(d*x+c))/(a+b),1/2-1/2*cos(d*x+c))*(a+b
*cos(d*x+c))^(1/3)*sin(d*x+c)*2^(1/2)/b/d/((a+b*cos(d*x+c))/(a+b))^(1/3)/(1
+cos(d*x+c))^(1/2)+(A*b-B*a)*AppellF1(1/2,2/3,1/2,3/2,b*(1-cos(d*x+c))/(a+b
),1/2-1/2*cos(d*x+c))*((a+b*cos(d*x+c))/(a+b))^(2/3)*sin(d*x+c)*2^(1/2)/b/d
/(a+b*cos(d*x+c))^(2/3)/(1+cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 226, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2835, 2744, 144, 143}

$$\int \frac{A+B\cos(c+dx)}{(a+b\cos(c+dx))^{2/3}}\,dx = \frac{\sqrt{2}(Ab-aB)\sin(c+dx)\left(\frac{a+b\cos(c+dx)}{a+b}\right)^{2/3}\operatorname{AppellF1}\left(\frac{1}{2},\frac{1}{2},\frac{2}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+\right.}{bd\sqrt{\cos(c+dx)+1}(a+b\cos(c+dx))^{2/3}}$$
$$+\frac{\sqrt{2}B\sin(c+dx)\sqrt[3]{a+b\cos(c+dx)}\operatorname{AppellF1}\left(\frac{1}{2},\frac{1}{2},-\frac{1}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)}{bd\sqrt{\cos(c+dx)+1}\sqrt[3]{\frac{a+b\cos(c+dx)}{a+b}}}$$

```
[In] Int[(A + B*Cos[c + d*x])/(a + b*Cos[c + d*x])^(2/3),x]
```

```
[Out] (Sqrt[2]*B*AppellF1[1/2, 1/2, -1/3, 3/2, (1 - Cos[c + d*x])/2, (b*(1 - Cos[
c + d*x]))/(a + b)]*(a + b*Cos[c + d*x])^(1/3)*Sin[c + d*x])/(b*d*Sqrt[1 +
Cos[c + d*x]]*((a + b*Cos[c + d*x])/(a + b))^(1/3)) + (Sqrt[2]*(A*b - a*B)*
AppellF1[1/2, 1/2, 2/3, 3/2, (1 - Cos[c + d*x])/2, (b*(1 - Cos[c + d*x]))/(
a + b)]*((a + b*Cos[c + d*x])/(a + b))^(2/3)*Sin[c + d*x])/(b*d*Sqrt[1 + Co
s[c + d*x]]*(a + b*Cos[c + d*x])^(2/3))
```

Rule 143

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_), x_Symbol] :> Simp[((a + b*x)^(m + 1)/(b*(m + 1)*(b/(b*c - a*d))^n*(b
/(b*e - a*f))^p))*AppellF1[m + 1, -n, -p, m + 2, (-d)*((a + b*x)/(b*c - a*d
)), (-f)*((a + b*x)/(b*e - a*f))], x] /; FreeQ[{a, b, c, d, e, f, m, n, p},
 x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !IntegerQ[p] && GtQ[b/(b*c - a*d)
, 0] && GtQ[b/(b*e - a*f), 0] &&  !(GtQ[d/(d*a - c*b), 0] && GtQ[d/(d*e - c
*f), 0] && SimplerQ[c + d*x, a + b*x]) &&  !(GtQ[f/(f*a - e*b), 0] && GtQ[f
/(f*c - e*d), 0] && SimplerQ[e + f*x, a + b*x])
```

Rule 144

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_), x_Symbol] :> Dist[(e + f*x)^FracPart[p]/((b/(b*e - a*f))^IntPart[p]*
(b*((e + f*x)/(b*e - a*f)))^FracPart[p]), Int[(a + b*x)^m*(c + d*x)^n*(b*(e
/(b*e - a*f)) + b*f*(x/(b*e - a*f)))^p, x], x] /; FreeQ[{a, b, c, d, e, f,
m, n, p}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !IntegerQ[p] && GtQ[b/(b
*c - a*d), 0] &&  !GtQ[b/(b*e - a*f), 0]
```

Rule 2744

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[Cos[c +
d*x]/(d*Sqrt[1 + Sin[c + d*x]]*Sqrt[1 - Sin[c + d*x]]), Subst[Int[(a + b*x)
^n/(Sqrt[1 + x]*Sqrt[1 - x]), x], x, Sin[c + d*x]], x] /; FreeQ[{a, b, c, d
, n}, x] && NeQ[a^2 - b^2, 0] &&  !IntegerQ[2*n]
```

Rule 2835

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*sin[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[(b*c - a*d)/b, Int[(a + b*Sin[e + f*x])^m,
x], x] + Dist[d/b, Int[(a + b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{a, b,
 c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 - b^2, 0]
```

Rubi steps

$$\text{integral} = \frac{B\int \sqrt[3]{a+b\cos(c+dx)}\,dx}{b} + \frac{(Ab-aB)\int \frac{1}{(a+b\cos(c+dx))^{2/3}}\,dx}{b}$$

$$= -\frac{(B\sin(c+dx))\text{Subst}\left(\int \frac{\sqrt[3]{a+bx}}{\sqrt{1-x}\sqrt{1+x}}\,dx, x, \cos(c+dx)\right)}{bd\sqrt{1-\cos(c+dx)}\sqrt{1+\cos(c+dx)}} - \frac{((Ab-aB)\sin(c+dx))\text{Subst}\left(\int \frac{1}{\sqrt{1-x}\sqrt{1+x}(a+bx)^{2/3}}\,dx, x, \cos(c+dx)\right)}{bd\sqrt{1-\cos(c+dx)}\sqrt{1+\cos(c+dx)}}$$

$$= -\frac{\left(B\sqrt[3]{a+b\cos(c+dx)}\sin(c+dx)\right)\text{Subst}\left(\int \frac{\sqrt[3]{-\frac{a}{-a-b}-\frac{bx}{-a-b}}}{\sqrt{1-x}\sqrt{1+x}}\,dx, x, \cos(c+dx)\right)}{bd\sqrt{1-\cos(c+dx)}\sqrt{1+\cos(c+dx)}\sqrt[3]{-\frac{a+b\cos(c+dx)}{-a-b}}} - \frac{\left((Ab-aB)\left(-\frac{a+b\cos(c+dx)}{-a-b}\right)^{2/3}\sin(c+dx)\right)\text{Subst}\left(\int \frac{1}{\sqrt{1-x}\sqrt{1+x}\left(-\frac{a}{-a-b}-\frac{bx}{-a-b}\right)^{2/3}}\,dx, x, \cos(c+dx)\right)}{bd\sqrt{1-\cos(c+dx)}\sqrt{1+\cos(c+dx)}(a+b\cos(c+dx))^{2/3}}$$

$$= \frac{\sqrt{2}B\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{2},-\frac{1}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)\sqrt[3]{a+b\cos(c+dx)}\sin(c+dx)}{bd\sqrt{1+\cos(c+dx)}\sqrt[3]{\frac{a+b\cos(c+dx)}{a+b}}} + \frac{\sqrt{2}(Ab-aB)\,\text{AppellF1}\left(\frac{1}{2},\frac{1}{2},\frac{2}{3},\frac{3}{2},\frac{1}{2}(1-\cos(c+dx)),\frac{b(1-\cos(c+dx))}{a+b}\right)\left(\frac{a+b\cos(c+dx)}{a+b}\right)^{2/3}\sin(c+dx)}{bd\sqrt{1+\cos(c+dx)}(a+b\cos(c+dx))^{2/3}}$$

Mathematica [A] (verified)

Time = 0.47 (sec) , antiderivative size = 188, normalized size of antiderivative = 0.83

$$\int \frac{A+B\cos(c+dx)}{(a+b\cos(c+dx))^{2/3}}\,dx = -\frac{3\sqrt{-\frac{b(-1+\cos(c+dx))}{a+b}}\sqrt{\frac{b(1+\cos(c+dx))}{-a+b}}\sqrt[3]{a+b\cos(c+dx)}\left(4(Ab-aB)\,\text{AppellF1}\left(\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},\frac{a+b\cos(c+dx)}{a-b},\frac{a+b\cos(c+dx)}{a+b}\right) \ldots\right.}{4b^2d}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/(a + b*Cos[c + d*x])^(2/3),x]
```

```
[Out] (-3*Sqrt[-((b*(-1 + Cos[c + d*x]))/(a + b))]*Sqrt[(b*(1 + Cos[c + d*x]))/(-
a + b)]*(a + b*Cos[c + d*x])^(1/3)*(4*(A*b - a*B)*AppellF1[1/3, 1/2, 1/2, 4
/3, (a + b*Cos[c + d*x])/(a - b), (a + b*Cos[c + d*x])/(a + b)] + B*AppellF
1[4/3, 1/2, 1/2, 7/3, (a + b*Cos[c + d*x])/(a - b), (a + b*Cos[c + d*x])/(a
 + b)]*(a + b*Cos[c + d*x]))*Csc[c + d*x])/(4*b^2*d)
```

Maple [F]

$$\int \frac{A + B\cos(dx + c)}{(a + \cos(dx + c)\, b)^{\frac{2}{3}}} dx$$

```
[In] int((A+B*cos(d*x+c))/(a+cos(d*x+c)*b)^(2/3),x)
[Out] int((A+B*cos(d*x+c))/(a+cos(d*x+c)*b)^(2/3),x)
```

Fricas [F]

$$\int \frac{A + B\cos(c + dx)}{(a + b\cos(c + dx))^{2/3}}\, dx = \int \frac{B\cos(dx + c) + A}{(b\cos(dx + c) + a)^{\frac{2}{3}}}\, dx$$

```
[In] integrate((A+B*cos(d*x+c))/(a+b*cos(d*x+c))^(2/3),x, algorithm="fricas")
[Out] integral((B*cos(d*x + c) + A)/(b*cos(d*x + c) + a)^(2/3), x)
```

Sympy [F]

$$\int \frac{A + B\cos(c + dx)}{(a + b\cos(c + dx))^{2/3}}\, dx = \int \frac{A + B\cos(c + dx)}{(a + b\cos(c + dx))^{\frac{2}{3}}}\, dx$$

```
[In] integrate((A+B*cos(d*x+c))/(a+b*cos(d*x+c))**(2/3),x)
[Out] Integral((A + B*cos(c + d*x))/(a + b*cos(c + d*x))**(2/3), x)
```

Maxima [F]

$$\int \frac{A + B\cos(c + dx)}{(a + b\cos(c + dx))^{2/3}}\, dx = \int \frac{B\cos(dx + c) + A}{(b\cos(dx + c) + a)^{\frac{2}{3}}}\, dx$$

```
[In] integrate((A+B*cos(d*x+c))/(a+b*cos(d*x+c))^(2/3),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)/(b*cos(d*x + c) + a)^(2/3), x)
```

Giac [F]

$$\int \frac{A + B\cos(c + dx)}{(a + b\cos(c + dx))^{2/3}}\,dx = \int \frac{B\cos(dx + c) + A}{(b\cos(dx + c) + a)^{\frac{2}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(a+b*cos(d*x+c))^(2/3),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)/(b*cos(d*x + c) + a)^(2/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A + B\cos(c + dx)}{(a + b\cos(c + dx))^{2/3}}\,dx = \int \frac{A + B\,\cos(c + d\,x)}{(a + b\,\cos(c + d\,x))^{2/3}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(a + b*cos(c + d*x))^(2/3),x)
[Out] int((A + B*cos(c + d*x))/(a + b*cos(c + d*x))^(2/3), x)
```

3.799 $\int \cos^2(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 168

$$\begin{aligned}
&\int \cos^2(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx \\
&= \frac{6A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}} + \frac{10bB\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d\sqrt{b\cos(c+dx)}} \\
&\quad + \frac{10B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21d} + \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5bd} \\
&\quad + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^2d}
\end{aligned}$$

```
[Out] 2/5*A*(b*cos(d*x+c))^(3/2)*sin(d*x+c)/b/d+2/7*B*(b*cos(d*x+c))^(5/2)*sin(d*
x+c)/b^2/d+10/21*b*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)+10/
21*B*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d+6/5*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/c
os(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2
)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used = {16, 2827, 2715, 2721, 2719, 2720}

$$\begin{aligned}&\int \cos^2(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx\\&=\frac{2A\sin(c+dx)(b\cos(c+dx))^{3/2}}{5bd}+\frac{6AE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{5d\sqrt{\cos(c+dx)}}\\&+\frac{2B\sin(c+dx)(b\cos(c+dx))^{5/2}}{7b^2d}+\frac{10B\sin(c+dx)\sqrt{b\cos(c+dx)}}{21d}\\&+\frac{10bB\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d\sqrt{b\cos(c+dx)}}\end{aligned}$$

```
[In] Int[Cos[c + d*x]^2*Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]),x]
```

```
[Out] (6*A*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(5*d*Sqrt[Cos[c + d*x]
]) + (10*b*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(21*d*Sqrt[b*Cos
[c + d*x]]) + (10*B*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(21*d) + (2*A*(b*Cos
[c + d*x])^(3/2)*Sin[c + d*x])/(5*b*d) + (2*B*(b*Cos[c + d*x])^(5/2)*Sin[c
+ d*x])/(7*b^2*d)
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx}{b^2}\\
&= \frac{A\int (b\cos(c+dx))^{5/2}\,dx}{b^2}+\frac{B\int (b\cos(c+dx))^{7/2}\,dx}{b^3}\\
&= \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5bd}+\frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^2d}\\
&\quad+\frac{1}{5}(3A)\int \sqrt{b\cos(c+dx)}\,dx+\frac{(5B)\int (b\cos(c+dx))^{3/2}\,dx}{7b}\\
&= \frac{10B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21d}+\frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5bd}\\
&\quad+\frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^2d}\\
&\quad+\frac{1}{21}(5bB)\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx+\frac{\left(3A\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{5\sqrt{\cos(c+dx)}}\\
&= \frac{6A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}}+\frac{10B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21d}\\
&\quad+\frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5bd}+\frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^2d}\\
&\quad+\frac{\left(5bB\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{21\sqrt{b\cos(c+dx)}}\\
&= \frac{6A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}}+\frac{10bB\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d\sqrt{b\cos(c+dx)}}\\
&\quad+\frac{10B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21d}+\frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5bd}\\
&\quad+\frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^2d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.70 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.60

$$\int \cos^2(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\frac{\sqrt{b\cos(c+dx)}\left(252AE\left(\frac{1}{2}(c+dx)\middle|2\right)+100B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+2\sqrt{\cos(c+dx)}(65B+42A\cos(c\right.}{210d\sqrt{\cos(c+dx)}}$$

```
[In] Integrate[Cos[c + d*x]^2*Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]),x]
```

```
[Out] (Sqrt[b*Cos[c + d*x]]*(252*A*EllipticE[(c + d*x)/2, 2] + 100*B*EllipticF[(c
 + d*x)/2, 2] + 2*Sqrt[Cos[c + d*x]]*(65*B + 42*A*Cos[c + d*x] + 15*B*Cos[2
*(c + d*x)])*Sin[c + d*x]))/(210*d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 8.57 (sec) , antiderivative size = 299, normalized size of antiderivative = 1.78

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b\left(240B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(-168A-360B)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+(\right.}{}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b\left(-8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right.}{5\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\right.\right.\right.}}$

```
[In] int(cos(d*x+c)^2*(cos(d*x+c)*b)^(1/2)*(A+B*cos(d*x+c)),x,method=_RETURNVERB
OSE)
```

```
[Out] -2/105*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*b*(240*B*c
os(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8+(-168*A-360*B)*sin(1/2*d*x+1/2*c)^6*
cos(1/2*d*x+1/2*c)+(168*A+280*B)*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+(-
42*A-80*B)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-63*A*(sin(1/2*d*x+1/2*c)
^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(
1/2))+25*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*El
lipticF(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*
x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/
d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 162, normalized size of antiderivative = 0.96

$$\int \cos^2(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$= \frac{-25i\sqrt{2}B\sqrt{b}\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+25i\sqrt{2}B\sqrt{b}\text{weierstrassPInverse}(}{}$$

```
[In] integrate(cos(d*x+c)^2*(b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c)),x, algorithm="
fricas")
```

```
[Out] 1/105*(-25*I*sqrt(2)*B*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c)) + 25*I*sqrt(2)*B*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x +
 c) - I*sin(d*x + c)) + 63*I*sqrt(2)*A*sqrt(b)*weierstrassZeta(-4, 0, weier
strassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 63*I*sqrt(2)*A*sqrt
(b)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(
d*x + c))) + 2*(15*B*cos(d*x + c)^2 + 21*A*cos(d*x + c) + 25*B)*sqrt(b*cos(
d*x + c))*sin(d*x + c))/d
```

Sympy [F(-1)]

Timed out.

$$\int \cos^2(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**2*(b*cos(d*x+c))**(1/2)*(A+B*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \cos^2(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$= \int (B\cos(dx+c)+A)\sqrt{b\cos(dx+c)}\cos(dx+c)^2\,dx$$

```
[In] integrate(cos(d*x+c)^2*(b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c)),x, algorithm="
maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))*cos(d*x + c)^2, x)
```

Giac [F]

$$\int \cos^2(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$= \int (B\cos(dx+c)+A)\sqrt{b\cos(dx+c)}\cos(dx+c)^2\,dx$$

```
[In] integrate(cos(d*x+c)^2*(b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c)),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))*cos(d*x + c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^2(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$= \int \cos(c+dx)^2\sqrt{b\cos(c+dx)}\,(A+B\cos(c+dx))\,dx$$

```
[In] int(cos(c + d*x)^2*(b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^2*(b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)), x)
```

3.800 $\int \cos(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 29, antiderivative size = 139

$$\int \cos(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \frac{6B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}}+\frac{2Ab\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}}+\frac{2A\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d}+\frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5bd}$$

```
[Out] 2/5*B*(b*cos(d*x+c))^(3/2)*sin(d*x+c)/b/d+2/3*A*b*(cos(1/2*d*x+1/2*c)^2)^(1
/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/
2)/d/(b*cos(d*x+c))^(1/2)+2/3*A*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d+6/5*B*(co
s(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2
^(1/2))*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used = {16, 2827, 2715, 2721, 2720, 2719}

$$\int \cos(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \frac{2A\sin(c+dx)\sqrt{b\cos(c+dx)}}{3d}+\frac{2Ab\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}}+\frac{2B\sin(c+dx)(b\cos(c+dx))^{3/2}}{5bd}+\frac{6BE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{5d\sqrt{\cos(c+dx)}}$$

```
[In] Int[Cos[c + d*x]*Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]),x]
```

```
[Out] (6*B*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(5*d*Sqrt[Cos[c + d*x]
]) + (2*A*b*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*d*Sqrt[b*Cos[c
 + d*x]]) + (2*A*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(3*d) + (2*B*(b*Cos[c +
 d*x])^(3/2)*Sin[c + d*x])/(5*b*d)
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx}{b}\\ &= \frac{A\int (b\cos(c+dx))^{3/2}\,dx}{b}+\frac{B\int (b\cos(c+dx))^{5/2}\,dx}{b^2}\end{aligned}$$

$$
\begin{aligned}
&= \frac{2A\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5bd} \\
&\quad + \frac{1}{3}(Ab)\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx + \frac{1}{5}(3B)\int \sqrt{b\cos(c+dx)}\,dx \\
&= \frac{2A\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5bd} \\
&\quad + \frac{\left(Ab\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3\sqrt{b\cos(c+dx)}} + \frac{\left(3B\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{5\sqrt{\cos(c+dx)}} \\
&= \frac{6B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}} + \frac{2Ab\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} \\
&\quad + \frac{2A\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5bd}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.28 (sec) , antiderivative size = 91, normalized size of antiderivative = 0.65

$$
\int \cos(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx
$$
$$
= \frac{2(b\cos(c+dx))^{3/2}\left(9BE\left(\frac{1}{2}(c+dx)\middle|2\right) + 5A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right) + \sqrt{\cos(c+dx)}(5A+3B\cos(c+
$$
$$
15bd\cos^{\frac{3}{2}}(c+dx)
$$

```
[In] Integrate[Cos[c + d*x]*Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]),x]
[Out] (2*(b*Cos[c + d*x])^(3/2)*(9*B*EllipticE[(c + d*x)/2, 2] + 5*A*EllipticF[(c
 + d*x)/2, 2] + Sqrt[Cos[c + d*x]]*(5*A + 3*B*Cos[c + d*x])*Sin[c + d*x]))/
(15*b*d*Cos[c + d*x]^(3/2))
```

Maple [A] (verified)

Time = 6.96 (sec) , antiderivative size = 271, normalized size of antiderivative = 1.95

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b\left(-24B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(20A+24B)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+(-\right.}{15\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.}}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b\left(4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\right.}{3\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\,c}}$

```
[In] int(cos(d*x+c)*(cos(d*x+c)*b)^(1/2)*(A+B*cos(d*x+c)),x,method=_RETURNVERBOS
E)
```

```
[Out] -2/15*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*b*(-24*B*co
s(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+(20*A+24*B)*sin(1/2*d*x+1/2*c)^4*cos(
1/2*d*x+1/2*c)+(-10*A-6*B)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+5*A*(sin
(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2
*d*x+1/2*c),2^(1/2))-9*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)
^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1/2*d*x+1/2*c
)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d*x+1/2*c)^
2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.09

$$\int \cos(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$= \frac{-5i\sqrt{2}A\sqrt{b}\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+5i\sqrt{2}A\sqrt{b}\text{weierstrassPInverse}(-4,$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c)),x, algorithm="fr
icas")
```

```
[Out] 1/15*(-5*I*sqrt(2)*A*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*si
n(d*x + c)) + 5*I*sqrt(2)*A*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c)
 - I*sin(d*x + c)) + 9*I*sqrt(2)*B*sqrt(b)*weierstrassZeta(-4, 0, weierstra
ssPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 9*I*sqrt(2)*B*sqrt(b)*w
eierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x +
 c))) + 2*(3*B*cos(d*x + c) + 5*A)*sqrt(b*cos(d*x + c))*sin(d*x + c))/d
```

Sympy [F(-1)]

Timed out.

$$\int \cos(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))**(1/2)*(A+B*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \cos(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\int (B\cos(dx+c)+A)\sqrt{b\cos(dx+c)}\cos(dx+c)\,dx$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c)),x, algorithm="ma
xima")
[Out] integrate((B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))*cos(d*x + c), x)
```

Giac [F]

$$\int \cos(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\int (B\cos(dx+c)+A)\sqrt{b\cos(dx+c)}\cos(dx+c)\,dx$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c)),x, algorithm="gi
ac")
[Out] integrate((B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))*cos(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\int \cos(c+dx)\,\sqrt{b\,\cos(c+dx)}\,(A+B\,\cos(c+dx))\,dx$$

```
[In] int(cos(c + d*x)*(b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)),x)
[Out] int(cos(c + d*x)*(b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)), x)
```

3.801 $\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 23, antiderivative size = 108

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \frac{2A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}} + \frac{2bB\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d}$$

```
[Out] 2/3*b*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d
*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)+2/3*B*sin(d*x+c)
*(b*cos(d*x+c))^(1/2)/d+2*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)
*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1
/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2827, 2721, 2719, 2715, 2720}

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \frac{2AE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}} + \frac{2B\sin(c+dx)\sqrt{b\cos(c+dx)}}{3d} + \frac{2bB\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]),x]
```

```
[Out] (2*A*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(d*Sqrt[Cos[c + d*x]])
 + (2*b*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*d*Sqrt[b*Cos[c +
 d*x]]) + (2*B*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(3*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= A\int \sqrt{b\cos(c+dx)}\,dx+\frac{B\int (b\cos(c+dx))^{3/2}\,dx}{b}\\
&= \frac{2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d}+\frac{1}{3}(bB)\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx\\
&\quad+\frac{\left(A\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{\sqrt{\cos(c+dx)}}
\end{aligned}$$

$$= \frac{2A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{\left(bB\sqrt{\cos(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3\sqrt{b\cos(c+dx)}}$$

$$= \frac{2A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}} + \frac{2bB\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d}$$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.69

$$\int\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \frac{2\sqrt{b\cos(c+dx)}\left(3AE\left(\frac{1}{2}(c+dx)\middle|2\right)+B\left(\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\sqrt{\cos(c+dx)}\sin(c+dx)\right)\right)}{3d\sqrt{\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]),x]
[Out] (2*Sqrt[b*Cos[c + d*x]]*(3*A*EllipticE[(c + d*x)/2, 2] + B*(EllipticF[(c +
d*x)/2, 2] + Sqrt[Cos[c + d*x]]*Sin[c + d*x])))/(3*d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.52 (sec) , antiderivative size = 238, normalized size of antiderivative = 2.20

method	result
default	$\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b\left(-4B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+3A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E\left(\cos\left(\frac{d}{\cdots}\right.\right.\right.}{3\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\cdots\right.}$
parts	$\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b}\,d} - \frac{2B\sqrt{\left(2\left(\cos^2\left(\frac{d}{2}+\cdots\right.\right.\right.}}{\cdots}$

```
[In] int((cos(d*x+c)*b)^(1/2)*(A+B*cos(d*x+c)),x,method=_RETURNVERBOSE)
[Out] 2/3*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*b*(-4*B*cos(1
/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4+3*A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(
1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+2*B*cos(1/2
*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2-B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*
```

```
d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1/2
*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d
*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 139, normalized size of antiderivative = 1.29

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$= \frac{-i\sqrt{2}B\sqrt{b}\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+i\sqrt{2}B\sqrt{b}\text{weierstrassPInverse}(-4,0}{}$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/3*(-I*sqrt(2)*B*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d
*x + c)) + I*sqrt(2)*B*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) - I*
sin(d*x + c)) + 3*I*sqrt(2)*A*sqrt(b)*weierstrassZeta(-4, 0, weierstrassPIn
verse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*I*sqrt(2)*A*sqrt(b)*weiers
trassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)))
 + 2*sqrt(b*cos(d*x + c))*B*sin(d*x + c))/d
```

Sympy [F]

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$

```
[In] integrate((b*cos(d*x+c))**(1/2)*(A+B*cos(d*x+c)),x)
```

```
[Out] Integral(sqrt(b*cos(c + d*x))*(A + B*cos(c + d*x)), x)
```

Maxima [F]

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)\sqrt{b\cos(dx+c)}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c)),x, algorithm="maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c)), x)
```

Giac [F]

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)\sqrt{b\cos(dx+c)}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c)),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \int \sqrt{b\,\cos(c+d\,x)}\,(A+B\,\cos(c+d\,x))\,dx$$

```
[In] int((b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)),x)
[Out] int((b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)), x)
```

3.802 $\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec(c+dx)\,dx$

Optimal result

Integrand size = 29, antiderivative size = 80

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec(c+dx)\,dx = \frac{2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}}+\frac{2Ab\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2*A*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x
+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)+2*B*(cos(1/2*d*x+1
/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*
cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.172, Rules used = {16, 2827, 2721, 2720, 2719}

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec(c+dx)\,dx = \frac{2Ab\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}}+\frac{2BE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x])*Sec[c + d*x],x]
```

```
[Out] (2*B*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(d*Sqrt[Cos[c + d*x]])
 + (2*A*b*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(d*Sqrt[b*Cos[c + d
*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= b\int \frac{A+B\cos(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx\\
&= (Ab)\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx + B\int \sqrt{b\cos(c+dx)}\,dx\\
&= \frac{\left(Ab\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{\sqrt{b\cos(c+dx)}} + \frac{\left(B\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}} + \frac{2Ab\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.69

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec(c+dx)\,dx = \frac{2b\sqrt{\cos(c+dx)}\left(BE\left(\frac{1}{2}(c+dx)\middle|2\right)+A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\right)}{d\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x])*Sec[c + d*x],x]
```

```
[Out] (2*b*Sqrt[Cos[c + d*x]]*(B*EllipticE[(c + d*x)/2, 2] + A*EllipticF[(c + d*x
)/2, 2]))/(d*Sqrt[b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 4.77 (sec) , antiderivative size = 161, normalized size of antiderivative = 2.01

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,\left(AF\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-BE\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\right.\right.}{\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b}\,d}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b}\,d}+\frac{2B\sqrt{\left(2\left(\cos^2\right.\right.}}{\sqrt{-}}$
risch	$-\frac{iB\sqrt{2}\,\sqrt{\left(e^{2i(dx+c)}+1\right)b\,e^{-i(dx+c)}}}{d}-\frac{i\left(\frac{iA\sqrt{-i\left(e^{i(dx+c)}+i\right)}\,\sqrt{2}\,\sqrt{i\left(e^{i(dx+c)}-i\right)}\,\sqrt{ie^{i(dx+c)}}\,F\left(\sqrt{-i\left(e^{i(dx+c)}+i\right)},\frac{\sqrt{2}}{2}\right)}{\sqrt{b\,e^{3i(dx+c)}+b\,e^{i(dx+c)}}}+B\left(-\frac{}{b\sqrt{e^{i}}}\right.\right.}{}$

```
[In] int((cos(d*x+c)*b)^(1/2)*(A+B*cos(d*x+c))*sec(d*x+c),x,method=_RETURNVERBOS
E)
```

```
[Out] -2*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*b*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*(A*EllipticF(cos(1/2*d*x
+1/2*c),2^(1/2))-B*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1/2*d*
x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d*x+
1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.49

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec(c+dx)\,dx$$
$$= \frac{-i\sqrt{2}A\sqrt{b}\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin{(dx+c)})+i\sqrt{2}A\sqrt{b}\text{weierstrassPInverse}(-4,0,}{}$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))*sec(d*x+c),x, algorithm="fr
icas")
```

```
[Out] (-I*sqrt(2)*A*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x +
 c)) + I*sqrt(2)*A*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(
d*x + c)) + I*sqrt(2)*B*sqrt(b)*weierstrassZeta(-4, 0, weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c))) - I*sqrt(2)*B*sqrt(b)*weierstrassZet
a(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/d
```

Sympy [F]

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec(c+dx)\,dx$$
$$= \int \sqrt{b\cos{(c+dx)}}(A+B\cos{(c+dx)})\sec{(c+dx)}\,dx$$

```
[In] integrate((b*cos(d*x+c))**(1/2)*(A+B*cos(d*x+c))*sec(d*x+c),x)
```

```
[Out] Integral(sqrt(b*cos(c + d*x))*(A + B*cos(c + d*x))*sec(c + d*x), x)
```

Maxima [F]

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec(c+dx)\,dx$$
$$= \int (B\cos{(dx+c)}+A)\sqrt{b\cos{(dx+c)}}\sec{(dx+c)}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))*sec(d*x+c),x, algorithm="ma
xima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))*sec(d*x + c), x)
```

Giac [F]

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec(c+dx)\,dx$$
$$=\int (B\cos(dx+c)+A)\sqrt{b\cos(dx+c)}\sec(dx+c)\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))*sec(d*x+c),x, algorithm="gi
ac")
[Out] integrate((B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))*sec(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec(c+dx)\,dx$$
$$=\int \frac{\sqrt{b\cos(c+dx)}\,(A+B\cos(c+dx))}{\cos(c+dx)}\,dx$$

```
[In] int(((b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)))/cos(c + d*x),x)
[Out] int(((b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)))/cos(c + d*x), x)
```

3.803 $\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 31, antiderivative size = 105

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = -\frac{2A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}} + \frac{2bB\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}} + \frac{2Ab\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2*A*b*sin(d*x+c)/d/(b*cos(d*x+c))^(1/2)+2*b*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/
cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/d
/(b*cos(d*x+c))^(1/2)-2*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*E
llipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2
)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used = {16, 2827, 2716, 2721, 2719, 2720}

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \frac{2Ab\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} - \frac{2AE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}} + \frac{2bB\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x])*Sec[c + d*x]^2,x]
```

```
[Out] (-2*A*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(d*Sqrt[Cos[c + d*x]]
) + (2*b*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(d*Sqrt[b*Cos[c +
d*x]]) + (2*A*b*Sin[c + d*x])/(d*Sqrt[b*Cos[c + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = b^2 \int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx$$

$$= \left(Ab^2\right) \int \frac{1}{(b\cos(c+dx))^{3/2}}\,dx + (bB) \int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx$$

$$= \frac{2Ab\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} - A\int\sqrt{b\cos(c+dx)}\,dx + \frac{\left(bB\sqrt{\cos(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{\sqrt{b\cos(c+dx)}}$$

$$= \frac{2bB\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}} + \frac{2Ab\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} - \frac{\left(A\sqrt{b\cos(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx}{\sqrt{\cos(c+dx)}}$$

$$= -\frac{2A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}} + \frac{2bB\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}} + \frac{2Ab\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.41 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.70

$$\int\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \frac{2\sqrt{b\cos(c+dx)}\left(-AE\left(\frac{1}{2}(c+dx)\middle|2\right)+B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\frac{A\sin(c+dx)}{\sqrt{\cos(c+dx)}}\right)}{d\sqrt{\cos(c+dx)}}$$

```
[In] Integrate[Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x])*Sec[c + d*x]^2,x]
```

```
[Out] (2*Sqrt[b*Cos[c + d*x]]*(-(A*EllipticE[(c + d*x)/2, 2]) + B*EllipticF[(c +
d*x)/2, 2] + (A*Sin[c + d*x])/Sqrt[Cos[c + d*x]]))/(d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.15 (sec) , antiderivative size = 215, normalized size of antiderivative = 2.05

method	result
default	$\frac{2b\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(2A\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right.\right.}{\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\right.\right.\right.}}$
parts	$-\frac{2Ab\left(-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{-2\left(\sin^4\right.}\right.}{\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)}}$

```
[In] int((cos(d*x+c)*b)^(1/2)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x,method=_RETURNVERB
OSE)
```

```
[Out] 2*b*(-2*sin(1/2*d*x+1/2*c)^4*b+b*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*A*cos(1/2*d
*x+1/2*c)*sin(1/2*d*x+1/2*c)^2-A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*
x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-B*(sin(1/2*d*x+1/
2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c)
,2^(1/2)))/(-b*(2*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2
*d*x+1/2*c)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.62

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^2(c+dx)\,dx$$
$$= \frac{-i\sqrt{2}B\sqrt{b}\cos(dx+c)\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+i\sqrt{2}B\sqrt{b}\cos(dx+c)}{}$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="
fricas")
```

```
[Out] (-I*sqrt(2)*B*sqrt(b)*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c)
+ I*sin(d*x + c)) + I*sqrt(2)*B*sqrt(b)*cos(d*x + c)*weierstrassPInverse(-4
, 0, cos(d*x + c) - I*sin(d*x + c)) - I*sqrt(2)*A*sqrt(b)*cos(d*x + c)*weie
rstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)
)) + I*sqrt(2)*A*sqrt(b)*cos(d*x + c)*weierstrassZeta(-4, 0, weierstrassPIn
verse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*sqrt(b*cos(d*x + c))*A*sin
(d*x + c))/(d*cos(d*x + c))
```

Sympy [F]

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^2(c+dx)\,dx$$
$$= \int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^2(c+dx)\,dx$$

```
[In] integrate((b*cos(d*x+c))**(1/2)*(A+B*cos(d*x+c))*sec(d*x+c)**2,x)
```

```
[Out] Integral(sqrt(b*cos(c + d*x))*(A + B*cos(c + d*x))*sec(c + d*x)**2, x)
```

Maxima [F]

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^2(c+dx)\,dx$$
$$=\int (B\cos(dx+c)+A)\sqrt{b\cos(dx+c)}\sec(dx+c)^2\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))*sec(d*x + c)^2, x)
```

Giac [F]

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^2(c+dx)\,dx$$
$$=\int (B\cos(dx+c)+A)\sqrt{b\cos(dx+c)}\sec(dx+c)^2\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))*sec(d*x + c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^2(c+dx)\,dx$$
$$=\int \frac{\sqrt{b\cos(c+d\,x)}\,(A+B\cos(c+d\,x))}{\cos(c+d\,x)^2}\,dx$$

```
[In] int(((b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^2,x)
[Out] int(((b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^2, x)
```

3.804 $\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 31, antiderivative size = 136

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = -\frac{2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}}+\frac{2Ab\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} +\frac{2Ab^2\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}}+\frac{2bB\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2/3*A*b^2*sin(d*x+c)/d/(b*cos(d*x+c))^(3/2)+2*b*B*sin(d*x+c)/d/(b*cos(d*x+c
))^(1/2)+2/3*A*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(
sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)-2*B*(co
s(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2
^(1/2))*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used = {16, 2827, 2716, 2721, 2720, 2719}

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \frac{2Ab^2\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}}+\frac{2Ab\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} +\frac{2bB\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}-\frac{2BE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x])*Sec[c + d*x]^3,x]
```

```
[Out] (-2*B*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(d*Sqrt[Cos[c + d*x]]
) + (2*A*b*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*d*Sqrt[b*Cos[c
+ d*x]]) + (2*A*b^2*Sin[c + d*x])/(3*d*(b*Cos[c + d*x])^(3/2)) + (2*b*B*Sin
[c + d*x])/(d*Sqrt[b*Cos[c + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = b^3 \int \frac{A + B\cos(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx$$

$$= \left(Ab^3\right) \int \frac{1}{(b\cos(c+dx))^{5/2}}\,dx + \left(b^2B\right) \int \frac{1}{(b\cos(c+dx))^{3/2}}\,dx$$

$$
\begin{aligned}
&= \frac{2Ab^2\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2bB\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} \\
&\quad + \frac{1}{3}(Ab)\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx - B\int \sqrt{b\cos(c+dx)}\,dx \\
&= \frac{2Ab^2\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2bB\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} + \frac{\left(Ab\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3\sqrt{b\cos(c+dx)}} \\
&\quad - \frac{\left(B\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{\sqrt{\cos(c+dx)}} \\
&= -\frac{2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}} + \frac{2Ab\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} \\
&\quad + \frac{2Ab^2\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2bB\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.41 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.62

$$
\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^3(c+dx)\,dx
$$

$$
= \frac{2b\left(-3B\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right) + A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right) + 3B\sin(c+dx) + A\,\text{t}\right.}{3d\sqrt{b\cos(c+dx)}}
$$

```
[In] Integrate[Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x])*Sec[c + d*x]^3,x]
[Out] (2*b*(-3*B*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2] + A*Sqrt[Cos[c + d*
x]]*EllipticF[(c + d*x)/2, 2] + 3*B*Sin[c + d*x] + A*Tan[c + d*x]))/(3*d*Sq
rt[b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 402 vs. 2(172) = 344.

Time = 6.51 (sec) , antiderivative size = 403, normalized size of antiderivative = 2.96

method	result
default	$\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(2A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12B\right.}{}$
parts	$-\frac{2A\left(-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\right.}{3\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\sin\left(\frac{dx}{2}\right.}$

```
[In] int((cos(d*x+c)*b)^(1/2)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x,method=_RETURNVERB
OSE)
```

```
[Out] 2/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d*x
+1/2*c)^3/(4*sin(1/2*d*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)*(2*A*(sin(1/2*d
*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*(2*sin(1/2*d*x+1/2
*c)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2-12*B*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2
*c)^4+6*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)
)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2+2*A*cos(1/2*d*x+1/2
*c)*sin(1/2*d*x+1/2*c)^2-A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*
c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+6*B*cos(1/2*d*x+1/2*c)*
sin(1/2*d*x+1/2*c)^2-3*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)
^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c)^4
*b+b*sin(1/2*d*x+1/2*c)^2)^(1/2)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 189, normalized size of antiderivative = 1.39

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^3(c+dx)\,dx$$
$$= \frac{-i\sqrt{2}A\sqrt{b}\cos{(dx+c)}^2\,\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin{(dx+c)})+i\sqrt{2}A\sqrt{b}\cos{(dx+c)}^2}{}$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="
fricas")
```

```
[Out] 1/3*(-I*sqrt(2)*A*sqrt(b)*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x
 + c) + I*sin(d*x + c)) + I*sqrt(2)*A*sqrt(b)*cos(d*x + c)^2*weierstrassPIn
verse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 3*I*sqrt(2)*B*sqrt(b)*cos(d*x
 + c)^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c))) + 3*I*sqrt(2)*B*sqrt(b)*cos(d*x + c)^2*weierstrassZeta(-4, 0
, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(3*B*cos(d
*x + c) + A)*sqrt(b*cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(1/2)*(A+B*cos(d*x+c))*sec(d*x+c)**3,x)
[Out] Timed out
```

Maxima [F]

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \int (B\cos(dx+c)+A)\sqrt{b\cos(dx+c)}\sec(dx+c)^3\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))*sec(d*x + c)^3, x)
```

Giac [F]

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \int (B\cos(dx+c)+A)\sqrt{b\cos(dx+c)}\sec(dx+c)^3\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))*sec(d*x + c)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^3(c+dx)\,dx$$
$$=\int \frac{\sqrt{b\,\cos\left(c+d\,x\right)}\,\left(A+B\,\cos\left(c+d\,x\right)\right)}{{\cos\left(c+d\,x\right)}^3}\,dx$$

```
[In] int(((b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^3,x)
[Out] int(((b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^3, x)
```

3.805 $\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^4(c+dx)\,dx$

Optimal result

Integrand size = 31, antiderivative size = 169

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^4(c+dx)\,dx = -\frac{6A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}}+\frac{2bB\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}}+\frac{2Ab^3\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}}+\frac{2b^2B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}}+\frac{6Ab\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2/5*A*b^3*sin(d*x+c)/d/(b*cos(d*x+c))^(5/2)+2/3*b^2*B*sin(d*x+c)/d/(b*cos(d
*x+c))^(3/2)+6/5*A*b*sin(d*x+c)/d/(b*cos(d*x+c))^(1/2)+2/3*b*B*(cos(1/2*d*x
+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*c
os(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)-6/5*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/c
os(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2
)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used

= {16, 2827, 2716, 2721, 2719, 2720}

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^4(c+dx)\,dx$$
$$= \frac{2Ab^3\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{6Ab\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}} - \frac{6AE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{5d\sqrt{\cos(c+dx)}} + \frac{2b^2B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2bB\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x])*Sec[c + d*x]^4,x]
```

```
[Out] (-6*A*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(5*d*Sqrt[Cos[c + d*x
]]) + (2*b*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*d*Sqrt[b*Cos[
c + d*x]]) + (2*A*b^3*Sin[c + d*x])/(5*d*(b*Cos[c + d*x])^(5/2)) + (2*b^2*B
*Sin[c + d*x])/(3*d*(b*Cos[c + d*x])^(3/2)) + (6*A*b*Sin[c + d*x])/(5*d*Sqr
t[b*Cos[c + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= b^4 \int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{7/2}}\,dx \\
&= \left(Ab^4\right)\int \frac{1}{(b\cos(c+dx))^{7/2}}\,dx + \left(b^3B\right)\int \frac{1}{(b\cos(c+dx))^{5/2}}\,dx \\
&= \frac{2Ab^3\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2b^2B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} \\
&\quad + \frac{1}{5}\left(3Ab^2\right)\int \frac{1}{(b\cos(c+dx))^{3/2}}\,dx + \frac{1}{3}(bB)\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx \\
&= \frac{2Ab^3\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2b^2B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{6Ab\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}} \\
&\quad - \frac{1}{5}(3A)\int \sqrt{b\cos(c+dx)}\,dx + \frac{\left(bB\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3\sqrt{b\cos(c+dx)}} \\
&= \frac{2bB\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2Ab^3\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} \\
&\quad + \frac{2b^2B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{6Ab\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}} \\
&\quad - \frac{\left(3A\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{5\sqrt{\cos(c+dx)}} \\
&= -\frac{6A\sqrt{b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}} + \frac{2bB\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} \\
&\quad + \frac{2Ab^3\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2b^2B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{6Ab\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.61 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.63

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^4(c+dx)\,dx$$
$$=\frac{2\sqrt{b\cos(c+dx)}\sec^2(c+dx)\left(-9A\cos^{\frac{3}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)+5B\cos^{\frac{3}{2}}(c+dx)\,\text{EllipticF}\left(\frac{1}{2}(c+dx),\right.\right.}{15d}$$

```
[In] Integrate[Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x])*Sec[c + d*x]^4,x]
```

```
[Out] (2*Sqrt[b*Cos[c + d*x]]*Sec[c + d*x]^2*(-9*A*Cos[c + d*x]^(3/2)*EllipticE[(
c + d*x)/2, 2] + 5*B*Cos[c + d*x]^(3/2)*EllipticF[(c + d*x)/2, 2] + 5*B*Sin
[c + d*x] + (9*A*Sin[2*(c + d*x)])/2 + 3*A*Tan[c + d*x]))/(15*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 575 vs. 2(197) = 394.

Time = 8.33 (sec) , antiderivative size = 576, normalized size of antiderivative = 3.41

method	result
default	$-\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(72A\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-36A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E\left(\right.\right.}{}$
parts	$-\frac{2A\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(24\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,E\left(\text{co}\right.\right.}{}$

```
[In] int((cos(d*x+c)*b)^(1/2)*(A+B*cos(d*x+c))*sec(d*x+c)^4,x,method=_RETURNVERB
OSE)
```

```
[Out] -2/15*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)/sin(1/2*d
*x+1/2*c)^3/(8*sin(1/2*d*x+1/2*c)^6-12*sin(1/2*d*x+1/2*c)^4+6*sin(1/2*d*x+1
/2*c)^2-1)*(72*A*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6-36*A*(sin(1/2*d*x+
1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*
c),2^(1/2))*sin(1/2*d*x+1/2*c)^4-20*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1
/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+
1/2*c)^4-72*A*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4+36*A*(sin(1/2*d*x+1/2
*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),
2^(1/2))*sin(1/2*d*x+1/2*c)^2-20*B*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4+
20*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Elliptic
F(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2+24*A*cos(1/2*d*x+1/2*c)*
sin(1/2*d*x+1/2*c)^2-9*A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)
^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+10*B*cos(1/2*d*x+1/2*c)*s
```

```
in(1/2*d*x+1/2*c)^2-5*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^
2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c)^4*
b+b*sin(1/2*d*x+1/2*c)^2)^(1/2)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.20

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^4(c+dx)\,dx$$
$$= \frac{-5i\sqrt{2}B\sqrt{b}\cos(dx+c)^3 \operatorname{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+5i\sqrt{2}B\sqrt{b}\cos(dx+$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))*sec(d*x+c)^4,x, algorithm="
fricas")
```

```
[Out] 1/15*(-5*I*sqrt(2)*B*sqrt(b)*cos(d*x + c)^3*weierstrassPInverse(-4, 0, cos(
d*x + c) + I*sin(d*x + c)) + 5*I*sqrt(2)*B*sqrt(b)*cos(d*x + c)^3*weierstra
ssPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 9*I*sqrt(2)*A*sqrt(b)*co
s(d*x + c)^3*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c)
 + I*sin(d*x + c))) + 9*I*sqrt(2)*A*sqrt(b)*cos(d*x + c)^3*weierstrassZeta(
-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(9*A*
cos(d*x + c)^2 + 5*B*cos(d*x + c) + 3*A)*sqrt(b*cos(d*x + c))*sin(d*x + c))
/(d*cos(d*x + c)^3)
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^4(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(1/2)*(A+B*cos(d*x+c))*sec(d*x+c)**4,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^4(c+dx)\,dx$$
$$=\int (B\cos(dx+c)+A)\sqrt{b\cos(dx+c)}\sec(dx+c)^4\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))*sec(d*x+c)^4,x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))*sec(d*x + c)^4, x)
```

Giac [F]

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^4(c+dx)\,dx$$
$$=\int (B\cos(dx+c)+A)\sqrt{b\cos(dx+c)}\sec(dx+c)^4\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))*sec(d*x+c)^4,x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))*sec(d*x + c)^4, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\sec^4(c+dx)\,dx$$
$$=\int \frac{\sqrt{b\,\cos(c+d\,x)}\,(A+B\,\cos(c+d\,x))}{\cos(c+d\,x)^4}\,dx$$

```
[In] int(((b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^4,x)
[Out] int(((b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^4, x)
```

3.806 $\int \cos(c+dx)(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 29, antiderivative size = 169

$$\int \cos(c+dx)(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \frac{6Ab\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}} + \frac{10b^2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d\sqrt{b\cos(c+dx)}} + \frac{10bB\sqrt{b\cos(c+dx)}\sin(c+dx)}{21d} + \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7bd}$$

```
[Out] 2/5*A*(b*cos(d*x+c))^(3/2)*sin(d*x+c)/d+2/7*B*(b*cos(d*x+c))^(5/2)*sin(d*x+
c)/b/d+10/21*b^2*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elliptic
F(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)+10/21
*b*B*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d+6/5*A*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)
/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1
/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used = {16, 2827, 2715, 2721, 2719, 2720}

$$\int \cos(c+dx)(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \frac{2A\sin(c+dx)(b\cos(c+dx))^{3/2}}{5d} + \frac{6AbE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{5d\sqrt{\cos(c+dx)}} + \frac{10b^2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d\sqrt{b\cos(c+dx)}} + \frac{2B\sin(c+dx)(b\cos(c+dx))^{5/2}}{7bd} + \frac{10bB\sin(c+dx)\sqrt{b\cos(c+dx)}}{21d}$$

```
[In] Int[Cos[c + d*x]*(b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (6*A*b*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(5*d*Sqrt[Cos[c + d*
x]]) + (10*b^2*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(21*d*Sqrt[b
*Cos[c + d*x]]) + (10*b*B*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(21*d) + (2*A*
(b*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(5*d) + (2*B*(b*Cos[c + d*x])^(5/2)*Si
n[c + d*x])/(7*b*d)
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx}{b} \\
&= \frac{A\int (b\cos(c+dx))^{5/2}\,dx}{b} + \frac{B\int (b\cos(c+dx))^{7/2}\,dx}{b^2} \\
&= \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7bd} \\
&\quad + \frac{1}{5}(3Ab)\int \sqrt{b\cos(c+dx)}\,dx + \frac{1}{7}(5B)\int (b\cos(c+dx))^{3/2}\,dx \\
&= \frac{10bB\sqrt{b\cos(c+dx)}\sin(c+dx)}{21d} + \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5d} \\
&\quad + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7bd} \\
&\quad + \frac{1}{21}\left(5b^2B\right)\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx + \frac{\left(3Ab\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{5\sqrt{\cos(c+dx)}} \\
&= \frac{6Ab\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}} + \frac{10bB\sqrt{b\cos(c+dx)}\sin(c+dx)}{21d} \\
&\quad + \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7bd} \\
&\quad + \frac{\left(5b^2B\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{21\sqrt{b\cos(c+dx)}} \\
&= \frac{6Ab\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}} \\
&\quad + \frac{10b^2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d\sqrt{b\cos(c+dx)}} + \frac{10bB\sqrt{b\cos(c+dx)}\sin(c+dx)}{21d} \\
&\quad + \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7bd}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.46 (sec) , antiderivative size = 103, normalized size of antiderivative = 0.61

$$\int \cos(c+dx)(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \frac{(b\cos(c+dx))^{5/2}\left(252AE\left(\frac{1}{2}(c+dx)\middle|2\right)+100B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+2\sqrt{\cos(c+\ldots}\right.}{210bd\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Integrate[Cos[c + d*x]*(b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]),x]
[Out] ((b*Cos[c + d*x])^(5/2)*(252*A*EllipticE[(c + d*x)/2, 2] + 100*B*EllipticF[
(c + d*x)/2, 2] + 2*Sqrt[Cos[c + d*x]]*(65*B + 42*A*Cos[c + d*x] + 15*B*Cos
[2*(c + d*x)])*Sin[c + d*x]))/(210*b*d*Cos[c + d*x]^(5/2))
```

Maple [A] (verified)

Time = 8.39 (sec) , antiderivative size = 301, normalized size of antiderivative = 1.78

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b^2\left(240B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(-168A-360B)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\ldots\right.}{\ldots}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b^2\left(-8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\ldots\right.\right.}{5\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\ldots\right.\right.\right.}}$

```
[In] int(cos(d*x+c)*(cos(d*x+c)*b)^(3/2)*(A+B*cos(d*x+c)),x,method=_RETURNVERBOS
E)
[Out] -2/105*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*b^2*(240*B
*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8+(-168*A-360*B)*sin(1/2*d*x+1/2*c)^
6*cos(1/2*d*x+1/2*c)+(168*A+280*B)*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+
(-42*A-80*B)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-63*A*(sin(1/2*d*x+1/2*
c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2
^(1/2))+25*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*
EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1/2*d*x+1/2*c)^4-sin(1/2*
d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2
)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 165, normalized size of antiderivative = 0.98

$$\int \cos(c+dx)(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \frac{-25i\sqrt{2}Bb^{\frac{3}{2}}\mathrm{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+25i\sqrt{2}Bb^{\frac{3}{2}}\mathrm{wei}}{}$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c)),x, algorithm="fr
icas")
```

```
[Out] 1/105*(-25*I*sqrt(2)*B*b^(3/2)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c)) + 25*I*sqrt(2)*B*b^(3/2)*weierstrassPInverse(-4, 0, cos(d*x +
 c) - I*sin(d*x + c)) + 63*I*sqrt(2)*A*b^(3/2)*weierstrassZeta(-4, 0, weier
strassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 63*I*sqrt(2)*A*b^(3
/2)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(
d*x + c))) + 2*(15*B*b*cos(d*x + c)^2 + 21*A*b*cos(d*x + c) + 25*B*b)*sqrt(
b*cos(d*x + c))*sin(d*x + c))/d
```

Sympy [F(-1)]

Timed out.

$$\int \cos(c+dx)(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))**(3/2)*(A+B*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \cos(c+dx)(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{3}{2}}\cos(dx+c)\,dx$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c)),x, algorithm="ma
xima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2)*cos(d*x + c), x)
```

Giac [F]

$$\int \cos(c+dx)(b\cos(c+dx))^{3/2}(A + B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{3}{2}}\cos(dx+c)\,dx$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c)),x, algorithm="gi
ac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2)*cos(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos(c+dx)(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \int \cos(c + d\,x)\,\left(b\,\cos(c+d\,x)\right)^{3/2}\,\left(A+B\,\cos(c+d\,x)\right)\,dx$$

```
[In] int(cos(c + d*x)*(b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)),x)
```

```
[Out] int(cos(c + d*x)*(b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)), x)
```

3.807 $\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 23, antiderivative size = 140

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \frac{6bB\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}} + \frac{2Ab^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2Ab\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5d}$$

```
[Out] 2/5*B*(b*cos(d*x+c))^(3/2)*sin(d*x+c)/d+2/3*A*b^2*(cos(1/2*d*x+1/2*c)^2)^(1
/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/
2)/d/(b*cos(d*x+c))^(1/2)+2/3*A*b*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d+6/5*b*B
*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*
c),2^(1/2))*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2827, 2715, 2721, 2720, 2719}

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx=\frac{2Ab^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}}+\frac{2Ab\sin(c+dx)\sqrt{b\cos(c+dx)}}{3d}+\frac{2B\sin(c+dx)(b\cos(c+dx))^{3/2}}{5d}+\frac{6bBE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{5d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (6*b*B*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(5*d*Sqrt[Cos[c + d*
x]]) + (2*A*b^2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*d*Sqrt[b*C
os[c + d*x]]) + (2*A*b*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(3*d) + (2*B*(b*C
os[c + d*x])^(3/2)*Sin[c + d*x])/(5*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= A\int (b\cos(c+dx))^{3/2}\,dx + \frac{B\int (b\cos(c+dx))^{5/2}\,dx}{b}\\
&= \frac{2Ab\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5d}\\
&\quad + \frac{1}{3}\left(Ab^2\right)\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx + \frac{1}{5}(3bB)\int \sqrt{b\cos(c+dx)}\,dx\\
&= \frac{2Ab\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5d}\\
&\quad + \frac{\left(Ab^2\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3\sqrt{b\cos(c+dx)}} + \frac{\left(3bB\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{5\sqrt{\cos(c+dx)}}\\
&= \frac{6bB\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}} + \frac{2Ab^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}}\\
&\quad + \frac{2Ab\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 88, normalized size of antiderivative = 0.63

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \frac{2(b\cos(c+dx))^{3/2}\left(9BE\left(\frac{1}{2}(c+dx)\middle|2\right)+5A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\sqrt{\cos(c+dx)}\right.}{15d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Integrate[(b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (2*(b*Cos[c + d*x])^(3/2)*(9*B*EllipticE[(c + d*x)/2, 2] + 5*A*EllipticF[(c
 + d*x)/2, 2] + Sqrt[Cos[c + d*x]]*(5*A + 3*B*Cos[c + d*x])*Sin[c + d*x]))/
(15*d*Cos[c + d*x]^(3/2))
```

Maple [A] (verified)

Time = 6.96 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.95

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b^2\left(-24B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(20A+24B)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+(-1\right.}{15\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right.\right.}}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b^2\left(4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{\right.}}{3\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\,d}}$

```
[In] int((cos(d*x+c)*b)^(3/2)*(A+B*cos(d*x+c)),x,method=_RETURNVERBOSE)
```

```
[Out] -2/15*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*b^2*(-24*B*
cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+(20*A+24*B)*sin(1/2*d*x+1/2*c)^4*co
s(1/2*d*x+1/2*c)+(-10*A-6*B)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+5*A*(s
in(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1
/2*d*x+1/2*c),2^(1/2))-9*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*
c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1/2*d*x+1/2
*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d*x+1/2*c
)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 153, normalized size of antiderivative = 1.09

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \frac{-5i\sqrt{2}Ab^{\frac{3}{2}}\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+5i\sqrt{2}Ab^{\frac{3}{2}}\text{weierstr}}{}$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/15*(-5*I*sqrt(2)*A*b^(3/2)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*si
n(d*x + c)) + 5*I*sqrt(2)*A*b^(3/2)*weierstrassPInverse(-4, 0, cos(d*x + c)
 - I*sin(d*x + c)) + 9*I*sqrt(2)*B*b^(3/2)*weierstrassZeta(-4, 0, weierstra
ssPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 9*I*sqrt(2)*B*b^(3/2)*w
eierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x +
 c))) + 2*(3*B*b*cos(d*x + c) + 5*A*b)*sqrt(b*cos(d*x + c))*sin(d*x + c))/d
```

Sympy [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(3/2)*(A+B*cos(d*x+c)),x)
[Out] Timed out
```

Maxima [F]

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{3}{2}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2), x)
```

Giac [F]

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{3}{2}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c)),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \int {\left(b\,\cos\left(c+d\,x\right)\right)}^{3/2}\,\left(A+B\,\cos\left(c+d\,x\right)\right)\,dx$$

```
[In] int((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)),x)
[Out] int((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)), x)
```

3.808 $\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec(c+dx)\,dx$

Optimal result

Integrand size = 29, antiderivative size = 112

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec(c+dx)\,dx = \frac{2Ab\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}} + \frac{2b^2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2bB\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d}$$

```
[Out] 2/3*b^2*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2
*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)+2/3*b*B*sin(d*
x+c)*(b*cos(d*x+c))^(1/2)/d+2*A*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+
1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/d/cos(d*x
+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used = {16, 2827, 2721, 2719, 2715, 2720}

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec(c+dx)\,dx = \frac{2AbE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}} + \frac{2b^2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2bB\sin(c+dx)\sqrt{b\cos(c+dx)}}{3d}$$

```
[In] Int[(b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x])*Sec[c + d*x],x]
```

```
[Out] (2*A*b*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(d*Sqrt[Cos[c + d*x]
]) + (2*b^2*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*d*Sqrt[b*Cos
[c + d*x]]) + (2*b*B*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(3*d)
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = b \int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$

$$= (Ab)\int \sqrt{b\cos(c+dx)}\,dx + B\int (b\cos(c+dx))^{3/2}\,dx$$

$$= \frac{2bB\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{1}{3}(b^2B)\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx + \frac{\left(Ab\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{\sqrt{\cos(c+dx)}}$$

$$= \frac{2Ab\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}} + \frac{2bB\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{\left(b^2B\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3\sqrt{b\cos(c+dx)}}$$

$$= \frac{2Ab\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}} + \frac{2b^2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2bB\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.68

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec(c+dx)\,dx = \frac{2b\sqrt{b\cos(c+dx)}\left(3AE\left(\frac{1}{2}(c+dx)\middle|2\right)+B\left(\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\sqrt{\cos(c+dx)}\sin(c+dx)\right)\right)}{3d\sqrt{\cos(c+dx)}}$$

```
[In] Integrate[(b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x])*Sec[c + d*x],x]
[Out] (2*b*Sqrt[b*Cos[c + d*x]]*(3*A*EllipticE[(c + d*x)/2, 2] + B*(EllipticF[(c
+ d*x)/2, 2] + Sqrt[Cos[c + d*x]]*Sin[c + d*x])))/(3*d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.90 (sec) , antiderivative size = 240, normalized size of antiderivative = 2.14

method	result
default	$\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b^2\left(-4B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+3A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E\left(\cos\left(\right.\right.\right.}{3\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\,\sin\left(\frac{dx}{2}+\right.}$
parts	$\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b^2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b}\,d} - \frac{2B\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\right.\right.\right.}}{}$

```
[In] int((cos(d*x+c)*b)^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c),x,method=_RETURNVERBOS
E)
```

```
[Out] 2/3*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*b^2*(-4*B*cos
(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4+3*A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*si
n(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+2*B*cos(1
/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2-B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/
2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1
/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2
*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.25

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec(c+dx)\,dx = \frac{-i\sqrt{2}Bb^{\frac{3}{2}}\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+i\sqrt{2}Bb^{\frac{3}{2}}\text{weierstrassPInvers}}{}$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c),x, algorithm="fr
icas")
```

```
[Out] 1/3*(-I*sqrt(2)*B*b^(3/2)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d
*x + c)) + I*sqrt(2)*B*b^(3/2)*weierstrassPInverse(-4, 0, cos(d*x + c) - I*
sin(d*x + c)) + 3*I*sqrt(2)*A*b^(3/2)*weierstrassZeta(-4, 0, weierstrassPIn
verse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*I*sqrt(2)*A*b^(3/2)*weiers
trassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)))
 + 2*sqrt(b*cos(d*x + c))*B*b*sin(d*x + c))/d
```

Sympy [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(3/2)*(A+B*cos(d*x+c))*sec(d*x+c),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{3}{2}}\sec(dx+c)\,dx$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c),x, algorithm="ma
xima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2)*sec(d*x + c), x)
```

Giac [F]

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{3}{2}}\sec(dx+c)\,dx$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c),x, algorithm="gi
ac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2)*sec(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec(c+dx)\,dx = \int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos(c+dx)}\,dx$$

```
[In] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x),x)
[Out] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x), x)
```

3.809 $\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 31, antiderivative size = 83

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^2(c+dx)\,dx=\frac{2bB\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}}+\frac{2Ab^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2*A*b^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d
*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)+2*b*B*(cos(1/2*d
*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))
*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.161, Rules used = {16, 2827, 2721, 2720, 2719}

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^2(c+dx)\,dx=\frac{2Ab^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}}+\frac{2bBE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x])*Sec[c + d*x]^2,x]
```

```
[Out] (2*b*B*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(d*Sqrt[Cos[c + d*x]
]) + (2*A*b^2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(d*Sqrt[b*Cos[c
 + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= b^2\int \frac{A+B\cos(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx\\
&= \left(Ab^2\right)\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx+(bB)\int \sqrt{b\cos(c+dx)}\,dx\\
&= \frac{\left(Ab^2\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{\sqrt{b\cos(c+dx)}}+\frac{\left(bB\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{2bB\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}}+\frac{2Ab^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.69

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^2(c+dx)\,dx=\frac{2b^2\sqrt{\cos(c+dx)}\left(BE\left(\frac{1}{2}(c+dx)\middle|2\right)+A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\right)}{d\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[(b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x])*Sec[c + d*x]^2,x]
```

```
[Out] (2*b^2*Sqrt[Cos[c + d*x]]*(B*EllipticE[(c + d*x)/2, 2] + A*EllipticF[(c + d
*x)/2, 2]))/(d*Sqrt[b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.00 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.96

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b^2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,\left(AF\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-BE\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\cdots\right.\right.\right.}{\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b}\,d}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b^2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b}\,d}+\frac{2B\sqrt{\left(2\left(\cos^2\left(\cdots\right.\right.\right.}}{\sqrt{\cdots}}$
risch	$-\frac{iBb\sqrt{2}\,\sqrt{\left(\mathrm{e}^{2i(dx+c)}+1\right)b\,\mathrm{e}^{-i(dx+c)}}}{d}-\frac{i\left(\frac{iA\sqrt{-i\left(\mathrm{e}^{i(dx+c)}+i\right)}\,\sqrt{2}\,\sqrt{i\left(\mathrm{e}^{i(dx+c)}-i\right)}\,\sqrt{i\mathrm{e}^{i(dx+c)}}\,F\left(\sqrt{-i\left(\mathrm{e}^{i(dx+c)}+i\right)},\frac{\sqrt{2}}{2}\right)}{\sqrt{b\,\mathrm{e}^{3i(dx+c)}+b\,\mathrm{e}^{i(dx+c)}}}+B\left(-\frac{\cdots}{b\sqrt{\cdots}}\right.\right.}{\cdots}$

```
[In] int((cos(d*x+c)*b)^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x,method=_RETURNVERB
OSE)
```

```
[Out] -2*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*b^2*(sin(1/2*d
*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*(A*EllipticF(cos(1/2*d
*x+1/2*c),2^(1/2))-B*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1/2*
d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d*
x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.43

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \frac{-i\sqrt{2}Ab^{\frac{3}{2}}\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+i\sqrt{2}Ab^{\frac{3}{2}}\text{weierstrassPInverse}}{}$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="
fricas")
```

```
[Out] (-I*sqrt(2)*A*b^(3/2)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x +
 c)) + I*sqrt(2)*A*b^(3/2)*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(
d*x + c)) + I*sqrt(2)*B*b^(3/2)*weierstrassZeta(-4, 0, weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c))) - I*sqrt(2)*B*b^(3/2)*weierstrassZet
a(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/d
```

Sympy [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)**2,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{3}{2}}\sec(dx+c)^2\,dx$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="
maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2)*sec(d*x + c)^2, x)
```

Giac [F]

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^2(c+dx)\,dx=\int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{3}{2}}\sec(dx+c)^2\,dx$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2)*sec(d*x + c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^2(c+dx)\,dx=\int \frac{(b\cos(c+d\,x))^{3/2}\,(A+B\cos(c+d\,x))}{\cos(c+d\,x)^2}\,dx$$

```
[In] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^2,x)
[Out] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^2, x)
```

3.810 $\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 31, antiderivative size = 110

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = -\frac{2Ab\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}} + \frac{2b^2B\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}} + \frac{2Ab^2\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2*A*b^2*sin(d*x+c)/d/(b*cos(d*x+c))^(1/2)+2*b^2*B*(cos(1/2*d*x+1/2*c)^2)^(1
/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/
2)/d/(b*cos(d*x+c))^(1/2)-2*A*b*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/
2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c
)^(1/2)
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.194$, Rules used = {16, 2827, 2716, 2721, 2719, 2720}

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \frac{2Ab^2\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} - \frac{2AbE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}} + \frac{2b^2B\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x])*Sec[c + d*x]^3,x]
```

```
[Out] (-2*A*b*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(d*Sqrt[Cos[c + d*x
]]) + (2*b^2*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(d*Sqrt[b*Cos[
c + d*x]]) + (2*A*b^2*Sin[c + d*x])/(d*Sqrt[b*Cos[c + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = b^3 \int \frac{A + B\cos(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx$$

$$= \left(Ab^3\right) \int \frac{1}{(b\cos(c+dx))^{3/2}}\,dx + \left(b^2 B\right) \int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx$$

$$= \frac{2Ab^2\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} - (Ab)\int \sqrt{b\cos(c+dx)}\,dx + \frac{\left(b^2B\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{\sqrt{b\cos(c+dx)}}$$

$$= \frac{2b^2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}} + \frac{2Ab^2\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} - \frac{\left(Ab\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{\sqrt{\cos(c+dx)}}$$

$$= -\frac{2Ab\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}} + \frac{2b^2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}} + \frac{2Ab^2\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.46 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.66

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \frac{2(b\cos(c+dx))^{3/2}\left(-AE\left(\frac{1}{2}(c+dx)\middle|2\right)+B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\frac{A\sin(c+dx)}{\sqrt{\cos(c+dx)}}\right)}{d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Integrate[(b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x])*Sec[c + d*x]^3,x]
[Out] (2*(b*Cos[c + d*x])^(3/2)*(-(A*EllipticE[(c + d*x)/2, 2]) + B*EllipticF[(c
+ d*x)/2, 2] + (A*Sin[c + d*x])/Sqrt[Cos[c + d*x]]))/(d*Cos[c + d*x]^(3/2))
```

Maple [A] (verified)

Time = 5.15 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.97

method	result
default	$\frac{2b^2\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(2A\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E\left(\cos\left(\frac{dx}{2}+\cdots\right)\right)\right)}{\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\cdots\right)\right)\right)}}$
parts	$-\frac{2A\,b^2\left(-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{-2\left(\sin\cdots\right)}\right)}{\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\cdots\right)}}$

```
[In] int((cos(d*x+c)*b)^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x,method=_RETURNVERB
OSE)
```

```
[Out] 2*b^2*(-2*sin(1/2*d*x+1/2*c)^4*b+b*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*A*cos(1/2
*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2-A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*
d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-B*(sin(1/2*d*x+
1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*
c),2^(1/2)))/(-b*(2*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1
/2*d*x+1/2*c)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 171, normalized size of antiderivative = 1.55

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \frac{-i\sqrt{2}Bb^{\frac{3}{2}}\cos(dx+c)\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+i\sqrt{2}Bb^{\frac{3}{2}}\cos(d$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="
fricas")
```

```
[Out] (-I*sqrt(2)*B*b^(3/2)*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c)
+ I*sin(d*x + c)) + I*sqrt(2)*B*b^(3/2)*cos(d*x + c)*weierstrassPInverse(-4
, 0, cos(d*x + c) - I*sin(d*x + c)) - I*sqrt(2)*A*b^(3/2)*cos(d*x + c)*weie
rstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)
)) + I*sqrt(2)*A*b^(3/2)*cos(d*x + c)*weierstrassZeta(-4, 0, weierstrassPIn
verse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*sqrt(b*cos(d*x + c))*A*b*s
in(d*x + c))/(d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)**3,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{3}{2}}\sec(dx+c)^3\,dx$$

[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="maxima")

[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2)*sec(d*x + c)^3, x)

Giac [F]

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{3}{2}}\sec(dx+c)^3\,dx$$

[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="giac")

[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2)*sec(d*x + c)^3, x)

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \int \frac{(b\cos(c+d\,x))^{3/2}\,(A+B\cos(c+d\,x))}{\cos(c+d\,x)^3}\,dx$$

[In] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^3,x)

[Out] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^3, x)

3.811 $\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^4(c+dx)\,dx$

Optimal result

Integrand size = 31, antiderivative size = 141

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^4(c+dx)\,dx = -\frac{2bB\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}}+\frac{2Ab^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}}+\frac{2Ab^3\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}}+\frac{2b^2B\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2/3*A*b^3*sin(d*x+c)/d/(b*cos(d*x+c))^(3/2)+2*b^2*B*sin(d*x+c)/d/(b*cos(d*x
+c))^(1/2)+2/3*A*b^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)-2*b
*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/
2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used = {16, 2827, 2716, 2721, 2720, 2719}

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^4(c+dx)\,dx = \frac{2Ab^3\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}}+\frac{2Ab^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}}+\frac{2b^2B\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}-\frac{2bBE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x])*Sec[c + d*x]^4,x]
```

```
[Out] (-2*b*B*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(d*Sqrt[Cos[c + d*x
]]) + (2*A*b^2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*d*Sqrt[b*Co
s[c + d*x]]) + (2*A*b^3*Sin[c + d*x])/(3*d*(b*Cos[c + d*x])^(3/2)) + (2*b^2
*B*Sin[c + d*x])/(d*Sqrt[b*Cos[c + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = b^4 \int \frac{A + B\cos(c + dx)}{(b\cos(c + dx))^{5/2}}\,dx$$

$$= \left(Ab^4\right) \int \frac{1}{(b\cos(c + dx))^{5/2}}\,dx + \left(b^3 B\right) \int \frac{1}{(b\cos(c + dx))^{3/2}}\,dx$$

$$
\begin{aligned}
&= \frac{2Ab^3\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}}+\frac{2b^2B\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} \\
&\quad+\frac{1}{3}(Ab^2)\int\frac{1}{\sqrt{b\cos(c+dx)}}\,dx-(bB)\int\sqrt{b\cos(c+dx)}\,dx \\
&= \frac{2Ab^3\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}}+\frac{2b^2B\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}+\frac{\left(Ab^2\sqrt{\cos(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3\sqrt{b\cos(c+dx)}} \\
&\quad-\frac{\left(bB\sqrt{b\cos(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx}{\sqrt{\cos(c+dx)}} \\
&= -\frac{2bB\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}}+\frac{2Ab^2\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} \\
&\quad+\frac{2Ab^3\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}}+\frac{2b^2B\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.34 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.62

$$
\int(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^4(c+dx)\,dx=\frac{2b^2\left(-3B\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)+A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+3B\sin(c+
$$

```
[In] Integrate[(b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x])*Sec[c + d*x]^4,x]
```

```
[Out] (2*b^2*(-3*B*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2] + A*Sqrt[Cos[c +
d*x]]*EllipticF[(c + d*x)/2, 2] + 3*B*Sin[c + d*x] + A*Tan[c + d*x]))/(3*d*
Sqrt[b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 403 vs. 2(177) = 354.

Time = 6.39 (sec) , antiderivative size = 404, normalized size of antiderivative = 2.87

method	result
default	$\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b\left(2A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12}{}$
parts	$-\frac{2A\left(-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}}{3\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\sin\left(\right.}$

```
[In] int((cos(d*x+c)*b)^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)^4,x,method=_RETURNVERB
OSE)
```

```
[Out] 2/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*b/sin(1/2*d
*x+1/2*c)^3/(4*sin(1/2*d*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)*(2*A*(sin(1/2
*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*(2*sin(1/2*d*x+1
/2*c)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2-12*B*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1
/2*c)^4+6*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/
2))*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2+2*A*cos(1/2*d*x+1
/2*c)*sin(1/2*d*x+1/2*c)^2-A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/
2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+6*B*cos(1/2*d*x+1/2*c
)*sin(1/2*d*x+1/2*c)^2-3*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*
c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c)
^4*b+b*sin(1/2*d*x+1/2*c)^2)^(1/2)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 192, normalized size of antiderivative = 1.36

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^4(c+dx)\,dx = \frac{-i\sqrt{2}Ab^{\frac{3}{2}}\cos(dx+c)^2\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+i\sqrt{2}Ab^{\frac{3}{2}}\cos(d}{}$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)^4,x, algorithm="
fricas")
```

```
[Out] 1/3*(-I*sqrt(2)*A*b^(3/2)*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x
 + c) + I*sin(d*x + c)) + I*sqrt(2)*A*b^(3/2)*cos(d*x + c)^2*weierstrassPIn
verse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 3*I*sqrt(2)*B*b^(3/2)*cos(d*x
 + c)^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c))) + 3*I*sqrt(2)*B*b^(3/2)*cos(d*x + c)^2*weierstrassZeta(-4, 0
, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(3*B*b*cos
(d*x + c) + A*b)*sqrt(b*cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^4(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)**4,x)
[Out] Timed out
```

Maxima [F]

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^4(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{3}{2}}\sec(dx+c)^4\,dx$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)^4,x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2)*sec(d*x + c)^4, x)
```

Giac [F]

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^4(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{3}{2}}\sec(dx+c)^4\,dx$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)^4,x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2)*sec(d*x + c)^4, x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^4(c+dx)\,dx=\int \frac{(b\,\cos\left(c+d\,x\right))^{3/2}\,\left(A+B\,\cos\left(c+d\,x\right)\right)}{\cos\left(c+d\,x\right)^4}\,dx$$

```
[In] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^4,x)
[Out] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^4, x)
```

3.812 $\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^5(c+dx)\,dx$

Optimal result

Integrand size = 31, antiderivative size = 174

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^5(c+dx)\,dx = -\frac{6Ab\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}}+\frac{2b^2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}}+\frac{2Ab^4\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}}+\frac{2b^3B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}}+\frac{6Ab^2\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2/5*A*b^4*sin(d*x+c)/d/(b*cos(d*x+c))^(5/2)+2/3*b^3*B*sin(d*x+c)/d/(b*cos(d
*x+c))^(3/2)+6/5*A*b^2*sin(d*x+c)/d/(b*cos(d*x+c))^(1/2)+2/3*b^2*B*(cos(1/2
*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2
))*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)-6/5*A*b*(cos(1/2*d*x+1/2*c)^2)^(
1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c)
)^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 174, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used

$= \{16, 2827, 2716, 2721, 2719, 2720\}$

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^5(c+dx)\,dx = \frac{2Ab^4\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{6Ab^2\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}} - \frac{6AbE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{5d\sqrt{\cos(c+dx)}} + \frac{2b^3B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2b^2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x])*Sec[c + d*x]^5,x]
```

```
[Out] (-6*A*b*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(5*d*Sqrt[Cos[c + d
*x]]) + (2*b^2*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*d*Sqrt[b*
Cos[c + d*x]]) + (2*A*b^4*Sin[c + d*x])/(5*d*(b*Cos[c + d*x])^(5/2)) + (2*b
^3*B*Sin[c + d*x])/(3*d*(b*Cos[c + d*x])^(3/2)) + (6*A*b^2*Sin[c + d*x])/(5
*d*Sqrt[b*Cos[c + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= b^5 \int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{7/2}}\,dx \\
&= \left(Ab^5\right)\int \frac{1}{(b\cos(c+dx))^{7/2}}\,dx + \left(b^4B\right)\int \frac{1}{(b\cos(c+dx))^{5/2}}\,dx \\
&= \frac{2Ab^4\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2b^3B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} \\
&\quad + \frac{1}{5}\left(3Ab^3\right)\int \frac{1}{(b\cos(c+dx))^{3/2}}\,dx + \frac{1}{3}\left(b^2B\right)\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx \\
&= \frac{2Ab^4\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2b^3B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{6Ab^2\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}} \\
&\quad - \frac{1}{5}(3Ab)\int \sqrt{b\cos(c+dx)}\,dx + \frac{\left(b^2B\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3\sqrt{b\cos(c+dx)}} \\
&= \frac{2b^2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} \\
&\quad + \frac{2Ab^4\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2b^3B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} \\
&\quad + \frac{6Ab^2\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}} - \frac{\left(3Ab\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{5\sqrt{\cos(c+dx)}} \\
&= -\frac{6Ab\sqrt{b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}} + \frac{2b^2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} \\
&\quad + \frac{2Ab^4\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2b^3B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{6Ab^2\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.55 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.61

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^5(c+dx)\,dx = \frac{2(b\cos(c+dx))^{3/2}\sec^3(c+dx)\left(-9A\cos^{\frac{3}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)+5B\cos^{\frac{3}{2}}(c+dx)\,\text{EllipticF}\left(\right.\right.}{15d}$$

```
[In] Integrate[(b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x])*Sec[c + d*x]^5,x]
```

```
[Out] (2*(b*Cos[c + d*x])^(3/2)*Sec[c + d*x]^3*(-9*A*Cos[c + d*x]^(3/2)*EllipticE
[(c + d*x)/2, 2] + 5*B*Cos[c + d*x]^(3/2)*EllipticF[(c + d*x)/2, 2] + 5*B*S
in[c + d*x] + (9*A*Sin[2*(c + d*x)])/2 + 3*A*Tan[c + d*x]))/(15*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 576 vs. 2(202) = 404.

Time = 8.30 (sec) , antiderivative size = 577, normalized size of antiderivative = 3.32

method	result
default	$-\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b\left(72A\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-36A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E\left(\right.\right.}{}$
parts	$-\frac{2A\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b\left(24\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,E\left(\right.\right.}{}$

```
[In] int((cos(d*x+c)*b)^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)^5,x,method=_RETURNVERB
OSE)
```

```
[Out] -2/15*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*b/sin(1/2
*d*x+1/2*c)^3/(8*sin(1/2*d*x+1/2*c)^6-12*sin(1/2*d*x+1/2*c)^4+6*sin(1/2*d*x
+1/2*c)^2-1)*(72*A*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6-36*A*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/
2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^4-20*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin
(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*
x+1/2*c)^4-72*A*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4+36*A*(sin(1/2*d*x+1
/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c
),2^(1/2))*sin(1/2*d*x+1/2*c)^2-20*B*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^
4+20*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Ellipt
icF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2+24*A*cos(1/2*d*x+1/2*c
)*sin(1/2*d*x+1/2*c)^2-9*A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*
c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+10*B*cos(1/2*d*x+1/2*c)
```

```
*sin(1/2*d*x+1/2*c)^2-5*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c
)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c)^
4*b+b*sin(1/2*d*x+1/2*c)^2)^(1/2)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 205, normalized size of antiderivative = 1.18

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^5(c+dx)\,dx = \frac{-5i\sqrt{2}Bb^{\frac{3}{2}}\cos(dx+c)^3\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\,\sin(dx+c))+5i\sqrt{2}Bb^{\frac{3}{2}}\cos}{}$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)^5,x, algorithm="
fricas")
```

```
[Out] 1/15*(-5*I*sqrt(2)*B*b^(3/2)*cos(d*x + c)^3*weierstrassPInverse(-4, 0, cos(
d*x + c) + I*sin(d*x + c)) + 5*I*sqrt(2)*B*b^(3/2)*cos(d*x + c)^3*weierstra
ssPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 9*I*sqrt(2)*A*b^(3/2)*co
s(d*x + c)^3*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c)
 + I*sin(d*x + c))) + 9*I*sqrt(2)*A*b^(3/2)*cos(d*x + c)^3*weierstrassZeta(
-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(9*A*
b*cos(d*x + c)^2 + 5*B*b*cos(d*x + c) + 3*A*b)*sqrt(b*cos(d*x + c))*sin(d*x
 + c))/(d*cos(d*x + c)^3)
```

Sympy [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^5(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)**5,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^5(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{3}{2}}\sec(dx+c)^5\,dx$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)^5,x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2)*sec(d*x + c)^5, x)
```

Giac [F]

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^5(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{3}{2}}\sec(dx+c)^5\,dx$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))*sec(d*x+c)^5,x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2)*sec(d*x + c)^5, x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\sec^5(c+dx)\,dx = \int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos(c+dx)^5}\,dx$$

```
[In] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^5,x)
[Out] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^5, x)
```

3.813 $\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 23, antiderivative size = 171

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx = \frac{6Ab^2\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}} + \frac{10b^3B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d\sqrt{b\cos(c+dx)}} + \frac{10b^2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21d} + \frac{2Ab(b\cos(c+dx))^{3/2}\sin(c+dx)}{5d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7d}$$

```
[Out] 2/5*A*b*(b*cos(d*x+c))^(3/2)*sin(d*x+c)/d+2/7*B*(b*cos(d*x+c))^(5/2)*sin(d*
x+c)/d+10/21*b^3*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elliptic
F(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)+10/21
*b^2*B*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d+6/5*A*b^2*(cos(1/2*d*x+1/2*c)^2)^(
1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c)
)^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 171, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2827, 2715, 2721, 2719, 2720}

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx = \frac{6Ab^2E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{5d\sqrt{\cos(c+dx)}} + \frac{2Ab\sin(c+dx)(b\cos(c+dx))^{3/2}}{5d} + \frac{10b^3B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d\sqrt{b\cos(c+dx)}} + \frac{10b^2B\sin(c+dx)\sqrt{b\cos(c+dx)}}{21d} + \frac{2B\sin(c+dx)(b\cos(c+dx))^{5/2}}{7d}$$

```
[In] Int[(b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (6*A*b^2*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(5*d*Sqrt[Cos[c +
d*x]]) + (10*b^3*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(21*d*Sqrt
[b*Cos[c + d*x]]) + (10*b^2*B*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(21*d) + (
2*A*b*(b*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(5*d) + (2*B*(b*Cos[c + d*x])^(5
/2)*Sin[c + d*x])/(7*d)
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= A\int (b\cos(c+dx))^{5/2}\,dx+\frac{B\int (b\cos(c+dx))^{7/2}\,dx}{b}\\
&= \frac{2Ab(b\cos(c+dx))^{3/2}\sin(c+dx)}{5d}+\frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7d}\\
&\quad+\frac{1}{5}\left(3Ab^2\right)\int \sqrt{b\cos(c+dx)}\,dx+\frac{1}{7}(5bB)\int (b\cos(c+dx))^{3/2}\,dx
\end{aligned}$$

$$= \frac{10b^2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21d} + \frac{2Ab(b\cos(c+dx))^{3/2}\sin(c+dx)}{5d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7d} + \frac{1}{21}(5b^3B)\int \frac{1}{\sqrt{b\cos(c+dx)}}dx + \frac{\left(3Ab^2\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}dx}{5\sqrt{\cos(c+dx)}}$$

$$= \frac{6Ab^2\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}} + \frac{10b^2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21d} + \frac{2Ab(b\cos(c+dx))^{3/2}\sin(c+dx)}{5d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7d} + \frac{\left(5b^3B\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}dx}{21\sqrt{b\cos(c+dx)}}$$

$$= \frac{6Ab^2\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}} + \frac{10b^3B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d\sqrt{b\cos(c+dx)}} + \frac{10b^2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21d} + \frac{2Ab(b\cos(c+dx))^{3/2}\sin(c+dx)}{5d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7d}$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.58

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx = \frac{(b\cos(c+dx))^{5/2}\left(252AE\left(\frac{1}{2}(c+dx)\middle|2\right) + 100B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right) + 2\sqrt{\cos(c+\right.}{210d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Integrate[(b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x]),x]
```

```
[Out] ((b*Cos[c + d*x])^(5/2)*(252*A*EllipticE[(c + d*x)/2, 2] + 100*B*EllipticF[
(c + d*x)/2, 2] + 2*Sqrt[Cos[c + d*x]]*(65*B + 42*A*Cos[c + d*x] + 15*B*Cos
[2*(c + d*x)])*Sin[c + d*x]))/(210*d*Cos[c + d*x]^(5/2))
```

Maple [A] (verified)

Time = 9.01 (sec) , antiderivative size = 301, normalized size of antiderivative = 1.76

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b^3\left(240B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(-168A-360B)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\right.}{}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b^3\left(-8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right.\right.}{5\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\right.\right.\right.}}$

```
[In] int((cos(d*x+c)*b)^(5/2)*(A+B*cos(d*x+c)),x,method=_RETURNVERBOSE)
```

```
[Out] -2/105*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*b^3*(240*B
*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8+(-168*A-360*B)*sin(1/2*d*x+1/2*c)^
6*cos(1/2*d*x+1/2*c)+(168*A+280*B)*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+
(-42*A-80*B)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-63*A*(sin(1/2*d*x+1/2*
c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2
^(1/2))+25*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*
EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1/2*d*x+1/2*c)^4-sin(1/2*
d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2
)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.13 (sec) , antiderivative size = 171, normalized size of antiderivative = 1.00

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx = \frac{-25i\sqrt{2}Bb^{\frac{5}{2}}\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+25i\sqrt{2}Bb^{\frac{5}{2}}\text{weier}}{}$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/105*(-25*I*sqrt(2)*B*b^(5/2)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c)) + 25*I*sqrt(2)*B*b^(5/2)*weierstrassPInverse(-4, 0, cos(d*x +
 c) - I*sin(d*x + c)) + 63*I*sqrt(2)*A*b^(5/2)*weierstrassZeta(-4, 0, weier
strassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 63*I*sqrt(2)*A*b^(5
/2)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(
d*x + c))) + 2*(15*B*b^2*cos(d*x + c)^2 + 21*A*b^2*cos(d*x + c) + 25*B*b^2)
*sqrt(b*cos(d*x + c))*sin(d*x + c))/d
```

Sympy [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(5/2)*(A+B*cos(d*x+c)),x)
[Out] Timed out
```

Maxima [F]

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{5}{2}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2), x)
```

Giac [F]

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{5}{2}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c)),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx = \int (b\,\cos(c+d\,x))^{5/2}\,(A+B\,\cos(c+d\,x))\,dx$$

```
[In] int((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)),x)
[Out] int((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)), x)
```

3.814 $\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec(c+dx)\,dx$

Optimal result

Integrand size = 29, antiderivative size = 145

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec(c+dx)\,dx = \frac{6b^2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}} + \frac{2Ab^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2Ab^2\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2bB(b\cos(c+dx))^{3/2}\sin(c+dx)}{5d}$$

```
[Out] 2/5*b*B*(b*cos(d*x+c))^(3/2)*sin(d*x+c)/d+2/3*A*b^3*(cos(1/2*d*x+1/2*c)^2)^
(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(
1/2)/d/(b*cos(d*x+c))^(1/2)+2/3*A*b^2*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d+6/5
*b^2*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*
x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used

$= \{16, 2827, 2715, 2721, 2720, 2719\}$

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec(c+dx)\,dx = \frac{2Ab^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2Ab^2\sin(c+dx)\sqrt{b\cos(c+dx)}}{3d} + \frac{6b^2BE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{5d\sqrt{\cos(c+dx)}} + \frac{2bB\sin(c+dx)(b\cos(c+dx))^{3/2}}{5d}$$

```
[In] Int[(b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x])*Sec[c + d*x],x]
```

```
[Out] (6*b^2*B*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(5*d*Sqrt[Cos[c +
d*x]]) + (2*A*b^3*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*d*Sqrt[b
*Cos[c + d*x]]) + (2*A*b^2*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(3*d) + (2*b*
B*(b*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(5*d)
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= b\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx\\
&= (Ab)\int (b\cos(c+dx))^{3/2}\,dx + B\int (b\cos(c+dx))^{5/2}\,dx\\
&= \frac{2Ab^2\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2bB(b\cos(c+dx))^{3/2}\sin(c+dx)}{5d}\\
&\quad + \frac{1}{3}\left(Ab^3\right)\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx + \frac{1}{5}\left(3b^2B\right)\int \sqrt{b\cos(c+dx)}\,dx\\
&= \frac{2Ab^2\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2bB(b\cos(c+dx))^{3/2}\sin(c+dx)}{5d}\\
&\quad + \frac{\left(Ab^3\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3\sqrt{b\cos(c+dx)}}\\
&\quad + \frac{\left(3b^2B\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{5\sqrt{\cos(c+dx)}}\\
&= \frac{6b^2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}} + \frac{2Ab^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}}\\
&\quad + \frac{2Ab^2\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{2bB(b\cos(c+dx))^{3/2}\sin(c+dx)}{5d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.61

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec(c+dx)\,dx = \frac{2b(b\cos(c+dx))^{3/2}\left(9BE\left(\frac{1}{2}(c+dx)\middle|2\right)+5A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\sqrt{\cos(c+dx)}(5A+3B\cos(c+dx))\sin(c+dx)\right)}{15d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Integrate[(b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x])*Sec[c + d*x],x]
[Out] (2*b*(b*Cos[c + d*x])^(3/2)*(9*B*EllipticE[(c + d*x)/2, 2] + 5*A*EllipticF[
(c + d*x)/2, 2] + Sqrt[Cos[c + d*x]]*(5*A + 3*B*Cos[c + d*x])*Sin[c + d*x])
)/(15*d*Cos[c + d*x]^(3/2))
```

Maple [A] (verified)

Time = 8.88 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.88

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\, b^3\left(-24B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(20A+24B)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+(\cdots\right.}{15\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\cdots\right.\right.}}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\, b^3\left(4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\cdots\right.}{3\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\cdots}}$

```
[In] int((cos(d*x+c)*b)^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c),x,method=_RETURNVERBOS
E)
```

```
[Out] -2/15*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*b^3*(-24*B*
cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+(20*A+24*B)*sin(1/2*d*x+1/2*c)^4*co
s(1/2*d*x+1/2*c)+(-10*A-6*B)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+5*A*(s
in(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1
/2*d*x+1/2*c),2^(1/2))-9*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*
c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1/2*d*x+1/2
*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d*x+1/2*c
)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.08

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec(c+dx)\,dx = \frac{-5i\sqrt{2}Ab^{\frac{5}{2}}\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+5i\sqrt{2}Ab^{\frac{5}{2}}\text{weierstrassPInve}\cdots}{\cdots}$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c),x, algorithm="fr
icas")
```

```
[Out] 1/15*(-5*I*sqrt(2)*A*b^(5/2)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*si
n(d*x + c)) + 5*I*sqrt(2)*A*b^(5/2)*weierstrassPInverse(-4, 0, cos(d*x + c)
 - I*sin(d*x + c)) + 9*I*sqrt(2)*B*b^(5/2)*weierstrassZeta(-4, 0, weierstra
ssPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 9*I*sqrt(2)*B*b^(5/2)*w
eierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x +
 c))) + 2*(3*B*b^2*cos(d*x + c) + 5*A*b^2)*sqrt(b*cos(d*x + c))*sin(d*x + c
))/d
```

Sympy [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(5/2)*(A+B*cos(d*x+c))*sec(d*x+c),x)
[Out] Timed out
```

Maxima [F]

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{5}{2}}\sec(dx+c)\,dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c),x, algorithm="ma
xima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2)*sec(d*x + c), x)
```

Giac [F]

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{5}{2}}\sec(dx+c)\,dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c),x, algorithm="gi
ac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2)*sec(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec(c+dx)\,dx=\int \frac{(b\,\cos\left(c+d\,x\right))^{5/2}\,\left(A+B\,\cos\left(c+d\,x\right)\right)}{\cos\left(c+d\,x\right)}\,dx$$

```
[In] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x),x)
[Out] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x), x)
```

3.815 $\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 31, antiderivative size = 116

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \frac{2Ab^2\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}} + \frac{2b^3B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2b^2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d}$$

```
[Out] 2/3*b^3*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2
*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)+2/3*b^2*B*sin(
d*x+c)*(b*cos(d*x+c))^(1/2)/d+2*A*b^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*
d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/d/cos
(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.194$, Rules used = {16, 2827, 2721, 2719, 2715, 2720}

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \frac{2Ab^2E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}} + \frac{2b^3B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2b^2B\sin(c+dx)\sqrt{b\cos(c+dx)}}{3d}$$

```
[In] Int[(b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x])*Sec[c + d*x]^2,x]
```

```
[Out] (2*A*b^2*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(d*Sqrt[Cos[c + d*
x]]) + (2*b^3*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*d*Sqrt[b*C
os[c + d*x]]) + (2*b^2*B*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(3*d)
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= b^2 \int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx \\
&= \left(Ab^2\right)\int \sqrt{b\cos(c+dx)}\,dx + (bB)\int (b\cos(c+dx))^{3/2}\,dx
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{2b^2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d} + \frac{1}{3}(b^3B)\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx \\
&\quad + \frac{\left(Ab^2\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{\sqrt{\cos(c+dx)}} \\
&= \frac{2Ab^2\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}} + \frac{2b^2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d} \\
&\quad + \frac{\left(b^3B\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3\sqrt{b\cos(c+dx)}} \\
&= \frac{2Ab^2\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}} \\
&\quad + \frac{2b^3B\sqrt{\cos(c+dx)}\,\mathrm{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2b^2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 78, normalized size of antiderivative = 0.67

$$
\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \frac{2b^2\sqrt{b\cos(c+dx)}\left(3AE\left(\frac{1}{2}(c+dx)\middle|2\right)+B\left(\mathrm{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\sqrt{\cos(c+dx)}\sin(c+dx)\right)\right)}{3d\sqrt{\cos(c+dx)}}
$$

```
[In] Integrate[(b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x])*Sec[c + d*x]^2,x]
[Out] (2*b^2*Sqrt[b*Cos[c + d*x]]*(3*A*EllipticE[(c + d*x)/2, 2] + B*(EllipticF[(
c + d*x)/2, 2] + Sqrt[Cos[c + d*x]]*Sin[c + d*x])))/(3*d*Sqrt[Cos[c + d*x]]
)
```

Maple [A] (verified)

Time = 15.67 (sec) , antiderivative size = 240, normalized size of antiderivative = 2.07

method	result
default	$\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b^3\left(-4B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+3A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E\left(\cos\right.\right.}{3\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\,\sin\left(\frac{dx}{2}\right.}$
parts	$\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b^3\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b}\,d}-\frac{2B\sqrt{\left(2\left(\cos^2\left(\frac{d}{}\right.\right.\right.}}{}$

```
[In] int((cos(d*x+c)*b)^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x,method=_RETURNVERB
OSE)
```

```
[Out] 2/3*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*b^3*(-4*B*cos
(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4+3*A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*si
n(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+2*B*cos(1
/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2-B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/
2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1
/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2
*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 142, normalized size of antiderivative = 1.22

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \frac{-i\sqrt{2}Bb^{\frac{5}{2}}\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+i\sqrt{2}Bb^{\frac{5}{2}}\text{weierstrassPInvers}}{}$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="
fricas")
```

```
[Out] 1/3*(-I*sqrt(2)*B*b^(5/2)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d
*x + c)) + I*sqrt(2)*B*b^(5/2)*weierstrassPInverse(-4, 0, cos(d*x + c) - I*
sin(d*x + c)) + 3*I*sqrt(2)*A*b^(5/2)*weierstrassZeta(-4, 0, weierstrassPIn
verse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*I*sqrt(2)*A*b^(5/2)*weiers
trassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)))
 + 2*sqrt(b*cos(d*x + c))*B*b^2*sin(d*x + c))/d
```

Sympy [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)**2,x)
[Out] Timed out
```

Maxima [F]

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{5}{2}}\sec(dx+c)^2\,dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2)*sec(d*x + c)^2, x)
```

Giac [F]

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{5}{2}}\sec(dx+c)^2\,dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2)*sec(d*x + c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \int \frac{\left(b\,\cos\left(c+d\,x\right)\right)^{5/2}\,\left(A+B\,\cos\left(c+d\,x\right)\right)}{{\cos\left(c+d\,x\right)}^2}\,dx$$

```
[In] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^2,x)
[Out] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^2, x)
```

3.816 $\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 31, antiderivative size = 85

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^3(c+dx)\,dx=\frac{2b^2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}}+\frac{2Ab^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2*A*b^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d
*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)+2*b^2*B*(cos(1/2
*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2
))*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.161, Rules used = {16, 2827, 2721, 2720, 2719}

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^3(c+dx)\,dx=\frac{2Ab^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}}+\frac{2b^2BE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x])*Sec[c + d*x]^3,x]
```

```
[Out] (2*b^2*B*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(d*Sqrt[Cos[c + d*
x]]) + (2*A*b^3*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(d*Sqrt[b*Cos
[c + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= b^3 \int \frac{A+B\cos(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx \\
&= \left(Ab^3\right)\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx + \left(b^2B\right)\int \sqrt{b\cos(c+dx)}\,dx \\
&= \frac{\left(Ab^3\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{\sqrt{b\cos(c+dx)}} + \frac{\left(b^2B\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{\sqrt{\cos(c+dx)}} \\
&= \frac{2b^2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{d\sqrt{\cos(c+dx)}} + \frac{2Ab^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.39 (sec) , antiderivative size = 54, normalized size of antiderivative = 0.64

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \frac{2(b\cos(c+dx))^{5/2}\left(BE\left(\frac{1}{2}(c+dx)\middle|2\right)+A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\right)}{d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Integrate[(b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x])*Sec[c + d*x]^3,x]
[Out] (2*(b*Cos[c + d*x])^(5/2)*(B*EllipticE[(c + d*x)/2, 2] + A*EllipticF[(c + d
*x)/2, 2]))/(d*Cos[c + d*x]^(5/2))
```

Maple [A] (verified)

Time = 53.23 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.92

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b^3\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\left(AF\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-BE\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\right.\right.}{\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b}\,d}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b^3\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b}\,d}+\frac{2B\sqrt{\left(2\left(\cos^2\left(\right.\right.\right.}}{\sqrt{-}}$
risch	$-\frac{iB\,b^2\sqrt{2}\,\sqrt{\left(e^{2i(dx+c)}+1\right)b\,e^{-i(dx+c)}}}{d}-\frac{i\left(\frac{iA\sqrt{-i\left(e^{i(dx+c)}+i\right)}\,\sqrt{2}\,\sqrt{i\left(e^{i(dx+c)}-i\right)}\,\sqrt{ie^{i(dx+c)}}\,F\left(\sqrt{-i\left(e^{i(dx+c)}+i\right)},\frac{\sqrt{2}}{2}\right)}{\sqrt{b\,e^{3i(dx+c)}+b\,e^{i(dx+c)}}}+B\left(-\frac{}{b\sqrt{e}}\right.\right.}{}$

```
[In] int((cos(d*x+c)*b)^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x,method=_RETURNVERB
OSE)
[Out] -2*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*b^3*(sin(1/2*d
*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*(A*EllipticF(cos(1/2*d
*x+1/2*c),2^(1/2))-B*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1/2*
d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d*
x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.40

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \frac{-i\sqrt{2}Ab^{\frac{5}{2}}\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+i\sqrt{2}Ab^{\frac{5}{2}}\text{weierstrassPInvers}}{}$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="
fricas")
```

```
[Out] (-I*sqrt(2)*A*b^(5/2)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x +
 c)) + I*sqrt(2)*A*b^(5/2)*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(
d*x + c)) + I*sqrt(2)*B*b^(5/2)*weierstrassZeta(-4, 0, weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c))) - I*sqrt(2)*B*b^(5/2)*weierstrassZet
a(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/d
```

Sympy [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)**3,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{5}{2}}\sec(dx+c)^3\,dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="
maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2)*sec(d*x + c)^3, x)
```

Giac [F]

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^3(c+dx)\,dx=\int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{5}{2}}\sec(dx+c)^3\,dx$$

[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="giac")

[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2)*sec(d*x + c)^3, x)

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^3(c+dx)\,dx=\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos(c+dx)^3}\,dx$$

[In] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^3,x)

[Out] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^3, x)

3.817 $\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^4(c+dx)\,dx$

Optimal result

Integrand size = 31, antiderivative size = 112

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^4(c+dx)\,dx = -\frac{2Ab^2\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}} + \frac{2b^3B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}} + \frac{2Ab^3\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2*A*b^3*sin(d*x+c)/d/(b*cos(d*x+c))^(1/2)+2*b^3*B*(cos(1/2*d*x+1/2*c)^2)^(1
/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/
2)/d/(b*cos(d*x+c))^(1/2)-2*A*b^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+
1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/d/cos(d*x
+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.194$, Rules used = {16, 2827, 2716, 2721, 2719, 2720}

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^4(c+dx)\,dx = \frac{2Ab^3\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} - \frac{2Ab^2E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}} + \frac{2b^3B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x])*Sec[c + d*x]^4,x]
```

```
[Out] (-2*A*b^2*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(d*Sqrt[Cos[c + d
*x]]) + (2*b^3*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(d*Sqrt[b*Co
s[c + d*x]]) + (2*A*b^3*Sin[c + d*x])/(d*Sqrt[b*Cos[c + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = b^4 \int \frac{A + B\cos(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx$$

$$= \left(Ab^4\right)\int \frac{1}{(b\cos(c+dx))^{3/2}}\,dx + \left(b^3B\right)\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx$$

$$
\begin{aligned}
&= \frac{2Ab^3 \sin(c+dx)}{d\sqrt{b\cos(c+dx)}} - (Ab^2)\int \sqrt{b\cos(c+dx)}\,dx + \frac{\left(b^3B\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{\sqrt{b\cos(c+dx)}} \\
&= \frac{2b^3B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}} + \frac{2Ab^3\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} \\
&\quad - \frac{\left(Ab^2\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{\sqrt{\cos(c+dx)}} \\
&= -\frac{2Ab^2\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{d\sqrt{\cos(c+dx)}} \\
&\quad + \frac{2b^3B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}} + \frac{2Ab^3\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.37 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.65

$$
\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^4(c+dx)\,dx = \frac{2(b\cos(c+dx))^{5/2}\left(-AE\left(\frac{1}{2}(c+dx)\middle|\,2\right)+B\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\frac{A\sin(c+dx)}{\sqrt{\cos(c+dx)}}\right)}{d\cos^{\frac{5}{2}}(c+dx)}
$$

```
[In] Integrate[(b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x])*Sec[c + d*x]^4,x]
[Out] (2*(b*Cos[c + d*x])^(5/2)*(-(A*EllipticE[(c + d*x)/2, 2]) + B*EllipticF[(c
+ d*x)/2, 2] + (A*Sin[c + d*x])/Sqrt[Cos[c + d*x]]))/(d*Cos[c + d*x]^(5/2))
```

Maple [A] (verified)

Time = 158.89 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.94

method	result
default	$\frac{2b^3\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(2A\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E\left(\cos\left(\frac{dx}{2}\cdots\right.\right.\right.}{\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}\cdots\right.\right.\right.}}$
parts	$-\frac{2A\,b^3\left(-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{-2\left(\cdots\right.}\right.}{\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\cdots\right.}}$

```
[In] int((cos(d*x+c)*b)^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^4,x,method=_RETURNVERB
OSE)
```

```
[Out] 2*b^3*(-2*sin(1/2*d*x+1/2*c)^4*b+b*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*A*cos(1/2
*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2-A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*
d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-B*(sin(1/2*d*x+
1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*
c),2^(1/2)))/(-b*(2*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1
/2*d*x+1/2*c)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.54

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^4(c+dx)\,dx = \frac{-i\sqrt{2}Bb^{\frac{5}{2}}\cos(dx+c)\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+i\sqrt{2}Bb^{\frac{5}{2}}\cos(dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^4,x, algorithm="
fricas")
```

```
[Out] (-I*sqrt(2)*B*b^(5/2)*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c)
+ I*sin(d*x + c)) + I*sqrt(2)*B*b^(5/2)*cos(d*x + c)*weierstrassPInverse(-4
, 0, cos(d*x + c) - I*sin(d*x + c)) - I*sqrt(2)*A*b^(5/2)*cos(d*x + c)*weie
rstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)
)) + I*sqrt(2)*A*b^(5/2)*cos(d*x + c)*weierstrassZeta(-4, 0, weierstrassPIn
verse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*sqrt(b*cos(d*x + c))*A*b^2
*sin(d*x + c))/(d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^4(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)**4,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^4(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{5}{2}}\sec(dx+c)^4\,dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^4,x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2)*sec(d*x + c)^4, x)
```

Giac [F]

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^4(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{5}{2}}\sec(dx+c)^4\,dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^4,x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2)*sec(d*x + c)^4, x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^4(c+dx)\,dx = \int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos(c+dx)^4}\,dx$$

```
[In] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^4,x)
[Out] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^4, x)
```

3.818 $\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^5(c+dx)\,dx$

Optimal result

Integrand size = 31, antiderivative size = 143

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^5(c+dx)\,dx = -\frac{2b^2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}}+\frac{2Ab^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}}+\frac{2Ab^4\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}}+\frac{2b^3B\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2/3*A*b^4*sin(d*x+c)/d/(b*cos(d*x+c))^(3/2)+2*b^3*B*sin(d*x+c)/d/(b*cos(d*x
+c))^(1/2)+2/3*A*b^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)-2*b
^2*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+
1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 143, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used = {16, 2827, 2716, 2721, 2720, 2719}

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^5(c+dx)\,dx = \frac{2Ab^4\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}}+\frac{2Ab^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}}+\frac{2b^3B\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}-\frac{2b^2BE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x])*Sec[c + d*x]^5,x]
```

```
[Out] (-2*b^2*B*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(d*Sqrt[Cos[c + d
*x]]) + (2*A*b^3*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*d*Sqrt[b*
Cos[c + d*x]]) + (2*A*b^4*Sin[c + d*x])/(3*d*(b*Cos[c + d*x])^(3/2)) + (2*b
^3*B*Sin[c + d*x])/(d*Sqrt[b*Cos[c + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = b^5 \int \frac{A + B\cos(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx$$

$$= \left(Ab^5\right)\int \frac{1}{(b\cos(c+dx))^{5/2}}\,dx + \left(b^4B\right)\int \frac{1}{(b\cos(c+dx))^{3/2}}\,dx$$

$$= \frac{2Ab^4\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2b^3B\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} + \frac{1}{3}(Ab^3)\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx - (b^2B)\int \sqrt{b\cos(c+dx)}\,dx$$

$$= \frac{2Ab^4\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2b^3B\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} + \frac{\left(Ab^3\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3\sqrt{b\cos(c+dx)}} - \frac{\left(b^2B\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{\sqrt{\cos(c+dx)}}$$

$$= -\frac{2b^2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}} + \frac{2Ab^3\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2Ab^4\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2b^3B\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.38 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.61

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^5(c+dx)\,dx = \frac{2b^3\left(-3B\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right) + A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right) + 3B\sin(c+d\right.}{3d\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[(b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x])*Sec[c + d*x]^5,x]
[Out] (2*b^3*(-3*B*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2] + A*Sqrt[Cos[c +
d*x]]*EllipticF[(c + d*x)/2, 2] + 3*B*Sin[c + d*x] + A*Tan[c + d*x]))/(3*d*
Sqrt[b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 405 vs. 2(179) = 358.

Time = 2.43 (sec) , antiderivative size = 406, normalized size of antiderivative = 2.84

$$\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b^2\left(2A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right.\right.}\right.}{}$$

```
[In] int((cos(d*x+c)*b)^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^5,x)
```

```
[Out] 2/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*b^2/sin(1/2
*d*x+1/2*c)^3/(4*sin(1/2*d*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)*(2*A*(sin(1
/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*(2*sin(1/2*d*x
+1/2*c)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2-12*B*cos(1/2*d*x+1/2*c)*sin(1/2*d*x
+1/2*c)^4+6*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(
1/2))*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2+2*A*cos(1/2*d*x
+1/2*c)*sin(1/2*d*x+1/2*c)^2-A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+
1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+6*B*cos(1/2*d*x+1/2
*c)*sin(1/2*d*x+1/2*c)^2-3*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/
2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*
c)^4*b+b*sin(1/2*d*x+1/2*c)^2)^(1/2)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 196, normalized size of antiderivative = 1.37

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^5(c+dx)\,dx = \frac{-i\sqrt{2}Ab^{\frac{5}{2}}\cos(dx+c)^2\,\mathrm{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+i\sqrt{2}Ab^{\frac{5}{2}}\cos(}{}$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^5,x, algorithm="
fricas")
```

```
[Out] 1/3*(-I*sqrt(2)*A*b^(5/2)*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x
 + c) + I*sin(d*x + c)) + I*sqrt(2)*A*b^(5/2)*cos(d*x + c)^2*weierstrassPIn
verse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 3*I*sqrt(2)*B*b^(5/2)*cos(d*x
 + c)^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c))) + 3*I*sqrt(2)*B*b^(5/2)*cos(d*x + c)^2*weierstrassZeta(-4, 0
, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(3*B*b^2*c
os(d*x + c) + A*b^2)*sqrt(b*cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^5(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)**5,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^5(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{5}{2}}\sec(dx+c)^5\,dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^5,x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2)*sec(d*x + c)^5, x)
```

Giac [F]

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^5(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{5}{2}}\sec(dx+c)^5\,dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^5,x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2)*sec(d*x + c)^5, x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^5(c+dx)\,dx = \int \frac{(b\cos(c+d\,x))^{5/2}\,(A+B\cos(c+d\,x))}{\cos(c+d\,x)^5}\,dx$$

```
[In] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^5,x)
[Out] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^5, x)
```

3.819 $\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^6(c+dx)\,dx$

Optimal result

Integrand size = 31, antiderivative size = 176

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^6(c+dx)\,dx = -\frac{6Ab^2\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}}+\frac{2b^3B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}}+\frac{2Ab^5\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}}+\frac{2b^4B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}}+\frac{6Ab^3\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2/5*A*b^5*sin(d*x+c)/d/(b*cos(d*x+c))^(5/2)+2/3*b^4*B*sin(d*x+c)/d/(b*cos(d
*x+c))^(3/2)+6/5*A*b^3*sin(d*x+c)/d/(b*cos(d*x+c))^(1/2)+2/3*b^3*B*(cos(1/2
*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2
))*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)-6/5*A*b^2*(cos(1/2*d*x+1/2*c)^2)
^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+
c))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used

$= \{16, 2827, 2716, 2721, 2719, 2720\}$

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^6(c+dx)\,dx = \frac{2Ab^5\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{6Ab^3\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}} - \frac{6Ab^2E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{5d\sqrt{\cos(c+dx)}} + \frac{2b^4B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2b^3B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x])*Sec[c + d*x]^6,x]
```

```
[Out] (-6*A*b^2*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(5*d*Sqrt[Cos[c +
 d*x]]) + (2*b^3*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*d*Sqrt[
b*Cos[c + d*x]]) + (2*A*b^5*Sin[c + d*x])/(5*d*(b*Cos[c + d*x])^(5/2)) + (2
*b^4*B*Sin[c + d*x])/(3*d*(b*Cos[c + d*x])^(3/2)) + (6*A*b^3*Sin[c + d*x])/
(5*d*Sqrt[b*Cos[c + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = b^6 \int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{7/2}}\,dx$$

$$= \left(Ab^6\right)\int \frac{1}{(b\cos(c+dx))^{7/2}}\,dx + \left(b^5B\right)\int \frac{1}{(b\cos(c+dx))^{5/2}}\,dx$$

$$= \frac{2Ab^5\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2b^4B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{1}{5}\left(3Ab^4\right)\int \frac{1}{(b\cos(c+dx))^{3/2}}\,dx + \frac{1}{3}\left(b^3B\right)\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx$$

$$= \frac{2Ab^5\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2b^4B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{6Ab^3\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}} - \frac{1}{5}\left(3Ab^2\right)\int \sqrt{b\cos(c+dx)}\,dx + \frac{\left(b^3B\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3\sqrt{b\cos(c+dx)}}$$

$$= \frac{2b^3B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2Ab^5\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2b^4B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{6Ab^3\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}} - \frac{\left(3Ab^2\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{5\sqrt{\cos(c+dx)}}$$

$$= -\frac{6Ab^2\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}} + \frac{2b^3B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2Ab^5\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2b^4B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{6Ab^3\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.67 (sec) , antiderivative size = 102, normalized size of antiderivative = 0.58

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^6(c+dx)\,dx =$$

$$-\frac{2b^4\left(9A\cos^{\frac{3}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)-5B\cos^{\frac{3}{2}}(c+dx)\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)-5B\sin(c+dx)-\frac{9}{2}A\sin}{15d(b\cos(c+dx))^{3/2}}$$

```
[In] Integrate[(b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x])*Sec[c + d*x]^6,x]
```

```
[Out] (-2*b^4*(9*A*Cos[c + d*x]^(3/2)*EllipticE[(c + d*x)/2, 2] - 5*B*Cos[c + d*x
]^(3/2)*EllipticF[(c + d*x)/2, 2] - 5*B*Sin[c + d*x] - (9*A*Sin[2*(c + d*x)
])/2 - 3*A*Tan[c + d*x]))/(15*d*(b*Cos[c + d*x])^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 578 vs. 2(204) = 408.

Time = 3.17 (sec) , antiderivative size = 579, normalized size of antiderivative = 3.29

$$-\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,b^2\left(72A\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-36A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}}{}$$

```
[In] int((cos(d*x+c)*b)^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^6,x)
```

```
[Out] -2/15*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*b^2/sin(1
/2*d*x+1/2*c)^3/(8*sin(1/2*d*x+1/2*c)^6-12*sin(1/2*d*x+1/2*c)^4+6*sin(1/2*d
*x+1/2*c)^2-1)*(72*A*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6-36*A*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+
1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^4-20*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*s
in(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*
d*x+1/2*c)^4-72*A*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4+36*A*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2
*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2-20*B*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c
)^4+20*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Elli
pticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2+24*A*cos(1/2*d*x+1/2
*c)*sin(1/2*d*x+1/2*c)^2-9*A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/
2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+10*B*cos(1/2*d*x+1/2*
c)*sin(1/2*d*x+1/2*c)^2-5*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2
*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c
)^4*b+b*sin(1/2*d*x+1/2*c)^2)^(1/2)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 211, normalized size of antiderivative = 1.20

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^6(c+dx)\,dx = \frac{-5i\sqrt{2}Bb^{\frac{5}{2}}\cos(dx+c)^3\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+5i\sqrt{2}Bb^{\frac{5}{2}}\text{co}}{}$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^6,x, algorithm="
fricas")
```

```
[Out] 1/15*(-5*I*sqrt(2)*B*b^(5/2)*cos(d*x + c)^3*weierstrassPInverse(-4, 0, cos(
d*x + c) + I*sin(d*x + c)) + 5*I*sqrt(2)*B*b^(5/2)*cos(d*x + c)^3*weierstra
ssPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 9*I*sqrt(2)*A*b^(5/2)*co
s(d*x + c)^3*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c)
 + I*sin(d*x + c))) + 9*I*sqrt(2)*A*b^(5/2)*cos(d*x + c)^3*weierstrassZeta(
-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(9*A*
b^2*cos(d*x + c)^2 + 5*B*b^2*cos(d*x + c) + 3*A*b^2)*sqrt(b*cos(d*x + c))*s
in(d*x + c))/(d*cos(d*x + c)^3)
```

Sympy [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^6(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)**6,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^6(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{5}{2}}\sec(dx+c)^6\,dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^6,x, algorithm="
maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2)*sec(d*x + c)^6, x)
```

Giac [F]

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^6(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{5}{2}}\sec(dx+c)^6\,dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))*sec(d*x+c)^6,x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2)*sec(d*x + c)^6, x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\sec^6(c+dx)\,dx = \int \frac{(b\,\cos(c+d\,x))^{5/2}\,(A+B\,\cos(c+d\,x))}{\cos(c+d\,x)^6}\,dx$$

```
[In] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^6,x)
[Out] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^6, x)
```

3.820 $\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 173

$$\begin{aligned}\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx &= \frac{6A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5bd\sqrt{\cos(c+dx)}}\\ &\quad+\frac{10B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d\sqrt{b\cos(c+dx)}}\\ &\quad+\frac{10B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21bd}\\ &\quad+\frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^2d}\\ &\quad+\frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^3d}\end{aligned}$$

```
[Out] 2/5*A*(b*cos(d*x+c))^(3/2)*sin(d*x+c)/b^2/d+2/7*B*(b*cos(d*x+c))^(5/2)*sin(
d*x+c)/b^3/d+10/21*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)+10/
21*B*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/b/d+6/5*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)
/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1
/2)/b/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used = {16, 2827, 2715, 2721, 2719, 2720}

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{2A\sin(c+dx)(b\cos(c+dx))^{3/2}}{5b^2d} + \frac{6AE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{5bd\sqrt{\cos(c+dx)}} + \frac{2B\sin(c+dx)(b\cos(c+dx))^{5/2}}{7b^3d} + \frac{10B\sin(c+dx)\sqrt{b\cos(c+dx)}}{21bd} + \frac{10B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^3*(A + B*Cos[c + d*x]))/Sqrt[b*Cos[c + d*x]],x]
```

```
[Out] (6*A*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(5*b*d*Sqrt[Cos[c + d*
x]]) + (10*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(21*d*Sqrt[b*Cos
[c + d*x]]) + (10*B*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(21*b*d) + (2*A*(b*C
os[c + d*x])^(3/2)*Sin[c + d*x])/(5*b^2*d) + (2*B*(b*Cos[c + d*x])^(5/2)*Si
n[c + d*x])/(7*b^3*d)
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx}{b^3} \\
&= \frac{A\int (b\cos(c+dx))^{5/2}\,dx}{b^3} + \frac{B\int (b\cos(c+dx))^{7/2}\,dx}{b^4} \\
&= \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^2d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^3d} \\
&\quad + \frac{(3A)\int \sqrt{b\cos(c+dx)}\,dx}{5b} + \frac{(5B)\int (b\cos(c+dx))^{3/2}\,dx}{7b^2} \\
&= \frac{10B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21bd} + \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^2d} \\
&\quad + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^3d} \\
&\quad + \frac{1}{21}(5B)\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx + \frac{\left(3A\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{5b\sqrt{\cos(c+dx)}} \\
&= \frac{6A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5bd\sqrt{\cos(c+dx)}} + \frac{10B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21bd} \\
&\quad + \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^2d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^3d} \\
&\quad + \frac{\left(5B\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{21\sqrt{b\cos(c+dx)}} \\
&= \frac{6A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5bd\sqrt{\cos(c+dx)}} + \frac{10B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21d\sqrt{b\cos(c+dx)}} \\
&\quad + \frac{10B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21bd} + \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^2d} \\
&\quad + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^3d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.67 (sec) , antiderivative size = 101, normalized size of antiderivative = 0.58

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx$$
$$= \frac{252A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)+100B\sqrt{\cos(c+dx)}\,\mathrm{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+(65B+42A\cos(c+d}{210d\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[(Cos[c + d*x]^3*(A + B*Cos[c + d*x]))/Sqrt[b*Cos[c + d*x]],x]
[Out] (252*A*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2] + 100*B*Sqrt[Cos[c + d*
x]]*EllipticF[(c + d*x)/2, 2] + (65*B + 42*A*Cos[c + d*x] + 15*B*Cos[2*(c +
 d*x)])*Sin[2*(c + d*x)])/(210*d*Sqrt[b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 7.52 (sec) , antiderivative size = 298, normalized size of antiderivative = 1.72

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(240B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(-168A-360B)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+(1\right.}{}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right.}{5\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\right.\right.\right.}}$

```
[In] int(cos(d*x+c)^3*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(1/2),x,method=_RETURNVERB
OSE)
[Out] -2/105*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*(240*B*cos
(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8+(-168*A-360*B)*sin(1/2*d*x+1/2*c)^6*co
s(1/2*d*x+1/2*c)+(168*A+280*B)*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+(-42
*A-80*B)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-63*A*(sin(1/2*d*x+1/2*c)^2
)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/
2))+25*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Elli
pticF(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+
1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 165, normalized size of antiderivative = 0.95

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{-25i\sqrt{2}B\sqrt{b}\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\sin{(dx+c)})+25i\sqrt{2}B\sqrt{b}\text{weierstrassPInverse}(}{}$$

```
[In] integrate(cos(d*x+c)^3*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorithm="
fricas")
```

```
[Out] 1/105*(-25*I*sqrt(2)*B*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c)) + 25*I*sqrt(2)*B*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x +
 c) - I*sin(d*x + c)) + 63*I*sqrt(2)*A*sqrt(b)*weierstrassZeta(-4, 0, weier
strassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 63*I*sqrt(2)*A*sqrt
(b)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(
d*x + c))) + 2*(15*B*cos(d*x + c)^2 + 21*A*cos(d*x + c) + 25*B)*sqrt(b*cos(
d*x + c))*sin(d*x + c))/(b*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{(B\cos{(dx+c)}+A)\cos{(dx+c)}^3}{\sqrt{b\cos{(dx+c)}}}\,dx$$

```
[In] integrate(cos(d*x+c)^3*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorithm="
maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^3/sqrt(b*cos(d*x + c)), x)
```

Giac [F]

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^3}{\sqrt{b\cos(dx+c)}}\,dx$$

```
[In] integrate(cos(d*x+c)^3*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^3/sqrt(b*cos(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{\cos(c+d\,x)^3\,(A+B\,\cos(c+d\,x))}{\sqrt{b\,\cos(c+d\,x)}}\,dx$$

```
[In] int((cos(c + d*x)^3*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(1/2),x)
[Out] int((cos(c + d*x)^3*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(1/2), x)
```

3.821 $\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 144

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{6B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5bd\sqrt{\cos(c+dx)}} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2A\sqrt{b\cos(c+dx)}\sin(c+dx)}{3bd} + \frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^2d}$$

```
[Out] 2/5*B*(b*cos(d*x+c))^(3/2)*sin(d*x+c)/b^2/d+2/3*A*(cos(1/2*d*x+1/2*c)^2)^(1
/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/
2)/d/(b*cos(d*x+c))^(1/2)+2/3*A*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/b/d+6/5*B*(
cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c)
,2^(1/2))*(b*cos(d*x+c))^(1/2)/b/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used

$= \{16, 2827, 2715, 2721, 2720, 2719\}$

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{2A\sin(c+dx)\sqrt{b\cos(c+dx)}}{3bd} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2B\sin(c+dx)(b\cos(c+dx))^{3/2}}{5b^2d} + \frac{6BE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{5bd\sqrt{\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^2*(A + B*Cos[c + d*x]))/Sqrt[b*Cos[c + d*x]],x]
```

```
[Out] (6*B*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(5*b*d*Sqrt[Cos[c + d*
x]]) + (2*A*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*d*Sqrt[b*Cos[c
 + d*x]]) + (2*A*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(3*b*d) + (2*B*(b*Cos[c
 + d*x])^(3/2)*Sin[c + d*x])/(5*b^2*d)
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx}{b^2}\\
&= \frac{A\int (b\cos(c+dx))^{3/2}\,dx}{b^2}+\frac{B\int (b\cos(c+dx))^{5/2}\,dx}{b^3}\\
&= \frac{2A\sqrt{b\cos(c+dx)}\sin(c+dx)}{3bd}+\frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^2d}\\
&\quad+\frac{1}{3}A\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx+\frac{(3B)\int \sqrt{b\cos(c+dx)}\,dx}{5b}\\
&= \frac{2A\sqrt{b\cos(c+dx)}\sin(c+dx)}{3bd}+\frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^2d}\\
&\quad+\frac{\left(A\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3\sqrt{b\cos(c+dx)}}+\frac{\left(3B\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{5b\sqrt{\cos(c+dx)}}\\
&= \frac{6B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5bd\sqrt{\cos(c+dx)}}+\frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}}\\
&\quad+\frac{2A\sqrt{b\cos(c+dx)}\sin(c+dx)}{3bd}+\frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^2d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.41 (sec) , antiderivative size = 88, normalized size of antiderivative = 0.61

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx$$
$$=\frac{2\sqrt{\cos(c+dx)}\left(9BE\left(\frac{1}{2}(c+dx)\middle|2\right)+5A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\sqrt{\cos(c+dx)}(5A+3B\cos(c+dx))\right.}{15d\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[(Cos[c + d*x]^2*(A + B*Cos[c + d*x]))/Sqrt[b*Cos[c + d*x]],x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*(9*B*EllipticE[(c + d*x)/2, 2] + 5*A*EllipticF[(c + d
*x)/2, 2] + Sqrt[Cos[c + d*x]]*(5*A + 3*B*Cos[c + d*x])*Sin[c + d*x]))/(15*
d*Sqrt[b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 6.29 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.88

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-24B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(20A+24B)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+(-10A\right.}{15\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right.}}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2}\right.}{3\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b}\,d}$

```
[In] int(cos(d*x+c)^2*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(1/2),x,method=_RETURNVERB
OSE)
```

```
[Out] -2/15*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-24*B*cos(
1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+(20*A+24*B)*sin(1/2*d*x+1/2*c)^4*cos(1/
2*d*x+1/2*c)+(-10*A-6*B)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+5*A*(sin(1
/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d
*x+1/2*c),2^(1/2))-9*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2
-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1/2*d*x+1/2*c)^
4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d*x+1/2*c)^2-
1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.07

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx$$
$$=\frac{-5i\sqrt{2}A\sqrt{b}\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+5i\sqrt{2}A\sqrt{b}\text{weierstrassPInverse}(-4,}{}$$

```
[In] integrate(cos(d*x+c)^2*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorithm="
fricas")
```

```
[Out] 1/15*(-5*I*sqrt(2)*A*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*si
n(d*x + c)) + 5*I*sqrt(2)*A*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c)
 - I*sin(d*x + c)) + 9*I*sqrt(2)*B*sqrt(b)*weierstrassZeta(-4, 0, weierstra
ssPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 9*I*sqrt(2)*B*sqrt(b)*w
eierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x +
 c))) + 2*(3*B*cos(d*x + c) + 5*A)*sqrt(b*cos(d*x + c))*sin(d*x + c))/(b*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**2*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^2}{\sqrt{b\cos(dx+c)}}\,dx$$

```
[In] integrate(cos(d*x+c)^2*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^2/sqrt(b*cos(d*x + c)), x)
```

Giac [F]

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^2}{\sqrt{b\cos(dx+c)}}\,dx$$

```
[In] integrate(cos(d*x+c)^2*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^2/sqrt(b*cos(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{\cos(c+d\,x)^2\,(A+B\,\cos(c+d\,x))}{\sqrt{b\,\cos(c+d\,x)}}\,dx$$

```
[In] int((cos(c + d*x)^2*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(1/2),x)
[Out] int((cos(c + d*x)^2*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(1/2), x)
```

3.822 $\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 113

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{2A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{bd\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3bd}$$

```
[Out] 2/3*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x
+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)+2/3*B*sin(d*x+c)*(
b*cos(d*x+c))^(1/2)/b/d+2*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)
*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/b/d/cos(d*x+c)^
(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 113, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used = {16, 2827, 2721, 2719, 2715, 2720}

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{2AE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{bd\sqrt{\cos(c+dx)}} + \frac{2B\sin(c+dx)\sqrt{b\cos(c+dx)}}{3bd} + \frac{2B\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]*(A + B*Cos[c + d*x]))/Sqrt[b*Cos[c + d*x]],x]
```

```
[Out] (2*A*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(b*d*Sqrt[Cos[c + d*x]
]) + (2*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*d*Sqrt[b*Cos[c +
 d*x]]) + (2*B*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(3*b*d)
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx}{b} \\
&= \frac{A\int \sqrt{b\cos(c+dx)}\,dx}{b} + \frac{B\int (b\cos(c+dx))^{3/2}\,dx}{b^2}
\end{aligned}$$

$$= \frac{2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3bd} + \frac{1}{3}B\int \frac{1}{\sqrt{b\cos(c+dx)}}dx + \frac{\left(A\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}dx}{b\sqrt{\cos(c+dx)}}$$

$$= \frac{2A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{bd\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3bd} + \frac{\left(B\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}dx}{3\sqrt{b\cos(c+dx)}}$$

$$= \frac{2A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{bd\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3bd}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 78, normalized size of antiderivative = 0.69

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}dx = \frac{2\sqrt{b\cos(c+dx)}\left(3AE\left(\frac{1}{2}(c+dx)\middle|2\right)+B\left(\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\sqrt{\cos(c+dx)}\sin(c+dx)\right)\right)}{3bd\sqrt{\cos(c+dx)}}$$

```
[In] Integrate[(Cos[c + d*x]*(A + B*Cos[c + d*x]))/Sqrt[b*Cos[c + d*x]],x]
[Out] (2*Sqrt[b*Cos[c + d*x]]*(3*A*EllipticE[(c + d*x)/2, 2] + B*(EllipticF[(c +
d*x)/2, 2] + Sqrt[Cos[c + d*x]]*Sin[c + d*x])))/(3*b*d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.13 (sec) , antiderivative size = 237, normalized size of antiderivative = 2.10

method	result
default	$\frac{2\sqrt{(2(\cos^2(\frac{dx}{2}+\frac{c}{2}))-1)b(\sin^2(\frac{dx}{2}+\frac{c}{2}))}\,(-4B\cos(\frac{dx}{2}+\frac{c}{2})(\sin^4(\frac{dx}{2}+\frac{c}{2}))+3A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2(\sin^2(\frac{dx}{2}+\frac{c}{2}))-1}\,E(\cos(\frac{dx}{2}}{3\sqrt{-b(2(\sin^4(\frac{dx}{2}+\frac{c}{2}))-(\sin^2(\frac{dx}{2}+\frac{c}{2})))}\,\sin(\frac{dx}{2}+\frac{c}{2}}$
parts	$\frac{2A\sqrt{(2(\cos^2(\frac{dx}{2}+\frac{c}{2}))-1)b(\sin^2(\frac{dx}{2}+\frac{c}{2}))}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2(\cos^2(\frac{dx}{2}+\frac{c}{2}))+1}\,E(\cos(\frac{dx}{2}+\frac{c}{2}),\sqrt{2})}{\sqrt{-b(2(\sin^4(\frac{dx}{2}+\frac{c}{2}))-(\sin^2(\frac{dx}{2}+\frac{c}{2})))}\,\sin(\frac{dx}{2}+\frac{c}{2})\sqrt{(2(\cos^2(\frac{dx}{2}+\frac{c}{2}))-1)b}\,d} - \frac{2B\sqrt{(2(\cos^2(\frac{dx}{2}+\frac{c}{2}}{}$

```
[In] int(cos(d*x+c)*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOS
E)
```

```
[Out] 2/3*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*(-4*B*cos(1/2
*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4+3*A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/
2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+2*B*cos(1/2*d
*x+1/2*c)*sin(1/2*d*x+1/2*c)^2-B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*
x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1/2*d
*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d*x
+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 142, normalized size of antiderivative = 1.26

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{-i\sqrt{2}B\sqrt{b}\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\sin{(dx+c)})+i\sqrt{2}B\sqrt{b}\text{weierstrassPInverse}(-4,0$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorithm="fr
icas")
```

```
[Out] 1/3*(-I*sqrt(2)*B*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d
*x + c)) + I*sqrt(2)*B*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) - I*
sin(d*x + c)) + 3*I*sqrt(2)*A*sqrt(b)*weierstrassZeta(-4, 0, weierstrassPIn
verse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*I*sqrt(2)*A*sqrt(b)*weiers
trassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)))
 + 2*sqrt(b*cos(d*x + c))*B*sin(d*x + c))/(b*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)}{\sqrt{b\cos(dx+c)}}\,dx$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorithm="ma
xima")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)/sqrt(b*cos(d*x + c)), x)
```

Giac [F]

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)}{\sqrt{b\cos(dx+c)}}\,dx$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorithm="gi
ac")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)/sqrt(b*cos(d*x + c)), x)
```

Mupad [B] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.83

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{2B\sin(c+dx)\sqrt{b\cos(c+dx)}}{3bd} + \frac{2A\sqrt{\cos(c+dx)}\,\mathrm{E}\left(\frac{c}{2}+\frac{dx}{2}\middle|2\right)}{d\sqrt{b\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\mathrm{F}\left(\frac{c}{2}+\frac{dx}{2}\middle|2\right)}{3d\sqrt{b\cos(c+dx)}}$$

```
[In] int((cos(c + d*x)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(1/2),x)
[Out] (2*B*sin(c + d*x)*(b*cos(c + d*x))^(1/2))/(3*b*d) + (2*A*cos(c + d*x)^(1/2)
*ellipticE(c/2 + (d*x)/2, 2))/(d*(b*cos(c + d*x))^(1/2)) + (2*B*cos(c + d*x
)^(1/2)*ellipticF(c/2 + (d*x)/2, 2))/(3*d*(b*cos(c + d*x))^(1/2))
```

3.823 $\int \frac{A+B\cos(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 82

$$\int \frac{A+B\cos(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx = \frac{2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{bd\sqrt{\cos(c+dx)}} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1
/2*c),2^(1/2))*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)+2*B*(cos(1/2*d*x+1/2
*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*co
s(d*x+c))^(1/2)/b/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2827, 2721, 2720, 2719}

$$\int \frac{A+B\cos(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx = \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}} + \frac{2BE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{bd\sqrt{\cos(c+dx)}}$$

```
[In] Int[(A + B*Cos[c + d*x])/Sqrt[b*Cos[c + d*x]],x]
```

```
[Out] (2*B*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(b*d*Sqrt[Cos[c + d*x]
]) + (2*A*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(d*Sqrt[b*Cos[c + d
*x]])
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= A\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx + \frac{B\int \sqrt{b\cos(c+dx)}\,dx}{b}\\
&= \frac{\left(A\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{\sqrt{b\cos(c+dx)}} + \frac{\left(B\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{b\sqrt{\cos(c+dx)}}\\
&= \frac{2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{bd\sqrt{\cos(c+dx)}} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 54, normalized size of antiderivative = 0.66

$$\int \frac{A+B\cos(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx = \frac{2\sqrt{\cos(c+dx)}\left(BE\left(\frac{1}{2}(c+dx)\middle|2\right)+A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\right)}{d\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/Sqrt[b*Cos[c + d*x]],x]
[Out] (2*Sqrt[Cos[c + d*x]]*(B*EllipticE[(c + d*x)/2, 2] + A*EllipticF[(c + d*x)/
2, 2]))/(d*Sqrt[b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 3.63 (sec) , antiderivative size = 160, normalized size of antiderivative = 1.95

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\left(AF\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-BE\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\right.\right.}{\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b}\,d}$
parts	$\frac{2A\sqrt{2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\operatorname{am}^{-1}\left(\frac{dx}{2}+\frac{c}{2}\middle\vert\sqrt{2}\right)}{d\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b}}+\frac{2B\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right.\right.}}{\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{d}{2}\right.\right.\right.}}$
risch	$-\frac{iB\left(e^{2i(dx+c)}+1\right)\sqrt{2}\,e^{-i(dx+c)}}{d\sqrt{\left(e^{2i(dx+c)}+1\right)b\,e^{-i(dx+c)}}}-\frac{i\left(\frac{iA\sqrt{-i\left(e^{i(dx+c)}+i\right)}\sqrt{2}\sqrt{i\left(e^{i(dx+c)}-i\right)}\sqrt{ie^{i(dx+c)}}F\left(\sqrt{-i\left(e^{i(dx+c)}+i\right)},\frac{\sqrt{2}}{2}\right)}{\sqrt{b\,e^{3i(dx+c)}+b\,e^{i(dx+c)}}}+B\left(-\frac{2(b}{b\sqrt{e^{i(dx-}}}\right.\right.}{}$

```
[In] int((A+B*cos(d*x+c))/(cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1
/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*(A*EllipticF(cos(1/2*d*x+1
/2*c),2^(1/2))-B*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1/2*d*x+
1/2*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d*x+1/
2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.49

$$\int \frac{A+B\cos(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx$$
$$=\frac{-i\sqrt{2}A\sqrt{b}\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+i\sqrt{2}A\sqrt{b}\text{weierstrassPInverse}(-4,0}{}$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] (-I*sqrt(2)*A*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x +
 c)) + I*sqrt(2)*A*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(
d*x + c)) + I*sqrt(2)*B*sqrt(b)*weierstrassZeta(-4, 0, weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c))) - I*sqrt(2)*B*sqrt(b)*weierstrassZet
a(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/(b*d)
```

Sympy [F]

$$\int \frac{A + B\cos(c + dx)}{\sqrt{b\cos(c + dx)}}\, dx = \int \frac{A + B\cos\left(c + dx\right)}{\sqrt{b\cos\left(c + dx\right)}}\, dx$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))**(1/2),x)
[Out] Integral((A + B*cos(c + d*x))/sqrt(b*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{A + B\cos(c + dx)}{\sqrt{b\cos(c + dx)}}\, dx = \int \frac{B\cos\left(dx + c\right) + A}{\sqrt{b\cos\left(dx + c\right)}}\, dx$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)/sqrt(b*cos(d*x + c)), x)
```

Giac [F]

$$\int \frac{A + B\cos(c + dx)}{\sqrt{b\cos(c + dx)}}\, dx = \int \frac{B\cos\left(dx + c\right) + A}{\sqrt{b\cos\left(dx + c\right)}}\, dx$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)/sqrt(b*cos(d*x + c)), x)
```

Mupad [B] (verification not implemented)

Time = 0.35 (sec) , antiderivative size = 48, normalized size of antiderivative = 0.59

$$\int \frac{A + B\cos(c + dx)}{\sqrt{b\cos(c + dx)}}\, dx = \frac{2\sqrt{\cos\left(c + d\,x\right)}\,\left(A\,\mathrm{F}\left(\frac{c}{2} + \frac{d\,x}{2}\middle|2\right) + B\,\mathrm{E}\left(\frac{c}{2} + \frac{d\,x}{2}\middle|2\right)\right)}{d\,\sqrt{b\,\cos\left(c + d\,x\right)}}$$

```
[In] int((A + B*cos(c + d*x))/(b*cos(c + d*x))^(1/2),x)
[Out] (2*cos(c + d*x)^(1/2)*(A*ellipticF(c/2 + (d*x)/2, 2) + B*ellipticE(c/2 + (d
*x)/2, 2)))/(d*(b*cos(c + d*x))^(1/2))
```

3.824 $\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 106

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx = -\frac{2A\sqrt{b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{bd\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2*A*sin(d*x+c)/d/(b*cos(d*x+c))^(1/2)+2*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(
1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/d/(b*
cos(d*x+c))^(1/2)-2*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellip
ticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/b/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used = {16, 2827, 2716, 2721, 2719, 2720}

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx = \frac{2A\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} - \frac{2AE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{bd\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[((A + B*Cos[c + d*x])*Sec[c + d*x])/Sqrt[b*Cos[c + d*x]],x]
```

```
[Out] (-2*A*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(b*d*Sqrt[Cos[c + d*x
]]) + (2*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(d*Sqrt[b*Cos[c +
d*x]]) + (2*A*Sin[c + d*x])/(d*Sqrt[b*Cos[c + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= b\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx\\
&= (Ab)\int \frac{1}{(b\cos(c+dx))^{3/2}}\,dx + B\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx
\end{aligned}
$$

$$= \frac{2A\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} - \frac{A\int\sqrt{b\cos(c+dx)}\,dx}{b} + \frac{\left(B\sqrt{\cos(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{\sqrt{b\cos(c+dx)}}$$

$$= \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} - \frac{\left(A\sqrt{b\cos(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx}{b\sqrt{\cos(c+dx)}}$$

$$= -\frac{2A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{bd\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{d\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.29 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.69

$$\int\frac{(A+B\cos(c+dx))\sec(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx = \frac{2\left(-A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right) + B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right) + A\sin(c+dx)\right)}{d\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[((A + B*Cos[c + d*x])*Sec[c + d*x])/Sqrt[b*Cos[c + d*x]],x]
[Out] (2*(-(A*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]) + B*Sqrt[Cos[c + d*x]
]*EllipticF[(c + d*x)/2, 2] + A*Sin[c + d*x]))/(d*Sqrt[b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.14 (sec) , antiderivative size = 214, normalized size of antiderivative = 2.02

method	result
default	$\frac{2\sqrt{-2(\sin^4(\frac{dx}{2}+\frac{c}{2}))b+b(\sin^2(\frac{dx}{2}+\frac{c}{2}))}\,(2A\cos(\frac{dx}{2}+\frac{c}{2})(\sin^2(\frac{dx}{2}+\frac{c}{2}))-A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2(\sin^2(\frac{dx}{2}+\frac{c}{2}))-1}\,E(\cos(\frac{dx}{2}+}{\sqrt{-b(2(\sin^4(\frac{dx}{2}+\frac{c}{2}))-(\sin^2(\frac{dx}{2}+\frac{c}{2})))}\,\sin(\frac{dx}{2}+\frac{c}{2})\sqrt{(2(\cos^2(\frac{dx}{2}}$
parts	$-\frac{2A(-2\cos(\frac{dx}{2}+\frac{c}{2})\sqrt{-2(\sin^4(\frac{dx}{2}+\frac{c}{2}))b+b(\sin^2(\frac{dx}{2}+\frac{c}{2}))}\,(\sin^2(\frac{dx}{2}+\frac{c}{2}))+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2(\sin^2(\frac{dx}{2}+\frac{c}{2}))-1}\,\sqrt{-2(\sin^4}{\sqrt{-b(2(\sin^4(\frac{dx}{2}+\frac{c}{2}))-(\sin^2(\frac{dx}{2}+\frac{c}{2})))}\,\sin(\frac{dx}{2}+\frac{c}{2})\sqrt{(2(\cos^2(\frac{dx}{2}+\frac{c}{2}))-1}}$

```
[In] int((A+B*cos(d*x+c))*sec(d*x+c)/(cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOS
E)
```

```
[Out] 2*(-2*sin(1/2*d*x+1/2*c)^4*b+b*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*A*cos(1/2*d*x
+1/2*c)*sin(1/2*d*x+1/2*c)^2-A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+
1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-B*(sin(1/2*d*x+1/2*
c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2
^(1/2)))/(-b*(2*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2*d
*x+1/2*c)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.63

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx$$
$$= \frac{-i\sqrt{2}B\sqrt{b}\cos{(dx+c)}\,\mathrm{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin{(dx+c)})+i\sqrt{2}B\sqrt{b}\cos{(dx+c)}\,\mathrm{w}}{}$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))^(1/2),x, algorithm="fr
icas")
```

```
[Out] (-I*sqrt(2)*B*sqrt(b)*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c)
+ I*sin(d*x + c)) + I*sqrt(2)*B*sqrt(b)*cos(d*x + c)*weierstrassPInverse(-4
, 0, cos(d*x + c) - I*sin(d*x + c)) - I*sqrt(2)*A*sqrt(b)*cos(d*x + c)*weie
rstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)
)) + I*sqrt(2)*A*sqrt(b)*cos(d*x + c)*weierstrassZeta(-4, 0, weierstrassPIn
verse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*sqrt(b*cos(d*x + c))*A*sin
(d*x + c))/(b*d*cos(d*x + c))
```

Sympy [F]

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{(A+B\cos{(c+dx)})\sec{(c+dx)}}{\sqrt{b\cos{(c+dx)}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral((A + B*cos(c + d*x))*sec(c + d*x)/sqrt(b*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{(B\cos(dx+c)+A)\sec(dx+c)}{\sqrt{b\cos(dx+c)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))^(1/2),x, algorithm="ma
xima")
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)/sqrt(b*cos(d*x + c)), x)
```

Giac [F]

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{(B\cos(dx+c)+A)\sec(dx+c)}{\sqrt{b\cos(dx+c)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))^(1/2),x, algorithm="gi
ac")
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)/sqrt(b*cos(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{A+B\,\cos(c+d\,x)}{\cos(c+d\,x)\,\sqrt{b\,\cos(c+d\,x)}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)*(b*cos(c + d*x))^(1/2)),x)
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)*(b*cos(c + d*x))^(1/2)), x)
```

3.825 $\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 135

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx = -\frac{2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{bd\sqrt{\cos(c+dx)}} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2Ab\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2B\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2/3*A*b*sin(d*x+c)/d/(b*cos(d*x+c))^(3/2)+2*B*sin(d*x+c)/d/(b*cos(d*x+c))^(
1/2)+2/3*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/
2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)-2*B*(cos(1/2*
d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2)
)*(b*cos(d*x+c))^(1/2)/b/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.194$, Rules used = {16, 2827, 2716, 2721, 2720, 2719}

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx = \frac{2Ab\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2B\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} - \frac{2BE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{bd\sqrt{\cos(c+dx)}}$$

```
[In] Int[((A + B*Cos[c + d*x])*Sec[c + d*x]^2)/Sqrt[b*Cos[c + d*x]],x]
```

```
[Out] (-2*B*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(b*d*Sqrt[Cos[c + d*x
]]) + (2*A*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*d*Sqrt[b*Cos[c
+ d*x]]) + (2*A*b*Sin[c + d*x])/(3*d*(b*Cos[c + d*x])^(3/2)) + (2*B*Sin[c +
 d*x])/(d*Sqrt[b*Cos[c + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= b^2 \int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx \\
&= \left(Ab^2\right)\int \frac{1}{(b\cos(c+dx))^{5/2}}\,dx + (bB)\int \frac{1}{(b\cos(c+dx))^{3/2}}\,dx \\
&= \frac{2Ab\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2B\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} + \frac{1}{3}A\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx - \frac{B\int \sqrt{b\cos(c+dx)}\,dx}{b} \\
&= \frac{2Ab\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2B\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} + \frac{\left(A\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3\sqrt{b\cos(c+dx)}} \\
&\quad - \frac{\left(B\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{b\sqrt{\cos(c+dx)}} \\
&= -\frac{2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{bd\sqrt{\cos(c+dx)}} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} \\
&\quad + \frac{2Ab\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2B\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.62

$$
\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx
= \frac{2\left(-3B\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)+A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+3B\sin(c+dx)+A\tan\right.}{3d\sqrt{b\cos(c+dx)}}
$$

```
[In] Integrate[((A + B*Cos[c + d*x])*Sec[c + d*x]^2)/Sqrt[b*Cos[c + d*x]],x]
[Out] (2*(-3*B*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2] + A*Sqrt[Cos[c + d*x]
]*EllipticF[(c + d*x)/2, 2] + 3*B*Sin[c + d*x] + A*Tan[c + d*x]))/(3*d*Sqrt
[b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 405 vs. $2(171) = 342$.

Time = 6.36 (sec) , antiderivative size = 406, normalized size of antiderivative = 3.01

method	result
default	$\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(2A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right.}{}$
parts	$-\frac{2A\left(-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx}{2}}\right.}{3\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\sin\left(\right.}$

```
[In] int((A+B*cos(d*x+c))*sec(d*x+c)^2/(cos(d*x+c)*b)^(1/2),x,method=_RETURNVERB
OSE)
```

```
[Out] 2/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)/b/sin(1/2*d
*x+1/2*c)^3/(4*sin(1/2*d*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)*(2*A*(sin(1/2
*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*(2*sin(1/2*d*x+1
/2*c)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2-12*B*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1
/2*c)^4+6*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/
2))*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2+2*A*cos(1/2*d*x+1
/2*c)*sin(1/2*d*x+1/2*c)^2-A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/
2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+6*B*cos(1/2*d*x+1/2*c
)*sin(1/2*d*x+1/2*c)^2-3*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*
c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c)
^4*b+b*sin(1/2*d*x+1/2*c)^2)^(1/2)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 192, normalized size of antiderivative = 1.42

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx$$
$$= \frac{-i\sqrt{2}A\sqrt{b}\cos(dx+c)^2\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+i\sqrt{2}A\sqrt{b}\cos(dx+c)}{}$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^2/(b*cos(d*x+c))^(1/2),x, algorithm="
fricas")
```

```
[Out] 1/3*(-I*sqrt(2)*A*sqrt(b)*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x
 + c) + I*sin(d*x + c)) + I*sqrt(2)*A*sqrt(b)*cos(d*x + c)^2*weierstrassPIn
verse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 3*I*sqrt(2)*B*sqrt(b)*cos(d*x
```

```
 + c)^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c))) + 3*I*sqrt(2)*B*sqrt(b)*cos(d*x + c)^2*weierstrassZeta(-4, 0
, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(3*B*cos(d
*x + c) + A)*sqrt(b*cos(d*x + c))*sin(d*x + c))/(b*d*cos(d*x + c)^2)
```

Sympy [F]

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{(A+B\cos{(c+dx)})\sec^2{(c+dx)}}{\sqrt{b\cos{(c+dx)}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)**2/(b*cos(d*x+c))**(1/2),x)
[Out] Integral((A + B*cos(c + d*x))*sec(c + d*x)**2/sqrt(b*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{(B\cos{(dx+c)}+A)\sec{(dx+c)}^2}{\sqrt{b\cos{(dx+c)}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^2/(b*cos(d*x+c))^(1/2),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^2/sqrt(b*cos(d*x + c)), x)
```

Giac [F]

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{(B\cos{(dx+c)}+A)\sec{(dx+c)}^2}{\sqrt{b\cos{(dx+c)}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^2/(b*cos(d*x+c))^(1/2),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^2/sqrt(b*cos(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{A+B\,\cos\left(c+d\,x\right)}{\cos\left(c+d\,x\right)^2\,\sqrt{b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)^2*(b*cos(c + d*x))^(1/2)),x)
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)^2*(b*cos(c + d*x))^(1/2)), x)
```

3.826 $\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 168

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx = -\frac{6A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5bd\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2Ab^2\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2bB\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{6A\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2/5*A*b^2*sin(d*x+c)/d/(b*cos(d*x+c))^(5/2)+2/3*b*B*sin(d*x+c)/d/(b*cos(d*x
+c))^(3/2)+6/5*A*sin(d*x+c)/d/(b*cos(d*x+c))^(1/2)+2/3*B*(cos(1/2*d*x+1/2*c
)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x
+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)-6/5*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2
*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/b/d/
cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used

$= \{16, 2827, 2716, 2721, 2719, 2720\}$

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx = \frac{2Ab^2\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{6A\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}} - \frac{6AE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{5bd\sqrt{\cos(c+dx)}} + \frac{2bB\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[((A + B*Cos[c + d*x])*Sec[c + d*x]^3)/Sqrt[b*Cos[c + d*x]],x]
```

```
[Out] (-6*A*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(5*b*d*Sqrt[Cos[c + d
*x]]) + (2*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*d*Sqrt[b*Cos[
c + d*x]]) + (2*A*b^2*Sin[c + d*x])/(5*d*(b*Cos[c + d*x])^(5/2)) + (2*b*B*S
in[c + d*x])/(3*d*(b*Cos[c + d*x])^(3/2)) + (6*A*Sin[c + d*x])/(5*d*Sqrt[b*
Cos[c + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
```

```
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= b^3 \int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{7/2}}\,dx \\
&= \left(Ab^3\right) \int \frac{1}{(b\cos(c+dx))^{7/2}}\,dx + \left(b^2B\right) \int \frac{1}{(b\cos(c+dx))^{5/2}}\,dx \\
&= \frac{2Ab^2\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2bB\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} \\
&\quad + \frac{1}{5}(3Ab) \int \frac{1}{(b\cos(c+dx))^{3/2}}\,dx + \frac{1}{3}B \int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx \\
&= \frac{2Ab^2\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2bB\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{6A\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}} \\
&\quad - \frac{(3A)\int\sqrt{b\cos(c+dx)}\,dx}{5b} + \frac{\left(B\sqrt{\cos(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3\sqrt{b\cos(c+dx)}} \\
&= \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} + \frac{2Ab^2\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} \\
&\quad + \frac{2bB\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{6A\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}} \\
&\quad - \frac{\left(3A\sqrt{b\cos(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx}{5b\sqrt{\cos(c+dx)}} \\
&= -\frac{6A\sqrt{b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5bd\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3d\sqrt{b\cos(c+dx)}} \\
&\quad + \frac{2Ab^2\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2bB\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{6A\sin(c+dx)}{5d\sqrt{b\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.41 (sec) , antiderivative size = 101, normalized size of antiderivative = 0.60

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx$$
$$= \frac{2\left(-9A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)+5B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+9A\sin(c+dx)+5B\right.}{15d\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[((A + B*Cos[c + d*x])*Sec[c + d*x]^3)/Sqrt[b*Cos[c + d*x]],x]
[Out] (2*(-9*A*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2] + 5*B*Sqrt[Cos[c + d*
x]]*EllipticF[(c + d*x)/2, 2] + 9*A*Sin[c + d*x] + 5*B*Tan[c + d*x] + 3*A*S
ec[c + d*x]*Tan[c + d*x]))/(15*d*Sqrt[b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 578 vs. 2(196) = 392.

Time = 8.49 (sec) , antiderivative size = 579, normalized size of antiderivative = 3.45

method	result
default	$-\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(72A\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-36A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E\right.}{}$
parts	$-\frac{2A\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(24\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,E\right.}{}$

```
[In] int((A+B*cos(d*x+c))*sec(d*x+c)^3/(cos(d*x+c)*b)^(1/2),x,method=_RETURNVERB
OSE)
[Out] -2/15*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)/b/sin(1/2
*d*x+1/2*c)^3/(8*sin(1/2*d*x+1/2*c)^6-12*sin(1/2*d*x+1/2*c)^4+6*sin(1/2*d*x
+1/2*c)^2-1)*(72*A*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6-36*A*(sin(1/2*d*
x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/
2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^4-20*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin
(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*
x+1/2*c)^4-72*A*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4+36*A*(sin(1/2*d*x+1
/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c
),2^(1/2))*sin(1/2*d*x+1/2*c)^2-20*B*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^
4+20*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Ellipt
icF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2+24*A*cos(1/2*d*x+1/2*c
)*sin(1/2*d*x+1/2*c)^2-9*A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*
```

```
c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+10*B*cos(1/2*d*x+1/2*c)
*sin(1/2*d*x+1/2*c)^2-5*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c
)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c)^
4*b+b*sin(1/2*d*x+1/2*c)^2)^(1/2)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 205, normalized size of antiderivative = 1.22

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx$$
$$= \frac{-5i\sqrt{2}B\sqrt{b}\cos(dx+c)^3\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))+5i\sqrt{2}B\sqrt{b}\cos(dx+c}{}$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^3/(b*cos(d*x+c))^(1/2),x, algorithm="
fricas")
```

```
[Out] 1/15*(-5*I*sqrt(2)*B*sqrt(b)*cos(d*x + c)^3*weierstrassPInverse(-4, 0, cos(
d*x + c) + I*sin(d*x + c)) + 5*I*sqrt(2)*B*sqrt(b)*cos(d*x + c)^3*weierstra
ssPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 9*I*sqrt(2)*A*sqrt(b)*co
s(d*x + c)^3*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c)
 + I*sin(d*x + c))) + 9*I*sqrt(2)*A*sqrt(b)*cos(d*x + c)^3*weierstrassZeta(
-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(9*A*
cos(d*x + c)^2 + 5*B*cos(d*x + c) + 3*A)*sqrt(b*cos(d*x + c))*sin(d*x + c))
/(b*d*cos(d*x + c)^3)
```

Sympy [F]

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)**3/(b*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral((A + B*cos(c + d*x))*sec(c + d*x)**3/sqrt(b*cos(c + d*x)), x)
```

Maxima [F]

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx=\int \frac{(B\cos(dx+c)+A)\sec(dx+c)^3}{\sqrt{b\cos(dx+c)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^3/(b*cos(d*x+c))^(1/2),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^3/sqrt(b*cos(d*x + c)), x)
```

Giac [F]

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx=\int \frac{(B\cos(dx+c)+A)\sec(dx+c)^3}{\sqrt{b\cos(dx+c)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^3/(b*cos(d*x+c))^(1/2),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^3/sqrt(b*cos(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx=\int \frac{A+B\,\cos(c+d\,x)}{\cos(c+d\,x)^3\,\sqrt{b\,\cos(c+d\,x)}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)^3*(b*cos(c + d*x))^(1/2)),x)
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)^3*(b*cos(c + d*x))^(1/2)), x)
```

3.827 $\int \frac{\cos^4(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 176

$$\int \frac{\cos^4(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{6A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5b^2d\sqrt{\cos(c+dx)}} + \frac{10B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21bd\sqrt{b\cos(c+dx)}} + \frac{10B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21b^2d} + \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^3d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^4d}$$

```
[Out] 2/5*A*(b*cos(d*x+c))^(3/2)*sin(d*x+c)/b^3/d+2/7*B*(b*cos(d*x+c))^(5/2)*sin(
d*x+c)/b^4/d+10/21*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/b/d/(b*cos(d*x+c))^(1/2)+1
0/21*B*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/b^2/d+6/5*A*(cos(1/2*d*x+1/2*c)^2)^(
1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c)
)^(1/2)/b^2/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used = {16, 2827, 2715, 2721, 2719, 2720}

$$\int \frac{\cos^4(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{2A\sin(c+dx)(b\cos(c+dx))^{3/2}}{5b^3d} + \frac{6AE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{5b^2d\sqrt{\cos(c+dx)}} + \frac{2B\sin(c+dx)(b\cos(c+dx))^{5/2}}{7b^4d} + \frac{10B\sin(c+dx)\sqrt{b\cos(c+dx)}}{21b^2d} + \frac{10B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21bd\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^4*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (6*A*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(5*b^2*d*Sqrt[Cos[c +
d*x]]) + (10*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(21*b*d*Sqrt[b
*Cos[c + d*x]]) + (10*B*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(21*b^2*d) + (2*
A*(b*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(5*b^3*d) + (2*B*(b*Cos[c + d*x])^(5
/2)*Sin[c + d*x])/(7*b^4*d)
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx}{b^4}\\ &= \frac{A\int (b\cos(c+dx))^{5/2}\,dx}{b^4}+\frac{B\int (b\cos(c+dx))^{7/2}\,dx}{b^5}\end{aligned}$$

$$= \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^3d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^4d} + \frac{(3A)\int\sqrt{b\cos(c+dx)}\,dx}{5b^2} + \frac{(5B)\int(b\cos(c+dx))^{3/2}\,dx}{7b^3}$$

$$= \frac{10B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21b^2d} + \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^3d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^4d} + \frac{(5B)\int\frac{1}{\sqrt{b\cos(c+dx)}}\,dx}{21b} + \frac{\left(3A\sqrt{b\cos(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx}{5b^2\sqrt{\cos(c+dx)}}$$

$$= \frac{6A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5b^2d\sqrt{\cos(c+dx)}} + \frac{10B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21b^2d} + \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^3d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^4d} + \frac{\left(5B\sqrt{\cos(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{21b\sqrt{b\cos(c+dx)}}$$

$$= \frac{6A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5b^2d\sqrt{\cos(c+dx)}} + \frac{10B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21bd\sqrt{b\cos(c+dx)}} + \frac{10B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21b^2d} + \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^3d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^4d}$$

Mathematica [A] (verified)

Time = 0.63 (sec) , antiderivative size = 104, normalized size of antiderivative = 0.59

$$\int \frac{\cos^4(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{252A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right) + 100B\sqrt{\cos(c+dx)}\,\text{EllipticF}}{210b}$$

```
[In] Integrate[(Cos[c + d*x]^4*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (252*A*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2] + 100*B*Sqrt[Cos[c + d*
x]]*EllipticF[(c + d*x)/2, 2] + (65*B + 42*A*Cos[c + d*x] + 15*B*Cos[2*(c +
 d*x)])*Sin[2*(c + d*x)])/(210*b*d*Sqrt[b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 8.57 (sec) , antiderivative size = 301, normalized size of antiderivative = 1.71

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(240B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(-168A-360B)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\right.}{}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right.\right.}{5b\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\right.\right.}}$

```
[In] int(cos(d*x+c)^4*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(3/2),x,method=_RETURNVERB
OSE)
```

```
[Out] -2/105*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)/b*(240*B*c
os(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8+(-168*A-360*B)*sin(1/2*d*x+1/2*c)^6*
cos(1/2*d*x+1/2*c)+(168*A+280*B)*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+(-
42*A-80*B)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-63*A*(sin(1/2*d*x+1/2*c)
^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(
1/2))+25*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*El
lipticF(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*
x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/
d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 165, normalized size of antiderivative = 0.94

$$\int \frac{\cos^4(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{-25i\sqrt{2}B\sqrt{b}\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+}{}$$

```
[In] integrate(cos(d*x+c)^4*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorithm="
fricas")
```

```
[Out] 1/105*(-25*I*sqrt(2)*B*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c)) + 25*I*sqrt(2)*B*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x +
 c) - I*sin(d*x + c)) + 63*I*sqrt(2)*A*sqrt(b)*weierstrassZeta(-4, 0, weier
strassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 63*I*sqrt(2)*A*sqrt
(b)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(
d*x + c))) + 2*(15*B*cos(d*x + c)^2 + 21*A*cos(d*x + c) + 25*B)*sqrt(b*cos(
d*x + c))*sin(d*x + c))/(b^2*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**4*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^4(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^4}{(b\cos(dx+c))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^4*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^4/(b*cos(d*x + c))^(3/2), x)
```

Giac [F]

$$\int \frac{\cos^4(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^4}{(b\cos(dx+c))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^4*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^4/(b*cos(d*x + c))^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos(c+d\,x)^4\,(A+B\,\cos(c+d\,x))}{(b\,\cos(c+d\,x))^{3/2}}\,dx$$

```
[In] int((cos(c + d*x)^4*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(3/2),x)
[Out] int((cos(c + d*x)^4*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(3/2), x)
```

3.828 $\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 147

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{6B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5b^2d\sqrt{\cos(c+dx)}} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3bd\sqrt{b\cos(c+dx)}} + \frac{2A\sqrt{b\cos(c+dx)}\sin(c+dx)}{3b^2d} + \frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^3d}$$

```
[Out] 2/5*B*(b*cos(d*x+c))^(3/2)*sin(d*x+c)/b^3/d+2/3*A*(cos(1/2*d*x+1/2*c)^2)^(1
/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/
2)/b/d/(b*cos(d*x+c))^(1/2)+2/3*A*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/b^2/d+6/5
*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/
2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/b^2/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used = {16, 2827, 2715, 2721, 2720, 2719}

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{2A\sin(c+dx)\sqrt{b\cos(c+dx)}}{3b^2d} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3bd\sqrt{b\cos(c+dx)}} + \frac{2B\sin(c+dx)(b\cos(c+dx))^{3/2}}{5b^3d} + \frac{6BE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{5b^2d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^3*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (6*B*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(5*b^2*d*Sqrt[Cos[c +
d*x]]) + (2*A*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*b*d*Sqrt[b*C
os[c + d*x]]) + (2*A*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(3*b^2*d) + (2*B*(b
*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(5*b^3*d)
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx}{b^3}\\ &= \frac{A\int (b\cos(c+dx))^{3/2}\,dx}{b^3}+\frac{B\int (b\cos(c+dx))^{5/2}\,dx}{b^4}\end{aligned}$$

$$
\begin{aligned}
&= \frac{2A\sqrt{b\cos(c+dx)}\sin(c+dx)}{3b^2d} + \frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^3d} \\
&\quad + \frac{A\int \frac{1}{\sqrt{b\cos(c+dx)}}dx}{3b} + \frac{(3B)\int \sqrt{b\cos(c+dx)}dx}{5b^2} \\
&= \frac{2A\sqrt{b\cos(c+dx)}\sin(c+dx)}{3b^2d} + \frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^3d} \\
&\quad + \frac{\left(A\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}dx}{3b\sqrt{b\cos(c+dx)}} + \frac{\left(3B\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}dx}{5b^2\sqrt{\cos(c+dx)}} \\
&= \frac{6B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5b^2d\sqrt{\cos(c+dx)}} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3bd\sqrt{b\cos(c+dx)}} \\
&\quad + \frac{2A\sqrt{b\cos(c+dx)}\sin(c+dx)}{3b^2d} + \frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^3d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.64 (sec) , antiderivative size = 88, normalized size of antiderivative = 0.60

$$
\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{2\cos^{\frac{3}{2}}(c+dx)\left(9BE\left(\frac{1}{2}(c+dx)\middle|2\right)+5A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\right.}{15d(b\cos(c+dx)}
$$

```
[In] Integrate[(Cos[c + d*x]^3*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(3/2),x]
[Out] (2*Cos[c + d*x]^(3/2)*(9*B*EllipticE[(c + d*x)/2, 2] + 5*A*EllipticF[(c + d
*x)/2, 2] + Sqrt[Cos[c + d*x]]*(5*A + 3*B*Cos[c + d*x])*Sin[c + d*x]))/(15*
d*(b*Cos[c + d*x])^(3/2))
```

Maple [A] (verified)

Time = 6.76 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.86

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-24B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(20A+24B)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+(-1\right.}{15b\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.}}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{\right.}{3b\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\,c}}$

```
[In] int(cos(d*x+c)^3*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(3/2),x,method=_RETURNVERB
OSE)
```

```
[Out] -2/15*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)/b*(-24*B*co
s(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+(20*A+24*B)*sin(1/2*d*x+1/2*c)^4*cos(
1/2*d*x+1/2*c)+(-10*A-6*B)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+5*A*(sin
(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2
*d*x+1/2*c),2^(1/2))-9*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)
^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1/2*d*x+1/2*c
)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d*x+1/2*c)^
2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.05

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{-5i\sqrt{2}A\sqrt{b}\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c)$$

```
[In] integrate(cos(d*x+c)^3*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorithm="
fricas")
```

```
[Out] 1/15*(-5*I*sqrt(2)*A*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*si
n(d*x + c)) + 5*I*sqrt(2)*A*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c)
 - I*sin(d*x + c)) + 9*I*sqrt(2)*B*sqrt(b)*weierstrassZeta(-4, 0, weierstra
ssPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 9*I*sqrt(2)*B*sqrt(b)*w
eierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x +
 c))) + 2*(3*B*cos(d*x + c) + 5*A)*sqrt(b*cos(d*x + c))*sin(d*x + c))/(b^2*
d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^3}{(b\cos(dx+c))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^3*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorithm="
maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^3/(b*cos(d*x + c))^(3/2), x)
```

Giac [F]

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^3}{(b\cos(dx+c))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^3*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^3/(b*cos(d*x + c))^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos(c+d\,x)^3\,(A+B\,\cos(c+d\,x))}{(b\,\cos(c+d\,x))^{3/2}}\,dx$$

```
[In] int((cos(c + d*x)^3*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(3/2),x)
```

```
[Out] int((cos(c + d*x)^3*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(3/2), x)
```

3.829 $\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 116

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{2A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^2d\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3bd\sqrt{b\cos(c+dx)}} + \frac{2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3b^2d}$$

```
[Out] 2/3*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x
+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/b/d/(b*cos(d*x+c))^(1/2)+2/3*B*sin(d*x+c)
*(b*cos(d*x+c))^(1/2)/b^2/d+2*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/
2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/b^2/d/cos(d
*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used = {16, 2827, 2721, 2719, 2715, 2720}

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{2AE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{b^2d\sqrt{\cos(c+dx)}} + \frac{2B\sin(c+dx)\sqrt{b\cos(c+dx)}}{3b^2d} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3bd\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^2*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*A*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(b^2*d*Sqrt[Cos[c + d*
x]]) + (2*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*b*d*Sqrt[b*Cos
[c + d*x]]) + (2*B*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(3*b^2*d)
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx}{b^2}\\
&= \frac{A\int \sqrt{b\cos(c+dx)}\,dx}{b^2}+\frac{B\int (b\cos(c+dx))^{3/2}\,dx}{b^3}\\
&= \frac{2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3b^2d}+\frac{B\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx}{3b}+\frac{\left(A\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{b^2\sqrt{\cos(c+dx)}}
\end{aligned}
$$

$$= \frac{2A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^2d\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3b^2d} + \frac{\left(B\sqrt{\cos(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}dx}{3b\sqrt{b\cos(c+dx)}}$$

$$= \frac{2A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^2d\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3bd\sqrt{b\cos(c+dx)}} + \frac{2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3b^2d}$$

Mathematica [A] (verified)

Time = 0.41 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.65

$$\int\frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{2\cos^{\frac{3}{2}}(c+dx)\left(3AE\left(\frac{1}{2}(c+dx)\middle|2\right)+B\left(\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\right.\right.}{3d(b\cos(c+dx))^{3/2}}$$

```
[In] Integrate[(Cos[c + d*x]^2*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*Cos[c + d*x]^(3/2)*(3*A*EllipticE[(c + d*x)/2, 2] + B*(EllipticF[(c + d*
x)/2, 2] + Sqrt[Cos[c + d*x]]*Sin[c + d*x])))/(3*d*(b*Cos[c + d*x])^(3/2))
```

Maple [A] (verified)

Time = 5.58 (sec) , antiderivative size = 240, normalized size of antiderivative = 2.07

method	result
default	$\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-4B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+3A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E\left(\cos\left(\frac{dx}{2}\right.\right.\right.}{3b\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\right.}$
parts	$\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{b\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b}\,d} - \frac{2B\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.}}{}$

```
[In] int(cos(d*x+c)^2*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(3/2),x,method=_RETURNVERB
OSE)
```

```
[Out] 2/3*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)/b*(-4*B*cos(1
/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4+3*A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(
1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+2*B*cos(1/2
*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2-B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*
d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1/2
```

```
*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d
*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 142, normalized size of antiderivative = 1.22

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{-i\sqrt{2}B\sqrt{b}\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c$$

```
[In] integrate(cos(d*x+c)^2*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorithm="
fricas")
```

```
[Out] 1/3*(-I*sqrt(2)*B*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d
*x + c)) + I*sqrt(2)*B*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) - I*
sin(d*x + c)) + 3*I*sqrt(2)*A*sqrt(b)*weierstrassZeta(-4, 0, weierstrassPIn
verse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*I*sqrt(2)*A*sqrt(b)*weiers
trassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)))
 + 2*sqrt(b*cos(d*x + c))*B*sin(d*x + c))/(b^2*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**2*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^2}{(b\cos(dx+c))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^2*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorithm="
maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^2/(b*cos(d*x + c))^(3/2), x)
```

Giac [F]

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^2}{(b\cos(dx+c))^{\frac{3}{2}}}\,dx$$

[In] integrate(cos(d*x+c)^2*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorithm="giac")

[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^2/(b*cos(d*x + c))^(3/2), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos(c+d\,x)^2\,(A+B\,\cos(c+d\,x))}{(b\,\cos(c+d\,x))^{3/2}}\,dx$$

[In] int((cos(c + d*x)^2*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(3/2),x)

[Out] int((cos(c + d*x)^2*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(3/2), x)

3.830 $\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}} dx$

Optimal result

Integrand size = 29, antiderivative size = 85

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}} dx = \frac{2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^2d\sqrt{\cos(c+dx)}} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{bd\sqrt{b\cos(c+dx)}}$$

```
[Out] 2*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1
/2*c),2^(1/2))*cos(d*x+c)^(1/2)/b/d/(b*cos(d*x+c))^(1/2)+2*B*(cos(1/2*d*x+1
/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*
cos(d*x+c))^(1/2)/b^2/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.172$, Rules used = {16, 2827, 2721, 2720, 2719}

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}} dx = \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{bd\sqrt{b\cos(c+dx)}} + \frac{2BE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{b^2d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*B*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(b^2*d*Sqrt[Cos[c + d*
x]]) + (2*A*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(b*d*Sqrt[b*Cos[c
 + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\int \frac{A+B\cos(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx}{b}\\
&= \frac{A\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx}{b}+\frac{B\int \sqrt{b\cos(c+dx)}\,dx}{b^2}\\
&= \frac{\left(A\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{b\sqrt{b\cos(c+dx)}}+\frac{\left(B\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{b^2\sqrt{\cos(c+dx)}}\\
&= \frac{2B\sqrt{b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|\,2\right)}{b^2d\sqrt{\cos(c+dx)}}+\frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{bd\sqrt{b\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.67

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{2\sqrt{\cos(c+dx)}\left(BE\left(\frac{1}{2}(c+dx)\middle|\,2\right)+A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\right)}{bd\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[(Cos[c + d*x]*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*(B*EllipticE[(c + d*x)/2, 2] + A*EllipticF[(c + d*x)/
2, 2]))/(b*d*Sqrt[b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 4.54 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.92

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,\left(AF\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-BE\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\right.\right.}{b\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b}\,d}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{b\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\,\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b}\,d}+\frac{2B\sqrt{\left(2\left(\cos^2\left(\frac{d}{2}\right.\right.\right.}}{b\sqrt{-}}$
risch	$-\frac{iB\left(e^{2i(dx+c)}+1\right)\sqrt{2}\,e^{-i(dx+c)}}{db\sqrt{\left(e^{2i(dx+c)}+1\right)b\,e^{-i(dx+c)}}}-\frac{i\left(\frac{iA\sqrt{-i\left(e^{i(dx+c)}+i\right)}\,\sqrt{2}\,\sqrt{i\left(e^{i(dx+c)}-i\right)}\,\sqrt{ie^{i(dx+c)}}\,F\left(\sqrt{-i\left(e^{i(dx+c)}+i\right)},\frac{\sqrt{2}}{2}\right)}{\sqrt{b\,e^{3i(dx+c)}+b\,e^{i(dx+c)}}}+B\left(-\frac{2\left(b\right.}{b\sqrt{e^{i(dx-}}}\right.\right.}{}$

```
[In] int(cos(d*x+c)*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOS
E)
```

```
[Out] -2*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1
/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*(A*EllipticF(cos(1/2*d*x+1
/2*c),2^(1/2))-B*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/b/(-b*(2*sin(1/2*d*
x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d*x+
1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.44

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{-i\sqrt{2}A\sqrt{b}\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))}{}$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorithm="fr
icas")
```

```
[Out] (-I*sqrt(2)*A*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x +
 c)) + I*sqrt(2)*A*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(
d*x + c)) + I*sqrt(2)*B*sqrt(b)*weierstrassZeta(-4, 0, weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c))) - I*sqrt(2)*B*sqrt(b)*weierstrassZet
a(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/(b^2*d
)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)}{(b\cos(dx+c))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorithm="ma
xima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)/(b*cos(d*x + c))^(3/2), x)
```

Giac [F]

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)}{(b\cos(dx+c))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorithm="gi
ac")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)/(b*cos(d*x + c))^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{\cos(c+d\,x)\,(A+B\,\cos(c+d\,x))}{(b\,\cos(c+d\,x))^{3/2}}\,dx$$

```
[In] int((cos(c + d*x)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(3/2),x)
[Out] int((cos(c + d*x)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(3/2), x)
```

3.831 $\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 112

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = -\frac{2A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^2d\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{bd\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{bd\sqrt{b\cos(c+dx)}}$$

```
[Out] 2*A*sin(d*x+c)/b/d/(b*cos(d*x+c))^(1/2)+2*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/co
s(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/b/d
/(b*cos(d*x+c))^(1/2)-2*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*E
llipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/b^2/d/cos(d*x+c)^
(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2827, 2716, 2721, 2719, 2720}

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = -\frac{2AE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{b^2d\sqrt{\cos(c+dx)}} + \frac{2A\sin(c+dx)}{bd\sqrt{b\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{bd\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(A + B*Cos[c + d*x])/(b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-2*A*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(b^2*d*Sqrt[Cos[c + d
*x]]) + (2*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(b*d*Sqrt[b*Cos[
c + d*x]]) + (2*A*Sin[c + d*x])/(b*d*Sqrt[b*Cos[c + d*x]])
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= A\int \frac{1}{(b\cos(c+dx))^{3/2}}\,dx + \frac{B\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx}{b} \\
&= \frac{2A\sin(c+dx)}{bd\sqrt{b\cos(c+dx)}} - \frac{A\int \sqrt{b\cos(c+dx)}\,dx}{b^2} + \frac{\left(B\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{b\sqrt{b\cos(c+dx)}} \\
&= \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{bd\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{bd\sqrt{b\cos(c+dx)}} \\
&\quad - \frac{\left(A\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{b^2\sqrt{\cos(c+dx)}}
\end{aligned}
$$

$$= -\frac{2A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^2d\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{bd\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{bd\sqrt{b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.68

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = \frac{2\left(-A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)+B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)+\right.}{bd\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/(b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*(-(A*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]) + B*Sqrt[Cos[c + d*x]
]*EllipticF[(c + d*x)/2, 2] + A*Sin[c + d*x]))/(b*d*Sqrt[b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 4.83 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.94

method	result
default	$\frac{2\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(2A\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.}{b\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\right.\right.\right.}}$
parts	$-\frac{2A\left(-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{-2\left(\sin^4\left(\right.\right.}\right.}{b\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)}}$

```
[In] int((A+B*cos(d*x+c))/(cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/b*(-2*sin(1/2*d*x+1/2*c)^4*b+b*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*A*cos(1/2*d
*x+1/2*c)*sin(1/2*d*x+1/2*c)^2-A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*
x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-B*(sin(1/2*d*x+1/
2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c)
,2^(1/2)))/(-b*(2*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2
*d*x+1/2*c)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.54

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = \frac{-i\sqrt{2}B\sqrt{b}\cos(dx+c)\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\,\sin(dx+c))}{}$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] (-I*sqrt(2)*B*sqrt(b)*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c)
+ I*sin(d*x + c)) + I*sqrt(2)*B*sqrt(b)*cos(d*x + c)*weierstrassPInverse(-4
, 0, cos(d*x + c) - I*sin(d*x + c)) - I*sqrt(2)*A*sqrt(b)*cos(d*x + c)*weie
rstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)
)) + I*sqrt(2)*A*sqrt(b)*cos(d*x + c)*weierstrassZeta(-4, 0, weierstrassPIn
verse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*sqrt(b*cos(d*x + c))*A*sin
(d*x + c))/(b^2*d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{B\cos(dx+c)+A}{(b\cos(dx+c))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)/(b*cos(d*x + c))^(3/2), x)
```

Giac [F]

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{B\cos\left(dx+c\right)+A}{\left(b\cos\left(dx+c\right)\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)/(b*cos(d*x + c))^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{A+B\,\cos\left(c+d\,x\right)}{{\left(b\,\cos\left(c+d\,x\right)\right)}^{3/2}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(b*cos(c + d*x))^(3/2),x)
[Out] int((A + B*cos(c + d*x))/(b*cos(c + d*x))^(3/2), x)
```

3.832 $\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 140

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = -\frac{2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^2d\sqrt{\cos(c+dx)}} + \frac{2A\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3bd\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2B\sin(c+dx)}{bd\sqrt{b\cos(c+dx)}}$$

```
[Out] 2/3*A*sin(d*x+c)/d/(b*cos(d*x+c))^(3/2)+2*B*sin(d*x+c)/b/d/(b*cos(d*x+c))^(
1/2)+2/3*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/
2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/b/d/(b*cos(d*x+c))^(1/2)-2*B*(cos(1/
2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/
2))*(b*cos(d*x+c))^(1/2)/b^2/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used = {16, 2827, 2716, 2721, 2720, 2719}

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = \frac{2A\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2A\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3bd\sqrt{b\cos(c+dx)}} - \frac{2BE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{b^2d\sqrt{\cos(c+dx)}} + \frac{2B\sin(c+dx)}{bd\sqrt{b\cos(c+dx)}}$$

```
[In] Int[((A + B*Cos[c + d*x])*Sec[c + d*x])/(b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-2*B*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(b^2*d*Sqrt[Cos[c + d
*x]]) + (2*A*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*b*d*Sqrt[b*Co
s[c + d*x]]) + (2*A*Sin[c + d*x])/(3*d*(b*Cos[c + d*x])^(3/2)) + (2*B*Sin[c
 + d*x])/(b*d*Sqrt[b*Cos[c + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= b\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx\\ &= (Ab)\int \frac{1}{(b\cos(c+dx))^{5/2}}\,dx+B\int \frac{1}{(b\cos(c+dx))^{3/2}}\,dx\end{aligned}$$

$$= \frac{2A\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2B\sin(c+dx)}{bd\sqrt{b\cos(c+dx)}} + \frac{A\int \frac{1}{\sqrt{b\cos(c+dx)}}dx}{3b} - \frac{B\int \sqrt{b\cos(c+dx)}dx}{b^2}$$

$$= \frac{2A\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2B\sin(c+dx)}{bd\sqrt{b\cos(c+dx)}} + \frac{\left(A\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}dx}{3b\sqrt{b\cos(c+dx)}} - \frac{\left(B\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}dx}{b^2\sqrt{\cos(c+dx)}}$$

$$= -\frac{2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^2d\sqrt{\cos(c+dx)}} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3bd\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2B\sin(c+dx)}{bd\sqrt{b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.62

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{3/2}}dx = \frac{2\left(-3B\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right) + A\sqrt{\cos(c+dx)}\,\text{EllipticF}}{3bd\sqrt{b\cos(c+dx}}$$

```
[In] Integrate[((A + B*Cos[c + d*x])*Sec[c + d*x])/(b*Cos[c + d*x])^(3/2),x]
[Out] (2*(-3*B*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2] + A*Sqrt[Cos[c + d*x]
]*EllipticF[(c + d*x)/2, 2] + 3*B*Sin[c + d*x] + A*Tan[c + d*x]))/(3*b*d*Sq
rt[b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 405 vs. 2(176) = 352.

Time = 6.60 (sec) , antiderivative size = 406, normalized size of antiderivative = 2.90

method	result
default	$\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(2A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right.}{}$
parts	$-\frac{2A\left(-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx}{2}}\right.}{3b\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\sin(}$

```
[In] int((A+B*cos(d*x+c))*sec(d*x+c)/(cos(d*x+c)*b)^(3/2),x,method=_RETURNVERBOS
E)
```

```
[Out] 2/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)/b^2/sin(1/2
*d*x+1/2*c)^3/(4*sin(1/2*d*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)*(2*A*(sin(1
/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*(2*sin(1/2*d*x
+1/2*c)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2-12*B*cos(1/2*d*x+1/2*c)*sin(1/2*d*x
+1/2*c)^4+6*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(
1/2))*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2+2*A*cos(1/2*d*x
+1/2*c)*sin(1/2*d*x+1/2*c)^2-A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+
1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+6*B*cos(1/2*d*x+1/2
*c)*sin(1/2*d*x+1/2*c)^2-3*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/
2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*
c)^4*b+b*sin(1/2*d*x+1/2*c)^2)^(1/2)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 192, normalized size of antiderivative = 1.37

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = \frac{-i\sqrt{2}A\sqrt{b}\cos{(dx+c)}^2\,\mathrm{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))^(3/2),x, algorithm="fr
icas")
```

```
[Out] 1/3*(-I*sqrt(2)*A*sqrt(b)*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x
 + c) + I*sin(d*x + c)) + I*sqrt(2)*A*sqrt(b)*cos(d*x + c)^2*weierstrassPIn
verse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 3*I*sqrt(2)*B*sqrt(b)*cos(d*x
 + c)^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c))) + 3*I*sqrt(2)*B*sqrt(b)*cos(d*x + c)^2*weierstrassZeta(-4, 0
, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(3*B*cos(d
*x + c) + A)*sqrt(b*cos(d*x + c))*sin(d*x + c))/(b^2*d*cos(d*x + c)^2)
```

Sympy [F]

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{(A+B\cos{(c+dx)})\sec{(c+dx)}}{(b\cos{(c+dx)})^{\frac{3}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))**(3/2),x)
```

```
[Out] Integral((A + B*cos(c + d*x))*sec(c + d*x)/(b*cos(c + d*x))**(3/2), x)
```

Maxima [F]

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\sec(dx+c)}{(b\cos(dx+c))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))^(3/2),x, algorithm="ma
xima")
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)/(b*cos(d*x + c))^(3/2), x)
```

Giac [F]

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\sec(dx+c)}{(b\cos(dx+c))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))^(3/2),x, algorithm="gi
ac")
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)/(b*cos(d*x + c))^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{A+B\cos(c+d\,x)}{\cos(c+d\,x)\,(b\cos(c+d\,x))^{3/2}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)*(b*cos(c + d*x))^(3/2)),x)
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)*(b*cos(c + d*x))^(3/2)), x)
```

3.833 $\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 171

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = -\frac{6A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5b^2d\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3bd\sqrt{b\cos(c+dx)}} + \frac{2Ab\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{6A\sin(c+dx)}{5bd\sqrt{b\cos(c+dx)}}$$

```
[Out] 2/5*A*b*sin(d*x+c)/d/(b*cos(d*x+c))^(5/2)+2/3*B*sin(d*x+c)/d/(b*cos(d*x+c))
^(3/2)+6/5*A*sin(d*x+c)/b/d/(b*cos(d*x+c))^(1/2)+2/3*B*(cos(1/2*d*x+1/2*c)^
2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c
)^(1/2)/b/d/(b*cos(d*x+c))^(1/2)-6/5*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2
*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/b^2/
d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 171, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.194$, Rules used

$= \{16, 2827, 2716, 2721, 2719, 2720\}$

$$\int \frac{(A + B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = -\frac{6AE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{5b^2d\sqrt{\cos(c+dx)}} + \frac{6A\sin(c+dx)}{5bd\sqrt{b\cos(c+dx)}} + \frac{2Ab\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3bd\sqrt{b\cos(c+dx)}}$$

```
[In] Int[((A + B*Cos[c + d*x])*Sec[c + d*x]^2)/(b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (-6*A*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(5*b^2*d*Sqrt[Cos[c +
 d*x]]) + (2*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*b*d*Sqrt[b*
Cos[c + d*x]]) + (2*A*b*Sin[c + d*x])/(5*d*(b*Cos[c + d*x])^(5/2)) + (2*B*S
in[c + d*x])/(3*d*(b*Cos[c + d*x])^(3/2)) + (6*A*Sin[c + d*x])/(5*b*d*Sqrt[
b*Cos[c + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= b^2 \int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{7/2}}\,dx\\
&= \left(Ab^2\right)\int \frac{1}{(b\cos(c+dx))^{7/2}}\,dx + (bB)\int \frac{1}{(b\cos(c+dx))^{5/2}}\,dx\\
&= \frac{2Ab\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}}\\
&\quad + \frac{1}{5}(3A)\int \frac{1}{(b\cos(c+dx))^{3/2}}\,dx + \frac{B\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx}{3b}\\
&= \frac{2Ab\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{6A\sin(c+dx)}{5bd\sqrt{b\cos(c+dx)}}\\
&\quad - \frac{(3A)\int \sqrt{b\cos(c+dx)}\,dx}{5b^2} + \frac{\left(B\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3b\sqrt{b\cos(c+dx)}}\\
&= \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3bd\sqrt{b\cos(c+dx)}} + \frac{2Ab\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}}\\
&\quad + \frac{2B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{6A\sin(c+dx)}{5bd\sqrt{b\cos(c+dx)}}\\
&\quad - \frac{\left(3A\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{5b^2\sqrt{\cos(c+dx)}}\\
&= -\frac{6A\sqrt{b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5b^2d\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3bd\sqrt{b\cos(c+dx)}}\\
&\quad + \frac{2Ab\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2B\sin(c+dx)}{3d(b\cos(c+dx))^{3/2}} + \frac{6A\sin(c+dx)}{5bd\sqrt{b\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 104, normalized size of antiderivative = 0.61

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = \frac{2\left(-9A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)+5B\sqrt{\cos(c+dx)}\,\text{Elliptic}\right.}{1}$$

```
[In] Integrate[((A + B*Cos[c + d*x])*Sec[c + d*x]^2)/(b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (2*(-9*A*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2] + 5*B*Sqrt[Cos[c + d*
x]]*EllipticF[(c + d*x)/2, 2] + 9*A*Sin[c + d*x] + 5*B*Tan[c + d*x] + 3*A*S
ec[c + d*x]*Tan[c + d*x]))/(15*b*d*Sqrt[b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 578 vs. 2(199) = 398.

Time = 8.14 (sec) , antiderivative size = 579, normalized size of antiderivative = 3.39

method	result
default	$-\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(72A\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-36A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E\right.}{}$
parts	$-\frac{2A\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(24\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,E\left(\right.\right.}{}$

```
[In] int((A+B*cos(d*x+c))*sec(d*x+c)^2/(cos(d*x+c)*b)^(3/2),x,method=_RETURNVERB
OSE)
```

```
[Out] -2/15*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)/b^2/sin(1
/2*d*x+1/2*c)^3/(8*sin(1/2*d*x+1/2*c)^6-12*sin(1/2*d*x+1/2*c)^4+6*sin(1/2*d
*x+1/2*c)^2-1)*(72*A*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6-36*A*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+
1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^4-20*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*s
in(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*
d*x+1/2*c)^4-72*A*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4+36*A*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2
*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2-20*B*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c
)^4+20*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Elli
pticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2+24*A*cos(1/2*d*x+1/2
*c)*sin(1/2*d*x+1/2*c)^2-9*A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/
2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+10*B*cos(1/2*d*x+1/2*
c)*sin(1/2*d*x+1/2*c)^2-5*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2
```

```
*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c
)^4*b+b*sin(1/2*d*x+1/2*c)^2)^(1/2)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 205, normalized size of antiderivative = 1.20

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = \frac{-5i\sqrt{2}B\sqrt{b}\cos{(dx+c)}^3\,\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^2/(b*cos(d*x+c))^(3/2),x, algorithm="
fricas")
```

```
[Out] 1/15*(-5*I*sqrt(2)*B*sqrt(b)*cos(d*x + c)^3*weierstrassPInverse(-4, 0, cos(
d*x + c) + I*sin(d*x + c)) + 5*I*sqrt(2)*B*sqrt(b)*cos(d*x + c)^3*weierstra
ssPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 9*I*sqrt(2)*A*sqrt(b)*co
s(d*x + c)^3*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c)
 + I*sin(d*x + c))) + 9*I*sqrt(2)*A*sqrt(b)*cos(d*x + c)^3*weierstrassZeta(
-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(9*A*
cos(d*x + c)^2 + 5*B*cos(d*x + c) + 3*A)*sqrt(b*cos(d*x + c))*sin(d*x + c))
/(b^2*d*cos(d*x + c)^3)
```

Sympy [F]

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{(A+B\cos{(c+dx)})\sec^2{(c+dx)}}{(b\cos{(c+dx)})^{\frac{3}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)**2/(b*cos(d*x+c))**(3/2),x)
```

```
[Out] Integral((A + B*cos(c + d*x))*sec(c + d*x)**2/(b*cos(c + d*x))**(3/2), x)
```

Maxima [F]

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{(B\cos{(dx+c)}+A)\sec{(dx+c)}^2}{(b\cos{(dx+c)})^{\frac{3}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^2/(b*cos(d*x+c))^(3/2),x, algorithm="
maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^2/(b*cos(d*x + c))^(3/2), x)
```

Giac [F]

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\sec(dx+c)^2}{(b\cos(dx+c))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^2/(b*cos(d*x+c))^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^2/(b*cos(d*x + c))^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{A+B\cos(c+d\,x)}{\cos(c+d\,x)^2\,(b\cos(c+d\,x))^{3/2}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)^2*(b*cos(c + d*x))^(3/2)),x)
```

```
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)^2*(b*cos(c + d*x))^(3/2)), x)
```

3.834 $\int \frac{\cos^5(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 176

$$\int \frac{\cos^5(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{6A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5b^3d\sqrt{\cos(c+dx)}} + \frac{10B\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21b^2d\sqrt{b\cos(c+dx)}} + \frac{10B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21b^3d} + \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^4d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^5d}$$

```
[Out] 2/5*A*(b*cos(d*x+c))^(3/2)*sin(d*x+c)/b^4/d+2/7*B*(b*cos(d*x+c))^(5/2)*sin(
d*x+c)/b^5/d+10/21*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/b^2/d/(b*cos(d*x+c))^(1/2)
+10/21*B*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/b^3/d+6/5*A*(cos(1/2*d*x+1/2*c)^2)
^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+
c))^(1/2)/b^3/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used = {16, 2827, 2715, 2721, 2719, 2720}

$$\int \frac{\cos^5(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{2A\sin(c+dx)(b\cos(c+dx))^{3/2}}{5b^4d} + \frac{6AE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{5b^3d\sqrt{\cos(c+dx)}} + \frac{2B\sin(c+dx)(b\cos(c+dx))^{5/2}}{7b^5d} + \frac{10B\sin(c+dx)\sqrt{b\cos(c+dx)}}{21b^3d} + \frac{10B\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21b^2d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^5*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (6*A*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(5*b^3*d*Sqrt[Cos[c +
d*x]]) + (10*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(21*b^2*d*Sqrt
[b*Cos[c + d*x]]) + (10*B*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(21*b^3*d) + (
2*A*(b*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(5*b^4*d) + (2*B*(b*Cos[c + d*x])^
(5/2)*Sin[c + d*x])/(7*b^5*d)
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = \frac{\int (b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx}{b^5}$$

$$= \frac{A\int (b\cos(c+dx))^{5/2}\,dx}{b^5} + \frac{B\int (b\cos(c+dx))^{7/2}\,dx}{b^6}$$

$$= \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^4d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^5d} + \frac{(3A)\int\sqrt{b\cos(c+dx)}\,dx}{5b^3} + \frac{(5B)\int(b\cos(c+dx))^{3/2}\,dx}{7b^4}$$

$$= \frac{10B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21b^3d} + \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^4d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^5d} + \frac{(5B)\int\frac{1}{\sqrt{b\cos(c+dx)}}\,dx}{21b^2} + \frac{\left(3A\sqrt{b\cos(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx}{5b^3\sqrt{\cos(c+dx)}}$$

$$= \frac{6A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5b^3d\sqrt{\cos(c+dx)}} + \frac{10B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21b^3d} + \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^4d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^5d} + \frac{\left(5B\sqrt{\cos(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{21b^2\sqrt{b\cos(c+dx)}}$$

$$= \frac{6A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5b^3d\sqrt{\cos(c+dx)}} + \frac{10B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{21b^2d\sqrt{b\cos(c+dx)}} + \frac{10B\sqrt{b\cos(c+dx)}\sin(c+dx)}{21b^3d} + \frac{2A(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^4d} + \frac{2B(b\cos(c+dx))^{5/2}\sin(c+dx)}{7b^5d}$$

Mathematica [A] (verified)

Time = 0.88 (sec) , antiderivative size = 104, normalized size of antiderivative = 0.59

$$\int\frac{\cos^5(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{252A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)+100B\sqrt{\cos(c+dx)}\,\text{EllipticF}}{210b}$$

```
[In] Integrate[(Cos[c + d*x]^5*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (252*A*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2] + 100*B*Sqrt[Cos[c + d*
x]]*EllipticF[(c + d*x)/2, 2] + (65*B + 42*A*Cos[c + d*x] + 15*B*Cos[2*(c +
 d*x)])*Sin[2*(c + d*x)])/(210*b^2*d*Sqrt[b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 8.29 (sec) , antiderivative size = 301, normalized size of antiderivative = 1.71

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(240B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(-168A-360B)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\cdots\right.}{}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\cdots\right.\right.}{5b^2\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos\cdots\right.\right.}}$

```
[In] int(cos(d*x+c)^5*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(5/2),x,method=_RETURNVERB
OSE)
```

```
[Out] -2/105*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)/b^2*(240*B
*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8+(-168*A-360*B)*sin(1/2*d*x+1/2*c)^
6*cos(1/2*d*x+1/2*c)+(168*A+280*B)*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+
(-42*A-80*B)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-63*A*(sin(1/2*d*x+1/2*
c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2
^(1/2))+25*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*
EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1/2*d*x+1/2*c)^4-sin(1/2*
d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2
)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 165, normalized size of antiderivative = 0.94

$$\int \frac{\cos^5(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{-25i\sqrt{2}B\sqrt{b}\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+\cdots}{}$$

```
[In] integrate(cos(d*x+c)^5*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorithm="
fricas")
```

```
[Out] 1/105*(-25*I*sqrt(2)*B*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c)) + 25*I*sqrt(2)*B*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x +
 c) - I*sin(d*x + c)) + 63*I*sqrt(2)*A*sqrt(b)*weierstrassZeta(-4, 0, weier
strassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 63*I*sqrt(2)*A*sqrt
(b)*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(
d*x + c))) + 2*(15*B*cos(d*x + c)^2 + 21*A*cos(d*x + c) + 25*B)*sqrt(b*cos(
d*x + c))*sin(d*x + c))/(b^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^5(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**5*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^5(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^5}{(b\cos(dx+c))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^5*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorithm="
maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^5/(b*cos(d*x + c))^(5/2), x)
```

Giac [F]

$$\int \frac{\cos^5(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^5}{(b\cos(dx+c))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^5*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^5/(b*cos(d*x + c))^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^5(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(c+d\,x)^5\,(A+B\,\cos(c+d\,x))}{(b\,\cos(c+d\,x))^{5/2}}\,dx$$

```
[In] int((cos(c + d*x)^5*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(5/2),x)
```

```
[Out] int((cos(c + d*x)^5*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(5/2), x)
```

3.835 $\int \frac{\cos^4(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 147

$$\int \frac{\cos^4(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{6B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5b^3d\sqrt{\cos(c+dx)}} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^2d\sqrt{b\cos(c+dx)}} + \frac{2A\sqrt{b\cos(c+dx)}\sin(c+dx)}{3b^3d} + \frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^4d}$$

```
[Out] 2/5*B*(b*cos(d*x+c))^(3/2)*sin(d*x+c)/b^4/d+2/3*A*(cos(1/2*d*x+1/2*c)^2)^(1
/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/
2)/b^2/d/(b*cos(d*x+c))^(1/2)+2/3*A*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/b^3/d+6
/5*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+
1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/b^3/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used = {16, 2827, 2715, 2721, 2720, 2719}

$$\int \frac{\cos^4(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{2A\sin(c+dx)\sqrt{b\cos(c+dx)}}{3b^3d} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^2d\sqrt{b\cos(c+dx)}} + \frac{2B\sin(c+dx)(b\cos(c+dx))^{3/2}}{5b^4d} + \frac{6BE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{5b^3d\sqrt{\cos(c+dx)}}$$

[In] Int[(Cos[c + d*x]^4*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),x]

[Out] (6*B*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(5*b^3*d*Sqrt[Cos[c + d*x]]) + (2*A*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*b^2*d*Sqrt[b*Cos[c + d*x]]) + (2*A*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(3*b^3*d) + (2*B*(b*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(5*b^4*d)

Rule 16

Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]

Rule 2715

Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2*n]

Rule 2719

Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]

Rule 2720

Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]

Rule 2721

Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ[-1, n, 1] && IntegerQ[2*n]

Rule 2827

Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\int (b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx}{b^4}\\
&= \frac{A\int (b\cos(c+dx))^{3/2}\,dx}{b^4} + \frac{B\int (b\cos(c+dx))^{5/2}\,dx}{b^5}
\end{aligned}$$

$$= \frac{2A\sqrt{b\cos(c+dx)}\sin(c+dx)}{3b^3d} + \frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^4d} + \frac{A\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx}{3b^2} + \frac{(3B)\int \sqrt{b\cos(c+dx)}\,dx}{5b^3}$$

$$= \frac{2A\sqrt{b\cos(c+dx)}\sin(c+dx)}{3b^3d} + \frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^4d} + \frac{\left(A\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3b^2\sqrt{b\cos(c+dx)}} + \frac{\left(3B\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{5b^3\sqrt{\cos(c+dx)}}$$

$$= \frac{6B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5b^3d\sqrt{\cos(c+dx)}} + \frac{2A\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^2d\sqrt{b\cos(c+dx)}} + \frac{2A\sqrt{b\cos(c+dx)}\sin(c+dx)}{3b^3d} + \frac{2B(b\cos(c+dx))^{3/2}\sin(c+dx)}{5b^4d}$$

Mathematica [A] (verified)

Time = 0.63 (sec) , antiderivative size = 91, normalized size of antiderivative = 0.62

$$\int \frac{\cos^4(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{2\sqrt{\cos(c+dx)}\left(9BE\left(\frac{1}{2}(c+dx)\middle|2\right)+5A\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\right.}{15b^2d\sqrt{b\cos(c+}}$$

```
[In] Integrate[(Cos[c + d*x]^4*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),x]
[Out] (2*Sqrt[Cos[c + d*x]]*(9*B*EllipticE[(c + d*x)/2, 2] + 5*A*EllipticF[(c + d
*x)/2, 2] + Sqrt[Cos[c + d*x]]*(5*A + 3*B*Cos[c + d*x])*Sin[c + d*x]))/(15*
b^2*d*Sqrt[b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 7.05 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.86

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-24B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+(20A+24B)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+(-1\right.}{15b^2\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right.\right.}}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{\right.}}{3b^2\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b}}$

```
[In] int(cos(d*x+c)^4*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(5/2),x,method=_RETURNVERB
OSE)
```

```
[Out] -2/15*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)/b^2*(-24*B*
cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+(20*A+24*B)*sin(1/2*d*x+1/2*c)^4*co
s(1/2*d*x+1/2*c)+(-10*A-6*B)*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+5*A*(s
in(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1
/2*d*x+1/2*c),2^(1/2))-9*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*
c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1/2*d*x+1/2
*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d*x+1/2*c
)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.05

$$\int \frac{\cos^4(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{-5i\sqrt{2}A\sqrt{b}\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin{(dx+c)}$$

```
[In] integrate(cos(d*x+c)^4*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorithm="
fricas")
```

```
[Out] 1/15*(-5*I*sqrt(2)*A*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*si
n(d*x + c)) + 5*I*sqrt(2)*A*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c)
 - I*sin(d*x + c)) + 9*I*sqrt(2)*B*sqrt(b)*weierstrassZeta(-4, 0, weierstra
ssPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 9*I*sqrt(2)*B*sqrt(b)*w
eierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x +
 c))) + 2*(3*B*cos(d*x + c) + 5*A)*sqrt(b*cos(d*x + c))*sin(d*x + c))/(b^3*
d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**4*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^4(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^4}{(b\cos(dx+c))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^4*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^4/(b*cos(d*x + c))^(5/2), x)
```

Giac [F]

$$\int \frac{\cos^4(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^4}{(b\cos(dx+c))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^4*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^4/(b*cos(d*x + c))^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^4(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(c+d\,x)^4\,(A+B\,\cos(c+d\,x))}{(b\,\cos(c+d\,x))^{5/2}}\,dx$$

```
[In] int((cos(c + d*x)^4*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(5/2),x)
[Out] int((cos(c + d*x)^4*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(5/2), x)
```

3.836 $\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 116

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{2A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^3d\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^2d\sqrt{b\cos(c+dx)}} + \frac{2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3b^3d}$$

```
[Out] 2/3*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x
+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/b^2/d/(b*cos(d*x+c))^(1/2)+2/3*B*sin(d*x+
c)*(b*cos(d*x+c))^(1/2)/b^3/d+2*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+
1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/b^3/d/cos
(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used = {16, 2827, 2721, 2719, 2715, 2720}

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{2AE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{b^3d\sqrt{\cos(c+dx)}} + \frac{2B\sin(c+dx)\sqrt{b\cos(c+dx)}}{3b^3d} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^2d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^3*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*A*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(b^3*d*Sqrt[Cos[c + d*
x]]) + (2*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*b^2*d*Sqrt[b*C
os[c + d*x]]) + (2*B*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(3*b^3*d)
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = \frac{\int \sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx}{b^3}$$

$$= \frac{A\int \sqrt{b\cos(c+dx)}\,dx}{b^3} + \frac{B\int (b\cos(c+dx))^{3/2}\,dx}{b^4}$$

$$= \frac{2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3b^3d} + \frac{B\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx}{3b^2} + \frac{\left(A\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{b^3\sqrt{\cos(c+dx)}}$$

$$= \frac{2A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^3d\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3b^3d} + \frac{\left(B\sqrt{\cos(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3b^2\sqrt{b\cos(c+dx)}}$$

$$= \frac{2A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^3d\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^2d\sqrt{b\cos(c+dx)}} + \frac{2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{3b^3d}$$

Mathematica [A] (verified)

Time = 0.46 (sec) , antiderivative size = 78, normalized size of antiderivative = 0.67

$$\int\frac{\cos^3(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{2\sqrt{\cos(c+dx)}\left(3AE\left(\frac{1}{2}(c+dx)\middle|2\right)+B\left(\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\right.\right.}{3b^2d\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[(Cos[c + d*x]^3*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*(3*A*EllipticE[(c + d*x)/2, 2] + B*(EllipticF[(c + d*
x)/2, 2] + Sqrt[Cos[c + d*x]]*Sin[c + d*x])))/(3*b^2*d*Sqrt[b*Cos[c + d*x]]
)
```

Maple [A] (verified)

Time = 5.70 (sec) , antiderivative size = 240, normalized size of antiderivative = 2.07

method	result
default	$\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(-4B\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+3A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E\left(\cos\left(\frac{dx}{2}\right.\right.\right.}{3b^2\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\right.}$
parts	$\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{b^2\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)bd}} - \frac{2B\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.}}{}$

```
[In] int(cos(d*x+c)^3*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(5/2),x,method=_RETURNVERB
OSE)
```

```
[Out] 2/3*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)/b^2*(-4*B*cos
(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4+3*A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*si
n(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+2*B*cos(1
/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2-B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/
```

```
2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))/(-b*(2*sin(1
/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2
*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 142, normalized size of antiderivative = 1.22

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{-i\sqrt{2}B\sqrt{b}\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\sin{(dx+c}$$

```
[In] integrate(cos(d*x+c)^3*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorithm="
fricas")
```

```
[Out] 1/3*(-I*sqrt(2)*B*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d
*x + c)) + I*sqrt(2)*B*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) - I*
sin(d*x + c)) + 3*I*sqrt(2)*A*sqrt(b)*weierstrassZeta(-4, 0, weierstrassPIn
verse(-4, 0, cos(d*x + c) + I*sin(d*x + c))) - 3*I*sqrt(2)*A*sqrt(b)*weiers
trassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)))
 + 2*sqrt(b*cos(d*x + c))*B*sin(d*x + c))/(b^3*d)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**3*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{(B\cos{(dx+c)}+A)\cos{(dx+c)}^3}{(b\cos{(dx+c)})^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^3*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorithm="
maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^3/(b*cos(d*x + c))^(5/2), x)
```

Giac [F]

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^3}{(b\cos(dx+c))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^3*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^3/(b*cos(d*x + c))^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^3(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(c+d\,x)^3\,(A+B\,\cos(c+d\,x))}{(b\,\cos(c+d\,x))^{5/2}}\,dx$$

```
[In] int((cos(c + d*x)^3*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(5/2),x)
[Out] int((cos(c + d*x)^3*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(5/2), x)
```

3.837 $\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 85

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^3d\sqrt{\cos(c+dx)}} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b^2d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1
/2*c),2^(1/2))*cos(d*x+c)^(1/2)/b^2/d/(b*cos(d*x+c))^(1/2)+2*B*(cos(1/2*d*x
+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(
b*cos(d*x+c))^(1/2)/b^3/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.161, Rules used = {16, 2827, 2721, 2720, 2719}

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b^2d\sqrt{b\cos(c+dx)}} + \frac{2BE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{b^3d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^2*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*B*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(b^3*d*Sqrt[Cos[c + d*
x]]) + (2*A*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(b^2*d*Sqrt[b*Cos
[c + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\int \frac{A+B\cos(c+dx)}{\sqrt{b\cos(c+dx)}}\,dx}{b^2} \\
&= \frac{A\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx}{b^2} + \frac{B\int \sqrt{b\cos(c+dx)}\,dx}{b^3} \\
&= \frac{\left(A\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{b^2\sqrt{b\cos(c+dx)}} + \frac{\left(B\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{b^3\sqrt{\cos(c+dx)}} \\
&= \frac{2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^3d\sqrt{\cos(c+dx)}} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b^2d\sqrt{b\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.67

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{2\sqrt{\cos(c+dx)}\left(BE\left(\frac{1}{2}(c+dx)\middle|2\right)+A\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\right)}{b^2d\sqrt{b\cos(c+dx)}}$$

[In] Integrate[(Cos[c + d*x]^2*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),x]

[Out] (2*Sqrt[Cos[c + d*x]]*(B*EllipticE[(c + d*x)/2, 2] + A*EllipticF[(c + d*x)/2, 2]))/(b^2*d*Sqrt[b*Cos[c + d*x]])

Maple [A] (verified)

Time = 4.59 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.92

method	result
default	$-\frac{2\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\left(AF\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-BE\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\right.\right.}{b^2\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b}\,d}$
parts	$-\frac{2A\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{b^2\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)b}\,d}+\frac{2B\sqrt{\left(2\left(\cos^2\left(\frac{d}{}\right.\right.\right.}}{b^2\sqrt{-}}$
risch	$-\frac{iB\left(e^{2i(dx+c)}+1\right)\sqrt{2}\,e^{-i(dx+c)}}{d\,b^2\sqrt{\left(e^{2i(dx+c)}+1\right)b\,e^{-i(dx+c)}}}-\frac{i\left(\frac{iA\sqrt{-i\left(e^{i(dx+c)}+i\right)}\sqrt{2}\sqrt{i\left(e^{i(dx+c)}-i\right)}\sqrt{ie^{i(dx+c)}}\,F\left(\sqrt{-i\left(e^{i(dx+c)}+i\right)},\frac{\sqrt{2}}{2}\right)}{\sqrt{b\,e^{3i(dx+c)}+b\,e^{i(dx+c)}}}+B\left(-\frac{2(}{b\sqrt{e^{i(dx}}}\right.\right.}{}$

[In] int(cos(d*x+c)^2*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)

[Out] -2*((2*cos(1/2*d*x+1/2*c)^2-1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(-2*cos(1/2*d*x+1/2*c)^2+1)^(1/2)*(A*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-B*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))/b^2/(-b*(2*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1/2*d*x+1/2*c)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.44

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{-i\sqrt{2}A\sqrt{b}\text{weierstrassPInverse}(-4,0,\cos(dx+c)+i\sin(dx+c))}{}$$

```
[In] integrate(cos(d*x+c)^2*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorithm="
fricas")
```

```
[Out] (-I*sqrt(2)*A*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x +
 c)) + I*sqrt(2)*A*sqrt(b)*weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(
d*x + c)) + I*sqrt(2)*B*sqrt(b)*weierstrassZeta(-4, 0, weierstrassPInverse(
-4, 0, cos(d*x + c) + I*sin(d*x + c))) - I*sqrt(2)*B*sqrt(b)*weierstrassZet
a(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))))/(b^3*d
)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**2*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^2}{(b\cos(dx+c))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^2*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorithm="
maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^2/(b*cos(d*x + c))^(5/2), x)
```

Giac [F]

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^2}{(b\cos(dx+c))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^2*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^2/(b*cos(d*x + c))^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos(c+d\,x)^2\,(A+B\,\cos(c+d\,x))}{(b\,\cos(c+d\,x))^{5/2}}\,dx$$

```
[In] int((cos(c + d*x)^2*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(5/2),x)
```

```
[Out] int((cos(c + d*x)^2*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(5/2), x)
```

3.838 $\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 112

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = -\frac{2A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^3d\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b^2d\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{b^2d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2*A*sin(d*x+c)/b^2/d/(b*cos(d*x+c))^(1/2)+2*B*(cos(1/2*d*x+1/2*c)^2)^(1/2)/
cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/b
^2/d/(b*cos(d*x+c))^(1/2)-2*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*
c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/b^3/d/cos(d*x
+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used = {16, 2827, 2716, 2721, 2719, 2720}

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = -\frac{2AE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{b^3d\sqrt{\cos(c+dx)}} + \frac{2A\sin(c+dx)}{b^2d\sqrt{b\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\operatorname{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b^2d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (-2*A*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(b^3*d*Sqrt[Cos[c + d
*x]]) + (2*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(b^2*d*Sqrt[b*Co
s[c + d*x]]) + (2*A*Sin[c + d*x])/(b^2*d*Sqrt[b*Cos[c + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{3/2}}\,dx}{b}\\
&= \frac{A\int \frac{1}{(b\cos(c+dx))^{3/2}}\,dx}{b} + \frac{B\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx}{b^2}\\
&= \frac{2A\sin(c+dx)}{b^2 d\sqrt{b\cos(c+dx)}} - \frac{A\int \sqrt{b\cos(c+dx)}\,dx}{b^3} + \frac{\left(B\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{b^2\sqrt{b\cos(c+dx)}}
\end{aligned}$$

$$= \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b^2d\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{b^2d\sqrt{b\cos(c+dx)}} - \frac{\left(A\sqrt{b\cos(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx}{b^3\sqrt{\cos(c+dx)}}$$

$$= -\frac{2A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^3d\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{b^2d\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{b^2d\sqrt{b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.68

$$\int\frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{2\left(-A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)+B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(\right.\right.}{b^2d\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[(Cos[c + d*x]*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*(-(A*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2]) + B*Sqrt[Cos[c + d*x]
]*EllipticF[(c + d*x)/2, 2] + A*Sin[c + d*x]))/(b^2*d*Sqrt[b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 4.66 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.94

method	result
default	$\frac{2\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(2A\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.}{b^2\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\right.\right.\right.}}$
parts	$-\frac{2A\left(-2\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)b+b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{-2\left(\sin^4\left(\right.\right.}\right.}{b^2\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)}}$

```
[In] int(cos(d*x+c)*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOS
E)
```

```
[Out] 2/b^2*(-2*sin(1/2*d*x+1/2*c)^4*b+b*sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*A*cos(1/2
*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^2-A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*
d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-B*(sin(1/2*d*x+
1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*
```

```
c),2^(1/2)))/(-b*(2*sin(1/2*d*x+1/2*c)^4-sin(1/2*d*x+1/2*c)^2))^(1/2)/sin(1
/2*d*x+1/2*c)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.54

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{-i\sqrt{2}B\sqrt{b}\cos(dx+c)\,\mathrm{weierstrassPInverse}(-4,0,\cos(dx+c)+i}{}$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorithm="fr
icas")
```

```
[Out] (-I*sqrt(2)*B*sqrt(b)*cos(d*x + c)*weierstrassPInverse(-4, 0, cos(d*x + c)
+ I*sin(d*x + c)) + I*sqrt(2)*B*sqrt(b)*cos(d*x + c)*weierstrassPInverse(-4
, 0, cos(d*x + c) - I*sin(d*x + c)) - I*sqrt(2)*A*sqrt(b)*cos(d*x + c)*weie
rstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*sin(d*x + c)
)) + I*sqrt(2)*A*sqrt(b)*cos(d*x + c)*weierstrassZeta(-4, 0, weierstrassPIn
verse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*sqrt(b*cos(d*x + c))*A*sin
(d*x + c))/(b^3*d*cos(d*x + c))
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)}{(b\cos(dx+c))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorithm="ma
xima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)/(b*cos(d*x + c))^(5/2), x)
```

Giac [F]

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{(B\cos{(dx+c)}+A)\cos{(dx+c)}}{(b\cos{(dx+c)})^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorithm="gi
ac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)/(b*cos(d*x + c))^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos{(c+d\,x)}\,\left(A+B\,\cos{(c+d\,x)}\right)}{{\left(b\,\cos{(c+d\,x)}\right)}^{5/2}}\,dx$$

```
[In] int((cos(c + d*x)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(5/2),x)
```

```
[Out] int((cos(c + d*x)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(5/2), x)
```

3.839 $\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 143

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx = -\frac{2B\sqrt{b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^3d\sqrt{\cos(c+dx)}} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^2d\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{3bd(b\cos(c+dx))^{3/2}} + \frac{2B\sin(c+dx)}{b^2d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2/3*A*sin(d*x+c)/b/d/(b*cos(d*x+c))^(3/2)+2*B*sin(d*x+c)/b^2/d/(b*cos(d*x+c
))^(1/2)+2/3*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(si
n(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/b^2/d/(b*cos(d*x+c))^(1/2)-2*B*(
cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c)
,2^(1/2))*(b*cos(d*x+c))^(1/2)/b^3/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 143, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2827, 2716, 2721, 2720, 2719}

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx = \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^2d\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{3bd(b\cos(c+dx))^{3/2}} - \frac{2BE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{b^3d\sqrt{\cos(c+dx)}} + \frac{2B\sin(c+dx)}{b^2d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(A + B*Cos[c + d*x])/(b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (-2*B*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(b^3*d*Sqrt[Cos[c + d
*x]]) + (2*A*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*b^2*d*Sqrt[b*
```

```
Cos[c + d*x]]) + (2*A*Sin[c + d*x])/(3*b*d*(b*Cos[c + d*x])^(3/2)) + (2*B*S
in[c + d*x])/(b^2*d*Sqrt[b*Cos[c + d*x]])
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= A\int \frac{1}{(b\cos(c+dx))^{5/2}}\,dx + \frac{B\int \frac{1}{(b\cos(c+dx))^{3/2}}\,dx}{b}\\
&= \frac{2A\sin(c+dx)}{3bd(b\cos(c+dx))^{3/2}} + \frac{2B\sin(c+dx)}{b^2d\sqrt{b\cos(c+dx)}} + \frac{A\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx}{3b^2} - \frac{B\int \sqrt{b\cos(c+dx)}\,dx}{b^3}\\
&= \frac{2A\sin(c+dx)}{3bd(b\cos(c+dx))^{3/2}} + \frac{2B\sin(c+dx)}{b^2d\sqrt{b\cos(c+dx)}}\\
&\quad + \frac{\left(A\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3b^2\sqrt{b\cos(c+dx)}} - \frac{\left(B\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{b^3\sqrt{\cos(c+dx)}}
\end{aligned}$$

$$= -\frac{2B\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{b^3d\sqrt{\cos(c+dx)}} + \frac{2A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^2d\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{3bd(b\cos(c+dx))^{3/2}} + \frac{2B\sin(c+dx)}{b^2d\sqrt{b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.61

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx = \frac{2\left(-3B\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right) + A\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\right.}{3b^2d\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/(b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*(-3*B*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2] + A*Sqrt[Cos[c + d*x]
]*EllipticF[(c + d*x)/2, 2] + 3*B*Sin[c + d*x] + A*Tan[c + d*x]))/(3*b^2*d*
Sqrt[b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 405 vs. $2(179) = 358$.

Time = 6.41 (sec) , antiderivative size = 406, normalized size of antiderivative = 2.84

method	result
default	$\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(2A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right.}{}$
parts	$-\frac{2A\left(-2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,F\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx}{2}}\right.}{3b^2\sqrt{-b\left(2\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right)}\left(2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)\sin}$

```
[In] int((A+B*cos(d*x+c))/(cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)/b^3/sin(1/2
*d*x+1/2*c)^3/(4*sin(1/2*d*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)*(2*A*(sin(1
/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*(2*sin(1/2*d*x
+1/2*c)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2-12*B*cos(1/2*d*x+1/2*c)*sin(1/2*d*x
+1/2*c)^4+6*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(
1/2))*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*sin(1/2*d*x+1/2*c)^2+2*A*cos(1/2*d*x
+1/2*c)*sin(1/2*d*x+1/2*c)^2-A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+
1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+6*B*cos(1/2*d*x+1/2
*c)*sin(1/2*d*x+1/2*c)^2-3*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/
```

```
2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*
c)^4*b+b*sin(1/2*d*x+1/2*c)^2)^(1/2)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 192, normalized size of antiderivative = 1.34

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx = \frac{-i\sqrt{2}A\sqrt{b}\cos{(dx+c)}^2\,\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin{(dx+c)})}{}$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/3*(-I*sqrt(2)*A*sqrt(b)*cos(d*x + c)^2*weierstrassPInverse(-4, 0, cos(d*x
 + c) + I*sin(d*x + c)) + I*sqrt(2)*A*sqrt(b)*cos(d*x + c)^2*weierstrassPIn
verse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 3*I*sqrt(2)*B*sqrt(b)*cos(d*x
 + c)^2*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) + I*
sin(d*x + c))) + 3*I*sqrt(2)*B*sqrt(b)*cos(d*x + c)^2*weierstrassZeta(-4, 0
, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(3*B*cos(d
*x + c) + A)*sqrt(b*cos(d*x + c))*sin(d*x + c))/(b^3*d*cos(d*x + c)^2)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{B\cos{(dx+c)}+A}{(b\cos{(dx+c)})^{\frac{5}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)/(b*cos(d*x + c))^(5/2), x)
```

Giac [F]

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{B\cos\left(dx+c\right)+A}{\left(b\cos\left(dx+c\right)\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)/(b*cos(d*x + c))^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{A+B\,\cos\left(c+d\,x\right)}{{\left(b\,\cos\left(c+d\,x\right)\right)}^{5/2}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(b*cos(c + d*x))^(5/2),x)
[Out] int((A + B*cos(c + d*x))/(b*cos(c + d*x))^(5/2), x)
```

3.840 $\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 173

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx = -\frac{6A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5b^3d\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^2d\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2B\sin(c+dx)}{3bd(b\cos(c+dx))^{3/2}} + \frac{6A\sin(c+dx)}{5b^2d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2/5*A*sin(d*x+c)/d/(b*cos(d*x+c))^(5/2)+2/3*B*sin(d*x+c)/b/d/(b*cos(d*x+c))
^(3/2)+6/5*A*sin(d*x+c)/b^2/d/(b*cos(d*x+c))^(1/2)+2/3*B*(cos(1/2*d*x+1/2*c
)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x
+c)^(1/2)/b^2/d/(b*cos(d*x+c))^(1/2)-6/5*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos
(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1/2)/
b^3/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.207$, Rules used

$= \{16, 2827, 2716, 2721, 2719, 2720\}$

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx = -\frac{6AE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{b\cos(c+dx)}}{5b^3d\sqrt{\cos(c+dx)}} + \frac{6A\sin(c+dx)}{5b^2d\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^2d\sqrt{b\cos(c+dx)}} + \frac{2B\sin(c+dx)}{3bd(b\cos(c+dx))^{3/2}}$$

```
[In] Int[((A + B*Cos[c + d*x])*Sec[c + d*x])/(b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (-6*A*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(5*b^3*d*Sqrt[Cos[c +
 d*x]]) + (2*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*b^2*d*Sqrt[
b*Cos[c + d*x]]) + (2*A*Sin[c + d*x])/(5*d*(b*Cos[c + d*x])^(5/2)) + (2*B*S
in[c + d*x])/(3*b*d*(b*Cos[c + d*x])^(3/2)) + (6*A*Sin[c + d*x])/(5*b^2*d*S
qrt[b*Cos[c + d*x]])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= b\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{7/2}}\,dx \\
&= (Ab)\int \frac{1}{(b\cos(c+dx))^{7/2}}\,dx + B\int \frac{1}{(b\cos(c+dx))^{5/2}}\,dx \\
&= \frac{2A\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2B\sin(c+dx)}{3bd(b\cos(c+dx))^{3/2}} + \frac{(3A)\int \frac{1}{(b\cos(c+dx))^{3/2}}\,dx}{5b} + \frac{B\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx}{3b^2} \\
&= \frac{2A\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2B\sin(c+dx)}{3bd(b\cos(c+dx))^{3/2}} + \frac{6A\sin(c+dx)}{5b^2d\sqrt{b\cos(c+dx)}} \\
&\quad - \frac{(3A)\int \sqrt{b\cos(c+dx)}\,dx}{5b^3} + \frac{\left(B\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3b^2\sqrt{b\cos(c+dx)}} \\
&= \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^2d\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} \\
&\quad + \frac{2B\sin(c+dx)}{3bd(b\cos(c+dx))^{3/2}} + \frac{6A\sin(c+dx)}{5b^2d\sqrt{b\cos(c+dx)}} \\
&\quad - \frac{\left(3A\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{5b^3\sqrt{\cos(c+dx)}} \\
&= -\frac{6A\sqrt{b\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5b^3d\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^2d\sqrt{b\cos(c+dx)}} \\
&\quad + \frac{2A\sin(c+dx)}{5d(b\cos(c+dx))^{5/2}} + \frac{2B\sin(c+dx)}{3bd(b\cos(c+dx))^{3/2}} + \frac{6A\sin(c+dx)}{5b^2d\sqrt{b\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 104, normalized size of antiderivative = 0.60

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx = \frac{2\left(-9A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)+5B\sqrt{\cos(c+dx)}\,\text{EllipticF}\right.}{15b^2}$$

```
[In] Integrate[((A + B*Cos[c + d*x])*Sec[c + d*x])/(b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (2*(-9*A*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2] + 5*B*Sqrt[Cos[c + d*
x]]*EllipticF[(c + d*x)/2, 2] + 9*A*Sin[c + d*x] + 5*B*Tan[c + d*x] + 3*A*S
ec[c + d*x]*Tan[c + d*x]))/(15*b^2*d*Sqrt[b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 578 vs. $2(201) = 402$.

Time = 8.42 (sec) , antiderivative size = 579, normalized size of antiderivative = 3.35

method	result
default	$-\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(72A\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-36A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E}{}$
parts	$-\frac{2A\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(24\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,E(}{}$

```
[In] int((A+B*cos(d*x+c))*sec(d*x+c)/(cos(d*x+c)*b)^(5/2),x,method=_RETURNVERBOS
E)
```

```
[Out] -2/15*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)/b^3/sin(1
/2*d*x+1/2*c)^3/(8*sin(1/2*d*x+1/2*c)^6-12*sin(1/2*d*x+1/2*c)^4+6*sin(1/2*d
*x+1/2*c)^2-1)*(72*A*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6-36*A*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+
1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^4-20*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*s
in(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*
d*x+1/2*c)^4-72*A*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4+36*A*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2
*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2-20*B*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c
)^4+20*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Elli
pticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2+24*A*cos(1/2*d*x+1/2
*c)*sin(1/2*d*x+1/2*c)^2-9*A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/
2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+10*B*cos(1/2*d*x+1/2*
c)*sin(1/2*d*x+1/2*c)^2-5*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2
*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c
)^4*b+b*sin(1/2*d*x+1/2*c)^2)^(1/2)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 205, normalized size of antiderivative = 1.18

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx = \frac{-5i\sqrt{2}B\sqrt{b}\cos(dx+c)^3\,\text{weierstrassPInverse}(-4,0,\cos(dx+c)}{}$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))^(5/2),x, algorithm="fr
icas")
```

```
[Out] 1/15*(-5*I*sqrt(2)*B*sqrt(b)*cos(d*x + c)^3*weierstrassPInverse(-4, 0, cos(
d*x + c) + I*sin(d*x + c)) + 5*I*sqrt(2)*B*sqrt(b)*cos(d*x + c)^3*weierstra
ssPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 9*I*sqrt(2)*A*sqrt(b)*co
s(d*x + c)^3*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c)
 + I*sin(d*x + c))) + 9*I*sqrt(2)*A*sqrt(b)*cos(d*x + c)^3*weierstrassZeta(
-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(9*A*
cos(d*x + c)^2 + 5*B*cos(d*x + c) + 3*A)*sqrt(b*cos(d*x + c))*sin(d*x + c))
/(b^3*d*cos(d*x + c)^3)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\sec(dx+c)}{(b\cos(dx+c))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))^(5/2),x, algorithm="ma
xima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)/(b*cos(d*x + c))^(5/2), x)
```

Giac [F]

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\sec(dx+c)}{(b\cos(dx+c))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))^(5/2),x, algorithm="gi
ac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)/(b*cos(d*x + c))^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{A+B\,\cos\left(c+d\,x\right)}{\cos\left(c+d\,x\right)\,\left(b\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)*(b*cos(c + d*x))^(5/2)),x)
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)*(b*cos(c + d*x))^(5/2)), x)
```

3.841 $\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 176

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{7/2}}\,dx = -\frac{6A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5b^4d\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^3d\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{5bd(b\cos(c+dx))^{5/2}} + \frac{2B\sin(c+dx)}{3b^2d(b\cos(c+dx))^{3/2}} + \frac{6A\sin(c+dx)}{5b^3d\sqrt{b\cos(c+dx)}}$$

```
[Out] 2/5*A*sin(d*x+c)/b/d/(b*cos(d*x+c))^(5/2)+2/3*B*sin(d*x+c)/b^2/d/(b*cos(d*x
+c))^(3/2)+6/5*A*sin(d*x+c)/b^3/d/(b*cos(d*x+c))^(1/2)+2/3*B*(cos(1/2*d*x+1
/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos
(d*x+c)^(1/2)/b^3/d/(b*cos(d*x+c))^(1/2)-6/5*A*(cos(1/2*d*x+1/2*c)^2)^(1/2)
/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(b*cos(d*x+c))^(1
/2)/b^4/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$, Rules used

$= \{2827, 2716, 2721, 2719, 2720\}$

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{7/2}}\,dx = -\frac{6AE\left(\frac{1}{2}(c+dx)\middle|\,2\right)\sqrt{b\cos(c+dx)}}{5b^4d\sqrt{\cos(c+dx)}} + \frac{6A\sin(c+dx)}{5b^3d\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{5bd(b\cos(c+dx))^{5/2}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^3d\sqrt{b\cos(c+dx)}} + \frac{2B\sin(c+dx)}{3b^2d(b\cos(c+dx))^{3/2}}$$

```
[In] Int[(A + B*Cos[c + d*x])/(b*Cos[c + d*x])^(7/2),x]
```

```
[Out] (-6*A*Sqrt[b*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(5*b^4*d*Sqrt[Cos[c +
 d*x]]) + (2*B*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(3*b^3*d*Sqrt[
b*Cos[c + d*x]]) + (2*A*Sin[c + d*x])/(5*b*d*(b*Cos[c + d*x])^(5/2)) + (2*B
*Sin[c + d*x])/(3*b^2*d*(b*Cos[c + d*x])^(3/2)) + (6*A*Sin[c + d*x])/(5*b^3
*d*Sqrt[b*Cos[c + d*x]])
```

Rule 2716

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1))), x] + Dist[(n + 2)/(b^2*(n + 1)), In
t[(b*Sin[c + d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] &&
IntegerQ[2*n]
```

Rule 2719

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticE[(1/2)*
(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2720

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2/d)*EllipticF[(1/2
)*(c - Pi/2 + d*x), 2], x] /; FreeQ[{c, d}, x]
```

Rule 2721

```
Int[((b_)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[(b*Sin[c + d*x])
^n/Sin[c + d*x]^n, Int[Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] && LtQ
[-1, n, 1] && IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = A\int \frac{1}{(b\cos(c+dx))^{7/2}}\,dx + \frac{B\int \frac{1}{(b\cos(c+dx))^{5/2}}\,dx}{b}$$

$$= \frac{2A\sin(c+dx)}{5bd(b\cos(c+dx))^{5/2}} + \frac{2B\sin(c+dx)}{3b^2d(b\cos(c+dx))^{3/2}} + \frac{(3A)\int \frac{1}{(b\cos(c+dx))^{3/2}}\,dx}{5b^2} + \frac{B\int \frac{1}{\sqrt{b\cos(c+dx)}}\,dx}{3b^3}$$

$$= \frac{2A\sin(c+dx)}{5bd(b\cos(c+dx))^{5/2}} + \frac{2B\sin(c+dx)}{3b^2d(b\cos(c+dx))^{3/2}} + \frac{6A\sin(c+dx)}{5b^3d\sqrt{b\cos(c+dx)}} - \frac{(3A)\int \sqrt{b\cos(c+dx)}\,dx}{5b^4} + \frac{\left(B\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3b^3\sqrt{b\cos(c+dx)}}$$

$$= \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^3d\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{5bd(b\cos(c+dx))^{5/2}} + \frac{2B\sin(c+dx)}{3b^2d(b\cos(c+dx))^{3/2}} + \frac{6A\sin(c+dx)}{5b^3d\sqrt{b\cos(c+dx)}} - \frac{\left(3A\sqrt{b\cos(c+dx)}\right)\int \sqrt{\cos(c+dx)}\,dx}{5b^4\sqrt{\cos(c+dx)}}$$

$$= -\frac{6A\sqrt{b\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5b^4d\sqrt{\cos(c+dx)}} + \frac{2B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)}{3b^3d\sqrt{b\cos(c+dx)}} + \frac{2A\sin(c+dx)}{5bd(b\cos(c+dx))^{5/2}} + \frac{2B\sin(c+dx)}{3b^2d(b\cos(c+dx))^{3/2}} + \frac{6A\sin(c+dx)}{5b^3d\sqrt{b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 104, normalized size of antiderivative = 0.59

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{7/2}}\,dx = \frac{2\left(-9A\sqrt{\cos(c+dx)}E\left(\frac{1}{2}(c+dx)\middle|2\right) + 5B\sqrt{\cos(c+dx)}\,\text{EllipticF}\left(\frac{1}{2}(c+dx),2\right)\right.}{15b^3d\sqrt{b\cos(c+}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/(b*Cos[c + d*x])^(7/2),x]

[Out] (2*(-9*A*Sqrt[Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2] + 5*B*Sqrt[Cos[c + d*
x]]*EllipticF[(c + d*x)/2, 2] + 9*A*Sin[c + d*x] + 5*B*Tan[c + d*x] + 3*A*S
ec[c + d*x]*Tan[c + d*x]))/(15*b^3*d*Sqrt[b*Cos[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 578 vs. $2(204) = 408$.

Time = 8.38 (sec) , antiderivative size = 579, normalized size of antiderivative = 3.29

method	result
default	$-\frac{2\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(72A\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-36A\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,E}{}$
parts	$-\frac{2A\sqrt{-\left(-2\left(\cos^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+1\right)b\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}\left(24\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,E(}{}$

[In] int((A+B*cos(d*x+c))/(cos(d*x+c)*b)^(7/2),x,method=_RETURNVERBOSE)

```
[Out] -2/15*(-(-2*cos(1/2*d*x+1/2*c)^2+1)*b*sin(1/2*d*x+1/2*c)^2)^(1/2)/b^4/sin(1
/2*d*x+1/2*c)^3/(8*sin(1/2*d*x+1/2*c)^6-12*sin(1/2*d*x+1/2*c)^4+6*sin(1/2*d
*x+1/2*c)^2-1)*(72*A*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6-36*A*(sin(1/2*
d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+
1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^4-20*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*s
in(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*
d*x+1/2*c)^4-72*A*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^4+36*A*(sin(1/2*d*x
+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2
*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2-20*B*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c
)^4+20*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Elli
pticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2+24*A*cos(1/2*d*x+1/2
*c)*sin(1/2*d*x+1/2*c)^2-9*A*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/
2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+10*B*cos(1/2*d*x+1/2*
c)*sin(1/2*d*x+1/2*c)^2-5*B*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2
*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2)))*(-2*sin(1/2*d*x+1/2*c
)^4*b+b*sin(1/2*d*x+1/2*c)^2)^(1/2)/((2*cos(1/2*d*x+1/2*c)^2-1)*b)^(1/2)/d
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 205, normalized size of antiderivative = 1.16

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{7/2}}\,dx = \frac{-5i\sqrt{2}B\sqrt{b}\cos{(dx+c)}^3\,\text{weierstrassPInverse}(-4,0,\cos{(dx+c)}+i\,\sin{(dx+c}}{}$$

[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))^(7/2),x, algorithm="fricas")

```
[Out] 1/15*(-5*I*sqrt(2)*B*sqrt(b)*cos(d*x + c)^3*weierstrassPInverse(-4, 0, cos(
d*x + c) + I*sin(d*x + c)) + 5*I*sqrt(2)*B*sqrt(b)*cos(d*x + c)^3*weierstra
```

```
ssPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c)) - 9*I*sqrt(2)*A*sqrt(b)*co
s(d*x + c)^3*weierstrassZeta(-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c)
 + I*sin(d*x + c))) + 9*I*sqrt(2)*A*sqrt(b)*cos(d*x + c)^3*weierstrassZeta(
-4, 0, weierstrassPInverse(-4, 0, cos(d*x + c) - I*sin(d*x + c))) + 2*(9*A*
cos(d*x + c)^2 + 5*B*cos(d*x + c) + 3*A)*sqrt(b*cos(d*x + c))*sin(d*x + c))
/(b^4*d*cos(d*x + c)^3)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{7/2}}\,dx = \text{Timed out}$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{7/2}}\,dx = \int \frac{B\cos\left(dx+c\right)+A}{\left(b\cos\left(dx+c\right)\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))^(7/2),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)/(b*cos(d*x + c))^(7/2), x)
```

Giac [F]

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{7/2}}\,dx = \int \frac{B\cos\left(dx+c\right)+A}{\left(b\cos\left(dx+c\right)\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))^(7/2),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)/(b*cos(d*x + c))^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{7/2}}\,dx = \int \frac{A+B\,\cos\left(c+d\,x\right)}{\left(b\,\cos\left(c+d\,x\right)\right)^{7/2}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(b*cos(c + d*x))^(7/2),x)
[Out] int((A + B*cos(c + d*x))/(b*cos(c + d*x))^(7/2), x)
```

3.842 $\int \cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 33, antiderivative size = 172

$$\begin{aligned}\int \cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx &= \frac{3Bx\sqrt{b\cos(c+dx)}}{8\sqrt{\cos(c+dx)}}+\frac{A\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} \\ &+\frac{3B\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{8d} \\ &+\frac{B\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}\sin(c+dx)}{4d}-\frac{A\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\sqrt{\cos(c+dx)}}\end{aligned}$$

```
[Out] 1/4*B*cos(d*x+c)^(5/2)*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d+3/8*B*x*(b*cos(d*x
+c))^(1/2)/cos(d*x+c)^(1/2)+A*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^
(1/2)-1/3*A*sin(d*x+c)^3*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)+3/8*B*sin(
d*x+c)*cos(d*x+c)^(1/2)*(b*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used

$= \{17, 2827, 2713, 2715, 8\}$

$$\int \cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$= -\frac{A\sin^3(c+dx)\sqrt{b\cos(c+dx)}}{3d\sqrt{\cos(c+dx)}} + \frac{A\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}} + \frac{3Bx\sqrt{b\cos(c+dx)}}{8\sqrt{\cos(c+dx)}} + \frac{B\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}}{4d} + \frac{3B\sin(c+dx)\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}{8d}$$

```
[In] Int[Cos[c + d*x]^(5/2)*Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]),x]
```

```
[Out] (3*B*x*Sqrt[b*Cos[c + d*x]])/(8*Sqrt[Cos[c + d*x]]) + (A*Sqrt[b*Cos[c + d*x
]]*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]]) + (3*B*Sqrt[Cos[c + d*x]]*Sqrt[b*Co
s[c + d*x]]*Sin[c + d*x])/(8*d) + (B*Cos[c + d*x]^(5/2)*Sqrt[b*Cos[c + d*x]
]*Sin[c + d*x])/(4*d) - (A*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x]^3)/(3*d*Sqrt[C
os[c + d*x]])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
```

```
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{b\cos(c+dx)}\int\cos^3(c+dx)(A+B\cos(c+dx))\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{\left(A\sqrt{b\cos(c+dx)}\right)\int\cos^3(c+dx)\,dx}{\sqrt{\cos(c+dx)}}+\frac{\left(B\sqrt{b\cos(c+dx)}\right)\int\cos^4(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{B\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}\sin(c+dx)}{4d}\\
&\quad+\frac{\left(3B\sqrt{b\cos(c+dx)}\right)\int\cos^2(c+dx)\,dx}{4\sqrt{\cos(c+dx)}}\\
&\quad-\frac{\left(A\sqrt{b\cos(c+dx)}\right)\text{Subst}\left(\int\left(1-x^2\right)\,dx,x,-\sin(c+dx)\right)}{d\sqrt{\cos(c+dx)}}\\
&= \frac{A\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}+\frac{3B\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{8d}\\
&\quad+\frac{B\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}\sin(c+dx)}{4d}\\
&\quad-\frac{A\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\sqrt{\cos(c+dx)}}+\frac{\left(3B\sqrt{b\cos(c+dx)}\right)\int 1\,dx}{8\sqrt{\cos(c+dx)}}\\
&= \frac{3Bx\sqrt{b\cos(c+dx)}}{8\sqrt{\cos(c+dx)}}+\frac{A\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}\\
&\quad+\frac{3B\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{8d}\\
&\quad+\frac{B\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}\sin(c+dx)}{4d}-\frac{A\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\sqrt{\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.40 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.47

$$\int \cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$= \frac{\sqrt{b\cos(c+dx)}(36Bc+36Bdx+72A\sin(c+dx)+24B\sin(2(c+dx))+8A\sin(3(c+dx))+3B\sin(4(c}{96d\sqrt{\cos(c+dx)}}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)*Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]),x]
[Out] (Sqrt[b*Cos[c + d*x]]*(36*B*c + 36*B*d*x + 72*A*Sin[c + d*x] + 24*B*Sin[2*(
c + d*x)] + 8*A*Sin[3*(c + d*x)] + 3*B*Sin[4*(c + d*x)]))/(96*d*Sqrt[Cos[c
+ d*x]])
```

Maple [A] (verified)

Time = 5.22 (sec) , antiderivative size = 91, normalized size of antiderivative = 0.53

method	result
default	$\frac{\sqrt{\cos(dx+c)b}\,(6B\sin(dx+c)(\cos^3(dx+c))+8A\sin(dx+c)(\cos^2(dx+c))+9B\sin(dx+c)\cos(dx+c)+16A\sin(dx+c)+9B(dx+c))}{24d\sqrt{\cos(dx+c)}}$
parts	$\frac{A(2+\cos^2(dx+c))\sin(dx+c)\sqrt{\cos(dx+c)b}}{3d\sqrt{\cos(dx+c)}}+\frac{B\sqrt{\cos(dx+c)b}\,(2\sin(dx+c)(\cos^3(dx+c))+3\cos(dx+c)\sin(dx+c)+3dx+3c)}{8d\sqrt{\cos(dx+c)}}$
risch	$\frac{3\sqrt{\cos(dx+c)b}\,(\sqrt{\cos}(dx+c))e^{i(dx+c)}xB}{4(e^{2i(dx+c)}+1)}-\frac{i\sqrt{\cos(dx+c)b}\,(\sqrt{\cos}(dx+c))e^{5i(dx+c)}B}{32(e^{2i(dx+c)}+1)d}-\frac{i\sqrt{\cos(dx+c)b}\,(\sqrt{\cos}(dx+c))e^{4i(dx+c)}A}{12(e^{2i(dx+c)}+1)d}$

```
[In] int(cos(d*x+c)^(5/2)*(cos(d*x+c)*b)^(1/2)*(A+B*cos(d*x+c)),x,method=_RETURN
VERBOSE)
[Out] 1/24/d*(cos(d*x+c)*b)^(1/2)*(6*B*sin(d*x+c)*cos(d*x+c)^3+8*A*sin(d*x+c)*cos
(d*x+c)^2+9*B*sin(d*x+c)*cos(d*x+c)+16*A*sin(d*x+c)+9*B*(d*x+c))/cos(d*x+c)
^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 252, normalized size of antiderivative = 1.47

$$\int \cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$= \left[\frac{9\,B\sqrt{-b}\cos(dx+c)\log\left(2\,b\cos(dx+c)^2-2\,\sqrt{b\cos(dx+c)}\sqrt{-b}\sqrt{\cos(dx+c)}\sin(dx+c)-b\right)+2}{48\,d\,\mathrm{co}}\right.$$

```
[In] integrate(cos(d*x+c)^(5/2)*(b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c)),x, algorit
hm="fricas")
```

```
[Out] [1/48*(9*B*sqrt(-b)*cos(d*x + c)*log(2*b*cos(d*x + c)^2 - 2*sqrt(b*cos(d*x
+ c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) + 2*(6*B*cos(d*x + c)^3
 + 8*A*cos(d*x + c)^2 + 9*B*cos(d*x + c) + 16*A)*sqrt(b*cos(d*x + c))*sqrt(
cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)), 1/24*(9*B*sqrt(b)*arctan(sqrt
(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/2)))*cos(d*x + c) +
(6*B*cos(d*x + c)^3 + 8*A*cos(d*x + c)^2 + 9*B*cos(d*x + c) + 16*A)*sqrt(b*
cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c))]
```

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)*(b*cos(d*x+c))**(1/2)*(A+B*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.48 (sec) , antiderivative size = 93, normalized size of antiderivative = 0.54

$$\int \cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$= \frac{3\left(12\,dx+12\,c+\sin\left(4\,dx+4\,c\right)+8\,\sin\left(\frac{1}{2}\,\arctan\left(\sin\left(4\,dx+4\,c\right),\cos\left(4\,dx+4\,c\right)\right)\right)\right)B\sqrt{b}+8\,A\sqrt{b}(\sin\left(3\right.}{96\,d}$$

```
[In] integrate(cos(d*x+c)^(5/2)*(b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c)),x, algorit
hm="maxima")
```

```
[Out] 1/96*(3*(12*d*x + 12*c + sin(4*d*x + 4*c) + 8*sin(1/2*arctan2(sin(4*d*x + 4
*c), cos(4*d*x + 4*c))))*B*sqrt(b) + 8*A*sqrt(b)*(sin(3*d*x + 3*c) + 9*sin(
1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))))/d
```

Giac [A] (verification not implemented)

none

Time = 3.40 (sec) , antiderivative size = 278, normalized size of antiderivative = 1.62

$$\int \cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$= \frac{9\,B\sqrt{b}dx\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{8}+36\,B\sqrt{b}dx\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{6}+48\,A\sqrt{b}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{7}-30\,B\sqrt{b}\tan\left(\frac{1}{2}\,dx\right.}{}$$

```
[In] integrate(cos(d*x+c)^(5/2)*(b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c)),x, algorit
hm="giac")
```

```
[Out] 1/24*(9*B*sqrt(b)*d*x*tan(1/2*d*x + 1/2*c)^8 + 36*B*sqrt(b)*d*x*tan(1/2*d*x
 + 1/2*c)^6 + 48*A*sqrt(b)*tan(1/2*d*x + 1/2*c)^7 - 30*B*sqrt(b)*tan(1/2*d*
x + 1/2*c)^7 + 54*B*sqrt(b)*d*x*tan(1/2*d*x + 1/2*c)^4 + 80*A*sqrt(b)*tan(1
/2*d*x + 1/2*c)^5 + 18*B*sqrt(b)*tan(1/2*d*x + 1/2*c)^5 + 36*B*sqrt(b)*d*x*
tan(1/2*d*x + 1/2*c)^2 + 80*A*sqrt(b)*tan(1/2*d*x + 1/2*c)^3 - 18*B*sqrt(b)
*tan(1/2*d*x + 1/2*c)^3 + 9*B*sqrt(b)*d*x + 48*A*sqrt(b)*tan(1/2*d*x + 1/2*
c) + 30*B*sqrt(b)*tan(1/2*d*x + 1/2*c))/(d*tan(1/2*d*x + 1/2*c)^8 + 4*d*tan
(1/2*d*x + 1/2*c)^6 + 6*d*tan(1/2*d*x + 1/2*c)^4 + 4*d*tan(1/2*d*x + 1/2*c)
^2 + d)
```

Mupad [B] (verification not implemented)

Time = 16.24 (sec) , antiderivative size = 105, normalized size of antiderivative = 0.61

$$\int \cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$= \frac{\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{b\,\cos\left(c+d\,x\right)}\,\left(24\,B\,\sin\left(c+d\,x\right)+80\,A\,\sin\left(2\,c+2\,d\,x\right)+8\,A\,\sin\left(4\,c+4\,d\,x\right)+27\,B\,\mathrm{s}\right.}{96\,d\,\left(\cos\left(2\,c+2\,d\,x\right)+1\right)}$$

```
[In] int(cos(c + d*x)^(5/2)*(b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)),x)
```

```
[Out] (cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(1/2)*(24*B*sin(c + d*x) + 80*A*sin(2*
c + 2*d*x) + 8*A*sin(4*c + 4*d*x) + 27*B*sin(3*c + 3*d*x) + 3*B*sin(5*c + 5
*d*x) + 72*B*d*x*cos(c + d*x)))/(96*d*(cos(2*c + 2*d*x) + 1))
```

3.843 $\int \cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 33, antiderivative size = 136

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \frac{Ax\sqrt{b\cos(c+dx)}}{2\sqrt{\cos(c+dx)}}+\frac{B\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{A\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d}-\frac{B\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\sqrt{\cos(c+dx)}}$$

```
[Out] 1/2*A*x*(b*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2)+B*sin(d*x+c)*(b*cos(d*x+c))^(
1/2)/d/cos(d*x+c)^(1/2)-1/3*B*sin(d*x+c)^3*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c
)^(1/2)+1/2*A*sin(d*x+c)*cos(d*x+c)^(1/2)*(b*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {17, 2827, 2715, 8, 2713}

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \frac{Ax\sqrt{b\cos(c+dx)}}{2\sqrt{\cos(c+dx)}}+\frac{A\sin(c+dx)\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}{2d} - \frac{B\sin^3(c+dx)\sqrt{b\cos(c+dx)}}{3d\sqrt{\cos(c+dx)}}+\frac{B\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^(3/2)*Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]),x]
```

```
[Out] (A*x*Sqrt[b*Cos[c + d*x]])/(2*Sqrt[Cos[c + d*x]]) + (B*Sqrt[b*Cos[c + d*x]]
*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]]) + (A*Sqrt[Cos[c + d*x]]*Sqrt[b*Cos[c
+ d*x]]*Sin[c + d*x])/(2*d) - (B*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x]^3)/(3*d*
Sqrt[Cos[c + d*x]])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sqrt{b\cos(c+dx)}\int\cos^2(c+dx)(A+B\cos(c+dx))\,dx}{\sqrt{\cos(c+dx)}}\\ &= \frac{\left(A\sqrt{b\cos(c+dx)}\right)\int\cos^2(c+dx)\,dx}{\sqrt{\cos(c+dx)}}+\frac{\left(B\sqrt{b\cos(c+dx)}\right)\int\cos^3(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\end{aligned}$$

$$= \frac{A\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d} + \frac{\left(A\sqrt{b\cos(c+dx)}\right)\int 1\,dx}{2\sqrt{\cos(c+dx)}} - \frac{\left(B\sqrt{b\cos(c+dx)}\right)\text{Subst}\left(\int (1-x^2)\,dx, x, -\sin(c+dx)\right)}{d\sqrt{\cos(c+dx)}}$$

$$= \frac{Ax\sqrt{b\cos(c+dx)}}{2\sqrt{\cos(c+dx)}} + \frac{B\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{A\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d} - \frac{B\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\sqrt{\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.28 (sec) , antiderivative size = 69, normalized size of antiderivative = 0.51

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \frac{\sqrt{b\cos(c+dx)}(6Ac+6Adx+9B\sin(c+dx)+3A\sin(2(c+dx))+B\sin(3(c+dx)))}{12d\sqrt{\cos(c+dx)}}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)*Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]),x]
```

```
[Out] (Sqrt[b*Cos[c + d*x]]*(6*A*c + 6*A*d*x + 9*B*Sin[c + d*x] + 3*A*Sin[2*(c + d*x)] + B*Sin[3*(c + d*x)]))/(12*d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 4.90 (sec) , antiderivative size = 74, normalized size of antiderivative = 0.54

method	result
default	$\frac{\sqrt{\cos(dx+c)b}\,(2B\sin(dx+c)(\cos^2(dx+c))+3A\sin(dx+c)\cos(dx+c)+3A(dx+c)+4B\sin(dx+c))}{6d\sqrt{\cos(dx+c)}}$
parts	$\frac{A\sqrt{\cos(dx+c)b}\,(\cos(dx+c)\sin(dx+c)+dx+c)}{2d\sqrt{\cos(dx+c)}} + \frac{B(2+\cos^2(dx+c))\sin(dx+c)\sqrt{\cos(dx+c)b}}{3d\sqrt{\cos(dx+c)}}$
risch	$\frac{\sqrt{\cos(dx+c)b}\,(\sqrt{\cos}(dx+c))e^{i(dx+c)}xA}{e^{2i(dx+c)}+1} - \frac{i\sqrt{\cos(dx+c)b}\,(\sqrt{\cos}(dx+c))e^{4i(dx+c)}B}{12(e^{2i(dx+c)}+1)d} - \frac{i\sqrt{\cos(dx+c)b}\,(\sqrt{\cos}(dx+c))e^{3i(dx+c)}A}{4(e^{2i(dx+c)}+1)d} -$

```
[In] int(cos(d*x+c)^(3/2)*(cos(d*x+c)*b)^(1/2)*(A+B*cos(d*x+c)),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/6/d*(cos(d*x+c)*b)^(1/2)*(2*B*sin(d*x+c)*cos(d*x+c)^2+3*A*sin(d*x+c)*cos(
d*x+c)+3*A*(d*x+c)+4*B*sin(d*x+c))/cos(d*x+c)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 230, normalized size of antiderivative = 1.69

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$

$$= \left[\frac{3\,A\sqrt{-b}\cos\left(dx+c\right)\log\left(2\,b\cos\left(dx+c\right)^2-2\,\sqrt{b\cos\left(dx+c\right)}\sqrt{-b}\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-b\right)+2}{12\,d\cos\left(dx+c\right)}\right.$$

```
[In] integrate(cos(d*x+c)^(3/2)*(b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c)),x, algorit
hm="fricas")
```

```
[Out] [1/12*(3*A*sqrt(-b)*cos(d*x + c)*log(2*b*cos(d*x + c)^2 - 2*sqrt(b*cos(d*x
+ c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) + 2*(2*B*cos(d*x + c)^2
 + 3*A*cos(d*x + c) + 4*B)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x
+ c))/(d*cos(d*x + c)), 1/6*(3*A*sqrt(b)*arctan(sqrt(b*cos(d*x + c))*sin(d*
x + c)/(sqrt(b)*cos(d*x + c)^(3/2)))*cos(d*x + c) + (2*B*cos(d*x + c)^2 + 3
*A*cos(d*x + c) + 4*B)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c)
)/(d*cos(d*x + c))]
```

Sympy [A] (verification not implemented)

Time = 81.20 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.49

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$

$$= \begin{cases} x\sqrt{b\cos\left(c\right)}(A+B\cos\left(c\right))\cos^{\frac{3}{2}}\left(c\right) \\ 0 \\ \frac{Ax\sqrt{b\cos\left(c+dx\right)}\sin^2\left(c+dx\right)}{2\sqrt{\cos\left(c+dx\right)}}+\frac{Ax\sqrt{b\cos\left(c+dx\right)}\cos^{\frac{3}{2}}\left(c+dx\right)}{2}+\frac{A\sqrt{b\cos\left(c+dx\right)}\sin\left(c+dx\right)\sqrt{\cos\left(c+dx\right)}}{2d}+\frac{2B\sqrt{b\cos\left(c+dx\right)}\sin^3\left(c+d\right.}{3d\sqrt{\cos\left(c+dx\right)}} \end{cases}$$

```
[In] integrate(cos(d*x+c)**(3/2)*(b*cos(d*x+c))**(1/2)*(A+B*cos(d*x+c)),x)
```

```
[Out] Piecewise((x*sqrt(b*cos(c))*(A + B*cos(c))*cos(c)**(3/2), Eq(d, 0)), (0, Eq
(c, -d*x + pi/2) | Eq(c, -d*x + 3*pi/2)), (A*x*sqrt(b*cos(c + d*x))*sin(c +
 d*x)**2/(2*sqrt(cos(c + d*x))) + A*x*sqrt(b*cos(c + d*x))*cos(c + d*x)**(3
/2)/2 + A*sqrt(b*cos(c + d*x))*sin(c + d*x)*sqrt(cos(c + d*x))/(2*d) + 2*B*
sqrt(b*cos(c + d*x))*sin(c + d*x)**3/(3*d*sqrt(cos(c + d*x))) + B*sqrt(b*co
s(c + d*x))*sin(c + d*x)*cos(c + d*x)**(3/2)/d, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.42 (sec) , antiderivative size = 68, normalized size of antiderivative = 0.50

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\frac{3\,(2\,dx+2\,c+\sin{(2\,dx+2\,c)})A\sqrt{b}+B\sqrt{b}\big(\sin{(3\,dx+3\,c)}+9\,\sin{\left(\frac{1}{3}\,\arctan{(\sin{(3\,dx+3\,c)}\,,\cos{(3\,dx+}}\right.}}{12\,d}$$

```
[In] integrate(cos(d*x+c)^(3/2)*(b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c)),x, algorit
hm="maxima")
```

```
[Out] 1/12*(3*(2*d*x + 2*c + sin(2*d*x + 2*c))*A*sqrt(b) + B*sqrt(b)*(sin(3*d*x +
 3*c) + 9*sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c)))))/d
```

Giac [A] (verification not implemented)

none

Time = 2.58 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.43

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\frac{3\,A\sqrt{b}dx\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{6}+9\,A\sqrt{b}dx\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{4}-6\,A\sqrt{b}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{5}+12\,B\sqrt{b}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\right.}{6\left(d\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{6}+3\,d\right.}$$

```
[In] integrate(cos(d*x+c)^(3/2)*(b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c)),x, algorit
hm="giac")
```

```
[Out] 1/6*(3*A*sqrt(b)*d*x*tan(1/2*d*x + 1/2*c)^6 + 9*A*sqrt(b)*d*x*tan(1/2*d*x +
 1/2*c)^4 - 6*A*sqrt(b)*tan(1/2*d*x + 1/2*c)^5 + 12*B*sqrt(b)*tan(1/2*d*x +
 1/2*c)^5 + 9*A*sqrt(b)*d*x*tan(1/2*d*x + 1/2*c)^2 + 8*B*sqrt(b)*tan(1/2*d*
x + 1/2*c)^3 + 3*A*sqrt(b)*d*x + 6*A*sqrt(b)*tan(1/2*d*x + 1/2*c) + 12*B*sq
rt(b)*tan(1/2*d*x + 1/2*c))/(d*tan(1/2*d*x + 1/2*c)^6 + 3*d*tan(1/2*d*x + 1
/2*c)^4 + 3*d*tan(1/2*d*x + 1/2*c)^2 + d)
```

Mupad [B] (verification not implemented)

Time = 16.09 (sec) , antiderivative size = 92, normalized size of antiderivative = 0.68

$$\int \cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\frac{\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{b\,\cos\left(c+d\,x\right)}\,\left(3\,A\,\sin\left(c+d\,x\right)+3\,A\,\sin\left(3\,c+3\,d\,x\right)+10\,B\,\sin\left(2\,c+2\,d\,x\right)+B\,\sin\left(\right.\right.}{12\,d\,\left(\cos\left(2\,c+2\,d\,x\right)+1\right)}$$

```
[In] int(cos(c + d*x)^(3/2)*(b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)),x)
```

```
[Out] (cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(1/2)*(3*A*sin(c + d*x) + 3*A*sin(3*c
+ 3*d*x) + 10*B*sin(2*c + 2*d*x) + B*sin(4*c + 4*d*x) + 12*A*d*x*cos(c + d*
x)))/(12*d*(cos(2*c + 2*d*x) + 1))
```

3.844 $\int \sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 33, antiderivative size = 98

$$\int \sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \frac{Bx\sqrt{b\cos(c+dx)}}{2\sqrt{\cos(c+dx)}}+\frac{A\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{B\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d}$$

```
[Out] 1/2*B*x*(b*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2)+A*sin(d*x+c)*(b*cos(d*x+c))^(
1/2)/d/cos(d*x+c)^(1/2)+1/2*B*sin(d*x+c)*cos(d*x+c)^(1/2)*(b*cos(d*x+c))^(1
/2)/d
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.061, Rules used = {17, 2813}

$$\int \sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \frac{A\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}+\frac{Bx\sqrt{b\cos(c+dx)}}{2\sqrt{\cos(c+dx)}} + \frac{B\sin(c+dx)\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}{2d}$$

```
[In] Int[Sqrt[Cos[c + d*x]]*Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]),x]
```

```
[Out] (B*x*Sqrt[b*Cos[c + d*x]])/(2*Sqrt[Cos[c + d*x]]) + (A*Sqrt[b*Cos[c + d*x]]
*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]]) + (B*Sqrt[Cos[c + d*x]]*Sqrt[b*Cos[c
+ d*x]]*Sin[c + d*x])/(2*d)
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sqrt{b\cos(c+dx)}\int\cos(c+dx)(A+B\cos(c+dx))\,dx}{\sqrt{\cos(c+dx)}}\\ &= \frac{Bx\sqrt{b\cos(c+dx)}}{2\sqrt{\cos(c+dx)}}+\frac{A\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}\\ &\quad+\frac{B\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.58

$$\begin{aligned}&\int\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx\\ &=\frac{\sqrt{b\cos(c+dx)}(4A\sin(c+dx)+B(2(c+dx)+\sin(2(c+dx))))}{4d\sqrt{\cos(c+dx)}}\end{aligned}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]*Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]),x]
```

```
[Out] (Sqrt[b*Cos[c + d*x]]*(4*A*Sin[c + d*x] + B*(2*(c + d*x) + Sin[2*(c + d*x)]
)))/(4*d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.02 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.56

method	result
default	$\frac{\sqrt{\cos(dx+c)b}\,(B\sin(dx+c)\cos(dx+c)+2A\sin(dx+c)+B(dx+c))}{2d\sqrt{\cos(dx+c)}}$
parts	$\frac{A\sin(dx+c)\sqrt{\cos(dx+c)b}}{d\sqrt{\cos(dx+c)}}+\frac{B\sqrt{\cos(dx+c)b}\,(\cos(dx+c)\sin(dx+c)+dx+c)}{2d\sqrt{\cos(dx+c)}}$
risch	$\frac{\sqrt{\cos(dx+c)b}\,(\sqrt{\cos}(dx+c))e^{i(dx+c)}xB}{e^{2i(dx+c)}+1}-\frac{i\sqrt{\cos(dx+c)b}\,(\sqrt{\cos}(dx+c))e^{3i(dx+c)}B}{4(e^{2i(dx+c)}+1)d}-\frac{i\sqrt{\cos(dx+c)b}\,(\sqrt{\cos}(dx+c))e^{2i(dx+c)}A}{(e^{2i(dx+c)}+1)d}+$

```
[In] int(cos(d*x+c)^(1/2)*(cos(d*x+c)*b)^(1/2)*(A+B*cos(d*x+c)),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/2/d*(cos(d*x+c)*b)^(1/2)*(B*sin(d*x+c)*cos(d*x+c)+2*A*sin(d*x+c)+B*(d*x+c
))/cos(d*x+c)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 204, normalized size of antiderivative = 2.08

$$\int \sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$

$$=\left[\frac{B\sqrt{-b}\cos(dx+c)\log\left(2\,b\cos(dx+c)^2-2\,\sqrt{b\cos(dx+c)}\sqrt{-b}\sqrt{\cos(dx+c)}\sin(dx+c)-b\right)+2\,(B}{4\,d\cos(dx+c)}\right.$$

```
[In] integrate(cos(d*x+c)^(1/2)*(b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c)),x, algorit
hm="fricas")
```

```
[Out] [1/4*(B*sqrt(-b)*cos(d*x + c)*log(2*b*cos(d*x + c)^2 - 2*sqrt(b*cos(d*x + c
))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) + 2*(B*cos(d*x + c) + 2*A)
*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)), 1/
2*(B*sqrt(b)*arctan(sqrt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x + c)
^(3/2)))*cos(d*x + c) + (B*cos(d*x + c) + 2*A)*sqrt(b*cos(d*x + c))*sqrt(co
s(d*x + c))*sin(d*x + c))/(d*cos(d*x + c))]
```

Sympy [A] (verification not implemented)

Time = 2.90 (sec) , antiderivative size = 165, normalized size of antiderivative = 1.68

$$\int \sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$= \begin{cases} x\sqrt{b\cos(c)}(A+B\cos(c))\sqrt{\cos(c)} \\ 0 \\ \frac{A\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{Bx\sqrt{b\cos(c+dx)}\sin^2(c+dx)}{2\sqrt{\cos(c+dx)}} + \frac{Bx\sqrt{b\cos(c+dx)}\cos^{\frac{3}{2}}(c+dx)}{2} + \frac{B\sqrt{b\cos(c+dx)}\sin(c+dx)\sqrt{\cos(c+dx)}}{2d} \end{cases}$$

```
[In] integrate(cos(d*x+c)**(1/2)*(b*cos(d*x+c))**(1/2)*(A+B*cos(d*x+c)),x)
```

```
[Out] Piecewise((x*sqrt(b*cos(c))*(A + B*cos(c))*sqrt(cos(c)), Eq(d, 0)), (0, Eq(
c, -d*x + pi/2) | Eq(c, -d*x + 3*pi/2)), (A*sqrt(b*cos(c + d*x))*sin(c + d*
x)/(d*sqrt(cos(c + d*x))) + B*x*sqrt(b*cos(c + d*x))*sin(c + d*x)**2/(2*sqr
t(cos(c + d*x))) + B*x*sqrt(b*cos(c + d*x))*cos(c + d*x)**(3/2)/2 + B*sqrt(
b*cos(c + d*x))*sin(c + d*x)*sqrt(cos(c + d*x))/(2*d), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.41 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.41

$$\int \sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$= \frac{(2\,dx + 2\,c + \sin(2\,dx + 2\,c))B\sqrt{b} + 4\,A\sqrt{b}\sin(dx + c)}{4\,d}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c)),x, algorit
hm="maxima")
```

```
[Out] 1/4*((2*d*x + 2*c + sin(2*d*x + 2*c))*B*sqrt(b) + 4*A*sqrt(b)*sin(d*x + c))
/d
```

Giac [A] (verification not implemented)

none

Time = 1.88 (sec) , antiderivative size = 142, normalized size of antiderivative = 1.45

$$\int \sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$= \frac{B\sqrt{b}dx\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)^4 + 2\,B\sqrt{b}dx\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)^2 + 4\,A\sqrt{b}\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)^3 - 2\,B\sqrt{b}\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right.}{2\left(d\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)^4 + 2\,d\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)^2\right.}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c)),x, algorit
hm="giac")
```

```
[Out] 1/2*(B*sqrt(b)*d*x*tan(1/2*d*x + 1/2*c)^4 + 2*B*sqrt(b)*d*x*tan(1/2*d*x + 1
/2*c)^2 + 4*A*sqrt(b)*tan(1/2*d*x + 1/2*c)^3 - 2*B*sqrt(b)*tan(1/2*d*x + 1/
2*c)^3 + B*sqrt(b)*d*x + 4*A*sqrt(b)*tan(1/2*d*x + 1/2*c) + 2*B*sqrt(b)*tan
(1/2*d*x + 1/2*c))/(d*tan(1/2*d*x + 1/2*c)^4 + 2*d*tan(1/2*d*x + 1/2*c)^2 +
 d)
```

Mupad [B] (verification not implemented)

Time = 14.95 (sec) , antiderivative size = 79, normalized size of antiderivative = 0.81

$$\int \sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$= \frac{\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{b\,\cos\left(c+d\,x\right)}\,\left(B\,\sin\left(c+d\,x\right)+4\,A\,\sin\left(2\,c+2\,d\,x\right)+B\,\sin\left(3\,c+3\,d\,x\right)+4\,B\,d\,x\,\cos\left(c\right.\right.}{4\,d\,\left(\cos\left(2\,c+2\,d\,x\right)+1\right)}$$

```
[In] int(cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)),x)
```

```
[Out] (cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(1/2)*(B*sin(c + d*x) + 4*A*sin(2*c +
2*d*x) + B*sin(3*c + 3*d*x) + 4*B*d*x*cos(c + d*x)))/(4*d*(cos(2*c + 2*d*x)
 + 1))
```

3.845 $\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 59

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \frac{Ax\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}} + \frac{B\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[Out] A*x*(b*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2)+B*sin(d*x+c)*(b*cos(d*x+c))^(1/2)
/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.01 (sec) , antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.061, Rules used = {17, 2717}

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \frac{Ax\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}} + \frac{B\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]))/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (A*x*Sqrt[b*Cos[c + d*x]])/Sqrt[Cos[c + d*x]] + (B*Sqrt[b*Cos[c + d*x]]*Sin
[c + d*x])/(d*Sqrt[Cos[c + d*x]])
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
```

```
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2717

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{b\cos(c+dx)}\int(A+B\cos(c+dx))\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{Ax\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}+\frac{\left(B\sqrt{b\cos(c+dx)}\right)\int\cos(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{Ax\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}+\frac{B\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.71

$$
\int\frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx=\frac{\sqrt{b\cos(c+dx)}(A(c+dx)+B\sin(c+dx))}{d\sqrt{\cos(c+dx)}}
$$

```
[In] Integrate[(Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]))/Sqrt[Cos[c + d*x]],x]
[Out] (Sqrt[b*Cos[c + d*x]]*(A*(c + d*x) + B*Sin[c + d*x]))/(d*Sqrt[Cos[c + d*x]]
)
```

Maple [A] (verified)

Time = 4.97 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.66

method	result	size
default	$\frac{\sqrt{\cos(dx+c)b}\,(A(dx+c)+B\sin(dx+c))}{d\sqrt{\cos(dx+c)}}$	39
risch	$\frac{Ax\sqrt{\cos(dx+c)b}}{\sqrt{\cos(dx+c)}}+\frac{B\sin(dx+c)\sqrt{\cos(dx+c)b}}{d\sqrt{\cos(dx+c)}}$	52
parts	$\frac{A\sqrt{\cos(dx+c)b}\,(dx+c)}{d\sqrt{\cos(dx+c)}}+\frac{B\sin(dx+c)\sqrt{\cos(dx+c)b}}{d\sqrt{\cos(dx+c)}}$	59

```
[In] int((cos(d*x+c)*b)^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/d*(cos(d*x+c)*b)^(1/2)*(A*(d*x+c)+B*sin(d*x+c))/cos(d*x+c)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 181, normalized size of antiderivative = 3.07

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \left[\frac{A\sqrt{-b}\cos\left(dx+c\right)\log\left(2\,b\cos\left(dx+c\right)^2-2\,\sqrt{b\cos\left(dx+c\right)}\sqrt{-b}\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-b\right)+2\,\sqrt{}}{2\,d\cos\left(dx+c\right)}\right.$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x, algorit
hm="fricas")
```

```
[Out] [1/2*(A*sqrt(-b)*cos(d*x + c)*log(2*b*cos(d*x + c)^2 - 2*sqrt(b*cos(d*x + c
))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) + 2*sqrt(b*cos(d*x + c))*B
*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)), (A*sqrt(b)*arctan(sqrt(
b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/2)))*cos(d*x + c) + s
qrt(b*cos(d*x + c))*B*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c))]
```

Sympy [A] (verification not implemented)

Time = 1.35 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.36

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \begin{cases} \frac{Ax\sqrt{b\cos\left(c+dx\right)}}{\sqrt{\cos\left(c+dx\right)}} + \frac{B\sqrt{b\cos\left(c+dx\right)}\sin\left(c+dx\right)}{d\sqrt{\cos\left(c+dx\right)}} & \text{for}\ d\neq 0 \\ \frac{x\sqrt{b\cos\left(c\right)}\left(A+B\cos\left(c\right)\right)}{\sqrt{\cos\left(c\right)}} & \text{otherwise} \end{cases}$$

```
[In] integrate((b*cos(d*x+c))**(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)**(1/2),x)
```

```
[Out] Piecewise((A*x*sqrt(b*cos(c + d*x))/sqrt(cos(c + d*x)) + B*sqrt(b*cos(c + d
*x))*sin(c + d*x)/(d*sqrt(cos(c + d*x))), Ne(d, 0)), (x*sqrt(b*cos(c))*(A +
 B*cos(c))/sqrt(cos(c)), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.68

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \frac{2\,A\sqrt{b}\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)+B\sqrt{b}\sin\left(dx+c\right)}{d}$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x, algorit
hm="maxima")
```

```
[Out] (2*A*sqrt(b)*arctan(sin(d*x + c)/(cos(d*x + c) + 1)) + B*sqrt(b)*sin(d*x +
c))/d
```

Giac [F]

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(B\cos\left(dx+c\right)+A)\sqrt{b\cos\left(dx+c\right)}}{\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))/sqrt(cos(d*x + c)), x)
```

Mupad [B] (verification not implemented)

Time = 0.32 (sec) , antiderivative size = 35, normalized size of antiderivative = 0.59

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \frac{\sqrt{b\,\cos\left(c+d\,x\right)}\,\left(B\,\sin\left(c+d\,x\right)+A\,d\,x\right)}{d\,\sqrt{\cos\left(c+d\,x\right)}}$$

```
[In] int(((b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(1/2),x)
```

```
[Out] ((b*cos(c + d*x))^(1/2)*(B*sin(c + d*x) + A*d*x))/(d*cos(c + d*x)^(1/2))
```

3.846 $\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 60

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{Bx\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}} + \frac{A\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

```
[Out] B*x*(b*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2)+A*arctanh(sin(d*x+c))*(b*cos(d*x+
c))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {17, 2814, 3855}

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{A\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}} + \frac{Bx\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}$$

```
[In] Int[(Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(3/2),x]
```

```
[Out] (B*x*Sqrt[b*Cos[c + d*x]])/Sqrt[Cos[c + d*x]] + (A*ArcTanh[Sin[c + d*x]]*Sq
rt[b*Cos[c + d*x]])/(d*Sqrt[Cos[c + d*x]])
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{b\cos(c+dx)}\int(A+B\cos(c+dx))\sec(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{Bx\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}} + \frac{\left(A\sqrt{b\cos(c+dx)}\right)\int\sec(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{Bx\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}} + \frac{A\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.67

$$
\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{(Bdx+A\text{arctanh}(\sin(c+dx)))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}
$$

```
[In] Integrate[(Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(3/2),x]
[Out] ((B*d*x + A*ArcTanh[Sin[c + d*x]])*Sqrt[b*Cos[c + d*x]])/(d*Sqrt[Cos[c + d*
x]])
```

Maple [A] (verified)

Time = 4.68 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.87

method	result	size
default	$-\frac{\sqrt{\cos(dx+c)b}\,(2A\ \operatorname{arctanh}(\cot(dx+c)-\csc(dx+c))-B(dx+c))}{d\sqrt{\cos(dx+c)}}$	52
parts	$-\frac{2A\ \operatorname{arctanh}(\cot(dx+c)-\csc(dx+c))\sqrt{\cos(dx+c)b}}{d\sqrt{\cos(dx+c)}}+\frac{B\sqrt{\cos(dx+c)b}\,(dx+c)}{d\sqrt{\cos(dx+c)}}$	70
risch	$\frac{Bx\sqrt{\cos(dx+c)b}}{\sqrt{\cos(dx+c)}}+\frac{\sqrt{\cos(dx+c)b}\,A\ln(\mathrm{e}^{i(dx+c)}+i)}{\sqrt{\cos(dx+c)}\,d}-\frac{\sqrt{\cos(dx+c)b}\,A\ln(\mathrm{e}^{i(dx+c)}-i)}{\sqrt{\cos(dx+c)}\,d}$	96

```
[In] int((cos(d*x+c)*b)^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x,method=_RETURN
VERBOSE)
```

```
[Out] -1/d*(cos(d*x+c)*b)^(1/2)*(2*A*arctanh(cot(d*x+c)-csc(d*x+c))-B*(d*x+c))/co
s(d*x+c)^(1/2)
```

Fricas [A] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 106 vs. 2(52) = 104.

Time = 0.36 (sec) , antiderivative size = 210, normalized size of antiderivative = 3.50

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$

$$= \left[-\frac{2\,A\sqrt{-b}\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)-B\sqrt{-b}\log\left(2\,b\cos\left(dx+c\right)^2-2\,\sqrt{b\cos\left(dx+c\right)}\sqrt{-b}\sqrt{\cos\right.\right.}{2\,d}\right.$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x, algorit
hm="fricas")
```

```
[Out] [-1/2*(2*A*sqrt(-b)*arctan(sqrt(b*cos(d*x + c))*sqrt(-b)*sin(d*x + c)/(b*sq
rt(cos(d*x + c)))) - B*sqrt(-b)*log(2*b*cos(d*x + c)^2 - 2*sqrt(b*cos(d*x +
 c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b))/d, 1/2*(2*B*sqrt(b)*arc
tan(sqrt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/2))) + A*sqr
t(b)*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x + c))*sqrt(b)*sqrt(cos(d*x +
 c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x + c)^3))/d]
```

Sympy [F]

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{\sqrt{b\cos{(c+dx)}}(A+B\cos{(c+dx)})}{\cos^{\frac{3}{2}}{(c+dx)}}\,dx$$

```
[In] integrate((b*cos(d*x+c))**(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)**(3/2),x)
[Out] Integral(sqrt(b*cos(c + d*x))*(A + B*cos(c + d*x))/cos(c + d*x)**(3/2), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 92, normalized size of antiderivative = 1.53

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{A\sqrt{b}\left(\log\left(\cos(dx+c)^2+\sin(dx+c)^2+2\sin(dx+c)+1\right)-\log\left(\cos(dx+c)^2+\sin(dx+c)^2-2\sin(d\right.\right.}{2d}$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x, algorit
hm="maxima")
[Out] 1/2*(A*sqrt(b)*(log(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*sin(d*x + c) + 1) -
 log(cos(d*x + c)^2 + sin(d*x + c)^2 - 2*sin(d*x + c) + 1)) + 4*B*sqrt(b)*a
rctan(sin(d*x + c)/(cos(d*x + c) + 1)))/d
```

Giac [F]

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(B\cos{(dx+c)}+A)\sqrt{b\cos{(dx+c)}}}{\cos{(dx+c)}^{\frac{3}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x, algorit
hm="giac")
[Out] integrate((B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))/cos(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{\sqrt{b\,\cos\left(c+d\,x\right)}\,\left(A+B\,\cos\left(c+d\,x\right)\right)}{{\cos\left(c+d\,x\right)}^{3/2}}\,dx$$

```
[In] int(((b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(3/2),x)
[Out] int(((b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(3/2), x)
```

3.847 $\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 68

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{B\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}} + \frac{A\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] A*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(3/2)+B*arctanh(sin(d*x+c))*
(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.152$, Rules used = {17, 2827, 3852, 8, 3855}

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{A\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\cos^{\frac{3}{2}}(c+dx)} + \frac{B\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[(Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(5/2),x]
```

```
[Out] (B*ArcTanh[Sin[c + d*x]]*Sqrt[b*Cos[c + d*x]])/(d*Sqrt[Cos[c + d*x]]) + (A*
Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(d*Cos[c + d*x]^(3/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{b\cos(c+dx)}\int (A+B\cos(c+dx))\sec^2(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{\left(A\sqrt{b\cos(c+dx)}\right)\int \sec^2(c+dx)\,dx}{\sqrt{\cos(c+dx)}}+\frac{\left(B\sqrt{b\cos(c+dx)}\right)\int \sec(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{B\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}-\frac{\left(A\sqrt{b\cos(c+dx)}\right)\text{Subst}\left(\int 1\,dx,x,-\tan(c+dx)\right)}{d\sqrt{\cos(c+dx)}}\\
&= \frac{B\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}+\frac{A\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.74

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{\sqrt{b\cos(c+dx)}(B\text{arctanh}(\sin(c+dx))\cos(c+dx)+A\sin(c+dx))}{d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Integrate[(Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(5/2),x]
```

```
[Out] (Sqrt[b*Cos[c + d*x]]*(B*ArcTanh[Sin[c + d*x]]*Cos[c + d*x] + A*Sin[c + d*x
]))/(d*Cos[c + d*x]^(3/2))
```

Maple [A] (verified)

Time = 5.06 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.84

method	result	size
default	$\frac{(-2B\cos(dx+c)\,\text{arctanh}(\cot(dx+c)-\csc(dx+c))+A\sin(dx+c))\sqrt{\cos(dx+c)b}}{d\cos(dx+c)^{\frac{3}{2}}}$	57
parts	$\frac{A\sin(dx+c)\sqrt{\cos(dx+c)b}}{d\cos(dx+c)^{\frac{3}{2}}}-\frac{2B\ \text{arctanh}(\cot(dx+c)-\csc(dx+c))\sqrt{\cos(dx+c)b}}{d\sqrt{\cos(dx+c)}}$	71
risch	$\frac{2i\sqrt{\cos(dx+c)b}\,A}{\sqrt{\cos(dx+c)}\,d(\mathrm{e}^{2i(dx+c)}+1)}+\frac{\sqrt{\cos(dx+c)b}\,B\ln(\mathrm{e}^{i(dx+c)}+i)}{\sqrt{\cos(dx+c)}\,d}-\frac{\sqrt{\cos(dx+c)b}\,B\ln(\mathrm{e}^{i(dx+c)}-i)}{\sqrt{\cos(dx+c)}\,d}$	113

```
[In] int((cos(d*x+c)*b)^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/d*(-2*B*cos(d*x+c)*arctanh(cot(d*x+c)-csc(d*x+c))+A*sin(d*x+c))*(cos(d*x+
c)*b)^(1/2)/cos(d*x+c)^(3/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 205, normalized size of antiderivative = 3.01

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx$$
$$=\left[\frac{B\sqrt{b}\cos(dx+c)^2\log\left(-\frac{b\cos(dx+c)^3-2\sqrt{b\cos(dx+c)}\sqrt{b}\sqrt{\cos(dx+c)}\sin(dx+c)-2b\cos(dx+c)}{\cos(dx+c)^3}\right)+2\sqrt{b\cos(dx+c)}A\sqrt{\cdots}}{2d\cos(dx+c)^2}\right.$$
$$\left.-\frac{B\sqrt{-b}\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)\cos(dx+c)^2-\sqrt{b\cos(dx+c)}A\sqrt{\cos(dx+c)}\sin(dx+c)}{d\cos(dx+c)^2}\right]$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x, algorit
hm="fricas")
```

```
[Out] [1/2*(B*sqrt(b)*cos(d*x + c)^2*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x +
c))*sqrt(b)*sqrt(cos(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x + c
)^3) + 2*sqrt(b*cos(d*x + c))*A*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x
 + c)^2), -(B*sqrt(-b)*arctan(sqrt(b*cos(d*x + c))*sqrt(-b)*sin(d*x + c)/(b
*sqrt(cos(d*x + c))))*cos(d*x + c)^2 - sqrt(b*cos(d*x + c))*A*sqrt(cos(d*x
+ c))*sin(d*x + c))/(d*cos(d*x + c)^2)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.42 (sec) , antiderivative size = 120, normalized size of antiderivative = 1.76

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx$$
$$=\frac{B\sqrt{b}\left(\log\left(\cos(dx+c)^2+\sin(dx+c)^2+2\sin(dx+c)+1\right)-\log\left(\cos(dx+c)^2+\sin(dx+c)^2-2\sin(\cdots\right.\right.}{2d}$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x, algorit
hm="maxima")
```

```
[Out] 1/2*(B*sqrt(b)*(log(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*sin(d*x + c) + 1) -
 log(cos(d*x + c)^2 + sin(d*x + c)^2 - 2*sin(d*x + c) + 1)) + 4*A*sqrt(b)*s
in(2*d*x + 2*c)/(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*
c) + 1))/d
```

Giac [F]

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(B\cos(dx+c)+A)\sqrt{b\cos(dx+c)}}{\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))/cos(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{\sqrt{b\cos(c+dx)}\,(A+B\cos(c+dx))}{\cos(c+dx)^{5/2}}\,dx$$

```
[In] int(((b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(5/2),x)
```

```
[Out] int(((b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(5/2), x)
```

3.848 $\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 107

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{A\operatorname{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{2d\sqrt{\cos(c+dx)}} + \frac{A\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d\cos^{\frac{5}{2}}(c+dx)} + \frac{B\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 1/2*A*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(5/2)+B*sin(d*x+c)*(b*co
s(d*x+c))^(1/2)/d/cos(d*x+c)^(3/2)+1/2*A*arctanh(sin(d*x+c))*(b*cos(d*x+c))
^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {17, 2827, 3853, 3855, 3852, 8}

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{A\operatorname{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{2d\sqrt{\cos(c+dx)}} + \frac{A\sin(c+dx)\sqrt{b\cos(c+dx)}}{2d\cos^{\frac{5}{2}}(c+dx)} + \frac{B\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Int[(Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(7/2),x]
```

```
[Out] (A*ArcTanh[Sin[c + d*x]]*Sqrt[b*Cos[c + d*x]])/(2*d*Sqrt[Cos[c + d*x]]) + (
A*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(2*d*Cos[c + d*x]^(5/2)) + (B*Sqrt[b*C
os[c + d*x]]*Sin[c + d*x])/(d*Cos[c + d*x]^(3/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{b\cos(c+dx)}\int (A+B\cos(c+dx))\sec^3(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{\left(A\sqrt{b\cos(c+dx)}\right)\int \sec^3(c+dx)\,dx}{\sqrt{\cos(c+dx)}}+\frac{\left(B\sqrt{b\cos(c+dx)}\right)\int \sec^2(c+dx)\,dx}{\sqrt{\cos(c+dx)}}
\end{aligned}
$$

$$= \frac{A\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d\cos^{\frac{5}{2}}(c+dx)} + \frac{\left(A\sqrt{b\cos(c+dx)}\right)\int \sec(c+dx)\,dx}{2\sqrt{\cos(c+dx)}} - \frac{\left(B\sqrt{b\cos(c+dx)}\right)\text{Subst}(\int 1\,dx, x, -\tan(c+dx))}{d\sqrt{\cos(c+dx)}}$$

$$= \frac{A\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{2d\sqrt{\cos(c+dx)}} + \frac{A\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d\cos^{\frac{5}{2}}(c+dx)} + \frac{B\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.61

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{\sqrt{b\cos(c+dx)}(A\text{arctanh}(\sin(c+dx))\cos^2(c+dx) + (A+2B\cos(c+dx))\sin(c+dx))}{2d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Integrate[(Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(7/2),x]
[Out] (Sqrt[b*Cos[c + d*x]]*(A*ArcTanh[Sin[c + d*x]]*Cos[c + d*x]^2 + (A + 2*B*Co
s[c + d*x])*Sin[c + d*x]))/(2*d*Cos[c + d*x]^(5/2))
```

Maple [A] (verified)

Time = 5.14 (sec) , antiderivative size = 103, normalized size of antiderivative = 0.96

method	result
default	$\frac{\left(A\left(\cos^2(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)+1)-A\left(\cos^2(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)-1)+2B\sin(dx+c)\cos(dx+c)+A\sin(\right.}{2d\cos(dx+c)^{\frac{5}{2}}}$
parts	$\frac{A\left(-\left(\cos^2(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)-1)+\left(\cos^2(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)+1)+\sin(dx+c)\right)\sqrt{\cos(dx+c)b}}{2d\cos(dx+c)^{\frac{5}{2}}} + \frac{B\,\text{s}}{}$
risch	$-\frac{i\sqrt{\cos(dx+c)b}\left(A\,e^{3i(dx+c)}-2B\,e^{2i(dx+c)}-A\,e^{i(dx+c)}-2B\right)}{\sqrt{\cos(dx+c)}\,d\left(e^{2i(dx+c)}+1\right)^2} + \frac{\sqrt{\cos(dx+c)b}\,A\ln\left(e^{i(dx+c)}+i\right)}{2\sqrt{\cos(dx+c)}\,d} - \frac{\sqrt{\cos(dx+c)b}\,A\ln\left(e^{i(dx+c)}-\right.}{2\sqrt{\cos(dx+c)}\,d}$

```
[In] int((cos(d*x+c)*b)^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x,method=_RETURN
VERBOSE)
[Out] 1/2/d*(A*cos(d*x+c)^2*ln(-cot(d*x+c)+csc(d*x+c)+1)-A*cos(d*x+c)^2*ln(-cot(d
*x+c)+csc(d*x+c)-1)+2*B*sin(d*x+c)*cos(d*x+c)+A*sin(d*x+c))*(cos(d*x+c)*b)^
(1/2)/cos(d*x+c)^(5/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 225, normalized size of antiderivative = 2.10

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx$$
$$= \left[\frac{A\sqrt{b}\cos(dx+c)^3\log\left(-\frac{b\cos(dx+c)^3-2\sqrt{b\cos(dx+c)}\sqrt{b}\sqrt{\cos(dx+c)}\sin(dx+c)-2b\cos(dx+c)}{\cos(dx+c)^3}\right)+2(2B\cos(dx+c)+A}{4d\cos(dx+c)^3}\right.$$
$$-\frac{A\sqrt{-b}\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)\cos(dx+c)^3-(2B\cos(dx+c)+A)\sqrt{b\cos(dx+c)}\sqrt{\cos(dx-}}{2d\cos(dx+c)^3}$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x, algorit
hm="fricas")
```

```
[Out] [1/4*(A*sqrt(b)*cos(d*x + c)^3*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x +
c))*sqrt(b)*sqrt(cos(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x + c
)^3) + 2*(2*B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin
(d*x + c))/(d*cos(d*x + c)^3), -1/2*(A*sqrt(-b)*arctan(sqrt(b*cos(d*x + c))
*sqrt(-b)*sin(d*x + c)/(b*sqrt(cos(d*x + c))))*cos(d*x + c)^3 - (2*B*cos(d*
x + c) + A)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*
x + c)^3)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)**(7/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 716 vs. 2(91) = 182.

Time = 0.62 (sec) , antiderivative size = 716, normalized size of antiderivative = 6.69

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x, algorit
hm="maxima")
```

```
[Out] -1/4*((4*(sin(4*d*x + 4*c) + 2*sin(2*d*x + 2*c))*cos(3/2*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c))) - 4*(sin(4*d*x + 4*c) + 2*sin(2*d*x + 2*c))*cos(
1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - (2*(2*cos(2*d*x + 2*c) +
 1)*cos(4*d*x + 4*c) + cos(4*d*x + 4*c)^2 + 4*cos(2*d*x + 2*c)^2 + sin(4*d*
x + 4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*sin(2*d*x + 2*c)^2 + 4
*cos(2*d*x + 2*c) + 1)*log(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/2
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (2*(2*cos(2*d*x + 2*c)
 + 1)*cos(4*d*x + 4*c) + cos(4*d*x + 4*c)^2 + 4*cos(2*d*x + 2*c)^2 + sin(4*
d*x + 4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*sin(2*d*x + 2*c)^2 +
 4*cos(2*d*x + 2*c) + 1)*log(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sin(1
/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - 4*(cos(4*d*x + 4*c)
+ 2*cos(2*d*x + 2*c) + 1)*sin(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c
))) + 4*(cos(4*d*x + 4*c) + 2*cos(2*d*x + 2*c) + 1)*sin(1/2*arctan2(sin(2*d
*x + 2*c), cos(2*d*x + 2*c))))*A*sqrt(b)/(2*(2*cos(2*d*x + 2*c) + 1)*cos(4*
d*x + 4*c) + cos(4*d*x + 4*c)^2 + 4*cos(2*d*x + 2*c)^2 + sin(4*d*x + 4*c)^2
 + 4*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*sin(2*d*x + 2*c)^2 + 4*cos(2*d*x
 + 2*c) + 1) - 8*B*sqrt(b)*sin(2*d*x + 2*c)/(cos(2*d*x + 2*c)^2 + sin(2*d*x
 + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1))/d
```

Giac [F]

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(B\cos(dx+c)+A)\sqrt{b\cos(dx+c)}}{\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))/cos(d*x + c)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{\sqrt{b\,\cos\left(c+d\,x\right)}\,\left(A+B\,\cos\left(c+d\,x\right)\right)}{{\cos\left(c+d\,x\right)}^{7/2}}\,dx$$

```
[In] int(((b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(7/2),x)
[Out] int(((b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(7/2), x)
```

3.849 $\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 145

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{B\operatorname{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{2d\sqrt{\cos(c+dx)}} + \frac{B\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d\cos^{\frac{5}{2}}(c+dx)} + \frac{A\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)} + \frac{A\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\cos^{\frac{7}{2}}(c+dx)}$$

```
[Out] 1/2*B*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(5/2)+A*sin(d*x+c)*(b*co
s(d*x+c))^(1/2)/d/cos(d*x+c)^(3/2)+1/3*A*sin(d*x+c)^3*(b*cos(d*x+c))^(1/2)/
d/cos(d*x+c)^(7/2)+1/2*B*arctanh(sin(d*x+c))*(b*cos(d*x+c))^(1/2)/d/cos(d*x
+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.152$, Rules used

$= \{17, 2827, 3852, 3853, 3855\}$

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{A\sin^3(c+dx)\sqrt{b\cos(c+dx)}}{3d\cos^{\frac{7}{2}}(c+dx)} + \frac{A\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\cos^{\frac{3}{2}}(c+dx)} + \frac{B\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{2d\sqrt{\cos(c+dx)}} + \frac{B\sin(c+dx)\sqrt{b\cos(c+dx)}}{2d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Int[(Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(9/2),x]
```

```
[Out] (B*ArcTanh[Sin[c + d*x]]*Sqrt[b*Cos[c + d*x]])/(2*d*Sqrt[Cos[c + d*x]]) + (
B*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(2*d*Cos[c + d*x]^(5/2)) + (A*Sqrt[b*C
os[c + d*x]]*Sin[c + d*x])/(d*Cos[c + d*x]^(3/2)) + (A*Sqrt[b*Cos[c + d*x]]
*Sin[c + d*x]^3)/(3*d*Cos[c + d*x]^(7/2))
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{b\cos(c+dx)}\int (A+B\cos(c+dx))\sec^4(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{\left(A\sqrt{b\cos(c+dx)}\right)\int \sec^4(c+dx)\,dx}{\sqrt{\cos(c+dx)}}+\frac{\left(B\sqrt{b\cos(c+dx)}\right)\int \sec^3(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{B\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d\cos^{\frac{5}{2}}(c+dx)}+\frac{\left(B\sqrt{b\cos(c+dx)}\right)\int \sec(c+dx)\,dx}{2\sqrt{\cos(c+dx)}}\\
&\quad-\frac{\left(A\sqrt{b\cos(c+dx)}\right)\mathrm{Subst}\left(\int \left(1+x^2\right)\,dx,x,-\tan(c+dx)\right)}{d\sqrt{\cos(c+dx)}}\\
&= \frac{B\operatorname{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{2d\sqrt{\cos(c+dx)}}+\frac{B\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d\cos^{\frac{5}{2}}(c+dx)}\\
&\quad+\frac{A\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)}+\frac{A\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\cos^{\frac{7}{2}}(c+dx)}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.52

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx$$
$$=\frac{\sqrt{b\cos(c+dx)}(3B\operatorname{arctanh}(\sin(c+dx))\cos^2(c+dx)+3B\sin(c+dx)+2A(2+\cos(2(c+dx)))\tan(c+}{6d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Integrate[(Sqrt[b*Cos[c + d*x]]*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(9/2),x]

[Out] (Sqrt[b*Cos[c + d*x]]*(3*B*ArcTanh[Sin[c + d*x]]*Cos[c + d*x]^2 + 3*B*Sin[c
 + d*x] + 2*A*(2 + Cos[2*(c + d*x)])*Tan[c + d*x]))/(6*d*Cos[c + d*x]^(5/2)
)
```

Maple [A] (verified)

Time = 4.93 (sec) , antiderivative size = 122, normalized size of antiderivative = 0.84

method	result
default	$\frac{(-3B(\cos^3(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)-1)+3B(\cos^3(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)+1)+4A\sin(dx+c)(\cos^2(dx+c))+3}{6d\cos(dx+c)^{\frac{7}{2}}}$
parts	$\frac{A(2(\cos^2(dx+c))+1)\sqrt{\cos(dx+c)b}\,\sin(dx+c)}{3d\cos(dx+c)^{\frac{7}{2}}}+\frac{B(-(\cos^2(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)-1)+(\cos^2(dx+c))\ln(-\cot(dx+c)+}{2d\cos(dx+c)^{\frac{5}{2}}}$
risch	$-\frac{i\sqrt{\cos(dx+c)b}\,(3B\,e^{5i(dx+c)}-12A\,e^{2i(dx+c)}-3B\,e^{i(dx+c)}-4A)}{3\sqrt{\cos(dx+c)}\,d(e^{2i(dx+c)}+1)^3}+\frac{\sqrt{\cos(dx+c)b}\,B\ln(e^{i(dx+c)}+i)}{2\sqrt{\cos(dx+c)}\,d}-\frac{\sqrt{\cos(dx+c)b}\,B\ln(e^{i(dx+c}}{2\sqrt{\cos(dx+c)}\,d}$

```
[In] int((cos(d*x+c)*b)^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(9/2),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/6/d*(-3*B*cos(d*x+c)^3*ln(-cot(d*x+c)+csc(d*x+c)-1)+3*B*cos(d*x+c)^3*ln(-
cot(d*x+c)+csc(d*x+c)+1)+4*A*sin(d*x+c)*cos(d*x+c)^2+3*B*sin(d*x+c)*cos(d*x
+c)+2*A*sin(d*x+c))*(cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(7/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 253, normalized size of antiderivative = 1.74

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx$$

$$= \left[\frac{3\,B\sqrt{b}\cos{(dx+c)}^4\log\left(-\frac{b\cos(dx+c)^3-2\,\sqrt{b\cos(dx+c)}\sqrt{b}\sqrt{\cos(dx+c)}\sin(dx+c)-2\,b\cos(dx+c)}{\cos(dx+c)^3}\right)+2\,\left(4\,A\cos{(dx+c)}^2+\right.}{12\,d\cos{(dx+c)}^4}\right.$$

$$-\frac{3\,B\sqrt{-b}\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)\cos{(dx+c)}^4-\left(4\,A\cos{(dx+c)}^2+3\,B\cos{(dx+c)}+2\,A\right)\sqrt{b}}{6\,d\cos{(dx+c)}^4}$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(9/2),x, algorit
hm="fricas")
```

```
[Out] [1/12*(3*B*sqrt(b)*cos(d*x + c)^4*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x
 + c))*sqrt(b)*sqrt(cos(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x
+ c)^3) + 2*(4*A*cos(d*x + c)^2 + 3*B*cos(d*x + c) + 2*A)*sqrt(b*cos(d*x +
c))*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^4), -1/6*(3*B*sqrt(-b)
*arctan(sqrt(b*cos(d*x + c))*sqrt(-b)*sin(d*x + c)/(b*sqrt(cos(d*x + c))))*
cos(d*x + c)^4 - (4*A*cos(d*x + c)^2 + 3*B*cos(d*x + c) + 2*A)*sqrt(b*cos(d
*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^4)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)**(9/2),x)
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 957 vs. $2(123) = 246$.

Time = 0.72 (sec) , antiderivative size = 957, normalized size of antiderivative = 6.60

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(9/2),x, algorit
hm="maxima")
[Out] 1/12*(16*((3*cos(2*d*x + 2*c) + 1)*sin(6*d*x + 6*c) + 3*(3*cos(2*d*x + 2*c)
 + 1)*sin(4*d*x + 4*c) - 3*cos(6*d*x + 6*c)*sin(2*d*x + 2*c) - 9*cos(4*d*x
+ 4*c)*sin(2*d*x + 2*c))*A*sqrt(b)/(2*(3*cos(4*d*x + 4*c) + 3*cos(2*d*x + 2
*c) + 1)*cos(6*d*x + 6*c) + cos(6*d*x + 6*c)^2 + 6*(3*cos(2*d*x + 2*c) + 1)
*cos(4*d*x + 4*c) + 9*cos(4*d*x + 4*c)^2 + 9*cos(2*d*x + 2*c)^2 + 6*(sin(4*
d*x + 4*c) + sin(2*d*x + 2*c))*sin(6*d*x + 6*c) + sin(6*d*x + 6*c)^2 + 9*si
n(4*d*x + 4*c)^2 + 18*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 9*sin(2*d*x + 2*c
)^2 + 6*cos(2*d*x + 2*c) + 1) - 3*(4*(sin(4*d*x + 4*c) + 2*sin(2*d*x + 2*c)
)*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 4*(sin(4*d*x + 4*c
) + 2*sin(2*d*x + 2*c))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
) - (2*(2*cos(2*d*x + 2*c) + 1)*cos(4*d*x + 4*c) + cos(4*d*x + 4*c)^2 + 4*c
os(2*d*x + 2*c)^2 + sin(4*d*x + 4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2*d*x + 2*c
) + 4*sin(2*d*x + 2*c)^2 + 4*cos(2*d*x + 2*c) + 1)*log(cos(1/2*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(
2*d*x + 2*c)))^2 + 2*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) +
 1) + (2*(2*cos(2*d*x + 2*c) + 1)*cos(4*d*x + 4*c) + cos(4*d*x + 4*c)^2 + 4
*cos(2*d*x + 2*c)^2 + sin(4*d*x + 4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2*d*x + 2
*c) + 4*sin(2*d*x + 2*c)^2 + 4*cos(2*d*x + 2*c) + 1)*log(cos(1/2*arctan2(si
n(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c)))^2 - 2*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
 + 1) - 4*(cos(4*d*x + 4*c) + 2*cos(2*d*x + 2*c) + 1)*sin(3/2*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c))) + 4*(cos(4*d*x + 4*c) + 2*cos(2*d*x + 2*c)
+ 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))))*B*sqrt(b)/(2*(2*
```

```
cos(2*d*x + 2*c) + 1)*cos(4*d*x + 4*c) + cos(4*d*x + 4*c)^2 + 4*cos(2*d*x +
 2*c)^2 + sin(4*d*x + 4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*sin(
2*d*x + 2*c)^2 + 4*cos(2*d*x + 2*c) + 1))/d
```

Giac [F]

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(B\cos(dx+c)+A)\sqrt{b\cos(dx+c)}}{\cos(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(9/2),x, algorit
hm="giac")
[Out] integrate((B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))/cos(d*x + c)^(9/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{b\cos(c+dx)}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{\sqrt{b\,\cos(c+d\,x)}\,(A+B\,\cos(c+d\,x))}{\cos(c+d\,x)^{9/2}}\,dx$$

```
[In] int(((b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(9/2),x)
[Out] int(((b*cos(c + d*x))^(1/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(9/2), x)
```

3.850 $\int \cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 33, antiderivative size = 177

$$\int \cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \frac{3bBx\sqrt{b\cos(c+dx)}}{8\sqrt{\cos(c+dx)}} + \frac{Ab\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{3bB\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{8d} + \frac{bB\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}\sin(c+dx)}{4d} - \frac{Ab\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\sqrt{\cos(c+dx)}}$$

```
[Out] 1/4*b*B*cos(d*x+c)^(5/2)*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d+3/8*b*B*x*(b*cos
(d*x+c))^(1/2)/cos(d*x+c)^(1/2)+A*b*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d/cos(d
*x+c)^(1/2)-1/3*A*b*sin(d*x+c)^3*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)+3/
8*b*B*sin(d*x+c)*cos(d*x+c)^(1/2)*(b*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 177, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.152$, Rules used

$= \{17, 2827, 2713, 2715, 8\}$

$$\int \cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = -\frac{Ab\sin^3(c+dx)\sqrt{b\cos(c+dx)}}{3d\sqrt{\cos(c+dx)}} + \frac{Ab\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}} + \frac{3bBx\sqrt{b\cos(c+dx)}}{8\sqrt{\cos(c+dx)}} + \frac{bB\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}}{4d} + \frac{3bB\sin(c+dx)\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}{8d}$$

```
[In] Int[Cos[c + d*x]^(3/2)*(b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (3*b*B*x*Sqrt[b*Cos[c + d*x]])/(8*Sqrt[Cos[c + d*x]]) + (A*b*Sqrt[b*Cos[c +
 d*x]]*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]]) + (3*b*B*Sqrt[Cos[c + d*x]]*Sqr
t[b*Cos[c + d*x]]*Sin[c + d*x])/(8*d) + (b*B*Cos[c + d*x]^(5/2)*Sqrt[b*Cos[
c + d*x]]*Sin[c + d*x])/(4*d) - (A*b*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x]^3)/(
3*d*Sqrt[Cos[c + d*x]])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
```

```
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = \frac{\left(b\sqrt{b\cos(c+dx)}\right)\int\cos^3(c+dx)(A+B\cos(c+dx))\,dx}{\sqrt{\cos(c+dx)}}$$

$$= \frac{\left(Ab\sqrt{b\cos(c+dx)}\right)\int\cos^3(c+dx)\,dx}{\sqrt{\cos(c+dx)}} + \frac{\left(bB\sqrt{b\cos(c+dx)}\right)\int\cos^4(c+dx)\,dx}{\sqrt{\cos(c+dx)}}$$

$$= \frac{bB\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}\sin(c+dx)}{4d} + \frac{\left(3bB\sqrt{b\cos(c+dx)}\right)\int\cos^2(c+dx)\,dx}{4\sqrt{\cos(c+dx)}} - \frac{\left(Ab\sqrt{b\cos(c+dx)}\right)\text{Subst}\left(\int\left(1-x^2\right)\,dx,x,-\sin(c+dx)\right)}{d\sqrt{\cos(c+dx)}}$$

$$= \frac{Ab\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{3bB\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{8d} + \frac{bB\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}\sin(c+dx)}{4d} - \frac{Ab\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\sqrt{\cos(c+dx)}} + \frac{\left(3bB\sqrt{b\cos(c+dx)}\right)\int 1\,dx}{8\sqrt{\cos(c+dx)}}$$

$$= \frac{3bBx\sqrt{b\cos(c+dx)}}{8\sqrt{\cos(c+dx)}} + \frac{Ab\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{3bB\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{8d} + \frac{bB\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}\sin(c+dx)}{4d} - \frac{Ab\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\sqrt{\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.37 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.46

$$\int \cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \frac{(b\cos(c+dx))^{3/2}(36Bc+36Bdx+72A\sin(c+dx)+24B\sin(2(c+dx))+8A\sin(3(c+\cdots}{96d\cos^{\frac{3}{2}}(c+dx)}$$

[In] Integrate[Cos[c + d*x]^(3/2)*(b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]),x]

[Out] ((b*Cos[c + d*x])^(3/2)*(36*B*c + 36*B*d*x + 72*A*Sin[c + d*x] + 24*B*Sin[2*(c + d*x)] + 8*A*Sin[3*(c + d*x)] + 3*B*Sin[4*(c + d*x)]))/(96*d*Cos[c + d*x]^(3/2))

Maple [A] (verified)

Time = 5.08 (sec) , antiderivative size = 92, normalized size of antiderivative = 0.52

method	result
default	$\frac{b\sqrt{\cos(dx+c)b}\,(6B\sin(dx+c)(\cos^3(dx+c))+8A\sin(dx+c)(\cos^2(dx+c))+9B\sin(dx+c)\cos(dx+c)+16A\sin(dx+c)+9B(dx+c))}{24d\sqrt{\cos(dx+c)}}$
parts	$\frac{Ab(2+\cos^2(dx+c))\sin(dx+c)\sqrt{\cos(dx+c)b}}{3d\sqrt{\cos(dx+c)}}+\frac{Bb\sqrt{\cos(dx+c)b}\,(2\sin(dx+c)(\cos^3(dx+c))+3\cos(dx+c)\sin(dx+c)+3dx+3c)}{8d\sqrt{\cos(dx+c)}}$
risch	$\frac{3b\sqrt{\cos(dx+c)b}\,(\sqrt{\cos}(dx+c))e^{i(dx+c)}xB}{4(e^{2i(dx+c)}+1)}-\frac{ib\sqrt{\cos(dx+c)b}\,(\sqrt{\cos}(dx+c))e^{5i(dx+c)}B}{32(e^{2i(dx+c)}+1)d}-\frac{ib\sqrt{\cos(dx+c)b}\,(\sqrt{\cos}(dx+c))e^{4i(dx+c)}A\cdots}{12(e^{2i(dx+c)}+1)d}$

[In] int(cos(d*x+c)^(3/2)*(cos(d*x+c)*b)^(3/2)*(A+B*cos(d*x+c)),x,method=_RETURNVERBOSE)

[Out] 1/24*b/d*(cos(d*x+c)*b)^(1/2)*(6*B*sin(d*x+c)*cos(d*x+c)^3+8*A*sin(d*x+c)*cos(d*x+c)^2+9*B*sin(d*x+c)*cos(d*x+c)+16*A*sin(d*x+c)+9*B*(d*x+c))/cos(d*x+c)^(1/2)

Fricas [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 261, normalized size of antiderivative = 1.47

$$\int \cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \left[\frac{9\,B\sqrt{-b}b\cos(dx+c)\log\left(2\,b\cos(dx+c)^2-2\,\sqrt{b\cos(dx+c)}\sqrt{-b}\sqrt{\cos(dx+c)}\sin\cdots\right.}{}\right.$$

```
[In] integrate(cos(d*x+c)^(3/2)*(b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c)),x, algorit
hm="fricas")
```

```
[Out] [1/48*(9*B*sqrt(-b)*b*cos(d*x + c)*log(2*b*cos(d*x + c)^2 - 2*sqrt(b*cos(d*
x + c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) + 2*(6*B*b*cos(d*x +
c)^3 + 8*A*b*cos(d*x + c)^2 + 9*B*b*cos(d*x + c) + 16*A*b)*sqrt(b*cos(d*x +
 c))*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)), 1/24*(9*B*b^(3/2)*a
rctan(sqrt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/2)))*cos(d
*x + c) + (6*B*b*cos(d*x + c)^3 + 8*A*b*cos(d*x + c)^2 + 9*B*b*cos(d*x + c)
 + 16*A*b)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x
 + c))]
```

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(3/2)*(b*cos(d*x+c))**(3/2)*(A+B*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.47 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.56

$$\int \cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \frac{8\left(b\sin\left(3\,dx+3\,c\right)+9\,b\sin\left(\frac{1}{3}\,\arctan\left(\sin\left(3\,dx+3\,c\right),\cos\left(3\,dx+3\,c\right)\right)\right)\right)A\sqrt{b}+3\,(12$$

```
[In] integrate(cos(d*x+c)^(3/2)*(b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c)),x, algorit
hm="maxima")
```

```
[Out] 1/96*(8*(b*sin(3*d*x + 3*c) + 9*b*sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d
*x + 3*c))))*A*sqrt(b) + 3*(12*(d*x + c)*b + b*sin(4*d*x + 4*c) + 8*b*sin(1
/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*B*sqrt(b))/d
```

Giac [A] (verification not implemented)

none

Time = 3.46 (sec) , antiderivative size = 279, normalized size of antiderivative = 1.58

$$\int \cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \frac{\left(9\,B\sqrt{b}dx\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^8+36\,B\sqrt{b}dx\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^6+48\,A\sqrt{b}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7 -$$

```
[In] integrate(cos(d*x+c)^(3/2)*(b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c)),x, algorit
hm="giac")
```

```
[Out] 1/24*(9*B*sqrt(b)*d*x*tan(1/2*d*x + 1/2*c)^8 + 36*B*sqrt(b)*d*x*tan(1/2*d*x
 + 1/2*c)^6 + 48*A*sqrt(b)*tan(1/2*d*x + 1/2*c)^7 - 30*B*sqrt(b)*tan(1/2*d*
x + 1/2*c)^7 + 54*B*sqrt(b)*d*x*tan(1/2*d*x + 1/2*c)^4 + 80*A*sqrt(b)*tan(1
/2*d*x + 1/2*c)^5 + 18*B*sqrt(b)*tan(1/2*d*x + 1/2*c)^5 + 36*B*sqrt(b)*d*x*
tan(1/2*d*x + 1/2*c)^2 + 80*A*sqrt(b)*tan(1/2*d*x + 1/2*c)^3 - 18*B*sqrt(b)
*tan(1/2*d*x + 1/2*c)^3 + 9*B*sqrt(b)*d*x + 48*A*sqrt(b)*tan(1/2*d*x + 1/2*
c) + 30*B*sqrt(b)*tan(1/2*d*x + 1/2*c))*b/(d*tan(1/2*d*x + 1/2*c)^8 + 4*d*t
an(1/2*d*x + 1/2*c)^6 + 6*d*tan(1/2*d*x + 1/2*c)^4 + 4*d*tan(1/2*d*x + 1/2*
c)^2 + d)
```

Mupad [B] (verification not implemented)

Time = 16.24 (sec) , antiderivative size = 106, normalized size of antiderivative = 0.60

$$\int \cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \frac{b\,\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{b\,\cos\left(c+d\,x\right)}\,\left(24\,B\,\sin\left(c+d\,x\right)+80\,A\,\sin\left(2\,c+2\,d\,x\right)+8\,A\,\sin\left(4\right.\right.}{96\,d\,\left(\cos\left(2\,c+2\right.\right.}$$

```
[In] int(cos(c + d*x)^(3/2)*(b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)),x)
```

```
[Out] (b*cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(1/2)*(24*B*sin(c + d*x) + 80*A*sin(
2*c + 2*d*x) + 8*A*sin(4*c + 4*d*x) + 27*B*sin(3*c + 3*d*x) + 3*B*sin(5*c +
 5*d*x) + 72*B*d*x*cos(c + d*x)))/(96*d*(cos(2*c + 2*d*x) + 1))
```

3.851 $\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 33, antiderivative size = 140

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \frac{Abx\sqrt{b\cos(c+dx)}}{2\sqrt{\cos(c+dx)}} + \frac{bB\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{Ab\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d} - \frac{bB\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\sqrt{\cos(c+dx)}}$$

```
[Out] 1/2*A*b*x*(b*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2)+b*B*sin(d*x+c)*(b*cos(d*x+c
))^(1/2)/d/cos(d*x+c)^(1/2)-1/3*b*B*sin(d*x+c)^3*(b*cos(d*x+c))^(1/2)/d/cos
(d*x+c)^(1/2)+1/2*A*b*sin(d*x+c)*cos(d*x+c)^(1/2)*(b*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {17, 2827, 2715, 8, 2713}

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \frac{Abx\sqrt{b\cos(c+dx)}}{2\sqrt{\cos(c+dx)}} + \frac{Ab\sin(c+dx)\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}{2d} - \frac{bB\sin^3(c+dx)\sqrt{b\cos(c+dx)}}{3d\sqrt{\cos(c+dx)}} + \frac{bB\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[Sqrt[Cos[c + d*x]]*(b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (A*b*x*Sqrt[b*Cos[c + d*x]])/(2*Sqrt[Cos[c + d*x]]) + (b*B*Sqrt[b*Cos[c + d
*x]]*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]]) + (A*b*Sqrt[Cos[c + d*x]]*Sqrt[b*
Cos[c + d*x]]*Sin[c + d*x])/(2*d) - (b*B*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x]^
3)/(3*d*Sqrt[Cos[c + d*x]])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = \frac{\left(b\sqrt{b\cos(c+dx)}\right)\int \cos^2(c+dx)(A+B\cos(c+dx))\,dx}{\sqrt{\cos(c+dx)}}$$

$$= \frac{\left(Ab\sqrt{b\cos(c+dx)}\right)\int \cos^2(c+dx)\,dx}{\sqrt{\cos(c+dx)}} + \frac{\left(bB\sqrt{b\cos(c+dx)}\right)\int \cos^3(c+dx)\,dx}{\sqrt{\cos(c+dx)}}$$

$$= \frac{Ab\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d} + \frac{\left(Ab\sqrt{b\cos(c+dx)}\right)\int 1\,dx}{2\sqrt{\cos(c+dx)}} - \frac{\left(bB\sqrt{b\cos(c+dx)}\right)\text{Subst}\left(\int (1-x^2)\ dx, x, -\sin(c+dx)\right)}{d\sqrt{\cos(c+dx)}}$$

$$= \frac{Abx\sqrt{b\cos(c+dx)}}{2\sqrt{\cos(c+dx)}} + \frac{bB\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{Ab\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d} - \frac{bB\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\sqrt{\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.23 (sec) , antiderivative size = 69, normalized size of antiderivative = 0.49

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^{3/2}(A + B\cos(c+dx))\,dx = \frac{(b\cos(c+dx))^{3/2}(6Ac+6Adx+9B\sin(c+dx)+3A\sin(2(c+dx))+B\sin(3(c+dx$$
$$12d\cos^{\frac{3}{2}}(c+dx)$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]*(b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]),x]
[Out] ((b*Cos[c + d*x])^(3/2)*(6*A*c + 6*A*d*x + 9*B*Sin[c + d*x] + 3*A*Sin[2*(c + d*x)] + B*Sin[3*(c + d*x)]))/(12*d*Cos[c + d*x]^(3/2))
```

Maple [A] (verified)

Time = 5.03 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.54

method	result
default	$\frac{b\sqrt{\cos(dx+c)b}\left(2B\sin(dx+c)\left(\cos^2(dx+c)\right)+3A\sin(dx+c)\cos(dx+c)+3A(dx+c)+4B\sin(dx+c)\right)}{6d\sqrt{\cos(dx+c)}}$
parts	$\frac{Ab\sqrt{\cos(dx+c)b}\left(\cos(dx+c)\sin(dx+c)+dx+c\right)}{2d\sqrt{\cos(dx+c)}} + \frac{Bb\left(2+\cos^2(dx+c)\right)\sin(dx+c)\sqrt{\cos(dx+c)b}}{3d\sqrt{\cos(dx+c)}}$
risch	$\frac{b\sqrt{\cos(dx+c)b}\left(\sqrt{\cos}(dx+c)\right)e^{i(dx+c)}xA}{e^{2i(dx+c)}+1} - \frac{ib\sqrt{\cos(dx+c)b}\left(\sqrt{\cos}(dx+c)\right)e^{4i(dx+c)}B}{12\left(e^{2i(dx+c)}+1\right)d} - \frac{ib\sqrt{\cos(dx+c)b}\left(\sqrt{\cos}(dx+c)\right)e^{3i(dx+c)}}{4\left(e^{2i(dx+c)}+1\right)d}$

```
[In] int(cos(d*x+c)^(1/2)*(cos(d*x+c)*b)^(3/2)*(A+B*cos(d*x+c)),x,method=_RETURNVERBOSE)
[Out] 1/6*b/d*(cos(d*x+c)*b)^(1/2)*(2*B*sin(d*x+c)*cos(d*x+c)^2+3*A*sin(d*x+c)*cos(d*x+c)+3*A*(d*x+c)+4*B*sin(d*x+c))/cos(d*x+c)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 237, normalized size of antiderivative = 1.69

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \left[\frac{3\,A\sqrt{-b}b\cos\left(dx+c\right)\log\left(2\,b\cos\left(dx+c\right)^2-2\,\sqrt{b\cos\left(dx+c\right)}\sqrt{-b}\sqrt{\cos\left(dx+c\right)}\sin\left(\right.\right.}{}\right.$$

[In] integrate(cos(d*x+c)^(1/2)*(b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c)),x, algorithm="fricas")

[Out] [1/12*(3*A*sqrt(-b)*b*cos(d*x + c)*log(2*b*cos(d*x + c)^2 - 2*sqrt(b*cos(d*x + c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) + 2*(2*B*b*cos(d*x + c)^2 + 3*A*b*cos(d*x + c) + 4*B*b)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)), 1/6*(3*A*b^(3/2)*arctan(sqrt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/2)))*cos(d*x + c) + (2*B*b*cos(d*x + c)^2 + 3*A*b*cos(d*x + c) + 4*B*b)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c))]

Sympy [F(-1)]

Timed out.

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \text{Timed out}$$

[In] integrate(cos(d*x+c)**(1/2)*(b*cos(d*x+c))**(3/2)*(A+B*cos(d*x+c)),x)

[Out] Timed out

Maxima [A] (verification not implemented)

none

Time = 0.45 (sec) , antiderivative size = 74, normalized size of antiderivative = 0.53

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \frac{3\left(2\left(dx+c\right)b+b\sin\left(2\,dx+2\,c\right)\right)A\sqrt{b}+\left(b\sin\left(3\,dx+3\,c\right)+9\,b\sin\left(\frac{1}{3}\arctan\left(\sin\left(3\,dx\right.\right.\right.\right.}{12\,d}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c)),x, algorit
hm="maxima")
```

```
[Out] 1/12*(3*(2*(d*x + c)*b + b*sin(2*d*x + 2*c))*A*sqrt(b) + (b*sin(3*d*x + 3*c
) + 9*b*sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))))*B*sqrt(b))/d
```

Giac [A] (verification not implemented)

none

Time = 2.59 (sec) , antiderivative size = 195, normalized size of antiderivative = 1.39

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \frac{\left(3\,A\sqrt{b}dx\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{6}+9\,A\sqrt{b}dx\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{4}-6\,A\sqrt{b}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{5}+\right.}{6\left(d\,t\right.}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c)),x, algorit
hm="giac")
```

```
[Out] 1/6*(3*A*sqrt(b)*d*x*tan(1/2*d*x + 1/2*c)^6 + 9*A*sqrt(b)*d*x*tan(1/2*d*x +
 1/2*c)^4 - 6*A*sqrt(b)*tan(1/2*d*x + 1/2*c)^5 + 12*B*sqrt(b)*tan(1/2*d*x +
 1/2*c)^5 + 9*A*sqrt(b)*d*x*tan(1/2*d*x + 1/2*c)^2 + 8*B*sqrt(b)*tan(1/2*d*
x + 1/2*c)^3 + 3*A*sqrt(b)*d*x + 6*A*sqrt(b)*tan(1/2*d*x + 1/2*c) + 12*B*sq
rt(b)*tan(1/2*d*x + 1/2*c))*b/(d*tan(1/2*d*x + 1/2*c)^6 + 3*d*tan(1/2*d*x +
 1/2*c)^4 + 3*d*tan(1/2*d*x + 1/2*c)^2 + d)
```

Mupad [B] (verification not implemented)

Time = 1.23 (sec) , antiderivative size = 93, normalized size of antiderivative = 0.66

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))\,dx = \frac{b\,\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{b\,\cos\left(c+d\,x\right)}\,\left(3\,A\,\sin\left(c+d\,x\right)+3\,A\,\sin\left(3\,c+3\,d\,x\right)+10\,B\,\sin\left(2\right.\right.}{12\,d\,\left(\cos\left(2\,c+2\,d\,x\right)+1\right)}$$

```
[In] int(cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)),x)
```

```
[Out] (b*cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(1/2)*(3*A*sin(c + d*x) + 3*A*sin(3*
c + 3*d*x) + 10*B*sin(2*c + 2*d*x) + B*sin(4*c + 4*d*x) + 12*A*d*x*cos(c +
d*x)))/(12*d*(cos(2*c + 2*d*x) + 1))
```

3.852 $\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 101

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \frac{bBx\sqrt{b\cos(c+dx)}}{2\sqrt{\cos(c+dx)}} + \frac{Ab\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{bB\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d}$$

```
[Out] 1/2*b*B*x*(b*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2)+A*b*sin(d*x+c)*(b*cos(d*x+c
))^(1/2)/d/cos(d*x+c)^(1/2)+1/2*b*B*sin(d*x+c)*cos(d*x+c)^(1/2)*(b*cos(d*x+
c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.061, Rules used = {17, 2813}

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \frac{Ab\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}} + \frac{bBx\sqrt{b\cos(c+dx)}}{2\sqrt{\cos(c+dx)}} + \frac{bB\sin(c+dx)\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}{2d}$$

```
[In] Int[((b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]))/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (b*B*x*Sqrt[b*Cos[c + d*x]])/(2*Sqrt[Cos[c + d*x]]) + (A*b*Sqrt[b*Cos[c + d
*x]]*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]]) + (b*B*Sqrt[Cos[c + d*x]]*Sqrt[b*
Cos[c + d*x]]*Sin[c + d*x])/(2*d)
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\left(b\sqrt{b\cos(c+dx)}\right)\int\cos(c+dx)(A+B\cos(c+dx))\,dx}{\sqrt{\cos(c+dx)}}\\ &= \frac{bBx\sqrt{b\cos(c+dx)}}{2\sqrt{\cos(c+dx)}}+\frac{Ab\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}\\ &\quad+\frac{bB\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.57

$$\int\frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx=\frac{b\sqrt{b\cos(c+dx)}(4A\sin(c+dx)+B(2(c+dx)+\sin(2(c+d}{4d\sqrt{\cos(c+dx)}}$$

```
[In] Integrate[((b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]))/Sqrt[Cos[c + d*x]],
x]
```

```
[Out] (b*Sqrt[b*Cos[c + d*x]]*(4*A*Sin[c + d*x] + B*(2*(c + d*x) + Sin[2*(c + d*x
)])))/(4*d*Sqrt[Cos[c + d*x]])
```

Maple [A] (verified)

Time = 4.90 (sec) , antiderivative size = 56, normalized size of antiderivative = 0.55

method	result	size
default	$\frac{b\sqrt{\cos(dx+c)b}\,(B\sin(dx+c)\cos(dx+c)+2A\sin(dx+c)+B(dx+c))}{2d\sqrt{\cos(dx+c)}}$	56
parts	$\frac{Ab\sin(dx+c)\sqrt{\cos(dx+c)b}}{d\sqrt{\cos(dx+c)}}+\frac{Bb\sqrt{\cos(dx+c)b}\,(\cos(dx+c)\sin(dx+c)+dx+c)}{2d\sqrt{\cos(dx+c)}}$	75
risch	$\frac{bBx\sqrt{\cos(dx+c)b}}{2\sqrt{\cos(dx+c)}}+\frac{Ab\sin(dx+c)\sqrt{\cos(dx+c)b}}{d\sqrt{\cos(dx+c)}}+\frac{b\sqrt{\cos(dx+c)b}\,B\sin(2dx+2c)}{4\sqrt{\cos(dx+c)}\,d}$	89

```
[In] int((cos(d*x+c)*b)^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/2*b/d*(cos(d*x+c)*b)^(1/2)*(B*sin(d*x+c)*cos(d*x+c)+2*A*sin(d*x+c)+B*(d*x
+c))/cos(d*x+c)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 209, normalized size of antiderivative = 2.07

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \left[\frac{B\sqrt{-b}b\cos(dx+c)\log\left(2\,b\cos(dx+c)^2-2\,\sqrt{b\cos(dx+c}\right.}{}\right.$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x, algorit
hm="fricas")
```

```
[Out] [1/4*(B*sqrt(-b)*b*cos(d*x + c)*log(2*b*cos(d*x + c)^2 - 2*sqrt(b*cos(d*x +
 c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) + 2*(B*b*cos(d*x + c) +
2*A*b)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c
)), 1/2*(B*b^(3/2)*arctan(sqrt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*
x + c)^(3/2)))*cos(d*x + c) + (B*b*cos(d*x + c) + 2*A*b)*sqrt(b*cos(d*x + c
))*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c))]
```

Sympy [A] (verification not implemented)

Time = 31.58 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.50

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \begin{cases} \frac{A(b\cos{(c+dx)})^{\frac{3}{2}}\sin{(c+dx)}}{d\cos^{\frac{3}{2}}{(c+dx)}} + \frac{Bx(b\cos{(c+dx)})^{\frac{3}{2}}\sin^2{(c+dx)}}{2\cos^{\frac{3}{2}}{(c+dx)}} + \frac{Bx(b\cos{(c-} \\ \frac{x(b\cos{(c)})^{\frac{3}{2}}(A+B\cos{(c)})}{\sqrt{\cos{(c)}}} \end{cases}$$

```
[In] integrate((b*cos(d*x+c))**(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)**(1/2),x)
```

```
[Out] Piecewise((A*(b*cos(c + d*x))**(3/2)*sin(c + d*x)/(d*cos(c + d*x)**(3/2)) +
 B*x*(b*cos(c + d*x))**(3/2)*sin(c + d*x)**2/(2*cos(c + d*x)**(3/2)) + B*x*
(b*cos(c + d*x))**(3/2)*sqrt(cos(c + d*x))/2 + B*(b*cos(c + d*x))**(3/2)*si
n(c + d*x)/(2*d*sqrt(cos(c + d*x))), Ne(d, 0)), (x*(b*cos(c))**(3/2)*(A + B
*cos(c))/sqrt(cos(c)), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.44 (sec) , antiderivative size = 43, normalized size of antiderivative = 0.43

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \frac{4\,Ab^{\frac{3}{2}}\sin{(dx+c)} + (2\,(dx+c)b + b\sin{(2\,dx+2\,c)})B\sqrt{b}}{4\,d}$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x, algorit
hm="maxima")
```

```
[Out] 1/4*(4*A*b^(3/2)*sin(d*x + c) + (2*(d*x + c)*b + b*sin(2*d*x + 2*c))*B*sqrt
(b))/d
```

Giac [F]

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(B\cos{(dx+c)}+A)(b\cos{(dx+c)})^{\frac{3}{2}}}{\sqrt{\cos{(dx+c)}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2)/sqrt(cos(d*x + c)), x
)
```

Mupad [B] (verification not implemented)

Time = 0.55 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.50

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \frac{b\,\sqrt{b\,\cos\left(c+d\,x\right)}\,\left(4\,A\,\sin\left(c+d\,x\right)+B\,\sin\left(2\,c+2\,d\,x\right)+2\,B}{4\,d\,\sqrt{\cos\left(c+d\,x\right)}}$$

```
[In] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(1/2),x)
```

```
[Out] (b*(b*cos(c + d*x))^(1/2)*(4*A*sin(c + d*x) + B*sin(2*c + 2*d*x) + 2*B*d*x)
)/(4*d*cos(c + d*x)^(1/2))
```

3.853 $\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 61

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{Abx\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}} + \frac{bB\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[Out] A*b*x*(b*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2)+b*B*sin(d*x+c)*(b*cos(d*x+c))^(
1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.061$, Rules used = {17, 2717}

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{Abx\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}} + \frac{bB\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[((b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(3/2),x]
```

```
[Out] (A*b*x*Sqrt[b*Cos[c + d*x]])/Sqrt[Cos[c + d*x]] + (b*B*Sqrt[b*Cos[c + d*x]]
*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]])
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2717

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\left(b\sqrt{b\cos(c+dx)}\right)\int(A+B\cos(c+dx))\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{Abx\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}+\frac{\left(bB\sqrt{b\cos(c+dx)}\right)\int\cos(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{Abx\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}+\frac{bB\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.69

$$\int\frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\frac{(b\cos(c+dx))^{3/2}(A(c+dx)+B\sin(c+dx))}{d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Integrate[((b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(3/2),
x]
[Out] ((b*Cos[c + d*x])^(3/2)*(A*(c + d*x) + B*Sin[c + d*x]))/(d*Cos[c + d*x]^(3/
2))
```

Maple [A] (verified)

Time = 5.10 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.66

method	result	size
default	$\frac{b\sqrt{\cos(dx+c)b}\,(A(dx+c)+B\sin(dx+c))}{d\sqrt{\cos(dx+c)}}$	40
risch	$\frac{Abx\sqrt{\cos(dx+c)b}}{\sqrt{\cos(dx+c)}}+\frac{bB\sin(dx+c)\sqrt{\cos(dx+c)b}}{d\sqrt{\cos(dx+c)}}$	54
parts	$\frac{Ab\sqrt{\cos(dx+c)b}\,(dx+c)}{d\sqrt{\cos(dx+c)}}+\frac{bB\sin(dx+c)\sqrt{\cos(dx+c)b}}{d\sqrt{\cos(dx+c)}}$	61

```
[In] int((cos(d*x+c)*b)^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x,method=_RETURN
VERBOSE)
[Out] b/d*(cos(d*x+c)*b)^(1/2)*(A*(d*x+c)+B*sin(d*x+c))/cos(d*x+c)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 184, normalized size of antiderivative = 3.02

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \left[\frac{A\sqrt{-b}b\cos(dx+c)\log\left(2\,b\cos(dx+c)^2-2\,\sqrt{b\cos(dx+\right.}{}\right.$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x, algorit
hm="fricas")
[Out] [1/2*(A*sqrt(-b)*b*cos(d*x + c)*log(2*b*cos(d*x + c)^2 - 2*sqrt(b*cos(d*x +
 c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) + 2*sqrt(b*cos(d*x + c))
*B*b*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)), (A*b^(3/2)*arctan(s
qrt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/2)))*cos(d*x + c)
 + sqrt(b*cos(d*x + c))*B*b*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c
))]
```

Sympy [A] (verification not implemented)

Time = 31.98 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.31

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \begin{cases} \frac{Ax(b\cos(c+dx))^{\frac{3}{2}}}{\cos^{\frac{3}{2}}(c+dx)}+\frac{B(b\cos(c+dx))^{\frac{3}{2}}\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)} & \text{for } d\neq 0 \\ \frac{x(b\cos(c))^{\frac{3}{2}}(A+B\cos(c))}{\cos^{\frac{3}{2}}(c)} & \text{otherwise} \end{cases}$$

```
[In] integrate((b*cos(d*x+c))**(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)**(3/2),x)
[Out] Piecewise((A*x*(b*cos(c + d*x))**(3/2)/cos(c + d*x)**(3/2) + B*(b*cos(c + d
*x))**(3/2)*sin(c + d*x)/(d*cos(c + d*x)**(3/2)), Ne(d, 0)), (x*(b*cos(c))*
*(3/2)*(A + B*cos(c))/cos(c)**(3/2), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.66

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2\,Ab^{\frac{3}{2}}\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)+Bb^{\frac{3}{2}}\sin\left(dx+c\right)}{d}$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x, algorit
hm="maxima")
```

```
[Out] (2*A*b^(3/2)*arctan(sin(d*x + c)/(cos(d*x + c) + 1)) + B*b^(3/2)*sin(d*x +
c))/d
```

Giac [F]

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(B\cos\left(dx+c\right)+A)(b\cos\left(dx+c\right))^{\frac{3}{2}}}{\cos\left(dx+c\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2)/cos(d*x + c)^(3/2), x
)
```

Mupad [B] (verification not implemented)

Time = 14.77 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.59

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{b\,\sqrt{b\,\cos\left(c+d\,x\right)}\,\left(B\,\sin\left(c+d\,x\right)+A\,d\,x\right)}{d\,\sqrt{\cos\left(c+d\,x\right)}}$$

```
[In] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(3/2),x)
```

```
[Out] (b*(b*cos(c + d*x))^(1/2)*(B*sin(c + d*x) + A*d*x))/(d*cos(c + d*x)^(1/2))
```

3.854 $\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 62

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{bBx\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}} + \frac{A\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

```
[Out] b*B*x*(b*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2)+A*b*arctanh(sin(d*x+c))*(b*cos(
d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {17, 2814, 3855}

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{A\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}} + \frac{bBx\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}$$

```
[In] Int[((b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(5/2),x]
```

```
[Out] (b*B*x*Sqrt[b*Cos[c + d*x]])/Sqrt[Cos[c + d*x]] + (A*b*ArcTanh[Sin[c + d*x]
]*Sqrt[b*Cos[c + d*x]])/(d*Sqrt[Cos[c + d*x]])
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\left(b\sqrt{b\cos(c+dx)}\right)\int(A+B\cos(c+dx))\sec(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\ &= \frac{bBx\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}+\frac{\left(Ab\sqrt{b\cos(c+dx)}\right)\int\sec(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\ &= \frac{bBx\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}+\frac{Ab\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.65

$$\int\frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx=\frac{(Bdx+A\text{arctanh}(\sin(c+dx)))(b\cos(c+dx))^{3/2}}{d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Integrate[((b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(5/2),
x]
[Out] ((B*d*x + A*ArcTanh[Sin[c + d*x]])*(b*Cos[c + d*x])^(3/2))/(d*Cos[c + d*x]^
(3/2))
```

Maple [A] (verified)

Time = 4.96 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.85

method	result	size
default	$-\frac{b\sqrt{\cos(dx+c)b}\,(2A\,\mathrm{arctanh}(\cot(dx+c)-\csc(dx+c))-B(dx+c))}{d\sqrt{\cos(dx+c)}}$	53
parts	$-\frac{2A\sqrt{\cos(dx+c)b}\,b\,\mathrm{arctanh}(\cot(dx+c)-\csc(dx+c))}{d\sqrt{\cos(dx+c)}}+\frac{Bb\sqrt{\cos(dx+c)b}\,(dx+c)}{d\sqrt{\cos(dx+c)}}$	72
risch	$\frac{bBx\sqrt{\cos(dx+c)b}}{\sqrt{\cos(dx+c)}}+\frac{b\sqrt{\cos(dx+c)b}\,A\ln(\mathrm{e}^{i(dx+c)}+i)}{\sqrt{\cos(dx+c)}\,d}-\frac{b\sqrt{\cos(dx+c)b}\,A\ln(\mathrm{e}^{i(dx+c)}-i)}{\sqrt{\cos(dx+c)}\,d}$	99

[In] int((cos(d*x+c)*b)^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x,method=_RETURN VERBOSE)

[Out] -b/d*(cos(d*x+c)*b)^(1/2)*(2*A*arctanh(cot(d*x+c)-csc(d*x+c))-B*(d*x+c))/co s(d*x+c)^(1/2)

Fricas [A] (verification not implemented)

none

Time = 0.38 (sec) , antiderivative size = 212, normalized size of antiderivative = 3.42

$$\int\frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx=\left[-\frac{2\,A\sqrt{-b}b\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)-B\sqrt{-b}b\log\left(\right.}{}\right.$$

[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x, algorit hm="fricas")

[Out] [-1/2*(2*A*sqrt(-b)*b*arctan(sqrt(b*cos(d*x + c))*sqrt(-b)*sin(d*x + c)/(b* sqrt(cos(d*x + c)))) - B*sqrt(-b)*b*log(2*b*cos(d*x + c)^2 - 2*sqrt(b*cos(d *x + c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b))/d, 1/2*(2*B*b^(3/2) *arctan(sqrt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/2))) + A *b^(3/2)*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x + c))*sqrt(b)*sqrt(cos(d *x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x + c)^3))/d]

Sympy [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)**(5/2),x)
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.44 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.53

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{4\,Bb^{\frac{3}{2}}\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right) + \left(b\log\left(\cos\left(dx+c\right)^2+\sin\left(dx+c\right)\right.\right.}{}$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x, algorit
hm="maxima")
[Out] 1/2*(4*B*b^(3/2)*arctan(sin(d*x + c)/(cos(d*x + c) + 1)) + (b*log(cos(d*x +
 c)^2 + sin(d*x + c)^2 + 2*sin(d*x + c) + 1) - b*log(cos(d*x + c)^2 + sin(d
*x + c)^2 - 2*sin(d*x + c) + 1))*A*sqrt(b))/d
```

Giac [F]

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(B\cos\left(dx+c\right)+A)(b\cos\left(dx+c\right))^{\frac{3}{2}}}{\cos\left(dx+c\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x, algorit
hm="giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2)/cos(d*x + c)^(5/2), x
)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{\left(b\,\cos\left(c+d\,x\right)\right)^{3/2}\,\left(A+B\,\cos\left(c+d\,x\right)\right)}{\cos\left(c+d\,x\right)^{5/2}}\,dx$$

```
[In] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(5/2),x)
[Out] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(5/2), x)
```

3.855 $\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 70

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{bB\operatorname{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}} + \frac{Ab\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] A*b*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(3/2)+b*B*arctanh(sin(d*x+
c))*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {17, 2827, 3852, 8, 3855}

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{Ab\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\cos^{\frac{3}{2}}(c+dx)} + \frac{bB\operatorname{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[((b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(7/2),x]
```

```
[Out] (b*B*ArcTanh[Sin[c + d*x]]*Sqrt[b*Cos[c + d*x]])/(d*Sqrt[Cos[c + d*x]]) + (
A*b*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(d*Cos[c + d*x]^(3/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\left(b\sqrt{b\cos(c+dx)}\right)\int(A+B\cos(c+dx))\sec^2(c+dx)\,dx}{\sqrt{\cos(c+dx)}} \\
&= \frac{\left(Ab\sqrt{b\cos(c+dx)}\right)\int\sec^2(c+dx)\,dx}{\sqrt{\cos(c+dx)}} + \frac{\left(bB\sqrt{b\cos(c+dx)}\right)\int\sec(c+dx)\,dx}{\sqrt{\cos(c+dx)}} \\
&= \frac{bB\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}} \\
&\quad - \frac{\left(Ab\sqrt{b\cos(c+dx)}\right)\text{Subst}\left(\int 1\,dx, x, -\tan(c+dx)\right)}{d\sqrt{\cos(c+dx)}} \\
&= \frac{bB\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}} + \frac{Ab\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.71

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{(b\cos(c+dx))^{3/2}(B\text{arctanh}(\sin(c+dx))\cos(c+dx)+A\sin(}{d\cos^{\frac{5}{2}}(c+dx)}$$

[In] Integrate[((b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(7/2), x]

[Out] ((b*Cos[c + d*x])^(3/2)*(B*ArcTanh[Sin[c + d*x]]*Cos[c + d*x] + A*Sin[c + d *x]))/(d*Cos[c + d*x]^(5/2))

Maple [A] (verified)

Time = 4.57 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.83

method	result	size
default	$\frac{b(-2B\cos(dx+c)\,\text{arctanh}(\cot(dx+c)-\csc(dx+c))+A\sin(dx+c))\sqrt{\cos(dx+c)b}}{d\cos(dx+c)^{\frac{3}{2}}}$	58
parts	$\frac{Ab\sin(dx+c)\sqrt{\cos(dx+c)b}}{d\cos(dx+c)^{\frac{3}{2}}}-\frac{2B\sqrt{\cos(dx+c)b}\,b\,\text{arctanh}(\cot(dx+c)-\csc(dx+c))}{d\sqrt{\cos(dx+c)}}$	73
risch	$\frac{2ib\sqrt{\cos(dx+c)b}\,A}{\sqrt{\cos(dx+c)}\,d\left(\mathrm{e}^{2i(dx+c)}+1\right)}+\frac{b\sqrt{\cos(dx+c)b}\,B\ln\left(\mathrm{e}^{i(dx+c)}+i\right)}{\sqrt{\cos(dx+c)}\,d}-\frac{b\sqrt{\cos(dx+c)b}\,B\ln\left(\mathrm{e}^{i(dx+c)}-i\right)}{\sqrt{\cos(dx+c)}\,d}$	116

[In] int((cos(d*x+c)*b)^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x,method=_RETURNVERBOSE)

[Out] b/d*(-2*B*cos(d*x+c)*arctanh(cot(d*x+c)-csc(d*x+c))+A*sin(d*x+c))*(cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(3/2)

Fricas [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 208, normalized size of antiderivative = 2.97

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \left[\frac{Bb^{\frac{3}{2}}\cos(dx+c)^2\log\left(-\frac{b\cos(dx+c)^3-2\sqrt{b\cos(dx+c)}\sqrt{b}\sqrt{\cos(dx+c)}\sin}{\cos(dx+c)^3}\right.}{2\,d\,\mathrm{c}}\right.$$

$$\left.-\frac{B\sqrt{-b}b\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)\cos(dx+c)^2-\sqrt{b\cos(dx+c)}Ab\sqrt{\cos(dx+c)}\sin(dx+c)}{d\cos(dx+c)^2}\right]$$

[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x, algorithm="fricas")

```
[Out] [1/2*(B*b^(3/2)*cos(d*x + c)^2*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x +
c))*sqrt(b)*sqrt(cos(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x + c
)^3) + 2*sqrt(b*cos(d*x + c))*A*b*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d
*x + c)^2), -(B*sqrt(-b)*b*arctan(sqrt(b*cos(d*x + c))*sqrt(-b)*sin(d*x + c
)/(b*sqrt(cos(d*x + c))))*cos(d*x + c)^2 - sqrt(b*cos(d*x + c))*A*b*sqrt(co
s(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^2)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)**(7/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.55 (sec) , antiderivative size = 123, normalized size of antiderivative = 1.76

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{(b\log\left(\cos\left(dx+c\right)^2+\sin\left(dx+c\right)^2+2\sin\left(dx+c\right)+1\right)-b$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x, algorit
hm="maxima")
```

```
[Out] 1/2*((b*log(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*sin(d*x + c) + 1) - b*log(c
os(d*x + c)^2 + sin(d*x + c)^2 - 2*sin(d*x + c) + 1))*B*sqrt(b) + 4*A*b^(3/
2)*sin(2*d*x + 2*c)/(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x
+ 2*c) + 1))/d
```

Giac [F]

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(B\cos\left(dx+c\right)+A)(b\cos\left(dx+c\right))^{\frac{3}{2}}}{\cos\left(dx+c\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2)/cos(d*x + c)^(7/2), x
)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(b\,\cos(c+d\,x))^{3/2}\,(A+B\,\cos(c+d\,x))}{\cos(c+d\,x)^{7/2}}\,dx$$

```
[In] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(7/2),x)
[Out] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(7/2), x)
```

3.856 $\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 110

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{Ab\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{2d\sqrt{\cos(c+dx)}} + \frac{Ab\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d\cos^{\frac{5}{2}}(c+dx)} + \frac{bB\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 1/2*A*b*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(5/2)+b*B*sin(d*x+c)*(
b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(3/2)+1/2*A*b*arctanh(sin(d*x+c))*(b*cos(d
*x+c))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {17, 2827, 3853, 3855, 3852, 8}

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{Ab\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{2d\sqrt{\cos(c+dx)}} + \frac{Ab\sin(c+dx)\sqrt{b\cos(c+dx)}}{2d\cos^{\frac{5}{2}}(c+dx)} + \frac{bB\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Int[((b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(9/2),x]
```

```
[Out] (A*b*ArcTanh[Sin[c + d*x]]*Sqrt[b*Cos[c + d*x]])/(2*d*Sqrt[Cos[c + d*x]]) +
 (A*b*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(2*d*Cos[c + d*x]^(5/2)) + (b*B*Sq
rt[b*Cos[c + d*x]]*Sin[c + d*x])/(d*Cos[c + d*x]^(3/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\left(b\sqrt{b\cos(c+dx)}\right)\int (A+B\cos(c+dx))\sec^3(c+dx)\,dx}{\sqrt{\cos(c+dx)}} \\
&= \frac{\left(Ab\sqrt{b\cos(c+dx)}\right)\int \sec^3(c+dx)\,dx}{\sqrt{\cos(c+dx)}} + \frac{\left(bB\sqrt{b\cos(c+dx)}\right)\int \sec^2(c+dx)\,dx}{\sqrt{\cos(c+dx)}} \\
&= \frac{Ab\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d\cos^{\frac{5}{2}}(c+dx)} + \frac{\left(Ab\sqrt{b\cos(c+dx)}\right)\int \sec(c+dx)\,dx}{2\sqrt{\cos(c+dx)}} \\
&\quad - \frac{\left(bB\sqrt{b\cos(c+dx)}\right)\text{Subst}(\int 1\,dx, x, -\tan(c+dx))}{d\sqrt{\cos(c+dx)}}
\end{aligned}$$

$$= \frac{Ab\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{2d\sqrt{\cos(c+dx)}} + \frac{Ab\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d\cos^{\frac{5}{2}}(c+dx)} + \frac{bB\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.59

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{(b\cos(c+dx))^{3/2}\left(A\text{arctanh}(\sin(c+dx))\cos^2(c+dx)+(A\right.}{2d\cos^{\frac{7}{2}}(c+dx)}$$

```
[In] Integrate[((b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(9/2),
x]
```

```
[Out] ((b*Cos[c + d*x])^(3/2)*(A*ArcTanh[Sin[c + d*x]]*Cos[c + d*x]^2 + (A + 2*B*
Cos[c + d*x])*Sin[c + d*x]))/(2*d*Cos[c + d*x]^(7/2))
```

Maple [A] (verified)

Time = 4.99 (sec) , antiderivative size = 104, normalized size of antiderivative = 0.95

method	result
default	$\frac{b\left(A\left(\cos^2(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)+1)-A\left(\cos^2(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)-1)+2B\sin(dx+c)\cos(dx+c)+A\sin\right.}{2d\cos(dx+c)^{\frac{5}{2}}}$
parts	$\frac{Ab\left(-\left(\cos^2(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)-1)+\left(\cos^2(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)+1)+\sin(dx+c)\right)\sqrt{\cos(dx+c)b}}{2d\cos(dx+c)^{\frac{5}{2}}}+\frac{bI}{}$
risch	$-\frac{ib\sqrt{\cos(dx+c)b}\left(A\,e^{3i(dx+c)}-2B\,e^{2i(dx+c)}-A\,e^{i(dx+c)}-2B\right)}{\sqrt{\cos(dx+c)}\,d\left(e^{2i(dx+c)}+1\right)^2}+\frac{b\sqrt{\cos(dx+c)b}\,A\ln\left(e^{i(dx+c)}+i\right)}{2\sqrt{\cos(dx+c)}\,d}-\frac{b\sqrt{\cos(dx+c)b}\,A\ln\left(e^{i(dx+\right.}{2\sqrt{\cos(dx+c)}\,d}$

```
[In] int((cos(d*x+c)*b)^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(9/2),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/2*b/d*(A*cos(d*x+c)^2*ln(-cot(d*x+c)+csc(d*x+c)+1)-A*cos(d*x+c)^2*ln(-cot
(d*x+c)+csc(d*x+c)-1)+2*B*sin(d*x+c)*cos(d*x+c)+A*sin(d*x+c))*(cos(d*x+c)*b
)^(1/2)/cos(d*x+c)^(5/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 232, normalized size of antiderivative = 2.11

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \left[\frac{Ab^{\frac{3}{2}}\cos\left(dx+c\right)^{3}\log\left(-\frac{b\cos(dx+c)^{3}-2\sqrt{b\cos(dx+c)}\sqrt{b}\sqrt{\cos(dx+c)}\sin}{\cos(dx+c)^{3}}\right.}{}\right.$$

$$-\frac{A\sqrt{-b}b\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)\cos\left(dx+c\right)^{3}-\left(2\,Bb\cos\left(dx+c\right)+Ab\right)\sqrt{b\cos\left(dx+c\right)}\sqrt{\cos\left(dx-\right.}}{2\,d\cos\left(dx+c\right)^{3}}$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(9/2),x, algorit
hm="fricas")
```

```
[Out] [1/4*(A*b^(3/2)*cos(d*x + c)^3*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x +
c))*sqrt(b)*sqrt(cos(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x + c
)^3) + 2*(2*B*b*cos(d*x + c) + A*b)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))
*sin(d*x + c))/(d*cos(d*x + c)^3), -1/2*(A*sqrt(-b)*b*arctan(sqrt(b*cos(d*x
 + c))*sqrt(-b)*sin(d*x + c)/(b*sqrt(cos(d*x + c))))*cos(d*x + c)^3 - (2*B*
b*cos(d*x + c) + A*b)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))
/(d*cos(d*x + c)^3)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)**(9/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 747 vs. 2(94) = 188.

Time = 0.55 (sec) , antiderivative size = 747, normalized size of antiderivative = 6.79

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(9/2),x, algorit
hm="maxima")
```

```
[Out] 1/4*(8*B*b^(3/2)*sin(2*d*x + 2*c)/(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2
+ 2*cos(2*d*x + 2*c) + 1) - (4*(b*sin(4*d*x + 4*c) + 2*b*sin(2*d*x + 2*c))*
cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 4*(b*sin(4*d*x + 4*c
) + 2*b*sin(2*d*x + 2*c))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c
))) - (b*cos(4*d*x + 4*c)^2 + 4*b*cos(2*d*x + 2*c)^2 + b*sin(4*d*x + 4*c)^2
 + 4*b*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*b*sin(2*d*x + 2*c)^2 + 2*(2*b*
cos(2*d*x + 2*c) + b)*cos(4*d*x + 4*c) + 4*b*cos(2*d*x + 2*c) + b)*log(cos(
1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*
d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(
2*d*x + 2*c))) + 1) + (b*cos(4*d*x + 4*c)^2 + 4*b*cos(2*d*x + 2*c)^2 + b*si
n(4*d*x + 4*c)^2 + 4*b*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*b*sin(2*d*x +
2*c)^2 + 2*(2*b*cos(2*d*x + 2*c) + b)*cos(4*d*x + 4*c) + 4*b*cos(2*d*x + 2*
c) + b)*log(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/
2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sin(1/2*arctan2(sin(2*
d*x + 2*c), cos(2*d*x + 2*c))) + 1) - 4*(b*cos(4*d*x + 4*c) + 2*b*cos(2*d*x
 + 2*c) + b)*sin(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 4*(b*co
s(4*d*x + 4*c) + 2*b*cos(2*d*x + 2*c) + b)*sin(1/2*arctan2(sin(2*d*x + 2*c)
, cos(2*d*x + 2*c))))*A*sqrt(b)/(2*(2*cos(2*d*x + 2*c) + 1)*cos(4*d*x + 4*c
) + cos(4*d*x + 4*c)^2 + 4*cos(2*d*x + 2*c)^2 + sin(4*d*x + 4*c)^2 + 4*sin(
4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*sin(2*d*x + 2*c)^2 + 4*cos(2*d*x + 2*c) +
 1))/d
```

Giac [F]

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{3}{2}}}{\cos(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(9/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2)/cos(d*x + c)^(9/2), x
)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(b\,\cos(c+d\,x))^{3/2}\,(A+B\,\cos(c+d\,x))}{\cos(c+d\,x)^{9/2}}\,dx$$

```
[In] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(9/2),x)
```

```
[Out] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(9/2), x)
```

3.857 $\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{11}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 149

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \frac{bB\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{2d\sqrt{\cos(c+dx)}} + \frac{bB\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d\cos^{\frac{5}{2}}(c+dx)} + \frac{Ab\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)} + \frac{Ab\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\cos^{\frac{7}{2}}(c+dx)}$$

```
[Out] 1/2*b*B*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(5/2)+A*b*sin(d*x+c)*(
b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(3/2)+1/3*A*b*sin(d*x+c)^3*(b*cos(d*x+c))^
(1/2)/d/cos(d*x+c)^(7/2)+1/2*b*B*arctanh(sin(d*x+c))*(b*cos(d*x+c))^(1/2)/d
/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 149, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {17, 2827, 3852, 3853, 3855}

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \frac{Ab\sin^3(c+dx)\sqrt{b\cos(c+dx)}}{3d\cos^{\frac{7}{2}}(c+dx)} + \frac{Ab\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\cos^{\frac{3}{2}}(c+dx)} + \frac{bB\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{2d\sqrt{\cos(c+dx)}} + \frac{bB\sin(c+dx)\sqrt{b\cos(c+dx)}}{2d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Int[((b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(11/2),x]
```

```
[Out] (b*B*ArcTanh[Sin[c + d*x]]*Sqrt[b*Cos[c + d*x]])/(2*d*Sqrt[Cos[c + d*x]]) +
 (b*B*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(2*d*Cos[c + d*x]^(5/2)) + (A*b*Sq
rt[b*Cos[c + d*x]]*Sin[c + d*x])/(d*Cos[c + d*x]^(3/2)) + (A*b*Sqrt[b*Cos[c
 + d*x]]*Sin[c + d*x]^3)/(3*d*Cos[c + d*x]^(7/2))
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\left(b\sqrt{b\cos(c+dx)}\right)\int(A+B\cos(c+dx))\sec^4(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\ &= \frac{\left(Ab\sqrt{b\cos(c+dx)}\right)\int\sec^4(c+dx)\,dx}{\sqrt{\cos(c+dx)}}+\frac{\left(bB\sqrt{b\cos(c+dx)}\right)\int\sec^3(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\end{aligned}$$

$$= \frac{bB\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d\cos^{\frac{5}{2}}(c+dx)} + \frac{\left(bB\sqrt{b\cos(c+dx)}\right)\int\sec(c+dx)\,dx}{2\sqrt{\cos(c+dx)}} - \frac{\left(Ab\sqrt{b\cos(c+dx)}\right)\text{Subst}\left(\int(1+x^2)\,dx, x, -\tan(c+dx)\right)}{d\sqrt{\cos(c+dx)}}$$

$$= \frac{bB\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{2d\sqrt{\cos(c+dx)}} + \frac{bB\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d\cos^{\frac{5}{2}}(c+dx)} + \frac{Ab\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)} + \frac{Ab\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\cos^{\frac{7}{2}}(c+dx)}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.52

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \frac{b\sqrt{b\cos(c+dx)}(3B\text{arctanh}(\sin(c+dx))\cos^2(c+dx)+3B\text{si}}{6d\cos^{\frac{5}{2}}(c+dx}$$

```
[In] Integrate[((b*Cos[c + d*x])^(3/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(11/2)
,x]
```

```
[Out] (b*Sqrt[b*Cos[c + d*x]]*(3*B*ArcTanh[Sin[c + d*x]]*Cos[c + d*x]^2 + 3*B*Sin
[c + d*x] + 2*A*(2 + Cos[2*(c + d*x)])*Tan[c + d*x]))/(6*d*Cos[c + d*x]^(5/
2))
```

Maple [A] (verified)

Time = 5.11 (sec) , antiderivative size = 123, normalized size of antiderivative = 0.83

method	result
default	$\frac{b\left(-3B(\cos^3(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)-1)+3B(\cos^3(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)+1)+4A\sin(dx+c)(\cos^2(dx+c))+\right.}{6d\cos(dx+c)^{\frac{7}{2}}}$
parts	$\frac{Ab(2(\cos^2(dx+c))+1)\sqrt{\cos(dx+c)b}\,\sin(dx+c)}{3d\cos(dx+c)^{\frac{7}{2}}} + \frac{Bb(-(\cos^2(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)-1)+(\cos^2(dx+c))\ln(-\cot(dx+c}{2d\cos(dx+c)^{\frac{5}{2}}}$
risch	$-\frac{ib\sqrt{\cos(dx+c)b}\,(3B\,e^{5i(dx+c)}-12A\,e^{2i(dx+c)}-3B\,e^{i(dx+c)}-4A)}{3\sqrt{\cos(dx+c)}\,d(e^{2i(dx+c)}+1)^3} + \frac{b\sqrt{\cos(dx+c)b}\,B\ln(e^{i(dx+c)}+i)}{2\sqrt{\cos(dx+c)}\,d} - \frac{b\sqrt{\cos(dx+c)b}\,B\ln(e^{i(dx}}{2\sqrt{\cos(dx+c)}\,d}$

```
[In] int((cos(d*x+c)*b)^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(11/2),x,method=_RETUR
NVERBOSE)
```

```
[Out] 1/6*b/d*(-3*B*cos(d*x+c)^3*ln(-cot(d*x+c)+csc(d*x+c)-1)+3*B*cos(d*x+c)^3*ln
(-cot(d*x+c)+csc(d*x+c)+1)+4*A*sin(d*x+c)*cos(d*x+c)^2+3*B*sin(d*x+c)*cos(d
*x+c)+2*A*sin(d*x+c))*(cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(7/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 260, normalized size of antiderivative = 1.74

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \left[\frac{3\,Bb^{\frac{3}{2}}\cos\left(dx+c\right)^4\log\left(-\frac{b\cos(dx+c)^3-2\,\sqrt{b\cos(dx+c)}\sqrt{b}\sqrt{\cos(dx+c)}\cdots}{\cos(dx+c)^3}\right)\cdots}{\cdots}\right.$$

$$-\frac{3\,B\sqrt{-b}b\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)\cos\left(dx+c\right)^4-\left(4\,Ab\cos\left(dx+c\right)^2+3\,Bb\cos\left(dx+c\right)+2\,Ab\right)\cdots}{6\,d\cos\left(dx+c\right)^4}$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(11/2),x, algori
thm="fricas")
```

```
[Out] [1/12*(3*B*b^(3/2)*cos(d*x + c)^4*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x
 + c))*sqrt(b)*sqrt(cos(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x
+ c)^3) + 2*(4*A*b*cos(d*x + c)^2 + 3*B*b*cos(d*x + c) + 2*A*b)*sqrt(b*cos(
d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^4), -1/6*(3*B*sq
rt(-b)*b*arctan(sqrt(b*cos(d*x + c))*sqrt(-b)*sin(d*x + c)/(b*sqrt(cos(d*x
+ c))))*cos(d*x + c)^4 - (4*A*b*cos(d*x + c)^2 + 3*B*b*cos(d*x + c) + 2*A*b
)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^4)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)**(11/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 992 vs. $2(127) = 254$.

Time = 0.54 (sec) , antiderivative size = 992, normalized size of antiderivative = 6.66

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(11/2),x, algori
thm="maxima")
```

```
[Out] -1/12*(16*(3*b*cos(6*d*x + 6*c)*sin(2*d*x + 2*c) + 9*b*cos(4*d*x + 4*c)*sin
(2*d*x + 2*c) - (3*b*cos(2*d*x + 2*c) + b)*sin(6*d*x + 6*c) - 3*(3*b*cos(2*
d*x + 2*c) + b)*sin(4*d*x + 4*c))*A*sqrt(b)/(2*(3*cos(4*d*x + 4*c) + 3*cos(
2*d*x + 2*c) + 1)*cos(6*d*x + 6*c) + cos(6*d*x + 6*c)^2 + 6*(3*cos(2*d*x +
2*c) + 1)*cos(4*d*x + 4*c) + 9*cos(4*d*x + 4*c)^2 + 9*cos(2*d*x + 2*c)^2 +
6*(sin(4*d*x + 4*c) + sin(2*d*x + 2*c))*sin(6*d*x + 6*c) + sin(6*d*x + 6*c)
^2 + 9*sin(4*d*x + 4*c)^2 + 18*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 9*sin(2*
d*x + 2*c)^2 + 6*cos(2*d*x + 2*c) + 1) + 3*(4*(b*sin(4*d*x + 4*c) + 2*b*sin
(2*d*x + 2*c))*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 4*(b*
sin(4*d*x + 4*c) + 2*b*sin(2*d*x + 2*c))*cos(1/2*arctan2(sin(2*d*x + 2*c),
cos(2*d*x + 2*c))) - (b*cos(4*d*x + 4*c)^2 + 4*b*cos(2*d*x + 2*c)^2 + b*sin
(4*d*x + 4*c)^2 + 4*b*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*b*sin(2*d*x + 2
*c)^2 + 2*(2*b*cos(2*d*x + 2*c) + b)*cos(4*d*x + 4*c) + 4*b*cos(2*d*x + 2*c
) + b)*log(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/2*arctan2(sin(2*d
*x + 2*c), cos(2*d*x + 2*c))) + 1) + (b*cos(4*d*x + 4*c)^2 + 4*b*cos(2*d*x
+ 2*c)^2 + b*sin(4*d*x + 4*c)^2 + 4*b*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4
*b*sin(2*d*x + 2*c)^2 + 2*(2*b*cos(2*d*x + 2*c) + b)*cos(4*d*x + 4*c) + 4*b
*cos(2*d*x + 2*c) + b)*log(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sin(1/2
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - 4*(b*cos(4*d*x + 4*c)
+ 2*b*cos(2*d*x + 2*c) + b)*sin(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c))) + 4*(b*cos(4*d*x + 4*c) + 2*b*cos(2*d*x + 2*c) + b)*sin(1/2*arctan2(s
in(2*d*x + 2*c), cos(2*d*x + 2*c))))*B*sqrt(b)/(2*(2*cos(2*d*x + 2*c) + 1)*
cos(4*d*x + 4*c) + cos(4*d*x + 4*c)^2 + 4*cos(2*d*x + 2*c)^2 + sin(4*d*x +
4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*sin(2*d*x + 2*c)^2 + 4*cos
(2*d*x + 2*c) + 1))/d
```

Giac [F]

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{3}{2}}}{\cos(dx+c)^{\frac{11}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(3/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(11/2),x, algori
thm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(3/2)/cos(d*x + c)^(11/2),
x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^{3/2}(A+B\cos(c+dx))}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \int \frac{(b\,\cos\left(c+d\,x\right))^{3/2}\,\left(A+B\,\cos\left(c+d\,x\right)\right)}{\cos\left(c+d\,x\right)^{11/2}}\,dx$$

```
[In] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(11/2),x)
[Out] int(((b*cos(c + d*x))^(3/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(11/2), x)
```

3.858 $\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 33, antiderivative size = 187

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx = \frac{3b^2Bx\sqrt{b\cos(c+dx)}}{8\sqrt{\cos(c+dx)}} + \frac{Ab^2\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{3b^2B\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{8d} + \frac{b^2B\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}\sin(c+dx)}{4d} - \frac{Ab^2\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\sqrt{\cos(c+dx)}}$$

```
[Out] 1/4*b^2*B*cos(d*x+c)^(5/2)*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d+3/8*b^2*B*x*(b
*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2)+A*b^2*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d
/cos(d*x+c)^(1/2)-1/3*A*b^2*sin(d*x+c)^3*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^
(1/2)+3/8*b^2*B*sin(d*x+c)*cos(d*x+c)^(1/2)*(b*cos(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 187, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used

= {17, 2827, 2713, 2715, 8}

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx = -\frac{Ab^2\sin^3(c+dx)\sqrt{b\cos(c+dx)}}{3d\sqrt{\cos(c+dx)}} + \frac{Ab^2\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}} + \frac{3b^2Bx\sqrt{b\cos(c+dx)}}{8\sqrt{\cos(c+dx)}} + \frac{b^2B\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}}{4d} + \frac{3b^2B\sin(c+dx)\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}{8d}$$

```
[In] Int[Sqrt[Cos[c + d*x]]*(b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (3*b^2*B*x*Sqrt[b*Cos[c + d*x]])/(8*Sqrt[Cos[c + d*x]]) + (A*b^2*Sqrt[b*Cos
[c + d*x]]*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]]) + (3*b^2*B*Sqrt[Cos[c + d*x
]]*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(8*d) + (b^2*B*Cos[c + d*x]^(5/2)*Sqr
t[b*Cos[c + d*x]]*Sin[c + d*x])/(4*d) - (A*b^2*Sqrt[b*Cos[c + d*x]]*Sin[c +
 d*x]^3)/(3*d*Sqrt[Cos[c + d*x]])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
```

```
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\left(b^2\sqrt{b\cos(c+dx)}\right)\int\cos^3(c+dx)(A+B\cos(c+dx))\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{\left(Ab^2\sqrt{b\cos(c+dx)}\right)\int\cos^3(c+dx)\,dx}{\sqrt{\cos(c+dx)}}+\frac{\left(b^2B\sqrt{b\cos(c+dx)}\right)\int\cos^4(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{b^2B\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}\sin(c+dx)}{4d}\\
&\quad+\frac{\left(3b^2B\sqrt{b\cos(c+dx)}\right)\int\cos^2(c+dx)\,dx}{4\sqrt{\cos(c+dx)}}\\
&\quad-\frac{\left(Ab^2\sqrt{b\cos(c+dx)}\right)\text{Subst}\left(\int\left(1-x^2\right)\,dx,x,-\sin(c+dx)\right)}{d\sqrt{\cos(c+dx)}}\\
&= \frac{Ab^2\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}+\frac{3b^2B\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{8d}\\
&\quad+\frac{b^2B\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}\sin(c+dx)}{4d}\\
&\quad-\frac{Ab^2\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\sqrt{\cos(c+dx)}}+\frac{\left(3b^2B\sqrt{b\cos(c+dx)}\right)\int 1\,dx}{8\sqrt{\cos(c+dx)}}\\
&= \frac{3b^2Bx\sqrt{b\cos(c+dx)}}{8\sqrt{\cos(c+dx)}}+\frac{Ab^2\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}\\
&\quad+\frac{3b^2B\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{8d}\\
&\quad+\frac{b^2B\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}\sin(c+dx)}{4d}-\frac{Ab^2\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\sqrt{\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.40 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.43

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx = \frac{(b\cos(c+dx))^{5/2}(36Bc+36Bdx+72A\sin(c+dx)+24B\sin(2(c+dx))+8A\sin(3(\cdots}{96d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]*(b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x]),x]
```

```
[Out] ((b*Cos[c + d*x])^(5/2)*(36*B*c + 36*B*d*x + 72*A*Sin[c + d*x] + 24*B*Sin[2
*(c + d*x)] + 8*A*Sin[3*(c + d*x)] + 3*B*Sin[4*(c + d*x)]))/(96*d*Cos[c + d
*x]^(5/2))
```

Maple [A] (verified)

Time = 5.10 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.50

method	result
default	$\frac{b^{2}\sqrt{\cos(dx+c)b}\,\left(6B\sin(dx+c)\left(\cos^{3}(dx+c)\right)+8A\sin(dx+c)\left(\cos^{2}(dx+c)\right)+9B\sin(dx+c)\cos(dx+c)+16A\sin(dx+c)+9B(dx+c)\right)}{24d\sqrt{\cos(dx+c)}}$
parts	$\frac{A\,b^{2}\left(2+\cos^{2}(dx+c)\right)\sqrt{\cos(dx+c)b}\,\sin(dx+c)}{3d\sqrt{\cos(dx+c)}}+\frac{B\,b^{2}\sqrt{\cos(dx+c)b}\,\left(2\sin(dx+c)\left(\cos^{3}(dx+c)\right)+3\cos(dx+c)\sin(dx+c)+3dx+3c\right)}{8d\sqrt{\cos(dx+c)}}$
risch	$\frac{3b^{2}\sqrt{\cos(dx+c)b}\,\left(\sqrt{\cos}(dx+c)\right)\mathrm{e}^{i(dx+c)}xB}{4\left(\mathrm{e}^{2i(dx+c)}+1\right)}-\frac{ib^{2}\sqrt{\cos(dx+c)b}\,\left(\sqrt{\cos}(dx+c)\right)\mathrm{e}^{5i(dx+c)}B}{32\left(\mathrm{e}^{2i(dx+c)}+1\right)d}-\frac{ib^{2}\sqrt{\cos(dx+c)b}\,\left(\sqrt{\cos}(dx+c)\right)\mathrm{e}^{4i(d\cdots}}{12\left(\mathrm{e}^{2i(dx+c)}+1\right)d}$

```
[In] int(cos(d*x+c)^(1/2)*(cos(d*x+c)*b)^(5/2)*(A+B*cos(d*x+c)),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/24*b^2/d*(cos(d*x+c)*b)^(1/2)*(6*B*sin(d*x+c)*cos(d*x+c)^3+8*A*sin(d*x+c)
*cos(d*x+c)^2+9*B*sin(d*x+c)*cos(d*x+c)+16*A*sin(d*x+c)+9*B*(d*x+c))/cos(d*
x+c)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 279, normalized size of antiderivative = 1.49

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx = \left[\frac{9\,B\sqrt{-b}b^{2}\cos(dx+c)\log\left(2\,b\cos(dx+c)^{2}-2\,\sqrt{b\cos(dx+c)}\sqrt{-b}\sqrt{\cos(dx+c)}\,\mathrm{s}\cdots\right.}{}\right.$$

```
[In] integrate(cos(d*x+c)^(1/2)*(b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c)),x, algorit
hm="fricas")
```

```
[Out] [1/48*(9*B*sqrt(-b)*b^2*cos(d*x + c)*log(2*b*cos(d*x + c)^2 - 2*sqrt(b*cos(
d*x + c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) + 2*(6*B*b^2*cos(d*
x + c)^3 + 8*A*b^2*cos(d*x + c)^2 + 9*B*b^2*cos(d*x + c) + 16*A*b^2)*sqrt(b
*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)), 1/24*(9*B
*b^(5/2)*arctan(sqrt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/
2)))*cos(d*x + c) + (6*B*b^2*cos(d*x + c)^3 + 8*A*b^2*cos(d*x + c)^2 + 9*B*
b^2*cos(d*x + c) + 16*A*b^2)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*
x + c))/(d*cos(d*x + c))]
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(1/2)*(b*cos(d*x+c))**(5/2)*(A+B*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.51 (sec) , antiderivative size = 110, normalized size of antiderivative = 0.59

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx = \frac{8\left(b^2\sin\left(3\,dx+3\,c\right)+9\,b^2\sin\left(\frac{1}{3}\,\arctan\left(\sin\left(3\,dx+3\,c\right),\cos\left(3\,dx+3\,c\right)\right)\right)\right)A\sqrt{b}+3\,(12$$

```
[In] integrate(cos(d*x+c)^(1/2)*(b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c)),x, algorit
hm="maxima")
```

```
[Out] 1/96*(8*(b^2*sin(3*d*x + 3*c) + 9*b^2*sin(1/3*arctan2(sin(3*d*x + 3*c), cos
(3*d*x + 3*c))))*A*sqrt(b) + 3*(12*(d*x + c)*b^2 + b^2*sin(4*d*x + 4*c) + 8
*b^2*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))))*B*sqrt(b))/d
```

Giac [A] (verification not implemented)

none

Time = 3.70 (sec) , antiderivative size = 278, normalized size of antiderivative = 1.49

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx = \frac{9\,Bb^{\frac{5}{2}}dx\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{8}+36\,Bb^{\frac{5}{2}}dx\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{6}+48\,Ab^{\frac{5}{2}}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{7}-3$$

```
[In] integrate(cos(d*x+c)^(1/2)*(b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c)),x, algorit
hm="giac")
```

```
[Out] 1/24*(9*B*b^(5/2)*d*x*tan(1/2*d*x + 1/2*c)^8 + 36*B*b^(5/2)*d*x*tan(1/2*d*x
 + 1/2*c)^6 + 48*A*b^(5/2)*tan(1/2*d*x + 1/2*c)^7 - 30*B*b^(5/2)*tan(1/2*d*
x + 1/2*c)^7 + 54*B*b^(5/2)*d*x*tan(1/2*d*x + 1/2*c)^4 + 80*A*b^(5/2)*tan(1
/2*d*x + 1/2*c)^5 + 18*B*b^(5/2)*tan(1/2*d*x + 1/2*c)^5 + 36*B*b^(5/2)*d*x*
tan(1/2*d*x + 1/2*c)^2 + 80*A*b^(5/2)*tan(1/2*d*x + 1/2*c)^3 - 18*B*b^(5/2)
*tan(1/2*d*x + 1/2*c)^3 + 9*B*b^(5/2)*d*x + 48*A*b^(5/2)*tan(1/2*d*x + 1/2*
c) + 30*B*b^(5/2)*tan(1/2*d*x + 1/2*c))/(d*tan(1/2*d*x + 1/2*c)^8 + 4*d*tan
(1/2*d*x + 1/2*c)^6 + 6*d*tan(1/2*d*x + 1/2*c)^4 + 4*d*tan(1/2*d*x + 1/2*c)
^2 + d)
```

Mupad [B] (verification not implemented)

Time = 15.84 (sec) , antiderivative size = 108, normalized size of antiderivative = 0.58

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))\,dx = \frac{b^2\,\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{b\,\cos\left(c+d\,x\right)}\,\left(24\,B\,\sin\left(c+d\,x\right)+80\,A\,\sin\left(2\,c+2\,d\,x\right)+8\,A\,\sin}{96\,d\,\left(\cos\left(2\,c+\right.\right.}$$

```
[In] int(cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)),x)
```

```
[Out] (b^2*cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(1/2)*(24*B*sin(c + d*x) + 80*A*si
n(2*c + 2*d*x) + 8*A*sin(4*c + 4*d*x) + 27*B*sin(3*c + 3*d*x) + 3*B*sin(5*c
 + 5*d*x) + 72*B*d*x*cos(c + d*x)))/(96*d*(cos(2*c + 2*d*x) + 1))
```

3.859 $\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 148

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \frac{Ab^2x\sqrt{b\cos(c+dx)}}{2\sqrt{\cos(c+dx)}} + \frac{b^2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{Ab^2\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d} - \frac{b^2B\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\sqrt{\cos(c+dx)}}$$

```
[Out] 1/2*A*b^2*x*(b*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2)+b^2*B*sin(d*x+c)*(b*cos(d
*x+c))^(1/2)/d/cos(d*x+c)^(1/2)-1/3*b^2*B*sin(d*x+c)^3*(b*cos(d*x+c))^(1/2)
/d/cos(d*x+c)^(1/2)+1/2*A*b^2*sin(d*x+c)*cos(d*x+c)^(1/2)*(b*cos(d*x+c))^(1
/2)/d
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.152$, Rules used = {17, 2827, 2715, 8, 2713}

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \frac{Ab^2x\sqrt{b\cos(c+dx)}}{2\sqrt{\cos(c+dx)}} + \frac{Ab^2\sin(c+dx)\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}{2d} - \frac{b^2B\sin^3(c+dx)\sqrt{b\cos(c+dx)}}{3d\sqrt{\cos(c+dx)}} + \frac{b^2B\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[((b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x]))/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (A*b^2*x*Sqrt[b*Cos[c + d*x]])/(2*Sqrt[Cos[c + d*x]]) + (b^2*B*Sqrt[b*Cos[c
 + d*x]]*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]]) + (A*b^2*Sqrt[Cos[c + d*x]]*S
qrt[b*Cos[c + d*x]]*Sin[c + d*x])/(2*d) - (b^2*B*Sqrt[b*Cos[c + d*x]]*Sin[c
 + d*x]^3)/(3*d*Sqrt[Cos[c + d*x]])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\left(b^2\sqrt{b\cos(c+dx)}\right)\int\cos^2(c+dx)(A+B\cos(c+dx))\,dx}{\sqrt{\cos(c+dx)}} \\
&= \frac{\left(Ab^2\sqrt{b\cos(c+dx)}\right)\int\cos^2(c+dx)\,dx}{\sqrt{\cos(c+dx)}}+\frac{\left(b^2B\sqrt{b\cos(c+dx)}\right)\int\cos^3(c+dx)\,dx}{\sqrt{\cos(c+dx)}}
\end{aligned}
$$

$$= \frac{Ab^2\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d} + \frac{\left(Ab^2\sqrt{b\cos(c+dx)}\right)\int 1\,dx}{2\sqrt{\cos(c+dx)}} - \frac{\left(b^2B\sqrt{b\cos(c+dx)}\right)\text{Subst}\left(\int(1-x^2)\,dx,x,-\sin(c+dx)\right)}{d\sqrt{\cos(c+dx)}}$$

$$= \frac{Ab^2x\sqrt{b\cos(c+dx)}}{2\sqrt{\cos(c+dx)}} + \frac{b^2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{Ab^2\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d} - \frac{b^2B\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\sqrt{\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.99 (sec) , antiderivative size = 69, normalized size of antiderivative = 0.47

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \frac{(b\cos(c+dx))^{5/2}(6Ac+6Adx+9B\sin(c+dx)+3A\sin(2(c}{12d\cos^{\frac{5}{2}}(c+dx)}$$

[In] Integrate[((b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x]))/Sqrt[Cos[c + d*x]], x]

[Out] ((b*Cos[c + d*x])^(5/2)*(6*A*c + 6*A*d*x + 9*B*Sin[c + d*x] + 3*A*Sin[2*(c + d*x)] + B*Sin[3*(c + d*x)]))/(12*d*Cos[c + d*x]^(5/2))

Maple [A] (verified)

Time = 5.22 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.52

method	result	size
default	$\frac{b^2\sqrt{\cos(dx+c)b}\,(2B\sin(dx+c)(\cos^2(dx+c))+3A\sin(dx+c)\cos(dx+c)+3A(dx+c)+4B\sin(dx+c))}{6d\sqrt{\cos(dx+c)}}$	77
parts	$\frac{A\,b^2\sqrt{\cos(dx+c)b}\,(\cos(dx+c)\sin(dx+c)+dx+c)}{2d\sqrt{\cos(dx+c)}} + \frac{B\,b^2\,(2+\cos^2(dx+c))\sqrt{\cos(dx+c)b}\,\sin(dx+c)}{3d\sqrt{\cos(dx+c)}}$	90
risch	$\frac{A\,b^2x\sqrt{\cos(dx+c)b}}{2\sqrt{\cos(dx+c)}} + \frac{3b^2B\sin(dx+c)\sqrt{\cos(dx+c)b}}{4d\sqrt{\cos(dx+c)}} + \frac{b^2\sqrt{\cos(dx+c)b}\,B\sin(3dx+3c)}{12\sqrt{\cos(dx+c)}\,d} + \frac{b^2\sqrt{\cos(dx+c)b}\,A\sin(2dx+2c)}{4\sqrt{\cos(dx+c)}\,d}$	132

[In] int((cos(d*x+c)*b)^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x,method=_RETURNVERBOSE)

[Out] 1/6*b^2/d*(cos(d*x+c)*b)^(1/2)*(2*B*sin(d*x+c)*cos(d*x+c)^2+3*A*sin(d*x+c)*cos(d*x+c)+3*A*(d*x+c)+4*B*sin(d*x+c))/cos(d*x+c)^(1/2)

Fricas [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 251, normalized size of antiderivative = 1.70

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \left[\frac{3\,A\sqrt{-b}b^2\cos\left(dx+c\right)\log\left(2\,b\cos\left(dx+c\right)^2-2\,\sqrt{b\cos\left(dx\right.}\right.}{}\right.$$

[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x, algorit
hm="fricas")

[Out] [1/12*(3*A*sqrt(-b)*b^2*cos(d*x + c)*log(2*b*cos(d*x + c)^2 - 2*sqrt(b*cos(
d*x + c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) + 2*(2*B*b^2*cos(d*
x + c)^2 + 3*A*b^2*cos(d*x + c) + 4*B*b^2)*sqrt(b*cos(d*x + c))*sqrt(cos(d*
x + c))*sin(d*x + c))/(d*cos(d*x + c)), 1/6*(3*A*b^(5/2)*arctan(sqrt(b*cos(
d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/2)))*cos(d*x + c) + (2*B*b^
2*cos(d*x + c)^2 + 3*A*b^2*cos(d*x + c) + 4*B*b^2)*sqrt(b*cos(d*x + c))*sqr
t(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c))]

Sympy [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \text{Timed out}$$

[In] integrate((b*cos(d*x+c))**(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)**(1/2),x)

[Out] Timed out

Maxima [A] (verification not implemented)

none

Time = 0.48 (sec) , antiderivative size = 82, normalized size of antiderivative = 0.55

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \frac{3\left(2\left(dx+c\right)b^2+b^2\sin\left(2\,dx+2\,c\right)\right)A\sqrt{b}+\left(b^2\sin\left(3\,dx+3\,c\right.\right.}{12}$$

[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x, algorit
hm="maxima")

[Out] 1/12*(3*(2*(d*x + c)*b^2 + b^2*sin(2*d*x + 2*c))*A*sqrt(b) + (b^2*sin(3*d*x
 + 3*c) + 9*b^2*sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))))*B*sqr
t(b))/d

Giac [F]

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{5}{2}}}{\sqrt{\cos(dx+c)}}\,dx$$

[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x, algorithm="giac")

[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2)/sqrt(cos(d*x + c)), x)

Mupad [B] (verification not implemented)

Time = 0.76 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.43

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \frac{b^2\sqrt{b\cos(c+dx)}\,(9B\sin(c+dx)+3A\sin(2c+2dx)+\dots}{12d\sqrt{\cos(c+dx)}}$$

[In] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(1/2),x)

[Out] (b^2*(b*cos(c + d*x))^(1/2)*(9*B*sin(c + d*x) + 3*A*sin(2*c + 2*d*x) + B*sin(3*c + 3*d*x) + 6*A*d*x))/(12*d*cos(c + d*x)^(1/2))

3.860 $\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 107

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{b^2Bx\sqrt{b\cos(c+dx)}}{2\sqrt{\cos(c+dx)}} + \frac{Ab^2\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}} + \frac{b^2B\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d}$$

```
[Out] 1/2*b^2*B*x*(b*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2)+A*b^2*sin(d*x+c)*(b*cos(d
*x+c))^(1/2)/d/cos(d*x+c)^(1/2)+1/2*b^2*B*sin(d*x+c)*cos(d*x+c)^(1/2)*(b*co
s(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.061, Rules used = {17, 2813}

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{Ab^2\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}} + \frac{b^2Bx\sqrt{b\cos(c+dx)}}{2\sqrt{\cos(c+dx)}} + \frac{b^2B\sin(c+dx)\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}{2d}$$

```
[In] Int[((b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(3/2),x]
```

```
[Out] (b^2*B*x*Sqrt[b*Cos[c + d*x]])/(2*Sqrt[Cos[c + d*x]]) + (A*b^2*Sqrt[b*Cos[c
 + d*x]]*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]]) + (b^2*B*Sqrt[Cos[c + d*x]]*S
qrt[b*Cos[c + d*x]]*Sin[c + d*x])/(2*d)
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\left(b^2\sqrt{b\cos(c+dx)}\right)\int\cos(c+dx)(A+B\cos(c+dx))\,dx}{\sqrt{\cos(c+dx)}}\\&= \frac{b^2Bx\sqrt{b\cos(c+dx)}}{2\sqrt{\cos(c+dx)}}+\frac{Ab^2\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}\\&\quad+\frac{b^2B\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.53

$$\int\frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx=\frac{(b\cos(c+dx))^{5/2}(4A\sin(c+dx)+B(2(c+dx)+\sin(2(c+d$$
$$\frac{}{4d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Integrate[((b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(3/2),
x]

[Out] ((b*Cos[c + d*x])^(5/2)*(4*A*Sin[c + d*x] + B*(2*(c + d*x) + Sin[2*(c + d*x
)])))/(4*d*Cos[c + d*x]^(5/2))
```

Maple [A] (verified)

Time = 5.11 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.54

method	result	size
default	$\frac{b^{2}\sqrt{\cos(dx+c)b}\,(B\sin(dx+c)\cos(dx+c)+2A\sin(dx+c)+B(dx+c))}{2d\sqrt{\cos(dx+c)}}$	58
parts	$\frac{A\,b^{2}\sin(dx+c)\sqrt{\cos(dx+c)b}}{d\sqrt{\cos(dx+c)}}+\frac{B\,b^{2}\sqrt{\cos(dx+c)b}\,(\cos(dx+c)\sin(dx+c)+dx+c)}{2d\sqrt{\cos(dx+c)}}$	79
risch	$\frac{b^{2}Bx\sqrt{\cos(dx+c)b}}{2\sqrt{\cos(dx+c)}}+\frac{A\,b^{2}\sin(dx+c)\sqrt{\cos(dx+c)b}}{d\sqrt{\cos(dx+c)}}+\frac{b^{2}\sqrt{\cos(dx+c)b}\,B\sin(2dx+2c)}{4\sqrt{\cos(dx+c)}\,d}$	95

```
[In] int((cos(d*x+c)*b)^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/2*b^2/d*(cos(d*x+c)*b)^(1/2)*(B*sin(d*x+c)*cos(d*x+c)+2*A*sin(d*x+c)+B*(d
*x+c))/cos(d*x+c)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 219, normalized size of antiderivative = 2.05

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \left[\frac{B\sqrt{-b}b^{2}\cos\left(dx+c\right)\log\left(2\,b\cos\left(dx+c\right)^{2}-2\,\sqrt{b\cos\left(dx+\right.}\right.}{}\right.$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x, algorit
hm="fricas")
```

```
[Out] [1/4*(B*sqrt(-b)*b^2*cos(d*x + c)*log(2*b*cos(d*x + c)^2 - 2*sqrt(b*cos(d*x
 + c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) + 2*(B*b^2*cos(d*x + c
) + 2*A*b^2)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d
*x + c)), 1/2*(B*b^(5/2)*arctan(sqrt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*
cos(d*x + c)^(3/2)))*cos(d*x + c) + (B*b^2*cos(d*x + c) + 2*A*b^2)*sqrt(b*c
os(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c))]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)**(3/2),x)
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.47 (sec) , antiderivative size = 47, normalized size of antiderivative = 0.44

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{4\,Ab^{\frac{5}{2}}\sin\left(dx+c\right)+\left(2\left(dx+c\right)b^2+b^2\sin\left(2\,dx+2\,c\right)\right)B\sqrt{b}}{4\,d}$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x, algorit
hm="maxima")
[Out] 1/4*(4*A*b^(5/2)*sin(d*x + c) + (2*(d*x + c)*b^2 + b^2*sin(2*d*x + 2*c))*B*
sqrt(b))/d
```

Giac [F]

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{\left(B\cos\left(dx+c\right)+A\right)\left(b\cos\left(dx+c\right)\right)^{\frac{5}{2}}}{\cos\left(dx+c\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x, algorit
hm="giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2)/cos(d*x + c)^(3/2), x
)
```

Mupad [B] (verification not implemented)

Time = 14.91 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.49

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{b^2\,\sqrt{b\,\cos\left(c+d\,x\right)}\,\left(4\,A\,\sin\left(c+d\,x\right)+B\,\sin\left(2\,c+2\,d\,x\right)+2\right.}{4\,d\,\sqrt{\cos\left(c+d\,x\right)}}$$

```
[In] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(3/2),x)
```

```
[Out] (b^2*(b*cos(c + d*x))^(1/2)*(4*A*sin(c + d*x) + B*sin(2*c + 2*d*x) + 2*B*d*
x))/(4*d*cos(c + d*x)^(1/2))
```

3.861 $\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 65

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{Ab^2x\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}} + \frac{b^2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}$$

```
[Out] A*b^2*x*(b*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2)+b^2*B*sin(d*x+c)*(b*cos(d*x+c
))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.061, Rules used = {17, 2717}

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{Ab^2x\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}} + \frac{b^2B\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[((b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(5/2),x]
```

```
[Out] (A*b^2*x*Sqrt[b*Cos[c + d*x]])/Sqrt[Cos[c + d*x]] + (b^2*B*Sqrt[b*Cos[c + d
*x]]*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]])
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2717

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\left(b^2\sqrt{b\cos(c+dx)}\right)\int (A+B\cos(c+dx))\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{Ab^2x\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}} + \frac{\left(b^2B\sqrt{b\cos(c+dx)}\right)\int \cos(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{Ab^2x\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}} + \frac{b^2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\sqrt{\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.65

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{(b\cos(c+dx))^{5/2}(A(c+dx)+B\sin(c+dx))}{d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Integrate[((b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(5/2),
x]
[Out] ((b*Cos[c + d*x])^(5/2)*(A*(c + d*x) + B*Sin[c + d*x]))/(d*Cos[c + d*x]^(5/
2))
```

Maple [A] (verified)

Time = 4.91 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.65

method	result	size
default	$\frac{b^{2} \sqrt{\cos(dx+c) b}\, (A(dx+c)+B \sin(dx+c))}{d \sqrt{\cos(dx+c)}}$	42
risch	$\frac{A\, b^{2} x \sqrt{\cos(dx+c) b}}{\sqrt{\cos(dx+c)}}+\frac{b^{2} B \sin(dx+c) \sqrt{\cos(dx+c) b}}{d \sqrt{\cos(dx+c)}}$	58
parts	$\frac{A\, b^{2} \sqrt{\cos(dx+c) b}\, (dx+c)}{d \sqrt{\cos(dx+c)}}+\frac{b^{2} B \sin(dx+c) \sqrt{\cos(dx+c) b}}{d \sqrt{\cos(dx+c)}}$	65

```
[In] int((cos(d*x+c)*b)^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x,method=_RETURN
VERBOSE)
```

```
[Out] b^2/d*(cos(d*x+c)*b)^(1/2)*(A*(d*x+c)+B*sin(d*x+c))/cos(d*x+c)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 190, normalized size of antiderivative = 2.92

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \left[\frac{A\sqrt{-b}b^2\cos\left(dx+c\right)\log\left(2\,b\cos\left(dx+c\right)^2-2\,\sqrt{b\cos\left(dx+c\right.}\right.}{}\right.$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x, algorit
hm="fricas")
```

```
[Out] [1/2*(A*sqrt(-b)*b^2*cos(d*x + c)*log(2*b*cos(d*x + c)^2 - 2*sqrt(b*cos(d*x
 + c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) + 2*sqrt(b*cos(d*x + c
))*B*b^2*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)), (A*b^(5/2)*arct
an(sqrt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/2)))*cos(d*x
+ c) + sqrt(b*cos(d*x + c))*B*b^2*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d
*x + c))]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.45 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.62

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2\,Ab^{\frac{5}{2}}\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)+Bb^{\frac{5}{2}}\sin\left(dx+c\right)}{d}$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x, algorit
hm="maxima")
```

```
[Out] (2*A*b^(5/2)*arctan(sin(d*x + c)/(cos(d*x + c) + 1)) + B*b^(5/2)*sin(d*x +
c))/d
```

Giac [F]

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(B\cos\left(dx+c\right)+A)(b\cos\left(dx+c\right))^{\frac{5}{2}}}{\cos\left(dx+c\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2)/cos(d*x + c)^(5/2), x
)
```

Mupad [B] (verification not implemented)

Time = 0.37 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.58

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{b^2\,\sqrt{b\,\cos\left(c+d\,x\right)}\,\left(B\,\sin\left(c+d\,x\right)+A\,d\,x\right)}{d\,\sqrt{\cos\left(c+d\,x\right)}}$$

```
[In] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(5/2),x)
```

```
[Out] (b^2*(b*cos(c + d*x))^(1/2)*(B*sin(c + d*x) + A*d*x))/(d*cos(c + d*x)^(1/2)
)
```

3.862 $\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 66

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{b^2Bx\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}} + \frac{Ab^2\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

```
[Out] b^2*B*x*(b*cos(d*x+c))^(1/2)/cos(d*x+c)^(1/2)+A*b^2*arctanh(sin(d*x+c))*(b*
cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {17, 2814, 3855}

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{Ab^2\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}} + \frac{b^2Bx\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}$$

```
[In] Int[((b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(7/2),x]
```

```
[Out] (b^2*B*x*Sqrt[b*Cos[c + d*x]])/Sqrt[Cos[c + d*x]] + (A*b^2*ArcTanh[Sin[c +
d*x]]*Sqrt[b*Cos[c + d*x]])/(d*Sqrt[Cos[c + d*x]])
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\left(b^2\sqrt{b\cos(c+dx)}\right)\int(A+B\cos(c+dx))\sec(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{b^2Bx\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}+\frac{\left(Ab^2\sqrt{b\cos(c+dx)}\right)\int\sec(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{b^2Bx\sqrt{b\cos(c+dx)}}{\sqrt{\cos(c+dx)}}+\frac{Ab^2\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.61

$$\int\frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx=\frac{(Bdx+A\text{arctanh}(\sin(c+dx)))(b\cos(c+dx))^{5/2}}{d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Integrate[((b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(7/2),
x]
```

```
[Out] ((B*d*x + A*ArcTanh[Sin[c + d*x]])*(b*Cos[c + d*x])^(5/2))/(d*Cos[c + d*x]^
(5/2))
```

Maple [A] (verified)

Time = 4.92 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.83

method	result	size
default	$-\frac{b^{2}\sqrt{\cos \left(d x +c \right) b}\, \left(2 A \,\operatorname{arctanh}\left(\cot \left(d x +c \right)-\csc \left(d x +c \right)\right)-B \left(d x +c \right)\right)}{d \sqrt{\cos \left(d x +c \right)}}$	55
parts	$-\frac{2 A \,\operatorname{arctanh}\left(\cot \left(d x +c \right)-\csc \left(d x +c \right)\right) b^{2} \sqrt{\cos \left(d x +c \right) b}}{d \sqrt{\cos \left(d x +c \right)}}+\frac{B \,b^{2} \sqrt{\cos \left(d x +c \right) b}\, \left(d x +c \right)}{d \sqrt{\cos \left(d x +c \right)}}$	76
risch	$\frac{b^{2} B x \sqrt{\cos \left(d x +c \right) b}}{\sqrt{\cos \left(d x +c \right)}}+\frac{b^{2} \sqrt{\cos \left(d x +c \right) b}\, A \ln \left({\mathrm e}^{i \left(d x +c \right)}+i\right)}{\sqrt{\cos \left(d x +c \right)}\, d}-\frac{b^{2} \sqrt{\cos \left(d x +c \right) b}\, A \ln \left({\mathrm e}^{i \left(d x +c \right)}-i\right)}{\sqrt{\cos \left(d x +c \right)}\, d}$	105

```
[In] int((cos(d*x+c)*b)^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x,method=_RETURN
VERBOSE)
```

```
[Out] -b^2/d*(cos(d*x+c)*b)^(1/2)*(2*A*arctanh(cot(d*x+c)-csc(d*x+c))-B*(d*x+c))/
cos(d*x+c)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 216, normalized size of antiderivative = 3.27

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \left[-\frac{2\,A\sqrt{-b}b^2\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)-B\sqrt{-b}b^2\log\left(\right.}{}\right.$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x, algorit
hm="fricas")
```

```
[Out] [-1/2*(2*A*sqrt(-b)*b^2*arctan(sqrt(b*cos(d*x + c))*sqrt(-b)*sin(d*x + c)/(
b*sqrt(cos(d*x + c)))) - B*sqrt(-b)*b^2*log(2*b*cos(d*x + c)^2 - 2*sqrt(b*c
os(d*x + c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b))/d, 1/2*(2*B*b^(
5/2)*arctan(sqrt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/2)))
 + A*b^(5/2)*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x + c))*sqrt(b)*sqrt(c
os(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x + c)^3))/d]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)**(7/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.40 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.50

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{4\,Bb^{\frac{5}{2}}\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right) + \left(b^2\log\left(\cos\left(dx+c\right)^2+\sin\left(dx\right.\right.\right.}{}$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x, algorit
hm="maxima")
```

```
[Out] 1/2*(4*B*b^(5/2)*arctan(sin(d*x + c)/(cos(d*x + c) + 1)) + (b^2*log(cos(d*x
 + c)^2 + sin(d*x + c)^2 + 2*sin(d*x + c) + 1) - b^2*log(cos(d*x + c)^2 + s
in(d*x + c)^2 - 2*sin(d*x + c) + 1))*A*sqrt(b))/d
```

Giac [F]

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(B\cos\left(dx+c\right)+A)(b\cos\left(dx+c\right))^{\frac{5}{2}}}{\cos\left(dx+c\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2)/cos(d*x + c)^(7/2), x
)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(b\ \cos\left(c+d\,x\right))^{5/2}\,\left(A+B\ \cos\left(c+d\,x\right)\right)}{\cos\left(c+d\,x\right)^{7/2}}\,dx$$

```
[In] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(7/2),x)
[Out] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(7/2), x)
```

3.863 $\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 74

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{b^2B\operatorname{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}} + \frac{Ab^2\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] A*b^2*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(3/2)+b^2*B*arctanh(sin(
d*x+c))*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 74, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {17, 2827, 3852, 8, 3855}

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{Ab^2\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\cos^{\frac{3}{2}}(c+dx)} + \frac{b^2B\operatorname{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}$$

```
[In] Int[((b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(9/2),x]
```

```
[Out] (b^2*B*ArcTanh[Sin[c + d*x]]*Sqrt[b*Cos[c + d*x]])/(d*Sqrt[Cos[c + d*x]]) +
 (A*b^2*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(d*Cos[c + d*x]^(3/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\left(b^2\sqrt{b\cos(c+dx)}\right)\int (A+B\cos(c+dx))\sec^2(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{\left(Ab^2\sqrt{b\cos(c+dx)}\right)\int \sec^2(c+dx)\,dx}{\sqrt{\cos(c+dx)}}+\frac{\left(b^2B\sqrt{b\cos(c+dx)}\right)\int \sec(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{b^2B\operatorname{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}\\
&\quad -\frac{\left(Ab^2\sqrt{b\cos(c+dx)}\right)\operatorname{Subst}(\int 1\,dx,x,-\tan(c+dx))}{d\sqrt{\cos(c+dx)}}\\
&= \frac{b^2B\operatorname{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}+\frac{Ab^2\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.68

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{(b\cos(c+dx))^{5/2}(B\operatorname{arctanh}(\sin(c+dx))\cos(c+dx)+A\sin$$

$$\frac{}{d\cos^{\frac{7}{2}}(c+dx)}$$

```
[In] Integrate[((b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(9/2),
x]
[Out] ((b*Cos[c + d*x])^(5/2)*(B*ArcTanh[Sin[c + d*x]]*Cos[c + d*x] + A*Sin[c + d
*x]))/(d*Cos[c + d*x]^(7/2))
```

Maple [A] (verified)

Time = 4.88 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.81

method	result	size
default	$\frac{b^{2}\left(-2B\cos(dx+c)\operatorname{arctanh}(\cot(dx+c)-\csc(dx+c))+A\sin(dx+c)\right)\sqrt{\cos(dx+c)b}}{d\cos(dx+c)^{\frac{3}{2}}}$	60
parts	$\frac{A\,b^{2}\sin(dx+c)\sqrt{\cos(dx+c)b}}{d\cos(dx+c)^{\frac{3}{2}}}-\frac{2B\,\operatorname{arctanh}(\cot(dx+c)-\csc(dx+c))b^{2}\sqrt{\cos(dx+c)b}}{d\sqrt{\cos(dx+c)}}$	77
risch	$\frac{2ib^{2}\sqrt{\cos(dx+c)b}\,A}{\sqrt{\cos(dx+c)}\,d\left(e^{2i(dx+c)}+1\right)}+\frac{b^{2}\sqrt{\cos(dx+c)b}\,B\ln\left(e^{i(dx+c)}+i\right)}{\sqrt{\cos(dx+c)}\,d}-\frac{b^{2}\sqrt{\cos(dx+c)b}\,B\ln\left(e^{i(dx+c)}-i\right)}{\sqrt{\cos(dx+c)}\,d}$	122

```
[In] int((cos(d*x+c)*b)^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(9/2),x,method=_RETURN
VERBOSE)
[Out] b^2/d*(-2*B*cos(d*x+c)*arctanh(cot(d*x+c)-csc(d*x+c))+A*sin(d*x+c))*(cos(d*
x+c)*b)^(1/2)/cos(d*x+c)^(3/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 214, normalized size of antiderivative = 2.89

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \left[\frac{Bb^{\frac{5}{2}}\cos(dx+c)^{2}\log\left(-\frac{b\cos(dx+c)^{3}-2\sqrt{b\cos(dx+c)}\sqrt{b}\sqrt{\cos(dx+c)}\,s}{\cos(dx+c)^{3}}\right.}{2\,d}\right.$$

$$\left.-\frac{B\sqrt{-b}b^{2}\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)\cos(dx+c)^{2}-\sqrt{b\cos(dx+c)}Ab^{2}\sqrt{\cos(dx+c)}\sin(dx+c)}{d\cos(dx+c)^{2}}\right]$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(9/2),x, algorit
hm="fricas")
```

```
[Out] [1/2*(B*b^(5/2)*cos(d*x + c)^2*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x +
c))*sqrt(b)*sqrt(cos(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x + c
)^3) + 2*sqrt(b*cos(d*x + c))*A*b^2*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos
(d*x + c)^2), -(B*sqrt(-b)*b^2*arctan(sqrt(b*cos(d*x + c))*sqrt(-b)*sin(d*x
 + c)/(b*sqrt(cos(d*x + c))))*cos(d*x + c)^2 - sqrt(b*cos(d*x + c))*A*b^2*s
qrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^2)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)**(9/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.49 (sec) , antiderivative size = 127, normalized size of antiderivative = 1.72

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{\frac{4Ab^{\frac{5}{2}}\sin(2dx+2c)}{\cos(2dx+2c)^2+\sin(2dx+2c)^2+2\cos(2dx+2c)+1} + \left(b^2\log\left(\cos(dx+c)^2\right.\right.}{}$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(9/2),x, algorit
hm="maxima")
```

```
[Out] 1/2*(4*A*b^(5/2)*sin(2*d*x + 2*c)/(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2
+ 2*cos(2*d*x + 2*c) + 1) + (b^2*log(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*si
n(d*x + c) + 1) - b^2*log(cos(d*x + c)^2 + sin(d*x + c)^2 - 2*sin(d*x + c)
+ 1))*B*sqrt(b))/d
```

Giac [F]

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{5}{2}}}{\cos(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(9/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2)/cos(d*x + c)^(9/2), x
)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(b\,\cos\left(c+d\,x\right))^{5/2}\,\left(A+B\,\cos\left(c+d\,x\right)\right)}{\cos\left(c+d\,x\right)^{9/2}}\,dx$$

```
[In] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(9/2),x)
[Out] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(9/2), x)
```

3.864 $\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{11}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 116

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \frac{Ab^2\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{2d\sqrt{\cos(c+dx)}} + \frac{Ab^2\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d\cos^{\frac{5}{2}}(c+dx)} + \frac{b^2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)}$$

```
[Out] 1/2*A*b^2*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(5/2)+b^2*B*sin(d*x+
c)*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(3/2)+1/2*A*b^2*arctanh(sin(d*x+c))*(b
*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {17, 2827, 3853, 3855, 3852, 8}

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \frac{Ab^2\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{2d\sqrt{\cos(c+dx)}} + \frac{Ab^2\sin(c+dx)\sqrt{b\cos(c+dx)}}{2d\cos^{\frac{5}{2}}(c+dx)} + \frac{b^2B\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Int[((b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(11/2),x]
```

```
[Out] (A*b^2*ArcTanh[Sin[c + d*x]]*Sqrt[b*Cos[c + d*x]])/(2*d*Sqrt[Cos[c + d*x]])
 + (A*b^2*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(2*d*Cos[c + d*x]^(5/2)) + (b^
2*B*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(d*Cos[c + d*x]^(3/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\left(b^2\sqrt{b\cos(c+dx)}\right)\int (A+B\cos(c+dx))\sec^3(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{\left(Ab^2\sqrt{b\cos(c+dx)}\right)\int \sec^3(c+dx)\,dx}{\sqrt{\cos(c+dx)}}+\frac{\left(b^2B\sqrt{b\cos(c+dx)}\right)\int \sec^2(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\
&= \frac{Ab^2\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d\cos^{\frac{5}{2}}(c+dx)}+\frac{\left(Ab^2\sqrt{b\cos(c+dx)}\right)\int \sec(c+dx)\,dx}{2\sqrt{\cos(c+dx)}}\\
&\quad-\frac{\left(b^2B\sqrt{b\cos(c+dx)}\right)\mathrm{Subst}\left(\int 1\,dx,x,-\tan(c+dx)\right)}{d\sqrt{\cos(c+dx)}}
\end{aligned}
$$

$$= \frac{Ab^2 \operatorname{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{2d\sqrt{\cos(c+dx)}} + \frac{Ab^2\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d\cos^{\frac{5}{2}}(c+dx)} + \frac{b^2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)}$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.56

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \frac{(b\cos(c+dx))^{5/2}\,(A\operatorname{arctanh}(\sin(c+dx))\cos^2(c+dx)+(A+}{2d\cos^{\frac{9}{2}}(c+dx)}$$

[In] Integrate[((b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(11/2)
,x]

[Out] ((b*Cos[c + d*x])^(5/2)*(A*ArcTanh[Sin[c + d*x]]*Cos[c + d*x]^2 + (A + 2*B*
Cos[c + d*x])*Sin[c + d*x]))/(2*d*Cos[c + d*x]^(9/2))

Maple [A] (verified)

Time = 4.72 (sec) , antiderivative size = 106, normalized size of antiderivative = 0.91

method	result
default	$\frac{b^2\left(A\left(\cos^2(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)+1)-A\left(\cos^2(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)-1)+2B\sin(dx+c)\cos(dx+c)+A\sin(\right.}{2d\cos(dx+c)^{\frac{5}{2}}}$
parts	$\frac{A\,b^2\left(-\left(\cos^2(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)-1)+\left(\cos^2(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)+1)+\sin(dx+c)\right)\sqrt{\cos(dx+c)b}}{2d\cos(dx+c)^{\frac{5}{2}}}+\frac{b^2}{}$
risch	$-\frac{ib^2\sqrt{\cos(dx+c)b}\left(A\,e^{3i(dx+c)}-2B\,e^{2i(dx+c)}-A\,e^{i(dx+c)}-2B\right)}{\sqrt{\cos(dx+c)}\,d\left(e^{2i(dx+c)}+1\right)^2}+\frac{b^2\sqrt{\cos(dx+c)b}\,A\ln\left(e^{i(dx+c)}+i\right)}{2\sqrt{\cos(dx+c)}\,d}-\frac{b^2\sqrt{\cos(dx+c)b}\,A\ln\left(e^{i(dx}\right.}{2\sqrt{\cos(dx+c)}\,d}$

[In] int((cos(d*x+c)*b)^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(11/2),x,method=_RETUR
NVERBOSE)

[Out] 1/2*b^2/d*(A*cos(d*x+c)^2*ln(-cot(d*x+c)+csc(d*x+c)+1)-A*cos(d*x+c)^2*ln(-c
ot(d*x+c)+csc(d*x+c)-1)+2*B*sin(d*x+c)*cos(d*x+c)+A*sin(d*x+c))*(cos(d*x+c)
*b)^(1/2)/cos(d*x+c)^(5/2)

Fricas [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 242, normalized size of antiderivative = 2.09

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \left[\frac{Ab^{\frac{5}{2}}\cos(dx+c)^3\log\left(-\frac{b\cos(dx+c)^3-2\sqrt{b\cos(dx+c)}\sqrt{b}\sqrt{\cos(dx+c)}\sin}{\cos(dx+c)^3}\right.}{}\right.$$

$$-\frac{A\sqrt{-b}b^2\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)\cos(dx+c)^3-(2Bb^2\cos(dx+c)+Ab^2)\sqrt{b\cos(dx+c)}\sqrt{\cos(}}{2d\cos(dx+c)^3}$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(11/2),x, algori
thm="fricas")
```

```
[Out] [1/4*(A*b^(5/2)*cos(d*x + c)^3*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x +
c))*sqrt(b)*sqrt(cos(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x + c
)^3) + 2*(2*B*b^2*cos(d*x + c) + A*b^2)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x +
 c))*sin(d*x + c))/(d*cos(d*x + c)^3), -1/2*(A*sqrt(-b)*b^2*arctan(sqrt(b*c
os(d*x + c))*sqrt(-b)*sin(d*x + c)/(b*sqrt(cos(d*x + c))))*cos(d*x + c)^3 -
 (2*B*b^2*cos(d*x + c) + A*b^2)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin
(d*x + c))/(d*cos(d*x + c)^3)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)**(11/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 803 vs. $2(100) = 200$.

Time = 0.44 (sec) , antiderivative size = 803, normalized size of antiderivative = 6.92

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(11/2),x, algori
thm="maxima")
```

```
[Out] 1/4*(8*B*b^(5/2)*sin(2*d*x + 2*c)/(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2
+ 2*cos(2*d*x + 2*c) + 1) - (4*(b^2*sin(4*d*x + 4*c) + 2*b^2*sin(2*d*x + 2*
c))*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 4*(b^2*sin(4*d*x
 + 4*c) + 2*b^2*sin(2*d*x + 2*c))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c))) - (b^2*cos(4*d*x + 4*c)^2 + 4*b^2*cos(2*d*x + 2*c)^2 + b^2*sin(
4*d*x + 4*c)^2 + 4*b^2*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*b^2*sin(2*d*x
+ 2*c)^2 + 4*b^2*cos(2*d*x + 2*c) + b^2 + 2*(2*b^2*cos(2*d*x + 2*c) + b^2)*
cos(4*d*x + 4*c))*log(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^
2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/2*arct
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (b^2*cos(4*d*x + 4*c)^2 + 4
*b^2*cos(2*d*x + 2*c)^2 + b^2*sin(4*d*x + 4*c)^2 + 4*b^2*sin(4*d*x + 4*c)*s
in(2*d*x + 2*c) + 4*b^2*sin(2*d*x + 2*c)^2 + 4*b^2*cos(2*d*x + 2*c) + b^2 +
 2*(2*b^2*cos(2*d*x + 2*c) + b^2)*cos(4*d*x + 4*c))*log(cos(1/2*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c)))^2 - 2*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
+ 1) - 4*(b^2*cos(4*d*x + 4*c) + 2*b^2*cos(2*d*x + 2*c) + b^2)*sin(3/2*arct
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 4*(b^2*cos(4*d*x + 4*c) + 2*b^2*
cos(2*d*x + 2*c) + b^2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
))*A*sqrt(b)/(2*(2*cos(2*d*x + 2*c) + 1)*cos(4*d*x + 4*c) + cos(4*d*x + 4*c
)^2 + 4*cos(2*d*x + 2*c)^2 + sin(4*d*x + 4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2*
d*x + 2*c) + 4*sin(2*d*x + 2*c)^2 + 4*cos(2*d*x + 2*c) + 1))/d
```

Giac [F]

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{5}{2}}}{\cos(dx+c)^{\frac{11}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(11/2),x, algori
thm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2)/cos(d*x + c)^(11/2),
x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{11}{2}}(c+dx)}\,dx = \int \frac{(b\cos(c+d\,x))^{5/2}\,(A+B\cos(c+d\,x))}{\cos(c+d\,x)^{11/2}}\,dx$$

```
[In] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(11/2),x)
```

```
[Out] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(11/2), x)
```

3.865 $\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{13}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 157

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{13}{2}}(c+dx)}\,dx = \frac{b^2B\,\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{2d\sqrt{\cos(c+dx)}} + \frac{b^2B\sqrt{b\cos(c+dx)}\sin(c+dx)}{2d\cos^{\frac{5}{2}}(c+dx)} + \frac{Ab^2\sqrt{b\cos(c+dx)}\sin(c+dx)}{d\cos^{\frac{3}{2}}(c+dx)} + \frac{Ab^2\sqrt{b\cos(c+dx)}\sin^3(c+dx)}{3d\cos^{\frac{7}{2}}(c+dx)}$$

```
[Out] 1/2*b^2*B*sin(d*x+c)*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(5/2)+A*b^2*sin(d*x+
c)*(b*cos(d*x+c))^(1/2)/d/cos(d*x+c)^(3/2)+1/3*A*b^2*sin(d*x+c)^3*(b*cos(d*
x+c))^(1/2)/d/cos(d*x+c)^(7/2)+1/2*b^2*B*arctanh(sin(d*x+c))*(b*cos(d*x+c))
^(1/2)/d/cos(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.152$, Rules used = {17, 2827, 3852, 3853, 3855}

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{13}{2}}(c+dx)}\,dx = \frac{Ab^2\sin^3(c+dx)\sqrt{b\cos(c+dx)}}{3d\cos^{\frac{7}{2}}(c+dx)} + \frac{Ab^2\sin(c+dx)\sqrt{b\cos(c+dx)}}{d\cos^{\frac{3}{2}}(c+dx)} + \frac{b^2B\,\text{arctanh}(\sin(c+dx))\sqrt{b\cos(c+dx)}}{2d\sqrt{\cos(c+dx)}} + \frac{b^2B\sin(c+dx)\sqrt{b\cos(c+dx)}}{2d\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Int[((b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(13/2),x]
```

```
[Out] (b^2*B*ArcTanh[Sin[c + d*x]]*Sqrt[b*Cos[c + d*x]])/(2*d*Sqrt[Cos[c + d*x]])
 + (b^2*B*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(2*d*Cos[c + d*x]^(5/2)) + (A*
b^2*Sqrt[b*Cos[c + d*x]]*Sin[c + d*x])/(d*Cos[c + d*x]^(3/2)) + (A*b^2*Sqrt
[b*Cos[c + d*x]]*Sin[c + d*x]^3)/(3*d*Cos[c + d*x]^(7/2))
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\left(b^2\sqrt{b\cos(c+dx)}\right)\int(A+B\cos(c+dx))\sec^4(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\\ &= \frac{\left(Ab^2\sqrt{b\cos(c+dx)}\right)\int\sec^4(c+dx)\,dx}{\sqrt{\cos(c+dx)}}+\frac{\left(b^2B\sqrt{b\cos(c+dx)}\right)\int\sec^3(c+dx)\,dx}{\sqrt{\cos(c+dx)}}\end{aligned}$$

$$= \frac{b^2 B \sqrt{b \cos(c+dx)} \sin(c+dx)}{2d \cos^{\frac{5}{2}}(c+dx)} + \frac{\left(b^2 B \sqrt{b \cos(c+dx)}\right) \int \sec(c+dx)\, dx}{2\sqrt{\cos(c+dx)}} - \frac{\left(A b^2 \sqrt{b \cos(c+dx)}\right) \text{Subst}\left(\int (1+x^2)\ dx, x, -\tan(c+dx)\right)}{d\sqrt{\cos(c+dx)}}$$

$$= \frac{b^2 B \text{arctanh}(\sin(c+dx)) \sqrt{b \cos(c+dx)}}{2d\sqrt{\cos(c+dx)}} + \frac{b^2 B \sqrt{b \cos(c+dx)} \sin(c+dx)}{2d \cos^{\frac{5}{2}}(c+dx)} + \frac{A b^2 \sqrt{b \cos(c+dx)} \sin(c+dx)}{d \cos^{\frac{3}{2}}(c+dx)} + \frac{A b^2 \sqrt{b \cos(c+dx)} \sin^3(c+dx)}{3d \cos^{\frac{7}{2}}(c+dx)}$$

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.48

$$\int \frac{(b \cos(c+dx))^{5/2} (A + B\cos(c+dx))}{\cos^{\frac{13}{2}}(c+dx)}\, dx = \frac{(b\cos(c+dx))^{5/2} \left(3B \text{arctanh}(\sin(c+dx)) \cos^2(c+dx) + 3B\right.}{6d \cos^{\frac{9}{2}}(c+}$$

```
[In] Integrate[((b*Cos[c + d*x])^(5/2)*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(13/2)
,x]
```

```
[Out] ((b*Cos[c + d*x])^(5/2)*(3*B*ArcTanh[Sin[c + d*x]]*Cos[c + d*x]^2 + 3*B*Sin
[c + d*x] + 2*A*(2 + Cos[2*(c + d*x)])*Tan[c + d*x]))/(6*d*Cos[c + d*x]^(9/
2))
```

Maple [A] (verified)

Time = 5.03 (sec) , antiderivative size = 125, normalized size of antiderivative = 0.80

method	result
default	$\frac{b^2 \left(-3B \left(\cos^3(dx+c)\right) \ln(-\cot(dx+c)+\csc(dx+c)-1)+3B \left(\cos^3(dx+c)\right) \ln(-\cot(dx+c)+\csc(dx+c)+1)+4A \sin(dx+c) \left(\cos^2(dx+c)\right.}{6d \cos(dx+c)^{\frac{7}{2}}}$
parts	$\frac{A b^2 \left(2\left(\cos^2(dx+c)\right)+1\right) \sqrt{\cos(dx+c) b}\, \sin(dx+c)}{3d \cos(dx+c)^{\frac{7}{2}}} + \frac{B b^2 \left(-\left(\cos^2(dx+c)\right) \ln(-\cot(dx+c)+\csc(dx+c)-1)+\left(\cos^2(dx+c)\right) \ln(-\cot(\right.}{2d \cos(dx+c)^{\frac{5}{2}}}$
risch	$-\frac{i b^2 \sqrt{\cos(dx+c) b}\, \left(3B\, e^{5i(dx+c)}-12A\, e^{2i(dx+c)}-3B\, e^{i(dx+c)}-4A\right)}{3\sqrt{\cos(dx+c)}\, d \left(e^{2i(dx+c)}+1\right)^3} + \frac{b^2 \sqrt{\cos(dx+c) b}\, B \ln\left(e^{i(dx+c)}+i\right)}{2\sqrt{\cos(dx+c)}\, d} - \frac{b^2 \sqrt{\cos(dx+c) b}\, B \ln}{2\sqrt{\cos(dx+}}$

```
[In] int((cos(d*x+c)*b)^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(13/2),x,method=_RETUR
NVERBOSE)
```

```
[Out] 1/6*b^2/d*(-3*B*cos(d*x+c)^3*ln(-cot(d*x+c)+csc(d*x+c)-1)+3*B*cos(d*x+c)^3*
ln(-cot(d*x+c)+csc(d*x+c)+1)+4*A*sin(d*x+c)*cos(d*x+c)^2+3*B*sin(d*x+c)*cos
(d*x+c)+2*A*sin(d*x+c))*(cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(7/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 274, normalized size of antiderivative = 1.75

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{13}{2}}(c+dx)}\,dx = \left[\frac{3\,Bb^{\frac{5}{2}}\cos\left(dx+c\right)^{4}\log\left(-\frac{b\cos(dx+c)^{3}-2\,\sqrt{b\cos(dx+c)}\sqrt{b}\sqrt{\cos(dx+c)}\,s}{\cos(dx+c)^{3}}\right.}{}\right.$$

$$-\frac{3\,B\sqrt{-b}b^{2}\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)\cos\left(dx+c\right)^{4}-\left(4\,Ab^{2}\cos\left(dx+c\right)^{2}+3\,Bb^{2}\cos\left(dx+c\right)+2\,Ab^{2}\right.}{6\,d\cos\left(dx+c\right)^{4}}$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(13/2),x, algori
thm="fricas")
```

```
[Out] [1/12*(3*B*b^(5/2)*cos(d*x + c)^4*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x
 + c))*sqrt(b)*sqrt(cos(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x
+ c)^3) + 2*(4*A*b^2*cos(d*x + c)^2 + 3*B*b^2*cos(d*x + c) + 2*A*b^2)*sqrt(
b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(d*cos(d*x + c)^4), -1/6*(
3*B*sqrt(-b)*b^2*arctan(sqrt(b*cos(d*x + c))*sqrt(-b)*sin(d*x + c)/(b*sqrt(
cos(d*x + c))))*cos(d*x + c)^4 - (4*A*b^2*cos(d*x + c)^2 + 3*B*b^2*cos(d*x
+ c) + 2*A*b^2)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(d*co
s(d*x + c)^4)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{13}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)**(13/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1060 vs. 2(135) = 270.

Time = 0.44 (sec) , antiderivative size = 1060, normalized size of antiderivative = 6.75

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{13}{2}}(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(13/2),x, algori
thm="maxima")
```

```
[Out] -1/12*(16*(3*b^2*cos(6*d*x + 6*c)*sin(2*d*x + 2*c) + 9*b^2*cos(4*d*x + 4*c)
*sin(2*d*x + 2*c) - (3*b^2*cos(2*d*x + 2*c) + b^2)*sin(6*d*x + 6*c) - 3*(3*
b^2*cos(2*d*x + 2*c) + b^2)*sin(4*d*x + 4*c))*A*sqrt(b)/(2*(3*cos(4*d*x + 4
*c) + 3*cos(2*d*x + 2*c) + 1)*cos(6*d*x + 6*c) + cos(6*d*x + 6*c)^2 + 6*(3*
cos(2*d*x + 2*c) + 1)*cos(4*d*x + 4*c) + 9*cos(4*d*x + 4*c)^2 + 9*cos(2*d*x
 + 2*c)^2 + 6*(sin(4*d*x + 4*c) + sin(2*d*x + 2*c))*sin(6*d*x + 6*c) + sin(
6*d*x + 6*c)^2 + 9*sin(4*d*x + 4*c)^2 + 18*sin(4*d*x + 4*c)*sin(2*d*x + 2*c
) + 9*sin(2*d*x + 2*c)^2 + 6*cos(2*d*x + 2*c) + 1) + 3*(4*(b^2*sin(4*d*x +
4*c) + 2*b^2*sin(2*d*x + 2*c))*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c))) - 4*(b^2*sin(4*d*x + 4*c) + 2*b^2*sin(2*d*x + 2*c))*cos(1/2*arctan
2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - (b^2*cos(4*d*x + 4*c)^2 + 4*b^2*co
s(2*d*x + 2*c)^2 + b^2*sin(4*d*x + 4*c)^2 + 4*b^2*sin(4*d*x + 4*c)*sin(2*d*
x + 2*c) + 4*b^2*sin(2*d*x + 2*c)^2 + 4*b^2*cos(2*d*x + 2*c) + b^2 + 2*(2*b
^2*cos(2*d*x + 2*c) + b^2)*cos(4*d*x + 4*c))*log(cos(1/2*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c)))^2 + 2*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) +
(b^2*cos(4*d*x + 4*c)^2 + 4*b^2*cos(2*d*x + 2*c)^2 + b^2*sin(4*d*x + 4*c)^2
 + 4*b^2*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*b^2*sin(2*d*x + 2*c)^2 + 4*b
^2*cos(2*d*x + 2*c) + b^2 + 2*(2*b^2*cos(2*d*x + 2*c) + b^2)*cos(4*d*x + 4*
c))*log(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*ar
ctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sin(1/2*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c))) + 1) - 4*(b^2*cos(4*d*x + 4*c) + 2*b^2*cos(2*d*x
 + 2*c) + b^2)*sin(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 4*(b^
2*cos(4*d*x + 4*c) + 2*b^2*cos(2*d*x + 2*c) + b^2)*sin(1/2*arctan2(sin(2*d*
x + 2*c), cos(2*d*x + 2*c))))*B*sqrt(b)/(2*(2*cos(2*d*x + 2*c) + 1)*cos(4*d
*x + 4*c) + cos(4*d*x + 4*c)^2 + 4*cos(2*d*x + 2*c)^2 + sin(4*d*x + 4*c)^2
+ 4*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*sin(2*d*x + 2*c)^2 + 4*cos(2*d*x
+ 2*c) + 1))/d
```

Giac [F]

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{13}{2}}(c+dx)}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{5}{2}}}{\cos(dx+c)^{\frac{13}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(5/2)*(A+B*cos(d*x+c))/cos(d*x+c)^(13/2),x, algori
thm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(5/2)/cos(d*x + c)^(13/2),
x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^{5/2}(A+B\cos(c+dx))}{\cos^{\frac{13}{2}}(c+dx)}\,dx = \int \frac{\left(b\,\cos\left(c+d\,x\right)\right)^{5/2}\,\left(A+B\,\cos\left(c+d\,x\right)\right)}{\cos\left(c+d\,x\right)^{13/2}}\,dx$$

```
[In] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(13/2),x)
[Out] int(((b*cos(c + d*x))^(5/2)*(A + B*cos(c + d*x)))/cos(c + d*x)^(13/2), x)
```

3.866 $\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 136

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{Ax\sqrt{\cos(c+dx)}}{2\sqrt{b\cos(c+dx)}} + \frac{B\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} + \frac{A\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{b\cos(c+dx)}} - \frac{B\sqrt{\cos(c+dx)}\sin^3(c+dx)}{3d\sqrt{b\cos(c+dx)}}$$

```
[Out] 1/2*A*cos(d*x+c)^(3/2)*sin(d*x+c)/d/(b*cos(d*x+c))^(1/2)+1/2*A*x*cos(d*x+c)
^(1/2)/(b*cos(d*x+c))^(1/2)+B*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^
(1/2)-1/3*B*sin(d*x+c)^3*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {17, 2827, 2715, 8, 2713}

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{Ax\sqrt{\cos(c+dx)}}{2\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{2d\sqrt{b\cos(c+dx)}} - \frac{B\sin^3(c+dx)\sqrt{\cos(c+dx)}}{3d\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)\sqrt{\cos(c+dx)}}{d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^(5/2)*(A + B*Cos[c + d*x]))/Sqrt[b*Cos[c + d*x]],x]
```

```
[Out] (A*x*Sqrt[Cos[c + d*x]])/(2*Sqrt[b*Cos[c + d*x]]) + (B*Sqrt[Cos[c + d*x]]*S
in[c + d*x])/(d*Sqrt[b*Cos[c + d*x]]) + (A*Cos[c + d*x]^(3/2)*Sin[c + d*x])
/(2*d*Sqrt[b*Cos[c + d*x]]) - (B*Sqrt[Cos[c + d*x]]*Sin[c + d*x]^3)/(3*d*Sq
rt[b*Cos[c + d*x]])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int \cos^2(c+dx)(A+B\cos(c+dx))\,dx}{\sqrt{b\cos(c+dx)}}\\ &= \frac{\left(A\sqrt{\cos(c+dx)}\right)\int \cos^2(c+dx)\,dx}{\sqrt{b\cos(c+dx)}}+\frac{\left(B\sqrt{\cos(c+dx)}\right)\int \cos^3(c+dx)\,dx}{\sqrt{b\cos(c+dx)}}\end{aligned}$$

$$= \frac{A\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{b\cos(c+dx)}} + \frac{\left(A\sqrt{\cos(c+dx)}\right)\int 1\,dx}{2\sqrt{b\cos(c+dx)}} - \frac{\left(B\sqrt{\cos(c+dx)}\right)\text{Subst}\left(\int(1-x^2)\,dx, x, -\sin(c+dx)\right)}{d\sqrt{b\cos(c+dx)}}$$

$$= \frac{Ax\sqrt{\cos(c+dx)}}{2\sqrt{b\cos(c+dx)}} + \frac{B\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} + \frac{A\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{b\cos(c+dx)}} - \frac{B\sqrt{\cos(c+dx)}\sin^3(c+dx)}{3d\sqrt{b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.42 (sec) , antiderivative size = 69, normalized size of antiderivative = 0.51

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{\sqrt{\cos(c+dx)}(6Ac+6Adx+9B\sin(c+dx)+3A\sin(2(c+dx))+B\sin(3(c+dx)))}{12d\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[(Cos[c + d*x]^(5/2)*(A + B*Cos[c + d*x]))/Sqrt[b*Cos[c + d*x]],x]
[Out] (Sqrt[Cos[c + d*x]]*(6*A*c + 6*A*d*x + 9*B*Sin[c + d*x] + 3*A*Sin[2*(c + d*x)] + B*Sin[3*(c + d*x)]))/(12*d*Sqrt[b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.04 (sec) , antiderivative size = 74, normalized size of antiderivative = 0.54

method	result	size
default	$\frac{\left(\sqrt{\cos}(dx+c)\right)\left(2B\sin(dx+c)\left(\cos^2(dx+c)\right)+3A\sin(dx+c)\cos(dx+c)+3A(dx+c)+4B\sin(dx+c)\right)}{6d\sqrt{\cos(dx+c)b}}$	74
parts	$\frac{A(\cos(dx+c)\sin(dx+c)+dx+c)\left(\sqrt{\cos}(dx+c)\right)}{2d\sqrt{\cos(dx+c)b}}+\frac{B\left(2+\cos^2(dx+c)\right)\sin(dx+c)\left(\sqrt{\cos}(dx+c)\right)}{3d\sqrt{\cos(dx+c)b}}$	84
risch	$\frac{Ax\left(\sqrt{\cos}(dx+c)\right)}{2\sqrt{\cos(dx+c)b}}+\frac{3B\sin(dx+c)\left(\sqrt{\cos}(dx+c)\right)}{4d\sqrt{\cos(dx+c)b}}+\frac{\left(\sqrt{\cos}(dx+c)\right)B\sin(3dx+3c)}{12\sqrt{\cos(dx+c)b}\,d}+\frac{\left(\sqrt{\cos}(dx+c)\right)A\sin(2dx+2c)}{4\sqrt{\cos(dx+c)b}\,d}$	120

```
[In] int(cos(d*x+c)^(5/2)*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/6/d*cos(d*x+c)^(1/2)*(2*B*sin(d*x+c)*cos(d*x+c)^2+3*A*sin(d*x+c)*cos(d*x+c)+3*A*(d*x+c)+4*B*sin(d*x+c))/(cos(d*x+c)*b)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 236, normalized size of antiderivative = 1.74

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \left[-\frac{3\,A\sqrt{-b}\cos\left(dx+c\right)\log\left(2\,b\cos\left(dx+c\right)^2+2\,\sqrt{b\cos\left(dx+c\right)}\sqrt{-b}\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-b\right)-2}{12\,bd\cos\left(dx+c\right)}\right.$$

```
[In] integrate(cos(d*x+c)^(5/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorit
hm="fricas")
```

```
[Out] [-1/12*(3*A*sqrt(-b)*cos(d*x + c)*log(2*b*cos(d*x + c)^2 + 2*sqrt(b*cos(d*x
 + c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) - 2*(2*B*cos(d*x + c)^
2 + 3*A*cos(d*x + c) + 4*B)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x
 + c))/(b*d*cos(d*x + c)), 1/6*(3*A*sqrt(b)*arctan(sqrt(b*cos(d*x + c))*sin
(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/2)))*cos(d*x + c) + (2*B*cos(d*x + c)^2
+ 3*A*cos(d*x + c) + 4*B)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x +
 c))/(b*d*cos(d*x + c))]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.43 (sec) , antiderivative size = 68, normalized size of antiderivative = 0.50

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{\frac{3\,(2\,dx+2\,c+\sin(2\,dx+2\,c))A}{\sqrt{b}}+\frac{B\left(\sin(3\,dx+3\,c)+9\,\sin\left(\frac{1}{3}\,\arctan(\sin(3\,dx+3\,c),\cos(3\,dx+3\,c))\right)\right)}{\sqrt{b}}}{12\,d}$$

```
[In] integrate(cos(d*x+c)^(5/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorit
hm="maxima")
```

```
[Out] 1/12*(3*(2*d*x + 2*c + sin(2*d*x + 2*c))*A/sqrt(b) + B*(sin(3*d*x + 3*c) +
9*sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))))/sqrt(b))/d
```

Giac [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^{\frac{5}{2}}}{\sqrt{b\cos(dx+c)}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^(5/2)/sqrt(b*cos(d*x + c)), x)
```

Mupad [B] (verification not implemented)

Time = 16.11 (sec) , antiderivative size = 95, normalized size of antiderivative = 0.70

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{\sqrt{\cos(c+d\,x)}\,\sqrt{b\,\cos(c+d\,x)}\,(3\,A\,\sin(c+d\,x)+3\,A\,\sin(3\,c+3\,d\,x)+10\,B\,\sin(2\,c+2\,d\,x)+B\,\sin(}{12\,b\,d\,(\cos(2\,c+2\,d\,x)+1)}$$

```
[In] int((cos(c + d*x)^(5/2)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(1/2),x)
```

```
[Out] (cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(1/2)*(3*A*sin(c + d*x) + 3*A*sin(3*c
+ 3*d*x) + 10*B*sin(2*c + 2*d*x) + B*sin(4*c + 4*d*x) + 12*A*d*x*cos(c + d*
x)))/(12*b*d*(cos(2*c + 2*d*x) + 1))
```

3.867 $\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 98

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{Bx\sqrt{\cos(c+dx)}}{2\sqrt{b\cos(c+dx)}} + \frac{A\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{b\cos(c+dx)}} + \frac{B\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{b\cos(c+dx)}}$$

```
[Out] 1/2*B*cos(d*x+c)^(3/2)*sin(d*x+c)/d/(b*cos(d*x+c))^(1/2)+1/2*B*x*cos(d*x+c)
^(1/2)/(b*cos(d*x+c))^(1/2)+A*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^
(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.061, Rules used = {17, 2813}

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{A\sin(c+dx)\sqrt{\cos(c+dx)}}{d\sqrt{b\cos(c+dx)}} + \frac{Bx\sqrt{\cos(c+dx)}}{2\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{2d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^(3/2)*(A + B*Cos[c + d*x]))/Sqrt[b*Cos[c + d*x]],x]
```

```
[Out] (B*x*Sqrt[Cos[c + d*x]])/(2*Sqrt[b*Cos[c + d*x]]) + (A*Sqrt[Cos[c + d*x]]*S
in[c + d*x])/(d*Sqrt[b*Cos[c + d*x]]) + (B*Cos[c + d*x]^(3/2)*Sin[c + d*x])
/(2*d*Sqrt[b*Cos[c + d*x]])
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int \cos(c+dx)(A+B\cos(c+dx))\,dx}{\sqrt{b\cos(c+dx)}}\\ &= \frac{Bx\sqrt{\cos(c+dx)}}{2\sqrt{b\cos(c+dx)}}+\frac{A\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}+\frac{B\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2d\sqrt{b\cos(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.58

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{\sqrt{\cos(c+dx)}(4A\sin(c+dx)+B(2(c+dx)+\sin(2(c+dx))))}{4d\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[(Cos[c + d*x]^(3/2)*(A + B*Cos[c + d*x]))/Sqrt[b*Cos[c + d*x]],x]
[Out] (Sqrt[Cos[c + d*x]]*(4*A*Sin[c + d*x] + B*(2*(c + d*x) + Sin[2*(c + d*x)]))
)/(4*d*Sqrt[b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 4.76 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.56

method	result	size
default	$\frac{\left(\sqrt{\cos}\left(dx+c\right)\right)\left(B\sin\left(dx+c\right)\cos\left(dx+c\right)+2A\sin\left(dx+c\right)+B\left(dx+c\right)\right)}{2d\sqrt{\cos\left(dx+c\right)b}}$	55
parts	$\frac{A\sin\left(dx+c\right)\left(\sqrt{\cos}\left(dx+c\right)\right)}{d\sqrt{\cos\left(dx+c\right)b}}+\frac{B\left(\cos\left(dx+c\right)\sin\left(dx+c\right)+dx+c\right)\left(\sqrt{\cos}\left(dx+c\right)\right)}{2d\sqrt{\cos\left(dx+c\right)b}}$	73
risch	$\frac{Bx\left(\sqrt{\cos}\left(dx+c\right)\right)}{2\sqrt{\cos\left(dx+c\right)b}}+\frac{A\sin\left(dx+c\right)\left(\sqrt{\cos}\left(dx+c\right)\right)}{d\sqrt{\cos\left(dx+c\right)b}}+\frac{\left(\sqrt{\cos}\left(dx+c\right)\right)B\sin\left(2dx+2c\right)}{4\sqrt{\cos\left(dx+c\right)b}\,d}$	86

```
[In] int(cos(d*x+c)^(3/2)*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(1/2),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/2/d*cos(d*x+c)^(1/2)*(B*sin(d*x+c)*cos(d*x+c)+2*A*sin(d*x+c)+B*(d*x+c))/(
cos(d*x+c)*b)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 210, normalized size of antiderivative = 2.14

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx$$
$$=\left[-\frac{B\sqrt{-b}\cos\left(dx+c\right)\log\left(2\,b\cos\left(dx+c\right)^{2}+2\,\sqrt{b\cos\left(dx+c\right)}\sqrt{-b}\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)-b\right)-2\,(A}{4\,bd\cos\left(dx+c\right)}\right.$$

```
[In] integrate(cos(d*x+c)^(3/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorit
hm="fricas")
```

```
[Out] [-1/4*(B*sqrt(-b)*cos(d*x + c)*log(2*b*cos(d*x + c)^2 + 2*sqrt(b*cos(d*x +
c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) - 2*(B*cos(d*x + c) + 2*A
)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(b*d*cos(d*x + c)),
 1/2*(B*sqrt(b)*arctan(sqrt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x +
 c)^(3/2)))*cos(d*x + c) + (B*cos(d*x + c) + 2*A)*sqrt(b*cos(d*x + c))*sqrt
(cos(d*x + c))*sin(d*x + c))/(b*d*cos(d*x + c))]
```

Sympy [A] (verification not implemented)

Time = 36.74 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.54

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx$$
$$= \begin{cases} \frac{A\sin{(c+dx)}\sqrt{\cos{(c+dx)}}}{d\sqrt{b\cos{(c+dx)}}} + \frac{Bx\sin^2{(c+dx)}\sqrt{\cos{(c+dx)}}}{2\sqrt{b\cos{(c+dx)}}} + \frac{Bx\cos^{\frac{5}{2}}{(c+dx)}}{2\sqrt{b\cos{(c+dx)}}} + \frac{B\sin{(c+dx)}\cos^{\frac{3}{2}}{(c+dx)}}{2d\sqrt{b\cos{(c+dx)}}} & \text{for } d \neq 0 \\ \frac{x(A+B\cos{(c)})\cos^{\frac{3}{2}}{(c)}}{\sqrt{b\cos{(c)}}} & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)**(3/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(1/2),x)
```

```
[Out] Piecewise((A*sin(c + d*x)*sqrt(cos(c + d*x))/(d*sqrt(b*cos(c + d*x))) + B*x
*sin(c + d*x)**2*sqrt(cos(c + d*x))/(2*sqrt(b*cos(c + d*x))) + B*x*cos(c +
d*x)**(5/2)/(2*sqrt(b*cos(c + d*x))) + B*sin(c + d*x)*cos(c + d*x)**(3/2)/(
2*d*sqrt(b*cos(c + d*x))), Ne(d, 0)), (x*(A + B*cos(c))*cos(c)**(3/2)/sqrt(
b*cos(c)), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.41 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.41

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{\frac{(2\,dx+2\,c+\sin(2\,dx+2\,c))B}{\sqrt{b}} + \frac{4\,A\sin(dx+c)}{\sqrt{b}}}{4\,d}$$

```
[In] integrate(cos(d*x+c)^(3/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorit
hm="maxima")
```

```
[Out] 1/4*((2*d*x + 2*c + sin(2*d*x + 2*c))*B/sqrt(b) + 4*A*sin(d*x + c)/sqrt(b))
/d
```

Giac [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{(B\cos{(dx+c)}+A)\cos{(dx+c)}^{\frac{3}{2}}}{\sqrt{b\cos{(dx+c)}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^(3/2)/sqrt(b*cos(d*x + c)), x)
```

Mupad [B] (verification not implemented)

Time = 0.90 (sec) , antiderivative size = 82, normalized size of antiderivative = 0.84

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx$$
$$= \frac{\sqrt{\cos(c+d\,x)}\,\sqrt{b\,\cos(c+d\,x)}\,(B\,\sin(c+d\,x)+4\,A\,\sin(2\,c+2\,d\,x)+B\,\sin(3\,c+3\,d\,x)+4\,B\,d\,x\,\cos(}{4\,b\,d\,(\cos(2\,c+2\,d\,x)+1)}$$

```
[In] int((cos(c + d*x)^(3/2)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(1/2),x)
```

```
[Out] (cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(1/2)*(B*sin(c + d*x) + 4*A*sin(2*c +
2*d*x) + B*sin(3*c + 3*d*x) + 4*B*d*x*cos(c + d*x)))/(4*b*d*(cos(2*c + 2*d*
x) + 1))
```

3.868 $\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 59

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{Ax\sqrt{\cos(c+dx)}}{\sqrt{b\cos(c+dx)}} + \frac{B\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}$$

```
[Out] A*x*cos(d*x+c)^(1/2)/(b*cos(d*x+c))^(1/2)+B*sin(d*x+c)*cos(d*x+c)^(1/2)/d/(
b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.061$, Rules used = {17, 2717}

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{Ax\sqrt{\cos(c+dx)}}{\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)\sqrt{\cos(c+dx)}}{d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(Sqrt[Cos[c + d*x]]*(A + B*Cos[c + d*x]))/Sqrt[b*Cos[c + d*x]],x]
```

```
[Out] (A*x*Sqrt[Cos[c + d*x]])/Sqrt[b*Cos[c + d*x]] + (B*Sqrt[Cos[c + d*x]]*Sin[c
 + d*x])/(d*Sqrt[b*Cos[c + d*x]])
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2717

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int(A+B\cos(c+dx))\,dx}{\sqrt{b\cos(c+dx)}} \\
&= \frac{Ax\sqrt{\cos(c+dx)}}{\sqrt{b\cos(c+dx)}} + \frac{\left(B\sqrt{\cos(c+dx)}\right)\int\cos(c+dx)\,dx}{\sqrt{b\cos(c+dx)}} \\
&= \frac{Ax\sqrt{\cos(c+dx)}}{\sqrt{b\cos(c+dx)}} + \frac{B\sqrt{\cos(c+dx)}\sin(c+dx)}{d\sqrt{b\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.71

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{\sqrt{\cos(c+dx)}(A(c+dx)+B\sin(c+dx))}{d\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[(Sqrt[Cos[c + d*x]]*(A + B*Cos[c + d*x]))/Sqrt[b*Cos[c + d*x]],x]
[Out] (Sqrt[Cos[c + d*x]]*(A*(c + d*x) + B*Sin[c + d*x]))/(d*Sqrt[b*Cos[c + d*x]]
)
```

Maple [A] (verified)

Time = 5.02 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.66

method	result	size
default	$\frac{(\sqrt{\cos}(dx+c))(A(dx+c)+B\sin(dx+c))}{d\sqrt{\cos(dx+c)b}}$	39
risch	$\frac{Ax(\sqrt{\cos}(dx+c))}{\sqrt{\cos(dx+c)b}}+\frac{B\sin(dx+c)(\sqrt{\cos}(dx+c))}{d\sqrt{\cos(dx+c)b}}$	52
parts	$\frac{A(\sqrt{\cos}(dx+c))(dx+c)}{d\sqrt{\cos(dx+c)b}}+\frac{B\sin(dx+c)(\sqrt{\cos}(dx+c))}{d\sqrt{\cos(dx+c)b}}$	59

```
[In] int(cos(d*x+c)^(1/2)*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(1/2),x,method=_RETURN
VERBOSE)
[Out] 1/d*cos(d*x+c)^(1/2)*(A*(d*x+c)+B*sin(d*x+c))/(cos(d*x+c)*b)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 187, normalized size of antiderivative = 3.17

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx$$
$$= \left[-\frac{A\sqrt{-b}\cos(dx+c)\log\left(2\,b\cos(dx+c)^2+2\,\sqrt{b\cos(dx+c)}\sqrt{-b}\sqrt{\cos(dx+c)}\sin(dx+c)-b\right)-2}{2\,bd\cos(dx+c)}\right.$$

```
[In] integrate(cos(d*x+c)^(1/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorit
hm="fricas")
```

```
[Out] [-1/2*(A*sqrt(-b)*cos(d*x + c)*log(2*b*cos(d*x + c)^2 + 2*sqrt(b*cos(d*x +
c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) - 2*sqrt(b*cos(d*x + c))*
B*sqrt(cos(d*x + c))*sin(d*x + c))/(b*d*cos(d*x + c)), (A*sqrt(b)*arctan(sq
rt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/2)))*cos(d*x + c)
+ sqrt(b*cos(d*x + c))*B*sqrt(cos(d*x + c))*sin(d*x + c))/(b*d*cos(d*x + c)
)]
```

Sympy [A] (verification not implemented)

Time = 1.43 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.36

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \begin{cases} \frac{Ax\sqrt{\cos(c+dx)}}{\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)\sqrt{\cos(c+dx)}}{d\sqrt{b\cos(c+dx)}} & \text{for}\ d \neq 0 \\ \frac{x(A+B\cos(c))\sqrt{\cos(c)}}{\sqrt{b\cos(c)}} & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)**(1/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(1/2),x)
```

```
[Out] Piecewise((A*x*sqrt(cos(c + d*x))/sqrt(b*cos(c + d*x)) + B*sin(c + d*x)*sqr
t(cos(c + d*x))/(d*sqrt(b*cos(c + d*x))), Ne(d, 0)), (x*(A + B*cos(c))*sqrt
(cos(c))/sqrt(b*cos(c)), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.40 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.68

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{\frac{2\,A\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{\sqrt{b}}+\frac{B\sin(dx+c)}{\sqrt{b}}}{d}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorit
hm="maxima")
```

```
[Out] (2*A*arctan(sin(d*x + c)/(cos(d*x + c) + 1))/sqrt(b) + B*sin(d*x + c)/sqrt(
b))/d
```

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \int \frac{(B\cos(dx+c)+A)\sqrt{\cos(dx+c)}}{\sqrt{b\cos(dx+c)}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*sqrt(cos(d*x + c))/sqrt(b*cos(d*x + c)), x)
```

Mupad [B] (verification not implemented)

Time = 0.59 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.03

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{\sqrt{b\cos(c+dx)}}\,dx = \frac{\sqrt{\cos(c+d\,x)}\,\sqrt{b\,\cos(c+d\,x)}\,(B\,\sin(2\,c+2\,d\,x)+2\,A\,d\,x\,\cos(c+d\,x))}{b\,d\,(\cos(2\,c+2\,d\,x)+1)}$$

```
[In] int((cos(c + d*x)^(1/2)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(1/2),x)
```

```
[Out] (cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(1/2)*(B*sin(2*c + 2*d*x) + 2*A*d*x*co
s(c + d*x)))/(b*d*(cos(2*c + 2*d*x) + 1))
```

3.869 $\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 60

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}\,dx = \frac{Bx\sqrt{\cos(c+dx)}}{\sqrt{b\cos(c+dx)}}+\frac{A\text{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{d\sqrt{b\cos(c+dx)}}$$

```
[Out] B*x*cos(d*x+c)^(1/2)/(b*cos(d*x+c))^(1/2)+A*arctanh(sin(d*x+c))*cos(d*x+c)^
(1/2)/d/(b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {18, 2814, 3855}

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}\,dx = \frac{A\sqrt{\cos(c+dx)}\text{arctanh}(\sin(c+dx))}{d\sqrt{b\cos(c+dx)}}+\frac{Bx\sqrt{\cos(c+dx)}}{\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(A + B*Cos[c + d*x])/(Sqrt[Cos[c + d*x]]*Sqrt[b*Cos[c + d*x]]),x]
```

```
[Out] (B*x*Sqrt[Cos[c + d*x]])/Sqrt[b*Cos[c + d*x]] + (A*ArcTanh[Sin[c + d*x]]*Sq
rt[Cos[c + d*x]])/(d*Sqrt[b*Cos[c + d*x]])
```

Rule 18

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m - 1/2
)*b^(n + 1/2)*(Sqrt[a*v]/Sqrt[b*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && ILtQ[n - 1/2, 0] && IntegerQ[m + n]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int (A+B\cos(c+dx))\sec(c+dx)\,dx}{\sqrt{b\cos(c+dx)}}\\
&= \frac{Bx\sqrt{\cos(c+dx)}}{\sqrt{b\cos(c+dx)}}+\frac{\left(A\sqrt{\cos(c+dx)}\right)\int \sec(c+dx)\,dx}{\sqrt{b\cos(c+dx)}}\\
&= \frac{Bx\sqrt{\cos(c+dx)}}{\sqrt{b\cos(c+dx)}}+\frac{A\operatorname{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{d\sqrt{b\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.67

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}\,dx=\frac{(Bdx+A\operatorname{arctanh}(\sin(c+dx)))\sqrt{\cos(c+dx)}}{d\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/(Sqrt[Cos[c + d*x]]*Sqrt[b*Cos[c + d*x]]),x]
[Out] ((B*d*x + A*ArcTanh[Sin[c + d*x]])*Sqrt[Cos[c + d*x]])/(d*Sqrt[b*Cos[c + d*
x]])
```

Maple [A] (verified)

Time = 4.91 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.87

method	result	size
default	$-\frac{(2A\ \mathrm{arctanh}(\cot(dx+c)-\csc(dx+c))-B(dx+c))(\sqrt{\cos}(dx+c))}{d\sqrt{\cos(dx+c)b}}$	52
parts	$-\frac{2A\ \mathrm{arctanh}(\cot(dx+c)-\csc(dx+c))(\sqrt{\cos}(dx+c))}{d\sqrt{\cos(dx+c)b}}+\frac{B(\sqrt{\cos}(dx+c))(dx+c)}{d\sqrt{\cos(dx+c)b}}$	70
risch	$\frac{Bx(\sqrt{\cos}(dx+c))}{\sqrt{\cos(dx+c)b}}+\frac{(\sqrt{\cos}(dx+c))A\ln(\mathrm{e}^{i(dx+c)}+i)}{\sqrt{\cos(dx+c)b}\,d}-\frac{(\sqrt{\cos}(dx+c))A\ln(\mathrm{e}^{i(dx+c)}-i)}{\sqrt{\cos(dx+c)b}\,d}$	96

```
[In] int((A+B*cos(d*x+c))/cos(d*x+c)^(1/2)/(cos(d*x+c)*b)^(1/2),x,method=_RETURN
VERBOSE)
```

```
[Out] -1/d*(2*A*arctanh(cot(d*x+c)-csc(d*x+c))-B*(d*x+c))*cos(d*x+c)^(1/2)/(cos(d
*x+c)*b)^(1/2)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 109 vs. 2(52) = 104.

Time = 0.37 (sec) , antiderivative size = 215, normalized size of antiderivative = 3.58

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}\,dx$$

$$= \left[-\frac{2\,A\sqrt{-b}\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)+B\sqrt{-b}\log\left(2\,b\cos\left(dx+c\right)^2+2\,\sqrt{b\cos\left(dx+c\right)}\sqrt{-b}\sqrt{\cos}\right.}{2\,bd}\right.$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(1/2)/(b*cos(d*x+c))^(1/2),x, algorit
hm="fricas")
```

```
[Out] [-1/2*(2*A*sqrt(-b)*arctan(sqrt(b*cos(d*x + c))*sqrt(-b)*sin(d*x + c)/(b*sq
rt(cos(d*x + c)))) + B*sqrt(-b)*log(2*b*cos(d*x + c)^2 + 2*sqrt(b*cos(d*x +
 c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b))/(b*d), 1/2*(2*B*sqrt(b)
*arctan(sqrt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/2))) + A
*sqrt(b)*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x + c))*sqrt(b)*sqrt(cos(d
*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x + c)^3))/(b*d)]
```

Sympy [F]

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}\,dx = \int \frac{A+B\cos\left(c+dx\right)}{\sqrt{b\cos\left(c+dx\right)}\sqrt{\cos\left(c+dx\right)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)**(1/2)/(b*cos(d*x+c))**(1/2),x)
[Out] Integral((A + B*cos(c + d*x))/(sqrt(b*cos(c + d*x))*sqrt(cos(c + d*x))), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.41 (sec) , antiderivative size = 92, normalized size of antiderivative = 1.53

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}\,dx = \frac{\frac{A\left(\log\left(\cos(dx+c)^2+\sin(dx+c)^2+2\sin(dx+c)+1\right)-\log\left(\cos(dx+c)^2+\sin(dx+c)^2-2\sin(dx+c)+1\right)\right)}{\sqrt{b}}+\frac{4B\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{\sqrt{b}}}{2d}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(1/2)/(b*cos(d*x+c))^(1/2),x, algorit
hm="maxima")
[Out] 1/2*(A*(log(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*sin(d*x + c) + 1) - log(cos
(d*x + c)^2 + sin(d*x + c)^2 - 2*sin(d*x + c) + 1))/sqrt(b) + 4*B*arctan(si
n(d*x + c)/(cos(d*x + c) + 1))/sqrt(b))/d
```

Giac [F]

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}\,dx = \int \frac{B\cos\left(dx+c\right)+A}{\sqrt{b\cos\left(dx+c\right)}\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(1/2)/(b*cos(d*x+c))^(1/2),x, algorit
hm="giac")
[Out] integrate((B*cos(d*x + c) + A)/(sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))), x
)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}\,dx=\int \frac{A+B\,\cos\left(c+d\,x\right)}{\sqrt{\cos\left(c+d\,x\right)}\,\sqrt{b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(1/2)),x)
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(1/2)), x)
```

3.870 $\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 68

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx = \frac{B\operatorname{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{d\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}$$

```
[Out] A*sin(d*x+c)/d/cos(d*x+c)^(1/2)/(b*cos(d*x+c))^(1/2)+B*arctanh(sin(d*x+c))*
cos(d*x+c)^(1/2)/d/(b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.152$, Rules used = {18, 2827, 3852, 8, 3855}

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx = \frac{A\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}} + \frac{B\sqrt{\cos(c+dx)}\operatorname{arctanh}(\sin(c+dx))}{d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(A + B*Cos[c + d*x])/(Cos[c + d*x]^(3/2)*Sqrt[b*Cos[c + d*x]]),x]
```

```
[Out] (B*ArcTanh[Sin[c + d*x]]*Sqrt[Cos[c + d*x]])/(d*Sqrt[b*Cos[c + d*x]]) + (A*
Sin[c + d*x])/(d*Sqrt[Cos[c + d*x]]*Sqrt[b*Cos[c + d*x]])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 18

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m - 1/2
)*b^(n + 1/2)*(Sqrt[a*v]/Sqrt[b*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && ILtQ[n - 1/2, 0] && IntegerQ[m + n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int (A+B\cos(c+dx))\sec^2(c+dx)\,dx}{\sqrt{b\cos(c+dx)}}\\
&= \frac{\left(A\sqrt{\cos(c+dx)}\right)\int \sec^2(c+dx)\,dx}{\sqrt{b\cos(c+dx)}}+\frac{\left(B\sqrt{\cos(c+dx)}\right)\int \sec(c+dx)\,dx}{\sqrt{b\cos(c+dx)}}\\
&= \frac{B\operatorname{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{d\sqrt{b\cos(c+dx)}}-\frac{\left(A\sqrt{\cos(c+dx)}\right)\operatorname{Subst}\left(\int 1\,dx,x,-\tan(c+dx)\right)}{d\sqrt{b\cos(c+dx)}}\\
&= \frac{B\operatorname{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{d\sqrt{b\cos(c+dx)}}+\frac{A\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.74

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx = \frac{B\text{arctanh}(\sin(c+dx))\cos(c+dx)+A\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/(Cos[c + d*x]^(3/2)*Sqrt[b*Cos[c + d*x]]),x]
[Out] (B*ArcTanh[Sin[c + d*x]]*Cos[c + d*x] + A*Sin[c + d*x])/(d*Sqrt[Cos[c + d*x
]]*Sqrt[b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.03 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.84

method	result	size
default	$\frac{-2B\cos(dx+c)\,\text{arctanh}(\cot(dx+c)-\csc(dx+c))+A\sin(dx+c)}{d\sqrt{\cos(dx+c)b}\,\sqrt{\cos(dx+c)}}$	57
parts	$\frac{A\sin(dx+c)}{d\sqrt{\cos(dx+c)}\,\sqrt{\cos(dx+c)b}}-\frac{2B\,\text{arctanh}(\cot(dx+c)-\csc(dx+c))\left(\sqrt{\cos}(dx+c)\right)}{d\sqrt{\cos(dx+c)b}}$	71
risch	$\frac{i\,\mathrm{e}^{-i(dx+c)}A}{\sqrt{\cos(dx+c)b}\,\sqrt{\cos(dx+c)}\,d}+\frac{\left(\sqrt{\cos}(dx+c)\right)B\ln\left(\mathrm{e}^{i(dx+c)}+i\right)}{\sqrt{\cos(dx+c)b}\,d}-\frac{\left(\sqrt{\cos}(dx+c)\right)B\ln\left(\mathrm{e}^{i(dx+c)}-i\right)}{\sqrt{\cos(dx+c)b}\,d}$	109

```
[In] int((A+B*cos(d*x+c))/cos(d*x+c)^(3/2)/(cos(d*x+c)*b)^(1/2),x,method=_RETURN
VERBOSE)
[Out] 1/d*(-2*B*cos(d*x+c)*arctanh(cot(d*x+c)-csc(d*x+c))+A*sin(d*x+c))/(cos(d*x+
c)*b)^(1/2)/cos(d*x+c)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 211, normalized size of antiderivative = 3.10

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx$$
$$= \left[\frac{B\sqrt{b}\cos(dx+c)^2\log\left(-\frac{b\cos(dx+c)^3-2\sqrt{b\cos(dx+c)}\sqrt{b}\sqrt{\cos(dx+c)}\sin(dx+c)-2b\cos(dx+c)}{\cos(dx+c)^3}\right)+2\sqrt{b\cos(dx+c)}A\sqrt{c}}{2bd\cos(dx+c)^2}\right.$$
$$\left.-\frac{B\sqrt{-b}\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)\cos(dx+c)^2-\sqrt{b\cos(dx+c)}A\sqrt{\cos(dx+c)}\sin(dx+c)}{bd\cos(dx+c)^2}\right]$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(3/2)/(b*cos(d*x+c))^(1/2),x, algorit
hm="fricas")
```

```
[Out] [1/2*(B*sqrt(b)*cos(d*x + c)^2*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x +
c))*sqrt(b)*sqrt(cos(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x + c
)^3) + 2*sqrt(b*cos(d*x + c))*A*sqrt(cos(d*x + c))*sin(d*x + c))/(b*d*cos(d
*x + c)^2), -(B*sqrt(-b)*arctan(sqrt(b*cos(d*x + c))*sqrt(-b)*sin(d*x + c)/
(b*sqrt(cos(d*x + c))))*cos(d*x + c)^2 - sqrt(b*cos(d*x + c))*A*sqrt(cos(d*
x + c))*sin(d*x + c))/(b*d*cos(d*x + c)^2)]
```

Sympy [F]

$$\int \frac{A + B\cos(c + dx)}{\cos^{\frac{3}{2}}(c + dx)\sqrt{b\cos(c + dx)}}\,dx = \int \frac{A + B\cos(c + dx)}{\sqrt{b\cos(c + dx)}\cos^{\frac{3}{2}}(c + dx)}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)**(3/2)/(b*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral((A + B*cos(c + d*x))/(sqrt(b*cos(c + d*x))*cos(c + d*x)**(3/2)), x
)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 125 vs. $2(60) = 120$.

Time = 0.42 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.84

$$\int \frac{A + B\cos(c + dx)}{\cos^{\frac{3}{2}}(c + dx)\sqrt{b\cos(c + dx)}}\,dx = \frac{\frac{B\left(\log\left(\cos(dx+c)^2+\sin(dx+c)^2+2\sin(dx+c)+1\right)-\log\left(\cos(dx+c)^2+\sin(dx+c)^2-2\sin(dx+c)+1\right)\right)}{\sqrt{b}} + \frac{4A\sqrt{b}\sin(2dx+2c)}{b\cos(2dx+2c)^2+b\sin(2dx+2c)^2+2b}}{2d}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(3/2)/(b*cos(d*x+c))^(1/2),x, algorit
hm="maxima")
```

```
[Out] 1/2*(B*(log(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*sin(d*x + c) + 1) - log(cos
(d*x + c)^2 + sin(d*x + c)^2 - 2*sin(d*x + c) + 1))/sqrt(b) + 4*A*sqrt(b)*s
in(2*d*x + 2*c)/(b*cos(2*d*x + 2*c)^2 + b*sin(2*d*x + 2*c)^2 + 2*b*cos(2*d*
x + 2*c) + b))/d
```

Giac [F]

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx=\int \frac{B\cos\left(dx+c\right)+A}{\sqrt{b\cos\left(dx+c\right)}\cos\left(dx+c\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(3/2)/(b*cos(d*x+c))^(1/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)/(sqrt(b*cos(d*x + c))*cos(d*x + c)^(3/2)), x
)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx=\int \frac{A+B\,\cos\left(c+d\,x\right)}{{\cos\left(c+d\,x\right)}^{3/2}\,\sqrt{b\,\cos\left(c+d\,x\right)}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)^(3/2)*(b*cos(c + d*x))^(1/2)),x)
```

```
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)^(3/2)*(b*cos(c + d*x))^(1/2)), x)
```

3.871 $\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 107

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx = \frac{A\text{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{2d\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)}{2d\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}$$

```
[Out] 1/2*A*sin(d*x+c)/d/cos(d*x+c)^(3/2)/(b*cos(d*x+c))^(1/2)+B*sin(d*x+c)/d/cos
(d*x+c)^(1/2)/(b*cos(d*x+c))^(1/2)+1/2*A*arctanh(sin(d*x+c))*cos(d*x+c)^(1/
2)/d/(b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {18, 2827, 3853, 3855, 3852, 8}

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx = \frac{A\sqrt{\cos(c+dx)}\text{arctanh}(\sin(c+dx))}{2d\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)}{2d\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(A + B*Cos[c + d*x])/(Cos[c + d*x]^(5/2)*Sqrt[b*Cos[c + d*x]]),x]
```

```
[Out] (A*ArcTanh[Sin[c + d*x]]*Sqrt[Cos[c + d*x]])/(2*d*Sqrt[b*Cos[c + d*x]]) + (
A*Sin[c + d*x])/(2*d*Cos[c + d*x]^(3/2)*Sqrt[b*Cos[c + d*x]]) + (B*Sin[c +
d*x])/(d*Sqrt[Cos[c + d*x]]*Sqrt[b*Cos[c + d*x]])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 18

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m - 1/2
)*b^(n + 1/2)*(Sqrt[a*v]/Sqrt[b*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && ILtQ[n - 1/2, 0] && IntegerQ[m + n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int (A+B\cos(c+dx))\sec^3(c+dx)\,dx}{\sqrt{b\cos(c+dx)}}\\
&= \frac{\left(A\sqrt{\cos(c+dx)}\right)\int \sec^3(c+dx)\,dx}{\sqrt{b\cos(c+dx)}}+\frac{\left(B\sqrt{\cos(c+dx)}\right)\int \sec^2(c+dx)\,dx}{\sqrt{b\cos(c+dx)}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{A\sin(c+dx)}{2d\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{\left(A\sqrt{\cos(c+dx)}\right)\int \sec(c+dx)\,dx}{2\sqrt{b\cos(c+dx)}} \\
&\quad - \frac{\left(B\sqrt{\cos(c+dx)}\right)\text{Subst}(\int 1\,dx, x, -\tan(c+dx))}{d\sqrt{b\cos(c+dx)}} \\
&= \frac{A\text{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{2d\sqrt{b\cos(c+dx)}} \\
&\quad + \frac{A\sin(c+dx)}{2d\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.61

$$
\begin{aligned}
&\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx \\
&= \frac{A\text{arctanh}(\sin(c+dx))\cos^2(c+dx) + (A+2B\cos(c+dx))\sin(c+dx)}{2d\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}}
\end{aligned}
$$

```
[In] Integrate[(A + B*Cos[c + d*x])/(Cos[c + d*x]^(5/2)*Sqrt[b*Cos[c + d*x]]),x]
```

```
[Out] (A*ArcTanh[Sin[c + d*x]]*Cos[c + d*x]^2 + (A + 2*B*Cos[c + d*x])*Sin[c + d*
x])/(2*d*Cos[c + d*x]^(3/2)*Sqrt[b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.03 (sec) , antiderivative size = 103, normalized size of antiderivative = 0.96

method	result
default	$\frac{A\left(\cos^2(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)+1)-A\left(\cos^2(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)-1)+2B\sin(dx+c)\cos(dx+c)+A\sin(d}{2d\sqrt{\cos(dx+c)b}\,\cos(dx+c)^{\frac{3}{2}}}$
parts	$\frac{A\left(-\left(\cos^2(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)-1)+\left(\cos^2(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)+1)+\sin(dx+c)\right)}{2d\sqrt{\cos(dx+c)b}\,\cos(dx+c)^{\frac{3}{2}}} + \frac{B\sin(dx}{d\sqrt{\cos(dx+c)}\,\sqrt{}}$
risch	$-\frac{i\left(A\,e^{2i(dx+c)}-A-4B\cos(dx+c)\right)}{2\sqrt{\cos(dx+c)b}\,\sqrt{\cos(dx+c)}\,\left(e^{2i(dx+c)}+1\right)d} + \frac{\left(\sqrt{\cos}(dx+c)\right)A\ln\left(e^{i(dx+c)}+i\right)}{2\sqrt{\cos(dx+c)b}\,d} - \frac{\left(\sqrt{\cos}(dx+c)\right)A\ln\left(e^{i(dx+c)}-i\right)}{2\sqrt{\cos(dx+c)b}\,d}$

```
[In] int((A+B*cos(d*x+c))/cos(d*x+c)^(5/2)/(cos(d*x+c)*b)^(1/2),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/2/d*(A*cos(d*x+c)^2*ln(-cot(d*x+c)+csc(d*x+c)+1)-A*cos(d*x+c)^2*ln(-cot(d
*x+c)+csc(d*x+c)-1)+2*B*sin(d*x+c)*cos(d*x+c)+A*sin(d*x+c))/(cos(d*x+c)*b)^
(1/2)/cos(d*x+c)^(3/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 231, normalized size of antiderivative = 2.16

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx$$
$$=\left[\frac{A\sqrt{b}\cos(dx+c)^3\log\left(-\frac{b\cos(dx+c)^3-2\sqrt{b\cos(dx+c)}\sqrt{b}\sqrt{\cos(dx+c)}\sin(dx+c)-2b\cos(dx+c)}{\cos(dx+c)^3}\right)+2\,(2B\cos(dx+c)+A\right.}{4\,bd\cos(dx+c)^3}$$
$$-\frac{A\sqrt{-b}\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)\cos(dx+c)^3-(2B\cos(dx+c)+A)\sqrt{b\cos(dx+c)}\sqrt{\cos(dx-}}{2\,bd\cos(dx+c)^3}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(5/2)/(b*cos(d*x+c))^(1/2),x, algorit
hm="fricas")
```

```
[Out] [1/4*(A*sqrt(b)*cos(d*x + c)^3*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x +
c))*sqrt(b)*sqrt(cos(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x + c
)^3) + 2*(2*B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin
(d*x + c))/(b*d*cos(d*x + c)^3), -1/2*(A*sqrt(-b)*arctan(sqrt(b*cos(d*x + c
))*sqrt(-b)*sin(d*x + c)/(b*sqrt(cos(d*x + c))))*cos(d*x + c)^3 - (2*B*cos(
d*x + c) + A)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(b*d*co
s(d*x + c)^3)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx = \text{Timed out}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)**(5/2)/(b*cos(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 722 vs. $2(91) = 182$.

Time = 0.42 (sec) , antiderivative size = 722, normalized size of antiderivative = 6.75

$$\int \frac{A + B\cos(c + dx)}{\cos^{\frac{5}{2}}(c + dx)\sqrt{b\cos(c + dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(5/2)/(b*cos(d*x+c))^(1/2),x, algorit
hm="maxima")
```

```
[Out] 1/4*(8*B*sqrt(b)*sin(2*d*x + 2*c)/(b*cos(2*d*x + 2*c)^2 + b*sin(2*d*x + 2*c
)^2 + 2*b*cos(2*d*x + 2*c) + b) - (4*(sin(4*d*x + 4*c) + 2*sin(2*d*x + 2*c)
)*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 4*(sin(4*d*x + 4*c
) + 2*sin(2*d*x + 2*c))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
) - (2*(2*cos(2*d*x + 2*c) + 1)*cos(4*d*x + 4*c) + cos(4*d*x + 4*c)^2 + 4*c
os(2*d*x + 2*c)^2 + sin(4*d*x + 4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2*d*x + 2*c
) + 4*sin(2*d*x + 2*c)^2 + 4*cos(2*d*x + 2*c) + 1)*log(cos(1/2*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(
2*d*x + 2*c)))^2 + 2*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) +
 1) + (2*(2*cos(2*d*x + 2*c) + 1)*cos(4*d*x + 4*c) + cos(4*d*x + 4*c)^2 + 4
*cos(2*d*x + 2*c)^2 + sin(4*d*x + 4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2*d*x + 2
*c) + 4*sin(2*d*x + 2*c)^2 + 4*cos(2*d*x + 2*c) + 1)*log(cos(1/2*arctan2(si
n(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c)))^2 - 2*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
 + 1) - 4*(cos(4*d*x + 4*c) + 2*cos(2*d*x + 2*c) + 1)*sin(3/2*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c))) + 4*(cos(4*d*x + 4*c) + 2*cos(2*d*x + 2*c)
+ 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))))*A/((2*(2*cos(2*d
*x + 2*c) + 1)*cos(4*d*x + 4*c) + cos(4*d*x + 4*c)^2 + 4*cos(2*d*x + 2*c)^2
 + sin(4*d*x + 4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*sin(2*d*x +
 2*c)^2 + 4*cos(2*d*x + 2*c) + 1)*sqrt(b)))/d
```

Giac [F]

$$\int \frac{A + B\cos(c + dx)}{\cos^{\frac{5}{2}}(c + dx)\sqrt{b\cos(c + dx)}}\,dx = \int \frac{B\cos(dx + c) + A}{\sqrt{b\cos(dx + c)}\cos(dx + c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(5/2)/(b*cos(d*x+c))^(1/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)/(sqrt(b*cos(d*x + c))*cos(d*x + c)^(5/2)), x
)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A + B\cos(c + dx)}{\cos^{\frac{5}{2}}(c + dx)\sqrt{b\cos(c + dx)}}\,dx = \int \frac{A + B\,\cos\left(c + d\,x\right)}{{\cos\left(c + d\,x\right)}^{5/2}\,\sqrt{b\,\cos\left(c + d\,x\right)}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)^(5/2)*(b*cos(c + d*x))^(1/2)),x)
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)^(5/2)*(b*cos(c + d*x))^(1/2)), x)
```

3.872 $\int \frac{A+B\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 145

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx = \frac{B\text{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{2d\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)}{2d\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}} + \frac{A\sin^3(c+dx)}{3d\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}}$$

```
[Out] 1/2*B*sin(d*x+c)/d/cos(d*x+c)^(3/2)/(b*cos(d*x+c))^(1/2)+1/3*A*sin(d*x+c)^3
/d/cos(d*x+c)^(5/2)/(b*cos(d*x+c))^(1/2)+A*sin(d*x+c)/d/cos(d*x+c)^(1/2)/(b
*cos(d*x+c))^(1/2)+1/2*B*arctanh(sin(d*x+c))*cos(d*x+c)^(1/2)/d/(b*cos(d*x+
c))^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.152$, Rules used

= {18, 2827, 3852, 3853, 3855}

$$\int \frac{A + B\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx = \frac{A\sin^3(c+dx)}{3d\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}} + \frac{B\sqrt{\cos(c+dx)}\operatorname{arctanh}(\sin(c+dx))}{2d\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)}{2d\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(A + B*Cos[c + d*x])/(Cos[c + d*x]^(7/2)*Sqrt[b*Cos[c + d*x]]),x]
```

```
[Out] (B*ArcTanh[Sin[c + d*x]]*Sqrt[Cos[c + d*x]])/(2*d*Sqrt[b*Cos[c + d*x]]) + (
B*Sin[c + d*x])/(2*d*Cos[c + d*x]^(3/2)*Sqrt[b*Cos[c + d*x]]) + (A*Sin[c +
d*x])/(d*Sqrt[Cos[c + d*x]]*Sqrt[b*Cos[c + d*x]]) + (A*Sin[c + d*x]^3)/(3*d
*Cos[c + d*x]^(5/2)*Sqrt[b*Cos[c + d*x]])
```

Rule 18

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m - 1/2
)*b^(n + 1/2)*(Sqrt[a*v]/Sqrt[b*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && ILtQ[n - 1/2, 0] && IntegerQ[m + n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int(A+B\cos(c+dx))\sec^4(c+dx)\,dx}{\sqrt{b\cos(c+dx)}} \\
&= \frac{\left(A\sqrt{\cos(c+dx)}\right)\int\sec^4(c+dx)\,dx}{\sqrt{b\cos(c+dx)}}+\frac{\left(B\sqrt{\cos(c+dx)}\right)\int\sec^3(c+dx)\,dx}{\sqrt{b\cos(c+dx)}} \\
&= \frac{B\sin(c+dx)}{2d\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}}+\frac{\left(B\sqrt{\cos(c+dx)}\right)\int\sec(c+dx)\,dx}{2\sqrt{b\cos(c+dx)}} \\
&\quad-\frac{\left(A\sqrt{\cos(c+dx)}\right)\text{Subst}\left(\int\left(1+x^2\right)\,dx,x,-\tan(c+dx)\right)}{d\sqrt{b\cos(c+dx)}} \\
&= \frac{B\text{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{2d\sqrt{b\cos(c+dx)}}+\frac{B\sin(c+dx)}{2d\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}} \\
&\quad+\frac{A\sin(c+dx)}{d\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}+\frac{A\sin^3(c+dx)}{3d\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.52

$$\int\frac{A+B\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx$$
$$=\frac{3B\text{arctanh}(\sin(c+dx))\cos^2(c+dx)+3B\sin(c+dx)+2A(2+\cos(2(c+dx)))\tan(c+dx)}{6d\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/(Cos[c + d*x]^(7/2)*Sqrt[b*Cos[c + d*x]]),x]
[Out] (3*B*ArcTanh[Sin[c + d*x]]*Cos[c + d*x]^2 + 3*B*Sin[c + d*x] + 2*A*(2 + Cos
[2*(c + d*x)])*Tan[c + d*x])/(6*d*Cos[c + d*x]^(3/2)*Sqrt[b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.04 (sec) , antiderivative size = 122, normalized size of antiderivative = 0.84

method	result
default	$\frac{-3B(\cos^3(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)-1)+3B(\cos^3(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)+1)+4A\sin(dx+c)(\cos^2(dx+c))+3B}{6d\sqrt{\cos(dx+c)b}\,\cos(dx+c)^{\frac{5}{2}}}$
parts	$\frac{A(2(\cos^2(dx+c))+1)\sin(dx+c)}{3d\sqrt{\cos(dx+c)b}\,\cos(dx+c)^{\frac{5}{2}}}+\frac{B(-(\cos^2(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)-1)+(\cos^2(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)+1}{2d\sqrt{\cos(dx+c)b}\,\cos(dx+c)^{\frac{3}{2}}}$
risch	$-\frac{i(3B\,e^{4i(dx+c)}-3B-16A\cos(dx+c)-8iA\sin(dx+c))}{6\sqrt{\cos(dx+c)b}\,\sqrt{\cos(dx+c)}\,(e^{2i(dx+c)}+1)^2d}+\frac{(\sqrt{\cos}(dx+c))B\ln(e^{i(dx+c)}+i)}{2\sqrt{\cos(dx+c)b}\,d}-\frac{(\sqrt{\cos}(dx+c))B\ln(e^{i(dx+c)}-i)}{2\sqrt{\cos(dx+c)b}\,d}$

[In] int((A+B*cos(d*x+c))/cos(d*x+c)^(7/2)/(cos(d*x+c)*b)^(1/2),x,method=_RETURNVERBOSE)

[Out] 1/6/d*(-3*B*cos(d*x+c)^3*ln(-cot(d*x+c)+csc(d*x+c)-1)+3*B*cos(d*x+c)^3*ln(-cot(d*x+c)+csc(d*x+c)+1)+4*A*sin(d*x+c)*cos(d*x+c)^2+3*B*sin(d*x+c)*cos(d*x+c)+2*A*sin(d*x+c))/(cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(5/2)

Fricas [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 259, normalized size of antiderivative = 1.79

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx$$
$$=\left[\frac{3\,B\sqrt{b}\cos{(dx+c)}^4\log\left(-\frac{b\cos(dx+c)^3-2\sqrt{b\cos(dx+c)}\sqrt{b}\sqrt{\cos(dx+c)}\sin(dx+c)-2\,b\cos(dx+c)}{\cos(dx+c)^3}\right)+2\left(4\,A\cos{(dx+c)}^2+\right.}{12\,bd\cos{(dx+c)}^4}\right.$$
$$-\frac{3\,B\sqrt{-b}\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)\cos{(dx+c)}^4-\left(4\,A\cos{(dx+c)}^2+3\,B\cos{(dx+c)}+2\,A\right)\sqrt{b}}{6\,bd\cos{(dx+c)}^4}$$

[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(7/2)/(b*cos(d*x+c))^(1/2),x, algorithm="fricas")

[Out] [1/12*(3*B*sqrt(b)*cos(d*x + c)^4*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x + c))*sqrt(b)*sqrt(cos(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x + c)^3) + 2*(4*A*cos(d*x + c)^2 + 3*B*cos(d*x + c) + 2*A)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(b*d*cos(d*x + c)^4), -1/6*(3*B*sqrt(-b)*arctan(sqrt(b*cos(d*x + c))*sqrt(-b)*sin(d*x + c)/(b*sqrt(cos(d*x + c))))*cos(d*x + c)^4 - (4*A*cos(d*x + c)^2 + 3*B*cos(d*x + c) + 2*A)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(b*d*cos(d*x + c)^4)]

Sympy [F(-1)]

Timed out.

$$\int \frac{A + B\cos(c + dx)}{\cos^{\frac{7}{2}}(c + dx)\sqrt{b\cos(c + dx)}}\,dx = \text{Timed out}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)**(7/2)/(b*cos(d*x+c))**(1/2),x)
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 957 vs. 2(123) = 246.

Time = 0.42 (sec) , antiderivative size = 957, normalized size of antiderivative = 6.60

$$\int \frac{A + B\cos(c + dx)}{\cos^{\frac{7}{2}}(c + dx)\sqrt{b\cos(c + dx)}}\,dx = \text{Too large to display}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(7/2)/(b*cos(d*x+c))^(1/2),x, algorit
hm="maxima")
[Out] 1/12*(16*((3*cos(2*d*x + 2*c) + 1)*sin(6*d*x + 6*c) + 3*(3*cos(2*d*x + 2*c)
 + 1)*sin(4*d*x + 4*c) - 3*cos(6*d*x + 6*c)*sin(2*d*x + 2*c) - 9*cos(4*d*x
+ 4*c)*sin(2*d*x + 2*c))*A/((2*(3*cos(4*d*x + 4*c) + 3*cos(2*d*x + 2*c) + 1
)*cos(6*d*x + 6*c) + cos(6*d*x + 6*c)^2 + 6*(3*cos(2*d*x + 2*c) + 1)*cos(4*
d*x + 4*c) + 9*cos(4*d*x + 4*c)^2 + 9*cos(2*d*x + 2*c)^2 + 6*(sin(4*d*x + 4
*c) + sin(2*d*x + 2*c))*sin(6*d*x + 6*c) + sin(6*d*x + 6*c)^2 + 9*sin(4*d*x
 + 4*c)^2 + 18*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 9*sin(2*d*x + 2*c)^2 + 6
*cos(2*d*x + 2*c) + 1)*sqrt(b)) - 3*(4*(sin(4*d*x + 4*c) + 2*sin(2*d*x + 2*
c))*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 4*(sin(4*d*x + 4
*c) + 2*sin(2*d*x + 2*c))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c
))) - (2*(2*cos(2*d*x + 2*c) + 1)*cos(4*d*x + 4*c) + cos(4*d*x + 4*c)^2 + 4
*cos(2*d*x + 2*c)^2 + sin(4*d*x + 4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2*d*x + 2
*c) + 4*sin(2*d*x + 2*c)^2 + 4*cos(2*d*x + 2*c) + 1)*log(cos(1/2*arctan2(si
n(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c)))^2 + 2*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
 + 1) + (2*(2*cos(2*d*x + 2*c) + 1)*cos(4*d*x + 4*c) + cos(4*d*x + 4*c)^2 +
 4*cos(2*d*x + 2*c)^2 + sin(4*d*x + 4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2*d*x +
 2*c) + 4*sin(2*d*x + 2*c)^2 + 4*cos(2*d*x + 2*c) + 1)*log(cos(1/2*arctan2(
sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c),
cos(2*d*x + 2*c)))^2 - 2*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
)) + 1) - 4*(cos(4*d*x + 4*c) + 2*cos(2*d*x + 2*c) + 1)*sin(3/2*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c))) + 4*(cos(4*d*x + 4*c) + 2*cos(2*d*x + 2*c
) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))))*B/((2*(2*cos(2
*d*x + 2*c) + 1)*cos(4*d*x + 4*c) + cos(4*d*x + 4*c)^2 + 4*cos(2*d*x + 2*c)
```

```
^2 + sin(4*d*x + 4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*sin(2*d*x
 + 2*c)^2 + 4*cos(2*d*x + 2*c) + 1)*sqrt(b)))/d
```

Giac [F]

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx=\int \frac{B\cos(dx+c)+A}{\sqrt{b\cos(dx+c)}\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(7/2)/(b*cos(d*x+c))^(1/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)/(sqrt(b*cos(d*x + c))*cos(d*x + c)^(7/2)), x
)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{7}{2}}(c+dx)\sqrt{b\cos(c+dx)}}\,dx=\int \frac{A+B\cos(c+d\,x)}{\cos(c+d\,x)^{7/2}\,\sqrt{b\cos(c+d\,x)}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)^(7/2)*(b*cos(c + d*x))^(1/2)),x)
```

```
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)^(7/2)*(b*cos(c + d*x))^(1/2)), x)
```

3.873 $\int \frac{\cos^{\frac{7}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 148

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{Ax\sqrt{\cos(c+dx)}}{2b\sqrt{b\cos(c+dx)}} + \frac{B\sqrt{\cos(c+dx)}\sin(c+dx)}{bd\sqrt{b\cos(c+dx)}} + \frac{A\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2bd\sqrt{b\cos(c+dx)}} - \frac{B\sqrt{\cos(c+dx)}\sin^3(c+dx)}{3bd\sqrt{b\cos(c+dx)}}$$

```
[Out] 1/2*A*cos(d*x+c)^(3/2)*sin(d*x+c)/b/d/(b*cos(d*x+c))^(1/2)+1/2*A*x*cos(d*x+
c)^(1/2)/b/(b*cos(d*x+c))^(1/2)+B*sin(d*x+c)*cos(d*x+c)^(1/2)/b/d/(b*cos(d*
x+c))^(1/2)-1/3*B*sin(d*x+c)^3*cos(d*x+c)^(1/2)/b/d/(b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {17, 2827, 2715, 8, 2713}

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{Ax\sqrt{\cos(c+dx)}}{2b\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{2bd\sqrt{b\cos(c+dx)}} - \frac{B\sin^3(c+dx)\sqrt{\cos(c+dx)}}{3bd\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)\sqrt{\cos(c+dx)}}{bd\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^(7/2)*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (A*x*Sqrt[Cos[c + d*x]])/(2*b*Sqrt[b*Cos[c + d*x]]) + (B*Sqrt[Cos[c + d*x]]
*Sin[c + d*x])/(b*d*Sqrt[b*Cos[c + d*x]]) + (A*Cos[c + d*x]^(3/2)*Sin[c + d
*x])/(2*b*d*Sqrt[b*Cos[c + d*x]]) - (B*Sqrt[Cos[c + d*x]]*Sin[c + d*x]^3)/(
3*b*d*Sqrt[b*Cos[c + d*x]])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int \cos^2(c+dx)(A+B\cos(c+dx))\,dx}{b\sqrt{b\cos(c+dx)}} \\
&= \frac{\left(A\sqrt{\cos(c+dx)}\right)\int \cos^2(c+dx)\,dx}{b\sqrt{b\cos(c+dx)}}+\frac{\left(B\sqrt{\cos(c+dx)}\right)\int \cos^3(c+dx)\,dx}{b\sqrt{b\cos(c+dx)}}
\end{aligned}$$

$$= \frac{A\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2bd\sqrt{b\cos(c+dx)}} + \frac{\left(A\sqrt{\cos(c+dx)}\right)\int 1\,dx}{2b\sqrt{b\cos(c+dx)}} - \frac{\left(B\sqrt{\cos(c+dx)}\right)\text{Subst}\left(\int(1-x^2)\,dx, x, -\sin(c+dx)\right)}{bd\sqrt{b\cos(c+dx)}}$$

$$= \frac{Ax\sqrt{\cos(c+dx)}}{2b\sqrt{b\cos(c+dx)}} + \frac{B\sqrt{\cos(c+dx)}\sin(c+dx)}{bd\sqrt{b\cos(c+dx)}} + \frac{A\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2bd\sqrt{b\cos(c+dx)}} - \frac{B\sqrt{\cos(c+dx)}\sin^3(c+dx)}{3bd\sqrt{b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.50 (sec) , antiderivative size = 69, normalized size of antiderivative = 0.47

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{\cos^{\frac{3}{2}}(c+dx)(6Ac+6Adx+9B\sin(c+dx)+3A\sin(2(c+dx))+}{12d(b\cos(c+dx))^{3/2}}$$

```
[In] Integrate[(Cos[c + d*x]^(7/2)*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(3/2),
x]
```

```
[Out] (Cos[c + d*x]^(3/2)*(6*A*c + 6*A*d*x + 9*B*Sin[c + d*x] + 3*A*Sin[2*(c + d*
x)] + B*Sin[3*(c + d*x)]))/(12*d*(b*Cos[c + d*x])^(3/2))
```

Maple [A] (verified)

Time = 5.01 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.52

method	result	size
default	$\frac{(\sqrt{\cos}(dx+c))(2B\sin(dx+c)(\cos^2(dx+c))+3A\sin(dx+c)\cos(dx+c)+3A(dx+c)+4B\sin(dx+c))}{6bd\sqrt{\cos(dx+c)b}}$	77
parts	$\frac{A(\sqrt{\cos}(dx+c))(\cos(dx+c)\sin(dx+c)+dx+c)}{2db\sqrt{\cos(dx+c)b}}+\frac{B(2+\cos^2(dx+c))\sin(dx+c)(\sqrt{\cos}(dx+c))}{3db\sqrt{\cos(dx+c)b}}$	90
risch	$\frac{Ax(\sqrt{\cos}(dx+c))}{2b\sqrt{\cos(dx+c)b}}+\frac{3B\sin(dx+c)(\sqrt{\cos}(dx+c))}{4bd\sqrt{\cos(dx+c)b}}+\frac{(\sqrt{\cos}(dx+c))B\sin(3dx+3c)}{12b\sqrt{\cos(dx+c)b}\,d}+\frac{(\sqrt{\cos}(dx+c))A\sin(2dx+2c)}{4b\sqrt{\cos(dx+c)b}\,d}$	132

```
[In] int(cos(d*x+c)^(7/2)*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(3/2),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/6/b/d*cos(d*x+c)^(1/2)*(2*B*sin(d*x+c)*cos(d*x+c)^2+3*A*sin(d*x+c)*cos(d*
x+c)+3*A*(d*x+c)+4*B*sin(d*x+c))/(cos(d*x+c)*b)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 236, normalized size of antiderivative = 1.59

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \left[-\frac{3\,A\sqrt{-b}\cos\left(dx+c\right)\log\left(2\,b\cos\left(dx+c\right)^{2}+2\,\sqrt{b\cos\left(dx+c\right)}\sqrt{}\right.}{}\right.$$

```
[In] integrate(cos(d*x+c)^(7/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorit
hm="fricas")
```

```
[Out] [-1/12*(3*A*sqrt(-b)*cos(d*x + c)*log(2*b*cos(d*x + c)^2 + 2*sqrt(b*cos(d*x
 + c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) - 2*(2*B*cos(d*x + c)^
2 + 3*A*cos(d*x + c) + 4*B)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x
 + c))/(b^2*d*cos(d*x + c)), 1/6*(3*A*sqrt(b)*arctan(sqrt(b*cos(d*x + c))*s
in(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/2)))*cos(d*x + c) + (2*B*cos(d*x + c)^
2 + 3*A*cos(d*x + c) + 4*B)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x
 + c))/(b^2*d*cos(d*x + c))]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(7/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.42 (sec) , antiderivative size = 68, normalized size of antiderivative = 0.46

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{\frac{3\,(2\,dx+2\,c+\sin(2\,dx+2\,c))A}{b^{\frac{3}{2}}}+\frac{B\left(\sin(3\,dx+3\,c)+9\,\sin\left(\frac{1}{3}\,\arctan(\sin(3\,dx+3\,c),\cos(3\,dx+3\right.\right.}{b^{\frac{3}{2}}}}{12\,d}$$

```
[In] integrate(cos(d*x+c)^(7/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorit
hm="maxima")
```

```
[Out] 1/12*(3*(2*d*x + 2*c + sin(2*d*x + 2*c))*A/b^(3/2) + B*(sin(3*d*x + 3*c) +
9*sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))))/b^(3/2))/d
```

Giac [F]

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx=\int \frac{(B\cos(dx+c)+A)\cos(dx+c)^{\frac{7}{2}}}{(b\cos(dx+c))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(7/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^(7/2)/(b*cos(d*x + c))^(3/2), x
)
```

Mupad [B] (verification not implemented)

Time = 15.81 (sec) , antiderivative size = 95, normalized size of antiderivative = 0.64

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx=\frac{\sqrt{\cos(c+d\,x)}\,\sqrt{b\,\cos(c+d\,x)}\,(3\,A\,\sin(c+d\,x)+3\,A\,\sin(3\,c+}{12\,b^2\,d\,(c}$$

```
[In] int((cos(c + d*x)^(7/2)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(3/2),x)
```

```
[Out] (cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(1/2)*(3*A*sin(c + d*x) + 3*A*sin(3*c
+ 3*d*x) + 10*B*sin(2*c + 2*d*x) + B*sin(4*c + 4*d*x) + 12*A*d*x*cos(c + d*
x)))/(12*b^2*d*(cos(2*c + 2*d*x) + 1))
```

3.874 $\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 107

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{Bx\sqrt{\cos(c+dx)}}{2b\sqrt{b\cos(c+dx)}} + \frac{A\sqrt{\cos(c+dx)}\sin(c+dx)}{bd\sqrt{b\cos(c+dx)}} + \frac{B\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2bd\sqrt{b\cos(c+dx)}}$$

```
[Out] 1/2*B*cos(d*x+c)^(3/2)*sin(d*x+c)/b/d/(b*cos(d*x+c))^(1/2)+1/2*B*x*cos(d*x+
c)^(1/2)/b/(b*cos(d*x+c))^(1/2)+A*sin(d*x+c)*cos(d*x+c)^(1/2)/b/d/(b*cos(d*
x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.061, Rules used = {17, 2813}

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{A\sin(c+dx)\sqrt{\cos(c+dx)}}{bd\sqrt{b\cos(c+dx)}} + \frac{Bx\sqrt{\cos(c+dx)}}{2b\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{2bd\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^(5/2)*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (B*x*Sqrt[Cos[c + d*x]])/(2*b*Sqrt[b*Cos[c + d*x]]) + (A*Sqrt[Cos[c + d*x]]
*Sin[c + d*x])/(b*d*Sqrt[b*Cos[c + d*x]]) + (B*Cos[c + d*x]^(3/2)*Sin[c + d
*x])/(2*b*d*Sqrt[b*Cos[c + d*x]])
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int\cos(c+dx)(A+B\cos(c+dx))\,dx}{b\sqrt{b\cos(c+dx)}}\\ &= \frac{Bx\sqrt{\cos(c+dx)}}{2b\sqrt{b\cos(c+dx)}}+\frac{A\sqrt{\cos(c+dx)}\sin(c+dx)}{bd\sqrt{b\cos(c+dx)}}+\frac{B\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2bd\sqrt{b\cos(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.53

$$\int\frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx=\frac{\cos^{\frac{3}{2}}(c+dx)(4A\sin(c+dx)+B(2(c+dx)+\sin(2(c+dx))))}{4d(b\cos(c+dx))^{3/2}}$$

```
[In] Integrate[(Cos[c + d*x]^(5/2)*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(3/2),
x]
[Out] (Cos[c + d*x]^(3/2)*(4*A*Sin[c + d*x] + B*(2*(c + d*x) + Sin[2*(c + d*x)]))
)/(4*d*(b*Cos[c + d*x])^(3/2))
```

Maple [A] (verified)

Time = 4.95 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.54

method	result	size
default	$\frac{\left(\sqrt{\cos}(dx+c)\right)\left(B\sin(dx+c)\cos(dx+c)+2A\sin(dx+c)+B(dx+c)\right)}{2bd\sqrt{\cos(dx+c)b}}$	58
parts	$\frac{A\sin(dx+c)\left(\sqrt{\cos}(dx+c)\right)}{bd\sqrt{\cos(dx+c)b}}+\frac{B\left(\sqrt{\cos}(dx+c)\right)\left(\cos(dx+c)\sin(dx+c)+dx+c\right)}{2db\sqrt{\cos(dx+c)b}}$	79
risch	$\frac{Bx\left(\sqrt{\cos}(dx+c)\right)}{2b\sqrt{\cos(dx+c)b}}+\frac{A\sin(dx+c)\left(\sqrt{\cos}(dx+c)\right)}{bd\sqrt{\cos(dx+c)b}}+\frac{\left(\sqrt{\cos}(dx+c)\right)B\sin(2dx+2c)}{4b\sqrt{\cos(dx+c)b}\,d}$	95

```
[In] int(cos(d*x+c)^(5/2)*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(3/2),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/2/b/d*cos(d*x+c)^(1/2)*(B*sin(d*x+c)*cos(d*x+c)+2*A*sin(d*x+c)+B*(d*x+c))
/(cos(d*x+c)*b)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 210, normalized size of antiderivative = 1.96

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \left[-\frac{B\sqrt{-b}\cos\left(dx+c\right)\log\left(2\,b\cos\left(dx+c\right)^{2}+2\,\sqrt{b\cos\left(dx+c\right)}\sqrt{-}\right.}{}\right.$$

```
[In] integrate(cos(d*x+c)^(5/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorit
hm="fricas")
```

```
[Out] [-1/4*(B*sqrt(-b)*cos(d*x + c)*log(2*b*cos(d*x + c)^2 + 2*sqrt(b*cos(d*x +
c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) - 2*(B*cos(d*x + c) + 2*A
)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(b^2*d*cos(d*x + c)
), 1/2*(B*sqrt(b)*arctan(sqrt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x
 + c)^(3/2)))*cos(d*x + c) + (B*cos(d*x + c) + 2*A)*sqrt(b*cos(d*x + c))*sq
rt(cos(d*x + c))*sin(d*x + c))/(b^2*d*cos(d*x + c))]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.41 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.37

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{\frac{(2\,dx+2\,c+\sin(2\,dx+2\,c))B}{b^{\frac{3}{2}}}+\frac{4\,A\sin(dx+c)}{b^{\frac{3}{2}}}}{4\,d}$$

```
[In] integrate(cos(d*x+c)^(5/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorit
hm="maxima")
```

```
[Out] 1/4*((2*d*x + 2*c + sin(2*d*x + 2*c))*B/b^(3/2) + 4*A*sin(d*x + c)/b^(3/2))
/d
```

Giac [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^{\frac{5}{2}}}{(b\cos(dx+c))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^(5/2)/(b*cos(d*x + c))^(3/2), x
)
```

Mupad [B] (verification not implemented)

Time = 0.83 (sec) , antiderivative size = 82, normalized size of antiderivative = 0.77

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{\sqrt{\cos(c+d\,x)}\,\sqrt{b\,\cos(c+d\,x)}\,(B\,\sin(c+d\,x)+4\,A\,\sin(2\,c+2}{4\,b^2\,d\,(\cos(2\,c+2\,d\,x)}$$

```
[In] int((cos(c + d*x)^(5/2)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(3/2),x)
```

```
[Out] (cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(1/2)*(B*sin(c + d*x) + 4*A*sin(2*c +
2*d*x) + B*sin(3*c + 3*d*x) + 4*B*d*x*cos(c + d*x)))/(4*b^2*d*(cos(2*c + 2*
d*x) + 1))
```

3.875 $\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 65

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{Ax\sqrt{\cos(c+dx)}}{b\sqrt{b\cos(c+dx)}} + \frac{B\sqrt{\cos(c+dx)}\sin(c+dx)}{bd\sqrt{b\cos(c+dx)}}$$

```
[Out] A*x*cos(d*x+c)^(1/2)/b/(b*cos(d*x+c))^(1/2)+B*sin(d*x+c)*cos(d*x+c)^(1/2)/b
/d/(b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.061$, Rules used = {17, 2717}

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{Ax\sqrt{\cos(c+dx)}}{b\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)\sqrt{\cos(c+dx)}}{bd\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^(3/2)*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (A*x*Sqrt[Cos[c + d*x]])/(b*Sqrt[b*Cos[c + d*x]]) + (B*Sqrt[Cos[c + d*x]]*S
in[c + d*x])/(b*d*Sqrt[b*Cos[c + d*x]])
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] && !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2717

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int(A+B\cos(c+dx))\,dx}{b\sqrt{b\cos(c+dx)}} \\
&= \frac{Ax\sqrt{\cos(c+dx)}}{b\sqrt{b\cos(c+dx)}} + \frac{\left(B\sqrt{\cos(c+dx)}\right)\int\cos(c+dx)\,dx}{b\sqrt{b\cos(c+dx)}} \\
&= \frac{Ax\sqrt{\cos(c+dx)}}{b\sqrt{b\cos(c+dx)}} + \frac{B\sqrt{\cos(c+dx)}\sin(c+dx)}{bd\sqrt{b\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.65

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{\cos^{\frac{3}{2}}(c+dx)(A(c+dx)+B\sin(c+dx))}{d(b\cos(c+dx))^{3/2}}$$

```
[In] Integrate[(Cos[c + d*x]^(3/2)*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(3/2),
x]
[Out] (Cos[c + d*x]^(3/2)*(A*(c + d*x) + B*Sin[c + d*x]))/(d*(b*Cos[c + d*x])^(3/
2))
```

Maple [A] (verified)

Time = 4.90 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.65

method	result	size
default	$\frac{\left(\sqrt{\cos}(dx+c)\right)(A(dx+c)+B\sin(dx+c))}{bd\sqrt{\cos(dx+c)b}}$	42
risch	$\frac{Ax\left(\sqrt{\cos}(dx+c)\right)}{b\sqrt{\cos(dx+c)b}}+\frac{B\sin(dx+c)\left(\sqrt{\cos}(dx+c)\right)}{bd\sqrt{\cos(dx+c)b}}$	58
parts	$\frac{A\left(\sqrt{\cos}(dx+c)\right)(dx+c)}{db\sqrt{\cos(dx+c)b}}+\frac{B\sin(dx+c)\left(\sqrt{\cos}(dx+c)\right)}{bd\sqrt{\cos(dx+c)b}}$	65

```
[In] int(cos(d*x+c)^(3/2)*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(3/2),x,method=_RETURN
VERBOSE)
[Out] 1/b/d*cos(d*x+c)^(1/2)*(A*(d*x+c)+B*sin(d*x+c))/(cos(d*x+c)*b)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 187, normalized size of antiderivative = 2.88

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \left[-\frac{A\sqrt{-b}\cos(dx+c)\log\left(2\,b\cos(dx+c)^2+2\,\sqrt{b\cos(dx+c)}\sqrt{-\right.}}{}\right.$$

```
[In] integrate(cos(d*x+c)^(3/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorit
hm="fricas")
```

```
[Out] [-1/2*(A*sqrt(-b)*cos(d*x + c)*log(2*b*cos(d*x + c)^2 + 2*sqrt(b*cos(d*x +
c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) - 2*sqrt(b*cos(d*x + c))*
B*sqrt(cos(d*x + c))*sin(d*x + c))/(b^2*d*cos(d*x + c)), (A*sqrt(b)*arctan(
sqrt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/2)))*cos(d*x + c
) + sqrt(b*cos(d*x + c))*B*sqrt(cos(d*x + c))*sin(d*x + c))/(b^2*d*cos(d*x
+ c))]
```

Sympy [A] (verification not implemented)

Time = 36.76 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.23

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \begin{cases} \frac{Ax\cos^{\frac{3}{2}}(c+dx)}{(b\cos(c+dx))^{\frac{3}{2}}} + \frac{B\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{d(b\cos(c+dx))^{\frac{3}{2}}} & \text{for } d \neq 0 \\ \frac{x(A+B\cos(c))\cos^{\frac{3}{2}}(c)}{(b\cos(c))^{\frac{3}{2}}} & \text{otherwise} \end{cases}$$

```
[In] integrate(cos(d*x+c)**(3/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(3/2),x)
```

```
[Out] Piecewise((A*x*cos(c + d*x)**(3/2)/(b*cos(c + d*x))**(3/2) + B*sin(c + d*x)
*cos(c + d*x)**(3/2)/(d*(b*cos(c + d*x))**(3/2)), Ne(d, 0)), (x*(A + B*cos(
c))*cos(c)**(3/2)/(b*cos(c))**(3/2), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.62

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{\frac{2\,A\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{b^{\frac{3}{2}}} + \frac{B\sin(dx+c)}{b^{\frac{3}{2}}}}{d}$$

```
[In] integrate(cos(d*x+c)^(3/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorit
hm="maxima")
```

```
[Out] (2*A*arctan(sin(d*x + c)/(cos(d*x + c) + 1))/b^(3/2) + B*sin(d*x + c)/b^(3/
2))/d
```

Giac [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^{\frac{3}{2}}}{(b\cos(dx+c))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^(3/2)/(b*cos(d*x + c))^(3/2), x
)
```

Mupad [B] (verification not implemented)

Time = 0.51 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.94

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{\sqrt{\cos(c+d\,x)}\,\sqrt{b\,\cos(c+d\,x)}\,(B\,\sin(2\,c+2\,d\,x)+2\,A\,d\,x\,\cos(}{b^2\,d\,(\cos(2\,c+2\,d\,x)+1)}$$

```
[In] int((cos(c + d*x)^(3/2)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(3/2),x)
```

```
[Out] (cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(1/2)*(B*sin(2*c + 2*d*x) + 2*A*d*x*co
s(c + d*x)))/(b^2*d*(cos(2*c + 2*d*x) + 1))
```

3.876 $\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 66

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{Bx\sqrt{\cos(c+dx)}}{b\sqrt{b\cos(c+dx)}} + \frac{A\text{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{bd\sqrt{b\cos(c+dx)}}$$

```
[Out] B*x*cos(d*x+c)^(1/2)/b/(b*cos(d*x+c))^(1/2)+A*arctanh(sin(d*x+c))*cos(d*x+c
)^(1/2)/b/d/(b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {17, 2814, 3855}

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{A\sqrt{\cos(c+dx)}\text{arctanh}(\sin(c+dx))}{bd\sqrt{b\cos(c+dx)}} + \frac{Bx\sqrt{\cos(c+dx)}}{b\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(Sqrt[Cos[c + d*x]]*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(3/2),x]
```

```
[Out] (B*x*Sqrt[Cos[c + d*x]])/(b*Sqrt[b*Cos[c + d*x]]) + (A*ArcTanh[Sin[c + d*x]
]*Sqrt[Cos[c + d*x]])/(b*d*Sqrt[b*Cos[c + d*x]])
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int (A+B\cos(c+dx))\sec(c+dx)\,dx}{b\sqrt{b\cos(c+dx)}}\\ &= \frac{Bx\sqrt{\cos(c+dx)}}{b\sqrt{b\cos(c+dx)}}+\frac{\left(A\sqrt{\cos(c+dx)}\right)\int \sec(c+dx)\,dx}{b\sqrt{b\cos(c+dx)}}\\ &= \frac{Bx\sqrt{\cos(c+dx)}}{b\sqrt{b\cos(c+dx)}}+\frac{A\text{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{bd\sqrt{b\cos(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.61

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx=\frac{(Bdx+A\text{arctanh}(\sin(c+dx)))\cos^{\frac{3}{2}}(c+dx)}{d(b\cos(c+dx))^{3/2}}$$

```
[In] Integrate[(Sqrt[Cos[c + d*x]]*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(3/2),
x]
```

```
[Out] ((B*d*x + A*ArcTanh[Sin[c + d*x]])*Cos[c + d*x]^(3/2))/(d*(b*Cos[c + d*x])^
(3/2))
```

Maple [A] (verified)

Time = 5.21 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.83

method	result	size
default	$-\frac{\left(2 A \operatorname{arctanh}\left(\cot \left(d x+c\right)-\csc \left(d x+c\right)\right)-B \left(d x+c\right)\right) \left(\sqrt{\cos}\left(d x+c\right)\right)}{b d \sqrt{\cos \left(d x+c\right) b}}$	55
parts	$-\frac{2 A \left(\sqrt{\cos}\left(d x+c\right)\right) \operatorname{arctanh}\left(\cot \left(d x+c\right)-\csc \left(d x+c\right)\right)}{d \sqrt{\cos \left(d x+c\right) b}\, b}+\frac{B \left(\sqrt{\cos}\left(d x+c\right)\right) \left(d x+c\right)}{d b \sqrt{\cos \left(d x+c\right) b}}$	76
risch	$\frac{B x \left(\sqrt{\cos}\left(d x+c\right)\right)}{b \sqrt{\cos \left(d x+c\right) b}}+\frac{\left(\sqrt{\cos}\left(d x+c\right)\right) A \ln \left({\mathrm e}^{i \left(d x+c\right)}+i\right)}{b \sqrt{\cos \left(d x+c\right) b}\, d}-\frac{\left(\sqrt{\cos}\left(d x+c\right)\right) A \ln \left({\mathrm e}^{i \left(d x+c\right)}-i\right)}{b \sqrt{\cos \left(d x+c\right) b}\, d}$	105

```
[In] int(cos(d*x+c)^(1/2)*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(3/2),x,method=_RETURN
VERBOSE)
```

```
[Out] -1/b/d*(2*A*arctanh(cot(d*x+c)-csc(d*x+c))-B*(d*x+c))*cos(d*x+c)^(1/2)/(cos
(d*x+c)*b)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.38 (sec) , antiderivative size = 215, normalized size of antiderivative = 3.26

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \left[-\frac{2\,A\sqrt{-b}\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)+B\sqrt{-b}\log\left(2\,b\cos\right.}{2}\right.$$

```
[In] integrate(cos(d*x+c)^(1/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorit
hm="fricas")
```

```
[Out] [-1/2*(2*A*sqrt(-b)*arctan(sqrt(b*cos(d*x + c))*sqrt(-b)*sin(d*x + c)/(b*sq
rt(cos(d*x + c)))) + B*sqrt(-b)*log(2*b*cos(d*x + c)^2 + 2*sqrt(b*cos(d*x +
 c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b))/(b^2*d), 1/2*(2*B*sqrt(
b)*arctan(sqrt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/2))) +
 A*sqrt(b)*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x + c))*sqrt(b)*sqrt(cos
(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x + c)^3))/(b^2*d)]
```

Sympy [F]

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{(A+B\cos{(c+dx)})\sqrt{\cos{(c+dx)}}}{(b\cos{(c+dx)})^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)**(1/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(3/2),x)
```

```
[Out] Integral((A + B*cos(c + d*x))*sqrt(cos(c + d*x))/(b*cos(c + d*x))**(3/2), x
)
```

Maxima [A] (verification not implemented)

none

Time = 0.38 (sec) , antiderivative size = 92, normalized size of antiderivative = 1.39

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \frac{\frac{A\left(\log\left(\cos(dx+c)^2+\sin(dx+c)^2+2\sin(dx+c)+1\right)-\log\left(\cos(dx+c)^2+\sin(dx+c)^2-2\sin\right.\right.}{b^{\frac{3}{2}}}}{2\,d}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorit
hm="maxima")
```

```
[Out] 1/2*(A*(log(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*sin(d*x + c) + 1) - log(cos
(d*x + c)^2 + sin(d*x + c)^2 - 2*sin(d*x + c) + 1))/b^(3/2) + 4*B*arctan(si
n(d*x + c)/(cos(d*x + c) + 1))/b^(3/2))/d
```

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{(B\cos{(dx+c)}+A)\sqrt{\cos{(dx+c)}}}{(b\cos{(dx+c)})^{\frac{3}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(3/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*sqrt(cos(d*x + c))/(b*cos(d*x + c))^(3/2), x
)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{(b\cos(c+dx))^{3/2}}\,dx = \int \frac{\sqrt{\cos\left(c+d\,x\right)}\,\left(A+B\,\cos\left(c+d\,x\right)\right)}{{\left(b\,\cos\left(c+d\,x\right)\right)}^{3/2}}\,dx$$

```
[In] int((cos(c + d*x)^(1/2)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(3/2),x)
[Out] int((cos(c + d*x)^(1/2)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(3/2), x)
```

3.877 $\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}(b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 74

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}(b\cos(c+dx))^{3/2}}\,dx = \frac{B\text{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{bd\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)}{bd\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}$$

```
[Out] A*sin(d*x+c)/b/d/cos(d*x+c)^(1/2)/(b*cos(d*x+c))^(1/2)+B*arctanh(sin(d*x+c)
)*cos(d*x+c)^(1/2)/b/d/(b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 74, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {18, 2827, 3852, 8, 3855}

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}(b\cos(c+dx))^{3/2}}\,dx = \frac{A\sin(c+dx)}{bd\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}} + \frac{B\sqrt{\cos(c+dx)}\text{arctanh}(\sin(c+dx))}{bd\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(A + B*Cos[c + d*x])/(Sqrt[Cos[c + d*x]]*(b*Cos[c + d*x])^(3/2)),x]
```

```
[Out] (B*ArcTanh[Sin[c + d*x]]*Sqrt[Cos[c + d*x]])/(b*d*Sqrt[b*Cos[c + d*x]]) + (
A*Sin[c + d*x])/(b*d*Sqrt[Cos[c + d*x]]*Sqrt[b*Cos[c + d*x]])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 18

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m - 1/2
)*b^(n + 1/2)*(Sqrt[a*v]/Sqrt[b*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && ILtQ[n - 1/2, 0] && IntegerQ[m + n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int (A+B\cos(c+dx))\sec^2(c+dx)\,dx}{b\sqrt{b\cos(c+dx)}}\\
&= \frac{\left(A\sqrt{\cos(c+dx)}\right)\int \sec^2(c+dx)\,dx}{b\sqrt{b\cos(c+dx)}}+\frac{\left(B\sqrt{\cos(c+dx)}\right)\int \sec(c+dx)\,dx}{b\sqrt{b\cos(c+dx)}}\\
&= \frac{B\operatorname{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{bd\sqrt{b\cos(c+dx)}}-\frac{\left(A\sqrt{\cos(c+dx)}\right)\operatorname{Subst}\left(\int 1\,dx,x,-\tan(c+dx)\right)}{bd\sqrt{b\cos(c+dx)}}\\
&= \frac{B\operatorname{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{bd\sqrt{b\cos(c+dx)}}+\frac{A\sin(c+dx)}{bd\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.68

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}(b\cos(c+dx))^{3/2}}\,dx=\frac{\sqrt{\cos(c+dx)}(B\text{arctanh}(\sin(c+dx))\cos(c+dx)+A\sin(c+dx))}{d(b\cos(c+dx))^{3/2}}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/(Sqrt[Cos[c + d*x]]*(b*Cos[c + d*x])^(3/2)),
x]
[Out] (Sqrt[Cos[c + d*x]]*(B*ArcTanh[Sin[c + d*x]]*Cos[c + d*x] + A*Sin[c + d*x])
)/(d*(b*Cos[c + d*x])^(3/2))
```

Maple [A] (verified)

Time = 5.05 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.81

method	result	size
default	$\frac{-2B\cos(dx+c)\,\text{arctanh}(\cot(dx+c)-\csc(dx+c))+A\sin(dx+c)}{bd\sqrt{\cos(dx+c)b}\,\sqrt{\cos(dx+c)}}$	60
parts	$\frac{A\sin(dx+c)}{bd\sqrt{\cos(dx+c)}\,\sqrt{\cos(dx+c)b}}-\frac{2B\left(\sqrt{\cos}(dx+c)\right)\text{arctanh}(\cot(dx+c)-\csc(dx+c))}{d\sqrt{\cos(dx+c)b}\,b}$	77
risch	$\frac{i\mathrm{e}^{-i(dx+c)}A}{b\sqrt{\cos(dx+c)b}\,\sqrt{\cos(dx+c)}\,d}+\frac{\left(\sqrt{\cos}(dx+c)\right)B\ln\left(\mathrm{e}^{i(dx+c)}+i\right)}{b\sqrt{\cos(dx+c)b}\,d}-\frac{\left(\sqrt{\cos}(dx+c)\right)B\ln\left(\mathrm{e}^{i(dx+c)}-i\right)}{b\sqrt{\cos(dx+c)b}\,d}$	118

```
[In] int((A+B*cos(d*x+c))/cos(d*x+c)^(1/2)/(cos(d*x+c)*b)^(3/2),x,method=_RETURN
VERBOSE)
[Out] 1/b/d*(-2*B*cos(d*x+c)*arctanh(cot(d*x+c)-csc(d*x+c))+A*sin(d*x+c))/(cos(d*
x+c)*b)^(1/2)/cos(d*x+c)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 211, normalized size of antiderivative = 2.85

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}(b\cos(c+dx))^{3/2}}\,dx=\left[\frac{B\sqrt{b}\cos\left(dx+c\right)^{2}\log\left(-\frac{b\cos(dx+c)^{3}-2\sqrt{b\cos(dx+c)}\sqrt{b}\sqrt{\cos(dx+c)}\sin(dx+c)}{\cos(dx+c)^{3}}\right.}{2\,b^{2}d\cos\left(d\right.}\right.$$
$$\left.-\frac{B\sqrt{-b}\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)\cos\left(dx+c\right)^{2}-\sqrt{b\cos\left(dx+c\right)}A\sqrt{\cos\left(dx+c\right)}\sin\left(dx+c\right)}{b^{2}d\cos\left(dx+c\right)^{2}}\right]$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(1/2)/(b*cos(d*x+c))^(3/2),x, algorit
hm="fricas")
```

```
[Out] [1/2*(B*sqrt(b)*cos(d*x + c)^2*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x +
c))*sqrt(b)*sqrt(cos(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x + c
)^3) + 2*sqrt(b*cos(d*x + c))*A*sqrt(cos(d*x + c))*sin(d*x + c))/(b^2*d*cos
(d*x + c)^2), -(B*sqrt(-b)*arctan(sqrt(b*cos(d*x + c))*sqrt(-b)*sin(d*x + c
)/(b*sqrt(cos(d*x + c))))*cos(d*x + c)^2 - sqrt(b*cos(d*x + c))*A*sqrt(cos(
d*x + c))*sin(d*x + c))/(b^2*d*cos(d*x + c)^2)]
```

Sympy [F]

$$\int \frac{A + B\cos(c + dx)}{\sqrt{\cos(c + dx)}(b\cos(c + dx))^{3/2}}\,dx = \int \frac{A + B\cos(c + dx)}{(b\cos(c + dx))^{\frac{3}{2}}\sqrt{\cos(c + dx)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)**(1/2)/(b*cos(d*x+c))**(3/2),x)
```

```
[Out] Integral((A + B*cos(c + d*x))/((b*cos(c + d*x))**(3/2)*sqrt(cos(c + d*x))),
 x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 133 vs. $2(66) = 132$.

Time = 0.41 (sec) , antiderivative size = 133, normalized size of antiderivative = 1.80

$$\int \frac{A + B\cos(c + dx)}{\sqrt{\cos(c + dx)}(b\cos(c + dx))^{3/2}}\,dx = \frac{\frac{4A\sqrt{b}\sin(2dx+2c)}{b^2\cos(2dx+2c)^2+b^2\sin(2dx+2c)^2+2b^2\cos(2dx+2c)+b^2} + \frac{B\left(\log\left(\cos(dx+c)^2+\sin(dx+c\right.\right.}{}}{2d}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(1/2)/(b*cos(d*x+c))^(3/2),x, algorit
hm="maxima")
```

```
[Out] 1/2*(4*A*sqrt(b)*sin(2*d*x + 2*c)/(b^2*cos(2*d*x + 2*c)^2 + b^2*sin(2*d*x +
 2*c)^2 + 2*b^2*cos(2*d*x + 2*c) + b^2) + B*(log(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*sin(d*x + c) + 1) - log(cos(d*x + c)^2 + sin(d*x + c)^2 - 2*sin(d
*x + c) + 1))/b^(3/2))/d
```

Giac [F]

$$\int \frac{A + B\cos(c + dx)}{\sqrt{\cos(c + dx)}(b\cos(c + dx))^{3/2}}\,dx = \int \frac{B\cos(dx + c) + A}{(b\cos(dx + c))^{\frac{3}{2}}\sqrt{\cos(dx + c)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(1/2)/(b*cos(d*x+c))^(3/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)/((b*cos(d*x + c))^(3/2)*sqrt(cos(d*x + c))),
 x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}(b\cos(c+dx))^{3/2}}\,dx=\int \frac{A+B\,\cos\left(c+d\,x\right)}{\sqrt{\cos\left(c+d\,x\right)}\,{\left(b\,\cos\left(c+d\,x\right)\right)}^{3/2}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(3/2)),x)
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(3/2)), x)
```

3.878 $\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 116

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{3/2}}\,dx = \frac{A\text{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{2bd\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)}{2bd\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)}{bd\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}$$

```
[Out] 1/2*A*sin(d*x+c)/b/d/cos(d*x+c)^(3/2)/(b*cos(d*x+c))^(1/2)+B*sin(d*x+c)/b/d
/cos(d*x+c)^(1/2)/(b*cos(d*x+c))^(1/2)+1/2*A*arctanh(sin(d*x+c))*cos(d*x+c)
^(1/2)/b/d/(b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {18, 2827, 3853, 3855, 3852, 8}

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{3/2}}\,dx = \frac{A\sqrt{\cos(c+dx)}\text{arctanh}(\sin(c+dx))}{2bd\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)}{2bd\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)}{bd\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(A + B*Cos[c + d*x])/(Cos[c + d*x]^(3/2)*(b*Cos[c + d*x])^(3/2)),x]
```

```
[Out] (A*ArcTanh[Sin[c + d*x]]*Sqrt[Cos[c + d*x]])/(2*b*d*Sqrt[b*Cos[c + d*x]]) +
 (A*Sin[c + d*x])/(2*b*d*Cos[c + d*x]^(3/2)*Sqrt[b*Cos[c + d*x]]) + (B*Sin[
c + d*x])/(b*d*Sqrt[Cos[c + d*x]]*Sqrt[b*Cos[c + d*x]])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 18

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m - 1/2
)*b^(n + 1/2)*(Sqrt[a*v]/Sqrt[b*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && ILtQ[n - 1/2, 0] && IntegerQ[m + n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int(A+B\cos(c+dx))\sec^3(c+dx)\,dx}{b\sqrt{b\cos(c+dx)}}\\
&= \frac{\left(A\sqrt{\cos(c+dx)}\right)\int\sec^3(c+dx)\,dx}{b\sqrt{b\cos(c+dx)}}+\frac{\left(B\sqrt{\cos(c+dx)}\right)\int\sec^2(c+dx)\,dx}{b\sqrt{b\cos(c+dx)}}\\
&= \frac{A\sin(c+dx)}{2bd\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}}+\frac{\left(A\sqrt{\cos(c+dx)}\right)\int\sec(c+dx)\,dx}{2b\sqrt{b\cos(c+dx)}}\\
&\quad-\frac{\left(B\sqrt{\cos(c+dx)}\right)\text{Subst}\left(\int 1\,dx,x,-\tan(c+dx)\right)}{bd\sqrt{b\cos(c+dx)}}
\end{aligned}$$

$$= \frac{A\text{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{2bd\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)}{2bd\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)}{bd\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.56

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{3/2}}\,dx = \frac{A\text{arctanh}(\sin(c+dx))\cos^2(c+dx)+(A+2B\cos(c+dx))\sin(c+dx)}{2d\sqrt{\cos(c+dx)}(b\cos(c+dx))^{3/2}}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/(Cos[c + d*x]^(3/2)*(b*Cos[c + d*x])^(3/2)),
x]
```

```
[Out] (A*ArcTanh[Sin[c + d*x]]*Cos[c + d*x]^2 + (A + 2*B*Cos[c + d*x])*Sin[c + d*
x])/(2*d*Sqrt[Cos[c + d*x]]*(b*Cos[c + d*x])^(3/2))
```

Maple [A] (verified)

Time = 4.84 (sec) , antiderivative size = 106, normalized size of antiderivative = 0.91

method	result
default	$\frac{A(\cos^2(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)+1)-A(\cos^2(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)-1)+2B\sin(dx+c)\cos(dx+c)+A\sin(dx+c)}{2bd\sqrt{\cos(dx+c)b}\cos(dx+c)^{\frac{3}{2}}}$
parts	$\frac{A(-(\cos^2(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)-1)+(\cos^2(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)+1)+\sin(dx+c))}{2db\sqrt{\cos(dx+c)b}\cos(dx+c)^{\frac{3}{2}}}+\frac{B\sin(dx+c)}{bd\sqrt{\cos(dx+c)}\sqrt{\cos(dx+c)b}}$
risch	$-\frac{i(A\,e^{2i(dx+c)}-A-4B\cos(dx+c))}{2b\sqrt{\cos(dx+c)b}\sqrt{\cos(dx+c)}(e^{2i(dx+c)}+1)d}+\frac{(\sqrt{\cos}(dx+c))A\ln(e^{i(dx+c)}+i)}{2b\sqrt{\cos(dx+c)b}\,d}-\frac{(\sqrt{\cos}(dx+c))A\ln(e^{i(dx+c)}-i)}{2b\sqrt{\cos(dx+c)b}\,d}$

```
[In] int((A+B*cos(d*x+c))/cos(d*x+c)^(3/2)/(cos(d*x+c)*b)^(3/2),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/2/b/d*(A*cos(d*x+c)^2*ln(-cot(d*x+c)+csc(d*x+c)+1)-A*cos(d*x+c)^2*ln(-cot
(d*x+c)+csc(d*x+c)-1)+2*B*sin(d*x+c)*cos(d*x+c)+A*sin(d*x+c))/(cos(d*x+c)*b
)^(1/2)/cos(d*x+c)^(3/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 231, normalized size of antiderivative = 1.99

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{3/2}}\,dx = \left[\frac{A\sqrt{b}\cos\left(dx+c\right)^{3}\log\left(-\frac{b\cos(dx+c)^{3}-2\sqrt{b\cos(dx+c)}\sqrt{b}\sqrt{\cos(dx+c)}\sin(dx+c)}{\cos(dx+c)^{3}}\right.}{4}\right.$$

$$-\frac{A\sqrt{-b}\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)\cos\left(dx+c\right)^{3}-\left(2\,B\cos\left(dx+c\right)+A\right)\sqrt{b\cos\left(dx+c\right)}\sqrt{\cos\left(dx+\right.}}{2\,b^{2}d\cos\left(dx+c\right)^{3}}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(3/2)/(b*cos(d*x+c))^(3/2),x, algorit
hm="fricas")
```

```
[Out] [1/4*(A*sqrt(b)*cos(d*x + c)^3*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x +
c))*sqrt(b)*sqrt(cos(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x + c
)^3) + 2*(2*B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin
(d*x + c))/(b^2*d*cos(d*x + c)^3), -1/2*(A*sqrt(-b)*arctan(sqrt(b*cos(d*x +
 c))*sqrt(-b)*sin(d*x + c)/(b*sqrt(cos(d*x + c))))*cos(d*x + c)^3 - (2*B*co
s(d*x + c) + A)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(b^2*
d*cos(d*x + c)^3)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)**(3/2)/(b*cos(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 739 vs. 2(100) = 200.

Time = 0.44 (sec) , antiderivative size = 739, normalized size of antiderivative = 6.37

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{3/2}}\,dx = \text{Too large to display}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(3/2)/(b*cos(d*x+c))^(3/2),x, algorit
hm="maxima")
```

```
[Out] 1/4*(8*B*sqrt(b)*sin(2*d*x + 2*c)/(b^2*cos(2*d*x + 2*c)^2 + b^2*sin(2*d*x +
 2*c)^2 + 2*b^2*cos(2*d*x + 2*c) + b^2) - (4*(sin(4*d*x + 4*c) + 2*sin(2*d*
x + 2*c))*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 4*(sin(4*d
*x + 4*c) + 2*sin(2*d*x + 2*c))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c))) - (2*(2*cos(2*d*x + 2*c) + 1)*cos(4*d*x + 4*c) + cos(4*d*x + 4*c)
^2 + 4*cos(2*d*x + 2*c)^2 + sin(4*d*x + 4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2*d
*x + 2*c) + 4*sin(2*d*x + 2*c)^2 + 4*cos(2*d*x + 2*c) + 1)*log(cos(1/2*arct
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*
c), cos(2*d*x + 2*c)))^2 + 2*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
2*c))) + 1) + (2*(2*cos(2*d*x + 2*c) + 1)*cos(4*d*x + 4*c) + cos(4*d*x + 4*
c)^2 + 4*cos(2*d*x + 2*c)^2 + sin(4*d*x + 4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2
*d*x + 2*c) + 4*sin(2*d*x + 2*c)^2 + 4*cos(2*d*x + 2*c) + 1)*log(cos(1/2*ar
ctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x +
2*c), cos(2*d*x + 2*c)))^2 - 2*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c))) + 1) - 4*(cos(4*d*x + 4*c) + 2*cos(2*d*x + 2*c) + 1)*sin(3/2*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 4*(cos(4*d*x + 4*c) + 2*cos(2*d*x
 + 2*c) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))))*A/((b*co
s(4*d*x + 4*c)^2 + 4*b*cos(2*d*x + 2*c)^2 + b*sin(4*d*x + 4*c)^2 + 4*b*sin(
4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*b*sin(2*d*x + 2*c)^2 + 2*(2*b*cos(2*d*x +
 2*c) + b)*cos(4*d*x + 4*c) + 4*b*cos(2*d*x + 2*c) + b)*sqrt(b)))/d
```

Giac [F]

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{3/2}}\,dx=\int \frac{B\cos(dx+c)+A}{(b\cos(dx+c))^{\frac{3}{2}}\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(3/2)/(b*cos(d*x+c))^(3/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)/((b*cos(d*x + c))^(3/2)*cos(d*x + c)^(3/2)),
 x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{3/2}}\,dx=\int \frac{A+B\cos(c+dx)}{\cos(c+dx)^{3/2}\,(b\cos(c+dx))^{3/2}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)^(3/2)*(b*cos(c + d*x))^(3/2)),x)
```

```
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)^(3/2)*(b*cos(c + d*x))^(3/2)), x)
```

3.879 $\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 157

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^{3/2}}\,dx = \frac{B\text{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{2bd\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)}{2bd\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)}{bd\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}} + \frac{A\sin^3(c+dx)}{3bd\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}}$$

```
[Out] 1/2*B*sin(d*x+c)/b/d/cos(d*x+c)^(3/2)/(b*cos(d*x+c))^(1/2)+1/3*A*sin(d*x+c)
^3/b/d/cos(d*x+c)^(5/2)/(b*cos(d*x+c))^(1/2)+A*sin(d*x+c)/b/d/cos(d*x+c)^(1
/2)/(b*cos(d*x+c))^(1/2)+1/2*B*arctanh(sin(d*x+c))*cos(d*x+c)^(1/2)/b/d/(b*
cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {18, 2827, 3852, 3853, 3855}

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^{3/2}}\,dx = \frac{A\sin^3(c+dx)}{3bd\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)}{bd\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}} + \frac{B\sqrt{\cos(c+dx)}\text{arctanh}(\sin(c+dx))}{2bd\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)}{2bd\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(A + B*Cos[c + d*x])/(Cos[c + d*x]^(5/2)*(b*Cos[c + d*x])^(3/2)),x]
```

```
[Out] (B*ArcTanh[Sin[c + d*x]]*Sqrt[Cos[c + d*x]])/(2*b*d*Sqrt[b*Cos[c + d*x]]) +
 (B*Sin[c + d*x])/(2*b*d*Cos[c + d*x]^(3/2)*Sqrt[b*Cos[c + d*x]]) + (A*Sin[
c + d*x])/(b*d*Sqrt[Cos[c + d*x]]*Sqrt[b*Cos[c + d*x]]) + (A*Sin[c + d*x]^3
)/(3*b*d*Cos[c + d*x]^(5/2)*Sqrt[b*Cos[c + d*x]])
```

Rule 18

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m - 1/2
)*b^(n + 1/2)*(Sqrt[a*v]/Sqrt[b*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && ILtQ[n - 1/2, 0] && IntegerQ[m + n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int (A+B\cos(c+dx))\sec^4(c+dx)\,dx}{b\sqrt{b\cos(c+dx)}} \\
&= \frac{\left(A\sqrt{\cos(c+dx)}\right)\int \sec^4(c+dx)\,dx}{b\sqrt{b\cos(c+dx)}} + \frac{\left(B\sqrt{\cos(c+dx)}\right)\int \sec^3(c+dx)\,dx}{b\sqrt{b\cos(c+dx)}}
\end{aligned}
$$

$$
= \frac{B\sin(c+dx)}{2bd\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{\left(B\sqrt{\cos(c+dx)}\right)\int \sec(c+dx)\,dx}{2b\sqrt{b\cos(c+dx)}} - \frac{\left(A\sqrt{\cos(c+dx)}\right)\text{Subst}\left(\int (1+x^2)\ dx, x, -\tan(c+dx)\right)}{bd\sqrt{b\cos(c+dx)}}
$$

$$
= \frac{B\text{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{2bd\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)}{2bd\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)}{bd\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}} + \frac{A\sin^3(c+dx)}{3bd\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}}
$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.48

$$
\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^{3/2}}\,dx = \frac{3B\text{arctanh}(\sin(c+dx))\cos^2(c+dx)+3B\sin(c+dx)+2A(2+\cos}{6d\sqrt{\cos(c+dx)}(b\cos(c+dx))^{3/2}}
$$

```
[In] Integrate[(A + B*Cos[c + d*x])/(Cos[c + d*x]^(5/2)*(b*Cos[c + d*x])^(3/2)),
x]
```

```
[Out] (3*B*ArcTanh[Sin[c + d*x]]*Cos[c + d*x]^2 + 3*B*Sin[c + d*x] + 2*A*(2 + Cos
[2*(c + d*x)])*Tan[c + d*x])/(6*d*Sqrt[Cos[c + d*x]]*(b*Cos[c + d*x])^(3/2)
)
```

Maple [A] (verified)

Time = 5.12 (sec) , antiderivative size = 125, normalized size of antiderivative = 0.80

method	result
default	$\frac{-3B(\cos^3(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)-1)+3B(\cos^3(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)+1)+4A\sin(dx+c)(\cos^2(dx+c))+}{6bd\sqrt{\cos(dx+c)b}\,\cos(dx+c)^{\frac{5}{2}}}$
parts	$\frac{A(2(\cos^2(dx+c))+1)\sin(dx+c)}{3db\sqrt{\cos(dx+c)b}\,\cos(dx+c)^{\frac{5}{2}}}+\frac{B(-(\cos^2(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)-1)+(\cos^2(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)+}{2db\sqrt{\cos(dx+c)b}\,\cos(dx+c)^{\frac{3}{2}}}$
risch	$-\frac{i(3B\,\mathrm{e}^{4i(dx+c)}-3B-16A\cos(dx+c)-8iA\sin(dx+c))}{6b\sqrt{\cos(dx+c)b}\,\sqrt{\cos(dx+c)}\,(\mathrm{e}^{2i(dx+c)}+1)^2 d}+\frac{(\sqrt{\cos}(dx+c))B\ln(\mathrm{e}^{i(dx+c)}+i)}{2b\sqrt{\cos(dx+c)b}\,d}-\frac{(\sqrt{\cos}(dx+c))B\ln(\mathrm{e}^{i(dx+c)}-i)}{2b\sqrt{\cos(dx+c)b}\,d}$

```
[In] int((A+B*cos(d*x+c))/cos(d*x+c)^(5/2)/(cos(d*x+c)*b)^(3/2),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/6/b/d*(-3*B*cos(d*x+c)^3*ln(-cot(d*x+c)+csc(d*x+c)-1)+3*B*cos(d*x+c)^3*ln
(-cot(d*x+c)+csc(d*x+c)+1)+4*A*sin(d*x+c)*cos(d*x+c)^2+3*B*sin(d*x+c)*cos(d
*x+c)+2*A*sin(d*x+c))/(cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(5/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 259, normalized size of antiderivative = 1.65

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^{3/2}}\,dx = \left[\frac{3\,B\sqrt{b}\cos\left(dx+c\right)^{4}\log\left(-\frac{b\cos(dx+c)^{3}-2\,\sqrt{b\cos(dx+c)}\sqrt{b}\sqrt{\cos(dx+c)}\sin(dx+c)}{\cos(dx+c)^{3}}\right.}{}\right.$$
$$-\frac{3\,B\sqrt{-b}\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)\cos\left(dx+c\right)^{4}-\left(4\,A\cos\left(dx+c\right)^{2}+3\,B\cos\left(dx+c\right)+2\,A\right)\sqrt{b\cos}}{6\,b^{2}d\cos\left(dx+c\right)^{4}}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(5/2)/(b*cos(d*x+c))^(3/2),x, algorit
hm="fricas")
```

```
[Out] [1/12*(3*B*sqrt(b)*cos(d*x + c)^4*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x
 + c))*sqrt(b)*sqrt(cos(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x
+ c)^3) + 2*(4*A*cos(d*x + c)^2 + 3*B*cos(d*x + c) + 2*A)*sqrt(b*cos(d*x +
c))*sqrt(cos(d*x + c))*sin(d*x + c))/(b^2*d*cos(d*x + c)^4), -1/6*(3*B*sqrt
(-b)*arctan(sqrt(b*cos(d*x + c))*sqrt(-b)*sin(d*x + c)/(b*sqrt(cos(d*x + c)
)))*cos(d*x + c)^4 - (4*A*cos(d*x + c)^2 + 3*B*cos(d*x + c) + 2*A)*sqrt(b*c
os(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(b^2*d*cos(d*x + c)^4)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)**(5/2)/(b*cos(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 983 vs. 2(135) = 270.

Time = 0.44 (sec) , antiderivative size = 983, normalized size of antiderivative = 6.26

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^{3/2}}\,dx = \text{Too large to display}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(5/2)/(b*cos(d*x+c))^(3/2),x, algorit
hm="maxima")
```

```
[Out] 1/12*(16*((3*cos(2*d*x + 2*c) + 1)*sin(6*d*x + 6*c) + 3*(3*cos(2*d*x + 2*c)
 + 1)*sin(4*d*x + 4*c) - 3*cos(6*d*x + 6*c)*sin(2*d*x + 2*c) - 9*cos(4*d*x
+ 4*c)*sin(2*d*x + 2*c))*A/((b*cos(6*d*x + 6*c)^2 + 9*b*cos(4*d*x + 4*c)^2
+ 9*b*cos(2*d*x + 2*c)^2 + b*sin(6*d*x + 6*c)^2 + 9*b*sin(4*d*x + 4*c)^2 +
18*b*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 9*b*sin(2*d*x + 2*c)^2 + 2*(3*b*co
s(4*d*x + 4*c) + 3*b*cos(2*d*x + 2*c) + b)*cos(6*d*x + 6*c) + 6*(3*b*cos(2*
d*x + 2*c) + b)*cos(4*d*x + 4*c) + 6*b*cos(2*d*x + 2*c) + 6*(b*sin(4*d*x +
4*c) + b*sin(2*d*x + 2*c))*sin(6*d*x + 6*c) + b)*sqrt(b)) - 3*(4*(sin(4*d*x
 + 4*c) + 2*sin(2*d*x + 2*c))*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c))) - 4*(sin(4*d*x + 4*c) + 2*sin(2*d*x + 2*c))*cos(1/2*arctan2(sin(2*d
*x + 2*c), cos(2*d*x + 2*c))) - (2*(2*cos(2*d*x + 2*c) + 1)*cos(4*d*x + 4*c
) + cos(4*d*x + 4*c)^2 + 4*cos(2*d*x + 2*c)^2 + sin(4*d*x + 4*c)^2 + 4*sin(
4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*sin(2*d*x + 2*c)^2 + 4*cos(2*d*x + 2*c) +
 1)*log(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*ar
ctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/2*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c))) + 1) + (2*(2*cos(2*d*x + 2*c) + 1)*cos(4*d*x + 4
*c) + cos(4*d*x + 4*c)^2 + 4*cos(2*d*x + 2*c)^2 + sin(4*d*x + 4*c)^2 + 4*si
n(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*sin(2*d*x + 2*c)^2 + 4*cos(2*d*x + 2*c)
 + 1)*log(cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sin(1/2*arctan2(sin(2*d*
x + 2*c), cos(2*d*x + 2*c))) + 1) - 4*(cos(4*d*x + 4*c) + 2*cos(2*d*x + 2*c
) + 1)*sin(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 4*(cos(4*d*x
+ 4*c) + 2*cos(2*d*x + 2*c) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c))))*B/((b*cos(4*d*x + 4*c)^2 + 4*b*cos(2*d*x + 2*c)^2 + b*sin(4*d*x
 + 4*c)^2 + 4*b*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*b*sin(2*d*x + 2*c)^2
+ 2*(2*b*cos(2*d*x + 2*c) + b)*cos(4*d*x + 4*c) + 4*b*cos(2*d*x + 2*c) + b)
*sqrt(b)))/d
```

Giac [F]

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^{3/2}}\,dx=\int \frac{B\cos\left(dx+c\right)+A}{\left(b\cos\left(dx+c\right)\right)^{\frac{3}{2}}\cos\left(dx+c\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(5/2)/(b*cos(d*x+c))^(3/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)/((b*cos(d*x + c))^(3/2)*cos(d*x + c)^(5/2)),
 x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^{3/2}}\,dx = \int \frac{A+B\,\cos\left(c+d\,x\right)}{\cos\left(c+d\,x\right)^{5/2}\,\left(b\,\cos\left(c+d\,x\right)\right)^{3/2}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)^(5/2)*(b*cos(c + d*x))^(3/2)),x)
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)^(5/2)*(b*cos(c + d*x))^(3/2)), x)
```

3.880 $\int \frac{\cos^{\frac{9}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 148

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{Ax\sqrt{\cos(c+dx)}}{2b^2\sqrt{b\cos(c+dx)}} + \frac{B\sqrt{\cos(c+dx)}\sin(c+dx)}{b^2d\sqrt{b\cos(c+dx)}} + \frac{A\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2b^2d\sqrt{b\cos(c+dx)}} - \frac{B\sqrt{\cos(c+dx)}\sin^3(c+dx)}{3b^2d\sqrt{b\cos(c+dx)}}$$

```
[Out] 1/2*A*cos(d*x+c)^(3/2)*sin(d*x+c)/b^2/d/(b*cos(d*x+c))^(1/2)+1/2*A*x*cos(d*
x+c)^(1/2)/b^2/(b*cos(d*x+c))^(1/2)+B*sin(d*x+c)*cos(d*x+c)^(1/2)/b^2/d/(b*
cos(d*x+c))^(1/2)-1/3*B*sin(d*x+c)^3*cos(d*x+c)^(1/2)/b^2/d/(b*cos(d*x+c))^
(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {17, 2827, 2715, 8, 2713}

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{Ax\sqrt{\cos(c+dx)}}{2b^2\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{2b^2d\sqrt{b\cos(c+dx)}} - \frac{B\sin^3(c+dx)\sqrt{\cos(c+dx)}}{3b^2d\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)\sqrt{\cos(c+dx)}}{b^2d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^(9/2)*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (A*x*Sqrt[Cos[c + d*x]])/(2*b^2*Sqrt[b*Cos[c + d*x]]) + (B*Sqrt[Cos[c + d*x
]]*Sin[c + d*x])/(b^2*d*Sqrt[b*Cos[c + d*x]]) + (A*Cos[c + d*x]^(3/2)*Sin[c
 + d*x])/(2*b^2*d*Sqrt[b*Cos[c + d*x]]) - (B*Sqrt[Cos[c + d*x]]*Sin[c + d*x
]^3)/(3*b^2*d*Sqrt[b*Cos[c + d*x]])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int \cos^2(c+dx)(A+B\cos(c+dx))\,dx}{b^2\sqrt{b\cos(c+dx)}}\\
&= \frac{\left(A\sqrt{\cos(c+dx)}\right)\int \cos^2(c+dx)\,dx}{b^2\sqrt{b\cos(c+dx)}}+\frac{\left(B\sqrt{\cos(c+dx)}\right)\int \cos^3(c+dx)\,dx}{b^2\sqrt{b\cos(c+dx)}}
\end{aligned}$$

$$= \frac{A\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2b^2d\sqrt{b\cos(c+dx)}} + \frac{\left(A\sqrt{\cos(c+dx)}\right)\int 1\,dx}{2b^2\sqrt{b\cos(c+dx)}} - \frac{\left(B\sqrt{\cos(c+dx)}\right)\text{Subst}\left(\int (1-x^2)\,dx, x, -\sin(c+dx)\right)}{b^2d\sqrt{b\cos(c+dx)}}$$

$$= \frac{Ax\sqrt{\cos(c+dx)}}{2b^2\sqrt{b\cos(c+dx)}} + \frac{B\sqrt{\cos(c+dx)}\sin(c+dx)}{b^2d\sqrt{b\cos(c+dx)}} + \frac{A\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2b^2d\sqrt{b\cos(c+dx)}} - \frac{B\sqrt{\cos(c+dx)}\sin^3(c+dx)}{3b^2d\sqrt{b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.78 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.49

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{\sqrt{\cos(c+dx)}(6Ac+6Adx+9B\sin(c+dx)+3A\sin(2(c+dx))}{12b^2d\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[(Cos[c + d*x]^(9/2)*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),
x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*(6*A*c + 6*A*d*x + 9*B*Sin[c + d*x] + 3*A*Sin[2*(c + d*
x)] + B*Sin[3*(c + d*x)]))/(12*b^2*d*Sqrt[b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 5.20 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.52

method	result	size
default	$\frac{\left(\sqrt{\cos}(dx+c)\right)\left(2B\sin(dx+c)\left(\cos^2(dx+c)\right)+3A\sin(dx+c)\cos(dx+c)+3A(dx+c)+4B\sin(dx+c)\right)}{6b^2d\sqrt{\cos(dx+c)b}}$	77
parts	$\frac{A\left(\sqrt{\cos}(dx+c)\right)\left(\cos(dx+c)\sin(dx+c)+dx+c\right)}{2d\,b^2\sqrt{\cos(dx+c)b}}+\frac{B\left(2+\cos^2(dx+c)\right)\sin(dx+c)\left(\sqrt{\cos}(dx+c)\right)}{3d\,b^2\sqrt{\cos(dx+c)b}}$	90
risch	$\frac{Ax\left(\sqrt{\cos}(dx+c)\right)}{2b^2\sqrt{\cos(dx+c)b}}+\frac{3B\sin(dx+c)\left(\sqrt{\cos}(dx+c)\right)}{4b^2d\sqrt{\cos(dx+c)b}}+\frac{\left(\sqrt{\cos}(dx+c)\right)B\sin(3dx+3c)}{12b^2\sqrt{\cos(dx+c)b}\,d}+\frac{\left(\sqrt{\cos}(dx+c)\right)A\sin(2dx+2c)}{4b^2\sqrt{\cos(dx+c)b}\,d}$	132

```
[In] int(cos(d*x+c)^(9/2)*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(5/2),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/6/b^2/d*cos(d*x+c)^(1/2)*(2*B*sin(d*x+c)*cos(d*x+c)^2+3*A*sin(d*x+c)*cos(
d*x+c)+3*A*(d*x+c)+4*B*sin(d*x+c))/(cos(d*x+c)*b)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 236, normalized size of antiderivative = 1.59

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \left[-\frac{3\,A\sqrt{-b}\cos\left(dx+c\right)\log\left(2\,b\cos\left(dx+c\right)^2+2\,\sqrt{b\cos\left(dx+c\right)}\sqrt{\vphantom{x}}\right.}{}\right.$$

```
[In] integrate(cos(d*x+c)^(9/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorit
hm="fricas")
```

```
[Out] [-1/12*(3*A*sqrt(-b)*cos(d*x + c)*log(2*b*cos(d*x + c)^2 + 2*sqrt(b*cos(d*x
 + c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) - 2*(2*B*cos(d*x + c)^
2 + 3*A*cos(d*x + c) + 4*B)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x
 + c))/(b^3*d*cos(d*x + c)), 1/6*(3*A*sqrt(b)*arctan(sqrt(b*cos(d*x + c))*s
in(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/2)))*cos(d*x + c) + (2*B*cos(d*x + c)^
2 + 3*A*cos(d*x + c) + 4*B)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x
 + c))/(b^3*d*cos(d*x + c))]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(9/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.42 (sec) , antiderivative size = 68, normalized size of antiderivative = 0.46

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{\frac{3\,(2\,dx+2\,c+\sin(2\,dx+2\,c))A}{b^{\frac{5}{2}}}+\frac{B\left(\sin(3\,dx+3\,c)+9\,\sin\left(\frac{1}{3}\,\arctan(\sin(3\,dx+3\,c),\cos(3\,dx+3\right.\right.}{b^{\frac{5}{2}}}}{12\,d}$$

```
[In] integrate(cos(d*x+c)^(9/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorit
hm="maxima")
```

```
[Out] 1/12*(3*(2*d*x + 2*c + sin(2*d*x + 2*c))*A/b^(5/2) + B*(sin(3*d*x + 3*c) +
9*sin(1/3*arctan2(sin(3*d*x + 3*c), cos(3*d*x + 3*c))))/b^(5/2))/d
```

Giac [F]

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^{\frac{9}{2}}}{(b\cos(dx+c))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(9/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorit
hm="giac")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^(9/2)/(b*cos(d*x + c))^(5/2), x
)
```

Mupad [B] (verification not implemented)

Time = 16.11 (sec) , antiderivative size = 95, normalized size of antiderivative = 0.64

$$\int \frac{\cos^{\frac{9}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{\sqrt{\cos(c+d\,x)}\,\sqrt{b\,\cos(c+d\,x)}\,(3\,A\,\sin(c+d\,x)+3\,A\,\sin(3\,c+}{12\,b^3\,d\,(c}$$

```
[In] int((cos(c + d*x)^(9/2)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(5/2),x)
[Out] (cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(1/2)*(3*A*sin(c + d*x) + 3*A*sin(3*c
+ 3*d*x) + 10*B*sin(2*c + 2*d*x) + B*sin(4*c + 4*d*x) + 12*A*d*x*cos(c + d*
x)))/(12*b^3*d*(cos(2*c + 2*d*x) + 1))
```

3.881 $\int \frac{\cos^{\frac{7}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 107

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{Bx\sqrt{\cos(c+dx)}}{2b^2\sqrt{b\cos(c+dx)}} + \frac{A\sqrt{\cos(c+dx)}\sin(c+dx)}{b^2d\sqrt{b\cos(c+dx)}} + \frac{B\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2b^2d\sqrt{b\cos(c+dx)}}$$

```
[Out] 1/2*B*cos(d*x+c)^(3/2)*sin(d*x+c)/b^2/d/(b*cos(d*x+c))^(1/2)+1/2*B*x*cos(d*
x+c)^(1/2)/b^2/(b*cos(d*x+c))^(1/2)+A*sin(d*x+c)*cos(d*x+c)^(1/2)/b^2/d/(b*
cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.061$, Rules used = {17, 2813}

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{A\sin(c+dx)\sqrt{\cos(c+dx)}}{b^2d\sqrt{b\cos(c+dx)}} + \frac{Bx\sqrt{\cos(c+dx)}}{2b^2\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)}{2b^2d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^(7/2)*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (B*x*Sqrt[Cos[c + d*x]])/(2*b^2*Sqrt[b*Cos[c + d*x]]) + (A*Sqrt[Cos[c + d*x
]]*Sin[c + d*x])/(b^2*d*Sqrt[b*Cos[c + d*x]]) + (B*Cos[c + d*x]^(3/2)*Sin[c
 + d*x])/(2*b^2*d*Sqrt[b*Cos[c + d*x]])
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2813

```
Int[((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])*((c_.) + (d_.)*sin[(e_.) + (f_.)
*(x_)]), x_Symbol] :> Simp[(2*a*c + b*d)*(x/2), x] + (-Simp[(b*c + a*d)*(Co
s[e + f*x]/f), x] - Simp[b*d*Cos[e + f*x]*(Sin[e + f*x]/(2*f)), x]) /; Free
Q[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int \cos(c+dx)(A+B\cos(c+dx))\,dx}{b^2\sqrt{b\cos(c+dx)}}\\ &= \frac{Bx\sqrt{\cos(c+dx)}}{2b^2\sqrt{b\cos(c+dx)}}+\frac{A\sqrt{\cos(c+dx)}\sin(c+dx)}{b^2d\sqrt{b\cos(c+dx)}}+\frac{B\cos^{\frac{3}{2}}(c+dx)\sin(c+dx)}{2b^2d\sqrt{b\cos(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.46 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.56

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx=\frac{\sqrt{\cos(c+dx)}(4A\sin(c+dx)+B(2(c+dx)+\sin(2(c+dx))))}{4b^2d\sqrt{b\cos(c+dx)}}$$

```
[In] Integrate[(Cos[c + d*x]^(7/2)*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),
x]
[Out] (Sqrt[Cos[c + d*x]]*(4*A*Sin[c + d*x] + B*(2*(c + d*x) + Sin[2*(c + d*x)]))
)/(4*b^2*d*Sqrt[b*Cos[c + d*x]])
```

Maple [A] (verified)

Time = 4.76 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.54

method	result	size
default	$\frac{\left(\sqrt{\cos}(dx+c)\right)\left(B\sin(dx+c)\cos(dx+c)+2A\sin(dx+c)+B(dx+c)\right)}{2b^{2}d\sqrt{\cos(dx+c)b}}$	58
parts	$\frac{A\sin(dx+c)\left(\sqrt{\cos}(dx+c)\right)}{b^{2}d\sqrt{\cos(dx+c)b}}+\frac{B\left(\sqrt{\cos}(dx+c)\right)\left(\cos(dx+c)\sin(dx+c)+dx+c\right)}{2d\,b^{2}\sqrt{\cos(dx+c)b}}$	79
risch	$\frac{Bx\left(\sqrt{\cos}(dx+c)\right)}{2b^{2}\sqrt{\cos(dx+c)b}}+\frac{A\sin(dx+c)\left(\sqrt{\cos}(dx+c)\right)}{b^{2}d\sqrt{\cos(dx+c)b}}+\frac{\left(\sqrt{\cos}(dx+c)\right)B\sin(2dx+2c)}{4b^{2}\sqrt{\cos(dx+c)b}\,d}$	95

```
[In] int(cos(d*x+c)^(7/2)*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(5/2),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/2/b^2/d*cos(d*x+c)^(1/2)*(B*sin(d*x+c)*cos(d*x+c)+2*A*sin(d*x+c)+B*(d*x+c
))/(cos(d*x+c)*b)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 210, normalized size of antiderivative = 1.96

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \left[-\frac{B\sqrt{-b}\cos\left(dx+c\right)\log\left(2\,b\cos\left(dx+c\right)^{2}+2\,\sqrt{b\cos\left(dx+c\right)}\sqrt{-\right.}}{}\right.$$

```
[In] integrate(cos(d*x+c)^(7/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorit
hm="fricas")
```

```
[Out] [-1/4*(B*sqrt(-b)*cos(d*x + c)*log(2*b*cos(d*x + c)^2 + 2*sqrt(b*cos(d*x +
c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) - 2*(B*cos(d*x + c) + 2*A
)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(b^3*d*cos(d*x + c)
), 1/2*(B*sqrt(b)*arctan(sqrt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x
 + c)^(3/2)))*cos(d*x + c) + (B*cos(d*x + c) + 2*A)*sqrt(b*cos(d*x + c))*sq
rt(cos(d*x + c))*sin(d*x + c))/(b^3*d*cos(d*x + c))]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(7/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.41 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.37

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{\frac{(2\,dx+2\,c+\sin(2\,dx+2\,c))B}{b^{\frac{5}{2}}} + \frac{4\,A\sin(dx+c)}{b^{\frac{5}{2}}}}{4\,d}$$

```
[In] integrate(cos(d*x+c)^(7/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorit
hm="maxima")
```

```
[Out] 1/4*((2*d*x + 2*c + sin(2*d*x + 2*c))*B/b^(5/2) + 4*A*sin(d*x + c)/b^(5/2))
/d
```

Giac [F]

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^{\frac{7}{2}}}{(b\cos(dx+c))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(7/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^(7/2)/(b*cos(d*x + c))^(5/2), x
)
```

Mupad [B] (verification not implemented)

Time = 0.74 (sec) , antiderivative size = 82, normalized size of antiderivative = 0.77

$$\int \frac{\cos^{\frac{7}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{\sqrt{\cos(c+d\,x)}\,\sqrt{b\,\cos(c+d\,x)}\,(B\,\sin(c+d\,x)+4\,A\,\sin(2\,c+2}{4\,b^3\,d\,(\cos(2\,c+2\,d\,x)}$$

```
[In] int((cos(c + d*x)^(7/2)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(5/2),x)
```

```
[Out] (cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(1/2)*(B*sin(c + d*x) + 4*A*sin(2*c +
2*d*x) + B*sin(3*c + 3*d*x) + 4*B*d*x*cos(c + d*x)))/(4*b^3*d*(cos(2*c + 2*
d*x) + 1))
```

3.882 $\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 65

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx=\frac{Ax\sqrt{\cos(c+dx)}}{b^2\sqrt{b\cos(c+dx)}}+\frac{B\sqrt{\cos(c+dx)}\sin(c+dx)}{b^2d\sqrt{b\cos(c+dx)}}$$

```
[Out] A*x*cos(d*x+c)^(1/2)/b^2/(b*cos(d*x+c))^(1/2)+B*sin(d*x+c)*cos(d*x+c)^(1/2)
/b^2/d/(b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.061, Rules used = {17, 2717}

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx=\frac{Ax\sqrt{\cos(c+dx)}}{b^2\sqrt{b\cos(c+dx)}}+\frac{B\sin(c+dx)\sqrt{\cos(c+dx)}}{b^2d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^(5/2)*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (A*x*Sqrt[Cos[c + d*x]])/(b^2*Sqrt[b*Cos[c + d*x]]) + (B*Sqrt[Cos[c + d*x]]
*Sin[c + d*x])/(b^2*d*Sqrt[b*Cos[c + d*x]])
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2717

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int (A+B\cos(c+dx))\,dx}{b^2\sqrt{b\cos(c+dx)}} \\
&= \frac{Ax\sqrt{\cos(c+dx)}}{b^2\sqrt{b\cos(c+dx)}} + \frac{\left(B\sqrt{\cos(c+dx)}\right)\int \cos(c+dx)\,dx}{b^2\sqrt{b\cos(c+dx)}} \\
&= \frac{Ax\sqrt{\cos(c+dx)}}{b^2\sqrt{b\cos(c+dx)}} + \frac{B\sqrt{\cos(c+dx)}\sin(c+dx)}{b^2d\sqrt{b\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 45, normalized size of antiderivative = 0.69

$$
\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{\sqrt{\cos(c+dx)}(A(c+dx)+B\sin(c+dx))}{b^2d\sqrt{b\cos(c+dx)}}
$$

```
[In] Integrate[(Cos[c + d*x]^(5/2)*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),
x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*(A*(c + d*x) + B*Sin[c + d*x]))/(b^2*d*Sqrt[b*Cos[c + d
*x]])
```

Maple [A] (verified)

Time = 4.96 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.65

method	result	size
default	$\frac{\left(\sqrt{\cos}(dx+c)\right)\left(A(dx+c)+B\sin(dx+c)\right)}{b^2d\sqrt{\cos(dx+c)b}}$	42
risch	$\frac{Ax\left(\sqrt{\cos}(dx+c)\right)}{b^2\sqrt{\cos(dx+c)b}}+\frac{B\sin(dx+c)\left(\sqrt{\cos}(dx+c)\right)}{b^2d\sqrt{\cos(dx+c)b}}$	58
parts	$\frac{A\left(\sqrt{\cos}(dx+c)\right)(dx+c)}{d\,b^2\sqrt{\cos(dx+c)b}}+\frac{B\sin(dx+c)\left(\sqrt{\cos}(dx+c)\right)}{b^2d\sqrt{\cos(dx+c)b}}$	65

```
[In] int(cos(d*x+c)^(5/2)*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(5/2),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/b^2/d*cos(d*x+c)^(1/2)*(A*(d*x+c)+B*sin(d*x+c))/(cos(d*x+c)*b)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 187, normalized size of antiderivative = 2.88

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \left[-\frac{A\sqrt{-b}\cos(dx+c)\log\left(2\,b\cos(dx+c)^2+2\,\sqrt{b\cos(dx+c)}\sqrt{-\right.}{}\right.$$

```
[In] integrate(cos(d*x+c)^(5/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorit
hm="fricas")
```

```
[Out] [-1/2*(A*sqrt(-b)*cos(d*x + c)*log(2*b*cos(d*x + c)^2 + 2*sqrt(b*cos(d*x +
c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b) - 2*sqrt(b*cos(d*x + c))*
B*sqrt(cos(d*x + c))*sin(d*x + c))/(b^3*d*cos(d*x + c)), (A*sqrt(b)*arctan(
sqrt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/2)))*cos(d*x + c
) + sqrt(b*cos(d*x + c))*B*sqrt(cos(d*x + c))*sin(d*x + c))/(b^3*d*cos(d*x
+ c))]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.62

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{\frac{2\,A\arctan\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\right)}{b^{\frac{5}{2}}}+\frac{B\sin(dx+c)}{b^{\frac{5}{2}}}}{d}$$

```
[In] integrate(cos(d*x+c)^(5/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorit
hm="maxima")
```

```
[Out] (2*A*arctan(sin(d*x + c)/(cos(d*x + c) + 1))/b^(5/2) + B*sin(d*x + c)/b^(5/
2))/d
```

Giac [F]

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^{\frac{5}{2}}}{(b\cos(dx+c))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorit
hm="giac")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^(5/2)/(b*cos(d*x + c))^(5/2), x
)
```

Mupad [B] (verification not implemented)

Time = 0.52 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.94

$$\int \frac{\cos^{\frac{5}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{\sqrt{\cos(c+d\,x)}\,\sqrt{b\,\cos(c+d\,x)}\,(B\,\sin(2\,c+2\,d\,x)+2\,A\,d\,x\,\cos(}{b^3\,d\,\left(\cos(2\,c+2\,d\,x)+1\right)}$$

```
[In] int((cos(c + d*x)^(5/2)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(5/2),x)
[Out] (cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(1/2)*(B*sin(2*c + 2*d*x) + 2*A*d*x*co
s(c + d*x)))/(b^3*d*(cos(2*c + 2*d*x) + 1))
```

3.883 $\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 66

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{Bx\sqrt{\cos(c+dx)}}{b^2\sqrt{b\cos(c+dx)}} + \frac{A\text{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{b^2d\sqrt{b\cos(c+dx)}}$$

```
[Out] B*x*cos(d*x+c)^(1/2)/b^2/(b*cos(d*x+c))^(1/2)+A*arctanh(sin(d*x+c))*cos(d*x
+c)^(1/2)/b^2/d/(b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {17, 2814, 3855}

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{A\sqrt{\cos(c+dx)}\text{arctanh}(\sin(c+dx))}{b^2d\sqrt{b\cos(c+dx)}} + \frac{Bx\sqrt{\cos(c+dx)}}{b^2\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^(3/2)*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (B*x*Sqrt[Cos[c + d*x]])/(b^2*Sqrt[b*Cos[c + d*x]]) + (A*ArcTanh[Sin[c + d*
x]]*Sqrt[Cos[c + d*x]])/(b^2*d*Sqrt[b*Cos[c + d*x]])
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2814

```
Int[((a_.) + (b_.)*sin[(e_.) + (f_.)*(x_)])/((c_.) + (d_.)*sin[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[b*(x/d), x] - Dist[(b*c - a*d)/d, Int[1/(c + d*
Sin[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int (A+B\cos(c+dx))\sec(c+dx)\,dx}{b^2\sqrt{b\cos(c+dx)}}\\
&= \frac{Bx\sqrt{\cos(c+dx)}}{b^2\sqrt{b\cos(c+dx)}}+\frac{\left(A\sqrt{\cos(c+dx)}\right)\int \sec(c+dx)\,dx}{b^2\sqrt{b\cos(c+dx)}}\\
&= \frac{Bx\sqrt{\cos(c+dx)}}{b^2\sqrt{b\cos(c+dx)}}+\frac{A\text{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{b^2d\sqrt{b\cos(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 43, normalized size of antiderivative = 0.65

$$
\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx=\frac{(Bdx+A\text{arctanh}(\sin(c+dx)))\sqrt{\cos(c+dx)}}{b^2d\sqrt{b\cos(c+dx)}}
$$

```
[In] Integrate[(Cos[c + d*x]^(3/2)*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),
x]
[Out] ((B*d*x + A*ArcTanh[Sin[c + d*x]])*Sqrt[Cos[c + d*x]])/(b^2*d*Sqrt[b*Cos[c
+ d*x]])
```

Maple [A] (verified)

Time = 4.96 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.83

method	result	size
default	$-\frac{(2A\ \operatorname{arctanh}(\cot(dx+c)-\csc(dx+c))-B(dx+c))(\sqrt{\cos}(dx+c))}{b^2 d\sqrt{\cos(dx+c)b}}$	55
parts	$-\frac{2A(\sqrt{\cos}(dx+c))\operatorname{arctanh}(\cot(dx+c)-\csc(dx+c))}{d\sqrt{\cos(dx+c)b}\,b^2}+\frac{B(\sqrt{\cos}(dx+c))(dx+c)}{d\,b^2\sqrt{\cos(dx+c)b}}$	76
risch	$\frac{Bx(\sqrt{\cos}(dx+c))}{b^2\sqrt{\cos(dx+c)b}}+\frac{(\sqrt{\cos}(dx+c))A\ln(\mathrm{e}^{i(dx+c)}+i)}{b^2\sqrt{\cos(dx+c)b}\,d}-\frac{(\sqrt{\cos}(dx+c))A\ln(\mathrm{e}^{i(dx+c)}-i)}{b^2\sqrt{\cos(dx+c)b}\,d}$	105

[In] int(cos(d*x+c)^(3/2)*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(5/2),x,method=_RETURN VERBOSE)

[Out] -1/b^2/d*(2*A*arctanh(cot(d*x+c)-csc(d*x+c))-B*(d*x+c))*cos(d*x+c)^(1/2)/(c os(d*x+c)*b)^(1/2)

Fricas [A] (verification not implemented)

none

Time = 0.40 (sec) , antiderivative size = 215, normalized size of antiderivative = 3.26

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \left[-\frac{2\,A\sqrt{-b}\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)+B\sqrt{-b}\log\left(2\,b\cos\left(\right.\right.}{2}\right.$$

[In] integrate(cos(d*x+c)^(3/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorit hm="fricas")

[Out] [-1/2*(2*A*sqrt(-b)*arctan(sqrt(b*cos(d*x + c))*sqrt(-b)*sin(d*x + c)/(b*sq rt(cos(d*x + c)))) + B*sqrt(-b)*log(2*b*cos(d*x + c)^2 + 2*sqrt(b*cos(d*x + c))*sqrt(-b)*sqrt(cos(d*x + c))*sin(d*x + c) - b))/(b^3*d), 1/2*(2*B*sqrt(b)*arctan(sqrt(b*cos(d*x + c))*sin(d*x + c)/(sqrt(b)*cos(d*x + c)^(3/2))) + A*sqrt(b)*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x + c))*sqrt(b)*sqrt(cos (d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x + c)^3))/(b^3*d)]

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(3/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.39 (sec) , antiderivative size = 92, normalized size of antiderivative = 1.39

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{\frac{A\left(\log\left(\cos(dx+c)^2+\sin(dx+c)^2+2\,\sin(dx+c)+1\right)-\log\left(\cos(dx+c)^2+\sin(dx+c)^2-2\,\sin(\right.\right.}{b^{\frac{5}{2}}}}{2\,d}$$

```
[In] integrate(cos(d*x+c)^(3/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorit
hm="maxima")
```

```
[Out] 1/2*(A*(log(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*sin(d*x + c) + 1) - log(cos
(d*x + c)^2 + sin(d*x + c)^2 - 2*sin(d*x + c) + 1))/b^(5/2) + 4*B*arctan(si
n(d*x + c)/(cos(d*x + c) + 1))/b^(5/2))/d
```

Giac [F]

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^{\frac{3}{2}}}{(b\cos(dx+c))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^(3/2)/(b*cos(d*x + c))^(5/2), x
)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^{\frac{3}{2}}(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{\cos\left(c+d\,x\right)^{3/2}\,\left(A+B\,\cos\left(c+d\,x\right)\right)}{\left(b\,\cos\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int((cos(c + d*x)^(3/2)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(5/2),x)
[Out] int((cos(c + d*x)^(3/2)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(5/2), x)
```

3.884 $\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 74

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{B\,\text{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{b^2d\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)}{b^2d\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}$$

```
[Out] A*sin(d*x+c)/b^2/d/cos(d*x+c)^(1/2)/(b*cos(d*x+c))^(1/2)+B*arctanh(sin(d*x+
c))*cos(d*x+c)^(1/2)/b^2/d/(b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 74, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {17, 2827, 3852, 8, 3855}

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{A\sin(c+dx)}{b^2d\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}} + \frac{B\sqrt{\cos(c+dx)}\,\text{arctanh}(\sin(c+dx))}{b^2d\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(Sqrt[Cos[c + d*x]]*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),x]
```

```
[Out] (B*ArcTanh[Sin[c + d*x]]*Sqrt[Cos[c + d*x]])/(b^2*d*Sqrt[b*Cos[c + d*x]]) +
 (A*Sin[c + d*x])/(b^2*d*Sqrt[Cos[c + d*x]]*Sqrt[b*Cos[c + d*x]])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 17

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m + 1/2
)*b^(n - 1/2)*(Sqrt[b*v]/Sqrt[a*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && IGtQ[n + 1/2, 0] && IntegerQ[m + n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int(A+B\cos(c+dx))\sec^2(c+dx)\,dx}{b^2\sqrt{b\cos(c+dx)}}\\
&= \frac{\left(A\sqrt{\cos(c+dx)}\right)\int\sec^2(c+dx)\,dx}{b^2\sqrt{b\cos(c+dx)}}+\frac{\left(B\sqrt{\cos(c+dx)}\right)\int\sec(c+dx)\,dx}{b^2\sqrt{b\cos(c+dx)}}\\
&= \frac{B\operatorname{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{b^2d\sqrt{b\cos(c+dx)}}-\frac{\left(A\sqrt{\cos(c+dx)}\right)\operatorname{Subst}\left(\int 1\,dx,x,-\tan(c+dx)\right)}{b^2d\sqrt{b\cos(c+dx)}}\\
&= \frac{B\operatorname{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{b^2d\sqrt{b\cos(c+dx)}}+\frac{A\sin(c+dx)}{b^2d\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.68

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{\cos^{\frac{3}{2}}(c+dx)(B\text{arctanh}(\sin(c+dx))\cos(c+dx)+A\sin(c+dx)}{d(b\cos(c+dx))^{5/2}}$$

```
[In] Integrate[(Sqrt[Cos[c + d*x]]*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(5/2),
x]
```

```
[Out] (Cos[c + d*x]^(3/2)*(B*ArcTanh[Sin[c + d*x]]*Cos[c + d*x] + A*Sin[c + d*x])
)/(d*(b*Cos[c + d*x])^(5/2))
```

Maple [A] (verified)

Time = 5.10 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.81

method	result	size
default	$\frac{-2B\cos(dx+c)\,\text{arctanh}(\cot(dx+c)-\csc(dx+c))+A\sin(dx+c)}{b^2 d\sqrt{\cos(dx+c)b}\,\sqrt{\cos(dx+c)}}$	60
parts	$\frac{A\sin(dx+c)}{b^2 d\sqrt{\cos(dx+c)}\,\sqrt{\cos(dx+c)b}}-\frac{2B\left(\sqrt{\cos}(dx+c)\right)\text{arctanh}(\cot(dx+c)-\csc(dx+c))}{d\sqrt{\cos(dx+c)b}\,b^2}$	77
risch	$\frac{2i\left(\sqrt{\cos}(dx+c)\right)A}{b^2\sqrt{\cos(dx+c)b}\,d\left(e^{2i(dx+c)}+1\right)}+\frac{\left(\sqrt{\cos}(dx+c)\right)B\ln\left(e^{i(dx+c)}+i\right)}{b^2\sqrt{\cos(dx+c)b}\,d}-\frac{\left(\sqrt{\cos}(dx+c)\right)B\ln\left(e^{i(dx+c)}-i\right)}{b^2\sqrt{\cos(dx+c)b}\,d}$	122

```
[In] int(cos(d*x+c)^(1/2)*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(5/2),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/b^2/d*(-2*B*cos(d*x+c)*arctanh(cot(d*x+c)-csc(d*x+c))+A*sin(d*x+c))/(cos(
d*x+c)*b)^(1/2)/cos(d*x+c)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 211, normalized size of antiderivative = 2.85

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \left[\frac{B\sqrt{b}\cos(dx+c)^2\log\left(-\frac{b\cos(dx+c)^3-2\sqrt{b\cos(dx+c)}\sqrt{b}\sqrt{\cos(dx+c)}\sin(}{\cos(dx+c)^3}\right.}{2b^3d\cos}\right.$$
$$\left.-\frac{B\sqrt{-b}\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)\cos(dx+c)^2-\sqrt{b\cos(dx+c)}A\sqrt{\cos(dx+c)}\sin(dx+c)}{b^3d\cos(dx+c)^2}\right]$$

```
[In] integrate(cos(d*x+c)^(1/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorit
hm="fricas")
```

```
[Out] [1/2*(B*sqrt(b)*cos(d*x + c)^2*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x +
c))*sqrt(b)*sqrt(cos(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x + c
)^3) + 2*sqrt(b*cos(d*x + c))*A*sqrt(cos(d*x + c))*sin(d*x + c))/(b^3*d*cos
(d*x + c)^2), -(B*sqrt(-b)*arctan(sqrt(b*cos(d*x + c))*sqrt(-b)*sin(d*x + c
)/(b*sqrt(cos(d*x + c))))*cos(d*x + c)^2 - sqrt(b*cos(d*x + c))*A*sqrt(cos(
d*x + c))*sin(d*x + c))/(b^3*d*cos(d*x + c)^2)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(1/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 133 vs. $2(66) = 132$.

Time = 0.42 (sec) , antiderivative size = 133, normalized size of antiderivative = 1.80

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \frac{\frac{4A\sqrt{b}\sin(2dx+2c)}{b^3\cos(2dx+2c)^2+b^3\sin(2dx+2c)^2+2b^3\cos(2dx+2c)+b^3} + \frac{B\left(\log\left(\cos(dx+c)^2+\sin(d\right.\right.}{}}{2d}$$

```
[In] integrate(cos(d*x+c)^(1/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorit
hm="maxima")
```

```
[Out] 1/2*(4*A*sqrt(b)*sin(2*d*x + 2*c)/(b^3*cos(2*d*x + 2*c)^2 + b^3*sin(2*d*x +
 2*c)^2 + 2*b^3*cos(2*d*x + 2*c) + b^3) + B*(log(cos(d*x + c)^2 + sin(d*x +
 c)^2 + 2*sin(d*x + c) + 1) - log(cos(d*x + c)^2 + sin(d*x + c)^2 - 2*sin(d
*x + c) + 1))/b^(5/2))/d
```

Giac [F]

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{(B\cos(dx+c)+A)\sqrt{\cos(dx+c)}}{(b\cos(dx+c))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(cos(d*x+c)^(1/2)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(5/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*sqrt(cos(d*x + c))/(b*cos(d*x + c))^(5/2), x
)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\cos(c+dx)}(A+B\cos(c+dx))}{(b\cos(c+dx))^{5/2}}\,dx = \int \frac{\sqrt{\cos(c+d\,x)}\,(A+B\,\cos(c+d\,x))}{(b\,\cos(c+d\,x))^{5/2}}\,dx$$

```
[In] int((cos(c + d*x)^(1/2)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(5/2),x)
[Out] int((cos(c + d*x)^(1/2)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(5/2), x)
```

3.885 $\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}(b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 116

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}(b\cos(c+dx))^{5/2}}\,dx = \frac{A\text{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{2b^2d\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)}{2b^2d\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)}{b^2d\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}$$

```
[Out] 1/2*A*sin(d*x+c)/b^2/d/cos(d*x+c)^(3/2)/(b*cos(d*x+c))^(1/2)+B*sin(d*x+c)/b
^2/d/cos(d*x+c)^(1/2)/(b*cos(d*x+c))^(1/2)+1/2*A*arctanh(sin(d*x+c))*cos(d*
x+c)^(1/2)/b^2/d/(b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {18, 2827, 3853, 3855, 3852, 8}

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}(b\cos(c+dx))^{5/2}}\,dx = \frac{A\sqrt{\cos(c+dx)}\text{arctanh}(\sin(c+dx))}{2b^2d\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)}{2b^2d\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)}{b^2d\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(A + B*Cos[c + d*x])/(Sqrt[Cos[c + d*x]]*(b*Cos[c + d*x])^(5/2)),x]
```

```
[Out] (A*ArcTanh[Sin[c + d*x]]*Sqrt[Cos[c + d*x]])/(2*b^2*d*Sqrt[b*Cos[c + d*x]])
 + (A*Sin[c + d*x])/(2*b^2*d*Cos[c + d*x]^(3/2)*Sqrt[b*Cos[c + d*x]]) + (B*
Sin[c + d*x])/(b^2*d*Sqrt[Cos[c + d*x]]*Sqrt[b*Cos[c + d*x]])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 18

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m - 1/2
)*b^(n + 1/2)*(Sqrt[a*v]/Sqrt[b*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && ILtQ[n - 1/2, 0] && IntegerQ[m + n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{\cos(c+dx)}\int (A+B\cos(c+dx))\sec^3(c+dx)\,dx}{b^2\sqrt{b\cos(c+dx)}}\\
&= \frac{\left(A\sqrt{\cos(c+dx)}\right)\int \sec^3(c+dx)\,dx}{b^2\sqrt{b\cos(c+dx)}}+\frac{\left(B\sqrt{\cos(c+dx)}\right)\int \sec^2(c+dx)\,dx}{b^2\sqrt{b\cos(c+dx)}}\\
&= \frac{A\sin(c+dx)}{2b^2d\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}}+\frac{\left(A\sqrt{\cos(c+dx)}\right)\int \sec(c+dx)\,dx}{2b^2\sqrt{b\cos(c+dx)}}\\
&\quad -\frac{\left(B\sqrt{\cos(c+dx)}\right)\text{Subst}\left(\int 1\,dx,x,-\tan(c+dx)\right)}{b^2d\sqrt{b\cos(c+dx)}}
\end{aligned}$$

$$= \frac{A\mathrm{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{2b^2d\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)}{2b^2d\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)}{b^2d\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.56

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}(b\cos(c+dx))^{5/2}}\,dx = \frac{\sqrt{\cos(c+dx)}(A\mathrm{arctanh}(\sin(c+dx))\cos^2(c+dx)+(A+2B\cos(c\ldots}{2d(b\cos(c+dx))^{5/2}}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/(Sqrt[Cos[c + d*x]]*(b*Cos[c + d*x])^(5/2)),
x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*(A*ArcTanh[Sin[c + d*x]]*Cos[c + d*x]^2 + (A + 2*B*Cos[
c + d*x])*Sin[c + d*x]))/(2*d*(b*Cos[c + d*x])^(5/2))
```

Maple [A] (verified)

Time = 5.11 (sec) , antiderivative size = 106, normalized size of antiderivative = 0.91

method	result
default	$\frac{A(\cos^2(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)+1)-A(\cos^2(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)-1)+2B\sin(dx+c)\cos(dx+c)+A\sin(dx+\ldots}{2b^2d\sqrt{\cos(dx+c)b}\,\cos(dx+c)^{\frac{3}{2}}}$
parts	$\frac{A(-(\cos^2(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)-1)+(\cos^2(dx+c))\ln(-\cot(dx+c)+\csc(dx+c)+1)+\sin(dx+c))}{2d\,b^2\sqrt{\cos(dx+c)b}\,\cos(dx+c)^{\frac{3}{2}}}+\frac{B\sin(dx+\ldots}{b^2d\sqrt{\cos(dx+c)}\,\sqrt{\ldots}}$
risch	$-\frac{i(A\,e^{2i(dx+c)}-A-4B\cos(dx+c))}{2b^2\sqrt{\cos(dx+c)b}\,\sqrt{\cos(dx+c)}\,(e^{2i(dx+c)}+1)d}+\frac{(\sqrt{\cos}(dx+c))A\ln(e^{i(dx+c)}+i)}{2b^2\sqrt{\cos(dx+c)b}\,d}-\frac{(\sqrt{\cos}(dx+c))A\ln(e^{i(dx+c)}-i)}{2b^2\sqrt{\cos(dx+c)b}\,d}$

```
[In] int((A+B*cos(d*x+c))/cos(d*x+c)^(1/2)/(cos(d*x+c)*b)^(5/2),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/2/b^2/d*(A*cos(d*x+c)^2*ln(-cot(d*x+c)+csc(d*x+c)+1)-A*cos(d*x+c)^2*ln(-c
ot(d*x+c)+csc(d*x+c)-1)+2*B*sin(d*x+c)*cos(d*x+c)+A*sin(d*x+c))/(cos(d*x+c)
*b)^(1/2)/cos(d*x+c)^(3/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.39 (sec) , antiderivative size = 231, normalized size of antiderivative = 1.99

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}(b\cos(c+dx))^{5/2}}\,dx = \left[\frac{A\sqrt{b}\cos\left(dx+c\right)^3\log\left(-\frac{b\cos(dx+c)^3-2\sqrt{b\cos(dx+c)}\sqrt{b}\sqrt{\cos(dx+c)}\sin(dx+c)}{\cos(dx+c)^3}\right.}{4}\right.$$

$$-\frac{A\sqrt{-b}\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)\cos\left(dx+c\right)^3-\left(2\,B\cos\left(dx+c\right)+A\right)\sqrt{b\cos\left(dx+c\right)}\sqrt{\cos\left(dx+\right.}}{2\,b^3d\cos\left(dx+c\right)^3}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(1/2)/(b*cos(d*x+c))^(5/2),x, algorit
hm="fricas")
```

```
[Out] [1/4*(A*sqrt(b)*cos(d*x + c)^3*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x +
c))*sqrt(b)*sqrt(cos(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x + c
)^3) + 2*(2*B*cos(d*x + c) + A)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin
(d*x + c))/(b^3*d*cos(d*x + c)^3), -1/2*(A*sqrt(-b)*arctan(sqrt(b*cos(d*x +
 c))*sqrt(-b)*sin(d*x + c)/(b*sqrt(cos(d*x + c))))*cos(d*x + c)^3 - (2*B*co
s(d*x + c) + A)*sqrt(b*cos(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(b^3*
d*cos(d*x + c)^3)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}(b\cos(c+dx))^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)**(1/2)/(b*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 757 vs. $2(100) = 200$.

Time = 0.44 (sec) , antiderivative size = 757, normalized size of antiderivative = 6.53

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}(b\cos(c+dx))^{5/2}}\,dx = \text{Too large to display}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(1/2)/(b*cos(d*x+c))^(5/2),x, algorit
hm="maxima")
```

```
[Out] 1/4*(8*B*sqrt(b)*sin(2*d*x + 2*c)/(b^3*cos(2*d*x + 2*c)^2 + b^3*sin(2*d*x +
 2*c)^2 + 2*b^3*cos(2*d*x + 2*c) + b^3) - (4*(sin(4*d*x + 4*c) + 2*sin(2*d*
x + 2*c))*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 4*(sin(4*d
*x + 4*c) + 2*sin(2*d*x + 2*c))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c))) - (2*(2*cos(2*d*x + 2*c) + 1)*cos(4*d*x + 4*c) + cos(4*d*x + 4*c)
^2 + 4*cos(2*d*x + 2*c)^2 + sin(4*d*x + 4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2*d
*x + 2*c) + 4*sin(2*d*x + 2*c)^2 + 4*cos(2*d*x + 2*c) + 1)*log(cos(1/2*arct
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*
c), cos(2*d*x + 2*c)))^2 + 2*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
2*c))) + 1) + (2*(2*cos(2*d*x + 2*c) + 1)*cos(4*d*x + 4*c) + cos(4*d*x + 4*
c)^2 + 4*cos(2*d*x + 2*c)^2 + sin(4*d*x + 4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2
*d*x + 2*c) + 4*sin(2*d*x + 2*c)^2 + 4*cos(2*d*x + 2*c) + 1)*log(cos(1/2*ar
ctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x +
2*c), cos(2*d*x + 2*c)))^2 - 2*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c))) + 1) - 4*(cos(4*d*x + 4*c) + 2*cos(2*d*x + 2*c) + 1)*sin(3/2*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 4*(cos(4*d*x + 4*c) + 2*cos(2*d*x
 + 2*c) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))))*A/((b^2*
cos(4*d*x + 4*c)^2 + 4*b^2*cos(2*d*x + 2*c)^2 + b^2*sin(4*d*x + 4*c)^2 + 4*
b^2*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*b^2*sin(2*d*x + 2*c)^2 + 4*b^2*co
s(2*d*x + 2*c) + b^2 + 2*(2*b^2*cos(2*d*x + 2*c) + b^2)*cos(4*d*x + 4*c))*s
qrt(b)))/d
```

Giac [F]

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}(b\cos(c+dx))^{5/2}}\,dx=\int \frac{B\cos\left(dx+c\right)+A}{\left(b\cos\left(dx+c\right)\right)^{\frac{5}{2}}\sqrt{\cos\left(dx+c\right)}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(1/2)/(b*cos(d*x+c))^(5/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)/((b*cos(d*x + c))^(5/2)*sqrt(cos(d*x + c))),
 x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{\sqrt{\cos(c+dx)}(b\cos(c+dx))^{5/2}}\,dx=\int \frac{A+B\,\cos\left(c+d\,x\right)}{\sqrt{\cos\left(c+d\,x\right)}\,{\left(b\,\cos\left(c+d\,x\right)\right)}^{5/2}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(5/2)),x)
```

```
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)^(1/2)*(b*cos(c + d*x))^(5/2)), x)
```

3.886 $\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 157

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{5/2}}\,dx = \frac{B\operatorname{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{2b^2d\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)}{2b^2d\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)}{b^2d\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}} + \frac{A\sin^3(c+dx)}{3b^2d\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}}$$

```
[Out] 1/2*B*sin(d*x+c)/b^2/d/cos(d*x+c)^(3/2)/(b*cos(d*x+c))^(1/2)+1/3*A*sin(d*x+
c)^3/b^2/d/cos(d*x+c)^(5/2)/(b*cos(d*x+c))^(1/2)+A*sin(d*x+c)/b^2/d/cos(d*x
+c)^(1/2)/(b*cos(d*x+c))^(1/2)+1/2*B*arctanh(sin(d*x+c))*cos(d*x+c)^(1/2)/b
^2/d/(b*cos(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.152$, Rules used = {18, 2827, 3852, 3853, 3855}

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{5/2}}\,dx = \frac{A\sin^3(c+dx)}{3b^2d\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)}{b^2d\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}} + \frac{B\sqrt{\cos(c+dx)}\operatorname{arctanh}(\sin(c+dx))}{2b^2d\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)}{2b^2d\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}}$$

```
[In] Int[(A + B*Cos[c + d*x])/(Cos[c + d*x]^(3/2)*(b*Cos[c + d*x])^(5/2)),x]
```

```
[Out] (B*ArcTanh[Sin[c + d*x]]*Sqrt[Cos[c + d*x]])/(2*b^2*d*Sqrt[b*Cos[c + d*x]])
 + (B*Sin[c + d*x])/(2*b^2*d*Cos[c + d*x]^(3/2)*Sqrt[b*Cos[c + d*x]]) + (A*
Sin[c + d*x])/(b^2*d*Sqrt[Cos[c + d*x]]*Sqrt[b*Cos[c + d*x]]) + (A*Sin[c +
d*x]^3)/(3*b^2*d*Cos[c + d*x]^(5/2)*Sqrt[b*Cos[c + d*x]])
```

Rule 18

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[a^(m - 1/2
)*b^(n + 1/2)*(Sqrt[a*v]/Sqrt[b*v]), Int[u*v^(m + n), x], x] /; FreeQ[{a, b
, m}, x] &&  !IntegerQ[m] && ILtQ[n - 1/2, 0] && IntegerQ[m + n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{\cos(c+dx)}\int (A+B\cos(c+dx))\sec^4(c+dx)\,dx}{b^2\sqrt{b\cos(c+dx)}}$$

$$= \frac{\left(A\sqrt{\cos(c+dx)}\right)\int \sec^4(c+dx)\,dx}{b^2\sqrt{b\cos(c+dx)}} + \frac{\left(B\sqrt{\cos(c+dx)}\right)\int \sec^3(c+dx)\,dx}{b^2\sqrt{b\cos(c+dx)}}$$

$$= \frac{B\sin(c+dx)}{2b^2d\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{\left(B\sqrt{\cos(c+dx)}\right)\int\sec(c+dx)\,dx}{2b^2\sqrt{b\cos(c+dx)}} - \frac{\left(A\sqrt{\cos(c+dx)}\right)\text{Subst}\left(\int(1+x^2)\,dx, x, -\tan(c+dx)\right)}{b^2d\sqrt{b\cos(c+dx)}}$$

$$= \frac{B\text{arctanh}(\sin(c+dx))\sqrt{\cos(c+dx)}}{2b^2d\sqrt{b\cos(c+dx)}} + \frac{B\sin(c+dx)}{2b^2d\cos^{\frac{3}{2}}(c+dx)\sqrt{b\cos(c+dx)}} + \frac{A\sin(c+dx)}{b^2d\sqrt{\cos(c+dx)}\sqrt{b\cos(c+dx)}} + \frac{A\sin^3(c+dx)}{3b^2d\cos^{\frac{5}{2}}(c+dx)\sqrt{b\cos(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.48

$$\int \frac{A+B\cos(c+dx)}{\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^{5/2}}\,dx = \frac{\sqrt{\cos(c+dx)}(3B\text{arctanh}(\sin(c+dx))\cos^2(c+dx) + 3B\sin(c+dx)}{6d(b\cos(c+dx))^{5/2}}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/(Cos[c + d*x]^(3/2)*(b*Cos[c + d*x])^(5/2)),
x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*(3*B*ArcTanh[Sin[c + d*x]]*Cos[c + d*x]^2 + 3*B*Sin[c +
 d*x] + 2*A*(2 + Cos[2*(c + d*x)])*Tan[c + d*x]))/(6*d*(b*Cos[c + d*x])^(5/
2))
```

Maple [A] (verified)

Time = 5.22 (sec) , antiderivative size = 125, normalized size of antiderivative = 0.80

method	result
default	$\frac{-3B\left(\cos^3(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)-1)+3B\left(\cos^3(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)+1)+4A\sin(dx+c)\left(\cos^2(dx+c)\right)+}{6b^2d\sqrt{\cos(dx+c)b}\,\cos(dx+c)^{\frac{5}{2}}}$
parts	$\frac{A\left(2\left(\cos^2(dx+c)\right)+1\right)\sin(dx+c)}{3d\,b^2\sqrt{\cos(dx+c)b}\,\cos(dx+c)^{\frac{5}{2}}} + \frac{B\left(-\left(\cos^2(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)-1)+\left(\cos^2(dx+c)\right)\ln(-\cot(dx+c)+\csc(dx+c)+\right.}{2d\,b^2\sqrt{\cos(dx+c)b}\,\cos(dx+c)^{\frac{3}{2}}}$
risch	$-\frac{i\left(3B\,e^{4i(dx+c)}-3B-16A\cos(dx+c)-8iA\sin(dx+c)\right)}{6b^2\sqrt{\cos(dx+c)b}\,\sqrt{\cos(dx+c)}\,\left(e^{2i(dx+c)}+1\right)^2d} + \frac{\left(\sqrt{\cos}(dx+c)\right)B\ln\left(e^{i(dx+c)}+i\right)}{2b^2\sqrt{\cos(dx+c)b}\,d} - \frac{\left(\sqrt{\cos}(dx+c)\right)B\ln\left(e^{i(dx+c)}-i\right)}{2b^2\sqrt{\cos(dx+c)b}\,d}$

```
[In] int((A+B*cos(d*x+c))/cos(d*x+c)^(3/2)/(cos(d*x+c)*b)^(5/2),x,method=_RETURN
VERBOSE)
```

```
[Out] 1/6/b^2/d*(-3*B*cos(d*x+c)^3*ln(-cot(d*x+c)+csc(d*x+c)-1)+3*B*cos(d*x+c)^3*
ln(-cot(d*x+c)+csc(d*x+c)+1)+4*A*sin(d*x+c)*cos(d*x+c)^2+3*B*sin(d*x+c)*cos
(d*x+c)+2*A*sin(d*x+c))/(cos(d*x+c)*b)^(1/2)/cos(d*x+c)^(5/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 259, normalized size of antiderivative = 1.65

$$\int \frac{A + B\cos(c + dx)}{\cos^{\frac{3}{2}}(c + dx)(b\cos(c + dx))^{5/2}}\, dx = \left[\frac{3\, B\sqrt{b}\cos\left(dx + c\right)^{4}\log\left(-\frac{b\cos(dx+c)^{3} - 2\,\sqrt{b\cos(dx+c)}\sqrt{b}\sqrt{\cos(dx+c)}\sin(dx+c)}{\cos(dx+c)^{3}}\right.}{} \right.$$

$$-\frac{3\, B\sqrt{-b}\arctan\left(\frac{\sqrt{b\cos(dx+c)}\sqrt{-b}\sin(dx+c)}{b\sqrt{\cos(dx+c)}}\right)\cos\left(dx + c\right)^{4} - \left(4\, A\cos\left(dx + c\right)^{2} + 3\, B\cos\left(dx + c\right) + 2\, A\right)\sqrt{b\cos}}{6\, b^{3}d\cos\left(dx + c\right)^{4}}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(3/2)/(b*cos(d*x+c))^(5/2),x, algorit
hm="fricas")
```

```
[Out] [1/12*(3*B*sqrt(b)*cos(d*x + c)^4*log(-(b*cos(d*x + c)^3 - 2*sqrt(b*cos(d*x
 + c))*sqrt(b)*sqrt(cos(d*x + c))*sin(d*x + c) - 2*b*cos(d*x + c))/cos(d*x
+ c)^3) + 2*(4*A*cos(d*x + c)^2 + 3*B*cos(d*x + c) + 2*A)*sqrt(b*cos(d*x +
c))*sqrt(cos(d*x + c))*sin(d*x + c))/(b^3*d*cos(d*x + c)^4), -1/6*(3*B*sqrt
(-b)*arctan(sqrt(b*cos(d*x + c))*sqrt(-b)*sin(d*x + c)/(b*sqrt(cos(d*x + c)
)))*cos(d*x + c)^4 - (4*A*cos(d*x + c)^2 + 3*B*cos(d*x + c) + 2*A)*sqrt(b*c
os(d*x + c))*sqrt(cos(d*x + c))*sin(d*x + c))/(b^3*d*cos(d*x + c)^4)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A + B\cos(c + dx)}{\cos^{\frac{3}{2}}(c + dx)(b\cos(c + dx))^{5/2}}\, dx = \text{Timed out}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)**(3/2)/(b*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1033 vs. 2(135) = 270.

Time = 0.43 (sec) , antiderivative size = 1033, normalized size of antiderivative = 6.58

$$\int \frac{A + B\cos(c + dx)}{\cos^{\frac{3}{2}}(c + dx)(b\cos(c + dx))^{5/2}}\, dx = \text{Too large to display}$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(3/2)/(b*cos(d*x+c))^(5/2),x, algorit
hm="maxima")
```

```
[Out] 1/12*(16*((3*cos(2*d*x + 2*c) + 1)*sin(6*d*x + 6*c) + 3*(3*cos(2*d*x + 2*c)
 + 1)*sin(4*d*x + 4*c) - 3*cos(6*d*x + 6*c)*sin(2*d*x + 2*c) - 9*cos(4*d*x
+ 4*c)*sin(2*d*x + 2*c))*A/((b^2*cos(6*d*x + 6*c)^2 + 9*b^2*cos(4*d*x + 4*c
)^2 + 9*b^2*cos(2*d*x + 2*c)^2 + b^2*sin(6*d*x + 6*c)^2 + 9*b^2*sin(4*d*x +
 4*c)^2 + 18*b^2*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 9*b^2*sin(2*d*x + 2*c)
^2 + 6*b^2*cos(2*d*x + 2*c) + b^2 + 2*(3*b^2*cos(4*d*x + 4*c) + 3*b^2*cos(2
*d*x + 2*c) + b^2)*cos(6*d*x + 6*c) + 6*(3*b^2*cos(2*d*x + 2*c) + b^2)*cos(
4*d*x + 4*c) + 6*(b^2*sin(4*d*x + 4*c) + b^2*sin(2*d*x + 2*c))*sin(6*d*x +
6*c))*sqrt(b)) - 3*(4*(sin(4*d*x + 4*c) + 2*sin(2*d*x + 2*c))*cos(3/2*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 4*(sin(4*d*x + 4*c) + 2*sin(2*d*x
 + 2*c))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - (2*(2*cos(2
*d*x + 2*c) + 1)*cos(4*d*x + 4*c) + cos(4*d*x + 4*c)^2 + 4*cos(2*d*x + 2*c)
^2 + sin(4*d*x + 4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*sin(2*d*x
 + 2*c)^2 + 4*cos(2*d*x + 2*c) + 1)*log(cos(1/2*arctan2(sin(2*d*x + 2*c), c
os(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^
2 + 2*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (2*(2*cos
(2*d*x + 2*c) + 1)*cos(4*d*x + 4*c) + cos(4*d*x + 4*c)^2 + 4*cos(2*d*x + 2*
c)^2 + sin(4*d*x + 4*c)^2 + 4*sin(4*d*x + 4*c)*sin(2*d*x + 2*c) + 4*sin(2*d
*x + 2*c)^2 + 4*cos(2*d*x + 2*c) + 1)*log(cos(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
)^2 - 2*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - 4*(cos(
4*d*x + 4*c) + 2*cos(2*d*x + 2*c) + 1)*sin(3/2*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c))) + 4*(cos(4*d*x + 4*c) + 2*cos(2*d*x + 2*c) + 1)*sin(1/2*ar
ctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))))*B/((b^2*cos(4*d*x + 4*c)^2 + 4*
b^2*cos(2*d*x + 2*c)^2 + b^2*sin(4*d*x + 4*c)^2 + 4*b^2*sin(4*d*x + 4*c)*si
n(2*d*x + 2*c) + 4*b^2*sin(2*d*x + 2*c)^2 + 4*b^2*cos(2*d*x + 2*c) + b^2 +
2*(2*b^2*cos(2*d*x + 2*c) + b^2)*cos(4*d*x + 4*c))*sqrt(b)))/d
```

Giac [F]

$$\int \frac{A + B\cos(c + dx)}{\cos^{\frac{3}{2}}(c + dx)(b\cos(c + dx))^{5/2}}\,dx = \int \frac{B\cos(dx + c) + A}{(b\cos(dx + c))^{\frac{5}{2}}\cos(dx + c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/cos(d*x+c)^(3/2)/(b*cos(d*x+c))^(5/2),x, algorit
hm="giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)/((b*cos(d*x + c))^(5/2)*cos(d*x + c)^(3/2)),
 x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A + B\cos(c + dx)}{\cos^{\frac{3}{2}}(c + dx)(b\cos(c + dx))^{5/2}}\, dx = \int \frac{A + B\,\cos(c + d\,x)}{\cos(c + d\,x)^{3/2}\,(b\,\cos(c + d\,x))^{5/2}}\, dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)^(3/2)*(b*cos(c + d*x))^(5/2)),x)
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)^(3/2)*(b*cos(c + d*x))^(5/2)), x)
```

3.887 $\int \cos^2(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 119

$$\int \cos^2(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = -\frac{3A(b\cos(c+dx))^{10/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{3},\frac{8}{3},\cos^2(c+dx)\right)\sin(c+dx)}{10b^3d\sqrt{\sin^2(c+dx)}} - \frac{3B(b\cos(c+dx))^{13/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{13}{6},\frac{19}{6},\cos^2(c+dx)\right)\sin(c+dx)}{13b^4d\sqrt{\sin^2(c+dx)}}$$

```
[Out] -3/10*A*(b*cos(d*x+c))^(10/3)*hypergeom([1/2, 5/3],[8/3],cos(d*x+c)^2)*sin(
d*x+c)/b^3/d/(sin(d*x+c)^2)^(1/2)-3/13*B*(b*cos(d*x+c))^(13/3)*hypergeom([1
/2, 13/6],[19/6],cos(d*x+c)^2)*sin(d*x+c)/b^4/d/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {16, 2827, 2722}

$$\int \cos^2(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = -\frac{3A\sin(c+dx)(b\cos(c+dx))^{10/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{3},\frac{8}{3},\cos^2(c+dx)\right)}{10b^3d\sqrt{\sin^2(c+dx)}} - \frac{3B\sin(c+dx)(b\cos(c+dx))^{13/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{13}{6},\frac{19}{6},\cos^2(c+dx)\right)}{13b^4d\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^2*(b*Cos[c + d*x])^(1/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-3*A*(b*Cos[c + d*x])^(10/3)*Hypergeometric2F1[1/2, 5/3, 8/3, Cos[c + d*x]
^2]*Sin[c + d*x])/(10*b^3*d*Sqrt[Sin[c + d*x]^2]) - (3*B*(b*Cos[c + d*x])^(
13/3)*Hypergeometric2F1[1/2, 13/6, 19/6, Cos[c + d*x]^2]*Sin[c + d*x])/(13*
b^4*d*Sqrt[Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\int (b\cos(c+dx))^{7/3}(A+B\cos(c+dx))\,dx}{b^2}\\
&= \frac{A\int (b\cos(c+dx))^{7/3}\,dx}{b^2}+\frac{B\int (b\cos(c+dx))^{10/3}\,dx}{b^3}\\
&= -\frac{3A(b\cos(c+dx))^{10/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{3},\frac{8}{3},\cos^2(c+dx)\right)\sin(c+dx)}{10b^3d\sqrt{\sin^2(c+dx)}}\\
&\quad-\frac{3B(b\cos(c+dx))^{13/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{13}{6},\frac{19}{6},\cos^2(c+dx)\right)\sin(c+dx)}{13b^4d\sqrt{\sin^2(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.79

$$\int \cos^2(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx =$$

$$-\frac{3\cos^2(c+dx)\sqrt[3]{b\cos(c+dx)}\cot(c+dx)\left(13A\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{3},\frac{8}{3},\cos^2(c+dx)\right)+10B\cos(c+\right.}{130d}$$

```
[In] Integrate[Cos[c + d*x]^2*(b*Cos[c + d*x])^(1/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-3*Cos[c + d*x]^2*(b*Cos[c + d*x])^(1/3)*Cot[c + d*x]*(13*A*Hypergeometric
2F1[1/2, 5/3, 8/3, Cos[c + d*x]^2] + 10*B*Cos[c + d*x]*Hypergeometric2F1[1/
2, 13/6, 19/6, Cos[c + d*x]^2])*Sqrt[Sin[c + d*x]^2])/(130*d)
```

Maple [F]

$$\int \left(\cos^2\left(dx+c\right)\right)\left(\cos\left(dx+c\right)b\right)^{\frac{1}{3}}\left(A+B\cos\left(dx+c\right)\right)dx$$

```
[In] int(cos(d*x+c)^2*(cos(d*x+c)*b)^(1/3)*(A+B*cos(d*x+c)),x)
```

```
[Out] int(cos(d*x+c)^2*(cos(d*x+c)*b)^(1/3)*(A+B*cos(d*x+c)),x)
```

Fricas [F]

$$\int \cos^2(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \int (B\cos\left(dx+c\right)+A)(b\cos\left(dx+c\right))^{\frac{1}{3}}\cos\left(dx+c\right)^2\,dx$$

```
[In] integrate(cos(d*x+c)^2*(b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c)),x, algorithm="
fricas")
```

```
[Out] integral((B*cos(d*x + c)^3 + A*cos(d*x + c)^2)*(b*cos(d*x + c))^(1/3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^2(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**2*(b*cos(d*x+c))**(1/3)*(A+B*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \cos^2(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{1}{3}}\cos(dx+c)^2\,dx$$

```
[In] integrate(cos(d*x+c)^2*(b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c)),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*cos(d*x + c)^2, x)
```

Giac [F]

$$\int \cos^2(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{1}{3}}\cos(dx+c)^2\,dx$$

```
[In] integrate(cos(d*x+c)^2*(b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c)),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*cos(d*x + c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^2(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\int \cos(c+d\,x)^2\,(b\,\cos(c+d\,x))^{1/3}\,(A+B\,\cos(c+d\,x))\,dx$$

```
[In] int(cos(c + d*x)^2*(b*cos(c + d*x))^(1/3)*(A + B*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^2*(b*cos(c + d*x))^(1/3)*(A + B*cos(c + d*x)), x)
```

3.888 $\int \cos(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 29, antiderivative size = 119

$$\int \cos(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = -\frac{3A(b\cos(c+dx))^{7/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)\sin(c+dx)}{7b^2d\sqrt{\sin^2(c+dx)}} - \frac{3B(b\cos(c+dx))^{10/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{3},\frac{8}{3},\cos^2(c+dx)\right)\sin(c+dx)}{10b^3d\sqrt{\sin^2(c+dx)}}$$

```
[Out] -3/7*A*(b*cos(d*x+c))^(7/3)*hypergeom([1/2, 7/6],[13/6],cos(d*x+c)^2)*sin(d
*x+c)/b^2/d/(sin(d*x+c)^2)^(1/2)-3/10*B*(b*cos(d*x+c))^(10/3)*hypergeom([1/
2, 5/3],[8/3],cos(d*x+c)^2)*sin(d*x+c)/b^3/d/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {16, 2827, 2722}

$$\int \cos(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = -\frac{3A\sin(c+dx)(b\cos(c+dx))^{7/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)}{7b^2d\sqrt{\sin^2(c+dx)}} - \frac{3B\sin(c+dx)(b\cos(c+dx))^{10/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{3},\frac{8}{3},\cos^2(c+dx)\right)}{10b^3d\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[Cos[c + d*x]*(b*Cos[c + d*x])^(1/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-3*A*(b*Cos[c + d*x])^(7/3)*Hypergeometric2F1[1/2, 7/6, 13/6, Cos[c + d*x]
^2]*Sin[c + d*x])/(7*b^2*d*Sqrt[Sin[c + d*x]^2]) - (3*B*(b*Cos[c + d*x])^(1
0/3)*Hypergeometric2F1[1/2, 5/3, 8/3, Cos[c + d*x]^2]*Sin[c + d*x])/(10*b^3
*d*Sqrt[Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx}{b}\\
&= \frac{A\int (b\cos(c+dx))^{4/3}\,dx}{b}+\frac{B\int (b\cos(c+dx))^{7/3}\,dx}{b^2}\\
&= -\frac{3A(b\cos(c+dx))^{7/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)\sin(c+dx)}{7b^2d\sqrt{\sin^2(c+dx)}}\\
&\quad-\frac{3B(b\cos(c+dx))^{10/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{3},\frac{8}{3},\cos^2(c+dx)\right)\sin(c+dx)}{10b^3d\sqrt{\sin^2(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.75

$$\int \cos(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx =$$

$$-\frac{3(b\cos(c+dx))^{4/3}\cot(c+dx)\left(10A\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)+7B\cos(c+dx)\,\text{Hyper}\right.}{70bd}$$

```
[In] Integrate[Cos[c + d*x]*(b*Cos[c + d*x])^(1/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-3*(b*Cos[c + d*x])^(4/3)*Cot[c + d*x]*(10*A*Hypergeometric2F1[1/2, 7/6, 1
3/6, Cos[c + d*x]^2] + 7*B*Cos[c + d*x]*Hypergeometric2F1[1/2, 5/3, 8/3, Co
s[c + d*x]^2])*Sqrt[Sin[c + d*x]^2])/(70*b*d)
```

Maple [F]

$$\int \cos \left(dx+c\right) \left(\cos \left(dx+c\right) b\right)^{\frac{1}{3}} \left(A+B\cos \left(dx+c\right)\right) dx$$

```
[In] int(cos(d*x+c)*(cos(d*x+c)*b)^(1/3)*(A+B*cos(d*x+c)),x)
```

```
[Out] int(cos(d*x+c)*(cos(d*x+c)*b)^(1/3)*(A+B*cos(d*x+c)),x)
```

Fricas [F]

$$\int \cos(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \int (B\cos\left(dx+c\right)+A)(b\cos\left(dx+c\right))^{\frac{1}{3}}\cos\left(dx+c\right)\,dx$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c)),x, algorithm="fr
icas")
```

```
[Out] integral((B*cos(d*x + c)^2 + A*cos(d*x + c))*(b*cos(d*x + c))^(1/3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \cos(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))**(1/3)*(A+B*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \cos(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{1}{3}}\cos(dx+c)\,dx$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c)),x, algorithm="ma
xima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*cos(d*x + c), x)
```

Giac [F]

$$\int \cos(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{1}{3}}\cos(dx+c)\,dx$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c)),x, algorithm="gi
ac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*cos(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\int \cos(c+d\,x)\,\left(b\,\cos(c+d\,x)\right)^{1/3}\,\left(A+B\,\cos(c+d\,x)\right)\,dx$$

```
[In] int(cos(c + d*x)*(b*cos(c + d*x))^(1/3)*(A + B*cos(c + d*x)),x)
[Out] int(cos(c + d*x)*(b*cos(c + d*x))^(1/3)*(A + B*cos(c + d*x)), x)
```

3.889 $\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 23, antiderivative size = 119

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = -\frac{3A(b\cos(c+dx))^{4/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)\sin(c+dx)}{4bd\sqrt{\sin^2(c+dx)}} - \frac{3B(b\cos(c+dx))^{7/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)\sin(c+dx)}{7b^2d\sqrt{\sin^2(c+dx)}}$$

```
[Out] -3/4*A*(b*cos(d*x+c))^(4/3)*hypergeom([1/2, 2/3],[5/3],cos(d*x+c)^2)*sin(d*
x+c)/b/d/(sin(d*x+c)^2)^(1/2)-3/7*B*(b*cos(d*x+c))^(7/3)*hypergeom([1/2, 7/
6],[13/6],cos(d*x+c)^2)*sin(d*x+c)/b^2/d/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2827, 2722}

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = -\frac{3A\sin(c+dx)(b\cos(c+dx))^{4/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)}{4bd\sqrt{\sin^2(c+dx)}} - \frac{3B\sin(c+dx)(b\cos(c+dx))^{7/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)}{7b^2d\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^(1/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-3*A*(b*Cos[c + d*x])^(4/3)*Hypergeometric2F1[1/2, 2/3, 5/3, Cos[c + d*x]^
2]*Sin[c + d*x])/(4*b*d*Sqrt[Sin[c + d*x]^2]) - (3*B*(b*Cos[c + d*x])^(7/3)
*Hypergeometric2F1[1/2, 7/6, 13/6, Cos[c + d*x]^2]*Sin[c + d*x])/(7*b^2*d*S
qrt[Sin[c + d*x]^2])
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= A\int \sqrt[3]{b\cos(c+dx)}\,dx+\frac{B\int (b\cos(c+dx))^{4/3}\,dx}{b}\\ &= -\frac{3A(b\cos(c+dx))^{4/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)\sin(c+dx)}{4bd\sqrt{\sin^2(c+dx)}}\\ &\quad -\frac{3B(b\cos(c+dx))^{7/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)\sin(c+dx)}{7b^2d\sqrt{\sin^2(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.72

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = -\frac{3\sqrt[3]{b\cos(c+dx)}\cot(c+dx)\left(7A\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)+4B\cos(c+dx)\,\text{Hypergeo}}{28d}$$

```
[In] Integrate[(b*Cos[c + d*x])^(1/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-3*(b*Cos[c + d*x])^(1/3)*Cot[c + d*x]*(7*A*Hypergeometric2F1[1/2, 2/3, 5/
3, Cos[c + d*x]^2] + 4*B*Cos[c + d*x]*Hypergeometric2F1[1/2, 7/6, 13/6, Cos
[c + d*x]^2])*Sqrt[Sin[c + d*x]^2])/(28*d)
```

Maple [F]

$$\int (\cos (dx+c)\, b)^{\frac{1}{3}} (A+B\cos (dx+c))\, dx$$

```
[In] int((cos(d*x+c)*b)^(1/3)*(A+B*cos(d*x+c)),x)
[Out] int((cos(d*x+c)*b)^(1/3)*(A+B*cos(d*x+c)),x)
```

Fricas [F]

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\, dx = \int (B\cos (dx+c)+A)(b\cos (dx+c))^{\frac{1}{3}}\, dx$$

```
[In] integrate((b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c)),x, algorithm="fricas")
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3), x)
```

Sympy [F]

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\, dx = \int \sqrt[3]{b\cos (c+dx)}(A+B\cos (c+dx))\, dx$$

```
[In] integrate((b*cos(d*x+c))**(1/3)*(A+B*cos(d*x+c)),x)
[Out] Integral((b*cos(c + d*x))**(1/3)*(A + B*cos(c + d*x)), x)
```

Maxima [F]

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\, dx = \int (B\cos (dx+c)+A)(b\cos (dx+c))^{\frac{1}{3}}\, dx$$

```
[In] integrate((b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3), x)
```

Giac [F]

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{1}{3}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c)),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = \int (b\,\cos(c+d\,x))^{1/3}\,(A+B\,\cos(c+d\,x))\,dx$$

```
[In] int((b*cos(c + d*x))^(1/3)*(A + B*cos(c + d*x)),x)
[Out] int((b*cos(c + d*x))^(1/3)*(A + B*cos(c + d*x)), x)
```

3.890 $\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec(c+dx)\,dx$

Optimal result

Integrand size = 29, antiderivative size = 114

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec(c+dx)\,dx = -\frac{3A\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)\sin(c+dx)}{d\sqrt{\sin^2(c+dx)}} - \frac{3B(b\cos(c+dx))^{4/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)\sin(c+dx)}{4bd\sqrt{\sin^2(c+dx)}}$$

```
[Out] -3*A*(b*cos(d*x+c))^(1/3)*hypergeom([1/6, 1/2],[7/6],cos(d*x+c)^2)*sin(d*x+
c)/d/(sin(d*x+c)^2)^(1/2)-3/4*B*(b*cos(d*x+c))^(4/3)*hypergeom([1/2, 2/3],[
5/3],cos(d*x+c)^2)*sin(d*x+c)/b/d/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {16, 2827, 2722}

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec(c+dx)\,dx = -\frac{3A\sin(c+dx)\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)}{d\sqrt{\sin^2(c+dx)}} - \frac{3B\sin(c+dx)(b\cos(c+dx))^{4/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)}{4bd\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^(1/3)*(A + B*Cos[c + d*x])*Sec[c + d*x],x]
```

```
[Out] (-3*A*(b*Cos[c + d*x])^(1/3)*Hypergeometric2F1[1/6, 1/2, 7/6, Cos[c + d*x]^
2]*Sin[c + d*x])/(d*Sqrt[Sin[c + d*x]^2]) - (3*B*(b*Cos[c + d*x])^(4/3)*Hyp
ergeometric2F1[1/2, 2/3, 5/3, Cos[c + d*x]^2]*Sin[c + d*x])/(4*b*d*Sqrt[Sin
[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= b\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx\\
&= (Ab)\int \frac{1}{(b\cos(c+dx))^{2/3}}\,dx + B\int \sqrt[3]{b\cos(c+dx)}\,dx\\
&= -\frac{3A\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)\sin(c+dx)}{d\sqrt{\sin^2(c+dx)}}\\
&\quad -\frac{3B(b\cos(c+dx))^{4/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)\sin(c+dx)}{4bd\sqrt{\sin^2(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.75

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec(c+dx)\,dx = -\frac{3b\cot(c+dx)\left(4A\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)+B\cos(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\right.\right.}{4d(b\cos(c+dx))^{2/3}}$$

```
[In] Integrate[(b*Cos[c + d*x])^(1/3)*(A + B*Cos[c + d*x])*Sec[c + d*x],x]
```

```
[Out] (-3*b*Cot[c + d*x]*(4*A*Hypergeometric2F1[1/6, 1/2, 7/6, Cos[c + d*x]^2] +
B*Cos[c + d*x]*Hypergeometric2F1[1/2, 2/3, 5/3, Cos[c + d*x]^2])*Sqrt[Sin[c
 + d*x]^2])/(4*d*(b*Cos[c + d*x])^(2/3))
```

Maple [F]

$$\int (\cos(dx+c)\,b)^{\frac{1}{3}}\,(A+B\cos(dx+c))\sec(dx+c)\,dx$$

```
[In] int((cos(d*x+c)*b)^(1/3)*(A+B*cos(d*x+c))*sec(d*x+c),x)
```

```
[Out] int((cos(d*x+c)*b)^(1/3)*(A+B*cos(d*x+c))*sec(d*x+c),x)
```

Fricas [F]

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{1}{3}}\sec(dx+c)\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c))*sec(d*x+c),x, algorithm="fr
icas")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*sec(d*x + c), x)
```

Sympy [F]

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec(c+dx)\,dx$$
$$=\int \sqrt[3]{b\cos\left(c+dx\right)}(A+B\cos\left(c+dx\right))\sec\left(c+dx\right)dx$$

```
[In] integrate((b*cos(d*x+c))**(1/3)*(A+B*cos(d*x+c))*sec(d*x+c),x)
[Out] Integral((b*cos(c + d*x))**(1/3)*(A + B*cos(c + d*x))*sec(c + d*x), x)
```

Maxima [F]

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec(c+dx)\,dx$$
$$=\int (B\cos\left(dx+c\right)+A)(b\cos\left(dx+c\right))^{\frac{1}{3}}\sec\left(dx+c\right)\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c))*sec(d*x+c),x, algorithm="ma
xima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*sec(d*x + c), x)
```

Giac [F]

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec(c+dx)\,dx$$
$$=\int (B\cos\left(dx+c\right)+A)(b\cos\left(dx+c\right))^{\frac{1}{3}}\sec\left(dx+c\right)\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c))*sec(d*x+c),x, algorithm="gi
ac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*sec(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec(c+dx)\,dx = \int \frac{(b\,\cos(c+d\,x))^{1/3}\,(A+B\,\cos(c+d\,x))}{\cos(c+d\,x)}\,dx$$

```
[In] int(((b*cos(c + d*x))^(1/3)*(A + B*cos(c + d*x)))/cos(c + d*x),x)
[Out] int(((b*cos(c + d*x))^(1/3)*(A + B*cos(c + d*x)))/cos(c + d*x), x)
```

3.891 $\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 31, antiderivative size = 112

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \frac{3Ab\,\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(c+dx)\right)\sin(c+dx)}{2d(b\cos(c+dx))^{2/3}\sqrt{\sin^2(c+dx)}} - \frac{3B\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)\sin(c+dx)}{d\sqrt{\sin^2(c+dx)}}$$

```
[Out] 3/2*A*b*hypergeom([-1/3, 1/2],[2/3],cos(d*x+c)^2)*sin(d*x+c)/d/(b*cos(d*x+c
))^(2/3)/(sin(d*x+c)^2)^(1/2)-3*B*(b*cos(d*x+c))^(1/3)*hypergeom([1/6, 1/2]
,[7/6],cos(d*x+c)^2)*sin(d*x+c)/d/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {16, 2827, 2722}

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \frac{3Ab\sin(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(c+dx)\right)}{2d\sqrt{\sin^2(c+dx)}(b\cos(c+dx))^{2/3}} - \frac{3B\sin(c+dx)\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)}{d\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^(1/3)*(A + B*Cos[c + d*x])*Sec[c + d*x]^2,x]
```

```
[Out] (3*A*b*Hypergeometric2F1[-1/3, 1/2, 2/3, Cos[c + d*x]^2]*Sin[c + d*x])/(2*d
*(b*Cos[c + d*x])^(2/3)*Sqrt[Sin[c + d*x]^2]) - (3*B*(b*Cos[c + d*x])^(1/3)
*Hypergeometric2F1[1/6, 1/2, 7/6, Cos[c + d*x]^2]*Sin[c + d*x])/(d*Sqrt[Sin
[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= b^2 \int \frac{A + B\cos(c+dx)}{(b\cos(c+dx))^{5/3}}\,dx \\
&= (Ab^2) \int \frac{1}{(b\cos(c+dx))^{5/3}}\,dx + (bB) \int \frac{1}{(b\cos(c+dx))^{2/3}}\,dx \\
&= \frac{3Ab\,\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(c+dx)\right)\sin(c+dx)}{2d(b\cos(c+dx))^{2/3}\sqrt{\sin^2(c+dx)}} \\
&\quad - \frac{3B\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)\sin(c+dx)}{d\sqrt{\sin^2(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.77

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \frac{3b\csc(c+dx)\left(A\,\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(c+dx)\right)-2B\cos(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\right.\right.}{2d(b\cos(c+dx))^{2/3}}$$

```
[In] Integrate[(b*Cos[c + d*x])^(1/3)*(A + B*Cos[c + d*x])*Sec[c + d*x]^2,x]
```

```
[Out] (3*b*Csc[c + d*x]*(A*Hypergeometric2F1[-1/3, 1/2, 2/3, Cos[c + d*x]^2] - 2*
B*Cos[c + d*x]*Hypergeometric2F1[1/6, 1/2, 7/6, Cos[c + d*x]^2])*Sqrt[Sin[c
 + d*x]^2])/(2*d*(b*Cos[c + d*x])^(2/3))
```

Maple [F]

$$\int (\cos(dx+c)\,b)^{\frac{1}{3}}\,(A+B\cos(dx+c))\left(\sec^2(dx+c)\right)dx$$

```
[In] int((cos(d*x+c)*b)^(1/3)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x)
```

```
[Out] int((cos(d*x+c)*b)^(1/3)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x)
```

Fricas [F]

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{1}{3}}\sec(dx+c)^2\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="
fricas")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*sec(d*x + c)^2, x)
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(1/3)*(A+B*cos(d*x+c))*sec(d*x+c)**2,x)
[Out] Timed out
```

Maxima [F]

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{1}{3}}\sec(dx+c)^2\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*sec(d*x + c)^2, x)
```

Giac [F]

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{1}{3}}\sec(dx+c)^2\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*sec(d*x + c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec^2(c+dx)\,dx$$
$$=\int \frac{(b\,\cos(c+d\,x))^{1/3}\,(A+B\,\cos(c+d\,x))}{\cos(c+d\,x)^2}\,dx$$

```
[In] int(((b*cos(c + d*x))^(1/3)*(A + B*cos(c + d*x)))/cos(c + d*x)^2,x)
[Out] int(((b*cos(c + d*x))^(1/3)*(A + B*cos(c + d*x)))/cos(c + d*x)^2, x)
```

3.892 $\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 31, antiderivative size = 117

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \frac{3Ab^2\,\text{Hypergeometric2F1}\left(-\frac{5}{6},\frac{1}{2},\frac{1}{6},\cos^2(c+dx)\right)\sin(c+dx)}{5d(b\cos(c+dx))^{5/3}\sqrt{\sin^2(c+dx)}} + \frac{3bB\,\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(c+dx)\right)\sin(c+dx)}{2d(b\cos(c+dx))^{2/3}\sqrt{\sin^2(c+dx)}}$$

```
[Out] 3/5*A*b^2*hypergeom([-5/6, 1/2],[1/6],cos(d*x+c)^2)*sin(d*x+c)/d/(b*cos(d*x
+c))^(5/3)/(sin(d*x+c)^2)^(1/2)+3/2*b*B*hypergeom([-1/3, 1/2],[2/3],cos(d*x
+c)^2)*sin(d*x+c)/d/(b*cos(d*x+c))^(2/3)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {16, 2827, 2722}

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \frac{3Ab^2\sin(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{5}{6},\frac{1}{2},\frac{1}{6},\cos^2(c+dx)\right)}{5d\sqrt{\sin^2(c+dx)}(b\cos(c+dx))^{5/3}} + \frac{3bB\sin(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(c+dx)\right)}{2d\sqrt{\sin^2(c+dx)}(b\cos(c+dx))^{2/3}}$$

```
[In] Int[(b*Cos[c + d*x])^(1/3)*(A + B*Cos[c + d*x])*Sec[c + d*x]^3,x]
```

```
[Out] (3*A*b^2*Hypergeometric2F1[-5/6, 1/2, 1/6, Cos[c + d*x]^2]*Sin[c + d*x])/(5
*d*(b*Cos[c + d*x])^(5/3)*Sqrt[Sin[c + d*x]^2]) + (3*b*B*Hypergeometric2F1[
-1/3, 1/2, 2/3, Cos[c + d*x]^2]*Sin[c + d*x])/(2*d*(b*Cos[c + d*x])^(2/3)*S
qrt[Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= b^3 \int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{8/3}}\,dx\\
&= \left(Ab^3\right)\int \frac{1}{(b\cos(c+dx))^{8/3}}\,dx+\left(b^2B\right)\int \frac{1}{(b\cos(c+dx))^{5/3}}\,dx\\
&= \frac{3Ab^2\,\text{Hypergeometric2F1}\left(-\frac{5}{6},\frac{1}{2},\frac{1}{6},\cos^2(c+dx)\right)\sin(c+dx)}{5d(b\cos(c+dx))^{5/3}\sqrt{\sin^2(c+dx)}}\\
&\quad+\frac{3bB\,\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(c+dx)\right)\sin(c+dx)}{2d(b\cos(c+dx))^{2/3}\sqrt{\sin^2(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.80

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec^3(c+dx)\,dx$$
$$=\frac{3\sqrt[3]{b\cos(c+dx)}\csc(c+dx)\left(2A\,\text{Hypergeometric2F1}\left(-\frac{5}{6},\frac{1}{2},\frac{1}{6},\cos^2(c+dx)\right)+5B\cos(c+dx)\,\text{Hypergeo}\right.}{10d}$$

```
[In] Integrate[(b*Cos[c + d*x])^(1/3)*(A + B*Cos[c + d*x])*Sec[c + d*x]^3,x]
```

```
[Out] (3*(b*Cos[c + d*x])^(1/3)*Csc[c + d*x]*(2*A*Hypergeometric2F1[-5/6, 1/2, 1/
6, Cos[c + d*x]^2] + 5*B*Cos[c + d*x]*Hypergeometric2F1[-1/3, 1/2, 2/3, Cos
[c + d*x]^2])*Sec[c + d*x]^2*Sqrt[Sin[c + d*x]^2])/(10*d)
```

Maple [F]

$$\int (\cos(dx+c)\,b)^{\frac{1}{3}}\,(A+B\cos(dx+c))\left(\sec^3(dx+c)\right)dx$$

```
[In] int((cos(d*x+c)*b)^(1/3)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x)
```

```
[Out] int((cos(d*x+c)*b)^(1/3)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x)
```

Fricas [F]

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec^3(c+dx)\,dx$$
$$=\int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{1}{3}}\sec(dx+c)^3\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="
fricas")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*sec(d*x + c)^3, x)
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(1/3)*(A+B*cos(d*x+c))*sec(d*x+c)**3,x)
[Out] Timed out
```

Maxima [F]

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{1}{3}}\sec(dx+c)^3\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*sec(d*x + c)^3, x)
```

Giac [F]

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{1}{3}}\sec(dx+c)^3\,dx$$

```
[In] integrate((b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*sec(d*x + c)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\sec^3(c+dx)\,dx$$
$$=\int \frac{(b\,\cos(c+d\,x))^{1/3}\,(A+B\,\cos(c+d\,x))}{\cos(c+d\,x)^3}\,dx$$

```
[In] int(((b*cos(c + d*x))^(1/3)*(A + B*cos(c + d*x)))/cos(c + d*x)^3,x)
[Out] int(((b*cos(c + d*x))^(1/3)*(A + B*cos(c + d*x)))/cos(c + d*x)^3, x)
```

3.893 $\int \cos^2(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 119

$$\int \cos^2(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = -\frac{3A(b\cos(c+dx))^{13/3}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{13}{6},\frac{19}{6},\cos^2(c+dx)\right)\sin(c+dx)}{13b^3d\sqrt{\sin^2(c+dx)}} - \frac{3B(b\cos(c+dx))^{16/3}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{8}{3},\frac{11}{3},\cos^2(c+dx)\right)\sin(c+dx)}{16b^4d\sqrt{\sin^2(c+dx)}}$$

```
[Out] -3/13*A*(b*cos(d*x+c))^(13/3)*hypergeom([1/2, 13/6],[19/6],cos(d*x+c)^2)*si
n(d*x+c)/b^3/d/(sin(d*x+c)^2)^(1/2)-3/16*B*(b*cos(d*x+c))^(16/3)*hypergeom(
[1/2, 8/3],[11/3],cos(d*x+c)^2)*sin(d*x+c)/b^4/d/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {16, 2827, 2722}

$$\int \cos^2(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = -\frac{3A\sin(c+dx)(b\cos(c+dx))^{13/3}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{13}{6},\frac{19}{6},\cos^2(c+dx)\right)}{13b^3d\sqrt{\sin^2(c+dx)}} - \frac{3B\sin(c+dx)(b\cos(c+dx))^{16/3}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{8}{3},\frac{11}{3},\cos^2(c+dx)\right)}{16b^4d\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^2*(b*Cos[c + d*x])^(4/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-3*A*(b*Cos[c + d*x])^(13/3)*Hypergeometric2F1[1/2, 13/6, 19/6, Cos[c + d*
x]^2]*Sin[c + d*x])/(13*b^3*d*Sqrt[Sin[c + d*x]^2]) - (3*B*(b*Cos[c + d*x])
^(16/3)*Hypergeometric2F1[1/2, 8/3, 11/3, Cos[c + d*x]^2]*Sin[c + d*x])/(16
*b^4*d*Sqrt[Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\int (b\cos(c+dx))^{10/3}(A+B\cos(c+dx))\,dx}{b^2}\\
&= \frac{A\int (b\cos(c+dx))^{10/3}\,dx}{b^2}+\frac{B\int (b\cos(c+dx))^{13/3}\,dx}{b^3}\\
&= -\frac{3A(b\cos(c+dx))^{13/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{13}{6},\frac{19}{6},\cos^2(c+dx)\right)\sin(c+dx)}{13b^3d\sqrt{\sin^2(c+dx)}}\\
&\quad -\frac{3B(b\cos(c+dx))^{16/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{8}{3},\frac{11}{3},\cos^2(c+dx)\right)\sin(c+dx)}{16b^4d\sqrt{\sin^2(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.79

$$\int \cos^2(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx =$$

$$-\frac{3\cos^2(c+dx)(b\cos(c+dx))^{4/3}\cot(c+dx)\left(16A\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{13}{6},\frac{19}{6},\cos^2(c+dx)\right)+13B\cos(c+dx)\right.}{208d}$$

```
[In] Integrate[Cos[c + d*x]^2*(b*Cos[c + d*x])^(4/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-3*Cos[c + d*x]^2*(b*Cos[c + d*x])^(4/3)*Cot[c + d*x]*(16*A*Hypergeometric
2F1[1/2, 13/6, 19/6, Cos[c + d*x]^2] + 13*B*Cos[c + d*x]*Hypergeometric2F1[
1/2, 8/3, 11/3, Cos[c + d*x]^2])*Sqrt[Sin[c + d*x]^2])/(208*d)
```

Maple [F]

$$\int \left(\cos^2\left(dx+c\right)\right)\left(\cos\left(dx+c\right)b\right)^{\frac{4}{3}}\left(A+B\cos\left(dx+c\right)\right)dx$$

```
[In] int(cos(d*x+c)^2*(cos(d*x+c)*b)^(4/3)*(A+B*cos(d*x+c)),x)
```

```
[Out] int(cos(d*x+c)^2*(cos(d*x+c)*b)^(4/3)*(A+B*cos(d*x+c)),x)
```

Fricas [F]

$$\int \cos^2(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx=\int (B\cos\left(dx+c\right)+A)(b\cos\left(dx+c\right))^{\frac{4}{3}}\cos\left(dx+c\right)^2\,dx$$

```
[In] integrate(cos(d*x+c)^2*(b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c)),x, algorithm="
fricas")
```

```
[Out] integral((B*b*cos(d*x + c)^4 + A*b*cos(d*x + c)^3)*(b*cos(d*x + c))^(1/3),
x)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^2(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx=\text{Timed out}$$

```
[In] integrate(cos(d*x+c)**2*(b*cos(d*x+c))**(4/3)*(A+B*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \cos^2(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx=\int (B\cos{(dx+c)}+A)(b\cos{(dx+c)})^{\frac{4}{3}}\cos{(dx+c)}^2\,dx$$

```
[In] integrate(cos(d*x+c)^2*(b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c)),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(4/3)*cos(d*x + c)^2, x)
```

Giac [F]

$$\int \cos^2(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx=\int (B\cos{(dx+c)}+A)(b\cos{(dx+c)})^{\frac{4}{3}}\cos{(dx+c)}^2\,dx$$

```
[In] integrate(cos(d*x+c)^2*(b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c)),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(4/3)*cos(d*x + c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^2(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx=\int \cos{(c+d\,x)}^2\,{(b\,\cos{(c+d\,x)})}^{4/3}\,(A+B\,\cos{(c+d\,x)})\,dx$$

```
[In] int(cos(c + d*x)^2*(b*cos(c + d*x))^(4/3)*(A + B*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^2*(b*cos(c + d*x))^(4/3)*(A + B*cos(c + d*x)), x)
```

3.894 $\int \cos(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 29, antiderivative size = 119

$$\int \cos(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = -\frac{3A(b\cos(c+dx))^{10/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{3},\frac{8}{3},\cos^2(c+dx)\right)\sin(c+dx)}{10b^2d\sqrt{\sin^2(c+dx)}} - \frac{3B(b\cos(c+dx))^{13/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{13}{6},\frac{19}{6},\cos^2(c+dx)\right)\sin(c+dx)}{13b^3d\sqrt{\sin^2(c+dx)}}$$

```
[Out] -3/10*A*(b*cos(d*x+c))^(10/3)*hypergeom([1/2, 5/3],[8/3],cos(d*x+c)^2)*sin(
d*x+c)/b^2/d/(sin(d*x+c)^2)^(1/2)-3/13*B*(b*cos(d*x+c))^(13/3)*hypergeom([1
/2, 13/6],[19/6],cos(d*x+c)^2)*sin(d*x+c)/b^3/d/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {16, 2827, 2722}

$$\int \cos(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = -\frac{3A\sin(c+dx)(b\cos(c+dx))^{10/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{3},\frac{8}{3},\cos^2(c+dx)\right)}{10b^2d\sqrt{\sin^2(c+dx)}} - \frac{3B\sin(c+dx)(b\cos(c+dx))^{13/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{13}{6},\frac{19}{6},\cos^2(c+dx)\right)}{13b^3d\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[Cos[c + d*x]*(b*Cos[c + d*x])^(4/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-3*A*(b*Cos[c + d*x])^(10/3)*Hypergeometric2F1[1/2, 5/3, 8/3, Cos[c + d*x]
^2]*Sin[c + d*x])/(10*b^2*d*Sqrt[Sin[c + d*x]^2]) - (3*B*(b*Cos[c + d*x])^(
13/3)*Hypergeometric2F1[1/2, 13/6, 19/6, Cos[c + d*x]^2]*Sin[c + d*x])/(13*
b^3*d*Sqrt[Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\int (b\cos(c+dx))^{7/3}(A+B\cos(c+dx))\,dx}{b}\\
&= \frac{A\int (b\cos(c+dx))^{7/3}\,dx}{b}+\frac{B\int (b\cos(c+dx))^{10/3}\,dx}{b^2}\\
&= -\frac{3A(b\cos(c+dx))^{10/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{3},\frac{8}{3},\cos^2(c+dx)\right)\sin(c+dx)}{10b^2d\sqrt{\sin^2(c+dx)}}\\
&\quad -\frac{3B(b\cos(c+dx))^{13/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{13}{6},\frac{19}{6},\cos^2(c+dx)\right)\sin(c+dx)}{13b^3d\sqrt{\sin^2(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.75

$$\int \cos(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx =$$

$$-\frac{3(b\cos(c+dx))^{7/3}\cot(c+dx)\left(13A\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{3},\frac{8}{3},\cos^2(c+dx)\right)+10B\cos(c+dx)\,\text{Hyperg}\right.}{130bd}$$

```
[In] Integrate[Cos[c + d*x]*(b*Cos[c + d*x])^(4/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-3*(b*Cos[c + d*x])^(7/3)*Cot[c + d*x]*(13*A*Hypergeometric2F1[1/2, 5/3, 8
/3, Cos[c + d*x]^2] + 10*B*Cos[c + d*x]*Hypergeometric2F1[1/2, 13/6, 19/6,
Cos[c + d*x]^2])*Sqrt[Sin[c + d*x]^2])/(130*b*d)
```

Maple [F]

$$\int \cos \left(dx+c\right) \left(\cos \left(dx+c\right) b\right)^{\frac{4}{3}} \left(A+B\cos \left(dx+c\right)\right) dx$$

```
[In] int(cos(d*x+c)*(cos(d*x+c)*b)^(4/3)*(A+B*cos(d*x+c)),x)
```

```
[Out] int(cos(d*x+c)*(cos(d*x+c)*b)^(4/3)*(A+B*cos(d*x+c)),x)
```

Fricas [F]

$$\int \cos(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = \int (B\cos\left(dx+c\right)+A)(b\cos\left(dx+c\right))^{\frac{4}{3}}\cos\left(dx+c\right)\,dx$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c)),x, algorithm="fr
icas")
```

```
[Out] integral((B*b*cos(d*x + c)^3 + A*b*cos(d*x + c)^2)*(b*cos(d*x + c))^(1/3),
x)
```

Sympy [F(-1)]

Timed out.

$$\int \cos(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))**(4/3)*(A+B*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \cos(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{4}{3}}\cos(dx+c)\,dx$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c)),x, algorithm="ma
xima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(4/3)*cos(d*x + c), x)
```

Giac [F]

$$\int \cos(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{4}{3}}\cos(dx+c)\,dx$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c)),x, algorithm="gi
ac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(4/3)*cos(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = \int \cos(c+dx)\,(b\cos(c+dx))^{4/3}\,(A+B\cos(c+dx))\,dx$$

```
[In] int(cos(c + d*x)*(b*cos(c + d*x))^(4/3)*(A + B*cos(c + d*x)),x)
[Out] int(cos(c + d*x)*(b*cos(c + d*x))^(4/3)*(A + B*cos(c + d*x)), x)
```

3.895 $\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 23, antiderivative size = 119

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = -\frac{3A(b\cos(c+dx))^{7/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)\sin(c+dx)}{7bd\sqrt{\sin^2(c+dx)}} - \frac{3B(b\cos(c+dx))^{10/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{3},\frac{8}{3},\cos^2(c+dx)\right)\sin(c+dx)}{10b^2d\sqrt{\sin^2(c+dx)}}$$

```
[Out] -3/7*A*(b*cos(d*x+c))^(7/3)*hypergeom([1/2, 7/6],[13/6],cos(d*x+c)^2)*sin(d
*x+c)/b/d/(sin(d*x+c)^2)^(1/2)-3/10*B*(b*cos(d*x+c))^(10/3)*hypergeom([1/2,
 5/3],[8/3],cos(d*x+c)^2)*sin(d*x+c)/b^2/d/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2827, 2722}

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = -\frac{3A\sin(c+dx)(b\cos(c+dx))^{7/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)}{7bd\sqrt{\sin^2(c+dx)}} - \frac{3B\sin(c+dx)(b\cos(c+dx))^{10/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{3},\frac{8}{3},\cos^2(c+dx)\right)}{10b^2d\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^(4/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-3*A*(b*Cos[c + d*x])^(7/3)*Hypergeometric2F1[1/2, 7/6, 13/6, Cos[c + d*x]
^2]*Sin[c + d*x])/(7*b*d*Sqrt[Sin[c + d*x]^2]) - (3*B*(b*Cos[c + d*x])^(10/
3)*Hypergeometric2F1[1/2, 5/3, 8/3, Cos[c + d*x]^2]*Sin[c + d*x])/(10*b^2*d
*Sqrt[Sin[c + d*x]^2])
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= A\int (b\cos(c+dx))^{4/3}\,dx+\frac{B\int (b\cos(c+dx))^{7/3}\,dx}{b}\\ &= -\frac{3A(b\cos(c+dx))^{7/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)\sin(c+dx)}{7bd\sqrt{\sin^2(c+dx)}}\\ &\quad-\frac{3B(b\cos(c+dx))^{10/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{3},\frac{8}{3},\cos^2(c+dx)\right)\sin(c+dx)}{10b^2d\sqrt{\sin^2(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.72

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx =$$

$$-\frac{3(b\cos(c+dx))^{4/3}\cot(c+dx)\left(10A\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)+7B\cos(c+dx)\,\text{Hyperg}\right.}{70d}$$

```
[In] Integrate[(b*Cos[c + d*x])^(4/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-3*(b*Cos[c + d*x])^(4/3)*Cot[c + d*x]*(10*A*Hypergeometric2F1[1/2, 7/6, 1
3/6, Cos[c + d*x]^2] + 7*B*Cos[c + d*x]*Hypergeometric2F1[1/2, 5/3, 8/3, Co
s[c + d*x]^2])*Sqrt[Sin[c + d*x]^2])/(70*d)
```

Maple [F]

$$\int (\cos (dx + c) b)^{\frac{4}{3}} (A + B \cos (dx + c)) dx$$

```
[In] int((cos(d*x+c)*b)^(4/3)*(A+B*cos(d*x+c)),x)
[Out] int((cos(d*x+c)*b)^(4/3)*(A+B*cos(d*x+c)),x)
```

Fricas [F]

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{4}{3}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c)),x, algorithm="fricas")
[Out] integral((B*b*cos(d*x + c)^2 + A*b*cos(d*x + c))*(b*cos(d*x + c))^(1/3), x)
```

Sympy [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(4/3)*(A+B*cos(d*x+c)),x)
[Out] Timed out
```

Maxima [F]

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{4}{3}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(4/3), x)
```

Giac [F]

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{4}{3}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c)),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(4/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = \int (b\,\cos(c+d\,x))^{4/3}\,(A+B\,\cos(c+d\,x))\,dx$$

```
[In] int((b*cos(c + d*x))^(4/3)*(A + B*cos(c + d*x)),x)
[Out] int((b*cos(c + d*x))^(4/3)*(A + B*cos(c + d*x)), x)
```

3.896 $\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec(c+dx)\,dx$

Optimal result

Integrand size = 29, antiderivative size = 116

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec(c+dx)\,dx = -\frac{3A(b\cos(c+dx))^{4/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)\sin(c+dx)}{4d\sqrt{\sin^2(c+dx)}} - \frac{3B(b\cos(c+dx))^{7/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)\sin(c+dx)}{7bd\sqrt{\sin^2(c+dx)}}$$

```
[Out] -3/4*A*(b*cos(d*x+c))^(4/3)*hypergeom([1/2, 2/3],[5/3],cos(d*x+c)^2)*sin(d*
x+c)/d/(sin(d*x+c)^2)^(1/2)-3/7*B*(b*cos(d*x+c))^(7/3)*hypergeom([1/2, 7/6]
,[13/6],cos(d*x+c)^2)*sin(d*x+c)/b/d/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {16, 2827, 2722}

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec(c+dx)\,dx = -\frac{3A\sin(c+dx)(b\cos(c+dx))^{4/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)}{4d\sqrt{\sin^2(c+dx)}} - \frac{3B\sin(c+dx)(b\cos(c+dx))^{7/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)}{7bd\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^(4/3)*(A + B*Cos[c + d*x])*Sec[c + d*x],x]
```

```
[Out] (-3*A*(b*Cos[c + d*x])^(4/3)*Hypergeometric2F1[1/2, 2/3, 5/3, Cos[c + d*x]^
2]*Sin[c + d*x])/(4*d*Sqrt[Sin[c + d*x]^2]) - (3*B*(b*Cos[c + d*x])^(7/3)*H
ypergeometric2F1[1/2, 7/6, 13/6, Cos[c + d*x]^2]*Sin[c + d*x])/(7*b*d*Sqrt[
Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= b\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx \\
&= (Ab)\int \sqrt[3]{b\cos(c+dx)}\,dx + B\int (b\cos(c+dx))^{4/3}\,dx \\
&= -\frac{3A(b\cos(c+dx))^{4/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)\sin(c+dx)}{4d\sqrt{\sin^2(c+dx)}} \\
&\quad -\frac{3B(b\cos(c+dx))^{7/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)\sin(c+dx)}{7bd\sqrt{\sin^2(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.00 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.75

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec(c+dx)\,dx =$$

$$-\frac{3b\sqrt[3]{b\cos(c+dx)}\cot(c+dx)\left(7A\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)+4B\cos(c+dx)\,\text{Hypergeon}\right.}{28d}$$

```
[In] Integrate[(b*Cos[c + d*x])^(4/3)*(A + B*Cos[c + d*x])*Sec[c + d*x],x]
```

```
[Out] (-3*b*(b*Cos[c + d*x])^(1/3)*Cot[c + d*x]*(7*A*Hypergeometric2F1[1/2, 2/3,
5/3, Cos[c + d*x]^2] + 4*B*Cos[c + d*x]*Hypergeometric2F1[1/2, 7/6, 13/6, C
os[c + d*x]^2])*Sqrt[Sin[c + d*x]^2])/(28*d)
```

Maple [F]

$$\int \left(\cos \left(dx+c\right)b\right)^{\frac{4}{3}} \left(A+B\cos \left(dx+c\right)\right)\sec \left(dx+c\right)dx$$

```
[In] int((cos(d*x+c)*b)^(4/3)*(A+B*cos(d*x+c))*sec(d*x+c),x)
```

```
[Out] int((cos(d*x+c)*b)^(4/3)*(A+B*cos(d*x+c))*sec(d*x+c),x)
```

Fricas [F]

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec(c+dx)\,dx=\int (B\cos\left(dx+c\right)+A)(b\cos\left(dx+c\right))^{\frac{4}{3}}\sec\left(dx+c\right)\,dx$$

```
[In] integrate((b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c))*sec(d*x+c),x, algorithm="fr
icas")
```

```
[Out] integral((B*b*cos(d*x + c)^2 + A*b*cos(d*x + c))*(b*cos(d*x + c))^(1/3)*sec
(d*x + c), x)
```

Sympy [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec(c+dx)\,dx=\text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(4/3)*(A+B*cos(d*x+c))*sec(d*x+c),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{4}{3}}\sec(dx+c)\,dx$$

```
[In] integrate((b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c))*sec(d*x+c),x, algorithm="ma
xima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(4/3)*sec(d*x + c), x)
```

Giac [F]

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{4}{3}}\sec(dx+c)\,dx$$

```
[In] integrate((b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c))*sec(d*x+c),x, algorithm="gi
ac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(4/3)*sec(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec(c+dx)\,dx = \int \frac{(b\cos(c+dx))^{4/3}\,(A+B\cos(c+dx))}{\cos(c+dx)}\,dx$$

```
[In] int(((b*cos(c + d*x))^(4/3)*(A + B*cos(c + d*x)))/cos(c + d*x),x)
[Out] int(((b*cos(c + d*x))^(4/3)*(A + B*cos(c + d*x)))/cos(c + d*x), x)
```

3.897 $\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 31, antiderivative size = 112

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = -\frac{3Ab\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)\sin(c+dx)}{d\sqrt{\sin^2(c+dx)}} - \frac{3B(b\cos(c+dx))^{4/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)\sin(c+dx)}{4d\sqrt{\sin^2(c+dx)}}$$

```
[Out] -3*A*b*(b*cos(d*x+c))^(1/3)*hypergeom([1/6, 1/2],[7/6],cos(d*x+c)^2)*sin(d*
x+c)/d/(sin(d*x+c)^2)^(1/2)-3/4*B*(b*cos(d*x+c))^(4/3)*hypergeom([1/2, 2/3]
,[5/3],cos(d*x+c)^2)*sin(d*x+c)/d/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {16, 2827, 2722}

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = -\frac{3Ab\sin(c+dx)\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)}{d\sqrt{\sin^2(c+dx)}} - \frac{3B\sin(c+dx)(b\cos(c+dx))^{4/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)}{4d\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^(4/3)*(A + B*Cos[c + d*x])*Sec[c + d*x]^2,x]
```

```
[Out] (-3*A*b*(b*Cos[c + d*x])^(1/3)*Hypergeometric2F1[1/6, 1/2, 7/6, Cos[c + d*x
]^2]*Sin[c + d*x])/(d*Sqrt[Sin[c + d*x]^2]) - (3*B*(b*Cos[c + d*x])^(4/3)*H
ypergeometric2F1[1/2, 2/3, 5/3, Cos[c + d*x]^2]*Sin[c + d*x])/(4*d*Sqrt[Sin
[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= b^2 \int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx \\
&= \left(Ab^2\right)\int \frac{1}{(b\cos(c+dx))^{2/3}}\,dx + (bB)\int \sqrt[3]{b\cos(c+dx)}\,dx \\
&= -\frac{3Ab\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)\sin(c+dx)}{d\sqrt{\sin^2(c+dx)}} \\
&\quad - \frac{3B(b\cos(c+dx))^{4/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)\sin(c+dx)}{4d\sqrt{\sin^2(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 88, normalized size of antiderivative = 0.79

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = -\frac{3b^2\cot(c+dx)\left(4A\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)+B\cos(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3}\right.\right.}{4d(b\cos(c+dx))^{2/3}}$$

```
[In] Integrate[(b*Cos[c + d*x])^(4/3)*(A + B*Cos[c + d*x])*Sec[c + d*x]^2,x]
```

```
[Out] (-3*b^2*Cot[c + d*x]*(4*A*Hypergeometric2F1[1/6, 1/2, 7/6, Cos[c + d*x]^2]
+ B*Cos[c + d*x]*Hypergeometric2F1[1/2, 2/3, 5/3, Cos[c + d*x]^2])*Sqrt[Sin
[c + d*x]^2])/(4*d*(b*Cos[c + d*x])^(2/3))
```

Maple [F]

$$\int \left(\cos\left(dx+c\right)b\right)^{\frac{4}{3}}\left(A+B\cos\left(dx+c\right)\right)\left(\sec^2\left(dx+c\right)\right)dx$$

```
[In] int((cos(d*x+c)*b)^(4/3)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x)
```

```
[Out] int((cos(d*x+c)*b)^(4/3)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x)
```

Fricas [F]

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \int (B\cos\left(dx+c\right)+A)(b\cos\left(dx+c\right))^{\frac{4}{3}}\sec\left(dx+c\right)^2\,dx$$

```
[In] integrate((b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="
fricas")
```

```
[Out] integral((B*b*cos(d*x + c)^2 + A*b*cos(d*x + c))*(b*cos(d*x + c))^(1/3)*sec
(d*x + c)^2, x)
```

Sympy [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(4/3)*(A+B*cos(d*x+c))*sec(d*x+c)**2,x)
[Out] Timed out
```

Maxima [F]

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{4}{3}}\sec(dx+c)^2\,dx$$

```
[In] integrate((b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(4/3)*sec(d*x + c)^2, x)
```

Giac [F]

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{4}{3}}\sec(dx+c)^2\,dx$$

```
[In] integrate((b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(4/3)*sec(d*x + c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \int \frac{(b\cos(c+d\,x))^{4/3}\,(A+B\cos(c+d\,x))}{\cos(c+d\,x)^2}\,dx$$

```
[In] int(((b*cos(c + d*x))^(4/3)*(A + B*cos(c + d*x)))/cos(c + d*x)^2,x)
[Out] int(((b*cos(c + d*x))^(4/3)*(A + B*cos(c + d*x)))/cos(c + d*x)^2, x)
```

3.898 $\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 31, antiderivative size = 115

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec^3(c+dx)\,dx=\frac{3Ab^2\,\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(c+dx)\right)\sin(c+dx)}{2d(b\cos(c+dx))^{2/3}\sqrt{\sin^2(c+dx)}}-\frac{3bB\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)\sin(c+dx)}{d\sqrt{\sin^2(c+dx)}}$$

```
[Out] 3/2*A*b^2*hypergeom([-1/3, 1/2],[2/3],cos(d*x+c)^2)*sin(d*x+c)/d/(b*cos(d*x
+c))^(2/3)/(sin(d*x+c)^2)^(1/2)-3*b*B*(b*cos(d*x+c))^(1/3)*hypergeom([1/6,
1/2],[7/6],cos(d*x+c)^2)*sin(d*x+c)/d/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {16, 2827, 2722}

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec^3(c+dx)\,dx=\frac{3Ab^2\sin(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(c+dx)\right)}{2d\sqrt{\sin^2(c+dx)}(b\cos(c+dx))^{2/3}}-\frac{3bB\sin(c+dx)\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)}{d\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^(4/3)*(A + B*Cos[c + d*x])*Sec[c + d*x]^3,x]
```

```
[Out] (3*A*b^2*Hypergeometric2F1[-1/3, 1/2, 2/3, Cos[c + d*x]^2]*Sin[c + d*x])/(2
*d*(b*Cos[c + d*x])^(2/3)*Sqrt[Sin[c + d*x]^2]) - (3*b*B*(b*Cos[c + d*x])^(
1/3)*Hypergeometric2F1[1/6, 1/2, 7/6, Cos[c + d*x]^2]*Sin[c + d*x])/(d*Sqrt
[Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= b^3 \int \frac{A + B\cos(c+dx)}{(b\cos(c+dx))^{5/3}}\,dx \\
&= \left(Ab^3\right)\int \frac{1}{(b\cos(c+dx))^{5/3}}\,dx + \left(b^2B\right)\int \frac{1}{(b\cos(c+dx))^{2/3}}\,dx \\
&= \frac{3Ab^2\,\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(c+dx)\right)\sin(c+dx)}{2d(b\cos(c+dx))^{2/3}\sqrt{\sin^2(c+dx)}} \\
&\quad - \frac{3bB\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)\sin(c+dx)}{d\sqrt{\sin^2(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 88, normalized size of antiderivative = 0.77

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \frac{3b^2\csc(c+dx)\left(A\,\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(c+dx)\right)-2B\cos(c+dx)\,\text{Hypergeometri}\right.}{2d(b\cos(c+dx))^{2/3}}$$

```
[In] Integrate[(b*Cos[c + d*x])^(4/3)*(A + B*Cos[c + d*x])*Sec[c + d*x]^3,x]
```

```
[Out] (3*b^2*Csc[c + d*x]*(A*Hypergeometric2F1[-1/3, 1/2, 2/3, Cos[c + d*x]^2] -
2*B*Cos[c + d*x]*Hypergeometric2F1[1/6, 1/2, 7/6, Cos[c + d*x]^2])*Sqrt[Sin
[c + d*x]^2])/(2*d*(b*Cos[c + d*x])^(2/3))
```

Maple [F]

$$\int \left(\cos\left(dx+c\right)b\right)^{\frac{4}{3}}\left(A+B\cos\left(dx+c\right)\right)\left(\sec^3\left(dx+c\right)\right)dx$$

```
[In] int((cos(d*x+c)*b)^(4/3)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x)
```

```
[Out] int((cos(d*x+c)*b)^(4/3)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x)
```

Fricas [F]

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \int \left(B\cos\left(dx+c\right)+A\right)\left(b\cos\left(dx+c\right)\right)^{\frac{4}{3}}\sec\left(dx+c\right)^3\,dx$$

```
[In] integrate((b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="
fricas")
```

```
[Out] integral((B*b*cos(d*x + c)^2 + A*b*cos(d*x + c))*(b*cos(d*x + c))^(1/3)*sec
(d*x + c)^3, x)
```

Sympy [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**(4/3)*(A+B*cos(d*x+c))*sec(d*x+c)**3,x)
[Out] Timed out
```

Maxima [F]

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{4}{3}}\sec(dx+c)^3\,dx$$

```
[In] integrate((b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(4/3)*sec(d*x + c)^3, x)
```

Giac [F]

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{4}{3}}\sec(dx+c)^3\,dx$$

```
[In] integrate((b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(4/3)*sec(d*x + c)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\sec^3(c+dx)\,dx=\int \frac{(b\,\cos\left(c+d\,x\right))^{4/3}\,\left(A+B\,\cos\left(c+d\,x\right)\right)}{\cos\left(c+d\,x\right)^3}\,dx$$

```
[In] int(((b*cos(c + d*x))^(4/3)*(A + B*cos(c + d*x)))/cos(c + d*x)^3,x)
[Out] int(((b*cos(c + d*x))^(4/3)*(A + B*cos(c + d*x)))/cos(c + d*x)^3, x)
```

3.899 $\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 119

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = -\frac{3A(b\cos(c+dx))^{7/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)\sin(c+dx)}{7b^3d\sqrt{\sin^2(c+dx)}} - \frac{3B(b\cos(c+dx))^{10/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{3},\frac{8}{3},\cos^2(c+dx)\right)\sin(c+dx)}{10b^4d\sqrt{\sin^2(c+dx)}}$$

```
[Out] -3/7*A*(b*cos(d*x+c))^(7/3)*hypergeom([1/2, 7/6],[13/6],cos(d*x+c)^2)*sin(d
*x+c)/b^3/d/(sin(d*x+c)^2)^(1/2)-3/10*B*(b*cos(d*x+c))^(10/3)*hypergeom([1/
2, 5/3],[8/3],cos(d*x+c)^2)*sin(d*x+c)/b^4/d/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {16, 2827, 2722}

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = -\frac{3A\sin(c+dx)(b\cos(c+dx))^{7/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)}{7b^3d\sqrt{\sin^2(c+dx)}} - \frac{3B\sin(c+dx)(b\cos(c+dx))^{10/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{3},\frac{8}{3},\cos^2(c+dx)\right)}{10b^4d\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^2*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(2/3),x]
```

```
[Out] (-3*A*(b*Cos[c + d*x])^(7/3)*Hypergeometric2F1[1/2, 7/6, 13/6, Cos[c + d*x]
^2]*Sin[c + d*x])/(7*b^3*d*Sqrt[Sin[c + d*x]^2]) - (3*B*(b*Cos[c + d*x])^(1
0/3)*Hypergeometric2F1[1/2, 5/3, 8/3, Cos[c + d*x]^2]*Sin[c + d*x])/(10*b^4
*d*Sqrt[Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\int (b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx}{b^2}\\
&= \frac{A\int (b\cos(c+dx))^{4/3}\,dx}{b^2}+\frac{B\int (b\cos(c+dx))^{7/3}\,dx}{b^3}\\
&= -\frac{3A(b\cos(c+dx))^{7/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)\sin(c+dx)}{7b^3d\sqrt{\sin^2(c+dx)}}\\
&\quad -\frac{3B(b\cos(c+dx))^{10/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{3},\frac{8}{3},\cos^2(c+dx)\right)\sin(c+dx)}{10b^4d\sqrt{\sin^2(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.79

$$
\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = -\frac{3\cos^2(c+dx)\cot(c+dx)\left(10A\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)+7B\cos(c+dx)\,\text{Hypergeom}\right.}{70d(b\cos(c+dx))^{2/3}}
$$

```
[In] Integrate[(Cos[c + d*x]^2*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(2/3),x]
```

[Out] (-3*Cos[c + d*x]^2*Cot[c + d*x]*(10*A*Hypergeometric2F1[1/2, 7/6, 13/6, Cos[c + d*x]^2] + 7*B*Cos[c + d*x]*Hypergeometric2F1[1/2, 5/3, 8/3, Cos[c + d*x]^2])*Sqrt[Sin[c + d*x]^2])/(70*d*(b*Cos[c + d*x])^(2/3))

Maple [F]

$$\int \frac{\left(\cos^2\left(dx+c\right)\right)\left(A+B\cos\left(dx+c\right)\right)}{\left(\cos\left(dx+c\right)b\right)^{\frac{2}{3}}}dx$$

[In] int(cos(d*x+c)^2*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(2/3),x)

[Out] int(cos(d*x+c)^2*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(2/3),x)

Fricas [F]

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{\left(B\cos\left(dx+c\right)+A\right)\cos\left(dx+c\right)^2}{\left(b\cos\left(dx+c\right)\right)^{\frac{2}{3}}}\,dx$$

[In] integrate(cos(d*x+c)^2*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(2/3),x, algorithm="fricas")

[Out] integral((B*cos(d*x + c)^2 + A*cos(d*x + c))*(b*cos(d*x + c))^(1/3)/b, x)

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = \text{Timed out}$$

[In] integrate(cos(d*x+c)**2*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(2/3),x)

[Out] Timed out

Maxima [F]

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{\left(B\cos\left(dx+c\right)+A\right)\cos\left(dx+c\right)^2}{\left(b\cos\left(dx+c\right)\right)^{\frac{2}{3}}}\,dx$$

[In] integrate(cos(d*x+c)^2*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(2/3),x, algorithm="maxima")

[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^2/(b*cos(d*x + c))^(2/3), x)

Giac [F]

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^2}{(b\cos(dx+c))^{\frac{2}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)^2*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(2/3),x, algorithm="
giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^2/(b*cos(d*x + c))^(2/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{\cos(c+d\,x)^2\,(A+B\,\cos(c+d\,x))}{(b\,\cos(c+d\,x))^{2/3}}\,dx$$

```
[In] int((cos(c + d*x)^2*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(2/3),x)
```

```
[Out] int((cos(c + d*x)^2*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(2/3), x)
```

3.900 $\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 119

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = -\frac{3A(b\cos(c+dx))^{4/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)\sin(c+dx)}{4b^2d\sqrt{\sin^2(c+dx)}} - \frac{3B(b\cos(c+dx))^{7/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)\sin(c+dx)}{7b^3d\sqrt{\sin^2(c+dx)}}$$

```
[Out] -3/4*A*(b*cos(d*x+c))^(4/3)*hypergeom([1/2, 2/3],[5/3],cos(d*x+c)^2)*sin(d*
x+c)/b^2/d/(sin(d*x+c)^2)^(1/2)-3/7*B*(b*cos(d*x+c))^(7/3)*hypergeom([1/2,
7/6],[13/6],cos(d*x+c)^2)*sin(d*x+c)/b^3/d/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {16, 2827, 2722}

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = -\frac{3A\sin(c+dx)(b\cos(c+dx))^{4/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)}{4b^2d\sqrt{\sin^2(c+dx)}} - \frac{3B\sin(c+dx)(b\cos(c+dx))^{7/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)}{7b^3d\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(2/3),x]
```

```
[Out] (-3*A*(b*Cos[c + d*x])^(4/3)*Hypergeometric2F1[1/2, 2/3, 5/3, Cos[c + d*x]^
2]*Sin[c + d*x])/(4*b^2*d*Sqrt[Sin[c + d*x]^2]) - (3*B*(b*Cos[c + d*x])^(7/
3)*Hypergeometric2F1[1/2, 7/6, 13/6, Cos[c + d*x]^2]*Sin[c + d*x])/(7*b^3*d
*Sqrt[Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\int \sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx}{b}\\ &= \frac{A\int \sqrt[3]{b\cos(c+dx)}\,dx}{b}+\frac{B\int (b\cos(c+dx))^{4/3}\,dx}{b^2}\\ &= -\frac{3A(b\cos(c+dx))^{4/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)\sin(c+dx)}{4b^2d\sqrt{\sin^2(c+dx)}}\\ &\quad -\frac{3B(b\cos(c+dx))^{7/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{6},\frac{13}{6},\cos^2(c+dx)\right)\sin(c+dx)}{7b^3d\sqrt{\sin^2(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.75

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx =$$

$$-\frac{3\sqrt[3]{b\cos(c+dx)}\cot(c+dx)\left(7A\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)+4B\cos(c+dx)\,\text{Hypergeom}\right.}{28bd}$$

```
[In] Integrate[(Cos[c + d*x]*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(2/3),x]
```

```
[Out] (-3*(b*Cos[c + d*x])^(1/3)*Cot[c + d*x]*(7*A*Hypergeometric2F1[1/2, 2/3, 5/
3, Cos[c + d*x]^2] + 4*B*Cos[c + d*x]*Hypergeometric2F1[1/2, 7/6, 13/6, Cos
[c + d*x]^2])*Sqrt[Sin[c + d*x]^2])/(28*b*d)
```

Maple [F]

$$\int \frac{\cos(dx+c)(A+B\cos(dx+c))}{(\cos(dx+c)b)^{\frac{2}{3}}}dx$$

```
[In] int(cos(d*x+c)*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(2/3),x)
```

```
[Out] int(cos(d*x+c)*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(2/3),x)
```

Fricas [F]

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)}{(b\cos(dx+c))^{\frac{2}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(2/3),x, algorithm="fr
icas")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)/b, x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(2/3),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)}{(b\cos(dx+c))^{\frac{2}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(2/3),x, algorithm="ma
xima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)/(b*cos(d*x + c))^(2/3), x)
```

Giac [F]

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)}{(b\cos(dx+c))^{\frac{2}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(2/3),x, algorithm="gi
ac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)/(b*cos(d*x + c))^(2/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{\cos(c+d\,x)\,\left(A+B\,\cos(c+d\,x)\right)}{{\left(b\,\cos(c+d\,x)\right)}^{2/3}}\,dx$$

```
[In] int((cos(c + d*x)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(2/3),x)
```

```
[Out] int((cos(c + d*x)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(2/3), x)
```

3.901 $\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 117

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = -\frac{3A\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)\sin(c+dx)}{bd\sqrt{\sin^2(c+dx)}} - \frac{3B(b\cos(c+dx))^{4/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)\sin(c+dx)}{4b^2d\sqrt{\sin^2(c+dx)}}$$

```
[Out] -3*A*(b*cos(d*x+c))^(1/3)*hypergeom([1/6, 1/2],[7/6],cos(d*x+c)^2)*sin(d*x+
c)/b/d/(sin(d*x+c)^2)^(1/2)-3/4*B*(b*cos(d*x+c))^(4/3)*hypergeom([1/2, 2/3]
,[5/3],cos(d*x+c)^2)*sin(d*x+c)/b^2/d/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2827, 2722}

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = -\frac{3A\sin(c+dx)\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)}{bd\sqrt{\sin^2(c+dx)}} - \frac{3B\sin(c+dx)(b\cos(c+dx))^{4/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)}{4b^2d\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(A + B*Cos[c + d*x])/(b*Cos[c + d*x])^(2/3),x]
```

```
[Out] (-3*A*(b*Cos[c + d*x])^(1/3)*Hypergeometric2F1[1/6, 1/2, 7/6, Cos[c + d*x]^
2]*Sin[c + d*x])/(b*d*Sqrt[Sin[c + d*x]^2]) - (3*B*(b*Cos[c + d*x])^(4/3)*H
ypergeometric2F1[1/2, 2/3, 5/3, Cos[c + d*x]^2]*Sin[c + d*x])/(4*b^2*d*Sqrt
[Sin[c + d*x]^2])
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= A\int \frac{1}{(b\cos(c+dx))^{2/3}}\,dx + \frac{B\int \sqrt[3]{b\cos(c+dx)}\,dx}{b} \\
&= -\frac{3A\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)\sin(c+dx)}{bd\sqrt{\sin^2(c+dx)}} \\
&\quad - \frac{3B(b\cos(c+dx))^{4/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(c+dx)\right)\sin(c+dx)}{4b^2d\sqrt{\sin^2(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.73

$$
\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = -\frac{3\cot(c+dx)\left(4A\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)+B\cos(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3}\right.\right.}{4d(b\cos(c+dx))^{2/3}}
$$

```
[In] Integrate[(A + B*Cos[c + d*x])/(b*Cos[c + d*x])^(2/3),x]
```

```
[Out] (-3*Cot[c + d*x]*(4*A*Hypergeometric2F1[1/6, 1/2, 7/6, Cos[c + d*x]^2] + B*
Cos[c + d*x]*Hypergeometric2F1[1/2, 2/3, 5/3, Cos[c + d*x]^2])*Sqrt[Sin[c +
 d*x]^2])/(4*d*(b*Cos[c + d*x])^(2/3))
```

Maple [F]

$$\int \frac{A+B\cos(dx+c)}{(\cos(dx+c)\,b)^{\frac{2}{3}}}dx$$

```
[In] int((A+B*cos(d*x+c))/(cos(d*x+c)*b)^(2/3),x)
[Out] int((A+B*cos(d*x+c))/(cos(d*x+c)*b)^(2/3),x)
```

Fricas [F]

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{B\cos(dx+c)+A}{(b\cos(dx+c))^{\frac{2}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))^(2/3),x, algorithm="fricas")
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)/(b*cos(d*x + c)), x)
```

Sympy [F]

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{\frac{2}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))**(2/3),x)
[Out] Integral((A + B*cos(c + d*x))/(b*cos(c + d*x))**(2/3), x)
```

Maxima [F]

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{B\cos(dx+c)+A}{(b\cos(dx+c))^{\frac{2}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))^(2/3),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)/(b*cos(d*x + c))^(2/3), x)
```

Giac [F]

$$\int \frac{A + B\cos(c + dx)}{(b\cos(c + dx))^{2/3}}\,dx = \int \frac{B\cos\left(dx + c\right) + A}{\left(b\cos\left(dx + c\right)\right)^{\frac{2}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))^(2/3),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)/(b*cos(d*x + c))^(2/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A + B\cos(c + dx)}{(b\cos(c + dx))^{2/3}}\,dx = \int \frac{A + B\,\cos\left(c + d\,x\right)}{{\left(b\,\cos\left(c + d\,x\right)\right)}^{2/3}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(b*cos(c + d*x))^(2/3),x)
[Out] int((A + B*cos(c + d*x))/(b*cos(c + d*x))^(2/3), x)
```

3.902 $\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 114

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx=\frac{3A\,\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(c+dx)\right)\sin(c+dx)}{2d(b\cos(c+dx))^{2/3}\sqrt{\sin^2(c+dx)}}-\frac{3B\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)\sin(c+dx)}{bd\sqrt{\sin^2(c+dx)}}$$

```
[Out] 3/2*A*hypergeom([-1/3, 1/2],[2/3],cos(d*x+c)^2)*sin(d*x+c)/d/(b*cos(d*x+c))
^(2/3)/(sin(d*x+c)^2)^(1/2)-3*B*(b*cos(d*x+c))^(1/3)*hypergeom([1/6, 1/2],[
7/6],cos(d*x+c)^2)*sin(d*x+c)/b/d/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {16, 2827, 2722}

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx=\frac{3A\sin(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(c+dx)\right)}{2d\sqrt{\sin^2(c+dx)}(b\cos(c+dx))^{2/3}}-\frac{3B\sin(c+dx)\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)}{bd\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[((A + B*Cos[c + d*x])*Sec[c + d*x])/(b*Cos[c + d*x])^(2/3),x]
```

```
[Out] (3*A*Hypergeometric2F1[-1/3, 1/2, 2/3, Cos[c + d*x]^2]*Sin[c + d*x])/(2*d*(
b*Cos[c + d*x])^(2/3)*Sqrt[Sin[c + d*x]^2]) - (3*B*(b*Cos[c + d*x])^(1/3)*H
ypergeometric2F1[1/6, 1/2, 7/6, Cos[c + d*x]^2]*Sin[c + d*x])/(b*d*Sqrt[Sin
[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= b\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{5/3}}\,dx \\
&= (Ab)\int \frac{1}{(b\cos(c+dx))^{5/3}}\,dx + B\int \frac{1}{(b\cos(c+dx))^{2/3}}\,dx \\
&= \frac{3A\,\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(c+dx)\right)\sin(c+dx)}{2d(b\cos(c+dx))^{2/3}\sqrt{\sin^2(c+dx)}} \\
&\quad - \frac{3B\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{1}{2},\frac{7}{6},\cos^2(c+dx)\right)\sin(c+dx)}{bd\sqrt{\sin^2(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.75

$$
\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \frac{3\csc(c+dx)\left(A\,\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(c+dx)\right) - 2B\right.}{2d(b\cos}
$$

```
[In] Integrate[((A + B*Cos[c + d*x])*Sec[c + d*x])/(b*Cos[c + d*x])^(2/3),x]
```

```
[Out] (3*Csc[c + d*x]*(A*Hypergeometric2F1[-1/3, 1/2, 2/3, Cos[c + d*x]^2] - 2*B*
Cos[c + d*x]*Hypergeometric2F1[1/6, 1/2, 7/6, Cos[c + d*x]^2])*Sqrt[Sin[c +
 d*x]^2])/(2*d*(b*Cos[c + d*x])^(2/3))
```

Maple [F]

$$\int \frac{(A + B\cos(dx + c))\sec(dx + c)}{(\cos(dx + c)\, b)^{\frac{2}{3}}}dx$$

[In] int((A+B*cos(d*x+c))*sec(d*x+c)/(cos(d*x+c)*b)^(2/3),x)

[Out] int((A+B*cos(d*x+c))*sec(d*x+c)/(cos(d*x+c)*b)^(2/3),x)

Fricas [F]

$$\int \frac{(A + B\cos(c + dx))\sec(c + dx)}{(b\cos(c + dx))^{2/3}}\, dx = \int \frac{(B\cos(dx + c) + A)\sec(dx + c)}{(b\cos(dx + c))^{\frac{2}{3}}}\, dx$$

[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))^(2/3),x, algorithm="fr icas")

[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*sec(d*x + c)/(b*cos(d* x + c)), x)

Sympy [F]

$$\int \frac{(A + B\cos(c + dx))\sec(c + dx)}{(b\cos(c + dx))^{2/3}}\, dx = \int \frac{(A + B\cos(c + dx))\sec(c + dx)}{(b\cos(c + dx))^{\frac{2}{3}}}\, dx$$

[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))**(2/3),x)

[Out] Integral((A + B*cos(c + d*x))*sec(c + d*x)/(b*cos(c + d*x))**(2/3), x)

Maxima [F]

$$\int \frac{(A + B\cos(c + dx))\sec(c + dx)}{(b\cos(c + dx))^{2/3}}\, dx = \int \frac{(B\cos(dx + c) + A)\sec(dx + c)}{(b\cos(dx + c))^{\frac{2}{3}}}\, dx$$

[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))^(2/3),x, algorithm="ma xima")

[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)/(b*cos(d*x + c))^(2/3), x)

Giac [F]

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\sec(dx+c)}{(b\cos(dx+c))^{\frac{2}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))^(2/3),x, algorithm="gi
ac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)/(b*cos(d*x + c))^(2/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{A+B\cos(c+dx)}{\cos(c+dx)\,(b\cos(c+dx))^{2/3}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)*(b*cos(c + d*x))^(2/3)),x)
```

```
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)*(b*cos(c + d*x))^(2/3)), x)
```

3.903 $\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 114

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx=\frac{3Ab\,\text{Hypergeometric2F1}\left(-\frac{5}{6},\frac{1}{2},\frac{1}{6},\cos^2(c+dx)\right)\sin(c+dx)}{5d(b\cos(c+dx))^{5/3}\sqrt{\sin^2(c+dx)}}+\frac{3B\,\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(c+dx)\right)\sin(c+dx)}{2d(b\cos(c+dx))^{2/3}\sqrt{\sin^2(c+dx)}}$$

```
[Out] 3/5*A*b*hypergeom([-5/6, 1/2],[1/6],cos(d*x+c)^2)*sin(d*x+c)/d/(b*cos(d*x+c
))^(5/3)/(sin(d*x+c)^2)^(1/2)+3/2*B*hypergeom([-1/3, 1/2],[2/3],cos(d*x+c)^
2)*sin(d*x+c)/d/(b*cos(d*x+c))^(2/3)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {16, 2827, 2722}

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx=\frac{3Ab\sin(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{5}{6},\frac{1}{2},\frac{1}{6},\cos^2(c+dx)\right)}{5d\sqrt{\sin^2(c+dx)}(b\cos(c+dx))^{5/3}}+\frac{3B\sin(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(c+dx)\right)}{2d\sqrt{\sin^2(c+dx)}(b\cos(c+dx))^{2/3}}$$

```
[In] Int[((A + B*Cos[c + d*x])*Sec[c + d*x]^2)/(b*Cos[c + d*x])^(2/3),x]
```

```
[Out] (3*A*b*Hypergeometric2F1[-5/6, 1/2, 1/6, Cos[c + d*x]^2]*Sin[c + d*x])/(5*d
*(b*Cos[c + d*x])^(5/3)*Sqrt[Sin[c + d*x]^2]) + (3*B*Hypergeometric2F1[-1/3
, 1/2, 2/3, Cos[c + d*x]^2]*Sin[c + d*x])/(2*d*(b*Cos[c + d*x])^(2/3)*Sqrt[
Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= b^2 \int \frac{A + B\cos(c+dx)}{(b\cos(c+dx))^{8/3}}\,dx \\ &= \left(Ab^2\right)\int \frac{1}{(b\cos(c+dx))^{8/3}}\,dx + (bB)\int \frac{1}{(b\cos(c+dx))^{5/3}}\,dx \\ &= \frac{3Ab\,\text{Hypergeometric2F1}\left(-\frac{5}{6},\frac{1}{2},\frac{1}{6},\cos^2(c+dx)\right)\sin(c+dx)}{5d(b\cos(c+dx))^{5/3}\sqrt{\sin^2(c+dx)}} \\ &\quad + \frac{3B\,\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(c+dx)\right)\sin(c+dx)}{2d(b\cos(c+dx))^{2/3}\sqrt{\sin^2(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.78

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \frac{3b^2\cot(c+dx)\left(2A\,\text{Hypergeometric2F1}\left(-\frac{5}{6},\frac{1}{2},\frac{1}{6},\cos^2(c+dx)\right) -\right.}{10d(}$$

```
[In] Integrate[((A + B*Cos[c + d*x])*Sec[c + d*x]^2)/(b*Cos[c + d*x])^(2/3),x]
```

```
[Out] (3*b^2*Cot[c + d*x]*(2*A*Hypergeometric2F1[-5/6, 1/2, 1/6, Cos[c + d*x]^2]
+ 5*B*Cos[c + d*x]*Hypergeometric2F1[-1/3, 1/2, 2/3, Cos[c + d*x]^2])*Sqrt[
Sin[c + d*x]^2])/(10*d*(b*Cos[c + d*x])^(8/3))
```

Maple [F]

$$\int \frac{(A+B\cos(dx+c))(\sec^2(dx+c))}{(\cos(dx+c)b)^{\frac{2}{3}}}dx$$

```
[In] int((A+B*cos(d*x+c))*sec(d*x+c)^2/(cos(d*x+c)*b)^(2/3),x)
```

```
[Out] int((A+B*cos(d*x+c))*sec(d*x+c)^2/(cos(d*x+c)*b)^(2/3),x)
```

Fricas [F]

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\sec(dx+c)^2}{(b\cos(dx+c))^{\frac{2}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^2/(b*cos(d*x+c))^(2/3),x, algorithm="
fricas")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*sec(d*x + c)^2/(b*cos(
d*x + c)), x)
```

Sympy [F]

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{\frac{2}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)**2/(b*cos(d*x+c))**(2/3),x)
```

```
[Out] Integral((A + B*cos(c + d*x))*sec(c + d*x)**2/(b*cos(c + d*x))**(2/3), x)
```

Maxima [F]

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\sec(dx+c)^2}{(b\cos(dx+c))^{\frac{2}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^2/(b*cos(d*x+c))^(2/3),x, algorithm="
maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^2/(b*cos(d*x + c))^(2/3), x)
```

Giac [F]

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\sec(dx+c)^2}{(b\cos(dx+c))^{\frac{2}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^2/(b*cos(d*x+c))^(2/3),x, algorithm="
giac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^2/(b*cos(d*x + c))^(2/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{A+B\,\cos(c+d\,x)}{\cos(c+d\,x)^2\,(b\,\cos(c+d\,x))^{2/3}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)^2*(b*cos(c + d*x))^(2/3)),x)
```

```
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)^2*(b*cos(c + d*x))^(2/3)), x)
```

3.904 $\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 117

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \frac{3Ab^2\,\text{Hypergeometric2F1}\left(-\frac{4}{3},\frac{1}{2},-\frac{1}{3},\cos^2(c+dx)\right)\sin(c+dx)}{8d(b\cos(c+dx))^{8/3}\sqrt{\sin^2(c+dx)}} + \frac{3bB\,\text{Hypergeometric2F1}\left(-\frac{5}{6},\frac{1}{2},\frac{1}{6},\cos^2(c+dx)\right)\sin(c+dx)}{5d(b\cos(c+dx))^{5/3}\sqrt{\sin^2(c+dx)}}$$

```
[Out] 3/8*A*b^2*hypergeom([-4/3, 1/2],[-1/3],cos(d*x+c)^2)*sin(d*x+c)/d/(b*cos(d*
x+c))^(8/3)/(sin(d*x+c)^2)^(1/2)+3/5*b*B*hypergeom([-5/6, 1/2],[1/6],cos(d*
x+c)^2)*sin(d*x+c)/d/(b*cos(d*x+c))^(5/3)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {16, 2827, 2722}

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \frac{3Ab^2\sin(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{4}{3},\frac{1}{2},-\frac{1}{3},\cos^2(c+dx)\right)}{8d\sqrt{\sin^2(c+dx)}(b\cos(c+dx))^{8/3}} + \frac{3bB\sin(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{5}{6},\frac{1}{2},\frac{1}{6},\cos^2(c+dx)\right)}{5d\sqrt{\sin^2(c+dx)}(b\cos(c+dx))^{5/3}}$$

```
[In] Int[((A + B*Cos[c + d*x])*Sec[c + d*x]^3)/(b*Cos[c + d*x])^(2/3),x]
```

```
[Out] (3*A*b^2*Hypergeometric2F1[-4/3, 1/2, -1/3, Cos[c + d*x]^2]*Sin[c + d*x])/(
8*d*(b*Cos[c + d*x])^(8/3)*Sqrt[Sin[c + d*x]^2]) + (3*b*B*Hypergeometric2F1
[-5/6, 1/2, 1/6, Cos[c + d*x]^2]*Sin[c + d*x])/(5*d*(b*Cos[c + d*x])^(5/3)*
Sqrt[Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= b^3 \int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{11/3}}\,dx \\
&= \left(Ab^3\right)\int \frac{1}{(b\cos(c+dx))^{11/3}}\,dx + \left(b^2B\right)\int \frac{1}{(b\cos(c+dx))^{8/3}}\,dx \\
&= \frac{3Ab^2\,\text{Hypergeometric2F1}\left(-\frac{4}{3},\frac{1}{2},-\frac{1}{3},\cos^2(c+dx)\right)\sin(c+dx)}{8d(b\cos(c+dx))^{8/3}\sqrt{\sin^2(c+dx)}} \\
&\quad + \frac{3bB\,\text{Hypergeometric2F1}\left(-\frac{5}{6},\frac{1}{2},\frac{1}{6},\cos^2(c+dx)\right)\sin(c+dx)}{5d(b\cos(c+dx))^{5/3}\sqrt{\sin^2(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.76

$$
\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \frac{3b^2\csc(c+dx)\left(5A\,\text{Hypergeometric2F1}\left(-\frac{4}{3},\frac{1}{2},-\frac{1}{3},\cos^2(c+dx)\right)\right.}{40d}
$$

```
[In] Integrate[((A + B*Cos[c + d*x])*Sec[c + d*x]^3)/(b*Cos[c + d*x])^(2/3),x]
```

```
[Out] (3*b^2*Csc[c + d*x]*(5*A*Hypergeometric2F1[-4/3, 1/2, -1/3, Cos[c + d*x]^2]
 + 8*B*Cos[c + d*x]*Hypergeometric2F1[-5/6, 1/2, 1/6, Cos[c + d*x]^2])*Sqrt
[Sin[c + d*x]^2])/(40*d*(b*Cos[c + d*x])^(8/3))
```

Maple [F]

$$\int \frac{(A+B\cos(dx+c))\left(\sec^3(dx+c)\right)}{(\cos(dx+c)\,b)^{\frac{2}{3}}}dx$$

[In] int((A+B*cos(d*x+c))*sec(d*x+c)^3/(cos(d*x+c)*b)^(2/3),x)

[Out] int((A+B*cos(d*x+c))*sec(d*x+c)^3/(cos(d*x+c)*b)^(2/3),x)

Fricas [F]

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\sec(dx+c)^3}{(b\cos(dx+c))^{\frac{2}{3}}}\,dx$$

[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^3/(b*cos(d*x+c))^(2/3),x, algorithm="fricas")

[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*sec(d*x + c)^3/(b*cos(d*x + c)), x)

Sympy [F]

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{(b\cos(c+dx))^{\frac{2}{3}}}\,dx$$

[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)**3/(b*cos(d*x+c))**(2/3),x)

[Out] Integral((A + B*cos(c + d*x))*sec(c + d*x)**3/(b*cos(c + d*x))**(2/3), x)

Maxima [F]

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\sec(dx+c)^3}{(b\cos(dx+c))^{\frac{2}{3}}}\,dx$$

[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^3/(b*cos(d*x+c))^(2/3),x, algorithm="maxima")

[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^3/(b*cos(d*x + c))^(2/3), x)

Giac [F]

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\sec(dx+c)^3}{(b\cos(dx+c))^{\frac{2}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^3/(b*cos(d*x+c))^(2/3),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^3/(b*cos(d*x + c))^(2/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{A+B\cos(c+dx)}{\cos(c+dx)^3\,(b\cos(c+dx))^{2/3}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)^3*(b*cos(c + d*x))^(2/3)),x)
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)^3*(b*cos(c + d*x))^(2/3)), x)
```

3.905 $\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 119

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = -\frac{3A(b\cos(c+dx))^{5/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{6},\frac{11}{6},\cos^2(c+dx)\right)\sin(c+dx)}{5b^3d\sqrt{\sin^2(c+dx)}} - \frac{3B(b\cos(c+dx))^{8/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{4}{3},\frac{7}{3},\cos^2(c+dx)\right)\sin(c+dx)}{8b^4d\sqrt{\sin^2(c+dx)}}$$

```
[Out] -3/5*A*(b*cos(d*x+c))^(5/3)*hypergeom([1/2, 5/6],[11/6],cos(d*x+c)^2)*sin(d
*x+c)/b^3/d/(sin(d*x+c)^2)^(1/2)-3/8*B*(b*cos(d*x+c))^(8/3)*hypergeom([1/2,
 4/3],[7/3],cos(d*x+c)^2)*sin(d*x+c)/b^4/d/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {16, 2827, 2722}

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = -\frac{3A\sin(c+dx)(b\cos(c+dx))^{5/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{6},\frac{11}{6},\cos^2(c+dx)\right)}{5b^3d\sqrt{\sin^2(c+dx)}} - \frac{3B\sin(c+dx)(b\cos(c+dx))^{8/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{4}{3},\frac{7}{3},\cos^2(c+dx)\right)}{8b^4d\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^2*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(4/3),x]
```

```
[Out] (-3*A*(b*Cos[c + d*x])^(5/3)*Hypergeometric2F1[1/2, 5/6, 11/6, Cos[c + d*x]
^2]*Sin[c + d*x])/(5*b^3*d*Sqrt[Sin[c + d*x]^2]) - (3*B*(b*Cos[c + d*x])^(8
/3)*Hypergeometric2F1[1/2, 4/3, 7/3, Cos[c + d*x]^2]*Sin[c + d*x])/(8*b^4*d
*Sqrt[Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\int (b\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx}{b^2}\\ &= \frac{A\int (b\cos(c+dx))^{2/3}\,dx}{b^2} + \frac{B\int (b\cos(c+dx))^{5/3}\,dx}{b^3}\\ &= -\frac{3A(b\cos(c+dx))^{5/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{6},\frac{11}{6},\cos^2(c+dx)\right)\sin(c+dx)}{5b^3d\sqrt{\sin^2(c+dx)}}\\ &\quad - \frac{3B(b\cos(c+dx))^{8/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{4}{3},\frac{7}{3},\cos^2(c+dx)\right)\sin(c+dx)}{8b^4d\sqrt{\sin^2(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.79

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = -\frac{3\cos^2(c+dx)\cot(c+dx)\left(8A\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{6},\frac{11}{6},\cos^2(c+dx)\right)+5B\cos(c+dx)\,\text{Hypergeome}\right.}{40d(b\cos(c+dx))^{4/3}}$$

```
[In] Integrate[(Cos[c + d*x]^2*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(4/3),x]
```

```
[Out] (-3*Cos[c + d*x]^2*Cot[c + d*x]*(8*A*Hypergeometric2F1[1/2, 5/6, 11/6, Cos[
c + d*x]^2] + 5*B*Cos[c + d*x]*Hypergeometric2F1[1/2, 4/3, 7/3, Cos[c + d*x
]^2])*Sqrt[Sin[c + d*x]^2])/(40*d*(b*Cos[c + d*x])^(4/3))
```

Maple [F]

$$\int \frac{(\cos^2(dx+c))\,(A+B\cos(dx+c))}{(\cos(dx+c)\,b)^{\frac{4}{3}}}dx$$

```
[In] int(cos(d*x+c)^2*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(4/3),x)
[Out] int(cos(d*x+c)^2*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(4/3),x)
```

Fricas [F]

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^2}{(b\cos(dx+c))^{\frac{4}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)^2*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(4/3),x, algorithm="
fricas")
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(2/3)/b^2, x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**2*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(4/3),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^2}{(b\cos(dx+c))^{\frac{4}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)^2*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(4/3),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^2/(b*cos(d*x + c))^(4/3), x)
```

Giac [F]

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^2}{(b\cos(dx+c))^{\frac{4}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)^2*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(4/3),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^2/(b*cos(d*x + c))^(4/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^2(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{\cos(c+d\,x)^2\,(A+B\,\cos(c+d\,x))}{(b\,\cos(c+d\,x))^{4/3}}\,dx$$

```
[In] int((cos(c + d*x)^2*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(4/3),x)
[Out] int((cos(c + d*x)^2*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(4/3), x)
```

3.906 $\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 119

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = -\frac{3A(b\cos(c+dx))^{2/3}\,\text{Hypergeometric2F1}\left(\frac{1}{3},\frac{1}{2},\frac{4}{3},\cos^2(c+dx)\right)\sin(c+dx)}{2b^2d\sqrt{\sin^2(c+dx)}} - \frac{3B(b\cos(c+dx))^{5/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{6},\frac{11}{6},\cos^2(c+dx)\right)\sin(c+dx)}{5b^3d\sqrt{\sin^2(c+dx)}}$$

```
[Out] -3/2*A*(b*cos(d*x+c))^(2/3)*hypergeom([1/3, 1/2],[4/3],cos(d*x+c)^2)*sin(d*
x+c)/b^2/d/(sin(d*x+c)^2)^(1/2)-3/5*B*(b*cos(d*x+c))^(5/3)*hypergeom([1/2,
5/6],[11/6],cos(d*x+c)^2)*sin(d*x+c)/b^3/d/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {16, 2827, 2722}

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = -\frac{3A\sin(c+dx)(b\cos(c+dx))^{2/3}\,\text{Hypergeometric2F1}\left(\frac{1}{3},\frac{1}{2},\frac{4}{3},\cos^2(c+dx)\right)}{2b^2d\sqrt{\sin^2(c+dx)}} - \frac{3B\sin(c+dx)(b\cos(c+dx))^{5/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{6},\frac{11}{6},\cos^2(c+dx)\right)}{5b^3d\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(4/3),x]
```

```
[Out] (-3*A*(b*Cos[c + d*x])^(2/3)*Hypergeometric2F1[1/3, 1/2, 4/3, Cos[c + d*x]^
2]*Sin[c + d*x])/(2*b^2*d*Sqrt[Sin[c + d*x]^2]) - (3*B*(b*Cos[c + d*x])^(5/
3)*Hypergeometric2F1[1/2, 5/6, 11/6, Cos[c + d*x]^2]*Sin[c + d*x])/(5*b^3*d
*Sqrt[Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\int \frac{A+B\cos(c+dx)}{\sqrt[3]{b\cos(c+dx)}}\,dx}{b} \\
&= \frac{A\int \frac{1}{\sqrt[3]{b\cos(c+dx)}}\,dx}{b} + \frac{B\int (b\cos(c+dx))^{2/3}\,dx}{b^2} \\
&= -\frac{3A(b\cos(c+dx))^{2/3}\,\text{Hypergeometric2F1}\left(\frac{1}{3},\frac{1}{2},\frac{4}{3},\cos^2(c+dx)\right)\sin(c+dx)}{2b^2d\sqrt{\sin^2(c+dx)}} \\
&\quad -\frac{3B(b\cos(c+dx))^{5/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{6},\frac{11}{6},\cos^2(c+dx)\right)\sin(c+dx)}{5b^3d\sqrt{\sin^2(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.75

$$
\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = -\frac{3\cot(c+dx)\left(5A\,\text{Hypergeometric2F1}\left(\frac{1}{3},\frac{1}{2},\frac{4}{3},\cos^2(c+dx)\right)+2B\cos(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{6},\right.\right.}{10bd\sqrt[3]{b\cos(c+dx)}}
$$

```
[In] Integrate[(Cos[c + d*x]*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(4/3),x]
```

```
[Out] (-3*Cot[c + d*x]*(5*A*Hypergeometric2F1[1/3, 1/2, 4/3, Cos[c + d*x]^2] + 2*
B*Cos[c + d*x]*Hypergeometric2F1[1/2, 5/6, 11/6, Cos[c + d*x]^2])*Sqrt[Sin[
c + d*x]^2])/(10*b*d*(b*Cos[c + d*x])^(1/3))
```

Maple [F]

$$\int \frac{\cos(dx+c)\,(A+B\cos(dx+c))}{(\cos(dx+c)\,b)^{\frac{4}{3}}}dx$$

```
[In] int(cos(d*x+c)*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(4/3),x)
```

```
[Out] int(cos(d*x+c)*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(4/3),x)
```

Fricas [F]

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)}{(b\cos(dx+c))^{\frac{4}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(4/3),x, algorithm="fr
icas")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(2/3)/(b^2*cos(d*x + c)), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(4/3),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)}{(b\cos(dx+c))^{\frac{4}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(4/3),x, algorithm="ma
xima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)/(b*cos(d*x + c))^(4/3), x)
```

Giac [F]

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)}{(b\cos(dx+c))^{\frac{4}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(4/3),x, algorithm="gi
ac")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)/(b*cos(d*x + c))^(4/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{\cos(c+d\,x)\,\left(A+B\,\cos(c+d\,x)\right)}{(b\,\cos(c+d\,x))^{4/3}}\,dx$$

```
[In] int((cos(c + d*x)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(4/3),x)
[Out] int((cos(c + d*x)*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(4/3), x)
```

3.907 $\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 117

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \frac{3A\,\text{Hypergeometric2F1}\left(-\frac{1}{6},\frac{1}{2},\frac{5}{6},\cos^2(c+dx)\right)\sin(c+dx)}{bd\sqrt[3]{b\cos(c+dx)}\sqrt{\sin^2(c+dx)}} - \frac{3B(b\cos(c+dx))^{2/3}\,\text{Hypergeometric2F1}\left(\frac{1}{3},\frac{1}{2},\frac{4}{3},\cos^2(c+dx)\right)\sin(c+dx)}{2b^2d\sqrt{\sin^2(c+dx)}}$$

```
[Out] 3*A*hypergeom([-1/6, 1/2],[5/6],cos(d*x+c)^2)*sin(d*x+c)/b/d/(b*cos(d*x+c))
^(1/3)/(sin(d*x+c)^2)^(1/2)-3/2*B*(b*cos(d*x+c))^(2/3)*hypergeom([1/3, 1/2]
,[4/3],cos(d*x+c)^2)*sin(d*x+c)/b^2/d/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2827, 2722}

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \frac{3A\sin(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{1}{6},\frac{1}{2},\frac{5}{6},\cos^2(c+dx)\right)}{bd\sqrt{\sin^2(c+dx)}\sqrt[3]{b\cos(c+dx)}} - \frac{3B\sin(c+dx)(b\cos(c+dx))^{2/3}\,\text{Hypergeometric2F1}\left(\frac{1}{3},\frac{1}{2},\frac{4}{3},\cos^2(c+dx)\right)}{2b^2d\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(A + B*Cos[c + d*x])/(b*Cos[c + d*x])^(4/3),x]
```

```
[Out] (3*A*Hypergeometric2F1[-1/6, 1/2, 5/6, Cos[c + d*x]^2]*Sin[c + d*x])/(b*d*(
b*Cos[c + d*x])^(1/3)*Sqrt[Sin[c + d*x]^2]) - (3*B*(b*Cos[c + d*x])^(2/3)*H
ypergeometric2F1[1/3, 1/2, 4/3, Cos[c + d*x]^2]*Sin[c + d*x])/(2*b^2*d*Sqrt
[Sin[c + d*x]^2])
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= A\int \frac{1}{(b\cos(c+dx))^{4/3}}\,dx + \frac{B\int \frac{1}{\sqrt[3]{b\cos(c+dx)}}\,dx}{b} \\ &= \frac{3A\,\text{Hypergeometric2F1}\left(-\frac{1}{6},\frac{1}{2},\frac{5}{6},\cos^2(c+dx)\right)\sin(c+dx)}{bd\sqrt[3]{b\cos(c+dx)}\sqrt{\sin^2(c+dx)}} \\ &\quad - \frac{3B(b\cos(c+dx))^{2/3}\,\text{Hypergeometric2F1}\left(\frac{1}{3},\frac{1}{2},\frac{4}{3},\cos^2(c+dx)\right)\sin(c+dx)}{2b^2d\sqrt{\sin^2(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.73

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = -\frac{3\cot(c+dx)\left(-2A\,\text{Hypergeometric2F1}\left(-\frac{1}{6},\frac{1}{2},\frac{5}{6},\cos^2(c+dx)\right)+B\cos(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{3},\right.\right.}{2d(b\cos(c+dx))^{4/3}}$$

```
[In] Integrate[(A + B*Cos[c + d*x])/(b*Cos[c + d*x])^(4/3),x]
```

```
[Out] (-3*Cot[c + d*x]*(-2*A*Hypergeometric2F1[-1/6, 1/2, 5/6, Cos[c + d*x]^2] +
B*Cos[c + d*x]*Hypergeometric2F1[1/3, 1/2, 4/3, Cos[c + d*x]^2])*Sqrt[Sin[c
 + d*x]^2])/(2*d*(b*Cos[c + d*x])^(4/3))
```

Maple [F]

$$\int \frac{A + B\cos(dx + c)}{(\cos(dx + c)\, b)^{\frac{4}{3}}} dx$$

```
[In] int((A+B*cos(d*x+c))/(cos(d*x+c)*b)^(4/3),x)
[Out] int((A+B*cos(d*x+c))/(cos(d*x+c)*b)^(4/3),x)
```

Fricas [F]

$$\int \frac{A + B\cos(c + dx)}{(b\cos(c + dx))^{4/3}}\, dx = \int \frac{B\cos(dx + c) + A}{(b\cos(dx + c))^{\frac{4}{3}}}\, dx$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))^(4/3),x, algorithm="fricas")
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(2/3)/(b^2*cos(d*x + c)^2),
x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A + B\cos(c + dx)}{(b\cos(c + dx))^{4/3}}\, dx = \text{Timed out}$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))**(4/3),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{A + B\cos(c + dx)}{(b\cos(c + dx))^{4/3}}\, dx = \int \frac{B\cos(dx + c) + A}{(b\cos(dx + c))^{\frac{4}{3}}}\, dx$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))^(4/3),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)/(b*cos(d*x + c))^(4/3), x)
```

Giac [F]

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{B\cos(dx+c)+A}{(b\cos(dx+c))^{\frac{4}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))/(b*cos(d*x+c))^(4/3),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)/(b*cos(d*x + c))^(4/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{A+B\,\cos(c+d\,x)}{(b\,\cos(c+d\,x))^{4/3}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(b*cos(c + d*x))^(4/3),x)
[Out] int((A + B*cos(c + d*x))/(b*cos(c + d*x))^(4/3), x)
```

3.908 $\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 114

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \frac{3A\,\text{Hypergeometric2F1}\left(-\frac{2}{3},\frac{1}{2},\frac{1}{3},\cos^2(c+dx)\right)\sin(c+dx)}{4d(b\cos(c+dx))^{4/3}\sqrt{\sin^2(c+dx)}} + \frac{3B\,\text{Hypergeometric2F1}\left(-\frac{1}{6},\frac{1}{2},\frac{5}{6},\cos^2(c+dx)\right)\sin(c+dx)}{bd\sqrt[3]{b\cos(c+dx)}\sqrt{\sin^2(c+dx)}}$$

```
[Out] 3/4*A*hypergeom([-2/3, 1/2],[1/3],cos(d*x+c)^2)*sin(d*x+c)/d/(b*cos(d*x+c))
^(4/3)/(sin(d*x+c)^2)^(1/2)+3*B*hypergeom([-1/6, 1/2],[5/6],cos(d*x+c)^2)*s
in(d*x+c)/b/d/(b*cos(d*x+c))^(1/3)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {16, 2827, 2722}

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \frac{3A\sin(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{2}{3},\frac{1}{2},\frac{1}{3},\cos^2(c+dx)\right)}{4d\sqrt{\sin^2(c+dx)}(b\cos(c+dx))^{4/3}} + \frac{3B\sin(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{1}{6},\frac{1}{2},\frac{5}{6},\cos^2(c+dx)\right)}{bd\sqrt{\sin^2(c+dx)}\sqrt[3]{b\cos(c+dx)}}$$

```
[In] Int[((A + B*Cos[c + d*x])*Sec[c + d*x])/(b*Cos[c + d*x])^(4/3),x]
```

```
[Out] (3*A*Hypergeometric2F1[-2/3, 1/2, 1/3, Cos[c + d*x]^2]*Sin[c + d*x])/(4*d*(
b*Cos[c + d*x])^(4/3)*Sqrt[Sin[c + d*x]^2]) + (3*B*Hypergeometric2F1[-1/6,
1/2, 5/6, Cos[c + d*x]^2]*Sin[c + d*x])/(b*d*(b*Cos[c + d*x])^(1/3)*Sqrt[Si
n[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= b\int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{7/3}}\,dx \\
&= (Ab)\int \frac{1}{(b\cos(c+dx))^{7/3}}\,dx + B\int \frac{1}{(b\cos(c+dx))^{4/3}}\,dx \\
&= \frac{3A\,\text{Hypergeometric2F1}\left(-\frac{2}{3},\frac{1}{2},\frac{1}{3},\cos^2(c+dx)\right)\sin(c+dx)}{4d(b\cos(c+dx))^{4/3}\sqrt{\sin^2(c+dx)}} \\
&\quad + \frac{3B\,\text{Hypergeometric2F1}\left(-\frac{1}{6},\frac{1}{2},\frac{5}{6},\cos^2(c+dx)\right)\sin(c+dx)}{bd\sqrt[3]{b\cos(c+dx)}\sqrt{\sin^2(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.75

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \frac{3b\cot(c+dx)\left(A\,\text{Hypergeometric2F1}\left(-\frac{2}{3},\frac{1}{2},\frac{1}{3},\cos^2(c+dx)\right)+4\right.}{4d(b\,\text{c}}$$

```
[In] Integrate[((A + B*Cos[c + d*x])*Sec[c + d*x])/(b*Cos[c + d*x])^(4/3),x]
```

```
[Out] (3*b*Cot[c + d*x]*(A*Hypergeometric2F1[-2/3, 1/2, 1/3, Cos[c + d*x]^2] + 4*
B*Cos[c + d*x]*Hypergeometric2F1[-1/6, 1/2, 5/6, Cos[c + d*x]^2])*Sqrt[Sin[
c + d*x]^2])/(4*d*(b*Cos[c + d*x])^(7/3))
```

Maple [F]

$$\int \frac{(A+B\cos (dx+c))\sec (dx+c)}{(\cos (dx+c)\, b)^{\frac{4}{3}}}dx$$

[In] int((A+B*cos(d*x+c))*sec(d*x+c)/(cos(d*x+c)*b)^(4/3),x)

[Out] int((A+B*cos(d*x+c))*sec(d*x+c)/(cos(d*x+c)*b)^(4/3),x)

Fricas [F]

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{4/3}}\, dx = \int \frac{(B\cos (dx+c)+A)\sec (dx+c)}{(b\cos (dx+c))^{\frac{4}{3}}}\, dx$$

[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))^(4/3),x, algorithm="fr
icas")

[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(2/3)*sec(d*x + c)/(b^2*cos(
d*x + c)^2), x)

Sympy [F]

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{4/3}}\, dx = \int \frac{(A+B\cos (c+dx))\sec (c+dx)}{(b\cos (c+dx))^{\frac{4}{3}}}\, dx$$

[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))**(4/3),x)

[Out] Integral((A + B*cos(c + d*x))*sec(c + d*x)/(b*cos(c + d*x))**(4/3), x)

Maxima [F]

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{4/3}}\, dx = \int \frac{(B\cos (dx+c)+A)\sec (dx+c)}{(b\cos (dx+c))^{\frac{4}{3}}}\, dx$$

[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))^(4/3),x, algorithm="ma
xima")

[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)/(b*cos(d*x + c))^(4/3), x)

Giac [F]

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{(B\cos{(dx+c)}+A)\sec{(dx+c)}}{(b\cos{(dx+c)})^{\frac{4}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)/(b*cos(d*x+c))^(4/3),x, algorithm="gi
ac")
```

```
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)/(b*cos(d*x + c))^(4/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+B\cos(c+dx))\sec(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{A+B\,\cos{(c+d\,x)}}{\cos{(c+d\,x)}\,\left(b\,\cos{(c+d\,x)}\right)^{4/3}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)*(b*cos(c + d*x))^(4/3)),x)
```

```
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)*(b*cos(c + d*x))^(4/3)), x)
```

3.909 $\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 114

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \frac{3Ab\,\text{Hypergeometric2F1}\left(-\frac{7}{6},\frac{1}{2},-\frac{1}{6},\cos^2(c+dx)\right)\sin(c+dx)}{7d(b\cos(c+dx))^{7/3}\sqrt{\sin^2(c+dx)}} + \frac{3B\,\text{Hypergeometric2F1}\left(-\frac{2}{3},\frac{1}{2},\frac{1}{3},\cos^2(c+dx)\right)\sin(c+dx)}{4d(b\cos(c+dx))^{4/3}\sqrt{\sin^2(c+dx)}}$$

```
[Out] 3/7*A*b*hypergeom([-7/6, 1/2],[-1/6],cos(d*x+c)^2)*sin(d*x+c)/d/(b*cos(d*x+
c))^(7/3)/(sin(d*x+c)^2)^(1/2)+3/4*B*hypergeom([-2/3, 1/2],[1/3],cos(d*x+c)
^2)*sin(d*x+c)/d/(b*cos(d*x+c))^(4/3)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {16, 2827, 2722}

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \frac{3Ab\sin(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{7}{6},\frac{1}{2},-\frac{1}{6},\cos^2(c+dx)\right)}{7d\sqrt{\sin^2(c+dx)}(b\cos(c+dx))^{7/3}} + \frac{3B\sin(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{2}{3},\frac{1}{2},\frac{1}{3},\cos^2(c+dx)\right)}{4d\sqrt{\sin^2(c+dx)}(b\cos(c+dx))^{4/3}}$$

```
[In] Int[((A + B*Cos[c + d*x])*Sec[c + d*x]^2)/(b*Cos[c + d*x])^(4/3),x]
```

```
[Out] (3*A*b*Hypergeometric2F1[-7/6, 1/2, -1/6, Cos[c + d*x]^2]*Sin[c + d*x])/(7*
d*(b*Cos[c + d*x])^(7/3)*Sqrt[Sin[c + d*x]^2]) + (3*B*Hypergeometric2F1[-2/
3, 1/2, 1/3, Cos[c + d*x]^2]*Sin[c + d*x])/(4*d*(b*Cos[c + d*x])^(4/3)*Sqrt
[Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= b^2 \int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{10/3}}\,dx\\
&= \left(Ab^2\right)\int \frac{1}{(b\cos(c+dx))^{10/3}}\,dx + (bB)\int \frac{1}{(b\cos(c+dx))^{7/3}}\,dx\\
&= \frac{3Ab\,\text{Hypergeometric2F1}\left(-\frac{7}{6},\frac{1}{2},-\frac{1}{6},\cos^2(c+dx)\right)\sin(c+dx)}{7d(b\cos(c+dx))^{7/3}\sqrt{\sin^2(c+dx)}}\\
&\quad+\frac{3B\,\text{Hypergeometric2F1}\left(-\frac{2}{3},\frac{1}{2},\frac{1}{3},\cos^2(c+dx)\right)\sin(c+dx)}{4d(b\cos(c+dx))^{4/3}\sqrt{\sin^2(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.78

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \frac{3b^2\cot(c+dx)\left(4A\,\text{Hypergeometric2F1}\left(-\frac{7}{6},\frac{1}{2},-\frac{1}{6},\cos^2(c+dx)\right)\right.}{28d}$$

```
[In] Integrate[((A + B*Cos[c + d*x])*Sec[c + d*x]^2)/(b*Cos[c + d*x])^(4/3),x]
[Out] (3*b^2*Cot[c + d*x]*(4*A*Hypergeometric2F1[-7/6, 1/2, -1/6, Cos[c + d*x]^2]
 + 7*B*Cos[c + d*x]*Hypergeometric2F1[-2/3, 1/2, 1/3, Cos[c + d*x]^2])*Sqrt
[Sin[c + d*x]^2])/(28*d*(b*Cos[c + d*x])^(10/3))
```

Maple [F]

$$\int \frac{(A+B\cos(dx+c))(\sec^2(dx+c))}{(\cos(dx+c)\,b)^{\frac{4}{3}}}dx$$

```
[In] int((A+B*cos(d*x+c))*sec(d*x+c)^2/(cos(d*x+c)*b)^(4/3),x)
[Out] int((A+B*cos(d*x+c))*sec(d*x+c)^2/(cos(d*x+c)*b)^(4/3),x)
```

Fricas [F]

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\sec(dx+c)^2}{(b\cos(dx+c))^{\frac{4}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^2/(b*cos(d*x+c))^(4/3),x, algorithm="
fricas")
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(2/3)*sec(d*x + c)^2/(b^2*co
s(d*x + c)^2), x)
```

Sympy [F]

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{\frac{4}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)**2/(b*cos(d*x+c))**(4/3),x)
[Out] Integral((A + B*cos(c + d*x))*sec(c + d*x)**2/(b*cos(c + d*x))**(4/3), x)
```

Maxima [F]

$$\int \frac{(A+B\cos(c+dx))\sec^2(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\sec(dx+c)^2}{(b\cos(dx+c))^{\frac{4}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^2/(b*cos(d*x+c))^(4/3),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^2/(b*cos(d*x + c))^(4/3), x)
```

Giac [F]

$$\int \frac{(A + B\cos(c + dx))\sec^2(c + dx)}{(b\cos(c + dx))^{4/3}}\,dx = \int \frac{(B\cos(dx + c) + A)\sec(dx + c)^2}{(b\cos(dx + c))^{\frac{4}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^2/(b*cos(d*x+c))^(4/3),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^2/(b*cos(d*x + c))^(4/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A + B\cos(c + dx))\sec^2(c + dx)}{(b\cos(c + dx))^{4/3}}\,dx = \int \frac{A + B\cos(c + dx)}{\cos(c + dx)^2\,(b\cos(c + dx))^{4/3}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)^2*(b*cos(c + d*x))^(4/3)),x)
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)^2*(b*cos(c + d*x))^(4/3)), x)
```

3.910 $\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 117

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \frac{3Ab^2 \,\text{Hypergeometric2F1}\left(-\frac{5}{3},\frac{1}{2},-\frac{2}{3},\cos^2(c+dx)\right)\sin(c+dx)}{10d(b\cos(c+dx))^{10/3}\sqrt{\sin^2(c+dx)}} + \frac{3bB\,\text{Hypergeometric2F1}\left(-\frac{7}{6},\frac{1}{2},-\frac{1}{6},\cos^2(c+dx)\right)\sin(c+dx)}{7d(b\cos(c+dx))^{7/3}\sqrt{\sin^2(c+dx)}}$$

```
[Out] 3/10*A*b^2*hypergeom([-5/3, 1/2],[-2/3],cos(d*x+c)^2)*sin(d*x+c)/d/(b*cos(d
*x+c))^(10/3)/(sin(d*x+c)^2)^(1/2)+3/7*b*B*hypergeom([-7/6, 1/2],[-1/6],cos
(d*x+c)^2)*sin(d*x+c)/d/(b*cos(d*x+c))^(7/3)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {16, 2827, 2722}

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \frac{3Ab^2\sin(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{5}{3},\frac{1}{2},-\frac{2}{3},\cos^2(c+dx)\right)}{10d\sqrt{\sin^2(c+dx)}(b\cos(c+dx))^{10/3}} + \frac{3bB\sin(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{7}{6},\frac{1}{2},-\frac{1}{6},\cos^2(c+dx)\right)}{7d\sqrt{\sin^2(c+dx)}(b\cos(c+dx))^{7/3}}$$

```
[In] Int[((A + B*Cos[c + d*x])*Sec[c + d*x]^3)/(b*Cos[c + d*x])^(4/3),x]
```

```
[Out] (3*A*b^2*Hypergeometric2F1[-5/3, 1/2, -2/3, Cos[c + d*x]^2]*Sin[c + d*x])/(
10*d*(b*Cos[c + d*x])^(10/3)*Sqrt[Sin[c + d*x]^2]) + (3*b*B*Hypergeometric2
F1[-7/6, 1/2, -1/6, Cos[c + d*x]^2]*Sin[c + d*x])/(7*d*(b*Cos[c + d*x])^(7/
3)*Sqrt[Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= b^3 \int \frac{A+B\cos(c+dx)}{(b\cos(c+dx))^{13/3}}\,dx \\
&= \left(Ab^3\right)\int \frac{1}{(b\cos(c+dx))^{13/3}}\,dx + \left(b^2B\right)\int \frac{1}{(b\cos(c+dx))^{10/3}}\,dx \\
&= \frac{3Ab^2\,\text{Hypergeometric2F1}\left(-\frac{5}{3},\frac{1}{2},-\frac{2}{3},\cos^2(c+dx)\right)\sin(c+dx)}{10d(b\cos(c+dx))^{10/3}\sqrt{\sin^2(c+dx)}} \\
&\quad + \frac{3bB\,\text{Hypergeometric2F1}\left(-\frac{7}{6},\frac{1}{2},-\frac{1}{6},\cos^2(c+dx)\right)\sin(c+dx)}{7d(b\cos(c+dx))^{7/3}\sqrt{\sin^2(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.76

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \frac{3b^2\csc(c+dx)\left(7A\,\text{Hypergeometric2F1}\left(-\frac{5}{3},\frac{1}{2},-\frac{2}{3},\cos^2(c+dx)\right)\right.}{70}$$

```
[In] Integrate[((A + B*Cos[c + d*x])*Sec[c + d*x]^3)/(b*Cos[c + d*x])^(4/3),x]
[Out] (3*b^2*Csc[c + d*x]*(7*A*Hypergeometric2F1[-5/3, 1/2, -2/3, Cos[c + d*x]^2]
 + 10*B*Cos[c + d*x]*Hypergeometric2F1[-7/6, 1/2, -1/6, Cos[c + d*x]^2])*Sq
rt[Sin[c + d*x]^2])/(70*d*(b*Cos[c + d*x])^(10/3))
```

Maple [F]

$$\int \frac{(A + B\cos(dx + c))(\sec^3(dx + c))}{(\cos(dx + c)\,b)^{\frac{4}{3}}}dx$$

```
[In] int((A+B*cos(d*x+c))*sec(d*x+c)^3/(cos(d*x+c)*b)^(4/3),x)
```

```
[Out] int((A+B*cos(d*x+c))*sec(d*x+c)^3/(cos(d*x+c)*b)^(4/3),x)
```

Fricas [F]

$$\int \frac{(A + B\cos(c + dx))\sec^3(c + dx)}{(b\cos(c + dx))^{4/3}}\,dx = \int \frac{(B\cos(dx + c) + A)\sec(dx + c)^3}{(b\cos(dx + c))^{\frac{4}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^3/(b*cos(d*x+c))^(4/3),x, algorithm="
fricas")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(2/3)*sec(d*x + c)^3/(b^2*co
s(d*x + c)^2), x)
```

Sympy [F]

$$\int \frac{(A + B\cos(c + dx))\sec^3(c + dx)}{(b\cos(c + dx))^{4/3}}\,dx = \int \frac{(A + B\cos(c + dx))\sec^3(c + dx)}{(b\cos(c + dx))^{\frac{4}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)**3/(b*cos(d*x+c))**(4/3),x)
```

```
[Out] Integral((A + B*cos(c + d*x))*sec(c + d*x)**3/(b*cos(c + d*x))**(4/3), x)
```

Maxima [F]

$$\int \frac{(A + B\cos(c + dx))\sec^3(c + dx)}{(b\cos(c + dx))^{4/3}}\,dx = \int \frac{(B\cos(dx + c) + A)\sec(dx + c)^3}{(b\cos(dx + c))^{\frac{4}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^3/(b*cos(d*x+c))^(4/3),x, algorithm="
maxima")
```

```
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^3/(b*cos(d*x + c))^(4/3), x)
```

Giac [F]

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\sec(dx+c)^3}{(b\cos(dx+c))^{\frac{4}{3}}}\,dx$$

```
[In] integrate((A+B*cos(d*x+c))*sec(d*x+c)^3/(b*cos(d*x+c))^(4/3),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*sec(d*x + c)^3/(b*cos(d*x + c))^(4/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+B\cos(c+dx))\sec^3(c+dx)}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{A+B\,\cos(c+d\,x)}{\cos(c+d\,x)^3\,(b\,\cos(c+d\,x))^{4/3}}\,dx$$

```
[In] int((A + B*cos(c + d*x))/(cos(c + d*x)^3*(b*cos(c + d*x))^(4/3)),x)
[Out] int((A + B*cos(c + d*x))/(cos(c + d*x)^3*(b*cos(c + d*x))^(4/3)), x)
```

3.911 $\int \cos^m(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 29, antiderivative size = 157

$$\int \cos^m(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = -\frac{A\cos^{1+m}(c+dx)(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(1+m+n),\frac{1}{2}(3+m+n),\cos^2(c+dx)\right)\sin}{d(1+m+n)\sqrt{\sin^2(c+dx)}} - \frac{B\cos^{2+m}(c+dx)(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(2+m+n),\frac{1}{2}(4+m+n),\cos^2(c+dx)\right)\sin}{d(2+m+n)\sqrt{\sin^2(c+dx)}}$$

```
[Out] -A*cos(d*x+c)^(1+m)*(b*cos(d*x+c))^n*hypergeom([1/2, 1/2+1/2*m+1/2*n],[3/2+
1/2*m+1/2*n],cos(d*x+c)^2)*sin(d*x+c)/d/(1+m+n)/(sin(d*x+c)^2)^(1/2)-B*cos(
d*x+c)^(2+m)*(b*cos(d*x+c))^n*hypergeom([1/2, 1+1/2*m+1/2*n],[2+1/2*m+1/2*n
],cos(d*x+c)^2)*sin(d*x+c)/d/(2+m+n)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {20, 2827, 2722}

$$\int \cos^m(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = -\frac{A\sin(c+dx)\cos^{m+1}(c+dx)(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(m+n+1),\frac{1}{2}(m+n+3),\cos^2(\right.}{d(m+n+1)\sqrt{\sin^2(c+dx)}} - \frac{B\sin(c+dx)\cos^{m+2}(c+dx)(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(m+n+2),\frac{1}{2}(m+n+4),\cos^2(\right.}{d(m+n+2)\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^m*(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]),x]
```

```
[Out] -((A*Cos[c + d*x]^(1 + m)*(b*Cos[c + d*x])^n*Hypergeometric2F1[1/2, (1 + m
+ n)/2, (3 + m + n)/2, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(1 + m + n)*Sqrt[Si
n[c + d*x]^2])) - (B*Cos[c + d*x]^(2 + m)*(b*Cos[c + d*x])^n*Hypergeometric
2F1[1/2, (2 + m + n)/2, (4 + m + n)/2, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(2
+ m + n)*Sqrt[Sin[c + d*x]^2])
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[b^IntPart[
n]*((b*v)^FracPart[n]/(a^IntPart[n]*(a*v)^FracPart[n])), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !
IntegerQ[m + n]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{m+n}(c+dx)(A+B\cos(c+dx))\,dx \\
&= \left(A\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{m+n}(c+dx)\,dx \\
&\quad + \left(B\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{1+m+n}(c+dx)\,dx \\
&= \\
&\quad -\frac{A\cos^{1+m}(c+dx)(b\cos(c+dx))^n\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(1+m+n),\frac{1}{2}(3+m+n),\cos^2(c+\right.}{d(1+m+n)\sqrt{\sin^2(c+dx)}} \\
&\quad -\frac{B\cos^{2+m}(c+dx)(b\cos(c+dx))^n\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(2+m+n),\frac{1}{2}(4+m+n),\cos^2(c+\right.}{d(2+m+n)\sqrt{\sin^2(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 130, normalized size of antiderivative = 0.83

$$\int \cos^m(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = -\frac{\cos^{1+m}(c+dx)(b\cos(c+dx))^n\csc(c+dx)\left(A(2+m+n)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(1+m+n),\frac{1}{2}(3+\right.\right.}{}$$

```
[In] Integrate[Cos[c + d*x]^m*(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]),x]
```

```
[Out] -((Cos[c + d*x]^(1 + m)*(b*Cos[c + d*x])^n*Csc[c + d*x]*(A*(2 + m + n)*Hype
rgeometric2F1[1/2, (1 + m + n)/2, (3 + m + n)/2, Cos[c + d*x]^2] + B*(1 + m
 + n)*Cos[c + d*x]*Hypergeometric2F1[1/2, (2 + m + n)/2, (4 + m + n)/2, Cos
[c + d*x]^2])*Sqrt[Sin[c + d*x]^2])/(d*(1 + m + n)*(2 + m + n)))
```

Maple [F]

$$\int (\cos^m(dx+c))(\cos(dx+c)\,b)^n\,(A+B\cos(dx+c))\,dx$$

```
[In] int(cos(d*x+c)^m*(cos(d*x+c)*b)^n*(A+B*cos(d*x+c)),x)
```

```
[Out] int(cos(d*x+c)^m*(cos(d*x+c)*b)^n*(A+B*cos(d*x+c)),x)
```

Fricas [F]

$$\int \cos^m(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^n\cos(dx+c)^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(b*cos(d*x+c))^n*(A+B*cos(d*x+c)),x, algorithm="fric
as")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*cos(d*x + c)^m, x)
```

Sympy [F]

$$\int \cos^m(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$= \int (b\cos{(c+dx)})^n\,(A+B\cos{(c+dx)})\cos^m{(c+dx)}\,dx$$

```
[In] integrate(cos(d*x+c)**m*(b*cos(d*x+c))**n*(A+B*cos(d*x+c)),x)
[Out] Integral((b*cos(c + d*x))**n*(A + B*cos(c + d*x))*cos(c + d*x)**m, x)
```

Maxima [F]

$$\int \cos^m(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$= \int (B\cos{(dx+c)}+A)(b\cos{(dx+c)})^n\cos{(dx+c)}^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(b*cos(d*x+c))^n*(A+B*cos(d*x+c)),x, algorithm="maxi
ma")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*cos(d*x + c)^m, x)
```

Giac [F]

$$\int \cos^m(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$= \int (B\cos{(dx+c)}+A)(b\cos{(dx+c)})^n\cos{(dx+c)}^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(b*cos(d*x+c))^n*(A+B*cos(d*x+c)),x, algorithm="giac
")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*cos(d*x + c)^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^m(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$=\int \cos\left(c+d\,x\right)^m\,\left(b\,\cos\left(c+d\,x\right)\right)^n\,\left(A+B\,\cos\left(c+d\,x\right)\right)\,dx$$

```
[In] int(cos(c + d*x)^m*(b*cos(c + d*x))^n*(A + B*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^m*(b*cos(c + d*x))^n*(A + B*cos(c + d*x)), x)
```

3.912 $\int \cos^2(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 29, antiderivative size = 141

$$\int \cos^2(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = -\frac{A(b\cos(c+dx))^{3+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+n}{2},\frac{5+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{b^3d(3+n)\sqrt{\sin^2(c+dx)}} - \frac{B(b\cos(c+dx))^{4+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{4+n}{2},\frac{6+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{b^4d(4+n)\sqrt{\sin^2(c+dx)}}$$

```
[Out] -A*(b*cos(d*x+c))^(3+n)*hypergeom([1/2, 3/2+1/2*n],[5/2+1/2*n],cos(d*x+c)^2
)*sin(d*x+c)/b^3/d/(3+n)/(sin(d*x+c)^2)^(1/2)-B*(b*cos(d*x+c))^(4+n)*hyperg
eom([1/2, 2+1/2*n],[3+1/2*n],cos(d*x+c)^2)*sin(d*x+c)/b^4/d/(4+n)/(sin(d*x+
c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {16, 2827, 2722}

$$\int \cos^2(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = -\frac{A\sin(c+dx)(b\cos(c+dx))^{n+3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n+3}{2},\frac{n+5}{2},\cos^2(c+dx)\right)}{b^3d(n+3)\sqrt{\sin^2(c+dx)}} - \frac{B\sin(c+dx)(b\cos(c+dx))^{n+4}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n+4}{2},\frac{n+6}{2},\cos^2(c+dx)\right)}{b^4d(n+4)\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^2*(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]),x]
```

```
[Out] -((A*(b*Cos[c + d*x])^(3 + n)*Hypergeometric2F1[1/2, (3 + n)/2, (5 + n)/2,
Cos[c + d*x]^2]*Sin[c + d*x])/(b^3*d*(3 + n)*Sqrt[Sin[c + d*x]^2])) - (B*(b
*Cos[c + d*x])^(4 + n)*Hypergeometric2F1[1/2, (4 + n)/2, (6 + n)/2, Cos[c +
 d*x]^2]*Sin[c + d*x])/(b^4*d*(4 + n)*Sqrt[Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\int (b\cos(c+dx))^{2+n}(A+B\cos(c+dx))\,dx}{b^2}\\ &= \frac{A\int (b\cos(c+dx))^{2+n}\,dx}{b^2}+\frac{B\int (b\cos(c+dx))^{3+n}\,dx}{b^3}\\ &= -\frac{A(b\cos(c+dx))^{3+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+n}{2},\frac{5+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{b^3d(3+n)\sqrt{\sin^2(c+dx)}}\\ &\quad-\frac{B(b\cos(c+dx))^{4+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{4+n}{2},\frac{6+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{b^4d(4+n)\sqrt{\sin^2(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 120, normalized size of antiderivative = 0.85

$$\int \cos^2(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx =$$

$$-\frac{\cos^2(c+dx)(b\cos(c+dx))^n\cot(c+dx)\left(A(4+n)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+n}{2},\frac{5+n}{2},\cos^2(c+dx)\right)+B(\right.}{d(3+n)(4+n)}$$

```
[In] Integrate[Cos[c + d*x]^2*(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]),x]
```

```
[Out] -((Cos[c + d*x]^2*(b*Cos[c + d*x])^n*Cot[c + d*x]*(A*(4 + n)*Hypergeometric
2F1[1/2, (3 + n)/2, (5 + n)/2, Cos[c + d*x]^2] + B*(3 + n)*Cos[c + d*x]*Hyp
ergeometric2F1[1/2, (4 + n)/2, (6 + n)/2, Cos[c + d*x]^2])*Sqrt[Sin[c + d*x
]^2])/(d*(3 + n)*(4 + n)))
```

Maple [F]

$$\int \left(\cos^2\left(dx+c\right)\right)\left(\cos\left(dx+c\right)b\right)^n\left(A+B\cos\left(dx+c\right)\right)dx$$

```
[In] int(cos(d*x+c)^2*(cos(d*x+c)*b)^n*(A+B*cos(d*x+c)),x)
```

```
[Out] int(cos(d*x+c)^2*(cos(d*x+c)*b)^n*(A+B*cos(d*x+c)),x)
```

Fricas [F]

$$\int \cos^2(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$=\int (B\cos\left(dx+c\right)+A)(b\cos\left(dx+c\right))^n\cos\left(dx+c\right)^2\,dx$$

```
[In] integrate(cos(d*x+c)^2*(b*cos(d*x+c))^n*(A+B*cos(d*x+c)),x, algorithm="fric
as")
```

```
[Out] integral((B*cos(d*x + c)^3 + A*cos(d*x + c)^2)*(b*cos(d*x + c))^n, x)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^2(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx=\text{Timed out}$$

```
[In] integrate(cos(d*x+c)**2*(b*cos(d*x+c))**n*(A+B*cos(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \cos^2(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$= \int (B\cos(dx+c)+A)(b\cos(dx+c))^n\cos(dx+c)^2\,dx$$

```
[In] integrate(cos(d*x+c)^2*(b*cos(d*x+c))^n*(A+B*cos(d*x+c)),x, algorithm="maxi
ma")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*cos(d*x + c)^2, x)
```

Giac [F]

$$\int \cos^2(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$= \int (B\cos(dx+c)+A)(b\cos(dx+c))^n\cos(dx+c)^2\,dx$$

```
[In] integrate(cos(d*x+c)^2*(b*cos(d*x+c))^n*(A+B*cos(d*x+c)),x, algorithm="giac
")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*cos(d*x + c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^2(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$= \int \cos(c+d\,x)^2\,(b\,\cos(c+d\,x))^n\,(A+B\,\cos(c+d\,x))\,dx$$

```
[In] int(cos(c + d*x)^2*(b*cos(c + d*x))^n*(A + B*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^2*(b*cos(c + d*x))^n*(A + B*cos(c + d*x)), x)
```

3.913 $\int \cos(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 27, antiderivative size = 141

$$\int \cos(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = -\frac{A(b\cos(c+dx))^{2+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+n}{2},\frac{4+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{b^2d(2+n)\sqrt{\sin^2(c+dx)}} - \frac{B(b\cos(c+dx))^{3+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+n}{2},\frac{5+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{b^3d(3+n)\sqrt{\sin^2(c+dx)}}$$

```
[Out] -A*(b*cos(d*x+c))^(2+n)*hypergeom([1/2, 1+1/2*n],[2+1/2*n],cos(d*x+c)^2)*si
n(d*x+c)/b^2/d/(2+n)/(sin(d*x+c)^2)^(1/2)-B*(b*cos(d*x+c))^(3+n)*hypergeom(
[1/2, 3/2+1/2*n],[5/2+1/2*n],cos(d*x+c)^2)*sin(d*x+c)/b^3/d/(3+n)/(sin(d*x+
c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {16, 2827, 2722}

$$\int \cos(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = -\frac{A\sin(c+dx)(b\cos(c+dx))^{n+2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n+2}{2},\frac{n+4}{2},\cos^2(c+dx)\right)}{b^2d(n+2)\sqrt{\sin^2(c+dx)}} - \frac{B\sin(c+dx)(b\cos(c+dx))^{n+3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n+3}{2},\frac{n+5}{2},\cos^2(c+dx)\right)}{b^3d(n+3)\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[Cos[c + d*x]*(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]),x]
```

```
[Out] -((A*(b*Cos[c + d*x])^(2 + n)*Hypergeometric2F1[1/2, (2 + n)/2, (4 + n)/2,
Cos[c + d*x]^2]*Sin[c + d*x])/(b^2*d*(2 + n)*Sqrt[Sin[c + d*x]^2])) - (B*(b
*Cos[c + d*x])^(3 + n)*Hypergeometric2F1[1/2, (3 + n)/2, (5 + n)/2, Cos[c +
 d*x]^2]*Sin[c + d*x])/(b^3*d*(3 + n)*Sqrt[Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\int (b\cos(c+dx))^{1+n}(A+B\cos(c+dx))\,dx}{b}\\ &= \frac{A\int (b\cos(c+dx))^{1+n}\,dx}{b}+\frac{B\int (b\cos(c+dx))^{2+n}\,dx}{b^2}\\ &= -\frac{A(b\cos(c+dx))^{2+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+n}{2},\frac{4+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{b^2d(2+n)\sqrt{\sin^2(c+dx)}}\\ &\quad-\frac{B(b\cos(c+dx))^{3+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+n}{2},\frac{5+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{b^3d(3+n)\sqrt{\sin^2(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 118, normalized size of antiderivative = 0.84

$$\int \cos(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx =$$
$$-\frac{\cos(c+dx)(b\cos(c+dx))^n\cot(c+dx)\left(A(3+n)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+n}{2},\frac{4+n}{2},\cos^2(c+dx)\right)+B(2\right.}{d(2+n)(3+n)}$$

```
[In] Integrate[Cos[c + d*x]*(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]),x]
```

```
[Out] -((Cos[c + d*x]*(b*Cos[c + d*x])^n*Cot[c + d*x]*(A*(3 + n)*Hypergeometric2F
1[1/2, (2 + n)/2, (4 + n)/2, Cos[c + d*x]^2] + B*(2 + n)*Cos[c + d*x]*Hyper
geometric2F1[1/2, (3 + n)/2, (5 + n)/2, Cos[c + d*x]^2])*Sqrt[Sin[c + d*x]^
2])/(d*(2 + n)*(3 + n)))
```

Maple [F]

$$\int \cos \left(dx+c\right) \left(\cos \left(dx+c\right) b\right)^{n} \left(A+B\cos \left(dx+c\right)\right) dx$$

```
[In] int(cos(d*x+c)*(cos(d*x+c)*b)^n*(A+B*cos(d*x+c)),x)
```

```
[Out] int(cos(d*x+c)*(cos(d*x+c)*b)^n*(A+B*cos(d*x+c)),x)
```

Fricas [F]

$$\int \cos(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$= \int (B\cos \left(dx+c\right)+A)(b\cos \left(dx+c\right))^{n}\cos \left(dx+c\right)\,dx$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))^n*(A+B*cos(d*x+c)),x, algorithm="fricas
")
```

```
[Out] integral((B*cos(d*x + c)^2 + A*cos(d*x + c))*(b*cos(d*x + c))^n, x)
```

Sympy [F]

$$\int \cos(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$= \int \left(b\cos \left(c+dx\right)\right)^{n} \left(A+B\cos \left(c+dx\right)\right)\cos \left(c+dx\right) dx$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))**n*(A+B*cos(d*x+c)),x)
```

```
[Out] Integral((b*cos(c + d*x))**n*(A + B*cos(c + d*x))*cos(c + d*x), x)
```

Maxima [F]

$$\int \cos(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$= \int (B\cos(dx+c)+A)(b\cos(dx+c))^n\cos(dx+c)\,dx$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))^n*(A+B*cos(d*x+c)),x, algorithm="maxima
")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*cos(d*x + c), x)
```

Giac [F]

$$\int \cos(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$= \int (B\cos(dx+c)+A)(b\cos(dx+c))^n\cos(dx+c)\,dx$$

```
[In] integrate(cos(d*x+c)*(b*cos(d*x+c))^n*(A+B*cos(d*x+c)),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*cos(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$= \int \cos(c+d\,x)\,\left(b\,\cos(c+d\,x)\right)^n\,\left(A+B\,\cos(c+d\,x)\right)\,dx$$

```
[In] int(cos(c + d*x)*(b*cos(c + d*x))^n*(A + B*cos(c + d*x)),x)
[Out] int(cos(c + d*x)*(b*cos(c + d*x))^n*(A + B*cos(c + d*x)), x)
```

3.914 $\int (b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 141

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = -\frac{A(b\cos(c+dx))^{1+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+n}{2},\frac{3+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{bd(1+n)\sqrt{\sin^2(c+dx)}} - \frac{B(b\cos(c+dx))^{2+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+n}{2},\frac{4+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{b^2d(2+n)\sqrt{\sin^2(c+dx)}}$$

```
[Out] -A*(b*cos(d*x+c))^(1+n)*hypergeom([1/2, 1/2+1/2*n],[3/2+1/2*n],cos(d*x+c)^2
)*sin(d*x+c)/b/d/(1+n)/(sin(d*x+c)^2)^(1/2)-B*(b*cos(d*x+c))^(2+n)*hypergeo
m([1/2, 1+1/2*n],[2+1/2*n],cos(d*x+c)^2)*sin(d*x+c)/b^2/d/(2+n)/(sin(d*x+c)
^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2827, 2722}

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = -\frac{A\sin(c+dx)(b\cos(c+dx))^{n+1}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n+1}{2},\frac{n+3}{2},\cos^2(c+dx)\right)}{bd(n+1)\sqrt{\sin^2(c+dx)}} - \frac{B\sin(c+dx)(b\cos(c+dx))^{n+2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n+2}{2},\frac{n+4}{2},\cos^2(c+dx)\right)}{b^2d(n+2)\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]),x]
```

```
[Out] -((A*(b*Cos[c + d*x])^(1 + n)*Hypergeometric2F1[1/2, (1 + n)/2, (3 + n)/2,
Cos[c + d*x]^2]*Sin[c + d*x])/(b*d*(1 + n)*Sqrt[Sin[c + d*x]^2])) - (B*(b*C
os[c + d*x])^(2 + n)*Hypergeometric2F1[1/2, (2 + n)/2, (4 + n)/2, Cos[c + d
*x]^2]*Sin[c + d*x])/(b^2*d*(2 + n)*Sqrt[Sin[c + d*x]^2])
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= A\int (b\cos(c+dx))^n\,dx + \frac{B\int (b\cos(c+dx))^{1+n}\,dx}{b}\\ &= -\frac{A(b\cos(c+dx))^{1+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+n}{2},\frac{3+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{bd(1+n)\sqrt{\sin^2(c+dx)}}\\ &\quad-\frac{B(b\cos(c+dx))^{2+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+n}{2},\frac{4+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{b^2d(2+n)\sqrt{\sin^2(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 112, normalized size of antiderivative = 0.79

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = -\frac{(b\cos(c+dx))^n\cot(c+dx)\left(A(2+n)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+n}{2},\frac{3+n}{2},\cos^2(c+dx)\right)+B(1+n)\cos(c\right.}{d(1+n)(2+n)}$$

```
[In] Integrate[(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]),x]
```

```
[Out] -(((b*Cos[c + d*x])^n*Cot[c + d*x]*(A*(2 + n)*Hypergeometric2F1[1/2, (1 + n
)/2, (3 + n)/2, Cos[c + d*x]^2] + B*(1 + n)*Cos[c + d*x]*Hypergeometric2F1[
1/2, (2 + n)/2, (4 + n)/2, Cos[c + d*x]^2])*Sqrt[Sin[c + d*x]^2])/(d*(1 + n
)*(2 + n)))
```

Maple [F]

$$\int (\cos (dx+c)\, b)^n \,(A+B\cos (dx+c))\, dx$$

```
[In] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c)),x)
[Out] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c)),x)
```

Fricas [F]

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\, dx = \int (B\cos (dx+c)+A)(b\cos (dx+c))^n\, dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c)),x, algorithm="fricas")
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n, x)
```

Sympy [F]

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\, dx = \int (b\cos (c+dx))^n\,(A+B\cos (c+dx))\, dx$$

```
[In] integrate((b*cos(d*x+c))**n*(A+B*cos(d*x+c)),x)
[Out] Integral((b*cos(c + d*x))**n*(A + B*cos(c + d*x)), x)
```

Maxima [F]

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\, dx = \int (B\cos (dx+c)+A)(b\cos (dx+c))^n\, dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c)),x, algorithm="maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n, x)
```

Giac [F]

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^n\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c)),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n, x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = \int (b\cos(c+d\,x))^n\,(A+B\cos(c+d\,x))\,dx$$

```
[In] int((b*cos(c + d*x))^n*(A + B*cos(c + d*x)),x)
[Out] int((b*cos(c + d*x))^n*(A + B*cos(c + d*x)), x)
```

3.915 $\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec(c+dx)\,dx$

Optimal result

Integrand size = 27, antiderivative size = 132

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec(c+dx)\,dx = -\frac{A(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n}{2},\frac{2+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{dn\sqrt{\sin^2(c+dx)}} - \frac{B(b\cos(c+dx))^{1+n} \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+n}{2},\frac{3+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{bd(1+n)\sqrt{\sin^2(c+dx)}}$$

```
[Out] -A*(b*cos(d*x+c))^n*hypergeom([1/2, 1/2*n],[1+1/2*n],cos(d*x+c)^2)*sin(d*x+
c)/d/n/(sin(d*x+c)^2)^(1/2)-B*(b*cos(d*x+c))^(1+n)*hypergeom([1/2, 1/2+1/2*
n],[3/2+1/2*n],cos(d*x+c)^2)*sin(d*x+c)/b/d/(1+n)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 132, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {16, 2827, 2722}

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec(c+dx)\,dx = -\frac{A\sin(c+dx)(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n}{2},\frac{n+2}{2},\cos^2(c+dx)\right)}{dn\sqrt{\sin^2(c+dx)}} - \frac{B\sin(c+dx)(b\cos(c+dx))^{n+1} \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n+1}{2},\frac{n+3}{2},\cos^2(c+dx)\right)}{bd(n+1)\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x])*Sec[c + d*x],x]
```

```
[Out] -((A*(b*Cos[c + d*x])^n*Hypergeometric2F1[1/2, n/2, (2 + n)/2, Cos[c + d*x]
^2]*Sin[c + d*x])/(d*n*Sqrt[Sin[c + d*x]^2])) - (B*(b*Cos[c + d*x])^(1 + n)
*Hypergeometric2F1[1/2, (1 + n)/2, (3 + n)/2, Cos[c + d*x]^2]*Sin[c + d*x])
/(b*d*(1 + n)*Sqrt[Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= b\int (b\cos(c+dx))^{-1+n}(A+B\cos(c+dx))\,dx\\ &= (Ab)\int (b\cos(c+dx))^{-1+n}\,dx + B\int (b\cos(c+dx))^{n}\,dx\\ &= -\frac{A(b\cos(c+dx))^{n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n}{2},\frac{2+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{dn\sqrt{\sin^2(c+dx)}}\\ &\quad-\frac{B(b\cos(c+dx))^{1+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+n}{2},\frac{3+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{bd(1+n)\sqrt{\sin^2(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 109, normalized size of antiderivative = 0.83

$$\int (b\cos(c+dx))^{n}(A+B\cos(c+dx))\sec(c+dx)\,dx =$$

$$-\frac{b(b\cos(c+dx))^{-1+n}\cot(c+dx)\left(A(1+n)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n}{2},\frac{2+n}{2},\cos^2(c+dx)\right)+Bn\cos(c+d\right.}{dn(1+n)}$$

```
[In] Integrate[(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x])*Sec[c + d*x],x]
```

```
[Out] -((b*(b*Cos[c + d*x])^(-1 + n)*Cot[c + d*x]*(A*(1 + n)*Hypergeometric2F1[1/
2, n/2, (2 + n)/2, Cos[c + d*x]^2] + B*n*Cos[c + d*x]*Hypergeometric2F1[1/2
, (1 + n)/2, (3 + n)/2, Cos[c + d*x]^2])*Sqrt[Sin[c + d*x]^2])/(d*n*(1 + n)
))
```

Maple [F]

$$\int (\cos (dx + c) b)^{n} (A + B\cos (dx + c)) \sec (dx + c) \, dx$$

```
[In] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))*sec(d*x+c),x)
```

```
[Out] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))*sec(d*x+c),x)
```

Fricas [F]

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{n}\sec(dx+c)\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))*sec(d*x+c),x, algorithm="fricas
")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*sec(d*x + c), x)
```

Sympy [F]

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec(c+dx)\,dx = \int (b\cos(c+dx))^{n}(A+B\cos(c+dx))\sec(c+dx)\,dx$$

```
[In] integrate((b*cos(d*x+c))**n*(A+B*cos(d*x+c))*sec(d*x+c),x)
```

```
[Out] Integral((b*cos(c + d*x))**n*(A + B*cos(c + d*x))*sec(c + d*x), x)
```

Maxima [F]

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^n\sec(dx+c)\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))*sec(d*x+c),x, algorithm="maxima
")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*sec(d*x + c), x)
```

Giac [F]

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^n\sec(dx+c)\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))*sec(d*x+c),x, algorithm="giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*sec(d*x + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec(c+dx)\,dx = \int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos(c+dx)}\,dx$$

```
[In] int(((b*cos(c + d*x))^n*(A + B*cos(c + d*x)))/cos(c + d*x),x)
[Out] int(((b*cos(c + d*x))^n*(A + B*cos(c + d*x)))/cos(c + d*x), x)
```

3.916 $\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^2(c+dx)\,dx$

Optimal result

Integrand size = 29, antiderivative size = 131

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \frac{Ab(b\cos(c+dx))^{-1+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(-1+n),\frac{1+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(1-n)\sqrt{\sin^2(c+dx)}} - \frac{B(b\cos(c+dx))^n\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n}{2},\frac{2+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{dn\sqrt{\sin^2(c+dx)}}$$

```
[Out] A*b*(b*cos(d*x+c))^(-1+n)*hypergeom([1/2, -1/2+1/2*n],[1/2+1/2*n],cos(d*x+c
)^2)*sin(d*x+c)/d/(1-n)/(sin(d*x+c)^2)^(1/2)-B*(b*cos(d*x+c))^n*hypergeom([
1/2, 1/2*n],[1+1/2*n],cos(d*x+c)^2)*sin(d*x+c)/d/n/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {16, 2827, 2722}

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^2(c+dx)\,dx = \frac{Ab\sin(c+dx)(b\cos(c+dx))^{n-1}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n-1}{2},\frac{n+1}{2},\cos^2(c+dx)\right)}{d(1-n)\sqrt{\sin^2(c+dx)}} - \frac{B\sin(c+dx)(b\cos(c+dx))^n\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n}{2},\frac{n+2}{2},\cos^2(c+dx)\right)}{dn\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x])*Sec[c + d*x]^2,x]
```

```
[Out] (A*b*(b*Cos[c + d*x])^(-1 + n)*Hypergeometric2F1[1/2, (-1 + n)/2, (1 + n)/2
, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(1 - n)*Sqrt[Sin[c + d*x]^2]) - (B*(b*Co
s[c + d*x])^n*Hypergeometric2F1[1/2, n/2, (2 + n)/2, Cos[c + d*x]^2]*Sin[c
+ d*x])/(d*n*Sqrt[Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= b^2\int (b\cos(c+dx))^{-2+n}(A+B\cos(c+dx))\,dx\\ &= \left(Ab^2\right)\int (b\cos(c+dx))^{-2+n}\,dx+(bB)\int (b\cos(c+dx))^{-1+n}\,dx\\ &= \frac{Ab(b\cos(c+dx))^{-1+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(-1+n),\frac{1+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(1-n)\sqrt{\sin^2(c+dx)}}\\ &\quad-\frac{B(b\cos(c+dx))^{n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n}{2},\frac{2+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{dn\sqrt{\sin^2(c+dx)}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 109, normalized size of antiderivative = 0.83

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^2(c+dx)\,dx=$$
$$-\frac{b(b\cos(c+dx))^{-1+n}\csc(c+dx)\left(An\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(-1+n),\frac{1+n}{2},\cos^2(c+dx)\right)+B(-1+n\right.}{d(-1+n)n}$$

```
[In] Integrate[(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x])*Sec[c + d*x]^2,x]
```

```
[Out] -((b*(b*Cos[c + d*x])^(-1 + n)*Csc[c + d*x]*(A*n*Hypergeometric2F1[1/2, (-1
 + n)/2, (1 + n)/2, Cos[c + d*x]^2] + B*(-1 + n)*Cos[c + d*x]*Hypergeometri
c2F1[1/2, n/2, (2 + n)/2, Cos[c + d*x]^2])*Sqrt[Sin[c + d*x]^2])/(d*(-1 + n
)*n))
```

Maple [F]

$$\int \left(\cos \left(dx+c\right) b\right)^{n} \left(A+B\cos \left(dx+c\right)\right) \left(\sec^{2}\left(dx+c\right)\right) dx$$

```
[In] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))*sec(d*x+c)^2,x)
```

```
[Out] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))*sec(d*x+c)^2,x)
```

Fricas [F]

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^2(c+dx)\,dx$$
$$=\int (B\cos \left(dx+c\right)+A)(b\cos \left(dx+c\right))^{n}\sec \left(dx+c\right)^{2}\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="fric
as")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*sec(d*x + c)^2, x)
```

Sympy [F]

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^2(c+dx)\,dx$$
$$=\int \left(b\cos \left(c+dx\right)\right)^{n} \left(A+B\cos \left(c+dx\right)\right)\sec^{2}\left(c+dx\right) dx$$

```
[In] integrate((b*cos(d*x+c))**n*(A+B*cos(d*x+c))*sec(d*x+c)**2,x)
```

```
[Out] Integral((b*cos(c + d*x))**n*(A + B*cos(c + d*x))*sec(c + d*x)**2, x)
```

Maxima [F]

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^2(c+dx)\,dx$$
$$= \int (B\cos(dx+c)+A)(b\cos(dx+c))^n\sec(dx+c)^2\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="maxi
ma")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*sec(d*x + c)^2, x)
```

Giac [F]

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^2(c+dx)\,dx$$
$$= \int (B\cos(dx+c)+A)(b\cos(dx+c))^n\sec(dx+c)^2\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))*sec(d*x+c)^2,x, algorithm="giac
")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*sec(d*x + c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^2(c+dx)\,dx$$
$$= \int \frac{(b\,\cos(c+d\,x))^n\,(A+B\,\cos(c+d\,x))}{\cos(c+d\,x)^2}\,dx$$

```
[In] int(((b*cos(c + d*x))^n*(A + B*cos(c + d*x)))/cos(c + d*x)^2,x)
[Out] int(((b*cos(c + d*x))^n*(A + B*cos(c + d*x)))/cos(c + d*x)^2, x)
```

3.917 $\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^3(c+dx)\,dx$

Optimal result

Integrand size = 29, antiderivative size = 139

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \frac{Ab^2(b\cos(c+dx))^{-2+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(-2+n),\frac{n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2-n)\sqrt{\sin^2(c+dx)}} + \frac{bB(b\cos(c+dx))^{-1+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(-1+n),\frac{1+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(1-n)\sqrt{\sin^2(c+dx)}}$$

```
[Out] A*b^2*(b*cos(d*x+c))^(-2+n)*hypergeom([1/2, -1+1/2*n],[1/2*n],cos(d*x+c)^2)
*sin(d*x+c)/d/(2-n)/(sin(d*x+c)^2)^(1/2)+b*B*(b*cos(d*x+c))^(-1+n)*hypergeo
m([1/2, -1/2+1/2*n],[1/2+1/2*n],cos(d*x+c)^2)*sin(d*x+c)/d/(1-n)/(sin(d*x+c
)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {16, 2827, 2722}

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \frac{Ab^2\sin(c+dx)(b\cos(c+dx))^{n-2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n-2}{2},\frac{n}{2},\cos^2(c+dx)\right)}{d(2-n)\sqrt{\sin^2(c+dx)}} + \frac{bB\sin(c+dx)(b\cos(c+dx))^{n-1}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n-1}{2},\frac{n+1}{2},\cos^2(c+dx)\right)}{d(1-n)\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x])*Sec[c + d*x]^3,x]
```

```
[Out] (A*b^2*(b*Cos[c + d*x])^(-2 + n)*Hypergeometric2F1[1/2, (-2 + n)/2, n/2, Co
s[c + d*x]^2]*Sin[c + d*x])/(d*(2 - n)*Sqrt[Sin[c + d*x]^2]) + (b*B*(b*Cos[
c + d*x])^(-1 + n)*Hypergeometric2F1[1/2, (-1 + n)/2, (1 + n)/2, Cos[c + d*
x]^2]*Sin[c + d*x])/(d*(1 - n)*Sqrt[Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= b^3\int (b\cos(c+dx))^{-3+n}(A+B\cos(c+dx))\,dx\\
&= \left(Ab^3\right)\int (b\cos(c+dx))^{-3+n}\,dx+\left(b^2B\right)\int (b\cos(c+dx))^{-2+n}\,dx\\
&= \frac{Ab^2(b\cos(c+dx))^{-2+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(-2+n),\frac{n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2-n)\sqrt{\sin^2(c+dx)}}\\
&\quad+\frac{bB(b\cos(c+dx))^{-1+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(-1+n),\frac{1+n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(1-n)\sqrt{\sin^2(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 118, normalized size of antiderivative = 0.85

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^3(c+dx)\,dx =$$

$$-\frac{(b\cos(c+dx))^n\csc(c+dx)\left(A(-1+n)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(-2+n),\frac{n}{2},\cos^2(c+dx)\right)+B(-2+\right.}{d(-2+n)(-}$$

```
[In] Integrate[(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x])*Sec[c + d*x]^3,x]
```

```
[Out] -(((b*Cos[c + d*x])^n*Csc[c + d*x]*(A*(-1 + n)*Hypergeometric2F1[1/2, (-2 +
 n)/2, n/2, Cos[c + d*x]^2] + B*(-2 + n)*Cos[c + d*x]*Hypergeometric2F1[1/2
, (-1 + n)/2, (1 + n)/2, Cos[c + d*x]^2])*Sec[c + d*x]^2*Sqrt[Sin[c + d*x]^
2])/(d*(-2 + n)*(-1 + n)))
```

Maple [F]

$$\int (\cos(dx+c)\,b)^n\,(A+B\cos(dx+c))\,\left(\sec^3(dx+c)\right)dx$$

```
[In] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))*sec(d*x+c)^3,x)
```

```
[Out] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))*sec(d*x+c)^3,x)
```

Fricas [F]

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^n\sec(dx+c)^3\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="fric
as")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*sec(d*x + c)^3, x)
```

Sympy [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**n*(A+B*cos(d*x+c))*sec(d*x+c)**3,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^n\sec(dx+c)^3\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="maxi
ma")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*sec(d*x + c)^3, x)
```

Giac [F]

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^n\sec(dx+c)^3\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))*sec(d*x+c)^3,x, algorithm="giac
")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*sec(d*x + c)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^3(c+dx)\,dx = \int \frac{(b\cos(c+dx))^n\,(A+B\cos(c+dx))}{\cos(c+dx)^3}\,dx$$

```
[In] int(((b*cos(c + d*x))^n*(A + B*cos(c + d*x)))/cos(c + d*x)^3,x)
[Out] int(((b*cos(c + d*x))^n*(A + B*cos(c + d*x)))/cos(c + d*x)^3, x)
```

3.918 $\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^4(c+dx)\,dx$

Optimal result

Integrand size = 29, antiderivative size = 141

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^4(c+dx)\,dx = \frac{Ab^3(b\cos(c+dx))^{-3+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(-3+n),\frac{1}{2}(-1+n),\cos^2(c+dx)\right)\sin(c+dx)}{d(3-n)\sqrt{\sin^2(c+dx)}} + \frac{b^2B(b\cos(c+dx))^{-2+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(-2+n),\frac{n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2-n)\sqrt{\sin^2(c+dx)}}$$

```
[Out] A*b^3*(b*cos(d*x+c))^(-3+n)*hypergeom([1/2, -3/2+1/2*n],[-1/2+1/2*n],cos(d*
x+c)^2)*sin(d*x+c)/d/(3-n)/(sin(d*x+c)^2)^(1/2)+b^2*B*(b*cos(d*x+c))^(-2+n)
*hypergeom([1/2, -1+1/2*n],[1/2*n],cos(d*x+c)^2)*sin(d*x+c)/d/(2-n)/(sin(d*
x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {16, 2827, 2722}

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^4(c+dx)\,dx = \frac{Ab^3\sin(c+dx)(b\cos(c+dx))^{n-3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n-3}{2},\frac{n-1}{2},\cos^2(c+dx)\right)}{d(3-n)\sqrt{\sin^2(c+dx)}} + \frac{b^2B\sin(c+dx)(b\cos(c+dx))^{n-2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n-2}{2},\frac{n}{2},\cos^2(c+dx)\right)}{d(2-n)\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x])*Sec[c + d*x]^4,x]
```

```
[Out] (A*b^3*(b*Cos[c + d*x])^(-3 + n)*Hypergeometric2F1[1/2, (-3 + n)/2, (-1 + n
)/2, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(3 - n)*Sqrt[Sin[c + d*x]^2]) + (b^2*
B*(b*Cos[c + d*x])^(-2 + n)*Hypergeometric2F1[1/2, (-2 + n)/2, n/2, Cos[c +
 d*x]^2]*Sin[c + d*x])/(d*(2 - n)*Sqrt[Sin[c + d*x]^2])
```

Rule 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= b^4 \int (b\cos(c+dx))^{-4+n}(A+B\cos(c+dx))\,dx \\
&= \left(Ab^4\right)\int (b\cos(c+dx))^{-4+n}\,dx+\left(b^3B\right)\int (b\cos(c+dx))^{-3+n}\,dx \\
&= \frac{Ab^3(b\cos(c+dx))^{-3+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(-3+n),\frac{1}{2}(-1+n),\cos^2(c+dx)\right)\sin(c+dx)}{d(3-n)\sqrt{\sin^2(c+dx)}} \\
&\quad+\frac{b^2B(b\cos(c+dx))^{-2+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(-2+n),\frac{n}{2},\cos^2(c+dx)\right)\sin(c+dx)}{d(2-n)\sqrt{\sin^2(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 118, normalized size of antiderivative = 0.84

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^4(c+dx)\,dx =$$
$$-\frac{(b\cos(c+dx))^n\csc(c+dx)\left(A(-2+n)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(-3+n),\frac{1}{2}(-1+n),\cos^2(c+dx)\right)+\right.}{d(-3+}$$

```
[In] Integrate[(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x])*Sec[c + d*x]^4,x]
```

```
[Out] -(((b*Cos[c + d*x])^n*Csc[c + d*x]*(A*(-2 + n)*Hypergeometric2F1[1/2, (-3 +
 n)/2, (-1 + n)/2, Cos[c + d*x]^2] + B*(-3 + n)*Cos[c + d*x]*Hypergeometric
2F1[1/2, (-2 + n)/2, n/2, Cos[c + d*x]^2])*Sec[c + d*x]^3*Sqrt[Sin[c + d*x]
^2])/(d*(-3 + n)*(-2 + n)))
```

Maple [F]

$$\int \left(\cos\left(dx+c\right)b\right)^{n}\left(A+B\cos\left(dx+c\right)\right)\left(\sec^{4}\left(dx+c\right)\right)dx$$

```
[In] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))*sec(d*x+c)^4,x)
```

```
[Out] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))*sec(d*x+c)^4,x)
```

Fricas [F]

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^4(c+dx)\,dx$$
$$=\int (B\cos\left(dx+c\right)+A)(b\cos\left(dx+c\right))^{n}\sec\left(dx+c\right)^{4}\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))*sec(d*x+c)^4,x, algorithm="fric
as")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*sec(d*x + c)^4, x)
```

Sympy [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^4(c+dx)\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**n*(A+B*cos(d*x+c))*sec(d*x+c)**4,x)
[Out] Timed out
```

Maxima [F]

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^4(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^n\sec(dx+c)^4\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))*sec(d*x+c)^4,x, algorithm="maxi
ma")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*sec(d*x + c)^4, x)
```

Giac [F]

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^4(c+dx)\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^n\sec(dx+c)^4\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))*sec(d*x+c)^4,x, algorithm="giac
")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*sec(d*x + c)^4, x)
```

Mupad [F(-1)]

Timed out.

$$\int (b\cos(c+dx))^n(A+B\cos(c+dx))\sec^4(c+dx)\,dx = \int \frac{(b\,\cos\left(c+d\,x\right))^n\,\left(A+B\,\cos\left(c+d\,x\right)\right)}{{\cos\left(c+d\,x\right)}^4} \,d x$$

```
[In] int(((b*cos(c + d*x))^n*(A + B*cos(c + d*x)))/cos(c + d*x)^4,x)
[Out] int(((b*cos(c + d*x))^n*(A + B*cos(c + d*x)))/cos(c + d*x)^4, x)
```

3.919 $\int \cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 163

$$\int \cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = -\frac{2A\cos^{\frac{7}{2}}(c+dx)(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(7+2n),\frac{1}{4}(11+2n),\cos^2(c+dx)\right)\sin(c+dx)}{d(7+2n)\sqrt{\sin^2(c+dx)}} - \frac{2B\cos^{\frac{9}{2}}(c+dx)(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(9+2n),\frac{1}{4}(13+2n),\cos^2(c+dx)\right)\sin(c+dx)}{d(9+2n)\sqrt{\sin^2(c+dx)}}$$

```
[Out] -2*A*cos(d*x+c)^(7/2)*(b*cos(d*x+c))^n*hypergeom([1/2, 7/4+1/2*n],[11/4+1/2
*n],cos(d*x+c)^2)*sin(d*x+c)/d/(7+2*n)/(sin(d*x+c)^2)^(1/2)-2*B*cos(d*x+c)^
(9/2)*(b*cos(d*x+c))^n*hypergeom([1/2, 9/4+1/2*n],[13/4+1/2*n],cos(d*x+c)^2
)*sin(d*x+c)/d/(9+2*n)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {20, 2827, 2722}

$$\int \cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = -\frac{2A\sin(c+dx)\cos^{\frac{7}{2}}(c+dx)(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(2n+7),\frac{1}{4}(2n+11),\cos^2(c+dx)\right)}{d(2n+7)\sqrt{\sin^2(c+dx)}} - \frac{2B\sin(c+dx)\cos^{\frac{9}{2}}(c+dx)(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(2n+9),\frac{1}{4}(2n+13),\cos^2(c+dx)\right)}{d(2n+9)\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^(5/2)*(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-2*A*Cos[c + d*x]^(7/2)*(b*Cos[c + d*x])^n*Hypergeometric2F1[1/2, (7 + 2*n
)/4, (11 + 2*n)/4, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(7 + 2*n)*Sqrt[Sin[c +
d*x]^2]) - (2*B*Cos[c + d*x]^(9/2)*(b*Cos[c + d*x])^n*Hypergeometric2F1[1/2
, (9 + 2*n)/4, (13 + 2*n)/4, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(9 + 2*n)*Sqr
t[Sin[c + d*x]^2])
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[b^IntPart[
n]*((b*v)^FracPart[n]/(a^IntPart[n]*(a*v)^FracPart[n])), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !
IntegerQ[m + n]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{\frac{5}{2}+n}(c+dx)(A+B\cos(c+dx))\,dx \\
&= \left(A\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{\frac{5}{2}+n}(c+dx)\,dx \\
&\quad + \left(B\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{\frac{7}{2}+n}(c+dx)\,dx \\
&= \\
&\quad -\frac{2A\cos^{\frac{7}{2}}(c+dx)(b\cos(c+dx))^n\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(7+2n),\frac{1}{4}(11+2n),\cos^2(c+dx)\right)\text{si}}{d(7+2n)\sqrt{\sin^2(c+dx)}} \\
&\quad -\frac{2B\cos^{\frac{9}{2}}(c+dx)(b\cos(c+dx))^n\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(9+2n),\frac{1}{4}(13+2n),\cos^2(c+dx)\right)\text{si}}{d(9+2n)\sqrt{\sin^2(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.29 (sec) , antiderivative size = 138, normalized size of antiderivative = 0.85

$$\int \cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = -\frac{2\cos^{\frac{7}{2}}(c+dx)(b\cos(c+dx))^n\csc(c+dx)\left(A(9+2n)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(7+2n),\frac{1}{4}(11+2n),\cos\right.\right.}{d(7\ldots}$$

```
[In] Integrate[Cos[c + d*x]^(5/2)*(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-2*Cos[c + d*x]^(7/2)*(b*Cos[c + d*x])^n*Csc[c + d*x]*(A*(9 + 2*n)*Hyperge
ometric2F1[1/2, (7 + 2*n)/4, (11 + 2*n)/4, Cos[c + d*x]^2] + B*(7 + 2*n)*Co
s[c + d*x]*Hypergeometric2F1[1/2, (9 + 2*n)/4, (13 + 2*n)/4, Cos[c + d*x]^2
])*Sqrt[Sin[c + d*x]^2])/(d*(7 + 2*n)*(9 + 2*n))
```

Maple [F]

$$\int \left(\cos^{\frac{5}{2}}(dx+c)\right)(\cos(dx+c)\,b)^n\,(A+B\cos(dx+c))\,dx$$

```
[In] int(cos(d*x+c)^(5/2)*(cos(d*x+c)*b)^n*(A+B*cos(d*x+c)),x)
```

```
[Out] int(cos(d*x+c)^(5/2)*(cos(d*x+c)*b)^n*(A+B*cos(d*x+c)),x)
```

Fricas [F]

$$\int \cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^n\cos(dx+c)^{\frac{5}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)*(b*cos(d*x+c))^n*(A+B*cos(d*x+c)),x, algorithm="
fricas")
```

```
[Out] integral((B*cos(d*x + c)^3 + A*cos(d*x + c)^2)*(b*cos(d*x + c))^n*sqrt(cos(
d*x + c)), x)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx=\text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(5/2)*(b*cos(d*x+c))**n*(A+B*cos(d*x+c)),x)
[Out] Timed out
```

Maxima [F]

$$\int \cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$=\int (B\cos{(dx+c)}+A)(b\cos{(dx+c)})^n\cos{(dx+c)}^{\frac{5}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)*(b*cos(d*x+c))^n*(A+B*cos(d*x+c)),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*cos(d*x + c)^(5/2), x)
```

Giac [F]

$$\int \cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$=\int (B\cos{(dx+c)}+A)(b\cos{(dx+c)})^n\cos{(dx+c)}^{\frac{5}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(5/2)*(b*cos(d*x+c))^n*(A+B*cos(d*x+c)),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*cos(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$=\int \cos(c+d\,x)^{5/2}\,(b\,\cos(c+d\,x))^n\,(A+B\,\cos(c+d\,x))\,dx$$

```
[In] int(cos(c + d*x)^(5/2)*(b*cos(c + d*x))^n*(A + B*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^(5/2)*(b*cos(c + d*x))^n*(A + B*cos(c + d*x)), x)
```

3.920 $\int \cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 163

$$\int \cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx =$$
$$-\frac{2A\cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(5+2n),\frac{1}{4}(9+2n),\cos^2(c+dx)\right)\sin(c+dx}{d(5+2n)\sqrt{\sin^2(c+dx)}}$$
$$-\frac{2B\cos^{\frac{7}{2}}(c+dx)(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(7+2n),\frac{1}{4}(11+2n),\cos^2(c+dx)\right)\sin(c+d}{d(7+2n)\sqrt{\sin^2(c+dx)}}$$

```
[Out] -2*A*cos(d*x+c)^(5/2)*(b*cos(d*x+c))^n*hypergeom([1/2, 5/4+1/2*n],[9/4+1/2*
n],cos(d*x+c)^2)*sin(d*x+c)/d/(5+2*n)/(sin(d*x+c)^2)^(1/2)-2*B*cos(d*x+c)^(
7/2)*(b*cos(d*x+c))^n*hypergeom([1/2, 7/4+1/2*n],[11/4+1/2*n],cos(d*x+c)^2)
*sin(d*x+c)/d/(7+2*n)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {20, 2827, 2722}

$$\int \cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx =$$
$$-\frac{2A\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(2n+5),\frac{1}{4}(2n+9),\cos^2(c+dx)}{d(2n+5)\sqrt{\sin^2(c+dx)}}$$
$$-\frac{2B\sin(c+dx)\cos^{\frac{7}{2}}(c+dx)(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(2n+7),\frac{1}{4}(2n+11),\cos^2(c+dx}{d(2n+7)\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^(3/2)*(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-2*A*Cos[c + d*x]^(5/2)*(b*Cos[c + d*x])^n*Hypergeometric2F1[1/2, (5 + 2*n
)/4, (9 + 2*n)/4, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(5 + 2*n)*Sqrt[Sin[c + d
*x]^2]) - (2*B*Cos[c + d*x]^(7/2)*(b*Cos[c + d*x])^n*Hypergeometric2F1[1/2,
 (7 + 2*n)/4, (11 + 2*n)/4, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(7 + 2*n)*Sqrt
[Sin[c + d*x]^2])
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[b^IntPart[
n]*((b*v)^FracPart[n]/(a^IntPart[n]*(a*v)^FracPart[n])), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !
IntegerQ[m + n]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = \left(\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{\frac{3}{2}+n}(c+dx)(A+B\cos(c+dx))\,dx$$

$$= \left(A\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{\frac{3}{2}+n}(c+dx)\,dx + \left(B\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{\frac{5}{2}+n}(c+dx)\,dx$$

$$= -\frac{2A\cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^n \,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(5+2n),\frac{1}{4}(9+2n),\cos^2(c+dx)\right)\sin(}{d(5+2n)\sqrt{\sin^2(c+dx)}} - \frac{2B\cos^{\frac{7}{2}}(c+dx)(b\cos(c+dx))^n \,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(7+2n),\frac{1}{4}(11+2n),\cos^2(c+dx)\right)\sin}{d(7+2n)\sqrt{\sin^2(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.23 (sec) , antiderivative size = 138, normalized size of antiderivative = 0.85

$$\int \cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx =$$
$$-\frac{2\cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^n\csc(c+dx)\left(A(7+2n)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(5+2n),\frac{1}{4}(9+2n),\cos\right.\right.}{d(5}$$

```
[In] Integrate[Cos[c + d*x]^(3/2)*(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-2*Cos[c + d*x]^(5/2)*(b*Cos[c + d*x])^n*Csc[c + d*x]*(A*(7 + 2*n)*Hyperge
ometric2F1[1/2, (5 + 2*n)/4, (9 + 2*n)/4, Cos[c + d*x]^2] + B*(5 + 2*n)*Cos
[c + d*x]*Hypergeometric2F1[1/2, (7 + 2*n)/4, (11 + 2*n)/4, Cos[c + d*x]^2]
)*Sqrt[Sin[c + d*x]^2])/(d*(5 + 2*n)*(7 + 2*n))
```

Maple [F]

$$\int \left(\cos^{\frac{3}{2}}\left(dx+c\right)\right)\left(\cos\left(dx+c\right)b\right)^{n}\left(A+B\cos\left(dx+c\right)\right)dx$$

```
[In] int(cos(d*x+c)^(3/2)*(cos(d*x+c)*b)^n*(A+B*cos(d*x+c)),x)
```

```
[Out] int(cos(d*x+c)^(3/2)*(cos(d*x+c)*b)^n*(A+B*cos(d*x+c)),x)
```

Fricas [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$=\int (B\cos(dx+c)+A)(b\cos(dx+c))^{n}\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(b*cos(d*x+c))^n*(A+B*cos(d*x+c)),x, algorithm="
fricas")
```

```
[Out] integral((B*cos(d*x + c)^2 + A*cos(d*x + c))*(b*cos(d*x + c))^n*sqrt(cos(d*
x + c)), x)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**(3/2)*(b*cos(d*x+c))**n*(A+B*cos(d*x+c)),x)
[Out] Timed out
```

Maxima [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^n\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(b*cos(d*x+c))^n*(A+B*cos(d*x+c)),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*cos(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^n\cos(dx+c)^{\frac{3}{2}}\,dx$$

```
[In] integrate(cos(d*x+c)^(3/2)*(b*cos(d*x+c))^n*(A+B*cos(d*x+c)),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*cos(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$=\int \cos\left(c+d\,x\right)^{3/2}\left(b\,\cos\left(c+d\,x\right)\right)^n\left(A+B\,\cos\left(c+d\,x\right)\right)\,dx$$

```
[In] int(cos(c + d*x)^(3/2)*(b*cos(c + d*x))^n*(A + B*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^(3/2)*(b*cos(c + d*x))^n*(A + B*cos(c + d*x)), x)
```

3.921 $\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 163

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = -\frac{2A\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(3+2n),\frac{1}{4}(7+2n),\cos^2(c+dx)\right)\sin(c+dx)}{d(3+2n)\sqrt{\sin^2(c+dx)}} - \frac{2B\cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(5+2n),\frac{1}{4}(9+2n),\cos^2(c+dx)\right)\sin(c+dx)}{d(5+2n)\sqrt{\sin^2(c+dx)}}$$

```
[Out] -2*A*cos(d*x+c)^(3/2)*(b*cos(d*x+c))^n*hypergeom([1/2, 3/4+1/2*n],[7/4+1/2*
n],cos(d*x+c)^2)*sin(d*x+c)/d/(3+2*n)/(sin(d*x+c)^2)^(1/2)-2*B*cos(d*x+c)^(
5/2)*(b*cos(d*x+c))^n*hypergeom([1/2, 5/4+1/2*n],[9/4+1/2*n],cos(d*x+c)^2)*
sin(d*x+c)/d/(5+2*n)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {20, 2827, 2722}

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = -\frac{2A\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(2n+3),\frac{1}{4}(2n+7),\cos^2(c+dx)\right)}{d(2n+3)\sqrt{\sin^2(c+dx)}} - \frac{2B\sin(c+dx)\cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(2n+5),\frac{1}{4}(2n+9),\cos^2(c+dx)\right)}{d(2n+5)\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[Sqrt[Cos[c + d*x]]*(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-2*A*Cos[c + d*x]^(3/2)*(b*Cos[c + d*x])^n*Hypergeometric2F1[1/2, (3 + 2*n
)/4, (7 + 2*n)/4, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(3 + 2*n)*Sqrt[Sin[c + d
*x]^2]) - (2*B*Cos[c + d*x]^(5/2)*(b*Cos[c + d*x])^n*Hypergeometric2F1[1/2,
 (5 + 2*n)/4, (9 + 2*n)/4, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(5 + 2*n)*Sqrt[
Sin[c + d*x]^2])
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[b^IntPart[
n]*((b*v)^FracPart[n]/(a^IntPart[n]*(a*v)^FracPart[n])), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !
IntegerQ[m + n]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{\frac{1}{2}+n}(c+dx)(A+B\cos(c+dx))\,dx \\
&= \left(A\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{\frac{1}{2}+n}(c+dx)\,dx \\
&\quad + \left(B\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{\frac{3}{2}+n}(c+dx)\,dx \\
&= \\
&\quad -\frac{2A\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^n\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(3+2n),\frac{1}{4}(7+2n),\cos^2(c+dx)\right)\sin}{d(3+2n)\sqrt{\sin^2(c+dx)}} \\
&\quad -\frac{2B\cos^{\frac{5}{2}}(c+dx)(b\cos(c+dx))^n\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(5+2n),\frac{1}{4}(9+2n),\cos^2(c+dx)\right)\sin}{d(5+2n)\sqrt{\sin^2(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 138, normalized size of antiderivative = 0.85

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = -\frac{2\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^n\csc(c+dx)\left(A(5+2n)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(3+2n),\frac{1}{4}(7+2n),\cos^2\right.\right.}{d(3+}$$

```
[In] Integrate[Sqrt[Cos[c + d*x]]*(b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-2*Cos[c + d*x]^(3/2)*(b*Cos[c + d*x])^n*Csc[c + d*x]*(A*(5 + 2*n)*Hyperge
ometric2F1[1/2, (3 + 2*n)/4, (7 + 2*n)/4, Cos[c + d*x]^2] + B*(3 + 2*n)*Cos
[c + d*x]*Hypergeometric2F1[1/2, (5 + 2*n)/4, (9 + 2*n)/4, Cos[c + d*x]^2])
*Sqrt[Sin[c + d*x]^2])/(d*(3 + 2*n)*(5 + 2*n))
```

Maple [F]

$$\int \left(\cos\left(dx+c\right)b\right)^{n}\left(A+B\cos\left(dx+c\right)\right)\left(\sqrt{\cos}(dx+c)\right)dx$$

```
[In] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))*cos(d*x+c)^(1/2),x)
```

```
[Out] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))*cos(d*x+c)^(1/2),x)
```

Fricas [F]

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx = \int (B\cos\left(dx+c\right)+A)(b\cos\left(dx+c\right))^{n}\sqrt{\cos\left(dx+c\right)}\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))*cos(d*x+c)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*sqrt(cos(d*x + c)), x)
```

Sympy [F]

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$= \int (b\cos{(c+dx)})^n\,(A+B\cos{(c+dx)})\,\sqrt{\cos{(c+dx)}}\,dx$$

```
[In] integrate((b*cos(d*x+c))**n*(A+B*cos(d*x+c))*cos(d*x+c)**(1/2),x)
[Out] Integral((b*cos(c + d*x))**n*(A + B*cos(c + d*x))*sqrt(cos(c + d*x)), x)
```

Maxima [F]

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$= \int (B\cos{(dx+c)}+A)(b\cos{(dx+c)})^n\,\sqrt{\cos{(dx+c)}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))*cos(d*x+c)^(1/2),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*sqrt(cos(d*x + c)), x)
```

Giac [F]

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$= \int (B\cos{(dx+c)}+A)(b\cos{(dx+c)})^n\,\sqrt{\cos{(dx+c)}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))*cos(d*x+c)^(1/2),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n*sqrt(cos(d*x + c)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{\cos(c+dx)}(b\cos(c+dx))^n(A+B\cos(c+dx))\,dx$$
$$=\int \sqrt{\cos\left(c+d\,x\right)}\,{\left(b\,\cos\left(c+d\,x\right)\right)}^n\,\left(A+B\,\cos\left(c+d\,x\right)\right)\,dx$$

```
[In] int(cos(c + d*x)^(1/2)*(b*cos(c + d*x))^n*(A + B*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^(1/2)*(b*cos(c + d*x))^n*(A + B*cos(c + d*x)), x)
```

3.922 $\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 163

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = -\frac{2A\sqrt{\cos(c+dx)}(b\cos(c+dx))^n \operatorname{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(1+2n),\frac{1}{4}(5+2n),\cos^2(c+dx)\right)\sin(c+d}{d(1+2n)\sqrt{\sin^2(c+dx)}} - \frac{2B\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^n \operatorname{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(3+2n),\frac{1}{4}(7+2n),\cos^2(c+dx)\right)\sin(c+dx}{d(3+2n)\sqrt{\sin^2(c+dx)}}$$

```
[Out] -2*B*cos(d*x+c)^(3/2)*(b*cos(d*x+c))^n*hypergeom([1/2, 3/4+1/2*n],[7/4+1/2*
n],cos(d*x+c)^2)*sin(d*x+c)/d/(3+2*n)/(sin(d*x+c)^2)^(1/2)-2*A*(b*cos(d*x+c
))^n*hypergeom([1/2, 1/4+1/2*n],[5/4+1/2*n],cos(d*x+c)^2)*sin(d*x+c)*cos(d*
x+c)^(1/2)/d/(1+2*n)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {20, 2827, 2722}

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = -\frac{2A\sin(c+dx)\sqrt{\cos(c+dx)}(b\cos(c+dx))^n \operatorname{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(2n+1),\frac{1}{4}(2n+5),\cos^2(c+dx\right.}{d(2n+1)\sqrt{\sin^2(c+dx)}} - \frac{2B\sin(c+dx)\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^n \operatorname{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(2n+3),\frac{1}{4}(2n+7),\cos^2(c+dx\right.}{d(2n+3)\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[((b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]))/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (-2*A*Sqrt[Cos[c + d*x]]*(b*Cos[c + d*x])^n*Hypergeometric2F1[1/2, (1 + 2*n
)/4, (5 + 2*n)/4, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(1 + 2*n)*Sqrt[Sin[c + d
*x]^2]) - (2*B*Cos[c + d*x]^(3/2)*(b*Cos[c + d*x])^n*Hypergeometric2F1[1/2,
 (3 + 2*n)/4, (7 + 2*n)/4, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(3 + 2*n)*Sqrt[
Sin[c + d*x]^2])
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[b^IntPart[
n]*((b*v)^FracPart[n]/(a^IntPart[n]*(a*v)^FracPart[n])), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !
IntegerQ[m + n]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = \left(\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{-\frac{1}{2}+n}(c+dx)(A+B\cos(c+dx))\,dx$$

$$= \left(A\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{-\frac{1}{2}+n}(c+dx)\,dx + \left(B\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{\frac{1}{2}+n}(c+dx)\,dx$$

$$= -\frac{2A\sqrt{\cos(c+dx)}(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(1+2n),\frac{1}{4}(5+2n),\cos^2(c+dx)\right)\sin}{d(1+2n)\sqrt{\sin^2(c+dx)}} - \frac{2B\cos^{\frac{3}{2}}(c+dx)(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(3+2n),\frac{1}{4}(7+2n),\cos^2(c+dx)\right)\sin(}{d(3+2n)\sqrt{\sin^2(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 138, normalized size of antiderivative = 0.85

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx =$$
$$-\frac{2\sqrt{\cos(c+dx)}(b\cos(c+dx))^n\csc(c+dx)\left(A(3+2n)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(1+2n),\frac{1}{4}(5+2n),\text{co}\right.\right.}{d(1}$$

```
[In] Integrate[((b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]))/Sqrt[Cos[c + d*x]],x]
```

```
[Out] (-2*Sqrt[Cos[c + d*x]]*(b*Cos[c + d*x])^n*Csc[c + d*x]*(A*(3 + 2*n)*Hyperge
ometric2F1[1/2, (1 + 2*n)/4, (5 + 2*n)/4, Cos[c + d*x]^2] + B*(1 + 2*n)*Cos
[c + d*x]*Hypergeometric2F1[1/2, (3 + 2*n)/4, (7 + 2*n)/4, Cos[c + d*x]^2])
*Sqrt[Sin[c + d*x]^2])/(d*(1 + 2*n)*(3 + 2*n))
```

Maple [F]

$$\int \frac{(\cos(dx+c)\,b)^n\,(A+B\cos(dx+c))}{\sqrt{\cos(dx+c)}}dx$$

```
[In] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x)
```

```
[Out] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x)
```

Fricas [F]

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^n}{\sqrt{\cos(dx+c)}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n/sqrt(cos(d*x + c)), x)
```

Sympy [F]

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(b\cos(c+dx))^n\,(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx$$

[In] integrate((b*cos(d*x+c))**n*(A+B*cos(d*x+c))/cos(d*x+c)**(1/2),x)

[Out] Integral((b*cos(c + d*x))**n*(A + B*cos(c + d*x))/sqrt(cos(c + d*x)), x)

Maxima [F]

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^n}{\sqrt{\cos(dx+c)}}\,dx$$

[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x, algorithm="maxima")

[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n/sqrt(cos(d*x + c)), x)

Giac [F]

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^n}{\sqrt{\cos(dx+c)}}\,dx$$

[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))/cos(d*x+c)^(1/2),x, algorithm="giac")

[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n/sqrt(cos(d*x + c)), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\sqrt{\cos(c+dx)}}\,dx = \int \frac{(b\,\cos(c+d\,x))^n\,(A+B\,\cos(c+d\,x))}{\sqrt{\cos(c+d\,x)}}\,dx$$

[In] int(((b*cos(c + d*x))^n*(A + B*cos(c + d*x)))/cos(c + d*x)^(1/2),x)

[Out] int(((b*cos(c + d*x))^n*(A + B*cos(c + d*x)))/cos(c + d*x)^(1/2), x)

3.923 $\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 163

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2A(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(-1+2n),\frac{1}{4}(3+2n),\cos^2(c+dx)\right)\sin(c+dx)}{d(1-2n)\sqrt{\cos(c+dx)}\sqrt{\sin^2(c+dx)}} - \frac{2B\sqrt{\cos(c+dx)}(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(1+2n),\frac{1}{4}(5+2n),\cos^2(c+dx)\right)\sin(c+dx)}{d(1+2n)\sqrt{\sin^2(c+dx)}}$$

```
[Out] 2*A*(b*cos(d*x+c))^n*hypergeom([1/2, -1/4+1/2*n],[3/4+1/2*n],cos(d*x+c)^2)*
sin(d*x+c)/d/(1-2*n)/cos(d*x+c)^(1/2)/(sin(d*x+c)^2)^(1/2)-2*B*(b*cos(d*x+c
))^n*hypergeom([1/2, 1/4+1/2*n],[5/4+1/2*n],cos(d*x+c)^2)*sin(d*x+c)*cos(d*
x+c)^(1/2)/d/(1+2*n)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {20, 2827, 2722}

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \frac{2A\sin(c+dx)(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(2n-1),\frac{1}{4}(2n+3),\cos^2(c+dx)\right)}{d(1-2n)\sqrt{\sin^2(c+dx)}\sqrt{\cos(c+dx)}} - \frac{2B\sin(c+dx)\sqrt{\cos(c+dx)}(b\cos(c+dx))^n \text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(2n+1),\frac{1}{4}(2n+5),\cos^2(c+dx)\right)}{d(2n+1)\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[((b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(3/2),x]
```

```
[Out] (2*A*(b*Cos[c + d*x])^n*Hypergeometric2F1[1/2, (-1 + 2*n)/4, (3 + 2*n)/4, C
os[c + d*x]^2]*Sin[c + d*x])/(d*(1 - 2*n)*Sqrt[Cos[c + d*x]]*Sqrt[Sin[c + d
*x]^2]) - (2*B*Sqrt[Cos[c + d*x]]*(b*Cos[c + d*x])^n*Hypergeometric2F1[1/2,
 (1 + 2*n)/4, (5 + 2*n)/4, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(1 + 2*n)*Sqrt[
Sin[c + d*x]^2])
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[b^IntPart[
n]*((b*v)^FracPart[n]/(a^IntPart[n]*(a*v)^FracPart[n])), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !
IntegerQ[m + n]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = \left(\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{-\frac{3}{2}+n}(c+dx)(A+B\cos(c+dx))\,dx$$

$$= \left(A\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{-\frac{3}{2}+n}(c+dx)\,dx + \left(B\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{-\frac{1}{2}+n}(c+dx)\,dx$$

$$= \frac{2A(b\cos(c+dx))^n \operatorname{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(-1+2n),\frac{1}{4}(3+2n),\cos^2(c+dx)\right)\sin(c+dx)}{d(1-2n)\sqrt{\cos(c+dx)}\sqrt{\sin^2(c+dx)}} - \frac{2B\sqrt{\cos(c+dx)}(b\cos(c+dx))^n \operatorname{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(1+2n),\frac{1}{4}(5+2n),\cos^2(c+dx)\right)\sin}{d(1+2n)\sqrt{\sin^2(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.21 (sec) , antiderivative size = 133, normalized size of antiderivative = 0.82

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx =$$
$$-\frac{2(b\cos(c+dx))^n\csc(c+dx)\left(A(1+2n)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(-1+2n),\frac{1}{4}(3+2n),\cos^2(c+dx)\right)\right.}{d\left(-1+4n^2\right)}$$

```
[In] Integrate[((b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(3/2),x]
```

```
[Out] (-2*(b*Cos[c + d*x])^n*Csc[c + d*x]*(A*(1 + 2*n)*Hypergeometric2F1[1/2, (-1
 + 2*n)/4, (3 + 2*n)/4, Cos[c + d*x]^2] + B*(-1 + 2*n)*Cos[c + d*x]*Hyperge
ometric2F1[1/2, (1 + 2*n)/4, (5 + 2*n)/4, Cos[c + d*x]^2])*Sqrt[Sin[c + d*x
]^2])/(d*(-1 + 4*n^2)*Sqrt[Cos[c + d*x]])
```

Maple [F]

$$\int \frac{(\cos(dx+c)\,b)^n\,(A+B\cos(dx+c))}{\cos(dx+c)^{\frac{3}{2}}}dx$$

```
[In] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x)
```

```
[Out] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x)
```

Fricas [F]

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^n}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n/cos(d*x + c)^(3/2), x)
```

Sympy [F]

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(b\cos(c+dx))^n\,(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx$$

```
[In] integrate((b*cos(d*x+c))**n*(A+B*cos(d*x+c))/cos(d*x+c)**(3/2),x)
[Out] Integral((b*cos(c + d*x))**n*(A + B*cos(c + d*x))/cos(c + d*x)**(3/2), x)
```

Maxima [F]

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^n}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n/cos(d*x + c)^(3/2), x)
```

Giac [F]

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^n}{\cos(dx+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))/cos(d*x+c)^(3/2),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n/cos(d*x + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{3}{2}}(c+dx)}\,dx = \int \frac{(b\cos(c+d\,x))^n\,(A+B\cos(c+d\,x))}{\cos(c+d\,x)^{3/2}}\,dx$$

```
[In] int(((b*cos(c + d*x))^n*(A + B*cos(c + d*x)))/cos(c + d*x)^(3/2),x)
[Out] int(((b*cos(c + d*x))^n*(A + B*cos(c + d*x)))/cos(c + d*x)^(3/2), x)
```

3.924 $\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 163

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2A(b\cos(c+dx))^n \,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(-3+2n),\frac{1}{4}(1+2n),\cos^2(c+dx)\right)\sin(c+dx)}{d(3-2n)\cos^{\frac{3}{2}}(c+dx)\sqrt{\sin^2(c+dx)}} + \frac{2B(b\cos(c+dx))^n \,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(-1+2n),\frac{1}{4}(3+2n),\cos^2(c+dx)\right)\sin(c+dx)}{d(1-2n)\sqrt{\cos(c+dx)}\sqrt{\sin^2(c+dx)}}$$

```
[Out] 2*A*(b*cos(d*x+c))^n*hypergeom([1/2, -3/4+1/2*n],[1/4+1/2*n],cos(d*x+c)^2)*
sin(d*x+c)/d/(3-2*n)/cos(d*x+c)^(3/2)/(sin(d*x+c)^2)^(1/2)+2*B*(b*cos(d*x+c
))^n*hypergeom([1/2, -1/4+1/2*n],[3/4+1/2*n],cos(d*x+c)^2)*sin(d*x+c)/d/(1-
2*n)/cos(d*x+c)^(1/2)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {20, 2827, 2722}

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \frac{2A\sin(c+dx)(b\cos(c+dx))^n \,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(2n-3),\frac{1}{4}(2n+1),\cos^2(c+dx)\right)}{d(3-2n)\sqrt{\sin^2(c+dx)}\cos^{\frac{3}{2}}(c+dx)} + \frac{2B\sin(c+dx)(b\cos(c+dx))^n \,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(2n-1),\frac{1}{4}(2n+3),\cos^2(c+dx)\right)}{d(1-2n)\sqrt{\sin^2(c+dx)}\sqrt{\cos(c+dx)}}$$

```
[In] Int[((b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(5/2),x]
```

```
[Out] (2*A*(b*Cos[c + d*x])^n*Hypergeometric2F1[1/2, (-3 + 2*n)/4, (1 + 2*n)/4, C
os[c + d*x]^2]*Sin[c + d*x])/(d*(3 - 2*n)*Cos[c + d*x]^(3/2)*Sqrt[Sin[c + d
*x]^2]) + (2*B*(b*Cos[c + d*x])^n*Hypergeometric2F1[1/2, (-1 + 2*n)/4, (3 +
 2*n)/4, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(1 - 2*n)*Sqrt[Cos[c + d*x]]*Sqrt
[Sin[c + d*x]^2])
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[b^IntPart[
n]*((b*v)^FracPart[n]/(a^IntPart[n]*(a*v)^FracPart[n])), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !
IntegerQ[m + n]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \left(\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int\cos^{-\frac{5}{2}+n}(c+dx)(A+B\cos(c+dx))\,dx\\
&= \left(A\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int\cos^{-\frac{5}{2}+n}(c+dx)\,dx\\
&\quad+\left(B\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int\cos^{-\frac{3}{2}+n}(c+dx)\,dx\\
&= \frac{2A(b\cos(c+dx))^n\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(-3+2n),\frac{1}{4}(1+2n),\cos^2(c+dx)\right)\sin(c+dx)}{d(3-2n)\cos^{\frac{3}{2}}(c+dx)\sqrt{\sin^2(c+dx)}}\\
&\quad+\frac{2B(b\cos(c+dx))^n\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(-1+2n),\frac{1}{4}(3+2n),\cos^2(c+dx)\right)\sin(c+dx)}{d(1-2n)\sqrt{\cos(c+dx)}\sqrt{\sin^2(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 138, normalized size of antiderivative = 0.85

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = -\frac{2(b\cos(c+dx))^n\csc(c+dx)\left(A(-1+2n)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(-3+2n),\frac{1}{4}(1+2n),\cos^2(c+dx\right.\right.}{d(-3+2n)(-1}$$

[In] Integrate[((b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(5/2),x]

[Out] (-2*(b*Cos[c + d*x])^n*Csc[c + d*x]*(A*(-1 + 2*n)*Hypergeometric2F1[1/2, (-3 + 2*n)/4, (1 + 2*n)/4, Cos[c + d*x]^2] + B*(-3 + 2*n)*Cos[c + d*x]*Hypergeometric2F1[1/2, (-1 + 2*n)/4, (3 + 2*n)/4, Cos[c + d*x]^2])*Sqrt[Sin[c + d*x]^2])/(d*(-3 + 2*n)*(-1 + 2*n)*Cos[c + d*x]^(3/2))

Maple [F]

$$\int \frac{(\cos(dx+c)\,b)^n\,(A+B\cos(dx+c))}{\cos(dx+c)^{\frac{5}{2}}}dx$$

[In] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x)

[Out] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x)

Fricas [F]

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^n}{\cos(dx+c)^{\frac{5}{2}}}\,dx$$

[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x, algorithm="fricas")

[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n/cos(d*x + c)^(5/2), x)

Sympy [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**n*(A+B*cos(d*x+c))/cos(d*x+c)**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^n}{\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n/cos(d*x + c)^(5/2), x)
```

Giac [F]

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^n}{\cos(dx+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))/cos(d*x+c)^(5/2),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n/cos(d*x + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{5}{2}}(c+dx)}\,dx = \int \frac{(b\,\cos(c+d\,x))^n\,(A+B\,\cos(c+d\,x))}{\cos(c+d\,x)^{5/2}}\,dx$$

```
[In] int(((b*cos(c + d*x))^n*(A + B*cos(c + d*x)))/cos(c + d*x)^(5/2),x)
[Out] int(((b*cos(c + d*x))^n*(A + B*cos(c + d*x)))/cos(c + d*x)^(5/2), x)
```

3.925 $\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 163

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2A(b\cos(c+dx))^n \operatorname{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(-5+2n),\frac{1}{4}(-1+2n),\cos^2(c+dx)\right)\sin(c+dx)}{d(5-2n)\cos^{\frac{5}{2}}(c+dx)\sqrt{\sin^2(c+dx)}} + \frac{2B(b\cos(c+dx))^n \operatorname{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(-3+2n),\frac{1}{4}(1+2n),\cos^2(c+dx)\right)\sin(c+dx)}{d(3-2n)\cos^{\frac{3}{2}}(c+dx)\sqrt{\sin^2(c+dx)}}$$

```
[Out] 2*A*(b*cos(d*x+c))^n*hypergeom([1/2, -5/4+1/2*n],[-1/4+1/2*n],cos(d*x+c)^2)
*sin(d*x+c)/d/(5-2*n)/cos(d*x+c)^(5/2)/(sin(d*x+c)^2)^(1/2)+2*B*(b*cos(d*x+
c))^n*hypergeom([1/2, -3/4+1/2*n],[1/4+1/2*n],cos(d*x+c)^2)*sin(d*x+c)/d/(3
-2*n)/cos(d*x+c)^(3/2)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {20, 2827, 2722}

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \frac{2A\sin(c+dx)(b\cos(c+dx))^n \operatorname{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(2n-5),\frac{1}{4}(2n-1),\cos^2(c+dx)\right)}{d(5-2n)\sqrt{\sin^2(c+dx)}\cos^{\frac{5}{2}}(c+dx)} + \frac{2B\sin(c+dx)(b\cos(c+dx))^n \operatorname{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(2n-3),\frac{1}{4}(2n+1),\cos^2(c+dx)\right)}{d(3-2n)\sqrt{\sin^2(c+dx)}\cos^{\frac{3}{2}}(c+dx)}$$

```
[In] Int[((b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(7/2),x]
```

```
[Out] (2*A*(b*Cos[c + d*x])^n*Hypergeometric2F1[1/2, (-5 + 2*n)/4, (-1 + 2*n)/4,
Cos[c + d*x]^2]*Sin[c + d*x])/(d*(5 - 2*n)*Cos[c + d*x]^(5/2)*Sqrt[Sin[c +
d*x]^2]) + (2*B*(b*Cos[c + d*x])^n*Hypergeometric2F1[1/2, (-3 + 2*n)/4, (1
+ 2*n)/4, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(3 - 2*n)*Cos[c + d*x]^(3/2)*Sqr
t[Sin[c + d*x]^2])
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[b^IntPart[
n]*((b*v)^FracPart[n]/(a^IntPart[n]*(a*v)^FracPart[n])), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !
IntegerQ[m + n]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{-\frac{7}{2}+n}(c+dx)(A+B\cos(c+dx))\,dx\\
&= \left(A\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{-\frac{7}{2}+n}(c+dx)\,dx\\
&\quad+\left(B\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{-\frac{5}{2}+n}(c+dx)\,dx\\
&= \frac{2A(b\cos(c+dx))^n\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(-5+2n),\frac{1}{4}(-1+2n),\cos^2(c+dx)\right)\sin(c+dx)}{d(5-2n)\cos^{\frac{5}{2}}(c+dx)\sqrt{\sin^2(c+dx)}}\\
&\quad+\frac{2B(b\cos(c+dx))^n\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(-3+2n),\frac{1}{4}(1+2n),\cos^2(c+dx)\right)\sin(c+dx)}{d(3-2n)\cos^{\frac{3}{2}}(c+dx)\sqrt{\sin^2(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 138, normalized size of antiderivative = 0.85

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx =$$
$$-\frac{2(b\cos(c+dx))^n\csc(c+dx)\left(A(-3+2n)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(-5+2n),\frac{1}{4}(-1+2n),\cos^2(c+d\right.\right.}{d(-5+2n)(-}$$

```
[In] Integrate[((b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(7/2),x]
```

```
[Out] (-2*(b*Cos[c + d*x])^n*Csc[c + d*x]*(A*(-3 + 2*n)*Hypergeometric2F1[1/2, (-
5 + 2*n)/4, (-1 + 2*n)/4, Cos[c + d*x]^2] + B*(-5 + 2*n)*Cos[c + d*x]*Hyper
geometric2F1[1/2, (-3 + 2*n)/4, (1 + 2*n)/4, Cos[c + d*x]^2])*Sqrt[Sin[c +
d*x]^2])/(d*(-5 + 2*n)*(-3 + 2*n)*Cos[c + d*x]^(5/2))
```

Maple [F]

$$\int \frac{(\cos(dx+c)\,b)^n\,(A+B\cos(dx+c))}{\cos(dx+c)^{\frac{7}{2}}}dx$$

```
[In] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x)
```

```
[Out] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x)
```

Fricas [F]

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^n}{\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x, algorithm="
fricas")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n/cos(d*x + c)^(7/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**n*(A+B*cos(d*x+c))/cos(d*x+c)**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^n}{\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n/cos(d*x + c)^(7/2), x)
```

Giac [F]

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^n}{\cos(dx+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))/cos(d*x+c)^(7/2),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n/cos(d*x + c)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{7}{2}}(c+dx)}\,dx = \int \frac{(b\cos(c+d\,x))^n\,(A+B\cos(c+d\,x))}{\cos(c+d\,x)^{7/2}}\,dx$$

```
[In] int(((b*cos(c + d*x))^n*(A + B*cos(c + d*x)))/cos(c + d*x)^(7/2),x)
[Out] int(((b*cos(c + d*x))^n*(A + B*cos(c + d*x)))/cos(c + d*x)^(7/2), x)
```

3.926 $\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 163

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{2A(b\cos(c+dx))^n \operatorname{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(-7+2n),\frac{1}{4}(-3+2n),\cos^2(c+dx)\right)\sin(c+dx)}{d(7-2n)\cos^{\frac{7}{2}}(c+dx)\sqrt{\sin^2(c+dx)}} + \frac{2B(b\cos(c+dx))^n \operatorname{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(-5+2n),\frac{1}{4}(-1+2n),\cos^2(c+dx)\right)\sin(c+dx)}{d(5-2n)\cos^{\frac{5}{2}}(c+dx)\sqrt{\sin^2(c+dx)}}$$

```
[Out] 2*A*(b*cos(d*x+c))^n*hypergeom([1/2, -7/4+1/2*n],[-3/4+1/2*n],cos(d*x+c)^2)
*sin(d*x+c)/d/(7-2*n)/cos(d*x+c)^(7/2)/(sin(d*x+c)^2)^(1/2)+2*B*(b*cos(d*x+
c))^n*hypergeom([1/2, -5/4+1/2*n],[-1/4+1/2*n],cos(d*x+c)^2)*sin(d*x+c)/d/(
5-2*n)/cos(d*x+c)^(5/2)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {20, 2827, 2722}

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \frac{2A\sin(c+dx)(b\cos(c+dx))^n \operatorname{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(2n-7),\frac{1}{4}(2n-3),\cos^2(c+dx)\right)}{d(7-2n)\sqrt{\sin^2(c+dx)}\cos^{\frac{7}{2}}(c+dx)} + \frac{2B\sin(c+dx)(b\cos(c+dx))^n \operatorname{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(2n-5),\frac{1}{4}(2n-1),\cos^2(c+dx)\right)}{d(5-2n)\sqrt{\sin^2(c+dx)}\cos^{\frac{5}{2}}(c+dx)}$$

```
[In] Int[((b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(9/2),x]
```

```
[Out] (2*A*(b*Cos[c + d*x])^n*Hypergeometric2F1[1/2, (-7 + 2*n)/4, (-3 + 2*n)/4,
Cos[c + d*x]^2]*Sin[c + d*x])/(d*(7 - 2*n)*Cos[c + d*x]^(7/2)*Sqrt[Sin[c +
d*x]^2]) + (2*B*(b*Cos[c + d*x])^n*Hypergeometric2F1[1/2, (-5 + 2*n)/4, (-1
 + 2*n)/4, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(5 - 2*n)*Cos[c + d*x]^(5/2)*Sq
rt[Sin[c + d*x]^2])
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[b^IntPart[
n]*((b*v)^FracPart[n]/(a^IntPart[n]*(a*v)^FracPart[n])), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \left(\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{-\frac{9}{2}+n}(c+dx)(A+B\cos(c+dx))\,dx \\
&= \left(A\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{-\frac{9}{2}+n}(c+dx)\,dx \\
&\quad+\left(B\cos^{-n}(c+dx)(b\cos(c+dx))^n\right)\int \cos^{-\frac{7}{2}+n}(c+dx)\,dx \\
&= \frac{2A(b\cos(c+dx))^n\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(-7+2n),\frac{1}{4}(-3+2n),\cos^2(c+dx)\right)\sin(c+dx)}{d(7-2n)\cos^{\frac{7}{2}}(c+dx)\sqrt{\sin^2(c+dx)}} \\
&\quad+\frac{2B(b\cos(c+dx))^n\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(-5+2n),\frac{1}{4}(-1+2n),\cos^2(c+dx)\right)\sin(c+dx)}{d(5-2n)\cos^{\frac{5}{2}}(c+dx)\sqrt{\sin^2(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 138, normalized size of antiderivative = 0.85

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = -\frac{2(b\cos(c+dx))^n\csc(c+dx)\left(A(-5+2n)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{4}(-7+2n),\frac{1}{4}(-3+2n),\cos^2(c+d\right.\right.}{d(-7+2n)(-}$$

```
[In] Integrate[((b*Cos[c + d*x])^n*(A + B*Cos[c + d*x]))/Cos[c + d*x]^(9/2),x]
```

```
[Out] (-2*(b*Cos[c + d*x])^n*Csc[c + d*x]*(A*(-5 + 2*n)*Hypergeometric2F1[1/2, (-
7 + 2*n)/4, (-3 + 2*n)/4, Cos[c + d*x]^2] + B*(-7 + 2*n)*Cos[c + d*x]*Hyper
geometric2F1[1/2, (-5 + 2*n)/4, (-1 + 2*n)/4, Cos[c + d*x]^2])*Sqrt[Sin[c +
 d*x]^2])/(d*(-7 + 2*n)*(-5 + 2*n)*Cos[c + d*x]^(7/2))
```

Maple [F]

$$\int \frac{\left(\cos\left(dx+c\right)b\right)^{n}\left(A+B\cos\left(dx+c\right)\right)}{\cos\left(dx+c\right)^{\frac{9}{2}}}dx$$

```
[In] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))/cos(d*x+c)^(9/2),x)
```

```
[Out] int((cos(d*x+c)*b)^n*(A+B*cos(d*x+c))/cos(d*x+c)^(9/2),x)
```

Fricas [F]

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(B\cos\left(dx+c\right)+A)(b\cos\left(dx+c\right))^{n}}{\cos\left(dx+c\right)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))/cos(d*x+c)^(9/2),x, algorithm="
fricas")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n/cos(d*x + c)^(9/2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \text{Timed out}$$

```
[In] integrate((b*cos(d*x+c))**n*(A+B*cos(d*x+c))/cos(d*x+c)**(9/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^n}{\cos(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))/cos(d*x+c)^(9/2),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n/cos(d*x + c)^(9/2), x)
```

Giac [F]

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(B\cos(dx+c)+A)(b\cos(dx+c))^n}{\cos(dx+c)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((b*cos(d*x+c))^n*(A+B*cos(d*x+c))/cos(d*x+c)^(9/2),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^n/cos(d*x + c)^(9/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(b\cos(c+dx))^n(A+B\cos(c+dx))}{\cos^{\frac{9}{2}}(c+dx)}\,dx = \int \frac{(b\cos(c+d\,x))^n\,(A+B\cos(c+d\,x))}{\cos(c+d\,x)^{9/2}}\,dx$$

```
[In] int(((b*cos(c + d*x))^n*(A + B*cos(c + d*x)))/cos(c + d*x)^(9/2),x)
[Out] int(((b*cos(c + d*x))^n*(A + B*cos(c + d*x)))/cos(c + d*x)^(9/2), x)
```

3.927 $\int \cos^m(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 169

$$\int \cos^m(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = -\frac{3Ab\cos^{2+m}(c+dx)\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(7+3m),\frac{1}{6}(13+3m),\cos^2(c+dx)\right)\sin(c+}{d(7+3m)\sqrt{\sin^2(c+dx)}} - \frac{3bB\cos^{3+m}(c+dx)\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(10+3m),\frac{1}{6}(16+3m),\cos^2(c+dx)\right)\sin(c}{d(10+3m)\sqrt{\sin^2(c+dx)}}$$

```
[Out] -3*A*b*cos(d*x+c)^(2+m)*(b*cos(d*x+c))^(1/3)*hypergeom([1/2, 7/6+1/2*m],[13
/6+1/2*m],cos(d*x+c)^2)*sin(d*x+c)/d/(7+3*m)/(sin(d*x+c)^2)^(1/2)-3*b*B*cos
(d*x+c)^(3+m)*(b*cos(d*x+c))^(1/3)*hypergeom([1/2, 5/3+1/2*m],[8/3+1/2*m],c
os(d*x+c)^2)*sin(d*x+c)/d/(10+3*m)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {20, 2827, 2722}

$$\int \cos^m(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = -\frac{3Ab\sin(c+dx)\sqrt[3]{b\cos(c+dx)}\cos^{m+2}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(3m+7),\frac{1}{6}(3m+13),\cos^2(c+d}{d(3m+7)\sqrt{\sin^2(c+dx)}} - \frac{3bB\sin(c+dx)\sqrt[3]{b\cos(c+dx)}\cos^{m+3}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(3m+10),\frac{1}{6}(3m+16),\cos^2(c+}{d(3m+10)\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^m*(b*Cos[c + d*x])^(4/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-3*A*b*Cos[c + d*x]^(2 + m)*(b*Cos[c + d*x])^(1/3)*Hypergeometric2F1[1/2,
(7 + 3*m)/6, (13 + 3*m)/6, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(7 + 3*m)*Sqrt[
Sin[c + d*x]^2]) - (3*b*B*Cos[c + d*x]^(3 + m)*(b*Cos[c + d*x])^(1/3)*Hyper
geometric2F1[1/2, (10 + 3*m)/6, (16 + 3*m)/6, Cos[c + d*x]^2]*Sin[c + d*x])
/(d*(10 + 3*m)*Sqrt[Sin[c + d*x]^2])
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[b^IntPart[
n]*((b*v)^FracPart[n]/(a^IntPart[n]*(a*v)^FracPart[n])), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !
IntegerQ[m + n]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = \frac{\left(b\sqrt[3]{b\cos(c+dx)}\right)\int \cos^{\frac{4}{3}+m}(c+dx)(A+B\cos(c+dx))\,dx}{\sqrt[3]{\cos(c+dx)}}$$

$$= \frac{\left(Ab\sqrt[3]{b\cos(c+dx)}\right)\int \cos^{\frac{4}{3}+m}(c+dx)\,dx}{\sqrt[3]{\cos(c+dx)}} + \frac{\left(bB\sqrt[3]{b\cos(c+dx)}\right)\int \cos^{\frac{7}{3}+m}(c+dx)\,dx}{\sqrt[3]{\cos(c+dx)}}$$

$$= -\frac{3Ab\cos^{2+m}(c+dx)\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(7+3m),\frac{1}{6}(13+3m),\cos^2(c+dx)\right)}{d(7+3m)\sqrt{\sin^2(c+dx)}}$$

$$-\frac{3bB\cos^{3+m}(c+dx)\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(10+3m),\frac{1}{6}(16+3m),\cos^2(c+dx\right.}{d(10+3m)\sqrt{\sin^2(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.33 (sec) , antiderivative size = 140, normalized size of antiderivative = 0.83

$$\int \cos^m(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx =$$
$$-\frac{3\cos^{1+m}(c+dx)(b\cos(c+dx))^{4/3}\csc(c+dx)\left(B(7+3m)\cos(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{3}+\frac{m}{2},\frac{8}{3}+\right.\right.}{d(7+3}$$

```
[In] Integrate[Cos[c + d*x]^m*(b*Cos[c + d*x])^(4/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-3*Cos[c + d*x]^(1 + m)*(b*Cos[c + d*x])^(4/3)*Csc[c + d*x]*(B*(7 + 3*m)*C
os[c + d*x]*Hypergeometric2F1[1/2, 5/3 + m/2, 8/3 + m/2, Cos[c + d*x]^2] +
A*(10 + 3*m)*Hypergeometric2F1[1/2, (7 + 3*m)/6, (13 + 3*m)/6, Cos[c + d*x]
^2])*Sqrt[Sin[c + d*x]^2])/(d*(7 + 3*m)*(10 + 3*m))
```

Maple [F]

$$\int \left(\cos^{m}\left(dx+c\right)\right)\left(\cos\left(dx+c\right)b\right)^{\frac{4}{3}}\left(A+B\cos\left(dx+c\right)\right)dx$$

```
[In] int(cos(d*x+c)^m*(cos(d*x+c)*b)^(4/3)*(A+B*cos(d*x+c)),x)
```

```
[Out] int(cos(d*x+c)^m*(cos(d*x+c)*b)^(4/3)*(A+B*cos(d*x+c)),x)
```

Fricas [F]

$$\int \cos^m(c+dx)(b\cos(c+dx))^{4/3}(A + B\cos(c+dx))\,dx = \int (B\cos\left(dx+c\right)+A)(b\cos\left(dx+c\right))^{\frac{4}{3}}\cos\left(dx+c\right)^{m}\,dx$$

```
[In] integrate(cos(d*x+c)^m*(b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c)),x, algorithm="
fricas")
```

```
[Out] integral((B*b*cos(d*x + c)^2 + A*b*cos(d*x + c))*(b*cos(d*x + c))^(1/3)*cos
(d*x + c)^m, x)
```

Sympy [F(-1)]

Timed out.

$$\int \cos^m(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = \text{Timed out}$$

```
[In] integrate(cos(d*x+c)**m*(b*cos(d*x+c))**(4/3)*(A+B*cos(d*x+c)),x)
[Out] Timed out
```

Maxima [F]

$$\int \cos^m(c+dx)(b\cos(c+dx))^{4/3}(A + B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{4}{3}}\cos(dx+c)^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c)),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(4/3)*cos(d*x + c)^m, x)
```

Giac [F]

$$\int \cos^m(c+dx)(b\cos(c+dx))^{4/3}(A + B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{4}{3}}\cos(dx+c)^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(b*cos(d*x+c))^(4/3)*(A+B*cos(d*x+c)),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(4/3)*cos(d*x + c)^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^m(c+dx)(b\cos(c+dx))^{4/3}(A+B\cos(c+dx))\,dx = \int \cos\left(c+d\,x\right)^m\,{\left(b\,\cos\left(c+d\,x\right)\right)}^{4/3}\,\left(A+B\,\cos\left(c+d\,x\right)\right)\,dx$$

```
[In] int(cos(c + d*x)^m*(b*cos(c + d*x))^(4/3)*(A + B*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^m*(b*cos(c + d*x))^(4/3)*(A + B*cos(c + d*x)), x)
```

3.928 $\int \cos^m(c+dx)(b\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 167

$$\int \cos^m(c+dx)(b\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx =$$
$$-\frac{3A\cos^{1+m}(c+dx)(b\cos(c+dx))^{2/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(5+3m),\frac{1}{6}(11+3m),\cos^2(c+dx)\right)\sin(c+}{d(5+3m)\sqrt{\sin^2(c+dx)}}$$
$$-\frac{3B\cos^{2+m}(c+dx)(b\cos(c+dx))^{2/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(8+3m),\frac{1}{6}(14+3m),\cos^2(c+dx)\right)\sin(c+}{d(8+3m)\sqrt{\sin^2(c+dx)}}$$

```
[Out] -3*A*cos(d*x+c)^(1+m)*(b*cos(d*x+c))^(2/3)*hypergeom([1/2, 5/6+1/2*m],[11/6
+1/2*m],cos(d*x+c)^2)*sin(d*x+c)/d/(5+3*m)/(sin(d*x+c)^2)^(1/2)-3*B*cos(d*x
+c)^(2+m)*(b*cos(d*x+c))^(2/3)*hypergeom([1/2, 4/3+1/2*m],[7/3+1/2*m],cos(d
*x+c)^2)*sin(d*x+c)/d/(8+3*m)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 167, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {20, 2827, 2722}

$$\int \cos^m(c+dx)(b\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx =$$
$$-\frac{3A\sin(c+dx)(b\cos(c+dx))^{2/3}\cos^{m+1}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(3m+5),\frac{1}{6}(3m+11),\cos^2(c+d\right.}{d(3m+5)\sqrt{\sin^2(c+dx)}}$$
$$-\frac{3B\sin(c+dx)(b\cos(c+dx))^{2/3}\cos^{m+2}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(3m+8),\frac{1}{6}(3m+14),\cos^2(c+d\right.}{d(3m+8)\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^m*(b*Cos[c + d*x])^(2/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-3*A*Cos[c + d*x]^(1 + m)*(b*Cos[c + d*x])^(2/3)*Hypergeometric2F1[1/2, (5
 + 3*m)/6, (11 + 3*m)/6, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(5 + 3*m)*Sqrt[Si
n[c + d*x]^2]) - (3*B*Cos[c + d*x]^(2 + m)*(b*Cos[c + d*x])^(2/3)*Hypergeom
etric2F1[1/2, (8 + 3*m)/6, (14 + 3*m)/6, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(
8 + 3*m)*Sqrt[Sin[c + d*x]^2])
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[b^IntPart[
n]*((b*v)^FracPart[n]/(a^IntPart[n]*(a*v)^FracPart[n])), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = \frac{(b\cos(c+dx))^{2/3}\int \cos^{\frac{2}{3}+m}(c+dx)(A+B\cos(c+dx))\,dx}{\cos^{\frac{2}{3}}(c+dx)}$$

$$= \frac{\left(A(b\cos(c+dx))^{2/3}\right)\int \cos^{\frac{2}{3}+m}(c+dx)\,dx}{\cos^{\frac{2}{3}}(c+dx)} + \frac{\left(B(b\cos(c+dx))^{2/3}\right)\int \cos^{\frac{5}{3}+m}(c+dx)\,dx}{\cos^{\frac{2}{3}}(c+dx)}$$

$$= -\frac{3A\cos^{1+m}(c+dx)(b\cos(c+dx))^{2/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(5+3m),\frac{1}{6}(11+3m),\cos^2(c+d}{d(5+3m)\sqrt{\sin^2(c+dx)}}$$

$$-\frac{3B\cos^{2+m}(c+dx)(b\cos(c+dx))^{2/3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(8+3m),\frac{1}{6}(14+3m),\cos^2(c+d}{d(8+3m)\sqrt{\sin^2(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 140, normalized size of antiderivative = 0.84

$$\int \cos^m(c+dx)(b\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx =$$
$$-\frac{3\cos^{1+m}(c+dx)(b\cos(c+dx))^{2/3}\csc(c+dx)\left(A(8+3m)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(5+3m),\frac{1}{6}(11+3m),\right.\right.}{d(5+3}$$

[In] Integrate[Cos[c + d*x]^m*(b*Cos[c + d*x])^(2/3)*(A + B*Cos[c + d*x]),x]

[Out] (-3*Cos[c + d*x]^(1 + m)*(b*Cos[c + d*x])^(2/3)*Csc[c + d*x]*(A*(8 + 3*m)*Hypergeometric2F1[1/2, (5 + 3*m)/6, (11 + 3*m)/6, Cos[c + d*x]^2] + B*(5 + 3*m)*Cos[c + d*x]*Hypergeometric2F1[1/2, (8 + 3*m)/6, 7/3 + m/2, Cos[c + d*x]^2])*Sqrt[Sin[c + d*x]^2])/(d*(5 + 3*m)*(8 + 3*m))

Maple [F]

$$\int \left(\cos^m(dx+c)\right)\left(\cos(dx+c)\,b\right)^{\frac{2}{3}}\left(A+B\cos(dx+c)\right)dx$$

[In] int(cos(d*x+c)^m*(cos(d*x+c)*b)^(2/3)*(A+B*cos(d*x+c)),x)

[Out] int(cos(d*x+c)^m*(cos(d*x+c)*b)^(2/3)*(A+B*cos(d*x+c)),x)

Fricas [F]

$$\int \cos^m(c+dx)(b\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{2}{3}}\cos(dx+c)^m\,dx$$

[In] integrate(cos(d*x+c)^m*(b*cos(d*x+c))^(2/3)*(A+B*cos(d*x+c)),x, algorithm="fricas")

[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(2/3)*cos(d*x + c)^m, x)

Sympy [F]

$$\int \cos^m(c+dx)(b\cos(c+dx))^{2/3}(A + B\cos(c+dx))\,dx = \int (b\cos(c+dx))^{\frac{2}{3}}(A+B\cos(c+dx))\cos^m(c+dx)\,dx$$

[In] integrate(cos(d*x+c)**m*(b*cos(d*x+c))**(2/3)*(A+B*cos(d*x+c)),x)

[Out] Integral((b*cos(c + d*x))**(2/3)*(A + B*cos(c + d*x))*cos(c + d*x)**m, x)

Maxima [F]

$$\int \cos^m(c+dx)(b\cos(c+dx))^{2/3}(A + B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{2}{3}}\cos(dx+c)^m\,dx$$

[In] integrate(cos(d*x+c)^m*(b*cos(d*x+c))^(2/3)*(A+B*cos(d*x+c)),x, algorithm="maxima")

[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(2/3)*cos(d*x + c)^m, x)

Giac [F]

$$\int \cos^m(c+dx)(b\cos(c+dx))^{2/3}(A + B\cos(c+dx))\,dx = \int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{2}{3}}\cos(dx+c)^m\,dx$$

[In] integrate(cos(d*x+c)^m*(b*cos(d*x+c))^(2/3)*(A+B*cos(d*x+c)),x, algorithm="giac")

[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(2/3)*cos(d*x + c)^m, x)

Mupad [F(-1)]

Timed out.

$$\int \cos^m(c+dx)(b\cos(c+dx))^{2/3}(A+B\cos(c+dx))\,dx=\int \cos\left(c+d\,x\right)^m\,{\left(b\,\cos\left(c+d\,x\right)\right)}^{2/3}\,\left(A+B\,\cos\left(c+d\,x\right)\right)\,dx$$

```
[In] int(cos(c + d*x)^m*(b*cos(c + d*x))^(2/3)*(A + B*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^m*(b*cos(c + d*x))^(2/3)*(A + B*cos(c + d*x)), x)
```

3.929 $\int \cos^m(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 167

$$\int \cos^m(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = -\frac{3A\cos^{1+m}(c+dx)\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(4+3m),\frac{1}{6}(10+3m),\cos^2(c+dx)\right)\sin(c+dx)}{d(4+3m)\sqrt{\sin^2(c+dx)}} - \frac{3B\cos^{2+m}(c+dx)\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(7+3m),\frac{1}{6}(13+3m),\cos^2(c+dx)\right)\sin(c+dx)}{d(7+3m)\sqrt{\sin^2(c+dx)}}$$

```
[Out] -3*A*cos(d*x+c)^(1+m)*(b*cos(d*x+c))^(1/3)*hypergeom([1/2, 2/3+1/2*m],[5/3+
1/2*m],cos(d*x+c)^2)*sin(d*x+c)/d/(4+3*m)/(sin(d*x+c)^2)^(1/2)-3*B*cos(d*x+
c)^(2+m)*(b*cos(d*x+c))^(1/3)*hypergeom([1/2, 7/6+1/2*m],[13/6+1/2*m],cos(d
*x+c)^2)*sin(d*x+c)/d/(7+3*m)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 167, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {20, 2827, 2722}

$$\int \cos^m(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx = -\frac{3A\sin(c+dx)\sqrt[3]{b\cos(c+dx)}\cos^{m+1}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(3m+4),\frac{1}{6}(3m+10),\cos^2(c+dx)\right)}{d(3m+4)\sqrt{\sin^2(c+dx)}} - \frac{3B\sin(c+dx)\sqrt[3]{b\cos(c+dx)}\cos^{m+2}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(3m+7),\frac{1}{6}(3m+13),\cos^2(c+dx)\right)}{d(3m+7)\sqrt{\sin^2(c+dx)}}$$

```
[In] Int[Cos[c + d*x]^m*(b*Cos[c + d*x])^(1/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-3*A*Cos[c + d*x]^(1 + m)*(b*Cos[c + d*x])^(1/3)*Hypergeometric2F1[1/2, (4
 + 3*m)/6, (10 + 3*m)/6, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(4 + 3*m)*Sqrt[Si
n[c + d*x]^2]) - (3*B*Cos[c + d*x]^(2 + m)*(b*Cos[c + d*x])^(1/3)*Hypergeom
etric2F1[1/2, (7 + 3*m)/6, (13 + 3*m)/6, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(
7 + 3*m)*Sqrt[Sin[c + d*x]^2])
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[b^IntPart[
n]*((b*v)^FracPart[n]/(a^IntPart[n]*(a*v)^FracPart[n])), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !
IntegerQ[m + n]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\text{integral} = \frac{\sqrt[3]{b\cos(c+dx)}\int \cos^{\frac{1}{3}+m}(c+dx)(A+B\cos(c+dx))\,dx}{\sqrt[3]{\cos(c+dx)}}$$

$$= \frac{\left(A\sqrt[3]{b\cos(c+dx)}\right)\int \cos^{\frac{1}{3}+m}(c+dx)\,dx}{\sqrt[3]{\cos(c+dx)}} + \frac{\left(B\sqrt[3]{b\cos(c+dx)}\right)\int \cos^{\frac{4}{3}+m}(c+dx)\,dx}{\sqrt[3]{\cos(c+dx)}}$$

$$= -\frac{3A\cos^{1+m}(c+dx)\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(4+3m),\frac{1}{6}(10+3m),\cos^2(c+dx)\right)}{d(4+3m)\sqrt{\sin^2(c+dx)}} - \frac{3B\cos^{2+m}(c+dx)\sqrt[3]{b\cos(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(7+3m),\frac{1}{6}(13+3m),\cos^2(c+dx)\right)}{d(7+3m)\sqrt{\sin^2(c+dx)}}$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 140, normalized size of antiderivative = 0.84

$$\int \cos^m(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx =$$
$$-\frac{3\cos^{1+m}(c+dx)\sqrt[3]{b\cos(c+dx)}\csc(c+dx)\left(A(7+3m)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(4+3m),\frac{5}{3}+\frac{m}{2},\cos\right.\right.}{d(4}$$

```
[In] Integrate[Cos[c + d*x]^m*(b*Cos[c + d*x])^(1/3)*(A + B*Cos[c + d*x]),x]
```

```
[Out] (-3*Cos[c + d*x]^(1 + m)*(b*Cos[c + d*x])^(1/3)*Csc[c + d*x]*(A*(7 + 3*m)*H
ypergeometric2F1[1/2, (4 + 3*m)/6, 5/3 + m/2, Cos[c + d*x]^2] + B*(4 + 3*m)
*Cos[c + d*x]*Hypergeometric2F1[1/2, (7 + 3*m)/6, (13 + 3*m)/6, Cos[c + d*x
]^2])*Sqrt[Sin[c + d*x]^2])/(d*(4 + 3*m)*(7 + 3*m))
```

Maple [F]

$$\int \left(\cos^m(dx+c)\right)\left(\cos(dx+c)\,b\right)^{\frac{1}{3}}\left(A+B\cos(dx+c)\right)dx$$

```
[In] int(cos(d*x+c)^m*(cos(d*x+c)*b)^(1/3)*(A+B*cos(d*x+c)),x)
```

```
[Out] int(cos(d*x+c)^m*(cos(d*x+c)*b)^(1/3)*(A+B*cos(d*x+c)),x)
```

Fricas [F]

$$\int \cos^m(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\int (B\cos(dx+c)+A)(b\cos(dx+c))^{\frac{1}{3}}\cos(dx+c)^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c)),x, algorithm="
fricas")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*cos(d*x + c)^m, x)
```

Sympy [F]

$$\int \cos^m(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\int \sqrt[3]{b\cos{(c+dx)}}(A+B\cos{(c+dx)})\cos^m{(c+dx)}\,dx$$

```
[In] integrate(cos(d*x+c)**m*(b*cos(d*x+c))**(1/3)*(A+B*cos(d*x+c)),x)
[Out] Integral((b*cos(c + d*x))**(1/3)*(A + B*cos(c + d*x))*cos(c + d*x)**m, x)
```

Maxima [F]

$$\int \cos^m(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\int (B\cos{(dx+c)}+A)(b\cos{(dx+c)})^{\frac{1}{3}}\cos{(dx+c)}^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c)),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*cos(d*x + c)^m, x)
```

Giac [F]

$$\int \cos^m(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\int (B\cos{(dx+c)}+A)(b\cos{(dx+c)})^{\frac{1}{3}}\cos{(dx+c)}^m\,dx$$

```
[In] integrate(cos(d*x+c)^m*(b*cos(d*x+c))^(1/3)*(A+B*cos(d*x+c)),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*cos(d*x + c)^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int \cos^m(c+dx)\sqrt[3]{b\cos(c+dx)}(A+B\cos(c+dx))\,dx$$
$$=\int \cos\left(c+d\,x\right)^m\,{\left(b\,\cos\left(c+d\,x\right)\right)}^{1/3}\,\left(A+B\,\cos\left(c+d\,x\right)\right)\,dx$$

```
[In] int(cos(c + d*x)^m*(b*cos(c + d*x))^(1/3)*(A + B*cos(c + d*x)),x)
[Out] int(cos(c + d*x)^m*(b*cos(c + d*x))^(1/3)*(A + B*cos(c + d*x)), x)
```

3.930 $\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{\sqrt[3]{b\cos(c+dx)}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 167

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{\sqrt[3]{b\cos(c+dx)}}\,dx = -\frac{3A\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(2+3m),\frac{1}{6}(8+3m),\cos^2(c+dx)\right)\sin(c+dx)}{d(2+3m)\sqrt[3]{b\cos(c+dx)}\sqrt{\sin^2(c+dx)}} - \frac{3B\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(5+3m),\frac{1}{6}(11+3m),\cos^2(c+dx)\right)\sin(c+dx)}{d(5+3m)\sqrt[3]{b\cos(c+dx)}\sqrt{\sin^2(c+dx)}}$$

```
[Out] -3*A*cos(d*x+c)^(1+m)*hypergeom([1/2, 1/3+1/2*m],[4/3+1/2*m],cos(d*x+c)^2)*
sin(d*x+c)/d/(2+3*m)/(b*cos(d*x+c))^(1/3)/(sin(d*x+c)^2)^(1/2)-3*B*cos(d*x+
c)^(2+m)*hypergeom([1/2, 5/6+1/2*m],[11/6+1/2*m],cos(d*x+c)^2)*sin(d*x+c)/d
/(5+3*m)/(b*cos(d*x+c))^(1/3)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 167, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {20, 2827, 2722}

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{\sqrt[3]{b\cos(c+dx)}}\,dx = -\frac{3A\sin(c+dx)\cos^{m+1}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(3m+2),\frac{1}{6}(3m+8),\cos^2(c+dx)\right)}{d(3m+2)\sqrt{\sin^2(c+dx)}\sqrt[3]{b\cos(c+dx)}} - \frac{3B\sin(c+dx)\cos^{m+2}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(3m+5),\frac{1}{6}(3m+11),\cos^2(c+dx)\right)}{d(3m+5)\sqrt{\sin^2(c+dx)}\sqrt[3]{b\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^m*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(1/3),x]
```

```
[Out] (-3*A*Cos[c + d*x]^(1 + m)*Hypergeometric2F1[1/2, (2 + 3*m)/6, (8 + 3*m)/6,
 Cos[c + d*x]^2]*Sin[c + d*x])/(d*(2 + 3*m)*(b*Cos[c + d*x])^(1/3)*Sqrt[Sin
[c + d*x]^2]) - (3*B*Cos[c + d*x]^(2 + m)*Hypergeometric2F1[1/2, (5 + 3*m)/
6, (11 + 3*m)/6, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(5 + 3*m)*(b*Cos[c + d*x]
)^(1/3)*Sqrt[Sin[c + d*x]^2])
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[b^IntPart[
n]*((b*v)^FracPart[n]/(a^IntPart[n]*(a*v)^FracPart[n])), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt[3]{\cos(c+dx)} \int \cos^{-\frac{1}{3}+m}(c+dx)(A+B\cos(c+dx))\,dx}{\sqrt[3]{b\cos(c+dx)}} \\
&= \frac{\left(A\sqrt[3]{\cos(c+dx)}\right)\int \cos^{-\frac{1}{3}+m}(c+dx)\,dx}{\sqrt[3]{b\cos(c+dx)}} + \frac{\left(B\sqrt[3]{\cos(c+dx)}\right)\int \cos^{\frac{2}{3}+m}(c+dx)\,dx}{\sqrt[3]{b\cos(c+dx)}} \\
&= -\frac{3A\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(2+3m),\frac{1}{6}(8+3m),\cos^2(c+dx)\right)\sin(c+dx)}{d(2+3m)\sqrt[3]{b\cos(c+dx)}\sqrt{\sin^2(c+dx)}} \\
&\quad -\frac{3B\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(5+3m),\frac{1}{6}(11+3m),\cos^2(c+dx)\right)\sin(c+dx)}{d(5+3m)\sqrt[3]{b\cos(c+dx)}\sqrt{\sin^2(c+dx)}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.21 (sec) , antiderivative size = 140, normalized size of antiderivative = 0.84

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{\sqrt[3]{b\cos(c+dx)}}\,dx = -\frac{3\cos^{1+m}(c+dx)\csc(c+dx)\left(A(5+3m)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(2+3m),\frac{1}{6}(8+3m),\cos^2(c+dx)\right)+\right.}{d(2+3m)(5+3m}$$

```
[In] Integrate[(Cos[c + d*x]^m*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(1/3),x]
```

```
[Out] (-3*Cos[c + d*x]^(1 + m)*Csc[c + d*x]*(A*(5 + 3*m)*Hypergeometric2F1[1/2, (
2 + 3*m)/6, (8 + 3*m)/6, Cos[c + d*x]^2] + B*(2 + 3*m)*Cos[c + d*x]*Hyperge
ometric2F1[1/2, (5 + 3*m)/6, (11 + 3*m)/6, Cos[c + d*x]^2])*Sqrt[Sin[c + d*
x]^2])/(d*(2 + 3*m)*(5 + 3*m)*(b*Cos[c + d*x])^(1/3))
```

Maple [F]

$$\int \frac{(\cos^m(dx+c))\,(A+B\cos(dx+c))}{(\cos(dx+c)\,b)^{\frac{1}{3}}}dx$$

```
[In] int(cos(d*x+c)^m*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(1/3),x)
```

```
[Out] int(cos(d*x+c)^m*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(1/3),x)
```

Fricas [F]

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{\sqrt[3]{b\cos(c+dx)}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^m}{(b\cos(dx+c))^{\frac{1}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)^m*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/3),x, algorithm="
fricas")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(2/3)*cos(d*x + c)^m/(b*cos(
d*x + c)), x)
```

Sympy [F]

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{\sqrt[3]{b\cos(c+dx)}}\,dx = \int \frac{(A+B\cos(c+dx))\cos^m(c+dx)}{\sqrt[3]{b\cos(c+dx)}}\,dx$$

```
[In] integrate(cos(d*x+c)**m*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(1/3),x)
[Out] Integral((A + B*cos(c + d*x))*cos(c + d*x)**m/(b*cos(c + d*x))**(1/3), x)
```

Maxima [F]

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{\sqrt[3]{b\cos(c+dx)}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^m}{(b\cos(dx+c))^{\frac{1}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)^m*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/3),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^m/(b*cos(d*x + c))^(1/3), x)
```

Giac [F]

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{\sqrt[3]{b\cos(c+dx)}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^m}{(b\cos(dx+c))^{\frac{1}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)^m*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(1/3),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^m/(b*cos(d*x + c))^(1/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{\sqrt[3]{b\cos(c+dx)}}\,dx = \int \frac{\cos(c+d\,x)^m\,(A+B\,\cos(c+d\,x))}{(b\,\cos(c+d\,x))^{1/3}}\,dx$$

```
[In] int((cos(c + d*x)^m*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(1/3),x)
[Out] int((cos(c + d*x)^m*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(1/3), x)
```

3.931 $\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 167

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = -\frac{3A\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(1+3m),\frac{1}{6}(7+3m),\cos^2(c+dx)\right)\sin(c+dx)}{d(1+3m)(b\cos(c+dx))^{2/3}\sqrt{\sin^2(c+dx)}} - \frac{3B\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(4+3m),\frac{1}{6}(10+3m),\cos^2(c+dx)\right)\sin(c+dx)}{d(4+3m)(b\cos(c+dx))^{2/3}\sqrt{\sin^2(c+dx)}}$$

```
[Out] -3*A*cos(d*x+c)^(1+m)*hypergeom([1/2, 1/6+1/2*m],[7/6+1/2*m],cos(d*x+c)^2)*
sin(d*x+c)/d/(1+3*m)/(b*cos(d*x+c))^(2/3)/(sin(d*x+c)^2)^(1/2)-3*B*cos(d*x+
c)^(2+m)*hypergeom([1/2, 2/3+1/2*m],[5/3+1/2*m],cos(d*x+c)^2)*sin(d*x+c)/d/
(4+3*m)/(b*cos(d*x+c))^(2/3)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 167, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {20, 2827, 2722}

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = -\frac{3A\sin(c+dx)\cos^{m+1}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(3m+1),\frac{1}{6}(3m+7),\cos^2(c+dx)\right)}{d(3m+1)\sqrt{\sin^2(c+dx)}(b\cos(c+dx))^{2/3}} - \frac{3B\sin(c+dx)\cos^{m+2}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(3m+4),\frac{1}{6}(3m+10),\cos^2(c+dx)\right)}{d(3m+4)\sqrt{\sin^2(c+dx)}(b\cos(c+dx))^{2/3}}$$

```
[In] Int[(Cos[c + d*x]^m*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(2/3),x]
```

```
[Out] (-3*A*Cos[c + d*x]^(1 + m)*Hypergeometric2F1[1/2, (1 + 3*m)/6, (7 + 3*m)/6,
 Cos[c + d*x]^2]*Sin[c + d*x])/(d*(1 + 3*m)*(b*Cos[c + d*x])^(2/3)*Sqrt[Sin
[c + d*x]^2]) - (3*B*Cos[c + d*x]^(2 + m)*Hypergeometric2F1[1/2, (4 + 3*m)/
6, (10 + 3*m)/6, Cos[c + d*x]^2]*Sin[c + d*x])/(d*(4 + 3*m)*(b*Cos[c + d*x]
)^(2/3)*Sqrt[Sin[c + d*x]^2])
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[b^IntPart[
n]*((b*v)^FracPart[n]/(a^IntPart[n]*(a*v)^FracPart[n])), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !
IntegerQ[m + n]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\cos^{\frac{2}{3}}(c+dx)\int\cos^{-\frac{2}{3}+m}(c+dx)(A+B\cos(c+dx))\,dx}{(b\cos(c+dx))^{2/3}}\\
&= \frac{\left(A\cos^{\frac{2}{3}}(c+dx)\right)\int\cos^{-\frac{2}{3}+m}(c+dx)\,dx}{(b\cos(c+dx))^{2/3}}+\frac{\left(B\cos^{\frac{2}{3}}(c+dx)\right)\int\cos^{\frac{1}{3}+m}(c+dx)\,dx}{(b\cos(c+dx))^{2/3}}\\
&= -\frac{3A\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(1+3m),\frac{1}{6}(7+3m),\cos^2(c+dx)\right)\sin(c+dx)}{d(1+3m)(b\cos(c+dx))^{2/3}\sqrt{\sin^2(c+dx)}}\\
&\quad-\frac{3B\cos^{2+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(4+3m),\frac{1}{6}(10+3m),\cos^2(c+dx)\right)\sin(c+dx)}{d(4+3m)(b\cos(c+dx))^{2/3}\sqrt{\sin^2(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 140, normalized size of antiderivative = 0.84

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx =$$
$$-\frac{3\cos^{1+m}(c+dx)\csc(c+dx)\left(A(4+3m)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(1+3m),\frac{1}{6}(7+3m),\cos^2(c+dx)\right)+B \cdots\right.}{d(1+3m)(4+3m)(b\cos \cdots}$$

```
[In] Integrate[(Cos[c + d*x]^m*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(2/3),x]
```

```
[Out] (-3*Cos[c + d*x]^(1 + m)*Csc[c + d*x]*(A*(4 + 3*m)*Hypergeometric2F1[1/2, (
1 + 3*m)/6, (7 + 3*m)/6, Cos[c + d*x]^2] + B*(1 + 3*m)*Cos[c + d*x]*Hyperge
ometric2F1[1/2, (4 + 3*m)/6, 5/3 + m/2, Cos[c + d*x]^2])*Sqrt[Sin[c + d*x]^
2])/(d*(1 + 3*m)*(4 + 3*m)*(b*Cos[c + d*x])^(2/3))
```

Maple [F]

$$\int \frac{(\cos^m(dx+c))\,(A+B\cos(dx+c))}{(\cos(dx+c)\,b)^{\frac{2}{3}}}dx$$

```
[In] int(cos(d*x+c)^m*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(2/3),x)
```

```
[Out] int(cos(d*x+c)^m*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(2/3),x)
```

Fricas [F]

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^m}{(b\cos(dx+c))^{\frac{2}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)^m*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(2/3),x, algorithm="
fricas")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(1/3)*cos(d*x + c)^m/(b*cos(
d*x + c)), x)
```

Sympy [F]

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{(A+B\cos(c+dx))\cos^m(c+dx)}{(b\cos(c+dx))^{\frac{2}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)**m*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(2/3),x)
[Out] Integral((A + B*cos(c + d*x))*cos(c + d*x)**m/(b*cos(c + d*x))**(2/3), x)
```

Maxima [F]

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^m}{(b\cos(dx+c))^{\frac{2}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)^m*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(2/3),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^m/(b*cos(d*x + c))^(2/3), x)
```

Giac [F]

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^m}{(b\cos(dx+c))^{\frac{2}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)^m*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(2/3),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^m/(b*cos(d*x + c))^(2/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx = \int \frac{\cos(c+dx)^m\,(A+B\cos(c+dx))}{(b\cos(c+dx))^{2/3}}\,dx$$

```
[In] int((cos(c + d*x)^m*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(2/3),x)
[Out] int((cos(c + d*x)^m*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(2/3), x)
```

3.932 $\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 171

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = \frac{3A\cos^m(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(-1+3m),\frac{1}{6}(5+3m),c\right.}{bd(1-3m)\sqrt[3]{b\cos(c+dx)}\sqrt{\sin^2(c+dx)}} - \frac{3B\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(2+3m),\frac{1}{6}(8+3m),\cos^2(c+dx)\right)\sin(c+dx)}{bd(2+3m)\sqrt[3]{b\cos(c+dx)}\sqrt{\sin^2(c+dx)}}$$

```
[Out] 3*A*cos(d*x+c)^m*hypergeom([1/2, -1/6+1/2*m],[5/6+1/2*m],cos(d*x+c)^2)*sin(
d*x+c)/b/d/(1-3*m)/(b*cos(d*x+c))^(1/3)/(sin(d*x+c)^2)^(1/2)-3*B*cos(d*x+c)
^(1+m)*hypergeom([1/2, 1/3+1/2*m],[4/3+1/2*m],cos(d*x+c)^2)*sin(d*x+c)/b/d/
(2+3*m)/(b*cos(d*x+c))^(1/3)/(sin(d*x+c)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 171, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {20, 2827, 2722}

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = \frac{3A\sin(c+dx)\cos^m(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(3m-1),\frac{1}{6}(\right.}{bd(1-3m)\sqrt{\sin^2(c+dx)}\sqrt[3]{b\cos(c+dx)}} - \frac{3B\sin(c+dx)\cos^{m+1}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(3m+2),\frac{1}{6}(3m+8),\cos^2(c+dx)\right)}{bd(3m+2)\sqrt{\sin^2(c+dx)}\sqrt[3]{b\cos(c+dx)}}$$

```
[In] Int[(Cos[c + d*x]^m*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(4/3),x]
```

```
[Out] (3*A*Cos[c + d*x]^m*Hypergeometric2F1[1/2, (-1 + 3*m)/6, (5 + 3*m)/6, Cos[c
 + d*x]^2]*Sin[c + d*x])/(b*d*(1 - 3*m)*(b*Cos[c + d*x])^(1/3)*Sqrt[Sin[c +
```

```
 d*x]^2]) - (3*B*Cos[c + d*x]^(1 + m)*Hypergeometric2F1[1/2, (2 + 3*m)/6, (
8 + 3*m)/6, Cos[c + d*x]^2]*Sin[c + d*x])/(b*d*(2 + 3*m)*(b*Cos[c + d*x])^(
1/3)*Sqrt[Sin[c + d*x]^2])
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[b^IntPart[
n]*((b*v)^FracPart[n]/(a^IntPart[n]*(a*v)^FracPart[n])), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 2722

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[Cos[c + d*x]*((
b*Sin[c + d*x])^(n + 1)/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]))*Hypergeometric2
F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c + d*x]^2], x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 2827

```
Int[((b_.)*sin[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*sin[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[c, Int[(b*Sin[e + f*x])^m, x], x] + Dist[d/b, Int[(
b*Sin[e + f*x])^(m + 1), x], x] /; FreeQ[{b, c, d, e, f, m}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt[3]{\cos(c+dx)}\int \cos^{-\frac{4}{3}+m}(c+dx)(A+B\cos(c+dx))\,dx}{b\sqrt[3]{b\cos(c+dx)}}\\
&= \frac{\left(A\sqrt[3]{\cos(c+dx)}\right)\int \cos^{-\frac{4}{3}+m}(c+dx)\,dx}{b\sqrt[3]{b\cos(c+dx)}}+\frac{\left(B\sqrt[3]{\cos(c+dx)}\right)\int \cos^{-\frac{1}{3}+m}(c+dx)\,dx}{b\sqrt[3]{b\cos(c+dx)}}\\
&= \frac{3A\cos^{m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(-1+3m),\frac{1}{6}(5+3m),\cos^2(c+dx)\right)\sin(c+dx)}{bd(1-3m)\sqrt[3]{b\cos(c+dx)}\sqrt{\sin^2(c+dx)}}\\
&\quad-\frac{3B\cos^{1+m}(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(2+3m),\frac{1}{6}(8+3m),\cos^2(c+dx)\right)\sin(c+dx)}{bd(2+3m)\sqrt[3]{b\cos(c+dx)}\sqrt{\sin^2(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 140, normalized size of antiderivative = 0.82

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx =$$
$$-\frac{3\cos^{1+m}(c+dx)\csc(c+dx)\left(A(2+3m)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{6}(-1+3m),\frac{1}{6}(5+3m),\cos^2(c+dx)\right)+\right.}{d(-1+3m)(2+3m)}$$

```
[In] Integrate[(Cos[c + d*x]^m*(A + B*Cos[c + d*x]))/(b*Cos[c + d*x])^(4/3),x]
```

```
[Out] (-3*Cos[c + d*x]^(1 + m)*Csc[c + d*x]*(A*(2 + 3*m)*Hypergeometric2F1[1/2, (
-1 + 3*m)/6, (5 + 3*m)/6, Cos[c + d*x]^2] + B*(-1 + 3*m)*Cos[c + d*x]*Hyper
geometric2F1[1/2, (2 + 3*m)/6, (8 + 3*m)/6, Cos[c + d*x]^2])*Sqrt[Sin[c + d
*x]^2])/(d*(-1 + 3*m)*(2 + 3*m)*(b*Cos[c + d*x])^(4/3))
```

Maple [F]

$$\int \frac{(\cos^m(dx+c))\,(A+B\cos(dx+c))}{(\cos(dx+c)\,b)^{\frac{4}{3}}}dx$$

```
[In] int(cos(d*x+c)^m*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(4/3),x)
```

```
[Out] int(cos(d*x+c)^m*(A+B*cos(d*x+c))/(cos(d*x+c)*b)^(4/3),x)
```

Fricas [F]

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^m}{(b\cos(dx+c))^{\frac{4}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)^m*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(4/3),x, algorithm="
fricas")
```

```
[Out] integral((B*cos(d*x + c) + A)*(b*cos(d*x + c))^(2/3)*cos(d*x + c)^m/(b^2*co
s(d*x + c)^2), x)
```

Sympy [F]

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{(A+B\cos(c+dx))\cos^m(c+dx)}{(b\cos(c+dx))^{\frac{4}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)**m*(A+B*cos(d*x+c))/(b*cos(d*x+c))**(4/3),x)
[Out] Integral((A + B*cos(c + d*x))*cos(c + d*x)**m/(b*cos(c + d*x))**(4/3), x)
```

Maxima [F]

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^m}{(b\cos(dx+c))^{\frac{4}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)^m*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(4/3),x, algorithm="
maxima")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^m/(b*cos(d*x + c))^(4/3), x)
```

Giac [F]

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{(B\cos(dx+c)+A)\cos(dx+c)^m}{(b\cos(dx+c))^{\frac{4}{3}}}\,dx$$

```
[In] integrate(cos(d*x+c)^m*(A+B*cos(d*x+c))/(b*cos(d*x+c))^(4/3),x, algorithm="
giac")
[Out] integrate((B*cos(d*x + c) + A)*cos(d*x + c)^m/(b*cos(d*x + c))^(4/3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\cos^m(c+dx)(A+B\cos(c+dx))}{(b\cos(c+dx))^{4/3}}\,dx = \int \frac{\cos(c+d\,x)^m\,(A+B\,\cos(c+d\,x))}{(b\,\cos(c+d\,x))^{4/3}}\,dx$$

```
[In] int((cos(c + d*x)^m*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(4/3),x)
[Out] int((cos(c + d*x)^m*(A + B*cos(c + d*x)))/(b*cos(c + d*x))^(4/3), x)
```

CHAPTER 4

APPENDIX

4.1 Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

Mathematica and Rubi grading function

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)

(* Nasser: April 7,2022. add second output which gives reason for the grade *)
(*                        Small rewrite of logic in main function to make it*)
(*                        match Maple's logic. No change in functionality otherwise*)

(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)


(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
```

```
(*          GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)


GradeAntiderivative[result_,optimal_] := Module[{expnResult,expnOptimal,leafCountResult,leafCou
    expnResult  = ExpnType[result];
    expnOptimal = ExpnType[optimal];
    leafCountResult = LeafCount[result];
    leafCountOptimal = LeafCount[optimal];

    (*Print["expnResult=",expnResult," expnOptimal=",expnOptimal];*)
    If[expnResult<=expnOptimal,
        If[Not[FreeQ[result,Complex]], (*result contains complex*)
            If[Not[FreeQ[optimal,Complex]], (*optimal contains complex*)
                If[leafCountResult<=2*leafCountOptimal,
                    finalresult={"A",""}
                    ,(*ELSE*)
                    finalresult={"B","Both result and optimal contain complex but leaf count is
                  ]
            ,(*ELSE*)
                finalresult={"C","Result contains complex when optimal does not."}
            ]
        ,(*ELSE*)(*result does not contains complex*)
            If[leafCountResult<=2*leafCountOptimal,
               finalresult={"A",""}
            ,(*ELSE*)
               finalresult={"B","Leaf count is larger than twice the leaf count of optimal. $"<
              ]
        ]
    ,(*ELSE*) (*expnResult>expnOptimal*)
        If[FreeQ[result,Integrate] && FreeQ[result,Int],
            finalresult={"C","Result contains higher order function than in optimal. Order "<>T
            ,
            finalresult={"F","Contains unresolved integral."}
        ]
    ];

    finalresult
]

(* ::Text:: *)
(*The following summarizes the type number assigned an *)
```

```
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
(*9 = unknown function*)


ExpnType[expn_] :=
  If[AtomQ[expn],
    1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
        1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]


ElementaryFunctionQ[func_] :=
  MemberQ[{
  Exp,Log,
  Sin,Cos,Tan,Cot,Sec,Csc,
  ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
```

```
  Sinh,Cosh,Tanh,Coth,Sech,Csch,
  ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]


SpecialFunctionQ[func_] :=
  MemberQ[{
  Erf, Erfc, Erfi,
  FresnelS, FresnelC,
  ExpIntegralE, ExpIntegralEi, LogIntegral,
  SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
  Gamma, LogGamma, PolyGamma,
  Zeta, PolyLog, ProductLog,
  EllipticF, EllipticE, EllipticPi
},func]


HypergeometricFunctionQ[func_] :=
  MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]


AppellFunctionQ[func_] :=
  MemberQ[{AppellF1},func]
```

Maple grading function

```
# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems
#Nasser 4/07/2022   add second output which gives reason for the grade

GradeAntiderivative := proc(result,optimal)
local leaf_count_result,
        leaf_count_optimal,
        ExpnType_result,
        ExpnType_optimal,
        debug:=false;

        leaf_count_result:=leafcount(result);
```

```
        #do NOT call ExpnType() if leaf size is too large. Recursion problem
        if leaf_count_result > 500000 then
            return "B","result has leaf size over 500,000. Avoiding possible recursion issues
        fi;

        leaf_count_optimal := leafcount(optimal);
        ExpnType_result  := ExpnType(result);
        ExpnType_optimal := ExpnType(optimal);

        if debug then
            print("ExpnType_result",ExpnType_result," ExpnType_optimal=",ExpnType_optimal);
        fi;

# If result and optimal are mathematical expressions,
#  GradeAntiderivative[result,optimal] returns
#   "F" if the result fails to integrate an expression that
#       is integrable
#   "C" if result involves higher level functions than necessary
#   "B" if result is more than twice the size of the optimal
#       antiderivative
#   "A" if result can be considered optimal

    #This check below actually is not needed, since I only
    #call this grading only for passed integrals. i.e. I check
    #for "F" before calling this. But no harm of keeping it here.
    #just in case.


    if not type(result,freeof('int')) then
        return "F","Result contains unresolved integral";
    fi;


    if ExpnType_result<=ExpnType_optimal then
        if debug then
             print("ExpnType_result<=ExpnType_optimal");
        fi;
        if is_contains_complex(result) then
            if is_contains_complex(optimal) then
                if debug then
                        print("both result and optimal complex");
                fi;
                if leaf_count_result<=2*leaf_count_optimal then
                    return "A"," ";
                else
                   return "B",cat("Both result and optimal contain complex but leaf count of
                                convert(leaf_count_result,string)," vs. $2 (",
```

```
                                   convert(leaf_count_optimal,string)," ) = ",convert(2*leaf_co
                end if
            else #result contains complex but optimal is not
                if debug then
                        print("result contains complex but optimal is not");
                fi;
                return "C","Result contains complex when optimal does not.";
            fi;
        else # result do not contain complex
             # this assumes optimal do not as well. No check is needed here.
            if debug then
                   print("result do not contain complex, this assumes optimal do not as well")
            fi;
            if leaf_count_result<=2*leaf_count_optimal then
                if debug then
                    print("leaf_count_result<=2*leaf_count_optimal");
                fi;
                return "A"," ";
            else
                if debug then
                    print("leaf_count_result>2*leaf_count_optimal");
                fi;
                return "B",cat("Leaf count of result is larger than twice the leaf count of opt
                                   convert(leaf_count_result,string),"$ vs. $2(",
                                   convert(leaf_count_optimal,string),")=",convert(2*leaf_coun
            fi;
        fi;
    else #ExpnType(result) > ExpnType(optimal)
        if debug then
            print("ExpnType(result) > ExpnType(optimal)");
        fi;
        return "C",cat("Result contains higher order function than in optimal. Order ",
                       convert(ExpnType_result,string)," vs. order ",
                       convert(ExpnType_optimal,string),".");
    fi;

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
#
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:
```

```
# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
# 6 = appell function
# 7 = rootsum function
# 8 = integrate function
# 9 = unknown function

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
       1
    else
       max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
         1
      else
         max(2,ExpnType(op(1,expn)))
      end if
    else
         max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
```

```
  9
  end if
end proc:


ElementaryFunctionQ := proc(func)
  member(func,[
        exp,log,ln,
        sin,cos,tan,cot,sec,csc,
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
        erf,erfc,erfi,
        FresnelS,FresnelC,
        Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:

AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
     op(2,u)
  else
     apply(op(0,u),op(2..nops(u),u))
  end if
end proc:

#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```

Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#              Port of original Maple grading function by
#              Albert Rich to use with Sympy/Python
#Dec 27, 2019  Nasser. Added `RootSum`. See problem 177, Timofeev file
#              added 'exp_polar'
from sympy import *

def leaf_count(expr):
   #sympy do not have leaf count function. This is approximation
   return round(1.7*count_ops(expr))

def is_sqrt(expr):
   if isinstance(expr,Pow):
      if expr.args[1] == Rational(1,2):
         return True
      else:
         return False
   else:
      return False

def is_elementary_function(func):
   return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
         asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
         asinh,acosh,atanh,acoth,asech,acsch
      ]

def is_special_function(func):
   return func in [ erf,erfc,erfi,
          fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
          gamma,loggamma,digamma,zeta,polylog,LambertW,
          elliptic_f,elliptic_e,elliptic_pi,exp_polar
       ]

def is_hypergeometric_function(func):
   return func in [hyper]

def is_appell_function(func):
   return func in [appellf1]

def is_atom(expn):
   try:
      if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
        return True
      else:
        return False
```

```
    except AttributeError as error:
        return False

def expnType(expn):
    debug=False
    if debug:
        print("expn=",expn,"type(expn)=",type(expn))

    if is_atom(expn):
       return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn))    #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow):   #type(expn,'`^`')
        if isinstance(expn.args[1],Integer):  #type(op(2,expn),'integer')
            return expnType(expn.args[0])    #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational):  #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
        else:
            return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,ExpnType(op(1,expn)),ExpnTy
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or type(expn,'`*`')
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):  #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))  #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)    #max(4,apply(max,map(ExpnType,[op(expn)])))
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(5,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
```

```
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    #print ("Enter grade_antiderivative for sagemath")
    #print("Enter grade_antiderivative, result=",result," optimal=",optimal)

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    #print("leaf_count_result=",leaf_count_result)
    #print("leaf_count_optimal=",leaf_count_optimal)

    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        grade = "F"
        grade_annotation =""
    else:
        if expnType_result <= expnType_optimal:
            if result.has(I):
                if optimal.has(I): #both result and optimal complex
                    if leaf_count_result <= 2*leaf_count_optimal:
                        grade = "A"
                        grade_annotation =""
                    else:
                        grade = "B"
                        grade_annotation ="Both result and optimal contain complex but leaf count of result is larg
                else: #result contains complex but optimal is not
                    grade = "C"
                    grade_annotation ="Result contains complex when optimal does not."
            else: # result do not contain complex, this assumes optimal do not as well
                if leaf_count_result <= 2*leaf_count_optimal:
                    grade = "A"
                    grade_annotation =""
                else:
                    grade = "B"
                    grade_annotation ="Leaf count of result is larger than twice the leaf count of optimal. "+str(le
        else:
            grade = "C"
            grade_annotation ="Result contains higher order function than in optimal. Order "+str(ExpnType_
```

```
    #print("Before returning. grade=",grade, " grade_annotation=",grade_annotation)

    return grade, grade_annotation
```

SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
#             Albert Rich to use with Sagemath. This is used to
#             grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#             'arctan2','floor','abs','log_integral'
#June 4, 2022  Made default grade_annotation "none" instead of "" due
#             issue later when reading the file.
#July 14, 2022. Added ellipticF. This is until they fix sagemath, then remove it.

from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

debug=False;

def tree_size(expr):
    r"""
    Return the tree size of this expression.
    """
    #print("Enter tree_size, expr is ",expr)

    if expr not in SR:
        # deal with lists, tuples, vectors
        return 1 + sum(tree_size(a) for a in expr)
    expr = SR(expr)
    x, aa = expr.operator(), expr.operands()
    if x is None:
        return 1
    else:
        return 1 + sum(tree_size(a) for a in aa)

def is_sqrt(expr):
    if expr.operator() == operator.pow:   #isinstance(expr,Pow):
        if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
            if debug: print ("expr is sqrt")
            return True
        else:
            return False
    else:
        return False
```

```
def is_elementary_function(func):
    #debug=False
    m = func.name() in ['exp','log','ln',
            'sin','cos','tan','cot','sec','csc',
            'arcsin','arccos','arctan','arccot','arcsec','arccsc',
            'sinh','cosh','tanh','coth','sech','csch',
            'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
        'arctan2','floor','abs'
        ]
    if debug:
        if m:
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    #debug=False
    if debug:
        print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
          'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','sinh_integral'
          'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
          'polylog','lambert_w','elliptic_f','elliptic_e','ellipticF',
          'elliptic_pi','exp_integral_e','log_integral']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m


def is_hypergeometric_function(func):
    return func.name() in ['hypergeometric','hypergeometric_M','hypergeometric_U']

def is_appell_function(func):
    return func.name() in ['hypergeometric']    #[appellf1] can't find this in sagemath
```

```
def is_atom(expn):

   #debug=False
   if debug:
       print ("Enter is_atom, expn=",expn)

   if not hasattr(expn, 'parent'):
      return False


   #thanks to answer at https://ask.sagemath.org/question/49179/what-is-sagemath-equivalent-to-atomic-t
   try:
      if expn.parent() is SR:
         return expn.operator() is None
      if expn.parent() in (ZZ, QQ, AA, QQbar):
         return expn in expn.parent() # Should always return True
      if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens"):
         return expn in expn.parent().base_ring() or expn in expn.parent().gens()

      return False

   except AttributeError as error:
      print("Exception,AttributeError in  is_atom")
      print ("cought exception" , type(error).__name__ )
      return False


def expnType(expn):

   if debug:
      print (">>>>>Enter expnType, expn=", expn)
      print (">>>>>is_atom(expn)=", is_atom(expn))

   if is_atom(expn):
      return 1
   elif type(expn)==list:   #isinstance(expn,list):
      return max(map(expnType, expn))    #apply(max,map(ExpnType,expn))
   elif  is_sqrt(expn):
      if  type(expn.operands()[0])==Rational:  #type(isinstance(expn.args[0],Rational):
         return 1
      else:
         return max(2,expnType(expn.operands()[0]))   #max(2,expnType(expn.args[0]))
   elif expn.operator() == operator.pow:    #isinstance(expn,Pow)
      if type(expn.operands()[1])==Integer:   #isinstance(expn.args[1],Integer)
         return expnType(expn.operands()[0])    #expnType(expn.args[0])
      elif type(expn.operands()[1])==Rational:   #isinstance(expn.args[1],Rational)
         if type(expn.operands()[0])==Rational:  #isinstance(expn.args[0],Rational)
```

```
            return 1
        else:
            return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.args[0]))
    else:
        return max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1])) #max(3,expnType(expn.
elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #isinstance(expn,Add) or isinst
    m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
    m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
    return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
elif is_elementary_function(expn.operator()):  #is_elementary_function(expn.func)
    return max(3,expnType(expn.operands()[0]))
elif is_special_function(expn.operator()): #is_special_function(expn.func)
    m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(expn.args)))
    return max(4,m1)   #max(4,m1)
elif is_hypergeometric_function(expn.operator()): #is_hypergeometric_function(expn.func)
    m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(expn.args)))
    return max(5,m1)   #max(5,m1)
elif is_appell_function(expn.operator()):
    m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(expn.args)))
    return max(6,m1)   #max(6,m1)
elif str(expn).find("Integral") != -1: #this will never happen, since it
        #is checked before calling the grading function that is passed.
        #but kept it here.
    m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(expn.args)))
    return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
else:
    return 9

#main function
def grade_antiderivative(result,optimal):


    if debug:
        print ("Enter grade_antiderivative for sagemath")
        print("Enter grade_antiderivative, result=",result)
        print("Enter grade_antiderivative, optimal=",optimal)
        print("type(anti)=",type(result))
        print("type(optimal)=",type(optimal))

    leaf_count_result  = tree_size(result) #leaf_count(result)
    leaf_count_optimal = tree_size(optimal) #leaf_count(optimal)

    #if debug: print ("leaf_count_result=", leaf_count_result, "leaf_count_optimal=",leaf_count_optimal)


    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)
```

```
if debug: print ("expnType_result=", expnType_result, "expnType_optimal=",expnType_optimal)

if expnType_result <= expnType_optimal:
    if result.has(I):
        if optimal.has(I): #both result and optimal complex
            if leaf_count_result <= 2*leaf_count_optimal:
                grade = "A"
                grade_annotation ="none"
            else:
                grade = "B"
                grade_annotation ="Both result and optimal contain complex but leaf count of result is larger th
        else: #result contains complex but optimal is not
            grade = "C"
            grade_annotation ="Result contains complex when optimal does not."
    else: # result do not contain complex, this assumes optimal do not as well
        if leaf_count_result <= 2*leaf_count_optimal:
            grade = "A"
            grade_annotation ="none"
        else:
            grade = "B"
            grade_annotation ="Leaf count of result is larger than twice the leaf count of optimal. "+str(leaf_c
else:
    grade = "C"
    grade_annotation ="Result contains higher order function than in optimal. Order "+str(expnType_resul


print("Before returning. grade=",grade, " grade_annotation=",grade_annotation)

return grade, grade_annotation
```